Cessna
A Textron Company

Maintenance Manual

MODEL 206/T206 SERIES 1998 AND ON

Member of GAMA

206HMM13

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REVISION 13 1 JULY 2007

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LIST OF MANUFACTURERS TECHNICAL PUBLICATIONS

1. List of Manufacturers Technical Publications

A. Outlined below is a list of manufacturers publications.

CHAPTER 22 - AUTOFLIGHT

Item	Cessna Part Number	Manufacturers Part Number	Publication Part Number	Publication Title	Manufacturer
GFC-700 Autopilot			190-00352-00	G1000 Line Maintenance Manual	Garmin USA 1200 East 151st Street Olathe, KS 66062
Autopilot Servo		GSA 8X/GSM 85	190-00303-72	Installation Manual	Garmin International, Inc. 1200 E. 151st Street Olathe, Kansas 66062
Auto pilot		KAP140	006-00991-0002	KAP 140 Installation Manual	Allied Signal 101 N. Industrial Parkway New Century, KS 66031

CHAPTER 23 - COMMUNICATIONS

Item	Cessna Part Number	Manufacturers Part Number	Publication Part Number	Publication Title	Manufacturer
Nav-Com		KX155A	006-10542-0000	Nav/Com Installation Manual	Allied Signal
Audio Amplifier/ Intercom/ Marker Beacon Receiver		KMA 26	006-10511-0000	Installation Manual	Allied Signal

CHAPTER 24 - ELECTRICAL POWER

Item	Cessna Part Number	Manufacturers Part Number	Publication Part Number	Publication Title	Manufacturer
Standby Battery		AVT-200413		Cyclon Selection Guide (Third Edition) (NOTE 1)	AVT Inc. DBA Electritek - AVT 400 East Mineral Avenue Littleton, CO 80122-2604 Hawker 617 North Ridgeview Drive Warrensburg, MO 64093-9301
Alternator	9910591-12	ASG10001-12		Overhaul and Repair Manual	Aero Electric, Inc. 3414 W. 29th St. Wichita, KS 67217

NOTE 1: The power cells inside the Standby Battery are manufactured by Hawker and the manufacturer publication that is shown above is from Hawker. AVT is the supplier of the Standby Battery pack as installed in the airplane. The data shown in the Hawker manual is informational only. Maintenance procedures for the Standby Battery given in Chapter 24, Standby Battery - Maintenance Practices must be followed.

CHAPTER 25 - EQUIPMENT FURNISHING

Item	Cessna Part Number	Manufacturers Part Number	Publication Part Number	Publication Title	Manufacturer
Air Bag Assembly		7035-1-0118105 (Co-Pilot Seat) 7035-1-0218105 (Pilot Seat) 7035-3-011-8105 (RH Center Seat) 7035-3-021-8105 (LH Center Seat) 7035-2-0118105 (LH Rear Seat) 7035-2-0218105 (RH Rear Seat)	E508804	Supplemental Maintenance Manual	AmSafe Aviation 5456 E. McDowell Rd. Mesa, AZ 85215 www.amsafe.com

CHAPTER 25 - EQUIPMENT FURNISHING

Item	Cessna Part Number	Manufacturers Part Number	Publication Part Number	Publication Title	Manufacturer
Inflation Assembly		508792-401 (Co-Pilot Seat)	E508804	Supplemental Maintenance Manual	AmSafe Aviation
		508794-401 (Pilot Seat)			
Electronics Module Assembly		508358-409	E508804	Supplemental Maintenance Manual	AmSafe Aviation
Three-Point Air Bag Belt		7035-2030118105 (Co-Pilot Seat)	E508804	Supplemental Maintenance Manual	AmSafe Aviation
		7035-2040218105 (Pilot Seat)			
		7035-20703118105 (RH Center Seat)			
		7035-20803218105 (LH Center Seat)			
		7035-2050218105 (LH Rear Seat)			
		7035-2060218105 (RH Rear Seat)			
V23 System Diagnostic Tool		508668-201	E508804	Supplemental Maintenance Manual	AmSafe Aviation

CHAPTER 26 - FIRE PROTECTION

Item	Cessna Part Number	Manufacturers Part Numbre	Publication Part Number	Publication Title	Manufacturer
Fire Extinguisher		A352 GS		Hand Portable Halon 1211 Fire Extinguisher Maintenance Manual	Amerex Corp. P.O. Box 81 Trussville, AL 35173-0081

CHAPTER 30 - ICE AND RAIN EQUIPMENT

Item	Cessna Part Number	Manufacturers Part Number	Publication Part Number	Publication Title	Manufacturer
Propeller De-Ice System		None	830415	McCauley Electrothermal De-Ice Systems Service, Parts and Installation Manual	McCauley Propeller Systems 3535 McCauley Drive Vandalia, OH 45377

CHAPTER 32 - LANDING GEAR

Item	Cessna Part Number	Manufacturers Part Number	Publication Part Number	Publication Title	Manufacturre
Cleveland Wheels and Brakes		None		Component Maintenance Manual	Cleveland Wheels and Brakes/ Parker Aerospace Parker Hannifin Corporation 1160 Center Road Avon, OH 44011

CHAPTER 34 - NAVIGATION

Item	Cessna Part Number	Manufacturers Part Number	Publication Part Number	Publication Title	Manufacturer
Blind Encoder		SSD120-20	M881000D	Altitude Encoder/ Digitizer Owner/ Installation Manual	Trans-Cal Industries, Inc. 16141 Cohasset St. Van Nuys, CA 91406
Automatic Direction Finder		KR87	006-00184-0005	Installation Manual	Allied Signal
Global Positioning System		KLN89/89B	006-10522-0001	Installation Manual	Allied Signal
Autopilot		KAP 140	006-00991-0000	Installation Manual	Allied Signal
Nav Indicators		KI209A	006-10543-0000	Installation Manual	Allied Signal

CHAPTER 34 - NAVIGATION

Item	Cessna Part Number	Manufacturers Part Number	Publication Part Number	Publication Title	Manufacturer
Nav Indicators		KI208/209	006-0140-0003	Installation Manual	Allied Signal
GDC 74 Air Data Unit				G1000 Line Maintenance Manual	Garmin USA 1200 East 151st Street Olathe, KS 66062
GIA 63 Integrated Avionics Unit				G1000 Line Maintenance Manual	Garmin USA
GMU 44 Magnetometer				G1000 Line Maintenance Manual	Garmin USA
GRS 77 AHRS				G1000 Line Maintenance Manual	Garmin USA
GTX 33 Transponder				G1000 Line Maintenance Manual	Garmin USA
GDU 1040 (PFD/MFD)				G1000 Line Maintenance Manual	Garmin USA
GMA 1347 Audio Panel				G1000 Line Maintenance Manual	Garmin USA

CHAPTER 71 - POWERPLANT

Item	Cessna Part Number	Manufacturers Part Number	Publication Part Number	Publication Title	Manufacturer
Engine (206)		IO-540-AC1A5		Operator's Manual Textron Lycoming Aircraft Engines	Textron Lycoming 652 Oliver Street Williamsport, PA 17701
Engine (206)		IO-540-AC1A5		Parts Catalog	Textron Lycoming
Engine (206)		IO-540-AC1A5		Direct Drive Engine Overhaul Manual	Textron Lycoming
Engine (T206)		TIO-540-AJ1A		Operator's Manual Textron Lycoming Aircraft Engines	Textron Lycoming
Engine (T206)		TIO-540-AJ1A		Parts Catalog	Textron Lycoming
Engine (T206)		TIO-540-AJ1A		Direct Drive Engine Overhaul Manual	Textron Lycoming

CHAPTER 73 - ENGINE FUEL AND CONTROL

Item	Cessna Part Number	Manufacturers Part Number	Publication Part Number	Publication Title	Manufacturer
Fuel Injection System		RSA-10ED1	15-338D	RSA-5 & RSA-10 Fuel Injection Systems Operation & Service Manual	Precision Airmotive 3220 100th St S.W.#E Everett, WA 98204
Fuel Injection System		RSA-10ED1	15-810B	Troubleshooting Techniques for the Precision Airmotive RSA Fuel Metering System	Precision Airmotive
Fuel Injection System		RSA-10ED1	15-895G	Index of Manuals, Bulletins, and Service Information Letters for Precision Airmotive Fuel Controls	Precision Airmotive

CHAPTER 74 - IGNITION

Item	Cessna Part Number	Manufacturers Part Number	Publication Part Number	Publication Title	Manufacturer
Magneto		6351/6361	L-1363C	4300/6300 Series Magneto Maintenance and Overhaul Manual	Slick Aircraft Products 530 Blackhawk Park Ave. Rockford, IL 61104

SERVICE BULLETIN LIST

Service Bulletin Number	Title	Service Bulletin Date	Manual Incorporation
SB99-71-01 R2	Engine Piston Pin Plug Wear Inspection	7/12/99	9/02/99
SB99-21-01	Fresh Air Vent Replacement	3/12/99	9/02/99
SB99-28-01	Wing Fuel Tank Vent Check Valve Inspection	4/26/99	9/02/99
SB99-34-01 R1	KLN 89B GPS Navigation System Modification	7/12/99	9/02/99
SB99-71-03	Engine Exhaust To Baffle Clearance	8/16/99	9/20/99
SB99-73-03	Engine Fuel Pump Relief Valve Cover Screws Torque Inspection	9/13/99	9/02/99
SB99-71-04	Alternate Air Door Hinge Assembly Inspection/ Replacement	9/13/99	9/02/99
SB99-25-01 R1	Emergency Locator Transmitter (ELT) Operational Test	12/27/99	3/31/00
SB99-71-05	Engine Valve Seat Inspection	10/25/99	3/31/00
SB99-71-06	Engine Exhaust Tailpipe Lanyard Installation And Fuel Flow Transducer Relocation	12/06/99	3/31/00
SB00-24-01	Main Power Junction Box Circuit Breaker Retrofit Kit Installation	3/13/00	3/31/00
SB00-11-02	Pilot's Operating Handbook And Pilot's Checklist Revisions	4/24/00	9/15/00
SB00-22-01	KAP-140 Autopilot Servo Inspection/Modification	2/14/00	9/15/00
SB00-24-02	Electrical Panel Wiring Modifications	6/5/00	9/15/00
SB00-25-01	Engine Winterization Kit Installation	1/31/00	9/15/00
SB00-34-01	Pitot Tube Heater Assembly Insulation Installation	4/10/00	9/15/00
SB00-53-02	Rivet Inspection/Installation	6/12/00	9/15/00
SB00-55-02	Elevator Trim Tab Modification	7/31/00	9/15/00
SB00-61-01	Propeller Governor Control Cable Routing Modification	7/3/00	9/15/00
SB00-73-01 R2	Engine Fuel Injection Lines And Support Clamps Inspection	12/24/01	No Effect
SB00-79-01 R1	Engine Low Oil Pressure Switch Replacement	2/21/00	9/15/00
SB99-24-02	Circuit Panel Assembly Cover Installation	12/27/00	4/18/01
SB99-37-01	Vacuum Hose Modification	12/27/00	4/18/01
SB00-27-02 R1	Aileron Control Cable Quadrant Inspection/ Modification	11/06/00	4/18/01
SB00-32-01	Nose Landing Gear Strut Brace And Drag Link Clearance Inspection	11/20/00	4/18/01

Service Bulletin Number	Title	Service Bulletin Date	Manual Incorporation
SB00-37-01	Vacuum System Air Filter Element Inspection/ Replacement	8/14/00	4/18/01
SB00-55-03	Horizontal Stabilizer Reinforcement Inspection/ Modification	8/28/00	4/18/01
SB01-28-01	Fuel Selector Shaft Assembly Inspection/ Replacement	1/22/01	10/15/01
SB01-11-01	Pilots Operating Handbook Revision	2/05/01	10/15/01
SB01-73-01 R2	Engine Driven Fuel Pump Inspection	10/17/05	10/15/01
SB01-11-03	Airplane Weight, Balance And Installed Equipment Data Sheet Revision	6/25/01	10/15/01
SB01-11-04	Pilot's Operating Handbook And Pilot's Checklist Revisions	7/23/01	No Effect
SB01-74-01	Ignition Switch Center Ground Terminal Inspection	6/25/01	10/15/01
SB01-25-01	Glareshield Shroud Installation	12/24/01	No Effect
SB01-28-05	Fuel Line Inspection	12/24/01	No Effect
SB01-73-02	Engine Driven Fuel Pump Relief Valve Housing Replacement	9/1701	No Effect
SB01-71-04	Engine Oil Filler Tube Replacement/Modification	10/29/01	No Effect
SB01-53-02	Battery Box Tray Liner Installation	9/03/02	No Effect
SB02-11-03	Pilot's Operating Handbook And Pilot's Checklist Revisions	5/13/02	No Effect
SB02-11-04	Pilot's Operating Handbook And Pilot's Checklist Revisions	9/13/02	No Effect
SB02-22-01	Honeywell KAP 140 Autopilot System Modification	11/25/02	No Effect
SB02-25-01	Pilot And Copilot Shoulder Harness Guide Removal	8/29/02	No Effect
SB02-34-01	Goodrich WX-500 Weather Mapping Sensor Modification	11/25/02	No Effect
SB02-37-02	Dry Vacuum Pump And Coupling Replacement Requirements	2/18/02	12/02/02
SB02-37-03	Vacuum System Reducer Fitting Replacement	2/18/02	No Effect
SB02-37-04	Airborne Air And Fuel Products Check Valve Manifold Inspection	10/28/02	4/05/04
SB02-52-01	Cabin Door Handle Replacement	1/21/02	No Effect
SB02-71-01	Engine Cylinder Drain Can Installation	8/05/02	---
SB02-71-02	Engine Crankshaft Core Sample Inspection	9/23/02	---
SB02-71-02 R1	Engine Crankshaft Core Sample Inspection	12/23/02	---
SB02-71-03	Engine Crankshaft Gear Retaining Bolt Replacement	10/07/02	---

Service Bulletin Number	Title	Service Bulletin Date	Manual Incorporation
SB02-71-03 R2	Engine Crankshaft Gear Retaining Bolt Replacement	5/10/04	No Effect
SB02-71-05	Engine Oil Pump Plug Inspection	11/29/02	---
SB02-71-05 R1	Engine Oil Pump Plug Inspection	2/03/03	---
SB03-23-01	Honeywell KMA 26 Audio Panel Modification	7/28/03	---
SB03-24-01	Alternator Replacement	7/28/03	---
SB03-24-02	MC01-3A Main Electrical Power Junction Box Modification	10/13/03	No Effect
SB03-27-02	Flap Control Bracket Attach Bolts Replacement	12/22/03	No Effect
SB03-28-01	Fuel Cap Lanyard Removal	10/27/03	1/02/06
SB03-32-01	Nose Landing Gear Wheel Fairing Modification	9/29/03	No Effect
SB03-34-01	Honeywell KS 270C, KS 271C and KS 272C Servo Friction Inspection	10/27/03	No Effect
SB03-34-02 R1	Altimeter Inspection	2/16/04	No Effect
SB03-37-01	Vacuum Manifold Inspection/Replacement	11/10/03	No Effect
SB03-53-02	Bottom Cabin Door Post To Main Landing Gear Spring Inspection	5/26/03	No Effect
SB03-53-02 R1	Bottom Cabin Door Post To Main Landing Gear Spring Inspection	6/23/03	No Effect
SB03-73-01	Throttle Arm Retention Inspection	11/04/03	No Effect
SB04-11-04	Cargo Door Placard Installation Inspection/ Modification	8/30/04	No Effect
SB04-24-01	Alternator Control Unit Inspection/Replacement	11/04/04	No Effect
SB04-25-01 R1	Crew Seat Recline Modification	6/14/04	No Effect
SB04-25-02 R1	Crew Seat Back Cylinder Lock Inspection And Crank Arm Modification	10/17/05	No Effect
SB04-25-04	Crew Seat Back Cylinder Lock Control Inspection/Adjustment	10/11/04	No Effect
SB04-34-01	Marker Beacon Placard Installation	11/22/04	No Effect
SB04-52-01	Security Lock Installation	6/28/04	No Effect
SB04-53-01	Bulkhead Rivet Inspection	3/01/04	No Effect
SB04-53-04	Firewall Sealant Application	12/20/04	1/2/06
SB04-73-01	Engine Fuel Injection Lines And Support Clamps Inspection	8/30/04	No Effect
SB04-73-02	Engine Fuel Manifold Spring Replacement	10/11/04	No Effect
SB05-11-01	Cargo Door Decals And Center Passenger Seats Placard Inspection/Replacement	3/28/05	No Effect

Service Bulletin Number	Title	Service Bulletin Date	Manual Incorporation
SB05-11-02	Pilot's Operating Handbook Revisions	3/28/05	No Effect
SB05-22-01	Trim Servo Cable Chain Inspection	12/5/05	No Effect
SB05-24-01	MC01-3A Main Electrical Power Junction Box Circuit Breakers Inspection	1/31/05	No Effect
SB05-25-03 R1	Inflatable Seat Restraints Installation	Dec 26/06	No Effect
SB05-28-01	Fuel Strainer Gasket Inspection	1/17/05	No Effect
SB05-33-01	High Intensity Discharge (Hid) Landing And Taxi Light Installation	5/09/05	1/02/06
SB05-34-01	Garmin G1000 System Software Upgrade	1/31/05	No Effect
SB05-34-02	Garmin GMA 1347 Audio Panel Modifications	2/14/05	No Effect
SB05-34-03	Garmin GIA 63 Integrated Avionics Unit Modification	2/14/05	No Effect
SB05-34-04	Garmin GIA 63 Integrated Avionics Unit Modification	4/25/05	No Effect
SB05-34-05	Garmin G1000 System Software Upgrade	7/29/05	No Effect
SB05-34-06	Garmin G1000 GDL-69A Weather And Digital Audio Entertainment Interface Installation	7/29/05	No Effect
SB05-34-07	Garmin G1000 Obstacle And Terrain Avoidance System Database Update	9/26/05	No Effect
SB05-34-08	Garmin G1000 System Software Upgrade	9/26/05	No Effect
SB05-34-09	Garmin G1000 GDL-69A Weather And Digital Audio Entertainment Interface Installation	9/26/05	No Effect
SB05-34-11	Garmin GIA 63 Integrated Avionics Unit Outside Cover Replacement	11/21/05	No Effect
SB05-34-12	Garmin GIA 63 Integrated Avionics Unit Outside Cover Replacement	12/5/05	No Effect
SB05-35-01	Oxygen System Pressure Gage Replacement	3/28/05	No Effect
SB05-37-01	Vacuum Pump Inspection/Replacement	11/7/05	No Effect
SB05-53-01	Fuselage Rivet Inspection	3/14/05	No Effect
SB05-71-01	Engine Crankshaft Replacement	7/18/05	No Effect
SB05-71-02	Engine Cylinder Drain System Inspection	12/19/05	No Effect
SB05-73-01	Engine Driven Fuel Pump Inspection	3/07/05	No Effect
SB06-11-01	Pilot's Operating Handbook Revisions	Mar 27/06	No Effect
SB06-11-02	Pilot's Checklist Revisions	Nov 6/06	No Effect
SB06-22-01	Honeywell KS270C Pitch Servo And KS271C Roll Servo Tach Generator Modification	Apr 24/06	No Effect
SB06-24-01	Electrical Ground Strap Inspection	May 8/06	No Effect
SB06-24-03	60 Ampere Alternator Brush Replacement	Dec 18/06	No Effect
SB06-24-04	Circuit Breaker Inspection	Dec 26/06	No Effect

Service Bulletin Number	Title	Service Bulletin Date	Manual Incorporation
SB06-24-05	Circuit Breaker Panel Assembly Inspection	Dec 26/06	No Effect
SB06-25-01	Restraint System Child Buckle Inspection	Dec 4/06	No Effect
SB06-27-01	Flap Aft Roller Bearing Installation Modification	Apr 10/06	No Effect
SB06-32-01	Brake Master Cylinder Covers Inspection	Sep 25/06	No Effect
SB06-34-01	Honeywell KT 73 Mode S Transponder Installation	Feb 27/06	No Effect
SB06-34-02 R1	Garmin G1000 System Software Upgrade	Mar 27/06	No Effect
SB06-34-03	Enablement Of Garmin G1000 Terrain Awareness Warning System Class-B (Taws-B)	May 22/06	No Effect
SB06-34-04	Automatic Direction Finder (ADF) and Distance Measuring Equipment (DME) Installation	Oct 23/06	No Effect
SB06-52-01	Cabin Door Modification	Mar 27/06	No Effect
SB06-53-02	Main landing Gear Attach Fittings Fastners Inspection	Nov 20/06	No Effect
SB06-71-01 R1	Engine Crankshaft Retirement	May 8/06	No Effect
SB06-71-02	Engine Compartment Fuel Hoses Security Inspection	Jun 19/06	No Effect

INTRODUCTION

1. General

WARNING: All the inspection intervals, replacement time limits, overhaul time limits, method of inspection, life limits, cycle limits, etc., recommended by Cessna are based on the use of new, remade, or overhauled Cessna-approved parts. If the parts are designed, made, remade, overhauled, and/or approved by someone other than Cessna, then the data in Cessna's maintenance/service manuals and parts catalogs are no longer applicable and the purchaser is warned not to rely on such data for non-Cessna parts. All inspection intervals, replacement time limits, overhaul time limits, the method of inspection, life limits, cycle limits, etc., for such non-Cessna parts must be received from the manufacturer and/or seller of such non-Cessna parts.

A. The information in this publication is based on data available at the time of publication. This publication is updated, supplemented, and automatically changed by all information issued in Service Newsletters, Service Bulletins, Supplier Service Notices, Publication Changes, Revisions, Reissues and Temporary Revisions. All such changes become part of and are incorporated in this publication. Users must keep informed of the latest changes to this publication through information available at Cessna Authorized Service Stations or through the Cessna Product Support subscription services. The Cessna Service Stations have also been supplied with a group of supplier publications which gives disassembly, overhaul, and parts breakdowns for some of the different supplier equipment items. Supplier's publications are updated, supplemented, and changed by supplier issued revisions and service information. Cessna may reissue this publication, which will amend this publication; and is communicated to the field through the Cessna's Authorized Service Stations and/or through Cessna's subscription services.

B. Inspection, maintenance and parts requirements for STC installations are not included in this manual. When an STC installation is incorporated on the airplane, you must have an inspection completed on those parts of the airplane affected by the installation. The inspection must be in accordance with the inspection program published by the owner of the STC. Since the STC installations may change systems interface, operating characteristics, component loads or stresses on adjacent structures, Cessna supplied inspection criteria may not be correct for airplanes with STC installations.

C. Revisions, reissues and temporary revisions can be purchased from a Cessna Service Station or directly from Cessna Propeller Aircraft Product Support, Department 751, Cessna Aircraft Company, P.O. Box 7706, Wichita, Kansas 67277-7706.

D. The information in this Maintenance Manual is applicable to all U.S. and Foreign Certified Model 206/T206 airplanes beginning at Serial 206080001 and On for non-turbocharged airplanes and beginning at Serial T20608001 for turbocharged airplanes. Information unique to a particular country is identified in the chapter(s) affected.

E. All the supplemental service information that is applicable to this manual is supplied to all applicable Cessna Service Stations so that they have the latest authoritative instructions to service these Cessna airplanes. It is recommended that Cessna owners use the knowledge and experience of the Cessna Service Organization.

2. Cross-Reference Listing of Popular Name Versus Model Numbers and Serials

A. All the airplanes are certified under the model number designations. For market purposes, popular names are frequently used. To refer to these airplanes and give a consistent method, the model number will be used in this publication unless the popular name is necessary to identify the versions of the same basic model. The table that follows gives a list of popular names, model numbers and serial numbers.

NAME	MODEL	SERIALS BEGINNING
Stationair	206H	20608001
Stationair TC	T206H	T20608001

3. Coverage and Format

A. The Cessna Model 206/T206 1998 And On Maintenance Manual has been prepared to help the maintenance personnel to service and maintain the Model 206/T206 airplanes (beginning at Serial 20680001and T20608001). This manual gives the necessary information required to let the mechanic service, troubleshoot, remove and replace components or repair systems and do an inspection.

NOTE: This manual is not intended to cover Model 206/T206 airplanes made prior to 1997. For manuals related to these airplanes, refer to the applicable lists in the Propeller Aircraft Cessna Customer Care Supplies & Publications Catalog.

B. This manual has been prepared with the Air Transport Association (ATA) Specification Number 100 for Manufacturer's Technical Data.

C. For more information than this manual can supply, refer to the applicable Model 206/T206 Wiring Diagram Manual, Illustrated Parts Catalog and the Structural Repair Manual.

D. Technical Publications are available for some of the different components and systems which are not supplied in this manual. These manuals must be used as required for maintenance of those components and systems, and may be purchased from the manufacturer.

4. Temporary Revisions

A. Additional information which becomes available may be supplied by a temporary revision. This service is used to give, without delay, new information which will help to maintain safe flight/ground operations. Temporary revisions are numbered consecutively in the ATA chapter assignment. Page numbers use the three-element number which matches the maintenance manual. Temporary revisions are incorporated into the maintenance manual at the next regular revision schedule.

5. Serialization

A. Each airplane is issued a serial number. This number is assigned as construction begins and will remain with the airplane during its service life. This serial number shows on the airplane ID plate. It is located below the horizontal stabilizer, and on a trim plate located on the pilot side doorpost. This serial number is used to identify changes in the text or within an illustration. The absence of a serial number in text or illustration shows the material is applicable to all airplanes.

6. Material Presentation

A. This Maintenance Manual is available on paper, aerofiche or Compact Disc (CD/ROM). The CD/ROM contains the Maintenance Manual, Illustrated Parts Catalog Manual, Wiring Diagram Manual and Structural Repair Manual on a single disc.

7. Service Bulletins

A. The Service Bulletins may require special inspections and authorize modifications to the airplane and/or system. As service bulletins are issued, they will be incorporated in the next scheduled revision and noted in the Service Bulletin List, located before the Introduction. The list of service bulletins use four columns to summarize the information.

(1) Service Bulletin Number - This service bulletin number column identifies the bulletin by number. Service bulletins are numbered consecutively within ATA chapter assignment.

(2) Service Bulletin Date - The service bulletin date column shows the initial date the bulletin became active.

(3) Title - The title column identifies the service bulletin by nomenclature. It is the same title that is displayed on page one of the service bulletin.

(4) Manual Incorporation - The manual incorporation column shows if the service bulletin has been incorporated in the maintenance manual (Incorp), if the service bulletin has no effect on the maintenance manual (No Effect), or if the service bulletin has not been worked (dashed lines).

8. Using the Maintenance Manual

A. Division of Subject Matter.

(1) The Maintenance Manual is divided into four major sections. The major sections are divided into chapters with each chapter with its own effectivity page and table of contents. The manual divisions are as follows:

(a) Major Section 1 - Airplane General

Chapter	Title
5	Time Limits/Maintenance Checks
6	Dimensions and Areas
7	Lifting and Shoring
8	Leveling and Weighing
9	Towing and Taxiing
10	Parking, Mooring, Storage and Return to Service
11	Placards and Markings
12	Servicing

(b) Major Section 2 - Airframe Systems

Chapter	Title
20	Standard Practices - Airframe
21	Air Conditioning
22	Auto Flight
23	Communications
24	Electrical Power
25	Equipment/Furnishings
26	Fire Protection
27	Flight Controls
28	Fuel
30	Ice and Rain Equipment
31	Indicating/Recording Systems
32	Landing Gear
33	Lights
34	Navigation
35	Oxygen
37	Vacuum

(c) Major Section 3 - Structures

Chapter	Title
51	Standard Practices and Structures - General
52	Doors
55	Stabilizers
56	Windows
57	Wings

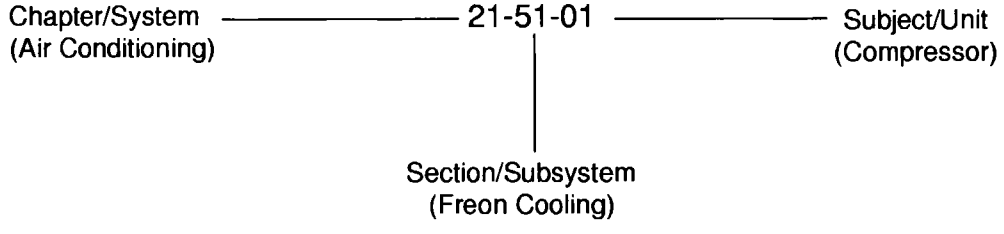
(d) Major Section 4 - Power Plant

Chapter	Title
61	Propeller
71	Power Plant
73	Engine Fuel and Control
74	Ignition
76	Engine Controls
77	Engine Indicating
78	Exhaust
79	Oil
80	Starting
81	Turbines

B. Page Numbering System.

(1) The page number system used in the Maintenance Manual consists of three-element numbers divided by dashes. Refer to the example below for an illustration of a typical number layout as used in the ATA format.

B1805



(2) When the chapter/system element number is followed with zeros in the section/subsystem and subject/unit element number (21-00-00), the information is applicable to the full system.

(3) When the section/subsystem element number is followed with zeros in the subject/unit element number (21-51-00), the information is applicable to the subsystem in the system.

(4) The subject/unit element number is used to identify information applicable to units in the subsystems. The subject/unit element number progresses sequentially from the number -01 in reference with the number of subsystem units requiring maintenance information.

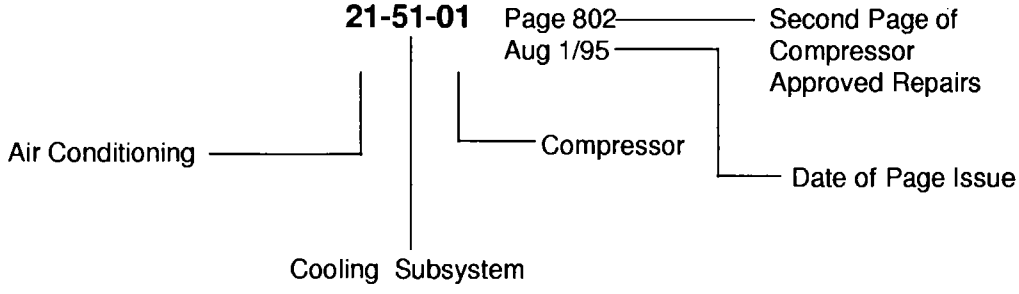
(5) All system/subsystem/unit (chapter/section/subject) maintenance data is divided into specific types of information: Description and Operation, Troubleshooting and Maintenance Practices. Blocks of sequential page numbers are used to identify the type of information:

- Page 1 through 99 - Description and Operation
- Page 101 through 199 - Troubleshooting
- Page 201 through 299 - Maintenance Practices
- Page 301 through 399 - Servicing
- Page 401 through 499 - Removal/Installation
- Page 501 through 599 - Adjustment/Test
- Page 601 through 699 - Inspection/Check
- Page 701 through 799 - Cleaning/Painting
- Page 801 through 899 - Approved Repairs

NOTE: In most cases, the individual topics have been combined into a 200-series document (Maintenance Practices). When specific topics require a lot of information, they will use the page blocks shown.

(6) A typical page number:

B1806



(7) Illustrations are also supplied through the page block numbering system. For example, all illustrations in a Maintenance Practices section will begin with the number 2 (i.e. Figure 201, Figure 202, etc.).

9. Effectivity Pages

A. A list of effective pages is supplied at the front of each maintenance manual chapter. All pages in the specific chapter are listed in numerical sequence on the Effectivity Page(s) with the date of issue for each page.

10. Revision Filing Instructions

A. Regular Revision.
(1) Pages to be removed or put in the maintenance manual will show on the effectivity page. Pages are listed in sequence by the three-element number (chapter/section/subject) and then by page number. When two pages display the same three-element number and page number, the page with the most recent Date of Page Issue must be put in the maintenance manual. The date column on the corresponding chapter effectivity page must show the active page.

B. Temporary Revision.
(1) Put the temporary revisions in the applicable chapter(s) in reference with the instructions shown on the first page of the temporary revision.
(2) The rescission of a temporary revision is completed by incorporation into the maintenance manual or by a superseding temporary revision. A Record of Temporary Revisions is supplied in the Temporary Revision List located before the Introduction. A Manual Incorporation Date column on the Temporary Revision List page will show the date the Temporary Revision was incorporated which approves the rescission of the temporary revision.

11. Identifying Revised Material

A. Additions or revisions to text in a section will be identified by a revision bar in the left margin of the page and adjacent to the change.

B. When technical changes cause unchanged text to appear on a different page, a revision bar will be placed in the left margin opposite to the chapter/section/subject, page number and date of all affected pages, as long as no other revision bar appears on the page. These pages will show the current revision date in the Date of Page Issue location.

C. Revised text inside tables will not show revision bars; however, the affected page will display the current revision date in the Date of Page Issue location.

D. When many technical changes are made to the text in an existing section, revision bars will show for the full length of text.

E. When art in an illustration is revised, a hand indicator or revision bar will appear in the illustration.

F. New art added to a section will be identified by a revision bar in the left margin.

12. Warnings, Cautions and Notes

A. Warnings, cautions and notes are applicable to the procedures being described. These adjuncts to the text are used to inform important points. Warnings and cautions precede the text they are applicable to, and notes follow the text they apply to.
   (1) WARNING - Calls attention to the use of materials, processes, methods, procedures or limits which must be followed to prevent injury or death to persons.
   (2) CAUTION - Calls attention to methods and procedures which must be followed to prevent damage to the equipment or airplane.
   (3) NOTE - For information only.

13. Propeller Aircraft Customer Care Supplies and Publications Catalog

A. A Cessna Propeller Aircraft Customer Care Supplies and Publications Catalog is available from a Cessna Service Station or directly from Cessna Propeller Aircraft Product Support, Dept. 751, Cessna Aircraft Company, P.O. Box 7706, Wichita, Kansas 67277-7706. The catalog lists all publications and Customer Care Supplies available from Cessna for prior year models as well as new products. To maintain this catalog in a current status, it is revised yearly and issued in paper and aerofiche form.

14. Customer Comments on Manual

A. Cessna Aircraft Company has worked to give you an accurate, useful, up-to-date manual. This manual can be improved with your help. Please use the return card supplied with your manual to report any errors, discrepancies, and omissions in this manual as well as any general comments you want to make.

LIST OF REVISIONS

1. Revisions

A. This Maintenance Manual includes the original issue and the revisions listed in Table 1. To make sure the information in this manual is current and the latest maintenance and inspections procedures are available, the revisions must be incorporated in the manual as they are issued.

Table 1. Basic Manual - Original Issue - 3 November 1997

Revision Number	Date	Writer	Revision Number	Date	Writer
1	3 August 1998	km	2	2 September 1999	km
3	31 March 2000	km	4	15 September 2000	km
5	18 April 2001	km	6	15 October 2001	jb
7	2 December 2002	jb	8	5 April 2004	jb
9	1 April 2005	dl	10	2 January 2006	bjo
11	3 July 2006	bjo	12	1 January 2007	jcn
13	1 July 2007	jcn			

LIST OF CHAPTERS

NOTE 1: *Represents date of page one of each chapter's List of Effective Pages which is applicable to Manual revision date.

CHAPTER

5

TIME LIMITS/ MAINTENANCE CHECKS

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
05-Title		
05-List of Effective Pages		
05-Record of Temporary Revisions		
05-Table of Contents		
5-00-00	Pages 1-2	Jul 1/2007
5-00-10	Page 1	Dec 2/2002
5-10-00	Pages 1-2	Jul 3/2006
5-10-01	Pages 1-16	Jul 3/2006
5-11-00	Pages 1-3	Jul 1/2007
5-12-00	Pages 1-2	Jul 1/2007
5-12-01	Pages 1-7	Jul 3/2006
5-12-02	Pages 1-6	Jul 3/2006
5-12-03	Pages 1-7	Jul 3/2006
5-12-04	Pages 1-6	Jul 3/2006
5-12-05	Page 1	Jul 3/2006
5-12-06	Page 1	Dec 2/2002
5-12-07	Page 1	Jul 3/2006
5-12-08	Page 1	Dec 2/2002
5-12-09	Page 1	Jul 3/2006
5-12-10	Page 1	Jul 3/2006
5-12-11	Page 1	Jul 3/2006
5-12-12	Page 1	Jul 3/2006
5-12-13	Page 1	Dec 2/2002
5-12-14	Page 1	Jul 3/2006
5-12-15	Page 1	Jul 3/2006
5-12-16	Page 1	Jul 3/2006
5-12-17	Page 1	Jul 3/2006
5-12-18	Page 1	Jul 3/2006
5-12-19	Page 1	Jul 3/2006
5-12-20	Page 1	Jul 3/2006
5-12-21	Page 1	Jul 3/2006
5-12-22	Page 1	Jul 3/2006
5-12-23	Page 1	Jul 3/2006
5-12-24	Page 1	Jul 3/2006
5-12-25	Page 1	Jul 3/2006
5-50-00	Pages 1-5	Jan 2/2006

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

TIME LIMITS/MAINTENANCE CHECKS

1. Scope

A. This chapter provides the time limits and maintenance checks for the Model 206 airplanes. It is divided into several sections, each with a specific purpose toward providing information necessary to establish inspection criteria.

2. Inspection Requirements

A. As required by U.S. Federal Aviation Regulations, all civil aircraft of U.S. registry must undergo a complete inspection (annual) each twelve calendar months. In addition to the required annual inspection, aircraft operated commercially (for hire) must have a complete inspection every 100 hours of operation.

B. Compliance with the regulations is accomplished using one of three methods:

(1) **Traditional (Annual/100 Hour) inspection program** which utilizes 14 CFR Part 43, Appendix D (scope and detail) to inspect the airplane. In addition, Cessna recommends certain components or items be inspected at 50 hour intervals. These inspection items are listed in Inspection Time Intervals, Section 5-10-01.

(2) **Progressive Care inspection program** which allows the work load to be divided into smaller operations that can be accomplished in a shorter time period. This method is detailed in Progressive Care Program, Section 5-12-00.

(3) **PhaseCard inspection program** which is geared toward high-utilization flight operations (approximately 600 flight hours per year). This system utilizes 50-hour intervals (Phase 1 and Phase 2) to inspect high-usage systems and components. At 12 months or 600 flight hours, whichever occurs first, the airplane undergoes a complete (Phase 3) inspection. PhaseCard Inspection programs can be ordered through Propeller Aircraft Product Support. P.O. Box 7706, Wichita, KS 67277, Phone (316) 941-7550, Fax (316) 942-9006.

3. Inspection Program Selection

A. The selection of an inspection program (Annual, Progressive Care or PhaseCard) is primarily based on owner/operator preferences, whether an airplane is flown for hire, and numbers of hours flown during the year.

4. Description

A. Listed below is a brief description and intended purpose of each section of this chapter. For detailed information related to each particular inspection program, refer to the specific section within this chapter.

B. Section 5-00-00, Time Limits/Maintenance Checks - General. This section provides a general overview of inspection requirements.

C. Section 5-10-01, Inspection Time Intervals. The primary purpose of this section is to provide a central location for inspection time intervals. This section may also be utilized in conjunction with 14 CFR Part 43 to provide greater detail on inspection criteria when performing Annual/100 Hour inspections.

D. Section 5-11-00, Component Time Limits. This section provides a list of components which are life- or time-limited. Although these components are not listed in any of Cessna's inspection programs, they must be considered and included in whatever inspection program is used.

E. Section 5-12-00, Progressive Care Program. This section outlines the progressive inspection program. The program is divided into four primary operations which cover all inspection requirements up through the 200-hour interval inspection items. The remaining operations cover inspections which are at intervals other than what the four primary operations cover. Refer to the Progressive Care Program section for a more detailed description of the Progressive Care Program.

5. General Inspection Terms and Guidelines

NOTE: When inspections criteria is required, this criteria is spelled out in the text. If more detailed instructions are required for an inspection, these instructions will be referenced out to appropriate locations (supplier publications and/or the maintenance manual).

A. Definitions of terms used through the inspection programs are as follows:
   (1) ON CONDITION is defined as the necessary inspections and/or checks to determine that a malfunction or failure of the component will not occur prior to the next scheduled inspection.
   (2) CONDITION is defined as inspection for (but not limited to) cleanliness, cracks, deformation, corrosion, wear, and loose or missing fasteners.
   (3) SECURITY: Inspect for looseness of fasteners and fastener securing devices such as safety wire, cotter pins and self-locking nuts.

B. During Inspections, use the following general guidelines:
   (1) MOVABLE PARTS: Inspect for lubrication, servicing, security of attachment, binding, excessive wear, safetying, proper operation, proper adjustment, correct travel, cracked fittings, security of hinges, defective bearings, cleanliness, corrosion, deformation, sealing, and tension.
   (2) FLUID LINES AND HOSES: Inspect for leaks, cracks, bulging, collapsed, twisted, dents, kinks, chafing, proper radius, security, discoloration, bleaching, deterioration, and proper routing; rubber hoses for hardness or flexibility and metal lines for corrosion.
   (3) METAL PARTS: Inspect for security of attachment, cracks, metal distortion, and heat deterioration.
   (4) WIRING: Inspect for security, chafing, burning, arcing, defective insulation, loose or broken terminals, heat deterioration, and corroded terminals.

CAUTION: Torque values listed in this manual are not to be used for checking tightness of installed parts during service.

   (5) STRUCTURAL FASTENERS: Inspect for correct torque in accordance with applicable torque values. Refer to Chapter 20, Torque Data - Maintenance Practices, during installation or when visual inspection indicates the need for a torque check.
   (6) FILTERS, SCREENS, AND FLUIDS: Inspect for cleanliness and the need for replacement at specified intervals.
   (7) A system check (operation or function) that requires electrical power, must be performed using 28.5 Volts, +0.25 or -1.00 Volts, bus voltage. This will make sure that all components are operating at their operational voltage.

C. Airplane file.
   (1) Miscellaneous data, information, and licenses are a part of the airplane file. Check that the following documents are up-to-date and in accordance with current Federal Aviation Regulations. Most of the items listed are required by the Federal Aviation Regulations. Since the regulations of other nations may require other documents and data, owners of airplanes operated outside the United States should check with their own aviation officials to determine their individual requirements.
      (a) To be displayed in the airplane at all times:
         1 Standard Airworthiness Certificate (FAA Form 8100-2).
         2 Aircraft Registration Certificate (FAA Form 8050-3).
         3 Aircraft Radio Station License (Federal Communication Commission Form 556 if transmitter is installed).
      (b) To be carried in the airplane at all times:
         1 Weight and Balance Data Sheets and associated papers (all copies of the Repair and Alteration Form, FAA Form 337, are applicable).
         2 Equipment List.
         3 Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.
      (c) To be made available upon request:
         1 Airplane, Engine and Propeller Logbooks.

AIRWORTHINESS LIMITATIONS - FAA APPROVED DATA

1. Scope

A. The Airworthiness Limitations section is FAA approved and specifies maintenance required under Parts 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

2. Airworthiness Limitations

A. There are no airworthiness limitations associated with this airplane.

INSPECTION TIME INTERVALS

1. General

A. The primary purpose of this section is to provide inspection time intervals. The section 5-10-01 may be utilized in conjunction with 14 CFR Part 43 inspection scope and detail, but is not intended to be utilized as the primary checklist for inspection of the airplane.

NOTE: The inspection guidelines contained in this section are not intended to be all-inclusive, for no such charts can replace the good judgment of certified airframe and powerplant mechanics in performance of their duties. As the one primarily responsible for the airworthiness of the airplane, the owner or operator should select only qualified personnel to maintain the airplane.

2. Procedure

A. A complete airplane inspection includes all inspection items as required by 14 CFR 43, Appendix D, Scope and Detail of annual/100-hour inspections. The chart provided in this section should be used to augment the inspection.

B. The Component Time Limits section (5-11-00) should be checked in conjunction with this inspection to ensure proper overhaul and replacement requirements are accomplished at the specified times.

C. The intervals shown are recommended intervals at which items are to be inspected based on normal usage under average environmental conditions. Airplanes operated in extremely humid areas (tropics), or in exceptionally cold, damp climates, etc., may need more frequent inspections for wear, corrosion, and lubrication. Under these adverse conditions, perform periodic inspections in compliance with this chart at more frequent intervals until the operator can set his own inspection periods based on field experience.

(1) The 14 CFR Part 91 operator's inspection intervals shall not deviate from the inspection time limits shown in this manual except as provided below: (Refer to 14 CFR 91.409)

(a) The airplane can only exceed its inspection point up to ten hours if the airplane is enroute to a facility to have the inspection completed.

(b) In the event of late compliance of any operation scheduled, the next operation in sequence retains a due point from the time the late operation was originally scheduled (reschedule if late).

(c) In the event of early compliance of any operation scheduled, that occurs 10 hours or less ahead of schedule, the next phase due point may remain where originally set.

(d) In the event of early compliance on any operation scheduled, that occurs more than 10 hours ahead of schedule, the next phase due point must be rescheduled to establish a new due point from the time of early accomplishment.

3. Inspection Terms and Guidelines

A. For inspection terms and guidelines, refer to Chapter 5, Time Limits/Maintenance Checks - General.

4. Chart Legend

A. Each page of the inspection listed in Inspection Time Limits, section 5-10-01 contains the following five columns:

(1) REVISION STATUS - This column provides the date that a given item was added, deleted or revised. A blank entry in this column indicates no change since the original issue of this manual.

(2) INSPECTION ITEM CODE NUMBER - This column lists a six-digit number permanently assigned to a scheduled maintenance item. A given inspection item code number will never change and will not be reused in the event the scheduled maintenance item is deleted.

(3) REQUIREMENTS - This column provides a short description of the inspection and/or servicing procedures. Where a more detailed description of the procedure is required, a reference will be made to either another selection located within the maintenance manual or a specific reference to a supplier publication.

(4) INTERVAL - This column lists the frequency of inspection in alphabetic coded form. The legend for the alpha code is listed below.
(5) OPERATION - The Progressive Care inspection program allows the work load to be divided into smaller operations that can be accomplished in a shorter time period. This program is detailed in section 5-12-00, which is the Progressive Care Program.
(6) ZONE - This column locates the components within a specific zone. For a breakdown of how the airplane is zoned, refer to Chapter 6, Airplane Zoning - Description and Operation.

INTERVAL	OPERATION	INTERVAL DETAILS
A.	1, 2, 3, 4	Every 50 hours.
B.	1, 2, 3, 4	Every 100 hours.
C.	1, 2, 3, 4	Every 200 hours.
D.	5	Every 400 hours or 1 year, whichever occurs first.
E.		**(Not used)**
F.	7	Every 600 hours or 1 year, whichever occurs first.
G.		**(Not used)**
H.	9	Every 500 hours.
I.	10	Every 1000 hours.
J.	11	Every 2 years.
K.	12	Beginning five years from the date of the manufacture, you must make sure of the serviceability of the components every twelve months. Refer to Airborne Air and Fuel Products Service Letter Number 39A or latest revision.
L.		**(Not used)**
M.	14	Every 2 years, or anytime components are added or removed which have the potential to affect the magnetic accuracy and/or variation of the compass calibration, or anytime the accuracy of the compass is in question.
N.	15	Every 2000 hours.
O.	16	Every 1000 hours or 1 year, whichever occurs first.
P.	17	Every 12 calendar months.
Q.	18	Every 6 years.
R.	19	Every 12 years.
S.	20	Every 3 years.
T.	21	Every 1 year.
U.	22	Every 100 hours or every one year, whichever occurs first.
V.	23	Every 100 hours, every annual inspection, every overhaul, and any time fuel lines or clamps are serviced, removed or replaced.
W.	24	First 600 hours and as defined by the manufacturer thereafter.
X.	25	Every 1000 hours or 3 years, whichever occurs first.

INSPECTION TIME LIMITS

1. Inspection Items

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
Added Apr 1/05	110000	Interior Placards, Exterior Placards, Decals, Markings and Identification Plates - Inspect for security of installation and legibility. Refer to Chapter 11, Placards and Markings - Inspection/Check.	B	1, 2, 3, 4	All
Deleted Apr 5/04	112101				
Deleted Apr 5/04	113101				
	212001	Ventilation System - Inspect clamps, hoses, and valves for condition and security.	D	5	211
Revised Apr 1/05	212002	Primary Flight Display (PFD) Fan and Multi-Function Display (MFD) Fan, Deck Skin Fan, and Remote Avionics Cooling Fan - Operational Check. Refer to Chapter 21, Avionics Cooling - Maintenance Practices.	U	22	220, 225
	214001	Cold and Hot Air Hoses - Check condition, routing, and security.	B	2, 4	120
Revised Aug 3/98	214002	Heater Components, Inlets, and Outlets - Inspect all lines, ducts, clamps, seals, and gaskets for condition, restriction, and security.	B	1, 3	211
Revised Mar 31/00	214003	Cabin Heat and Ventilation Controls - Check freedom of movement through full travel. Check friction locks for proper operation.	B	1, 3	211
	221001	Autopilot Rigging - Refer to Autopilot - Maintenance Practices.	F	7	610
Added Aug 3/98	221002	Autopilot Servo Capstan Assemblies. Check slip-clutch torque settings. Refer to Autopilot - Maintenance Practices.	O	16	610
Added Aug 3/98	221003	Autopilot Servo Actuators. Inspect for evidence of corrosion and or buildup of dirt or other particulate matter which may interfere with servo operation. Refer to Autopilot - Maintenance Practices.	O	16	610
	231001	Communication Antennas and Cables - Inspect for security of attachment, connection, and condition.	C	3	210

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
	235001	Microphones, Headsets, and Jacks - Inspect for cleanliness, security, and evidence of damage.	C	1	211
Added Apr 5/04	235002	Microphone Push-To-Talk Switch - Clean the pilot's and copilot's microphone switches. Refer to Chapter 23, Communication - Maintenance Practices.	B	1, 3	222, 223
	242001	Alternator, Mounting Bracket, and Electrical Connections - Check condition and security. Check alternator belts for condition and proper adjustment. Check belt tension.	A	1, 2, 3, 4	120
Revised Apr 1/05	243001	Main Battery - Examine the general condition and security. Complete a check of the level of electrolyte. Refer to Chapter 12-17-00.	B	2, 4	120
Revised Apr 1/05	243002	Main Battery Box and Cables - Clean and remove any corrosion. Examine the cables for routing, support, and security of the connections.	B	2, 4	120
	243003	General Airplane and System Wiring - Inspect for proper routing, chafing, broken or loose terminals, general condition, broken or inadequate clamps, and sharp bends in wiring.	C	1	210
	243004	External Power Receptacle and Power Cables - Inspect for condition and security.	C	2	120
Added Apr 1/05	243005	Standby Battery - Complete the Standby Battery Capacity Test. Refer to Chapter 24, Standby Battery - Maintenance Practices.	T	21	220
	246001	Switch and Circuit Breaker Panel, Terminal Blocks, and Junction Boxes - Inspect wiring and terminals for condition and security.	C	1	222
Revised Sep 15/00	246002	Power Junction Box - Check operation and condition. Check availability and condition of spare fuse (if applicable).	B	1, 3	222
Added Jul 3/06	246003	Alternator Control Unit - Complete the Over-voltage Protection Circuit Test. Refer to Chapter 24, Alternator Control Unit.	J	11	222

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
Revised Apr 1/05	246101	Essential and Crossfeed Bus Diodes - Check for proper operation. Complete the Essential and Crossfeed Bus Diode Inspection. Refer to Chapter 24, Essential and Crossfeed Bus Diodes - Maintenance Practices.	T	21	224
Revised Jul 3/06	251001	Seats - Examine the seats to make sure they are serviceable and installed correctly. Make sure the seat stops and adjustment mechanism operate correctly. Examine the seat recline control and attaching hardware to make sure the hardware and lock are not damaged and are correctly installed. Lubricate the threads of the Seat Crank Handle Assembly with MIL-PRF-81322 general purpose grease.	B	1, 3	211
	251002	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Inspect seat rails for cracks.	B	2, 4	230
	251101	Restraint System, front and rear - Check belts for thinning, fraying, cutting, broken stitches, or ultra-violet deterioration. Check system hardware for security of installation.	B	1, 3	211
Added Apr 1/05	251102	AMSAFE Aviation Inflatable Restraint (AAIR) - Examine the restraint for dirt, frayed edges, unserviceable stitching, loose connections, and other wear.	T	21	211
	252201	Upholstery, Headliner, Trim, and Carpeting - Check condition and security.	D	5	211
Revised Jan 2/06	256001	Emergency Locator Transmitter - Examine for security of attachment and check operation by verifying transmitter output. Check cumulative time and useful life of batteries in accordance with 14 CFR Part 91.207.	B	1, 3	310
	262001	Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition, security of installation, and servicing date.	B	1, 3	230
Added Aug 3/98	262002	Cockpit Mounted Halon Type Fire Extinguisher - Weigh bottle. Bottle must be reserviced by qualified individual if more than 2 ounces is lost.	P	17	211

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
Added Aug 3/98	262003	Cockpit Mounted Halon Type Fire Extinguishers - Perform hydrostatic test. The hydrostatic test shall be at twelve-year intervals based on initial servicing or date of last hydrostatic test.	R	19	211
Added Aug 3/98	262004	Cockpit Mounted Halon Type Fire Extinguishers - Empty, inspect for damage, and recharge.	Q	18	211
Revised Mar 31/00	271001	Aileron Controls - Check freedom of movement and proper operation through full travel.	B	1, 3	120, 520, 620
	271002	Ailerons and Cables - Check operation and security of stops. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment or if stops are damaged. Check fairleads and rub strips for condition.	C	3	120, 520, 620
	271003	Aileron Structure, Control Rods, Hinges, Balance Weights, Bell Cranks, Linkage, Bolts, Pulleys, and Pulley Brackets - Check condition, operation, and security of attachment.	B	1, 3	520, 620
	271004	Ailerons and Hinges - Check condition, security, and operation	B	1, 3	520, 620
	271005	Control Wheel Lock - Check general condition and operation.	C	1	222
Revised Aug 3/98	271006	Control Linkage - Inspect pulleys, cables, bearings, and turnbuckles for condition and security.	C	1	222, 223
	272001	Rudder - Check internal surfaces for corrosion, condition of fasteners, and balance weight attachment.	C	3	340
Revised Mar 31/00	272002	Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings, and bonding jumper for evidence of damage and wear, failed fasteners, and security. Inspect balance weight for looseness and the supporting structure for damage.	B	1, 3	340
Revised Aug 3/98	272003	Rudder, Tips, Hinges, Stops, Clips and Cable Attachment - Check condition, security, and operation.	B	1, 3	340

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
	272004	Rudder Pedals and Linkage - Check for general condition, proper rigging, and operation. Check for security of attachment.	C	1	230
Added Aug 3/98	272005	Rudder Control - Check freedom of movement and proper operation through full travel. Check rudder stops for damage and security.	B	1, 3	340
Revised Aug 3/98	273001	Elevator Control - Check freedom of movement and proper operation through full travel.	B	1, 3	222, 223
Revised Mar 31/00	273002	Elevator Control System - Inspect pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition, security, and operation. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety.	B	1, 3	222, 223
Revised Aug 3/98	273003	Elevator, Hinges, Stops, and Cable Attachment - Check condition, security, and operation.	B	1, 3	320, 330
Added Aug 3/98	273004	Elevator Downspring - Check structure, bolts, linkage, bellcrank, and push-pull tube for condition, operation, and security. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travels if cables require tension adjustment or if stops are damaged.	B	1, 3	310
	273101	Elevator Trim System - Check cables, push-pull rods, bell cranks, pulleys, turnbuckles, fairleads, rub strips, etc. for proper routing, condition, and security.	B	1, 3	224, 240, 310
Revised Mar 31/00	273102	Elevator Trim Control and Indicator - Check freedom of movement and proper operation through full travel. Check pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition and security. Check electric trim controls for operation as applicable. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety.	C	1	224, 240, 310
	273103	Elevator Trim Tab and Hinges - Check condition, security, and operation.	B	1, 3	224

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
Revised Jul 3/06	273104	Elevator Trim Tab Actuator - Examine the free play limits. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices, Trim Tab Free Play Inspection. If the free play is more than the permitted limits, lubricate the actuator and examine the free play limits again. If the free play is still more than the permitted limits, replace the actuator.	B	1, 3	320
Deleted Aug 3/98	273105				
	273106	Elevator Trim Tab Stop Blocks - Inspect for damage and security.	C	1	240
Added Jul 3/06	273107	Elevator Trim Tab Actuator - Remove, clean, examine, and lubricate the actuator. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices.	X	25	320
Revised Aug 3/98	275001	Flaps - Check tracks, rollers, and control rods for security of attachment. Check rod end bearings for corrosion. Check operation.	B	1, 3	510, 610
	275002	Wing Flap Control - Check operation through full travel and observe Flap Position indicator for proper indication.	C	1	221
	275003	Flap Structure, Linkage, Bellcranks, Pulleys, and Pulley Brackets - Check for condition, operation and security.	C	3	510, 610
	275004	Flaps and Cables - Check cables for proper tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment.	C	3	510, 610
Revised Aug 3/98	275005	Flap Motor, Actuator, and Limit Switches - Check wiring and terminals for condition and security. Check actuator for condition and security.	C	3	610
Revised Aug 3/98	275006	Flap Actuator Threads - Clean and lubricate. Refer to Chapter 12-21-03.	B	1, 3	610
	282001	Fuel System - Inspect plumbing and components for mounting and security.	B	1, 3	510, 610
Revised Aug 3/98	282002	Fuel Tank Vent Lines and Vent Valves - Check vents for obstruction and proper positioning. Check valves for operation.	B	1, 3	510, 610
	282003	Fuel Selector Valve - Check controls for dentent in each position, security of attachment, and for proper placarding.	B	1, 3	224

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
Revised Aug 3/98	282004	Integral Fuel Bays - Check for evidence of leakage and condition of fuel caps, adapters, and placards. Using quick drains, ensure no contamination exists. Check quick drains for proper shut off.	B	1, 3	510, 610
	282005	Fuel Reservoir - Using quick drain, ensure no contamination exists.	B	1, 3	510, 610
	282006	Fuel Selector - Using quick drain, ensure no contamination exists.	B	1, 3	224
	282007	Fuel Strainer, Drain Valve, and Controls - Check freedom of movement, security, and proper operation. Disassemble, flush, and clean screen and bowl.	B	1, 3	510, 610
Revised Apr 1/05	282008	Fuel Quantity Indicators - Examine for damage and security of installation. Complete a fuel quantity calibration check. Refer to Chapter 28, Fuel Storage and Distribution - Maintenance Practices.	F	7	220
Revised Apr 1/05	282009	Integral Fuel Bays - Drain the fuel (Refer to Chapter 12, Fuel - Servicing) and purge the tanks (Refer to the Single Engine Structural Repair Manual, 1996 and On). Complete an inspection of the tank interior and outlet screens and remove any foreign object debris. Complete an inspection of the tank interior surfaces for sealant deterioration and corrosion (especially in the sump areas).	I	10	510, 610
Revised Sep 15/00	282010	Auxiliary (Electric) Fuel Pump - Check pump and fittings for condition, operation, security.	B	2, 4	120
	311001	Instruments - Check general condition and markings for legibility.	B	1, 3	220
Deleted Apr 1/05	311002				
	311003	Instrument Lines, Fittings, Ducting, and Instrument Panel Wiring - Check for proper routing, support, and security of attachment.	C	1	220
Revised Mar 31/00	321001	Main Landing Gear Wheel Fairings and Brake Fairings - Check for cracks, dents, and condition of paint.	B	2, 4	721,722

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
Revised Apr 1/05	321002	Main Gear Spring Assemblies - Examine for cracks, dents, corrosion, condition of paint or other damage. Examine for chips, scratches, or other damage that lets corrosion get to the steel spring. Examine the axles for condition and security.	B	2, 4	721, 722
	321003	Main Landing Gear Attachment Structure - Check for damage, cracks, loose rivets, bolts and nuts and security of attachment.	B	2, 4	721, 722
	322001	Nose Gear - Inspect torque links, steering rods, and boots for condition and security of attachment. Check strut for evidence of leakage and proper extension. Check strut barrel for corrosion, pitting, and cleanliness. Check shimmy damper and/or bungees for operation, leakage, and attach points for wear and security.	B	2, 4	720
	322002	Nose Landing Gear Wheel Fairings - Check for cracks, dents, and condition of paint.	B	2, 4	720
	322003	Nose Gear Fork - Inspect for cracks, general condition, and security of attachment.	C	4	720
	322004	Nose Gear Attachment Structure - Inspect for cracks, corrosion, or other damage and security of attachment.	B	2, 4	720
	324001	Brakes - Test toe brakes and parking brake for proper operation.	B	2, 4	230
Revised Aug 3/98	324002	Brakes, Master Cylinders, and Parking Brake - Check master cylinders and parking brake mechanism for condition and security. Check fluid level and test operation of toe and parking brake. Refer to Chapter 12-13-00 for servicing instructions.	B	2, 4	224, 230
	324003	Brake Lines, Wheel Cylinders, Hoses, Clamps, and Fittings - Check for leaks, condition, and security and hoses for bulges and deterioration. Check brake lines and hoses for proper routing and support.	D	5	721, 722
	324004	Tires - Check tread wear and general condition. Check for proper inflation.	B	2, 4	720, 721, 722

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
	324005	Wheels, Brake Discs, and Linings - Inspect for wear, cracks, warps, dents, or other damage. Check wheel through-bolts and nuts for looseness.	B	2, 4	721, 722
Revised Aug 3/98	324006	Wheel Bearings - Clean, inspect and lube.	B	4	720, 721, 722
	325001	Nose Gear Steering Mechanism - Check for wear, security, and proper rigging.	C	4	720
	331001	Instrument and Cabin Lights - Check operation, condition of lens, and security of attachment.	B	1, 3	220, 211, 221
	334001	Navigation, Beacon, Strobe, and Landing Lights - Check operation, condition of lens, and security of attachment.	B	1, 3	340, 520, 620
	341101	Static System - Inspect for security of installation, cleanliness, and evidence of damage.	C	3	210
Revised Jan 2/06	341102	Pitot and Static System - Examine in accordance with 14 CFR Part 91.411.	J	11	220
	341103	Pitot Tube and Stall Warning Vane - Check for condition and obstructions and verify operation of anti-ice heat.	A	1, 2, 3, 4	510
	342101	Magnetic Compass - Inspect for security of installation, cleanliness, and evidence of damage.	C	1	225
Revised Aug 3/98	342102	Magnetic Compass - Calibrate.	M	14	220
Revised Aug 3/98	345001	Instrument Panel Mounted Avionics Units (Including Audio Panel, VHF Nav/Com(s), ADF, GPS, Transponder, and Compass System) - Inspect for deterioration, cracks, and security of instrument panel mounts. Inspect for security of electrical connections, condition, and security of wire routing.	C	1	225
	345002	Avionics Operating Controls - Inspect for security and proper operation of controls and switches and ensure that all digital segments will illuminate properly.	C	1	225
	345003	Navigation Indicators, Controls, and Components - Inspect for condition and security.	C	1	220, 225

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
	345004	Navigation Antennas and Cables - Inspect for security of attachment, connection, and condition.	C	1	310
Revised Mar 31/00	351001	Oxygen System (if applicable) - Inspect masks, hoses, lines, and fittings for condition, routing, and support. Test operation and check for leaks.	C	1	211
Revised Mar 31/00	351002	Oxygen Cylinder (if applicable) - Inspect for condition, check hydrostatic test date and perform hydrostatic test, if due.	S	20	211
	371001	Vacuum System - Inspect for condition and security.	B	2, 4	120
	371002	Vacuum Pumps - Check for condition and security. Check vacuum system breather line for obstructions, condition, and security.	B	2, 4	120
	371003	Vacuum System Hoses - Inspect for hardness, deterioration, looseness, or collapsed hoses.	B	2, 4	120
Revised Aug 3/98	371004	Gyro Filter - Inspect for damage, deterioration and contamination. Clean or replace if required.	B	2, 4	120
Revised Aug 3/98	371005	Regulator Valve and Filter - Inspect valve assembly for security of installation. Visually inspect filter for damage, deterioration and contamination. Clean or replace if required.	B	2, 4	120
Revised Apr 1/05	371006	Vacuum Manifold Check Valve - Complete a check for the proper operation. (Only airplanes with dual vacuum pumps or Airborne manifolds. Refer to the Airborne Air & Fuel Products Service Letter Number 39A or latest revision, and in accordance with SB02-37-04.) Refer to Chapter 37, Vacuum System - Maintenance Practices for the removal and installation procedures for the check valve.	K	12	120
Revised Jan 2/06	371007	Do an inspection of the wear indicator ports on the vacuum pump described in the Tempest Service Letter 004.	W	24	120
	521001	Doors - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	B	1, 3	210

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
	531001	Fuselage Surface - Inspect for skin damage, loose rivets, condition of paint, and check pitot-static ports and drain holes for obstruction. Inspect covers and fairings for security.	B	1, 3	210
Revised Mar 31/00	531002	Firewall Structure - Inspect for wrinkles, damage, cracks, sheared rivets, etc.	C	2	120
	531003	Internal Fuselage Structure - Inspect bulkheads, doorposts, stringers, doublers, and skins for corrosion, cracks, buckles, and loose rivets, bolts and nuts.	C	1	211
Revised Aug 3/98	551001	Horizontal Stabilizer and Tailcone structure - Inspect bulkheads, spars, ribs, and skins, for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect horizontal stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tips.	B	1, 3	320, 330
Revised Aug 3/98	551002	Horizontal Stabilizer and Tips - Inspect externally for skin damage and condition of paint.	B	1, 3	320, 330
Revised Aug 3/98	553001	Vertical Stabilizer Fin - Inspect bulkheads, spars, ribs, and skins for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect vertical stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tip.	B	1, 3	340
Revised Aug 3/98	553002	Vertical Stabilizer Fin and Tailcone - Inspect externally for skin damage and condition of paint.	B	1, 3	340
	561001	Windows and Windshield - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	B	1, 3	210
	571001	Wing Surfaces and Tips - Inspect for skin damage, loose rivets, and condition of paint.	B	1, 3	510, 520, 610, 620
	571002	Wing Struts and Strut Fairings - Check for dents, cracks, loose screws and rivets, and condition of paint.	B	1, 3	510, 610
	571003	Wing Access Plates - Check for damage and security on installation.	C	3	510, 520, 610, 620

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
	571004	Wing Spar and Wing Strut Fittings - Check for evidence of wear. Check attach bolts for indications of looseness and retorque as required.	C	3	510, 520, 610, 620
	571005	Wing Structure - Inspect spars, ribs, skins, and stringers for cracks, wrinkles, loose rivets, corrosion, or other damage.	C	3	510, 520, 610, 620
Revised Jan 5/04	611001	Spinner - Complete a check of its general condition and that it is correctly attached. Make sure it has a minimum clearance of 0.14 inch (3.56 mm) to the propeller blades.	A	1, 2, 3, 4	110
	611002	Spinner and Spinner Bulkhead - Remove spinner, wash, and inspect for cracks and fractures.	B	2, 4	110
	611003	Propeller Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	A	1, 2, 3, 4	110
	611004	Propeller Hub - Check general condition.	C	2	110
	611005	Propeller Mounting - Check for security of installation.	A	1, 2, 3, 4	110
	611006	Propeller Mounting Bolts - Inspect mounting bolts and safety wire for signs of looseness. Retorque mounting bolts as required.	C	2	110
Added Aug 3/98	611007	Propeller Heat Slip Rings, Brushes, and Boots - Inspect for condition, and security. Perform operational check.	A	1, 2, 3, 4	110
Added Aug 3/98	612001	Propeller Governor and Control - Inspect for oil and grease leaks. If leakage is evident, refer to McCauley Service Manual.	A	1, 2, 3, 4	110
Revised Apr 1/05	612002	Propeller Governor and Control - Examine the security and operation of the controls. The maximum linear freeplay is 0.050 inch.	C	2	110

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
Added Aug 3/98	710001	Turbocharger (if applicable) - Inspect turbocharger mounting brackets, ducting, linkage, and attaching parts for general condition, leakage or damage, and security of attachment. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	A	1, 2, 3, 4	120
Revised May 5/03	710002	Turbocharger (if applicable) - Examine the turbocharger for burned areas, bulges, or cracks. Use a flashlight and mirror in the tailpipe to examine the turbine for coking, carbonization, oil deposits, and turbine impellers for damage.	C	2	120
Added May 5/03	710003	Remove the engine compressor inlet duct. Examine the compressor for blade condition on the impeller and oil deposits in the turbocharger. Make sure the compressor turns freely.	C	2	120
Revised Aug 3/98	711001	Cowling and Cowl Flaps - Inspect for cracks, dents, other damage and security of cowl fasteners. Check cowl flaps for condition, security, and operation. Check cowl flap controls for freedom of movement through full travel.	A	1, 2, 3, 4	120
	712001	Engine Shock Mounts, Engine Mount Structure, and Ground Straps - Check condition, security, and alignment.	C	2	120
	716001	Alternate Induction Air System - Check for obstructions, operation, and security.	A	1, 2, 3, 4	120
	716002	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	A	1, 2, 3, 4	120
Revised Sep 15/00	716003	Induction Airbox, Valves, Doors, and Controls - Remove air filter and inspect hinges, doors, seals, and attaching parts for wear and security. Check operation.	B	2, 4	120
	716004	Induction Air Filter - Remove and clean. Inspect for damage and service.	A	2, 4	120

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
Added Jan 2/06	720000	Fuel line (Stainless steel tube assembly) and support clamp inspection and installation. Refer to Lycoming Service Bulletin Number 342E or later version.	V	23	120
	722001	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	A	1, 2, 3, 4	120
	722002	Crankcase, Oil Sump, and Accessory Section - Inspect for cracks and evidence of oil leakage. Check bolts and nuts for looseness and retorque as necessary. Check crankcase breather lines for obstructions, security, and general condition.	B	2, 4	120
	722003	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	A	1, 2, 3, 4	120
	723001	Engine Cylinders, Rocker Box Covers, and Pushrod Housings - Check for fin damage, cracks, oil leakage, security of attachment, and general condition.	B	2, 4	120
	723002	Engine Metal Lines, Hoses, Clamps, and Fittings - Check for leaks, condition, and security. Check for proper routing and support.	C	2	120
	723003	Engine Baffles and Seals - Check condition and security of attachment.	A	1, 2, 3, 4	120
Revised Apr 1/05	723004	Cylinder Compression - Complete a differential compression test. If there is weak cylinder compression, refer to Chapter 71, Engine - Troubleshooting, for further procedures.	B	2, 4	120
	730001	Engine-Driven Fuel Pump - Check for evidence of leakage, security of attachment, and general condition.	B	2, 4	120
	730002	Fuel Injection System - Check system for security and condition. Clean fuel inlet screen, check and clean injection nozzles and screens (if evidence of contamination is found), and lubricate air throttle shaft.	B	2, 4	120
Added Apr 18/01	730003	Idle and Mixture Adjustment - Check idle speed and idle mixture (lean rise). Adjust if necessary. Refer to Chapter 73-00-01, Idle and Mixture Adjustment.	U	22	120

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
Revised Apr 1/05	741001	Magnetos - Examine the external condition and for correct installation. Examine the condition of the electrical leads. Complete a check of the engine timing (external timing). You must set the internal timing if the total of all external adjustments are more than 0.125 inch (3.17 mm) from the original factory position, or between each of the internal timing adjustments. Refer to Chapter 74-10-00, Ignition System - Maintenance Practices.	B	2, 4	120
Revised Jul 3/06	741002	Magnetos - Clean, examine, and adjust as necessary. Do the 500-hour inspection in accordance with the Slick 4300/6300 Series Magneto Maintenance and Overhaul Manual.	H	9	120
	742001	Ignition Harness and Insulators - Check for proper routing, deterioration, and condition of terminals.	B	2, 4	120
	742002	Spark Plugs - Remove, clean, analyze, test, gap, and rotate top plugs to bottom and bottom plugs to top.	B	2, 4	120
	743001	Ignition Switch and Electrical Harness - Inspect for damage, condition, and security.	B	2, 4	120
Revised Sep 15/00	743002	Inspect and lubricate ACS brand ignition switch. Refer to Chapter 74, Ignition System - Maintenance Practices.	N	15	224
Revised Apr 1/05	761001	Engine Controls and Linkage - Examine the general condition and freedom of movement through the full range. Complete a check for the proper travel, security of attachment, and for evidence of wear. Complete a check of the friction lock and vernier adjustment for proper operation. Complete a check that the throttle, fuel mixture, and propeller governor arms operate through their full arc of travel. The maximum linear freeplay is 0.050 inch.	B	1, 2, 3, 4	120, 225
Revised Aug 3/98	781001	Exhaust System - Inspect for cracks and security. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust system - Maintenance Practices.	A	1, 2, 3, 4	120

REVISION STATUS	ITEM CODE NUMBER	TASK	INTERVAL	OPERATION	ZONE
Added Aug 3/98	781002	Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust System - Maintenance Practices. Note: This inspection is specifically required for German (LBA) certification.	A	1, 2, 3, 4	120
Added May 5/03	781003	Do an inspection on the multi-segment V-Band coupling clamps. Refer to Chapter 78, Exhaust System (Turbocharged) - Maintenance Practices.	A	1, 2, 3, 4	120
Revised Sep 15/00	791001	Engine Oil - Drain oil sump and oil cooler. Check for metal particles or foreign material in filter, on sump drain plug, and on engine suction screen. Refer to Textron Lycoming Service Bulletin #480C or latest revision. Replace filter, and refill with recommended grade aviation oil.	A	1, 2, 3, 4	120
	792001	Oil Cooler - Check for obstructions, leaks, and security of attachment.	A	1, 2, 3, 4	120
Revised Mar 31/00	801001	Starter and Electrical Connections - Check security and condition of starter, electrical connection, and cable.	B	2, 4	120
Added Apr 1/02	801002	Bendix Drive Starter Assembly - Clean and lubricate starter drive assembly.	A	1, 2, 3, 4	120

COMPONENT TIME LIMITS

1. General

A. Most components given in Chapter 5 must be examined as shown elsewhere in this chapter and repaired, overhauled, or replaced as necessary. Some components have a time or life limit and must be overhauled or replaced on or before the specified limit.

B. The terms overhaul and replacement as used within this section are defined as follows:
(1) Overhaul - Overhaul the item as given in 14 CFR 43.2 or replace it.
(2) Replacement - Replace the item with a new item or a serviceable item that is within its service life and time limits or has been rebuilt as given in 14 CFR 43.2.

C. This section (5-11-00) gives a list of items which must be overhauled or replaced at specific time limits. Cessna-Supplied Replacement Time Limits shows those items which Cessna has found necessary to overhaul or replace at specific time limits. Supplier-Supplied Replacement Time Limits shows component time limits which have been given by an outside supplier for their products. In addition to these time limits, the components shown in this section are also examined at regular time intervals given in the Inspection Time Intervals section. If necessary, based on service use and inspection results, these components can be overhauled or replaced before their time limit is reached.

2. Cessna-Supplied Replacement Time Limits

A. Equipment/Furnishings (Chapter 25).
(1) 504516-401-XXXX Restraint System, Pilot's Left Hand or Right Hand Auto Adjust - Replace every 10 years.
(2) 504851-401-XXXX Restraint System, Pilot's Left Hand or Right Hand Manual Adjust - Replace every 10 years.
(3) 504516-405-XXXX Restraint System, Passenger Auto Adjust - Replace every 10 years.
(4) 504851-405-XXXX Restraint System, Passenger Manual Adjust - Replace every 10 years.
(5) 504516-403-XXXX Restraint System, Aft Bench Left Hand or Right Hand Auto Adjust - Replace every 10 years.
(6) 504851-403-XXXX Restraint System, Aft Bench Left Hand or Right Hand Manual Adjust - Replace every 10 years.
(7) 2000031-09-203 Restraint Assembly, Pilot's Seat - Replace every 10 years.
(8) 2000031-10-203 Restraint Assembly, Copilot's Seat - Replace every 10 years.
(9) 2000031-11-203 Restraint Assembly, Right Rear Seat - Replace every 10 years.
(10) 2000031-13-203 Restraint Assembly, Right Center Seat - Replace every 10 years.
(11) 2000031-14-203 Restraint Assembly, Left Center Seat - Replace every 10 years.
(12) 2000031-12-203 Restraint Assembly, Left Rear Seat - Replace every 10 years.

B. Flight Controls (Chapter 27).
(1) 1260149-1 Trim Tab Actuator - Replace the trim tab actuators when the free play cannot be kept in limits by the adjustment or replacement of the rod ends, rod end bolts, screw assembly, and the lubrication of the trim tab actuator.
(2) 1260149-2 Trim Tab Actuator (with dual axis autopilot) - Replace the trim tab actuators when the free play cannot be kept in limits by the adjustment or replacement of the rod ends, rod end bolts, screw assembly, and the lubrication of the trim tab actuator.

C. Vacuum (Chapter 37).
(1) C294502-0201 Gyro Filter - Replace at 600 hours.
(2) B3-5-1 or ARB3-5-1 Regulator Valve Filter - Replace at 100 hours.
(3) Dry Vacuum Pump - Replace the engine-driven vacuum pump, if it does not have a wear indicator, every 500 hours of operation, or replace the pump at the vacuum pump manufacturer's recommended inspection and replacement interval, whichever occurs first. For vacuum pumps with a wear indicator, replace the pump at the manufacturer's recommended inspection and replacement interval for that vacuum pump.
(4) Airborne 350 Vacuum Pump Coupling - Replace every 6 years.

D. Propeller (Chapter 61).
(1) 165-510-504 Propeller Control Cable - Replace at engine TBO.

E. Powerplant (Chapter 71).
(1) Engine Compartment Flexible Fluid-Carrying Teflon Hoses (Cessna-Installed), Except Drain Hoses - Replace every 10 years or at the engine overhaul, whichever occurs first.

NOTE: This life limit is intended not to let flexible, fluid-carrying Teflon hoses in a deteriorated or damaged condition stay in service. Replace the flexible, fluid-carrying Teflon hoses in the engine compartment (Cessna-installed only) every 10 years or at the engine overhaul, whichever occurs first. This does not include drain hoses. Serviceable hoses which are beyond these limits must be put on order immediately and replaced within 30 days after the new hose is received from Cessna.

(2) Engine Compartment Drain Hoses - Replace on condition.
(3) Engine Flexible Hoses (Textron Lycoming Installed) - Refer to latest Textron Lycoming Engine Service Bulletins.
(4) 1250704-4 Air Filter (206) - Replace every 500 hours or if the condition of the part shows the need for replacement.
(5) P197268 Air Filter (T206) - Replace every 500 hours or if the condition of the part shows the need for replacement.
(6) Mixture and Throttle Cables - Replace at every engine TBO.
(7) 31B22101 Engine Starter - Replace at every engine TBO.
(8) Engine Shock Mounts - Replace at every engine TBO or if the condition of the part shows the need for replacement.

F. Chapter 79 (Oil).
(1) 83278 Oil Pressure Switch - Replace every 3000 hours.

NOTE: If the 83278 Oil Pressure Switch has more than 3000 hours and is in serviceable condition, you must submit an order for a new switch immediately and replace the switch within 60 days after you receive it from Cessna.

3. Supplier-Supplied Replacement Time Limits

A. Chapter 25 (Equipment/Furnishings).
(1) 2020-0 Pointer ELT Battery - Refer to 14 CFR 91.207 for battery replacement time limits.
(2) 508358-409 and 508358-421 AMSAFE Aviation Inflatable Restraint (AAIR) Forward and Aft Electronics Module Assemblies (EMA) - Remove and return the forward and aft EMA's to AMSAFE Aviation after seven years from the manufacture date. The expiration of the service life, that is the total sum of storage life and installation life, must not be more than seven years from the manufacture date. Only the manufacturer can renew the EMA's.
(3) 508792-401 and 508794-401 Pilot's, Copilot's, Left Passenger's, and Right Passenger's AMSAFE Aviation Inflatable Restraint (AAIR) Inflator Assemblies - Remove and return the pilot's, copilot's, left passenger's, and right passenger's inflator assemblies to AMSAFE Aviation after seven years from the manufacture date. The expiration of the service life, that is the total sum of storage life and installation life, must not be more than seven years from the manufacture date. The expiration date is found on the gas cylinder. Only the manufacturer can renew the inflator assemblies.
(4) 452-201-[X] Remote Mounted CO Detector - Replace 7 years.

B. Chapter 28 (Fuel).
(1) Weldon Model A10056-5 and A-10055-B Electric Fuel Pumps - Replace at 10 Years if not overhauled.

C. Chapter 37 (Vacuum).
(1) 1H5-25 Vacuum Manifold - Refer to Airborne Air & Fuel Product Reference Memo No. 39 or the latest revision for replacement time limits.
(2) B3-5-1 or ARB3-5-1 Regulator Valve Filter - Replace at 100 hours.

(3) Dry Vacuum Pump - Replace the engine-driven vacuum pump, if it does not have a wear indicator, every 500 hours of operation, or replace the pump at the vacuum pump manufacturer's recommended inspection and replacement interval, whichever occurs first. For vacuum pumps with a wear indicator, replace the pump at the manufacturer's recommended inspection and replacement interval for that vacuum pump.

(4) Airborne 350 Vacuum Pump Coupling - Replace every 6 years.

D. Chapter 61 (Propeller).

(1) Propeller - Refer to the latest revision of McCauley Service Bulletin 137 for the overhaul time limits.

(2) C161031-0121(206), C161031-120 (T206) Propeller Governor - Any governor damaged by a propeller blade strike, propeller or engine lightning strike, engine detonation, oil contamination, or sudden engine stop must not be returned to service. All such parts must be repaired or overhauled. Refer to McCauley Service Bulletin 215C or latest revision.

E. Chapter 71 (Powerplant).

(1) IO-540-AC1A5 (206), IO-540-AJ1A (T206) Engine - Refer to Textron/Lycoming Service Instruction S.I. 1009AJ or latest revision for time limits.

(2) CH48110 Engine Oil Filter - Refer to Textron/Lycoming Service Instructions S.I. 1492B, S.I. 1267C, and Service Bulletin SB.480C, or latest revisions.

F. Chapter 74 (Ignition).

(1) 4371 Slick Magnetos - Refer to Slick Service Bulletin SB2-80C, or latest revision, for time limits.

PROGRESSIVE CARE PROGRAM

1. General

NOTE: The inspection charts contained within the Progressive Care Program are not intended to be all inclusive, for no such charts can replace the good judgment of a certified airframe and powerplant mechanic in performance of his duties. As the one primarily responsible for the airworthiness of the airplane, the owner or operator should select only qualified personnel to maintain the airplane.

A. The program is divided into four primary operations (operations 1 through 4) which cover all 50-hour, 100-hour and 200-hour inspection requirements. The remaining operations include all of the inspection requirements due at other intervals.

B. The inspection program is divided into operations to enable the progressive inspection to be accomplished.

Operation 1 - Consists of all 50-hour interval inspections items and those 100- or 200-hour interval inspections items contained in the fuselage area.

Operation 2 - Consists of all 50-hour interval inspections items and those 100- or 200-hour interval inspections items contained in the engine compartment area.

Operation 3 - Consists of all 50-hour interval inspections items and those 100- or 200-hour interval inspections items contained in the wing.

Operation 4 - Consists of all 50-hour interval inspections items and those 100- or 200-hour interval inspections items contained in the landing gear.

Operation 5 - Every 400 hours or 1 year, whichever occurs first.

Operation 6 - First 100 hours and each 500 hours thereafter (NOT CURRENTLY USED).

Operation 7 - Every 600 hours or 1 year, whichever occurs first.

Operation 8 - Every 1000 hours or 3 years, whichever occurs first (NOT CURRENTLY USED).

Operation 9 - Every 500 hours.

Operation 10 - Every 1000 hours.

Operation 11 - Every 2 years.

Operation 12 - Beginning 5 years from the date of the manufacture, you must make sure of the serviceability of the components every twelve months. Refer to Airborne Air and Fuel Products Service Letter Number 39A or latest revision.

Operation 13 - Every 50 hours or 4 months, whichever comes first (NOT CURRENTLY USED).

Operation 14 - Every 2 years, or anytime components are added or removed which have the potential to affect the magnetic accuracy and/or variation of the compass calibration, or anytime the accuracy of the compass is in question.

Operation 15 - Every 2000 hours.

Operation 16 - Every 1000 hours or 1 year, whichever occurs first.

Operation 17 - Every 12 calendar months.

Operation 18 - Every 6 years.

Operation 19 - Every 12 years.

Operation 20 - Every 3 years.

Operation 21 - Every 1 year.

Operation 22 - Every 100 hours or every one year, whichever occurs first.

Operation 23 - Every 100 hours, every annual inspection, every overhaul, and any time fuel lines or clamps are serviced, removed or replaced.

Operation 24 - First 600 hours and as defined by the manufacturer thereafter.

Operation 25 - Every 1000 hours or 3 years, whichever occurs first.

2. Procedure

A. A COMPLETE AIRPLANE INSPECTION includes all 50-, 100- and 200-hour items plus those Inspection Items contained in other operations which are due at the specified time.

B. The Component Time Limits Section (5-11-00) should be checked at each inspection interval to ensure proper overhaul and replacement requirements are accomplished at the specified times.

C. The Inspection Operations have been developed based on normal usage under average environmental conditions. Airplanes operated in extremely humid areas (tropics), or in exceptionally cold, damp climates, etc., may need more frequent inspections for wear, corrosion, and lubrication. Under these adverse conditions, do the periodic inspections in compliance with the Inspection Operations at more frequent intervals until the operator can set his own inspection periods based on field experience. The operator's inspection intervals must not deviate from the inspection time limits shown in this manual except as given below:

(1) Each inspection interval can be exceeded by 10 hours (if time-controlled), or by 30 days (if date-controlled), or can be performed early at any time prior to the regular interval as provided below:

(a) In the event of late compliance of any operation scheduled, the next operation in sequence retains a due point from the time the late operation was originally scheduled.

(b) In the event of early compliance of any operation scheduled, that occurs 10 hours or less ahead of schedule, the next phase due point may remain where originally set.

(c) In the event of early compliance of any operation scheduled, that occurs more than 10 hours ahead of schedule, the next operation due point must be rescheduled to establish a new due point from the time of early accomplishment.

3. Inspection Terms and Guidelines

A. For inspection terms and guidelines, refer to Time Limits/Maintenance Checks - General.

INSPECTION OPERATION 1

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 1 gives a list of item(s), which has all 50-hour interval inspection items and those 100- or 200-hour interval inspection items contained in the fuselage area. Items from other areas are included to meet their required time interval.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
611001	Spinner - Complete a check of its general condition and that it is correctly attached. Make sure it has a minimum clearance of 0.14 inch (3.56 mm) to the propeller blades.	110		
611003	Propeller Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	110		
611005	Propeller Mounting - Check for security of installation.	110		
611007	Propeller Heat Slip Rings, Brushes, and Boots - Inspect for condition, and security. Perform operational check.	110		
612001	Propeller Governor and Control - Inspect for oil and grease leaks. If leakage is evident, refer to McCauley Service Manual.	110		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
242001	Alternator, Mounting Bracket, and Electrical Connections - Check condition and security. Check alternator belts for condition and proper adjustment. Check belt tension.	120		
710001	Turbocharger (if applicable) - Inspect turbocharger mounting brackets, ducting, linkage, and attaching parts for general condition, leakage or damage, and security of attachment. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	120		
711001	Cowling and Cowl Flaps - Inspect for cracks, dents, other damage and security of cowl fasteners. Check cowl flaps for condition, security, and operation. Check cowl flap controls for freedom of movement through full travel.	120		
716001	Alternate Induction Air System - Check for obstructions, operation, and security.	120		
716002	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	120		
722001	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	120		
722003	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	120		
723003	Engine Baffles and Seals - Check condition and security of attachment.	120		
781001	Exhaust System - Inspect for cracks and security. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust system - Maintenance Practices.	120		
781002	Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust System - Maintenance Practices. Note: This inspection is specifically required for German (LBA) certification.	120		
781003	Do an inspection on the multi-segment V-Band coupling clamps. Refer to Chapter 78, Exhaust System (Turbocharged) - Maintenance Practices.	120		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
791001	Engine Oil - Drain oil sump and oil cooler. Check for metal particles or foreign material in filter, on sump drain plug, and on engine suction screen. Refer to Textron Lycoming Service Bulletin #480C or latest revision. Replace filter, and refill with recommended grade aviation oil.	120		
792001	Oil Cooler - Check for obstructions, leaks, and security of attachment.	120		
801002	Bendix Drive Starter Assembly - Clean and lubricate starter drive assembly.	120		
761001	Engine Controls and Linkage - Examine the general condition and freedom of movement through the full range. Complete a check for the proper travel, security of attachment, and for evidence of wear. Complete a check of the friction lock and vernier adjustment for proper operation. Complete a check that the throttle, fuel mixture, and propeller governor arms operate through their full arc of travel. The maximum linear freeplay is 0.050 inch.	120, 225		
271001	Aileron Controls - Check freedom of movement and proper operation through full travel.	120, 520, 620		
243003	General Airplane and System Wiring - Inspect for proper routing, chafing, broken or loose terminals, general condition, broken or inadequate clamps, and sharp bends in wiring.	210		
521001	Doors - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	210		
531001	Fuselage Surface - Inspect for skin damage, loose rivets, condition of paint, and check pitot-static ports and drain holes for obstruction. Inspect covers and fairings for security.	210		
561001	Windows and Windshield - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	210		
214002	Heater Components, Inlets, and Outlets - Inspect all lines, ducts, clamps, seals, and gaskets for condition, restriction, and security.	211		
214003	Cabin Heat and Ventilation Controls - Check freedom of movement through full travel. Check friction locks for proper operation.	211		
235001	Microphones, Headsets, and Jacks - Inspect for cleanliness, security, and evidence of damage.	211		

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
251001	Seats - Examine the seats to make sure they are serviceable and installed correctly. Make sure the seat stops and adjustment mechanism operate correctly. Examine the seat recline control and attaching hardware to make sure the hardware and lock are not damaged and are correctly installed. Lubricate the threads of the Seat Crank Handle Assembly with MIL-PRF-81322 general purpose grease.	211			
251101	Restraint System, front and rear - Check belts for thinning, fraying, cutting, broken stitches, or ultra-violet deterioration. Check system hardware for security of installation.	211			
351001	Oxygen System (if applicable) - Inspect masks, hoses, lines, and fittings for condition, routing, and support. Test operation and check for leaks.	211			
531003	Internal Fuselage Structure - Inspect bulkheads, doorposts, stringers, doublers, and skins for corrosion, cracks, buckles, and loose rivets, bolts and nuts.	211			
311001	Instruments - Check general condition and markings for legibility.	220			
311003	Instrument Lines, Fittings, Ducting, and Instrument Panel Wiring - Check for proper routing, support, and security of attachment.	220			
331001	Instrument and Cabin Lights - Check operation, condition of lens, and security of attachment.	220, 211, 221			
345003	Navigation Indicators, Controls, and Components - Inspect for condition and security.	220, 225			
275002	Wing Flap Control - Check operation through full travel and observe Flap Position indicator for proper indication.	221			
246001	Switch and Circuit Breaker Panel, Terminal Blocks, and Junction Boxes - Inspect wiring and terminals for condition and security.	222			
246002	Power Junction Box - Check operation and condition. Check availability and condition of spare fuse (if applicable).	222			
271005	Control Wheel Lock - Check general condition and operation.	222			
235002	Microphone Push-To-Talk Switch - Clean the pilot's and copilot's microphone switches. Refer to Chapter 23, Communication - Maintenance Practices.	222, 223			
271006	Control Linkage - Inspect pulleys, cables, bearings, and turnbuckles for condition and security.	222, 223			

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
273001	Elevator Control - Check freedom of movement and proper operation through full travel.	222, 223		
273002	Elevator Control System - Inspect pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition, security, and operation. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety.	222, 223		
273103	Elevator Trim Tab and Hinges - Check condition, security, and operation.	224		
282003	Fuel Selector Valve - Check controls for dentent in each position, security of attachment, and for proper placarding.	224		
282006	Fuel Selector - Using quick drain, ensure no contamination exists.	224		
273101	Elevator Trim System - Check cables, push-pull rods, bell cranks, pulleys, turnbuckles, fairleads, rub strips, etc. for proper routing, condition, and security.	224, 240, 310		
273102	Elevator Trim Control and Indicator - Check freedom of movement and proper operation through full travel. Check pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition and security. Check electric trim controls for operation as applicable. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety.	224, 240, 310		
342101	Magnetic Compass - Inspect for security of installation, cleanliness, and evidence of damage.	225		
345001	Instrument Panel Mounted Avionics Units (Including Audio Panel, VHF Nav/Com(s), ADF, GPS, Transponder, and Compass System) - Inspect for deterioration, cracks, and security of instrument panel mounts. Inspect for security of electrical connections, condition, and security of wire routing.	225		
345002	Avionics Operating Controls - Inspect for security and proper operation of controls and switches and ensure that all digital segments will illuminate properly.	225		
262001	Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition, security of installation, and servicing date.	230		
272004	Rudder Pedals and Linkage - Check for general condition, proper rigging, and operation. Check for security of attachment.	230		
273106	Elevator Trim Tab Stop Blocks - Inspect for damage and security.	240		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
256001	Emergency Locator Transmitter - Examine for security of attachment and check operation by verifying transmitter output. Check cumulative time and useful life of batteries in accordance with 14 CFR Part 91.207.	310		
273004	Elevator Downspring - Check structure, bolts, linkage, bellcrank, and push-pull tube for condition, operation, and security. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travels if cables require tension adjustment or if stops are damaged.	310		
345004	Navigation Antennas and Cables - Inspect for security of attachment, connection, and condition.	310		
273104	Elevator Trim Tab Actuator - Examine the free play limits. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices, Trim Tab Free Play Inspection. If the free play is more than the permitted limits, lubricate the actuator and examine the free play limits again. If the free play is still more than the permitted limits, replace the actuator.	320		
273003	Elevator, Hinges, Stops, and Cable Attachment - Check condition, security, and operation.	320, 330		
551001	Horizontal Stabilizer and Tailcone structure - Inspect bulkheads, spars, ribs, and skins, for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect horizontal stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tips.	320, 330		
551002	Horizontal Stabilizer and Tips - Inspect externally for skin damage and condition of paint.	320, 330		
272002	Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings, and bonding jumper for evidence of damage and wear, failed fasteners, and security. Inspect balance weight for looseness and the supporting structure for damage.	340		
272003	Rudder, Tips, Hinges, Stops, Clips and Cable Attachment - Check condition, security, and operation.	340		
272005	Rudder Control - Check freedom of movement and proper operation through full travel. Check rudder stops for damage and security.	340		
553001	Vertical Stabilizer Fin - Inspect bulkheads, spars, ribs, and skins for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect vertical stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tip.	340		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
553002	Vertical Stabilizer Fin and Tailcone - Inspect externally for skin damage and condition of paint.	340		
334001	Navigation, Beacon, Strobe, and Landing Lights - Check operation, condition of lens, and security of attachment.	340, 520, 620		
341103	Pitot Tube and Stall Warning Vane - Check for condition and obstructions and verify operation of anti-ice heat.	510		
571001	Wing Surfaces and Tips - Inspect for skin damage, loose rivets, and condition of paint.	510, 520, 610, 620		
275001	Flaps - Check tracks, rollers, and control rods for security of attachment. Check rod end bearings for corrosion. Check operation.	510, 610		
282001	Fuel System - Inspect plumbing and components for mounting and security.	510, 610		
282002	Fuel Tank Vent Lines and Vent Valves - Check vents for obstruction and proper positioning. Check valves for operation.	510, 610		
282004	Integral Fuel Bays - Check for evidence of leakage and condition of fuel caps, adapters, and placards. Using quick drains, ensure no contamination exists. Check quick drains for proper shut off.	510, 610		
282005	Fuel Reservoir - Using quick drain, ensure no contamination exists.	510, 610		
282007	Fuel Strainer, Drain Valve, and Controls - Check freedom of movement, security, and proper operation. Disassemble, flush, and clean screen and bowl.	510, 610		
571002	Wing Struts and Strut Fairings - Check for dents, cracks, loose screws and rivets, and condition of paint.	510, 610		
271003	Aileron Structure, Control Rods, Hinges, Balance Weights, Bell Cranks, Linkage, Bolts, Pulleys, and Pulley Brackets - Check condition, operation, and security of attachment.	520, 620		
271004	Ailerons and Hinges - Check condition, security, and operation	520, 620		
275006	Flap Actuator Threads - Clean and lubricate. Refer to Chapter 12-21-03.	610		
110000	Interior Placards, Exterior Placards, Decals, Markings and Identification Plates - Inspect for security of installation and legibility. Refer to Chapter 11, Placards and Markings - Inspection/Check.	All		

*** End of Operation 1 Inspection Items ***

INSPECTION OPERATION 2

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 2 gives a list of item(s), which has all 50-hour interval inspection items and those 100- or 200-hour interval inspection items contained in the engine compartment. Items from other areas are included to meet their required time interval.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
611001	Spinner - Complete a check of its general condition and that it is correctly attached. Make sure it has a minimum clearance of 0.14 inch (3.56 mm) to the propeller blades.	110		
611002	Spinner and Spinner Bulkhead - Remove spinner, wash, and inspect for cracks and fractures.	110		
611003	Propeller Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	110		
611004	Propeller Hub - Check general condition.	110		
611005	Propeller Mounting - Check for security of installation.	110		
611006	Propeller Mounting Bolts - Inspect mounting bolts and safety wire for signs of looseness. Retorque mounting bolts as required.	110		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
611007	Propeller Heat Slip Rings, Brushes, and Boots - Inspect for condition, and security. Perform operational check.	110		
612001	Propeller Governor and Control - Inspect for oil and grease leaks. If leakage is evident, refer to McCauley Service Manual.	110		
612002	Propeller Governor and Control - Examine the security and operation of the controls. The maximum linear freeplay is 0.050 inch.	110		
214001	Cold and Hot Air Hoses - Check condition, routing, and security.	120		
242001	Alternator, Mounting Bracket, and Electrical Connections - Check condition and security. Check alternator belts for condition and proper adjustment. Check belt tension.	120		
243001	Main Battery - Examine the general condition and security. Complete a check of the level of electrolyte. Refer to Chapter 12-17-00.	120		
243002	Main Battery Box and Cables - Clean and remove any corrosion. Examine the cables for routing, support, and security of the connections.	120		
243004	External Power Receptacle and Power Cables - Inspect for condition and security.	120		
282010	Auxiliary (Electric) Fuel Pump - Check pump and fittings for condition, operation, security.	120		
371001	Vacuum System - Inspect for condition and security.	120		
371002	Vacuum Pumps - Check for condition and security. Check vacuum system breather line for obstructions, condition, and security.	120		
371003	Vacuum System Hoses - Inspect for hardness, deterioration, looseness, or collapsed hoses.	120		
371004	Gyro Filter - Inspect for damage, deterioration and contamination. Clean or replace if required.	120		
371005	Regulator Valve and Filter - Inspect valve assembly for security of installation. Visually inspect filter for damage, deterioration and contamination. Clean or replace if required.	120		
531002	Firewall Structure - Inspect for wrinkles, damage, cracks, sheared rivets, etc.	120		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
710001	Turbocharger (if applicable) - Inspect turbocharger mounting brackets, ducting, linkage, and attaching parts for general condition, leakage or damage, and security of attachment. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	120		
710002	Turbocharger (if applicable) - Examine the turbocharger for burned areas, bulges, or cracks. Use a flashlight and mirror in the tailpipe to examine the turbine for coking, carbonization, oil deposits, and turbine impellers for damage.	120		
710003	Remove the engine compressor inlet duct. Examine the compressor for blade condition on the impeller and oil deposits in the turbocharger. Make sure the compressor turns freely.	120		
711001	Cowling and Cowl Flaps - Inspect for cracks, dents, other damage and security of cowl fasteners. Check cowl flaps for condition, security, and operation. Check cowl flap controls for freedom of movement through full travel.	120		
712001	Engine Shock Mounts, Engine Mount Structure, and Ground Straps - Check condition, security, and alignment.	120		
716001	Alternate Induction Air System - Check for obstructions, operation, and security.	120		
716002	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	120		
716003	Induction Airbox, Valves, Doors, and Controls - Remove air filter and inspect hinges, doors, seals, and attaching parts for wear and security. Check operation.	120		
716004	Induction Air Filter - Remove and clean. Inspect for damage and service.	120		
722001	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	120		
722002	Crankcase, Oil Sump, and Accessory Section - Inspect for cracks and evidence of oil leakage. Check bolts and nuts for looseness and retorque as necessary. Check crankcase breather lines for obstructions, security, and general condition.	120		
722003	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	120		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
723001	Engine Cylinders, Rocker Box Covers, and Pushrod Housings - Check for fin damage, cracks, oil leakage, security of attachment, and general condition.	120		
723002	Engine Metal Lines, Hoses, Clamps, and Fittings - Check for leaks, condition, and security. Check for proper routing and support.	120		
723003	Engine Baffles and Seals - Check condition and security of attachment.	120		
723004	Cylinder Compression - Complete a differential compression test. If there is weak cylinder compression, refer to Chapter 71, Engine - Troubleshooting, for further procedures.	120		
730001	Engine-Driven Fuel Pump - Check for evidence of leakage, security of attachment, and general condition.	120		
730002	Fuel Injection System - Check system for security and condition. Clean fuel inlet screen, check and clean injection nozzles and screens (if evidence of contamination is found), and lubricate air throttle shaft.	120		
741001	Magnetos - Examine the external condition and for correct installation. Examine the condition of the electrical leads. Complete a check of the engine timing (external timing). You must set the internal timing if the total of all external adjustments are more than 0.125 inch (3.17 mm) from the original factory position, or between each of the internal timing adjustments. Refer to Chapter 74-10-00, Ignition System - Maintenance Practices.	120		
742001	Ignition Harness and Insulators - Check for proper routing, deterioration, and condition of terminals.	120		
742002	Spark Plugs - Remove, clean, analyze, test, gap, and rotate top plugs to bottom and bottom plugs to top.	120		
743001	Ignition Switch and Electrical Harness - Inspect for damage, condition, and security.	120		
781001	Exhaust System - Inspect for cracks and security. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust system - Maintenance Practices.	120		
781002	Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust System - Maintenance Practices. Note: This inspection is specifically required for German (LBA) certification.	120		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
781003	Do an inspection on the multi-segment V-Band coupling clamps. Refer to Chapter 78, Exhaust System (Turbocharged) - Maintenance Practices.	120		
791001	Engine Oil - Drain oil sump and oil cooler. Check for metal particles or foreign material in filter, on sump drain plug, and on engine suction screen. Refer to Textron Lycoming Service Bulletin #480C or latest revision. Replace filter, and refill with recommended grade aviation oil.	120		
792001	Oil Cooler - Check for obstructions, leaks, and security of attachment.	120		
801001	Starter and Electrical Connections - Check security and condition of starter, electrical connection, and cable.	120		
801002	Bendix Drive Starter Assembly - Clean and lubricate starter drive assembly.	120		
761001	Engine Controls and Linkage - Examine the general condition and freedom of movement through the full range. Complete a check for the proper travel, security of attachment, and for evidence of wear. Complete a check of the friction lock and vernier adjustment for proper operation. Complete a check that the throttle, fuel mixture, and propeller governor arms operate through their full arc of travel. The maximum linear freeplay is 0.050 inch.	120, 225		
324002	Brakes, Master Cylinders, and Parking Brake - Check master cylinders and parking brake mechanism for condition and security. Check fluid level and test operation of toe and parking brake. Refer to Chapter 12-13-00 for servicing instructions.	224, 230		
251002	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Inspect seat rails for cracks.	230		
324001	Brakes - Test toe brakes and parking brake for proper operation.	230		
341103	Pitot Tube and Stall Warning Vane - Check for condition and obstructions and verify operation of anti-ice heat.	510		
322001	Nose Gear - Inspect torque links, steering rods, and boots for condition and security of attachment. Check strut for evidence of leakage and proper extension. Check strut barrel for corrosion, pitting, and cleanliness. Check shimmy damper and/or bungees for operation, leakage, and attach points for wear and security.	720		
322002	Nose Landing Gear Wheel Fairings - Check for cracks, dents, and condition of paint.	720		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
322004	Nose Gear Attachment Structure - Inspect for cracks, corrosion, or other damage and security of attachment.	720		
324004	Tires - Check tread wear and general condition. Check for proper inflation.	720, 721, 722		
321002	Main Gear Spring Assemblies - Examine for cracks, dents, corrosion, condition of paint or other damage. Examine for chips, scratches, or other damage that lets corrosion get to the steel spring. Examine the axles for condition and security.	721, 722		
321003	Main Landing Gear Attachment Structure - Check for damage, cracks, loose rivets, bolts and nuts and security of attachment.	721, 722		
324005	Wheels, Brake Discs, and Linings - Inspect for wear, cracks, warps, dents, or other damage. Check wheel through-bolts and nuts for looseness.	721, 722		
321001	Main Landing Gear Wheel Fairings and Brake Fairings - Check for cracks, dents, and condition of paint.	721,722		
110000	Interior Placards, Exterior Placards, Decals, Markings and Identification Plates - Inspect for security of installation and legibility. Refer to Chapter 11, Placards and Markings - Inspection/Check.	All		

*** End of Operation 2 Inspection Items ***

INSPECTION OPERATION 3

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 3 gives a list of item(s), which has all 50-hour interval inspection items and those 100- or 200-hour interval inspection items contained in the wing. Items from other areas are included to meet their required time interval.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
611001	Spinner - Complete a check of its general condition and that it is correctly attached. Make sure it has a minimum clearance of 0.14 inch (3.56 mm) to the propeller blades.	110		
611003	Propeller Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	110		
611005	Propeller Mounting - Check for security of installation.	110		
611007	Propeller Heat Slip Rings, Brushes, and Boots - Inspect for condition, and security. Perform operational check.	110		
612001	Propeller Governor and Control - Inspect for oil and grease leaks. If leakage is evident, refer to McCauley Service Manual.	110		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
242001	Alternator, Mounting Bracket, and Electrical Connections - Check condition and security. Check alternator belts for condition and proper adjustment. Check belt tension.	120		
710001	Turbocharger (if applicable) - Inspect turbocharger mounting brackets, ducting, linkage, and attaching parts for general condition, leakage or damage, and security of attachment. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	120		
711001	Cowling and Cowl Flaps - Inspect for cracks, dents, other damage and security of cowl fasteners. Check cowl flaps for condition, security, and operation. Check cowl flap controls for freedom of movement through full travel.	120		
716001	Alternate Induction Air System - Check for obstructions, operation, and security.	120		
716002	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	120		
722001	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	120		
722003	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	120		
723003	Engine Baffles and Seals - Check condition and security of attachment.	120		
781001	Exhaust System - Inspect for cracks and security. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust system - Maintenance Practices.	120		
781002	Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust System - Maintenance Practices. Note: This inspection is specifically required for German (LBA) certification.	120		
781003	Do an inspection on the multi-segment V-Band coupling clamps. Refer to Chapter 78, Exhaust System (Turbocharged) - Maintenance Practices.	120		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
791001	Engine Oil - Drain oil sump and oil cooler. Check for metal particles or foreign material in filter, on sump drain plug, and on engine suction screen. Refer to Textron Lycoming Service Bulletin #480C or latest revision. Replace filter, and refill with recommended grade aviation oil.	120		
792001	Oil Cooler - Check for obstructions, leaks, and security of attachment.	120		
801002	Bendix Drive Starter Assembly - Clean and lubricate starter drive assembly.	120		
761001	Engine Controls and Linkage - Examine the general condition and freedom of movement through the full range. Complete a check for the proper travel, security of attachment, and for evidence of wear. Complete a check of the friction lock and vernier adjustment for proper operation. Complete a check that the throttle, fuel mixture, and propeller governor arms operate through their full arc of travel. The maximum linear freeplay is 0.050 inch.	120, 225		
271001	Aileron Controls - Check freedom of movement and proper operation through full travel.	120, 520, 620		
271002	Ailerons and Cables - Check operation and security of stops. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment or if stops are damaged. Check fairleads and rub strips for condition.	120, 520, 620		
231001	Communication Antennas and Cables - Inspect for security of attachment, connection, and condition.	210		
341101	Static System - Inspect for security of installation, cleanliness, and evidence of damage.	210		
521001	Doors - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	210		
531001	Fuselage Surface - Inspect for skin damage, loose rivets, condition of paint, and check pitot-static ports and drain holes for obstruction. Inspect covers and fairings for security.	210		
561001	Windows and Windshield - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	210		
214002	Heater Components, Inlets, and Outlets - Inspect all lines, ducts, clamps, seals, and gaskets for condition, restriction, and security.	211		
214003	Cabin Heat and Ventilation Controls - Check freedom of movement through full travel. Check friction locks for proper operation.	211		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
251001	Seats - Examine the seats to make sure they are serviceable and installed correctly. Make sure the seat stops and adjustment mechanism operate correctly. Examine the seat recline control and attaching hardware to make sure the hardware and lock are not damaged and are correctly installed. Lubricate the threads of the Seat Crank Handle Assembly with MIL-PRF-81322 general purpose grease.	211		
251101	Restraint System, front and rear - Check belts for thinning, fraying, cutting, broken stitches, or ultra-violet deterioration. Check system hardware for security of installation.	211		
311001	Instruments - Check general condition and markings for legibility.	220		
331001	Instrument and Cabin Lights - Check operation, condition of lens, and security of attachment.	220, 211, 221		
246002	Power Junction Box - Check operation and condition. Check availability and condition of spare fuse (if applicable).	222		
235002	Microphone Push-To-Talk Switch - Clean the pilot's and copilot's microphone switches. Refer to Chapter 23, Communication - Maintenance Practices.	222, 223		
273001	Elevator Control - Check freedom of movement and proper operation through full travel.	222, 223		
273002	Elevator Control System - Inspect pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition, security, and operation. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety.	222, 223		
273103	Elevator Trim Tab and Hinges - Check condition, security, and operation.	224		
282003	Fuel Selector Valve - Check controls for dentent in each position, security of attachment, and for proper placarding.	224		
282006	Fuel Selector - Using quick drain, ensure no contamination exists.	224		
273101	Elevator Trim System - Check cables, push-pull rods, bell cranks, pulleys, turnbuckles, fairleads, rub strips, etc. for proper routing, condition, and security.	224, 240, 310		
262001	Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition, security of installation, and servicing date.	230		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
256001	Emergency Locator Transmitter - Examine for security of attachment and check operation by verifying transmitter output. Check cumulative time and useful life of batteries in accordance with 14 CFR Part 91.207.	310		
273004	Elevator Downspring - Check structure, bolts, linkage, bellcrank, and push-pull tube for condition, operation, and security. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travels if cables require tension adjustment or if stops are damaged.	310		
273104	Elevator Trim Tab Actuator - Examine the free play limits. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices, Trim Tab Free Play Inspection. If the free play is more than the permitted limits, lubricate the actuator and examine the free play limits again. If the free play is still more than the permitted limits, replace the actuator.	320		
273003	Elevator, Hinges, Stops, and Cable Attachment - Check condition, security, and operation.	320, 330		
551001	Horizontal Stabilizer and Tailcone structure - Inspect bulkheads, spars, ribs, and skins, for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect horizontal stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tips.	320, 330		
551002	Horizontal Stabilizer and Tips - Inspect externally for skin damage and condition of paint.	320, 330		
272001	Rudder - Check internal surfaces for corrosion, condition of fasteners, and balance weight attachment.	340		
272002	Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings, and bonding jumper for evidence of damage and wear, failed fasteners, and security. Inspect balance weight for looseness and the supporting structure for damage.	340		
272003	Rudder, Tips, Hinges, Stops, Clips and Cable Attachment - Check condition, security, and operation.	340		
272005	Rudder Control - Check freedom of movement and proper operation through full travel. Check rudder stops for damage and security.	340		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
553001	Vertical Stabilizer Fin - Inspect bulkheads, spars, ribs, and skins for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect vertical stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tip.	340		
553002	Vertical Stabilizer Fin and Tailcone - Inspect externally for skin damage and condition of paint.	340		
334001	Navigation, Beacon, Strobe, and Landing Lights - Check operation, condition of lens, and security of attachment.	340, 520, 620		
341103	Pitot Tube and Stall Warning Vane - Check for condition and obstructions and verify operation of anti-ice heat.	510		
571001	Wing Surfaces and Tips - Inspect for skin damage, loose rivets, and condition of paint.	510, 520, 610, 620		
571003	Wing Access Plates - Check for damage and security on installation.	510, 520, 610, 620		
571004	Wing Spar and Wing Strut Fittings - Check for evidence of wear. Check attach bolts for indications of looseness and retorque as required.	510, 520, 610, 620		
571005	Wing Structure - Inspect spars, ribs, skins, and stringers for cracks, wrinkles, loose rivets, corrosion, or other damage.	510, 520, 610, 620		
275001	Flaps - Check tracks, rollers, and control rods for security of attachment. Check rod end bearings for corrosion. Check operation.	510, 610		
275003	Flap Structure, Linkage, Bellcranks, Pulleys, and Pulley Brackets - Check for condition, operation and security.	510, 610		
275004	Flaps and Cables - Check cables for proper tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment.	510, 610		
282001	Fuel System - Inspect plumbing and components for mounting and security.	510, 610		
282002	Fuel Tank Vent Lines and Vent Valves - Check vents for obstruction and proper positioning. Check valves for operation.	510, 610		
282004	Integral Fuel Bays - Check for evidence of leakage and condition of fuel caps, adapters, and placards. Using quick drains, ensure no contamination exists. Check quick drains for proper shut off.	510, 610		
282005	Fuel Reservoir - Using quick drain, ensure no contamination exists.	510, 610		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
282007	Fuel Strainer, Drain Valve, and Controls - Check freedom of movement, security, and proper operation. Disassemble, flush, and clean screen and bowl.	510, 610		
571002	Wing Struts and Strut Fairings - Check for dents, cracks, loose screws and rivets, and condition of paint.	510, 610		
271003	Aileron Structure, Control Rods, Hinges, Balance Weights, Bell Cranks, Linkage, Bolts, Pulleys, and Pulley Brackets - Check condition, operation, and security of attachment.	520, 620		
271004	Ailerons and Hinges - Check condition, security, and operation	520, 620		
275005	Flap Motor, Actuator, and Limit Switches - Check wiring and terminals for condition and security. Check actuator for condition and security.	610		
275006	Flap Actuator Threads - Clean and lubricate. Refer to Chapter 12-21-03.	610		
110000	Interior Placards, Exterior Placards, Decals, Markings and Identification Plates - Inspect for security of installation and legibility. Refer to Chapter 11, Placards and Markings - Inspection/Check.	All		

*** End of Operation 3 Inspection Items ***

INSPECTION OPERATION 4

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 4 gives a list of item(s), which has all 50-hour interval inspection items and those 100- or 200-hour interval inspection items contained in the landing gear. Items from other areas are included to meet their required time interval.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
611001	Spinner - Complete a check of its general condition and that it is correctly attached. Make sure it has a minimum clearance of 0.14 inch (3.56 mm) to the propeller blades.	110		
611002	Spinner and Spinner Bulkhead - Remove spinner, wash, and inspect for cracks and fractures.	110		
611003	Propeller Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	110		
611005	Propeller Mounting - Check for security of installation.	110		
611007	Propeller Heat Slip Rings, Brushes, and Boots - Inspect for condition, and security. Perform operational check.	110		
612001	Propeller Governor and Control - Inspect for oil and grease leaks. If leakage is evident, refer to McCauley Service Manual.	110		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
214001	Cold and Hot Air Hoses - Check condition, routing, and security.	120		
242001	Alternator, Mounting Bracket, and Electrical Connections - Check condition and security. Check alternator belts for condition and proper adjustment. Check belt tension.	120		
243001	Main Battery - Examine the general condition and security. Complete a check of the level of electrolyte. Refer to Chapter 12-17-00.	120		
243002	Main Battery Box and Cables - Clean and remove any corrosion. Examine the cables for routing, support, and security of the connections.	120		
282010	Auxiliary (Electric) Fuel Pump - Check pump and fittings for condition, operation, security.	120		
371001	Vacuum System - Inspect for condition and security.	120		
371002	Vacuum Pumps - Check for condition and security. Check vacuum system breather line for obstructions, condition, and security.	120		
371003	Vacuum System Hoses - Inspect for hardness, deterioration, looseness, or collapsed hoses.	120		
371004	Gyro Filter - Inspect for damage, deterioration and contamination. Clean or replace if required.	120		
371005	Regulator Valve and Filter - Inspect valve assembly for security of installation. Visually inspect filter for damage, deterioration and contamination. Clean or replace if required.	120		
710001	Turbocharger (if applicable) - Inspect turbocharger mounting brackets, ducting, linkage, and attaching parts for general condition, leakage or damage, and security of attachment. Check waste gate, actuator, controller, oil and vent lines, overboost relief valve, and compressor housing for leakage, apparent damage, security of attachment, and evidence of wear. Check waste gate return spring for condition and security.	120		
711001	Cowling and Cowl Flaps - Inspect for cracks, dents, other damage and security of cowl fasteners. Check cowl flaps for condition, security, and operation. Check cowl flap controls for freedom of movement through full travel.	120		
716001	Alternate Induction Air System - Check for obstructions, operation, and security.	120		
716002	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	120		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
716003	Induction Airbox, Valves, Doors, and Controls - Remove air filter and inspect hinges, doors, seals, and attaching parts for wear and security. Check operation.	120		
716004	Induction Air Filter - Remove and clean. Inspect for damage and service.	120		
722001	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	120		
722002	Crankcase, Oil Sump, and Accessory Section - Inspect for cracks and evidence of oil leakage. Check bolts and nuts for looseness and retorque as necessary. Check crankcase breather lines for obstructions, security, and general condition.	120		
722003	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	120		
723001	Engine Cylinders, Rocker Box Covers, and Pushrod Housings - Check for fin damage, cracks, oil leakage, security of attachment, and general condition.	120		
723003	Engine Baffles and Seals - Check condition and security of attachment.	120		
723004	Cylinder Compression - Complete a differential compression test. If there is weak cylinder compression, refer to Chapter 71, Engine - Troubleshooting, for further procedures.	120		
730001	Engine-Driven Fuel Pump - Check for evidence of leakage, security of attachment, and general condition.	120		
730002	Fuel Injection System - Check system for security and condition. Clean fuel inlet screen, check and clean injection nozzles and screens (if evidence of contamination is found), and lubricate air throttle shaft.	120		
741001	Magnetos - Examine the external condition and for correct installation. Examine the condition of the electrical leads. Complete a check of the engine timing (external timing). You must set the internal timing if the total of all external adjustments are more than 0.125 inch (3.17 mm) from the original factory position, or between each of the internal timing adjustments. Refer to Chapter 74-10-00, Ignition System - Maintenance Practices.	120		
742001	Ignition Harness and Insulators - Check for proper routing, deterioration, and condition of terminals.	120		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
742002	Spark Plugs - Remove, clean, analyze, test, gap, and rotate top plugs to bottom and bottom plugs to top.	120		
743001	Ignition Switch and Electrical Harness - Inspect for damage, condition, and security.	120		
781001	Exhaust System - Inspect for cracks and security. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust system - Maintenance Practices.	120		
781002	Exhaust System (turbocharged engine) - Inspect couplings, seals, clamps, and expansion joints for cracks. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust System - Maintenance Practices. Note: This inspection is specifically required for German (LBA) certification.	120		
781003	Do an inspection on the multi-segment V-Band coupling clamps. Refer to Chapter 78, Exhaust System (Turbocharged) - Maintenance Practices.	120		
791001	Engine Oil - Drain oil sump and oil cooler. Check for metal particles or foreign material in filter, on sump drain plug, and on engine suction screen. Refer to Textron Lycoming Service Bulletin #480C or latest revision. Replace filter, and refill with recommended grade aviation oil.	120		
792001	Oil Cooler - Check for obstructions, leaks, and security of attachment.	120		
801001	Starter and Electrical Connections - Check security and condition of starter, electrical connection, and cable.	120		
801002	Bendix Drive Starter Assembly - Clean and lubricate starter drive assembly.	120		
761001	Engine Controls and Linkage - Examine the general condition and freedom of movement through the full range. Complete a check for the proper travel, security of attachment, and for evidence of wear. Complete a check of the friction lock and vernier adjustment for proper operation. Complete a check that the throttle, fuel mixture, and propeller governor arms operate through their full arc of travel. The maximum linear freeplay is 0.050 inch.	120, 225		
324002	Brakes, Master Cylinders, and Parking Brake - Check master cylinders and parking brake mechanism for condition and security. Check fluid level and test operation of toe and parking brake. Refer to Chapter 12-13-00 for servicing instructions.	224, 230		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
251002	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Inspect seat rails for cracks.	230		
324001	Brakes - Test toe brakes and parking brake for proper operation.	230		
341103	Pitot Tube and Stall Warning Vane - Check for condition and obstructions and verify operation of anti-ice heat.	510		
322001	Nose Gear - Inspect torque links, steering rods, and boots for condition and security of attachment. Check strut for evidence of leakage and proper extension. Check strut barrel for corrosion, pitting, and cleanliness. Check shimmy damper and/or bungees for operation, leakage, and attach points for wear and security.	720		
322002	Nose Landing Gear Wheel Fairings - Check for cracks, dents, and condition of paint.	720		
322003	Nose Gear Fork - Inspect for cracks, general condition, and security of attachment.	720		
322004	Nose Gear Attachment Structure - Inspect for cracks, corrosion, or other damage and security of attachment.	720		
325001	Nose Gear Steering Mechanism - Check for wear, security, and proper rigging.	720		
324004	Tires - Check tread wear and general condition. Check for proper inflation.	720, 721, 722		
324006	Wheel Bearings - Clean, inspect and lube.	720, 721, 722		
321002	Main Gear Spring Assemblies - Examine for cracks, dents, corrosion, condition of paint or other damage. Examine for chips, scratches, or other damage that lets corrosion get to the steel spring. Examine the axles for condition and security.	721, 722		
321003	Main Landing Gear Attachment Structure - Check for damage, cracks, loose rivets, bolts and nuts and security of attachment.	721, 722		
324005	Wheels, Brake Discs, and Linings - Inspect for wear, cracks, warps, dents, or other damage. Check wheel through-bolts and nuts for looseness.	721, 722		

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
321001	Main Landing Gear Wheel Fairings and Brake Fairings - Check for cracks, dents, and condition of paint.	721,722		
110000	Interior Placards, Exterior Placards, Decals, Markings and Identification Plates - Inspect for security of installation and legibility. Refer to Chapter 11, Placards and Markings - Inspection/Check.	All		

*** End of Operation 4 Inspection Items ***

INSPECTION OPERATION 5

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 5 gives a list of item(s), which are completed every 400 hours or 1 year, whichever occurs first.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
212001	Ventilation System - Inspect clamps, hoses, and valves for condition and security.	211		
252201	Upholstery, Headliner, Trim, and Carpeting - Check condition and security.	211		
324003	Brake Lines, Wheel Cylinders, Hoses, Clamps, and Fittings - Check for leaks, condition, and security and hoses for bulges and deterioration. Check brake lines and hoses for proper routing and support.	721, 722		

*** End of Operation 5 Inspection Items ***

PROGRESSIVE CARE

1. Operation 6

THERE ARE CURRENTLY NO PROGRESSIVE CARE OPERATIONS CONTAINED IN THIS SECTION.

INSPECTION OPERATION 7

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 7 gives a list of item(s), which are completed every 600 hours or 1 year, whichever occurs first.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
282008	Fuel Quantity Indicators - Examine for damage and security of installation. Complete a fuel quantity calibration check. Refer to Chapter 28, Fuel Storage and Distribution - Maintenance Practices.	220		
221001	Autopilot Rigging - Refer to Autopilot - Maintenance Practices.	610		

*** End of Operation 7 Inspection Items ***

PROGRESSIVE CARE

1. Operation 8

THERE ARE CURRENTLY NO PROGRESSIVE CARE OPERATIONS CONTAINED IN THIS SECTION.

INSPECTION OPERATION 9

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 9 gives a list of item(s), which are completed every 500 hours.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
741002	Magnetos - Clean, examine, and adjust as necessary. Do the 500-hour inspection in accordance with the Slick 4300/6300 Series Magneto Maintenance and Overhaul Manual.	120		

*** End of Operation 9 Inspection Items ***

INSPECTION OPERATION 10

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 10 gives a list of item(s), which are completed every 1000 hours.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
282009	Integral Fuel Bays - Drain the fuel (Refer to Chapter 12, Fuel - Servicing) and purge the tanks (Refer to the Single Engine Structural Repair Manual, 1996 and On). Complete an inspection of the tank interior and outlet screens and remove any foreign object debris. Complete an inspection of the tank interior surfaces for sealant deterioration and corrosion (especially in the sump areas).	510, 610		

*** End of Operation 10 Inspection Items ***

INSPECTION OPERATION 11

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 11 gives a list of item(s), which are completed every 2 years.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
341102	Pitot and Static System - Examine in accordance with 14 CFR Part 91.411.	220		
246003	Alternator Control Unit - Complete the Over-voltage Protection Circuit Test. Refer to Chapter 24, Alternator Control Unit.	222		

*** End of Operation 11 Inspection Items ***

INSPECTION OPERATION 12

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 12 gives a list of item(s), which are completed beginning five years from the date of the manufacture. You must make sure of the serviceability of the components every twelve months. Refer to Airborne Air and Fuel Products Service Letter Number 39A or latest revision.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
371006	Vacuum Manifold Check Valve - Complete a check for the proper operation. (Only airplanes with dual vacuum pumps or Airborne manifolds. Refer to the Airborne Air & Fuel Products Service Letter Number 39A or latest revision, and in accordance with SB02-37-04.) Refer to Chapter 37, Vacuum System - Maintenance Practices for the removal and installation procedures for the check valve.	120		

*** End of Operation 12 Inspection Items ***

PROGRESSIVE CARE

1. Operation 13

THERE ARE CURRENTLY NO PROGRESSIVE CARE OPERATIONS CONTAINED IN THIS SECTION.

INSPECTION OPERATION 14

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 14 gives a list of item(s), which are completed every 2 years, or anytime components are added or removed from the airplane which have the potential to affect the magnetic accuracy and/or variation of the compass calibration, or anytime the accuracy of the compass is in question.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
342102	Magnetic Compass - Calibrate.	220		

*** End of Operation 14 Inspection Items ***

INSPECTION OPERATION 15

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 15 gives a list of item(s), which are completed every every 2000 hours.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
743002	Inspect and lubricate ACS brand ignition switch. Refer to Chapter 74, Ignition System - Maintenance Practices.	224			

*** End of Operation 15 Inspection Items ***

INSPECTION OPERATION 16

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 16 gives a list of item(s), which are completed every 1000 hours or 1 year, whichever occurs first.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
221002	Autopilot Servo Capstan Assemblies. Check slip-clutch torque settings. Refer to Autopilot - Maintenance Practices.	610		
221003	Autopilot Servo Actuators. Inspect for evidence of corrosion and or buildup of dirt or other particulate matter which may interfere with servo operation. Refer to Autopilot - Maintenance Practices.	610		

*** End of Operation 16 Inspection Items ***

INSPECTION OPERATION 17

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 17 gives a list of item(s), which are completed every 12 calendar months.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
262002	Cockpit Mounted Halon Type Fire Extinguisher - Weigh bottle. Bottle must be reserviced by qualified individual if more than 2 ounces is lost.	211			

*** End of Operation 17 Inspection Items ***

INSPECTION OPERATION 18

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 18 gives a list of item(s), which are completed every 6 years.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
262004	Cockpit Mounted Halon Type Fire Extinguishers - Empty, inspect for damage, and recharge.	211		

*** End of Operation 18 Inspection Items ***

INSPECTION OPERATION 19

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 19 gives a list of item(s), which are completed every 12 years.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH	INSP	REMARKS
262003	Cockpit Mounted Halon Type Fire Extinguishers - Perform hydrostatic test. The hydrostatic test shall be at twelve-year intervals based on initial servicing or date of last hydrostatic test.	211			

*** End of Operation 19 Inspection Items ***

INSPECTION OPERATION 20

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 20 gives a list of item(s), which are completed every 3 years.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
351002	Oxygen Cylinder (if applicable) - Inspect for condition, check hydrostatic test date and perform hydrostatic test, if due.	211		

*** End of Operation 20 Inspection Items ***

INSPECTION OPERATION 21

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 21 gives a list of item(s), which are completed every 1 year.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
251102	AMSAFE Aviation Inflatable Restraint (AAIR) - Examine the restraint for dirt, frayed edges, unserviceable stitching, loose connections, and other wear.	211		
243005	Standby Battery - Complete the Standby Battery Capacity Test. Refer to Chapter 24, Standby Battery - Maintenance Practices.	220		
246101	Essential and Crossfeed Bus Diodes - Check for proper operation. Complete the Essential and Crossfeed Bus Diode Inspection. Refer to Chapter 24, Essential and Crossfeed Bus Diodes - Maintenance Practices.	224		

*** End of Operation 21 Inspection Items ***

INSPECTION OPERATION 22

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 22 gives a list of item(s), which are completed every 100 hours or every one year, whichever occurs first.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
730003	Idle and Mixture Adjustment - Check idle speed and idle mixture (lean rise). Adjust if necessary. Refer to Chapter 73-00-01, Idle and Mixture Adjustment.	120		
212002	Primary Flight Display (PFD) Fan and Multi-Function Display (MFD) Fan, Deck Skin Fan, and Remote Avionics Cooling Fan - Operational Check. Refer to Chapter 21, Avionics Cooling - Maintenance Practices.	220, 225		

*** End of Operation 22 Inspection Items ***

INSPECTION OPERATION 23

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 23 gives a list of item(s), which are completed every 100 hours, every annual inspection, every overhaul, and any time fuel lines or clamps are serviced, removed, or replaced.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
720000	Fuel line (Stainless steel tube assembly) and support clamp inspection and installation. Refer to Lycoming Service Bulletin Number 342E or later version.	120		

*** End of Operation 23 Inspection Items ***

INSPECTION OPERATION 24

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 23 gives a list of item(s), which are completed the first 600 hours and as defined by the manufacturer thereafter

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
371007	Do an inspection of the wear indicator ports on the vacuum pump described in the Tempest Service Letter 004.	120		

*** End of Operation 24 Inspection Items ***

INSPECTION OPERATION 25

Date: _____

Registration Number: _____

Serial Number: _____

Total Time: _____

1. Description

A. Operation 25 gives a list of item(s), which are completed every 1000 hours or 3 years, whichever occurs first.

B. Inspection items are given in the order of the zone in which the inspection is to be completed. A general description of the inspection required and the Item Code Number for cross-reference to section 5-10-01 are shown. Frequently, the tasks define more specifically the scope and extent of each required inspection. These tasks are printed in the individual chapters of this manual.

C. The right portion of each page gives space for the mechanic's and inspector's initials and remarks. A copy of these pages can be used as a checklist when these inspections are completed.

2. General Inspection Criteria

A. During each of the specified inspection tasks in this section, more general inspections of the adjacent areas must be done while access is available. These general inspections are used to find apparent conditions which can need more maintenance.

B. If a component or system is changed after a required task has been completed, then that specified task must be done again to make sure it is correct before the system or component is returned to service.

C. Do a preflight inspection after these inspections are completed to make sure all the required items are correctly serviced. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

ITEM CODE NUMBER	TASK	ZONE	MECH INSP	REMARKS
273107	Elevator Trim Tab Actuator - Remove, clean, examine, and lubricate the actuator. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices.	320		

*** End of Operation 25 Inspection Items ***

UNSCHEDULED MAINTENANCE CHECKS

1. General

A. During operation, the airplane can go through:
(1) Hard landings.
(2) Overspeed.
(3) Extreme turbulence or extreme maneuvers.
(4) Towing with a large fuel unbalance or high drag/side loads due to ground handling.
(5) Lightning strikes.

B. When the flight crew gives a report of any of these conditions, complete a visual inspection of the airframe and specific inspections of components and areas involved.

C. Do the inspections to find and examine the damage in local areas of visible damage, and in the structure and components adjacent to the area of damage.

D. If foreign object damage (FOD) is found, complete a visual inspection of the airplane before the airplane is returned to service.

2. Unscheduled Maintenance Checks Defined and Areas of Inspection

A. Hard/Overweight Landings.
(1) A hard landing is any landing made when the sink rate is more than the permitted sink rate limit. An overweight landing is any landing made when the gross weight is more than the maximum gross landing weight given in the approved Pilot's Operating Handbook.

NOTE: If the hard/overweight landing also has high drag/side loads, more checks are necessary.

(2) Hard or overweight landing check.
(a) Landing gear.
1 Main gear struts - Examine for correct attachment and permanent set.
2 Main gear attachments and supporting structure - Examine for loose or unserviceable fasteners and signs of structural damage.
3 Nose gear trunnion supports and attaching structure - Examine for loose or unserviceable fasteners and signs of structural damage.
4 Nose gear attachments and supporting structure - Examine for loose or unserviceable fasteners and signs of structural damage.
(b) Wings.
1 Wing surface and lift strut - Examine the skin for buckles, loose or unserviceable fasteners, and fuel leaks. Examine the attach fittings for security.
2 Trailing edge - Examine for any deformation that stops the normal flap operation.

B. Overspeed.
(1) Overspeed occurs when one of the conditions that follow are met:
(a) The airplane was flown at a speed more than the speed limit of the flaps.
(b) The airplane was flown at a speed more than the maximum design speed.
(2) Overspeed (airspeed) check.
(a) Fuselage.
1 Windshield and Windows - Examine for buckling, dents, loose or unserviceable fasteners, and signs of structural damage.
2 All hinged doors - Examine the hinges, hinge attach points, latches and attachments, and skins for deformation and signs of structural damage.
(b) Cowling.
1 Skins - Examine for buckling, cracks, loose or unserviceable fasteners, and signs of structural damage.

(c) Stabilizers.
1 Stabilizers - Examine the skins, hinges and attachments, movable surfaces, mass balance weights, and the structure for cracks, dents, buckling, loose or unserviceable fasteners, and signs of structural damage.
(d) Wings.
1 Flaps - Examine the skin for buckling, cracks, loose or unserviceable fasteners, attachments, and signs of structural damage.
2 Fillets and fairings - Examine for buckling, dents, cracks, and loose or unserviceable fasteners.

C. Extreme Turbulence or Extreme Maneuvers.
(1) Extreme turbulence is caused by atmospheric conditions that produce dangerous quantities of stress on the airplane. Extreme maneuvers are any maneuvers that do not stay within the limits given in the Pilot's Operating Handbook.
(2) Extreme turbulence and/or maneuvers checks.
(a) Stabilizers.
1 Horizontal stabilizer hinge fittings, actuator fittings, and stabilizer center section - Examine for loose or unserviceable fasteners and signs of structural damage.
2 Vertical stabilizer - Examine the vertical stabilizer for signs of structural damage, skin buckles, loose or unserviceable fasteners, and damage to the hinges and actuator fittings.
3 Elevator and rudder balance weight supporting structure - Examine for loose or unserviceable fasteners and signs of structural damage.
(b) Wing.
1 Wing to body strut fittings and supporting structure - Examine for loose or unserviceable fasteners and signs of structural damage.
2 Trailing Edge - Examine for any deformation that stops the normal operation of the flap and aileron.

D. Lightning Strike.
(1) If the airplane is flown through an electrically charged region of the atmosphere, it can be struck by an electrical discharge moving from cloud to cloud or from cloud to ground. During a lightning strike, the current goes into the airplane at one point and comes out of another, usually at opposite extremities. The wing tips, nose and tail sections are the areas where damage is most likely to occur. You can find burns and/or erosion of small surface areas of the skin and structure during inspection. In most cases, the damage is easily seen. In some cases, however, a lightning strike can cause damage that is not easily seen. The function of the lightning strike inspection is to find any damage to the airplane before it is returned to service.
(2) Lightning strike check. As the checks that follow are performed, complete the Lightning Strike/ Static Discharge Incident Reporting Form and return it to Cessna Propeller Aircraft Product Support Dept. 751, Cessna Aircraft Company, P.O. Box 7706, Wichita, KS. 67277-7706. If there are components listed on the form that are not applicable to your airplane, please write "Not Applicable" in the space provided.
(a) Communications.
1 Antennas - Examine all antennas for burns or erosion. If you find damage, complete the functional test of the communication system.
(b) Navigation.
1 Glideslope antenna - Examine for burning and pitting. If damage is found, complete a functional check of the glideslope system.
2 Compass - The compass is serviceable if the corrected heading is within plus or minus 10 degrees of the heading shown by the remote compass system. Remove, repair, or replace the compass if the indication is not within the tolerance limits.
(c) Fuselage.
1 Skin - Examine the surface of the fuselage skin for signs of damage.
2 Tailcone - Examine the tailcone and static dischargers for damage.
(d) Stabilizers.
1 Examine the surfaces of the stabilizers for signs of damage.
(e) Wings.
1 Skins - Examine the skin for burns and erosion.

2 Wing tips - Examine the wing tips for burns and pits.
3 Flight surfaces and hinging mechanisms - Examine for burns and pits.

(f) Propeller.
1 Propeller - Remove the propeller and have it examined at an authorized repair station.

(g) Powerplant.
1 Engine - Refer to the engine manufacturer's overhaul manual for inspection procedures.

E. Foreign Object Damage.

(1) Foreign object damage (FOD) is damage to the airplane caused by a bird strike or by any other foreign object while operating the airplane on the ground or in normal flight. Tools, bolts, nuts, washers, rivets, rags or pieces of safety-wire left in the aircraft during maintenance operations can also cause damage. The function of the foreign object damage inspection is to find any damage before the airplane is repaired or returned to service.

(2) Use caution to prevent unwanted objects from hitting the airplane during towing and at all times when the airplane is not in service.

(3) The aerodynamic cleanliness level (degree of surface smoothness), has an effect on the performance of the airplane. It is important to keep a high level of cleanliness.

(4) Normal operation or careless maintenance operations can cause contour distortion of the aerodynamic surface. Careless maintenance operations can also cause distortion to the doors and access panels. Be careful when you work with these items.

(5) Foreign object damage check.

(a) Landing gear.
1 Fairings - Examine for dents, cracks, misalignment, and signs of structural damage.

(b) Fuselage.
1 Skin - Examine the forward and belly areas for dents, punctures, cracks, and signs of structural damage.

(c) Cowling.
1 Skins - Examine for dents, punctures, loose or unserviceable fasteners, cracks, and signs of structural damage.

(d) Stabilizers.
1 Leading edge skins - Examine for dents, cracks, scratches, and signs of structural damage.

(e) Windows.
1 Windshield - Examine for pits, scratches, and cracks.

(f) Wings.
1 Leading edge skins - Examine for dents, cracks, punctures, and signs of structural damage.

(g) Engine.
1 Propeller - Examine the propeller for nicks, bends, cracks, and worn areas on the blades.

F. High Drag/Side Loads Due To Ground Handling.

(1) A high drag/side load condition occurs when the airplane skids or overruns the prepared surface and goes onto an unprepared surface. It also includes landings that are short of the prepared surface, or landings which involve the damage of tires or skids on a runway to the extent that the safety of the airplane is in question. This includes takeoff and landings or unusual taxi conditions.

(2) High drag/side loads due to ground handling check.

(a) Landing gear.
1 Main gear and fairings - Examine for loose or unserviceable fasteners, buckling, cracks, and signs of structural damage.
2 Nose gear and fairing - Examine for loose or unserviceable fasteners, cracks, loose steering cable tension, buckling, and signs of structural damage.

(b) Wings.
1 Wing to fuselage attach fittings and attaching structure - Examine for loose or unserviceable fasteners and signs of structural damage.

B4224

LIGHTNING STRIKE/STATIC DISCHARGE INCIDENT REPORTING FORM
Part 1

1. Flight Crew must complete Part 1.

NOTE: Entire report must be filled out following any lightning strike incident. If lightning strike is discovered after the fact, complete as much of report as possible. File form immediately following incident. Attach additional sheet(s) to provide complete description.

A. Flight Information:
Flight Number _____ Strike Date _____ Model _____ Unit/Serial Number _____
Altitude _____ ft Airspeed _____ knots Geographical Location _____

B. Airplane Orientation:
Takeoff _____ Climb _____ Cruise _____ Descent _____
Approach _____ Other _____

C. At time of Strike, aircraft was:
Above Clouds _____ Within Clouds _____ Below Ceiling _____

D. Precipitation at Strike:
Rain _____ Sleet _____ Hail _____ Snow _____ None _____

E. Lightning in Vicinity:
Before _____ After _____ None _____

F. Static in Comm/Nav
Before _____ After _____ None _____

G. Was St. Elmo's fire (bluish electrical discharge or corona) visible before strike?
Yes _____ No _____

H. Interference (**I**) or Outage (**O**) report. Check all the following which apply, and list affected systems, such as dimming of cabin lights, total system outage, etc.

Engines	I _____	O _____
Navigation	I _____	O _____
Communication	I _____	O _____
Flight Instruments	I _____	O _____
Flight Control	I _____	O _____
AC Power System	I _____	O _____
DC Power System	I _____	O _____

I. Additional comments and descriptions:

Part 1 completed by: _____ Date _____ Phone _____

B4229

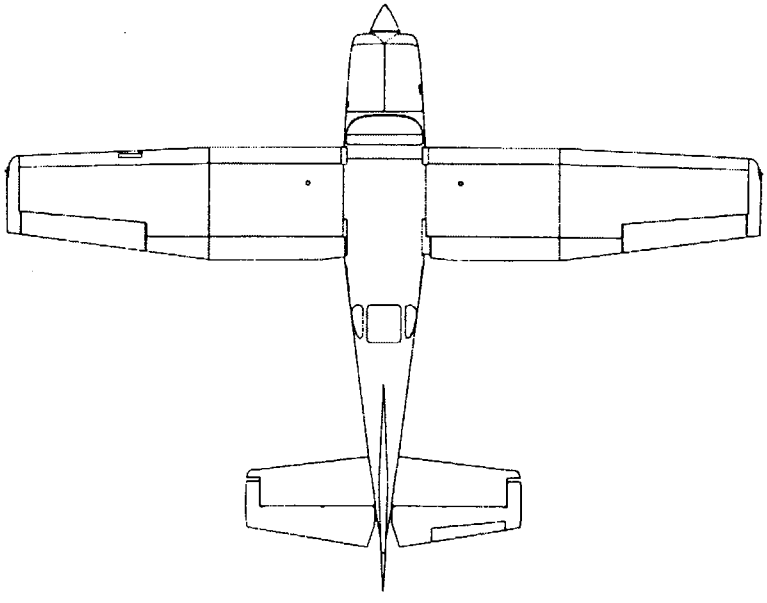
LIGHTNING STRIKE/STATIC DISCHARGE INCIDENT REPORTING FORM
Part 2

1. **Ground Crew must complete Part 2.**

   NOTE: Attach additional sheet(s) to provide complete description. Photos and sketches of damage are recommended and must be itemized and referenced in their description.

   NOTE: If damage is severe, please report the lightning strike as soon as possible. Inspection by Cessna Engineering Representative(s) may be required.

   A. List any sweeping points, such as burn marks, divots, etc., and skin penetrations on airplane skin believed to be the result of the lightning strike. Itemize and reference location(s) of damage on drawing provided. Indicate top, bottom, left or right.



   B. Describe damage to structure and external components caused by previously mentioned damage points. In the case of skin penetration(s), indicate hole diameter(s). List all damage to radome and any other composite structure, such as fairings, control surfaces, etc. If lightning diverter strips are damaged, include lightning diverter strip location(s) on radome. For damage to composite structure, paint thickness must be included in description.

   C. List any damage to avionics and electrical components believed to be the result of the lightning strike, including damaged wiring, disengaged circuit breakers, etc. Include manufacturer, model number and serial number of damaged units where applicable.

   D. Estimate cost of repair.

   E. Mention severity of damage (light, moderate, heavy).

   F. Additional comments and descriptions:

Part 2 completed by: _____ Date _____ Phone _____

CHAPTER

6

DIMENSIONS AND AREAS

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
06-Title		
06-List of Effective Pages		
06-Record of Temporary Revisions		
06-Table of Contents		
6-00-00	Page 1	Dec 2/2002
6-10-00	Pages 1-5	Dec 2/2002
6-15-00	Pages 1-3	Dec 2/2002
6-20-00	Pages 1-4	Jul 1/2007
6-20-02	Pages 1-11	Jul 1/2007

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

DIMENSIONS AND AREAS - GENERAL

1. Scope

A. This chapter includes statistical information and illustrations concerning the Model 206/T206 airplane.

2. Definition

A. This chapter is divided into sections to aid maintenance personnel in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief definition of the sections incorporated in this chapter is as follows:

(1) The section on airplane dimensions and specifications provides information on overall airplane dimensions, maximum weights, fuel and oil capacities, propeller type and pitch range information, tire data, and control surface travel/control cable tension settings.

(2) The section on stations provides illustrations to identify fuselage stations (FS) and wing stations (WS) used on the Model 206/T206 airplane.

(3) This section provides illustrations of all airplane zones and is used in conjunction with the Model 206/T206 Illustrated Parts Catalog to provide location information for required placards and markings.

(4) This section provides illustrations of all access/inspection plates located on or in the airplane.

AIRPLANE DIMENSIONS AND SPECIFICATIONS - DESCRIPTION AND OPERATION

1. General

A. This section identifies dimensions and specifications of the airplane. Dimensions are selected for pertinent information of measurements to assist operators, maintenance personal and/or ground handling personnel. Refer to the respective charts below.

B. Airplane dimensions are illustrated in Figure 1.

2. Dimensions and Specifications

AIRPLANE OVERALL

Length (Overall)	27.97 Feet
Height (Maximum)	7.35 Feet
Wing Span (Overall)	36.00 Feet
Tail Span	13.03 Feet
Landing Gear Track Width	97.40 Inches

FUSELAGE DIMENSIONS

Cabin Width (Maximum Sidewall to Sidewall)	42.0 Inches
Cabin Height (Floorboard to Headliner)	48.5 Inches

MAXIMUM WEIGHT

Ramp (206)	3614 Pounds
Ramp (T206)	3617 Pounds
Takeoff	3600 Pounds
Landing	3600 Pounds

FUEL CAPACITY

Total	92.0 Gallons
Usable	88.0 Gallons

ENGINE DATA

Type (206)	Lycoming IO-540-AC1A5
Oil Capacity	11.0 Quarts
RPM (Maximum)	2700 RPM
Horsepower	300 HP
Type (T206)	Lycoming TIO-540-AJ1A
Oil Capacity	11.0 Quarts
RPM (Maximum)	2500 RPM
Horsepower	310 HP

PROPELLER

Type	McCauley B3D36C432/80VSA-1, 3-Blade
Diameter (Maximum to Minimum)	79.0 to 77.5 Inches
Pitch Range (High to Low)	30.0 to 12.6 Degrees (206)
Pitch Range (High to Low)	33.8 to 16.9 Degrees (T206)

TIRE, STRUT AND WHEEL ALIGNMENT DATA

Main Tire Pressure (6.00 X 6, 6-Ply Rating)	42.0 ±2 PSI
Main Tire Pressure (8.00 X 6, 6 Ply Rating)	35.0 ±3 PSI
Nose Tire Pressure (5.00 X 5, 6-Ply Rating)	49.0 ±3 PSI
Nose Tire Pressure (6.00 X 6, 4-Ply Rating)	29.0 ±3 PSI
Nose Gear Strut Pressure (Strut Extended)	80 PSI
Camber (Measured With Airplane Empty)	4 Degrees +1 or -1 Degree 30 Minutes
Toe-In (Measured With Airplane Empty)	0.00 to 0.06 Inch

CONTROL SURFACE TRAVELS/CABLE TENSION SETTINGS

AILERONS

Aileron Up Travel	21 Degrees +2 or -2 Degrees
Aileron Down Travel	14 Degrees 30 Minutes +2 or -2 Degrees
Aileron Cable Tension	40 Pounds +10 or -10 Pounds

RUDDER

Rudder Travel (Measured Parallel to Water Line)

Right	24 Degrees +1 or -1 Degree
Left	24 Degrees +1or -1 Degree

Rudder Travel (Measured Perpendicular to Hinge Line)

RUDDER

Right	27 Degrees 13 Minutes +1 or -1Degree
Left	27 Degrees 13 Minutes +1 or -1 Degree
Rudder Cable Tension	20 to 40 Pounds

ELEVATOR

Up Travel (Relative to Stabilizer)	21 Degrees
Down Travel (Relative to Stabilizer)	17 Degrees +1 or -1Degree
Cable Tension	20 to 40 Pounds

ELEVATOR TRIM TAB

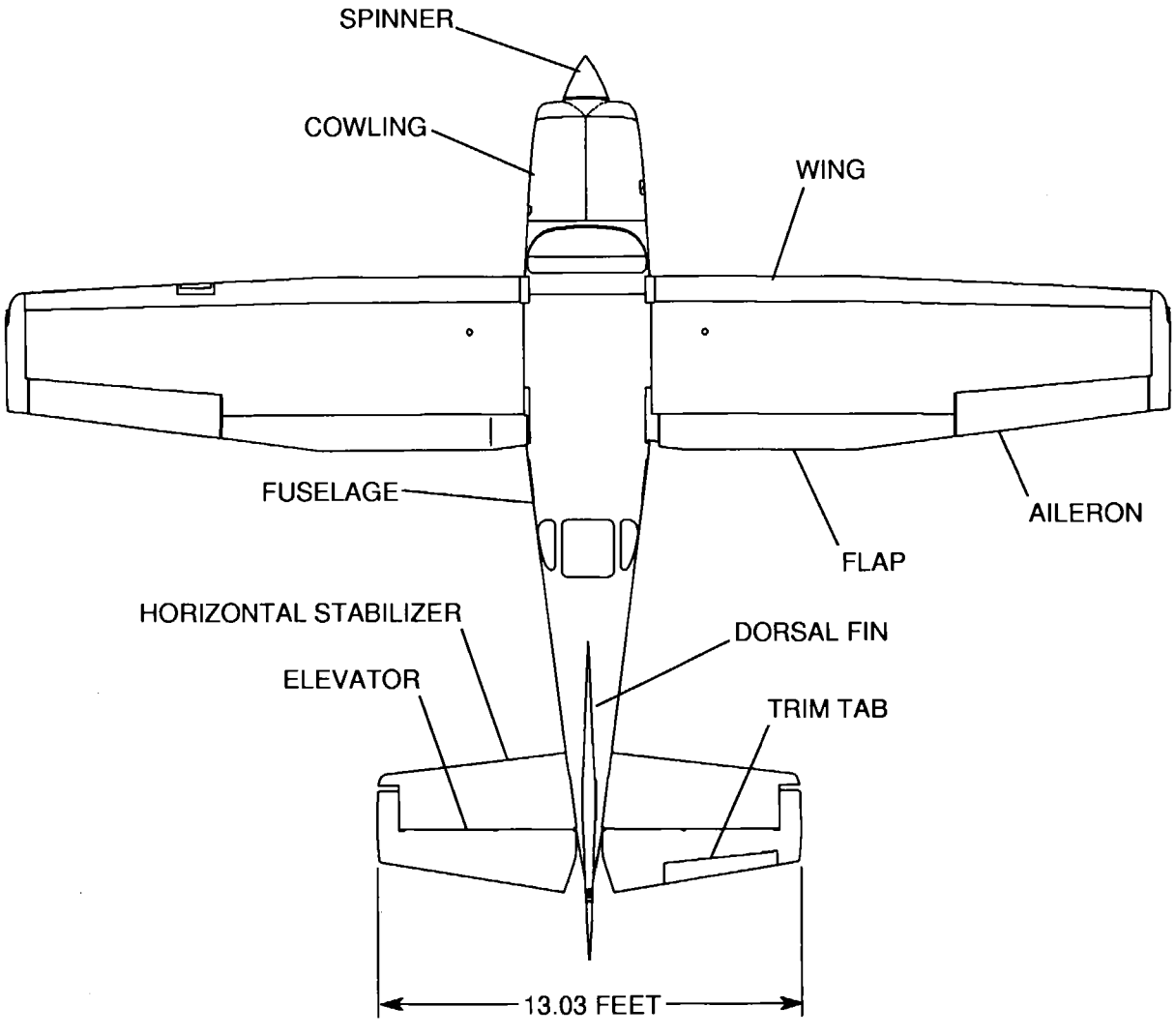
Up Travel	25 Degrees +1 or -0 Degrees
Down Travel	5 Degrees +1 or -0 Degrees

FLAPS

Flap Setting:

0 Degrees	0 Degrees
10 Degrees	10 Degrees, +1 or -2 Degree
20 Degrees	20 Degrees, +1 or -2 Degree
30 Degrees	30 Degrees, +1 or -2 Degree
40 Degrees	40 Degrees, +1 or -2 Degree

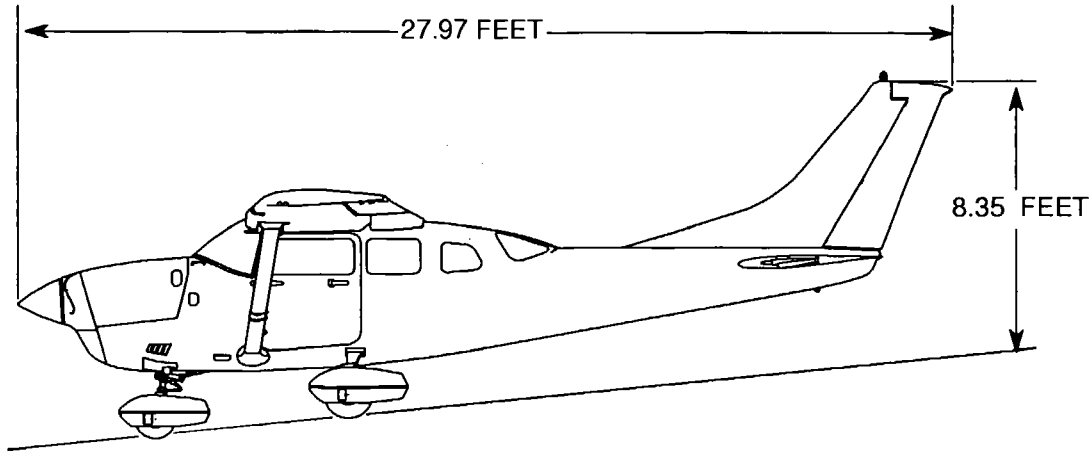
B435

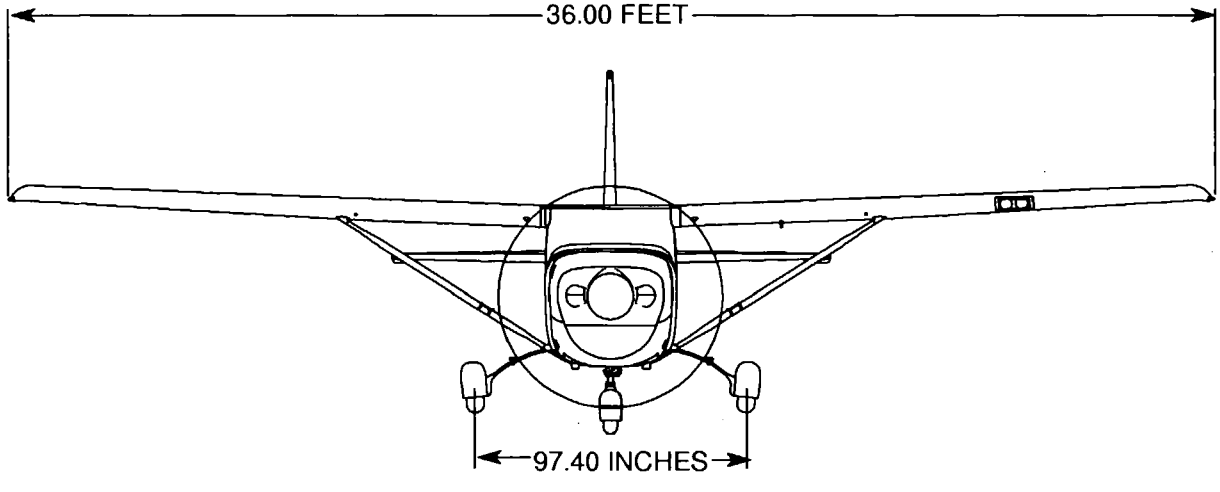


1210T1002

Airplane Dimensions and Areas
Figure 1 (Sheet 1)

B436





1210T1002
1210T1002

Airplane Dimensions and Areas
Figure 1 (Sheet 2)

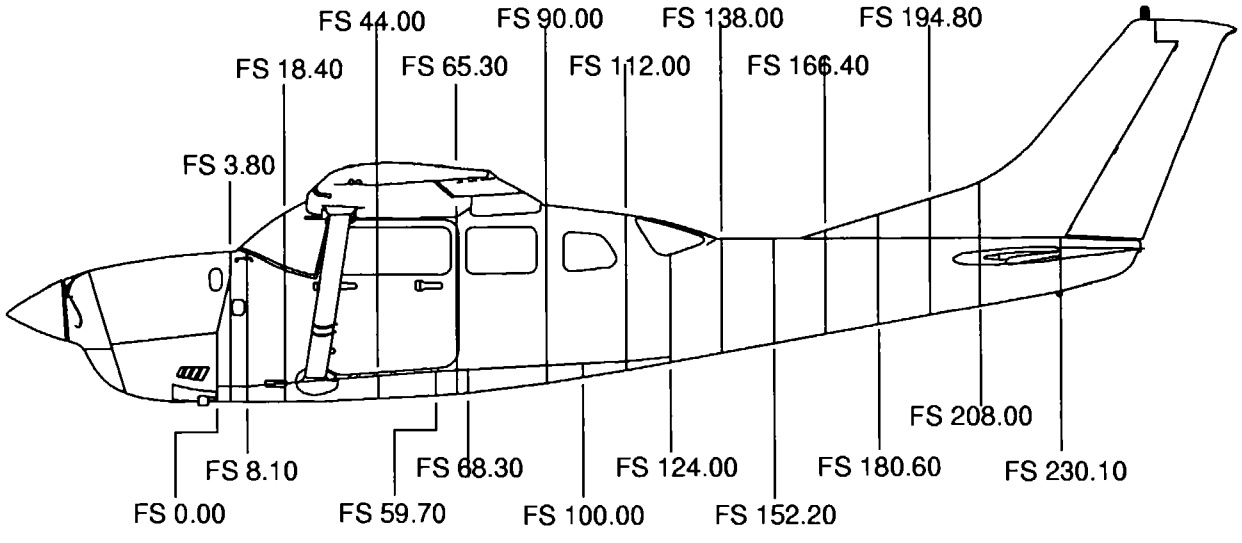
AIRPLANE STATIONS - DESCRIPTION AND OPERATION

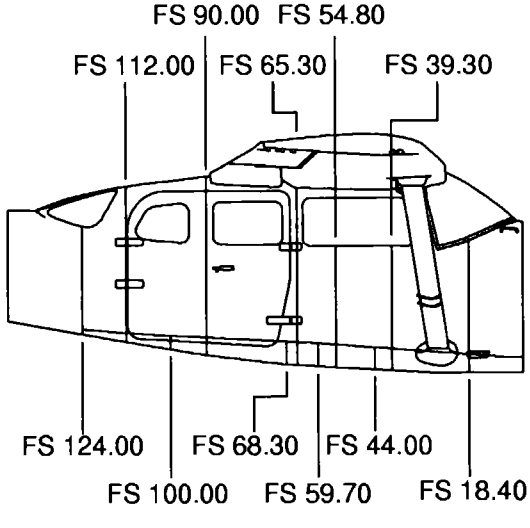
1. General

A. The airplane is laid out according to fuselage stations (FS) and wing stations (WS). These stations provide fixed reference points for all components located on or within the airplane. Fuselage Stations begin at the firewall (FS 0.00) and extend to the tailcone area (FS 230.17). Wing Stations begin at the root (WS 23.62) and extend to the tip (WS 208.00). Both Fuselage Stations and Wing Stations are measured in inches. For example, FS 185.50 is 185.50 inches aft of the firewall (FS 0.00).

B. For an illustration of Fuselage Stations, refer to Figure 1. For an illustration of Wing Stations, refer to Figure 2.

B819



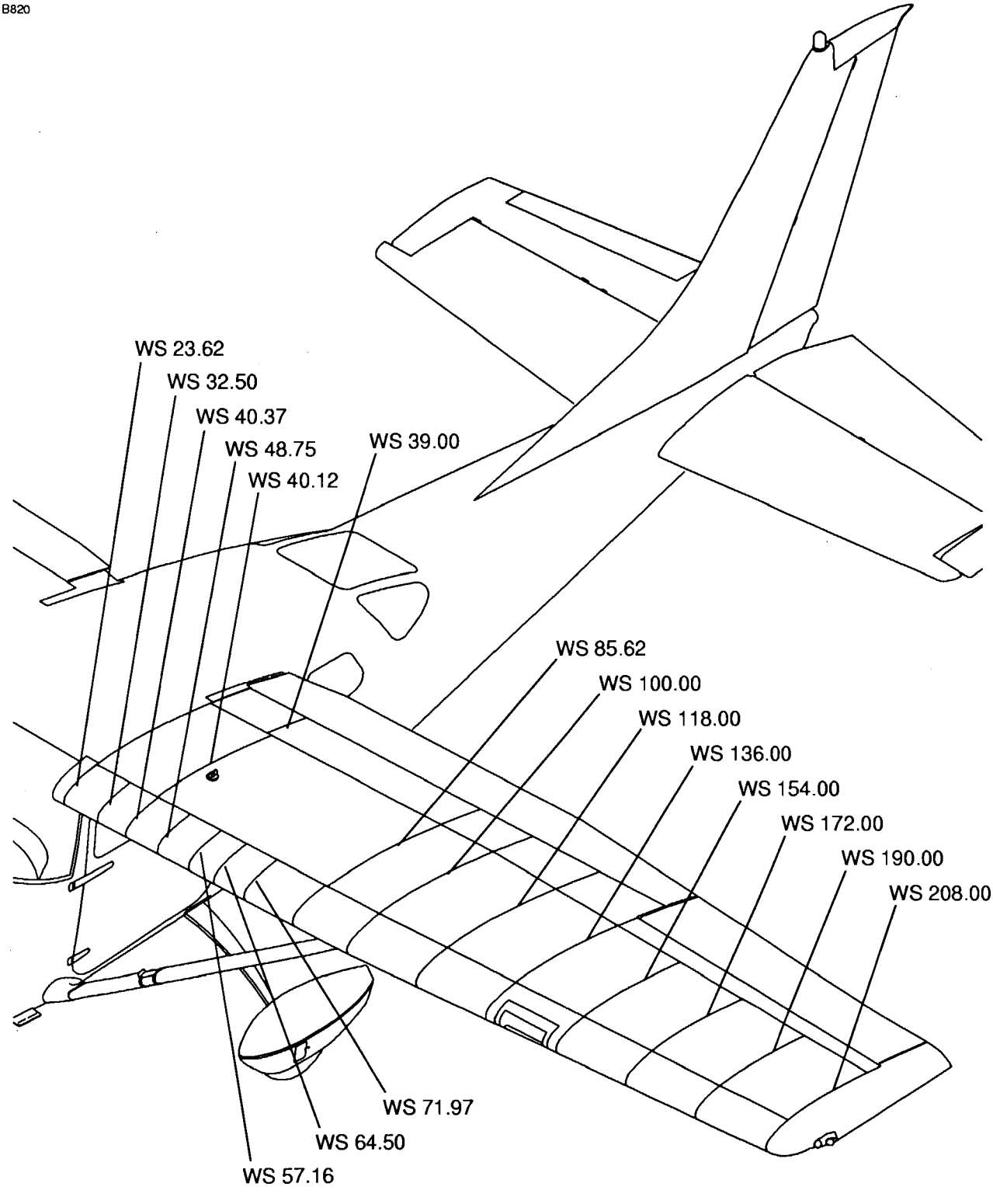


CARGO DOORS
(RIGHT SIDE ONLY)

1210T1007
1210T1007

Fuselage Stations
Figure 1 (Sheet 1)

B820



1210T1003

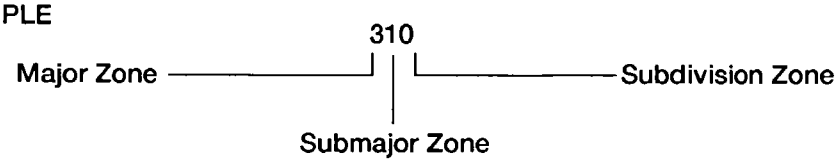
Wing Stations
Figure 2 (Sheet 1)

AIRPLANE ZONING - DESCRIPTION AND OPERATION

1. General

A. The Model 206/T206 is divided into numbered zones to provide a method for locating components and/or placards throughout the airplane. The zones are identified by a three digit number as shown in the example below. The first digit in the sequence denotes the major zone (300 series for aft of cabin, 500 series for left wing, etc.). The second digit in the sequence further divides the zone into submajor zones (Zone 510 for inboard portion of the left wing and Zone 520 for outboard portion of the left wing, etc.). The third digit further divides the submajor zones into subdivisions (if no subdivision is needed, this digit is typically assigned as 0 (zero).

EXAMPLE

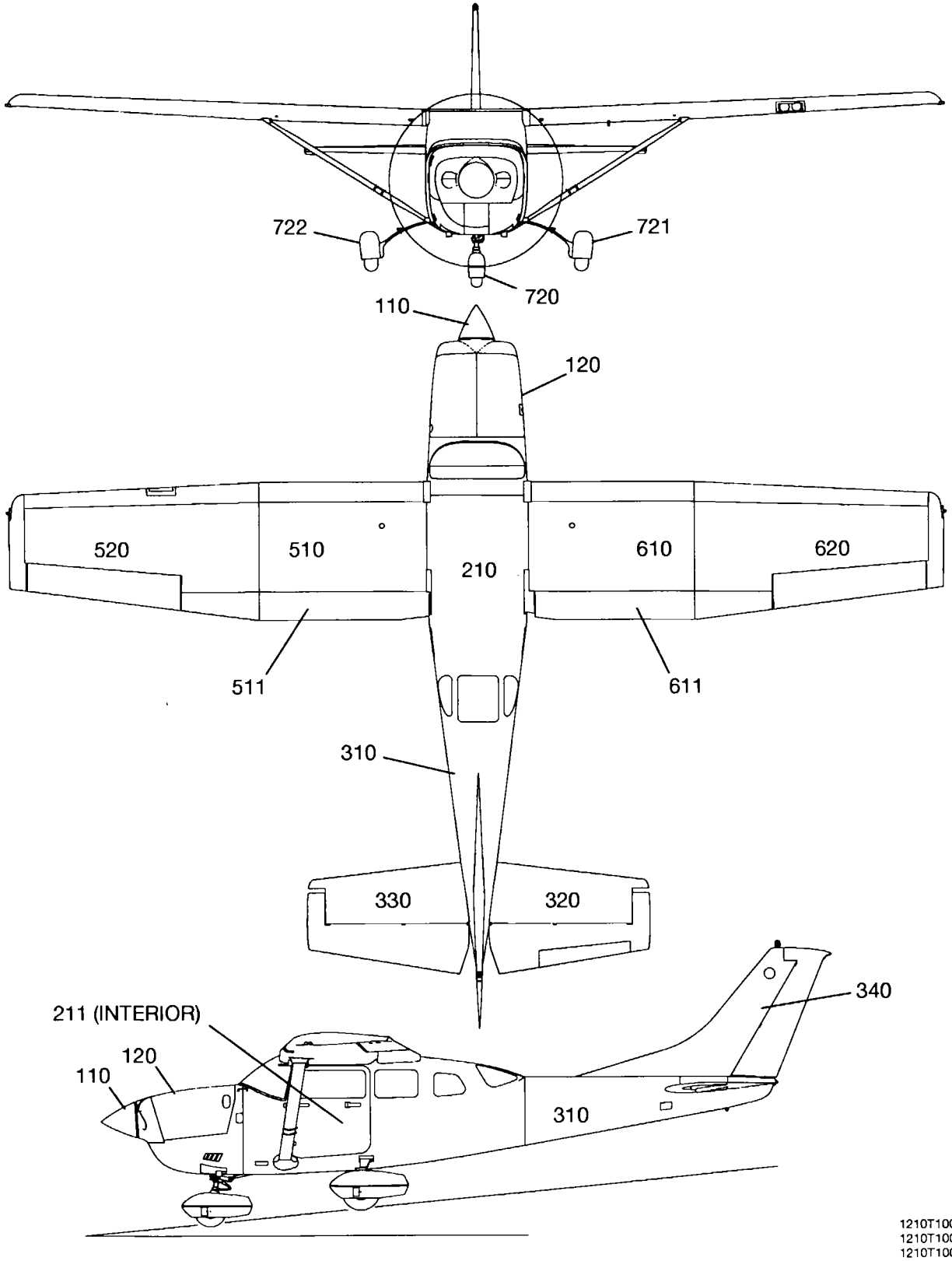


B. Major Zones.
(1) 100 - Forward side of firewall and forward.
(2) 200 - Aft side of firewall to end of cabin.
(3) 300 - Aft of cabin to end of airplane.
(4) 500 - Left wing.
(5) 600 - Right wing.
(6) 700 - Landing gear.

2. Description

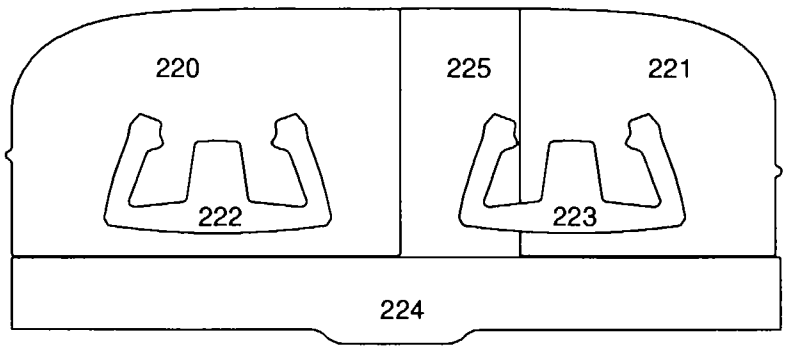
A. For a breakdown of airplane zones, refer to Figure 1.

B822

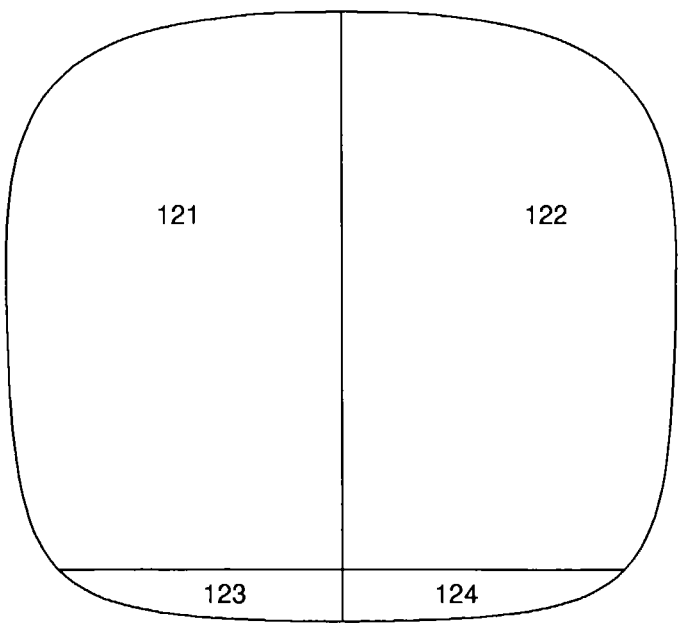


Airplane Zones
Figure 1 (Sheet 1)

B823



INSTRUMENT PANEL

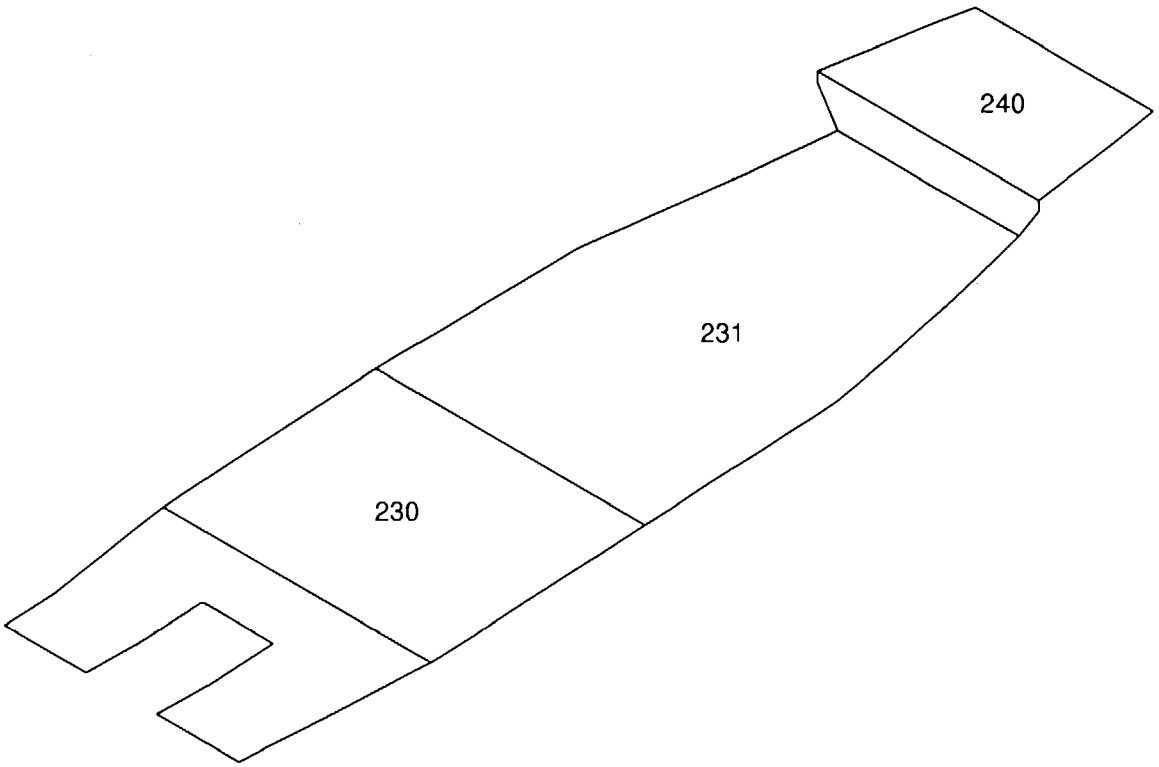


FIREWALL LOOKING FORWARD

0513T1003
0710T1004

Airplane Zones
Figure 1 (Sheet 2)

B824



INTERIOR FLOOR

0513T1003
0710T1004

Airplane Zones
Figure 1 (Sheet 3)

ACCESS/INSPECTION PLATES - DESCRIPTION AND OPERATION

1. General

A. There are access and inspection panels on the interior and exterior of the airplane. These panels give access to components and airframe areas.

NOTE: Panels that have hinges attached to them (like the oil door for example) are not referred to as panels and are not included in this section.

B. This section can be used in conjunction with inspection practices (Chapter 5) or standard maintenance practices to quickly find related components throughout the airplane.

2. Access/Inspection Panel Numbering

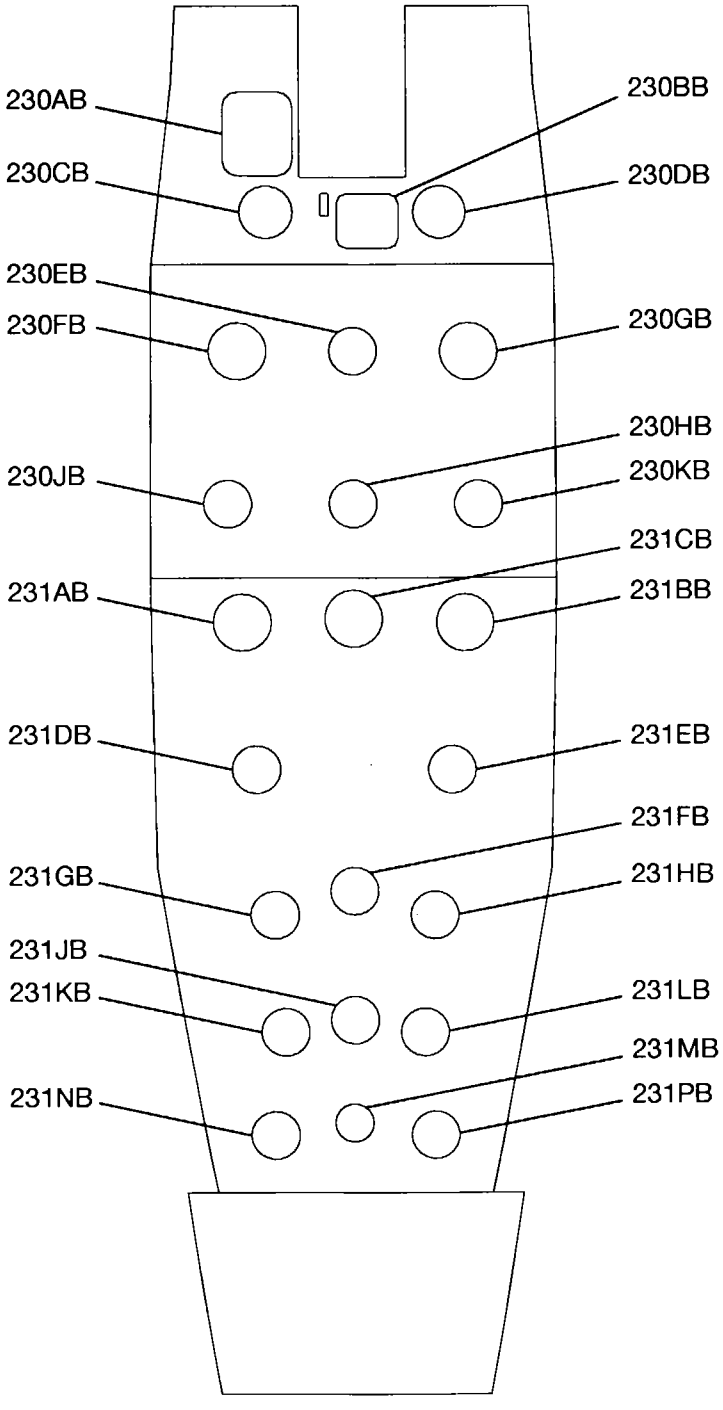
A. All access/inspection panels have a series of numbers and letters which identify their zone location, sequence, and orientation.
   (1) Zone Location - Zone location is identified by the first three numbers of any panels. This three-number sequence is specified in Airplane Zoning - Description and Operation.
   (2) Sequence - The sequence is identified by alphabetical letters follow the three-number sequence. The first panel is identified as "A," the second panel is identified as "B", and so on.
   (3) Orientation - The orientation for each panel is identified by one of four letters that come after the sequence letter. The orientation letters are "T" for top, "B" for bottom, "L" for left, and "R" for right.

B. With access panel 510AB as an example, the breakdown is as follows:
   (1) Zone Location = 510 (inboard portion of left wing)
   (2) Sequence = A (the first panel within the zone)
   (3) Orientation = B (located on the bottom of the zone).

3. Description

A. Access/Inspection Panels.

B826



CABIN FLOORBOARD PANELS

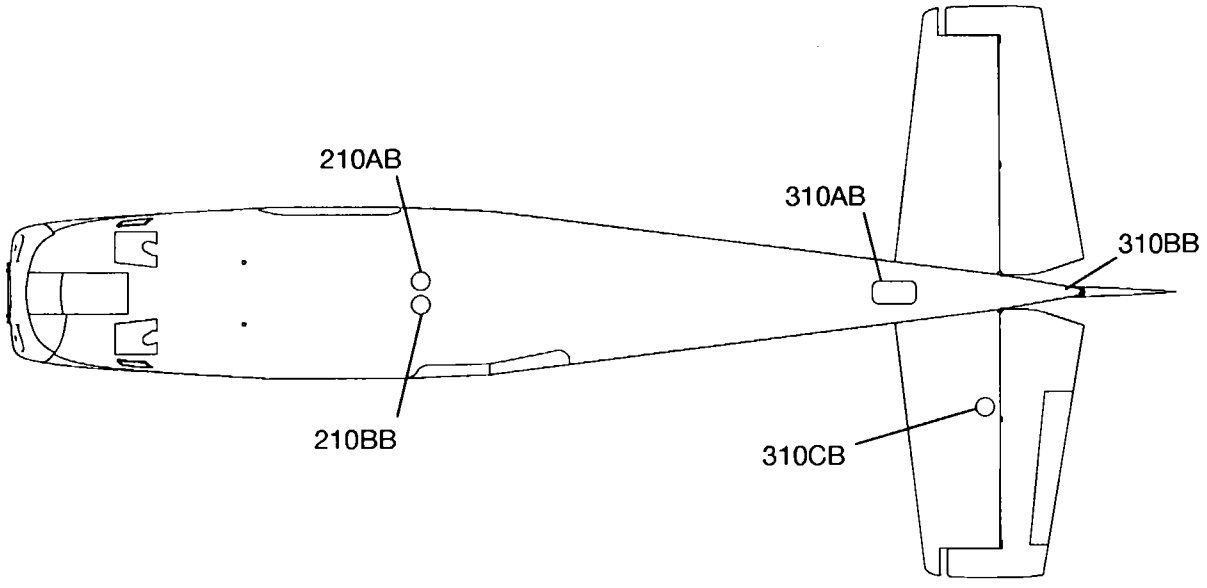
1210T1013

Cabin Floorboard Panels
Figure 1 (Sheet 1)

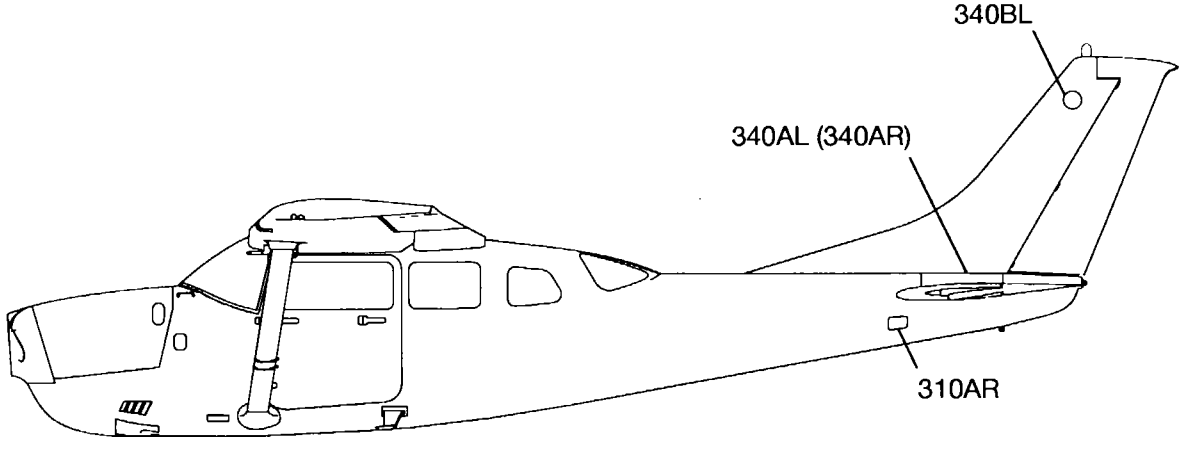
Table 1. Cabin Floorboard Panels

Panel	Equipment Located In Area (Refer to Figure 1)
230AB	Fuel Pump
230BB	Fuel Selector
230CB	Fuel Reservoir
230DB	Fuel Reservoir
230EB	Rudder Cables, Elevator Cables, Elevator Trim Cables
230FB	Fuel Line
230GB	Fuel Line
230HB	Rudder Cables, Elevator Cables, Elevator Trim Cables
230JB	Fuel Line And Landing Gear
230KB	Fuel Line And Landing Gear
231AB	Structure
231BB	Structure
231CB	Rudder Cables, Elevator Cables, Elevator Trim Cables
231DB	Structure
231EB	Structure
231FB	Rudder Cables, Elevator Cables, Elevator Trim Cables
231GB	Structure
231HB	Structure
231JB	Rudder Cables, Elevator Cables, Elevator Trim Cables
231KB	Structure
231LB	Structure
231MB	Rudder Cables, Elevator Cables, Elevator Trim Cables
231NB	Structure
231PB	Structure

B825



BOTTOM VIEW



LEFT VIEW

FUSELAGE PANELS

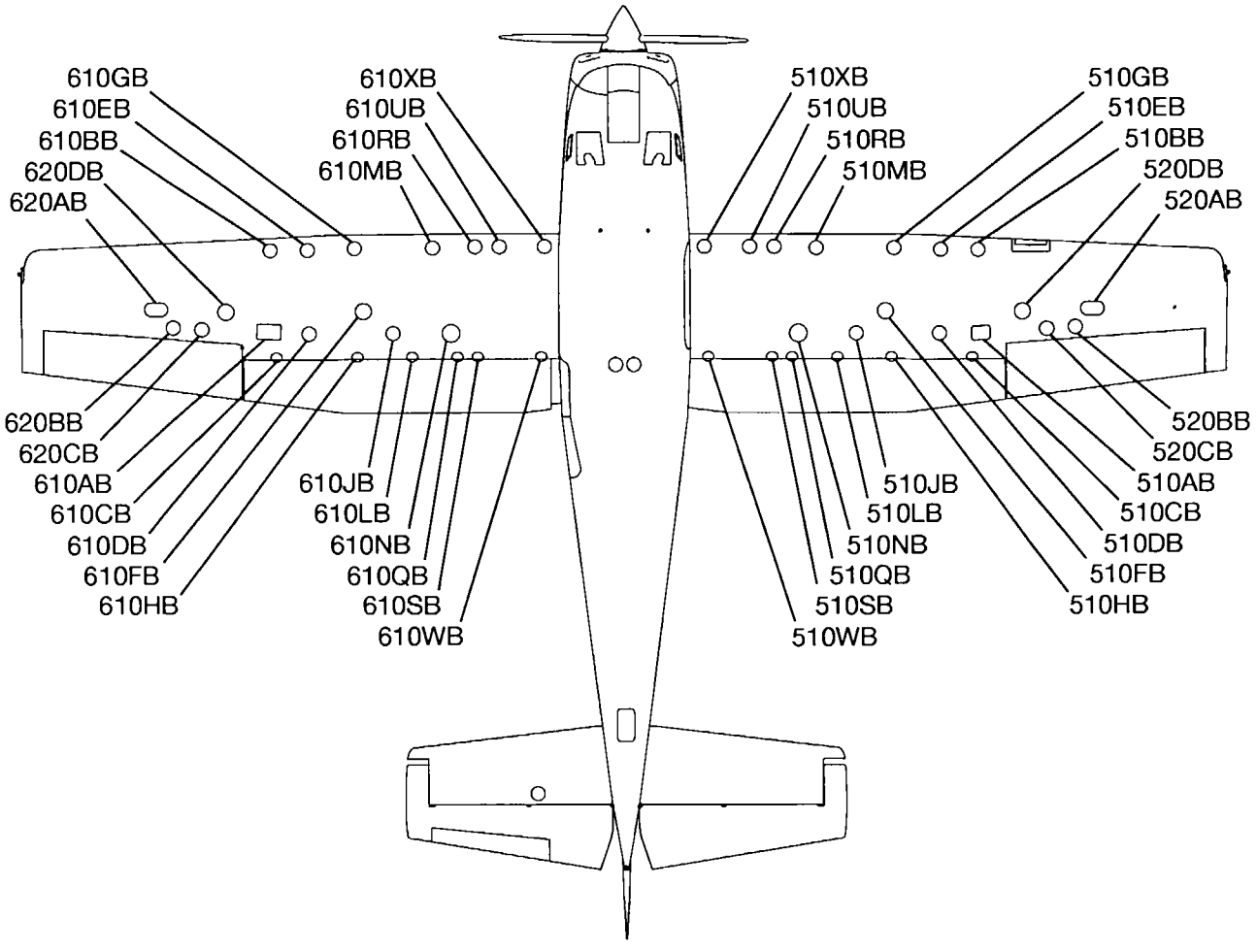
1210T1005
1210T1002

Fuselage Panels
Figure 2 (Sheet 1)

Table 2. Fuselage Panels

Panel	Equipment Located In Area (Refer to Figure 2)
210AB	Landing Gear
210BB	Landing Gear
310AB	Elevator Bellcrank Assembly, Elevator Cable Turnbuckles, Elevator Push/Pull Tube
310BB	Elevator Bellcrank
310CB	Elevator Trim Actuator
310AR	Elevator Bellcrank
340AL	Elevator Trim Cables
340AR	Elevator Trim Cables
340BL	Antenna

B827



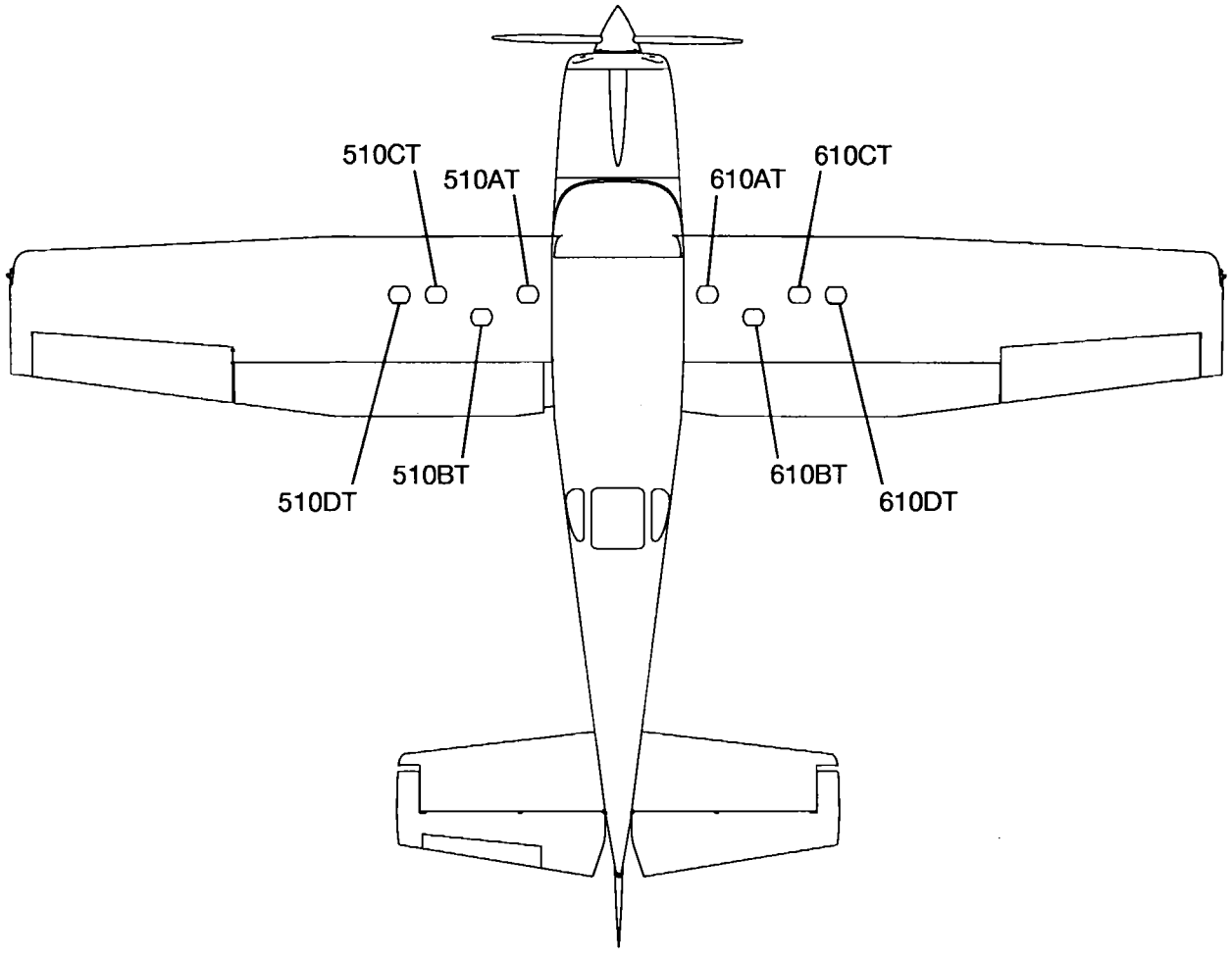
BOTTOM VIEW

WING ACCESS PANELS

1210T1005

Wing Access Panels
Figure 3 (Sheet 1)

B828



TOP VIEW

WING ACCESS PANELS

1210T1005

Wing Access Panels
Figure 3 (Sheet 2)

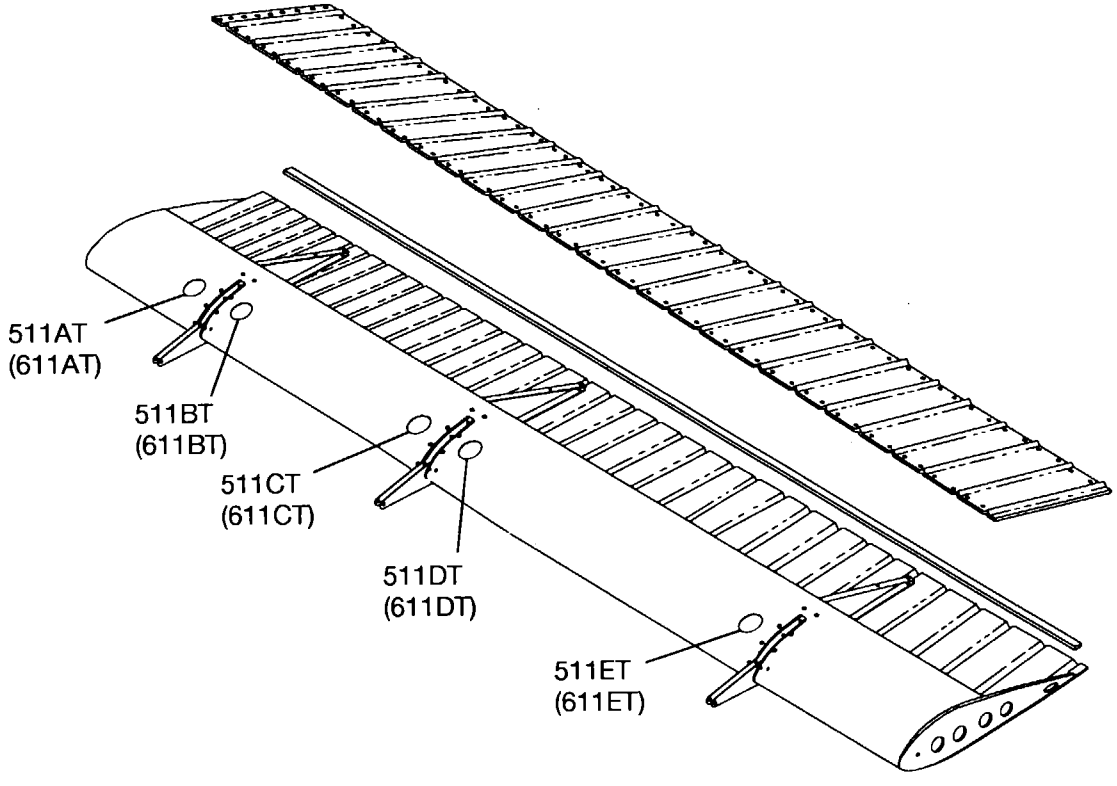
Table 3. Wing Access Panels

Panel	Equipment Located In Area (Refer to Figure 3)
620AB	Aileron Bellcrank
620BB	Aileron Bellcrank
620CB	Aileron Cable And Pulley
620DB	Aileron Turnbuckle
610AB	Aileron Cable, Aileron Cable Pulleys
610BB	Navigation Light Wiring
610CB	Wing Structure
610DB	Flap Bellcrank
610EB	Aileron Pulley
610FB	Courtesy Light
610GB	Wing Strut
610HB	Wing Structure
610JB	Flap Motor
610KT	Fuel Bay Access
610LB	Wing Structure
610MB	Aileron Cable, Electrical Wiring
610NB	Flap Bellcrank, Courtesy Light
610PT	Fuel Bay Access
610QB	Wing Structure
610RB	Aileron Cable, Electrical Wiring
610SB	Wing Structure
610TT	Fuel Bay Access
610UB	Aileron Cable, Electrical Wiring
610VT	Fuel Bay Access
610WB	Wing Structure
610XB	Aileron Cable, Fresh Air Duct, Electrical Wiring
520AB	Aileron Bellcrank
520BB	Aileron Bellcrank
520CB	Aileron Cable, Aileron Cable Pulley
520DB	Aileron Turnbuckle, Magnetometer
510AB	Aileron Cable, Aileron Cable Pulley
510BB	Navigation Light Wiring, Landing Light Wiring
510CB	Wing Structure
510DB	Flap Bellcrank

Table 3. Wing Access Panels (continued)

Panel	Equipment Located In Area (Refer to Figure 3)
510EB	Aileron Pulley
510FB	Courtesy Light
510GB	Wing Strut
510HB	Wing Structure
510JB	Aileron Pulley
510KT	Fuel Bay Access
510LB	Wing Structure
510MB	Pitot Tube
510NB	Flap Bellcrank, Courtesy Light
510PT	Fuel Bay Access
510QB	Wing Structure
510RB	Aileron Cable, Electrical Wiring
510SB	Wing Structure
510TT	Fuel Bay Access
510UB	Aileron Cable, Electrical Wiring, Pitot Line
510VT	Fuel Bay Access
510WB	Wing Structure
510XB	Aileron Cable, Electrical Wiring, Pitot Line, Fresh Air Duct

B7581



FLAP PANELS

1225T1012

Flap Panels
Figure 4 (Sheet 1)

Table 4. Flap Panels

Panel	Equipment Located In Area (Refer to Figure 4)
511AT	Flap Access
511BT	Flap Access
511CT	Flap Access
511DT	Flap Access
511ET	Flap Access
611AT	Flap Access
611BT	Flap Access
611CT	Flap Access
611DT	Flap Access
611ET	Flap Access

CHAPTER

7

LIFTING AND SHORING

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
07-Title		
07-List of Effective Pages		
07-Record of Temporary Revisions		
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7-00-00	Page 1	Dec 2/2002
7-10-00	Pages 201-202	Apr 1/2005
7-11-00	Page 201	Dec 2/2002

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

LIFTING AND SHORING - GENERAL

1. Scope

A. This chapter describes both standard and emergency procedures used to lift the airplane off the ground.

2. Tools, Equipment and Material

NOTE: Equivalent substitutes may be used for the following listed items:

NAME	NUMBER	MANUFACTURER	USE
Jack		Obtain locally	To jack wing.
Leg Extension		Obtain locally	To extend legs on jack.
Slide Tube Extension		Obtain locally	To extend jack height.
Universal TailStand		Obtain locally	To secure tail.
Padded Block		Fabricate locally	To provide cushion between wing jack and wing spar.

3. Definition

A. This chapter is divided into sections to aid maintenance personnel in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief definition of the sections incorporated in this chapter is as follows:
   (1) The section on jacking provides normal procedures and techniques used to jack the airplane off the ground.
   (2) The section on emergency lifting provides procedures, techniques and fabrication information needed to lift the airplane by overhead means.

JACKING - MAINTENANCE PRACTICES

1. General

A. When it is necessary to lift the airplane from the ground at all points, use the procedures that follow.

2. Tools, Equipment and Materials

A. For a list of required tools, equipment and materials, refer to Lifting and Shoring - General. Also refer to MK206-57-02 for procedures, if installed.

3. Jacking Procedure

A. Lift the Airplane (Refer to Figure 201).

NOTE: For airplanes that are changed with MK206-57-02, a padded block is not necessary for the jacking procedure. MK206-57-02 is a modification kit that gives procedures and parts to install a jack pad on the bottom side of the wing. Refer to MK206-57-02 for an alternative to the jacking procedure that follows.

(1) Put wing jacks and padded blocks under the front spar, just outboard of the wing strut. Make sure that a padded block (1 inch X 4 inch X 4 inch with 0.25-inch rubber pad) is put firmly between the spar and jack.
(2) Lift the wing jacks at the same time on the left and right wings until they are at the necessary height. Keep the wings as level as possible during the lift.

CAUTION: Do not let the tail move up during the jacking procedure. When put on jacks, the airplane is nose-heavy. Tail stands must have sufficient weight in all conditions. Also, the tail stand must be sufficiently strong to hold all the weight that can possibly move to the tailcone area during maintenance and cause a tail-heavy condition.

(3) Carefully attach a tail stand to the tail tiedown ring.

B. Lower the Airplane (Refer to Figure 201).
(1) Remove the tail stand from tail tiedown ring.
(2) Slowly lower the wing jacks at the same time until the main tires are on the ground.
(3) Remove the wing jacks and jack pads from the wing area.

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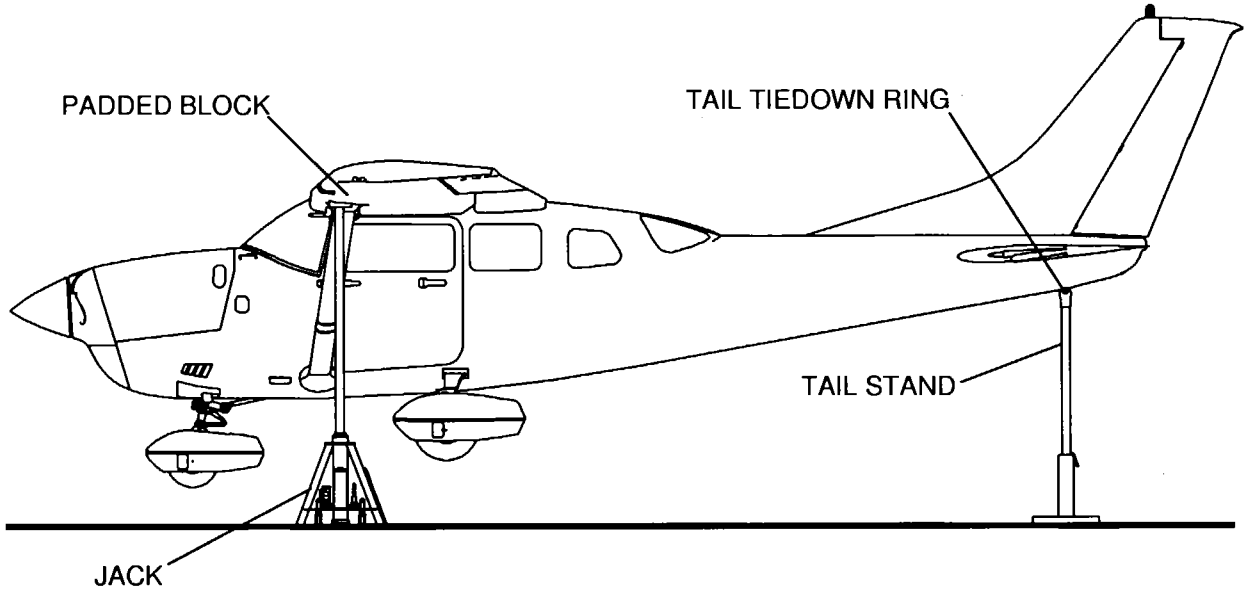

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Airplane Jacking
Figure 201 (Sheet 1)

EMERGENCY LIFTING/HOISTING - MAINTENANCE PRACTICES

1. Lifting Procedure

CAUTION: Airplane should be at minimum weight if slings are used. Fuel and all other items such as cargo etc, should be removed.

A. The airplane may be lifted by means of suitable slings. The front sling should be hooked to the engine hoisting ring, and the aft sling should be positioned around the fuselage at the first bulkhead forward of the leading edge of the stabilizer.

CHAPTER

8

LEVELING AND WEIGHING

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CONTENTS

LEVELING AND WEIGHING - GENERAL

1. Scope

A. This chapter provides information necessary to properly level the airplane.

B. For information on airplane weighing procedures, refer to Section 6 of the Pilot's Operating Handbook And FAA Approved Airplane Flight Manual.

2. Tools, Equipment and Material

NOTE: Equivalent substitutes may be used for the following items:

NAME	NUMBER	MANUFACTURER	USE
Spirit Level		Commercially available	Bubble level used to level airplane.

3. Definition

A. This chapter is divided into sections to aid maintenance personnel in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief definition of the section incorporated in this chapter is as follows:

(1) The section on leveling provides maintenance practices and instructions for longitudinal and lateral leveling of the airplane.

LEVELING - MAINTENANCE PRACTICES

1. General

A. This section provides reference points for leveling the airplane laterally and longitudinally.

B. For an illustration of leveling, refer to Figure 201.

2. Tools, Equipment and Materials

A. For a list of required tools, equipment and materials, refer to Leveling And Weighing - General.

3. Leveling Points

A. Lateral Leveling.
   (1) The airplane may be leveled laterally by selecting two corresponding points on the front seat rails and placing the level across these points.

B. Longitudinal Leveling.
   (1) Place level on the top of the tailcone adjacent to the vertical fin.

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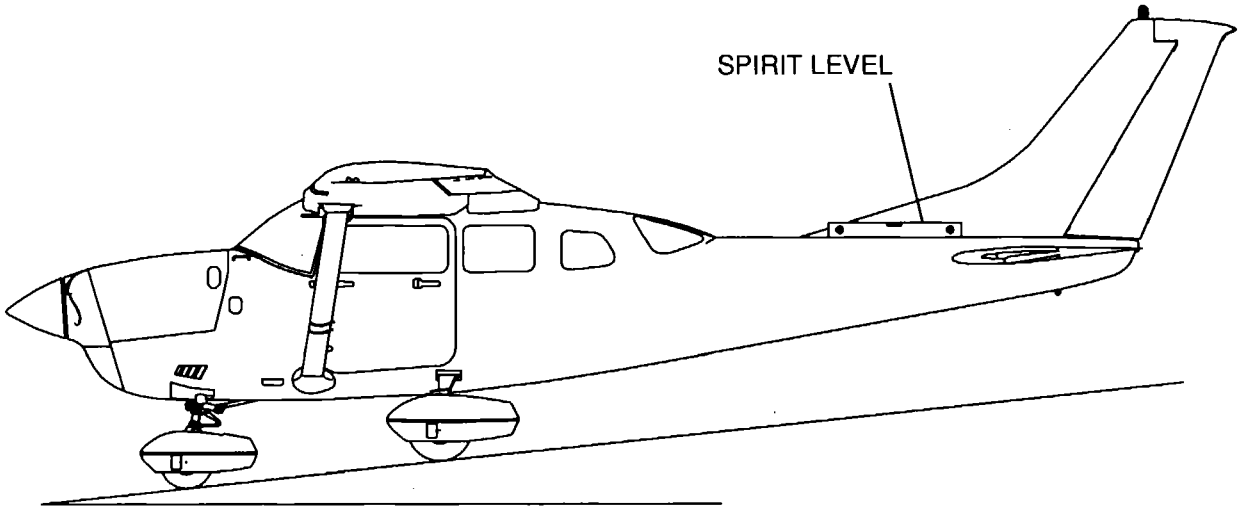

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Airplane Leveling
Figure 201 (Sheet 1)

CHAPTER

9

TOWING AND TAXIING

LIST OF EFFECTIVE PAGES

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CONTENTS

TOWING AND TAXIING - GENERAL

1. Scope

A. This chapter describes towing procedures for movement of the airplane on the ground.

2. Definition

A. This chapter is divided into sections to aid maintenance personnel in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief definition of the section incorporated in this chapter is as follows;

(1) The section on towing describes those procedures and cautions applicable for the Model 206 airplanes.

TOWING - MAINTENANCE PRACTICES

1. General

A. Towing.

CAUTION: When towing the airplane, never turn the nose wheel more than 29 degrees either side of center or the gear will be damaged. Do not push on control surfaces or outboard empennage surfaces. When pushing on the tailcone, always apply pressure at a bulkhead to avoid buckling the skin.

(1) Moving the airplane by hand is accomplished by using the wing struts and landing gear struts as push points. A tow bar attached to the nose gear should be used for steering and maneuvering the airplane on the ground.

CHAPTER 10

PARKING AND MOORING

LIST OF EFFECTIVE PAGES

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CONTENTS

PARKING, MOORING, STORAGE AND RETURN TO SERVICE - GENERAL

1. Scope

A. This chapter provides maintenance instructions for parking, mooring, storage and return to service.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the following items:

NAME	NUMBER	MANUFACTURER	USE
Wheel Chocks		Available Commercially	To chock landing wheels.
Engine Air Inlet Cover		Cessna Aircraft Cessna Parts Distribution Department 701, CPD 2 5800 East Pawnee Road Wichita, KS 67218-5590	To prevent entry of moisture and/or foreign particles through cowling.
Pitot Tube Cover		Cessna Aircraft	To prevent entry of moisture and/or foreign particles in pitot tubes.
Static Ground Cable		Available Commercially	To static ground airplane.
Rope (0.375 inch diameter minimum) or equivalent		Available Commercially	To tie down wing and tail.
Dehydrator Plugs	MS27215-1 or -2	Available Commercially	To prevent moisture in cylinders during indefinite storage.
Corrosion Preventive Oil	One part MIL-L-6529, Type 1, with one part Royal "D"	Royal Lubricants Co. Inc. 72 Eagle Rock Ave. East Hanover, NJ 07936	Preserve engine during long term storage.
Presrvative Oil	MIL-C-6529	Available Commercially	Preserve engine during long term storage.

3. Definition

A. This chapter is divided into sections to aid maintenance personnel in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief definition of the sections incorporated in this chapter is as follows:
   (1) The section on parking describes methods, procedures and precautions used when parking the airplane.
   (2) The section on mooring describes procedures and equipment used to moor the airplane.
   (3) The section on storage provides information on recommended storage procedures. Recommendations vary with the length of time the airplane is to be stored.
   (4) The section on return to service describes procedures used when returning the airplane to service from flyable, temporary or indefinite storage.

PARKING - MAINTENANCE PRACTICES

1. General

A. These maintenance practices cover procedures used to park the airplane.

B. The airplane should be moored if high winds are anticipated or anytime the airplane remains outside for extended periods of time. Refer to Mooring - Maintenance Practices, for mooring procedures. Refer to Storage - Maintenance Practices, for detailed instructions regarding short term or long term storage.

2. Parking Instructions

A. Hard Surface and Sod.
(1) Position airplane on level surface headed into wind.

CAUTION: Do not set parking brake during cold weather, when accumulated moisture may freeze brakes, or when brakes are overheated.

(2) Set parking brake or chock main gear wheels.
(3) Install control column lock.

STORAGE - MAINTENANCE PRACTICES

1. General

A. This section provides maintenance instructions and inspection criteria for airplanes in flyable, temporary and indefinite storage. Refer to the Lycoming Service Letter L180B (or latest revision).
   (1) Flyable Storage is defined as a maximum of 30 days nonoperational storage and/or the first 25 hours of intermittent engine operation.
   (2) Temporary Storage is defined as a maximum of 90 days of nonoperational status.
   (3) Indefinite Storage is defined as more than 90 days of nonoperational status.

2. Flyable Storage

A. Flyable storage is a maximum of 30 days storage with no engine operation and/or the first 25 hours of intermittent engine operation.

B. Engine temperature and length of operation time are very important in the control of corrosion. The desired flight time for air cooled engines is at least one continuous hour at oil temperatures of 165 degrees F (74 degrees C) to 200 degrees F (93 degrees C) at intervals not to exceed 30 days. The one hour does not include taxi, take-off, and landing time.

C. The aircraft temperature gages must operate correctly.

D. The cooling air baffles must be in good condition and fitted properly.

E. The oil cooler system must be of the proper size for the engine and airframe. Oil coolers that are not the correct size can cause an engine to operate at too high or low a temperature. Low temperatures are as dangerous as high temperatures because of build-up of water and acids.

F. Pulling the propeller through by hand is not recommended when the airplane has not operated for approximately a week. Pulling the propeller through by hand before you start the engine or to minimize corrosion can cause damage. When the propeller is pulled through by hand, the rings can remove oil from the cylinder walls. The cam load made by the valve train removes oil from the cam and followers. After two or three times of pulling the propeller through by hand without engine starts, the cylinders, cam, and followers are left without the correct quantity of oil film. Engine starts without the correct lubrication can cause the engine parts to score, which can cause damage to the engine.

G. The pitot tube, static air vents, air vents, openings in the engine cowl, and other openings must have protective covers installed to prevent entry of foreign object debris.

3. Temporary Storage

NOTE: The airplane is constructed of corrosion resistant, epoxy primed aluminum, which will last indefinitely under normal conditions, if kept clean. However, these alloys are subject to oxidation. The first indication of corrosion on unpainted surfaces is in the form of white deposits or spots. Corrosion on painted surfaces shows up as the paint being discolored or blistered. Storage in a dry hangar is essential to good preservation and should be procured, if possible.

A. Instructions For Temporary Storage:

WARNING: During all fueling procedures, fire fighting equipment must be available. Two ground wires from different points on the airplane connected to separate approved ground stakes shall be used in case of accidental disconnection of one ground wire. Ensure that fueling nozzle is grounded to the airplane.

(1) Fill fuel tanks with the correct grade of gasoline.

NOTE: Tiedown rings should be used as grounding points for all grounding wires during refueling procedures.

(9) Rotate crankshaft so that no piston is at a top position. If the airplane is to be stored outside, stop two bladed propeller so that blades are as near horizontal as possible to provide maximum clearance for passing airplane.
(10) Again, spray each cylinder without moving the crankshaft to thoroughly cover all interior surfaces of the cylinder above the piston.
(11) Install spark plugs and connect spark plug leads. Apply preservative oil to the engine interior by spraying approximately two ounces of the preservative oil through the oil filler tube.
(12) Seal all engine openings exposed to the atmosphere, using suitable plugs. Attach a red streamer at each point where a plug is installed.
(13) If the airplane is to be stored outside, tie down and secure using procedures outlined in Mooring - Maintenance Practices. In addition, the pitot tube, static source vents, air vent openings in the engine cowling and other similar openings should have protective covers installed to prevent entry of foreign material.
(14) Attach a warning placard to the propeller to the effect that the propeller shall not be moved while the engine is in storage.

4. Indefinite Storage

NOTE: Engines treated in accordance with the following procedure are protected against normal atmospheric corrosion for an indefinite period. However, periodic inspections should be performed to assure the integrity of preservation methods. Refer to Inspection During Indefinite Storage.

A. Instructions for Indefinite Storage:
(1) Operate engine until oil temperature reaches normal operating range. Drain engine oil sump.
(2) Reinstall plug in sump when all oil has drained.
(3) Disconnect battery.
(4) Fill oil sump to normal operating capacity with thoroughly mixed corrosion preventative oil. Refer to Parking, Mooring, Storage and Return to Service - General.
(5) Remove top spark plugs, and with the crankcase full of oil, slowly turn the propeller through two revolutions. Let engine stand for ten minutes after which the propeller should be turned back and forth through 90 degrees for twelve cycles.
(6) Drain the preservative oil.
(7) With the piston approximately 1/4 turn before top center of the exhaust stroke, spray the exhaust port and valve of each cylinder using MIL-C-6529 oil, Type 1.
(8) Using an airless spray gun, spray two ounces (60 ml) of MIL-C-6529 oil, Type 1, into each cylinder through the spark plug hole.
(9) For all spraying the spray nozzle temperature shall be maintained between 200°F (93.33°C) and 220°F (104.44°C).
(10) Install dehydrator plugs in the upper spark plug holes. Ensure dehydrator plugs are blue in color when installed.
(11) Cover spark plug lead terminals with shipping plugs or other suitable covers.
(12) With throttle in full open position, place a bag of desiccant in the induction air intake and seal opening with moisture resistant paper and tape.
(13) Place a bag of desiccant in the exhaust tailpipe and seal openings with moisture resistant tape.
(14) Seal cold air inlet to the heater muff with moisture resistant tape.
(15) Seal engine breather tube by inserting a plug in the breather hose and clamping in place.
(16) Seal all other engine openings exposed to atmosphere, using suitable plugs or nonhydroscopic tape.

NOTE: Attach a red streamer to each location where a plug or tape is installed. Either attach red streamers outside the sealed area with tape or to the inside of the sealed area with safety wire to prevent wicking of moisture into the sealed area.

(17) Drain corrosion preventative mixture from engine sump and reinstall drain plug.

NOTE: The corrosion preventative mixture is harmful to paint and should be wiped from painted surfaces immediately.

(14) Seal cold air inlet to the heater muff with moisture resistant tape.
(15) Seal engine breather tube by inserting a plug in the breather hose and clamping in place.
(16) Seal all other engine openings exposed to atmosphere, using suitable plugs or nonhydroscopic tape.

NOTE: Attach a red streamer to each location where a plug or tape is installed. Either attach red streamers outside the sealed area with tape or to the inside of the sealed area with safety wire to prevent wicking of moisture into the sealed area.

(17) Drain corrosion preventative mixture from engine sump and reinstall drain plug.

NOTE: The corrosion preventative mixture is harmful to paint and should be wiped from painted surfaces immediately.

(18) Attach a warning placard on the throttle control knob to the effect that the engine contains no lubricating oil. Placard the propeller to the effect that is should not be moved while the engine is in storage.

NOTE: As an alternate method of indefinite storage, the airplane may be serviced according to Temporary Storage procedures, run up at maximum intervals of 90 days, and then serviced again according to procedures in Temporary Storage.

5. Inspection During Flyable Storage

A. There are no inspection requirements for airplanes in flyable storage.

6. Inspection During Temporary Storage

A. Airplanes in temporary storage should be inspected using the following procedure:
(1) Inspect airframe for corrosion every 30 days.
(2) Remove dust collections as frequently as possible.
(3) Clean and wax airplane as required.
(4) Inspect interior of at least one cylinder for corrosion every 30 days.

NOTE: Do not move crankshaft when inspecting interior of cylinder for corrosion.

7. Inspection During Indefinite Storage

A. Airplanes in indefinite storage should be inspected using the following procedure:
(1) Inspect cylinder dehydrator plugs every seven days. Change protex plugs if their color indicates an unsafe condition.
(2) If dehydrator plugs have changed color in one half of the cylinders, all desiccant material in the engine should be replaced with new material.
(3) Respray cylinder interiors with corrosion preventative mixture every six months and replace desiccant and dehydrator plugs.

NOTE: Before spraying, inspect the interior of one cylinder for corrosion through the spark plug hole and remove at least one rocker box cover and inspect the valve mechanism.

MOORING - MAINTENANCE PRACTICES

1. General

A. This section provides instructions for mooring the airplane.

2. Mooring Procedures

A. When mooring the airplane in the open, head into the wind if possible. Tie down the airplane as follows:
   (1) Secure control surfaces with the internal control lock and set brakes.
   (2) Tie ropes, cables, or chains to the wing tiedown fittings located at the upper end of each wing strut. Secure the opposite ends of ropes, cables, or chains to ground anchors.
   (3) Secure rope (no chains or cables) to forward mooring ring and secure opposite end to ground anchor.
   (4) Secure the middle of a rope to the tail tiedown ring. Pull each end of rope away at a 45 degree angle and secure to ground anchors at each side of tail.
   (5) Secure control lock on pilot control column. If control lock is not available, tie pilot control wheel back with front seat belt.
   (6) These airplanes are equipped with a spring- loaded steering system which affords protection against normal wind gusts. However, if extremely high wind gusts are anticipated, additional external locks may be installed.

3. Brace Installation (required for float planes)

A. Install Brace (Refer to Figure 201).

NOTE: This is for first time installation.

(1) Remove left and right forward window molding for attachment of upper brace at wing spar carry-through.
(2) Using the existing outboard spar bolts, secure upper brace to spar.

NOTE: Ensure proper hardware. Refer to The Model 206/T206 1997 And On Illustrated Parts Catalog, Chapter 10, Brace Installation - Float Plane.

NOTE: Discard any extra washers as required.

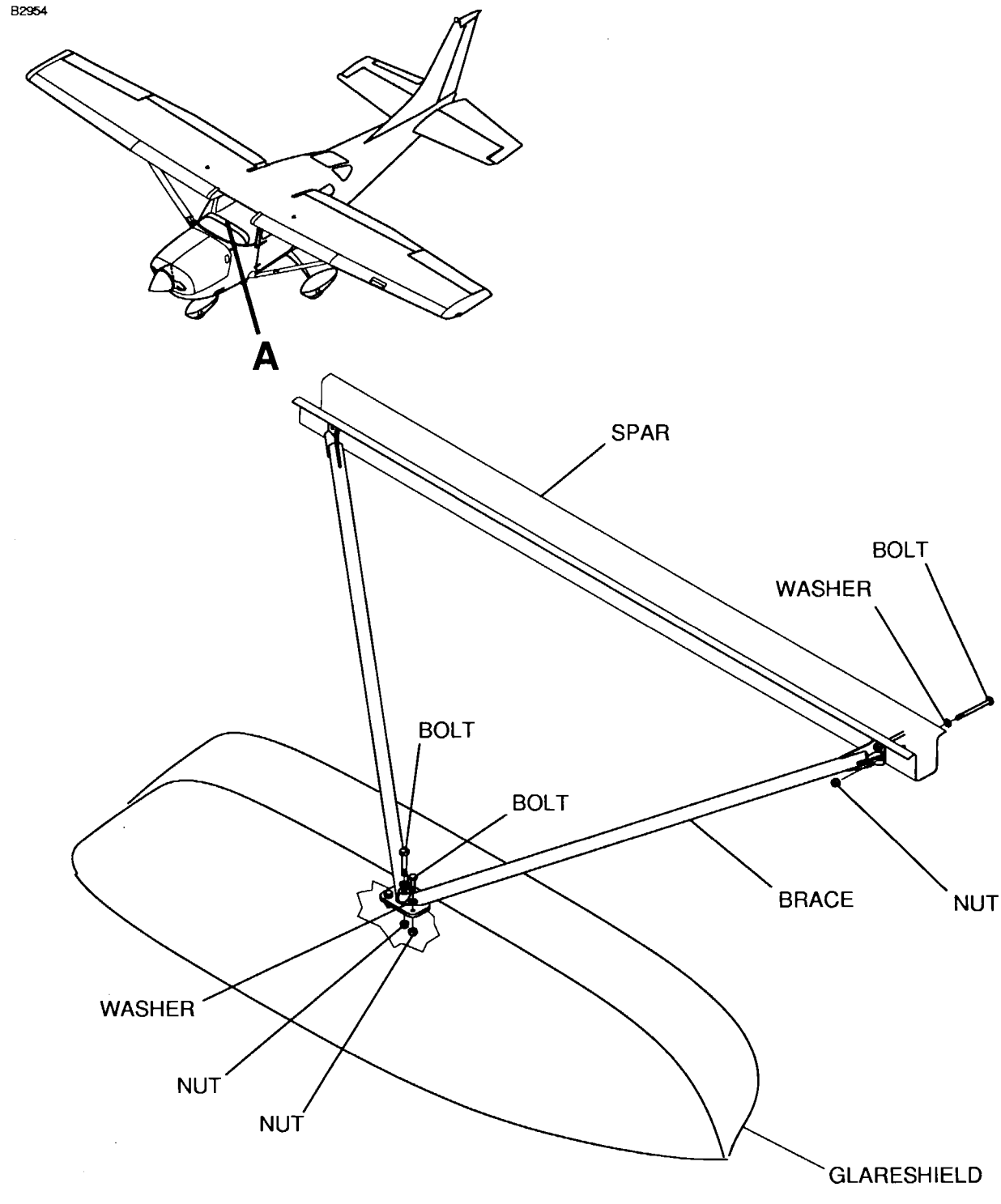
(3) Trim window molding and glareshield as required to allow brace to pass through. Reinstall window molding.

NOTE: Cut a straight line on outside of window molding, then cut a hole in the top and bottom. This allows it to be opened up and snapped around the brace allowing the brace to pass through the upholstery.

(4) Remove pilot's inboard instrument panel and avionics as necessary for drilling center brace bolt holes.

CAUTION: Protect electrical and avionics from shavings.

(5) Install center bolt, washer and nut to position brace and drill the two (2) .193 bolt holes. Secure center brace using bolts washers and nuts.
(6) Remove shavings. Reinstall pilot's instrument panel and avionics.



DETAIL A

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Brace Installation - Float Planes
Figure 201 (Sheet 1)

RETURN TO SERVICE - MAINTENANCE PRACTICES

1. General

A. Airplanes which have been in storage must be returned to service prior to first flight. Procedures for returning an airplane to service depend on length of time the airplane was stored. Refer to the following procedures for return to service after flyable storage, temporary storage and indefinite storage.

2. Flyable Storage Return to Service

A. Accomplish the following:
(1) Perform a thorough preflight inspection.

NOTE: At the end of the first 25 hours of engine operation, drain engine oil, change oil filter and service engine with correct grade and quantity of engine oil.

3. Temporary Storage Return to Service

A. Accomplish the following:
(1) Remove airplane from blocks and check tires for proper inflation. Check for proper nose gear strut inflation.
(2) Check battery and install.
(3) Ensure oil sump has proper grade and quantity of engine oil.
(4) Service induction air filter and remove warning placard from propeller.
(5) Remove materials used to cover openings.
(6) Remove, clean and gap spark plugs.
(7) While spark plugs are removed, rotate propeller several revolutions to clear excess rust preventative oil from cylinders.
(8) Install spark plugs. Torque plugs to 330 inch-pounds (37.29 N.m.) and connect spark plug leads.
(9) Check fuel strainer. Remove and clean filter screen if necessary. Check fuel tanks and fuel lines for moisture and sediment. Drain enough fuel to eliminate any moisture and sediment.
(10) Perform a thorough preflight inspection, then start and warm up engine.

4. Indefinite Storage Return to Service

A. Accomplish the following:
(1) Remove aircraft from blocks. Check tires for correct Inflation.
(2) Check and install battery.
(3) Remove all materials used to seal and cover openings.
(4) Remove warning placards posted at throttle and propeller.
(5) Remove drain plug and allow preservative oil to drain from engine sump.

NOTE: Preservative oil which remains in sump will mix with engine oil. Flushing of the oil system is not required.

(6) Remove old oil filter. Install new oil filter.
(7) Reinstall drain plug and service engine with correct quantity and grade of engine oil.
(8) Service and install induction air filter.
(9) Remove dehydrator plugs and spark plugs/plugs installed in spark plug holes. Rotate propeller several revolutions by hand to clear corrosion preventative mixture from cylinders.
(10) Clean, gap and install spark plugs.
(11) Rotate propeller by hand through compression stroke of each cylinder to check for possible liquid lock. Torque plug to 330 inch-pounds (37.29 N.m).
(12) Check fuel strainer. Remove and clean filter screen if necessary. Check fuel tanks and fuel lines for moisture and sediment. Drain enough fuel to eliminate any moisture and sediment.
(13) Perform a thorough preflight inspection, then start and warm up engine.
(14) Thoroughly clean and test fly airplane.

CHAPTER 11

PLACARDS AND MARKINGS

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CONTENTS

PLACARDS AND MARKINGS - GENERAL

1. General

A. Placards and markings found on the exterior surfaces of the airplane are detailed in the Model 206/T206 Illustrated Parts Catalog, Chapter 11.

PLACARDS AND MARKINGS - INSPECTION/CHECK

1. Scope

A. This section has inspection data for the interior and exterior placards.

2. Interior and Exterior Placard and Decal Inspection

NOTE: This section gives an inspection procedure for all placards, decals, and markings on the airplane.

A. Do an inspection of the placards, decals, and markings.
   (1) Examine the interior of the airplane. Include the aft baggage areas for the installation of all required placards, decals and markings.
      (a) For required placards, decals, and markings, refer to the Model 206H/T206H Illustrated Parts Catalog.
   (2) Examine the exterior of the airplane for the installation of all required placards, decals, and markings.
      (a) For required placards, decals, and markings, refer to the Model 206H/T206H Illustrated Parts Catalog.
   (3) Examine the airplane identification plate.
      (a) The ID plate is on the left side of the stinger, Zone 310. Refer to the Model 206H/T206H Illustrated Parts Catalog and Chapter 6, Airplane Zoning - Description and Operation.

CHAPTER 12

SERVICING

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SERVICING - GENERAL

1. Scope

A. This chapter provides instructions for the replenishment of fluids and for scheduled and unscheduled servicing applicable to the entire airplane. Personnel shall observe safety precautions pertaining to the individual servicing application.

2. Definition

A. This chapter is divided into sections to aid maintenance personnel in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief description of each section follows.

(1) The section on replenishing is subdivided into categories to group servicing information, such as, systems requiring hydraulic fluid or compressed gas. A brief description of the subdivision subjects follows.

(a) Replenishing charts for the liquids most commonly used to service the airplane are grouped together to aid maintenance personnel in servicing.

(b) The subdivision of fuel and oil provides maintenance personnel with general servicing procedures. Safety precautions and servicing procedures required by federal and local regulations may supersede the procedures described.

(c) The subject on hydraulic fluid servicing provides servicing procedures for the airplane hydraulic brake system, nose gear shimmy damper and nose gear strut.

(d) The remaining subject subdivisions provide service information on either a system, an assembly or a component.

(2) The section on scheduled servicing includes lubrication information, external cleaning and internal cleaning. The section is subdivided to provide individual system, assembly or component service information.

REPLENISHING - DESCRIPTION AND OPERATION

1. General

A. This section gives information about servicing to help supply the fuel and oil to the airplane.

2. Description

A. For an illustration of the service points located on the airplane, refer to Figure 1.

3. Fuel Capacity Table

A. The table that follows lists the capacity for airplane fuel.

WARNING: Only aviation-grade fuels are approved for use.

Table 1. Fuel Capacity

Fuel Quantity	Usable Fuel
92.0 Gallons (348.26 liters)	88.0 Gallons (333.12 liters)

4. Approved Fuel Table

A. The table that follows lists approved fuels for use in the airplane.

Table 2. Approved Fuels

TYPE OF FUEL	SPECIFICATION	COLOR
100 LL	ASTM-D910	Blue
100	ASTM-D910	Green

5. Engine Oil Capacity Table

A. The table that follows lists oil capacity for the airplane.

WARNING: The U.S. Environmental Protection Agency advises mechanics and other workers who handle oil to minimize skin contact with used oil and promptly remove used oil from skin.

Table 3. Engine Oil Capacity

Oil quantity (total with filter, oil cooler and cooler hoses)	12.0 quarts (12.30 liters)

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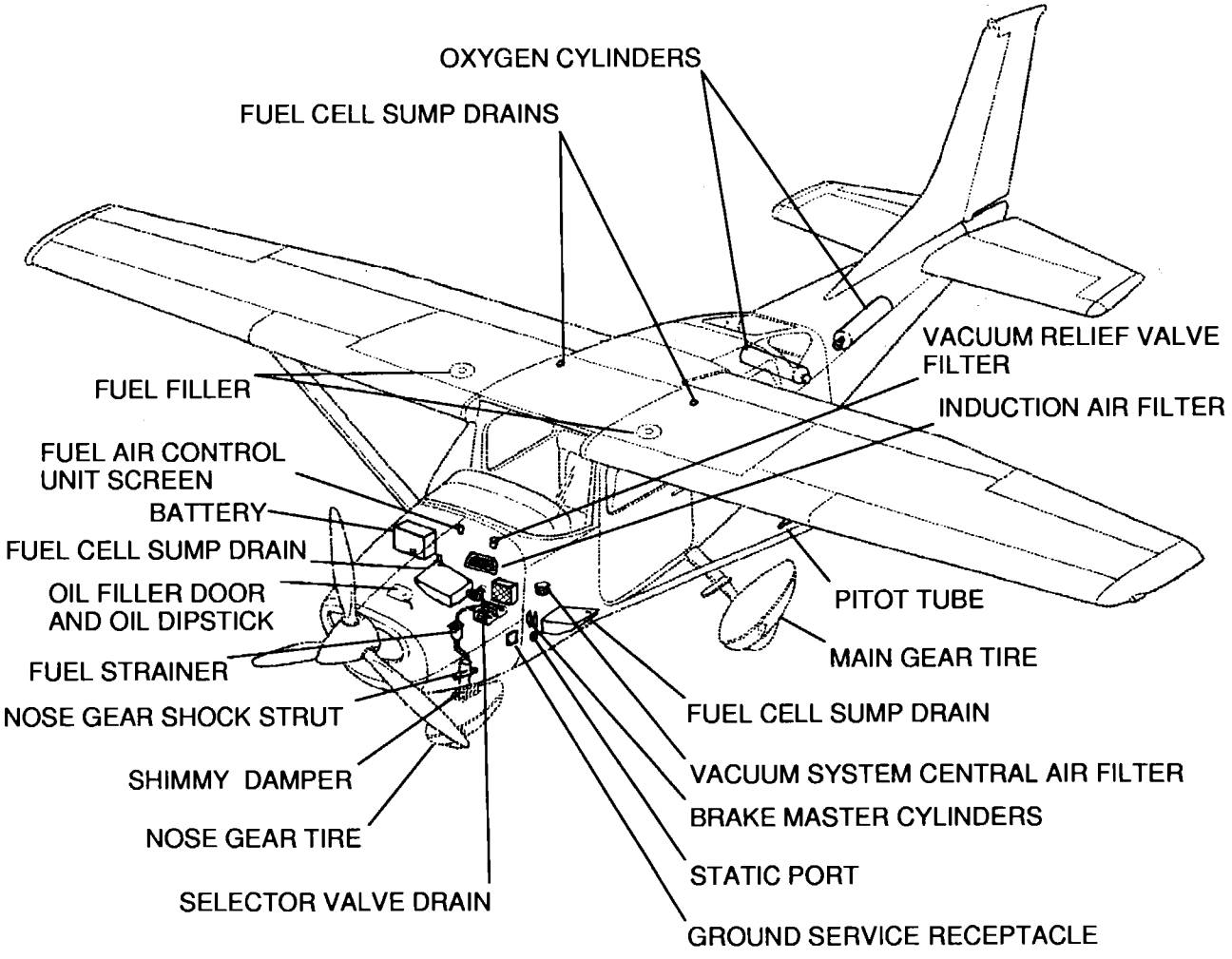

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Airplane Service Points
Figure 1 (Sheet 1)

NOSE LANDING GEAR SHOCK STRUT - SERVICING

1. General

A. The shock strut for the nose gear must have inspections to make sure that the strut is filled with hydraulic fluid and is inflated to the correct air pressure. This procedure gives only the replenishment and service instructions. For the disassembly and repair procedures, refer to Chapter 32, Nose Landing Gear - Maintenance Practices.

2. Shock Strut Servicing Procedures

A. Use the time limits to service the shock strut for the nose landing gear. Refer to Chapter 5, Inspection Time Limits.

B. Service the shock strut for the nose gear.
   (1) Remove the valve cap and release the air.
   (2) Remove the valve housing assembly.
   (3) Fully compress the strut, which will stop when it touches the outer barrel hub.
   (4) Examine and fill the fluid quantity if necessary.
      (a) The fluid used must agree with specification MIL-PRF-5606.
      (b) Fill the strut to the bottom of the valve installation hole.
      (c) Maintain the fluid quantity at the bottom of the valve installation hole.
   (5) Fully extend the strut.
   (6) Install valve housing assembly.
   (7) Make sure the strut pressure is 80 PSI (551.59 kPa) with the strut fully extended and the nose wheel above the ground.
      (a) Use a clean, lint free cloth soaked with MIL-PRF-5606 or kerosene to clean the machined surfaces from dirt and dust . All surfaces must be clean of hydraulic fluid if too much is applied.

NOSE LANDING GEAR SHIMMY DAMPER - SERVICING

1. General

A. The shimmy damper for the nose gear (on airplanes that do not have the Lord Shimmy Damper) has a mechanism for adjustment in the hollow piston rod. This is for thermal expansion and contraction of the hydraulic fluid in the damper. The shimmy damper must be filled fully with hydraulic fluid and be free of air. Make sure the piston is at the bottom in the piston rod before you do the shimmy damper servicing. For the disassembly of the shimmy damper, refer to Chapter 32, Nose Gear - Maintenance Practices.

B. The nose gear shimmy damper (on airplanes with the Lord Shimmy Damper installed) uses rubber with a lubricant to absorb nose wheel vibration. The damper piston shaft is secured to the nose gear steering shaft, and the housing is attached to a bracket on the lower trunnion.

2. Shimmy Damper Servicing (On Airplanes that do not have the Lord Shimmy Damper)

A. Do the shimmy damper servicing in the time intervals in Chapter 5, Inspection Time Limits.

B. Service the shimmy damper as follows:
   (1) Remove the shimmy damper from the airplane. Refer to Chapter 32, Nose Landing Gear - Maintenance Practices.
   (2) While you hold the shimmy damper in a vertical position (with the filler plug pointed up), loosen the filler plug and let the fluid release.
   (3) Let the spring go to the bottom of the floating piston in the shimmy damper rod.
   (4) When the flow of the fluid stops, put a length of rigid wire through the bleed air hole in the setscrew which is found at the end of the piston rod until the rigid wire touches the floating piston.
      (a) Insert the wire to the depth of 3.81 inches (95.25 mm).

      NOTE: If the wire insertion is less than 3.81 inches (95.25 mm), the floating piston will not move freely in the shaft.

   (5) After you find that the floating piston is bottomed out, move the damper rod to put the piston at the end of the barrel opposite the filler plug.
   (6) Remove the filler plug and fill the shimmy damper with hydraulic fluid.
      (a) Make sure that the shimmy damper and MIL-PRF-5606 hydraulic fluid are at 70°F to 80°F (21°C to 26°C) while you fill the shimmy damper.
   (7) Install the filler plug.
   (8) Clean the shimmy damper in cleaning solvent.
   (9) Use a clean cloth to make sure the shimmy damper is dry.
   (10) Install the shimmy damper on the airplane. Refer to Chapter 32, Nose Landing Gear - Maintenance Practices.
      (a) Keep the shimmy damper clean to prevent the collection of dust and grit, which can cut seals in the barrel. Make sure the areas that you can see are very clean.
      (b) Use a clean, lint-free cloth soaked with MIL-PRF-5606 hydraulic fluid or kerosene to keep the machined surfaces clean of dirt and dust.
      (c) After the surfaces are clean, remove the remaining hydraulic fluid from them with a clean, lint-free cloth.

3. Shimmy Damper Servicing (On Airplanes with the Lord Shimmy Damper)

A. Lord Shimmy Dampers do not need special servicing. However, you must lubricate the nose wheel shimmy damper pivots with general purpose oil MIL-L-7870.

B. Keep the shimmy damper clean.
   (1) Clean the shimmy damper with a clean, lint-free cloth to prevent the collection of dust and grit.
   (2) Make sure that the part of the damper piston shaft that you can see is always clean.
   (3) Clean the machined surfaces of the shimmy damper with a clean, lint-free cloth to prevent the collection of dust and dust.

C. If necessary, exercise a shimmy damper before installation.

(1) If a shimmy damper has been in storage for a long period, make sure that it moves freely before you install it.

CAUTION: Make sure that you do not push or pull on the shaft of the shimmy damper after it has reached its limit in either the up or the down position. If you continue to push a fully compressed, bottomed-out shaft, you can damage the shimmy damper. If you continue to pull on a fully extended shaft, you can damage the shimmy damper.

(2) If the shimmy damper does not move freely, push and pull the shaft through complete cycles until it does move freely. When the shimmy damper shaft comes to its limit of travel up and down as you push and pull, make sure that you do not continue to push or pull it beyond that limit of travel.

HYDRAULIC BRAKES - SERVICING

1. General

A. Do the brake master cylinders servicing in the time intervals in Chapter 5, Inspection Time Limits.

B. The brake master cylinders are on the rudder pedals and are filled with MIL-PRF-5606 hydraulic fluid. Refer to the fill and bleed procedures in Chapter 32, Brake System - Maintenance Practices.

FUEL AND ENGINE OIL - DESCRIPTION AND OPERATION

1. General

A. This section provides servicing procedures for the fuel and engine oil systems. It is subdivided as follows:
   (1) The fuel system section includes procedures for adding fuel, defueling the airplane and mixing anti-icing additives in the fuel.
   (2) The engine oil section includes procedures for checking, adding and changing engine oil.

2. Fuel Precautions

A. Safety Precautions.
   (1) The safety precautions on fueling and defueling may be superseded by local directives. However, following is a typical list of precautions.
      (a) Ground, by designated grounding cables, the fueling and/or defueling vehicle to the airplane. Also, a static ground device shall contact the fueling or defueling vehicle and ground.
      (b) Fire fighting equipment shall be immediately available.
      (c) Wear proper clothing.
         1 Do not wear clothing that has a tendency to generate static electricity, such as, nylon or synthetic fabrics.
         2 Do not wear metal taps on shoes when working in areas where fuel fumes may accumulate at ground level.
      (d) The airplane shall be in a designated fuel loading or unloading area.
      (e) High wattage, pulse transmitting avionics equipment shall not be operated in the immediate vicinity.

B. Maintenance Precautions.
   (1) Use designated equipment for fuel loading and unloading to prevent contamination.
   (2) Use proper procedures when adding fuel inhibitors.
   (3) Use specified type of fuel.

3. Oil Precautions

A. Maintenance Precautions.
   (1) Use proper servicing procedures; do not overfill, do not mix manufacturers brands of oil.

FUEL - SERVICING

1. General

A. Fuel Tanks.
(1) Each wing has a fuel tank. You can find the fuel tanks between the forward and aft spars that extend from WS 23.62 to WS 85.96. You must fill the fuel tanks immediately after each flight to decrease the amount of condensation that can be produced in the tanks and fuel lines. A fuel filler cap that vents is found on top of each wing to fuel and defuel each fuel tank.

B. Fuel Drains.
(1) The fuel drains are found at different areas of the fuel system. They are used to collect fuel samples to analyze fuel for contaminates.
(2) The analysis is completed with the fuel sample cup positioned up to the drain valve. The drain valve is pressed with the rod that extends up from the cup, which lets the fuel to drain out.
(3) The airplane is supplied with a fuel strainer drain valve. You will find the drain valve in the bottom of the cowl. It lets the fuel drain out through the fuel strainer drain.

C. Fuel System.
(1) For information on the description and maintenance procedures of the fuel system, refer to Chapter 28, Fuel - General.

2. Safety and Maintenance Precautions

A. Safety Precautions.

WARNING: Fire fighting equipment must be available for all fuel system service procedures. To prevent accidental disconnection of a ground wire, you must use two ground wires from the tiedown rings on the airplane attached to approved ground stakes. Make sure the battery switch is turned off, unless otherwise specified.

(1) Connect an electrical ground.
(a) Ground the airplane with two ground wires connected from the tie-down rings to ground stakes.
(b) Ground the vehicle (or hose cart) to the same ground stakes as the airplane.
(c) Ground the vehicle (or hose cart) to the airplane.
(d) Ground the refuel nozzle to the airplane.
(2) Make sure the equipment to fight fires is available.
(3) Do not wear clothes such as nylon or synthetic fabrics that can make static electricity.
(4) Do not wear metal taps on shoes.
(5) The airplane must be in a designated fuel loading/unloading area.
(6) High wattage, pulse transmitted avionics equipment must not be operated in the area when you fill or drain the fuel.

B. Maintenance Precautions.
(1) Use approved equipment to fill or remove fuel to prevent contamination.
(2) Use the authorized type of fuel and anti-ice additive. It is very important that the correct anti-ice additive mix procedures be followed. Incorrect mixture of the fuel and anti-ice additive will cause damage to the fuel tanks interior finish, which increases corrosion. Refer to Fuel Additive Procedure.
(3) When you fuel the airplane, make sure you do not mix the fuel with the anti-ice additive and the fuel without the anti-ice additive.

3. Fuel Servicing

A. Fuel Fill Procedures (Refer to Figure 301).

CAUTION: Make sure that the correct grade and type of fuel is used to service the airplane. Refer to Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for a list of approved fuels.

(1) Electrically ground the airplane and vehicle. Refer to Safety and Maintenance Precautions.
(2) Make sure you turn the ALT/BAT MASTER switch to the off position.
(3) Set a protective mat around the fuel filler area.
(4) Remove the fuel filler caps.
(5) Fill the airplane with fuel. Make sure the correct grade of aviation fuel is used. Refer to Approved Fuel Table.
(6) Install the filler caps.
(7) Clean any spilled fuel from the wing area.
(8) Remove the electrical ground equipment.

B. Fuel Removal Procedures (Refer to Figure 301 and Figure 302).
(1) Electrically ground the airplane and vehicle. Refer to Safety and Maintenance Precautions.
(2) Make sure the ALT/BAT MASTER switch is set to off.
(3) Remove the fuel filler caps.
(4) Insert the fuel nozzle into the fuel bay.
(5) Remove the fuel.
(6) Remove the fuel nozzle and install the fuel filler caps.
(7) Set a container under each drain valve.
(8) Remove the safety wire from the drain valves.
(9) Remove the drain valves from the bottom of the fuel tank to drain any fuel that remains.
(10) Install the drain valves.
(11) Install safety wire to the drain valves. Refer to Chapter 20, Safetying - Maintenance Practices.
(12) Remove the electrical ground equipment.

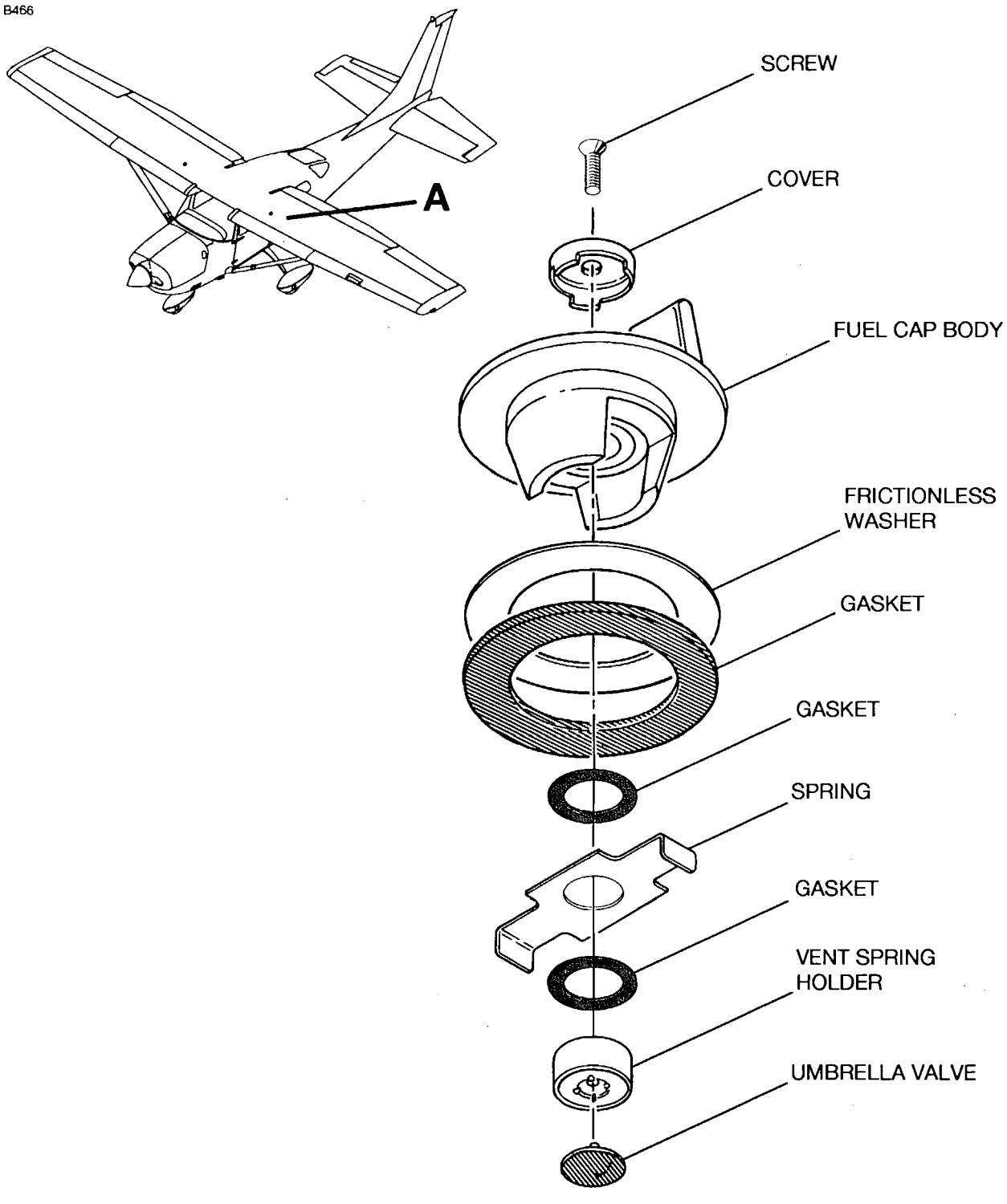
4. Fuel Additive (DIEGME) Precautions

WARNING: MIL-DTL-85470 NATO code S-1745 anti-ice additive is toxic. It is dangerous to the health when it is breathed and/or absorbed into the skin. When you service fuel with the anti-ice additive in an unventilated area, use acceptable personal protective equipment such as eye goggles with a shield, respirator with organic vapor cartridges, non-absorbing gloves and additional skin protection from spraying or splashing anti-ice additive. If anti-ice additive enters the eyes, flush with water and contact a physician immediately. The anti-ice additive is combustible. Before you use this material, refer to all safety information on the container.

CAUTION: Use only equipment that is recommended by the manufacturer to supply the correct quantities. The correct mixture of anti-ice additives with the fuel is very important. A quantity that is more than recommended will result in damage to the fuel tanks. Deterioration of the protective primer and sealants and damage to the O-rings and seals in the fuel system and engine compounds will result with an incorrect mixture.

CAUTION: Do not let the concentrated anti-ice additive come in contact with the airplane finish and fuel cell or damage will result.

A. Emergency and First Aid Procedures.



DETAIL A
LEFT SIDE SHOWN
(RIGHT SIDE TYPICAL)

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Fuel Filler Cap
Figure 301 (Sheet 1)

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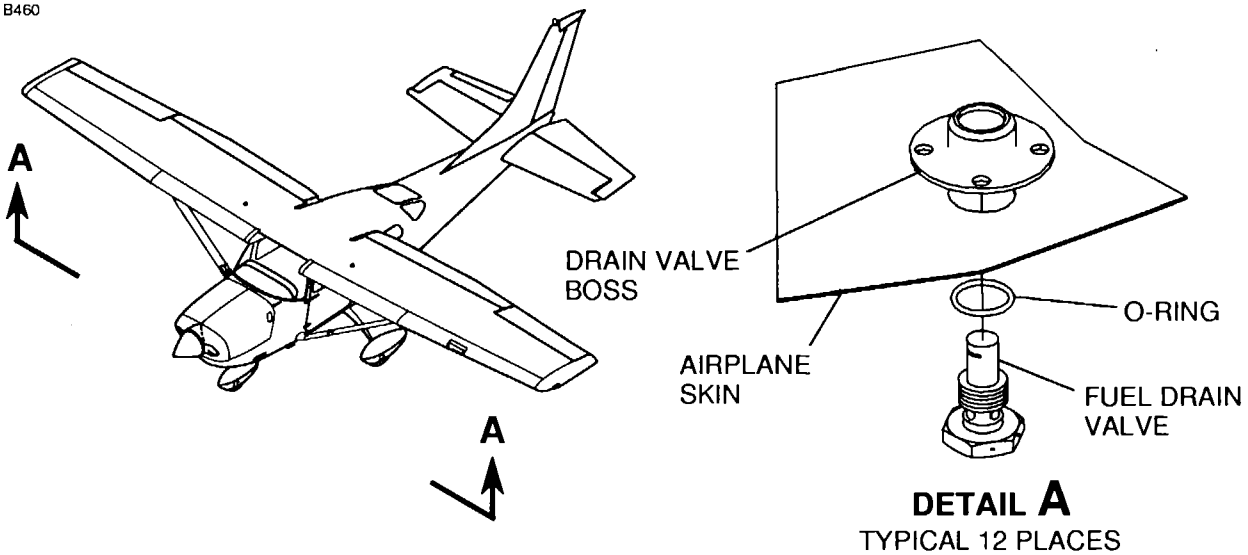
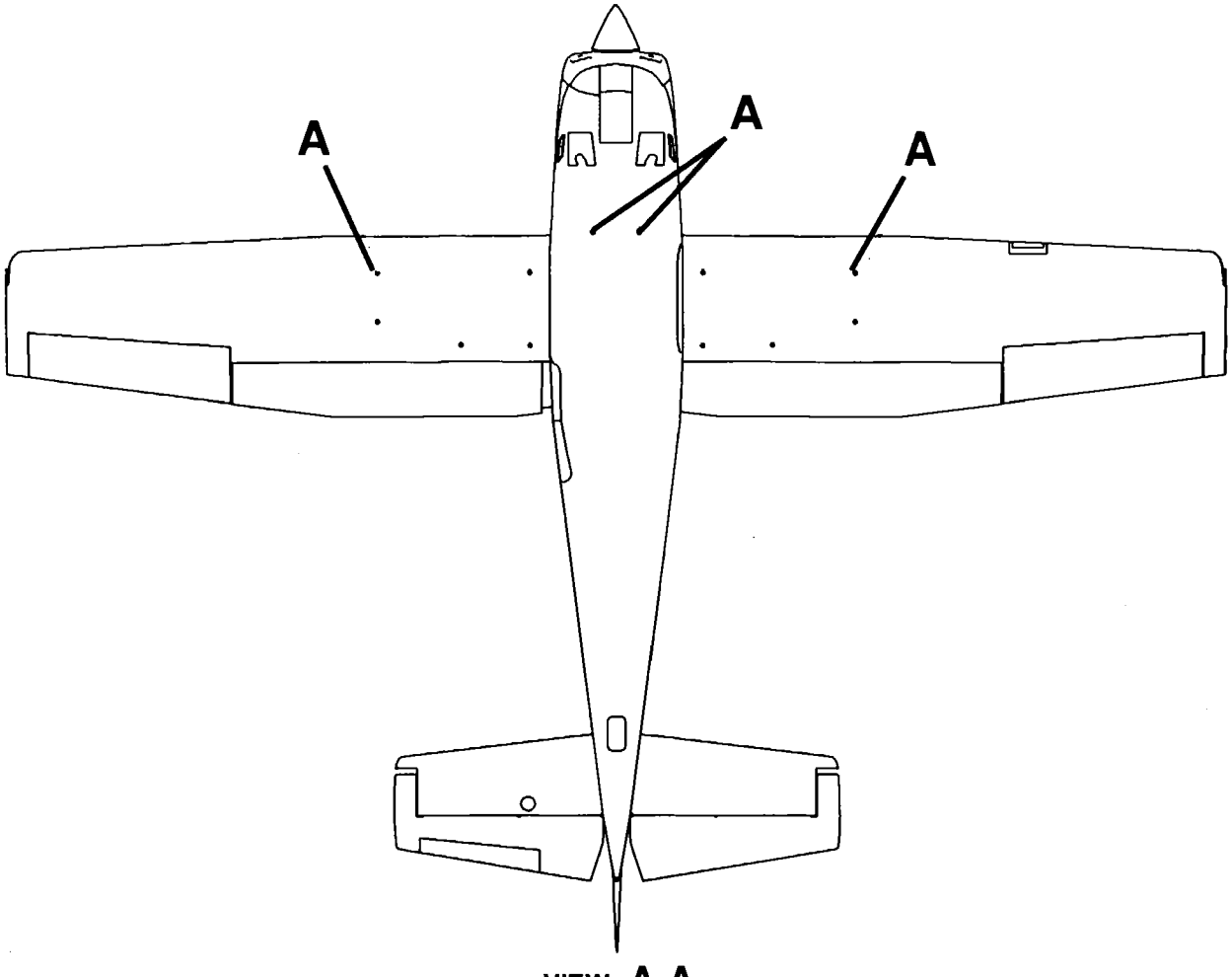


DETAIL A
TYPICAL 12 PLACES



VIEW A-A
LOOKING UP

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AA1226T1005

Fuel Drains
Figure 302 (Sheet 1)

WARNING: You must call medical personnel for help.

(1) Remove the person to fresh air if DIEGME is breathed.
  (a) Give artificial respiration if the person does can not breathe.
  (b) If the person cannot breathe easily, supply oxygen.
(2) If DIEGME is swallowed, drink large quantities of water.

WARNING: Do not induce vomiting or give anything by mouth to an unconscious person.

  (a) If the accident victim is unconscious or in convulsions, take the person immediately to the hospital or a physician.
  (b) If the accident victim is conscious, put a finger far back into the throat to make the person vomit.
  (c) If the accident victim cannot vomit, take the person immediately to the hospital or a physician.
(3) If eye or skin contact is experienced, flush with plenty of water (use soap and water for skin) for at least 15 minutes while you remove contaminated clothes and shoes.
  (a) You will need to clean the contaminated clothes before you put them on.

B. You can provide antistatic and biocidal protection with approved products. Refer to Chapter 28, Tools, Equipment and Materials section for approved manufacturers. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for concentration levels of the products.

5. Fuel Additive Procedures

A. Obey the preflight fuel drain instructions to remove any water from the tank sumps.

NOTE: An exception to this can be found when operated under the combined effect of the use of certain fuels with high humidity conditions on the ground and followed by flight at high altitude and low temperature. Under these unusual conditions, small amounts of water in solution can precipitate from the fuel stream and freeze in sufficient quantities to induce partial icing of the engine fuel system. These conditions are quite rare and will not normally pose a problem to owners and operators. They do exist in certain areas of the world and consequently must be dealt with, when encountered.

(1) It is acceptable to add isopropyl alcohol or Diethylene glycol monomethyl ether (DIEGME) compound to the fuel supply to help prevent the possibility of ice in the fuel.
(2) The introduction of alcohol or DIEGME compound into the fuel provides two distinct effects:
  (a) It absorbs the dissolved water from the gasoline.
  (b) Alcohol has a freezing temperature depressant effect.

B. Alcohol that meets Federal Specification TT-I-735 and has a maximum water content not more than 0.4 percent by volume can be used. If you use it, it must be mixed with the fuel in a concentration of 1% by volume. Concentrations greater than 1% must not be used because they can damage the fuel tank materials. Refer to the Pilot's Operating Handbook and the FAA approved airplane flight manual graph for the fuel and alcohol mix ratios.

C. The procedure used for the alcohol that is added to the fuel is important because alcohol is most effective when it is fully dissolved in the fuel. To make sure you mix it correctly, complete the instructions that follow:
(1) For best results, the alcohol must be added during the fueling operation.
  (a) Add the alcohol directly on the fuel stream from the fuel nozzle.
(2) An alternate method that can be used, would be to pre-mix the complete alcohol dosage with some fuel in a separate clean container (approximately 2 to 3 gallon capacity). Then transfer the mixture to the tank before you refuel the airplane.

D. If used, carefully mix Diethylene glycol monomethyl ether (DIEGME) compound in compliance with MIL-DTL-85470 Nato Code S-1745,. Refer to Pilot's Operating Handbook And FAA Approved Airplane Flight Manual for fuel/DIEGME mix ratios.

E. The storage of the airplane for long periods will cause a water buildup in the fuel which "leeches out" the additive. An indication of this is when too much water collects in the fuel tank sumps. You can check the concentration with a concentration tester. You must follow the instructions in the technical manual for the tester when you check the additive concentration.

ENGINE OIL - SERVICING

1. General

A. This section gives instructions to examine and replace the engine oil.

2. Oil Change Intervals

NOTE: An inspection of the oil filter can help find unusual engine wear. Refer to the Lycoming Service Bulletin 480D or the latest revision.

A. Non-turbocharged engines.

NOTE: Non-turbocharged airplanes are from the factory with aviation grade mineral oil which agrees with SAE J1966.

(1) You must frequently do a check of the oil level and can possibly have to add oil during the first 25 hours of engine operation. Use an aviation grade mineral oil of the required viscosity which agrees with SAE J1966. Refer to Engine Oil Check.
(2) After the first 25 hours, drain the engine oil and replace the oil filter. Fill the engine through the oil filler tube with aviation grade mineral oil of the required viscosity which agrees with SAE J1966. Refer to Engine Oil Change.
(3) Continue to use the aviation grade mineral oil until the airplane completes a total of 50 hours of engine operation or oil consumption is stabilized. You must then drain the engine oil, replace the oil filter and add ashless dispersant oil to the engine. Refer to Engine Oil Change.
(4) For more information on engine oil replacement intervals, refer to Chapter 5, Inspection Time Limits.

B. Turbocharged Engines.

CAUTION: During the engine break-in period, the turbocharged engines use only ashless dispersant oil which agrees with SAE J1899.

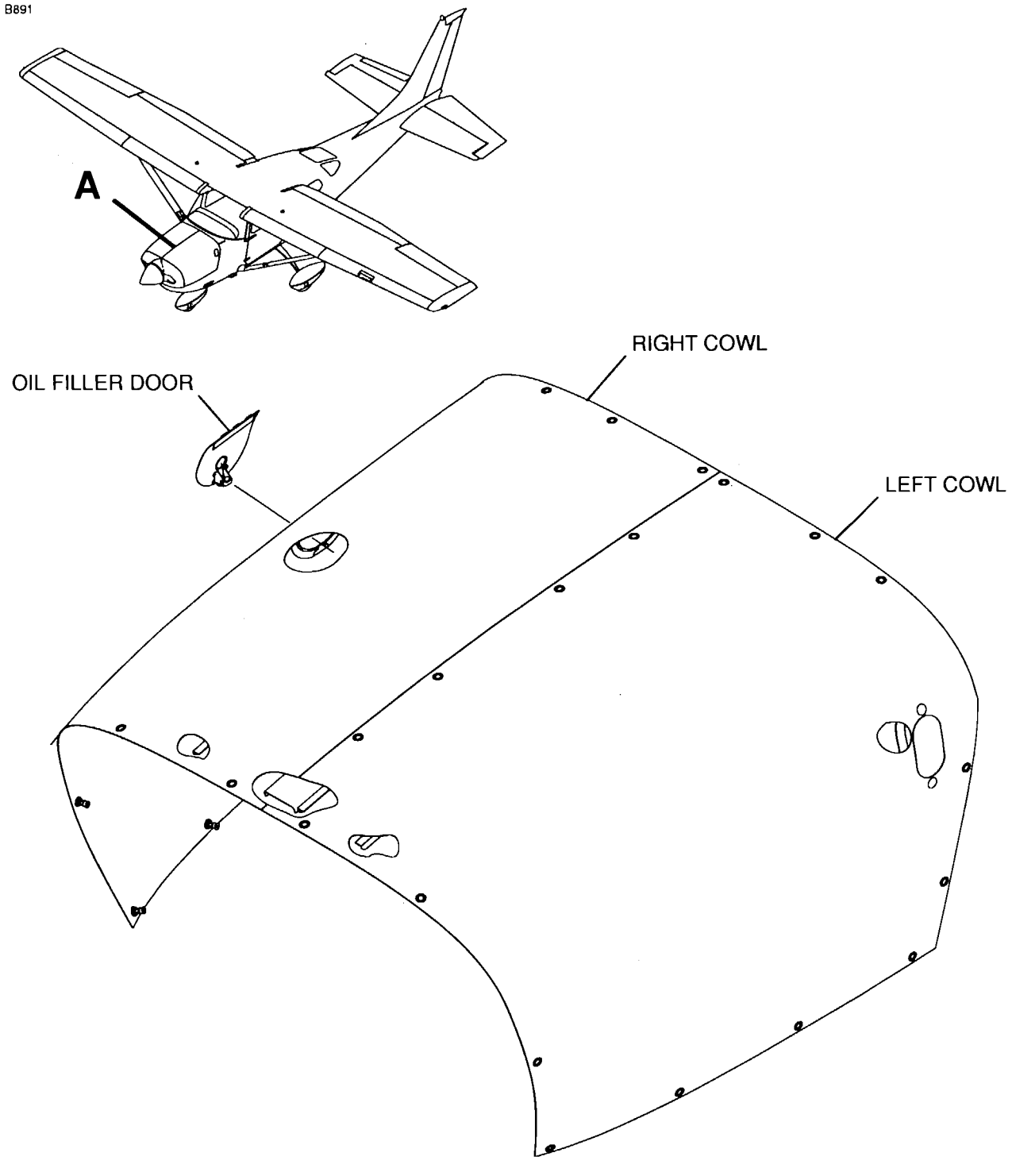
(1) You must frequently do a check of the oil during the first 25 hours of engine operation. You can possibly have to add oil. Use an ashless dispersant oil of the required viscosity which agrees with SAE J1899. Refer to Engine Oil Check.
(2) After the first 25 hours, drain the engine oil and change the oil filter. Fill the engine through the oil filler tube with ashless dispersant oil of the required viscosity which agrees with SAE J1899. Refer to Engine Oil Change.
(3) Operate the engine until it completes a total of 50 hours of engine operation or oil consumption is stabilized. You must then drain the engine oil, replace the oil filter and add ashless dispersant oil to the engine. Refer to Engine Oil Change.
(4) For additional engine oil replacement intervals, refer to Chapter 5, Inspection Time Limits.

3. Engine Oil Level

A. Engine Oil Level Check. Refer to Figure 301.
(1) Wait five to ten minutes after the engine has stopped, then examine the engine oil level on the dipstick.

NOTE: The airplane must be in a level position for the best indication.

(a) Open the oil filler door in the right cowl.
(b) Remove the dipstick from the oil filler tube.
(c) Clean the dipstick with a clean cloth.
(d) Fully put the dip stick into the oil filler tube and remove the dipstick.
(e) Examine the oil level on the dipstick.



DETAIL A

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Oil Filler Door
Figure 301 (Sheet 1)

CAUTION: A non-turbocharged airplane can operate with SAE J1966 straight mineral oil during the initial break-in period or after an overhaul. After the break-in period, use an ashless dispersant oil that agrees with SAE J1899. Make sure you use the correct oil type when you service the engine.

(2) If the oil is low, add the correct quantity and viscosity of aviation grade engine oil. Refer to Replenishing - Description and Operation.
(3) Put the dipstick into the oil filler tube.
(4) Do a check for the correct fit of the dipstick to make sure that it is not loose.
(5) Close the engine oil door.

4. Engine Oil Change

A. Change the Engine Oil. Refer to Figure 302.
(1) The front of the airplane must be raised slightly to drain sludge that can collect in the engine oil sump.
(2) Operate the engine until the oil temperature is at a normal operating temperature.

NOTE: Normal temperature operation is within the green arc of the oil temperature gage. The engine oil must drain while the engine is still warm.

(3) Stop the engine.
(4) Remove the left and right side cowlings to get access to the oil drain plug and external oil filter. Refer to Chapter 71, Cowls - Maintenance Practices.
(5) Put a cover such as a plastic bag over the lower vacuum pump when you replace the oil or oil filter to prevent contamination of the vacuum pump.
(6) Remove and discard the safety-wire from the drain plug.

WARNING: You must prevent skin contact with engine oil. Any engine oil that gets on the skin must be removed immediately.

(7) Remove the drain plug and let the oil drain into an oil container.

NOTE: Total oil capacity with oil filter and oil cooler is 12 quarts (12.30 liters).

(8) After the engine oil has drained, install the drain plug. Refer to the Lycoming SSP-1776 Table of Limits or latest revision, for the torque requirements.
(9) Attach safety-wire to the drain plug. Refer to Chapter 20, Safetying - Maintenance Practices.
(10) Remove the suction screen from the oil sump.
(a) Complete an inspection for metal particles.
1 If you see metal content, keep the material for identification. Additional investigation will be required to find the source of the metal and possible need for corrective maintenance. Refer to Lycoming SSP500 (or latest revision) and contact a Textron Lycoming representative.
(b) Install the suction screen with a new gasket. Refer to the Lycoming SSP-1776 Table of Limits (or latest revision) for torque requirements.
(c) Attach safety-wire to the suction screen. Refer to Chapter 20, Safetying - Maintenance Practices.
(11) Remove the external oil filter.
(a) Open the filter can and examine the oil from the filter for metal particles.
(b) Carefully remove and unfold the paper element. Do an inspection of the material in the filter.
1 If metal content is shown, keep the material for identification. Additional investigation will be necessary to find the source of the metal and possible need for corrective maintenance. Refer to Lycoming SSP500 and contact a Textron Lycoming representative.

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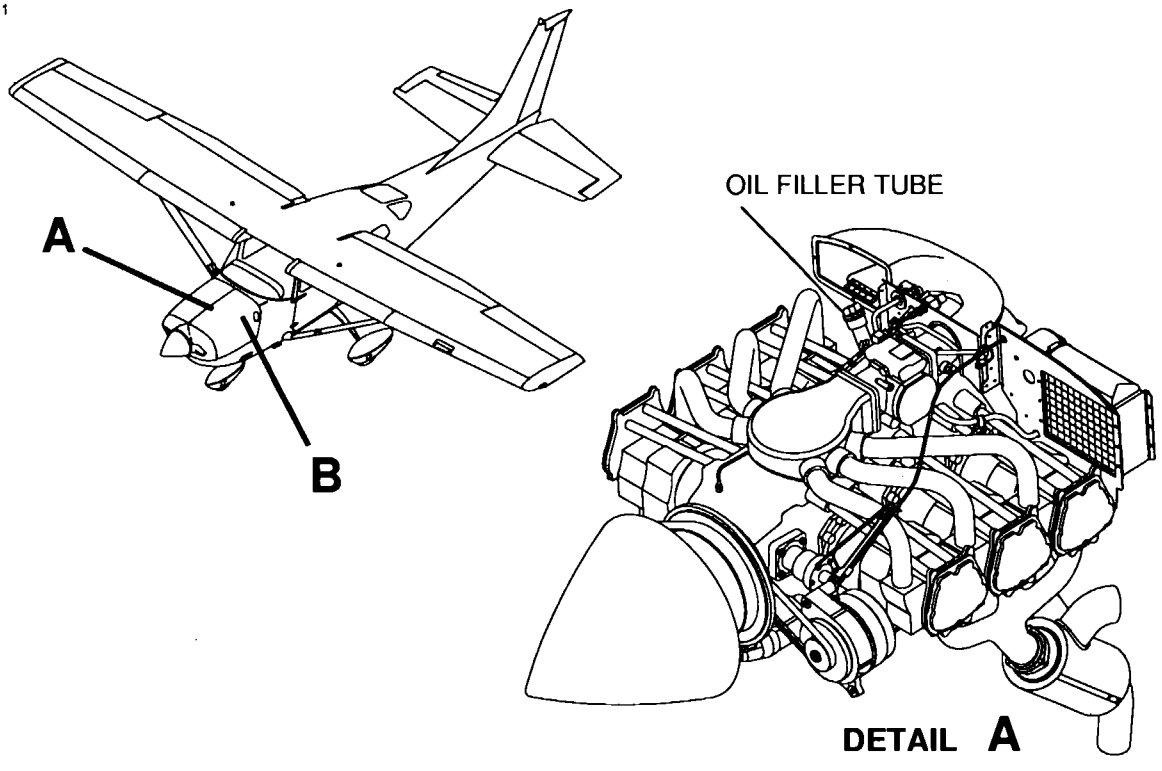

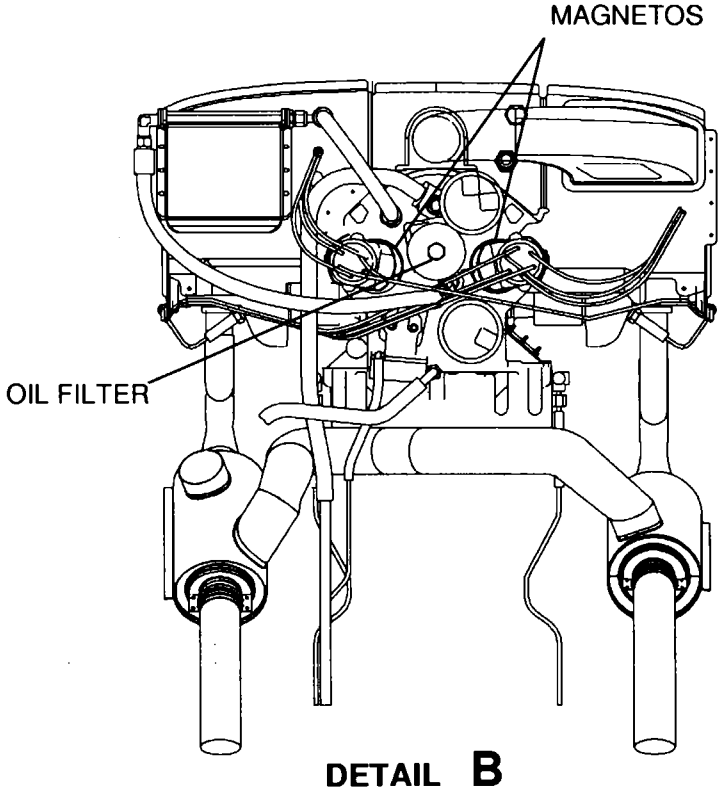

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Engine Oil Service
Figure 302 (Sheet 1)

(c) Install a new external oil filter.
(d) Attach safety-wire to the oil filter. Refer to Chapter 20, Safetying - Maintenance Practices.

(12) Fill the engine oil sump through the filler tube. Use the correct grade and quantity of oil. Refer to Replenishing - Description and Operation for oil quantity. Refer to Figure 303 for oil grade versus temperature chart.
(13) Install the dipstick and make sure of the correct fit on the filler tube.
(14) Remove the bag from the lower vacuum pump.
(15) Operate the engine until the normal operating temperature is reached.
(16) Stop the engine.
(17) Examine the engine for oil leaks.

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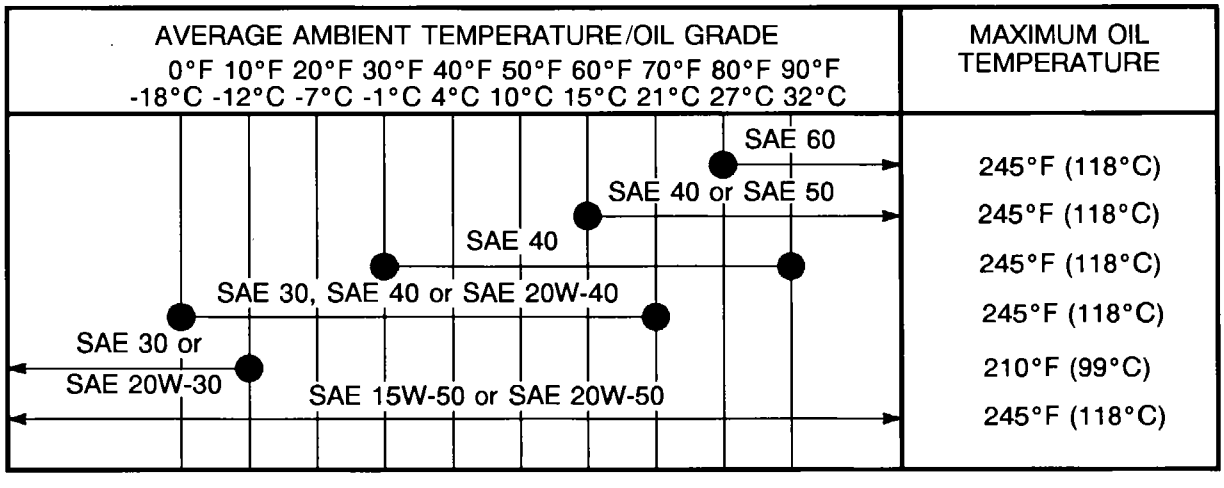
SPECIFIED AVIATION GRADE OIL:



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Temperature Versus Oil Viscosity
Figure 303 (Sheet 1)

INDUCTION AIR FILTER - SERVICING

1. General

A. The induction air filter keeps dust and dirt from entering the induction system. The value of maintaining the air filter in a good clean condition can never be over stressed. More engine wear is caused through the use of a dirty or damaged air filter than is generally believed. The frequency with which the filter should be removed, inspected, and cleaned will be determined primarily by airplane operating conditions. Under extremely dusty conditions, daily servicing of the filter may be required.

2. Air Filter Servicing

A. The induction air filter should be serviced using time intervals set forth in Chapter 5, Inspection Time Limits.

B. Servicing Procedures.

(1) Remove filter from airplane. If damaged or split, replace filter. If filter is in serviceable condition, proceed with following steps.

(2) Clean filter by blowing with compressed air (not over 100 PSI) (679.49 kPa) from direction opposite of normal air flow. Arrows on filter case indicate direction of normal air flow.

(3) If compressed air does not clean filter, it may be washed using a solution of water and mild household detergent.

NOTE: The filter assembly may be cleaned with compressed air a maximum of 30 times or washed a maximum of 20 times. A new filter should be installed according to time limits set forth in Chapter 5, Inspection Time Limits, or anytime the filter becomes damaged.

(4) After washing, rinse filter with clear water until rinse water draining from filter is clear. Allow water to drain from filter and dry with compressed air (not over 100 PSI) (689.49 kPa).

NOTE: The filtering panels of the filter may become distorted when wet, but will return to their original shape when dry.

(5) Ensure air box is clean and free of debris before installing filter.

(6) Install filter at entrance to air box with gasket on aft face of filter frame, and with air flow arrows on filter frame pointed in toward the engine.

VACUUM SYSTEM FILTERS - SERVICING

1. General

A. The vacuum system contains two filters which require occasional servicing. The vacuum system central air filter is located behind the instrument panel, and the vacuum system relief valve filter is located in the engine compartment.

NOTE: Smoking in cabin will significantly decrease the vacuum system central air filter life. If air filter becomes sufficiently clogged to cause suction gage readings to drop below 4.6 in.Hg, air filter must be replaced regardless of time remaining until inspection/replacement.

2. Central Air Filter Servicing

A. The central air filter should be serviced using time intervals set forth in Chapter 5, Inspection Time Limits.

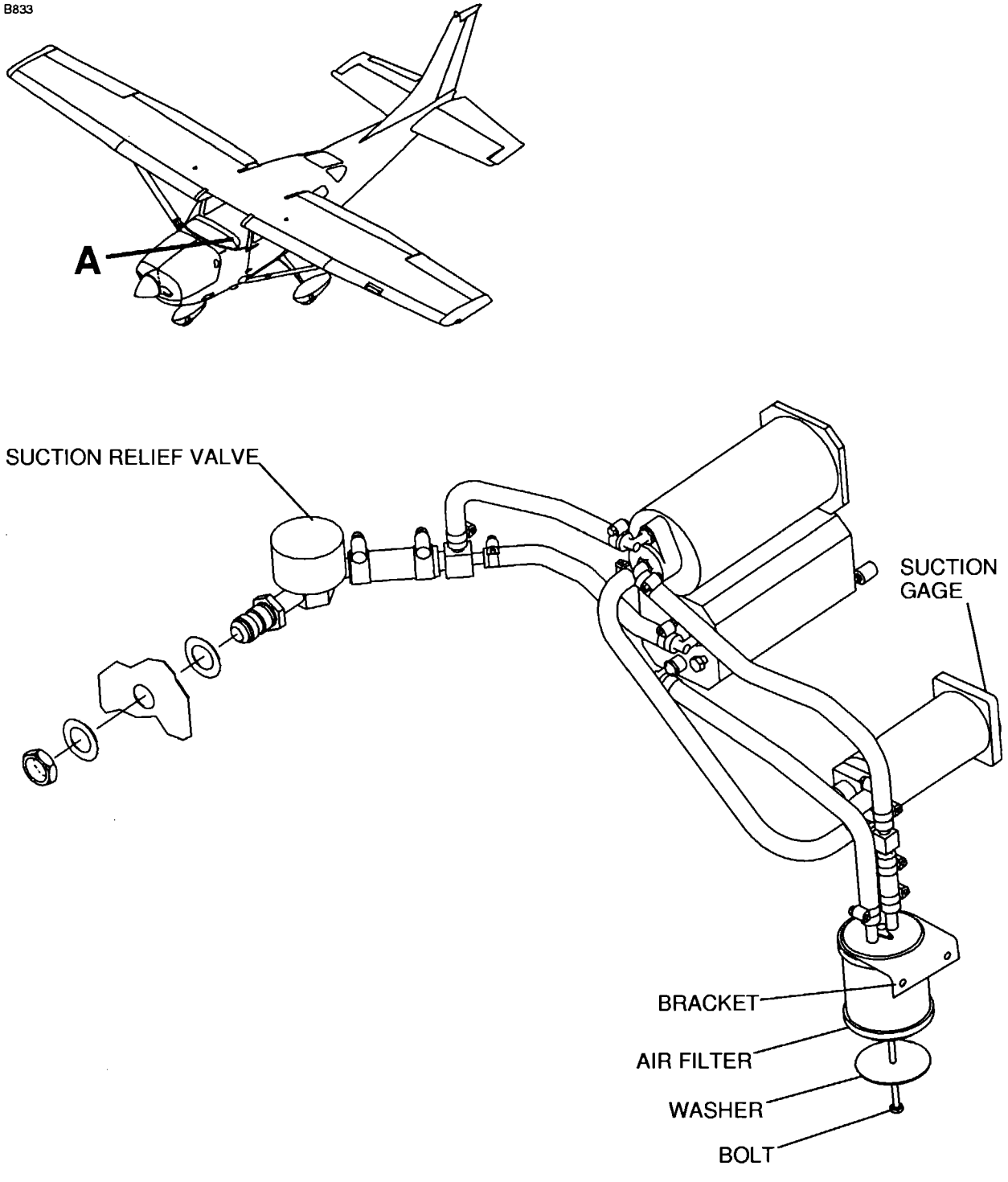
B. Servicing Procedures (Refer to Figure 301).

CAUTION: Do not operate the vacuum system with air filter removed or with a vacuum line disconnected. Particles or dust or other foreign matter may enter the system and damage the vacuum operated instruments.

(1) Locate air filter behind instrument panel.
(2) Remove bolt and washer securing air filter to cover.
(3) Check for damage, deterioration and contamination. Clean (or replace) as required.
(4) Install air filter in cover and secure using bolt and washer.

3. Vacuum System Relief Valve Filter

A. The relief valve filter should be serviced using time intervals set forth in Chapter 5, Inspection Time Limits.



DETAIL A

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Vacuum System Air Filter - Servicing
Figure 301 (Sheet 1)

BATTERY - SERVICING

1. General

A. This procedure provides instructions for adding water to the battery. For testing, charging and maintenance on the battery, refer to Chapter 24, Battery - Maintenance Practices.

2. Battery Servicing

A. The battery should be serviced according to time limits set forth in Chapter 5, Inspection Time Limits.

B. Battery servicing involves adding distilled water to maintain the electrolyte even with the horizontal baffle plate at the bottom of the filler holes, checking the battery cable connections, and neutralizing and cleaning off any spilled electrolyte or corrosion. Use bicarbonate of soda (baking soda) and water to neutralize electrolyte or corrosion. Follow with a thorough flushing with a wire brush, then coat with petroleum jelly before connecting. The battery box should also be checked and cleaned if any corrosion is noted. Distilled water, not acid or "rejuvenators," should be used to maintain electrolyte level. Inspect the battery in accordance with time limits outlined in Chapter 5, Inspection Time Limits.

TIRES - SERVICING

1. General

A. Servicing the tire by maintaining correct inflation pressure is the most important job in any tire preventative maintenance program. Improper inflation pressure causes uneven tread wear.
   (1) Under inflation, indicated by excessive wear in the shoulder area, is particularly damaging. It increases the chance of bruising sidewalls and shoulders against rim flanges. In addition, it shortens tire life by permitting excessive heat buildup.
   (2) Over inflation is indicated by excessive wear in the center of the tire. This condition reduces traction, increases tire growth and makes treads more susceptible to cutting.

2. Safety Precautions and Notes

A. Safety Precautions.
   (1) Tire should be allowed to cool before attempting to service.

WARNING: The tendency of a bursting tire is to rupture along the bead. Standing in any position in front of either bead area could cause injury if the tire should burst.

   (2) Personnel should stand at a 90-degree angle to the axle along the centerline of the tire during servicing.

CAUTION: Applying a tire sealant to the tire may cause wheel corrosion.

   (3) The use of tire sealant is not recommended.

B. Notes.
   (1) A tube-type tire that has been freshly mounted and installed should be closely monitored during the first week of operation, ideally before every takeoff. Air trapped between the tire and the tube at the time of mounting could seep out under the bead, through sidewall vents or around the valve stem, resulting in an under inflated assembly.
   (2) The initial stretch or growth of a tire results in a pressure drop after mounting. Consequently, tires should not be placed in service until they have been inflated a minimum of 12 hours, pressures rechecked, and tires reinflated if necessary.
   (3) Inaccurate tire pressure gages are a major cause of improper inflation pressures. Ensure gages used are accurate.

3. Tire Servicing

A. Check tire pressure regularly.
   (1) Tire pressure should be checked when tire is cold (at least 2 or 3 hours after flight) on a regular basis. Tire pressure should be checked prior to each flight when practical.
   (2) When checking tire pressure, examine tires for wear, cuts, and bruises. Remove oil, grease and mud from tires with soap and water.

B. Use recommended tire pressure. Consult the table below.

NOTE: Recommended tire pressures should be maintained, especially in cold weather. Any drop in temperature of the air inside a tire causes a corresponding drop in air pressure.

Main Gear Tire Type:	Pressure
6.00 x 6, 6-ply rated tire	42.0 ±2 PSI (289.66 ±13.79 kPa)
8.00 x 6, 6-ply rated tire	35.0 ± 3 PSI (227.59 ±20.69 kPa)

Nose Gear Tire Type:

5.00 x 5, 6-ply rated tire	49.0 ±3 PSI (337.93 ±20.69 kPa)
6.00 x 6, 4-ply rated tire	29.0 ±3 PSI (186.21 ±20.69 kPa)

4. Cold Weather Servicing

A. Cold Weather Servicing.

(1) Check tires for excessive deflation.

NOTE: Tire air pressure will decrease somewhat as the temperature drops, but excessive deflation could indicate cold weather leakage at the air valve. Avoid unnecessary pressure checks.

(2) If it is necessary to pressure check tires in cold climates, always apply heat to air valves and surrounding areas before unseating valves.

(3) Continue application of heat during reinflation to ensure air valve seal flexibility when valve closes.

(4) Do not allow tires to stand in snow soaked with fuel, or on fuel covered ramp areas.

(5) If tires become frozen to parking ramp, use hot air or water to melt ice bond before attempting to move airplane.

SCHEDULED SERVICING - DESCRIPTION AND OPERATION

1. General

A. This section provides instructions necessary to carry out scheduled servicing as well as internal/external cleaning. It also includes instructions for lubricating specific points identified in periodic inspection and/or preventive maintenance programs. This section does not include lubrication procedures required for the accomplishment of maintenance practices.

2. Description

A. This section is subdivided to provide maintenance personnel with charts, text and illustrations to prevent confusion. Also included in this section is a table containing a list of lubricants.
   (1) The subdivisions are separated according to airplane systems. This aids maintenance personnel in locating service information.

LUBRICANTS - DESCRIPTION AND OPERATION

1. General

A. This section helps the operator to select recommended lubricants. For best results and continued trouble free service, use clean and approved lubricants.

B. For a list of recommended lubricants, refer to Recommended Lubricants Table.

2. Lubrication Service Notes

A. Lubricant Application.
(1) Lubricants and equipment must be kept clean. Use only one lubricant in a grease gun or oil can.
(2) Store lubricants in a protected area. Containers must be closed at all times when they are not in use.
(3) Wipe grease fittings and areas to be lubricated with clean, dry cloths before you lubricate.
(4) When you lubricate bearings that are vented, force the grease into fitting until the old grease is removed.
(5) After you lubricate, clean any lubricant from all but actual working parts.
(6) All sealed or prepackaged anti-friction bearings are lubricated with grease by the manufacturer and require no added lubrication.
(7) Friction bearings of the porous, sintered-type are prelubricated. An occasional application of oil to such bearings with general purpose oil (MIL-PRF-7770) increases its service life.
(8) Lubricate with general purpose oil (MIL-PRF-7870) any unsealed pulley bearings, rod ends, pivot end hinge points and any other friction point in need of lubrication.
(9) Paraffin wax rubbed on seat rails will help slide the seats fore and aft.
(10) Do not lubricate roller chains or cables except under the seacoast conditions. Wipe with a clean, dry cloth.
(11) All piano hinges can be lubricated with (PG) powered graphite (SS-G-659) when assembly is installed.
(12) Lubricate the door latch mechanism with MIL-PRF-81705 general purpose grease. Apply sparingly to friction points, if a bind occurs. No lubrication is recommended on the rotary clutch.

3. Definition of "As Needed"

A. In the sections that follows, the time requirements for lubrication are given in one of two formats. When specific time intervals for lubrication exist, those intervals are given in Chapter 5, Inspection Time Limits. When no time limit has been given, lubrication is on an "as needed" basis. This leaves much of the decision process in the hands of the airframe and powerplant mechanics, who have been trained to make these types of decisions.

B. In an effort to standardize the decision making process, the following guidelines can be considered to determine if a component requires lubrication. Any one of the conditions that follow would indicate a need for lubrication, and can indicate the need for an inspection:
(1) A visual inspection that indicates dirt or wear near the movement contact area.
(2) An audible inspection that indicates squeaks, grinding or other abnormal sounds.
(3) A tactile (touch and feel) inspection that indicates jerky or restricted movement throughout sections of the travel range.

4. Recommended Lubricants Table

NOTE: Equivalent alternatives can be used for the items that follow:

Table 1. Recommended Lubricants

SYMBOL	PROCUREMENT SPECIFICATION	LUBRICANT DESCRIPTION	PRODUCT PART NUMBER	SUPPLIER
GR	MIL-PRF-81322	Grease, wide temperature range	Mobil Grease 28	Mobil Oil Corp. 150 E. 42nd Street New York, NY 10017
			Royco 22C	Royal Lubricants Co., Inc. River Road East Hanover, NJ 07936
			Aeroshell Grease 22	Shell Oil Co. One Shell Plaza Houston, TX 77001
GH	MIL-PRF-23827	Grease, aircraft and instrument, gear and actuator screw	Southwest Grease 16215	Southwest Petro- Chem, Inc. Division - Witco 1400 S. Harrison Olathe, KS 66061
			Aeroshell Grease 7	Shell Oil Co.
			Royco 27A	Royal Lubricants Co., Inc.
			Supermil Grease No. A72832	Amoco Oil Co. 200 East Randolph Dr. Chicago, IL 60601
			Braycote 6275	Burmah-Castrol, Inc. Bray Products Div. 16815 Von Karman Ave. Irving, CA 92714
			Castrolease A1	Burmah-Castrol, Inc.
			TG-11900 Low Temp Grease EP	Southwest Petro-Chem, Inc.
			Brayco 885	Brumah-Castrol, Inc.
OG	MIL-PRF-7870	Oil, general purpose	Royco 363	Royal Lubricants Co., Inc.
			Petrotect 7870A	Penreco 106 South Main Street Butler, PA 16001
			Windsor lube L-1018	Anderson Oil & Chemical Co., Inc. Portland, CT 06480
			Octoil 70	Octagon Process, Inc. 596 River Road Edgewater, NJ 07020

Table 1. Recommended Lubricants (continued)

SYMBOL	PROCUREMENT SPECIFICATION	LUBRICANT DESCRIPTION	PRODUCT PART NUMBER	SUPPLIER
PL	VV-P-236	Petrolatum technical		Available Commercially
PG	SS-G-659	Powdered graphite		Available Commercially
GL	MIL-G-21164	High and low temperature grease	Everlube 211-G Moly Grease	E/M Corporation Box 2200 Highway 52 N.W. West Lafayette, IN 47906
			Royco 64	Royal Lubricants Co., Inc.
GP	NONE	Number 10 weight, non-detergent oil		Available Commercially
OL	VV-L-800	Light oil		Available Commercially

BATTERY TERMINALS - SERVICING

1. General

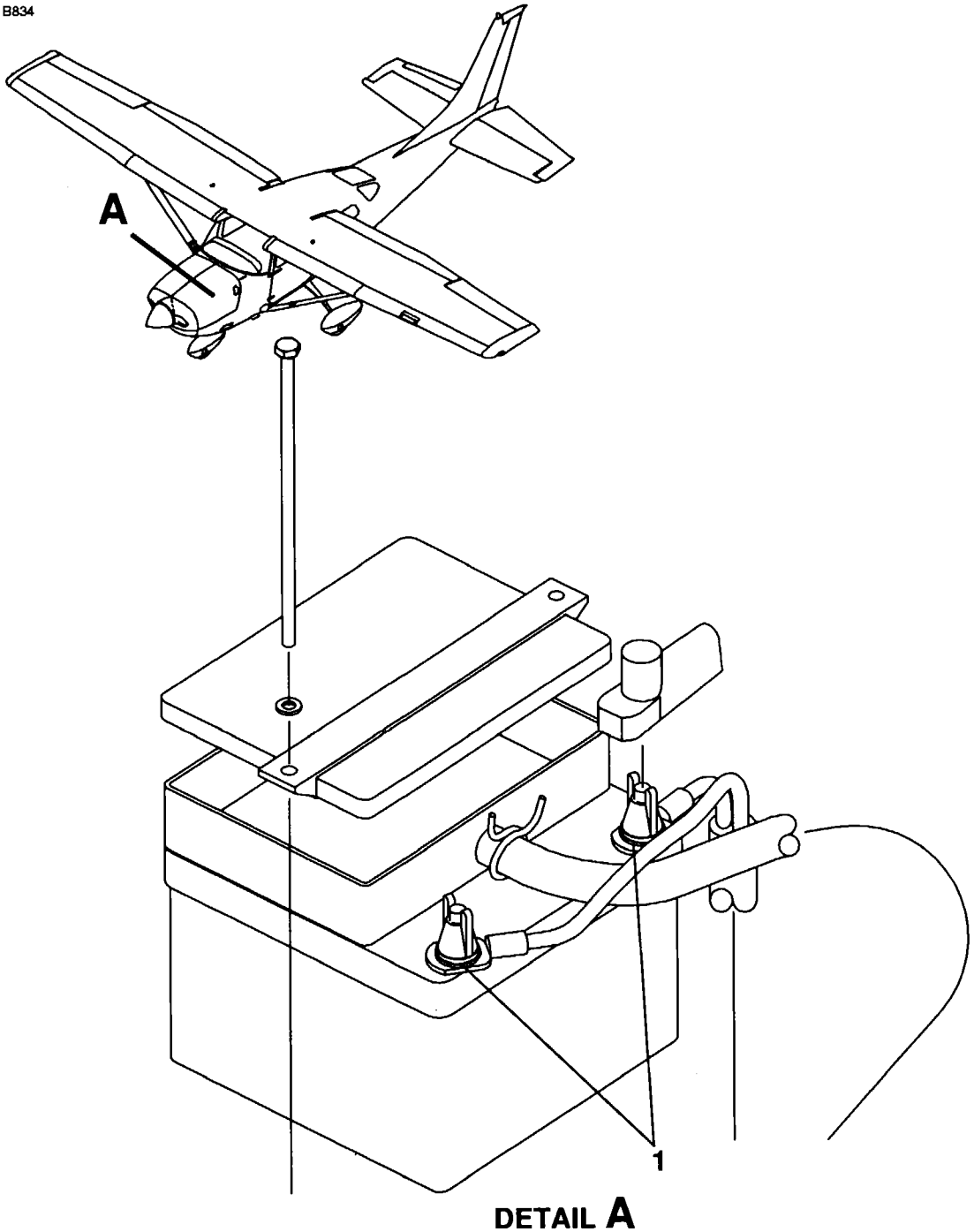
A. It is recommended the airplane be secured in an area free of contamination from sand, dust or other environmental conditions that may contribute to improper lubrication practices.

2. Battery Terminal Lubrication

A. Battery terminals should be lubricated when cables are installed to terminals.

B. Refer to Figure 301 for lubrication requirements of the battery terminals.

B834



DETAIL A

ITEM NUMBER	ITEM DESCRIPTION	LUBE TYPE	APPLICATION
1	BATTERY TERMINALS	PL	HAND

PL - GREASE, PETROLATUM - VV-P236

1210T1001
A0718T1016

Battery Terminals Lubrication
Figure 301 (Sheet 1)

LANDING GEAR AND PARKING BRAKE - SERVICING

1. General

A. It is recommended that the airplane be secured in an area free of contamination from sand, dust or other environmental conditions that may contribute to improper lubrication practices.

2. Wheel Bearing Lubrication

A. Wheel bearings should be lubricated using time intervals set forth in Chapter 5, Inspection Time Limits.

WARNING: When cleaning wheel bearings, use low pressure shop air to dry bearings. Do not spin bearing cones with compressed air. Dry bearings without lubrication may explode at high rpm.

B. Refer to Figure 301 for lubrication requirements of the wheel bearings.

3. Nose Gear Torque Link Lubrication

A. Nose gear torque links should be lubricated using time intervals set forth in Chapter 5, Inspection Time Limits.

B. Refer to Figure 301 for lubrication requirements of the nose gear torque links.

4. Shimmy Damper Pivots Lubrication

A. Shimmy damper pivots should be lubricated on an "as needed" basis and when assembled or installed.

B. Refer to Figure 301 for lubrication requirements of the shimmy damper pivots.

5. Steering System Needle Bearing Lubrication

A. Steering system needle bearings should be lubricated on an "as needed" basis and when assembled or installed.

B. Refer to Figure 301 for lubrication requirements of the steering system needle bearings.

6. Nose Gear Steering Pushrods Lubrication

A. Nose gear steering pushrods should be lubricated using time intervals set forth in Chapter 5, Inspection Time Limits.

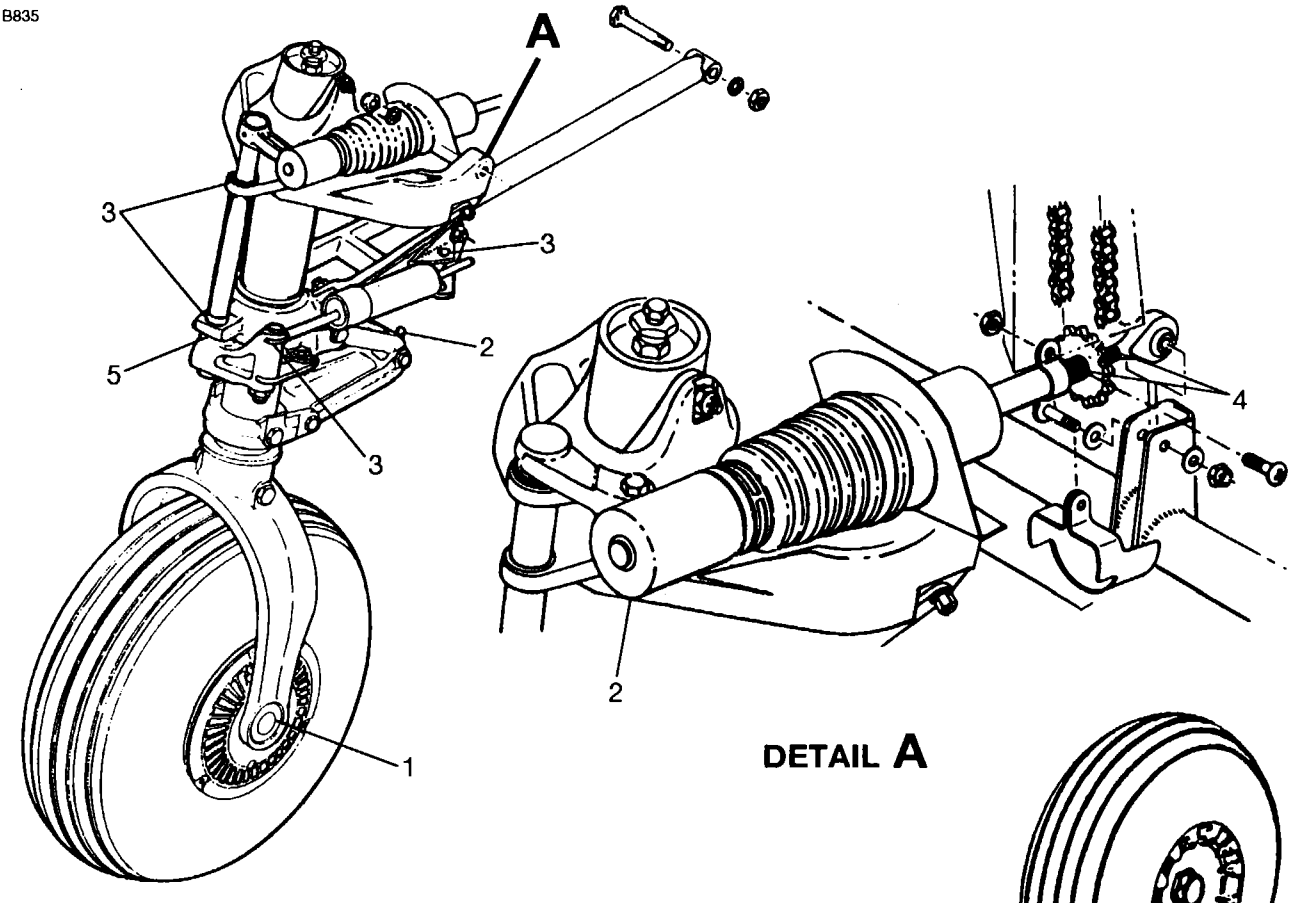
B. Refer to Figure 301 for lubrication requirements of the nose gear steering pushrods.

7. Parking Brake Handle Shaft Lubrication

A. The parking brake handle shaft should be lubricated on an "as needed" basis and when assembled or installed.

B. Refer to Figure 302 for lubrication requirements of the parking brake handle shaft.

B835



NOSE GEAR

MAIN GEAR

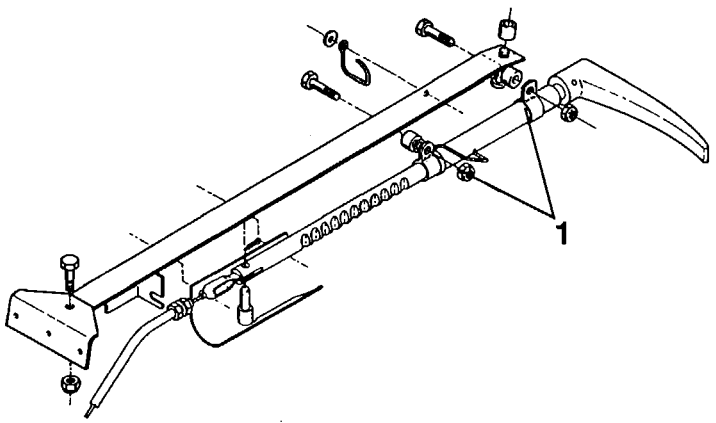
GR – GREASE, GENERAL PURPOSE – (MIL–G–81322)
OG – OIL, GENERAL PURPOSE – (MIL–L–7870)
GL – HIGH AND LOW TEMPERATURE GREASE (MIL–G–21164C)
GH – GREASE, AIRCRAFT AND INSTRUMENT,
GEAR AND ACTUATOR SCREW (MIL–PRF–23827)

ITEM NUMBER	ITEM DESCRIPTION	LUBE TYPE	APPLICATION
1	WHEEL BEARINGS	GR	HAND
2	TORQUE LINKS STEERING BUNGEE	GR	GUN
3	SHIMMY DAMPER PIVOTS STEERING SHAFT	OG	OIL CAN
4	STEERING BUNGEE THREADS	GL	HAND
5	STEERING SYSTEM NEEDLE BEARING	GH	HAND

1242T1005
A1242T1016
0741T1001

Landing Gear Lubrication
Figure 301 (Sheet 1)

B836



ITEM NUMBER	ITEM DESCRIPTION	LUBE TYPE	APPLICATION
1	PARKING BRAKE HANDLE SHAFT	OG	OIL CAN

OG - OIL, GENERAL PURPOSE - (MIL-L-7870)

0741T1002

Parking Brake Handle Shaft Lubrication
Figure 302 (Sheet 1)

FLIGHT CONTROLS - SERVICING

1. General

A. It is recommended that the airplane be secured in an area free of contamination from sand, dust or other environmental conditions that may contribute to improper lubrication practices.

2. Aileron System Lubrication

A. Bearings in the control column should be lubricated on an "as needed" basis and when assembled or installed.

B. Needle bearings on the aileron bellcrank should be lubricated on an "as needed" basis and when assembled or installed.

C. Rod end bearings on the aileron bellcrank should be lubricated using time intervals set forth in Chapter 5, Inspection Time Limits.

D. Refer to Figure 301 for lubrication requirements of the aileron system.

3. Flap System Lubrication

A. Flap motor screw jack threads should be lubricated using time intervals set forth in Chapter 5, Inspection Time Limits. To lubricate the jack screw, operate flaps to full down position, clean screw threads with solvent rag, and dry with compressed air.

NOTE: It is not necessary to remove actuator from airplane to clean or lubricate threads.

B. Needle bearings should be lubricated on an "as needed" basis and when assembled or installed.

C. Refer to Figure 302 for lubrication requirements of the flap system.

4. Elevator System Lubrication

A. Bearings in the trim wheel controls should be lubricated on an "as needed" basis and when assembled or installed.

B. The elevator down spring link rub strip should be lubricated using time intervals set forth in Chapter 5, Inspection Time Limits.

C. Trim tab piano hinges should be lubricated on an "as needed" basis and when assembled or installed.

D. The trim tab actuator should be lubricated using time intervals set forth in Chapter 5, Inspection Time Limits.

E. Refer to Figure 303 for lubrication requirements of the elevator system.

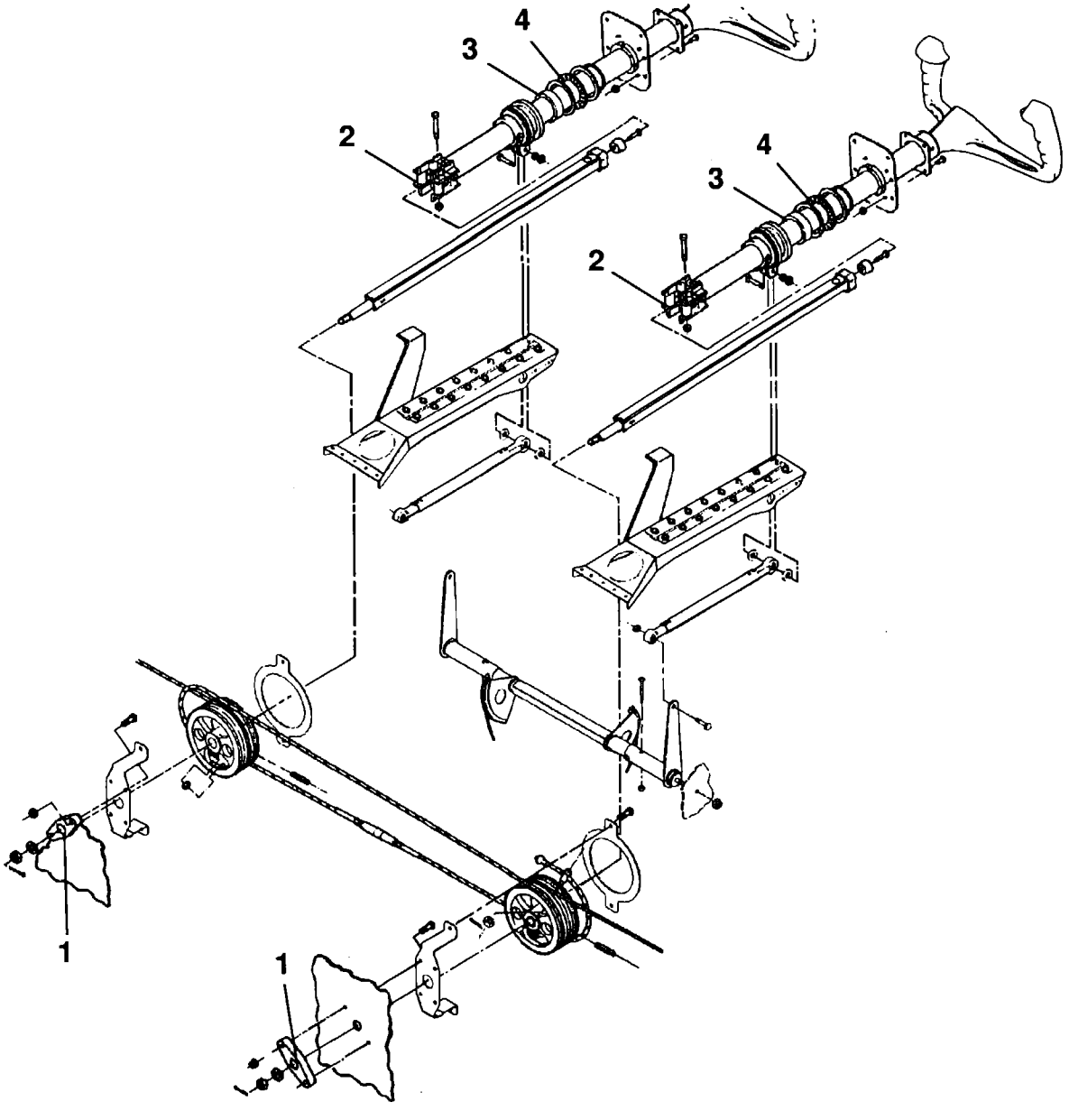
5. Rudder System Lubrication

A. The rudder bar bearings and linkage point pivots should be lubricated on an "as needed" basis and when assembled or installed.

B. The oilite bearings in the rudder bar ends and linkage point pivots should be lubricated using time intervals set forth in Chapter 5, Inspection Time Limits.

C. Refer to Figure 304 for lubrication requirements of the rudder system.

B837



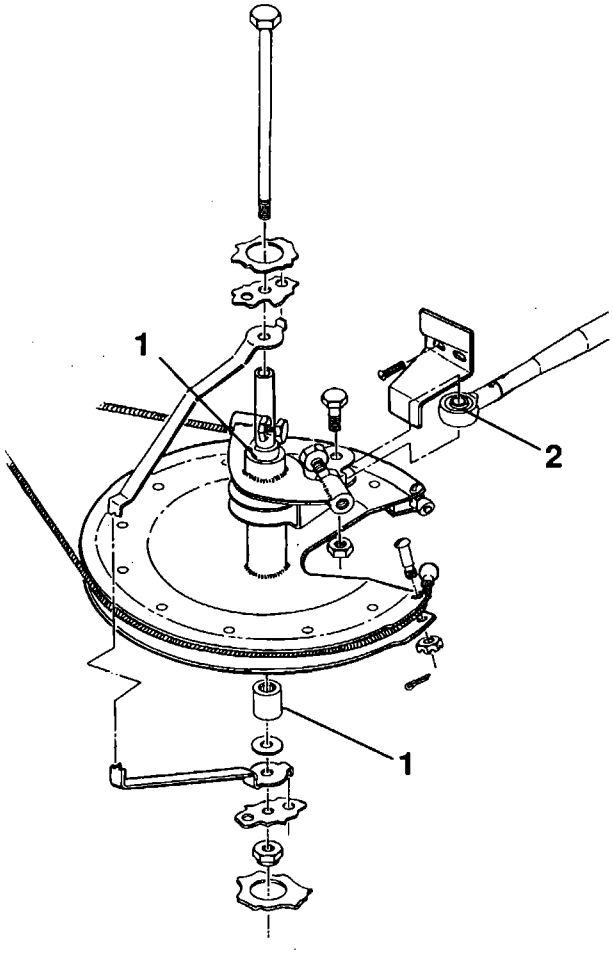
ITEM NUMBER	ITEM DESCRIPTION	LUBE TYPE	APPLICATION
1	NEEDLE BEARINGS	GR	HAND
2	NEEDLE BEARING ROLLERS	GR	HAND
3	NEEDLE BEARING	GR	HAND
4	THRUST BEARING	GR	HAND

GR - GREASE, GENERAL PURPOSE - (MIL-G-81322)

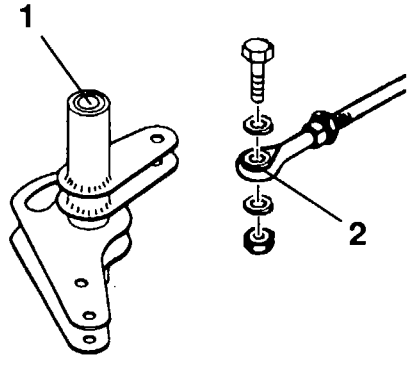
1260T1003
1260T1004
1260T1005

Aileron System Lubrication
Figure 301 (Sheet 1)

B838



AILERON DRIVE PULLEY



AILERON BELLCRANK

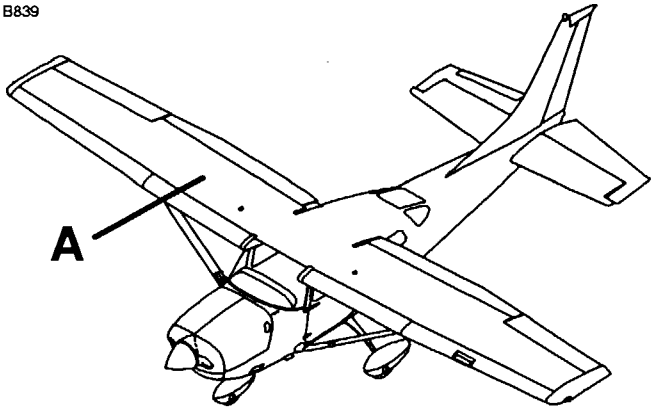
ITEM NUMBER	ITEM DESCRIPTION	LUBE TYPE	APPLICATION
1	BELLCRANK NEEDLE BEARINGS	GR	HAND
2	ROD END BEARINGS	OG	OIL CAN

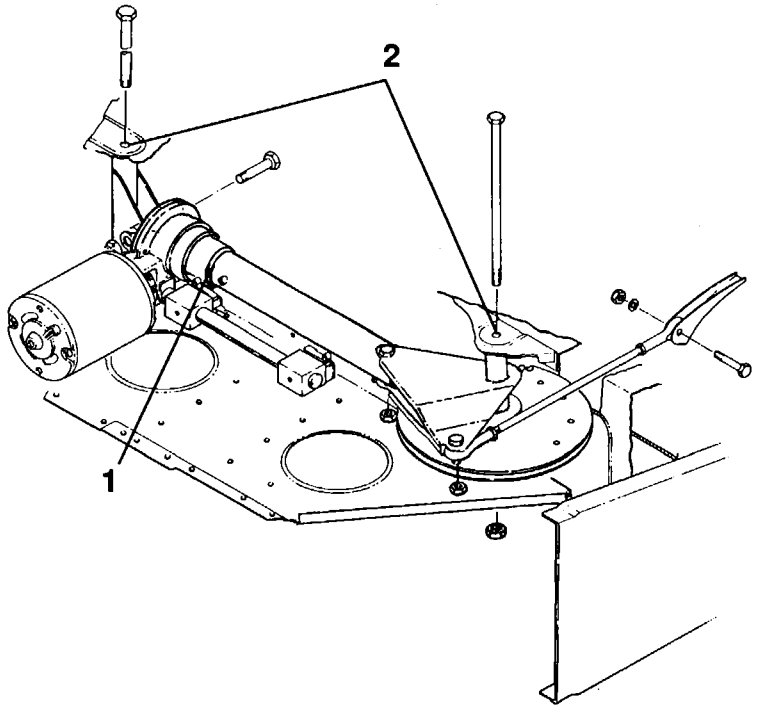
GR - GREASE, GENERAL PURPOSE - (MIL-G-81322)
OG - OIL, GENERAL PURPOSE - (MIL-L-7870)

1224T1011
0724T1002

Aileron System Lubrication
Figure 301 (Sheet 2)

B839





DETAIL A

ELECTRIC FLAP DRIVE MECHANISM

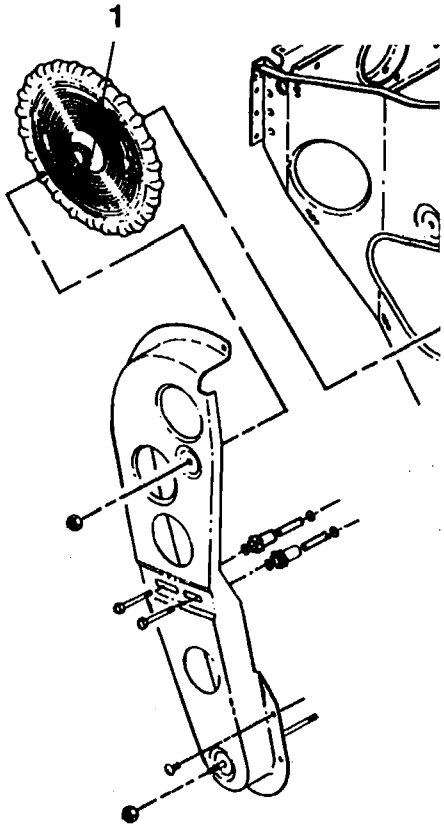
ITEM NUMBER	ITEM DESCRIPTION	LUBE TYPE	APPLICATION
1	FLAP MOTOR SCREW JACK THREADS	GP	OIL CAN
2	NEEDLE BEARINGS	GR	HAND

GP - OIL NO. 10-WEIGHT, NON-DETERGENT
GR - GREASE, GENERAL PURPOSE - (MIL-G-81322)

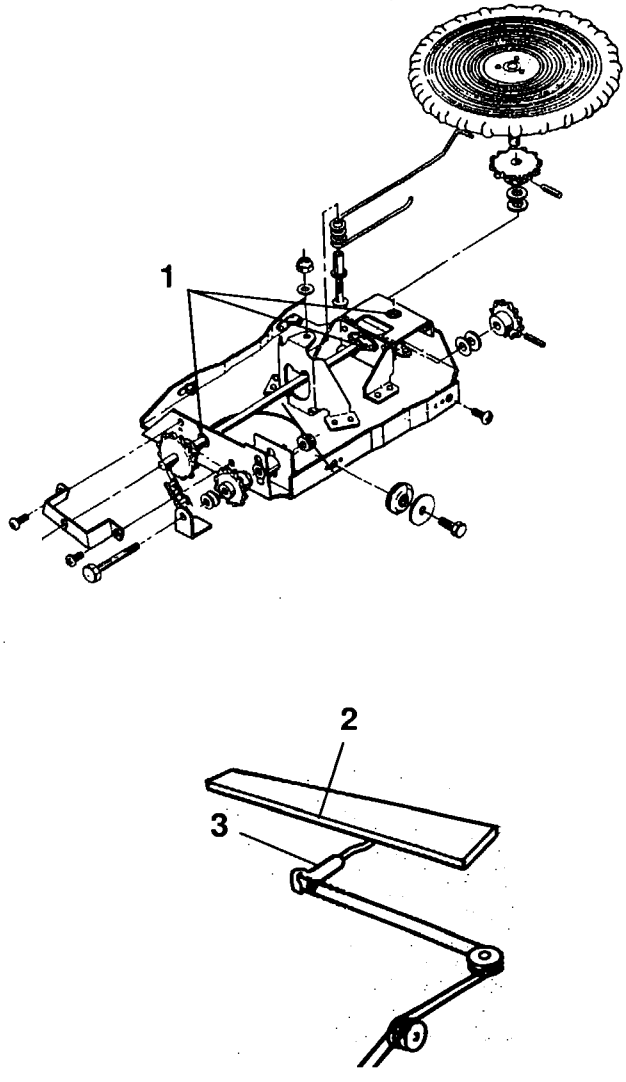
1210T1001
A0718T1005

Flap System Lubrication
Figure 302 (Sheet 1)

B840



TRIM WHEEL



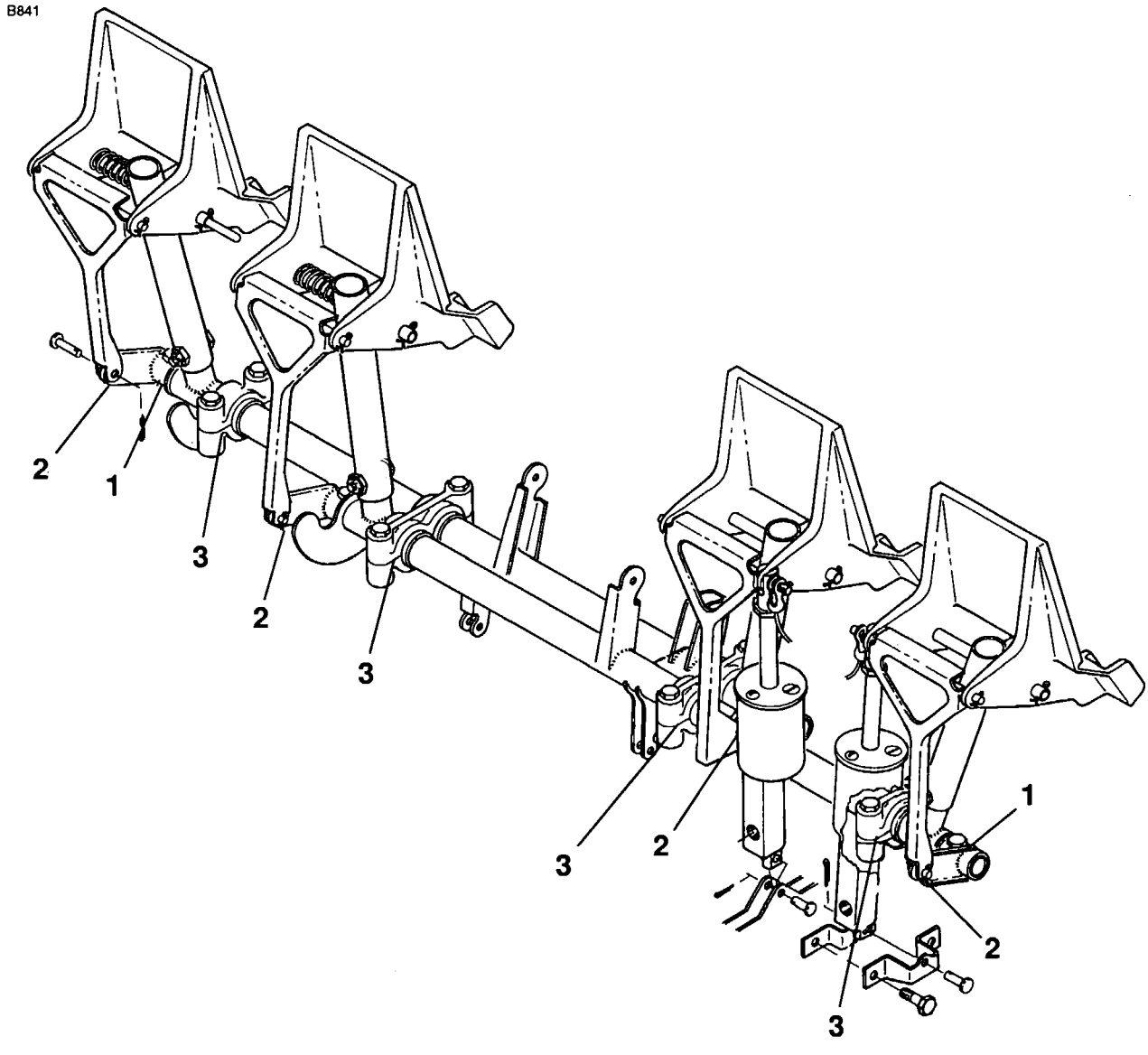
ACTUATOR AND TRIM TAB

ITEM NUMBER	ITEM DESCRIPTION	LUBE TYPE	APPLICATION
1	OILITE BEARINGS	OG	OIL CAN
2	TRIM TAB PIANO HINGES	PG	SYRINGE
3	TRIM TAB ACTUATOR	GL	HAND

OG - OIL, GENERAL PURPOSE (MIL-L-7870)
PG - POWDERED GRAPHITE (SS-G-659)
GL - GREASE, HIGH AND LOW TEMPERATURE (MIL-G-21164)

1234T1029
1233T1008
1234T1013

Elevator System Lubrication
Figure 303 (Sheet 1)



ITEM NUMBER	ITEM DESCRIPTION	LUBE TYPE	APPLICATION
1	OILITE BEARING (RUDDER BAR ENDS)	OG	OIL CAN
2	ALL LINKAGE PIVOT POINTS	OG	OIL CAN
3	BEARING BLOCK HALVES	OG	OIL CAN

OG - OIL, GENERAL PURPOSE - (MIL-L-7870)

1262T3001

Rudder Pedals Lubrication
Figure 304 (Sheet 1)

ENGINE CONTROL CABLES - SERVICING

1. General

A. It is recommended that the airplane be secured in an area free of contamination from sand, dust or other environmental conditions that may contribute to improper lubrication practices.

2. Engine Control Cables Lubrication

A. All housed, pull-type, push-pull or vernier controls should have each outer housing lightly lubricated internally with VV-L-700 General Purpose Lube Oil.

HEATING AND VENTILATION CONTROL CABLES - SERVICING

1. General

A. It is recommended that the airplane be secured in an area free of contamination from sand, dust or other environmental conditions that may contribute to improper lubrication practices.

2. Heating And Ventilation Control Cables Lubrication

A. All housed, pull-type, push-pull or vernier controls should have each outer housing lightly lubricated internally with VV-L-700 General Purpose Lube Oil.

AIRPLANE EXTERIOR - CLEANING/PAINTING

1. General

A. Wash the airplane frequently to keep it clean and minimize corrosion. Polish the painted areas of the airplane frequently to remove chalking paint and keep its gloss bright.

B. Clean the exterior surface of the airplane with water and detergent.

2. Precautions

A. Read and obey all manufacturer's instructions, warnings, and cautions on the cleaning/solvent compounds used.

B. Do not use silicone based wax to polish the airplane exterior. Silicone based wax, especially if buffed to a high shine, can cause P-static to be on the airplane.

C. Do not park or store the airplane adjacent to fluid or vapors from methanol, denatured alcohol, gasoline, benzene, xylene, methyl n-propyl ketone, acetone, carbon tetrachloride, lacquer thinners, commercial or household window cleaning sprays, paint strippers or other types of solvents.

D. Do not leave the sun visors extended so that they touch the windshield when not in use. The reflected heat from these items will cause high temperatures on the windshield. If the solar screens are installed on the inside of the airplane, make sure that they are the silver-appearing, reflective type.

E. Do not use a power drill motor or other powered device to clean, polish, or wax surfaces.

3. Preventive Maintenance

A. Keep all surfaces of windshields and windows clean.

B. If necessary, wax the acrylic surfaces.

C. Carefully cover all surfaces during any painting, power plant cleaning, or any other procedure for which the use of any type of solvent or chemical is necessary. Table 701 lists approved coatings for use in the protection of surfaces from solvent attack.

Table 701. Approved Protective Coatings

NAME	NUMBER	MANUFACTURER	USE
Spray	MIL-C-6799, Type 1, Class II	Available Commerically	Gives protection to surfaces from solvents.
Masking Paper	WPL-3	Champion Intl. Corp. Forest Product Division 7785 Bay Meadows Way Jacksonville, FL 32256	Gives protection to surfaces from solvents.
Poly-Spotstick	SXN	Champion Intl. Corp.	Gives protection to surfaces from solvents.
Protex 40		Mask Off Company 345 Marie Avenue Monrovia, CA	Gives protection to surfaces from solvents.

4. Windshield and Window Cleaners

CAUTION: Do not use gasoline, alcohol, benzene, acetone, carbon tetrachloride, fire extinguisher fluid, deicer fluid, lacquer thinner, or glass window cleaning spray. These solvents will make the plastic soft and can cause crazing.

NOTE: Equivalent substitutes can be used for the following items:

Table 702. Windshield and Window Cleaners/Polishers

NAME	NUMBER	MANUFACTURER	USE
Mild soap or detergent (hand dishwashing type without abrasives)		Commercially Available	Cleans windshields and windows.
Aliphatic Naphtha Type II	Federal Specification TT-N-95	Commercially Available	Removes deposits which cannot be removed with mild soap solution on acrylic windshields and windows.
Turtle Wax (paste)		Commercially Available	Waxes acrylic windshields and windows.
Permatex Plastic Cleaner No. 403D	Federal Specification P-P-560	Permatex Company, Inc. Kansas City, KS 66115	Waxes acrylic windshields and windows.
Soft cloth (cotton flannel or cotton terry cloth)		Commercially Available	Application and removal of wax and polish.

5. Cleaning Windshield and Windows

CAUTION: Use care and correct techniques during the handling and cleaning of the windshields. Damage easily occurs to windshields and windows.

CAUTION: Do not use any of the following to clean windshields and windows: methanol, denatured alcohol, gasoline, benzene, xylene, acetone, carbon tetrachloride, lacquer thinners, commercial, or household window cleaning sprays.

A. Refer to Table 702 for cleaning materials.

B. Windshield Cleaning Procedures.
   (1) Put the airplane inside a hanger or in a shaded area and let it cool from the heat of the sunlight.
   (2) Cover the surface with clean (running, if possible) water. Use your hands to feel and dislodge any dirt or abrasive materials.

CAUTION: Remove all jewelry before you begin to clean the airplane. The jewelry can cause scratches or other damage to the surface of the windshield.

   (3) Wash the surface with a mild soap or detergent (such as dish washing liquid). Use only your hands to rub the surface. (A clean cloth may be used to put the soap solution on the surface, but be extremely careful to prevent scratches on the surface.)
   (4) For acrylic windshields and windows only, Type II aliphatic naphtha applied with a soft clean cloth can be used as a cleaning solvent, if there are soiled areas that cannot be removed with a mild detergent. Make sure to frequently fold the wash cloth to a clean side to help clean the surface satisfactorily and to prevent scratches on the windshield by any abrasive particles.
   (5) Flush the surface fully with clean fresh water and dry with a clean cloth.

6. Waxing and Polishing Windshield and Windows

CAUTION: Do not use rain repellent on acrylic surfaces.

NOTE: Windshields and windows must be cleaned before the application of wax. A clean, soft cloth is used to apply and remove wax and polish.

A. Refer to Table 702 for polishing materials.

B. Apply only hand-polish wax (or other polish meeting Federal Specification P-P-560) to acrylic surfaces. The wax has an index of refraction almost the same as transparent acrylic and can mask any scratches on windshield surface.

7. Aluminum Surfaces

A. Minimum care is necessary for aluminum surfaces, but some care is necessary. The airplane can be washed with clean water to remove dirt and can be washed with nonalkaline grease solvents to remove oil and/or grease. Household-type detergent soap powders are good cleaners, but must be used cautiously, since some of them are very alkaline. Many good aluminum cleaners, polishes and waxes are available from commercial suppliers of airplane products.

8. Painted External Surfaces

A. Usually, the painted surfaces can be kept bright if washed with water and mild soap, followed by a flush with water and drying with cloths or a chamois. Strong or abrasive soaps or detergents that could cause corrosion or scratches must not be used. Clean difficult-to-remove oil and grease with a cloth moist with Stoddard solvent.

NOTE: For additional information on the exterior paint finish, refer to Chapter 20, Interior and Exterior Finish - Cleaning/Painting.

B. The airplane must be waxed regularly with a good automotive wax applied correctly to seal any minor surface chips or scratches and protect against corrosion. Refer to the manufacturer's instructions. If the airplane is operated in a seacoast area or other salt water environment, it must be washed and waxed more frequently to give adequate protection. Care must be taken to seal around rivet heads and skin laps, which are the areas where corrosion occurs. A heavier coat of wax on the leading edges of the wings and tail and on the cowl nose cap and propeller spinner will help decrease the abrasion in these areas. Another application of wax will usually be necessary after the surface is cleaned with soap solutions or after chemical deicing operations.

9. Engine and Engine Compartment Washing

A. Notes and Precautions.
   (1) A wash of the engine and accessories must be done during each 100- hour inspection to remove oil, grease, salt, corrosion or other unwanted material that can cover component problems during inspection. Also, frequent cleaning can be very good in preventive maintenance.
   (2) When you do work with cleaning agents, protective devices (rubber gloves, aprons, face shields, etc.) must be used. Use the least toxic of available cleaning agents that will satisfactorily do the work.
   (3) All cleaning operations must be done in a well ventilated work area.
   (4) Sufficient fire fighting and safety equipment must be available.
   (5) Do not smoke or let a flame within 100 feet of the cleaning area.
   (6) Compressed air, if used to apply solvent or to dry components, must be adjusted to the least pressure possible.
   (7) Use a new bristle brush (as opposed to a steel brush) is if the cleaning agents do not remove all of the grease and other dirt during spraying.

B. Cleaning Procedures.
   (1) Remove the engine cowling.

(2) Carefully cover the coupling area between the vacuum pump and the engine drive shaft so no cleaning solvent can touch the coupling or seal.
(3) Put a cover on the opening of the vacuum discharge tube.
(4) If the engine is covered with salt or corrosive chemicals, first flush engine compartment with fresh water.

CAUTION: Do not use gasoline or other highly flammable substances to wash the engine.

CAUTION: Do not try to wash an engine that is hot or turned on. Let the engine cool before you start to clean it.

CAUTION: Use care to not get cleaning agents or water on the openings of the starter, magnetos, alternator, or vacuum pump.

(5) Apply solvent or cleaning agent to the engine compartment. The following solutions (or equivalent) can be used to satisfactorily clean the engine compartment:
  (a) Stoddard Solvent (Specification P-D-680, Type II).
  (b) Water alkaline detergent cleaner (MIL-C-25769 mixed 1 part cleaner, with 2 to 3 parts water and 8 to 12 parts Stoddard Solvent).
  (c) Solvent based emulsion cleaner (MIL-C-4361 mixed 1 part cleaner with 3 parts Stoddard Solvent).
(6) After application of the solvent, fully rinse with clean, warm water.

CAUTION: Do not leave cleaning agents on the engine components for a long period of time. If they are not removed, they can cause damage to the components. Damage can occur to the neoprene seals and silicone fire sleeves, and corrosion can also occur.

(7) Fully dry the engine and accessories with clean, dry compressed air.
(8) Remove the protective cover from the coupling area.
(9) Remove the protective cover from the vacuum discharge tube.
(10) If necessary, the engine cowling can be washed with the same cleaning agents, then flushed fully and wiped dry. After the engine is cleaned, add lubricant to all control arms and moving parts as necessary.
(11) Install the engine cowling.

WARNING: Make sure that the magneto switches are off, the throttle is closed, the mixture control is in the idle cut-off position, and the airplane wheels have chocks on them before you turn the propeller by hand. Do not stand within the arc of the propeller blades while you turn the propeller.

(12) Before the engine is started, turn the propeller by hand no less than four complete revolutions.

10. Propeller

A. You must wipe the propeller occasionally with an oily cloth to remove grass and bug stains. In salt water areas, this will help to prevent corrosion on the propeller.

11. Tires and Wheels

A. Remove oil, grease, and mud from tires and wheels with soap and water.

12. Stabilizer Abrasion Boots

A. Wash and regularly service the stabilizer abrasion boots. Keep the boots clean and free of oil, grease and other solvents that can cause the rubber to swell and deteriorate.

INTERIOR - CLEANING/PAINTING

1. General

A. This section helps the operator and recommends different types of materials and procedures to clean the interior of the airplane.

2. Interior Cleaning Materials

NOTE: Equivalent alternatives can be used for the items that follow:

NAME	NUMBER	MANUFACTURER	USE
Son-Of-A-Gun		Commercially available	To protect and shine interior components (excluding fabric materials).
Fantastic		Commercially available	For general purpose cleaning of interior components.
Aliphatic Naphtha	TT-N-95	Commercially available	For removing tar, asphalt, etc. from interior.
Rug Shampoo		Commercially available	For cleaning carpet.
Household Ammonia		Commercially available	For cleaning seat fabric.
Household Vinegar		Commercially available	For cleaning seat fabric.
Isopropyl Alcohol	(TT-I-735)	Commercially available	For cleaning seat fabric.
Ivory Liquid (White or colorless)		Commercially available	For cleaning seat fabric.
Cheer		Commercially available	For cleaning seat fabric.

3. Cleaning Interior Panels

A. Interior panels (headliners, sidewalls, door panels, etc.) can be cleaned with mild detergent solutions or premixed commercial cleaners. Difficult stains can be removed with aliphatic naphtha. Care must be used to make sure that the cleaners are compatible with the interior. If you are not sure, apply a small quantity of cleaner to non-visible area and look for the reaction and fading of the material.

4. Cleaning Carpet

A. The carpet is made with a polypropylene weave combined with a fire retardant backing. The polypropylene gives stain resistant qualities and normally little maintenance is necessary.

B. If the carpet becomes soiled, you can clean it with a commercially available carpet cleaner.

5. Cleaning Seats

A. The seats are made of a flame retardant Trevira polyester fiber. They have inherent fire retardant and stain resistant properties. You must vacuum and clean the seats on a regular basis to keep their appearance. You must clean spills immediately before the stains are set in the fabric.

B. A table on the page the follows gives help in stain removal. The table has two columns. One column lists the stain and the other lists the procedure and sequence of how to clean. For example, coffee and tea stains are removed with processes 2, 4, 5 and 1. The first step would be application of process 2 (dishwashing liquid with warm water) to the stain. The second step would be application of process

4 (vinegar and water) to the stain. The third step would be application of process 5 (laundry powder and warm water followed by blotting) to the stain. The final step would be application of process 1 (dry cleaning solvent applied to the stain).

Table 701. Methods For Cleaning Trevira Fabric on Seats

STAIN	PROCESS AND SEQUENCE	STAIN	PROCESS AND SEQUENCE
Antacid (Maalox)	1	Infant Formula	2,1
Betadine (Iodine)	2,3,4,6	Ink (ball point)	8
Blood *	2,3,5	Motor Oil	1,2,3,4
Catsup	2,3,5	Mud	2,1
Chewing Gum	7,1,2	Petroleum Jelly	1,2
Chocolate Syrup	5,1	Pepto Bismol	6,1
Coffee/Tea	2,4,5,1	Urine	2,3,4
Cola	2,3,4	Suntan Lotion	1,2
Cough Syrup	2	Shoe Polish	1,2,3
Egg	2,3,5,1	Vomit	2,3,4,5
Grape Drink	2,3,4,5	Wax	7,1
Ice Cream	2,3,4,5,1	Wine	2,3,4

KEY

1. Apply a small quantity of dry cleaning solvent to the stain. Do not smoke or use near open flame. Use ventilation.

2. Mix one teaspoon of white or colorless dishwashing liquid with a cup of warm water.

3. Mix one tablespoon of household ammonia with half a cup of water.

4. Mix one part household vinegar with two parts water.

5. Mix a solution of laundry powder with water and let it stay on the stain. Follow the label directions. Rinse with warm water and blot dry.

6. Mix one part household bleach with nine parts water. Apply with dropper to stain. Rinse with water, blot dry.

7. Chill area with an ice cube wrapped in a plastic bag. Crack gum or wax off surface of fabric.

8. Apply a small quantity of rubbing alcohol to the ink stain and blot to remove the ink. Continue until the ink is removed.

* All solutions must be cool when applied, or heat from the solutions will set the stain.

6. Cleaning the GDU 1040 Display Lens

NOTE: The Primary Flight Display (PFD) and Multi-Function Display (MFD) are the GDU 1040 displays in airplanes with Garmin G1000.

CAUTION: Do not touch the lens, if possible. The GDU 1040 lens has a layer of anti-reflective material which is very sensitive to skin oils, waxes and abrasive cleaners.

CAUTION: Do not use cleaners that contain ammonia. Ammonia will cause damage to the anti-reflective material.

A. Clean the GDU 1040 Display Lens.
   (1) Use a clean, lint-free cloth and an eyeglass lens cleaner that is specified as safe for anti-reflective material to clean the lens.

UNSCHEDULED SERVICING - DESCRIPTION AND OPERATION

1. General

A. This section gives procedures and recommendations for normally unscheduled servicing.

B. Instructions are given in the Cold Soak procedures for operation of the airplane during very cold temperatures.

NOTE: During operation at outside air temperatures below International Standard Atmosphere (ISA) Standard, the engine can develop more than its rated power at normal-rated RPM. This occurs more at lower altitudes.

2. Extreme Weather Maintenance

A. Seacoast and Humid areas.
(1) In salt water areas special care should be taken to keep engine, accessories, and airframe clean to help prevent oxidation.
(2) In humid areas, fuel and oil should be checked frequently and drained of condensation to prevent corrosion.

3. Ground Power Receptacle

A. Connect to 24-volt DC, negative ground power unit with a maximum output of 27.8 volts, for cold weather starting and lengthy ground maintenance of the airplane electrical equipment, with exception of electronic equipment. Refer to Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for engine starting instructions with auxiliary power.

NOTE: The ground power receptacle circuit incorporates a polarity reversal protection. Power from the external power source will flow only if the ground service plug is connected correctly to the airplane.

4. Cold Soak

A. If extended exposure to cold weather is expected, refer to this procedure to prepare the airplane for cold soak. If the airplane has cold soaked for more than two hours at temperatures colder than -10°C (14°F), refer to this procedure and the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual to prepare the airplane for flight.
(1) Cold temperatures have an effect on control cable tension. Refer to Chapter 27, Aileron Control System - Maintenance Practices, Rudder Control System - Maintenance Practices, Elevator Control System - Maintenance Practices, Elevator Trim Control - Maintenance Practices, and Flap Control System - Maintenance Practices for flight control cable tensions.
(2) For information on lubrication and greasing of moving parts, refer to this maintenance manual, Chapter 12, Lubricants - Description and Operation.
(3) Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for the correct engine oil viscosity.
(4) Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for additional information on procedures for operation of the airplane in cold temperatures.

B. The engine must be preheated before an engine start when exposed to very cold temperatures. Preheat the engine as follows:
(1) Direct warm air into the engine cooling inlets behind the propeller.

CAUTION: Do not use air with a temperature of more than 120°C (248°F) when you preheat the engine. Air with a temperature of more than 120°C (248°F) can do damage to the exterior paint of the airplane.

(2) Make sure that the temperature of the warm air is no more than 120°C (248°F).

WARNING: Do not put open flames near the airplane. If you use a heater with an open flame to preheat the engine, it can cause injury to personnel and damage to the airplane.

(3) Do not use a heater with open flames to supply the warm air to preheat the engine.
(4) Preheat the engine before an engine start if the engine temperature is less then -6°C (20°F).
(5) When the temperature is less than 0°C (32°F), preheat the engine to more than 0°C (32°F) before you start the engine again after an engine start and stop.

NOTE: When the temperature is less than 0°C (32°F), water from combustion can freeze to the engine spark plugs if the engine does not continue to operate after it is started. This will prevent the engine from starting again.

C. The Garmin GDU 1040 PFD/MFD requires warm-up time when exposed to very cold temperatures.
(1) A warm-up time of up to 30 minutes is necessary when the GDU is exposed to down to -40°C (-40°F) for an extended period.
(2) A warm-up time of up to 15 minutes is necessary when the GDU is exposed to down to -30°C (-22°F) for an extended period.

D. Before takeoff, preheat the airplane cabin to more than -30°C (-22°F) for correct operation of the standby altimeter.

NOTE: If there is no warning that an instrument is not operating correctly, all other instruments will operate continuously until at the minimum temperature of the airplane.

CHAPTER

20

STANDARD PRACTICES - AIRFRAME

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
20-Title		
20-List of Effective Pages		
20-Record of Temporary Revisions		
20-Table of Contents		
20-00-00	Pages 1-2	Dec 2/2002
20-10-00	Pages 1-2	Dec 2/2002
20-11-00	Pages 201-206	Jan 1/2007
20-12-00	Pages 201-211	Apr 5/2004
20-13-00	Pages 201-202	Apr 1/2005
20-30-00	Page 1	Dec 2/2002
20-31-00	Pages 1-3	Dec 2/2002
20-31-00	Pages 201-202	Dec 2/2002
20-31-00	Pages 701-705	Dec 2/2002
20-32-00	Pages 201-218	Jul 3/2006
20-40-00	Page 1	Dec 2/2002

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

STANDARD PRACTICES AIRFRAME - GENERAL

1. Scope

A. This chapter gives the maintenance practices to maintain and repair items of the airframe and systems that are typical to more than one area or system. Maintenance practices that are unique to a particular system or subject are given in the appropriate chapter and section in the maintenance manual.

NOTE: Equivalent alternatives can be used for the items that follow:

NAME	NUMBER	MANUFACTURER	USE
Overall Base Paint	Jet Glo High Solids System 710 Series	Sherwin-Williams 630 E. 13th St. Andover, KS 67002	Used as a topcoat overall color.
Acid Resistant Enamel	Jet-Glo Urethane 571-567	Sherwin-Williams 630 E. 13th St. Andover, KS 67002	Used as a topcoat for battery box.
Pretreatment Primer DOD-P-15328	728-013/ 702-701	Sherwin-Williams 630 E. 13th St. Andover, KS 67002	Pretreatment primer
Corrosion Resistant Primer MIL-PRF-23377G or later	513 x 419/ 910 x 942	Courtaulds Aerospace 1608 Fourth St. Berkeley, CA 94710	Corrosion protection primer.
Corrosion Resistant Primer MIL-PRF-23377G or later	02-Y-40 02-4-40 CATA	DEFT, Inc. 17451 Von Karman Ave. Irvine, CA 92714	Corrosion protection primer.
Corrosion Resistant Primer MIL-PRF-23377G or later	U-1201F/ U-1202F	Sterling Lacquer Mfg. 3150 Brannon Ave. St. Louis, MO 63139	Corrosion protection primer.
Corrosion Resistant Primer MIL-PRF-23377G or later	R4001-K14 MAX COR	U. S. Paint Corp. 831 S. 21st St. St. Louis, MO 63103	Corrosion protection primer.
Heat Resistant Enamel (Gray)	521- 520	Sherwin-Williams	Used for engine mount and hardware in the engine compartment.
Polishing Compound	808 Polishing Compound	DuPont	To rub out the overspray.
Cloth	Hex Wiping Cloth	Western Uniform & Towel Service 1707 N. Mosley 67214	Used with solvent to clean the airplane exterior.
Tape	Masking Tape, Y-231	3M Co. 3M Center Minneapolis, Minn. 55144	To hold the masking paper in place.

2. Definition

A. This chapter is divided into sections to aid maintenance personnel to find information. Read the Table of Contents to help find a applicable subject. A brief definition of the subjects and sections in this chapter is listed as follows.

(1) The section on Material and Tool Cautions gives cautions and warnings applicable to maintenance on or around the airplane.

(2) The section on Torque Data gives tables, formulas, requirements and torque limits for different kinds of fasteners.

(3) The section on Safetying gives the correct procedures and use of safety wire/lockwire, cotter pins and lock clip installations.

(4) The section on Control Cables and Pulleys gives the construction, examination and storage of cable assemblies and pulleys.

(5) The section on Solvents, Sealants and Adhesives gives the procedures and uses for solvents and cleaners, fuel, weather, pressure and high temperature sealing and the application of adhesives and solvent bonding.

(6) The section on Conversion Data has information for converting the more commonly used units of measure that are in the Maintenance Manual.

MATERIAL AND TOOL CAUTIONS - DESCRIPTION AND OPERATION

1. Mercury

CAUTION: Thermometers and other test equipment that contain mercury must not be used on the airplane.

A. Damage from Mercury Corrosion.
(1) Mercury can penetrate any break in the finish, paint or seal coating of a metal structural element.
(2) The corrosion and embrittlement that results from mercury to enter the airplane structure will be very rapid on structural members under load.
(3) Moisture present on the metal surfaces will increase the corrosive and embrittlement process.
(4) Soils, greases or other inert contaminants, will help prevent the start of the corrosion.
(5) An oxide coat on a dry metallic surface will prevent an immediate action.
(6) A bright, polished, shining or scratched surface will limit the corrosive process.
(7) If corrosion and embrittlement has started, there is no known method to stop it. Destruction of the load carry capacity of the metal will result.

2. Maintenance Precautions

WARNING: During maintenance, repair and servicing of the airplane, many substances and environments encountered can cause injury if correct precautions are not obeyed.

A. Carefully read and follow all instructions. Make sure to obey all cautions and warnings given by the manufacturer of the product being used. Use correct safety equipment as required. This includes eye protection, face shields, breathing devise, protective clothes and gloves. Fuel, engine oil, solvents, volatile chemicals, adhesives, paints and strong cleaning agents can cause injury with contact to the skin or eyes, or when vapors are breathed. When you sand composites or metals or otherwise work in an area where dust particles can be made, the area must be ventilated and the correct respirator must be used.

3. General Usage Solvents

A. General usage solvents are included in the list that follows:

Methyl Propyl Ketone

Toluene

Isopropyl Alcohol

Acetone

Methylene Chloride

1,1,1-Trichloroethane

Naptha

ASTM D4080

B. The chemicals/solvents are generally colorless, evaporate faster than water, and tend to give off vapors in greater quantities as their temperature increases. The vapors are generally heavier than air, which cause them to collect in low surface areas or push normal oxygen and air out of a confined area. This situation can lead to oxygen deficient atmospheres. Many general solvents are flammable.

C. Solvents are hazardous to work with because of their flammability, rate of evaporation and reaction to oxidizers. Solvents can also be an irritant to the skin and eyes.

D. A single spark, a smoldering cigarette, or even atmospheric conditions can ignite solvent vapors. The lower the flash point of the chemical, the more likely it is to become flammable. Generally, flash points of less than 100℉ (37.8℃) are considered flammables. Examples of solvent flash points are shown below:

SOLVENT	FLASH POINT
Methyl n-Propyl Ketone	45℉ (7.2℃)
Toluene	39℉ (3.9℃)
Isopropyl Alcohol	53.6℉ (12℃)
Acetone	1.4℉ (-17℃)

E. The rate of evaporation is closely tied to flammability, because normally the vapors must be present to ignite the liquid. Vaporization also lets solvents, even those that are not flammable, to get into the air and into the body's blood stream through the lungs.

F. Solvents can also react explosively with oxidizers (chemicals that release oxygen). A very violent and uncontrollable reaction takes place which generates heat rapidly. For this reason, it is very important for each person to be aware of specific chemicals in use in the work area, and to obey the label on the containers. Chemical manufacturers are required to label each container with a diamond shaped symbol: red for flammable and yellow for oxidizers.

G. Solvents can also damage the hands and skin. Solvents dry out skin and dissolve the natural oils. The condition can develop into an irritation. If left untreated with continuous exposure, it can progress to a dermatitis. Damaged skin allows other contaminants to worsen the condition because the contaminants have easier access to the deeper levels of the skin. In serious cases, blood poisoning is possible.

H. The best defense against skin irritation is not to be exposed. If exposure is unavoidable, steps must be taken to limit exposure times. To much exposure to these chemicals can lead to long term liver damage.

TORQUE DATA - MAINTENANCE PRACTICES

1. General

A. To make sure of correct installation and to prevent over stress of components during installation, the torque values listed in this section and other applicable chapters of this manual must be used when you install and repair components.

B. The torque value tables listed in this section are standard torque values for the nut and bolt combinations shown. If a component requires special torque values, those values will be listed in the applicable maintenance practices section.

C. Torque is typically applied and measured with a torque wrench. Different adapters, used in combination with the torque wrench, can produce an actual torque to the nut or bolt which is different from the torque value. Figure 201 helps calculate the actual torque in relation to specific adaptors used with the torque wrench.

D. Running Torque Value.
(1) Running torque value is the torque value required to rotate a nut on a threaded shaft, without tightening. Running torque value does not represent the torque values listed in the tables of this section. Torque values listed in the tables represent the torque values above running torque. For example, if final torque required is to be 150 inch-pounds and the running torque is 25 inch-pounds, then the running torque must be added to the required torque to achieve final torque of 150 +25 = 175 inch-pounds.
(2) Break-away torque value is the value of torque required to start a nut rotating on a thread shaft. It does not represent running torque value. It must be noted that on some installations the break-away torque value cannot be measured.

E. General Torquing Notes.
(1) These requirements do not apply to threaded parts used for adjustment, such as turnbuckles and rod ends.
(2) Torque values shown are for clean, non-lubricated parts. Threads must be free of dust, metal filings, etc. Lubricants, other than that on the nut as purchased, must not be used on any bolt installation unless specified.
(3) Assembly of threaded fasteners, such as bolts, screws and nuts, must conform to torque values shown in Table 201.
(4) When necessary to tighten from the bolt head, increase maximum torque value by an amount equal to shank friction. Measure shank friction with a torque wrench.
(5) Sheet metal screws must be tightened firmly, but not to a specific torque value.
(6) Countersunk washers used with close tolerance bolts must be installed correctly to make sure of proper torque (refer to Figure 202).
(7) For Hi-Lok fasteners used with MS21042 self-locking nuts, fastener and nut must be lubricated prior to tightening.
(8) Tighten accessible nuts to torque values per Table 201. Screws attached to nutplates, or screws with threads not listed in Table 201 must be tightened firmly, but not to a specific torque value. Screws used with dimpled washers must not be drawn tight enough to eliminate the washer crown.
(9) Table 201 is not applicable to bolts, nuts and screws used in control systems or installations where the required torque would cause binding or would interfere with correct operation of parts. On these installations, the assembly must be firm but does not bind.
(10) Castellated Nuts.
(a) Self-locking and non-locking castellated nuts, except MS17826, require cotter pins and must be tightened to the minimum torque value shown in Table 201. The torque can be increased to install the cotter pin, but the increase must not be more than the alternate torque values.
(b) MS17826 self-locking, castellated nuts must be torqued per Table 201.
(c) The end of the bolt or screw must extend through the nut at least two full threads, which include the chamfer.

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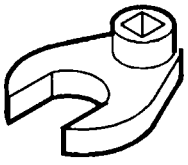
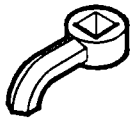
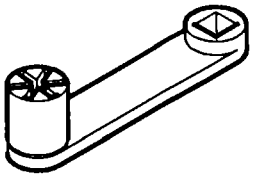


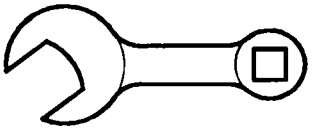
SHORT OPEN END ADAPTER



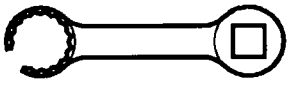
SETSCREW ADAPTER



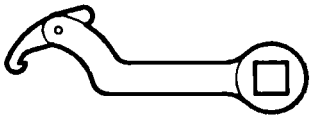
HOSE CLAMP ADAPTER



OPEN-END WRENCH ADAPTER

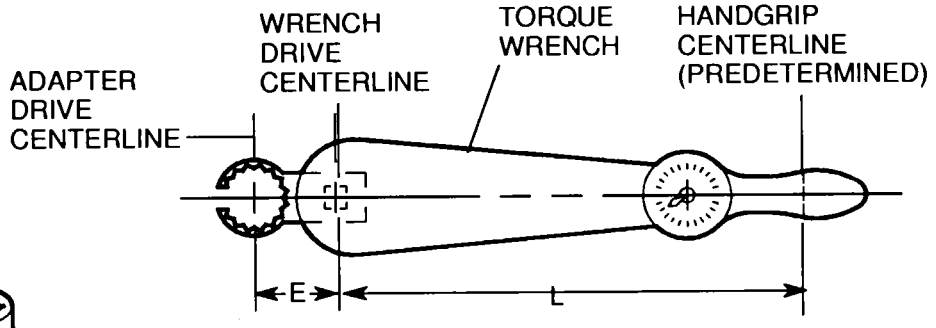


FLARE NUT WRENCH ADAPTER



SPANNER WRENCH ADAPTER

NOTE: WHEN USING A TORQUE WRENCH ADAPTER WHICH CHANGES THE DISTANCE FROM THE TORQUE WRENCH DRIVE TO THE ADAPTER DRIVE, APPLY THE FOLLOWING FORMULAS TO OBTAIN THE CORRECTED TORQUE READING.



FORMULA $\frac{T \times L}{L+E} = Y$

EXAMPLE (WITH 252E272 AS PLUS DIMENSION)

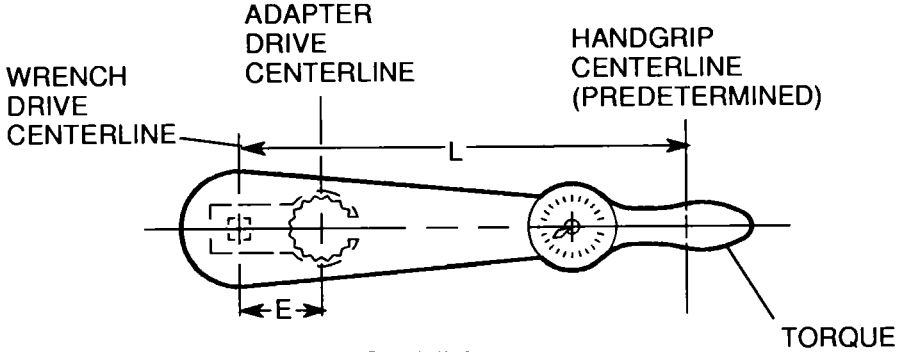
T = 135 IN-LB
Y = UNKNOWN
E = 1.5 IN
L = 10.0 IN

$Y = \frac{135 \times 10}{10 + 1.5} = 117.39$

Y = 117 IN-LB

LEGEND

T = ACTUAL (DESIRED) TORQUE
Y = APPARENT (INDICATED) TORQUE
L = EFFECTIVE LENGTH LEVER
E = EFFECTIVE LENGTH OF EXTENSION



FORMULA $\frac{T \times L}{L-E} = Y$

EXAMPLE (WITH 252E272 AS MINUS DIMENSION)

T = 135 IN-LB
Y = UNKNOWN
L = 10.0 IN
E = 1.5 IN

$Y = \frac{135 \times 10}{10 - 1.5} = \frac{1350}{8.5} = 158.82$

Y = 159 IN-LB

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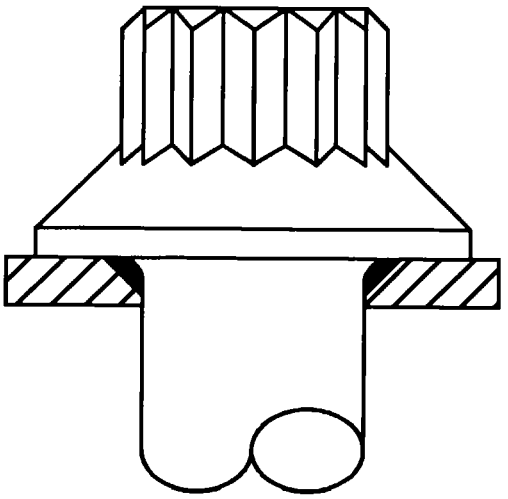
Torque Wrench and Adapter Formulas
Figure 201 (Sheet 1)

B843

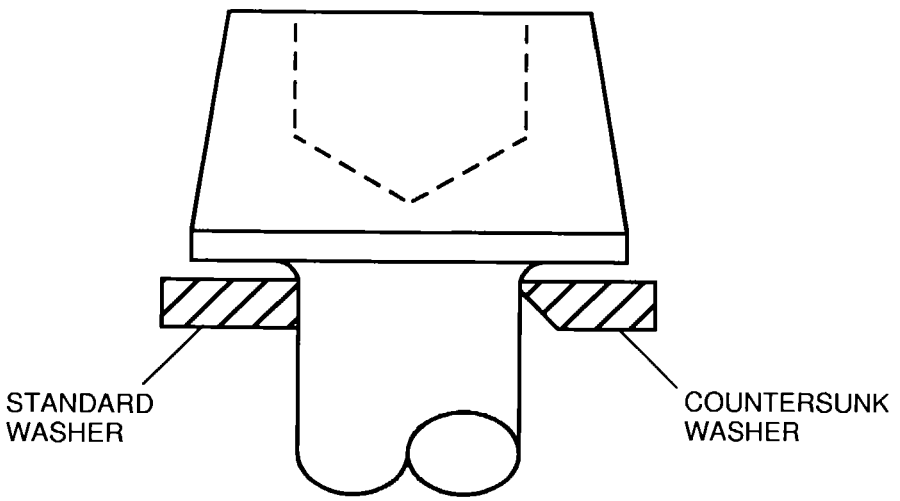
EXTERNAL WRENCHING HEAD



CORRECT INSTALLATION

INSTALL WASHER WITH COUNTERSUNK FACE NEXT TO BOLT HEAD RADIUS

INTERNAL WRENCHING HEAD



INCORRECT INSTALLATION

CAUTION: NEVER INSTALL STANDARD WASHER OR COUNTERSUNK WASHER IN REVERSE WHEN USING BOLTS WITH RADIUS UNDER THE HEAD

5598T1004
5598T1004A

Washer Installation Close Tolerance Bolts
Figure 202 (Sheet 1)

(11) Joints that contain wood, plastics, rubber or rubber like materials must be torqued to values approximately 80 percent of the torque at which crushing is observed, or to the requirements of Table 201, whichever is lower, or as specified.

2. Torque Requirements for Bolts, Screws and Nuts

A. Use Table 201 to determine torque requirements for bolts, screws and nuts.

Table 201. Torque Requirements For Steel Bolts, Screws, and Nuts (Inch-Pounds)

SIZE	FINE THREADED SERIES (TENSION TYPE NUTS)		FINE THREADED SERIES (SHEAR TYPE NUTS EXCEPT MS17826)		MS17826 NUTS	
	Standard Torque	Alternate Torque	Standard Torque	Alternate Torque	Standard Torque	Alternate Torque
8-36	12 to 15	- -	7 to 9	- -	- -	- -
10-32	20 to 25	20 to 28	12 to 15	12 to 19	12 to 15	12 to 20
1/4-28	50 to 70	50 to 75	30 to 40	30 to 48	30 to 40	30 to 45
5/16-24	100 to 140	100 to 150	60 to 85	60 to 100	60 to 80	60 to 90
3/8- 24	160 to 190	160 to 260	95 to 110	95 to 170	95 to 110	95 to 125
7/16-20	450 to 500	450 to 560	270 to 300	270 to 390	180 to 210	180 to 225
1/2-20	480 to 690	480 to 730	290 to 410	290 to 500	240 to 280	240 to 300
9/16-18	800 to 1000	800 to 1070	480 to 600	480 to 750	320 to 370	320 to 400
5/8-18	1100 to 1300	1100 to 1600	660 to 780	660 to 1060	480 to 550	480 to 600
3/4-16	2300 to 2500	2300 to 3350	1300 to 1500	1300 to 2200	880 to 1010	880 to 1100
7/8-14	2500 to 3000	2500 to 4650	1500 to 1800	1500 to 2900	1500 to 1750	1500 to 1900
1-14	3700 to 4500	3700 to 6650	2200 to 3300	2200 to 4400	2200 to 2700	2200 to 3000
1-1/8-12	5000 to 7000	5000 to 10000	3000 to 4200	3000 to 6300	3200 to 4200	3200 to 5000
1-1/4-12	9000 to 11000	9000 to 16700	5400 to 6600	5400 to 10000	5900 to 6400	5900 to 7000

Fine Thread Tension application nuts include: AN310, AN315, AN345, MS17825, MS20365, NASM21044 through MS21048, MS21078, NAS679, NAS1291

Fine Thread Shear application nuts include: AN316, AN320, MS21025, MS21042, MS21043, MS21083, MS21245, NAS1022, S1117

Coarse Thread application nuts include: AN340, MS20341, MS20365, MS35649

3. Torque Requirements for Hi-Lok Fasteners

A. Use Table 202 to determine torque requirements for Hi-Lok fasteners.

NOTE: This table is used with MS21042 self- locking nuts.

Table 202. Torque Values Hi-Lok Fasteners (Used with MS21042 Self-Locking Nuts)

NOMINAL FASTENER DIAMETER	ALLOY STEEL 180 - 200 KSI (INCH-POUNDS)
6-32	8-10
8-32	12-15
10-32	20-25
1/4-28	50-70
5/16-24	100-140
3/8-24	160-190
7/16-20	450-500
1/2-20	480-690

4. Torque Requirements for Electrical Current Carrying And Airframe Ground Fasteners

A. Use Table 203 to determine torque requirements for threaded electrical current carrying fasteners.
(1) Torque values shown are clean, non-lubricated parts. Threads must be free of dust and metal filings. Lubricants, other than on the nut as purchased, must not be used on any bolt installations unless specified in the applicable chapters of this manual.
(2) All threaded electrical current carrying fasteners for relay terminals, shunt terminals, fuse limiter mount block terminals and bus bar attaching hardware must be torqued per Table 203.

NOTE: There is no satisfactory method of determining the torque previously applied to a threaded fastener. When retorquing, always back off approximately 1/4 turn or more before reapplying torque.

Table 203. Torque Values Electrical Current Carrying Fasteners

FASTENER DIAMETER	TORQUE VALUE (INCH-POUNDS)
6-32	8-12
8-32	13-17
10-32	20-30
3/16	20-30
1/4	40-60
5/16	80-100
3/8	105-125
1/2	130-150

B. Use Table 204 to determine torque requirements for threaded fasteners used as airframe electrical ground terminals.

Table 204. Torque Values Airframe Electrical Ground Terminals

FASTENER DIAMETER	TORQUE VALUE (INCH-POUNDS)
5/16	130-150
3/8	160-190

5. Torque Requirements for Rigid Tubing and Hoses

A. Use Table 205 to determine torque requirements for tubes and hoses.

Table 205. Tubing/Hose Torque Limits (Inch-Pounds)

Hose Size	Tubing O.D.	Flared or Flareless fitting with Aluminum or Annealed Stainless Steel Tubing, and Hose with Aluminum Inserts		Flared or Flareless fitting with Steel Tubing, and Hose with Steel Inserts	
		Min	Max	Min	Max
-2	1/8	20	30	75	85
-3	3/16	25	35	95	105
-4	1/4	50	65	135	150
-5	5/16	70	90	170	200
-6	3/8	110	130	270	300
-8	1/2	230	260	450	500
-10	5/8	330	360	650	700
-12	3/4	460	500	900	1000
-16	1	500	700	1200	1400
-20	1 1/4	800	900	1520	1680
-24	1 1/2	800	900	1900	2100

SAFETYING - MAINTENANCE PRACTICES

1. General

A. Safety Wire.
(1) Inconel (Uncoated), Monel (Uncoated).
(a) Inconel and monel safety wire is used for general safety wiring purposes. Safety wiring is the application of wire to prevent relative movement of structural or other critical components subjected to vibration, tension, torque, etc. Monel is to be used at temperatures up to 700℉ (370℃) and inconel is to be used at temperatures u p to 1500℉ (815℃). Safety wire can be identi fied by the color of the finish. Monel and inconel color is natural wire color.
(2) Copper is cadmium plated and dyed yellow in accordance with FED-STD 595.
(a) This wire will be used for shear and seal wiring applications. Shear applications are those where it is necessary to purposely break or shear the wire to permit operation or actuation of emergency devices. Seal applications are those where the wire is used with a lead seal to prevent tampering or use of a device without indication. Identified by the color of the finish, copper wire is dyed yellow.
(3) Aluminum Alloy (Alclad 5056), is anodized and dyed blue in accordance with FED-STD 595.
(a) This wire will be used exclusively for safety-wiring magnesium parts.

NOTE: Surface treatments which obscure visual identification of safety wire are prohibited.

(4) Inconel, monel, wire can be substituted for same diameter and length of carbon steel or corrosion-resistant wire.
(5) Wires are visually identifiable by their colors: natural for inconel and monel, yellow for copper, and blue for aluminum.

B. Cotter Pin.
(1) The selection of material shall be in accordance with temperature, atmosphere and service limitations.

2. Safety Wire

A. Wire Size.
(1) The size of the safety wire shall be in accordance with the requirements of Table 201.
(a) 0.032 inch diameter safety wire is for general purpose use; however, 0.020 inch diameter safety wire may be used on parts having a nominal hole diameter of less than 0.045 inch, on parts having a nominal hole diameter between 0.045 and 0.062 inch with spacing between parts of less than two inches, or on closely spaced screws and bolts of 0.25 inch diameter and smaller.
(b) 0.020 inch diameter copper wire shall be used for shear and seal wire applications.
(c) When employing the single wire method of locking, the largest nominal size wire for the applicable material or part which the hole will accommodate shall be used.

Table 201. Safety Wire

MATERIAL	SIZE AND NUMBER (MS20995-XXX)							
	.015	.020	.032	.040	.041	.047	.051	.091
Ni-Cu Alloy (Monel)		NC20	NC32	NC40			NC51	NC91
Ni-Cr-Fe Alloy (Inconel)		N20	N32	N40			N51	N91
Carbon Steel		F20	F32		F41	F47		F91

Table 201. Safety Wire (continued)

MATERIAL	SIZE AND NUMBER (MS20995-XXX)							
	.015	.020	.032	.040	.041	.047	.051	.091
Corrosion-Resistant Steel	C15	C20	C32		C41	C47		C91
Aluminum Alloy (Blue)		AB20	AB32		AB41	AB47		AB91
Copper (Yellow)	CY15	CY20						

3. Safety Wire Installation

A. Method (Refer to Figure 201).

CAUTION: Screws in closely spaced geometric patterns which secure hydraulic or air seals, hold hydraulic pressure, or are used in critical areas should use the double twist method of safety wiring.

(1) Single wire method of safety wiring shall use the largest nominal size wire listed in Table 201, which will fit the hole.

(2) The double twist method of safety wiring shall be used as the common method of safety wiring. It is really one wire twisted on itself several times. The single wire method of safety wiring may be used in a closely spaced, closed geometrical pattern (triangle, square, circle, etc.), on parts in electrical systems, and in places that would make the single wire method more advisable. A closely spaced pattern shall be considered a maximum of two inches between centers.

(3) Use single wire method for shear and seal wiring application. Make sure the wire is installed so that it can be easily broken when required in an emergency situation. For securing emergency devices where it is necessary to break the wire quickly, use copper only.

(4) Safety wiring by the double twist method shall be done as follows:

(a) One end of the safety wire shall be inserted through one set of safety wire holes in the bolt head. The other end of the safety wire shall preferably be looped firmly around the head to the next set of safety wire holes in the same unit and inserted through this set of safety wire holes. The "other end" may go over the head when the clearances around the head are obstructed by adjacent parts.

(b) The strands, while taut, shall be twisted until the twisted part is just short of the nearest safety wire hole in the next unit. The twisted portion shall be within 1/8 inch of the holes in each unit. The actual number of twists will depend upon the wire diameter, with smaller diameters being able to have more twists than larger diameters. The twisting shall keep the wire taut without over stressing or allowing it to become nicked, kinked or mutilated. Abrasions from commercially available twist pliers shall be acceptable.

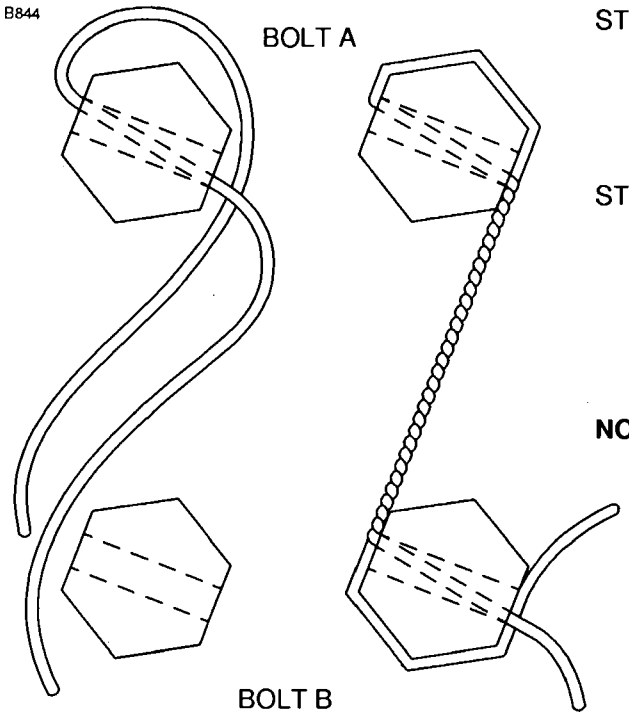
(c) The wire shall be twisted to form a pigtail of 3 to 5 twists after wiring the last unit. The excess wire shall be cut off. The pigtail shall be bent toward the part to prevent it from becoming a snag. Safety wiring multiple groups by the double twist double hole method shall be the same as the previous double twist single hole method except the twist direction between subsequent fasteners may be clockwise or counterclockwise.

B. Spacing.

(1) When safety wiring widely spaced multiple groups by the double twist method, three units shall be the maximum number in a series.

(2) When safety wiring closely spaced multiple groups, the number of units that can be safety wired by a twenty four inch length of wire shall be the maximum number in a series.

(3) Widely spaced multiple groups shall mean those in which the fastenings are from four to six inches apart. Safety wiring shall not be used to secure fasteners or fittings which are spaced more than six inches apart, unless tie points are provided on adjacent parts to shorten the span of the safety wire to less than six inches.

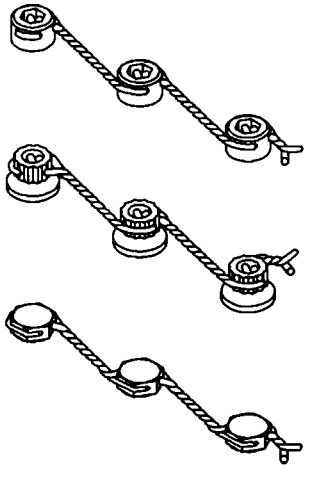


DOUBLE-WIRE SAFETYING

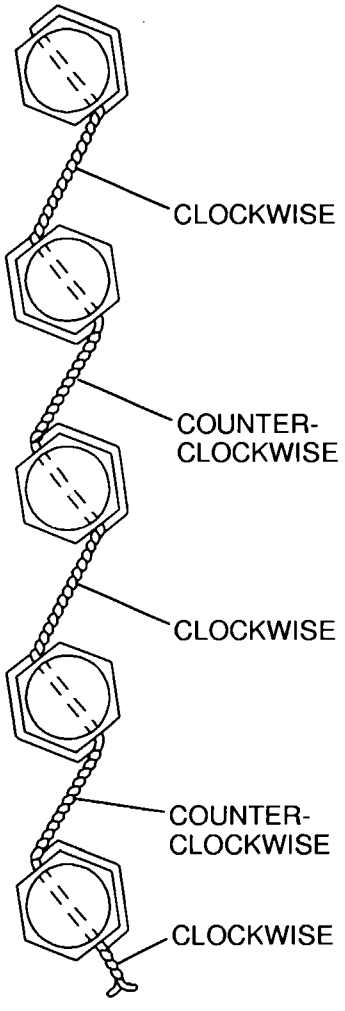
STEP 1. INSERT WIRE THROUGH BOLT A AND BEND AROUND BOLT (IF NECESSARY, BEND WIRE ACROSS BOLT HEAD). TWIST WIRES CLOCKWISE UNTIL THEY REACH BOLT B.

STEP 2. INSERT ONE END OF WIRE THROUGH BOLT B. BEND OTHER END AROUND BOLT (IF NECESSARY, BEND WIRE ACROSS HEAD OF BOLT). TWIST WIRES COUNTERCLOCKWISE 1/2 INCH OR SIX TWISTS. CLIP ENDS. BEND PIGTAIL BACK AGAINST PART.

NOTE: RIGHT THREADED PARTS SHOWN: REVERSE DIRECTIONS FOR LEFT PARTS.



MULTIPLE FASTENER APPLICATION DOUBLE TWIST - MULTIPLE HOLE METHOD.



DOUBLE-TWIST SAFETYING SINGLE HOLE METHOD

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Lockwire Safetying
Figure 201 (Sheet 1)

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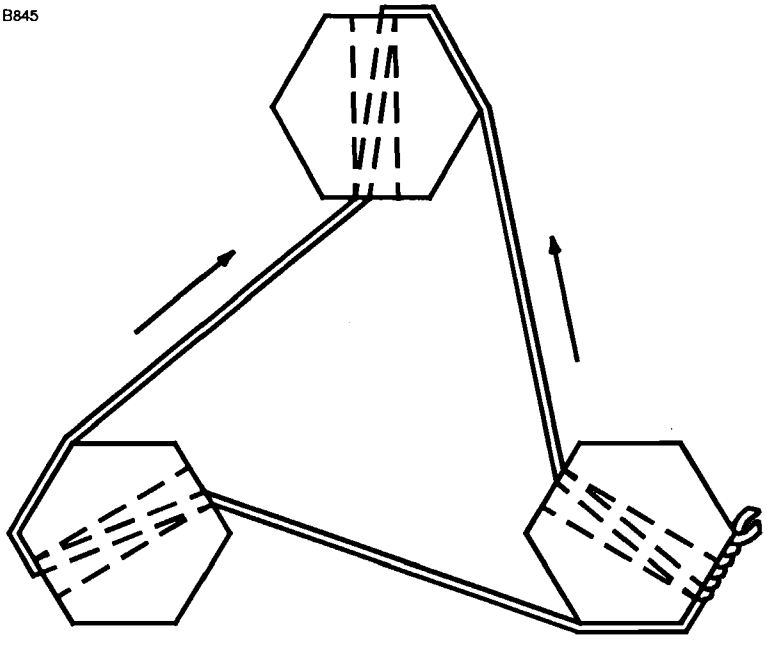
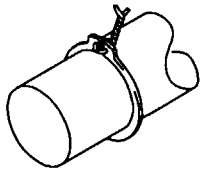
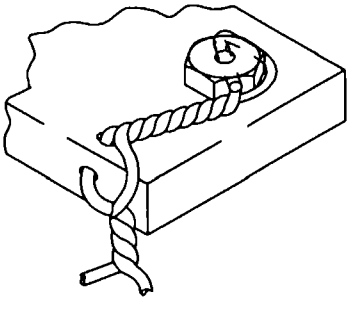


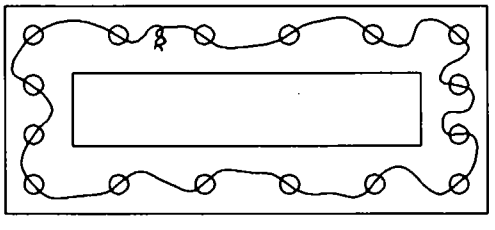
BOLTS IN CLOSELY SPACED, CLOSED GEOMETRICAL PATTERN, SINGLE WIRE METHOD



EXTERNAL SNAP RING
SINGLE-WIRE METHOD



SINGLE FASTENER APPLICATION
DOUBLE-TWIST METHOD



SMALL SCREWS IN CLOSELY SPACED, CLOSED GEOMETRICAL PATTERN, SINGLE WIRE METHOD

NOTE: RIGHT THREADED PARTS SHOWN. REVERSE DIRECTION FOR LEFT THREADS

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Lockwire Safetying
Figure 201 (Sheet 2)

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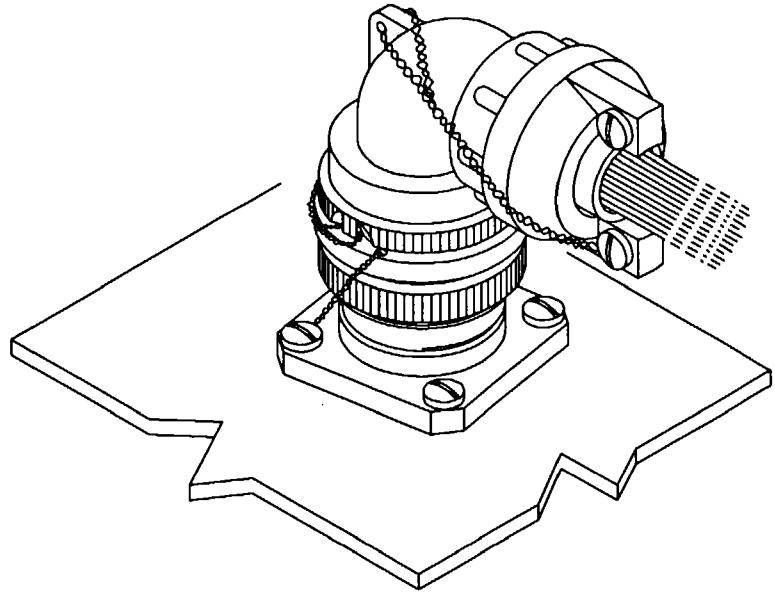

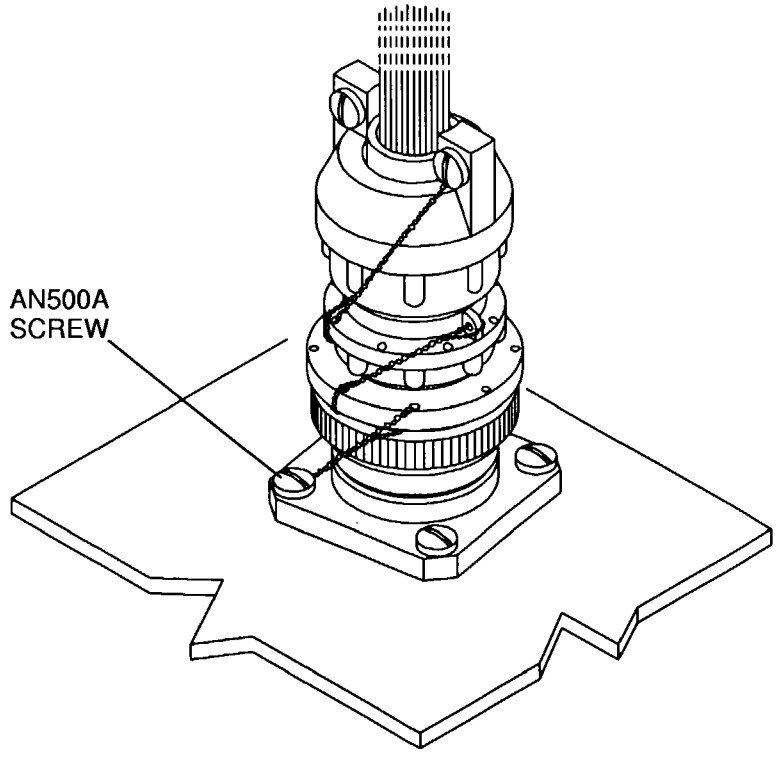

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Lockwire Safetying
Figure 201 (Sheet 3)

C. Tension.
(1) Parts shall be safety wired in such a manner that the safety wire shall be put in tension when the part tends to loosen. The safety wire should always be installed and twisted so that the loop around the head stays down and does not tend to come up over the bolt head and leave a slack loop.

NOTE: This does not necessarily apply to castellated nuts when the slot is close to the top of the nut, the wire will be more secure if it is made to pass along the side of the stud.

(2) Care shall be exercised when installing safety wire to ensure that it is tight but not over stressed.

D. Usage.
(1) A pigtail of 0.25 to 0.50 inch (3 to 5 twists) shall be made at the end of the wiring. This pigtail shall be bent back or under to prevent it from becoming a snag.
(2) Safety wire shall be new upon each application.
(3) When castellated nuts are to be secured with safety wire, tighten the nut to the low side of the selected torque range, unless otherwise specified, and if necessary, continue tightening until a slot aligns with the hole.
(4) In blind tapped hole applications of bolts or castellated nuts on studs, the safety wiring shall be as described in these instructions.
(5) Hollow head bolts are safetied in the manner prescribed for regular bolts.
(6) Drain plugs and pet cocks may be safetied to a bolt, nut or other part having a free lock hole in accordance with the instructions described in this text.
(7) External snap rings may be locked, if necessary, in accordance with the general locking principles as described and illustrated. Internal snap rings shall not be safety wired.
(8) When safety wiring is required on electrical connectors which use threaded coupling rings, or on plugs which employ screws or rings to fasten the individual parts of the plug together, they shall be safety wired with 0.020 inch diameter wire in accordance with the safety wiring principles as described and illustrated. It is preferable to safety wire all electrical connectors individually. Do not safety wire one connector to another unless it is necessary to do so.
(9) Drilled head bolts and screws need not be safety wired if installed into self-locking nuts or installed with lock washers. Castellated nuts with cotter pins or safety wire are preferred on bolts or studs with drilled shanks but self-locking nuts are permissible within the limitations of MS33588.
(10) Larger assemblies, such as hydraulic cylinder heads for which safety wiring is required but not specified, shall be safety wired as described in these instructions.
(11) Safety wire shall not be used to secure nor shall safety wire be dependent upon fracture as the basis for operation of emergency devices such as handles, switches, guards covering handles, etc., that operate emergency mechanism such as emergency exits, fire extinguishers, emergency cabin pressure release, emergency landing gear release and the like. However, where existing structural equipment or safety of flight emergency devices require shear wire to secure equipment while not in use, but which are dependent upon shearing or breaking of the safety wire for successful emergency operation of equipment, particular care shall be exercised to that wiring under these circumstances shall not prevent emergency operations of these devices.

4. Cotter Pin Installation

A. General instruction for the selection and application of cotter pins (Refer to Figure 202).
(1) Select cotter pin material in accordance with temperature, atmosphere and service limitations.
(2) Cotter pins shall be new upon each application.
(3) When nuts are to be secured to the fastener with cotter pins, tighten the nut to the low side (minimum) of the applicable specified or selected torque range, unless otherwise specified, and if necessary, continue tightening until the slot aligns with the hole. In no case shall the high side (maximum) torque range be exceeded.
(4) Castellated nuts mounted on bolts may be safetied with cotter pins or safety wire. The preferred method is with the cotter pin. An alternate method where the cotter pin is mounted normal to the axis of the bolt may be used where the cotter pin in the preferred method is apt to become a snag.

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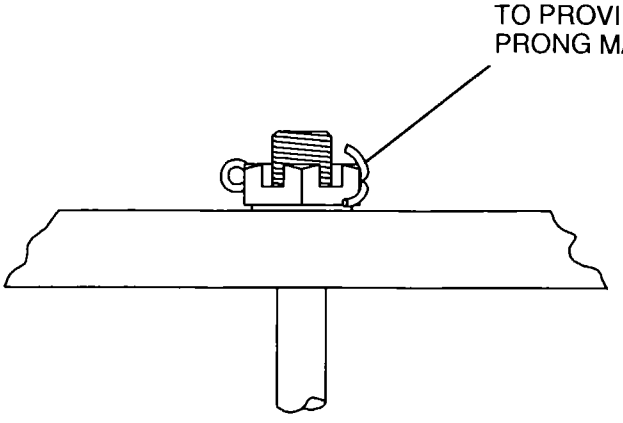
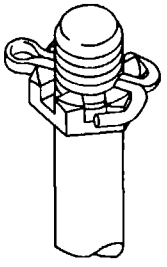
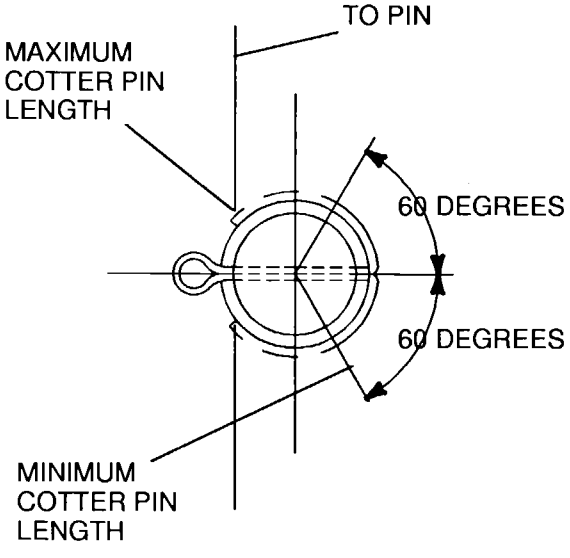


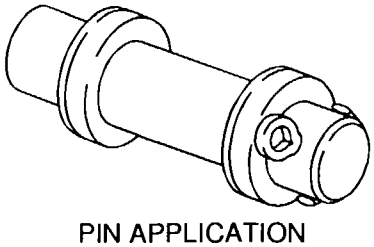
CASTELLATED NUT ON BOLT
PREFERRED METHOD



CASTELLATED NUT ON BOLT
ALTERNATE METHOD



THREAD SIZE	MINIMUM PIN SIZE (INCH)
6	0.028
8	0.044
10	0.044
1/4	0.044
5/16	0.044
3/8	0.072
7/16	0.072
1/2	0.072
9/16	0.086
5/8	0.086
3/4	0.086
7/8	0.086
1	0.086
1 1/8	0.116
1 1/4	0.116
1 3/8	0.116
1 1/2	0.116



PIN APPLICATION

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5598T1025

Cotter Pin Safetying
Figure 202 (Sheet 1)

(5) In the event of more than 50 percent of the cotter pin diameter is above the nut castellation, a washer should be used under the nut or a shorter fastener should be used. A maximum of two washers may be permitted under a nut.
(6) The largest nominal diameter cotter pin listed in MS24665, which the hole and slots will accommodate, shall be used; but in no application to a nut, bolt or screw shall the pin size be less than the sizes described in Figure 202.
(7) Install the cotter pin with the head firmly in the slot of the nut with the axis of the eye at right angles to the bolt shank, and bend prongs so that the head and upper prong are firmly seated against the bolt.
(8) In the pin applications, install the cotter pin with the axis of the eye parallel to the shank of the clevis pin or rod end. Bend the prongs around the shank of the pin or rod end.
(9) Cadmium plated cotter pins shall not be used in applications bringing them in contact with fuel, hydraulic fluid or synthetic lubricants.

5. Safetying Turnbuckles

A. Use of Locking Clips (Refer to Figure 203).
(1) Prior to safetying, both threaded terminals should be screwed an equal distance into the turnbuckle barrel, and should be screwed in, at a minimum, so no more than three threads of any terminal are exposed outside the body.
(2) After the turnbuckle has been adjusted to its locking position, with the groove on terminals and slot indicator notch on barrel aligned, insert the end of the locking clip into the terminal and barrel until the "U" curved end of the locking clip is over the hole in the center of the barrel.
(a) Press the locking clip into the hole to its full extent.
(b) The curved end of the locking clip will latch in the hole in the barrel.
(c) To check proper seating of locking clip, attempt to remove pressed "U" end from barrel hole with fingers only.

NOTE: Do not use a tool as the locking clip could be distorted.

(3) Locking clips are for one time use only and should not be reused.
(4) Both locking clips may be inserted in the same hole of the turnbuckle barrel or in opposite holes of the turnbuckle barrel.

B. Use of Safety Wire (Refer to Figure 204).
(1) Some turnbuckles use safety wire. For more information, refer to Federal Publication AC 43-13.1B, Safety Methods For Turnbuckles.

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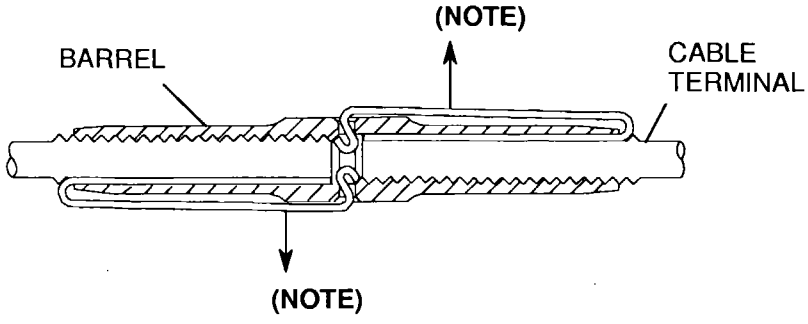
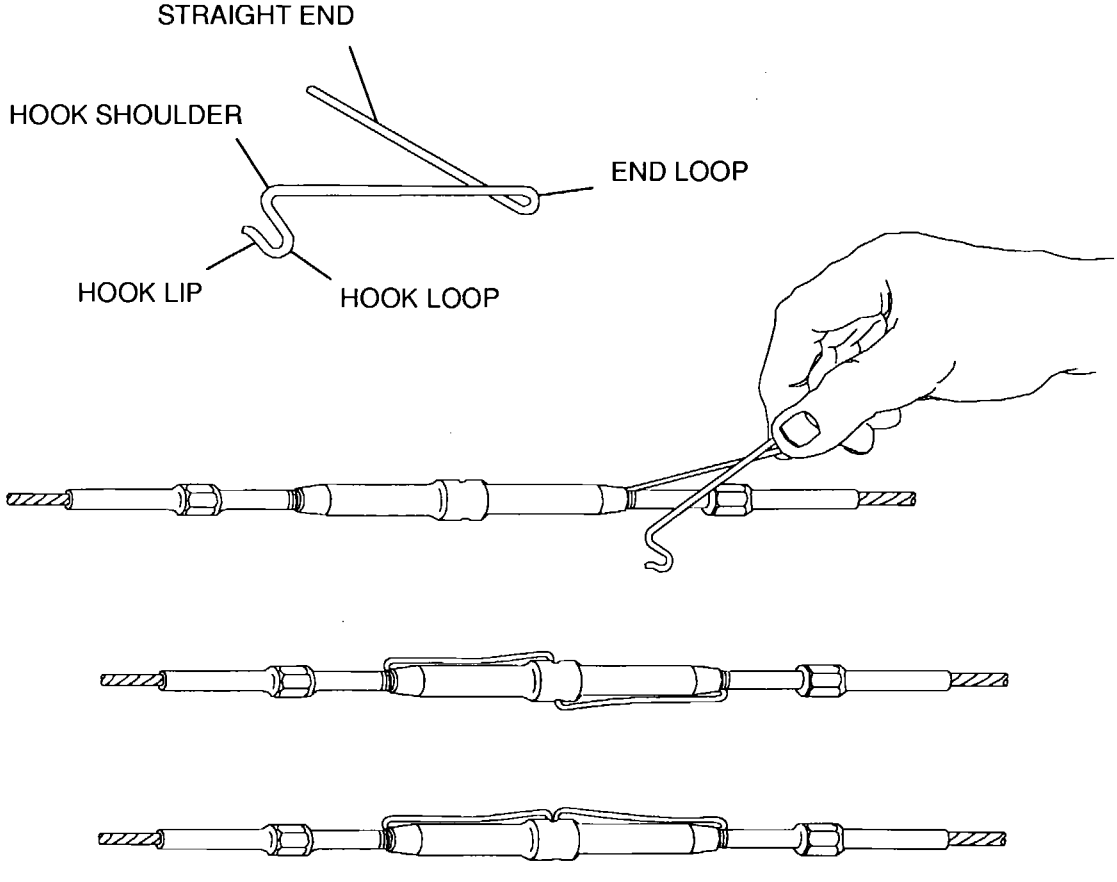


NOTE: PULL WITH YOUR FINGERS FOR AN INSPECTION TO MAKE SURE THE CLIP WILL NOT COME OUT.



SAFETY CLIP INSTALLATION

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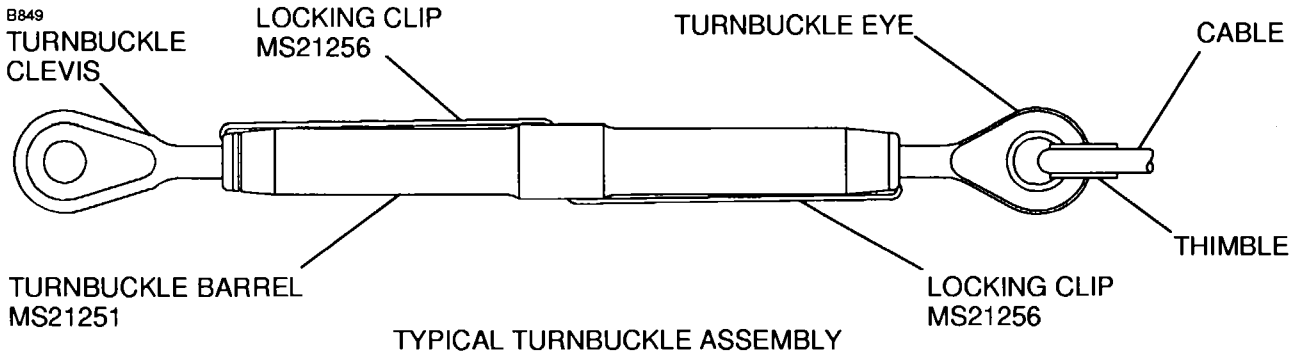
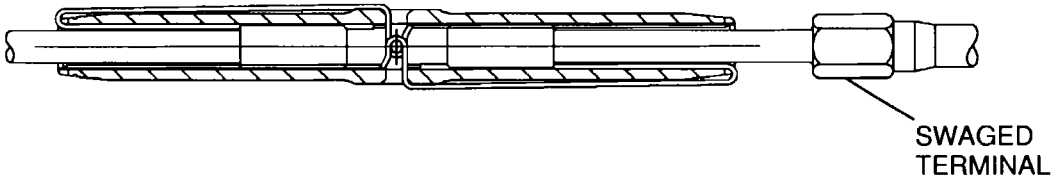
Safetying Turnbuckle Assemblies
Figure 203 (Sheet 1)



TYPICAL TURNBUCKLE ASSEMBLY



METHOD OF ASSEMBLING LOCKING CLIPS, TURNBUCKLE BARREL AND TERMINALS

NOMINAL CABLE DIAMETER	THREAD UNF-3	LOCKING CLIP MS21256 **(NOTE 1)**	TURNBUCKLE BODY MS21251
1/16	No. 6-40	-1	-2S
3/32	No. 10-32		-3S
		-2	-3L
		-1	-4S
1/8		-2	-4L
5/32	1/4-28	-1	-5S
		-2	-5L
			-6S
3/16	5/16-24	-1	-6L
7/32			-7L
1/4	3/8-24	-2	-8L
9/32	7/16-20		-9L
5/16	1/2-20	-3	-10L

NOTE 1: TWO LOCKING CLIPS REQUIRED FOR EACH TURNBUCKLE.

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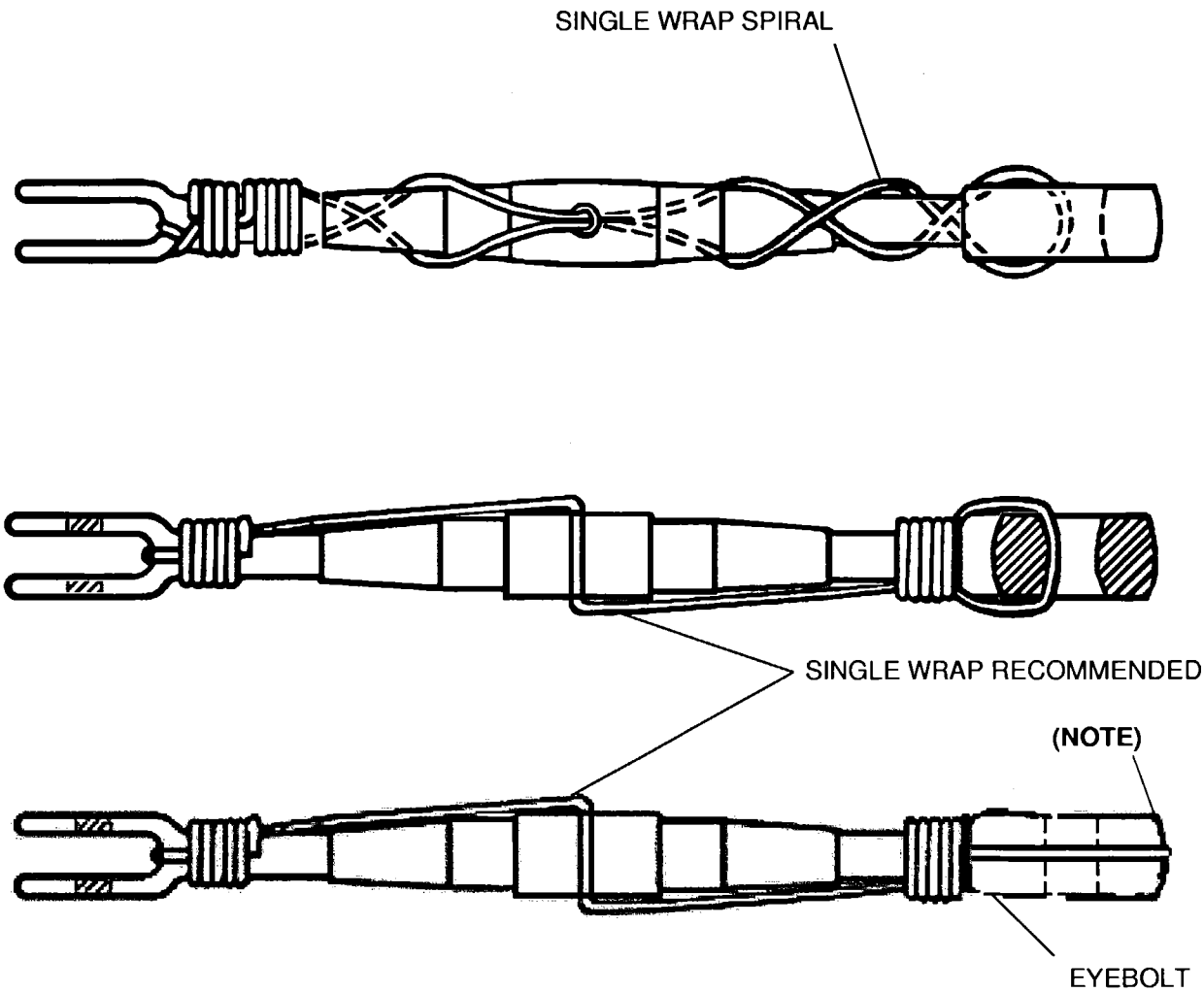
Safetying Turnbuckle Assemblies
Figure 203 (Sheet 2)

B2495



NOTE: IF THERE IS NO SAFETY WIRE HOLE TO USE, PUT THE SAFETY WIRE AROUND THE CIRCUMFERENCE OF THE EYEBOLT

A0714R1047

Safetying Turnbuckle Assemblies
Figure 204 (Sheet 1)

CONTROL CABLE WIRE BREAKAGE AND CORROSION LIMITATIONS - MAINTENANCE PRACTICES

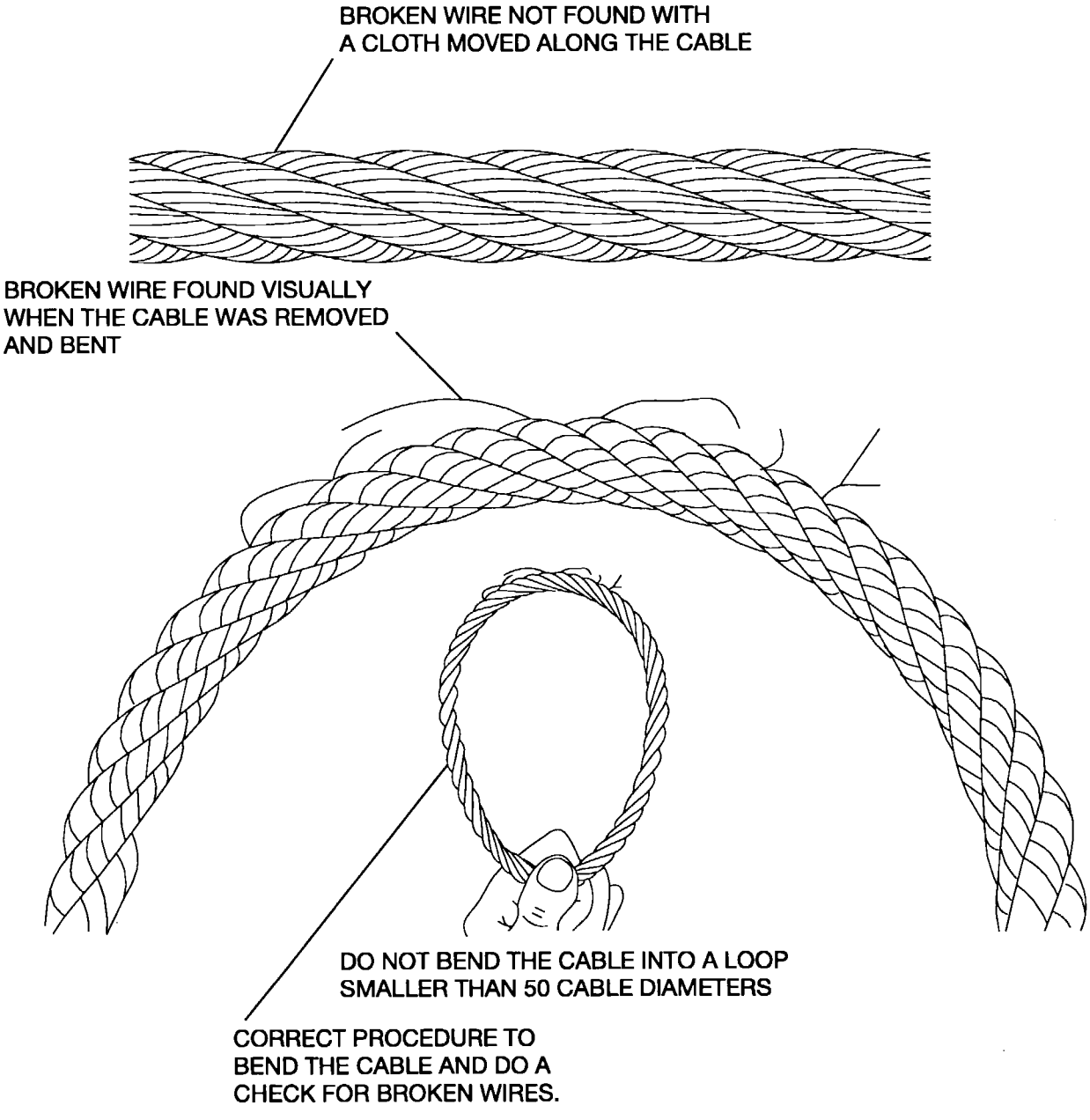
1. Examination of Control Cables.

A. Control cable assemblies are subject to many environmental conditions and forms of deterioration. Some deterioration, such as wire or strand breakage, is easy to identify. Other deterioration, such as internal corrosion or cable distortion, is harder to identify. The information that follows will help to find these cable conditions.

B. Broken Wire Examination (Refer to Figure 201).
   (1) Move a cloth along the length of the cable to examine for broken wires. This will find broken wires, if the cloth catches on the cable. Very important areas for wire breakage are those sections of the cable that pass through fairleads, across rub blocks, and around pulleys. If the cloth does not catch on any part of the cable, no more inspection is necessary. If the cloth catches on the cable or if it is thought that there are broken wires, a more detailed inspection is necessary. It is necessary that the cable be bent in a loop to make sure that there are broken wires. Loosen or remove the cable so that it can be bent in a loop as shown. While the cable is turned, examine the bent area for broken wires.
   (2) Wire breakage criteria for cables in the flap, aileron, rudder, and elevator systems are as follows:
      (a) Individual broken wires at random locations are permitted in primary and secondary control cables when there are no more than six broken wires in any 10 inches of the cable length.

C. Corrosion.
   (1) Carefully examine any cable for corrosion that has a broken wire in a section that does not touch wear-producing airframe components, such as pulleys, fairleads, or rub blocks. It can be necessary to remove and bend the cable to correctly examine it for internal strand corrosion, as this condition is usually not found on the outer surface of the cable. Replace the cable if internal corrosion is found. If the corrosion-preventative lubricant is removed from the cable and the metal is brighter than usual, examine the cable carefully for corrosion. For a description of control cable corrosion, refer to Chapter 51, Corrosion - Description and Operation.

B850



5561T1119

Cable Broken Wire Examination
Figure 201 (Sheet 1)

SOLVENTS, SEALANTS, AND ADHESIVES - DESCRIPTION AND OPERATION

1. General

A. Solvents, sealants and adhesives are composed of a group of chemicals that often prove toxic. Anyone engaged in maintenance, repair and operation of airplane and airplane accessories may be exposed to these chemicals.

B. To help avoid the effects of these toxic substances, work only in a clean, well-lighted and well-ventilated area. Rubber gloves and protective clothing should be worn. Avoid breathing spray vapors as they are highly toxic.

C. When working with toxic substances, always be alert for symptoms of poisoning. If symptoms are observed, immediate removal of the victim from the contaminated area is most important.

2. Description

A. For clarification, the description of solvents, sealants and adhesives are presented in individual paragraphs.
   (1) Solvents.
      (a) Solvents are composed of chemicals which are capable of dissolving other materials and are primarily used as a cleaning agent. Solvent cleaning should be used when it is not practical to clean parts by vapor degreasing or immersion in chemical cleaners.
   (2) Sealants.
      (a) Sealants are composed of chemical compounds which are primarily used as a seal against the passage of air and liquids. Classification of sealants are categorized by type according to their application.
   (3) Adhesives.
      (a) Adhesives are composed of a mixture of chemicals which make an adherent that is primarily used for bonding like or unlike materials, and are classified according to their application.

ACCEPTABLE REPLACEMENTS FOR CHEMICALS AND SOLVENTS - DESCRIPTION AND OPERATION

1. General

A. In response to the Aerospace National Emissions Standards for Hazardous Air Pollutants (NESHAP), this data is issued to tell customers of acceptable alternatives for chemicals and solvents in the Maintenance Manual that have been restricted or prohibited by the standards.

B. For complete details of the regulatory standards, refer to Federal Register, 40 CFR Part 63 (Ad-FRL-5636-1), RIN 2060-AG65.

C. Compliance with the standard is mandatory by September 1, 1997.

2. Hand-Wipe Cleaning Operations

NOTE: All hazardous air pollutants (HAP) or volatile organic compounds (VOC) hand-wipe solvents that clean, must meet a composition requirement, have a vapor pressure less than or equal to 0.87 psi at 68℉ (6 kPa at 20℃), or meet the requirements speci fied in an alternative compliance plan administered by the authority that permits and approved under Section 112 (1) of the Clean Air Act.

Table 1. Replacement Products for Hand-Wipe Cleaning Operation

SURFACE	APPROVED PRODUCT/ NUMBER	SUPPLIER ADDRESS
All Metals and Painted Surfaces	Methyl n-propyl ketone (CAS No. 107-87-9)	Eastman Chemical Products Wilcox Dr. And Lincoln St. Kingsport, TN
	Desoclean 110 (020K19)	Courtaulds Aerospace Glendale, CA 91203
	DS108	Dynamold Solvents, Incorporated 2905 Shamrock Ave. Fort Worth, TX 76107
All Plastics (Except Windows and Windshields)	Isopropyl Alcohol (TT-I-735)	Available Commercially
All Rubber (Natural or Synthetic) and Silicone	Isopropyl Alcohol (TT-I-735)	Available Commercially

3. Priming Operations

NOTE: Priming operations cannot be more than the maximum Hazardous Air Pollutant (HAP) limit of 2.9 lb./Gallon (350 Grams/Liter) (less water) per application. Priming operations cannot be more than the volatile organic compounds (VOC) limit of 2.9 lb./Gallon (350 Grams/Liter) (less water and exempt solvents) per application. Compliance of this limit can be completed through the use of layers that are less than the content limits, or with a monthly volume-weighted average to meet content limits.

Table 2. Replacement Products for Priming Operations

PRIMER APPLICATION	APPROVED PRODUCT/ NUMBER	SUPPLIER ADDRESS
Corrosion Primer (Notes 1,4)	Corrosion Primer (513 X 419) (910 X 942)	Courtaulds Aerospace 1608 Fourth St. Berkeley, CA 94710
	Corrosion Primer (02-Y-40) (02-4-40 CATA)	DEFT, Inc. 17451 Von Karman Ave. Irvine, CA 92714
	Corrosion Primer (U-1201F/U-1202F)	Sterling Lacquer Mfg. 3150 Brannon Ave. St. Louis, MO 63139
	Corrosion Primer R4001-K14 MAX COR	U.S. Paint Corp. 831 S. 21st St. St. Louis, MO 63103
Fuel Bay Primer (Notes 2, 4)	Fuel Bay Primer (10P30–5)	Dexter Crown Metro Aerospace East Water St. Waukegan, IL 60085
Pretreatment Primer (Notes 3, 4)	Pretreatment Primer (728-013/702-701)	Pratt & Lambert Industrial Coatings 630 E. 13th St. Andover, KS 67002

NOTE 1: Any primers which meet MIL-PRF-23377G or later requirements may be used.

NOTE 2: This primer is restricted to the fuel bay area.

NOTE 3: Any pretreatment primers that meet DOD-P-15328 can be used.

NOTE 4: Specific application techniques must be used. If an alternative is necessary, it can only be used if the missions are less than or equal to HVLP or electrostatic spray application techniques. All application equipment must be operated according to the manufacturer's specifications, company procedures, or locally specified operating procedures.

4. Topcoat Operations

NOTE: Topcoat operations cannot be more than the maximum Hazardous Air Pollutant (HAP) limit of 3.5 lb./Gallon (420 Grams/Liter) (less water) per application. Topcoat operations cannot be more than the volatile organic compounds (VOC) limit of 3.5 lb./Gallon (420 Grams/Liter) (less water and exempt solvents) per application. Compliance of this limit can be completed through the use of layers that are less than the content limits, or by the monthly volume-weighted average to meet content limits. Topcoats that meet the requirements of MIL-C-85285 can also be used.

Table 3. Replacement Products for Topcoat Painting Operations

TOPCOAT APPLICATION	APPROVED PRODUCT/ NUMBER	SUPPLIER ADDRESS
Basecoat (Note 4)	830 Series High Solids Acry Glo	Pratt & Lambert
	Low VOC Enamel	Sterling Lacquer Mfg.
	24-F 20 Series	Dexter Crown Metro Aerospace
Paint Stripes (Note 4)	Low VOC Acrylic 830 Series	Pratt & Lambert

5. Paint Stripping Operations

NOTE: Unless exempted, no organic Hazardous Air Pollutant (HAP) are to be emitted from chemical strippers or solvents. Use of organic HAP materials for spot stripping and decal removal is limited to 190 pounds per airplane per year.

Table 4. Replacement Products for Paint Stripping Operations

APPLICATION	APPROVED PRODUCT/ NUMBER	SUPPLIER ADDRESS
Chemical Stripping	Turco T-6776 LO	Turco Products, Inc. Westminster, CA 92684
Mechanical Stripping (Note 5)	180 Grit or finer	Available Commercially

NOTE 5: Mechanical and hand-sanding operations are exempt from these requirements.

GENERAL SOLVENTS/CLEANERS - MAINTENANCE PRACTICES

1. General

A. Solvents are used in a wide range of cleaning activities and selected solvents can be used in the removal of oil, grease and dirt from objects without harm to metal, plastics or elastomeric parts. Refer to Tools, Equipment and Materials.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the following items.

NAME	NUMBER	MANUFACTURER	USE
Detergent		Commercially available	General cleaning.
ScotchBrite Pads	Type A	Minnesota Mining and Mfg. Co. 3M Center St. Paul, MN 55101	Light abrasion of metal surfaces.
Sandpaper	320 Grit	Commercially available	Light abrasion of metal surfaces.
Rymple Cloth		Commercially available	Wiping and applying cleaning agents.
Wiping cloth white, oil free, absorbent		Commercially available	Wiping and applying cleaning agents.

3. Safety Precautions

A. Solvents are composed of a group of chemicals that often prove toxic. Anyone engaged in maintenance, repair and operation of airplane and airplane accessories may be exposed to these chemicals.

B. To help avoid the effects of these toxic substances, work only a clean, well-lighted and well-ventilated area. Rubber gloves and protective clothing should be worn. Avoid breathing spray vapors as they are highly toxic.

C. When working with toxic substances, always be alert for symptoms of poisoning. If symptoms are observed, immediate removal of the victim from the contaminated area is most important.

4. Description

A. Solvents exhibit a selective solvent action which permits its use in the removal of oil, grease or dirt. For selection of proper solvent, refer to Table 201. For the cleaning of metal, plastics or rubber, proceed as follows:

(1) Metal.

NOTE: Prior to bonding or priming, lightly abrade surface with either a ScotchBrite pad or sandpaper prior to cleaning.

(a) Wipe off all excess oil, grease or dirt from surface.
(b) Apply solvent to a clean cloth by pouring solvent on the cloth from a safety can or other approved container. The cloth should be well saturated but not to the point of dripping.
(c) Wipe the surface with the moistened cloth as required to dissolve or loosen soil. Work on small enough area so the surface being cleaned remains wet.
(d) With a clean dry cloth, immediately wipe the surface while the solvent is still wet. Do not allow the surface to evaporate dry.
(e) Repeat steps (b) through (d) until there is no discoloration on the drying cloth.

(2) Plastic or Rubber.

NOTE: If cleaning a bonding surface, lightly abrade the bonding surface with sandpaper prior to cleaning.

(a) Remove heavy soil from surface by washing with a water detergent solution.
(b) Apply solvent to a clean cloth by pouring solvent onto cloth from a safety can or other approved container. The cloth should be well saturated but not to the point where dripping.
(c) Wipe the surface with the moistened cloth as required to dissolve or loosen soil. Work on a small enough area so that the surface being clean remains wet.
(d) Using a clean dry cloth, immediately wipe the surface while the surface is still wet. Do not allow the surface to evaporate dry.
(e) Repeat steps (b) through (d) until there is no discoloration on the drying cloth.

Table 201. General Solvents

CLEANER/ SOLVENT	FED-ERAL SPECIFI-CATION	TYPE CLASSIFI-CATION	USE/ DESCRIPTION FUNCTION	CAUTION/ WARNING
Dry	MIL-PRF-680	Type I -100℉ Type II -140℉	General cleaning solvent. Dry cleaning of textile materials. Grease removal.	FLAMMABLE.
Methyl-n Propyl Ketone			Paint and adhesive thinner, cleaning agent.	FLAMMABLE.
Isopropyl Alcohol	TT-I-735	Grade B -0.4% water	For use with organic coatings and as an anti-icing fluid. General Solvent for synthetic rubbers.	USE DISCRIMINATELY WITH ACRYLIC PLASTICS.
Wax, Airplane, Waterproof Solvent Type	MIL- W-18723C		A waterproof wax that can be dissolved or dispersed with an organic solvent.	DO NOT USE SOLVENTS THAT MAY DAMAGE PAINT OR FINISH FOR REMOVAL OF WAX.

INTERIOR AND EXTERIOR FINISH - CLEANING/PAINTING

1. General

A. Interior and exterior finish cleaning/painting consists of general information and instructions for applying chemical film treatments, primer and topcoats to the airplane.

2. Interior and Exterior Finishes

A. Detail aluminum parts are chemically pretreated and epoxy primed prior to assembly. The chem-film pretreatment and the epoxy primer are primary coatings and must be maintained and preserved for corrosion control. Exterior assemblies that are to be topcoated receive ScotchBrite, hand solvent cleaning and another overall application of epoxy primer. The airplane exterior then receives an overall topcoat of polyurethane paint.

CAUTION: All plastic and fiberglass parts, except bushings, bearings, grommets and certain purchased antenna covers which are not colored or painted, shall be colored or painted to match adjacent surface. The head of the pitot tube must be open and free from paint and other foreign objects. The surface adjacent to static port must be smooth and free from all paint imperfection. Do not paint pitot tube, fuel caps, trim tab pushrods where they operate in an actuator, oleo strut sliding surfaces, standard polished spinners, exhausts stall warning vanes, chromed items (handles, locks, etc.) or the tie-down lugs or light lens. Paint the landing gear barrels and torque links to match the overall color.

3. Paint Facility

A. Painting facilities must include the ability to maintain environmental control of temperature at a minimum of 65℉ (18℃). All paint equipment must be clean. Ac curate measuring containers should be available for mixing protective coatings. Use of approved respirators while painting is a must for personal safety. All solvent containers should be grounded to prevent static buildup. Catalyst materials are toxic, therefore, breathing fumes or allowing contact with skin can cause serious irritation. Material stock should be rotated to allow use of older materials first, because its useful life is limited. All supplies should be stored in an area where temperature is higher than 50℉ (10℃), but lower than 90℉ (32℃). Storage at 90℉ (32℃) is allowable f or no more than sixty days, providing it is returned to room temperature for mixing and use.

(1) Areas in which cleaning or painting are done shall have adequate ventilation and shall be protected from uncontrolled spray, dust, or fumes.
(2) Areas for prolonged storage of cleaned parts and assemblies awaiting painting shall be free from uncontrolled spray, dust, or fumes, or else positive means of protecting part cleanliness such as enclosed bins or wrapping in kraft paper shall be provided.
(3) Areas in which cleaning or painting are done shall be periodically cleaned and dusted.
(4) Compressed air used for dusting and paint spraying shall be free from oil, water and particulate matter.

4. Sanding Surfacer

A. Purpose and Requirements.

(1) Surfacer is applied over fiberglass and Kevlar assemblies to provide aerodynamic contour, smoothness and to seal porous surfaces. Application of surfacer also provides a good surface for a polyurethane finish.
(2) The objective of a surfacer is to fill local depressions, pits, pin holes and other small surface defects so a smooth surface is obtained for paint. The total surfacer thickness shall not be greater than 15 mils (0.38 mm). Only enough surfacer shall be applied to obtain a smooth surface for paint. If less thickness will provide a smooth surface, this is better. A thick layer of surfacer is less flexible and may crack in service.

(3) To complete the airplane's polyurethane finish over surfacer, begin by applying the intermediate coat. Apply topcoat (polyurethane enamel) using same procedure.
(4) Should a repair be required (cracked or chipped paint) to areas where surfacer is applied, sanding surfacer should be removed to expose fiberglass or Kevlar. It may be necessary to remove all sanding surfacer on that individual assembly and/or component to obtain a satisfactory finish. For additional information, refer to Cleaning.
(5) Sanding surfacer methods.
(a) Do not intermix vendor material or substitute material. Also, do not substitute instructions. Select and use one vendor's material and use the corresponding instructions.

B. Cleaning.

CAUTION: Do not use chemical strippers on plastic, fiberglass, Kevlar and graphite composite assemblies. Paint stripper solvent will damage these assemblies.

CAUTION: Sanding of paint and/or sanding surfacer must be very carefully accomplished. Do not sand into the fabric layers of composite assemblies as this will result in loss of strength.

(1) Remove paint covering sanding surfacer by sanding. Paint should be removed well beyond damaged area. For best results, it is recommended to remove all paint covering sanding surfacer of that individual composite component.
(2) Remove sanding surfacer by sanding from individual component to expose fabric.
(3) Scuff sand area to be refinished with 320 grit paper. Do not over expose fabric.
(4) Clean surface with Methyl n-Propyl Ketone. Follow manufacturer's instructions for final cleaning prior to sanding surfacer application.

5. Paint Stripping

A. Mechanical Stripping
(1) Mechanical methods of stripping include power sanding with a disc or jitterbug type sander, grinder, hand sanding, and wire brushing.
(a) Ensure mechanical methods do not damage surfaces being stripped. Damage may include, but is not limited to, cutting fibers of composite structures or scratches in the surface of metallic surfaces.

CAUTION: Do not use low carbon steel brushes on aluminum, magnesium, copper, stainless steel or titanium surfaces. Steel particles may become embedded in the surfaces, and later rust or cause galvanic corrosion of the metal surfaces.

(2) Mechanical stripping must be used for stripping composite or plastic surfaces.
(3) Mechanical stripping is recommended for surfaces which might entrap chemical strippers and result in corrosion.
(4) Mechanical stripping is required for painted surfaces masked during chemical stripping.

B. Chemical Stripping.

WARNING: All paint strippers are harmful to eyes and skin. All operators should wear goggle-type eyeglasses, rubber gloves, aprons and boots. In case of contact with skin, flush with water. In case of contact with eyes, flush eyes thoroughly with water and consult physician immediately. Paint stripping should be done in a well ventilated area.

CAUTION: Use of a heater with an open flame in an area in which stripping with a methylene chloride type stripper is used produces hydrochloric acid fumes. If acid is deposited on airplane it will corrode all surfaces.

(1) Thoroughly clean airplane surfaces to remove all grease and other dirt which might keep stripping agent from attacking paint.
(2) All seams and joints must be protected by applying a tape, resistant to strippers, to every joint to prevent stripping chemicals from entering the skin joints. Chemicals used for stripping polyurethane paint are very difficult to remove from joints, and may promote corrosion or deteriorate bonding agents used in assembly of airplane.
(3) Mask following surfaces using plastic sheeting or waxed paper and plastic tape so as to make a safety margin of at least one-half inch (13 mm) between protected surface and surface to be stripped.

NOTE: Do not use masking tape.

(a) Mask all windows and transparencies.

CAUTION: Acrylic windows may be softened or otherwise damaged by paint stripper, solvent or paint. Use water and grease-proof barrier material and polyethylene coated tape to protect windows.

1 Place barrier material over window and seal around periphery with polyethylene backed masking tape.
2 Cut second sheet of barrier material an inch (26 mm) or more larger than window.
3 Place second sheet of barrier material over window and seal with polyethylene tape.

(b) Mask all rubber and other non metals.
(c) Composites if possible, shall be removed from airplane prior to stripping.
(d) Mask all pivots, bearings and landing gear.
(e) Mask all skin laps, inspection holes, drain holes, or any opening that would allow stripper to enter airplane structure.

CAUTION: Do not allow paint stripper to contact main landing gear springs or high heat treated steel pins, such as pins attaching landing gear components. Paint strippers may induce hydrogen embrittlement in high heat treated steel.

(4) Apply approved stripper by spray or brush method.

WARNING: Use normal safety precautions when using flammable materials during cleaning and painting procedures.

WARNING: Paint stripper solution is harmful to eyes and skin. Wear goggles, rubber gloves, apron and boots when working with paint stripper. Also wear appropriate respirator when applying "spray-on" strippers. The chemical supplier bulletins and instructions should be closely followed for proper mixing of solution, application methods and safety precautions.

(a) If using spray method, apply a mist coat to area to be stripped, then when paint begins to lift, apply a second heavy coat.
(b) If applying with brush, brush across the surface only once, in one direction.

(5) Allow stripper coating to lay on the surface until paint lifts.
(6) After paint begins to lift, use a propylene bristle brush to agitate stripper to allow deeper penetration of stripper.
(7) Remove lifted paint with a plastic squeegee. Dispose of residue in accordance with local regulations.
(8) Inspect all surfaces for incomplete paint removal.
(a) Repeat previous procedural steps as necessary until all paint is removed.
(9) After stripping airplane, thoroughly rinse to remove any stripping residue.
(10) Remove tape applied to protect joints and other masked areas.
(11) Carefully remove remaining paint at skin joints and masked areas by sanding with a hand or orbital type sander.

NOTE: Do not sand rivet heads.

(12) If necessary to remove paint from inside skin joints, refer to Cleanout of Skin Joints.
(13) If corrosion is encountered, refer to Chapter 51, Corrosion - Description and Operation for corrosion treatment.

C. Cleanout of Skin Joints.
(1) Install a surface conditioning disc on a pneumatic drill.
(2) Taper edge of disc to an edge which will allow edge to fit into skin joint seam.
(a) Run disc against a piece of coarse abrasive paper or a mill file until edge is tapered.

CAUTION: Excessive pressure or dwell time will cause scratches or grooves in metal. Ensure doubler at bottom of joint is not damaged or gouged in any way by this process.

(3) Using tapered surface conditioning disc, remove paint and other material from joint seams.
(4) Carefully, and using as low speed as possible, remove paint and all other material from joint.

NOTE: Surface conditioning disc will wear rapidly, it will be necessary to resharpen (retaper) disc frequently.

6. Hand Solvent Cleaning

WARNING: Work in a well ventilated area free from sources of ignition. Use only approved solvents and materials.

CAUTION: Airplane shall be grounded during solvent wipe.

A. Surface Cleaning.
   (1) Apply solvent to a clean wiping cloth by pouring from a safety can or other approved container. The cloth should be well saturated with solvent. Avoid dipping wipers into open solvent containers as this contaminates the solvent.
   (2) Wipe the surface with the wet cloth as required to dissolve or loosen soils. Work on a small enough area so that the area being cleaned remains wet with solvent.
   (3) With a clean dry cloth, immediately wipe dry the area being cleaned. Do not allow the surface to evaporate dry.
   (4) Repeat steps (1) through (3) as required and change cloths often.

7. Maintenance of the Interior and Exterior Primary Coatings and Topcoat

A. Rework and repair primary coatings on airplane interior and exterior surfaces for protection and corrosion control.
   (1) Minor scratches or defects, which do not penetrate the epoxy primer or which penetrate the primer and expose bare metal, with the total area of exposed bare metal less than the size of a dime, touch up as follows:
      (a) Hand solvent clean and sand with 320 grit or finer sandpaper.
      (b) Clean with compressed air, hand solvent clean again, then wipe with a tack rag.
      (c) Mix and reapply epoxy primer (MIL P-23377 or equivalent) as directed by the primer manufacturer or supplier.
      (d) On a properly prepared surface, mix and apply polyurethane topcoat as directed by the paint manufacturer or supplier.
   (2) Major defects which expose bare metal to an area larger than the size of a dime, touch up as follows:
      (a) Hand solvent clean and sand with 320 grit or finer sandpaper.
      (b) Clean with compressed air, hand solvent clean again, then wipe with a tack rag.
      (c) Apply a spray wash primer or (preferred method) brush chem film primer. Mask the area to minimize the amount of primer from spreading over the existing epoxy primer. Let cure according to the product manufacturers recommendations.
      (d) Mix and apply epoxy primer (MIL P-23377 or equivalent) to the affected area within four hours.
      (e) If an exterior painted surface, mix and apply polyurethane topcoat as directed by the paint manufacturer or supplier.

FUEL, WEATHER, AND HIGH-TEMPERATURE SEALING - MAINTENANCE PRACTICES

1. General

A. Procedures for application of sealants are given for various types of sealing required for the airplane.

2. Tools and Equipment

NOTE: Specified sealants, solvents that clean, parting agents, adhesion inhibitors and equipment are listed for use. Acceptable alternatives can be used to seal equipment only.

SEALANTS TYPE I, CLASS A-1/2, OR A-2 - AMS-S-8802

NAME	NUMBER	MANUFACTURER	USE
Sealants	GC-408	Goal Chemical Sealant Corp. 3137 East 26th Street Los Angeles, CA 90023	Fuel, pressure and weather sealant brush application.
	Pro-Seal 890	PRC-DeSoto International 5426 San Fernando Rd. Glendale, CA 91209	
	PR-1422	PRC-DeSoto International	
	PR-1440	PRC-DeSoto International	
	MC-236	Morton Aerospace Polymer Systems 9341 Anaconda Ave Garden Grove, CA 92641	

SEALANTS TYPE I, CLASS B-1/4, QUICK REPAIR - MIL-S-83318

NAME	NUMBER	MANUFACTURER	USE
Sealant	GC-435	Goal Chemical Sealant Corp.	Fuel, pressure and weather sealant. For limited repairs requiring rapid curing sealant.

SEALANTS TYPE I, CLASS B-1/2, B-2 OR B-4 - AMS-S-8802

NAME	NUMBER	MANUFACTURER	USE
Sealants	GC-408	Goal Chemical Sealant Corp.	Fuel, pressure and weather sealant spatula, faying seals application.
	Pro-Seal 890	PRC-DeSoto International	
	PR-1422 Class B-1/2 Class B-2	PRC-DeSoto International	
	PR-1440 Class B-2 Class B-4	PRC-DeSoto International	
	PR-1826	PRC-DeSoto International	
	MC-236	Morton Aerospace Polymer Systems	

SEALANTS TYPE I, CLASS C-20, C-48 OR C-80

NAME	NUMBER	MANUFACTURER	USE
Sealant	Pro-Seal 890	PRC-DeSoto International	Fuel, pressure and weather sealant. Suitable for faying surface sealing.

SEALANTS TYPE IV

NAME	NUMBER	MANUFACTURER	USE
Sealant	Dapco 2100	D - Aircraft Inc. Anaheim, CA 92807	Firewall and wire bundle sealing.
	Pro Seal 700	PRC-DeSoto International	Firewall sealing (except wire bundles).
	Q3-6077	Dow Corning	Wire bundle firewall sealing.

SEALANTS TYPE VI

NAME	NUMBER	MANUFACTURER	USE
Sealant	FA-0606 125	HB Fuller St. Paul, MN 55116	Water and weather-tight acrylic latex sealant for windows and metal lap joints.
Sealant	SM8500	Schnee-Moorehead Irving, TX 75017	Water and weather-tight acrylic latex sealant for windows and metal lap joints.

SEALANT TYPE VIII

NAME	NUMBER	MANUFACTURER	USE
Sealant	PR-1428 Class B2	PRC-DeSoto International	Used in areas for access.
	PR-1081 Class B2	PRC-DeSoto International	

SEALANT TYPE XI

NAME	NUMBER	MANUFACTURER	USE
Sealant	U000927S	Available from Cessna Parts Distribution Cessna Aircraft Company Department 701 5800 E. Pawnee Rd. Wichita, KS 67218-5590	Permanently pliable extruded tape for fixed windows.

CLEANING SOLVENTS

NAME	NUMBER	MANUFACTURER	USE
Desoclean 110, 020k019		Commercially Available	Presealing cleaning.
Methyl-n Propyl Ketone		Commercially Available	Cleaning organic coating.
Isopropyl alcohol	Federal Specification TT-I-735	Commercially Available	Cleaning plastic transparencies.

PARTING AGENTS

NAME	NUMBER	MANUFACTURER	USE
Silicone compound	AS 8660	Commercially available	Prevent sealant sticking.
Petrolatum technical	Federal Specification VV-P-236	Commercially available	Prevent sealant sticking.

EQUIPMENT

NAME	NUMBER	MANUFACTURER	USE
Pneumatic sealing gun.	Semco Number 250 with accessories (or equivalent)	PRC-DeSoto International	Injection sealing.
Hand-operated sealing gun	Semco Number 850	PRC-DeSoto International	Injection sealing.
Nozzles		PRC-DeSoto International	Application of sealant.
Round 1/16 orifice	Semco No. 420		Application of sealant.
Round 1/8 orifice	Semco No. 440		Application of sealant.
Duckbill	Semco No. 8615		Application of sealant.
Duckbill	Semco No. 8648		Application of sealant.
Comb	Semco No. 8646		Application of sealant.
Polyethylene cartridges with plungers and caps for sealant gun.		Commercially available	Application of sealant.

EQUIPMENT

NAME	NUMBER	MANUFACTURER	USE
Metal spatulas with either stainless steel or glass plates.		Commercially available	Mixing sealant.
Plastic lined cups, wax-free with caps		Commercially available	Mixing sealant.
Sealant fairing tools		Commercially available	To fair-in sealant.
Cheesecloth, lint free		Commercially available	Cleaning.
Plastic scraper, 45-degree cutting edge.		Commercially available	Removing old sealant.
Durometer	Rex Model 1500 (or equivalent)	Rex Gauge Company, Inc. 3230 West Lake Avenue P.O. Box 46 Glenview, IL 60025	Testing cure of sealant.
Gloves, lightweight lint free white cotton		Commercially available	Removing old sealant.
Nylon bristle brushes		Commercially available	Removing old sealant.
Pipe cleaners		Commercially available	Cleaning.
Funnel brushes		Commercially available	Cleaning.

3. Definition of Sealing Terms

A. The definitions that follow are included to give a basic concept of the special terms used to seal. This list is not all inclusive but the more common terms are listed.

(1) Absolute Sealing - No leaks are permitted. All openings of any kind through the seal plane are positively sealed. This is the first level of sealing. (All holes, slots, joggles, fasteners and seams must be sealed.)

(2) Accelerator (Activator) - Cure agent for sealants.

(3) Application Time - The quantity of time the sealant remains workable or suitable for application to structure by brush, extrusion gun, spatula or roller.

(4) Base Compound - The major component of a two-part seal compound that is mixed with the accelerator before the application to make a fuel, temperature, pressure, weather and/or firewall seal material.

(5) Brush Coat - Apply an overcoat or continuous film of the correct seal compound with a brush.

(6) Fay Seal or Faying Surface Seal - A seal barrier created by the sandwiching of sealant between mating surfaces of structure. Special attention must be taken to avoid metal chips or dirt at the faying surface.

(7) Fillet Seal - Sealant material applied at the seam, joint or fastener after the assembly has all permanent fasteners installed and must conform to the dimension in applicable figure.

(8) Hole - An opening that has no appreciable depth, such as a tool hole. Holes that penetrate the seal plane must be metal filled with a fastener, gusset or patch.

(9) Injection Seal - Filling of channels by forcing sealant into a void or cavity after assembly.

(10) Integral Tank - Composition of structure and sealant material which forms a tank that is capable of containing fuel without a bladder.

(11) Intermediate Seal - The second level of sealing. All holes, slots, joggles and seams in the seal plane must be sealed. A minor amount of leakage is tolerable and permanent fasteners are not required to be sealed.
(12) Post-Assembly Seal - A seal that is applied after the structure is assembled. (Fillet and injection seals.)
(13) Preassembly Seal - Sealant material that must be applied during or prior to the assembly of the structure. (Faying surface and pre-pack seals.)
(14) Pre-Pack Seal - A preassembly seal used to fill voids and cavities; can be a primary seal used to provide seal continuity when used in conjunction with a fillet seal. It can be used as a backup seal to support a fillet across a void. Fill the entire cavity to be prepacked. Usage as a primary seal must be kept to a minimum.
(15) Primary Seal - Sealant material that prevents leakage and forms a continuous seal plane. This seal is in direct contact with fuel, vapor, air, acid, etc. With few exceptions, it is in the form of a fillet seal.
(16) Sealant - A compound applied to form a seal barrier.
(17) Seal Plane - A surface composed of structure, sealant and fasteners on which the continuity of seal is established.
(18) Shank Sealing - Sealant compound must be applied to the hole or to both the shank and the under head area of the fastener in sufficient quantity that the entire shank is coated and a small continuous bead of sealant is extruded out around the complete periphery of each end of the fastener when installed. The fastener must be installed within the application time of the sealing compound used.
(19) Squeeze-Out Life - Length of time sealant remains suitable for structure assembly in faying surface seal application.
(20) Tack-Free Time - Tack-free time is a stage, during the cure of the sealant compound, after which the sealant compound is no longer tacky. When the sealant compound is pressed firmly with the knuckles, but no longer adheres to the knuckles, the sealant compound is tack-free.

4. Materials

A. Type of Sealants - Sealants are categorized by type of usage. Type I sealants are separated into classes to differentiate the materials according to method of application. Dash numbers following the class designation indicate the minimum application time (in hours) for Class A and Class B, and minimum work life (in hours) for Class C. Refer to Table 201 for application time, curing rate, etc., for Type I sealants.
(1) Type I - Fuel, pressure, and weather sealant.
(a) Class A - Sealant which is suitable for brush application.
(b) Class B - Sealant which is suitable for application by extrusion gun, spatula, etc.
(c) Class C - Sealant which is suitable in faying surface applications.

CAUTION: Quick repair sealant must be applied within its working life of 15 minutes. Attempts to work quick repair sealant beyond working life will result in incomplete wetting of surface and will result in a failed seal.

(d) Quick Repair Sealant - This material is for use only in making repairs when an extremely rapid curing sealant is required. A possible application includes sealing a leaking fuel tank on an airplane which must be dispatched within a few hours.
(2) Type VIII - Low Adhesion Access Door Sealant. This Class B sealant is designed for sealing faying surfaces where easy separation of the joined surfaces is required. The sealant has low adhesion and forms a gasket that molds itself to fill all irregularities between two surfaces. The sealant is exceptionally resistant to fuels, greases, water, most solvents and oils including hydraulic oil.

NOTE: Time periods presented below are based on a temperature of 77°F (25°C) and 50 percent relative humidity. Any increase in either temperature or relative humidity may shorten these time periods and accelerate the sealant cure.

Table 201. Curing Properties of Type I Sealant

CLASS	APPLICATION TIME (HOURS, MINIMUM)	WORK LIFE (HOURS, MINIMUM)	TACK-FREE TIME (HOURS, MAXIMUM)	CURING RATE (HOURS, MAXIMUM)
A-1/2	1/2		10	40
A-2	2		40	72
B-1/2	1/2		4	6
B-2	2		40	72
B-4	4		48	90
C-24	8	24	96	168 (7 days)
C-48	12	48	120	336 (14 days)
C-80	8	80	120	504 (21 days)

5. General Requirements

A. When working with sealants observe the following requirements.

(1) Unmixed sealants must not be more than two months old when received. These sealants must not be more than six months old when used.

(2) Unmixed sealants stored at temperatures exceeding 80°F (27°C) must be used within five weeks.

(3) Sealants which have been premixed, degassed and flash frozen must be maintained at -40°F (-40°C) or lower and must not be received more than two weeks beyond the date of mixing. These sealants must not be used more than six weeks after the date of mixing.

(4) Frozen sealant must be thawed before being used. If sealant were applied at a temperature below 60°F (15°C), it would not be sufficiently pliable for proper application and adhesion could be critically reduced by condensation of moisture. On the other hand, although sealant must extrude freely for proper application, it would be subject to excessive slumping if applied at a temperature above 80°F (27°C). Frozen sealant may be thawed by any suitable means which does not cause contamination or overheating of the sealant and does not shorten the application time of the sealant to an impractical period. Examples: Thawing by exposure to ambient air temperature, accelerated thawing by exposure in a constant temperature bath (using clean, hot water), accelerated thawing in a microwave oven. In any case, thawing temperature and time must be adjusted to give a thawed sealant temperature between 60°F and 80°F (15°C and 27°C) at the time the sealant is applied.

(5) Mixed, frozen sealants which have thawed must not be refrozen.

(6) Complete preassembly operations, such as fitting, filing, drilling, countersinking, dimpling and deburring, prior to cleaning and sealant application.

(7) Surfaces must be clean and dry, free from dust, lint, grease, chips, oil condensation or other moisture and all other contaminating substances prior to the application of sealant.

(a) All exposed bonding primer or bonded assemblies which are to be sealed must be cleaned or lightly scuffed using ScotchBrite followed by solvent cleaning using Trichloroethane.

NOTE: Bond primer must not be removed.

(8) Sealant materials may be applied to unprimed or primed surfaces. Nonchromated or epoxy primers must have good adhesion to the substrate material and must have aged at least 48 hours prior to sealant application. Adhesive bonding primer must be lightly scuffed and cleaned before applying sealant.

(9) Sealants must not be applied when the temperature of either the sealant or the structure is below 60°F (15°C).

(10) Sealant applied by the fillet or brush coat methods must always be applied to the pressure side of a joint if possible.
(11) After application, sealants must be free of entrapped air bubbles and must not exhibit poor adhesion. All fillets must be smoothed down and pressed into the seam or joint with a filleting tool before the sealant application time has expired.
(12) Where fasteners have been shank or under head sealed, extruded sealant must be evident around the complete periphery of the fastener to indicate adequate sealing. Sealant extruded through a hole by a rivet must be wiped from the end of the rivet before bucking. Threaded fasteners which have been shank or under head sealed must not be retorqued after the expiration of the application time of the sealant. Prior to torquing, sealant must be removed from the threads. In torquing, turn the nut rather than the bolt, if possible.
(13) Pressure testing must not be accomplished until the sealant is cured.
(14) Sealant must not be applied over ink, pencil or wax pencil marks. If these materials extend into the sealing area, they must be removed.
(15) If sealing is to be accomplished over primer and the primer is removed during the cleaning process, it is permissible to seal directly over the cleaned area and then touch up the exposed areas after the sealant has been applied and is tack free.
(16) Sealed structure must not be handled or moved until sealant is tack free (sealant may be dislodged or have the adhesion damaged). Excessive vibration of structure, such as riveting, engine run up, etc., is not permitted.
(17) Drilling holes and installing fasteners through a fay sealed area must be performed during the working life of the faying sealant or the entire shank and area under fastener head must be fay sealed.

6. Sealant Curing

A. Room Temperature.
(1) Room temperature curing properties are based on a temperature of 77°F, +5 or -5°F (25°C, +3 or - 3°C) and a relative humidity of 50 percent unless otherwise indicated.
(2) Room temperature curing properties of Type I sealants are given in Table 201.
(3) Curing properties of Type VIII, Class B sealants are the same as for Type I, Class B. Adhesion to aluminum must be (peel) less than two pounds per inch width (1.4 N per 10 mm width).

B. Accelerated Curing.
(1) Accelerated curing of sealant can be accomplished in several ways. The procedure to be used is dependent on the type of sealant and other factors.
(2) The cure of Type I sealants can be accelerated by an increase in temperature and/or relative humidity. Warm circulating air at a temperature not to exceed 140°F (60°C) may be used to accelerate cure. Heat lamps may be used if the surface temperature of the sealant does not exceed 140°F (60°C). At temperatures above 120°F (49°C), the relative humidity will normally be so low (below 40 percent) that sealant curing will be retarded. If necessary, the relative humidity may be increased by the use of water containing less than 100 parts per million total solids and less than 10 parts per million chlorides.

7. Mixing of Sealants

A. Requirements.
(1) Sealants must be mixed or thinned in accordance with the manufacturers recommendations and thoroughly blended prior to application. All mixed sealant must be as void free as possible.
(2) Prior to mixing, the sealing compound base and its curing agent, both in their respective original unopened containers, must be brought to a temperature between 75°F and 90°F (24°C and 32°C) along with all required mixing equipment.

B. Hand Mixing of Sealant.
(1) Weigh into clean, wax free containers the correct amount of base and curing agent, per manufacturers instructions, immediately prior to mixing. An alternate method is to mix the sealant on a flat plate with a spatula. The scales and weighing process must be controlled within +2 or -2 percent to ensure good quality.
(2) Do not allow the accelerator to come into contact with the sides of the container.

(3) Materials must be accurately weighed on scales that are calibrated and maintained for required accuracy.
(4) Mix the components until the color is uniform taking care not to trap air in the sealant.
(5) Transfer the sealant to another clean container and complete the mix.

C. Sem-Kit Mixing (Refer to Figure 201).

WARNING: The cartridge must be held firmly, but must not be squeezed, as the dasher blades may penetrate the cartridge and injure the hand.

(1) Pull dasher rod to the FULL OUT position so that the dasher is at the nozzle end of the cartridge.
(2) Insert ramrod in the center of the dasher rod against the piston and push the piston in approximately one inch (25 mm).

NOTE: Extra force will be needed on the ramrod at the beginning of accelerator injection into the base material.

(3) Move the dasher rod in approximately one inch (25 mm), then push piston in another inch (25 mm). Repeat this action until accelerator is distributed along the entire length of the cartridge.

NOTE: The accelerator has been fully injected into the cartridge when the ramrod is fully inserted into the dasher rod.

(4) Remove and properly discard the ramrod.

NOTE: Mixing the accelerator and base material can be accomplished manually, or as an alternate method, with the use of a drill motor.

(5) Manual Mixing.
(a) Begin mixing operation by rotating the dasher rod in a clockwise direction while slowly moving it to the FULL OUT position.

NOTE: Do not rotate the dasher rod counterclockwise. The four blade dasher inside the cartridge will unscrew and separate from the dasher rod.

(b) Continue clockwise rotation and slowly move the dasher rod to the FULL IN position.
1 A minimum of five full clockwise revolutions must be made for each full out stroke and for each full in stroke of the dasher rod. Approximately sixty strokes are necessary for a complete mix.

NOTE: If streaks are present in the sealant (viewing through the side of the cartridge), the sealant is not completely mixed.

(c) End mixing operation with the four blade dasher at the bottom of the cartridge.
(d) Hold cartridge upright; unscrew dasher rod from the four blade dasher by gripping the cartridge at the four blade dasher and turn the dasher rod counterclockwise. Remove dasher rod.
(e) Screw appropriate nozzle into the cartridge. If sealant gun is to be used, install cartridge in gun.
(6) Drill motor mixing.

NOTE: A tapered rotary file or a 25/64 inch drill bit may be used with a drill motor to turn the dasher rod.

(a) Insert the rotary file/drill bit into the dasher rod approximately 1/2 inch (13 mm).

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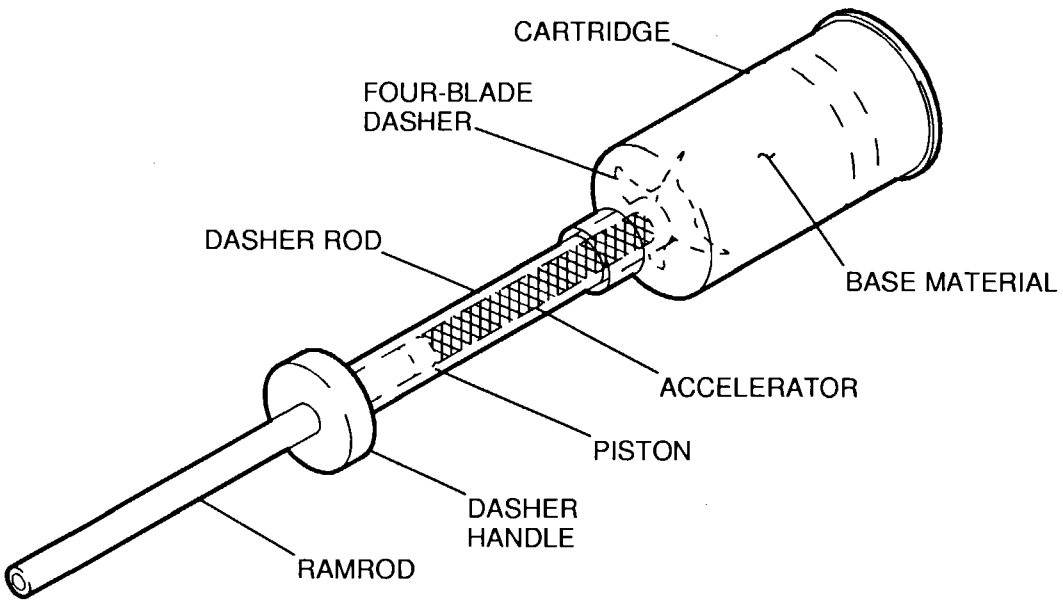

NOTE: CARTRIDGE IS DISPOSABLE AFTER USE.

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Two-Part Sealant Cartridge
Figure 201 (Sheet 1)

WARNING: The cartridge must be held firmly, but not squeezed, as the dasher blades may penetrate the cartridge and injure the hand.

(b) Verify the drill motor will rotate the dasher rod clockwise (looking toward the nozzle end of the cartridge).

(c) With the cartridge held firmly in one hand and the drill motor in the other, rotate the dasher rod at approximately 50 revolutions-per-minute while moving the dasher rod to FULL IN and FULL OUT positions.

1 Mix sealant for at least 50 strokes (a stroke is one complete full in and full out stroke of the dasher rod).

NOTE: If streaks are present in the sealant (viewing through the side of the cartridge), the sealant is not completely mixed.

(d) End mixing operation with the four blade dasher at the bottom of the cartridge.

(e) Hold cartridge upright; remove drill motor and rotary file/drill bit from the dasher rod; unscrew dasher rod from the four blade dasher by gripping the cartridge at the four blade dasher and turn the dasher rod counterclockwise. Remove dasher rod.

(f) Screw appropriate nozzle into the cartridge. If sealant gun is to be used, install cartridge in gun.

8. Cleaning

A. All surfaces to which sealant is to be applied must be clean and dry.

B. Remove all dust, lint, chips, shavings, etc. with a vacuum cleaner where necessary.

C. Cleaning must be accomplished by scrubbing the surface with clean cheesecloth moistened with solvent. The cloth must not be saturated to the point where dripping will occur. For channels and joggles, pipe cleaners and/or funnel brushes may be used instead of cheesecloth.

(1) For solvents to be used for the cleaning in the integral fuel tank refer to Tools and Equipment-Cleaning Solvents.

D. The cleaning solvent must never be poured or sprayed on the structure.

E. The cleaning solvent must be wiped from the surfaces before evaporation using a piece of clean, dry cheesecloth in order that oils, grease, wax etc., will not be redeposited.

F. It is essential that only clean cheesecloth and clean solvent be used in the cleaning operations. Solvents must be kept in safety containers and must be poured onto the cheesecloth. The cheesecloth must not be dipped into the solvent containers and contaminated solvents must not be returned to the clean solvent containers.

G. Final cleaning must be accomplished immediately prior to sealant application by the person who is going to apply the sealant.

(1) The area which is to be sealed must be thoroughly cleaned. A small clean paint brush may be needed to clean corners, gaps, etc. Always clean an area larger than the area where the sealant is to be applied. Never clean an area larger than 30 inches (0.8 m) in length when practical. When the area is being scrubbed with a moistened cloth in one hand, another clean dry cloth must be held in the other hand and must be used to dry the structure. The solvent must be wiped from the surfaces before it evaporates.

(2) The above procedure must be repeated until there is no discoloration on the clean drying cloth. Marks resulting from wax or grease pencils must be removed from parts prior to sealing.

H. Allow all cleaned surfaces to dry a minimum of 5 minutes before the application of sealant materials.

I. Sealant must be applied as soon as possible after cleaning and drying the surfaces to be sealed. Do not handle the parts between the cleaning and sealing operations. Sealant application personnel handling cleaned surfaces must wear clean white gloves to prevent surface contamination. In the event contamination does occur, the surfaces must be recleaned.

J. Safety precautions must be observed during the cleaning and sealing operation. Cleaning solvents are toxic and flammable in most cases. Fresh air masks and/or adequate ventilation are required for all closed areas. The structure must be electrically grounded before starting any cleaning or sealing operation.

9. Sealing Application

A. General.
(1) All new sealing must be accomplished using the type of sealing material required for the area being sealed. All sealant repairs must be accomplished using the same type of sealing material as that which is being repaired.
(2) Application time of the sealing compound must be strictly observed. Material which becomes too stiff and difficult to work or which does not wet the surface properly must be discarded even though the application time has not expired.
(3) For an illustration of the integral fuel bay and sealing techniques, refer to Figure 201.
(4) Prior to sealant application, all surfaces to be sealed must be cleaned per step 8, Cleaning.

B. Fay Surface Sealing (Refer to Figure 202).
(1) A fay surface seal must be made when a new structure is added to the airplane and a fay surface seal is necessary.
(a) The fay sealed joints must be closed and attached before the work life is expired as given in Table 201
(2) A fay surface seal must be made when the structure and/or parts have been disassembled for causes other than a defective seal.
(a) Fay sealed joints must be closed and attached before the work life is expired as given in Table 201
(3) A fay sealed joint must have sufficient sealant applied so the space between the assembled fay surfaces is filled with sealant.
(a) A small quantity of sealant must come out in a continuous bead around the edges.
(4) Countersink or ream the holes through the fay sealed joints with temporary or permanent fasteners installed.
(a) Metal work operations must be completed before the clean and seal operations.

NOTE: Fabrication and changes done after the seal are not recommended.

(b) Countersink or ream holes through the fay sealed joint with permanent fasteners in every other hole.
1 Use temporary fasteners (Clecos or bolts) if assembly with permanent fasteners is not possible.
2 Temporary fasteners must be replaced by permanent fasteners before the expiration of the fay surface sealant.
3 Remove temporary fasteners and install permanent fasteners with wet sealing compound.
(5) Immediately after the assembly is completed and all permanent fasteners are installed, remove any sealant that has not cured and unwanted sealant with clean rags moist with A-A-59107, Toluene or Methyl Propyl Ketone.

C. Injection Sealing (Refer to Figure 202).
(1) Sealant must be put into the channel, void or any open space from one point only with a pneumatic sealant tool.
(a) After sealant is added, air must not be trapped and the channel, void or any open area.
(b) Sealant must be seen at the opposite opening.
1 Cause a blockage at each channel or exit as the sealer is applied in the area so that sealant is seen at the openings of all applicable channels.
(2) Sealant must be put into wire bundles that go through firewalls and bulkheads to fill any voids and open areas between the wires.
(a) Bundle ties must be no more than 6 inches (152.4 mm) of the location to be sealed.

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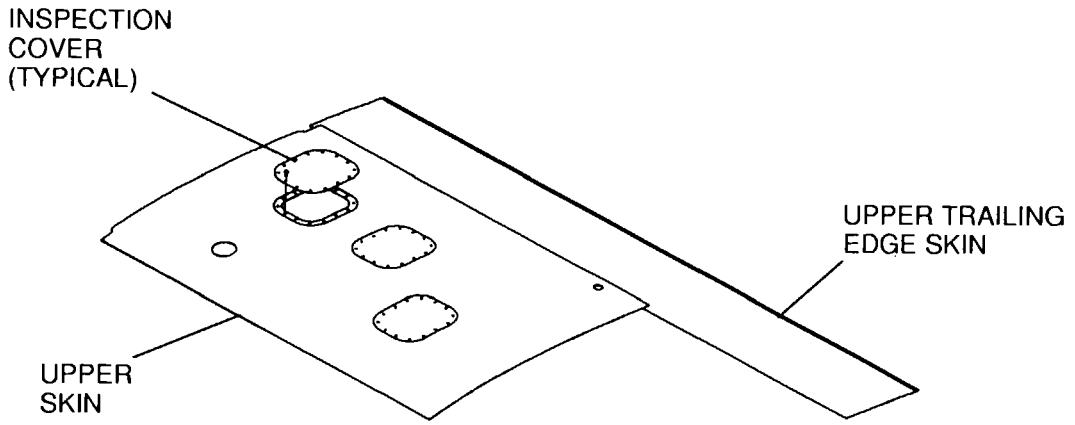

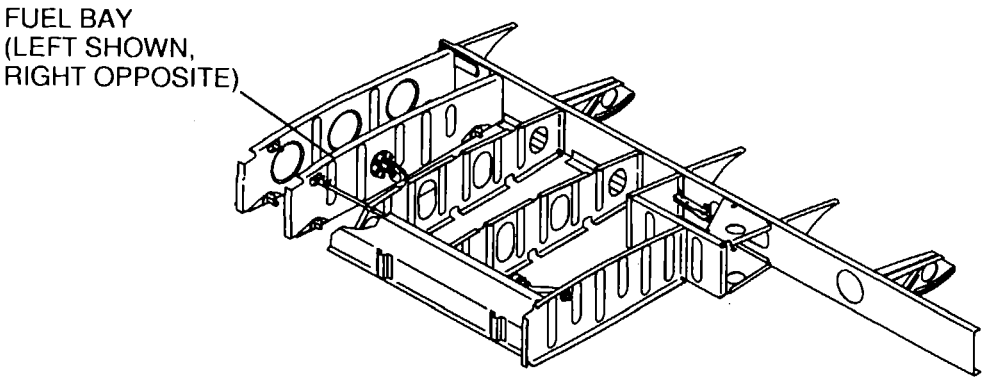

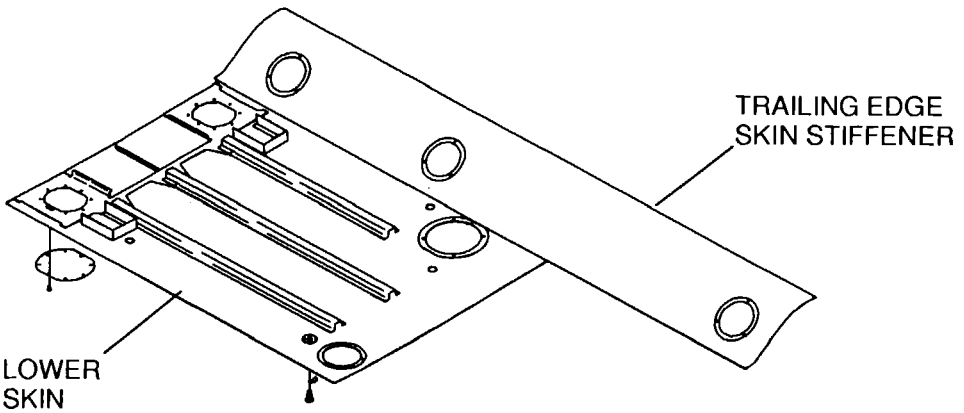

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Integral Fuel Bay Sealing
Figure 202 (Sheet 1)

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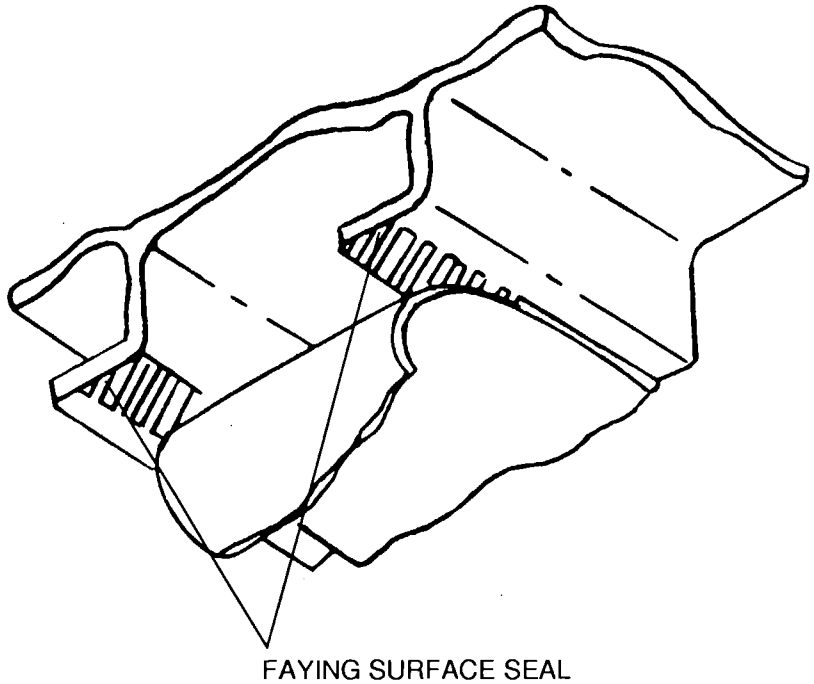

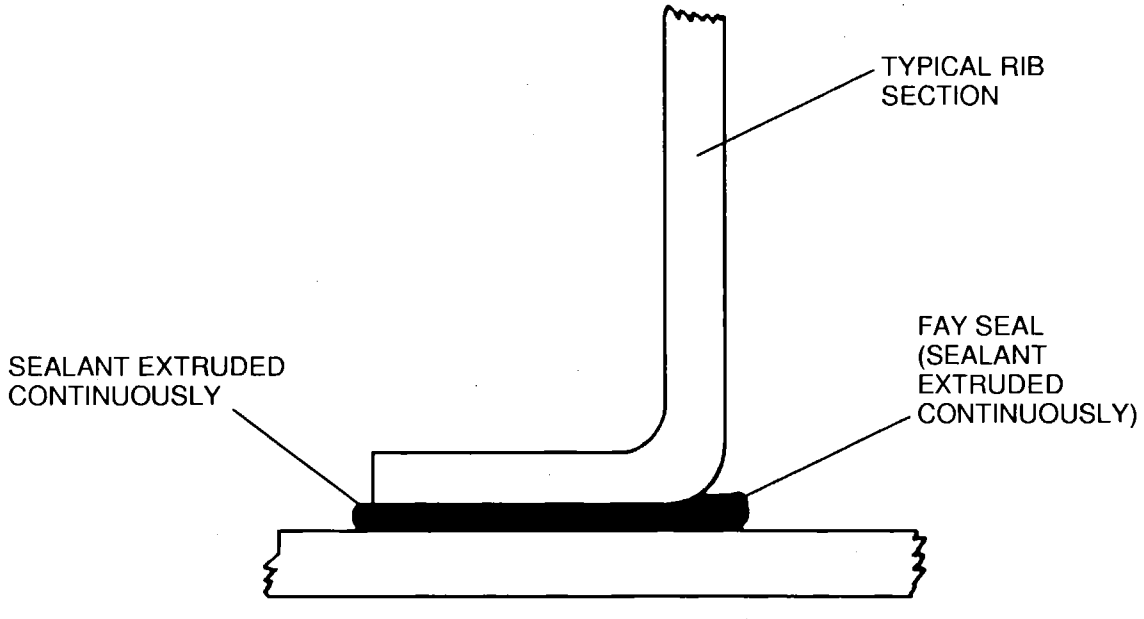

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Integral Fuel Bay Sealing
Figure 202 (Sheet 2)

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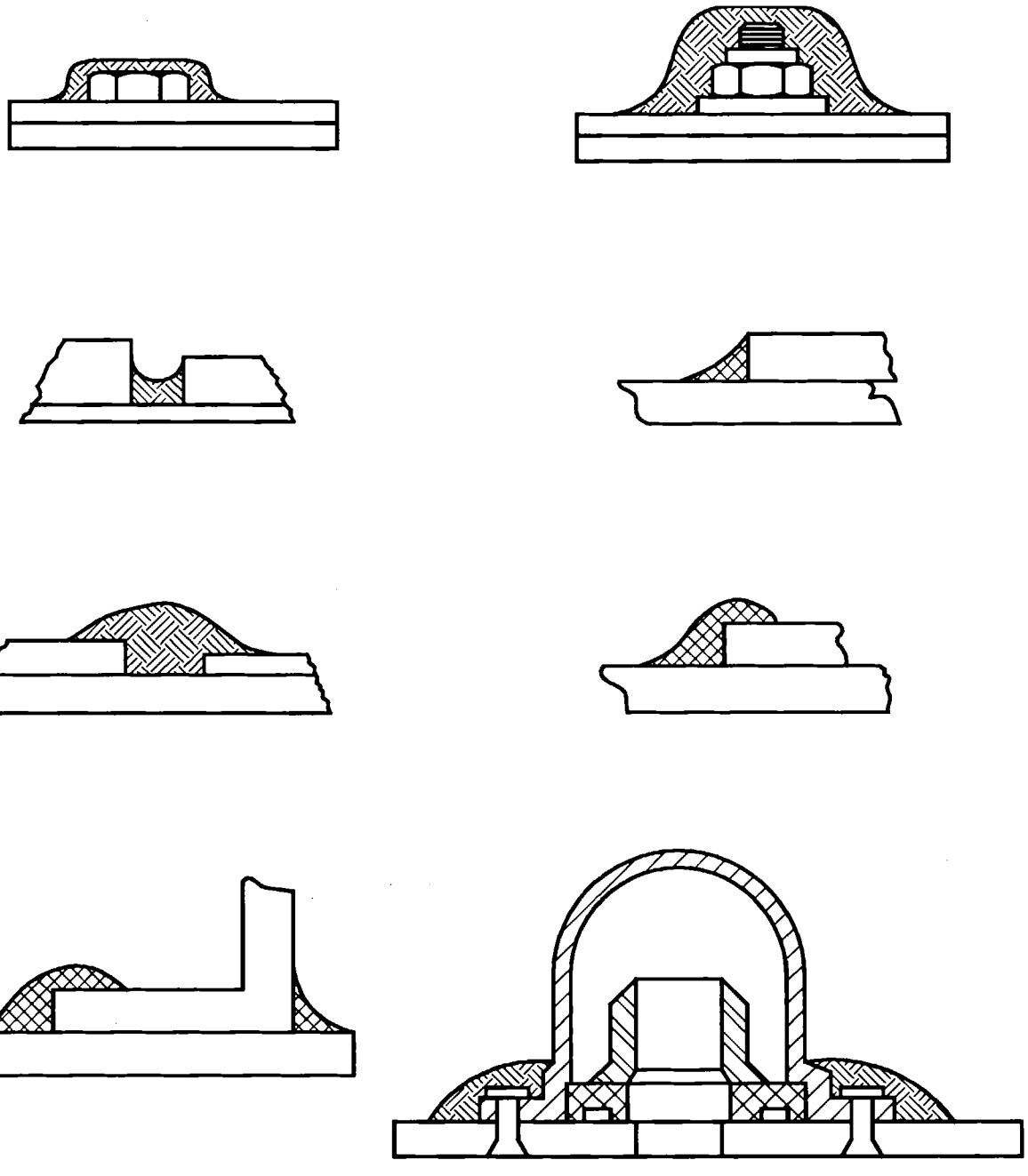

NOTE: THE EXAMPLES SHOW TYPICAL CROSS SECTIONS OF DIFFERENT SEAL METHODS USED IN THE FUEL COMPARTMENT. THE MINIMUM SEALANT THICKNESS AT ANY POINT MUST NOT BE LESS THAN 0.060 INCH (1.5 mm).

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Integral Fuel Bay Sealing
Figure 202 (Sheet 3)

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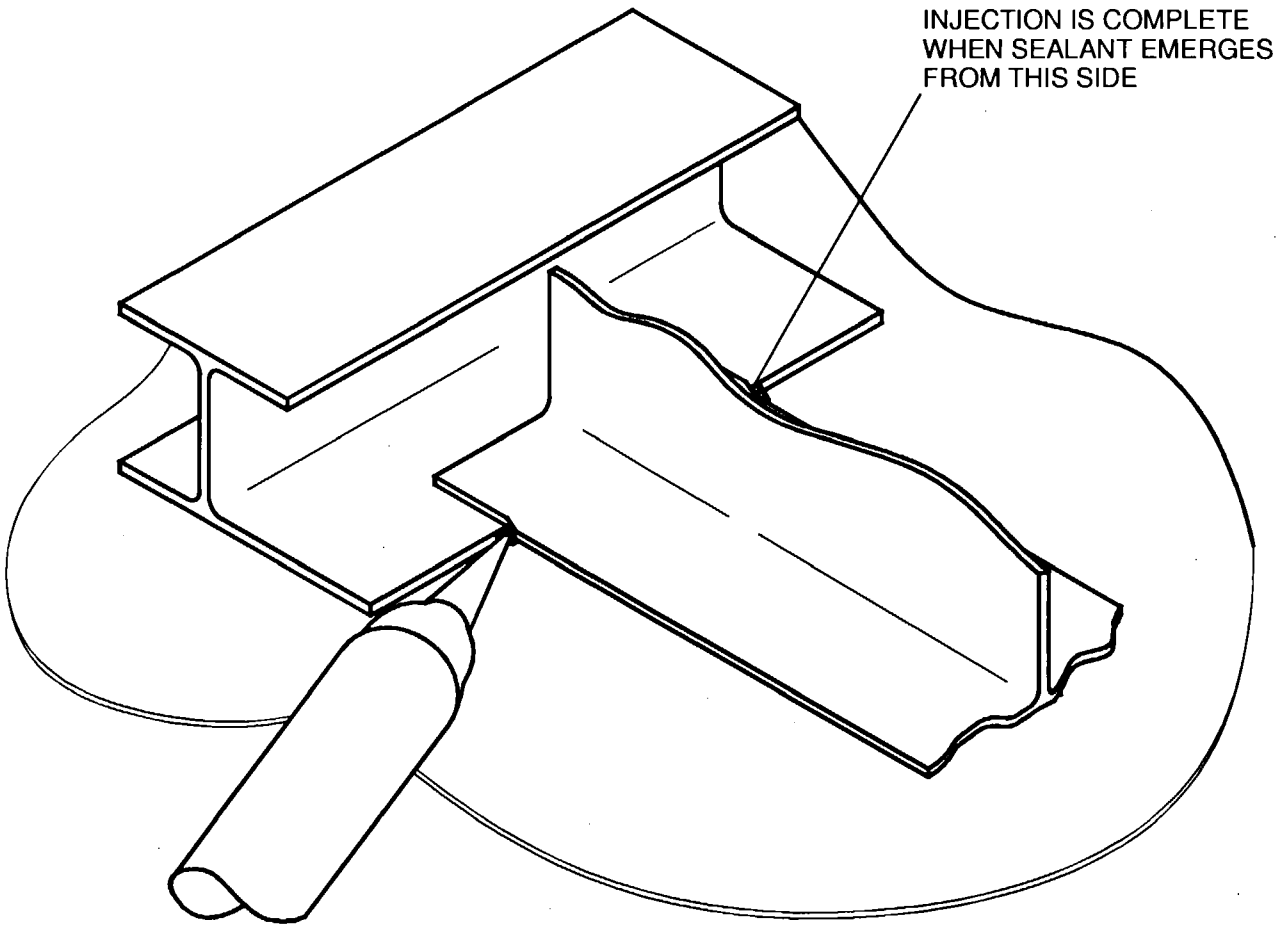

5598T1009

Integral Fuel Bay Sealing
Figure 202 (Sheet 4)

(b) Pull the wires apart from each other.
1 Layer each wire with sealant over the length which goes through the bulkhead or seal assembly.
2 Layer each wire with sealant 0.5 inch (12.7 mm) added length on each side of the bulkhead or seal assembly.
3 Pull the wires through the bulkhead or seal assembly into position.
4 Fill the open areas of the wires that remain until the sealant is seen from the opposite side.

(3) Remove unwanted sealant before the work life of the sealant is expired.
(4) Use an applicable tool to make the sealant smooth and flush with the surface.

D. Fillet Sealing.
(1) Fastener considerations:
(a) Do not fillet seal any parts until they are held completely together by permanent fasteners.
(b) Prior to filleting the periphery of bolted structure and fittings, it is necessary that all bolts, accomplishing the attachment, be properly torqued.
(2) The sealant must be applied using a sealant gun or spatula.
(3) When using a sealant gun for fillet sealing, the nozzle tip must be pointed into the seam or joint and must be maintained nearly perpendicular to the line of travel. A continuous bead of sealant must precede the tip and the tip size, shape and rate of travel must be such that sufficient sealant must be applied to produce the required fillet.
(4) Fillets must be shaped or formed to meet the size and shape requirements as shown in applicable figures using the nozzle tip and/or fairing tools to press against the sealant while moving parallel to the bead. Exercise caution to prevent folds and entrapment of air during application and shaping of the fillet and work out any visible air bubbles. The fillet must be formed so that the highest portion of the fillet is centered over the edge of the structure or fitting. Lubrication in any form must not be used for smoothing purposes. In all cases, fillet size must be kept as near minimum as practical.
(5) Where it is more convenient or fillet slumping is encountered, the fillet may be applied in two stages. A small first fillet must be applied which is allowed to cure to a tack-free state, followed by a second application of sealant sufficient to form the final fillet conforming to the specified dimensions for a fillet seal. If the first fillet has cured, it must be cleaned before the second application of sealant is made. If the fillet has only cured to a tack-free state, it must be wiped lightly with a gauze pad or cheesecloth pad dampened with cleaning solvent.
(6) Allow the sealant to cure to a tack-free condition prior to the airplane being moved, handled and/or worked on.
(7) In cases where a fillet seal connects to an injection seal, the full bodied fillet must extend past the end of the injection and then taper out.
(8) Lap joint and seam fillets must be as shown in Figure 202.
(9) Butt joint fillets must be as shown in Figure 202.
(10) Bolts must be fillet sealed as shown in Figure 202. The area for sealing must consist of the area of the structure surrounding the base of the fastener end plus the entire exposed area of the fastener. An optional method of sealing threaded fasteners is to apply a brush coat of Type I, Class A sealant. Where brush coating is used as the method of sealing threaded fasteners, the sealant must be worked around each fastener with a stiff brush and considerable care to be effective. A simple pass of the brush with the sealant is not sufficient to produce an effective seal.
(11) Dome type nutplates must be fillet sealed as shown in Figure 202. The area for sealing must consist of the area of the structure surrounding the base of the fastener and from there up over the rivets to the dome.
(12) Hole filling and slot fillets must be as shown in Figure 202.
(a) Tooling holes must be plugged with a shank sealed soft rivet and then brush coated with Type I, Class A sealant.

10. Sealant Repair

A. Materials - Repairs, in general, must be accomplished with the same type of material as that being repaired.

NOTE: Type I, Class B-1/2 is recommended for use during cold weather to obtain an accelerated cure.

NOTE: Type I, Quick Repair sealant may be used as a repair for sealant in fuel tanks if desired for fast cure and rapid dispatch.

B. Temperature Requirements.

(1) The structure must be above 60°F (15°C) before the sealant is applied and must remain above 60°F (15°C) until the sealant is tack-free.

NOTE: For outside operations only, the temperature of the structure may be allowed to drop below 60°F (15°C) but not below 58°F (14°C), after application for a period of time not to exceed 48 hours. The structure must be subsequently heated to above 60°F (15°C) and the sealant allowed to become tack-free before the tanks are refueled.

(2) The maximum air temperature allowed to come in contact with the curing sealant is 120°F (49°C).

C. Fillet and Fastener Sealing Repairs.

(1) Repair of damaged or faulty sealant applications must be accomplished as follows:

(a) Remove all damaged or faulty sealant to ensure solid residual material.

(b) Sealant must be cut to produce a smooth continuous scarfed face. The sealant must be completely removed in the affected areas. The cutting tools must only be made from nonmetallic materials that are softer than aluminum.

(c) Inspect repair areas for clean and smooth cuts. Loose chunks or flaps of sealant on the cut areas must be removed.

(d) Clean the area to be sealed, including the scarfed face of the old seal. Refer to step 8, Cleaning.

(e) Apply new fillet seals. Slight overlapping of the fresh material over the existing fillet is permissible. A large buildup of sealant must not be allowed.

(f) Rework of a fillet which has been oversprayed or brushed with primer must be accomplished by a scarfed joint and removal of the fillet having primer on it, in the area of the repair. The primer must not be sandwiched between the old and new sealants.

(g) If the primer is removed during the cleaning operation, it is permissible to apply the new fillet seal directly over the clean bare metal and then touch up with the proper primer all exposed areas of bare metal after the sealant has been applied.

D. Faying Surface Sealing Repair - After determining the area which contains the faulty and/or leaking faying surface seal, the repair must be accomplished by applying a fillet seal along the edge of the part adjacent to the faying surface seal long enough to fully cover the area of the faulty and/or leaking seal.

E. Brush Coat Sealing Repair - Repair of damaged or leaking brush coat seals must be accomplished by removing the discrepant brush coat. Clean the area of sealant removal and the surrounding structure and sealant. Refer to step 8, Cleaning. Apply a new brush coat of sealant.

F. Integral Fuel Tank Sealing Using PR-1826 Class B Rapid Curing Sealant.

(1) Remove damaged section of sealant with a sharp Plexiglas scraper. Taper all cuts in old sealant at 45-degree angles.

(2) Thoroughly clean with solvent and abrade old areas which are to be over coated. Clean one small area at a time, then dry with a clean cloth before the solvent evaporates.

NOTE: Always pour solvent on the cloth to maintain a clean solvent supply.

NOTE: In fuel tanks which have been in operation, the sealant will be soaked and must be dried in area of the repair with a vapor proof heat lamp or hot air blower before new sealant is applied.

(3) After the surface has been cleaned and dried, apply a heavy layer of PR- 1826 Adhesion Promoter with a clean brush or gauze pad. Allow adhesion promoter a minimum of 30 minutes to dry.

NOTE: Care must be taken to obtain a uniform thin coat of adhesion promoter. Thin enough to cover the surface, but not heavy enough to run.

(4) Mix PR-1826 Class B sealant according to instructions supplied with the material.
(5) Apply PR-1826 Class B sealant, 0.125 to 0.375 inch (3.2 to 9.5 mm) thick, to the repair area with a spatula or paddle shaped tool. Firmly press sealant in place and form to desired shape. Overlap PR-1826 Class B sealant over old sealant from 0.125 to 0.25 inch (3.2 to 6.4 mm).

NOTE: Sealant may be applied up to 8 hours after the application of adhesion promoter. After 8 hours, the surface must be recleaned and adhesion promoter reapplied.

(6) Allow sealant to cure a minimum of 2 hours at 77°F (25°C) before refueling. Curing time is based solely on temperature and will be halved for every 18°F (10°C) increase, and doubled for every 18°F (10°C) decrease from the standard 77°F (25°C).

CONVERSION DATA - DESCRIPTION AND OPERATION

1. General

A. This section contains information for converting the more commonly used measuring units found in this manual from the common United States system to the International System of Units (metric system).

B. Other conversion factors may be found in manuals such as Standard for Use of the International System of Units (SI) : The Modern Metric System, prepared by ASTM, 100 Bar Harbor Drive, West Conshohocken, PA 19427-2959 USA.

2. Conversion Factors

A. Distance and Length
(1) Multiply inches by 25.4 to obtain mm (millimeters).
(2) Multiply feet by 0.3048 to obtain m (meters).

B. Mass
(1) Multiply ounces by 28.35 to obtain g (grams).
(2) Multiply pounds by 0.436 to obtain kg (kilograms).

C. Temperature
(1) Subtract 32 from degrees Fahrenheit and multiply by 5/9 to obtain degrees in Celsius.

D. Torque
(1) Multiply inch-pounds by 0.11298 to obtain Newton-meters.
(2) Multiply foot pounds by 1.3588 to obtain Newton-meters.

E. Force
(1) Multiply pounds of forces by 4.4482 to obtain N (Newtons).

F. Pressure
(1) Multiply pressure (psi) by 6.8948 to obtain kPa (kiloPascals).

CHAPTER

21

AIR CONDITIONING

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
21-Title		
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21-20-00	Pages 201-203	Dec 2/2002
21-21-00	Pages 201-206	Apr 1/2005
21-40-00	Pages 201-204	Apr 1/2005

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

AIR CONDITIONING - GENERAL

1. Scope

A. This chapter describes those units and components which furnish a means of heating and ventilating the cockpit/cabin area.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the following items:

NAME	NUMBER	MANUFACTURER	USE
Type II Sealant	PR1488	Courtaulds Aerospace 5426 San Fernando Rd. Glendale, CA 91209	To secure cabin duct to various air outlets.
Type IV Sealant	Pro-Seal 700	Courtaulds Aerospace	To seal shutoff valve to firewall.
Type IV Sealant	GC- 1900	Courtaulds Aerospace	To seal shutoff valve to firewall.

3. Definition

A. This chapter is divided into sections to aid maintenance technicians in locating information. Consulting the table of contents will further assist in locating a particular subject. A brief description of the sections follows:
   (1) The section on distribution describes that portion of the system used to distribute fresh and heated air throughout the cockpit/cabin area.
   (2) The section on heating describes those components used to generate (but not distribute) heat for the cockpit/cabin area.
   (3) The section on temperature control describes components used to control heat in the cockpit/cabin area.

FRESH AIR DISTRIBUTION - DESCRIPTION AND OPERATION

1. General

A. The cockpit/cabin area is ventilated with fresh air by means of external wing root openings, an adjustable air scoop, and internal ducting.

2. Description

A. Fresh air enters the cabin from six sources. Four of those sources are located on the leading edge of the wing (two left and two right). The outboard scoop on each wing supplies air to the cockpit area, and the two inboard scoops supply air to the cabin area. The other two sources are located on the left and right side of the fuselage, just aft of the firewall.

(1) Fresh air from the outboard leading edge scoops is distributed through tubes to adjustable air outlet valves (Wemacs) located at the upper corner of the windshield and between the instrument panel and forward doorpost. The inboard scoops on each wing distribute fresh air through ducts to adjustable air outlet valves (Wemacs), two on each side, located on the overhead in the rear cabin area.

(2) Fresh air entering from the left and right sides of the fuselage is controlled by infinitely positionable scoops (doors). This air is ducted directly into the heated air plenum and is distributed throughout the cabin.

3. System Operation

A. The amount of fresh air entering the cabin can be controlled by any of the six Wemacs. Rotating the Wemac valve will vary the airflow from fully closed to fully open.

B. Air flow into the cabin can also be adjusted by the CABIN AIR control cable. Pulling the control fully aft allows the maximum amount of fresh air to flow through the distribution system. Pushing the control fully forward closes the scoop (door) and allows no fresh air to flow through the distribution system.

NOTE: Air temperature in the distribution system can be altered by use of the CABIN HT control. As the CABIN HT control is gradually pulled out, more and more heated air will blend with the fresh air from the scoop, and is distributed into the cabin. Either one or both of the controls may be set at any position from full open to full closed.

FRESH AIR DISTRIBUTION - TROUBLESHOOTING

1. General

A. A troubleshooting chart has been developed to aid the maintenance technician in system understanding. Refer to Figure 101.

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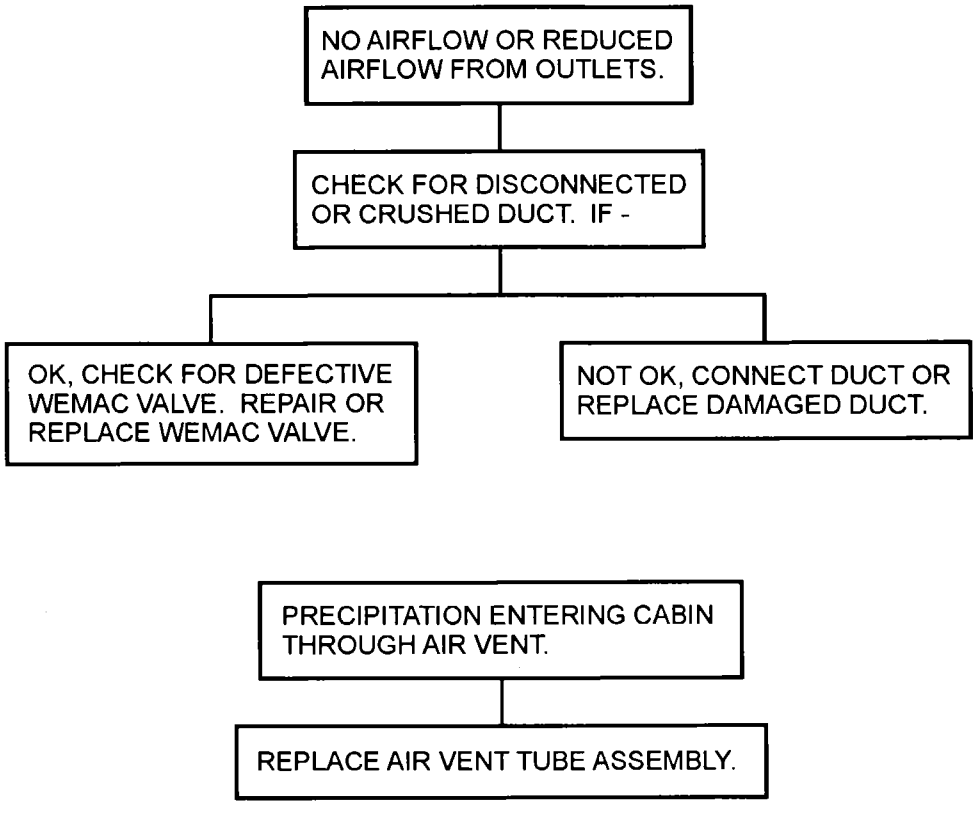


Fresh Air System Troubleshooting Chart
Figure 101 (Sheet 1)

FRESH AIR DISTRIBUTION - MAINTENANCE PRACTICES

1. General

A. Fresh air enters the cabin from five sources. Four of those sources are located on the leading edge of the wing (two left and two right). The outboard scoop on each wing supplies air to the cockpit area, and the two inboard scoops supply air to the cabin area. Air outlet valve removal/installation is typical at each location. Door assemblies, located on the left side and right side of the fuselage just aft of the firewall, also allow fresh air to be routed into the heat ducts. The doors are operated by a control on the instrument panel labeled CABIN AIR.

2. Air Outlet Valve (Wemac) Removal/Installation

A. Remove Air Outlet Valve (Wemac) (Refer to Figure 201)
   (1) Remove retaining ring from air outlet valve (Wemac).
   (2) Remove upholstery panel or headliner. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
   (3) Remove clamp securing ducting hose to air outlet valve adapter.
   (4) Remove air outlet valve and adapter.

B. Install Wing Root Air Outlet Valve (Wemac) (Refer to Figure 201).
   (1) Install air outlet valve (Wemac) and valve adapter to ducting. Secure with clamp.
   (2) Install upholstery panel or headliner. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
   (3) Install retaining ring to air outlet valve.

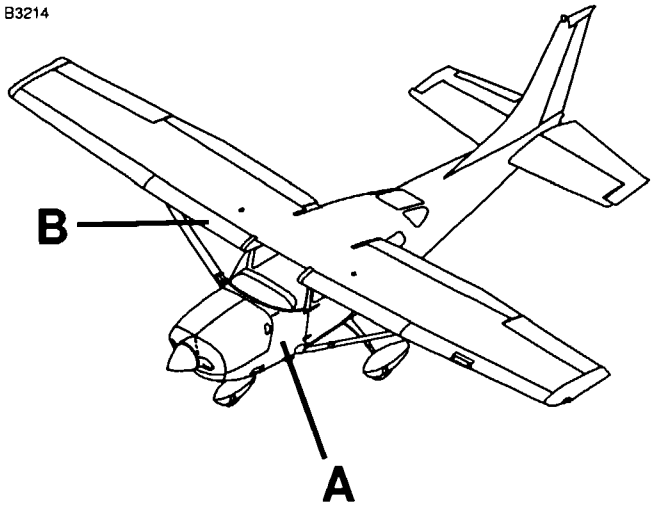
3. Cabin Air Control Cable Removal/Installation

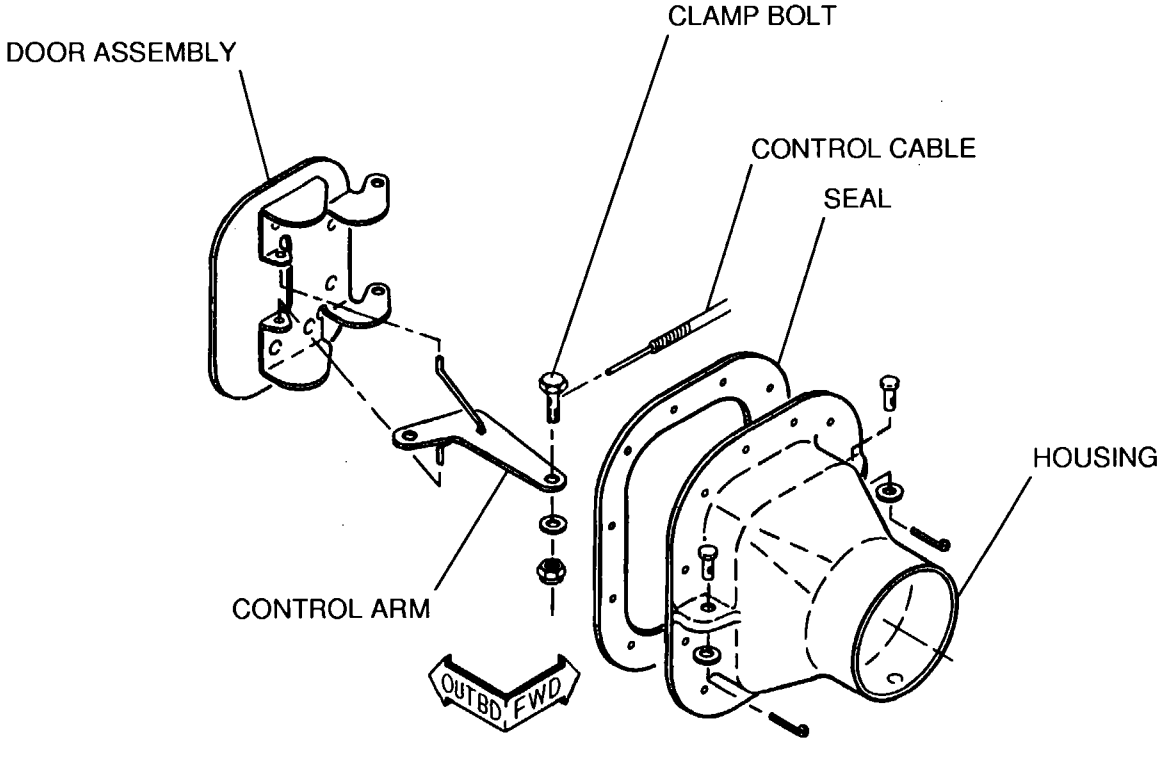
A. Remove Cabin Air Control Cable (Refer to Figure 201).
   (1) Carefully straighten end of CABIN AIR control cable.
   (2) Loosen clamp bolt on control arm and withdraw cable from control arm.
   (3) Remove screws securing clamp.
   (4) Gain access to the backside of the CABIN AIR control cable.
   (5) Loosen nut on backside of control cable.
   (6) Carefully withdraw cable from instrument panel.

B. Install Cabin Air Control Cable (Refer to Figure 201).
   (1) Thread end of control cable through hole in instrument panel.
   (2) Secure CABIN AIR control cable to backside of instrument panel using existing jamnut.
   (3) Thread end of control cable through the clamp bolt.
   (4) Clamp control housing.
   (5) Test control cable to ensure full range of travel. Travel may be adjusted by positioning control housing in clamps.
   (6) When full range of travel has been established, bend end of control cable around clamp bolt.

4. Distribution Duct Removal/Installation

A. The majority of the fresh air distribution system components do not require replacement during normal maintenance. Ducts are secured to these components using clamps. If ducts become damaged or worn, they should be replaced.





DETAIL A

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Fresh Air System Installation
Figure 201 (Sheet 1)

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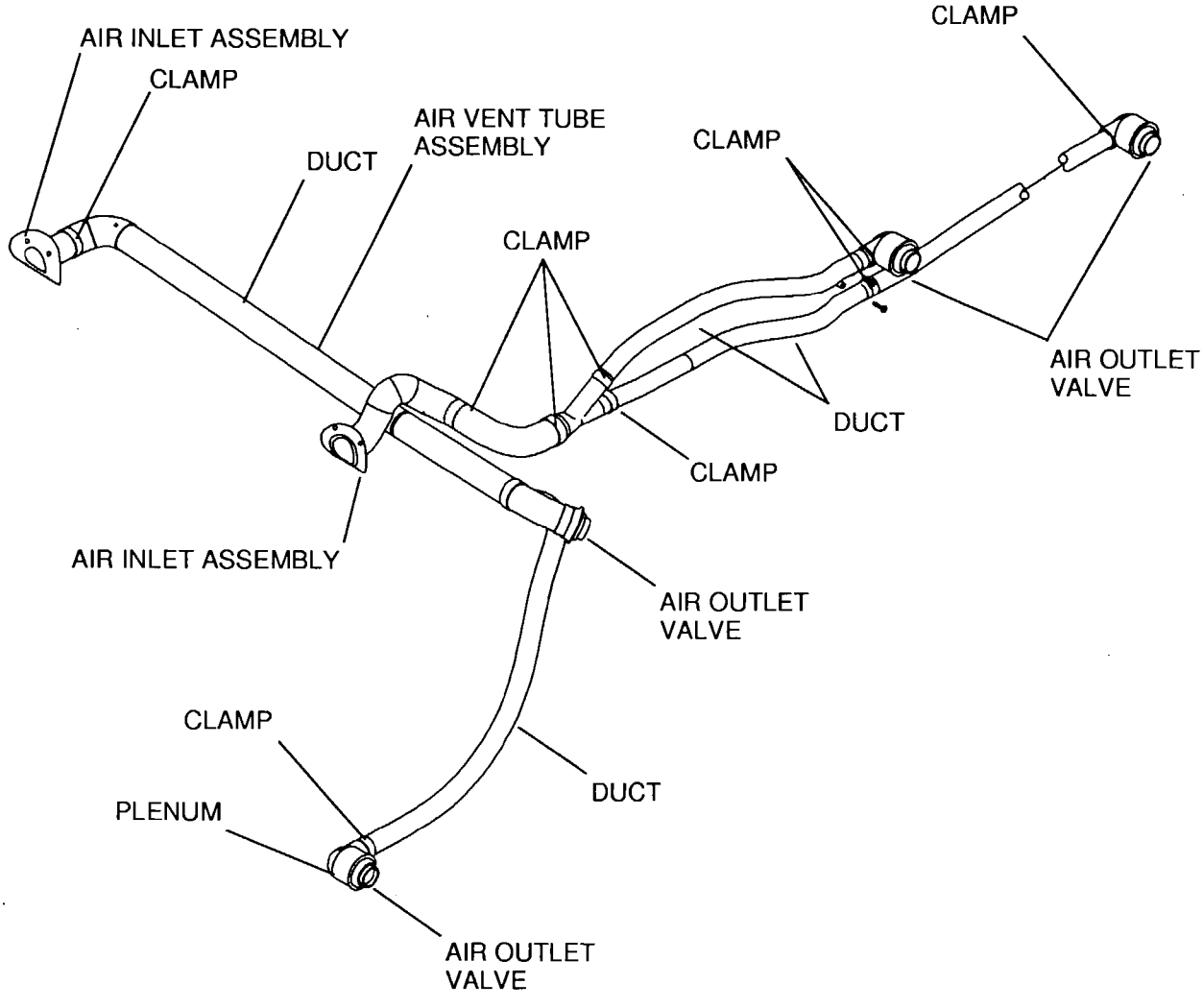


DETAIL B

RIGHT SIDE SHOWN
LEFT SIDE OPPOSITE

B1214T1010

Fresh Air System Installation
Figure 201 (Sheet 2)

AVIONICS COOLING - MAINTENANCE PRACTICES

1. General

A. The maintenance procedures that follow are for the removal and installation of the avionic cooling fan(s).

B. Airplanes with the standard avionic system, have one cooling fan for the instrument panel installed on the forward top right side of the firewall. The fan is used to cool the different components in the radio stack.

C. Airplanes that have the Garmin G1000 (NAV III) avionics system installed, have four avionic fans. Two of the fans are installed behind the instrument panel to help cool each Control Display Unit (CDU). One fan is installed in the top of the deck skin to help pull hot air out from the instrument panel. The fourth fan is installed in the tailcone next to the avionics .

2. Firewall Avionics Fan Removal/Installation

NOTE: The procedures that follow are for airplanes with standard avionics.

A. Remove the fan from the firewall (Refer to Figure 201).
   (1) Make sure that the MASTER and AVIONICS switches are in the off position.
   (2) Remove the screws that attach the fan to the firewall.
   (3) Disconnect the electrical connector (PC901) from the fan.
   (4) Disconnect the flexible ducts from the fan and remove the fan from the airplane.

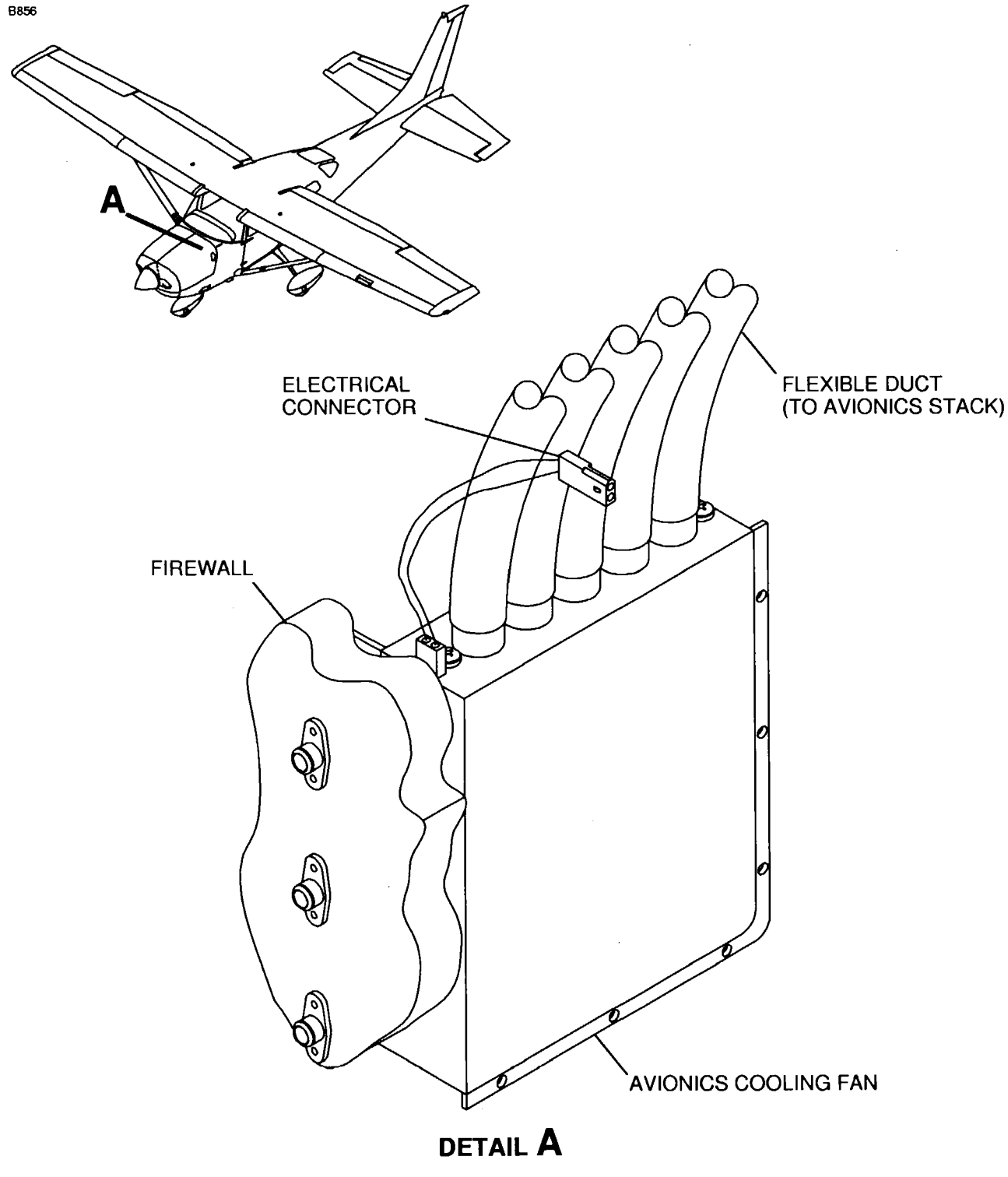
B. Install the Avionics Fan (Refer to Figure 201).
   (1) Attach the fan to the firewall with the hardware.
   (2) Connect the electrical connector (PC901) to the fan.
   (3) Connect with tie wraps the flexible ducts to the fan.
   (4) Make sure that the cooling fan operates correctly.
      (a) Set the MASTER and AVIONICS switch to the ON position and listen for the operation of the avionics fan.
   (5) Set the AVIONICS and MASTER switches to the off positions.

3. Primary Flight Display (PFD) Fan Removal/Installation

NOTE: The procedures that follow are for airplanes with Garmin G1000.

A. Remove the PFD Fan (Refer to Figure 202).
   (1) Record the fan airflow direction.
   (2) Make sure that the Master and Avionic switches are in the off position.
   (3) Remove the PFD. Refer to Chapter 34, Control Display Unit - Maintenance Practices.
   (4) Remove the screws and nuts that attach the fan to the fan bracket.
   (5) Disconnect the electrical connector (PC1316) from the avionics fan.
   (6) Remove the fan from the airplane.

B. Install the PFD Fan (Refer to Figure 202).
   (1) Connect the electrical connector (PC1316) to the avionics fan.
   (2) Make sure that the airflow is directed to the PFD.
   (3) Install the screws and nuts that attach the fan to the fan bracket.
   (4) Complete a test of the fan.
      (a) Put the MASTER and AVIONICS switches in the ON position.
      (b) Listen for the operation of the fan.
   (5) Set the MASTER and AVIONICS switches to the off positions.
   (6) Install the PFD. Refer to Chapter 34, Control Display Unit - Maintenance Practices.



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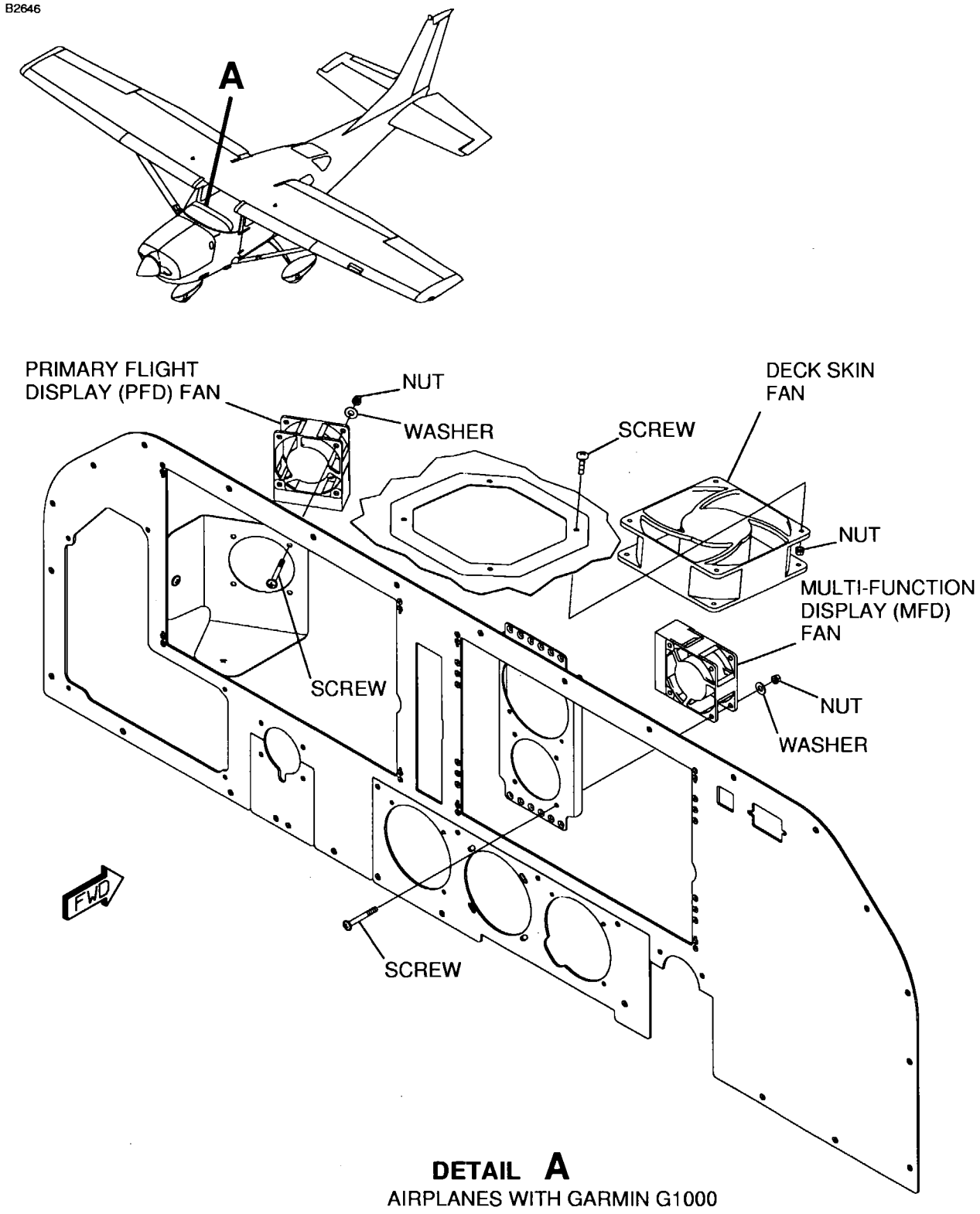
Firewall Avionics Fan Installation
Figure 201 (Sheet 1)



DETAIL A
AIRPLANES WITH GARMIN G1000

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A0718T1063

Avionics Cooling Installation
Figure 202 (Sheet 1)

4. Multi-Function Display (MFD) Fan Removal/Installation

NOTE: The procedures that follow are for airplanes with Garmin G1000.

A. Remove the MFD Fan (Refer to Figure 202).
   (1) Record the fan airflow direction.
   (2) Make sure that the MASTER and AVIONIC switches are in the off position.
   (3) Remove the turn coordinator. Refer to Chapter 34, Turn Coordinator - Maintenance Practices.
   (4) Remove the screws and nuts that attach the fan to the fan bracket.
   (5) Disconnect the electrical connector (PI315) from the avionics fan.
   (6) Remove the fan through the turn coordinator hole.
   (7) Remove the fan from the airplane.

B. Install the MFD Fan (Refer to Figure 202).
   (1) Connect the electrical connector (PI315) to the avionics fan.
   (2) Make sure that the airflow is directed to the MFD.
   (3) Install the fan through the turn coordinator hole.
   (4) Install the screws and nuts that attach the fan to the fan bracket.
   (5) Complete a test of the fan.
      (a) Set the MASTER switch and AVIONICS switch to the ON position.
      (b) Listen for the operation of the fan.
   (6) Set the AVIONICS switch and MASTER switch to the off positions.
   (7) Install the turn coordinator. Refer to Chapter 34, Turn Coordinator - Maintenance Practices.
   (8) Install the MFD. Refer to Chapter 34, Control Display Unit - Maintenance Practices.

5. Deck Skin Fan Removal/Installation

NOTE: The procedures that follow are for airplanes with Garmin G1000.

A. Remove the Deck Skin Fan (Refer to Figure 202).
   (1) Record the fan airflow direction.
   (2) Make sure that the MASTER and AVIONICS switches are in the off position.
   (3) Remove the PFD. Refer to Chapter 34, Control Display Unit - Maintenance Practices.
   (4) Remove the screws and nuts that attach the fan to the deck skin.
   (5) Disconnect the electrical connector (PI314) from the deck skin fan.
   (6) Remove the fan from the airplane.

B. Install the Deck Skin Fan (Refer to Figure 202).
   (1) Connect the electrical connector (PI314) to the deck skin fan.
   (2) Install the screws and nuts that attach the fan to the deck skin.
   (3) Make sure that the airflow is directed at the windshield.
   (4) Complete a test of the fan.
      (a) Set the MASTER and AVIONICS switches to the ON position and listen for the fan operation.
   (5) Set the AVIONICS and MASTER switches in the off positions.
   (6) Install the PFD. Refer to Chapter 34, Control Display Unit - Maintenance Practices.

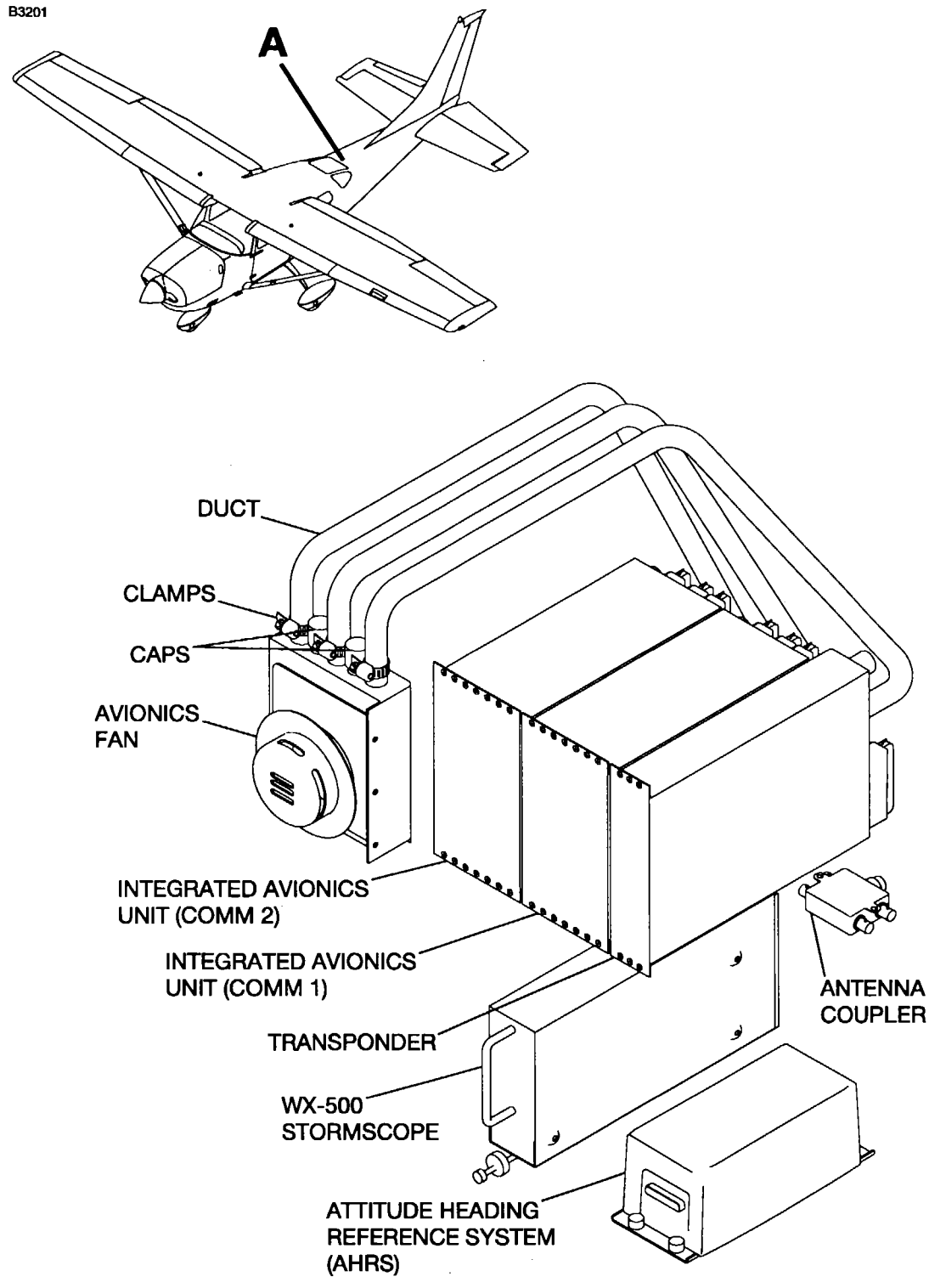
6. Tailcone Avionics Fan Removal/Installation

NOTE: The procedures that follow are for airplanes with Garmin G1000.

A. Remove the Tailcone Avionics Fan (Refer to Figure 203).
   (1) Make sure that the MASTER and AVIONICS switches are in the off position.

CAUTION: If the engine is removed, make sure there is a tailcone stand in position before you get inside the tailcone.

   (2) Remove the baggage divider to get access inside the tailcone.
   (3) Remove the caps from the unused ports, if necessary.



DETAIL A

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Tailcone Avionics Fan Installation
Figure 203 (Sheet 1)

(4) Disconnect the electrical connector (PT901) from the fan.
(5) Disconnect the ducts from the fan.
(6) Remove the fan from the avionics shelf.

B. Install the Tailcone Avionics Fan (Refer to Figure 203).
(1) Make sure the MASTER and AVIONICS switches are in the off position.

CAUTION: If the engine is removed, make sure that there is a tailcone stand in position before you get inside the tailcone.

(2) Set the fan in position and attach it to the avionics shelf.
(3) Connect the ducts to the fan.
(4) Connect the electrical connector (PT901) to the fan.
(5) Install caps on the unused ports, if necessary.
(6) Set the MASTER and AVIONIC switches to the ON position.
(7) Examine the fan to make sure that it operates.
(8) Set the baggage divider in position.

7. Primary Flight Display (PFD) and Multi-Function Display (MFD) Fan Operational Check

A. PFD and MFD Fan Operational Check (Refer to Figure 202).
(1) Remove the PFD and the MFD. Refer to Control Display Unit - Maintenance Practices.
(2) Put the MASTER and AVIONICS switches in the ON position.
(3) Listen and look for the correct operation of both fans.
(4) Install the PFD and MFD. Refer to Control Display Unit - Maintenance Practices.

HEATING AND DEFROSTING - MAINTENANCE PRACTICES

1. General

A. The heating and defrosting system has several core components: the heat exchange section of the exhaust muffler; a shutoff valve attached to the firewall; a cockpit area distribution plenum, which is attached to the firewall; a defrost valve outlet found under the deck, just aft of the windshield; various outlets, which supply heated air to the floorboard and cabin area; push-pull controls on the instrument panel and flexible ducting connect the system.

2. System Operation

A. Ram air enters the engine compartment through the forward baffle inlet found aft of the propeller. This air goes through ducting to the heat exchange heater shroud around the exhaust interconnect tube on the forward end of the engine. As air passes into the heat shroud and around the exhaust interconnect tube, it gets heat from the engine exhaust. The heated air goes through ducting, to a firewall shutoff valve. The shutoff valve is cable-controlled from the cockpit and controls the flow of heated air that enters the cockpit area distribution plenum. From the plenum, several ducts supply the heated air to floorboard and defroster outlets.

NOTE: The cockpit-area distribution plenum is also set to receive outside fresh air from the left and right external air scoops (doors). This arrangement lets a combination of fresh air and heated air to be mixed and supplied to the entire system. For maximum heating of the airplane cabin, all valves must be fully open. This includes the valves that control the fresh air flow from the left and right external air scoops.

3. Shutoff Valve Removal/Installation

A. The shutoff valve is attached to the firewall and is not removed from the airplane during normal maintenance. If the valve is replaced, the firewall must be sealed with Type IV sealant when the shutoff valve is attached to the firewall. For a list of Type IV sealants, refer to Air Conditioning - General.

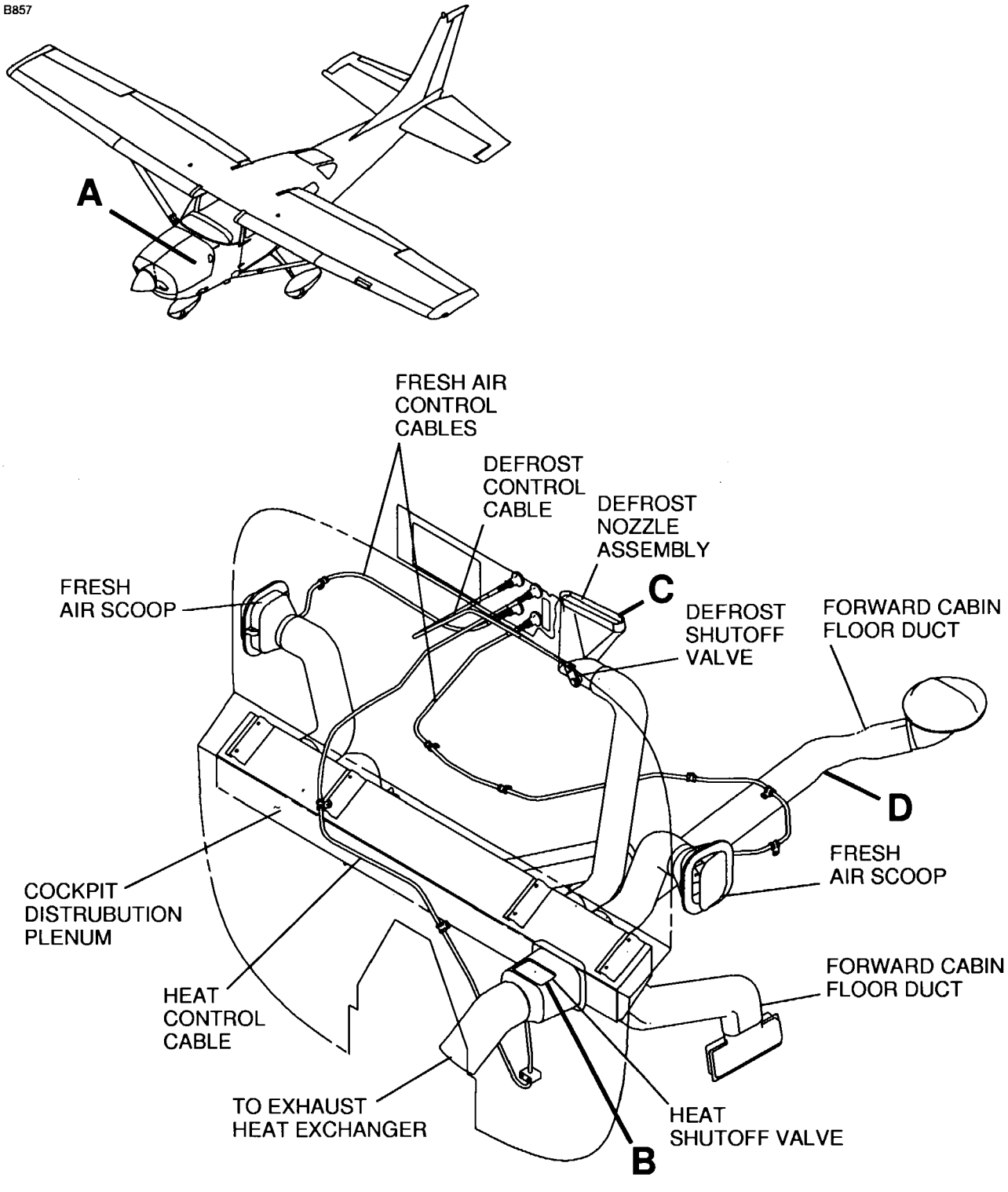
4. Cabin Heat Control Cable Removal/Installation

A. Remove the Control Cable (Refer to Figure 201).
(1) Remove the engine cowling. Refer to Chapter 71, Cowls - Maintenance Practices.
(2) Carefully make the end of the cabin heat control cable straight.
(3) Loosen the clamp bolt on the control arm and remove the cable from the control arm.
(4) Remove the screws that attache the clamps to the firewall.
(5) From the inside of the cabin, get access to the backside of the CABIN HT control cable.
(6) Loosen the nut on the backside of the control cable.
(7) Carefully remove the cable from the instrument panel and firewall.

B. Install the Control Cable (Refer to Figure 201).
(1) Put the end of the control cable through the hole in the instrument panel and through the hole in the firewall.
(2) Attach the CABIN HT control cable to the backside of the instrument panel with the jam nut.
(3) Put the end of the control cable through the clamp bolt and tighten the clamp bolt.
(4) Attach the control to the firewall.
(5) Do a test of the control cable to make sure that there is a full range of travel. Put the control housing in the clamp on the firewall to adjust the travel.
(6) When a there is a full range of travel, bend the end of the control cable around the clamp bolt.
(7) Install the engine cowl. Refer to Chapter 71, Cowls - Maintenance Practices.

5. Defrost Control Cable Removal/Installation

A. Remove the Defrost Control Cable (Refer to Figure 201).
(1) Carefully make the end of the defrost control cable straight.
(2) Loosen the clamp bolt on the control arm and remove the cable from the control arm.



DETAIL A

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Heating System Installation
Figure 201 (Sheet 1)

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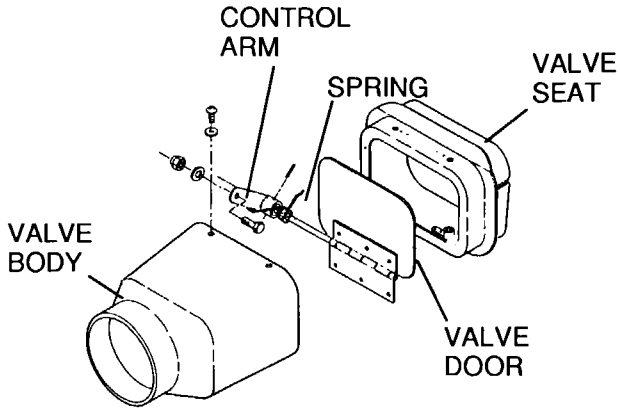
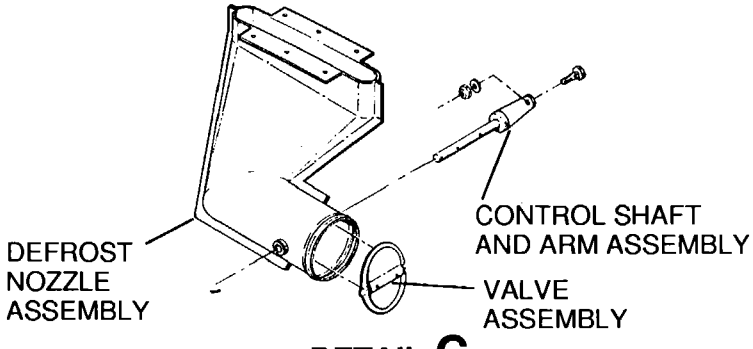
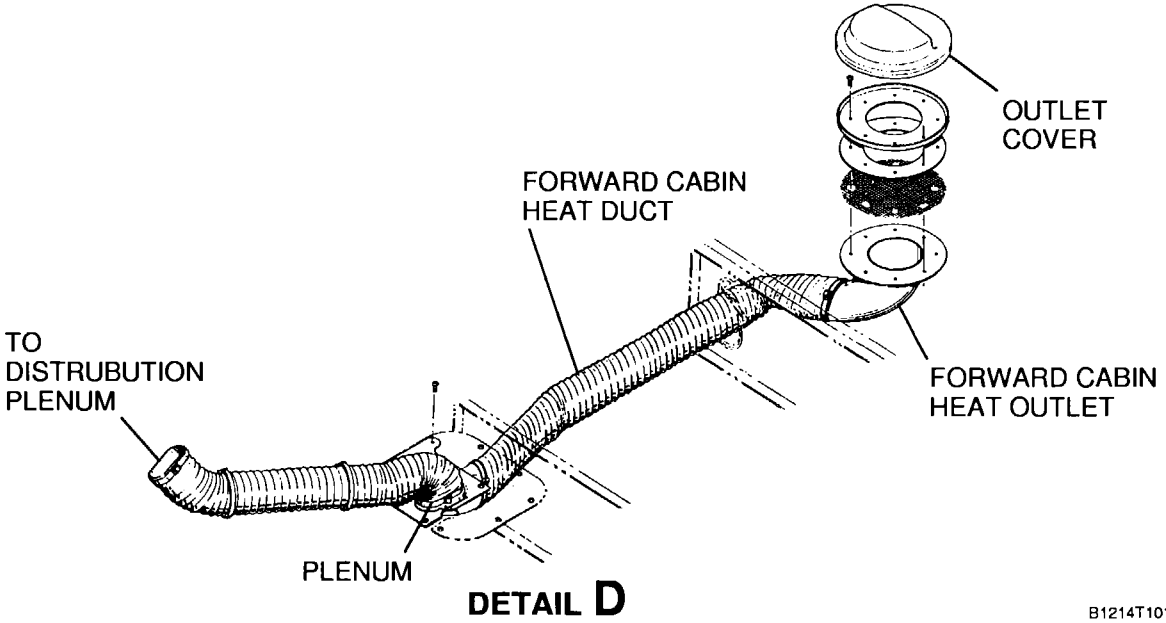


DETAIL B



DETAIL C



DETAIL D

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C1214T1015
D1214T1013

Heating System Installation
Figure 201 (Sheet 2)

(3) Remove the screws that connect the clamps.
(4) From the inside of the cabin, get access to the backside of the DEFROST control cable.
(5) Loosen the nut on the backside of the control cable.
(6) Carefully remove the cable from the instrument panel.

B. Install the Defrost Control Cable (Refer to Figure 201).
(1) Put the end of the control cable through the hole in the instrument panel.
(2) Attach the DEFROST control cable to the backside of the instrument panel with the jam nut.
(3) Put the end of the control cable through the clamp bolt.
(4) Use a clamp to attach the control housing.
(5) Do a test of the control cable to make sure that there is a full range of travel. Put the control housing in the clamp on the firewall to adjust the travel.
(6) When a there is a full range of travel, bend the end of the control cable around the clamp bolt.

6. Distribution System Components Removal/Installation

A. The cockpit area distribution plenum is bolted to the firewall, and the other components of the heated air distribution system are connected to the cockpit area distribution plenum by ducts, which are connected by clamps. The heated air distribution system components do not require replacement during normal maintenance. If the ducts become damaged or worn, they must be replaced with new ducting.

CHAPTER

22

AUTO FLIGHT

LIST OF EFFECTIVE PAGES

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CONTENTS

AUTO FLIGHT - GENERAL

1. Scope and Definition

A. The GFC-700 flight control system is a two-axis (pitch and roll) autopilot system. The GFC-700 flight control system has the GIA-63W Integrated Avionics Unit, Primary Flight Display (PFD), Multi-Function Display (MFD), roll axis servo, pitch axis servo, pitch trim servo, and servo mounts.

B. The KAP-140 flight control system can be one of two autopilot systems: single-axis (roll) or two-axis (pitch and roll).
   (1) The KAP-140 single-axis configuration has the flight computer, configuration module, roll axis servo actuator, rate gyro, directional gyro and servo mount.
   (2) The KAP-140 two-axis configuration has the flight computer, configuration module, roll axis servo actuator, pitch axis servo actuator, pitch trim servo actuator, rate gyro, directional gyro and servo mounts.

C. This chapter gives the removal and installation procedures for the KAP-140 (single and two-axis) and GFC-700 autopilot flight computers and servo actuators.

AUTOPILOT - MAINTENANCE PRACTICES

1. General

A. A single-axis autopilot featuring heading hold is installed as standard equipment on the base model airplane. Heading hold is based on turn coordinator and directional gyro input and can incorporate GPS, VOR or Localizer input on demand.

B. A dual-axis autopilot is available as an option. The two-axis system provides heading, vertical speed and altitude hold selection. Altitude alerting and altitude preselection are optional features with the two-axis autopilot system.

2. KC-140 (Single-Axis) Autopilot Flight Computer Removal/Installation

A. Remove Autopilot (Single-Axis) Flight Computer (Refer to Figure 201).
(1) Ensure that power is OFF to autopilot flight computer.
(2) Loosen mounting screw on face of autopilot flight computer.
(3) Pull autopilot flight computer out and away from mounting tray.

B. Install Autopilot Computer (Refer to Figure 201).
(1) Slide autopilot computer forward into mounting tray.
(2) Tighten mounting screw on face of autopilot computer.
(3) Turn power ON to autopilot controller.
(4) Push HDG button to engage autopilot in Heading Mode.
(5) Move heading bug on directional gyro left and right of current heading to verify proper deflection of ailerons.

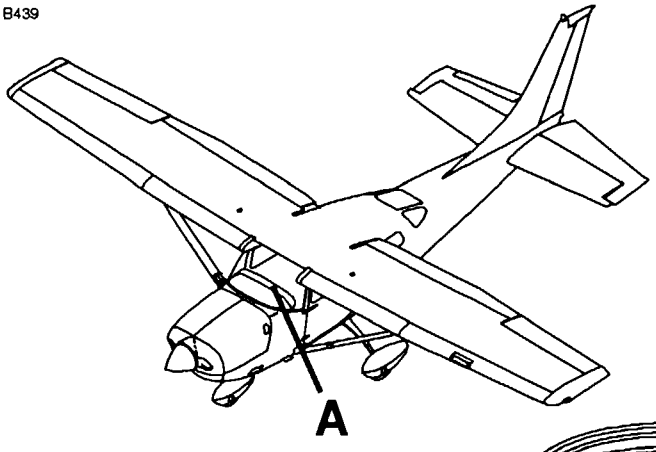
C. Remove Roll Servo (Refer to Figure 202).
(1) Remove access plate 610AB. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(2) Disconnect electrical connector from roll servo.
(3) Release cable tension, loosen roll servo cable at turnbuckle.
(4) Remove bolts securing roll servo to bracket assembly.
(5) Remove roll servo from airplane.

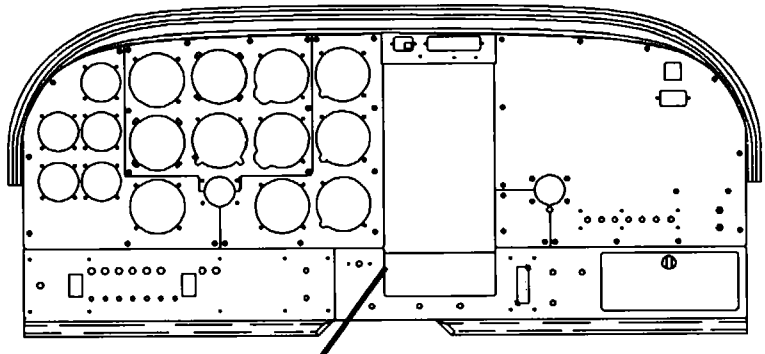
D. Inspect Roll Servo (Refer to Figure 202).
(1) Remove servo cover.

CAUTION: Any disassembly/assembly of the servo must be done at a static-safe workstation. The inspector and bench should be grounded.

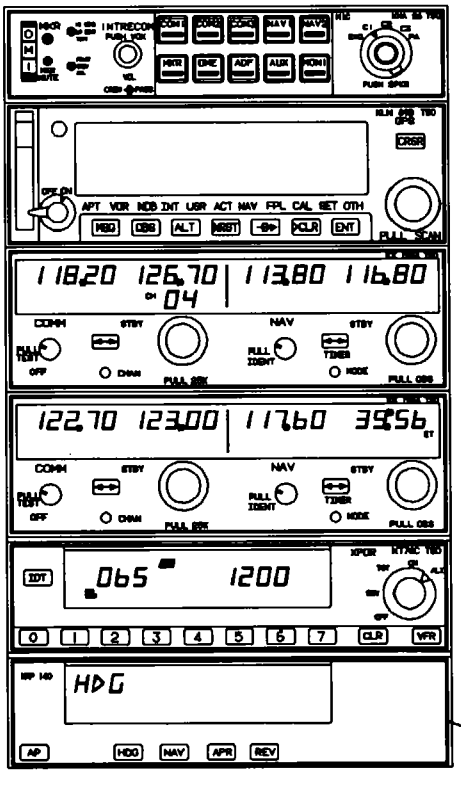
(a) Remove the two screws that hold the cover on the unit, and carefully slide the cover off over the wiring harness.
(b) Place the servo (without the cover) on the bench so that the inner parts of the unit will not be damaged.
(2) Inspect solenoid/clutch.
(a) Inspect the operation of the solenoid. The plunger should move freely in and out of the solenoid body. There should be no dirt, contamination, or corrosion around the solenoid plunger. This could impede the actuation of the solenoid.
(b) The release spring should pull the plunger out of the solenoid and against its stop freely and without hesitation. With hands clear of the solenoid plunger and spring, the pinion gear should spin with no interference from the clutch gears.
(3) Perform general inspection.
(a) Inspect the electrical wiring for evidence of wear or damage to the insulation. This could cause electrical shorting and unit malfunction.
(b) Inspect the entire servo for any loose hardware or other abnormalities.
(4) Install cover.
(a) Carefully slide the cover back on over the wiring harness and onto the unit to its original position.

B439





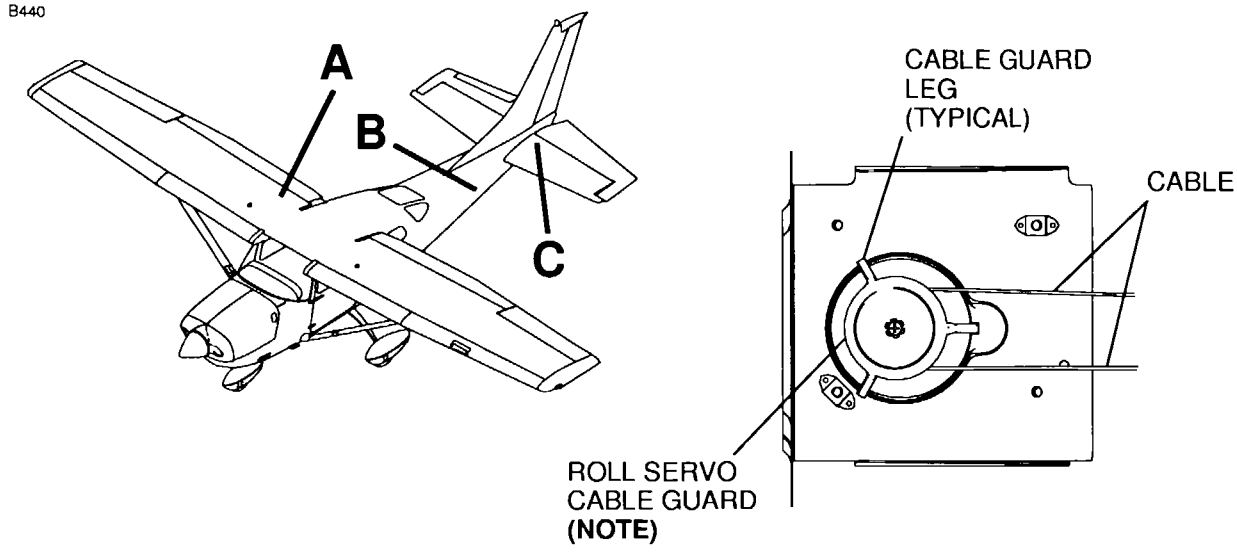
DETAIL A



DETAIL B

1210T1001
A0718TC1002
B0718T1001

KAP-140 Autopilot Installation
Figure 201 (Sheet 1)

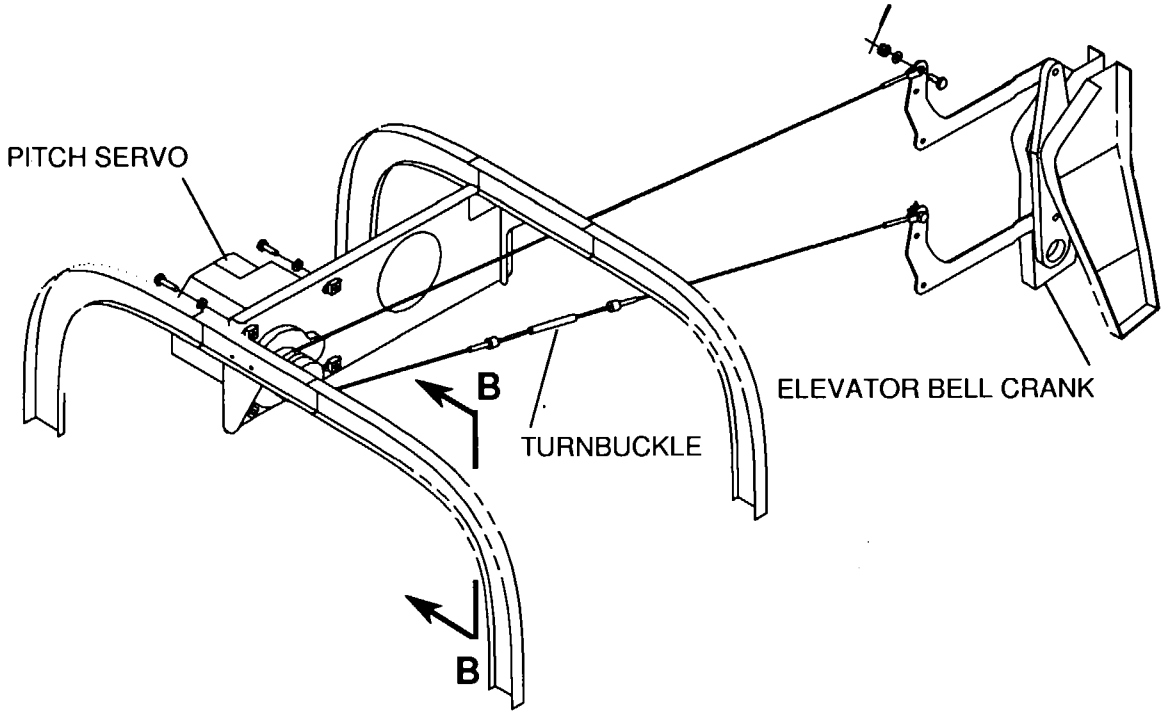


DETAIL A

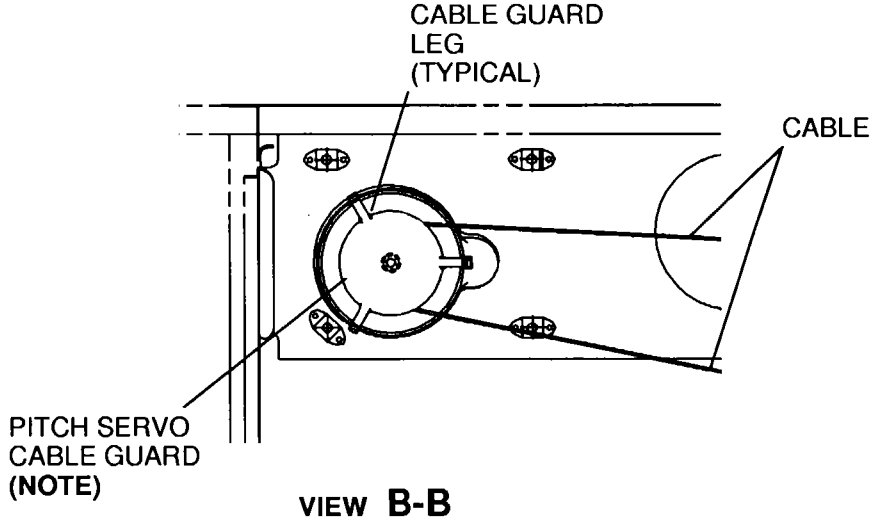
1210T1001
A1260T1006
AA1214T1029

Autopilot Servo Installation
Figure 202 (Sheet 1)

B441



DETAIL B



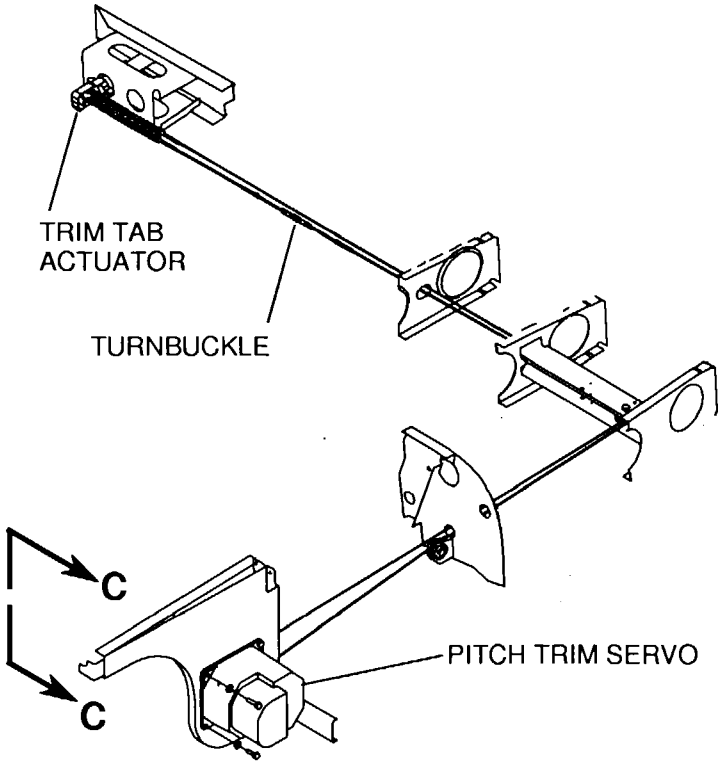
VIEW B-B

NOTE: CABLES MUST NOT CONTACT CABLE GUARD LEGS

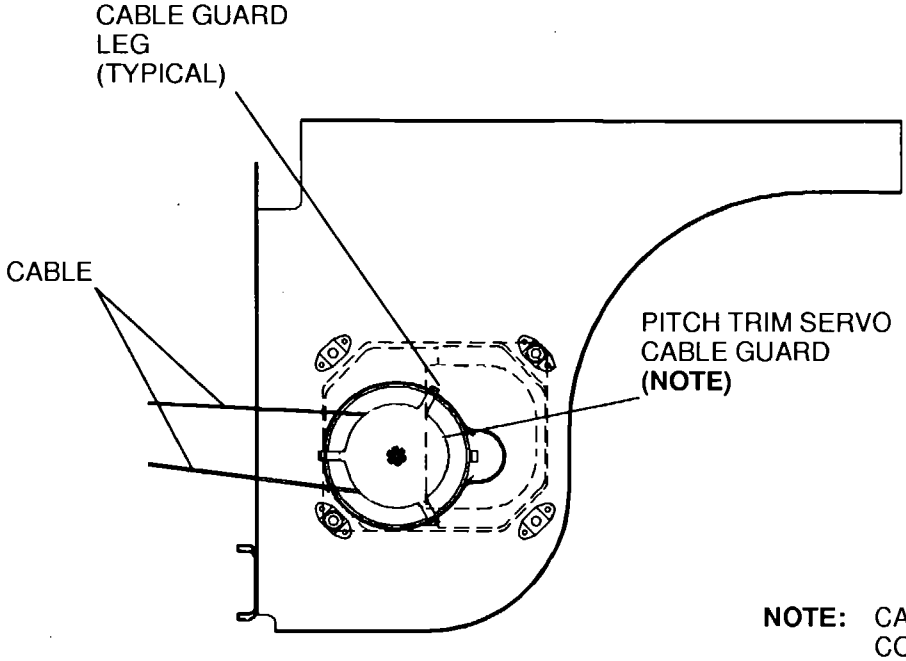
B1260T1008
B-B1214T1030

Autopilot Servo Installation
Figure 202 (Sheet 2)

B442



DETAIL C



VIEW C-C

NOTE: CABLES MUST NOT CONTACT CABLE GUARD LEGS

C1260T1009
C-C1214T1031

Autopilot Servo Installation
Figure 202 (Sheet 3)

(b) Install the screws using a low-strength thread-locking compound such as Loctite 222 or Loctite 242.

(5) Remove the servo capstan assembly and check the slip-clutch torque setting (Refer to KAP-140 Installation Manual).
(a) Set servo clutch plate torque to 33 ±3 inch pounds.
(b) Record setting information and date by permanently marking placard on internal face of servo clutch housing.

E. Install Roll Servo (Refer to Figure 202).
(1) Position roll servo to bracket assembly in the install position and secure with bolts.
(2) Connect electrical connector to roll servo.

NOTE: Removal of servo mount requires disconnecting the servo cable. Consequently, servo cable rigging is required upon reinstallation of the servo mount.

(3) Install roll servo cable on roll servo.

NOTE: System rigging should be accomplished with aileron and bellcrank in neutral position.

NOTE: Wrap cable around servo drum approximately 1.25 turns each direction from swaged ball when rigging (drum ball detent facing inboard).

NOTE: When installing cable guard, ensure that the legs of the cable guard do not touch the cable. Be sure that feet of cable guard straddle notches around perimeter of mount.

(4) Adjust roll servo cable tension with turnbuckle to obtain cable tension of 15 pounds, ±3 pounds.
(5) Turn power ON to autopilot controller.
(6) Push HDG button to engage autopilot in Heading Mode.
(7) Move heading bug on directional gyro left and right of current heading to verify proper deflection of ailerons.

3. KC-140 (Dual-Axis) Autopilot Flight Computer Removal/Installation

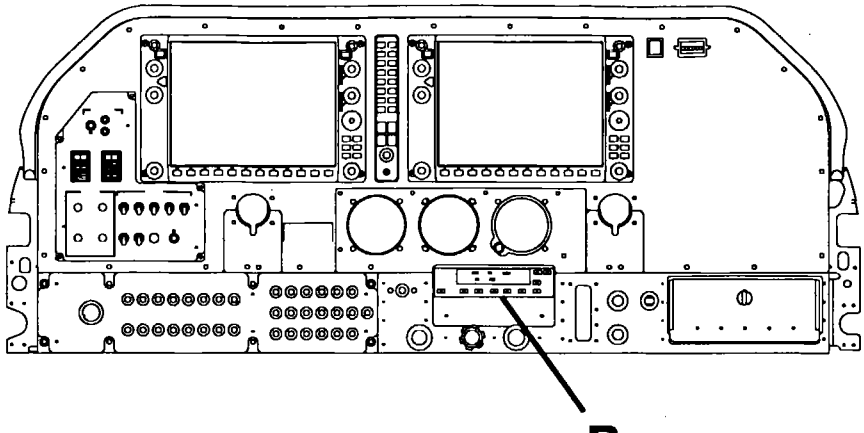
A. Remove Autopilot (Dual-Axis) Flight Computer (For Airplanes without the Garmin G1000, refer toFigure 201. For Airplanes with the Garmin G1000, refer to Figure 203).
(1) Ensure that power is OFF to autopilot flight computer.
(2) Loosen mounting screw on face of autopilot flight computer.
(3) Pull autopilot flight computer out and away from mounting tray.

B. Install Autopilot Computer (Refer to Figure 201).
(1) Slide autopilot computer forward into mounting tray.
(2) Tighten mounting screw on face of autopilot computer.
(3) Turn power ON to autopilot computer and operationally test in accordance with manufacturers manual.

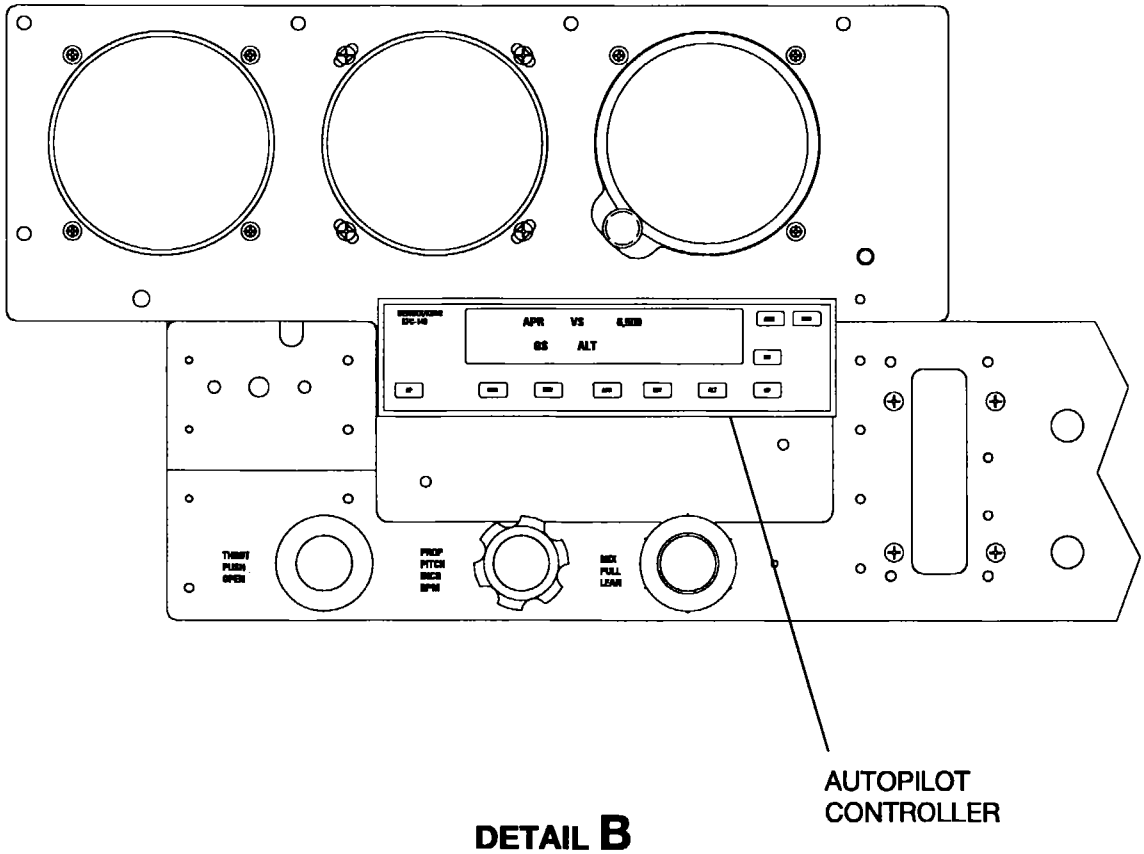
C. Remove Roll Servo (Refer to Figure 202).
(1) Remove access plate (610AB). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(2) Disconnect electrical connector from roll servo.
(3) Release cable tension, loosen roll servo cable at turnbuckle.
(4) Remove bolts securing roll servo to bracket assembly.
(5) Remove roll servo from airplane.

D. Inspect Roll Servo (Refer to Figure 202).
(1) Remove servo cover.

B3488



DETAIL A



DETAIL B
AIRPLANES WITH GARMIN G1000

A0718T1053
B0718T1053

KAP-140 Autopilot Installation
Figure 203 (Sheet 1)

CAUTION: Any disassembly/assembly of the servo must be done at a static-safe workstation. The inspector and bench should be grounded.

(a) Remove the two screws that hold the cover on the unit, and carefully slide the cover off over the wiring harness.
(b) Place the servo (without the cover) on the bench so that the inner parts of the unit will not be damaged.

(2) Inspect solenoid/clutch.
(a) Inspect the operation of the solenoid. The plunger should move freely in and out of the solenoid body. There should be no dirt, contamination, or corrosion around the solenoid plunger. This could impede the actuation of the solenoid.
(b) The release spring should pull the plunger out of the solenoid and against its stop freely and without hesitation. With hands clear of the solenoid plunger and spring, the pinion gear should spin with no interference from the clutch gears.

(3) Perform general inspection.
(a) Inspect the electrical wiring for evidence of wear or damage to the insulation. This could cause electrical shorting and unit malfunction.
(b) Inspect the entire servo for any loose hardware or other abnormalities.

(4) Install cover.
(a) Carefully slide the cover back on over the wiring harness and onto the unit to its original position.
(b) Install the screws using a low-strength thread-locking compound such as Loctite 222 or Loctite 242.

(5) Remove the servo capstan assembly and check the slip-clutch torque setting (Refer to KAP-140 Installation Manual).
(a) Set servo clutch plate torque to 33 ±3 inch pounds.
(b) Record setting information and date by permanently marking placard on internal face of servo clutch housing.

E. Install Roll Servo (Refer to Figure 202).
(1) Position roll servo to bracket assembly in the install position and secure with bolts.
(2) Connect electrical connector to roll servo.

NOTE: Removal of servo mount requires disconnecting the servo cable. Consequently, servo cable rigging is required upon reinstallation of the servo mount.

(3) Install roll servo cable on roll servo.

NOTE: System rigging should be accomplished with aileron and bellcrank in neutral position.

NOTE: Wrap cable around servo drum approximately 1.25 turns each direction from swaged ball when rigging (drum ball detent facing inboard).

NOTE: When installing cable guard, ensure that the legs of the cable guard do not touch the cable. Be sure that feet of cable guard straddle notches around perimeter of mount.

(4) Adjust roll servo cable tension with turnbuckle to obtain cable tension of 15 pounds, ±3 pounds.
(5) Install access plate.
(6) Turn autopilot on and operationally test in accordance with the manufacturers installation manual. Refer to Introduction, List of Manufacturers Technical Publications.

F. Remove Pitch Servo (Refer to Figure 202).
(1) Remove access plates 310AR, 340AL and 340AR. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(2) Disconnect electrical connector from pitch servo.
(3) Release cable tension, loosen pitch servo cable at turnbuckle.
(4) Remove bolts securing pitch servo to bracket assembly.
(5) Remove pitch servo from airplane.

G. Inspect Pitch Servo (Refer to Figure 202).
(1) Remove servo cover.

CAUTION: Any disassembly/assembly of the servo must be done at a static-safe workstation. The inspector and bench should be grounded.

(a) Remove the two screws that hold the cover on the unit, and carefully slide the cover off over the wiring harness.
(b) Place the servo (without the cover) on the bench so that the inner parts of the unit will not be damaged.

NOTE: Take care not to move the positions of any wires, wire ties, or the counterweight spring clamp. Their positions are preset at the factory, and are important to insure proper performance of the unit.

(2) Inspect solenoid/clutch.
(a) Inspect the operation of the solenoid. The plunger should move freely in and out of the solenoid body. There should be no dirt, contamination, or corrosion around the solenoid plunger. This could impede the actuation of the solenoid.
(b) The release spring should pull the plunger out of the solenoid and against its stop freely and without hesitation. With hands clear of the solenoid plunger and spring, the pinion gear should spin with no interference from the clutch gears.
(3) Perform general inspection.
(a) Inspect the electrical wiring for evidence of wear or damage to the insulation. This could cause electrical shorting and unit malfunction.
(b) Inspect the entire servo for any loose hardware or other abnormalities.
(4) Perform additional inspection for the pitch servo.
(a) Position the servo so that the baseplate is on the bottom side of the unit.
(b) While holding on to the top section of the motor, gently rotate the motor. It should rotate freely side to side a slight amount before touching and beginning to deflect the trim-sensing strain gauge beam.
(5) Install cover.
(a) Carefully slide the cover back on over the wiring harness and onto the unit to its original position.
(b) Install the screws using a low-strength thread-locking compound such as Loctite 222 or Loctite 242.
(6) Remove the servo capstan assembly and check the slip-clutch torque setting (Refer to KAP-140 Installation Manual).
(a) Set servo clutch plate torque to 15 ±2 inch pounds.
(b) Record setting information and date by permanently marking placard on internal face of servo clutch housing.

H. Install Pitch Servo (Refer to Figure 202).
(1) Position pitch servo to bracket assembly in the install position and secure with bolts.
(2) Connect electrical connector to pitch servo.

NOTE: Removal of servo mount requires disconnecting the servo cable. Consequently, servo cable rigging is required upon reinstallation of the servo mount.

(3) Install pitch servo cable on pitch servo actuator.

NOTE: System rigging should be accomplished with elevator and bell crank in neutral position.

NOTE: Wrap cable around pitch servo drum approximately 1.25 turns each direction from swaged ball when rigging (drum ball detent facing forward).

NOTE: When installing cable guard, ensure that the legs of the cable guard do not touch the cable. Be sure that feet of cable guard straddle notches around perimeter of mount.

(4) Adjust pitch servo cable tension with turnbuckle to obtain cable tension of 15 pounds ±3 pounds (66.7 N, ±13.34 N).
(5) Install access plates 310AR, 340AL and 340AR. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(6) Turn autopilot on and operationally test in accordance with the manufacturers installation manual. Refer to Introduction, List of Manufacturers Technical Publications.

I. Remove Pitch Trim Servo (Refer to Figure 202).
(1) Remove access plates 310AR, 340AL and 340AR. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(2) Disconnect electrical connector from pitch trim servo.
(3) Release cable tension, loosen pitch trim servo cable at turnbuckle.
(4) Remove bolts securing pitch trim servo to bracket assembly.
(5) Remove pitch trim servo from airplane.

J. Inspect Pitch Trim Servo (Refer to Figure 202).
(1) Remove servo cover.

CAUTION: Any disassembly/assembly of the servo must be done at a static-safe workstation. The inspector and bench should be grounded.

(a) Remove the two screws that hold the cover on the unit, and carefully slide the cover off over the wiring harness.
(b) Place the servo (without the cover) on the bench so that the inner parts of the unit will not be damaged.
(2) Inspect solenoid/clutch.
(a) Inspect the operation of the solenoid. The plunger should move freely in and out of the solenoid body. There should be no dirt, contamination, or corrosion around the solenoid plunger. This could impede the actuation of the solenoid.
(b) The release spring should pull the plunger out of the solenoid and against its stop freely and without hesitation. With hands clear of the solenoid plunger and spring, the pinion gear should spin with no interference from the clutch gears.
(3) Perform general inspection.
(a) Inspect the electrical wiring for evidence of wear or damage to the insulation. This could cause electrical shorting and unit malfunction.
(b) Inspect the entire servo for any loose hardware or other abnormalities.
(4) Install cover.
(a) Carefully slide the cover back on over the wiring harness and onto the unit to its original position.
(b) Install the screws using a low-strength thread-locking compound such as Loctite 222 or Loctite 242.
(5) Remove the servo capstan assembly and check the slip-clutch torque setting (Refer to KAP-140 Installation Manual).
(a) Set servo clutch plate torque to 40 ±4 inch pounds.
(b) Record setting information and date by permanently marking placard on internal face of servo clutch housing.

K. Install Pitch Trim Servo (Refer to Figure 202).
(1) Position pitch trim servo to bracket assembly in the install position and secure with bolts.
(2) Connect electrical connector to pitch trim servo.

NOTE: Removal of servo mount requires disconnecting the servo cable. Consequently, servo cable rigging is required upon reinstallation of the servo mount.

(3) Rig pitch trim servo cable.

NOTE: Servo trim chain must be located on aft sprocket of actuator prior to rigging manual trim system. Manual trim system must be rigged prior to rigging servo trim system. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices, Trim Tab Control Adjustment/Test.

(a) Set elevator in neutral position.
(b) Set trim tab to 10 degrees up relative to elevator using an inclinometer.

NOTE: This will place the chain sprocket on the actuator at approximately the halfway point in its rotation from its mechanical stops.

(c) Relocate servo trim chain on aft sprocket of actuator so that equal lengths of chain are on either side of sprocket.
(d) Wrap cable around pitch trim servo drum approximately 1.25 turns each direction from swaged ball.
(e) Adjust pitch trim servo cable tension with turnbuckle to obtain cable tension of 15 pounds, ±3 pounds.

NOTE: When installing cable guard, ensure that the legs of the cable guard do not touch the cable. Be sure that feet of cable guard straddle notches around perimeter of mount.

(4) Install access plates 310AR, 340AL and 340AR. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(5) Turn autopilot on and operationally test in accordance with the manufacturers installation manual. Refer to Introduction, List of Manufacturers Technical Publications.

L. Check pitch trim rigging.
(1) Streamline the elevator and trim tab. Mount an inclinometer to trim tab and set to 0 degrees. Manually run trim tab to up and down limits and record limits of travel.
(2) Position observer at bottom aft access opening in tailcone. Apply power to the airplane and run electric trim to full nose-up position until the observer notices clutch slippage. With servo clutch still slipping, apply an additional 1/4 turn of the manual trim wheel nose-up (test load condition).
(3) In this condition, observer needs to verify that the swaged ball on the cable assembly does not rotate aft of the tangent point.
(4) Release the trim wheel and disengage the autopilot. Manually run the trim to full nose-up position and check trim tab deflection with an inclinometer. Additional trim tab deflection (compared with the values recorded in step L.1.) indicates slippage of the stop blocks. Rerig trim system, check torque on stop block bolts, then repeat pitch trim rigging check.
(5) If swaged ball needs adjustment, make adjustments by repositioning cable assembly chain on gear teeth of actuator sprocket. One chain link corresponds to approximately 17 degrees of travel on the capstan. Re-tension cable and repeat pitch trim rigging check.
(6) Repeat procedure for the full nose-down trim condition.

4. Autopilot Roll Null.

A. Set the Autopilot Roll Null (If Autopilot Installed).
(1) You must first have the auto-pilot flight computer pass the pre-flight test.
(2) Unplug the roll servo connector from the airplane harness.
(3) Apply a ground to pin K of the harness connector.

(4) Connect the digital multimeter across the harness connector at pins D and L to monitor the servo drive voltage.
(5) Press the autopilot AP button on the auto-pilot flight computer to engage it.
  (a) The default ROL mode must be selected. For example, the HDG, NAV or APR modes are not engaged.
  (b) Use a DMM to measure the DC voltage across pins D and L of the roll servo harness connector.
  (c) Adjust the pot until a value of 0 volts +0.020 or -0.020 volts are measured.
    1 If you reach the end of the pot movement before the servo drive is nulled, disengage the autopilot, turn the pot fully to the opposite stop and then engage the autopilot.
  (d) The roll null adjustment range emulates a four turn pot that lets the method of setting the pot adjustment range.

    NOTE: This adjustment compensates for offsets in the roll axes, including the Turn Coordinator.

  (e) Continue to turn the pot to null the voltage.
(6) Connect the airplane roll servo harness connector to the servo connector.

GFC-700 AUTOPILOT - MAINTENANCE PRACTICES

1. General

A. The GFC-700 is a dual-axis autopilot with heading, altitude, and vertical speed hold.

2. GFC-700 Autopilot Flight Computer Removal/Installation

A. Remove the Autopilot Flight Computer.
   (1) Refer to Chapter 23, Communications - Maintenance Practices

B. Install the Autopilot Flight Computer.
   (1) Refer to Chapter 23, Communications - Maintenance Practices

3. Roll Servo Actuator Removal/Installation

A. Remove the Roll Servo Actuator (Refer to Figure 201).
   (1) Make sure the MASTER and AVIONICS switches are in the OFF position.
   (2) Remove the 610AB access panel. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
   (3) Disconnect the electrical connector from the roll servo actuator.
   (4) Remove the bolts and washers that attach the roll servo actuator to the torque mount.
   (5) Remove the roll servo actuator from the airplane.

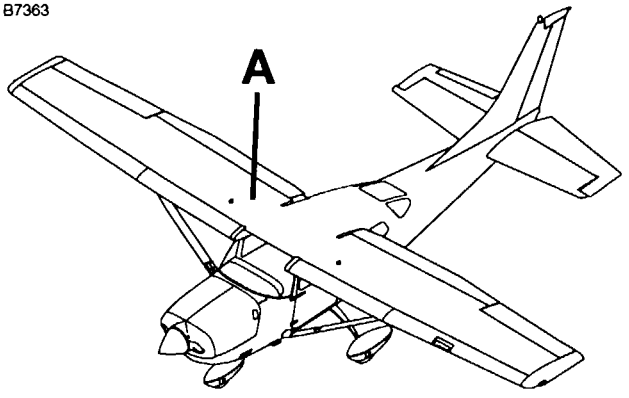
B. Install the Roll Servo Actuator (Refer to Figure 201).
   (1) Put the roll servo actuator in position on the torque mount and attach with bolts and washers.
   (2) Connect the electrical connector to the roll servo actuator.
   (3) Do a check to make sure the servo operates correctly. Refer to the Garmin G1000 Maintenance Manual, Revision G or later.
   (4) Install the 610AB access panel. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

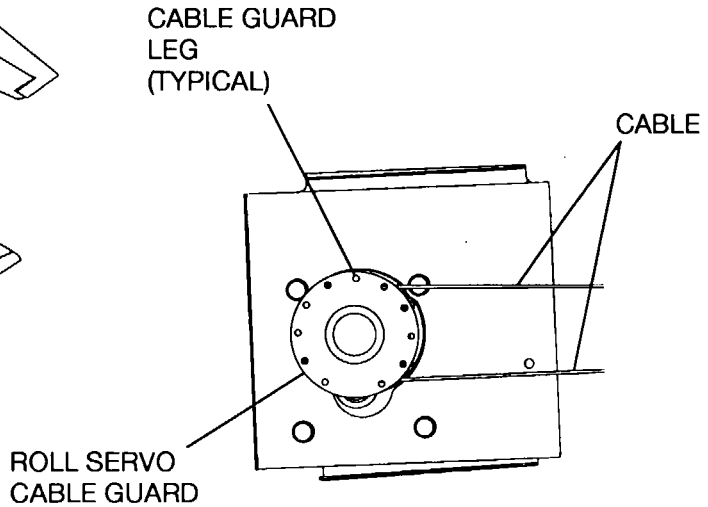
4. Roll Servo and Cable Removal/Installation

A. Remove the Roll Servo and Cable (Refer to Figure 201).
   (1) Make sure the MASTER and AVIONICS switches are in the OFF position.
   (2) Remove the 610AB access panel to get access to the roll servo and the cable. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
   (3) Disconnect the electrical connector.
   (4) Release the servo cable tension at the turnbuckle.
   (5) Remove the cable guard.
   (6) Record how the cable is installed on the capstan.
   (7) Disconnect the cable from the turnbuckle.
   (8) Remove the cable from the capstan.
   (9) Remove the bolts that attach the servo assembly to the bracket.
   (10) Remove the servo from the airplane.

B. Install the Roll Servo and Cable (Refer toFigure 201).
   (1) Put the servo and the cable in position at the servo mount and install the bolts.
   (2) Put the servo cable in position on the capstan.
   (3) Wind the cable approximately 1.25 turns each direction around the capstan.
   (4) Install the cable guard.
   (5) Connect the cable to the turnbuckle.
   (6) Use the turnbuckle to adjust the roll servo cable tension to 15 pounds, +3 or -3 pounds.
   (7) Connect the electrical connector.
   (8) Do a check to make sure the servo operates correctly. Refer to the Garmin G1000 Maintenance Manual, Revision G or later.
   (9) Install the 610AB access panel. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

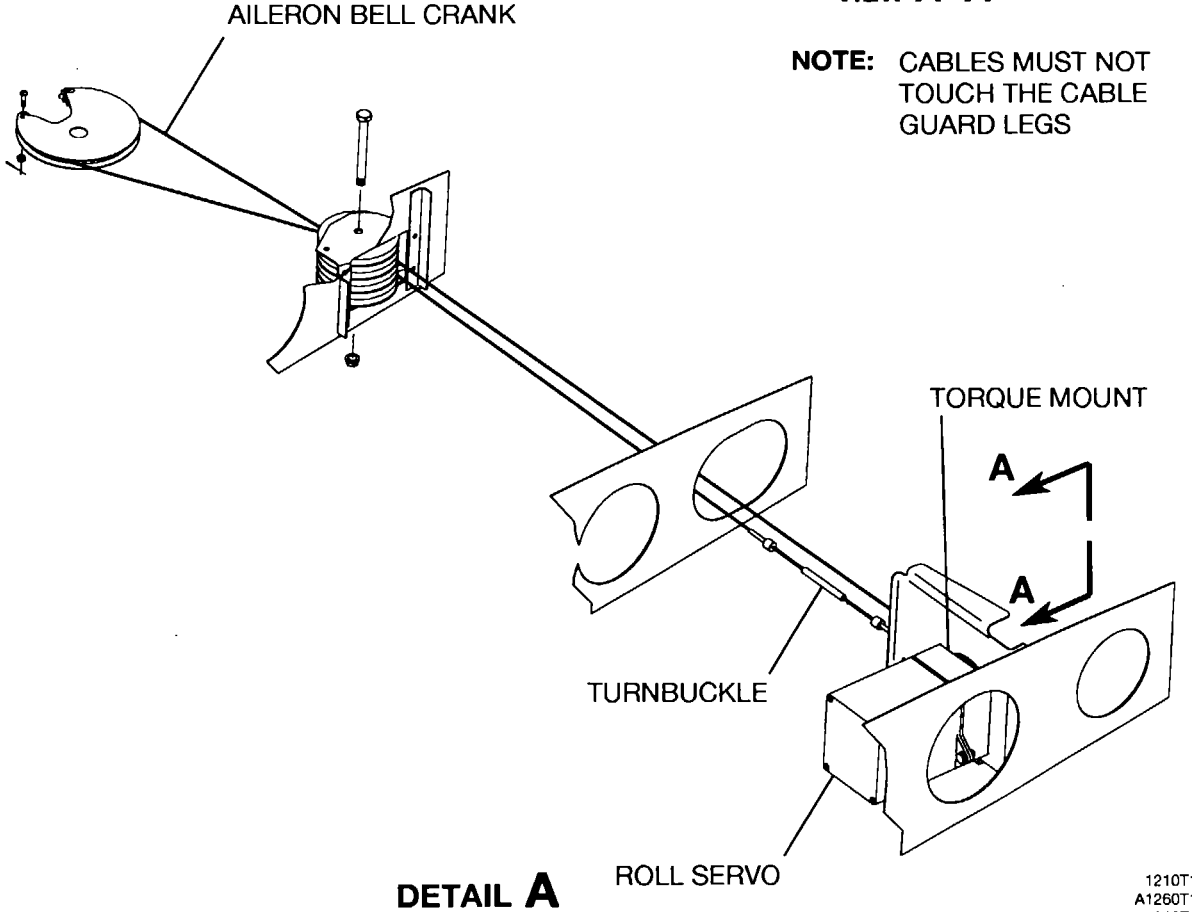
B7363





VIEW A–A

NOTE: CABLES MUST NOT TOUCH THE CABLE GUARD LEGS

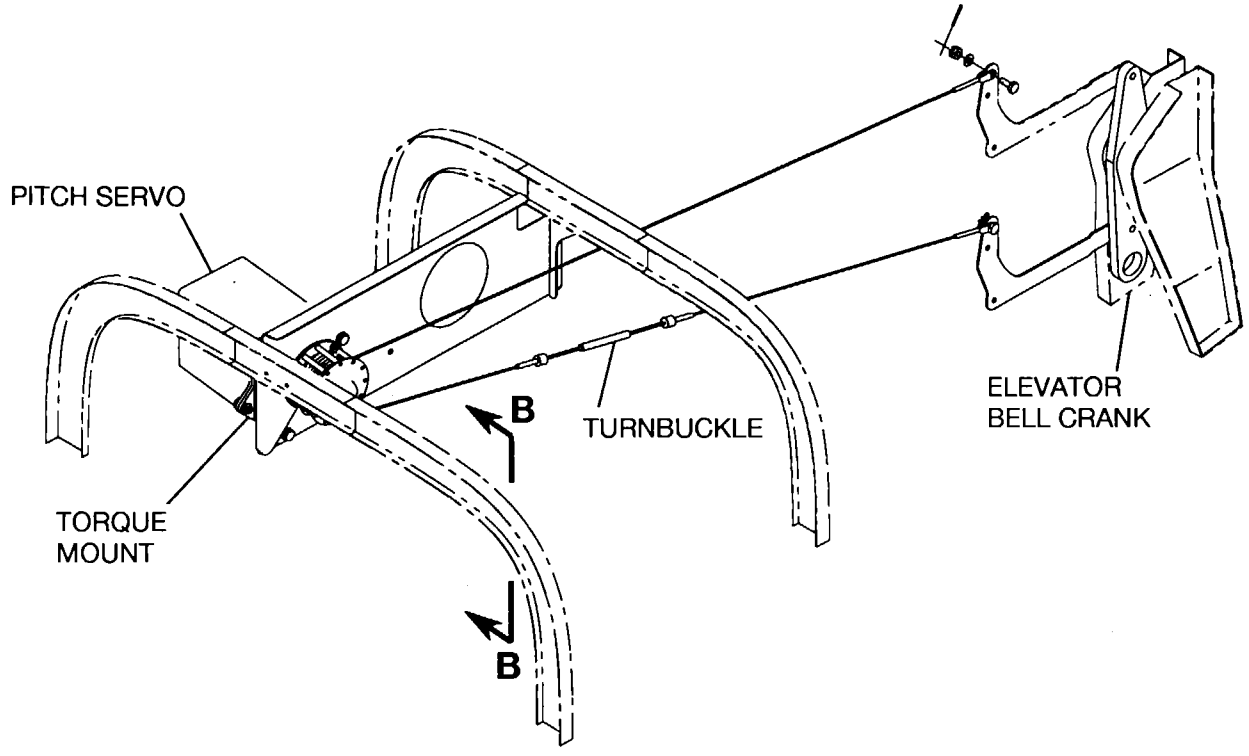


DETAIL A

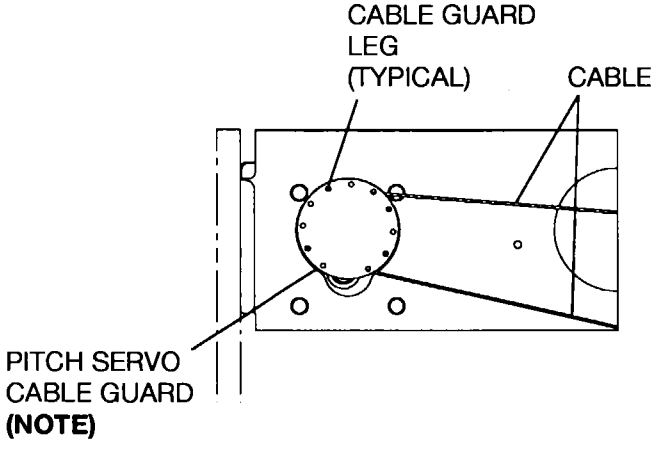
1210T1001
A1260T1014
AA1260T1014

Autopilot Servo Installation
Figure 201 (Sheet 1)

B7364



DETAIL B



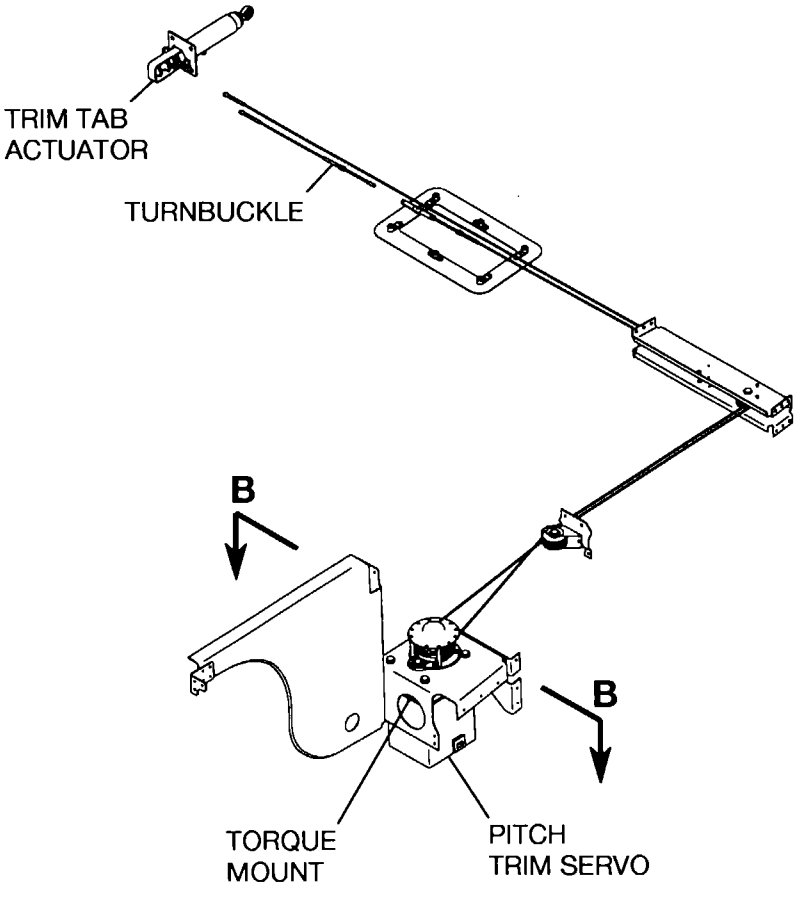
VIEW B–B

NOTE: CABLES MUST NOT TOUCH THE CABLE GUARD LEGS

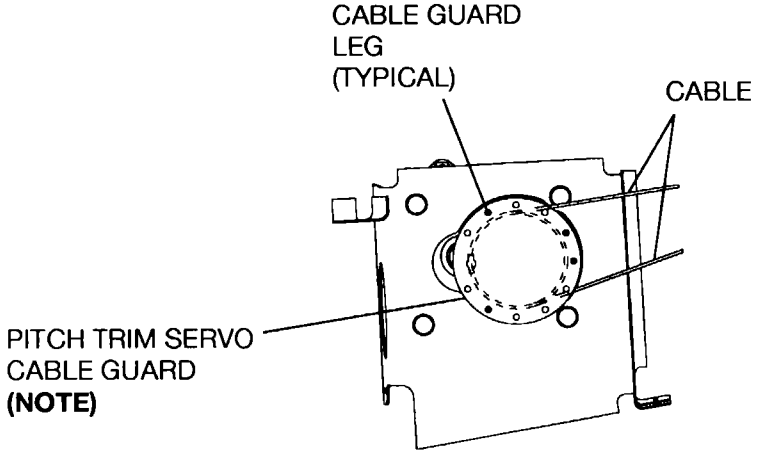
B1260T1008
BB1260T1008

Autopilot Servo Installation
Figure 201 (Sheet 2)

B7365



DETAIL A



NOTE: CABLES MUST NOT TOUCH THE CABLE GUARD LEGS

VIEW B–B

C1214T1072
CC1214T1072

Autopilot Servo Installation
Figure 201 (Sheet 3)

5. Pitch Servo Actuator Removal/Installation

A. Remove Pitch Servo Actuator (Refer to Figure 201).
(1) Make sure the MASTER and AVIONICS switches are in the OFF position.
(2) Remove the 310AR, 340AL and 340AR access panels. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(3) Disconnect the electrical connector from the pitch servo.
(4) Remove the bolts and washers that attach the pitch servo to the torque mount.
(5) Remove the pitch servo actuator from the airplane.

B. Install the Pitch Servo (Refer to Figure 201).
(1) Put the pitch servo in position on the torque mount and attach with the bolts.
(2) Connect the electrical connector to the pitch servo.
(3) Do a check to make sure the servo operates correctly. Refer to the Garmin G1000 Maintenance Manual, Revision G or later.
(4) Install the 310AR, 340AL and 340AR access panels. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

6. Pitch Servo and Cable Removal/Installation

A. Remove the Pitch Servo and Cable (Refer to Figure 201).
(1) Make sure the MASTER and AVIONICS switches are in the OFF position.
(2) Remove the 310AR, 340AL and 340AR access panels to get access to the pitch servo and the cable. Refer to Chapter 6, Access Plates and Panels Identification - Description and Operation.
(3) Disconnect the electrical connector .
(4) Release the servo cable tension at the turnbuckle.
(5) Remove the cable guard.
(6) Record how the cable is installed on the capstan.
(7) Disconnect the cable from the turnbuckle.
(8) Remove the cable from the capstan.
(9) Remove the bolts that attach the servo assembly to the bracket.
(10) Remove the servo from the airplane.

B. Install the Pitch Servo and Cable (Refer to Figure 201).
(1) Put the servo and the cable in position at the servo mount and install the bolts.
(2) Put the servo cable in position on the capstan.
(3) Wind the cable approximately 1.25 turns each direction around the capstan.
(4) Install the cable guard.
(5) Connect the cable to the turnbuckle.
(6) Use the turnbuckle to adjust the roll servo cable tension to 15 pounds, +3 or -3 pounds.
(7) Connect the electrical connector.
(8) Do a check to make sure the servo operates correctly. Refer to the Garmin G1000 Maintenance Manual, Revision G or later.
(9) Install the 310AR, 340AL and 340AR access panel. Refer to Chapter 6, Access Plates and Panels Identification - Description and Operation.

7. Pitch Trim Servo Actuator Removal/Installation

A. Remove the Pitch Trim Servo (Refer to Figure 201).
(1) Make sure the MASTER and AVIONICS switches are in the OFF position.
(2) Remove the 310AR, 340AL and 340AR access panels. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(3) Disconnect the electrical connector from the pitch trim servo.
(4) Remove the bolts and washers that attach the pitch trim servo to the torque mount.
(5) Remove the pitch trim servo from the airplane.

B. Install the Pitch Trim Servo (Refer to Figure 201).
(1) Put the pitch trim servo in position on the torque mount and attach with bolts.
(2) Connect the electrical connector to the pitch trim servo.

(3) Do a check to make sure the servo operates correctly. Refer to the Garmin G1000 Maintenance Manual, Revision G or later.
(4) Install the 310AR, 340AL and 340AR access panels. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(5) Put the MASTER and AVIONICS switches in the ON position.

8. Pitch Trim Servo and Cable Removal/Installation

A. Remove the Pitch Trim Servo (Refer to Figure 201).
(1) Make sure the MASTER and AVIONICS switches are in the OFF position.
(2) Remove the 310AR, 340AL and 340AR access panels. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(3) Disconnect the electrical connector from the pitch trim servo.
(4) Release the control cable tension and loosen the pitch trim servo control cable at the turnbuckle.
(5) Remove the bolts and washers that attach the pitch trim servo to the bracket.
(6) Remove the pitch trim servo from the airplane.

B. Install the Pitch Trim Servo (Refer to Figure 201).
(1) Put the pitch trim servo in position on the bracket assembly and attach with the bolts.
(2) Connect the electrical connector to the pitch trim servo.
(3) Do the pitch trim servo control cable rigging.
(a) The servo trim chain must be on the aft sprocket of the actuator before the manual trim system rigging can be done.
(b) Do the manual trim system rigging before the servo trim system rigging. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices, Trim Tab Control Adjustment/Test.
(c) Put the elevator in the neutral position.
(d) Use an inclinometer to put the trim tab to 5 degrees up in relation to the elevator.

NOTE: The chain sprocket on the actuator will be at approximately the halfway point in its rotation from the mechanical stops.

(e) Move the servo trim chain on the aft sprocket of the actuator so that equal lengths of the chain are on either side of the sprocket.
(f) Wind the control cable around the pitch trim servo drum approximately 1.25 turns each direction from the swaged ball.
(g) Make sure the flanges of the control cable guard do not touch the control cable.
(h) Make sure the flanges of the control cable guard are on either side of the notches around the outer edge of the mount.
(i) Use the turnbuckle to adjust the pitch trim servo control cable tension to 15 pounds, +3 or -3 pounds.
(4) Do a check to make sure the servo operates correctly. Refer to the Garmin G1000 Maintenance Manual, Revision G or later.
(5) Install the 310AR, 340AL and 340AR access panels. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

9. Pitch Trim Rigging Inspection

A. Do a check of the pitch trim rigging.
(1) Attach an inclinometer to the trim tab.
(2) Put the trim tab in the 0 degree position.
(3) Manually operate the trim tab to the up and down limits.
(4) Record the limits of travel.
(5) Put an observer at the right-hand access opening of the tailcone.
(6) Put the electrical trim to the full nose-up position until the observer sees the clutch slip.
(7) Turn the manual trim wheel nose-up (test load condition) 1/4 turn more while the clutch slips.
(8) Make sure the swaged ball on the control cable assembly does not turn aft of the tangent point.
(9) Release the trim wheel and disengage the autopilot.
(10) Manually operate the trim to the full nose-up position.
(11) Do a check of the trim tab position with an inclinometer.

(12) Trim tab position that is greater than the limits of travel values recorded is an indication that the stop blocks slipped.
  (a) Do the trim system rigging again.
  (b) Make sure the stop block bolts torque is correct.
  (c) Do the check of the pitch trim rigging again.

(13) If necessary, make adjustments to the swaged ball position.
  (a) Put the control cable assembly chain in the applicable position on the gear teeth of the actuator sprocket.

    NOTE: One chain link adjustment is related to approximately 17 degrees of travel on the capstan.

  (b) Apply the applicable tension to the control cable and do the check of the pitch trim rigging again.

(14) Do the procedure again for the full nose-down trim condition.

10. Servo Capstan Clutch Adjustment

A. Adjust the servo capstan clutch in accordance with the manufactures installation manual. Refer to Introduction, the List of Manufacturers Technical Publications for the manufacturer's installation manual.

Roll Servo Clutch Plate	77, +9 or -9 inch-pounds (8.7, +1.02 or -1.02 N-m)
Pitch Servo Clutch Plate	39, +5 or -5 inch-pounds (4.4, +0.56 or -0.56 N-m)
Pitch Trim Servo Clutch Plate	64, +8 or -8 inch-pounds (7.2, +0.90 or -0.90 N-m)

CHAPTER 23

COMMUNICATIONS

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
23-Title		
23-List of Effective Pages		
23-Record of Temporary Revisions		
23-Table of Contents		
23-00-00	Page 1	Dec 2/2002
23-10-00	Pages 201-209	Jan 1/2007
23-50-00	Pages 201-204	Dec 2/2002
23-60-00	Pages 201-202	Dec 2/2002

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

COMMUNICATIONS - GENERAL

1. Scope

A. This chapter describes and provides maintenance instructions for equipment which furnishes a means of communicating from one part of the airplane to another, and between the airplane and other airplanes or ground stations.

B. Additional information on communications equipment can be found in the Wiring Diagram Manual supplied with the airplane.

C. Technical publications available from the manufacturer of the various components and systems which are not covered in this manual must be utilized as required for maintenance of those components and systems.

2. Tools and Equipment

NOTE: Equivalent substitutes may be used for the following items:

NAME	NUMBER	MANUFACTURER	USE
Type I, Class B-2 Sealant	PR1440	Courtaulds Aerospace 5426 San Fernando Rd. Glendale, CA 91209	To fay seal antenna to fuselage.

3. Definition

A. Information contained in this chapter provides the basic procedures which can be accomplished at the flight line level; such as, removal and installation of components and system operation.

B. This chapter is divided into sections to aid maintenance personnel in locating information. A brief description of each section is as follows:

(1) The speech communication section describes radio equipment used for reception and transmission of voice communication.

(2) The audio integrating system section describes that portion of the system which controls the output of the communications and navigation receivers into the pilot and passengers headphones and speakers, and the output of the pilot's microphone into the communications transmitters.

(3) The static discharging section describes the static discharge wicks used to dissipate static electricity.

COMMUNICATIONS - MAINTENANCE PRACTICES

1. General

A. Maintenance practices for the NAV/COM units have procedures for the removal and installation of the different components.

B. The dual navigation/communications (NAV/COM/) radio is in the instrument panel.

C. For airplanes with the Garmin G1000, the center of the Garmin G1000 is the GIA 63 Integrated Avionics Unit (IAU), which is in the tailcone. The GIA 63 operates as a primary communications center that connects all of the Line Replaceable Units (LRUs) with the Primary Function Display (PFD) and Multi-Function Display (MFD). The GIA 63 has the GPS receiver, VHF NAV/COM receivers, and system integration microprocessors. The GIA 63W has the Wide Area Augmentation System (WAAS) installed. The GIA 63 transmits directly to the PFD and MFD by a High-Speed Data Bus (HSDB) Ethernet connection. Software and configurations are sent from the displays through the GIA 63 to the LRU's in the system.

2. Troubleshooting

A. For troubleshooting procedures of the GIA 63 Integrated Avionics Units in airplanes with Garmin G1000, refer to the Garmin G1000 Line Maintenance Manual.

3. NAV/COM Radio Removal/Installation

CAUTION: Do not interchange the KX-155A and the KX-165A NAV/COM radios. The wiring is not the same for the two different radios. If these radios are interchanged and used with the same wiring, damage can occur to the KX-155A and/or the KX-165A NAV/COM radios.

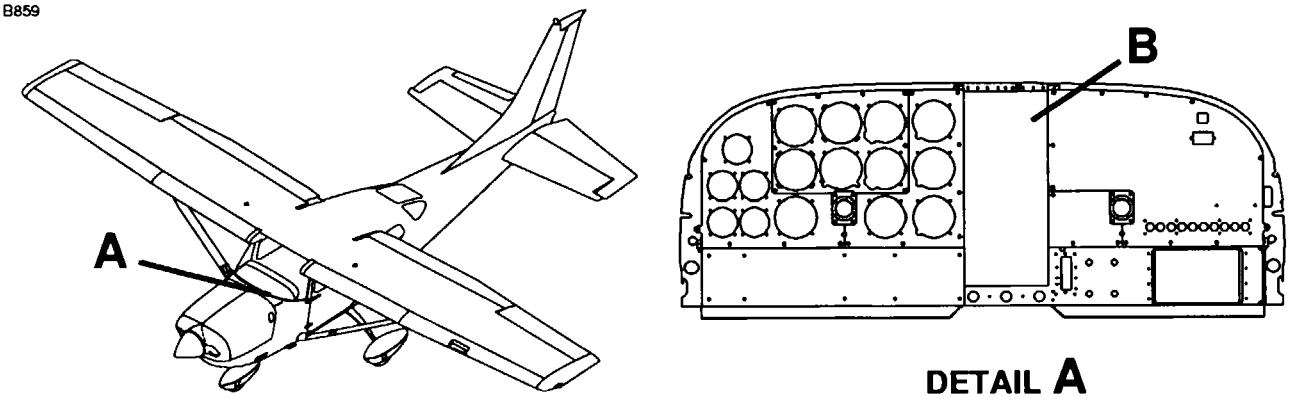
NOTE: The airplane has dual NAV/COM units installed. One NAV/COM unit has glideslope. The removal and installation is typical.

NOTE: The procedures that follow are for airplanes with standard avionics.

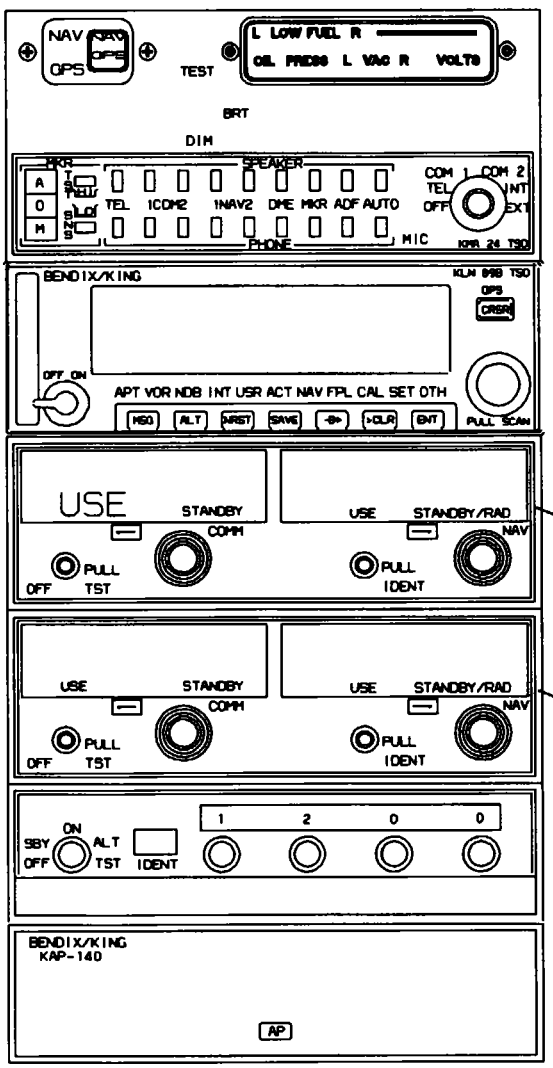
A. Remove the NAV/COM with the Glide Slope (Refer to Figure 201).
   (1) Make sure the NAV/COM power is OFF.
   (2) Disengage the NAV COM 1 and/or NAV COM 2 circuit breaker.
   (3) On the face of the NAV/COM unit, turn the mounting screw counterclockwise until locking paw releases the unit from the back of the tray.
   (4) Hold the NAV/COM unit and gently pull it out of the tray.
   (5) Pull the NAV/COM panel out from the mounting tray to disconnect the COM 1 electrical connectors and/or COM 2 connectors from the back of the NAV/COM panel.

B. Install the NAV/COM with the Glide Slope (Refer to Figure 201).
   (1) Put the NAV/COM panel in the tray and push it in position.
   (2) Connect the electrical connectors and/or to rear of NAV/COM.
   (3) Slide the NAV/COM unit into tray. Make sure the NAV/COM panel is correctly connected to the electrical connectors at the rear of the tray.
   (4) Turn the screw on face of NAV/COM clockwise until the NAV/COM unit is attached in the tray.
   (5) Engage the NAV COM 1 and/or NAV COM 2 circuit breaker.
   (6) Set the MASTER switch in the ON position.
   (7) Turn the NAV/COM power ON and make sure the electronic display illuminates.
   (8) Set the MASTER and NAV/COM switches in the OFF position.

B859



DETAIL A



NAV/COM WITH GLIDE SLOPE

NAV/COM

DETAIL B

1210T1001
A1218T1002
B1218T1012

NAV/COM Installation
Figure 201 (Sheet 1)

4. GIA-63 Integrated Avionics Unit Removal/Installation

NOTE: The procedures that follow are for airplanes with Garmin G1000.

NOTE: The airplane has dual integrated avionics units installed. The removal and installation is typical.

A. Remove the Integrated Avionics Unit (Refer to Figure 202).
   (1) Disconnect electrical power to the airplane.
   (2) Set the MASTER switch and AVIONICS switch to the off position.
   (3) Disengage the applicable COM 1 or COM 2 circuit breaker.

CAUTION: Use a tailcone stand when you get in the tailcone.

   (4) Get access to the avionics inside the tailcone.
      (a) Remove the baggage divider.
   (5) Push on the D-Ring and turn it 90 degrees counterclockwise to release the lever on the unit.
   (6) Move the lever up to disengage the locking stud with the dogleg slot in the mounting rack.
   (7) Remove the unit from the mounting rack.

B. Install the Integrated Avionics Unit (Refer to Figure 202).

CAUTION: Make sure the unit goes into position without resistance. Damage to the connectors, unit, or mounting rack will occur if the unit is pushed into position with force.

NOTE: The unit must be in position in the mounting rack to let the locking stud engage the channel.

   (1) Carefully put the unit in position in the mounting rack.
   (2) Push the lever down toward the bottom of the unit to engage the locking stud with the dogleg slot in the mounting rack.
   (3) Push on the D-Ring and turn it 90 degrees clockwise to attach the lever.
   (4) Install the baggage divider.
   (5) Engage the applicable COM 1 or COM 2 circuit breaker.
   (6) Set the AVIONICS and MASTER switches to the ON position.
   (7) Do a check for correct operation. Refer to the Garmin G1000 Line Maintenance Manual.

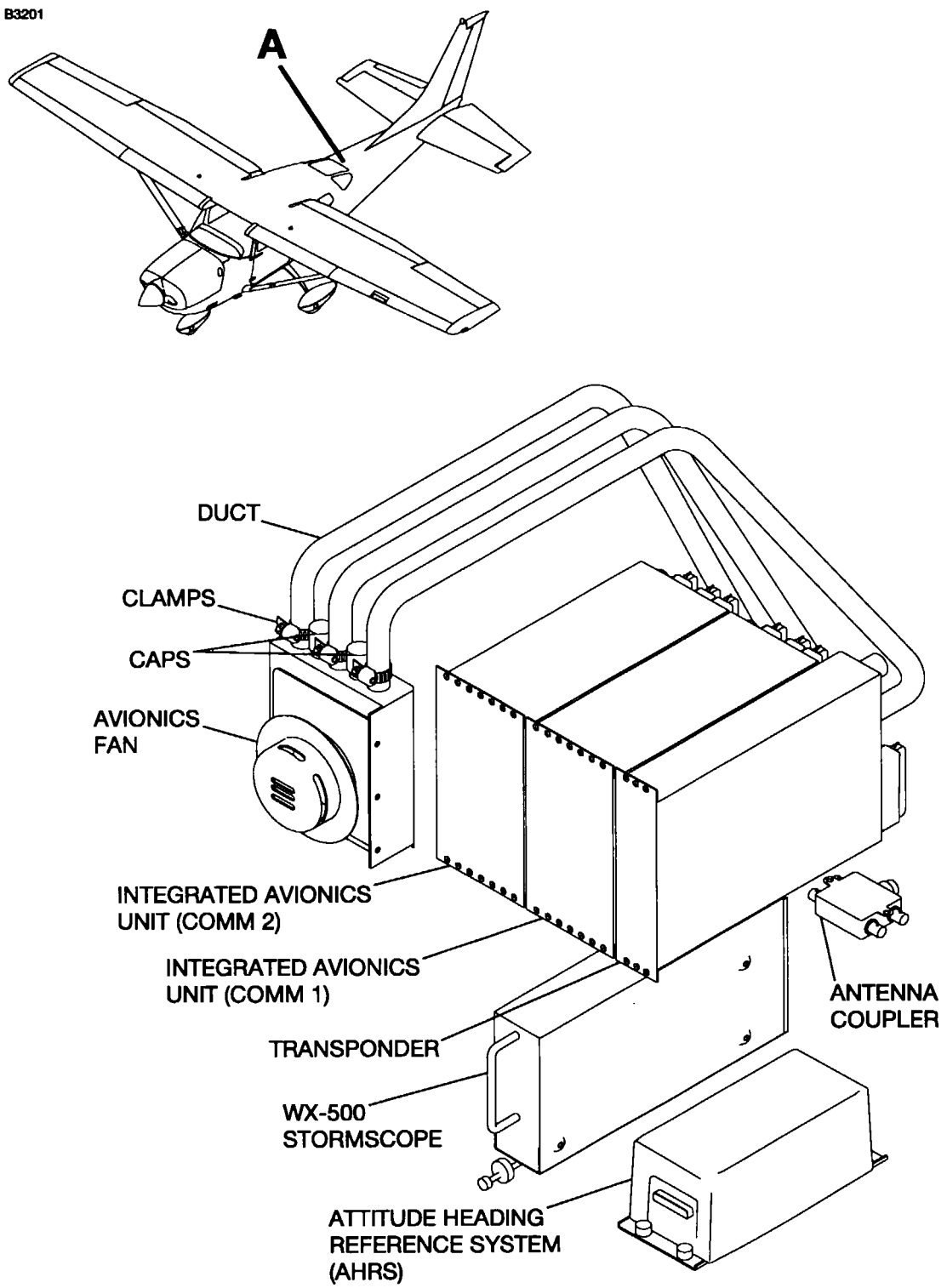
5. VHF Antenna Removal/Installation

NOTE: The removal/installation procedures are typical for both antennas.

NOTE: On airplanes with Garmin G1000 avionics, the left VHF antenna is also the GDL-69A antenna and a GPS antenna.

A. Remove the Antenna (Refer to Figure 203).
   (1) Make sure all electrical power to the airplane is disconnected.
   (2) Get access to the top of the wing.
   (3) Remove the four screws and lock washers, which attach the antenna to the top of the fuselage.
   (4) Pull the antenna away from the fuselage far enough to disconnect the coaxial connector COMM 1 and/or COMM 2 from the antenna.
      (a) Attach the coax cable to the airplane structure to prevent the cable from falling down into the headliner area.

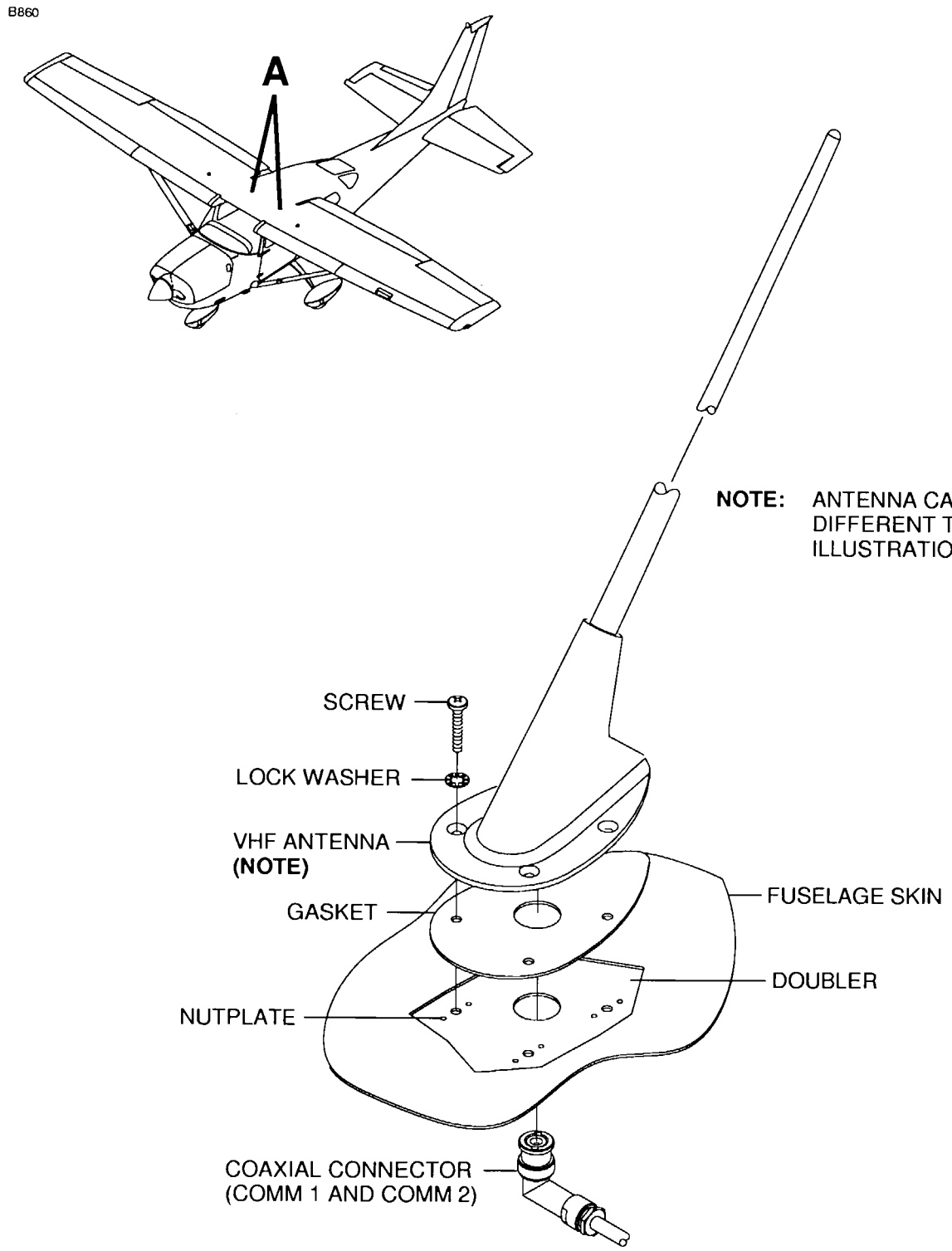
B. Install the Antenna (Refer to Figure 203).
   (1) Connect the coaxial connector COMM 1 and/or to COMM 2 to the antenna.
   (2) Attach the base of the antenna to the top of the fuselage.
   (3) Clean and fillet seal interface area of the antenna base and fuselage with Type I, Class B-2 sealant. Refer to Communications - General for a list of Type I sealants.



DETAIL A

1210T1001
A1218T1046

Tailcone Avionics
Figure 202 (Sheet 1)

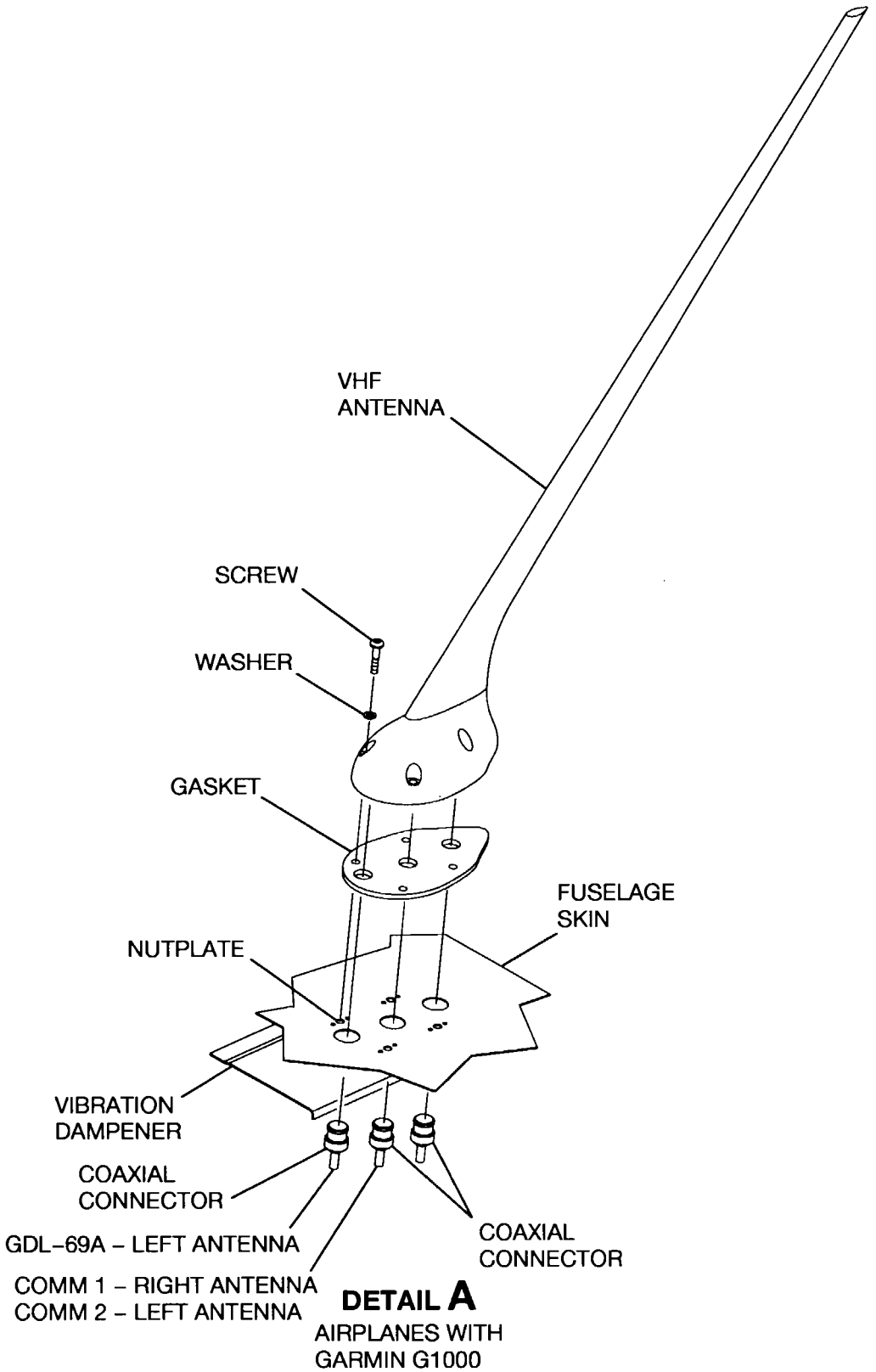


DETAIL A
AIRPLANES WITH VHF ANTENNA

1210T1001
A0518T1025

VHF Communication Antenna Installation
Figure 203 (Sheet 1)

B2496



A0518T1107

VHF Communication Antenna Installation
Figure 203 (Sheet 2)

6. NAV Antenna Removal/Installation

A. Remove the NAV Antenna (Refer to Figure 204).
(1) Put the MASTER switch in the off position.
(2) Remove the screws that attach the NAV antenna to the tail.
(3) Pull the antenna away from the fuselage to disconnect the coax connector from the antenna.
(4) Carefully remove the fillet seal from the junction of the NAV antenna and the skin of the airplane.

B. Install the NAV Antenna (Refer to Figure 204).
(1) Connect the coaxial connector to the antenna.
(2) Attach the antenna to the tail with the screws.
(3) Clean and fillet seal the interface area of the antenna base and the fuselage with Type VI sealant. Refer to Chapter 20, Fuel, Weather and High Temperature Sealing for a list of Type VI sealants.

7. Microphone Switch Removal/Installation

A. Remove the Microphone Switch (Refer to Figure 205).
(1) Remove the nut that attaches the microphone switch (S1) to the escutcheon.
(2) Remove the screw that attaches the escutcheon to the control wheel.
(3) Lift up the escutcheon to get access to the microphone switch and disconnect the microphone switch from the control wheel connection.

B. Install the Microphone Switch (Refer to Figure 205).
(1) Connect the microphone switch (S1) to the connection in the control wheel.
(2) Attach the microphone switch to the escutcheon with the nut.
(3) Set the escutcheon in position and install the screw in the escutcheon.

8. Microphone Switch Button Cleaning

A. Clean the Switch Button (Refer to Figure 205).

CAUTION: Make sure that oil and dirt do not collect on the internal electrical contacts of the switch and cause the button to operate incorrectly.

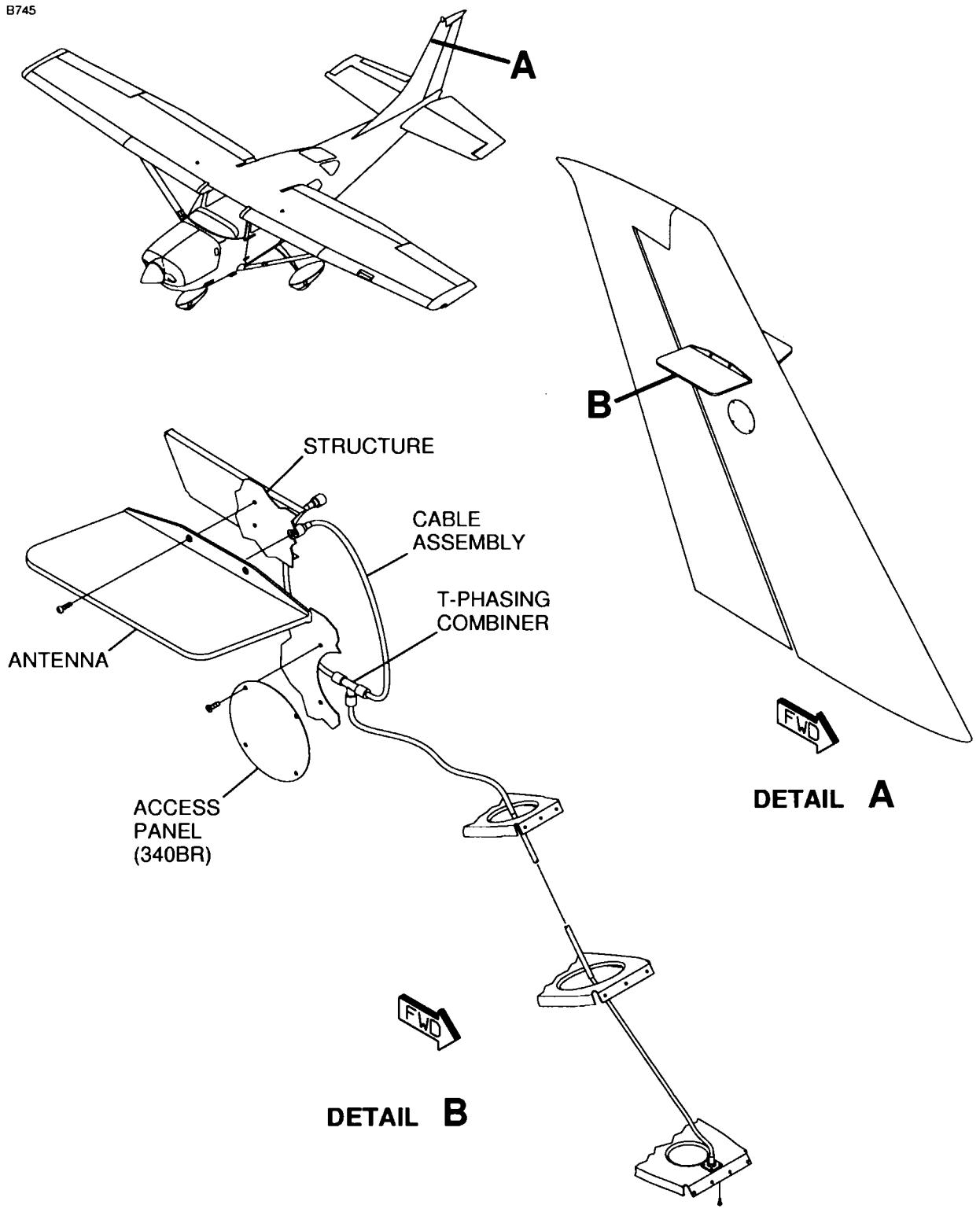
(1) Apply a sufficient quantity of electrical contact cleaning spray around the full edge of the button so it will soak down into the switch.

NOTE: The electrical contact cleaning spray will help to remove oil and dirt from the internal electrical contacts of the switch. The recommended contact cleaner is Electro Contact Cleaner 03116 or equivalent, which can be supplied by LPS Laboratories, Inc. The phone number is 1-800-241-8334.

(2) Press the button many times to make sure the cleaner gets into the internal electrical contacts of the switch.
(3) Complete an operational check of the switch.

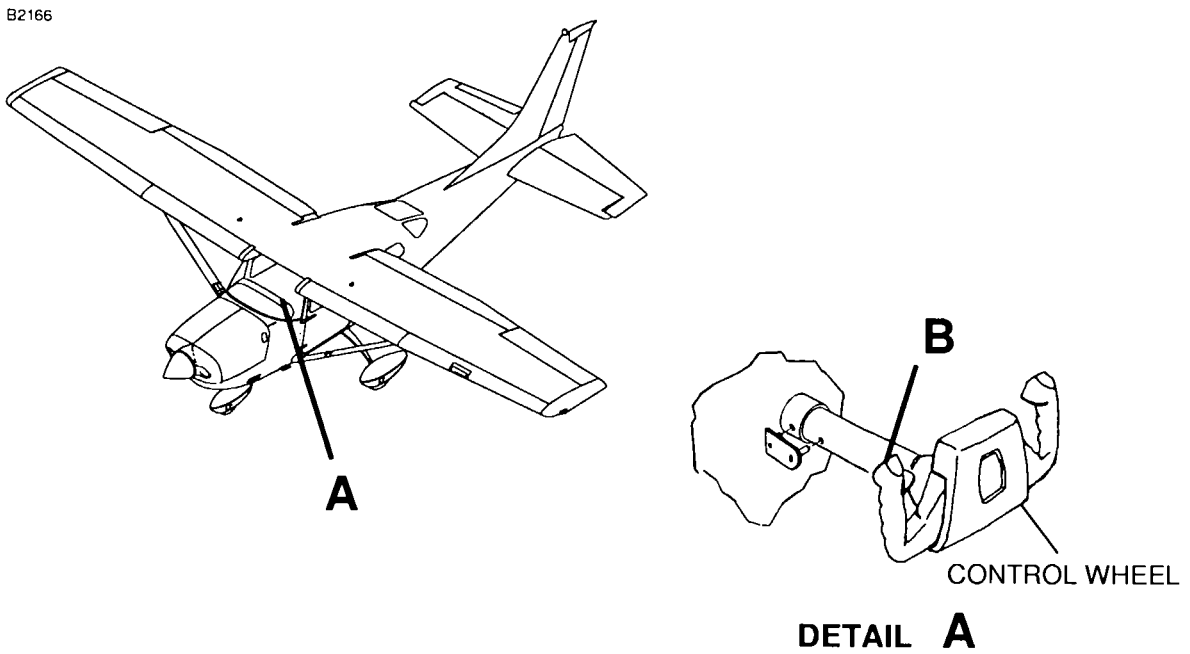
NOTE: The transmit light on the com radio will come on when the power is turned on.

(4) If the button does not operate after the first application of the electric cleaner, apply more cleaner.
(5) If the button continues to have a malfunction, replace the microphone switch. Refer to Microphone Switch Removal/Installation.

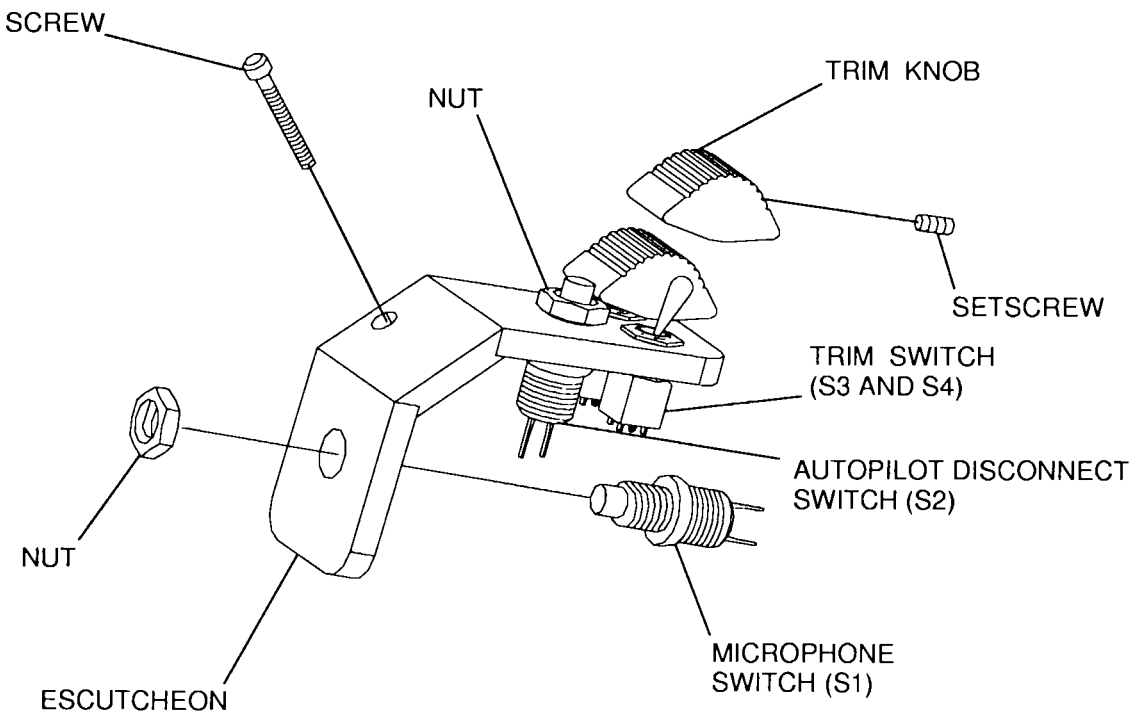


1210T1001
A0718T1061
B0718T1062

NAV Antenna Installation
Figure 204 (Sheet 1)



DETAIL A



DETAIL B

0710T1001
A0760R1007
B0715T1004

Microphone Switch
Figure 205 (Sheet 1)

AUDIO PANEL - MAINTENANCE PRACTICES

1. General

A. The audio panel is installed in the center of the instrument panel and incorporates audio integrating functions, intercom functions and marker beacon indicators in a single unit.

B. Maintenance practices for the audio panel consist of removal/installation of the audio panel and the intercom jacks.

C. For the removal/installation of the overhead speaker, refer to Chapter 25, Interior Upholstery - Maintenance Practices.

2. Audio Panel Removal/Installation

NOTE: Removal and installation procedures are typical for airplanes with standard avionics and airplanes with Garmin G1000.

A. Remove the Audio Panel (Refer to Figure 201).
   (1) Make sure the AVIONIC switch is in off position.
   (2) On the face of the audio panel, turn the recessed screw counterclockwise until the lock releases the unit from the back of the tray.
   (3) Carefully pull the audio panel out from the tray and disconnect the electrical connectors from the audio panel.

B. Install Audio Panel (Refer to Figure 201).
   (1) Place the audio panel in the install position and slide forward into mounting tray.

   NOTE: Ensure audio panel is properly connected to electrical connectors at rear of mounting tray.

   (2) Turn recessed mounting screw on face of audio panel clockwise until audio panel is secured to mounting tray.
   (3) Do a check to make sure the audio panel operates correctly. For airplanes with Garmin G1000, refer to the Garmin Line Maintenance Manual.

3. Intercom Jacks Removal/Installation

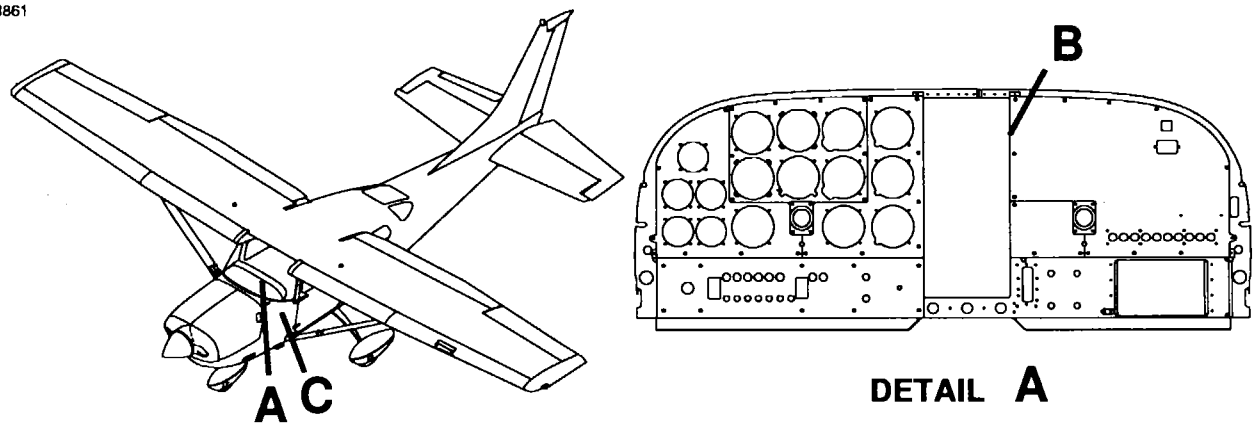
A. Remove Pilot/Front Passenger Intercom Jacks (Refer to Figure 201).
   (1) Ensure avionic and master switches are in the OFF position.
   (2) To gain access to backside of jacks, remove interior sidewall panel located between instrument panel and forward door post. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
   (3) Loosen and remove jamnuts securing jacks to interior panel.
   (4) Carefully label all wires to microphone jack (small plug) and headphone jack (large plug).
   (5) Cut wires near solder point at each jack.

B. Install Pilot/Front Passenger Intercom Jacks (Refer to Figure 201).
   (1) Remove all traces of old solder from jacks.
   (2) Reconnect and solder wires to jacks. Ensure all wires are soldered to correct pins on jacks.
   (3) Secure jacks to sidewall panel using jamnuts.
   (4) Reinstall sidewall panel. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

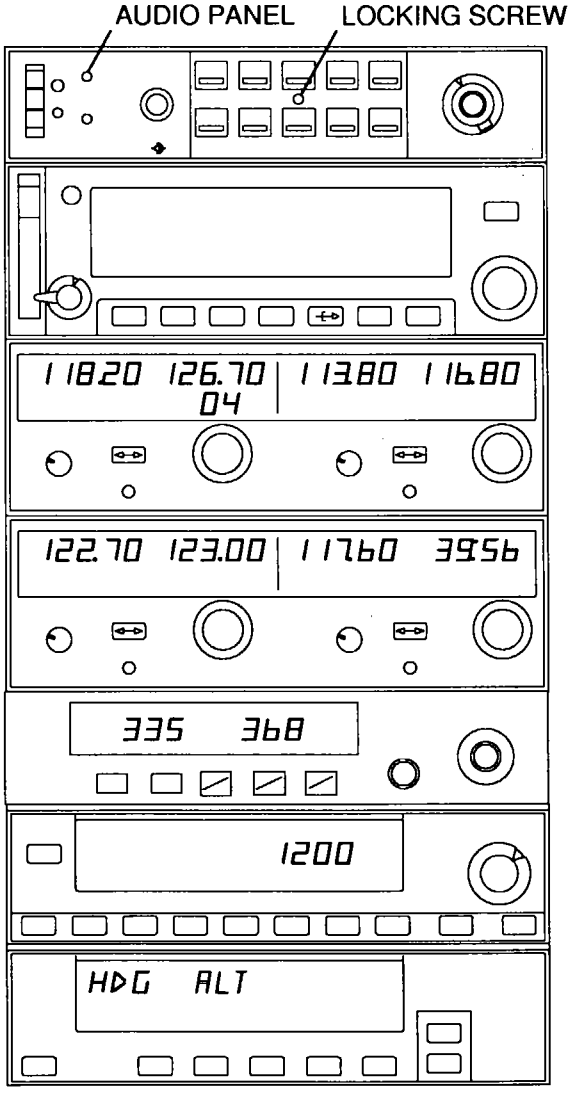
C. Remove Rear Passenger Intercom Jacks (Refer to Figure 201).
   (1) Ensure avionics and master switches are in the OFF position.
   (2) Remove rear seat. Refer to Chapter 25, Rear Seats - Maintenance Practices.
   (3) Remove rear sidewall panel. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
   (4) Carefully label all wires to microphone jack (small plug) and headphone jack (large plug).
   (5) Cut wires near solder point at each jack.
   (6) Loosen and remove jamnuts securing jacks to rear sidewall panel.

D. Install Rear Passenger Intercom Jacks (Refer to Figure 201).
   (1) Remove all traces of old solder from jacks.

B861



DETAIL A

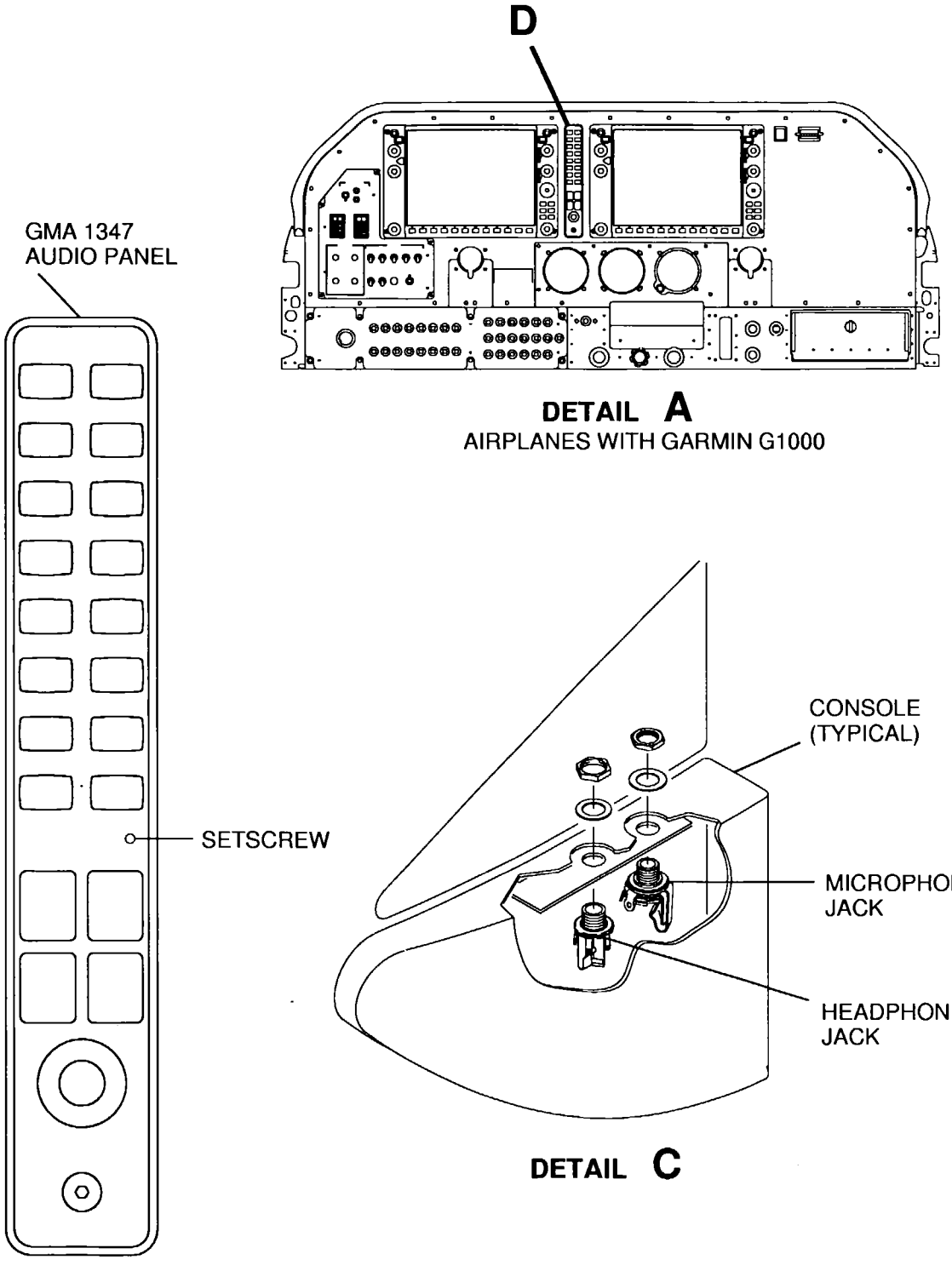


DETAIL B

1210T1001
A1218T1002
B1218T1014

Audio Panel Installation
Figure 201 (Sheet 1)

B3475



DETAIL A
AIRPLANES WITH GARMIN G1000

DETAIL C

DETAIL D

A0718T1053A
C0518T1041
D0718T1053A

Audio Panel Installation
Figure 201 (Sheet 2)

(2) Reconnect and solder wires to jacks. Ensure all wires are soldered to correct pins on jacks.
(3) Secure jacks to sidewall panel using jamnuts.
(4) Reinstall rear sidewall panel. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(5) Reinstall rear seat. Refer to Chapter 25, Rear Seats - Maintenance Practices.

STATIC WICKS - MAINTENANCE PRACTICES

1. General

A. Maintenance of the static (discharger) wicks consists of removal/replacement of the wick assembly and ensuring that bonding straps are properly connected between control surfaces and primary structure.

B. Static wicks are mounted on the trailing edges of the ailerons, rudder and the elevators. Bonding straps are secured to flight control surfaces and electrically connect those surfaces to the primary structure.

2. Tools and Equipment

A. For a list of applicable tools and equipment, refer to Communications - General.

3. Static Wicks Removal/Installation

A. Remove Static Wick (Refer to Figure 201).
   (1) Carefully drill out mounting rivets which attach static wick to structure. Ensure holes are not drilled oversize.
   (2) Remove static wick from the airplane skin.

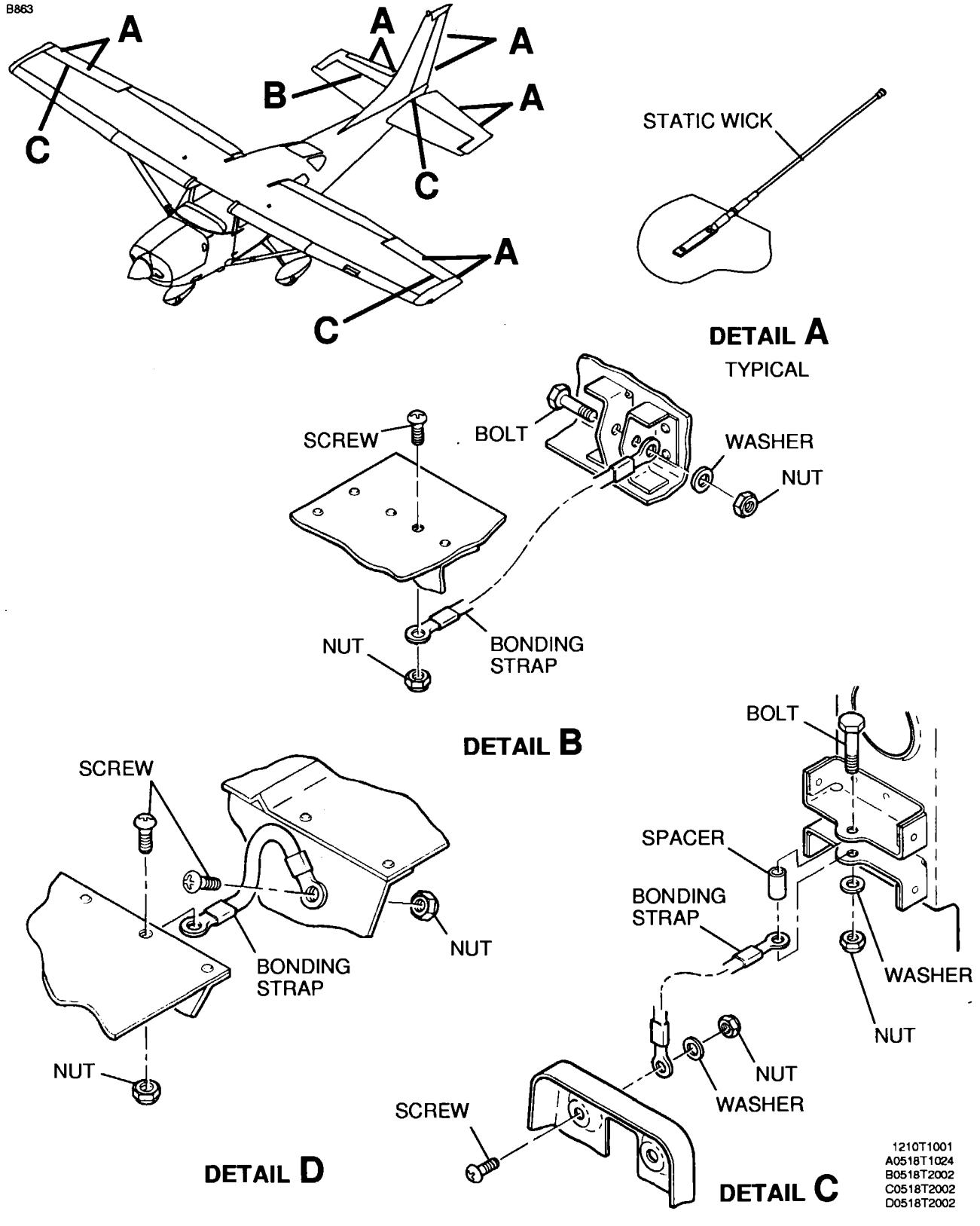
B. Install Static Wick (Refer to Figure 201).
   (1) Clean surface of airplane skin where static wick will attach to skin. Remove all traces of contaminants (including paint/primer) using ScotchBrite and P-D-680 solvent.
   (2) Secure static wick to airplane skin using rivets called out in Model 206/T206 Illustrated Parts Catalog.
   (3) Repaint base of new wick (if required).
   (4) Rebalance control surfaces. Refer to Single Engine Models 172, 182, 206, and T206 1996 And On Structural Repair Manual.

4. Bonding Straps Removal/Installation

A. Bonding straps are provided to ensure that electrical potential between primary and secondary structure remains nearly equal. If bonding straps are removed, they should be reinstalled using hardware called out in the Model 206/T206 Illustrated Parts Catalog.

B. The maximum allowable resistance (in ohms) for bonding straps is 0.0025 ohms.

C. Primary and secondary structure should be cleaned using ScotchBrite pad and P-D-680 solvent before installing bonding hardware. Aluminum surfaces should be chemically protected (Alodine or equivalent) before attaching bonding hardware to surface.



Static Discharger Installation
Figure 201 (Sheet 1)

CHAPTER 24

ELECTRICAL POWER

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
24-Title		
24-List of Effective Pages		
24-Record of Temporary Revisions		
24-Table of Contents		
24-00-00	Pages 1-2	Jul 3/2006
24-20-00	Pages 101-105	Jul 3/2006
24-20-00	Pages 201-202	Jul 3/2006
24-30-00	Pages 101-107	Dec 2/2002
24-30-00	Pages 201-206	Dec 2/2002
24-30-10	Pages 201-205	Jan 2/2006
24-60-00	Pages 101-103	Jan 2/2006
24-60-00	Pages 201-205	Jul 3/2006
24-60-01	Pages 201-206	Jul 3/2006
24-61-00	Pages 201-203	Apr 1/2005
24-61-01	Pages 201-206	Jul 3/2006
24-70-00	Pages 1-4	Jul 3/2006

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

ELECTRICAL POWER - GENERAL

1. Scope

A. This chapter gives the electrical units and components which control and supply electrical power for the airplane systems. This includes the alternator, batteries, and relays.

B. Electrical energy for the airplanes is supplied by a 28-volt, direct current, single primary bus, negative ground electrical system. A single 24-volt main battery supplies power to the starting system and gives a reserve source of power if an alternator failure were to occur. Airplanes that have the Garmin G1000 system have a second battery known as the Standby Battery. The Standby Battery is controlled and monitored by the Standby Battery Controller and supplies power to the G1000 Essential Bus if there is a failure of the main battery and alternator. A power junction box, also referred to as a Master Control Unit (MCU), is attached to the forward left side of the firewall and includes electrical relays, an alternator control unit (ACU), an ammeter sensor, an external power receptacle, fuses and/or circuit breakers in a single box. An engine-driven alternator is the normal source of power during flight and maintains a battery charge controlled by the ACU. The external power receptacle is used for ground operation of the electrical equipment and helps the main battery during ground starts.

C. Electrical power is supplied to the two primary electrical busses through two 30A fuses, two 30A circuit breakers, or two 40A circuit breakers in the junction box. These electrical busses supply power to two avionics busses through 15A circuit breakers. The two avionics busses are controlled by an avionics master switch. Airplanes that have propeller heat have three electrical busses that supply power through three 30A fuses, three 30A circuit breakers, or three 40A circuit breakers.

D. The operation of the main battery and alternator system is controlled by the MASTER ALT BAT switch. The switch is an interlocking split rocker and is found on the left side of the switch panel. The right half of the rocker controls the main battery and the left half controls the alternator. It is possible in this configuration for the main battery to be on-line without the alternator, however, operation of the alternator without the main battery is not possible. The BAT MASTER switch, when operated, connects the main battery contactor coil to ground so that the contacts close and supply power to the system from the main battery only. The ALT MASTER switch, when ON, applies positive voltage to the ACU and to the alternator contactor coil at the same time, which then applies field voltage to the alternator field and supplies power to the electrical system from the alternator.

E. The operation of the Standby Battery, if installed, is controlled by a three-position STDBY BATT switch. Normal flight operation is with the switch in the ARM position that lets the standby battery charge from the G1000 Essential Bus. If there is an alternator failure, the standby battery controller will not let the standby battery discharge to the G1000 Essential Bus until the depletion or failure of the main battery. It is necessary during preflight to do an "energy level" acceptance test. Refer to the Pilot's Operating Handbook, Chapter 4, Starting Engine, for details of the "energy level" acceptance test.

F. The main battery ammeter is controlled by a sensor found in the power junction box. In flight, without the use of external power, the meter shows the quantity of current that flows to or from the battery. With a low battery and the engine at cruise speed, the ammeter will show a large positive output and a charge of the main battery. When the main battery is fully charged, the ammeter will show a minimum charge rate.

G. The standard main battery is a 24-volt, 12.75 Amp-hour (5-hour rate), flooded lead-acid type. The battery is installed in the front-right side of the firewall. A heavy-duty main battery is installed in airplanes with propeller heat systems installed. The heavy-duty battery is a 24-volt, 15.5 Amp-hour (5-hour rate), flooded lead-acid type.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes can be used for the following items:

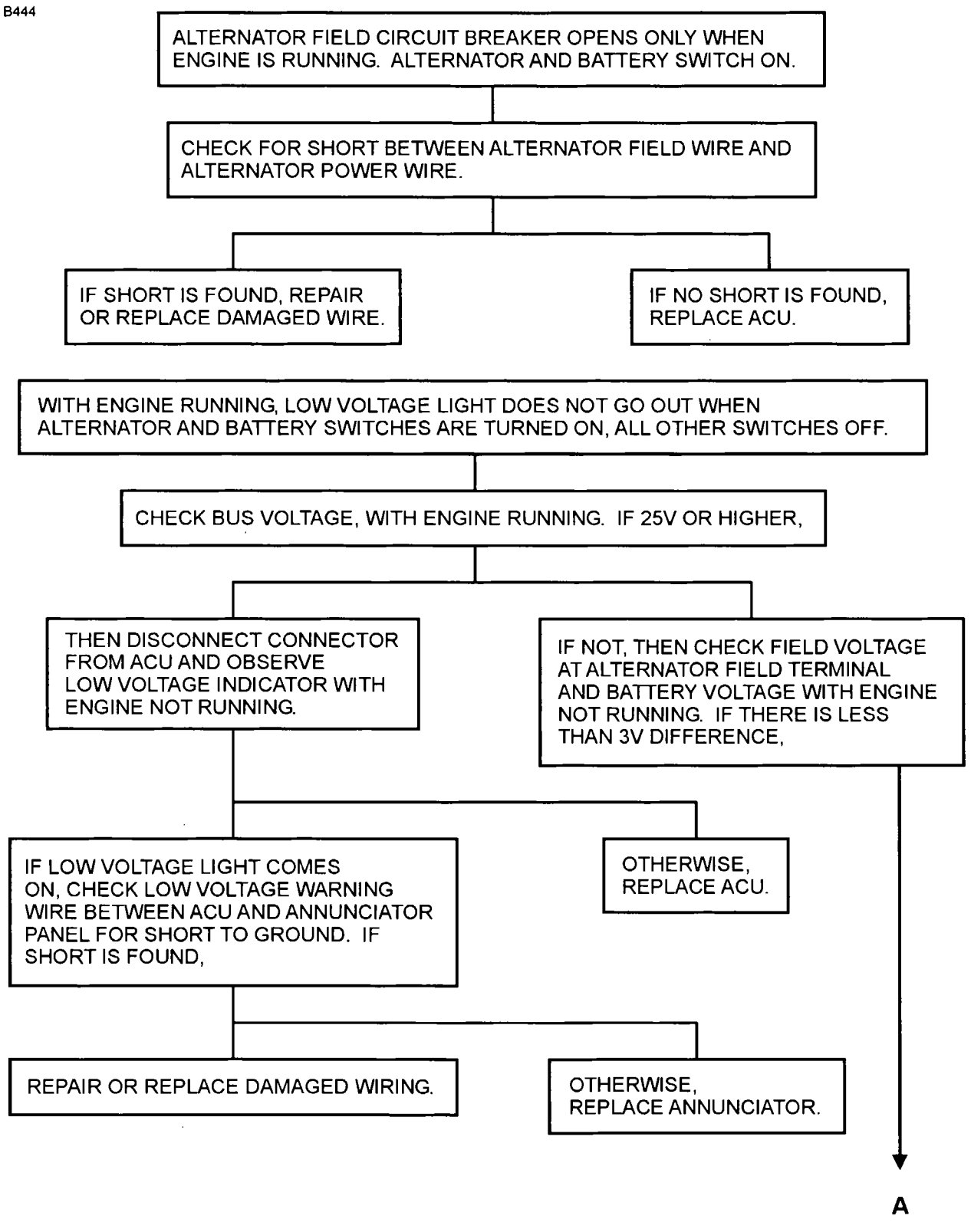
NAME	NUMBER	MANUFACTURER	USE
Adhesive	41-30	Mid-West Industrial Chemical Company 1509 Sublette St. Louis, MO 63110	Used to bond the battery vent drain tubes to the battery case elbows.
Battery Charger	TDMC-81	Cessna Aircraft Company	Charges the battery.
Cleaning Cloth		Available Commercially	Cleans the battery.
Digital Voltmeter	Model 87	John Fluke Mfg. Co. 6920 Seaway Blvd. Everett, WA 98206	General electrical use.
Hydrometer (1.100 to 1.310 specific gravity range)		Available Commercially	Measures the specific gravity of electrolytes.
MCU Test Set (With instructions, LI-0021)	TE04	Lamar Technology Inc. 14900 40th Avenue North East Marysville, WA 98271	To do the tests and troubleshooting for the J-box, (MCU) and alternator systems.
Nonmetallic Brush (Acid-Resistant)		Available Commercially	Cleans battery cells.
Rubber Gloves, Rubber Apron, and Protective Goggles.		Available Commercially	Give protection when you clean the battery.
Small syringe		Available Commercially	Service of the battery.
Variable Power Supply		Available Commercially	Supplies external power for ground maintenance.
12 Volt DC Power Adapter	D02-0042	Cessna Aircraft Company Cessna Parts Distribution Department 701, CPD 2 5800 East Pawnee Road Wichita, KS 67218-5590	Cabin Power System. Commercial Airline Connector adapts to Automotive Power Port Connector.
24-Volt Battery Charger	TSC-01V	Teledyne Continental Motors Battery Products 840 West Brockton Avenue Redlands, CA 92374 Phone: 1-800-456-0070	Charges the battery.

ALTERNATOR SYSTEM - TROUBLESHOOTING

1. General

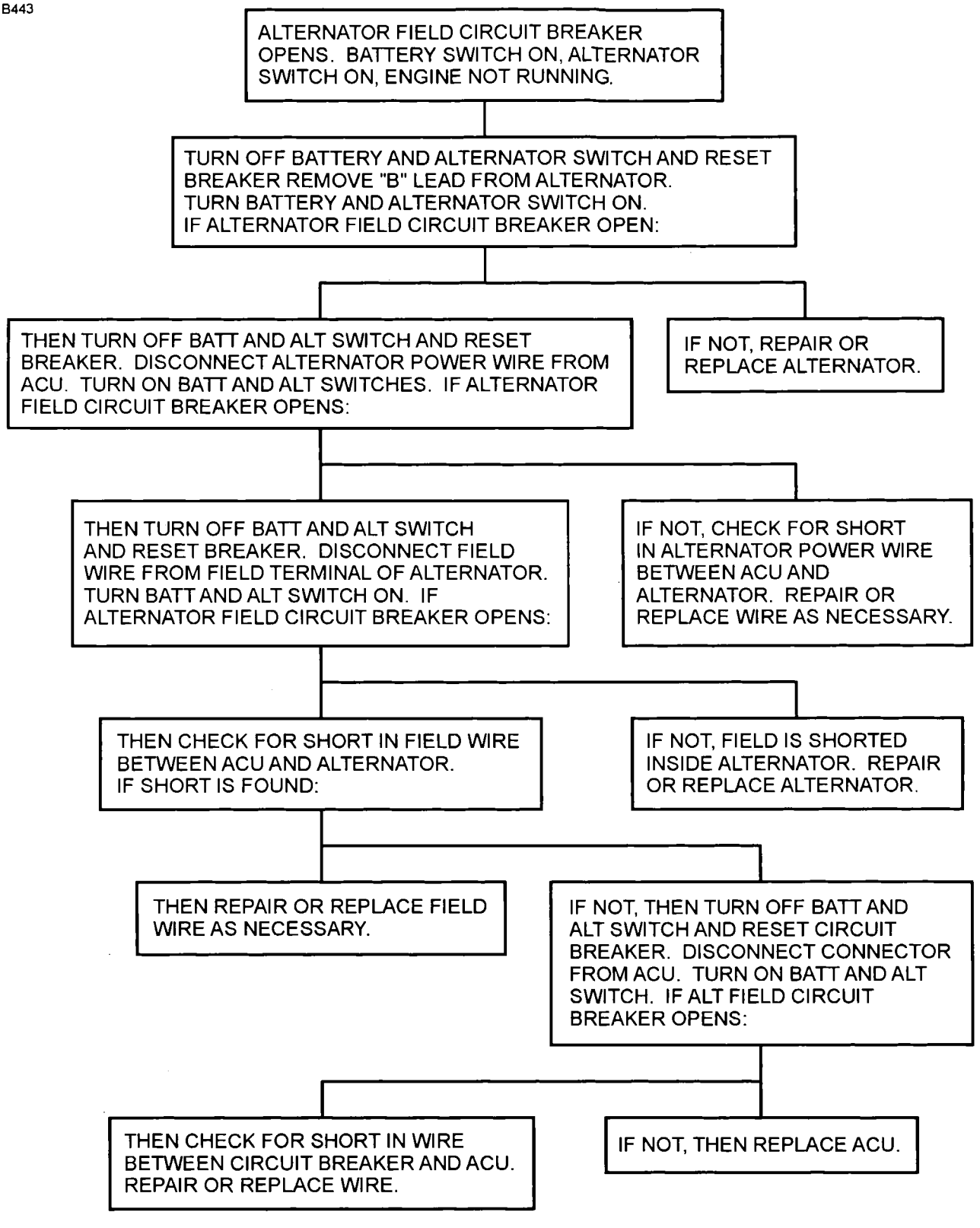
A. A troubleshooting chart has been developed to aid the maintenance technician in system understanding. Refer to Figure 101.

NOTE: Refer to the Lamar TE04 MCU Test Set and the LI-0021 instructions for additional testing procedures of the alternator system. Refer to Electrical Power - General, Tools, Equipment, and Materials.



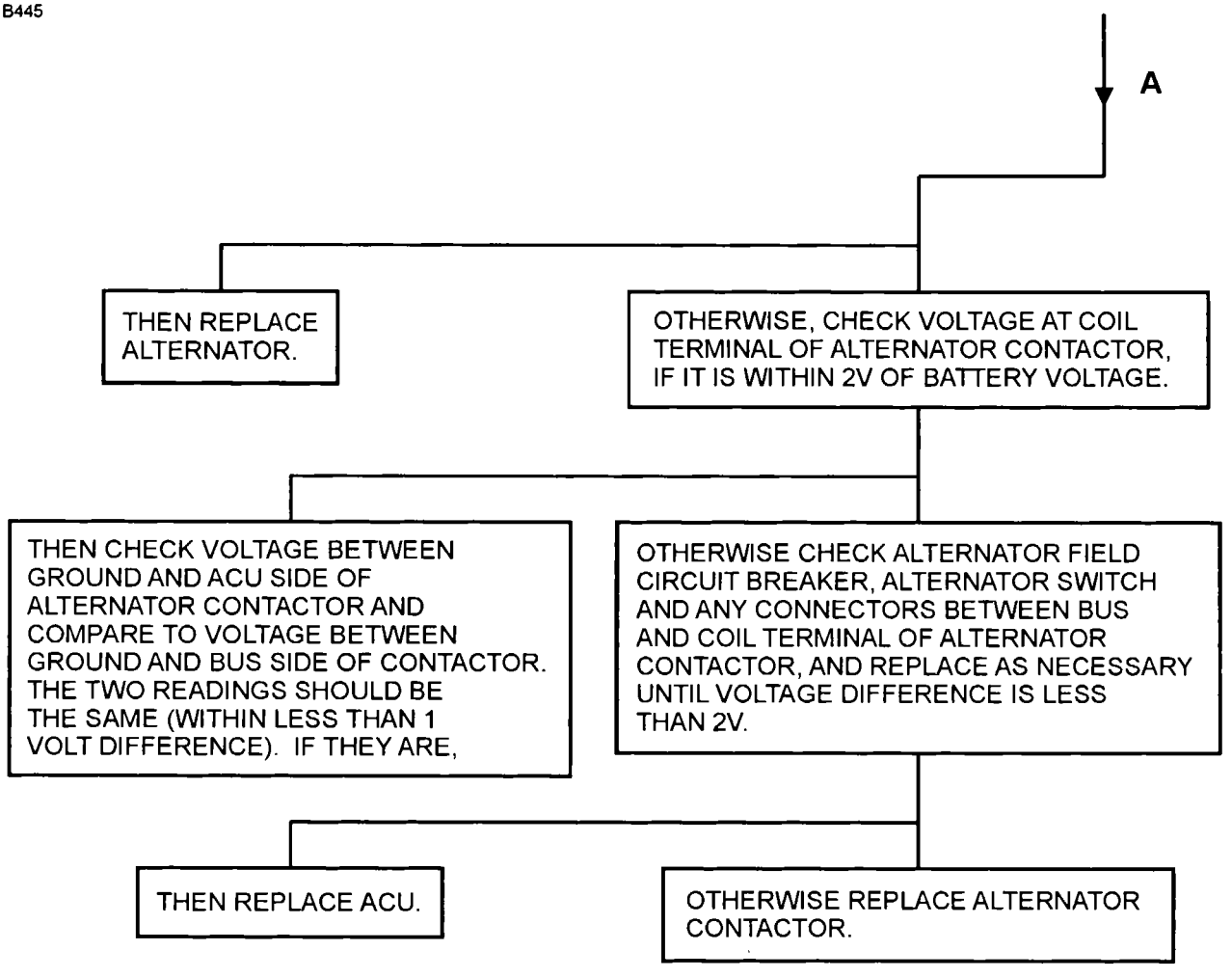
Alternator System Troubleshooting Chart
Figure 101 (Sheet 1)

B443



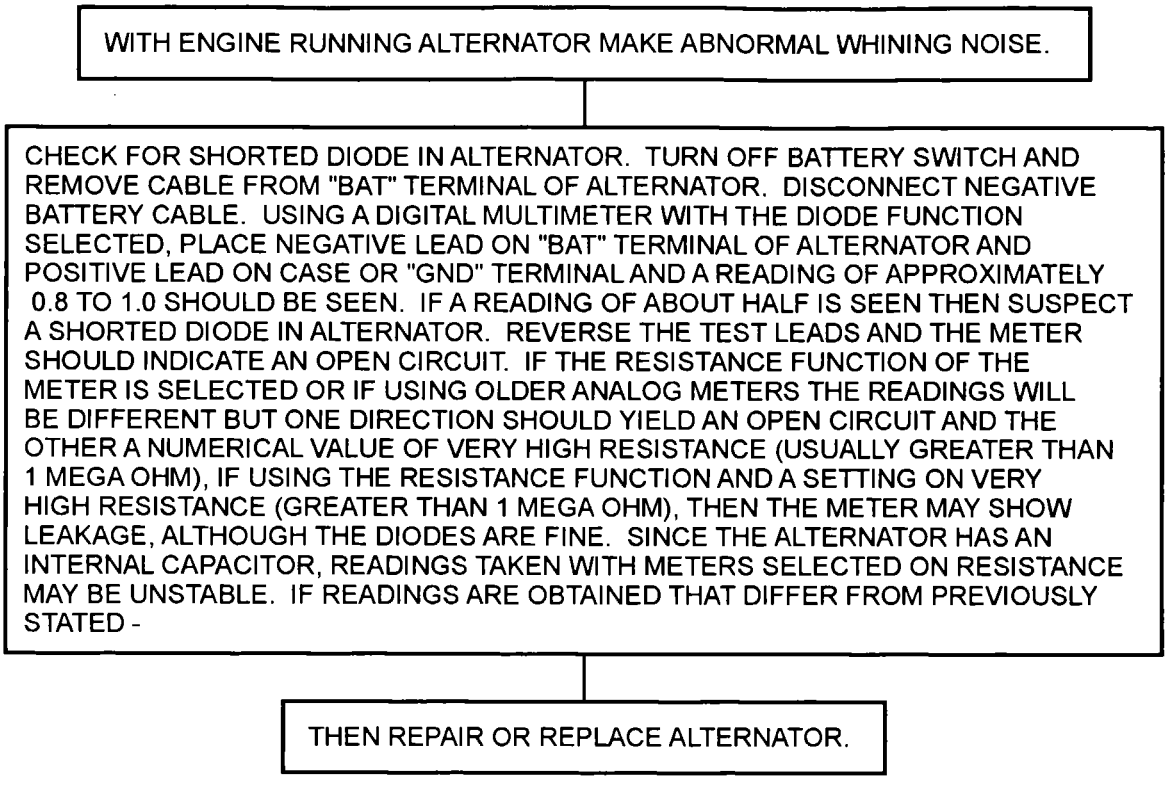
Alternator System Troubleshooting Chart
Figure 101 (Sheet 2)

B445



Alternator System Troubleshooting Chart
Figure 101 (Sheet 3)

B417



Alternator System Troubleshooting Chart
Figure 101 (Sheet 4)

ALTERNATOR - MAINTENANCE PRACTICES

1. General

A. Either a 60-amp or a 95-amp alternator is installed on the forward left side of the engine.

2. Alternator Removal/Installation

CAUTION: Make sure that you are careful when you remove and install the power and ground ring terminals.

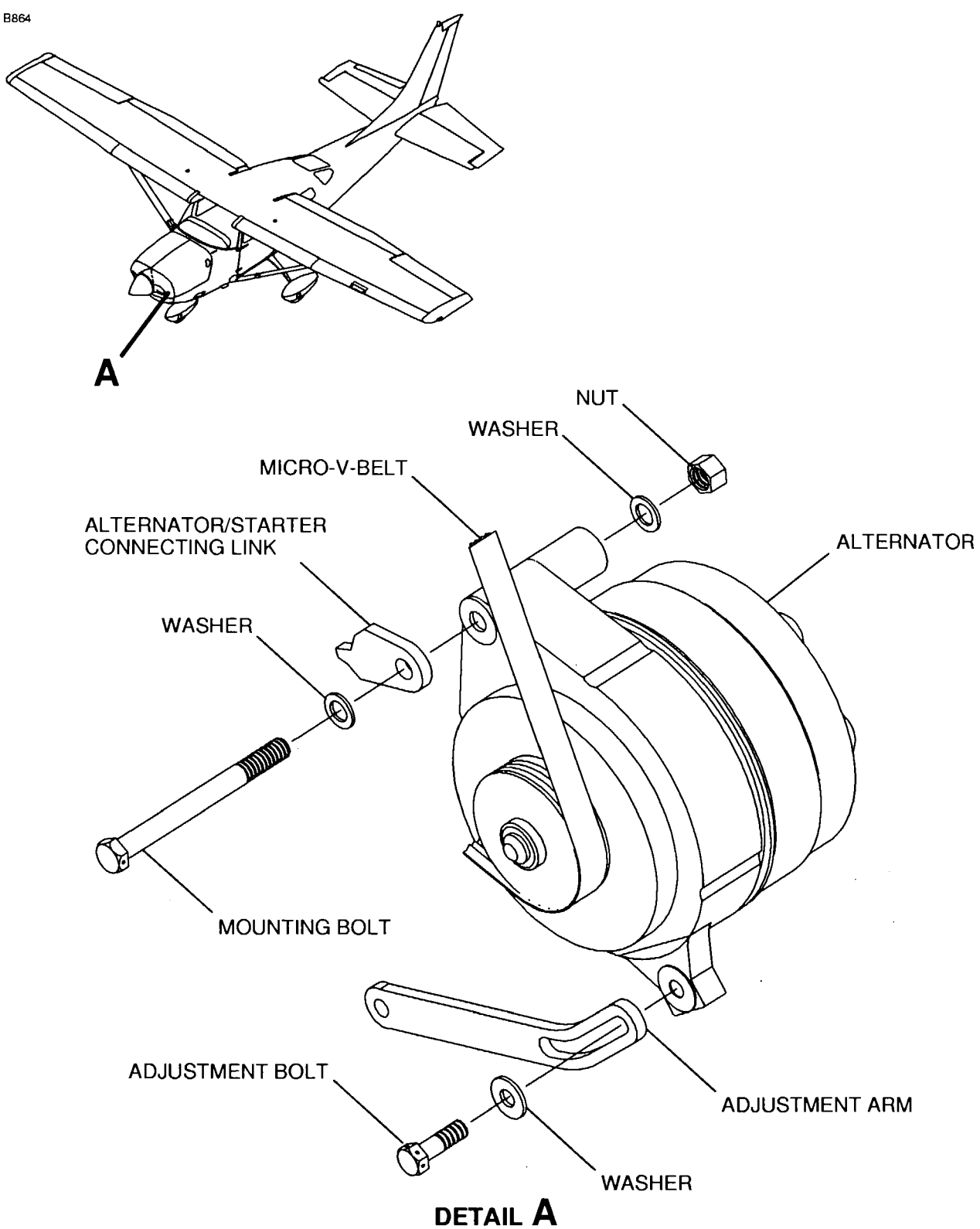
- Do not bend or twist the terminals.
- If possible, always remove the terminals from the alternator before you remove the alternator.
- If possible, always install the terminals to the alternator after you install the alternator.
- If you must remove or install the alternator with the terminals installed, make sure that the terminals do not bend or twist.
- After the terminals are installed, make sure that the cables do not apply a load to the terminals that can cause them to bend or twist.

A. Alternator Removal (Refer to Figure 201).
(1) Remove the upper cowl. Refer to Chapter 71, Cowls - Maintenance Practices.
(2) Disconnect the battery cables. Refer to Battery - Maintenance Practices.
(3) Disconnect the electrical connectors from the alternator.
(4) Remove the safety wire from the adjustment bolt. Loosen the bolt.
(5) Loosen the alternator mounting bolt.
(6) Rotate the alternator and remove the drive belt from the alternator pulley.
(7) Remove the adjustment bolt and the mounting bolt, and remove the alternator from the airplane.

B. Alternator Installation (Refer to Figure 201).
(1) Put the alternator in position on the mounting bracket and install the mounting bolt and the nut. Do not tighten at this time.
(2) Put the drive belt on the alternator pulley.
(3) Install the adjustment bolt.

CAUTION: On airplanes with a new alternator belt installed and on new airplanes, do a check of the belt tension again in the first 10 to 25 hours of operation.

(4) Apply a torque wrench to the nut on the alternator pulley and adjust the belt tension so the belt slips at 7 to 9 foot-pounds (9.49 to 12.20 Nm) of torque with a used belt, or 11 to 13 foot-pounds (14.91 to 17.62 Nm) of torque with a new belt.
(5) Tighten and safety the wire adjusting bolt.
(6) Tighten the alternator mounting bolt.
(7) Connect the electrical connectors to the alternator.
(8) Install the upper cowl. Refer to Chapter 71, Cowls - Maintenance Practices.



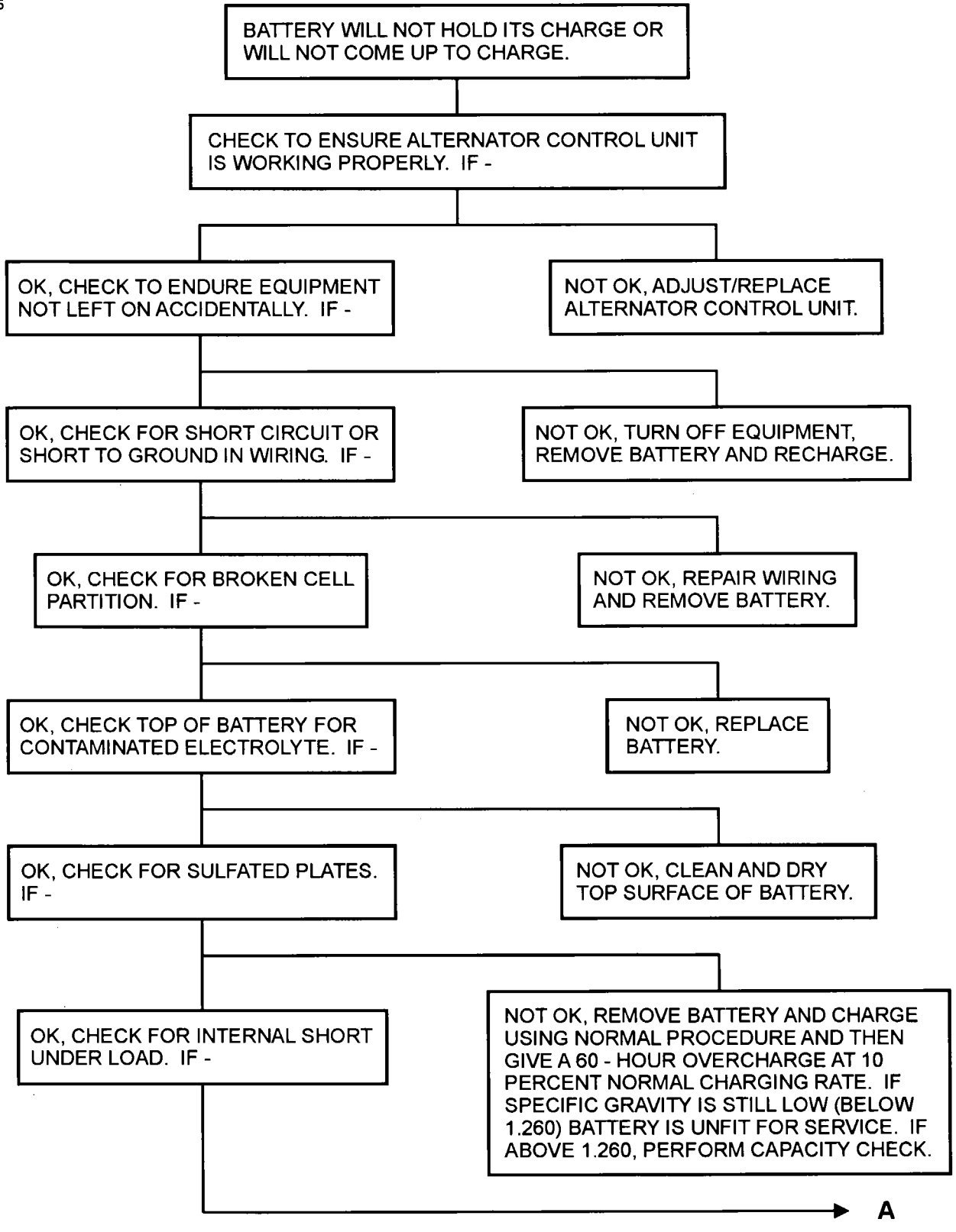
Alternator Installation
Figure 201 (Sheet 1)

BATTERY - TROUBLESHOOTING

1. General

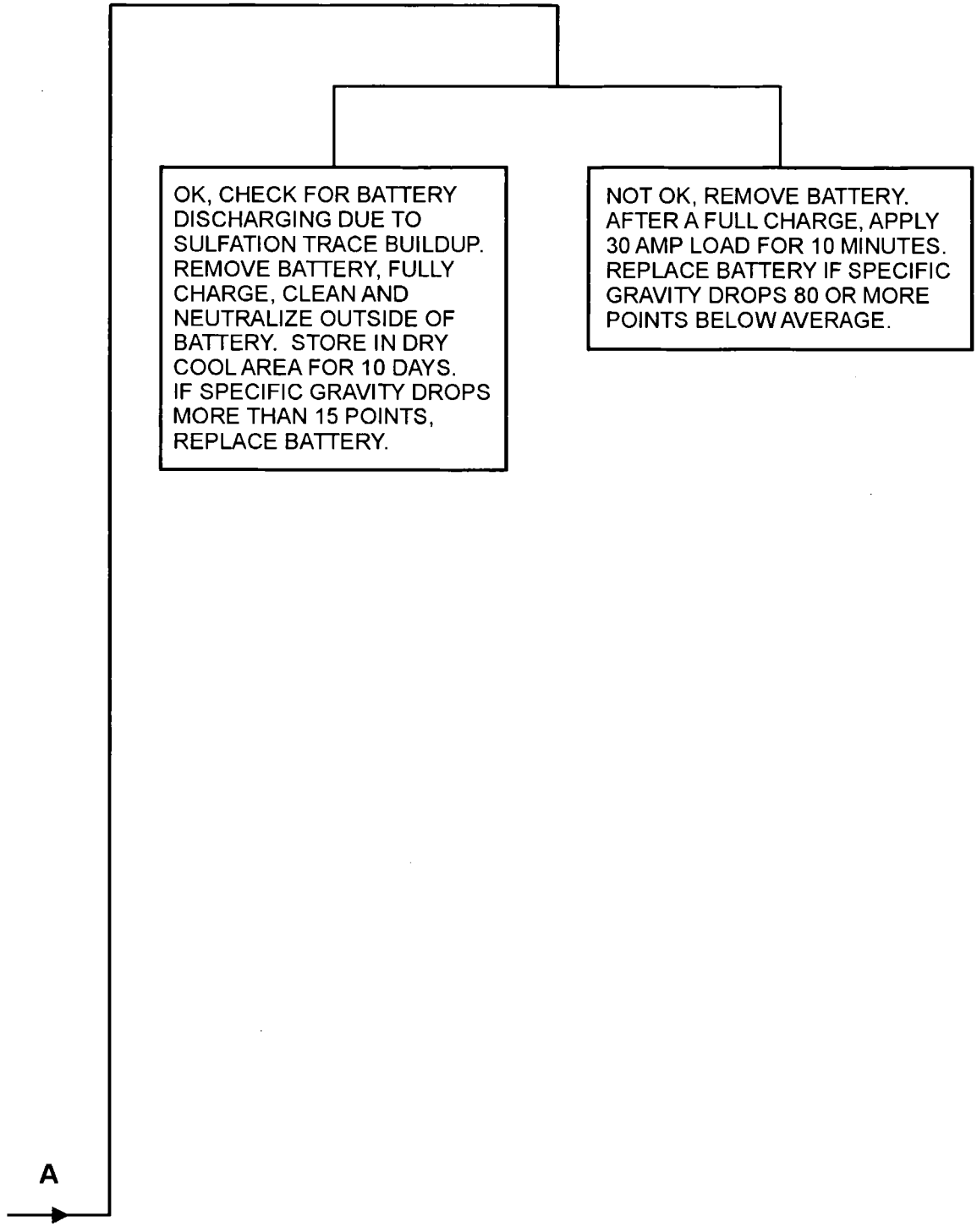
A. A troubleshooting chart is included to aid in maintenance of the battery system. Refer to Figure 101.

B865



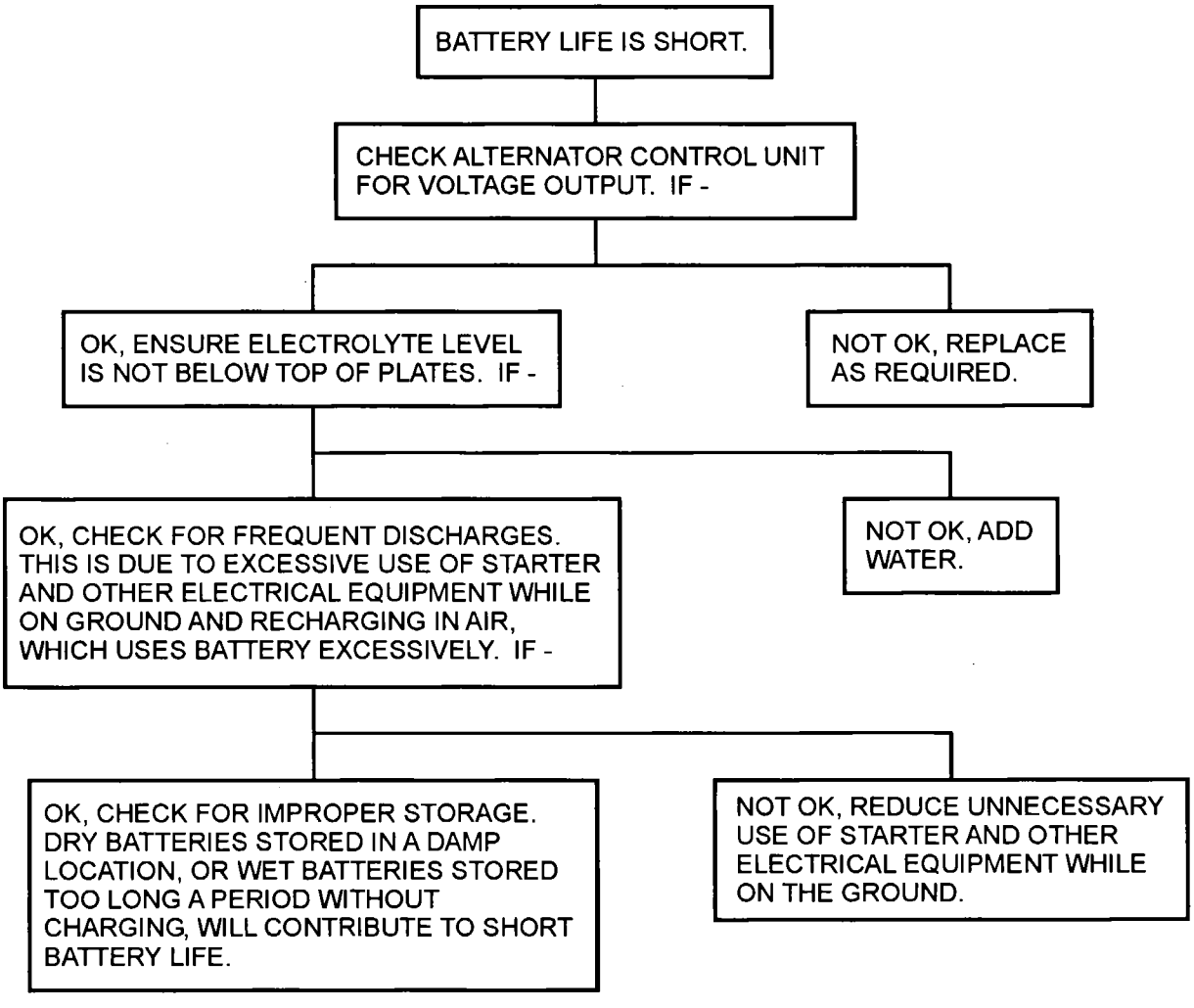
Battery Troubleshooting Chart
Figure 101 (Sheet 1)

B866



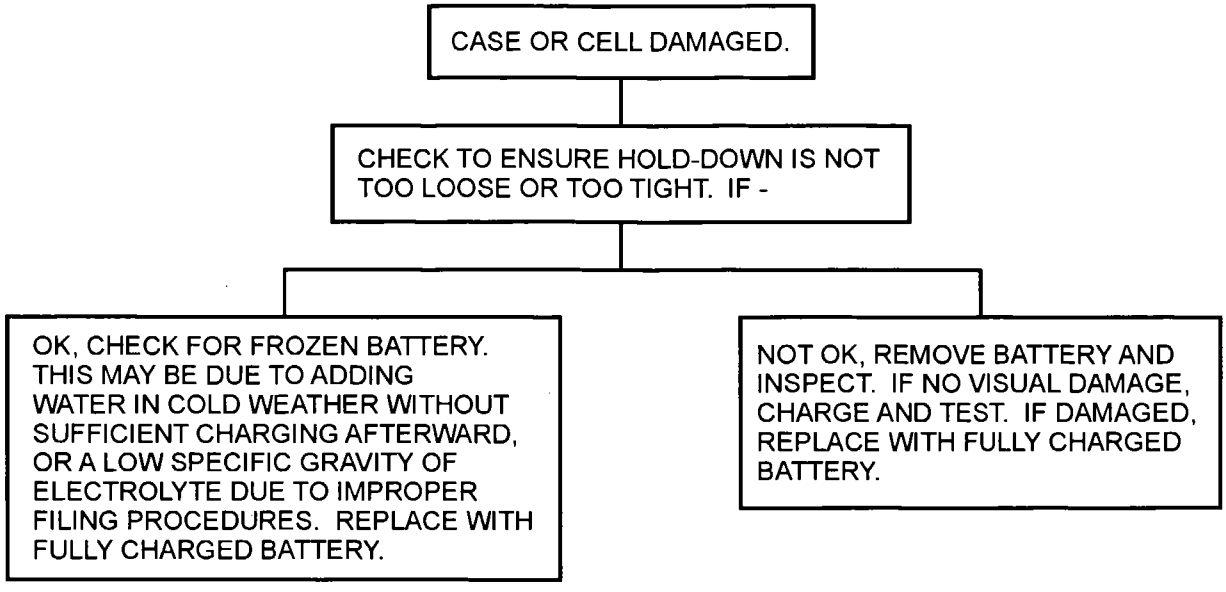
Battery Troubleshooting Chart
Figure 101 (Sheet 2)

B867



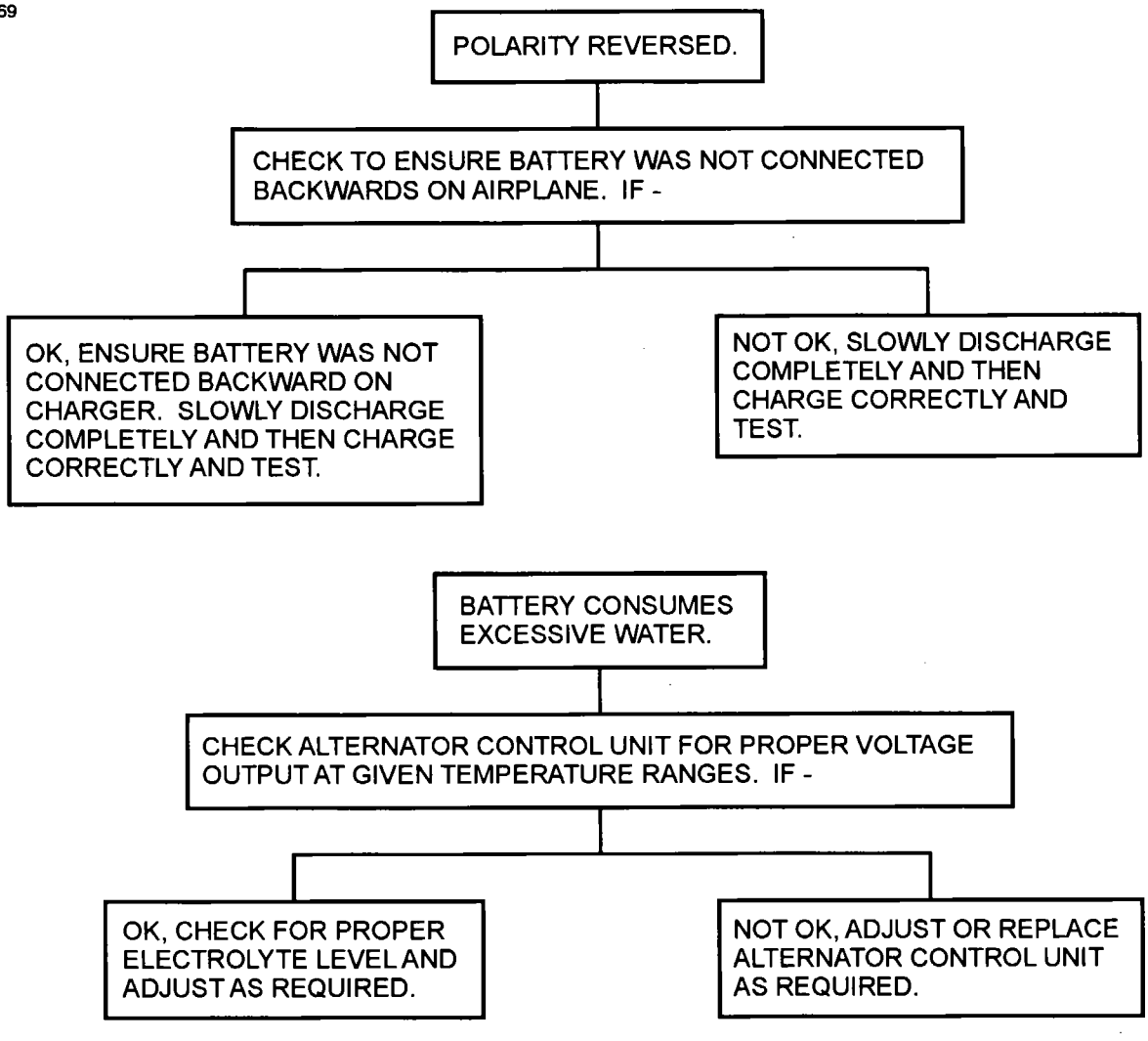
Battery Troubleshooting Chart
Figure 101 (Sheet 3)

B868



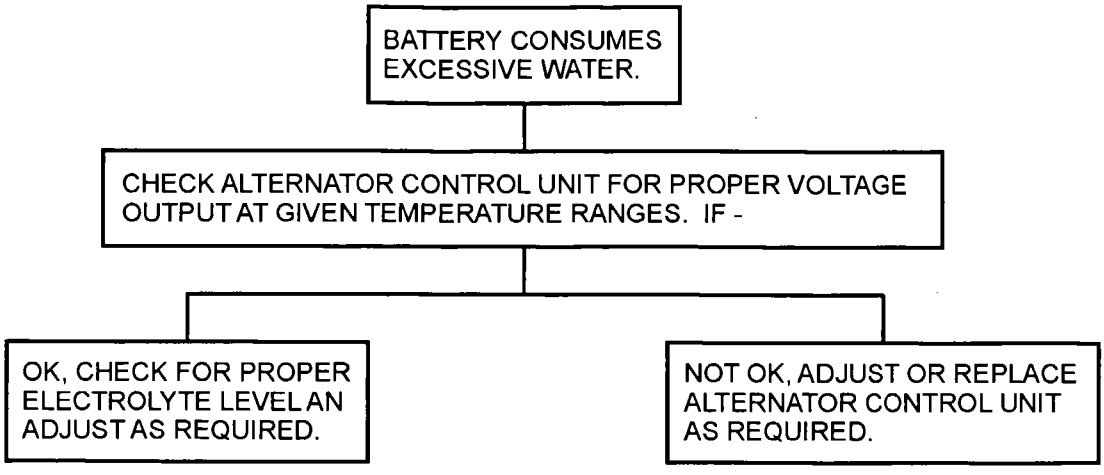
Battery Troubleshooting Chart
Figure 101 (Sheet 4)

B869



Battery Troubleshooting Chart
Figure 101 (Sheet 5)

B870



Battery Troubleshooting Chart
Figure 101 (Sheet 6)

BATTERY - MAINTENANCE PRACTICES

1. General

A. The battery is a 24-Volt, 12.75 Amp-hour, flooded lead-acid type. It is installed in the battery box on the front-right side of the firewall. In airplanes with the optional propeller heat, the battery is a heavy duty 24-Volt, 15.5 Amp-hour, lead-acid type.

NOTE: The Amp-hour rating is based on a five hour discharge rate.

2. Battery Removal/Installation

A. Remove the Battery (Refer to Figure 201).
(1) Remove the upper right cowl. Refer to Chapter 71, Cowls - Maintenance Practices.
(2) Remove the battery box top cover.

CAUTION: Disconnect the negative battery cable first, then the positive cable. This will prevent an accidental short of the battery from hand tools.

(3) Disconnect the negative and positive cable from the battery.
(4) Remove the battery from the airplane.

B. Install the Battery (Refer to Figure 201).

CAUTION: Do not tighten the hold-down bolts too much or you will damage the hold-down strap.

(1) Place the battery in the battery support assembly.

CAUTION: Connect the positive battery cable first, then the negative cable. This will prevent an accidental short of the battery from hand tools.

(2) Connect the positive and negative battery cables.
(3) Install the top cover to the battery support assembly.
(4) Install the upper right cowl, refer to Chapter 71, Cowls - Maintenance Practices.

3. Battery Cleaning

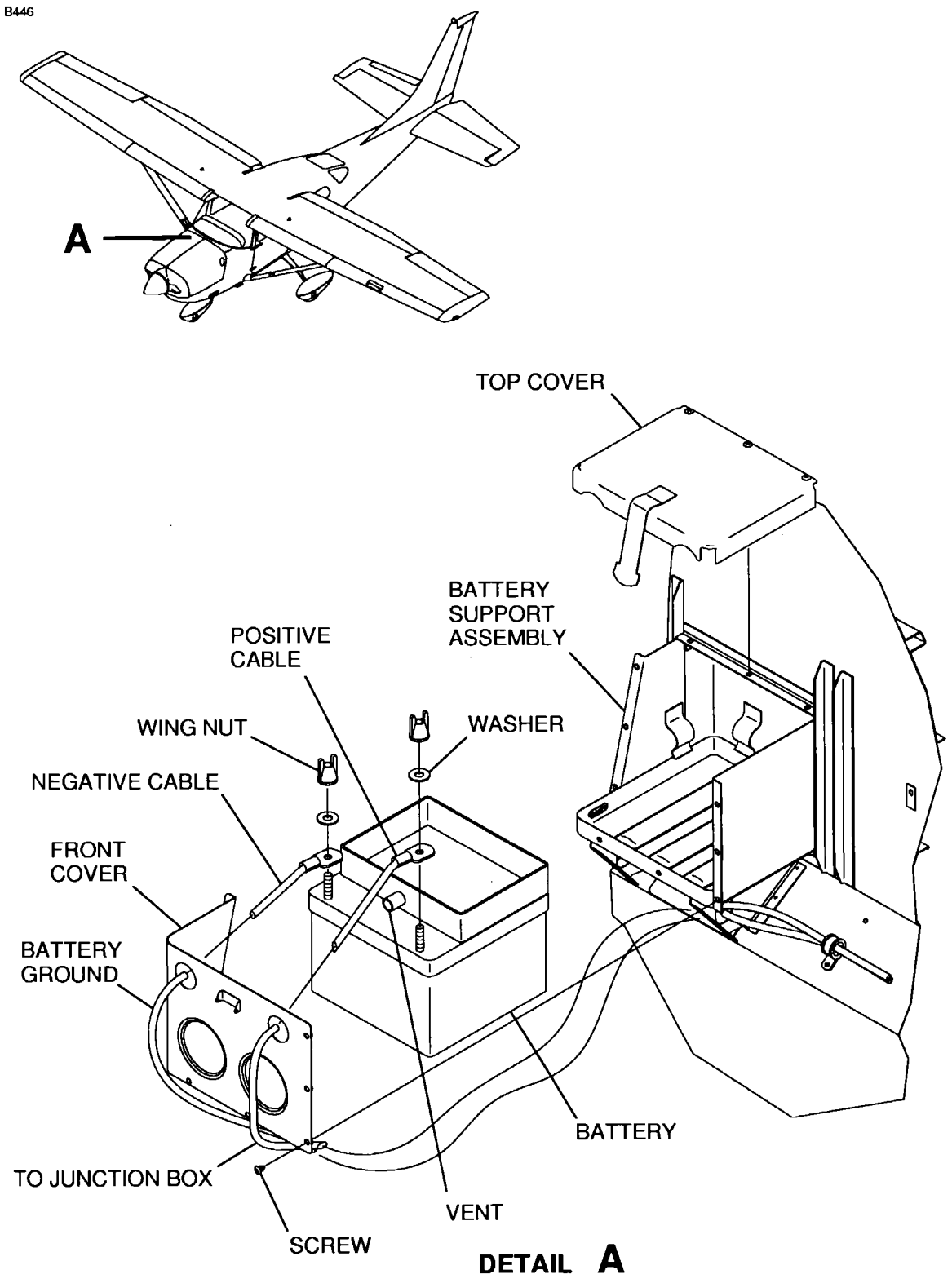
A. Clean the Battery (Refer to Figure 201).

NOTE: For correct operation, the battery and connections must be clean at all times.

(1) Remove the battery. Refer to Battery Removal/Installation.
(2) Tighten the battery cell filler caps to prevent the cleaning solution from entering the cells.
(3) Use a clean cloth moistened with a solution of bicarbonate (baking soda) and water to clean the battery cable ends, battery terminals and the surfaces of the battery.
(4) Rinse with clear water.
(5) Use a dry cloth to clean off the water and let the battery dry.
(6) Polish the cable ends and battery terminals with an emery cloth or a wire brush.
(7) Install the battery. Refer to Battery Removal/Installation.
(8) Apply petroleum jelly or an ignition spray product to the battery terminals to decrease corrosion.

4. New Battery Activation

A. Activate the New Battery.
(1) Do a specific gravity check to make sure the correct strength of electrolyte is used. The electrolyte must be 1.285 +0.005 or -0.005 specific gravity when it is measured between 75°F to 85°F (24°C to 30°C).
(2) To charge a new battery, use the manufacturer's instructions supplied with the battery.



Battery Installation
Figure 201 (Sheet 1)

(3) Before you install the battery, clean the battery box. Refer to Chapter 12, Battery - Servicing.
(4) Install the battery in the airplane. Refer to Battery Removal/Installation.

5. Battery Charging

NOTE: The procedures that follow are for batteries that use a Gill TSC-01V or a Gill TDMC Battery Charger.

WARNING: You must keep sparks and open flame away from the battery. The battery makes hydrogen and oxygen gases when it is charged. The gases will collect and create a hazardous, explosive condition. You must have free ventilation of the battery area when you charge it.

WARNING: The battery cell temperature must not be more than 115℉ (46℃). Reduce the charge rate if the temperature increases more than 115℉ (46℃). The charge must not cause acid to be blown from the ven ts.

A. If you use a Gill TSC-01V battery charger, do the instructions that follow.

NOTE: The Gill TSC-01V is automated with a typical charge time of approximately two hours. Some batteries will take more time to charge as a result of the battery condition.

(1) Remove the battery from the airplane and place it in a well ventilated area to charge. Refer to Battery Removal/Installation.
(2) Remove the vent caps and make sure the electrolyte level is above the plates and separator material. Do not fill the battery to the split rings at this time.
(3) Do a specific gravity check of the battery electrolyte with a hydrometer such as the Gill FR-1 (or equivalent) to determine the battery charge. Refer to Table 201 and Table 202.
(4) Record the value for each battery cell.
(5) Install the vent caps.
(6) Attach the red cable to the positive battery terminal and the black cable to the negative battery terminal.
(7) Connect the charger to AC power. The procedures that follow will result:
  (a) The AC POWER ON indicator light will come on.
  (b) The three battery level indicators will flash one time.
  (c) The EMPTY battery level indicator will flash on and remain on.

  NOTE: The EMPTY battery level indicator shows that the battery is correctly connected and charging.

(8) If the battery is not fully charged, the PARTIALLY CHARGED indicator light will come on. Make sure that the battery stays connected at this time.

  NOTE: Make sure that you let the battery fully charge. This will make sure of a good battery life and performance.

  (a) Do not disconnect the battery. The charger will not operate correctly if the battery is disconnected and then connected after the PARTIALLY CHARGED indicator light comes on. If the battery is disconnected, you must disconnect and connect the charger at the electrical outlet to start the charge process.
(9) When the battery is fully charged, the BATTERY READY indicator will come on.
(10) The electrolyte level must touch the bottom of the split ring while the battery is warm and still on the charger.
  (a) If the electrolyte level needs to increased, use only distilled or mineral free water to adjust the electrolyte level. The battery must be warm when the electrolyte level is increased.

  NOTE: The electrolyte level decreases as the battery temperature decreases.

(11) Do not add any more fluid after these instructions unless the battery electrolyte spills.
  (a) If the fluid level is below the plates and separator material because a spill occurs, add electrolyte with a value of 1.285 specific gravity.
(12) When the BATTERY READY indicator light comes on, turn the AC power off.
(13) Disconnect the battery charger from the electrical outlet.
(14) Disconnect and remove the battery from the charger.
(15) Do a specific gravity check of the battery electrolyte. Refer to Table 201 and Table 202.
  (a) The specific gravity values between cells must not have a difference of more than 0.020.
  (b) Acceptable specific gravity values that are adjusted for temperature, must be between 1.260 and 1.290.
  (c) If the battery does not give sufficient power to crank the engine with the starter, then replace it with a new battery. Refer to New Battery Activation.

B. If you use a Gill TDMC battery charger, do the instructions that follow.
(1) Remove the battery from the airplane and place it in a well ventilated area to charge. Refer to Battery Removal/Installation.
(2) Remove the vent caps and make sure the electrolyte level is above the plates and separator material. Do not fill the battery to the split rings at this time.
(3) Do a specific gravity check of the battery electrolyte with a hydrometer such as the Gill FR-1 (or equivalent) to determine the battery charge. Refer to Table 201 and Table 202.
(4) Record the value for each battery cell.
(5) Install the vent caps.
(6) Click the Gill TDMC charger ON button two times to select the 24 volt position.
(7) Set the timer for 8 to 10 hours.

NOTE: The charger is in a constant current mode when the timer is on.

(8) Set the charge rate to 1.5 amps.

CAUTION: Do not let the battery charger charge at 32 volts for more than thirty minutes.

(9) Charge the battery until the voltage stabilizes for three consecutive hours or shows 32 volts, whichever occurs first.

NOTE: The charge is measured across the battery terminals with the charger on.

(10) The electrolyte level must touch the bottom of the split ring while the battery is warm and still on the charger.
  (a) If the electrolyte level needs to increased, use only distilled or mineral free water to adjust the electrolyte level. The battery must be warm when the electrolyte level is increased.

NOTE: The electrolyte level decreases as the battery temperature decreases.

(11) Do not add any more fluid after these instructions unless the battery electrolyte spills.
  (a) If the fluid level is below the plates and separator material because a spill occurs, add electrolyte with a value of 1.285 specific gravity.
(12) Do a specific gravity check of the battery electrolyte. Refer to Table 201 and Table 202.
  (a) The specific gravity values between cells must not have a difference of more than 0.020.
  (b) Acceptable specific gravity values that are adjusted for temperature, must be between 1.260 and 1.290.
  (c) If the battery does not give sufficient power to crank the engine with the starter, then replace it with a new battery. Refer to New Battery Activation.

6. Battery Test

A. Complete a Specific Gravity Check. Refer to Table 201 and Table 202.

(1) Measure the specific gravity of the battery with a hydrometer to find the condition of the battery charge.

NOTE: Some hydrometers will have a built-in temperature compensation chart and a thermometer.

(2) The battery condition for various hydrometer values with an electrolyte temperature of 80°F (27°C) is shown in Table 201.

(a) Electrolyte measurements with the hydrometer must be compensated for the temperature of the electrolyte. Refer to Table 202.

NOTE: For increased temperatures, the values will be lower. For decreased temperatures, the values will be higher.

(3) If the specific gravity indicates the battery is not fully charged, refer to Battery Charging.

NOTE: For more accurate results, you can use a load type tester after you charge the battery.

NOTE: A specific gravity check can be completed after the charge. This check will not find cells that short circuit under loads or have broken connectors between cell plates.

Table 201. Battery Hydrometer Values at 80°F (27°C)

VALUE	BATTERY CONDITION
1.280 Specific Gravity	100% Charged
1.250 Specific Gravity	75% Charged
1.220 Specific Gravity	50% Charged
1.190 Specific Gravity	25% Charged
1.160 Specific Gravity	Not Charged

Table 202. Specific Gravity Correction to 80° (27°C)

ELECTROLYTE TEMPERATURE	ADD TO VALUE	SUBTRACT FROM VALUE
140°F (60°C)	1.024	
130°F (54°C)	1.020	
120°F (49°C)	1.016	
110°F (43 °C)	0.012	
100°F (38°C)	0.008	
90°F (32°C)		
80°F (27°C)		
70°F (21°C)		
60°F (16°C)		0.008
50°F (10 °C)		0.012
40°F (4°C)		0.016

Table 202. Specific Gravity Correction to 80°(27°C) (continued)

ELECTROLYTE TEMPERATURE	ADD TO VALUE	SUBTRACT FROM VALUE
30°F (-1°C)		0.020
20°F (-7°C)		0.024
10°F (-12°C)		0.028
0°F (-18°C)		0.032
-10°F (-23°C)		0.036
-20°F (-29°C)		0.040
-30°F (-34°C)		0.044

STANDBY BATTERY - MAINTENANCE PRACTICES

1. General

A. The maintenance procedures that follow have information for the removal and installation of the standby battery, which is installed behind the Primary Flight Display. If there is no primary power source, the standby battery has been shown to give power to the essential bus for at least 30 minutes. The standby battery PC board is installed on the forward side of the switch panel. The standby battery PC board controls and monitors the release of electrical power to and from the standby battery.

2. Standby Battery Removal/Installation

A. Remove the Standby Battery (Refer to Figure 201).
   (1) Make sure the STDBY BATT switch is in the OFF position.
   (2) Make sure that the MASTER ALT BAT switch is in the OFF position.
   (3) Remove the Primary Flight Display. Refer to Chapter 34, Control Display Unit - Maintenance Practices.
   (4) Disconnect the electrical connection to the battery.
   (5) Remove the nut and washer from the bracket.
   (6) Loosen the forward nut on the bracket.
   (7) Carefully remove the battery from the airplane.

B. Install the Standby Battery (Refer to Figure 201).
   (1) Carefully set the battery in position on the tray.
   (2) Set bracket in position on the top of the battery and install the washer and nut.
   (3) Attach the safety wire to the nut.
   (4) Connect the electrical connection to the battery.
   (5) Do a check of the battery to make sure the battery will not move.
   (6) Install the Primary Flight Display. Refer to Chapter 34, Control Display Unit - Maintenance Practices.
   (7) Put the STDBY BATT switch to the ARM position to make sure that the standby battery and essential bus voltage for the primary flight display operates.

3. Standby Battery PC Board Removal/Installation

A. Remove the Standby Battery PC Board (Refer to Figure 202).

CAUTION: Make sure you use a wrist strap when the standby battery pc board is removed. The standby battery pc board is sensitive to electrostatic discharge.

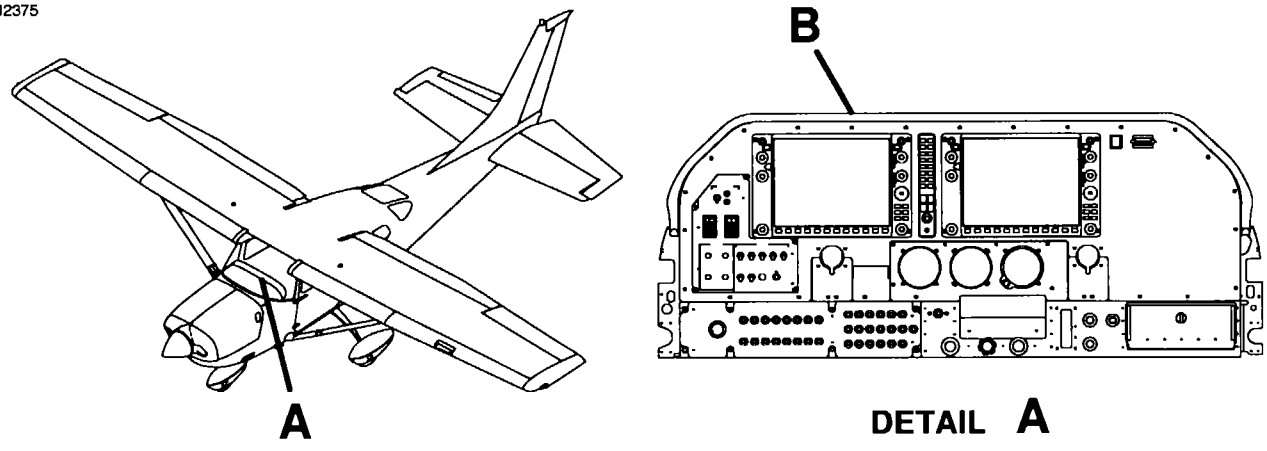
   (1) Make sure the STDBY BATT switch is in the OFF position.
   (2) Make sure that the MASTER ALT BAT switch is in the OFF position.
   (3) Remove the switch panel. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.
   (4) Put on a wrist strap and ground the wrist strap to the airframe.
   (5) Disconnect the PC board from electrical connector.
   (6) Remove the screws that attach the board to the extrusion.
   (7) Carefully remove the board from the extrusion.
   (8) If applicable, put the PC board in an electrostatic safe bag.

B. Install the Standby Battery PC Board (Refer to Figure 202).

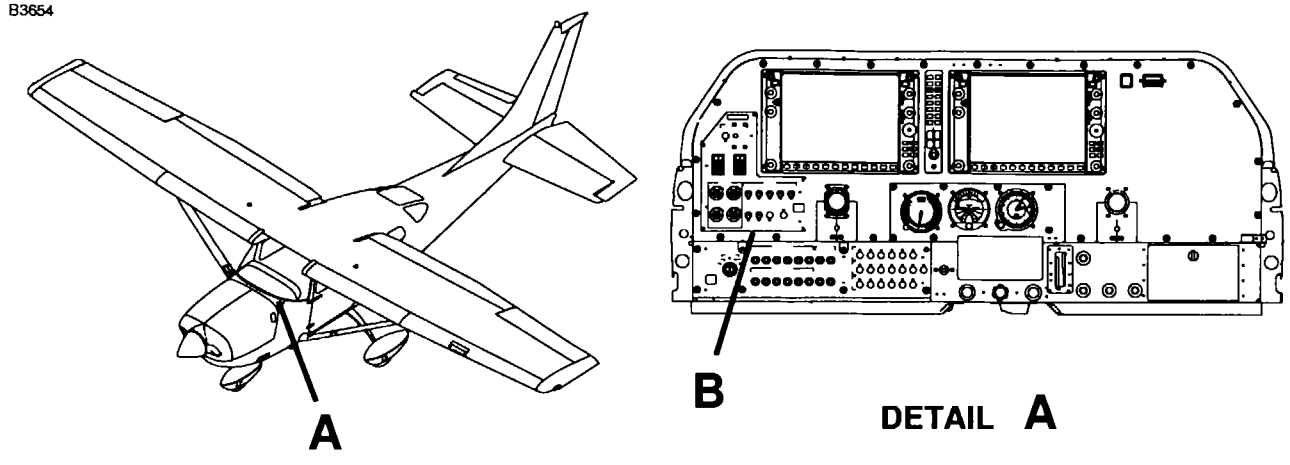
CAUTION: Make sure you use a wrist strap when the standby battery pc board is installed. The standby battery pc board is sensitive to electrostatic discharge.

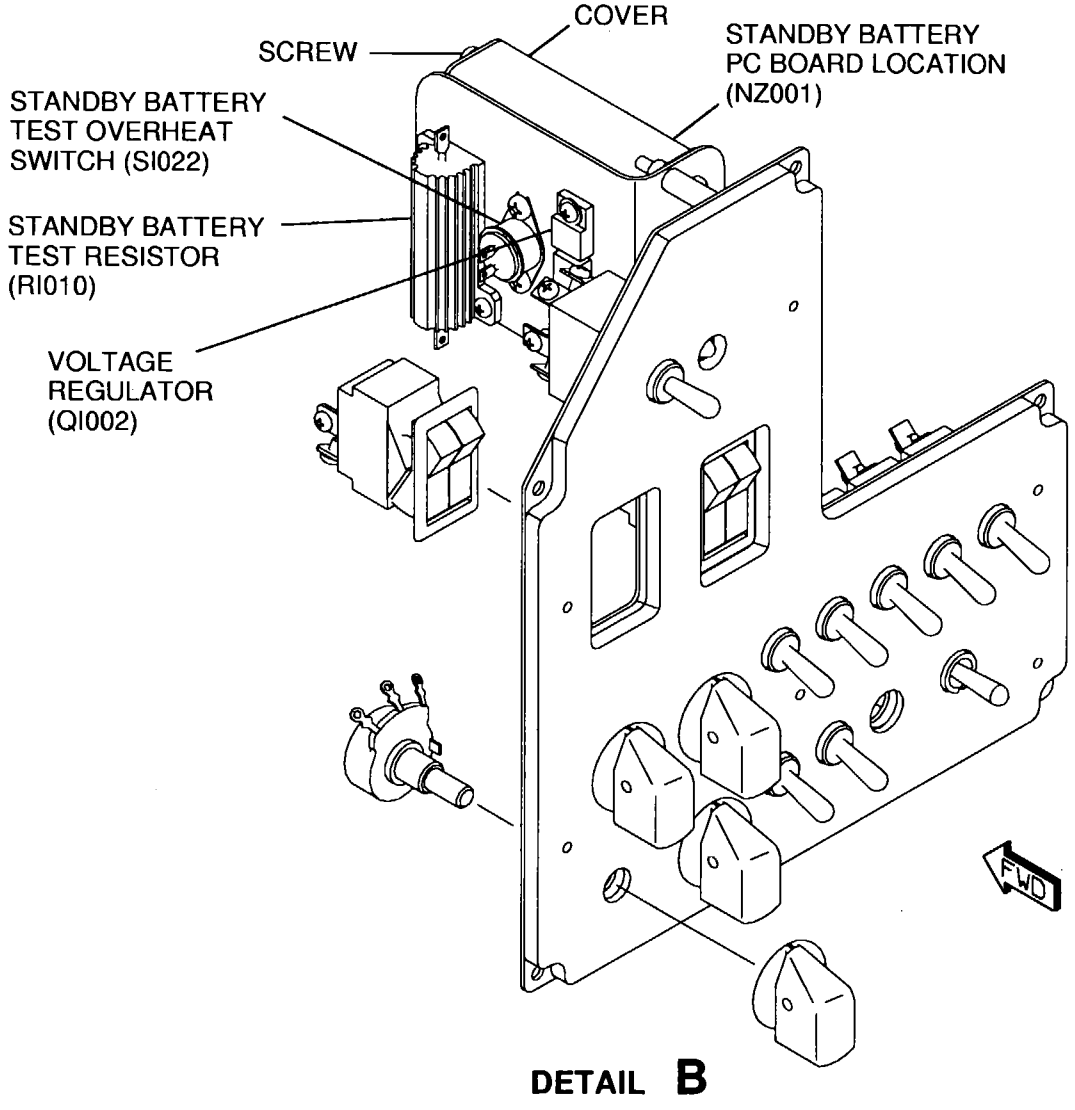
   (1) Put on a wrist strap and ground the wrist strap to the airframe.

B2375



Standby Battery Installation
Figure 201 (Sheet 1)





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Standby Battery PC Board Installation
Figure 202 (Sheet 1)

(2) Carefully install the standby battery controller/monitor PC board in the extrusion.
(3) Install the screws that attach the board to the extrusion.
(4) Connect the board to the electrical connector.
(5) Install the switch panel. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.

4. Standby Battery Charging

A. Charge the Battery.
(1) Remove the battery from the airplane and put it in a well ventilated area to charge (Refer to Standby Battery - Removal/Installation).
(2) Connect the battery to the charger with the black, round Standby Battery Connector (P1). A mating connector (JC032) can be purchased through Cessna. Refer to the Model 206/T206 Wiring Diagram Manual - Chapter 24, Electrical Power.

NOTE: To charge the standby battery, a constant voltage charger, constant current charger or a modification of both can be used. Use only chargers that are made to charge lead acid batteries. A constant voltage "fast" charge can be done with a charger that has a DC voltage between 28.3 and 30.0. A "float" charge can be done with a charger that has a DC voltage between 27.2 and 28.2.

CAUTION: Never set the charger to a level that is higher than 30.0 volts or you can cause damage to the battery.

(3) For a constant current charger, charge the battery. Refer to the charger's instructions.

NOTE: There is no limit on the initial charge current as long as the voltage is not more than 30.0 volts. If it is necessary to set the charger to the battery capacity, use 8 Amp-hour as the standby battery capacity. 8 Amp-hour is the battery's capacity at a 10-hour rate.

(4) For a constant voltage charger, charge the battery for up to 16 hours with a "fast" charge voltage between 28.3 and 30.0 volts.

NOTE: If the state of charge of the battery is satisfactory, charge times of less than 16 hours are possible. The battery is completely charged if the charge current stays stable (approximately .1 to .2 amps) for a minimum of one hour. Charge times greater than 16 hours can be done if the charge voltages are kept between the recommended float charge range of 27.2 to 28.2.

(5) Install the battery (Refer to Standby Battery - Removal/Installation).
(6) Do the Standby Battery Energy Level Test described in the Pilot's Operating Handbook, Chapter 4 - Starting Engine Procedures. Make sure the green standby battery test light comes on and stays on for the described time period.

5. Standby Battery Storage

A. For the best battery life, the standby battery must be kept in a fully charged state when not in use. This is true when installed on the aircraft and when in long-term storage. To leave the battery in an uncharged state for any given period of time will decrease the life of the battery. It is recommended to charge the battery at a minimum of once every three months of inactivity. In warm climates, a more frequent charge will be necessary.

B. Do not keep the standby battery in a temperature environment greater than approximately 25°C for long periods. Sun shades that cover the aircraft deck skin that decrease the temperature of the battery are recommended when the aircraft is parked in direct sunlight.

6. Standby Battery Capacity Test

A. The battery capacity must be tested according to the time limits set forth in Chapter 5, Inspection Time Limits. This test is also necessary to give the battery condition if the battery voltage decreases to less than 20.0 volts such as in an unintentional deep discharge.

B. Standby Battery Capacity Test

(1) Make sure that the standby battery is fully charged before the capacity test is started. If the charge condition is unknown, charge the battery (Refer to Standby Battery Charging).

(2) Put the airplane in an area where there are high cabin light levels. Use sunlight or a well-lit hangar facility.

NOTE: It is important that the photocell on the PFD controls the PFD light level to FULL BRIGHT. The manual AVIONICS rheostat is not operational with the primary alternator and main battery power turned off.

(3) Turn the STDBY IND rheostat to the full clockwise position.

NOTE: A stopwatch will be necessary in the following steps to measure the time of the standby battery discharge.

(4) With the MASTER ALT BAT switch in the OFF position, set the STDBY BATT switch to the ARM position and immediately start the stopwatch.

(5) Make sure that all of the equipment on the essential bus operates correctly.

NOTE: After initialization, the PFD will operate in full bright mode with only red X's over the NAV 2, COM 2, and XPDR functions.

(6) Make sure that all the standby indicator lights come on.

(7) Make sure that the MFD and all the other electrical and avionic equipment on the primary busses are not on.

(a) If the conditions in steps 5 thru 7 do not occur, stop the test and correct these conditions.

(b) Start at Step 1 when the condition has been corrected.

NOTE: The standby battery initial current discharge will be between 2.1 and 3.1 amps as shown on the PFD standby battery ammeter. The essential bus initial voltage will be approximately 24.2 volts as shown on the PFD essential bus voltmeter.

(8) Continuously monitor the essential bus voltage as shown on the PFD essential bus voltmeter. The standby battery capacity is satisfactory if the bus voltage stays more than 20.0 volts for 55 minutes.

(9) Set the STDBY BATT switch to OFF if the essential bus decreases to 20.0 volts or after a minimum of 55 minutes.

CAUTION: Do not let the essential bus voltage decrease below 20.0 volts or the standby battery can be damaged. Set the STDBY BATT switch to the OFF position before the voltage decreases to less than 20.0 volts. Voltage values less than 22.5 volts can decrease quickly so monitor the voltage closely. If the voltage decreases to less than 20.0 volts, charge the battery immediately and do the test again.

NOTE: If the standby battery voltage does not stay more than 20.0 volts for 55 minutes during the standby battery capacity test, the battery is not acceptable for return to service.

(10) Charge the battery (Refer to Standby Battery Charging).

12-VOLT CABIN POWER SYSTEM - TROUBLESHOOTING

1. General

A. The 12-volt cabin power outlet on the pedestal uses a power converter in the tailcone to convert 28-volt DC input power to 13.8-volt DC output power. The converter output can be used to power other electrical devices that require a 12-volt power input. The electrical connections are made with the use of a terminal block that is located on the side of the converter. The converter output can be turned on and off with the ON/OFF signal terminal located on the converter terminal block. When 28-VDC is applied to this terminal, the converter will turn the output on. No connection to the terminal will turn the output off.

B. The 12-volt cabin power outlet behind the copilot seat and forward of the aft headset jacks on airplanes with Garmin G1000 uses a power converter to convert 28-volt DC input power to 13.8-volt DC output power. The 20 amps of 12-volt power are split evenly between the forward and the aft power outlets. In airplanes with the Garmin G1000 installed, a CABIN PWR 12V switch is located on the switch panel.

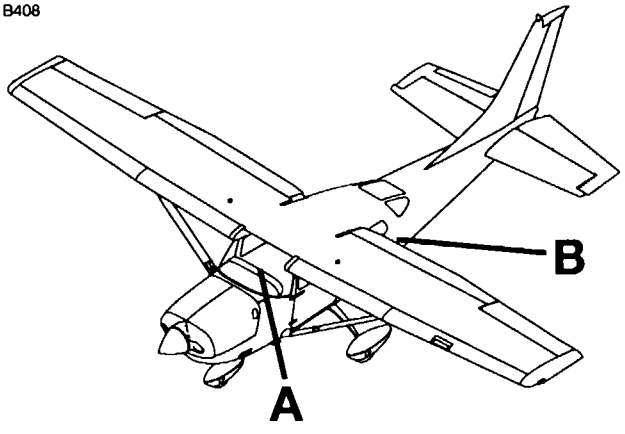
2. Cabin Power Interface

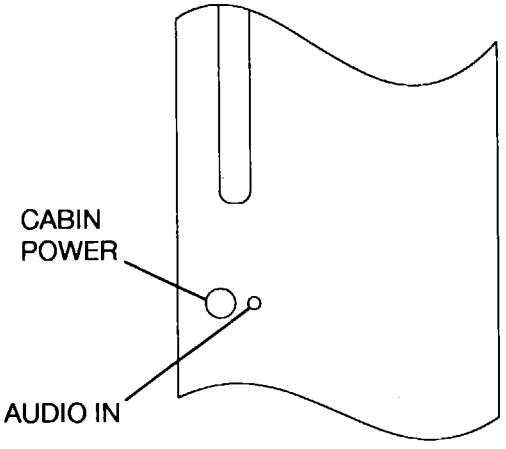
A. Test the Cabin Power Interface (Refer to Figure 101).
   (1) Make sure the ALT/BAT Master switch is in the ON position.
   (2) For airplanes with serials 20608001 thru 20608189 and T20608001 thru T20608387, you will have to use a 12 Volt DC power adapter to do the test. Refer to Tools, Equipment and Materials.
      (a) Attach the adapter to the cabin power system.
   (3) Use a voltmeter to make sure the output indicates 13.4 +0.9 or -0.9 volts at the cabin power interface.
   (4) If the correct voltage is not indicated, troubleshoot the Power Converter.

3. Power Converter

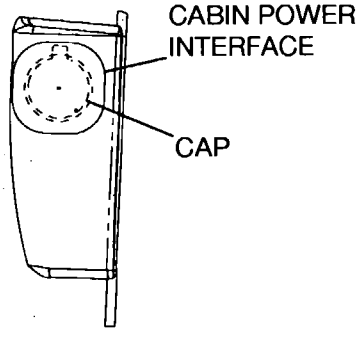
A. Test the Power Converter (Refer to Figure 102 and to the Model 206/T206 Wire Diagram Manual, Chapter 24, Power Interface).
   (1) Disconnect the connector (JI).
   (2) Test for approximately 24 Volts between VI+ and VI- at the aircraft side of the connector (JI).
   (3) Test for approximately 24 Volts between the ON/OFF and VI- at the aircraft side of the connector (JI).
   (4) If there is no voltage, exam the wiring from the power convertor to the connector (JI) for damage or bad connections.
      (a) Repair or replace the connector (JI) or the wiring as necessary.
         1 Attach the connector (JI).
         2 Test the cabin power interface for correct operation. Refer to Cabin Power Interface.
         3 Proceed to step 3.A.(5) if the cabin power interface does not operate correctly.
   (5) Test the pins VO+ and VO- at the converter for an output of 13.4 +0.9 or -0.9 volts.
      (a) If the correct voltage is supplied, do a check of the continuity from the aircraft side of the connector (J1) to the cabin power interface (JC022 automotive style) or (JC008 airline style).
         1 If the wire continuity is not correct or the wire is damaged, replace the wiring as necessary.
         2 If the wire continuity is correct, replace the power converter.

B408

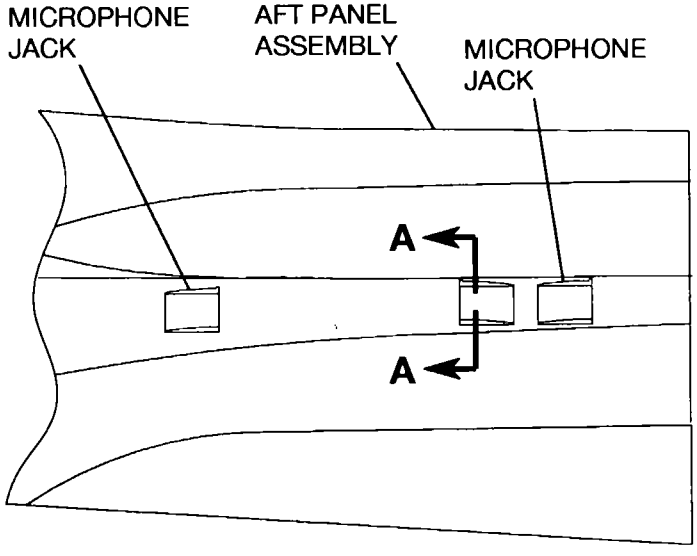




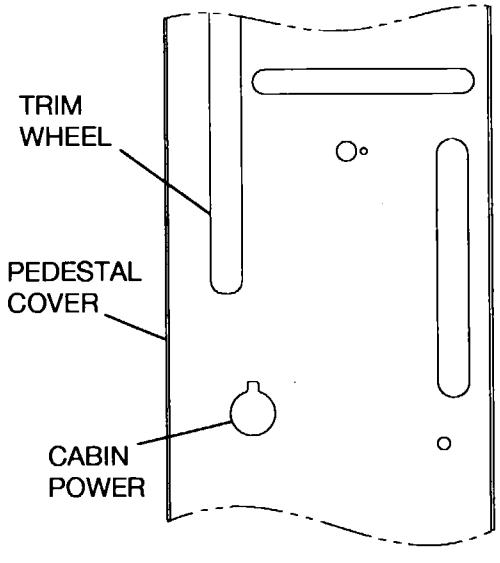
DETAIL A
AIRPLANES 20608001 THRU 20608189 AND
AIRPLANES T20608001 THRU T20608387



VIEW A–A



DETAIL B
VIEW LOOKING OUTBOARD ON LEFT HAND SIDE
AIRPLANES WITH GARMIN G1000



DETAIL A
AIRPLANES 20608190 AND ON
AIRPLANES T20608388 AND ON

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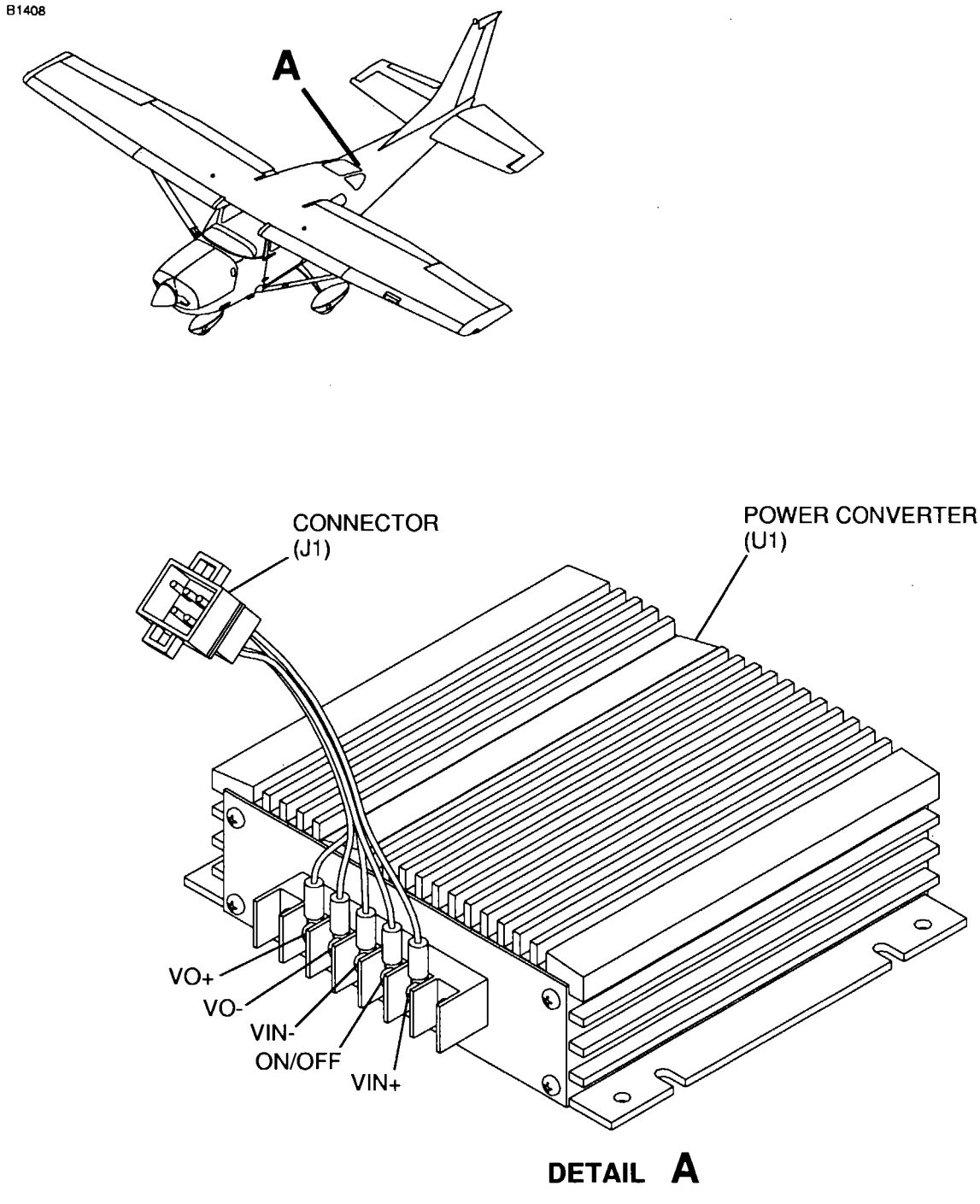
A0719T1032
B1219T097
AA1219T097

Cabin Power Interface
Figure 101 (Sheet 1)



Power Converter
Figure 102 (Sheet 1)

POWER JUNCTION BOX - MAINTENANCE PRACTICES

1. General

A. The power junction box, also referred to as a Master Control Unit (MCU), is installed on the forward, left side of the firewall. The power junction box has a battery relay, starter relay, alternator relay, current sensor, external power relay, alternator control unit, power distribution bus, and bus fuses (or circuit breakers as applicable).

2. Power Junction Box Removal/Installation

A. Remove the Power Junction Box. (Refer to Figure 201).
(1) Remove the upper cowl, refer to Chapter 71, Cowls - Maintenance Practices.
(2) Disconnect the battery cables, refer to Battery - Maintenance Practices.
(3) Remove the cover from the power junction box.
(4) Disconnect the electrical connectors, cables, and ground strap from the power junction box.
(5) Remove the cooling shield.

NOTE: Turbocharged airplanes do not have a cooling shield installed on the power junction box.

(a) Remove the bolts that connect the cooling shield to the power junction box.
(b) Disconnect the cooling shield from the power junction box.
(6) Remove the bolts that connect the power junction box to the firewall.
(7) Remove the power junction box from the airplane.

B. Install the Power Junction Box. (Refer to Figure 201).
(1) Put the power junction box on the firewall and attach it with bolts.
(2) Connect the electrical connectors, cables, and ground strap to the power junction box.
(3) Install the cover on the power junction box.
(4) Install the cooling shield.

NOTE: Turbocharged airplanes do not have a cooling shield installed on the power junction box.

(5) Connect the battery cables, refer to Battery - Maintenance Practices.
(6) Install the upper cowl, refer to Chapter 71, Cowls - Maintenance Practices.

3. Component Removal/Installation

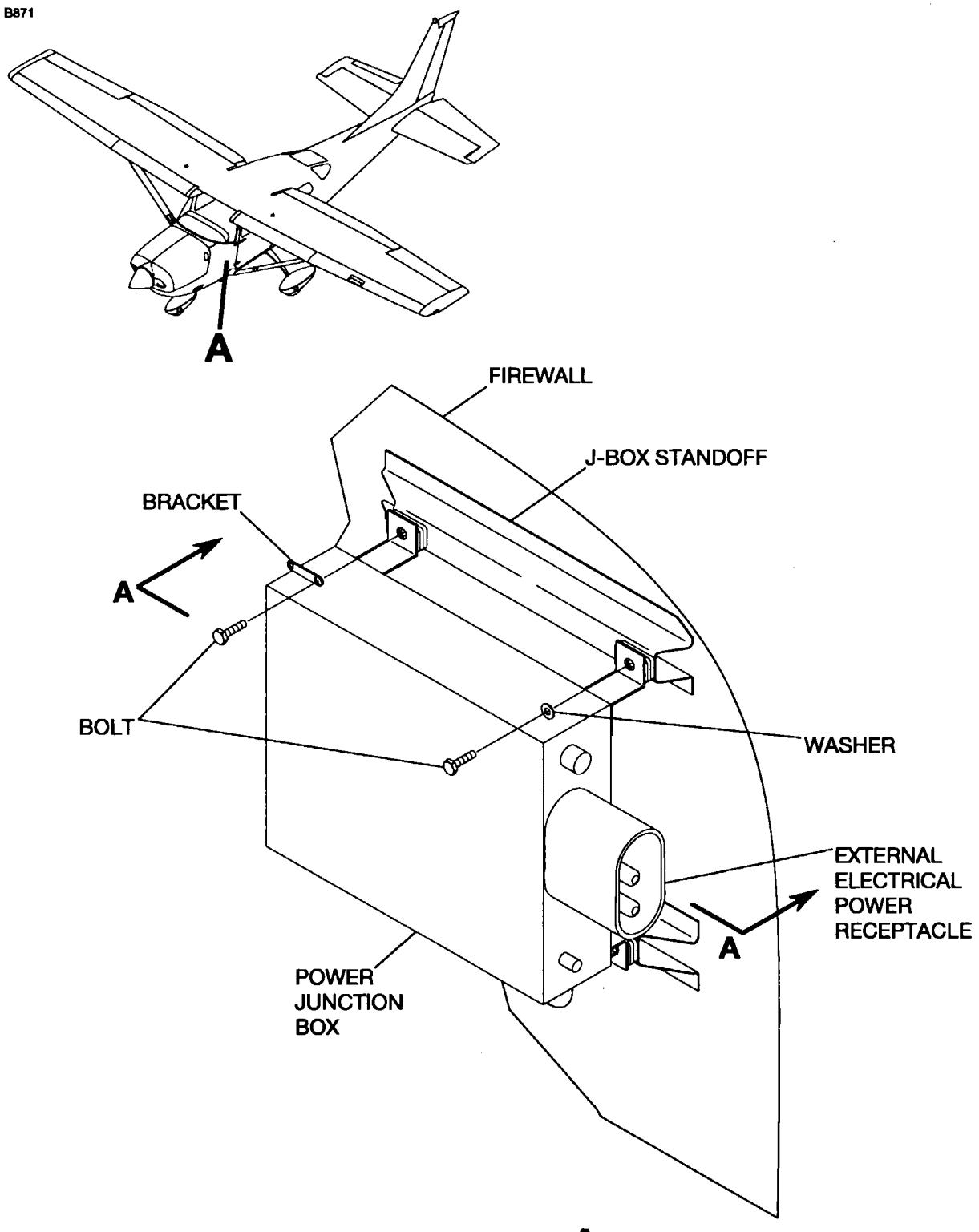
A. General Precautions and Notes.

CAUTION: Make sure that all electrical power is removed from the airplane and that the battery is disconnected before you do work on power junction box components.

(1) Components such as relays, current sensors and the alternator control unit can be replaced when necessary. Refer to the Model 206H/T206H Illustrated Parts Catalog for replacement part numbers.
(2) Before disconnecting wires, identify and put a label on them for installation.
(3) Torque values for ground and conductive studs can be found in Chapter 20, Torque Data - Maintenance Practices.

4. Power Junction Box Troubleshooting

A. Complete the Power Junction Box Troubleshooting.
(1) The power junction box troubleshooting is done with the Lamar TE04 MCU Test Set. Use the LI-0021 instructions. Refer to Electrical Power - General, Tools, Equipment, and Materials.



DETAIL A
TURBOCHARGED AIRPLANES

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Power Junction Box Installation
Figure 201 (Sheet 1)

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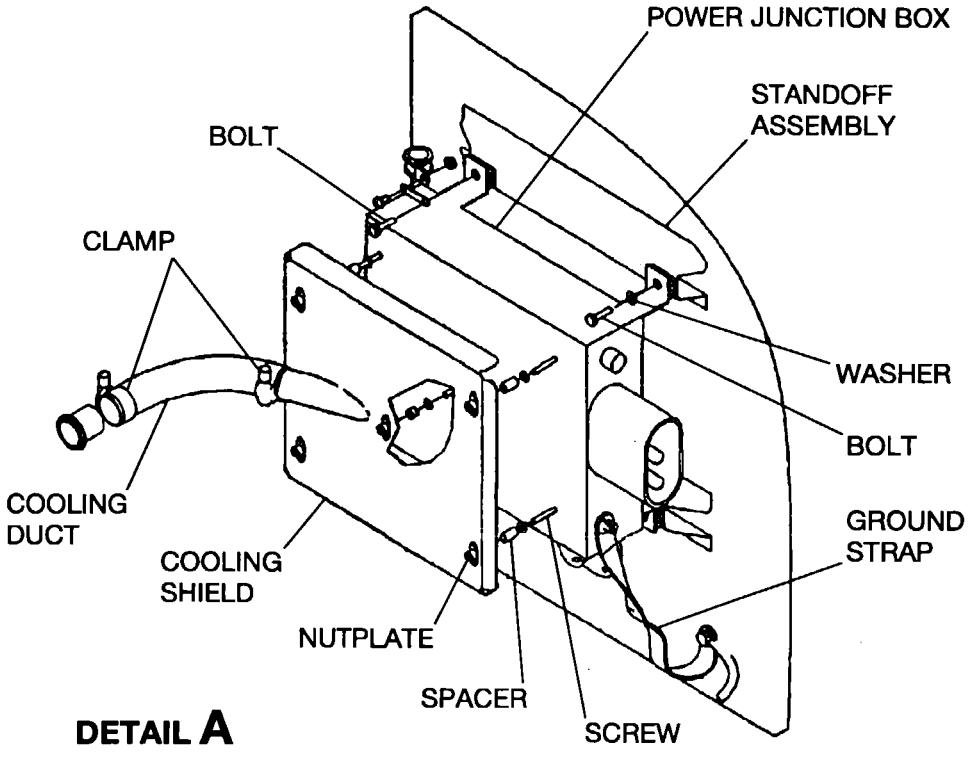
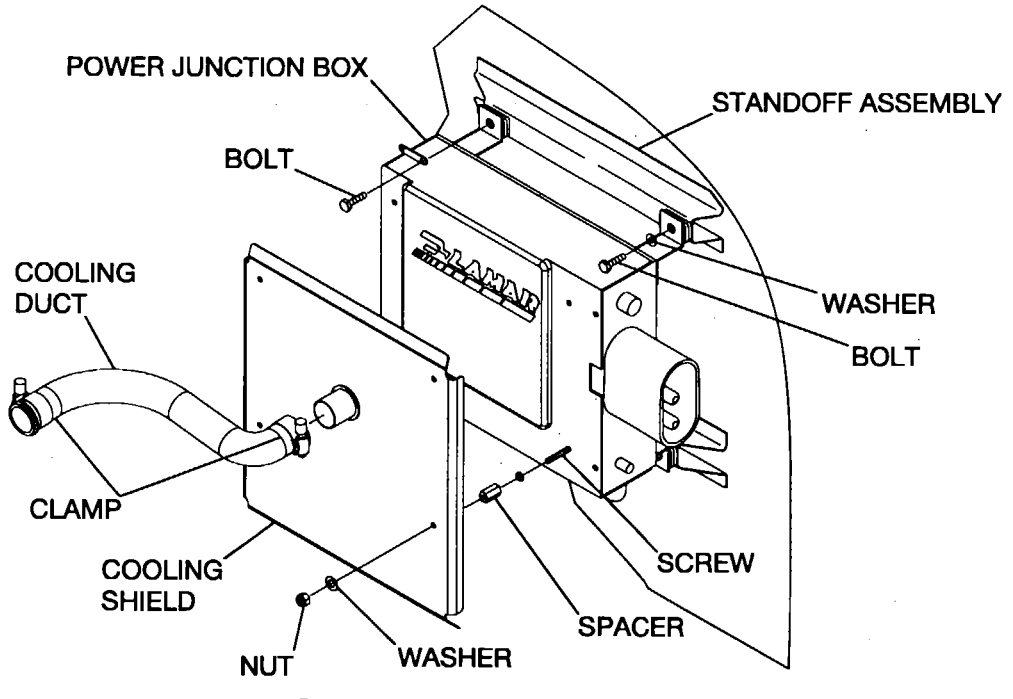


DETAIL A
AIRPLANES 20608001 THRU 20608214



DETAIL A
AIRPLANES 20608215 AND ON

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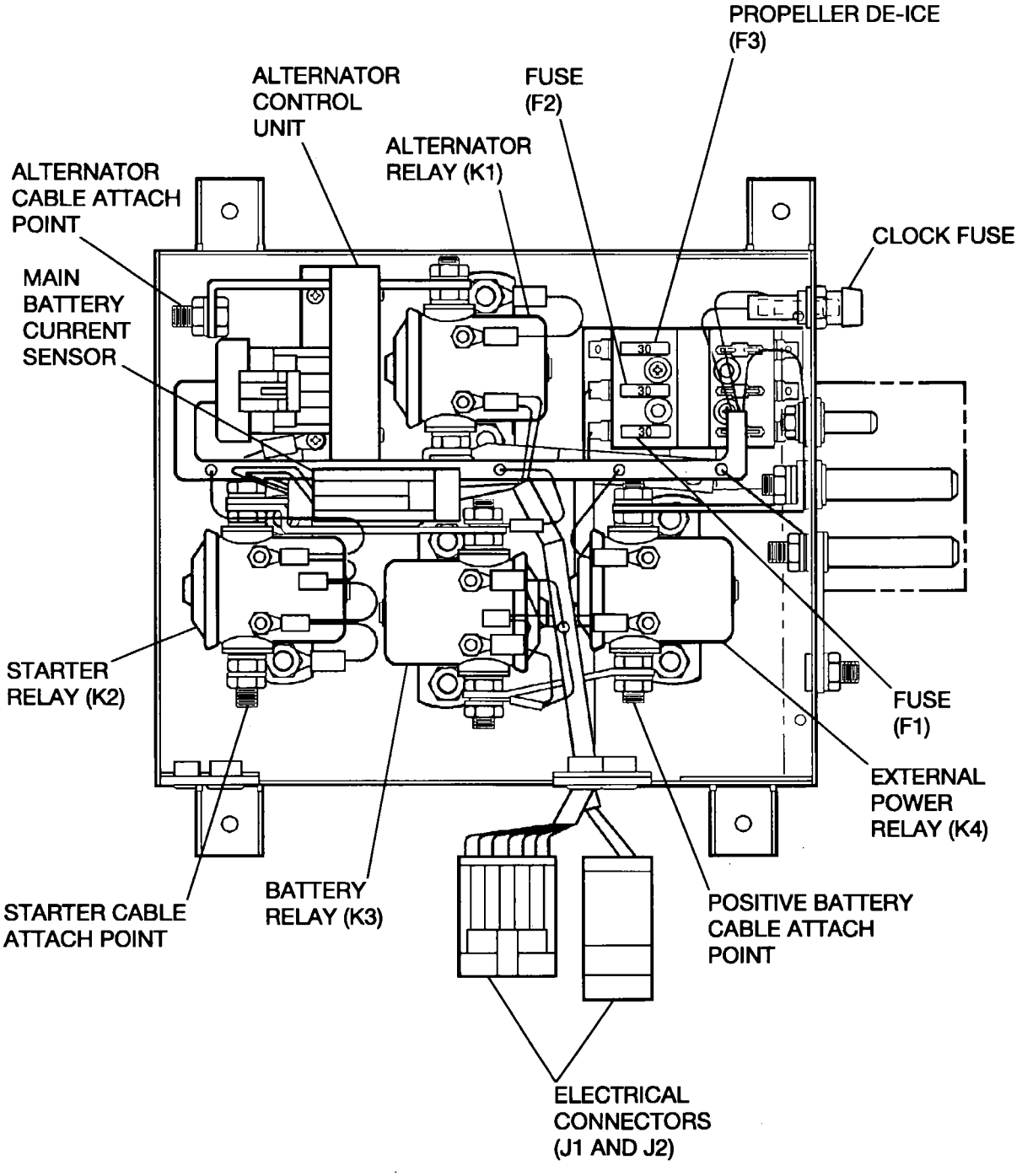
A1258T1007

Power Junction Box Installation
Figure 201 (Sheet 2)

B3981

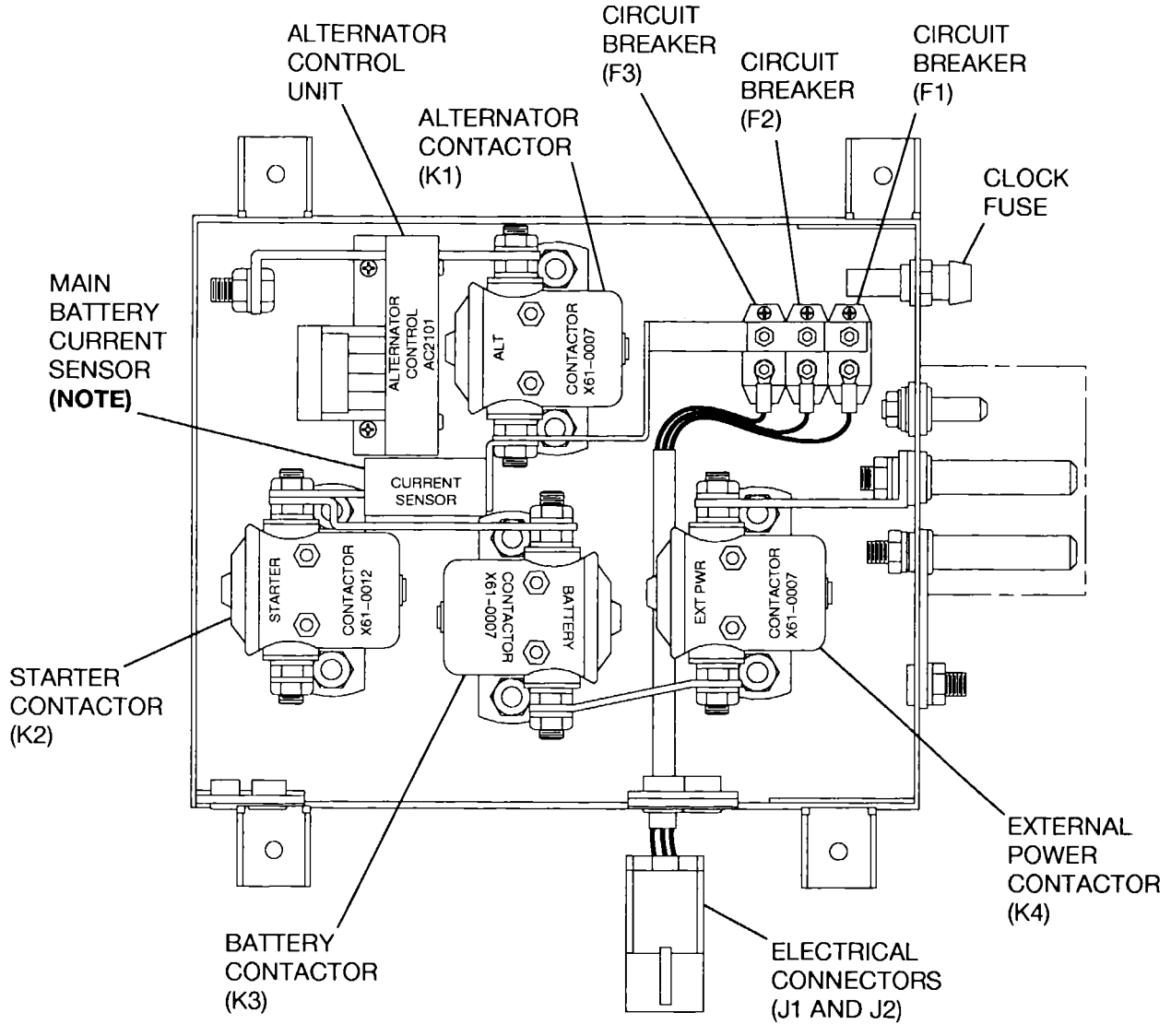


VIEW A-A
AIRPLANES 20608001 THRU 20608094 AND
AIRPLANES T20608001 THRU T20608164 THAT
DO NOT INCORPORATE SB00-24-01

AA0558T1002

Power Junction Box Installation
Figure 201 (Sheet 3)

B3993



VIEW A–A

AIRPLANES 20608095 AND ON AND
AIRPLANES T20608165 AND ON AND
AIRPLANES 18280001 THRU 18280944
INCORPORATING SB00-24-01

NOTE: CS3100 CURRENT SENSOR SHOWN
CS3200 CURRENT SENSOR SIMILAR
FOR J-BOXES MC01-3A(IC10) AND ON.

AA0558T1007

Power Junction Box Installation
Figure 201 (Sheet 4)

ALTERNATOR CONTROL UNIT - MAINTENANCE PRACTICES

1. General

A. The Alternator Control Unit (ACU) is found inside the power junction box, also referred to as a Master Control Unit (MCU) or J-Box. The alternator system includes the ACU, Alternator Contactor, and alternator field circuit. The ACU functions are as follows:
   (1) Alternator Voltage Regulation - The ACU controls the alternator field circuit to supply a main bus voltage of approximately 28.5 volts.
   (2) Low Voltage Annunciation - The ACU monitors the main bus voltage in the power junction box and supplies an output for low voltage (less than 24.5 +0.35 or -0.35 volts) for the annunciation.
   (3) Over-voltage Protection - The ACU monitors the main bus voltage in the power junction box and disengages the aircraft ALT FIELD circuit breaker. This removes the power from the alternator system if there is an over-voltage condition greater than 31.75 +0.5 or -0.5 volts.
   (4) Reverse Alternator Current Protection - The ACU monitors the alternator output current and disengages the aircraft ALT FIELD circuit breaker. This removes the power from the alternator system if there is a reverse alternator current.
   (5) Excess Field Current Protection - The ACU monitors the alternator field current and disengages the aircraft ALT FIELD circuit breaker. This removes the power from the alternator system if there is an excessive field current.

2. Alternator Control Unit Removal/Installation

A. Remove the Alternator Control Unit. Refer to Power Junction Box - Maintenance Practices, Component Removal/Installation.

B. Install the Alternator Control Unit. Refer to Power Junction Box - Maintenance Practices, Component Removal/Installation.

3. Over-voltage Protection Circuit Test

A. General.
   (1) The ACU Over-voltage Protection Circuit must be tested in accordance with the time limits in Chapter 5, Inspection Time Limits. Use one of the two procedures that follow to do the test of the Over-voltage Protection Circuit. The recommended procedure uses the Lamar TE04 MCU Test Set, The external battery procedure can be used if a TE04 test set is not available.

B. Over-voltage Protection Circuit Test with the Lamar TE04 MCU Test Set
   (1) Use a Lamar TE04 MCU Test Set and do steps 4.2, 4.3.A, 4.3.B, and 4.3.I in the Lamar's TE04 MCU Test Set instructions LI-0021(refer to Electrical Power - General, Tools, Equipment, and Materials).
   (2) If the ACU TRIP indicator on the TE04 MCU Test Set does not illuminate in step 4.3.I, the Over-voltage Protection Circuit is not operational.
      (a) Replace the ACU.
      (b) Do this test again.
   (3) If the ACU TRIP indicator does illuminate in step 4.3.I, the Over-voltage Protection Circuit is operational.
      (a) Complete the Lamar procedure 4.3.I.
      (b) Remove the TE04 MCU Test Set.
      (c) Continue with step D in this section.

C. Over-voltage Protection Circuit Test with External Batteries

NOTE: It is necessary to use two general non-rechargeable 9 volt batteries in new condition to apply a temporary over-voltage condition on the ACU Sense wire. A locally fabricated battery test harness is also necessary. The test harness uses two 9-volt snap connectors and two insulated alligator clips. (Refer to Figure 201.) These components are available at most battery supply stores. For ground safety reasons, only general household 9 volt batteries which have a relatively low ampere rating are used.

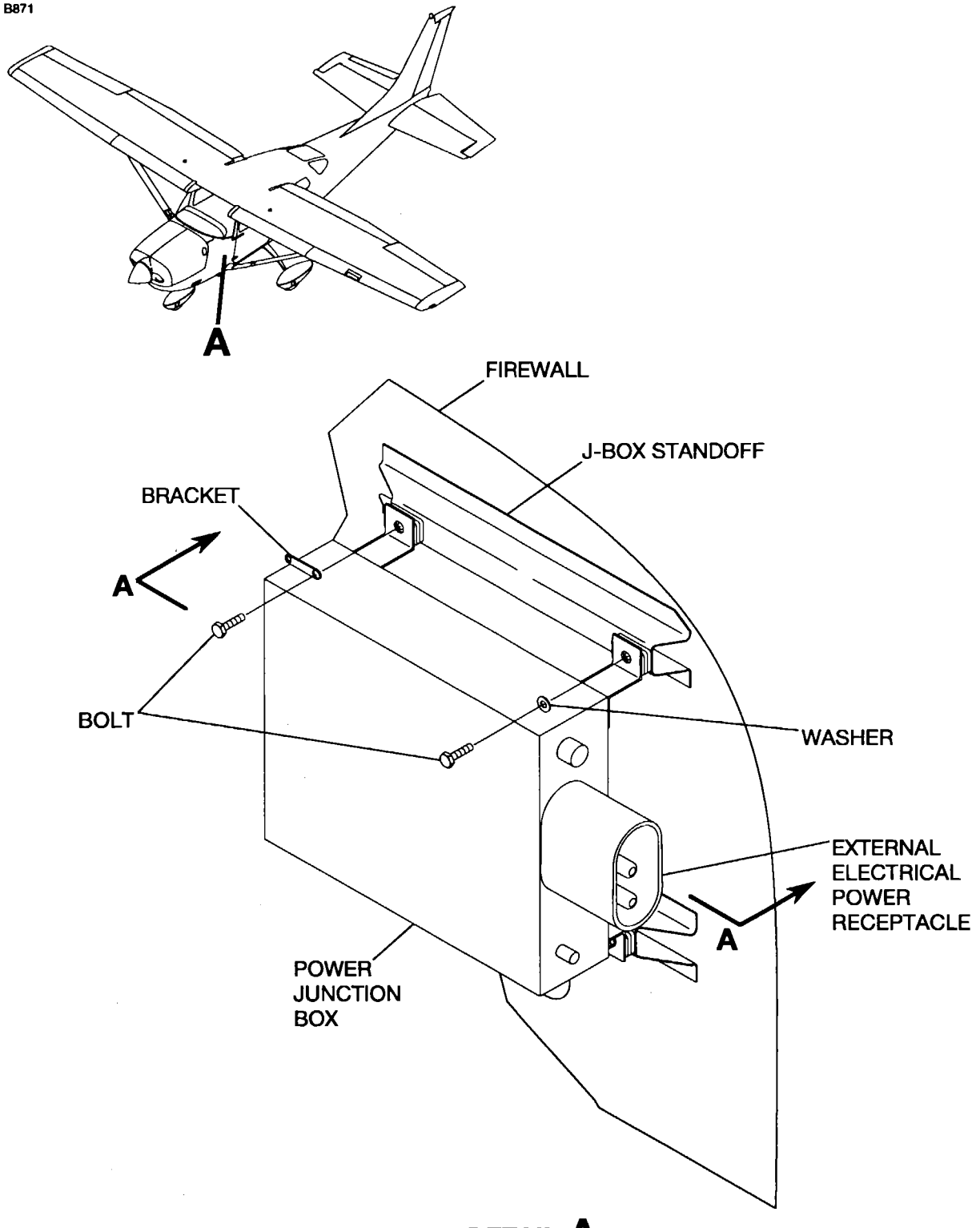
(1) Make sure the BAT MASTER, ALT MASTER, AVIONICS master, and all electrical system switches are in the OFF position.
(2) Remove the upper cowl. Refer to Chapter 71, Cowls – Maintenance Practices.
(3) Disconnect the airplane 24 volt battery cables from the battery. Refer to Battery – Maintenance Practices.
(4) Remove the cover from the power junction box.
(5) Find the orange ACU sense wire attached to the upper Battery Contactor terminal inside the power junction box. Refer to Figure 201.
  (a) Remove the nut, washer, and orange ACU sense wire ring terminal from the upper Battery Contactor terminal.

    NOTE: The ACU sense wire is connected to Pin B in the ACU connector.

(6) Connect the battery test harness in series with the orange ACU Sense wire and the upper Battery Contactor terminal as shown in Figure 201.
  (a) Use tape or an equivalent as electrical insulation on the bare sense wire ring terminal.

    NOTE: This will help prevent accidental electrical shorts.

(7) Connect two new 9-volt batteries to the harness.
  (a) Put the 9 volt batteries in position below the power junction box as shown in Figure 201.
(8) Connect the airplane 24 volt battery cables to the battery. Refer to Battery – Maintenance Practices.
(9) Make sure the ALT FIELD circuit breaker on the pilot's circuit breaker panel is engaged.
(10) Put the BAT and ALT MASTER switches to the ON position for 5 seconds and then return to the OFF position.
  (a) Make sure the ALT Field circuit breaker opens or the cap pops out.
  (b) If the circuit breaker opens, the Over-voltage Protection circuit is operational. Continue with step 11.
  (c) If the circuit breaker does not open, do step 10 a second time.
    1 Use a digital voltmeter and measure the voltage between the orange ACU sense wire ring terminal and the power junction box ground stud.
  (d) If the circuit breaker does not open the second time and the ACU sense voltage is greater than 34 volts, the Over-voltage Protection Circuit is not operational.
    1 Replace the ACU.
  (e) Do step 10 again after a new ACU is installed.
(11) Engage the ALT Field circuit breaker.
(12) Disconnect the airplane 24 volt battery cables from the battery. Refer to Battery – Maintenance Practices.
(13) Disconnect the two 9-volt batteries from the harness.
(14) Disconnect the battery test harness.
(15) Install the nut, washer, and orange ACU sense wire ring terminal to the upper Battery Contactor terminal.
  (a) Torque the terminal nut from 35 to 45 inch-pounds.
(16) Install the cover on the power junction box.
(17) Connect the airplane 24 volt battery cables to the battery. Refer to Battery – Maintenance Practices.
(18) Install the upper cowl. Refer to Chapter 71, Cowls – Maintenance Practices.
(19) Continue with step D in this section.



DETAIL A
TURBOCHARGED AIRPLANES

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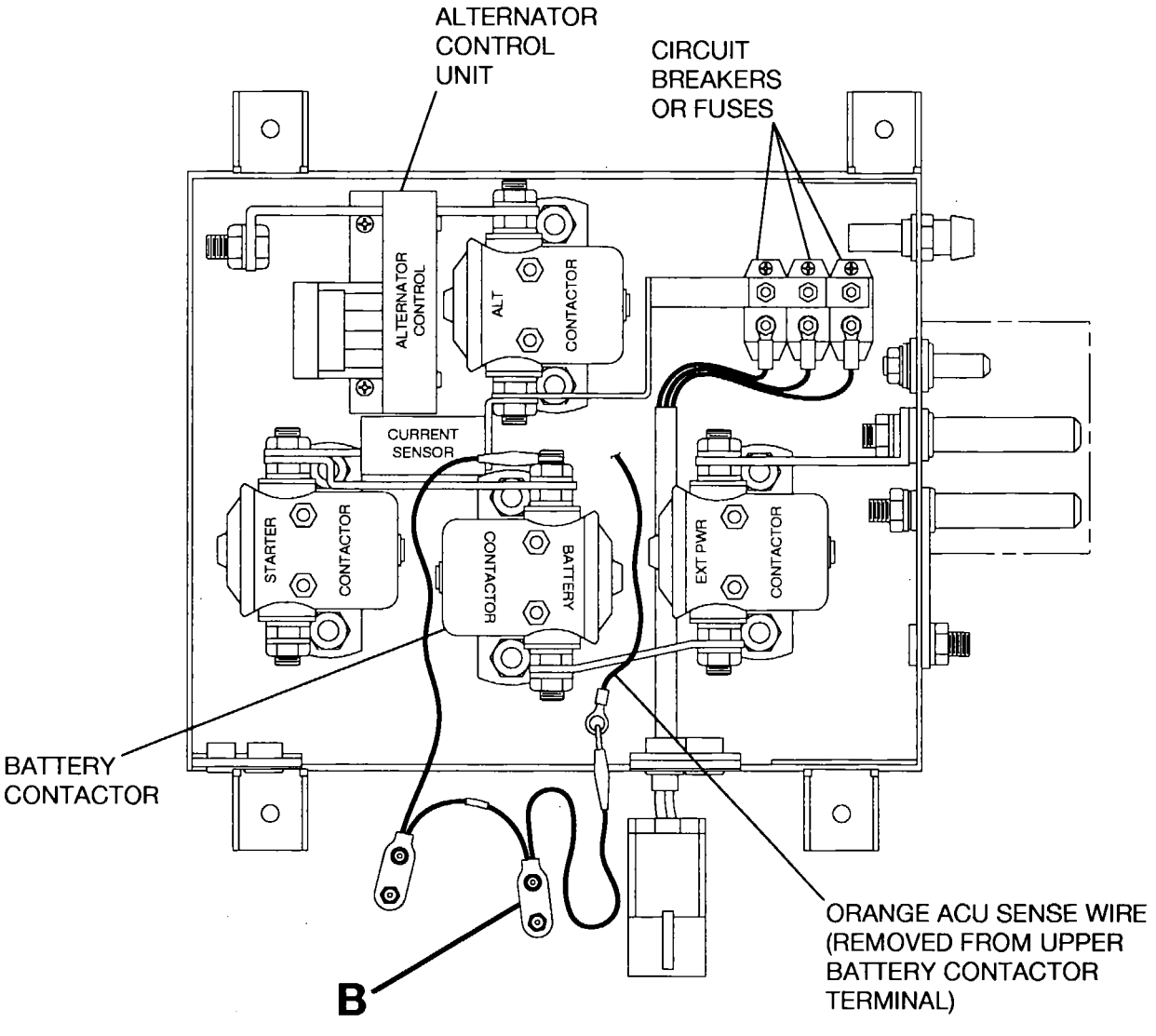
Over-Voltage Protection Circuit Test with External Batteries
Figure 201 (Sheet 1)

B6230



VIEW A–A

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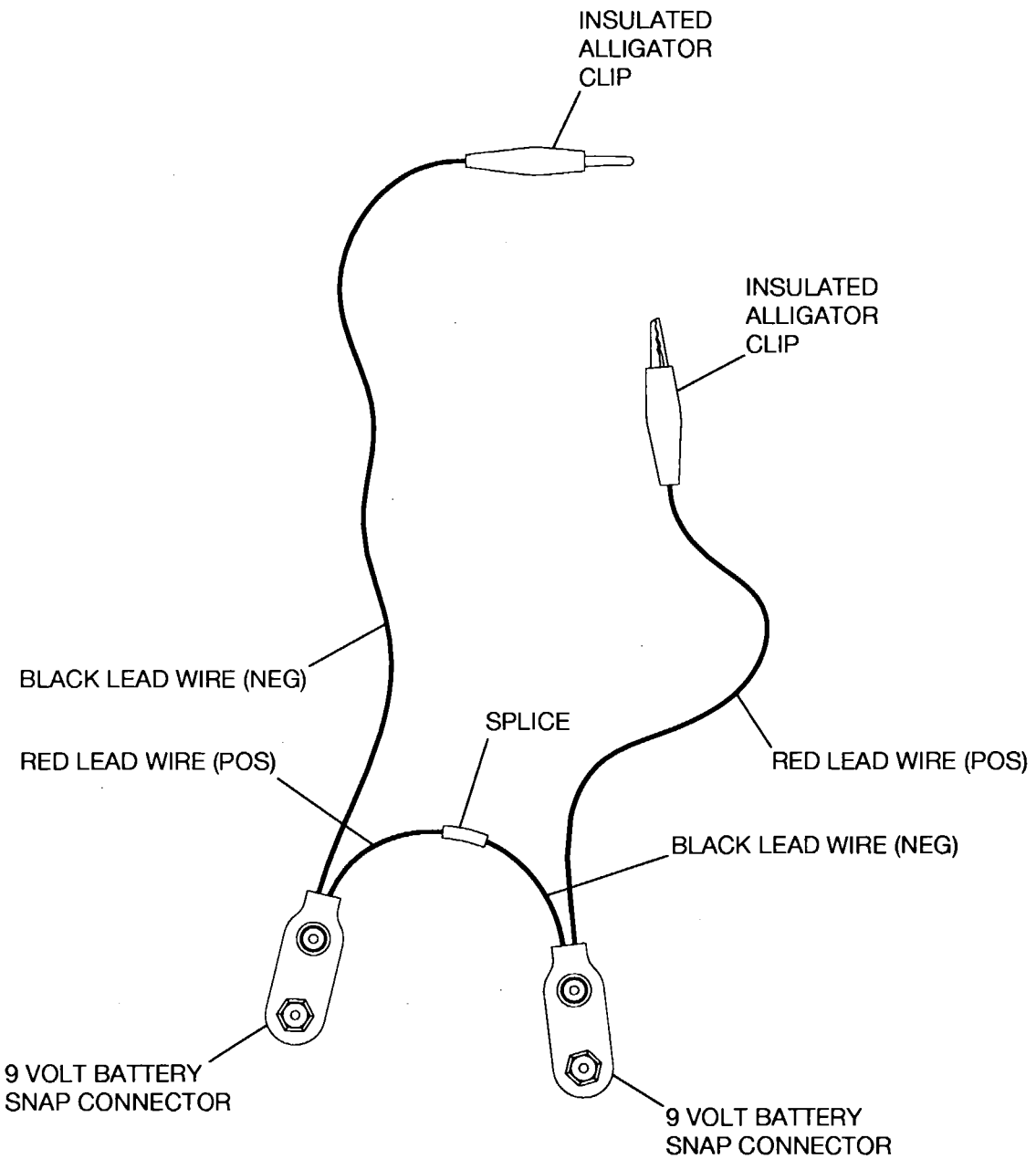
Over-Voltage Protection Circuit Test with External Batteries
Figure 201 (Sheet 2)

B6231



DETAIL B

B0558T1007

Over-Voltage Protection Circuit Test with External Batteries
Figure 201 (Sheet 3)

D. Make sure of the correct ACU functions immediately after the next engine start.
   (1) Start the engine in accordance with the Pilot's Operating Handbook, Starting Engine (Using Battery) procedure but make sure the ALT MASTER switch is in the OFF position.
   (2) After the engine start and oil pressure check, set the engine RPM to idle.
   (3) Make sure the Low Voltage annunciator is On.
   (4) While you monitor the aircraft voltmeter, set the ALT MASTER switch to the ON position.
      (a) If the voltmeter shows more than 29 volts, immediately set the ALT MASTER switch to the OFF position and stop the engine.

         NOTE: The ACU regulation circuit is non operational. The ALT FLD circuit breaker should open if the voltage is more than 32 volts.

         1 Replace the ACU and do the Over-voltage Protection Test again.
      (b) If the voltmeter shows less than 29 volts, slowly increase the throttle to an engine speed of 1300 RPM.
   (5) If the voltmeter shows approximately 28 volts at an engine speed of 1300 RPM the ACU regulation circuit is operational.
   (6) Make sure the battery charge is shown on the aircraft battery ammeter.
   (7) Make sure the LOW VOLTS annunciator is off.

4. Alternator Control Unit Troubleshooting

A. Complete the Alternator Control Unit Troubleshooting.
   (1) The Alternator Control Unit troubleshooting is done with the Lamar TE04 MCU Test Set. The instructions are contained in the test set. Refer to Electrical Power - General, Tools, Equipment, and Materials.

CIRCUIT BREAKER - MAINTENANCE PRACTICES

1. General

A. The circuit breaker panel is on the left, lower instrument panel, below the pilot's control wheel. The circuit breaker panel for airplanes with Garmin G1000 holds the electrical circuit breakers and the magneto switches. The circuit breaker panel for airplanes without Garmin G1000 also holds the MASTER ALT BAT switch, AVIONICS master switch and the panel lighting controls.

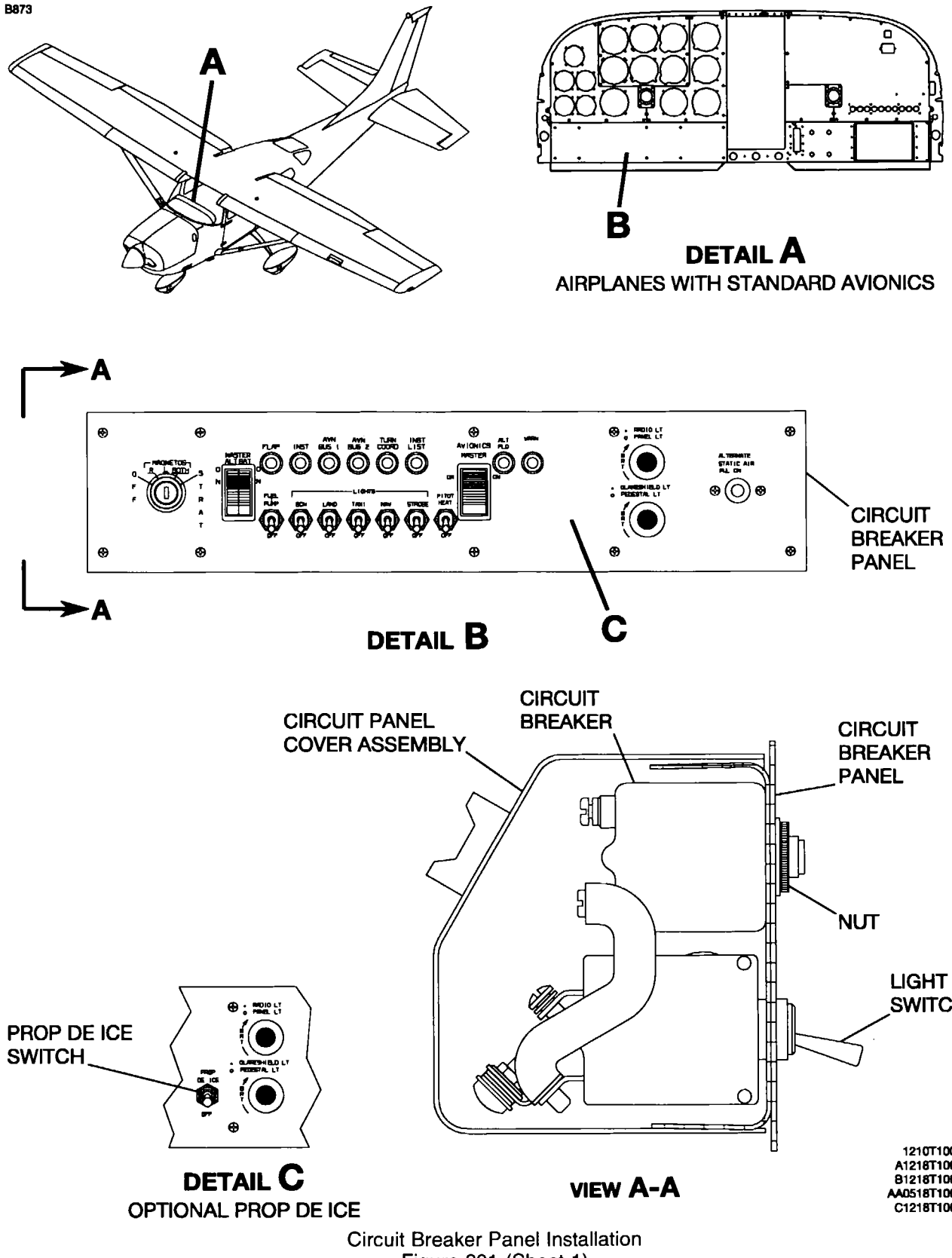
2. Circuit Breaker Removal/Installation

A. Remove the Circuit Breaker (Refer to Figure 201 or Figure 202).
   (1) Remove the top right cowl. Refer to Chapter 71, Cowl - Maintenance Practices.
   (2) Disconnect the battery cables. Refer to Battery - Maintenance Practices.
   (3) Remove the screws that attach the circuit breaker panel to the bottom instrument panel.
   (4) Remove the circuit panel.
   (5) Identify with a label the wires for the circuit breaker and disconnect them.
   (6) Remove the nut and washer that attach the circuit breaker to the circuit breaker panel.
   (7) Remove the circuit breaker.

B. Install the Circuit Breaker (Refer to Figure 201 or Figure 202).
   (1) Put the circuit breaker in the circuit breaker panel and attach it with a washer and nut.
   (2) Connect the wire to the circuit breaker and remove the identification label.
   (3) Install the circuit breaker panel.
      (a) Put three ground straps between the circuit breakers and the panel.
      (b) Put the circuit breaker cover over the circuit breakers. Make sure you put the main power bus wires and the circuit panel wire bundle out through the left side of the cover.

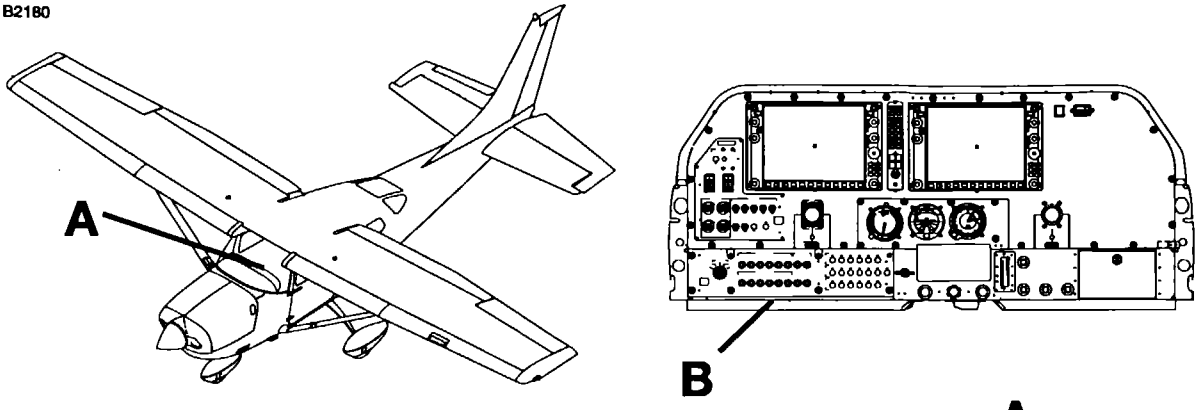
      NOTE: The flanges on the cover fit between the circuit breakers and the panel. Indentions in the cover must match screw holes in panel.

      (c) Tie down the cover with the three ground straps installed.
   (4) Install the circuit breaker panel on the bottom instrument panel and attach with screws.
   (5) Connect the battery cables, refer to Battery - Maintenance Practices.
   (6) Install the top right cowl, refer to Chapter 71, Cowl - Maintenance Practices.

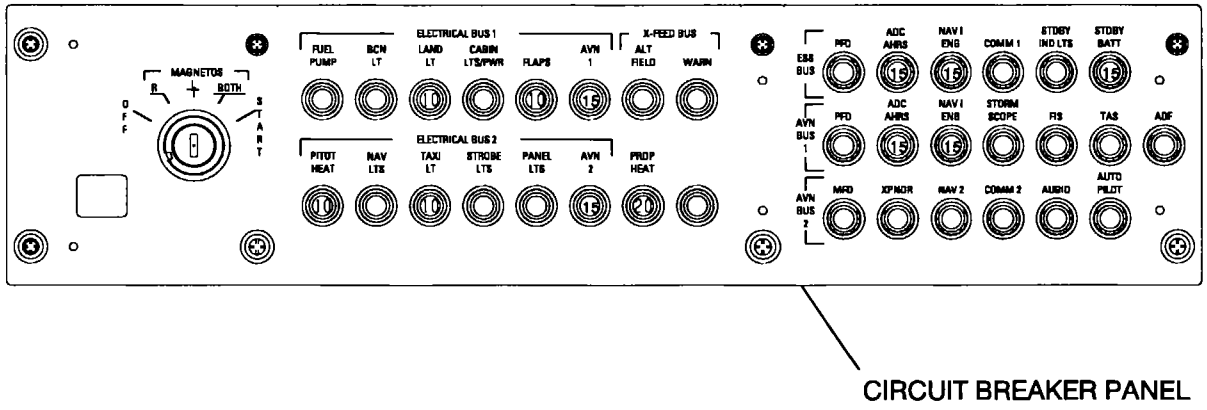


Circuit Breaker Panel Installation
Figure 201 (Sheet 1)

B2180



DETAIL A



DETAIL B
AIRPLANES WITH GARMIN G1000

1210T1001
A1218T1001A
B1218T1001A

Circuit Breaker Panel Installation
Figure 202 (Sheet 1)

ESSENTIAL AND CROSSFEED BUS DIODES - MAINTENANCE PRACTICES

1. General

A. Airplanes that have the Garmin G1000 avionics system have an essential bus and a crossfeed bus. Airplanes without the Garmin G1000 avionics will have only a crossfeed bus.

B. The essential and crossfeed bus diodes are found on the circuit breaker panel. The diodes give power to the essential and crossfeed buses from the two primary buses and at the same time isolate the two primary buses.

C. For maintenance data on the power junction box, refer to Power Junction Box - Maintenance Practices.

2. Essential and Crossfeed Bus Diode Removal/Installation

A. Remove the essential or crossfeed bus diode. (Refer to Figure 201).
(1) Remove the circuit breaker panel. Refer to Circuit Breaker - Maintenance Practices.
(2) Carefully remove the heat shrinkable tubing from the diode. Refer to the 206H/T206H 1997 and On Wiring Diagram Manual, Chapter 20, Heat Shrinkable Tubing - Maintenance Practices.
(3) Remove the solder from the wire and from the diode. Refer to the Model 206H/T206H 1997 and On Wiring Diagram Manual, Chapter 20, Soldering - Maintenance Practices.
(4) Remove the nut and washer from the diode.
(5) Remove the diode.

B. Install the essential or crossfeed bus diode. (Refer to Figure 201).
(1) Put the diode in position on the circuit breaker panel.
(2) Attach the diode with the nut and washer to the circuit breaker panel.
(3) Install the heat shrinkable tubing over the wire. Refer to the 206H/T206H 1997 and On Wiring Diagram Manual, Chapter 20, Heat Shrinkable Tubing - Maintenance Practices.
(4) Add solder to attach the wire to the diode. Refer to Model 206H/T206H 1997 and On Wiring Diagram Manual, Chapter 20, Soldering - Maintenance Practices.
(5) Apply heat to the heat shrinkable tubing with a heat gun until the tubing has a tight fit around the wire and diode. Refer to the 206H/T206H 1997 and On Wiring Diagram Manual, Chapter 20, Heat Shrinkable Tubing - Maintenance Practices.
(6) Install the circuit breaker panel. Refer to Circuit Breaker - Maintenance Practices.

3. Essential and Crossfeed Bus Diode Inspection

NOTE: When the diodes are replaced, the inspections that follow (3A, 3B, or 3C) must be done to make sure that all of the diodes operate correctly.

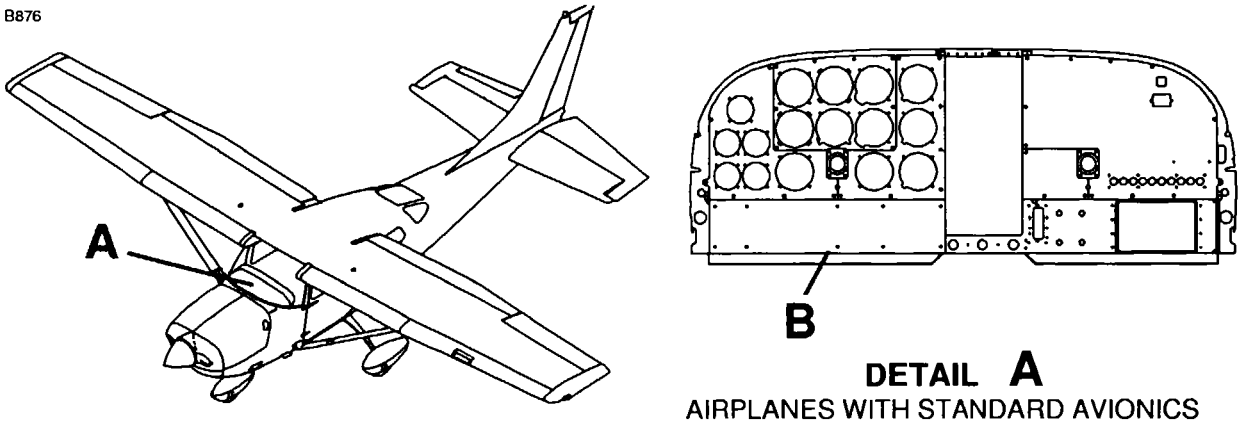
NOTE: The Lamar TE04 MCU Test Set is used as an alternative to inspections 3A, 3B, or 3C. Refer to the Lamar TE04 MCU Test Set, instructions LI-0021 steps 4.3.A through 4.3.E.

A. Do an inspection of the crossfeed bus diodes. (Refer to Figure 201). The inspection procedure that follows is for power junction boxes that have primary bus fuses. Do inspections of the essential and crossfeed bus diodes in accordance with the time limits shown in Chapter 5, Inspection Time Limits.

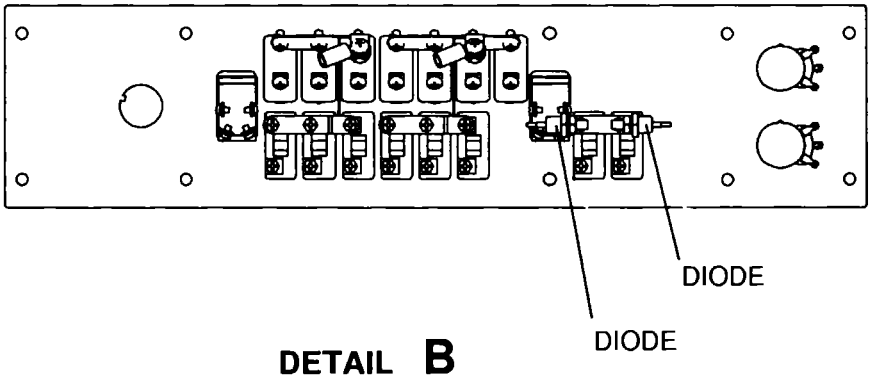
NOTE: Airplanes 20608095 and ON, Airplanes T20608165 and ON, and Airplanes incorporating SB00-24-01 do not use fuses in the power junction box.

CAUTION: Do not remove fuses with the MASTER BAT switch in the on position.

(1) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the ON position.
(2) Make sure that the landing light, taxi light, and oil pressure annunciation come on.
(3) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the OFF position.
(4) Remove the screws that attach the power junction box cover.
(5) Remove the power junction box cover.
(6) Remove the fuse (F1). (Refer to Power Junction Box - Maintenance Practices, Figure 201).
(7) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the ON position.



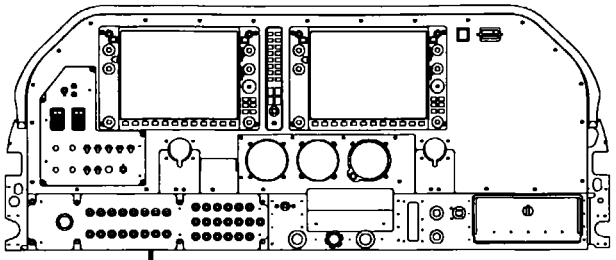
DETAIL A
AIRPLANES WITH STANDARD AVIONICS



DETAIL B
VIEW LOOKING AFT

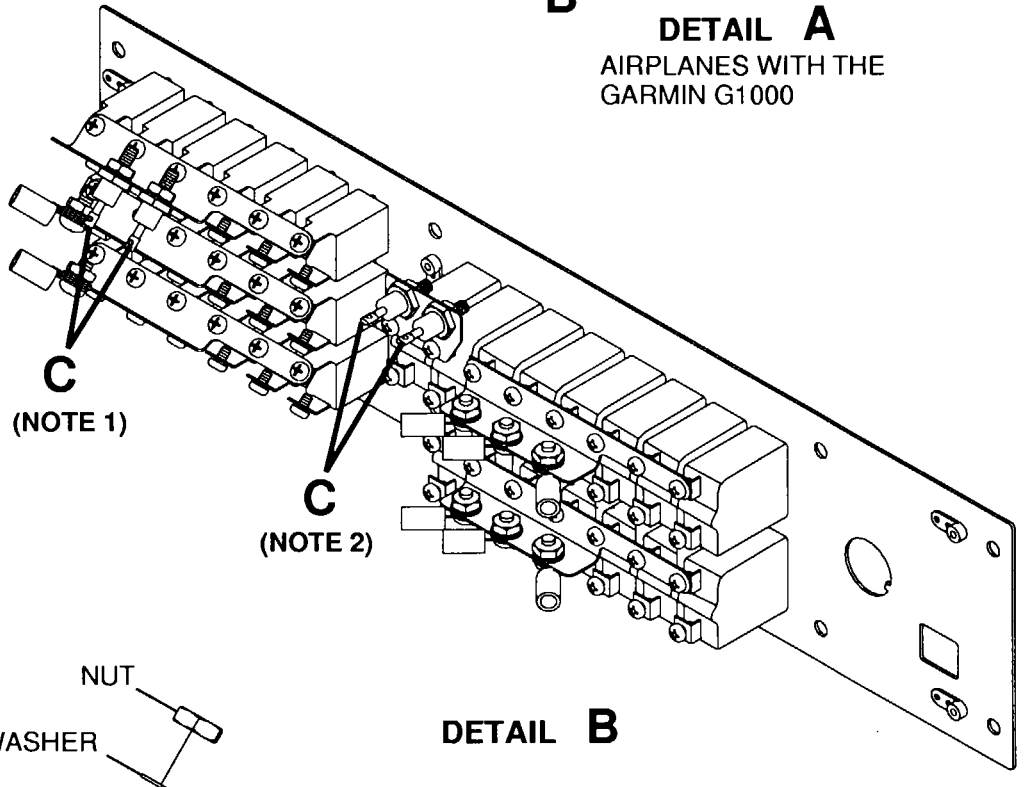
Essential and Crossfeed Bus Diode Installation
Figure 201 (Sheet 1)

B2245

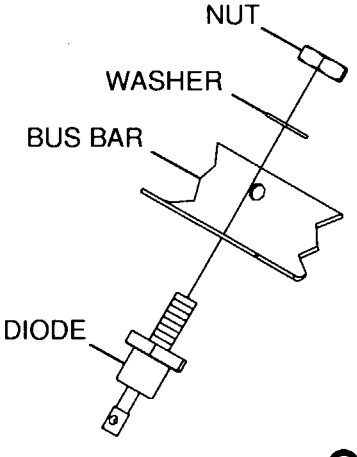


B

DETAIL A
AIRPLANES WITH THE
GARMIN G1000



DETAIL B



DETAIL C

NOTE 1: ESSENTIAL BUS DIODES

NOTE 2: CROSSFEED BUS DIODES

A0718T1053A
B0718T1056
C0718T1055

Essential and Crossfeed Bus Diode Installation
Figure 201 (Sheet 2)

(8) Make sure that the landing light and oil pressure annunciation come on. If the taxi light comes on or the oil pressure annunciation does not come on, do a test of the crossfeed bus diodes with the diode test function of a digital multimeter to find which diodes must be replaced. Refer to Essential and Crossfeed Bus Diode Multimeter Test.
(9) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the OFF position.
(10) Install the fuse (F1) in the power junction box. If the fuse is pitted, arced, or does not fit tightly into the fuse receptacle, replace the fuse with one of the same type. Do not replace the fuse with thinner blades.
(11) Remove the fuse (F2). (Refer to Power Junction Box - Maintenance Practices, Figure 201).
(12) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the ON position.
(13) Make sure that the taxi light and oil pressure annunciation come on. If the landing light comes on or the oil pressure annunciation does not come on, do a test of the crossfeed bus diodes with the diode test function of a digital multimeter to find which diodes must be replaced. Refer to Essential and Crossfeed Bus Diode Multimeter Test.
(14) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the OFF position.
(15) Install the fuse (F2) in the power junction box. If the fuse is pitted, arced, or does not fit tightly into the fuse receptacle, replace the fuse with one of the same type. Do not replace the fuse with thinner blades.
(16) If the diodes are replaced, do this test again to make sure that all diodes operate correctly.
(17) Install the junction box cover with the screws.

B. Do an inspection of the crossfeed bus diodes. (Refer to Figure 201). The inspection procedure that follows is for power junction boxes that have primary bus circuit breakers.

NOTE: The inspection procedure that follows is for airplanes without Garmin G1000 avionics.

CAUTION: Do not remove bus wires from the circuit breakers with MASTER BAT switch in the on position.

(1) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the ON position.
(2) Make sure that the landing light, taxi light, and oil pressure annunciation come on.
(3) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the OFF position.
(4) Remove the screws that attach the power junction box cover.
(5) Remove the power junction box cover.
(6) Remove the hex nut and lock washer that connect the bus wire to the circuit breaker (F1). (Refer to Power Junction Box - Maintenance Practices, Figure 201).
(7) Remove the wire terminal from the F1 circuit breaker stud that has a label of AUX and isolate the end of the bus wire.
(8) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the ON position.
(9) Make sure that the landing light and oil pressure annunciation come on. If the taxi light comes on, or the oil pressure annunciation does not come on, do a test of the crossfeed bus diodes with the diode test function of a digital multimeter to find which diodes must be replaced. Refer to Essential and Crossfeed Bus Diode Multimeter Test.
(10) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the OFF position.
(11) Install the bus wire to the circuit breaker (F1) terminal. Use the same hex nut and washer that were removed.
(12) Torque the nut to 20 inch-pounds to 25 inch-pounds (2.3 N-m to 2.8 N-m).
(13) Remove the hex nut and lock washer that connect the bus wire to the circuit breaker (F2). (Refer to Power Junction Box - Maintenance Practices, Figure 201).
(14) Remove the wire terminal from the F2 circuit breaker stud with the label of AUX and isolate the end of the bus wire.
(15) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the ON position.
(16) Make sure that the taxi light and oil pressure annunciation come on. If the landing light comes on or the oil pressure annunciation does not come on, do a test of the crossfeed bus diodes with the diode test function of a digital multimeter to find which diodes must be replaced. Refer to Essential and Crossfeed Bus Diode Multimeter Test.
(17) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the OFF position.

(18) Install the bus wire to the circuit breaker (F2) terminal. Use the same hex nut and washer that were removed. (Refer to Power Junction Box - Maintenance Practices, Figure 201).
(19) Torque the nut to 20 inch-pounds to 25 inch-pounds (2.3 N-m to 2.8 N-m).
(20) If the diodes are replaced, do this test again to make sure that all diodes operate correctly.
(21) Install the junction box cover with the screws.

C. Do an inspection of the essential and crossfeed bus diodes. (Refer to Figure 201). The inspection procedure that follows is for airplanes that have Garmin G1000 avionics.

CAUTION: Do not remove bus wires from the circuit breakers with the MASTER BAT or the STDBY BATT switches in the on position.

(1) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the ON position.
(2) Make sure that the STDBY BATT and the AVIONICS master switches are in the OFF position.
(3) Make sure that the landing and taxi lights come on.
(4) Make sure that a minimum of 20 volts shows on the primary flight display (PFD) for the main and essential bus voltmeters.

NOTE: A minimum of 20 volts shows that there is power to the crossfeed and essential buses. The GEA-71 must be on to show the voltage of the crossfeed bus. If there are no red X's on the engine indications, the GEA-71 is on.

(5) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the OFF position.
(6) Remove the screws that attach the power junction box cover to the power junction box.
(7) Remove the power junction box cover.
(8) Remove the hex nut and lock washer that connect the bus wire to the circuit breaker (F1). (Refer to Power Junction Box - Maintenance Practices, Figure 201).
(9) Remove the wire terminal from the F1 circuit breaker stud that has a label of AUX and isolate the end of the bus wire.
(10) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the ON position.
(11) Make sure that the landing light comes on and the main and essential bus voltages show a minimum of 20 volts on the primary flight display (PFD). If the taxi light comes on or the main and essential bus voltages do not show a minimum of 20 volts, or the PFD does not come on, do a test of the essential and crossfeed bus diodes with the diode test function of a digital multimeter to find which diodes must be replaced. Refer to Essential and Crossfeed Bus Diode Multimeter Test.
(12) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the OFF position.
(13) Install the bus wire to the circuit breaker (F1) terminal. Use the same hex nut and washer that was removed. (Refer to Power Junction Box - Maintenance Practices, Figure 201).
(14) Torque the nut to 20 inch-pounds to 25 inch-pounds (2.3 to 2.8 N-m).
(15) Remove the hex nut and lock washer that connects the bus wire to the circuit breaker (F2). (Refer to Power Junction Box - Maintenance Practices, Figure 201).
(16) Remove the wire terminal from the circuit breaker (F2) stud and isolate the end of the bus wire.
(17) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the ON position.
(18) Make sure that the taxi light comes on and the main and essential bus voltages show a minimum of 20 volts on the PFD. If the landing light comes on, or the main and essential bus voltages do not show a minimum of 20 volts, or the PFD does not come on, do a test of the essential and crossfeed bus diodes with the diode test function of a digital multimeter to find which diodes must be replaced. Refer to Essential and Crossfeed Bus Diode Multimeter Test.
(19) Set the MASTER BAT, TAXI LIGHT, and LAND LIGHT switches to the OFF position.
(20) Install the bus wire to the circuit breaker (F2) terminal. Use the same hex nut and washer that was removed. (Refer to Power Junction Box - Maintenance Practices, Figure 201).
  (a) Tighten the nut to a torque of 20 inch-pounds to 25 inch-pounds (2.3 to 2.8 N-m).
(21) If the diodes are replaced, do this test again to make sure that all diodes operate correctly.
(22) Install the junction box cover with the screws.

4. Essential and Crossfeed Bus Diode Multimeter Test

NOTE: Do the essential or crossfeed bus diode inspection procedure applicable to your airplane before the test that follows is done. Refer to Essential and Crossfeed Bus Diode Inspection.

NOTE: The test that follows must be done only if required by the essential or crossfeed bus diode inspections. The replacement of all the essential/crossfeed diodes is an alternative to the test procedure that follows.

A. Do a test of the essential/crossfeed bus diodes.
   (1) Remove the circuit breaker panel to get access to the essential and crossfeed bus diodes. Refer to Circuit Breaker - Maintenance Practices.
   (2) Remove the nut and washer from each diode. (Refer to Figure 201).
   (3) Isolate the diode from the bus bar on the circuit breaker panel. Do not remove the heat shrink or wire from the diode.
   (4) Do a test of each diode with the diode test function of a Fluke 75, 77, or 87 digital multimeter (or equivalent digital multimeter with a diode test function).
      (a) Connect the negative (-), or common lead of the meter to the threaded part of the diode and the positive (+) lead of the meter to the opposite end of the wire to which the diode is soldered. If the diode operates correctly, it will be conductive of an electric current and the meter will show the forward voltage drop of the diode (approximately 0.2 to 0.8 volts).
      (b) Interchange the meter leads. Connect the positive (+) lead of the meter to the threaded part of the diode and the negative (-), or common lead of the meter to the opposite end of the wire to which the diode is soldered. If the diode operates correctly, it will not be conductive of an electric current and the meter will give an open circuit indication. This indication on the meter will be the same as if the leads are not connected.
      (c) Replace each diode that does not give a satisfactory indication during the multimeter test. Refer to Essential and Crossfeed Bus Diode Removal/Installation.
   (5) Install the diodes that give a satisfactory indication during the multimeter test. Refer to Essential and Crossfeed Bus Diode Removal/Installation.
   (6) When the diodes are replaced, do the applicable essential/crossfeed diode inspection (3A, 3B, or 3C) again to make sure that all diodes operate correctly.
   (7) Install the circuit breaker panel. Refer to Circuit Breaker - Maintenance Practices.

ELECTRICAL LOAD ANALYSIS - DESCRIPTION AND OPERATION

1. General

A. The tables give an electrical load analysis of some of the components used on the airplane.

Table 1. Components on all airplanes

Component	Draw at 24 VDC (Amperes)	Draw at 28 VDC (Amperes)
Landing Light (4596 Lamp)	7.65	8.93
Landing Light (4591 Lamp)	3.06	3.57
Landing Light (35 Watt HID)	1.65	1.41
Taxi Light (4587 Lamp)	7.65	8.93
Taxi Light (4626 Lamp)	4.59	5.36
Taxi Light (35 Watt HID)	1.65	1.41
Navigation Lights	2.65	3.1
Wing Anti-collision Lights (average value) (Qty. 2)	1.98	1.7
Beacon Light (peak value)	1.07	1.25
Under Wing Courtesy Lights (Qty. 2)	0.98	1.14
Pilot Overhead Light (1864 Lamp)	0.14	0.16
Pilot Overhead Light (LED Lamp)	0.02	0.02
Copilot Overhead Light (1864 Lamp)	0.14	0.16
Copilot Overhead Light (LED Lamp)	0.02	0.02
Passenger Overhead Light (1864 Lamp) (Qty. 2)	0.14	0.16
Passenger Overhead Light (LED Lamp)	0.02	0.02
Map Light	0.08	0.09
Instrument Light (2 and 3 inch round) (Each)	0.02	0.02
Oxygen Control/Gauge Lights (Qty 2)	0.02	0.02
Pedestal Lights (Qty. 3)	0.12	0.15
Flap Motor	2.06	2.4
Fuel Pump	2.74	3.2
Pitot Heat	3.33	3.89
Stall Warning Heat	1.46	1.7
Stall Warning Horn	0.4	0.35
Prop Heat	13.3	15.5
12V Cabin Power Converter (Peak 10A out)	6.33	5.42
Hourmeter	0.01	0.02
Battery Relay Coil	0.29	0.33

Table 1. Components on all airplanes (continued)

Component	Draw at 24 VDC (Amperes)	Draw at 28 VDC (Amperes)
Start Relay Coil	0.85	N/A
Alternator Relay Coil	0.29	0.33
Alternator Field and ACU Power (Maximum)	1.63	1.9
ACU Bus Sense	0.02	0.02
Start Motor	100	N/A
Autopilot Computer (KAP 140)	0.58	0.5
Pitch Servo & Clutch	0.58	0.5
Pitch Trim Servo & Clutch	0.58	0.5
Roll Servo & Clutch	0.53	0.45
Turn Coordinator	0.27	0.33
Stormscope (WX-500)	0.93	0.8
ADF Receiver (KR 87)	0.6	0.52

Table 2. Components used only on airplanes that do not have Garmin G1000 installation.

Component	Draw at 24 VDC (Amperes)	Draw at 28 VDC (Amperes)
Glareshield Light (Fluorescent)	0.86	1
Glareshield Light (LED)	0.17	0.2
Radio Lights	0.17	0.2
Annunciator Panel (All annunciations on)	0.35	0.3
Avionics Fan	0.43	0.5
Engine and Fuel Gauges	0.38	0.45
Audio Panel (KMA-26) (Maximum)	1.5	1.29
Audio Panel (KMA-28) (Maximum)	1.5	1.29
MFD (KMD-550)	0.93	0.8
GPS (KLN 89/89B)	1.45	1.25
GPS (KLN 94)	1.4	1.2
Transponder (KT 73) (Maximum)	1.07	1.25
Transponder (KT 76) (Maximum)	0.6	0.7
Altitude Encoder (SSD120)	0.2	0.23
HSI (KCS 55A) (Maximum)	1.46	1.25
HIS (NSD 1000) (Maximum)	1.2	1.03
#1 Nav/Comm (KX 155A) (Receive)	0.8	0.69

Table 2. Components used only on airplanes that do not have Garmin G1000 installation. (continued)

Component	Draw at 24 VDC (Amperes)	Draw at 28 VDC (Amperes)
#1 Nav/Comm (KX 155A) (Transmit) (Maximum)	6	6
#2 Nav/Comm (KX 165A) (Receive)	0.8	0.69
#2 Nav/Comm (KX 165A) (Transmit) (Maximum)	6	6

Table 3. Components used only on airplanes that have Garmin G1000 installation.

Component	Draw at 24 VDC (Amperes)	Draw at 28 VDC (Amperes)
Circuit Breaker Panel Light (LED)	0.06	0.07
Switch Panel Light (LED)	0.07	0.08
Avionics Panel Lights (MFD, PFD, A/P)	0.17	0.2
Throttle/Flap Panel Light (LED)	0.07	0.08
Standby Battery Main Volt Sense	0.001	0.001
Standby Battery Controller	0.007	0.008
Standby Battery Test	2	N/A
Main Bus Voltage Sense	0.001	0.001
Essential Bus Voltage Sense	0.001	0.001
Deck Skin Fan	0.28	0.33
PFD Fan	0.08	0.09
MFD Fan	0.08	0.09
#1 Comm (GIA 63) (Receive)	0.22	0.19
#1 Comm (GIA 63) (Transmit) (VSWR 3)	4.96	4.16
#2 Comm (GIA 63) (Receive)	0.22	0.19
#2 Comm (GIA 63) (Transmit) (VSWR 3)	4.96	4.16
#1 Nav (GIA 63)	0.94	0.8
#2 Nav (GIA 63)	0.94	0.8
PFD (GDU 1040)	1.46	1.25
MFD (GDU 1040)	1.46	1.25
AHRS (GRS 77)	0.29	0.25
Air Data Computer (GDC 74)	0.25	0.21
Engine/Airframe Unit (GEA 71)	0.2	0.17
Transponder (GTX 33)	1.17	1

Table 3. Components used only on airplanes that have Garmin G1000 installation. (continued)

Component	Draw at 24 VDC (Amperes)	Draw at 28 VDC (Amperes)
Audio Panel (GMA 1347)	1.58	1.36
FIS (GDL 69A)	0.42	0.36
TAS (KTA 870)	1.34	1.15

CHAPTER 25

EQUIPMENT/ FURNISHINGS

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
25-Title		
25-List of Effective Pages		
25-Record of Temporary Revisions		
25-Table of Contents		
25-00-00	Page 1	Jan 1/2007
25-10-00	Pages 201-204	Jan 1/2007
25-10-04	Pages 201-202	Dec 2/2002
25-10-10	Pages 201-209	Jan 1/2007
25-11-00	Pages 201-205	Jul 3/2006
25-20-00	Pages 201-203	Jul 3/2006
25-21-00	Pages 201-202	Jul 3/2006
25-22-00	Pages 201-205	Dec 2/2002
25-50-00	Pages 201-202	Dec 2/2002
25-60-00	Pages 201-208	Jan 1/2007
25-60-01	Pages 201-205	Jan 1/2007
25-60-01	Pages 601-602	Jan 1/2007
25-60-02	Page 1	Jan 1/2007
25-60-02	Page 101	Jan 1/2007
25-60-02	Pages 201-205	Jan 1/2007
25-60-02	Pages 601-606	Jan 1/2007
25-60-10	Pages 201-202	Jan 1/2007
25-80-00	Pages 201-203	Dec 2/2002

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

EQUIPMENT/FURNISHING - GENERAL

1. Scope

A. This chapter describes the interior equipment and furnishings used throughout the airplane. Also included in this chapter is information on the emergency locator transmitter and the carbon monoxide detector.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the following listed items:

NAME	NUMBER	MANUFACTURER	USE
Aeroflex Communications Test Set	IFR 4000	Aeroflex, Wichita Division 10200 West York Street Wichita, KS 67215-8935	To complete the functional test of the Artex ELT ME406 Emergency Locator Transmitter.
Spray Adhesive	Airtac 2	Advanced Materials Group 2542 East Del Amo Blvd. Box 6207 Carson, CA	To adhere soundproofing and insulation to fuselage structure.
V23 System Diagnostic Tool	508668-201	Cessna Aircraft Company Cessna Parts Distribution Department 701, CPD 2 5800 East Pawnee Road Wichita, KS 67218-5590	Test of the inflatable restraint system.
SARSAT Beacon Test Set	453-0131	Artex PO Box 1270 Canby, OR 97013	To complete the functional test of the Artex ELT.
30-dB Attenuator			To do the test of the ELT.

3. Definition

A. The chapter is divided into sections to aid maintenance personnel in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief definition of the subjects and sections incorporated in this chapter is as follows:

(1) The section on Flight Compartment covers those items installed in the cabin area, including seats, seat belts, carpets and interior panels.

(2) The section on emergency equipment covers the emergency locator transmitter installed behind the aft baggage compartment. It also covers the carbon monoxide detector installed forward of the instrument panel on airplanes that are equipped with Garmin G1000.

(3) The section on soundproofing and insulation covers the material used to deaden sound throughout the airplane.

FRONT SEATS AND RAILS - MAINTENANCE PRACTICES

1. General

A. This maintenance practices section gives the removal and installation of the front seats and the seat rails. For the removal and installation of seat belts and harnesses, refer to Seat Belts/Restraints - Maintenance Practices. For the removal and installation of the rear seats, refer to Rear Seat - Maintenance Practices.

WARNING: If the airplane has the AMSAFE inflatable restraints, do not do maintenance on the seats or seat rails until you have first looked at and obeyed all the applicable precautions and instructions supplied in the AMSAFE publications and this Maintenance Manual. If you do not obey and follow these instructions and safety precautions, damage to equipment and injury to personnel can occur.

B. If your airplane has the AMSAFE inflatable restraint system, do not do maintenance on the seats or the seat restraint system unless you first obey all applicable precautions and instructions in the E508804 Supplemental Amsafe Maintenance Manual and this Maintenance Manual. Refer to Inflatable Restraint System - Maintenance Practices.

2. Seat Removal/Installation

A. Seat Removal (Refer to Figure 201).

WARNING: If the airplane has the AMSAFE inflatable restraints, do not remove the seats with the seat belts buckled or the EMA connected. Damage can occur to the system and an accidental deployment of the system can cause injury to personnel.

(1) Disarm the AMSAFE inflatable restraints. Refer to AMSAFE Inflatable Restraint Disarm/Arm.
(2) Remove the seat stops from the front and the rear of the two seat tracks.
(3) Unlatch the seat from the seat track and move the seat forward on the seat track until the forward roller clears the seat track.
(4) Move the seat backward on the seat track until the rear rollers clear the seat track.
(5) Remove the seat from the airplane.

B. Seat Installation (Refer to Figure 201).
(1) Put the rear roller of the seat in position on the seat track.
(2) Move the seat forward on the seat track until the front roller can be installed on the seat track.

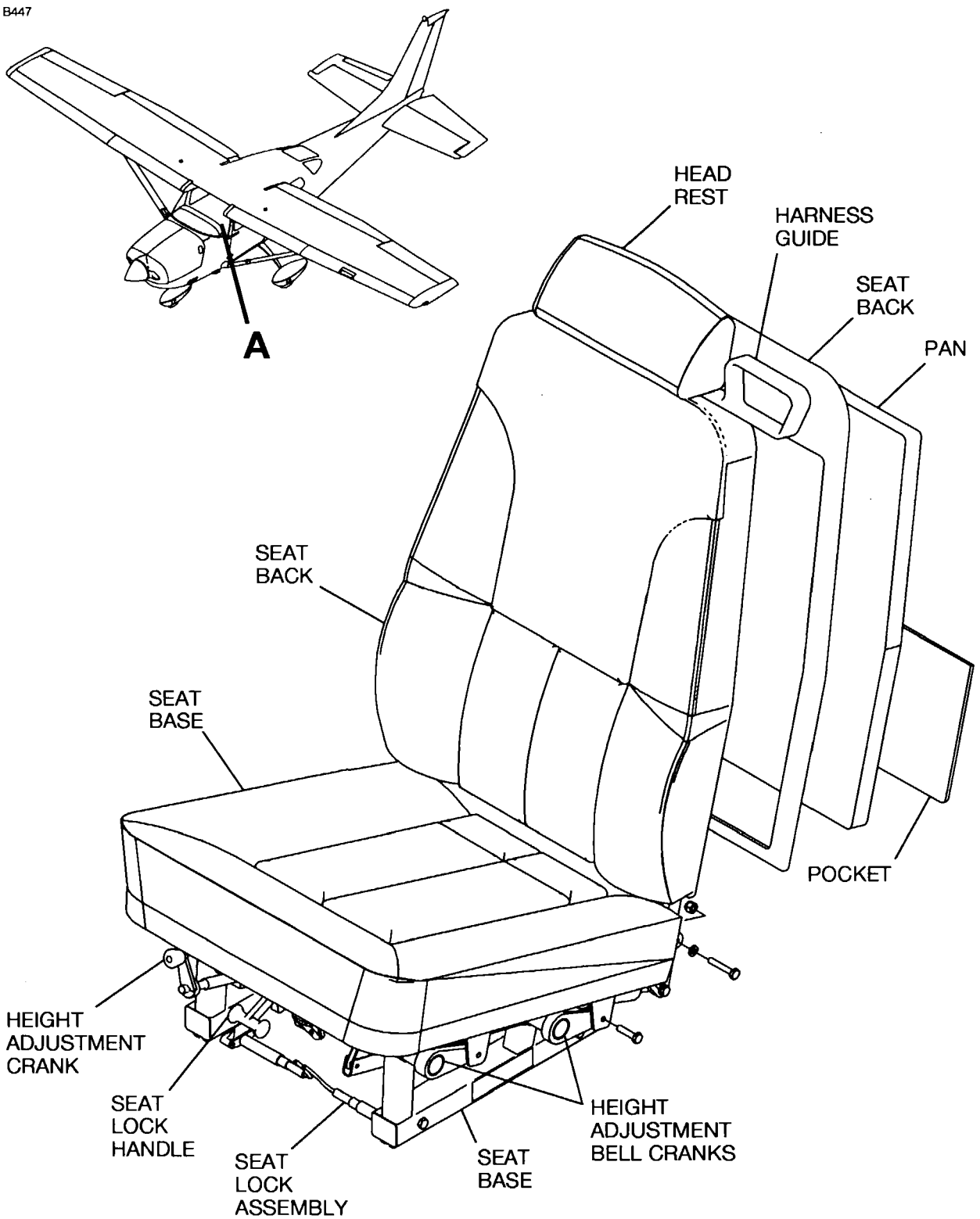
WARNING: Make sure the seat stops are set correctly. Incorrectly installed seat stops can let the seat move during flight, with the result of serious injury or death.

(3) Install the seat stops to the front and the rear of the seat track.
(4) Make sure that the seat stops are installed correctly.
(5) Do a test of the seat through the full range of motion to make sure of the correct operation.
(6) Arm the AMSAFE inflatable restraints. Refer to AMSAFE Inflatable Restraint Disarm/Arm.

3. Seat Rail Removal/Installation

A. Seat Rail Removal (Refer to Figure 202).
(1) Remove the bolts that attach the seat rails to the fuselage.

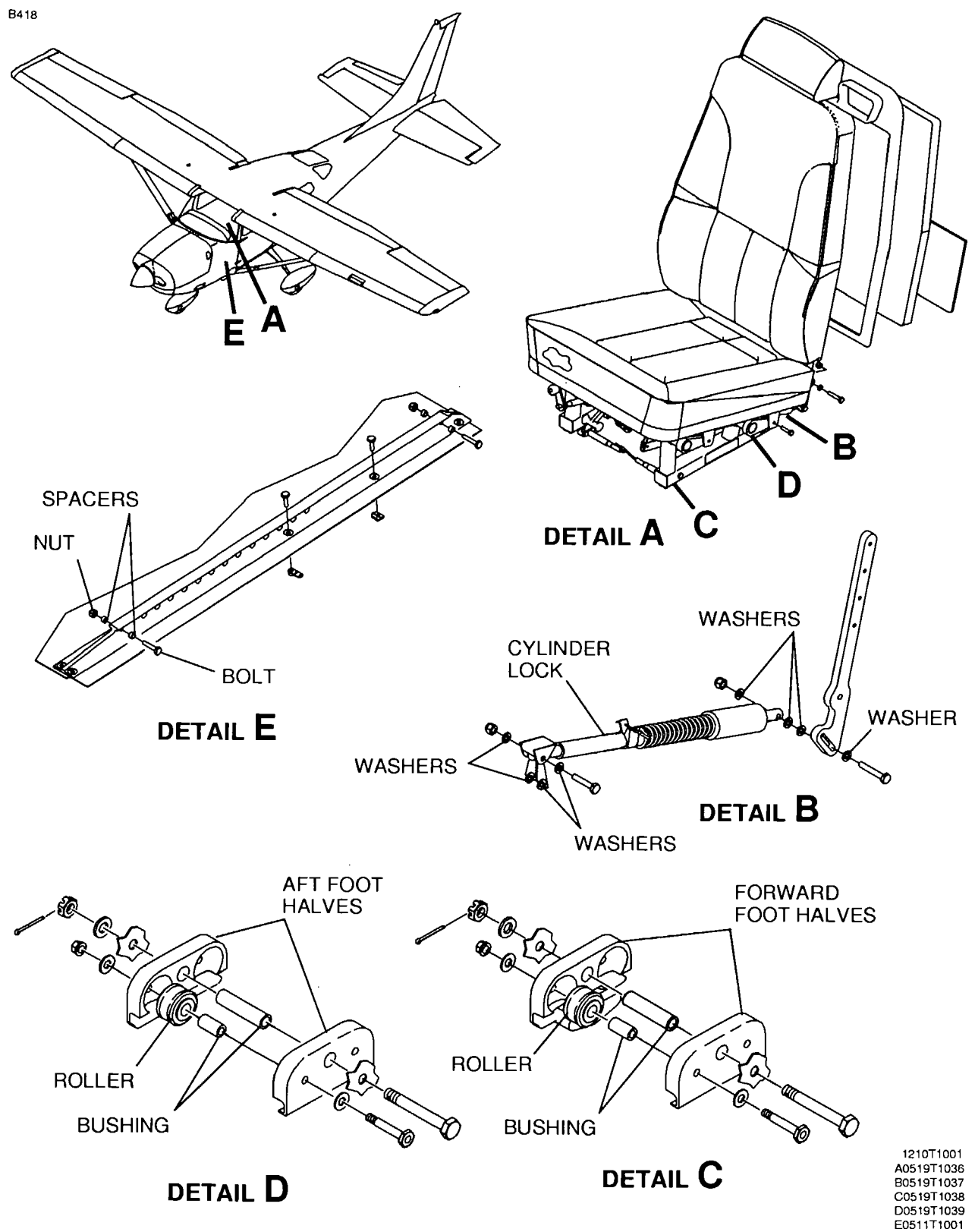
B. Seat Rail Installation (Refer to Figure 202).
(1) Install the seat rails to the fuselage with the bolts.



DETAIL A

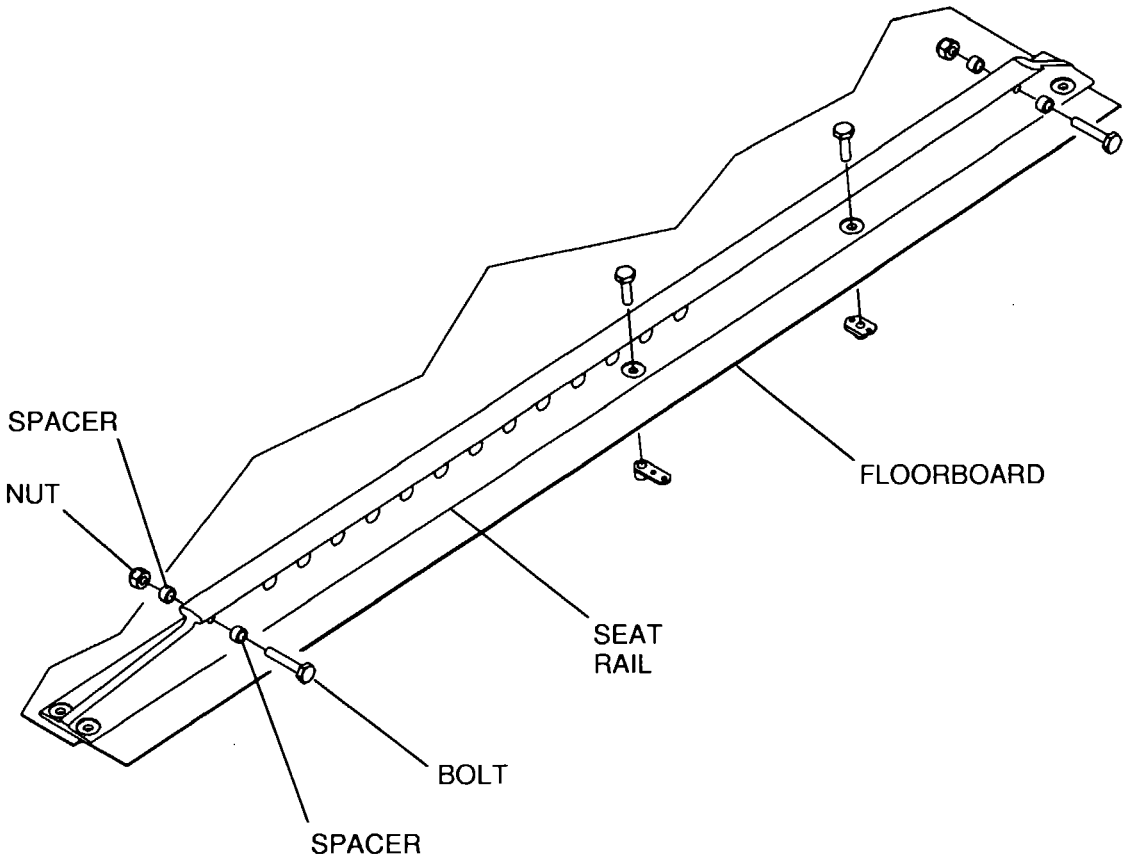
1210T1001
A0519T1036

Seat Installation
Figure 201 (Sheet 1)



Seat Installation
Figure 201 (Sheet 2)

B448



WARNING: IT IS EXTREMELY IMPORTANT THAT PILOT'S SEAT STOPS ARE INSTALLED, SINCE ACCELERATION AND DECELERATION COULD POSSIBLY PERMIT SEAT TO BECOME DISENGAGED FROM SEAT RAILS AND CREATE A HAZARDOUS SITUATION, ESPECIALLY DURING TAKEOFF AND LANDING.

0511T1001

Seat Stop Installation
Figure 202 (Sheet 1)

MAP COMPARTMENT - MAINTENANCE PRACTICES

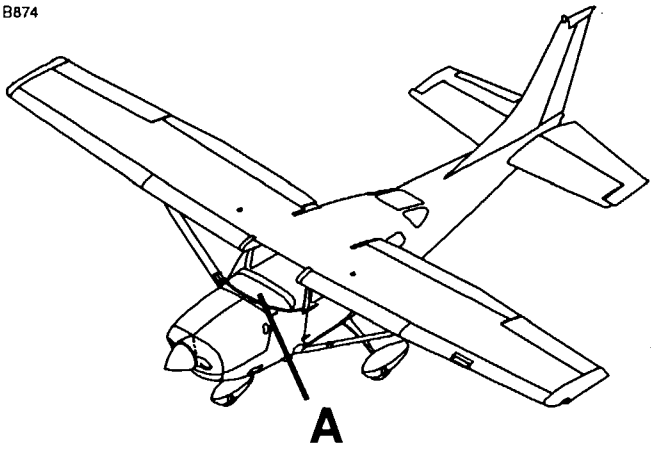
1. General

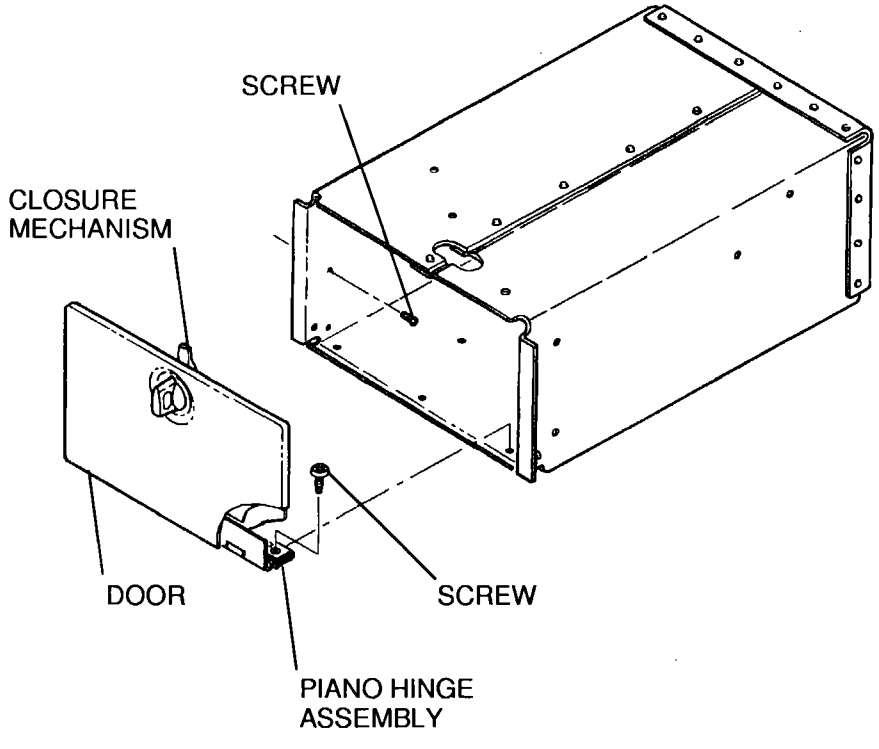
A. This maintenance practices section consists of removal and installation of the map compartment.

2. Map Compartment Removal/Installation

A. Remove Map Compartment (Refer to Figure 201).
   (1) Remove interior screws securing map compartment to instrument panel structure.

B. Install Map Compartment (Refer to Figure 201).
   (1) Place map compartment in position and secure to instrument panel structure using screws.





DETAIL A

1210T1001
A1214T1001

Map Compartment Installation
Figure 201 (Sheet 1)

INFLATABLE RESTRAINT SYSTEM - MAINTENANCE PRACTICES
Airplanes with AMSAFE Inflatable Restraint System

1. General

A. This section has maintenance information for the AMSAFE Aviation Inflatable Restraint (AAIR). The AAIR is a self-contained, modular, three-point restraint system that will help to protect occupants from head-impact injury during an accident. The AAIR system has four core components: the air bag assembly, the inflation assembly, the electronics module assembly (EMA), and the cable interface assembly.

B. The Model 206/T206 airplanes with the AAIR restraint system installed have three systems that will operate independently during an accident. The pilot's seat and the left-middle seat restraints operate on one system, the copilot's seat and the middle-right seat restraints operate on one system, and the aft bench seat restraints operate on one system.

WARNING: Do not try to open the inflator assembly. Do not apply an electric current to the electronics connection. The inflator assembly is a stored, gas/energetic material device and can cause injury if accidentally deployed.

2. Inflatable Restraint System Component Cleaning

A. AMSAFE recommends that the AAIR components be cleaned on a regular (annual) basis. Buildup of dirt and unwanted material can cause problems with system operation, decrease the life of the system, and help cause corrosion of the metal parts in the system. Clean the belt assembly, hoses, cables, inflation device/cap assembly and the EMA.

CAUTION: Use care to keep contamination and cleaning agents away from the hardware assemblies.

CAUTION: Do not let any part of the AAIR soak in any solution. This can cause damage to the AAIR system. Do not use too much water when you clean the AAIR parts. Too much water can cause damage to the internal components and cause them to be unserviceable.

CAUTION: Only use sufficient cleaning agent to make minimal suds. You must remove excess soap before the you install the part in the system.Do not dry the belt assembly in sunlight or near any source of heat. Do not dry clean the belt assembly. Do not put the belt assembly fully into water.

CAUTION: Keep the isopropyl alcohol away from the webbing, air bag cover, and the gas hose material.

CAUTION: Do not use soap or water on metal parts.

(1) Clean non-metallic parts with warm water and a household soap/laundry detergent and a moist cloth.
(2) Flush the parts with clear water on a clean cloth.
(3) Use a soft brush and cold soap solution to clean the webbing, air bag cover, and gas hose by hand. Use a household liquid soap or detergent.
(4) Let the belt assembly dry by air.
(5) Clean any spacers, washers, nuts, or bolts with a lint-free cloth and isopropyl alcohol.
(6) Cover the cable opening into the EMA with pieces of cloth. Clean the inflator and cables by hand with a lint-free cloth and a cold water and mild soap solution.

3. Inflatable Restraint System Inspection

NOTE: The AMSAFE Aviation Inflatable Restraint (AAIR) must be examined in accordance with the time intervals in Chapter 5, Inspection Time Limits. The AMSAFE Aviation Inflatable Restraint (AAIR) assemblies have a time life associated with them. Refer to Chapter 5, Component Time Limits for these limits.

A. Do an inspection of the AAIR system parts.
   (1) Air bag assembly.
      (a) Make sure that the attachments are tightly connected.
      (b) Do a visual inspection for dirt, oil, grease or other unwanted material.
      (c) Do a check for wear on the edges of the belt.
      (d) Do a check for damage on stitching or fabric threads.
      (e) Do a check for holes or rub marks on the air bag cover.
      (f) Do a check of the end fittings, buckle and connector for cracks, dents, or corrosion.
   (2) Inflator hose.
      (a) Do a check for fraying, wear, or tears.
   (3) Cable interface assembly.
      (a) Make sure that all attachments are tightly connected.
   (4) Inflator assembly.
      (a) Do a check for loose mounting hardware.
      (b) Do a check of the hose connection.
      (c) Do a check of the electrical connection.
   (5) Electronics module assembly (EMA).
      (a) Do a check for loose connections and mounting hardware.

4. Storage of Spares

A. Inflator Assembly.

NOTE: The maximum continuous storage time for the inflator assembly is seven years from the date of manufacture. After seven years, send the inflator assembly to AMSAFE Aviation for inspection and repair.

   (1) Keep the inflator assembly in a cool and dry area. The permitted temperature range is -30° C to +55° C.
   (2) Keep the inflator assembly away from sunlight, dust, moisture and other contamination.
   (3) Keep the inflator assembly away from high electromagnetic, radio frequency, and electrostatic environments.
   (4) Obey all local storage regulations.

B. Electronics Module Assembly (EMA).

NOTE: The maximum continuous storage time for the EMA is seven years from the date of manufacture. After seven years, send the EMA to AMSAFE Aviation for inspection and repair.

   (1) Keep the EMA assembly in a cool and dry area. The permitted temperature range is -30° C to +55° C.
   (2) Make sure that the EMA is kept away from sunlight, dust, moisture and other contamination.
   (3) Keep the inflator away from EMI/RFI/ESD environments.
   (4) Obey all local storage regulations.

C. Air bag Assembly.
   (1) Keep the air bag assembly in a cool and dry area. The permitted temperature range is -30° C to +55° C.
   (2) Make sure that the air bag assembly is kept away from sunlight, dust, moisture and other contamination.

5. AMSAFE Inflatable Restraint Disarm/Arm

A. Disarm the AMSAFE Inflatable Restraints.
(1) Make sure all seat belts are unbuckled.
(2) Find the end-release connector at the seat base.
(3) Remove the tie straps that attach the cable and end-release connector.
(4) Disconnect the end-release connector to disable the inflatable restraint.

B. Arm the AMSAFE Inflatable Restraints.
(1) Connect the end-release connector.
(2) Attach the cable and end-release connector to the seat frame with tie wraps.

6. Inflatable Restraint System Removal/Installation

WARNING: Keep all magnetic fields away from the electronics module assembly (EMA) during the removal and installation procedure. Accidental deployment of the system can cause injury.

A. Restraint System Removal (Refer to Figure 201).

WARNING: Do not remove seats from the airplane with the seat belts buckled or the EMA connected. Damage can occur to the system and an accidental deployment of the system can cause injury.

WARNING: Do not connect the EMA to the cable interface assembly unless the EMA is mounted to the airplane structure first. Accidental deployment can cause injury.

(1) Disarm the AMSAFE inflatable restraints. Refer to AMSAFE Inflatable Restraint Disarm/Arm.
(2) Disconnect the squib connector from the inflator assembly.
(3) Disconnect the gas hose from the inflator assembly.

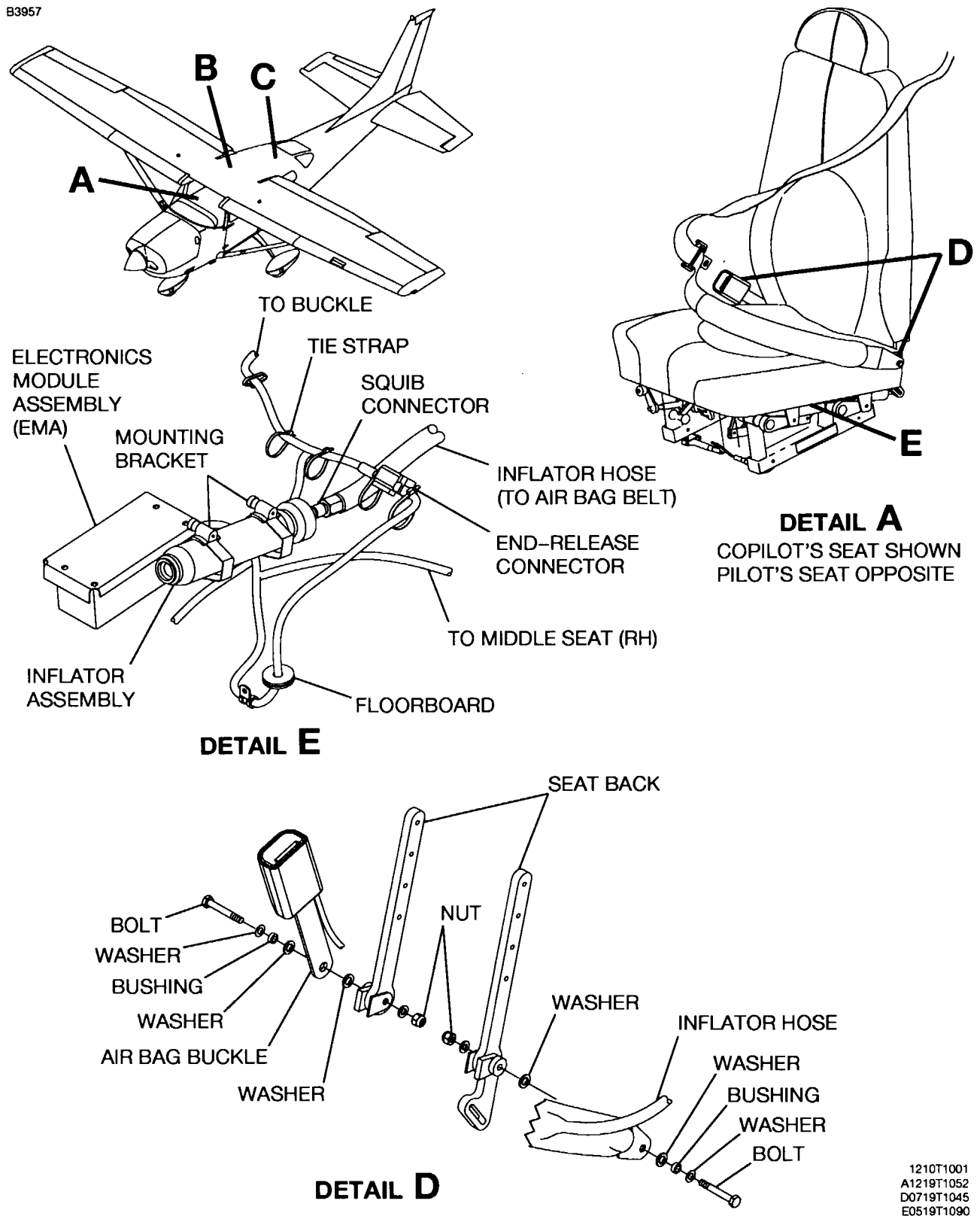
NOTE: The gas hose barb has a layer of Loctite and is tightly attached to the fitting. Use soft-grip channel-lock type pliers to hold the barb while you disconnect the hose.

(4) Loosen the clamps on the inflator-assembly mounting bracket.
(5) Remove the inflator assembly from the mounting bracket.
(6) Put shipping caps on the inflator-hose connector fitting. (Refer to Table 201).

Table 201. Torque Values and Tool Sizes

PART DESCRIPTION	RELATED SUBASSEMBLY	TOOL AND SIZE	TORQUE (IN-LBS.)
Inflator Shipping Cap	Inflator Assembly	Torque Wrench (In-lb. type)	5 - 10
Hose Connection to the Inflator	Air bag assembly/Inflator Assembly	Torque Wrench (In-lb. type)	110 - 130

(7) Remove the inertia reel (three-point air bag belt) from the airplane. Refer to Chapter 25, Seat Belts/Restraints- Maintenance Practices.
(8) Remove the end-release buckle assembly from the airplane. Refer to Chapter 25, Seat Belts/ Restraints - Maintenance Practices.
(9) Disconnect the cable interface assembly from the EMA.
(a) Push down on the locking clip on the EMA connector and pull on the connector.



Inflatable Restraint System
Figure 201 (Sheet 1)

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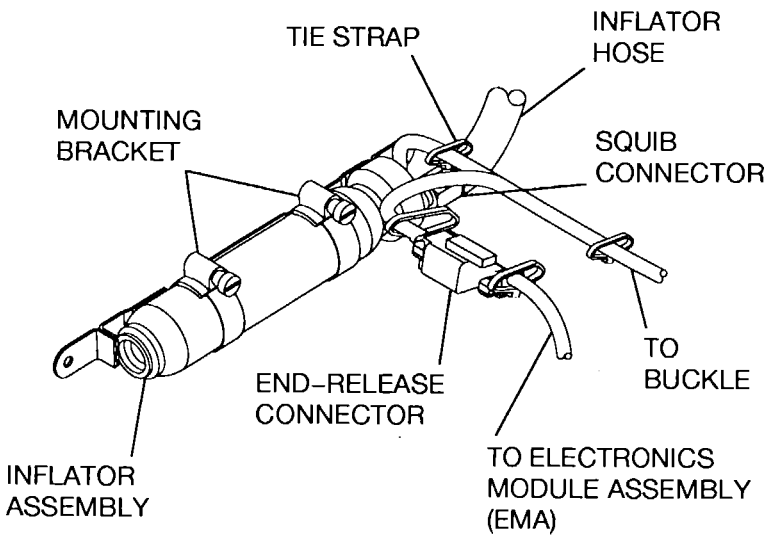
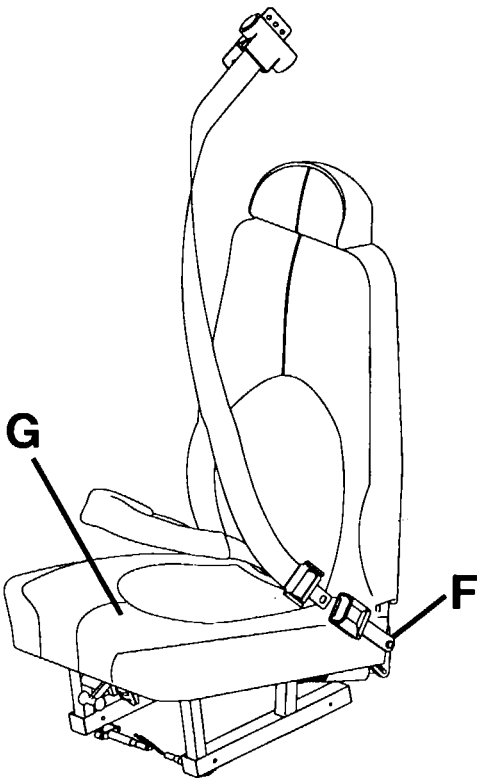
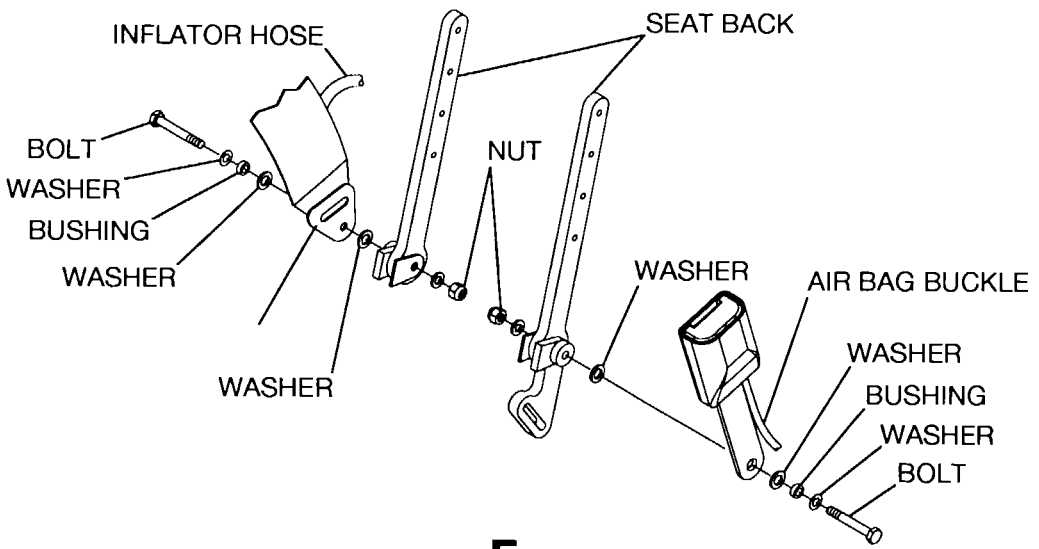


DETAIL G



DETAIL B
MIDDLE RIGHT SEAT SHOWN,
MIDDLE LEFT SEAT OPPOSITE



DETAIL F

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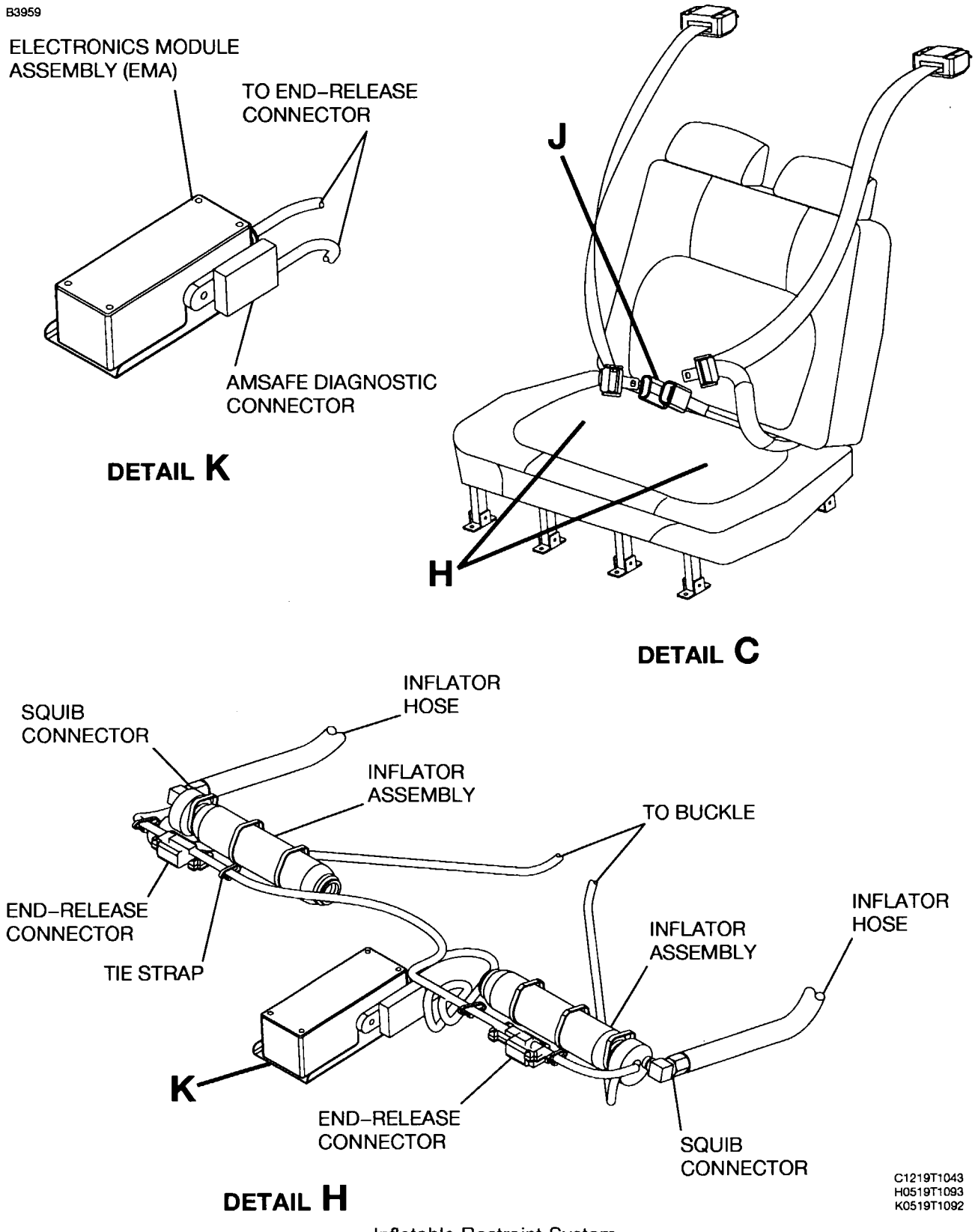
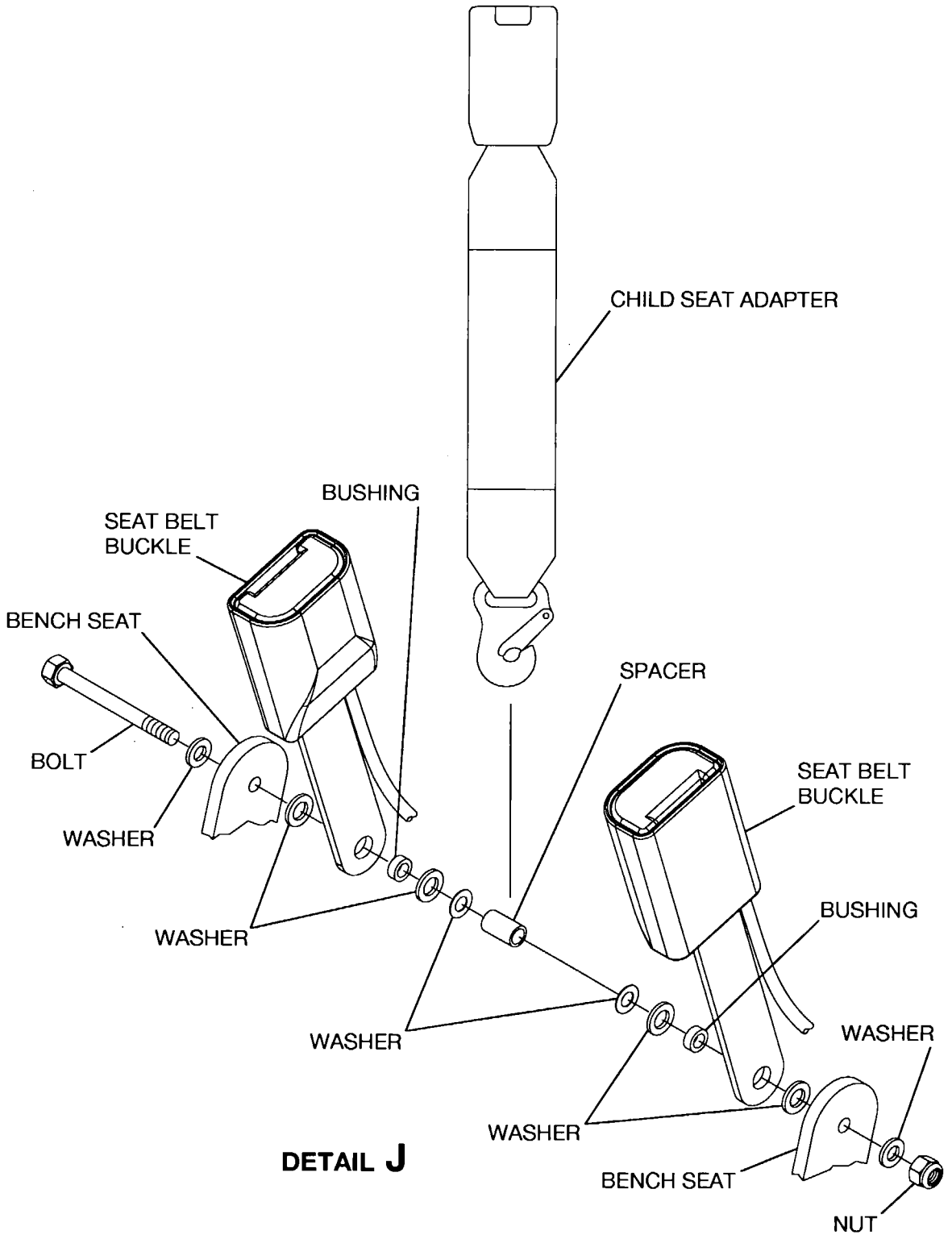
F0719T1045
G0519T1091

Inflatable Restraint System
Figure 201 (Sheet 2)



Inflatable Restraint System
Figure 201 (Sheet 3)

B6063



J0514T1054

Inflatable Restraint System
Figure 201 (Sheet 4)

(10) Remove the cable interface assembly from the airplane.
(11) Remove the EMA from the airplane.
  (a) Remove the nuts, washers and bolts that attach the EMA to the floorboard.
  (b) Carefully remove the EMA from the airplane.

B. Restraint System Installation (Refer to Figure 201).

NOTE: Leave the protective plastic bag on the air bag belt during installation to keep it clean.

(1) Remove and keep the shipping caps from the inflator-hose connector fitting.

NOTE: The shipping caps can be used again.

(2) Put the inflator assembly into the mounting bracket. Do not tighten the clamps on the mounting bracket.
(3) Remove and discard the end cap plug (if new) from the three-point air bag belt hose. Do not remove the safety cable tie for the air bag connector tongue.
(4) If the three-point air bag belt is not new, and the inflator is new, apply a thin layer of Loctite 242 thread locking compound on the hose barb threads before you attach the inflator assembly.
(5) Make sure that the seat belt is aligned correctly.

NOTE: If aligned correctly, the gas hose will be on top of the seat belt attachment hardware. The label will be on aft side of the belt.

(6) Connect the gas hose from the three-point air bag belt to the inflator assembly with the correct torque. (Refer to Table 201).

NOTE: The inflator hose connector fitting is a pressure fitting which must be fully extended onto the gas hose barb to make an airtight connection.

(7) Attach the squib connector to the inflator assembly.
(8) Tighten the clamps on the mounting bracket to between 21 and 25 inch-pounds of torque.
(9) Attach the EMA to the floorboard with the washers, nuts, and bolts.
(10) Connect the cable interface assembly to the EMA.
(11) Make sure that the cables and hoses of the AAIR are clear of the height-adjustment crank, the seat lock handle, and the seat-back adjustment lever.
(12) Install the inertia reel (three-point air bag belt) in the airplane. Refer to Chapter 25, Seat Belts/ Restraints - Maintenance Practices.
(13) Arm the AMSAFE inflatable restraints. Refer to AMSAFE Inflatable Restraint Disarm/Arm.
(14) Remove the safety cable tie from the air bag buckle tongue.
(15) Do a seat operation test on the pilot's and copilot's seat.
  (a) Move the seat-back aft and forward to its maximum travel.
  (b) Move the seat-base up an down to its maximum travel.
  (c) Move the seat-base aft and forward to its maximum travel.
(16) Do a functional test on the system. Refer to Inflatable Restraint System Adjustment/Test. Refer to the AMSAFE Aviation AAIR Supplemental Maintenance Manual, V23 System Diagnostic Tool - Operation and Maintenance Manual.

7. Inflatable Restraint System Adjustment/Test

A. The AAIR diagnostic check gives a system functional test of the AAIR circuits. To find problems in system components, use a replace-and-test procedure. There are two seats in each AAIR system. The 1 LED light will show an indication for the first seat on the AAIR system circuit. The 2 LED light will show an indication for the second seat on the AAIR system circuit. Once the V23 system diagnostic tool (SDT) is connected to the airplane, a check of the system is done one seat at a time. Refer to Chapter 25, Equipment/Furnishing - General.

B. The V23 system diagnostic tool uses a 9-volt battery that can be replaced. A check of the diagnostic tool must be done yearly. The label on the back of the diagnostic tool will show when a check of the tool needs to be done. The diagnostic tool must only be sent to AMSAFE to be calibrated.

CAUTION: Calibrate the V23 system diagnostic tool again before use if it is hit or shaken or if it falls to the floor.

C. Before the V23 system diagnostic tool is connected to the airplane, do the steps that follow.
(1) Set the SDT ON/OFF Switch to the ON position.
(2) Look at the Tool Battery Indicator LED light.
(a) If the LED light is green, the battery condition is satisfactory.
(b) If the LED light is red, replace the 9-volt battery on the back of the SDT.

D. Do the system functional test.

NOTE: There are two seats in each AAIR system. This functional test must be completed for each AAIR system on the airplane.

(1) Make sure that the seat belt safety buckles are not attached.
(2) Remove the protective cap from the cable interface assembly.
(3) Connect the V23 system diagnostic tool to the diagnostic connector.
(4) Set the SDT ON/OFF Switch to the ON position.
(5) Look at the Seat Position PASS/FAIL LED light.
(6) If the 1 and 2 LED lights are amber, do the steps that follow. If the 1 and 2 LED lights do not give an amber indication, troubleshoot the system. Refer to Inflatable Restraint System Troubleshooting.
(a) Connect the air bag safety buckle on the seat.
(b) If the 1 LED light is green, the AAIR system for that seat is satisfactory.
(c) If there is an amber LED light indication, a red indication, or no indication, troubleshoot the system. Refer to Inflatable Restraint System Troubleshooting.
(d) Disconnect the air bag safety buckle.
(e) Do steps (a) thru (d) again for the second seat location.

NOTE: For the second seat location, the 2 LED light will be used to give an indication.

(7) Set the SDT ON/OFF Switch to the OFF position.
(8) Disconnect the V23 system diagnostic tool from the diagnostic connector.
(9) Put the protective cap on the cable interface assembly.

8. Inflatable Restraint System Troubleshooting

A. The procedures in this section must be done if the V23 system diagnostic tool gives an unsatisfactory indication for the seats in the AAIR System Adjustment/Test. An unsatisfactory indication by the seat LED light is an amber indication, red indication, or no indication. If the V23 system diagnostic tool gives a satisfactory indication after the replacement of the individual components, stop the troubleshooting procedure.
(1) If an unsatisfactory indication is given before the safety buckle is connected, do the steps that follow.
(a) Do a check of all connections and tighten loose connections that are found. Do the Adjustment/Test procedure again if there are loose connections found.
(b) Replace the cable interface assembly. Do the Adjustment/Test procedure again.
(c) Replace the EMA. Do the Adjustment/Test procedure again.
(d) Replace the inflator. Do the Adjustment/Test procedure again.
(2) If an unsatisfactory indication is given after the safety buckle is connected, do the steps that follow.
(a) Replace the cable interface assembly. Do the Adjustment/Test procedure again.
(b) Replace the air bag safety buckle. Do the Adjustment/Test procedure again.
(c) Replace the EMA. Do the Adjustment/Test procedure again.
(d) Replace the inflator. Do the Adjustment/Test procedure again.

SEAT BELTS/RESTRAINTS - MAINTENANCE PRACTICES

1. General

A. The airplane is equipped with inertia style reels which allow the user to lean forward, but will lock in position with sudden movement. The seat belts retract and stow in position when not in use. This maintenance practices section covers removal and installation for restraints used in both the front and rear positions.

NOTE: The restraint system components are non-repairable field items. If any component in the restraint system is not operating properly, the system must be replaced.

WARNING: If the airplane has the AMSAFE inflatable restraints, do not do maintenance on the seats or the seat restraint system until you have first looked at and obeyed all the applicable precautions and instructions supplied in the AMSAFE publications and this Maintenance Manual. If you do not obey and follow these instructions and safety precautions, injury to personnel and damage to equipment can occur.

B. If your airplane has the AMSAFE inflatable restraint system, do not do maintenance on the seats or the seat restraint system unless you first obey all the applicable precautions and instructions in the E508804 Supplemental Amsafe Maintenance Manual and this Maintenance Manual. Refer to Inflatable Restraint System - Maintenance Practices.

2. Seat Belt/Restraints Removal and Installation

NOTE: Seat belt/restraint assembly removal/installation is typical for restraints in all locations.

A. Pilot's and Copilot's Restraints Removal (Refer to Figure 201).
(1) Remove access cover on overhead console to gain access to the restraint inertia reel assemblies.
(2) Remove nuts, bolts and washers securing inertia reel assembly to bracket assembly.
(3) Remove nuts, washers, bolts and bushing securing restraint assembly to seats.

B. Pilot's and Copilot's Restraints Installation (Refer to Figure 201).
(1) Secure restraint inertia reel assembly on bracket assembly above overhead console with bolts, washers and nuts.
(2) Install access cover on overhead console.
(3) Secure restraint assemblies to seats with bolts, washers, spacers and nuts.
(4) Check system for security of installation and proper operation.

C. Center Seat Restraints Removal (Refer to Figure 201).
(1) Remove bolts, washers, and bushings securing inertia assembly to bracket.
(2) Remove nuts, washers, bolts, and bushings securing restraint assemblies to seats.

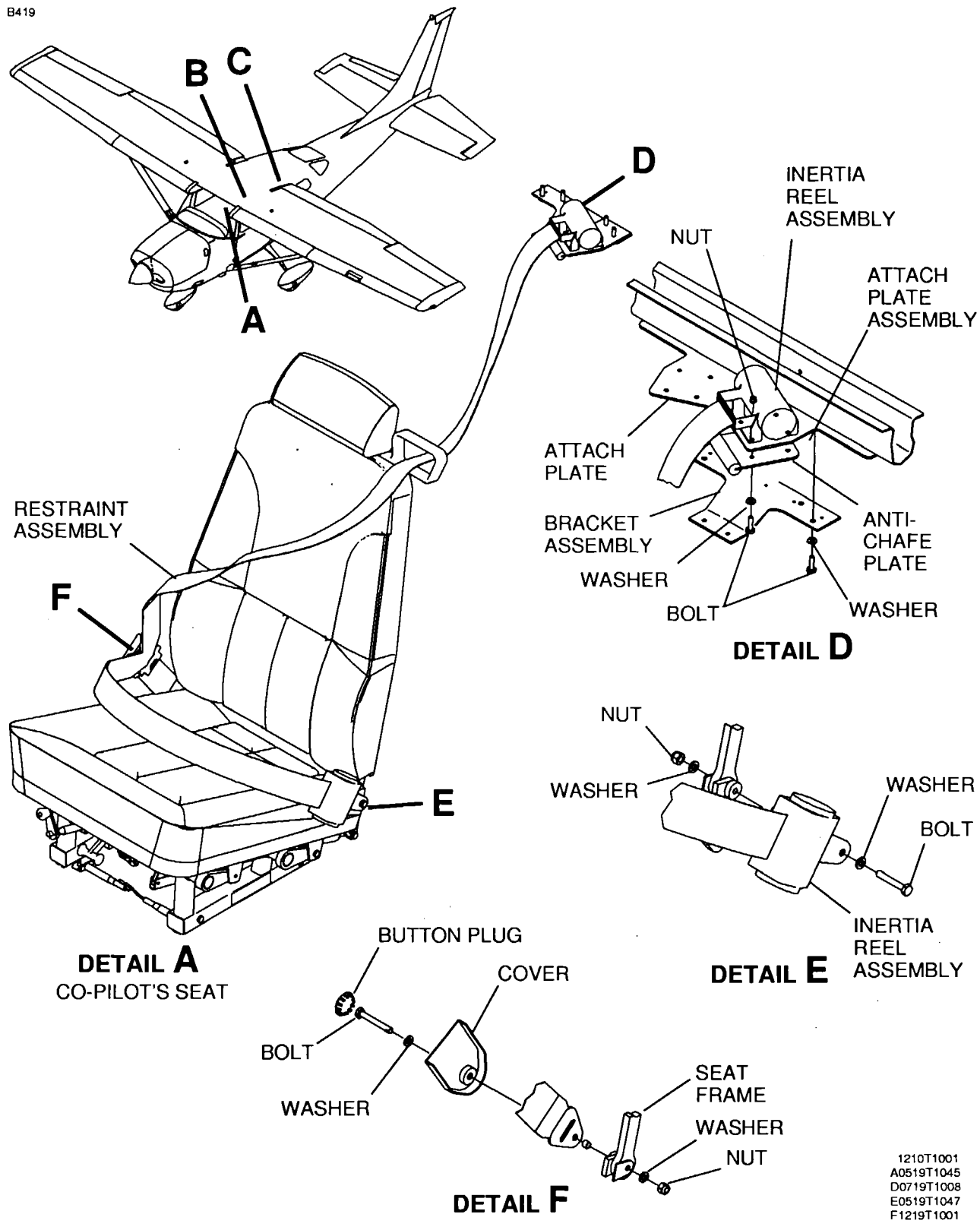
D. Center Seat Restraints Installation(Refer to Figure 201).
(1) Secure restraint inertia reel assemblies on brackets.
(2) Secure restraint assemblies to seats with bolts, washers, bushings and nuts.
(3) Check system for security of installation and proper operation.

E. Bench Seat Restraints Removal (Refer to Figure 201).
(1) Remove bolt and washer securing seat restraint inertia reel to aft cabin structure.
(2) Remove bolts, washers, and bushings securing restraint inertia reels to seat frames.

F. Bench Seat Restraints Installation (Refer to Figure 201).
(1) Secure restraint inertia reels to seat frame with bushings, washers, and bolts.
(2) Secure restraint inertia reels to aft cabin structure with washers and bolts.
(3) Check system for security of installation and proper operation.

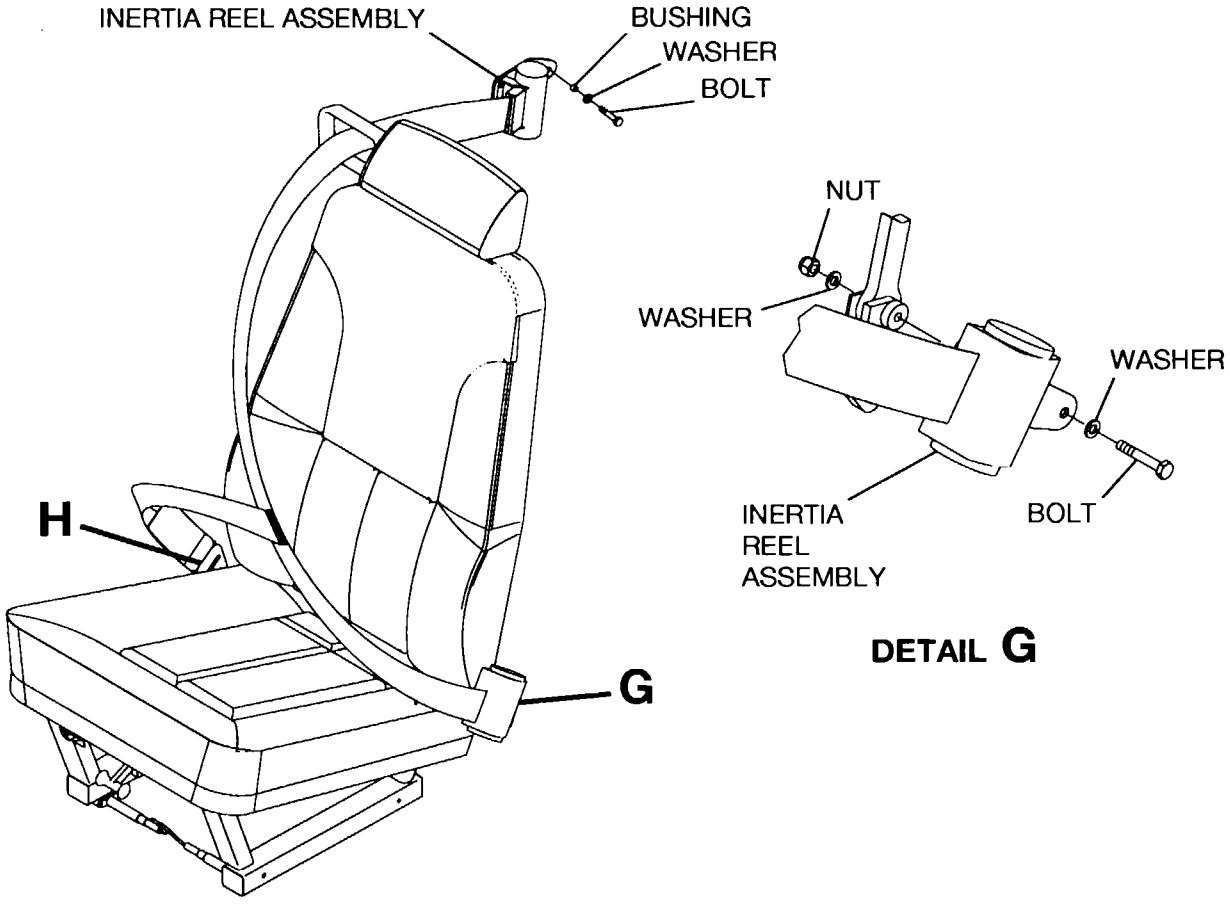
3. Restraint Testing

A. The restraint system should be inspected in accordance with time intervals set forth in Chapter 5, Inspection Time Limits. In addition to these scheduled inspections, the restraint assemblies have life limits. Refer to Chapter 5, Component Time Limits.



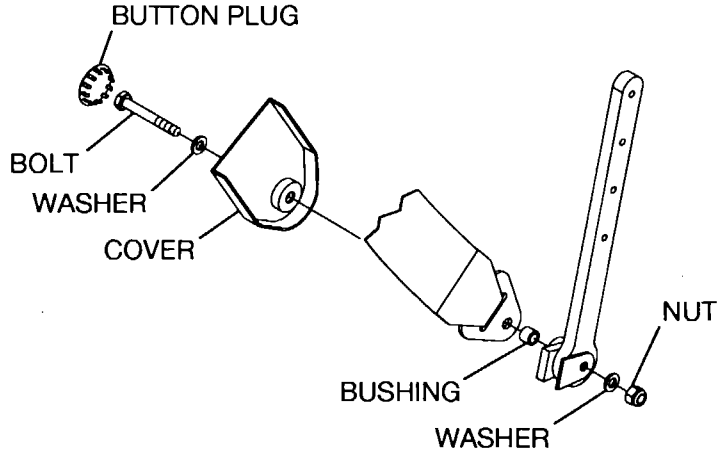
Seat Belts/Restraints Installation
Figure 201 (Sheet 1)

B420



DETAIL B
LEFT CENTER SEAT

DETAIL G



DETAIL H

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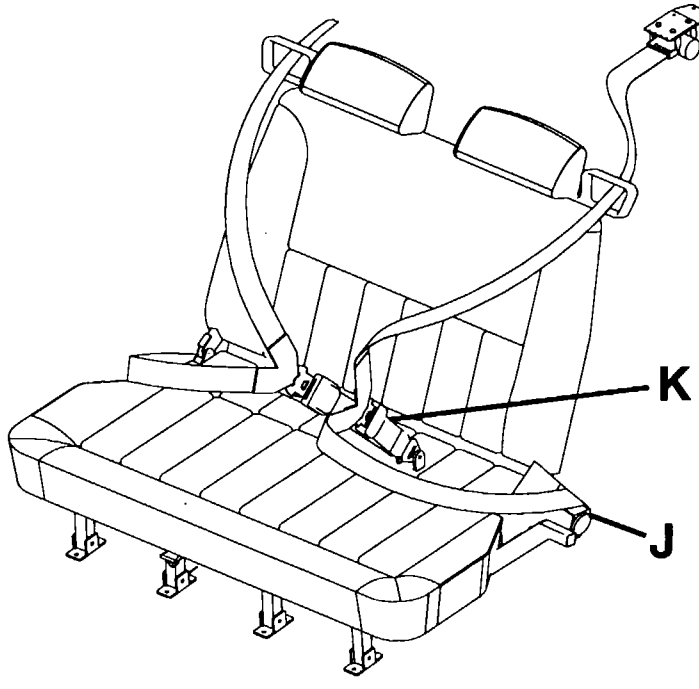
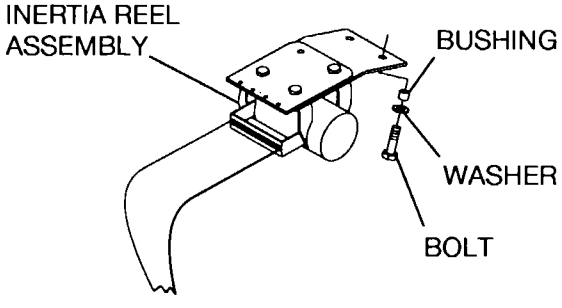
G0519T1047
H1219T1004

Seat Belts/Restraints Installation
Figure 201 (Sheet 2)

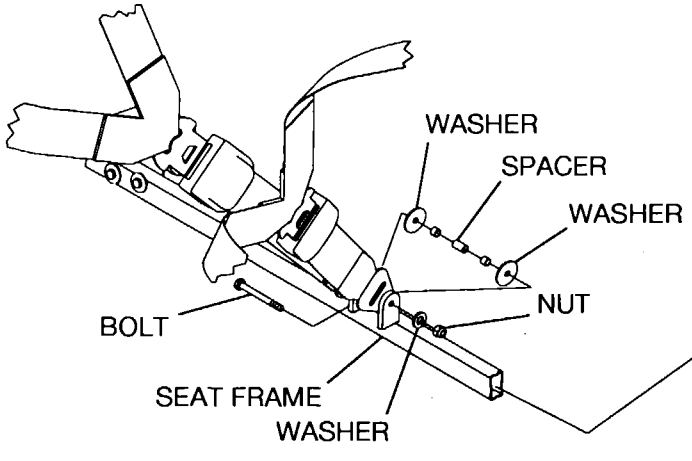
B421



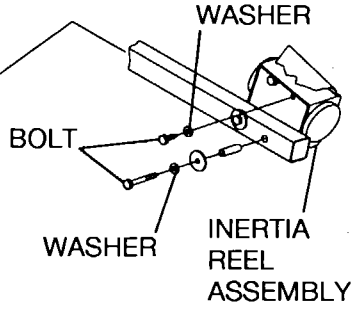
DETAIL C



DETAIL L



DETAIL K



DETAIL J

C1219T1002
J1219T1003
K1219T1003
L0519T1049

Seat Belts/Restraints Installation
Figure 201 (Sheet 3)

CENTER SEATS AND RAILS - MAINTENANCE PRACTICES

1. General

A. This section provides instructions for the removal and the installation of the center seats.

WARNING: If the airplane has the AMSAFE inflatable restraints, do not do maintenance on the seats or seat rails until you have first looked at and obeyed all the applicable precautions and instructions supplied in the AMSAFE publications and this Maintenance Manual. If you do not obey and follow these instructions and safety precautions, injury to personnel and damage to equipment can occur.

B. If your airplane has the AMSAFE inflatable restraint system, do not do maintenance on the seats or the seat restraint system unless you first obey all applicable precautions and instructions in the E508804 Supplemental Amsafe Maintenance Manual and this Maintenance Manual. Refer to Inflatable Restraint System - Maintenance Practices.

2. Center Seat Removal/Installation

A. Center Seat Removal (Refer to Figure 201).

WARNING: If the airplane has the AMSAFE inflatable restraints, do not remove seats with the seat belts buckled or the EMA connected. Damage can occur to the system and an accidental deployment of the system can cause injury.

(1) Remove restraints prior to seat removal. Refer to Seat Belts/Restraints - Maintenance Practices.
(2) Remove seat stops from front and rear of each seat track.
(3) Unlatch seat from seat track and move seat forward on seat track until forward roller clears seat track.
(4) Remove seat from airplane.

B. Center Seat Installation (Refer to Figure 201).
(1) Position rear roller of seat on seat track.
(2) Move seat forward on seat track until front roller can be installed on seat track.
(3) Install seat stops to front and rear of seat track.

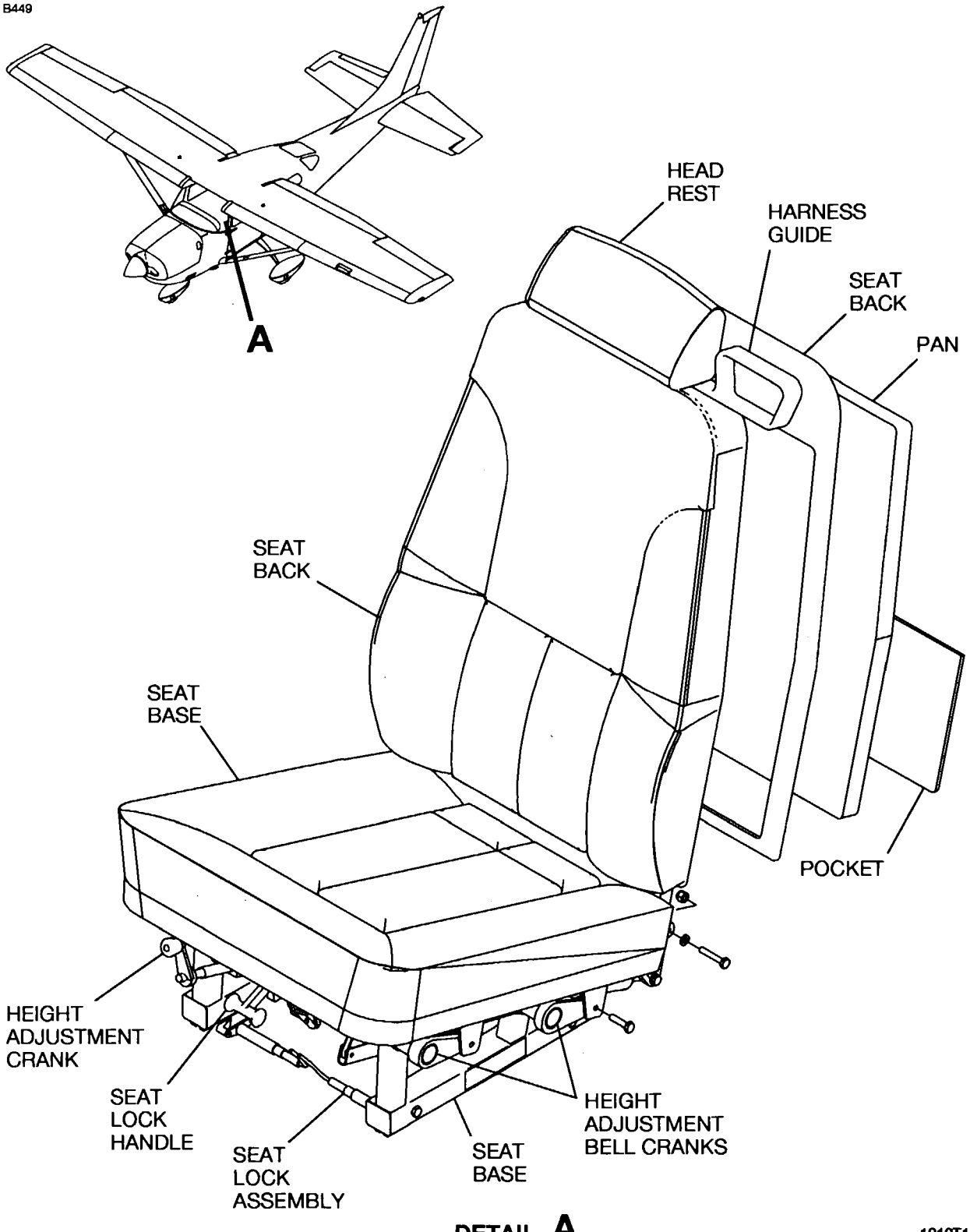
WARNING: Improperly installed seat stops could allow seat movement during flight maneuvers, resulting in serious injury or death.

(4) Test seat through full range of motion to ensure proper operation. Ensure seat stops are properly installed.
(5) Install restraints. Refer to Seat Belts/Restraints - Maintenance Practices.

3. Seat Rail Removal/Installation

A. Seat Rail Removal (Refer to Figure 201).
(1) Remove bolts securing seat rails to fuselage.

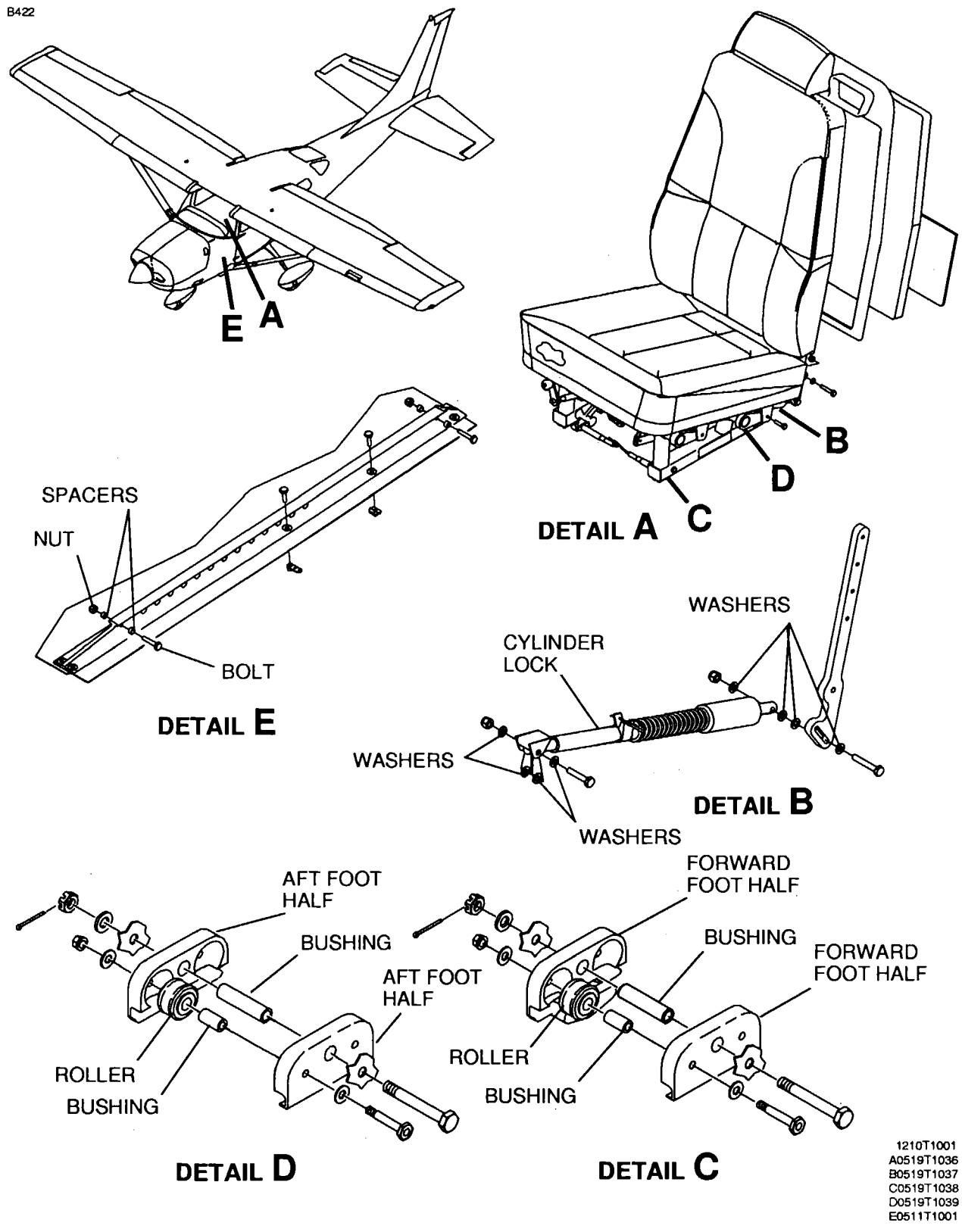
B. Seat Rail Installation (Refer to Figure 201).
(1) Install seat rails to fuselage using bolts.



DETAIL A

1210T1001
A0519T1036

Center Seats Installation
Figure 201 (Sheet 1)



Center Seats Installation
Figure 201 (Sheet 2)

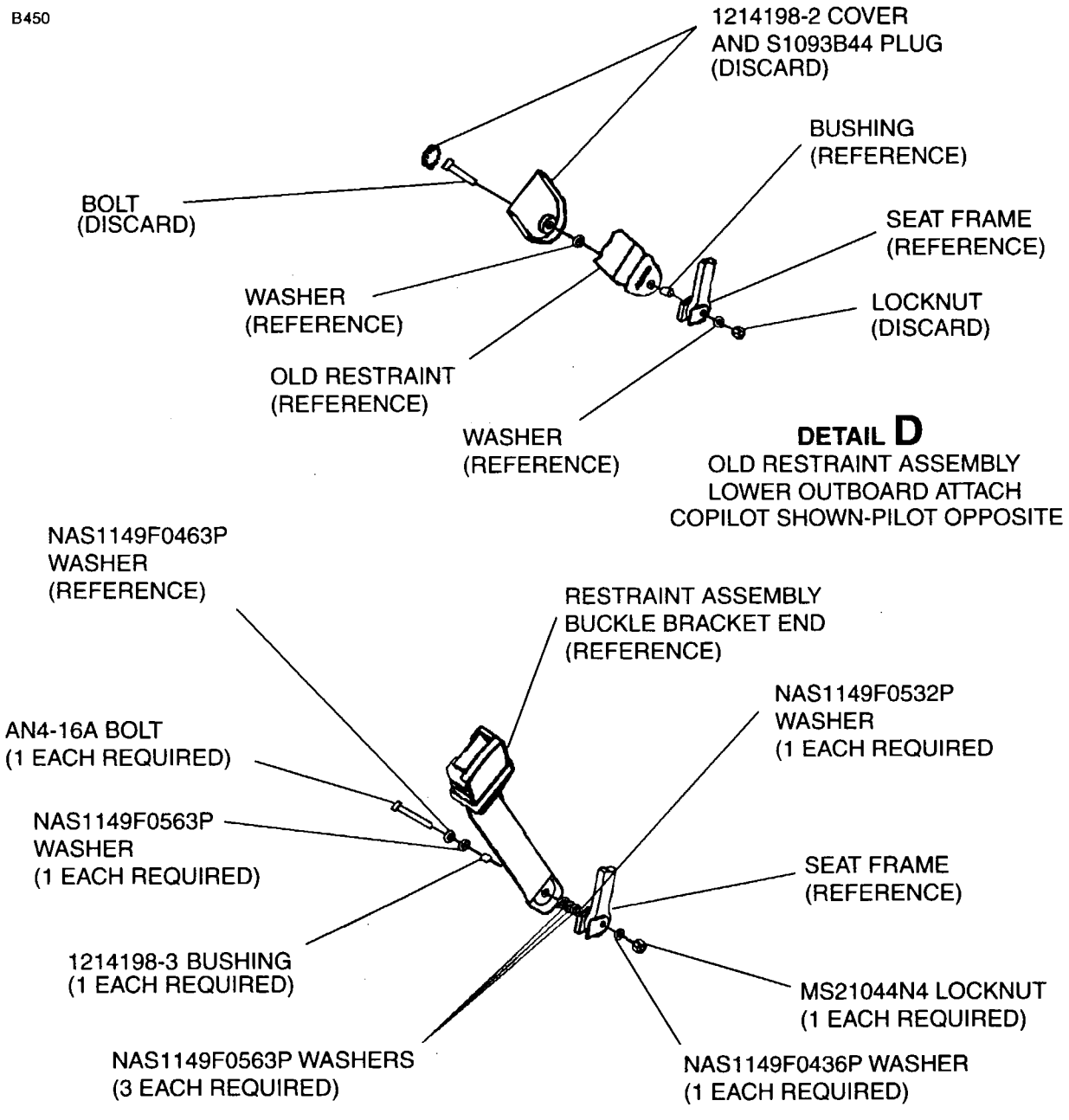


Figure 1. Crew Seat Restraint Installation (Sheet 3)

Seat Stop Installation
Figure 202 (Sheet 1)

REAR SEAT - MAINTENANCE PRACTICES

1. General

A. This section provides instruction for removal and installation of the rear seat.

WARNING: If the airplane has the AMSAFE inflatable restraints, do not do maintenance on the seats until you have first looked at and obeyed all the applicable precautions and instructions supplied in the AMSAFE publications and this Maintenance Manual. If you do not obey and follow these instructions and safety precautions, damage to equipment and injury to personnel can occur.

B. If your airplane has the AMSAFE inflatable restraint system, do not do maintenance on the seats or the seat restraint system unless you first obey all applicable precautions and instructions in the E508804 Supplemental Amsafe Maintenance Manual and this Maintenance Manual. Refer to Inflatable Restraint System - Maintenance Practices.

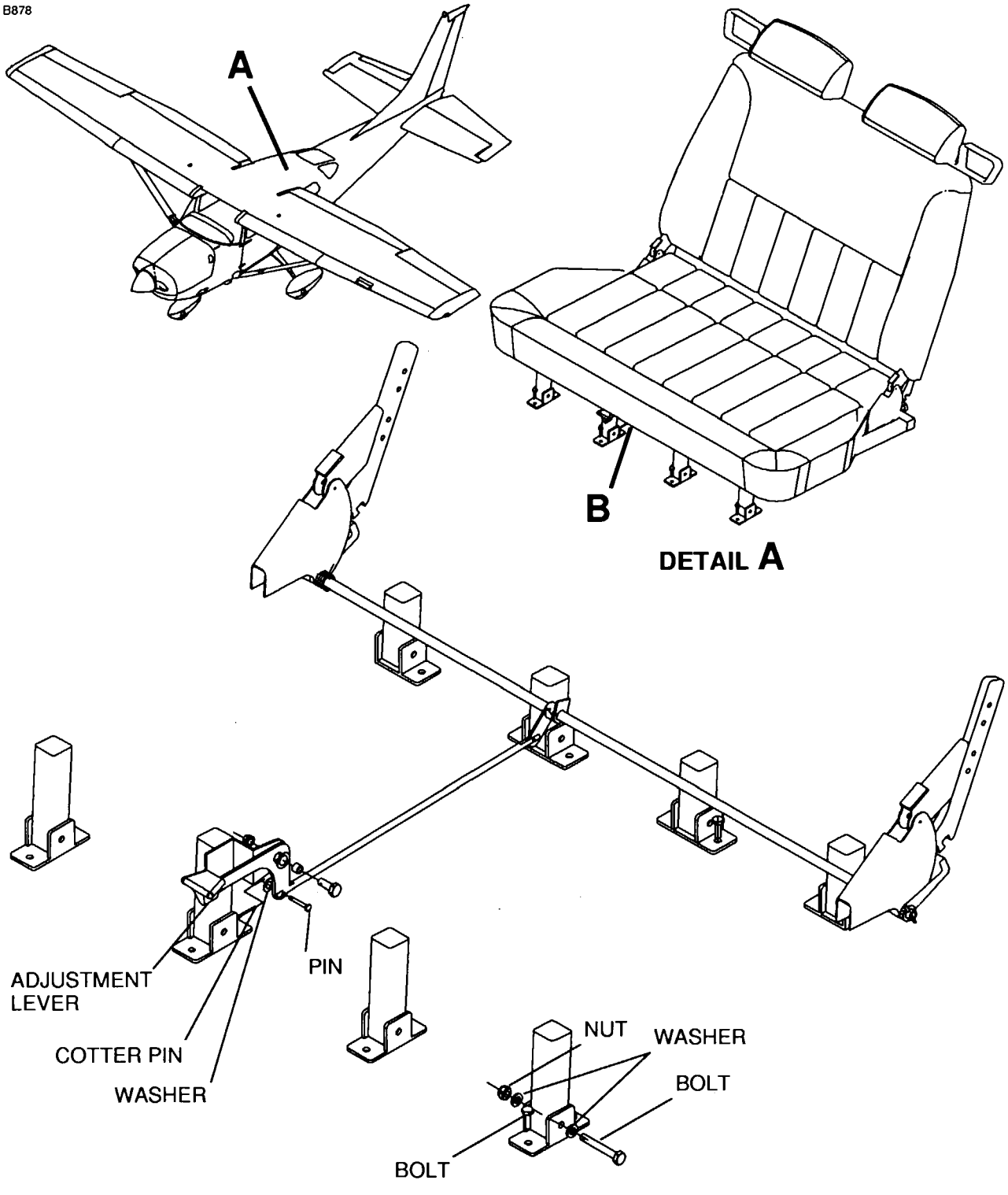
2. Rear Seat Removal/Installation

A. Rear Seat Removal (Refer to Figure 201).

WARNING: If the airplane has the AMSAFE inflatable restraints, do not remove seats with the seat belts buckled or the EMA connected. Damage can occur to the system and an accidental deployment of the system can cause injury.

(1) Remove restraints prior to seat removal. Refer to Seat Belts/Restraints - Maintenance Practices.
(2) Remove bolts securing seat frame to fuselage.
(3) Remove seat from airplane.

B. Rear Seat Installation (Refer to Figure 201).
(1) Install seat to fuselage and secure using bolts.
(2) Install restraints. Refer to Seat Belts/Restraints - Maintenance Practices.



1210T1001
A1219T1002
B1219T1002

Aft Bench Seat Installation
Figure 201 (Sheet 1)

INTERIOR UPHOLSTERY - MAINTENANCE PRACTICES

1. General

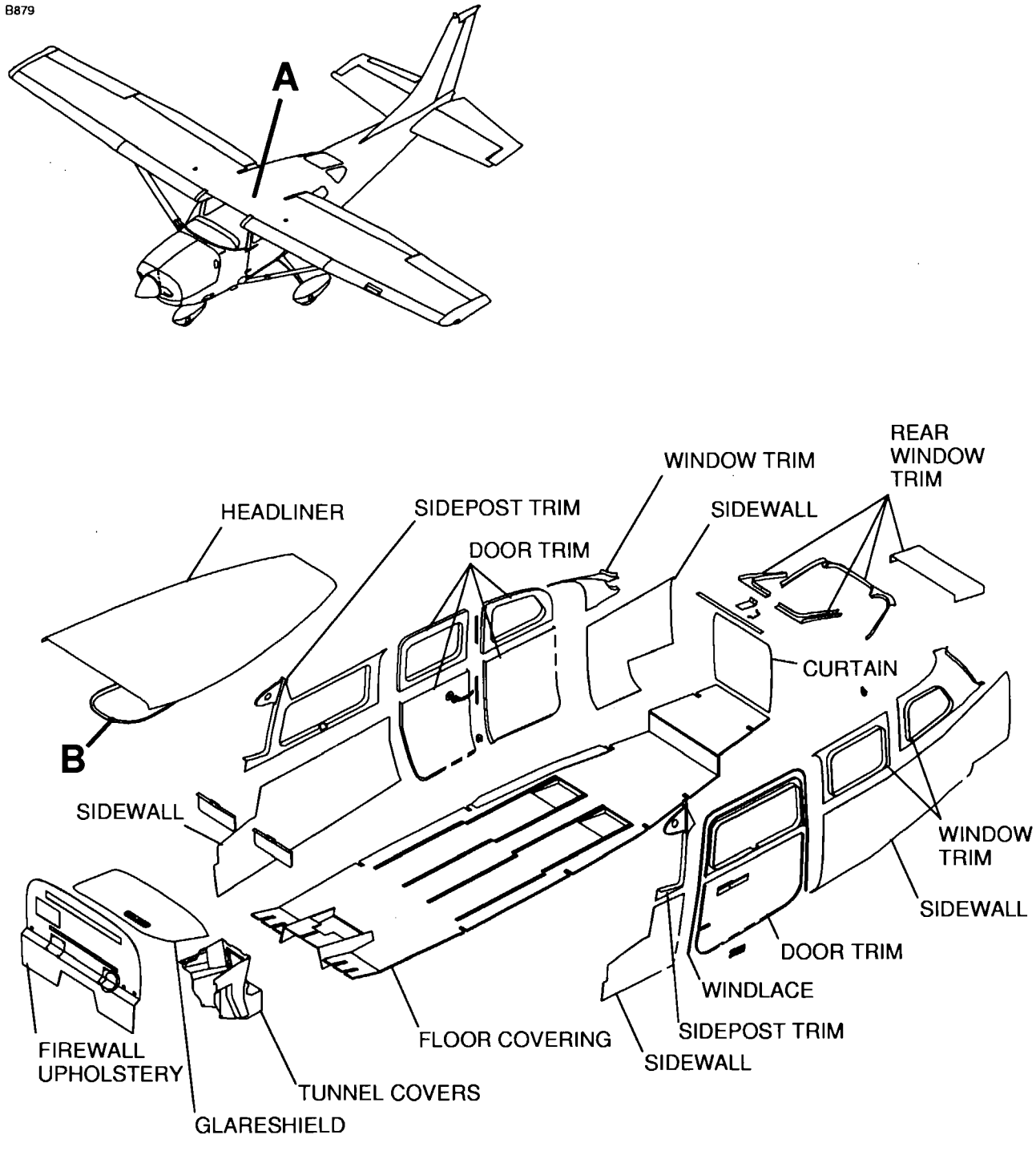
A. This section provides general instructions for removal and installation of the interior panels and carpet.

2. Cabin Panels Removal/Installation

A. Interior panels are typically attached to fuselage structure using screws. Refer to Figure 201 for an exploded view of the interior panels, headliner and overhead console.

3. Door Panels and Carpet Removal/Installation

A. Cabin door panels are typically attached to the fuselage and door structure using small screws. Carpet is attached to the floorboard using velcro. Refer to Figure 202 for a view of the side panels and carpet.

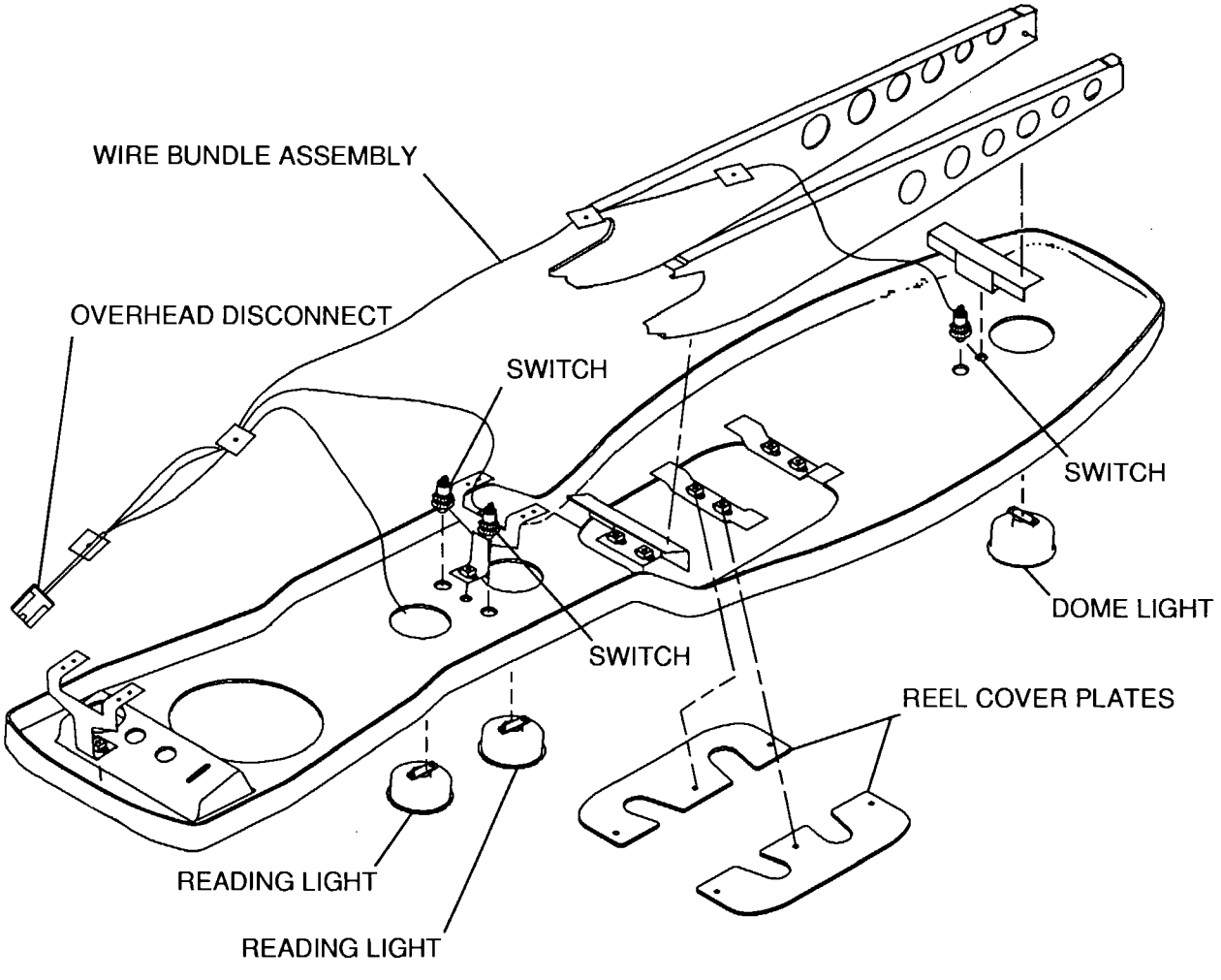


DETAIL A

1210T1001
A1219T1010

Cabin Top and Interior Installation
Figure 201 (Sheet 1)

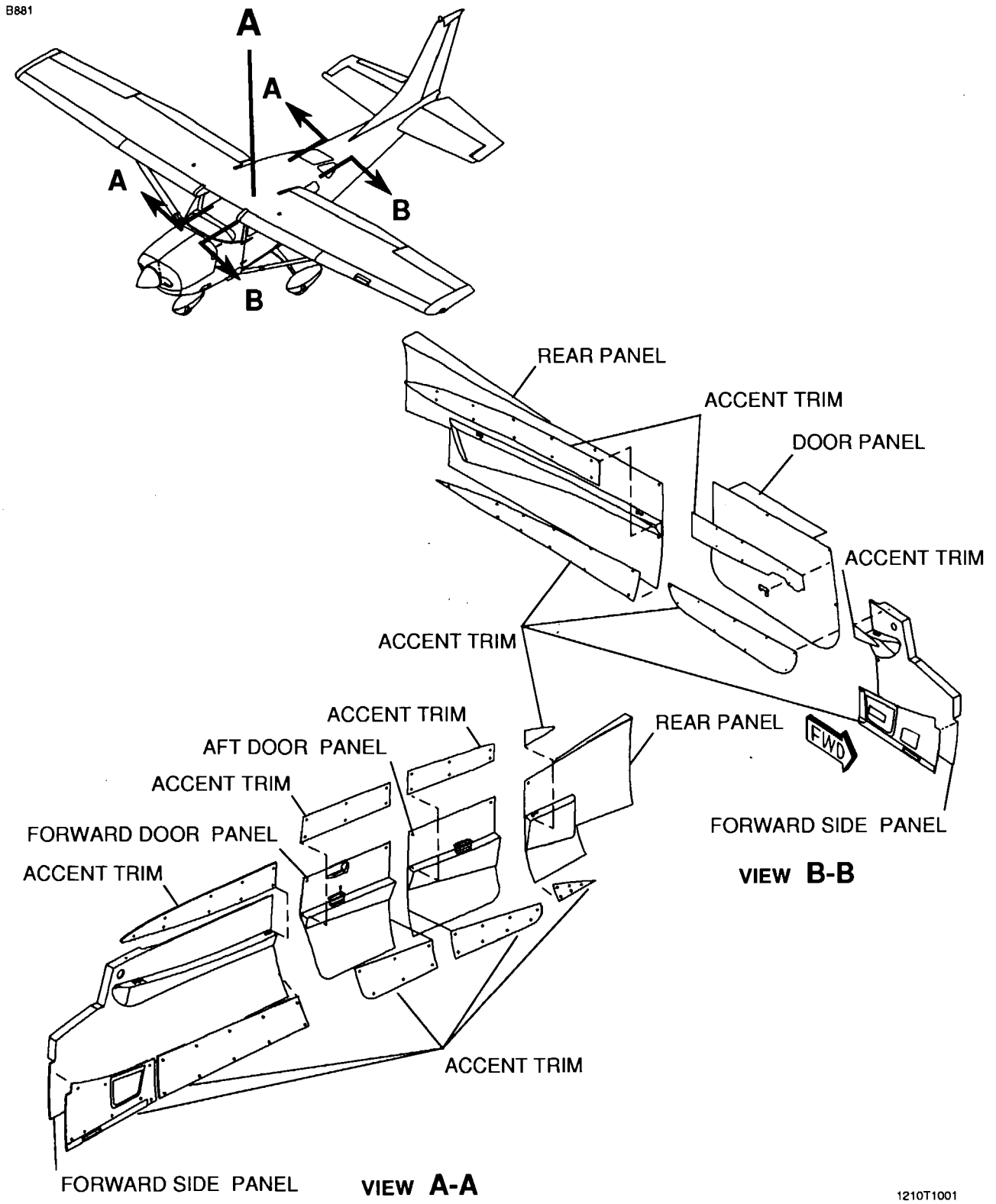
B880



DETAIL B

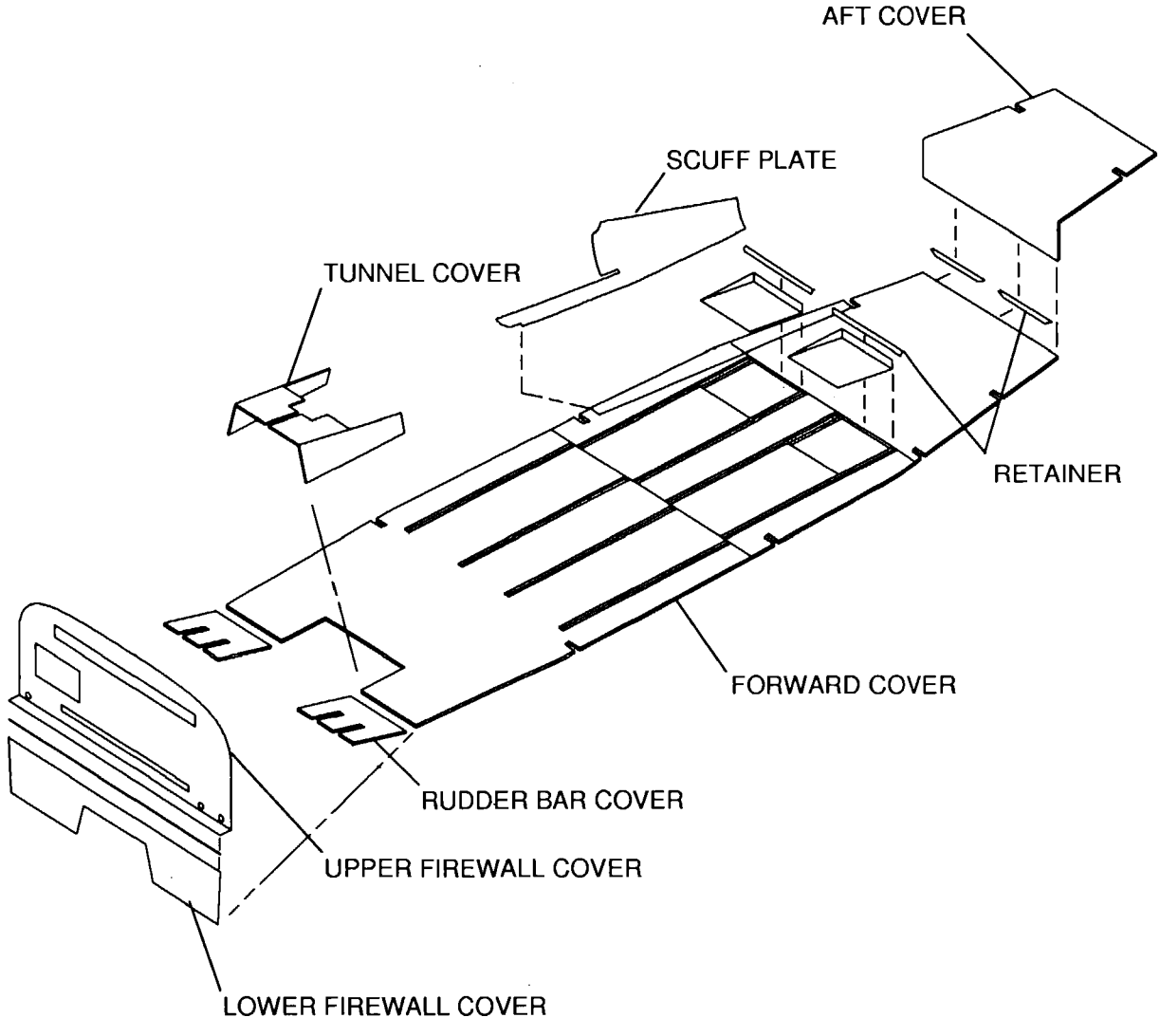
B1219T1011
B1219T1012

Cabin Top and Interior Installation
Figure 201 (Sheet 2)



Cabin Side Panel and Floorboard Upholstery Installation
Figure 202 (Sheet 1)

B882



DETAIL A

A1219T1009

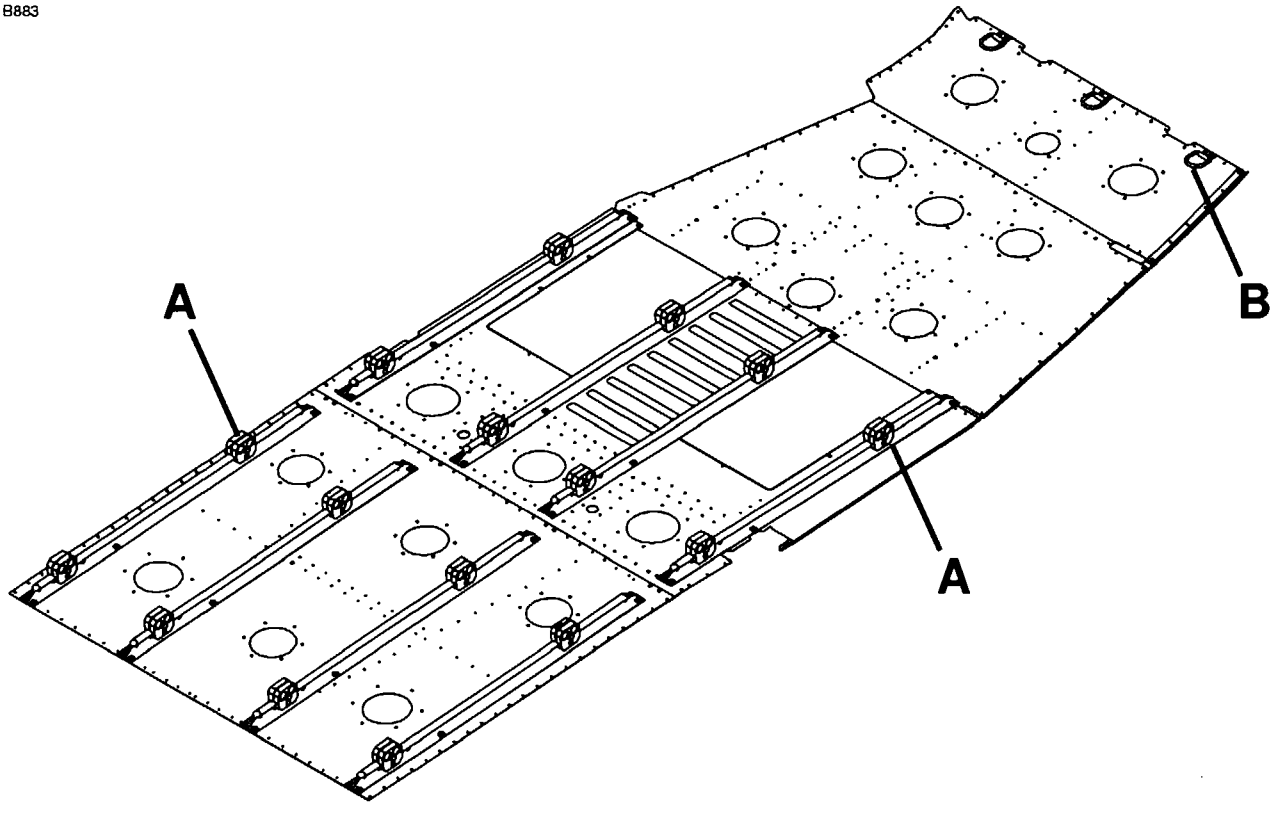
Cabin Side Panel and Floorboard Upholstery Installation
Figure 202 (Sheet 2)

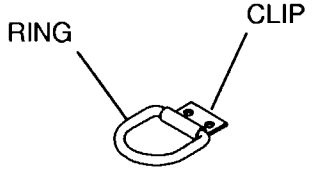
CARGO TIE-DOWNS - MAINTENANCE PRACTICES

1. General

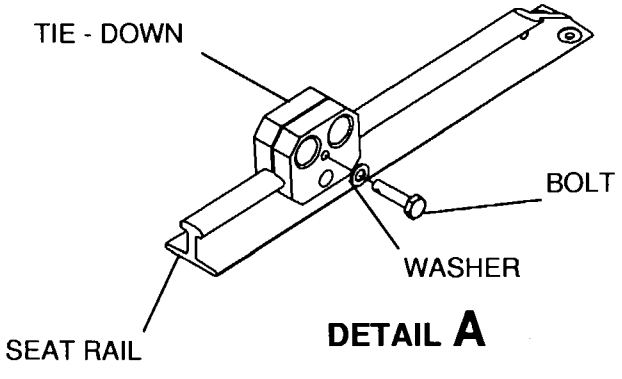
A. Cargo tie-downs are provided for the airplane to accommodate a variety of loading positions. These tie-downs are secured directly to the floorboard through nutplates or indirectly to the floorboard through seat rails. Refer to Figure 201 for an illustration of tie-downs.

B883





DETAIL B



DETAIL A

1211T1024
A1211T1024
B1211T1024

Cargo Tie - Down Installation
Figure 201 (Sheet 1)

POINTER EMERGENCY LOCATOR TRANSMITTER - MAINTENANCE PRACTICES

1. General

A. This section gives maintenance practices for the Emergency Locator Transmitter (ELT). The ELT is activated by an internal G-switch or manually by a remote switch on the instrument panel, or by the ELT master switch. The ELT transmits an emergency distress signal on 121.5/243.0 MHz.

2. Pointer ELT Removal/Installation.

A. ELT Removal (Refer to Figure 201).
(1) Put a support stand under the tail tie-down ring to support the tailcone. Refer to Chapter 7, Jacking - Maintenance Practices.
(2) Remove the rear seat. Refer to Rear Seat - Maintenance Practices.
(3) Remove the baggage curtain to get access to the ELT. Refer to Interior Upholstery - Maintenance Practices.
(4) Remove the bolts, tiedowns, and plastic closeout from the lower baggage area (Zone 240). Refer to Airplane Zoning - Description and Operation.
(5) Put the ELT master switch in the OFF/RESET (center) position.

CAUTION: Do not disconnect the ELT remote connector before you put the ELT master switch in the OFF/RESET (center) position. ELT internal fuse failure can occur if the ELT remote connector is disconnected before the ELT master switch is put in the OFF/RESET (center) position.

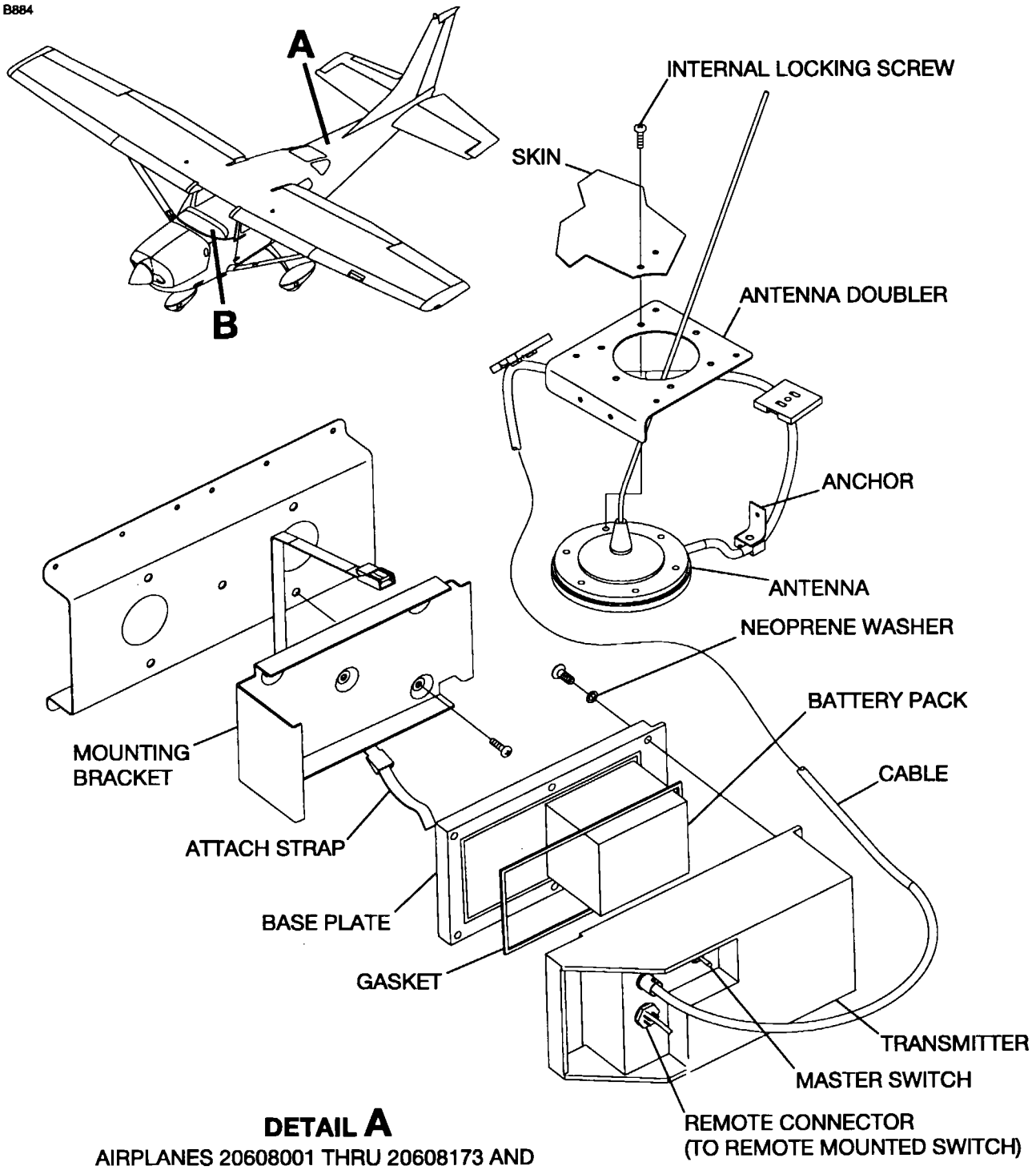
(6) Disconnect the ELT antenna coaxial cable from the ELT.
(7) Disconnect the ELT remote connector from the ELT.
(8) Disengage the attach strap from around the ELT and remove the ELT from the airplane.

B. ELT Installation (Refer to Figure 201).
(1) Complete an ELT G-Switch Operational Check. Refer to ELT Operational Check, ELT G-Switch Operational Check.

CAUTION: Make sure that the direction-of-flight arrow on the ELT points to the nose of the airplane.

CAUTION: Make sure that the ELT master switch is in the OFF/RESET position. ELT internal fuse failure can occur if the ELT remote connector is installed with the ELT master switch in the ON or AUTO position.

(2) Put the ELT into the ELT bracket and tighten with the attach strap.
(3) Connect the remote connector to the ELT.
(4) Connect the ELT antenna coaxial cable to the ELT.
(5) Put the ELT master switch in the AUTO position.
(6) Do an operational check of the ELT. Refer to ELT Operational Check.
(7) Install the bolts, tiedowns, and plastic closeout to the lower baggage area (Zone 240). Refer to Airplane Zoning - Description and Operation.
(8) Install the baggage curtain. Refer to Interior Upholstery - Maintenance Practices.
(9) Install the rear seat. Refer to Rear Seat - Maintenance Practices.
(10) Remove the support stand. Refer to Chapter 7, Jacking - Maintenance Practices.



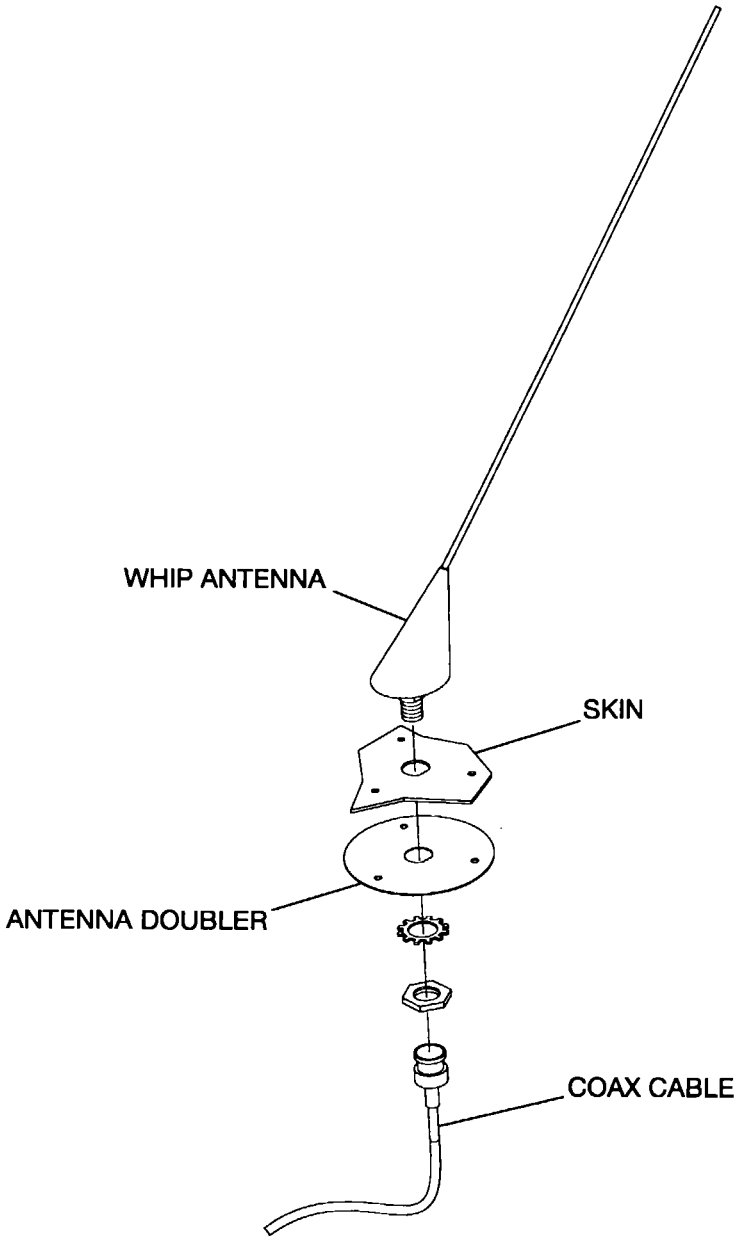
DETAIL A

AIRPLANES 20608001 THRU 20608173 AND
AIRPLANES T20608001 THRU T20608361 AND
CANADIAN AIRPLANES 20608030 THRU
20608173 AND 20608178 AND ON AND
CANADIAN AIRPLANES T20608053 THRU
T20608361 AND T20608370 AND ON

1210T1001
A1218T1021

Pointer Emergency Locator Transmitter Installation
Figure 201 (Sheet 1)

B885



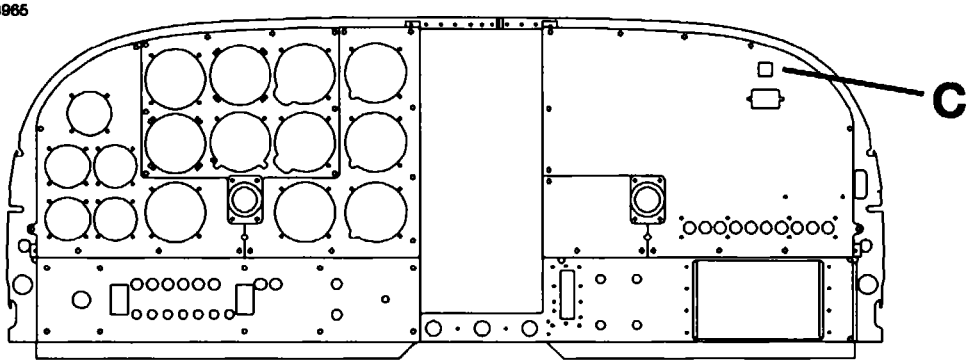
DETAIL A

AIRPLANES 20608174 AND ON AND
AIRPLANES T20608362 AND ON

1218T1066

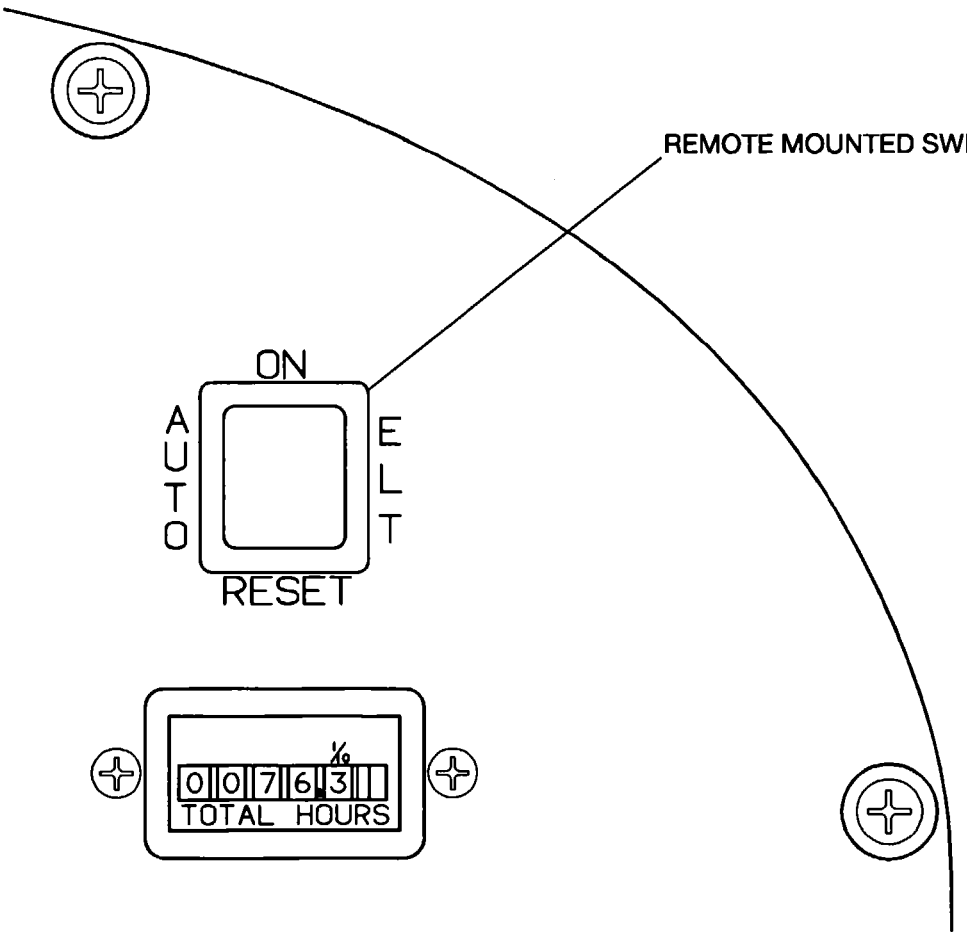
Pointer Emergency Locator Transmitter Installation
Figure 201 (Sheet 2)

B3965



DETAIL B

NOTE: ON AIRPLANES THAT HAVE THE GARMIN G1000 AVIONICS, THE REMOTE MOUNTED SWITCH IS FOUND NEXT TO THE MULTI-FUNCTION DISPLAY (MFD).



DETAIL C

B1218T1002
C0585T1040

Pointer Emergency Locator Transmitter Installation
Figure 201 (Sheet 3)

3. Pointer ELT Remote Switch Removal/Installation.

CAUTION: Do not disconnect the ELT remote connector before you put the ELT master switch in the OFF/RESET (center) position. An ELT internal fuse failure can occur if you disconnect the ELT remote connector before you put the ELT master switch in the OFF/RESET (center) position.

CAUTION: Disconnect the ELT remote connector from the ELT before you remove the ELT remote switch or disconnect the ELT remote switch connector. An ELT internal fuse failure can occur if the ELT remote switch or disconnect is removed before the ELT remote connector is disconnected.

A. ELT Remote Switch Removal (Refer to Figure 201).
   (1) Put the airplane master switch (ALT/BAT) in the OFF position.
   (2) Remove the bolts, tiedowns, and plastic closeout from the lower baggage area (Zone 240). Refer to Airplane Zoning - Description and Operation.
   (3) Put the ELT master switch in OFF/RESET (center) position.
   (4) Disconnect the ELT remote connector from the ELT.
   (5) Get access to backside of remote mounted switch. Compress the locking tabs on each side of the switch and, at the same time, pull the switch aft and away from the instrument panel.
   (6) Disconnect electrical connector from switch.

B. ELT Remote Switch Installation (Refer to Figure 201).
   (1) Hold the edges of the remote switch and put it into the instrument panel cutout. Make sure that the locking tabs engage and that switch is installed correctly.
   (2) Connect the electrical connector to the remote switch.
   (3) Put the ELT remote switch in the AUTO position.

CAUTION: Make sure that the ELT master switch is in the OFF/RESET position. An ELT internal fuse failure can occur if you install the ELT remote connector with the ELT master switch in the ON or AUTO position.

   (4) Connect the ELT remote connector to the ELT.
   (5) Put the ELT master switch in the AUTO position.
   (6) Do an operational check of the ELT. Refer to ELT Operational Check.
   (7) Install the bolts, tiedowns, and plastic closeout to the lower baggage area (Zone 240). Refer to Airplane Zoning - Description and Operation.

4. ELT Antenna Removal/Installation (Integral Base with Coaxial Cable)

A. ELT Antenna Removal (Refer to Figure 201).
   (1) Put a support stand under the tail tie-down ring so that the tailcone does not fall while the person is inside. Refer to Chapter 7, Jacking - Maintenance Practices.
   (2) Remove the rear seat. Refer to Rear Seat - Maintenance Practices.
   (3) Remove the baggage curtain to get access to the ELT. Refer to Interior Upholstery - Maintenance Practices.
   (4) Remove the bolts, tiedowns, and plastic closeout from the lower baggage area (Zone 240). Refer to Airplane Zoning - Description and Operation.
   (5) Disconnect the ELT antenna coaxial cable from the ELT.
   (6) Remove all of the tie straps that attach the ELT antenna coaxial cable to the fuselage.
   (7) On the external skin of the airplane, remove the six internal locking screws that attach the ELT antenna to the fuselage.

NOTE: The ELT antenna has an integral base and a coaxial cable.

(8) Remove the ELT antenna from the inside of the airplane.

B. ELT Antenna Installation (Refer to Figure 201).
(1) From the inside of the airplane, put the ELT antenna (with integral base and coaxial cable) on the fuselage with the ELT antenna pointing aft.
(2) On the external skin of the airplane, use the internal locking screws to attach the ELT antenna base to the fuselage.
(3) Connect the ELT antenna coaxial cable to the ELT.
(4) Use tie straps to attach the ELT antenna coaxial cable to the fuselage.
(5) Do an operational check of the ELT. Refer to ELT Operational Check.
(6) Install the baggage curtain. Refer to Interior Upholstery - Maintenance Practices.
(7) Install the rear seat. Refer to Rear Seat - Maintenance Practices.
(8) Remove the support stand. Refer to Chapter 7, Jacking - Maintenance Practices.

5. ELT Whip Antenna Removal/Installation

A. ELT Whip Antenna Removal (Refer to Figure 201).
(1) Put a support stand under the tail tie-down ring so that the tailcone does not fall while the person is inside. Refer to Chapter 7, Jacking - Maintenance Practices.
(2) Remove the rear seat. Refer to Rear Seat - Maintenance Practices.
(3) Remove the baggage curtain to get access to the ELT. Refer to Interior Upholstery - Maintenance Practices.
(4) Remove the bolts, tiedowns, and plastic closeout from the lower baggage area (Zone 240). Refer to Airplane Zoning - Description and Operation.
(5) Disconnect the ELT whip antenna coaxial cable from the ELT whip antenna.
(6) From inside the airplane, remove the nut and washer that attach the ELT whip antenna to the fuselage.
(7) Remove the ELT whip antenna from the external skin of the airplane.

B. ELT Whip Antenna Installation (Refer to Figure 201).
(1) Put the ELT whip antenna in position on the external skin of the fuselage with the ELT whip antenna pointing aft.
(2) From inside the airplane, use the nut and washer to connect the ELT whip antenna to the fuselage.
(3) Connect the ELT antenna coaxial cable to the ELT whip antenna.
(4) Install the bolts, tiedowns, and plastic closeout to the lower baggage area.
(5) Do an operational check of the ELT. Refer to ELT Operational Check.
(6) Remove the support stand. Refer to Chapter 7, Jacking - Maintenance Practices.

6. Pointer ELT Battery Pack Removal/Installation.

A. ELT Battery Pack Removal (Refer to Figure 201).

WARNING: Obey the correct procedures to discard the unserviceable ELT battery pack to prevent damage to the environment or personal injury.

(1) Remove the ELT from the airplane. Refer to ELT Removal/Installation.
(2) Remove the screws that attach the base plate to the ELT.
(3) Disconnect the ELT battery pack and the electrical connectors.
(4) Remove the ELT battery pack from the ELT.

B. ELT Battery Pack Installation (Refer to Figure 201).

CAUTION: Use only the recommended battery pack for the ELT, or the operating life and/or signal strength of the ELT will decrease. The incorrect battery pack can also change the mechanical configuration and cause it to make too much vibration as well as corrosion.

(1) Put the ELT battery pack in the ELT.
(2) Connect the ELT battery pack electrical connectors.

CAUTION: Do not tighten the ELT gasket and screws too much.

(3) Use screws to attach the ELT base plate and gasket to the ELT.

NOTE: When the new battery pack expiration date is put in the airplane records, it is also recommended that you record the expiration date in the ELT owner's manual for quick reference.

(4) Put the new replacement date on the outside of the ELT with a stamp. Put the date on the ELT switch nameplate, on the side of the ELT transmitter, and in the instruction nameplate on the top of the ELT.
(5) Install the ELT in the airplane. Refer to ELT Removal/Installation.

7. **Pointer ELT Operational Check.**

A. Control Tower Monitored ELT Operational Check.

CAUTION: Operate the Emergency Locator Transmitter (ELT) system only during the first five minutes of each hour. Refer to the FAA Advisory Circular AC-91-44A.

(1) Get permission from the control tower and/or flight service station to do a test of the ELT system.

CAUTION: Do not operate the ELT system for more than three pulses of the audio signal. Longer operation can decrease the ELT battery power supply.

(2) Put the ELT remote switch in the ON position.
(3) Contact the control tower and/or flight service station to make sure that the ELT system operates correctly.
(4) Momentarily put the ELT remote switch in the RESET position.
(5) Put the ELT remote switch in the AUTO position.
(6) Contact the control tower and/or flight service station to make sure that the ELT stopped transmission.

B. Locally Monitored ELT Operational Check.

CAUTION: Operate the Emergency Locator Transmitter (ELT) system only during the first five minutes of each hour. Refer to the FAA Advisory Circular AC-91-44A.

(1) Put a small, hand held AM radio tuned to any frequency, within six inches of the ELT antenna.

CAUTION: Do not operate the ELT system for more than three pulses of the audio signal. Longer operation can decrease the ELT battery power supply.

NOTE: The airplane's VHF receiver or ADF will not correctly do a check of the power of the ELT audio signal.

(2) Put the ELT remote switch to the ON position.
(3) Make sure that the ELT signal is heard on the AM radio.
(4) Momentarily put the ELT remote switch in the RESET position.
(5) Put the ELT remote switch in the AUTO position.

C. ELT Master Switch Operational Check.

CAUTION: Operate the Emergency Locator Transmitter (ELT) system only during the first five minutes of each hour. Refer to the FAA Advisory Circular AC-91-44A.

CAUTION: Do not operate the ELT system for more than three pulses of the audio signal. Longer operation can decrease the ELT battery power supply.

(1) Put the ELT master switch in the ON position
(2) Make sure that the signal is heard by the Control Tower, a Flight Service Station, or AM radio.
(3) Put the ELT master switch in the OFF/RESET position.
(4) Put the ELT master switch in the AUTO position.

D. ELT G Switch Operational Check.
(1) Remove the ELT from the airplane. Refer to ELT Removal/Installation.
(2) Put the ELT master switch in the AUTO position.
(3) Hold the ELT tightly in one hand, and move the ELT fast in one direction, followed by a sudden movement of the ELT in the opposite direction.
(4) Make sure that the ELT G-switch has been actuated.
(5) Put the ELT master switch in the OFF/RESET position to reset the ELT G-switch.
(6) Install the ELT in the airplane. Refer to Transmitter Removal/Installation.

ARTEX C406-N EMERGENCY LOCATOR TRANSMITTER SYSTEM - MAINTENANCE PRACTICES

1. General

A. This section gives maintenance practices for the emergency locator transmitter (ELT) system. Components in the ELT system include the ELT, antenna, remote switch, and buzzer.

2. Artex C406-N ELT Removal/Installation.

A. ELT Removal (Refer to Figure 201).
(1) Put a support stand under the tail tie-down ring to support the tailcone. Refer to Chapter 7, Jacking - Maintenance Practices.
(2) Remove the rear seat. Refer to Rear Seat - Maintenance Practices.
(3) Remove the baggage curtain to get access to the ELT. Refer to Interior Upholstery - Maintenance Practices.
(4) Remove the bolts, tiedowns, and plastic closeout from the lower baggage area (Zone 240). Refer to Airplane Zoning - Description and Operation.
(5) Put the ELT master switch in the OFF position.
(6) Disconnect the electrical connector (PT905) and the coaxial connector (PT1029) from the ELT.
(7) Loosen the knurl nuts on the end cap of the transmitter and the mounting tray.
(8) Pull the front cover away from the transmitter and the mounting tray.
(9) Carefully pull the mounting tray end and the tray away from the ELT.
(10) Remove the ELT from the mounting tray.
(11) Remove the screws that attach the mounting tray to the shelf assembly.

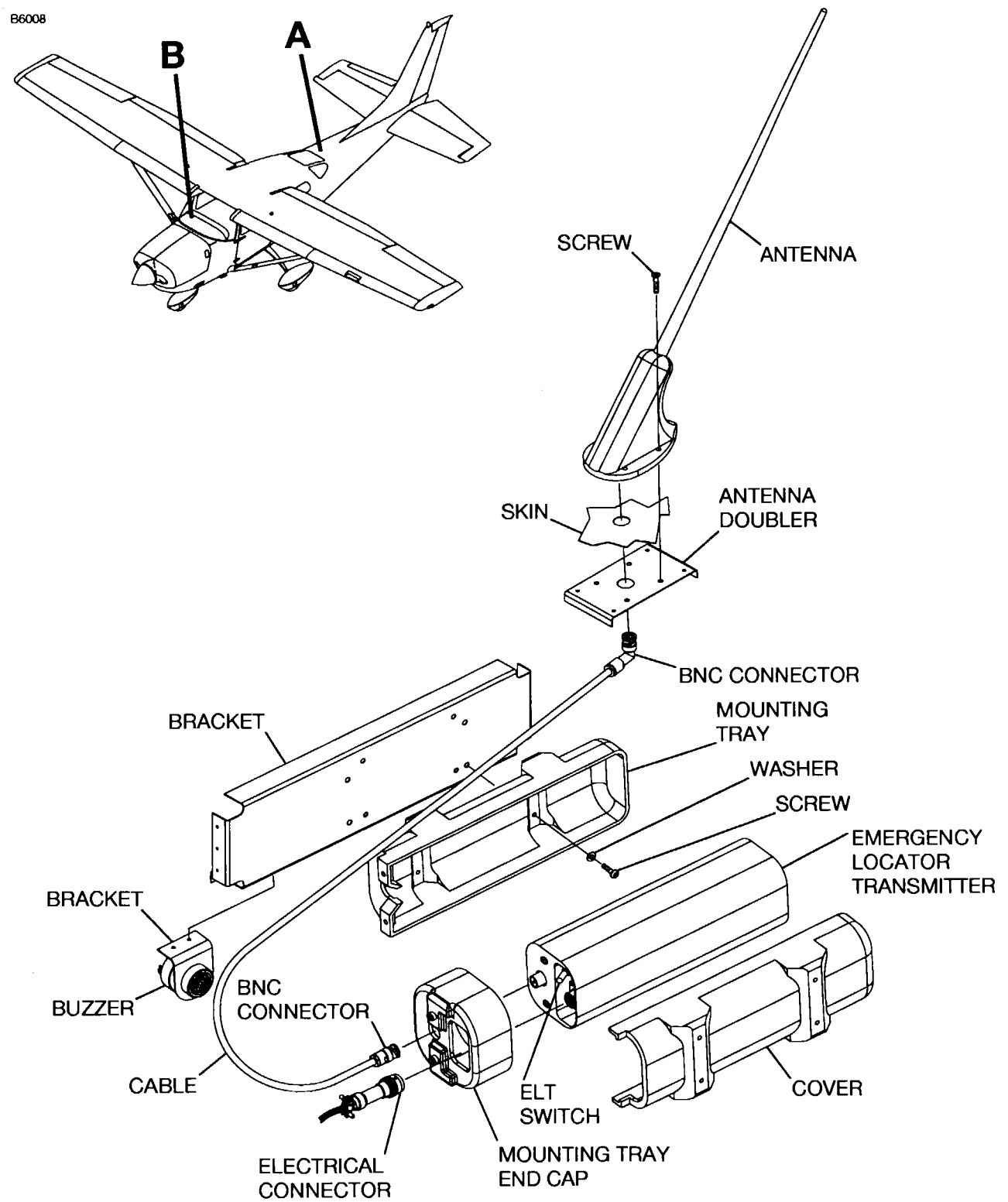
B. ELT Installation (Refer to Figure 201).
(1) Attach the mounting tray to the shelf assembly with the screws.

CAUTION: Make sure that the direction-of-flight arrow on the ELT points to the nose of the airplane.

(2) Put the ELT transmitter in position in the tray at an angle. Move the locking ears at the end opposite to the direction-of-flight arrow into the mounting tray locking slots.
(3) Make sure that the ELT switch on the ELT is in the OFF position.
(4) Put the ELT in the mounting tray at an angle to engage the locking mechanism at the opposite end of the ELT.
(5) Push the ELT down into the mounting tray until it is fully installed in the tray.
(6) Put the top cover on the top of the transmitter.
(7) Make sure that the top cover locks into the aft end of the transmitter.
(8) Put the end cap on the transmitter and mounting tray.
(9) Tighten the knurl nuts.
(10) Connect the electrical connectors (PT905) and (PT1029) to the ELT transmitter.
(11) Connect the electrical power to the airplane.
(12) Do a functional test of the ELT. Refer to Artex C406-N ELT Functional Test.
(13) Install the bolts, tiedowns, and plastic closeout to the lower baggage area (Zone 240). Refer to Airplane Zoning - Description and Operation.
(14) Install the baggage curtain. Refer to Interior Upholstery - Maintenance Practices.
(15) Install the rear seat. Refer to Rear Seat - Maintenance Practices.
(16) Remove the support stand. Refer to Chapter 7, Jacking - Maintenance Practices.

3. ELT Remote Switch Removal/Installation.

A. ELT Remote Switch Removal (Refer to Figure 201).
(1) Put the airplane master switch (ALT/BAT) in the OFF position.
(2) Get access to the ELT.
(3) Put the ELT master switch in the OFF position.
(4) Disconnect the electrical connector (PT905) from the ELT.
(5) Get access to the back of the ELT remote switch (Zone 221).
(6) Disconnect the ELT remote switch connector.



DETAIL A

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Artex C406-N ELT Installation
Figure 201 (Sheet 1)

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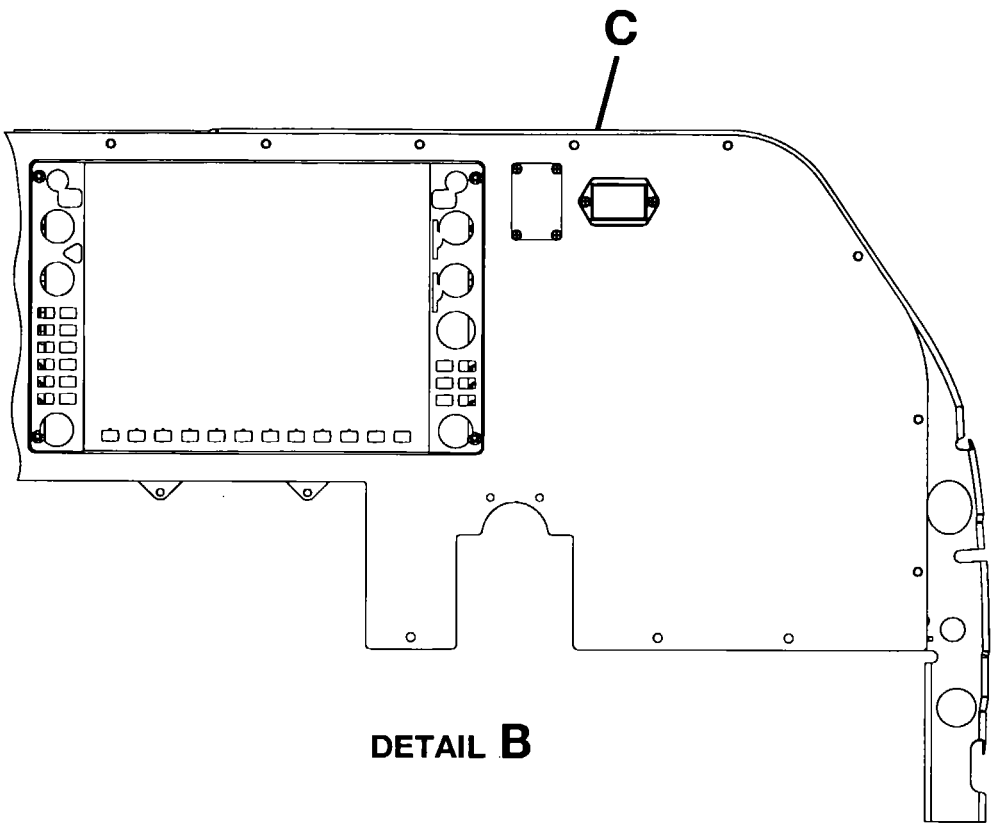
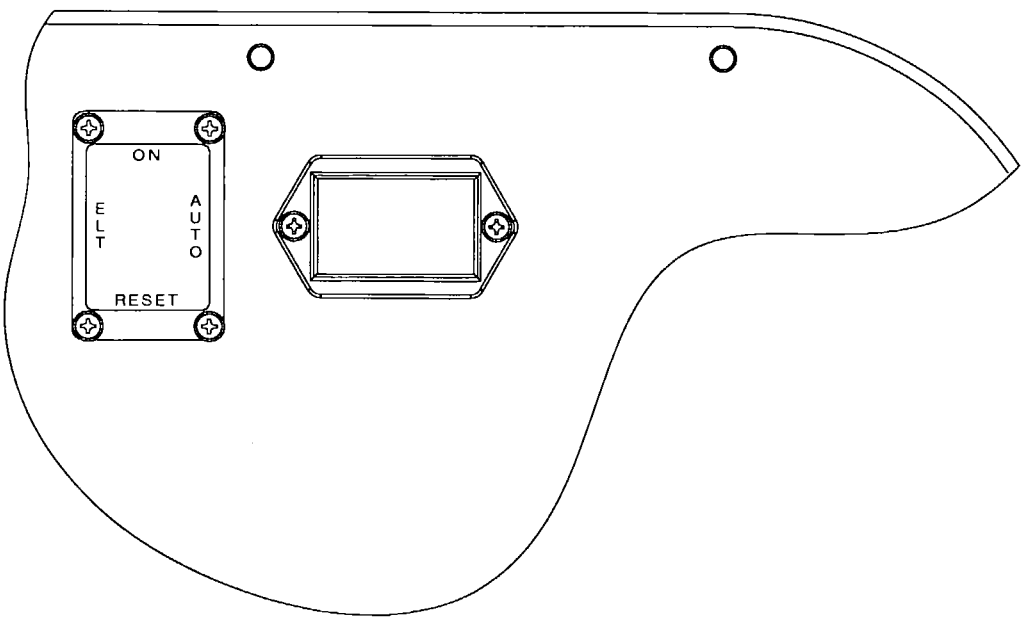


DETAIL B



DETAIL C

B1218T1089
C1218T1089

Artex C406-N ELT Installation
Figure 201 (Sheet 2)

(7) Remove the screws that attach the ELT remote switch to the instrument panel.
(8) Remove the ELT remote switch from the airplane.

B. ELT Remote Switch Installation (Refer to Figure 201).
(1) Put the ELT remote switch in position in the instrument panel.
(2) Attach the ELT remote switch to the instrument panel with the screws.
(3) Connect the ELT remote switch connector.
(4) Put the ELT remote switch to the AUTO position.
(5) Connect the electrical connector (PT905) to the ELT.
(6) Make sure that the ELT master switch is set to the OFF position.
(7) Do a functional test of the ELT. Refer toArtex C406-N ELT Functional Test.

4. ELT Rod Antenna Removal/Installation.

A. ELT Antenna Removal (Refer to Figure 201).
(1) Put a support stand under the tail tie-down ring to support the tailcone. Refer to Chapter 7, Jacking - Maintenance Practices.
(2) Remove the rear seat. Refer to Rear Seat - Maintenance Practices.
(3) Remove the baggage curtain to get access to the ELT. Refer to Interior Upholstery - Maintenance Practices.
(4) Remove the bolts, tiedowns, and plastic closeout from the lower baggage area (Zone 240). Refer to Airplane Zoning - Description and Operation.
(5) Disconnect the coaxial cable connector (PT1030) for the ELT antenna from the ELT.
(6) Remove the tie strap that attaches the ELT antenna coaxial cable to the fuselage.
(7) Remove the four screws that attach the ELT antenna to the fuselage.
(8) Remove the ELT antenna from the airplane.

B. ELT Antenna Installation (Refer to Figure 201).
(1) Remove all of the old sealant from the ELT rod antenna and from the airplane skin. Refer to Chapter 20, General Solvents/Cleaners - Maintenance Practices.
(2) Put the ELT antenna in position on the fuselage with the ELT antenna pointing aft.
(3) Install the four screws that attach the ELT antenna to the fuselage.
(4) Connect the ELT antenna coaxial cable to the ELT.
(5) With the tie strap, attach the ELT antenna coaxial cable to the mount on the fuselage.
(6) Make sure that there is a correct electrical bond between the antenna and the airplane structure.
(a) Remove one screw.
(b) With an ohmmeter, measure the electrical resistance from the antenna base metal insert to the structure at the screw position.

NOTE: The maximum allowable resistance (in ohms) at each of the four measured positions is 0.0025.

(7) Install the screw and remove and install each of the remaining screws in turn as you measure the electrical resistance at each screw hole.
(8) Apply a fillet seal around the antenna with Type I Class B Sealant. Do not cover the screw head with the sealant. Refer to Chapter 20, Fuel, Weather and High-Temperature Sealing - Maintenance Practices.
(9) Do a functional test of the ELT. Refer toArtex C406-N ELT Functional Test.
(10) Install the bolts, tiedowns, and plastic closeout to the lower baggage area (Zone 240). Refer to Airplane Zoning - Description and Operation.
(11) Install the baggage curtain. Refer to Interior Upholstery - Maintenance Practices.
(12) Install the rear seat. Refer to Rear Seat - Maintenance Practices.
(13) Remove the support stand. Refer to Chapter 7, Jacking - Maintenance Practices.

5. Buzzer Removal/Installation.

A. Buzzer Removal (Refer toFigure 201).
(1) Put a support stand under the tail tie-down ring to support the tailcone. Refer to Chapter 7, Jacking - Maintenance Practices.

(2) Remove the rear seat. Refer to Rear Seat - Maintenance Practices.
(3) Remove the baggage curtain to get access to the ELT. Refer to Interior Upholstery - Maintenance Practices.
(4) Remove the bolts, tiedowns, and plastic closeout from the lower baggage area (Zone 240). Refer to Airplane Zoning - Description and Operation.
(5) Make sure that the ELT switch on the ELT transmitter is in the OFF position.
(6) Tag the wires and terminals for identification.
(7) Remove the screws that attach the electrical terminals to the buzzer.
(8) Loosen the black retainer ring on the outboard side of the buzzer.
(9) Remove the buzzer from the bracket.

B. Buzzer Installation (Refer to Figure 201)
(1) Put the buzzer in the bracket.
(2) Install the black retainer ring on the outboard face of the buzzer.
(3) Connect the electrical wires to the buzzer with the screws.
(4) Do a functional test of the ELT. Refer to Artex C406-N ELT Functional Test.
(5) Install the bolts, tiedowns, and plastic closeout to the lower baggage area (Zone 240). Refer to Airplane Zoning - Description and Operation.
(6) Install the baggage curtain. Refer to Interior Upholstery - Maintenance Practices.
(7) Install the rear seat. Refer to Rear Seat - Maintenance Practices.
(8) Remove the support stand. Refer to Chapter 7, Jacking - Maintenance Practices.

ARTEX C406-N EMERGENCY LOCATOR TRANSMITTER SYSTEM - INSPECTION/CHECK

1. Artex C406-N ELT Functional Test.

CAUTION: Operate the emergency locator transmitter (ELT) system only during the first five minutes of each hour. If you must complete the functional test at a time other than the first five minutes of the hour, you must do the test with a direct connection to the ELT and a 30 dB attenuator. Refer to the FAA Advisory Circular AC-91-44A.

CAUTION: Do not operate the emergency locator transmitter (ELT) for more than five seconds at a time. Do not operate the ELT again for 15 seconds. The ELT will transmit a 406.028 MHz signal after the ELT is active for approximately 50 seconds. This signal is identified as a distress signal

A. Prepare for the Artex C406-N ELT Functional Test.
   (1) You must replace the ELT battery with a new ELT battery if one or more of the conditions that follow occur:
      - Use of the ELT battery in an emergency
      - Operation for an unknown amount of time
      - Use for more than one hour of cumulative time
      - On or before the replacement date shown on the battery label.
   (2) Examine the ELT battery to make sure that it is not due for replacement.
   (3) If the battery must be replaced, follow the manufacturer's instructions to replace it.
   (4) Supply +28 V, +0.25 or –0.25 V, external electrical power to the airplane.
   (5) Initialize the global positioning system (GPS) on the multi function display (MFD).

B. Do the ELT Transmitter Test.
   (1) Adjust the volume to make sure that the transmissions from the radio are heard in the cockpit.
   (2) Adjust the COM 1 frequency to 121.50 MHz. Make sure that the audio is heard through the cockpit speakers.
   (3) Put the cockpit ELT switch in the ON position for approximately one second.
   (4) Make sure that the ELT audio signal and the cockpit ELT switch light adjacent to the ELT remote switch come on.
   (5) Immediately put the cockpit ELT switch in the ARM position.
   (6) Make sure that the LED stays on for approximately one second before it goes off.
   (7) If the ELT system has sensed a fault in the system, the LED will flash a fault code at this time. Refer to the Installation and Operation Manual for the Artex ELT system for information on the possible codes.

C. Do the NAV Interface Test.
   (1) Hold the SARSAT tester no more than fifteen feet from the antenna.

   NOTE: The SARSAT tester is used as an example to gather test information. However, other equivalent test equipment such as the Aeroflex IFR 4000 Communications Test Set is acceptable.

   (2) Turn on the SARSAT tester.
   (3) Engage the receive function of the SARSAT tester.
   (4) Make sure that the display on the tester shows that it is searching for a signal.
   (5) Put the ELT remote switch in the ON position.
   (6) Within 15 seconds, put the ELT remote switch in the ARM position.
   (7) Monitor the SARSAT tester to see if it received a signal from the ELT system.
      (a) If no signal was received, do the test again after the 15-second off cycle.
   (8) Make sure that the tail number on the SARSAT tester is correct.
   (9) Make sure that the Mode S code shown on the SARSAT tester is the same as the number that is on the back of the transmitter.

(10) Make sure that the latitude and longitude information is the same as that shown on the MFD display.
(11) Turn the SARSAT tester off.
(12) Disconnect external electrical power from the aircraft.

D. Do the G-Switch Operational Test.

CAUTION: Operate the Emergency Locator Transmitter system only during the first five minutes of each hour. If you must complete the functional test at a time other than the first five minutes of the hour, you must do the test with a direct connection to the ELT and a 30 dB attenuator. Refer to the FAA Advisory Circular AC-91-44A.

CAUTION: Do not operate the emergency locator transmitter for more than five seconds at a time. Do not operate the ELT again for 15 seconds. The ELT will transmit a 406.028 MHz signal after the ELT is active for approximately 50 seconds. This signal is identified as a distress signal.

(1) Remove the ELT from the airplane. Refer to ELT Removal/Installation (On airplanes with the Artex C406-N.
(2) Install a jumper wire between pins 12 and 13 on the electrical connector of the ELT.

NOTE: The ELT will not activate with the G-switch unless electrical pins 12 and 13 have a jumper wire installed between them (this happens automatically when the ELT is locked into the mount tray with the electrical connector in position). Because of the potential physical damage that can occur if the jumper wire is not installed correctly, it is recommended that an experienced technician do this procedure.

(3) Put the ELT switch in the OFF position.
(4) Use a receiver, and set it to 121.5 MHz to listen for the aural warning sweep tone.
(5) Hold the ELT transmitter tightly in one hand and make a throwing movement followed by an opposite movement of the ELT transmitter.
(6) Make sure that the G-switch operates and that the aural warning sweep tone is heard on the receiver set to 121.5 MHz.
(7) Set the ELT switch to the ON position and then back to the OFF position to reset the G-switch.
(8) Remove the jumper wire from electrical pins 12 and 13 on the electrical connector of the ELT.
(9) Install the emergency locator transmitter in the airplane. Refer to ELT Removal/Installation (On airplanes with the Artex C406-N.

ARTEX ME406 EMERGENCY LOCATOR TRANSMITTER SYSTEM - DESCRIPTION AND OPERATION

1. General

A. An Artex ME406 Emergency Locator Transmitter (ELT) System is installed to help rescue teams find the airplane in the event of a crash. It is made to operate in a wide range of environmental conditions and is resistant to the forces caused by many types of accidents.

2. Description

A. Artex ME406 ELT.
   (1) The Artex ME406 Emergency Locator Transmitter (ELT) system includes an ELT unit, an integral battery pack, warning buzzer, internal G-switch, antenna, remote switch, cable assembly, and antenna coaxial cable. The ELT unit transmits on 121.5 MHz and 406.028 MHz.
   (2) The battery pack has two D-size lithium cells mounted under a battery cover. The battery pack is replaced as necessary in the field.
   (3) The ELT activates a buzzer that is installed near the ELT assembly. The buzzer makes a loud noise to let people know that the ELT is on.
   (4) The G-switch is internally installed in the ELT transmitter and is activated with a sudden reduction in forward speed.

B. Artex ELT Antenna.
   (1) The ELT system uses an antenna to transmit the emergency locator signal. The ELT antenna is installed on top of the tailcone skin, forward of the vertical stabilizer. The ELT antenna is connected with a coaxial cable to the ELT unit inside the dorsal.

C. ELT Remote Switch.
   (1) The ELT remote switch is installed on the right panel. The ELT remote switch is a two-position rocker switch that can be set in the ARM or the ON positions.

3. Operation

CAUTION: Operate the emergency locator transmitter (ELT) system only during the first five minutes of each hour. If you must complete the functional test at a time other than the first five minutes of the hour, you must do the test with a direct connection to the ELT and a 30 dB attenuator. Refer to the FAA Advisory Circular AC-91-44A.

CAUTION: Do not operate the emergency locator transmitter (ELT) for more than five seconds at a time. Do not operate the ELT again for 15 seconds. The ELT will transmit a 406.028 MHz signal after the ELT is active for approximately 50 seconds. This signal is identified as a distress signal.

A. Artex ME406 ELT.
   (1) During an accident, the ELT will activate automatically and transmit a standard swept tone on 121.5 MHz (emergency frequency). The 121.5 MHz signal will continue until the ELT battery has expired. Every 50 seconds for 440 milliseconds, the 406.028 MHz transmitter will activate and send a message to the satellite. The 406.028 MHz transmission will continue for 24 hours and then stop. During operation, the ELT will receive electrical power from the ELT battery pack only.

B. ELT Remote Switch.
   (1) The ELT can also be activated manually in the cockpit with the ELT remote switch. To manually activate the ELT, put the ELT remote switch in the ON position. The red LED will come on when the remote switch is set in the ON position. The ELT remote switch can also be used to do a test of the ELT system (refer to Artex ME406 Emergency Locator Transmitter - Troubleshooting). During typical operation, the ELT remote switch will be in the ARM position.

ARTEX ME406 EMERGENCY LOCATOR TRANSMITTER SYSTEM - TROUBLESHOOTING

1. General

A. This section contains the information that is needed to complete the self test for the ARTEX ME406 Emergency Locator Transmitter system. The system transmits on two frequencies at the same time.

2. Tools and Equipment

A. For information on tools and equipment, refer to Equipment and Furnishings - General.

3. ME406 Emergency Locator Transmitter Self Test Preparation

CAUTION: Operate the Emergency Locator Transmitter system only during the first five minutes of each hour. If you must complete the functional test at a time other than the first five minutes of the hour, you must do the test with a direct connection to the ELT and a 30 dB attenuator. Refer to the FAA Advisory Circular AC-91-44A.

CAUTION: Do not operate the emergency locator transmitter for more than five seconds at a time. Do not operate the ELT again for 15 seconds. The ELT will transmit a 406.028 MHz signal after the ELT is active for approximately 50 seconds. This signal is identified as a distress signal.

A. Prepare the Airplane for the ME406 Emergency Locator Transmitter Troubleshooting.
   (1) Put the BATTERY switch in the ON position.
   (2) Examine the ELT battery to make sure that it is serviceable.
      (a) If the battery must be replaced, follow the manufacturers instructions to replace it.

B. ELT 121.5 MHz Test.
   (1) Tune the receiver (usually the aircraft radio) to 121.5 MHz.
   (2) Set the ELT instrument panel remote switch to the ON position and wait for 3 sweeps on the receiver which takes about 1 second.
   (3) Set the remote switch back to the ARM (OFF) position immediately and the switch LED and buzzer will give 1 pulse. If more pulses are displayed, find the problem from the list below.
      (a) One flash - Shows that the system is operational and that no error conditions were found.
      (b) Three flashes - Shows an open or short condition on the antenna output or cable. Use the list below to isolate and repair the problem:
         1 Examine that the coaxial cable is connected and in good condition. Do a continuity check of the center conductor and shield. Examine for a shorted cable.
         2 Examine for a intermittent connection in the coaxial cable.
         3 Examine the antenna installation if this error code persists. This can be examined with a VSWR meter. Examine the antenna for opens, shorts, and a resistive ground plane connection.
      (c) Four flashes - This shows a low power condition. This occurs if the output power is below approximately 33 dBm (2 watts) for the 406.028 MHz signal, or 17 dBm (50mW) for the 121.5 MHz signal. Also this can show that the 406.028 MHz signal is off frequency. For this error code the ELT must be sent back for repair or replacement.
      (d) Five flashes - This shows that the ELT has not been programmed, however this does not show erroneous or corrupted programmed data.
      (e) Six flashes - This shows that the G-switch loop between pins 5 and 12 at the D-sub connector is not installed. The ELT will not activate during a crash.
         1 Do a resistance test to make sure the harness D-sub jumper is installed. There must be less than 1 ohm of resistance between pins 5 and 12.
      (f) Seven flashes- This shows that the ELT battery has too much accumulated operation time and must be replaced to meet FAA specifications.

C. Put the BATTERY switch in the OFF position.

ARTEX ME406 EMERGENCY LOCATOR TRANSMITTER SYSTEM - MAINTENANCE PRACTICES

1. General

A. This section gives maintenance practices for the emergency locator transmitter (ELT) system. Components in the ELT system include the ELT, antenna, remote switch, and buzzer.

2. Emergency Locator Transmitter (ELT) Removal/Installation

A. Remove the Emergency Locator Transmitter (ELT) (Refer to Figure 201).
(1) Make sure the MASTER switch is in the OFF position.
(2) Get access to the ELT.
(a) Put a support stand under the tail tie-down ring to support the tailcone. Refer to Chapter 7, Jacking - Maintenance Practices.
(b) Remove the rear seat. Refer to Rear Seat - Maintenance Practices.
(c) Remove the baggage curtain to get access to the ELT. Refer to Interior Upholstery - Maintenance Practices.
(3) Make sure the ON/ARM switch on the ELT in the ARM position.

CAUTION: Although the ELT is off with the electrical connector removed, the ELT can be activated if the switch on the front is moved to the ON position. Be careful not to move the switch to the ON position.

(4) Disconnect the BNC connector (PT1029) and the electrical connector (PT907) from the ELT.

NOTE: The ELT is off when the electrical connector is removed from the ELT.

(5) Open the Velcro strap that holds the ELT to the mounting tray.
(6) Remove the ELT from the airplane.

B. Install the Emergency Locator Transmitter (ELT) (Refer to Figure 201).

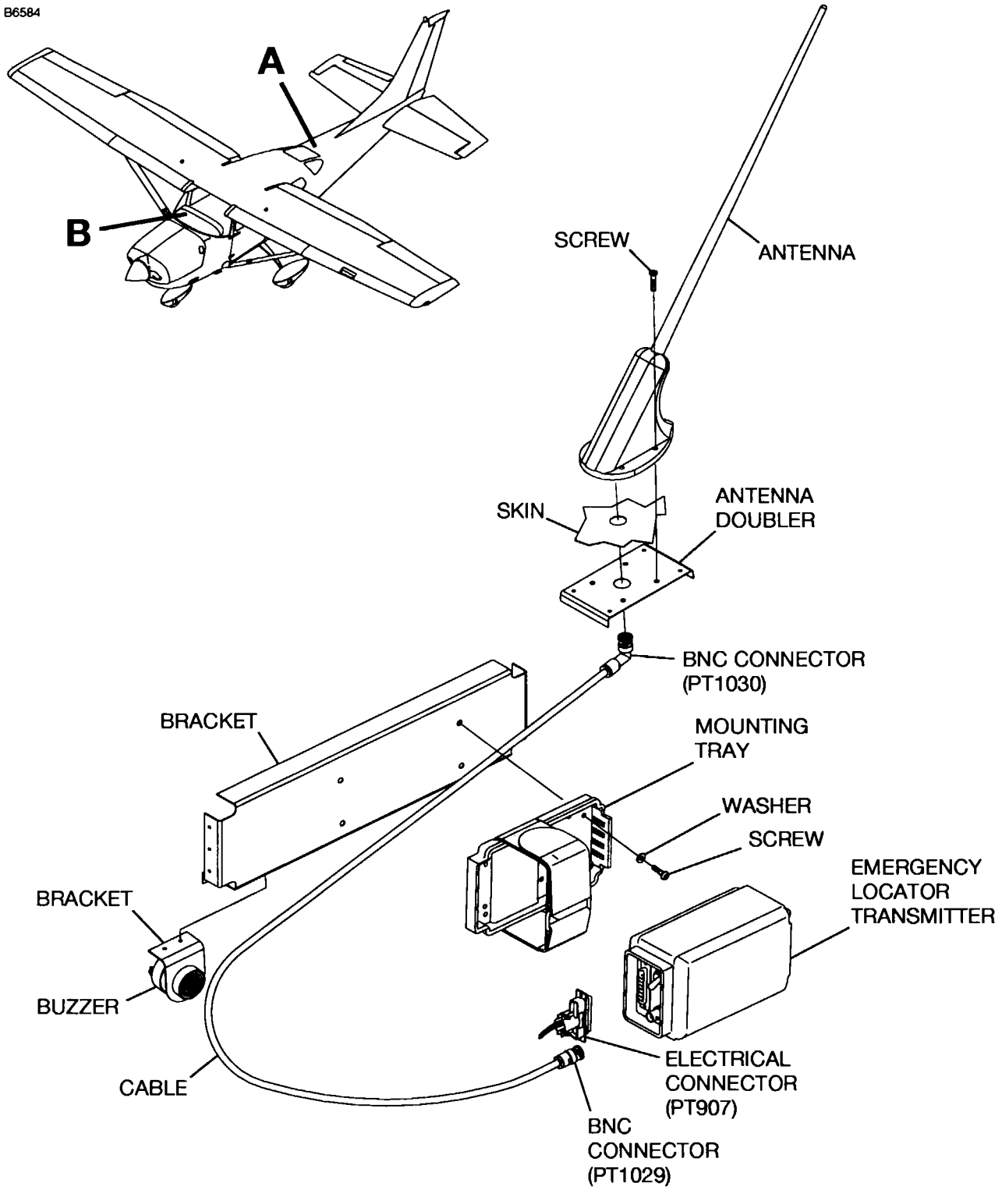
NOTE: The ELT is off when the electrical connector is removed from the ELT.

CAUTION: Although the ELT is off with the electrical connector removed, the ELT can be activated if the switch on the front is moved to the ON position. Be careful not to move the switch to the ON position.

(1) Put the ELT in the mounting tray at an angle to engage the lock mechanism at the opposite end of the ELT.
(2) Push the ELT down into the mounting tray until it is fully installed in the tray.
(3) Connect the Velcro strap that holds the ELT firmly to the mounting tray.
(4) Connect the BNC connector and the electrical connector to the ELT.
(5) Make sure the ON/ARM switch is in the ARM position.
(6) Complete a functional test of the ELT system to make sure the installation is correct. Refer to Artex ME406 Emergency Locator Transmitter - Troubleshooting.
(7) Install the baggage curtain. Refer to Interior Upholstery - Maintenance Practices.
(8) Install the rear seat. Refer to Rear Seat - Maintenance Practices.
(9) Remove the support stand. Refer to Chapter 7, Jacking - Maintenance Practices.

3. ELT Buzzer Removal/Installation

A. Remove the ELT Buzzer (Refer to Figure 201).
(1) Get access to the ELT.
(a) Put a support stand under the tail tie-down ring to support the tailcone. Refer to Chapter 7, Jacking - Maintenance Practices.
(b) Remove the rear seat. Refer to Rear Seat - Maintenance Practices.



DETAIL A

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Artex ME406 Emergency Locator Transmitter System Installation
Figure 201 (Sheet 1)

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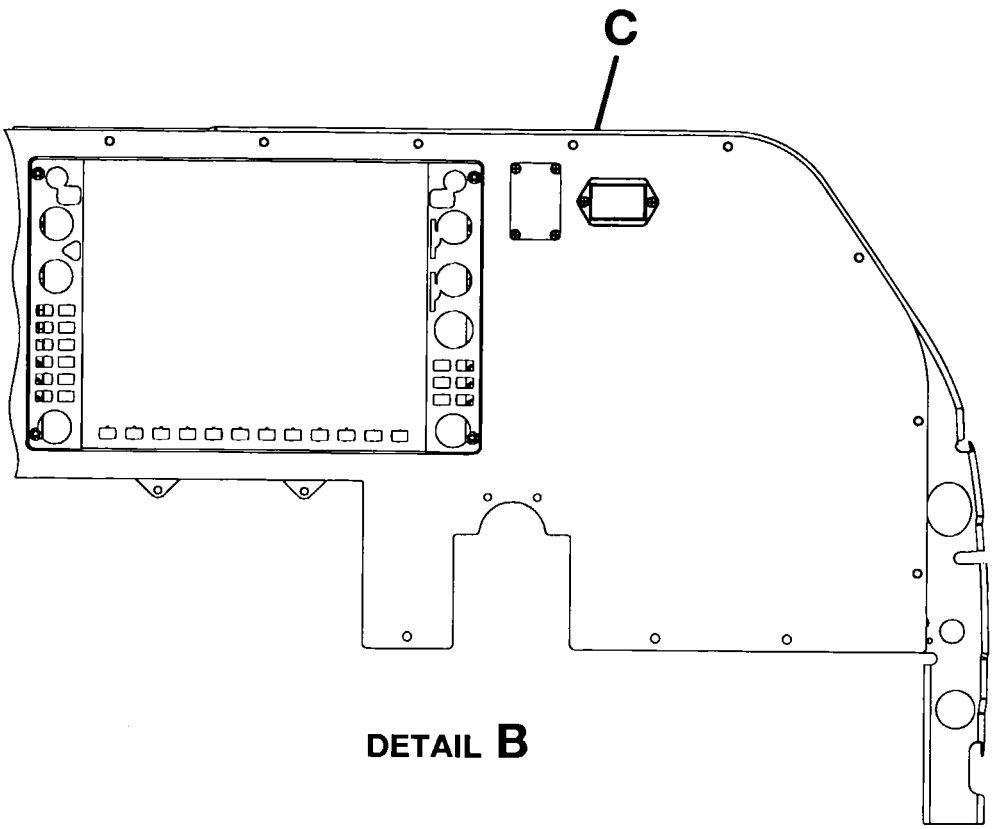
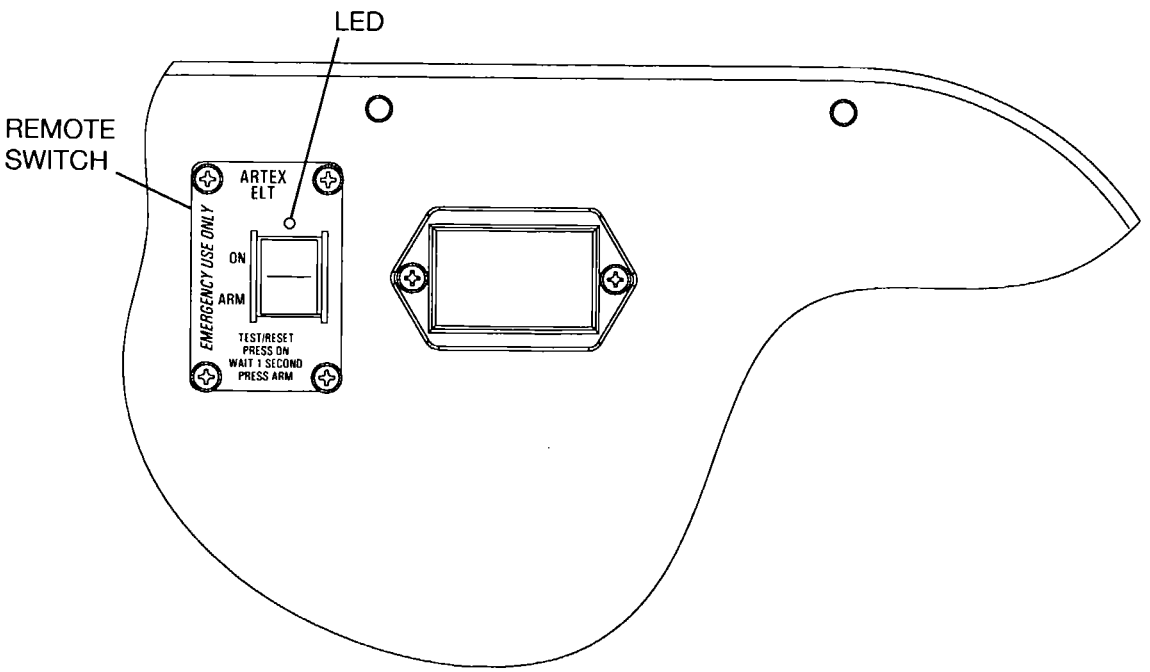


DETAIL B



DETAIL C

B1218T1089
C1218T1089

Artex ME406 Emergency Locator Transmitter System Installation
Figure 201 (Sheet 2)

(c) Remove the baggage curtain to get access to the ELT. Refer to Interior Upholstery - Maintenance Practices.
(2) Make sure that the ELT master switch on the ELT transmitter is in the ARM position.
(3) Tag the wires and terminals for identification.
(4) Remove the screws that attach the electrical terminals to the buzzer.
(5) Loosen the black retainer ring on the outboard side of the buzzer.
(6) Remove the buzzer from the bracket.

B. Install the ELT Buzzer (Refer to Figure 201).
(1) Put the buzzer in the bracket.
(2) Install the black retainer ring on the outboard face of the buzzer.
(3) Connect the electrical wires to the buzzer with the screws.
(4) Do a check of the ELT system. Refer to Refer to Artex ME406 ELT Functional Test.
(5) Install the baggage curtain. Refer to Interior Upholstery - Maintenance Practices.
(6) Install the rear seat. Refer to Rear Seat - Maintenance Practices.
(7) Remove the support stand. Refer to Chapter 7, Jacking - Maintenance Practices.

4. Remote Switch Removal/Installation

A. Remove the Remote Switch.
(1) Remove electrical power from the aircraft.
(2) Get access to the ELT.
(a) Put a support stand under the tail tie-down ring to support the tailcone. Refer to Chapter 7, Jacking - Maintenance Practices.
(b) Remove the rear seat. Refer to Rear Seat - Maintenance Practices.
(c) Remove the baggage curtain to get access to the ELT. Refer to Interior Upholstery - Maintenance Practices.
(3) Disconnect the electrical connector (PT907) from the ELT.
(4) Remove the screws from the front of the switch.
(5) Pull the remote switch from the panel to get to the electrical connector.
(a) Disconnect the connector from the back of the switch.

B. Install the Remote Switch.
(1) Connect the electrical connector to the back of the switch.
(2) Put the remote switch into the panel.
(a) Install the screws that attach the switch to the panel.
(3) Connect the electrical connector to the ELT.
(4) Complete a functional test of the ELT system to make sure the installation is correct. Refer to Artex ME406 ELT Functional Test.
(5) Install the baggage curtain. Refer to Interior Upholstery - Maintenance Practices.
(6) Install the rear seat. Refer to Rear Seat - Maintenance Practices.
(7) Remove the support stand. Refer to Chapter 7, Jacking - Maintenance Practices.

5. ELT Antenna Removal/Installation

A. Remove the ELT Antenna (Refer to Figure 201).
(1) Remove the screws that attach the antenna to the fuselage.
(2) Pull the antenna upward from fuselage and disconnect the BNC connector (PT1030) from antenna.
(3) Remove the antenna from the airplane.
(4) Remove sealant from antenna and airplane.

B. Install the ELT Antenna (Refer to Figure 201).
(1) Put the antenna near the mounting position and connect the BNC connector (PT1030) to the antenna.
(2) Install the screws that attach the antenna to the fuselage.
(3) Make sure that there is a correct electrical bond between the antenna and the airplane structure.
(a) Remove one screw.

(b) With an ohmmeter, measure the electrical resistance from the antenna base metal insert to the structure at the screw positon.

NOTE: The maximum allowable resistance (in ohms) at each of the four measured positions is 0.0025.

(c) Install the screw and remove and install each of the remaining screws in turn as you measure the electrical resistance at each screw hole.

(4) Apply a fillet seal around the antenna with Type I Class B Sealant. Do not cover the screw head with the sealant. Refer to Chapter 20, Fuel, Weather and High-Temperature Sealing - Maintenance Practices.

(5) Do a functional test of the ELT system. Refer to Artex ME406 ELT Functional Test.

ARTEX ME406 EMERGENCY LOCATOR TRANSMITTER (ELT) SYSTEM - INSPECTION/CHECK

1. General

A. This section gives the procedures that are necessary to do the inspection and operational checks necessary to comply with 14 CFR 91.207, for the Artex ME406 Emergency Locator Transmitter (ELT) System. The system transmits on two frequencies. The 121.5 MHz frequency has the standard swept tone that rescue personnel can follow to the source. The other frequency is 406.028 MHz and is used to activate a satellite tracking system. The 406.028 MHz frequency includes other information such as the country code of the airplane, the aircraft identification beacon serial number, the 24-bit address, the tail number, or other identification.

2. Tools and Equipment

A. For information on tools and equipment, refer to Equipment and Furnishings - General.

3. Artex ME406 Emergency Locator Transmitter (ELT) Inspection

A. Get access to the ELT.
   (1) Put a support stand under the tail tie-down ring to support the tailcone. Refer to Chapter 7, Jacking - Maintenance Practices.
   (2) Remove the rear seat. Refer to Rear Seat - Maintenance Practices.
   (3) Remove the baggage curtain to get access to the ELT. Refer to Interior Upholstery - Maintenance Practices.
   (4) Remove the bolts, tiedowns, and plastic closeout from the lower baggage area (Zone 240). Refer to Airplane Zoning - Description and Operation.

B. Do an inspection of the ELT, mounting tray, antenna, and the ELT battery for condition and correct installation.
   (1) Make sure that the ELT switch, found on the forward end of the ELT, is set to the ARM position.
   (2) Remove the ELT from the mounting tray. Refer to Artex ELT ME406 Emergency Locator Transmitter System - Maintenance Practices.

CAUTION: Do not use solvents to clean the ELT, mounting tray, or electrical contacts. Solvents used in these areas can cause damage to the ELT housing.

   (3) Examine the ELT and the mounting tray for correct installation, cleanliness, cracks, or other damage.
   (4) Examine the ELT battery for corrosion.
   (5) Look at the battery expiration date.
      (a) Make sure that the battery life limit is not expired.
      (b) Make sure that the battery expiration date is shown correctly in the Maintenance Records.

NOTE: The battery manufacturer puts a mark on the battery to show the battery life limit. When you install a new battery in an ELT, make sure a record of the expiration date is put in the space given on the ELT name and data plate.

      (c) If you have to replace the ELT battery, refer to Artex Maintenance Manual 570-1600.
      (d) You must replace the ELT battery with a new battery if one or more of the conditions that follow occur:
         - Use of the ELT battery in an emergency
         - Operation for an unknown amount of time
         - Use for more than one hour of cumulative time
         - Replacement date shown on the battery label has expired.
      (e) Record the new battery expiration date in the maintenance log if you replaced it.
   (6) Examine the ELT antenna for correct installation and cracks or other damage.
   (7) Install the ELT into the mounting tray. Refer to Artex ELT ME406 Emergency Locator Transmitter System - Maintenance Practices.

4. Artex ME406 Emergency Locator Functional Test

NOTE: If possible, do the test procedure for the emergency locator transmitter inside a metal hangar with the doors closed to decrease the signal transmission from the ELT unit during the test.

A. Do a G-Switch Operational Test:

CAUTION: Operate the Emergency Locator Transmitter (ELT) system only during the first five minutes of each hour. If you must complete the functional test at a time other than the first five minutes of the hour, you must do the test with a direct connection to the ELT and a 30 dB attenuator. Refer to the FAA Advisory Circular AC-91-44A.

CAUTION: Do not operate the Emergency Locator Transmitter (ELT) for more than five seconds at a time. Do not operate the ELT again for 15 seconds. The ELT will transmit a 406.028 MHz distress signal after it is activated for approximately 50 seconds.

(1) Remove the ELT from the airplane. Refer to Artex ELT ME406 Emergency Locator Transmitter System - Maintenance Practices.
(2) Install a jumper wire between pins 5 and 12 on the electrical connector of the ELT.

CAUTION: It is recommended that an experienced technician do this procedure because of the potential physical damage that can occur if the jumper wire is not installed correctly.

NOTE: The ELT will not activate with the G-switch unless electrical pins 5 and 12 have a jumper wire installed between them (this happens automatically when the ELT is locked into the mount tray with the electrical connector in position).

(3) Make sure the ELT switch is in the ARM position.
(4) Use a receiver set to 121.5 MHz to listen for the aural warning sweep tone.
(5) Hold the ELT transmitter tightly in one hand and make a throwing movement followed by an opposite movement of the ELT transmitter.
(6) Make sure that the G-switch operates and that the aural warning sweep tone is heard on the receiver set to 121.5 MHz.
(7) Set the ELT switch to the ON position and then back to the ARM position to reset the G-switch.
(8) Remove the jumper wire from electrical pins 5 and 12 on the electrical connector of the ELT.
(9) Install the emergency locator transmitter in the airplane. Refer toArtex ELT ME406 Emergency Locator Transmitter System - Maintenance Practices.

B. Do a Transmitter Test of the Artex ME406 Emergency Locator Transmitter (ELT) System:

CAUTION: Operate the Emergency Locator Transmitter (ELT) system only during the first five minutes of each hour. If you must complete the functional test at a time other than the first five minutes of the hour, you must do the test with a direct connection to the ELT and a 30 dB attenuator. Refer to the FAA Advisory Circular AC-91-44A.

CAUTION: Do not operate the Emergency Locator Transmitter (ELT) for more than five seconds at a time. Do not operate the ELT again for 15 seconds. The ELT will transmit a 406.028 MHz distress signal after it is activated for approximately 50 seconds.

(1) Make sure the BATTERY switch and the AVIONICS switches are in the OFF position.
(2) Connect external electrical power to the airplane.
(3) Make sure that the COM/NAV 1 and AUD/MKR circuit breakers on the circuit breaker panel are engaged.
(4) Set the BATTERY switch to the ON position.
(5) Set the AVIONICS switches to the ON position.
(6) Get access to the ELT. Refer to Artex ELT ME406 Emergency Locator Transmitter System - Maintenance Practices
(7) Make sure that the ELT remote switch on the right panel is in the ARM position.
(8) Set one of the communication units to receive a frequency of 121.5 MHz.
(9) Set the communication unit to the airplane speakers at an audio level loud enough to be heard.

NOTE: The SARSAT tester is used as an example to gather test information. However, other equivalent test equipment such as the Aeroflex IFR 4000 Communications Test Set is acceptable.

(10) Have another person use the SARSAT tester set to the RECV function. Refer to Figure 601.

NOTE: The SARSAT tester must be less than 15 feet from the ELT antenna and must have a line-of-sight between the ELT antenna and SARSAT tester.

NOTE: The person with the SARSAT tester must make sure that the ELT buzzer is heard during the test.

NOTE: If it is necessary to do the transmitter test after the first five minutes of the hour, the SARSAT tester is connected directly to the ELT with a coaxial cable and a 30 dB attenuator. You will not hear the sweep tone from the ELT on the airplane speakers with the attenuator installed.

(11) Install the 30 dB attenuator between the ELT and SARSAT tester if necessary.
(12) Set the ELT remote switch on the right panel to the ON position.
(13) Let the ELT make three sweeps on the airplane speakers.

NOTE: This will take one second. The ELT remote switch will start to flash.

(14) Set the ELT remote switch back to the ARM position and monitor the LED.

NOTE: The ELT will do a self-test. The LED will stay on for one second and the ELT sweeps are not audible on the airplane speakers if the ELT operation is normal.

NOTE: The ELT does not transmit a 406.028 MHz test signal to the SARSAT tester until the ELT remote switch is set back to the ARM position.

(15) If the LED continues to flash, refer to Artex ME406 Emergency Locator Transmitter - Troubleshooting.

(16) If the SARSAT tester did not receive a 406.028 MHz signal and the ELT remote switch LED does not show a transmitter problem, do the test again.

(17) When the SARSAT tester receives a 406.028 MHz signal, scroll the pages on the tester and make sure of the information that follows:

(a) Make sure the information shown by the SARSAT tester agrees with the placard on the ELT.

NOTE: The information that follows must match the data on the ELT placard:

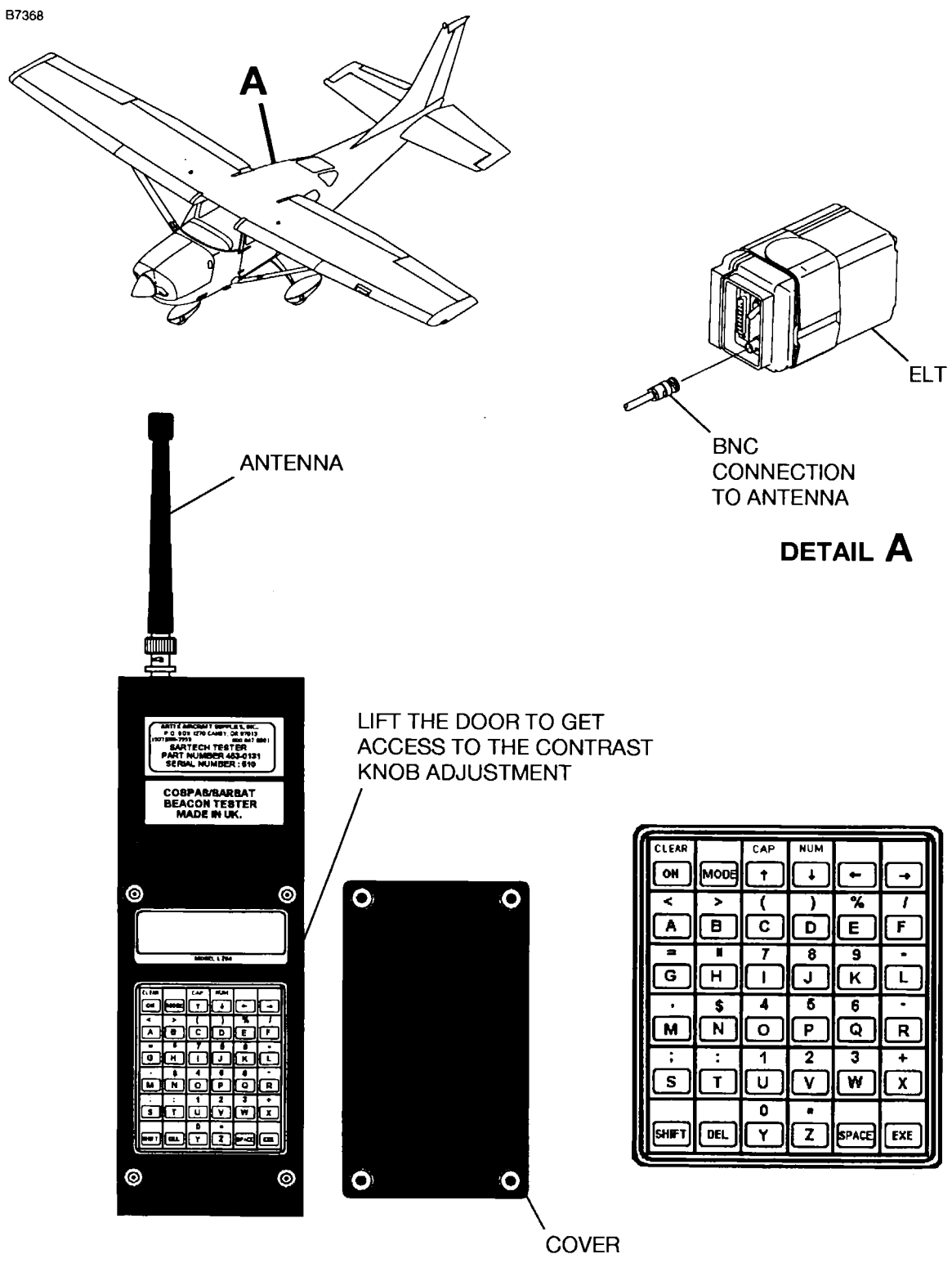
- COUNTRY code
- 15-digit Hex code ID
- Aircraft identification number.

(b) Make sure that the SARSAT tester shows the messages that follow:

- S' TEST OK
- Frequency - PASS
- Homing frequency
- Message format (short).

NOTE: When ownership of an aircraft is transferred within the same country, the ME406 ELT should be reregistered with the applicable authority. When an aircraft with a ME406 ELT changes tail number or country registration, the ELT will need to have the new identification data entered. The ELT will also need to be registered with the applicable authority.

(18) Install the bolts, tiedowns, and plastic closeout to the lower baggage area (Zone 240). Refer to Airplane Zoning - Description and Operation.



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Artex ME406 Emergency Locator Transmitter (ELT) SARSAT Test Set-up
Figure 601 (Sheet 1)

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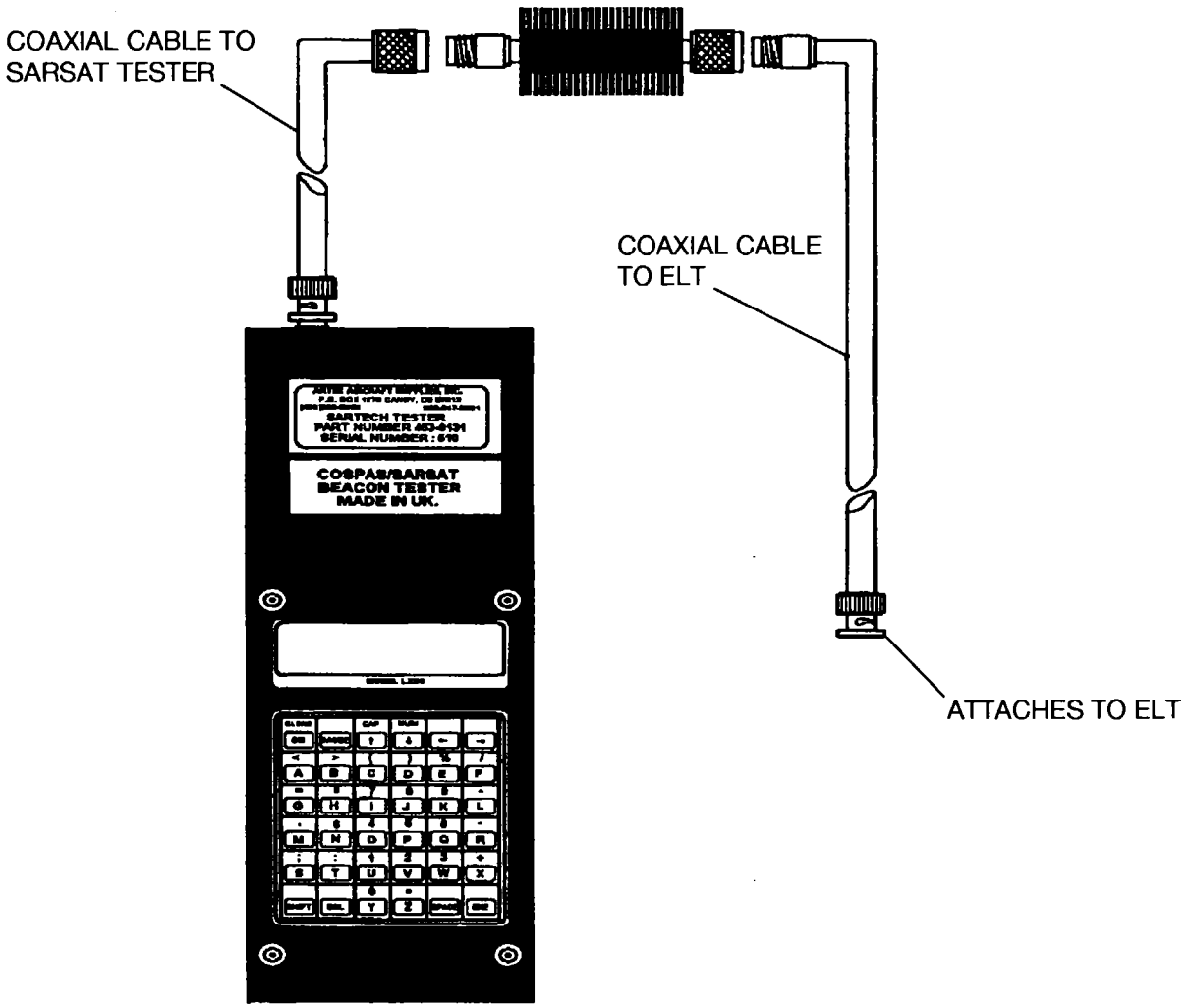

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Artex ME406 Emergency Locator Transmitter (ELT) SARSAT Test Set-up
Figure 601 (Sheet 2)

CARBON MONOXIDE DETECTOR - MAINTENANCE PRACTICES

1. General

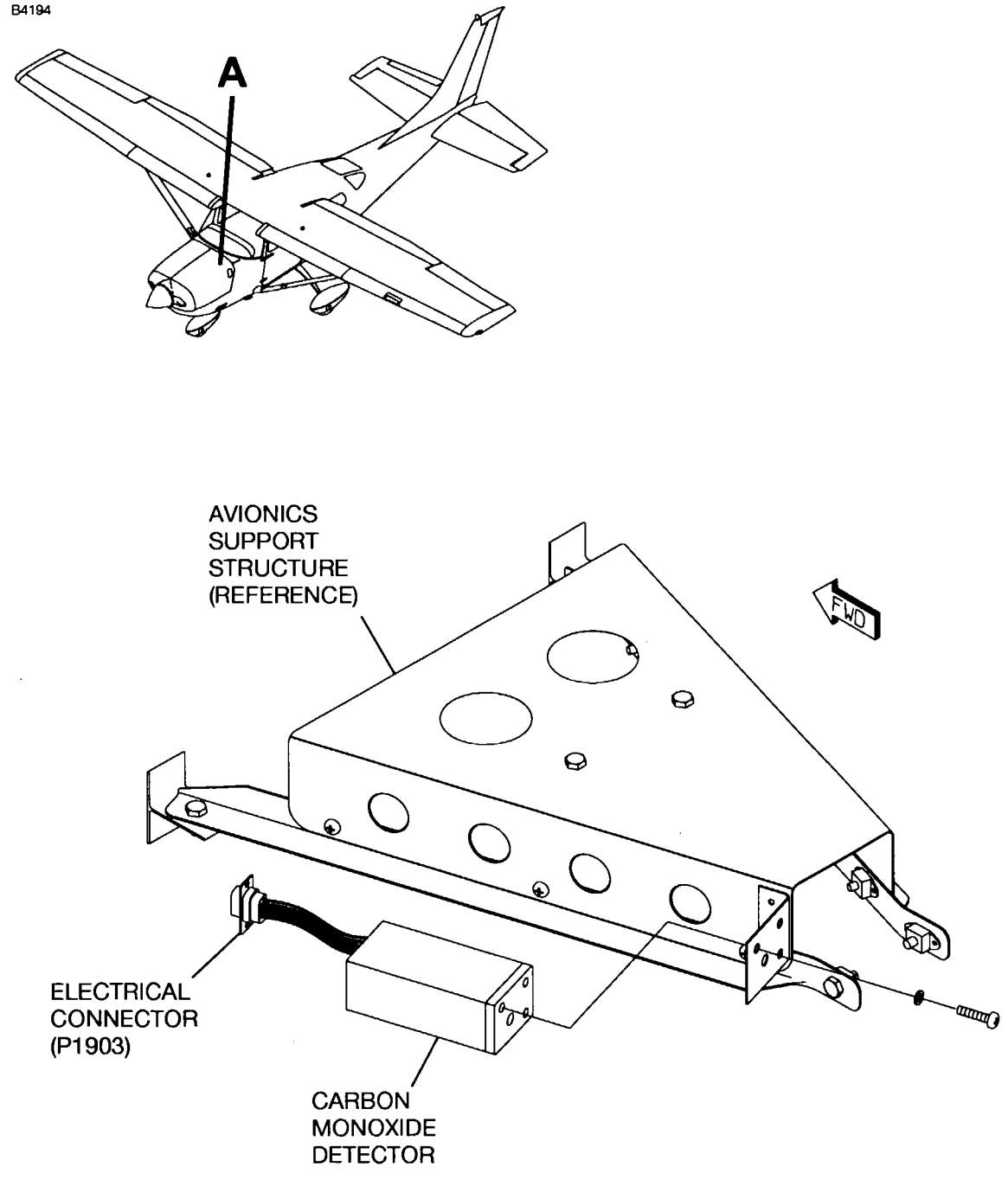
A. The carbon monoxide (CO) detector is installed on Airplanes 206008285 and On and Airplanes T206008586 and On that have the Garmin G1000.

B. The CO detector detects, measures, and gives an alert to the crew before the cockpit level of CO reaches a critical level. The CO data is displayed and controlled through the CO detector RS232 interface with the multi-function display (MFD).

2. Carbon Monoxide Detector Removal/Installation

A. Carbon Monoxide Detector Removal (Refer to Figure 201).
(1) Put the AVIONICS MASTER switch in the off position.
(2) Remove the MFD from the copilot side of the instrument panel. Refer to Chapter 34, Control Display Unit - Maintenance Practices.
(3) Disconnect the electrical connector (P1903) from the CO detector.
(4) Remove and keep the screws and washers that connect the CO detector to the avionics support structure.
(5) Remove the CO detector from the airplane.

B. Carbon Monoxide Detector Installation (Refer to Figure 201).
(1) Put the CO detector in position on the avionics support structure.
(2) Attach the CO detector to the structure with the kept screws and kept washers.
(3) Connect the electrical connector (P1903) to the CO detector.
(4) Install the MFD on the copilot side of the instrument panel. Refer to Chapter 34, Control Display Unit - Maintenance Practices.
(5) Put the AVIONICS MASTER switch in the ON position.
(6) On the primary flight display (PFD), do a check to make sure that the CO detector operates correctly.



DETAIL A
AIRPLANES THAT HAVE GARMIN G1000

1210T1001
A1218T1087

Carbon Monoxide Detector Installation
Figure 201 (Sheet 1)

SOUNDPROOFING AND INSULATION - MAINTENANCE PRACTICES

1. General

A. The airplane utilizes soundproofing and insulation throughout the fuselage area. This material is glued in place using spray adhesive. Any time old material is being replaced, care should be taken to ensure all traces are removed from fuselage skin before reapplication. For a list of spray adhesives, refer to Equipment/Furnishing - General.

B. For installation locations of soundproofing and insulation , refer to Figure 201 and Figure 202.

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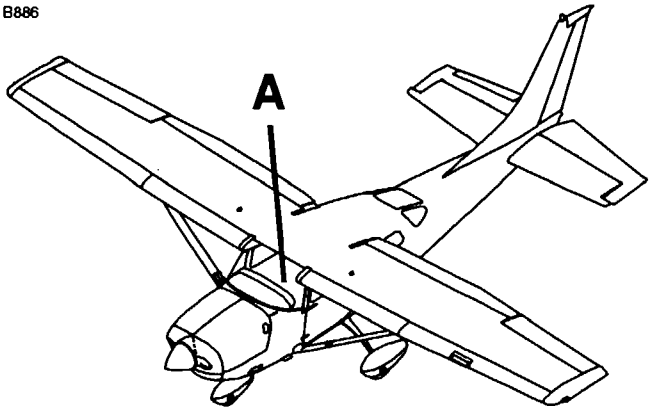

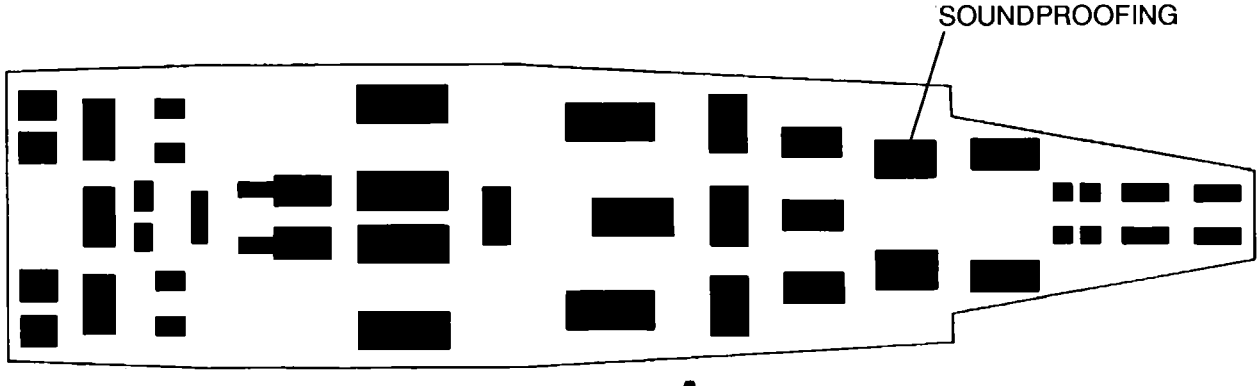

DETAIL A

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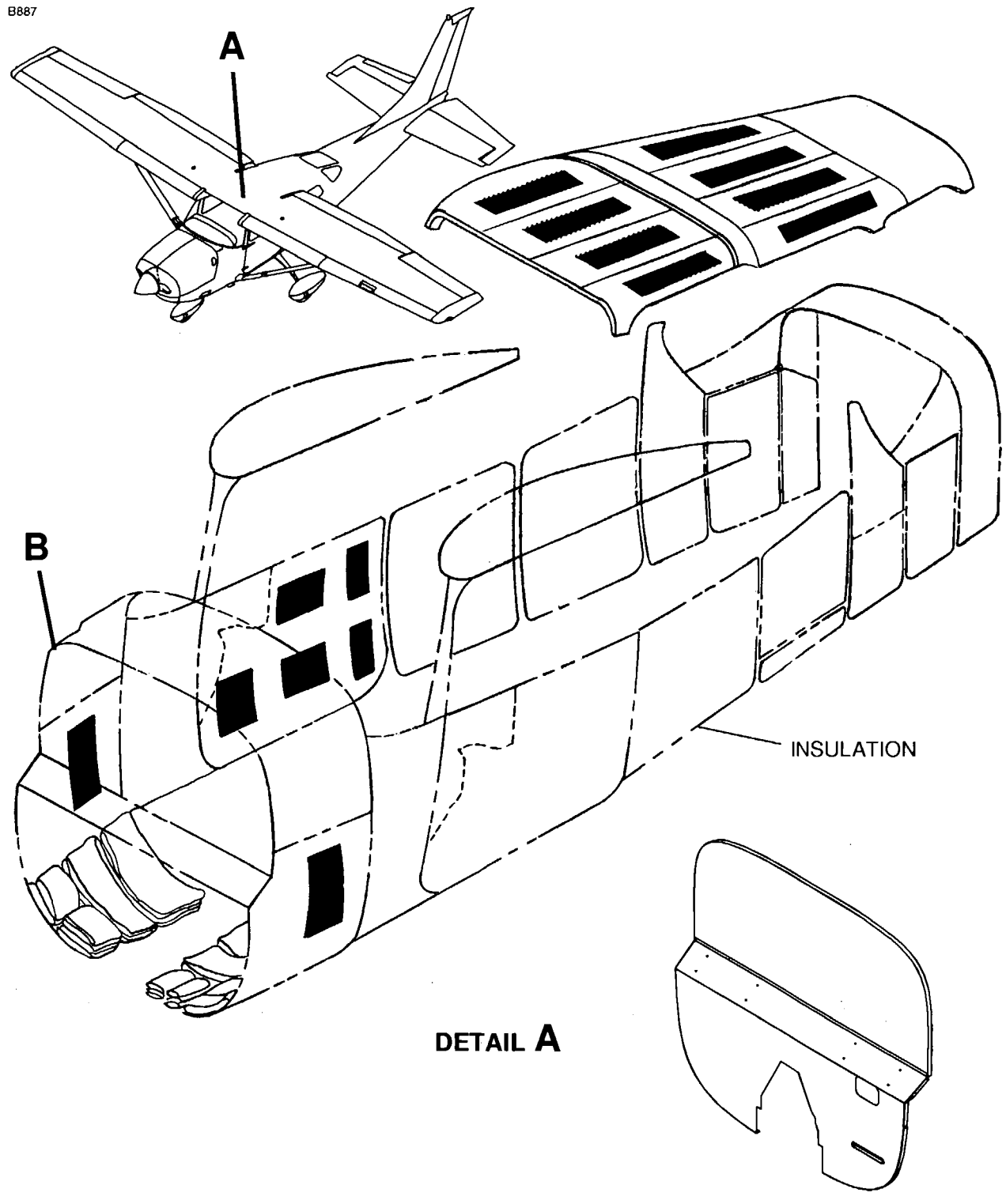
Soundproofing Installation
Figure 201 (Sheet 1)



Insulation Installation
Figure 202 (Sheet 1)

CHAPTER

26

FIRE PROTECTION

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
26-Title		
26-List of Effective Pages		
26-Record of Temporary Revisions		
26-Table of Contents		
26-00-00	Page 1	Dec 2/2002
26-20-00	Pages 1-2	Dec 2/2002

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

FIRE PROTECTION - GENERAL

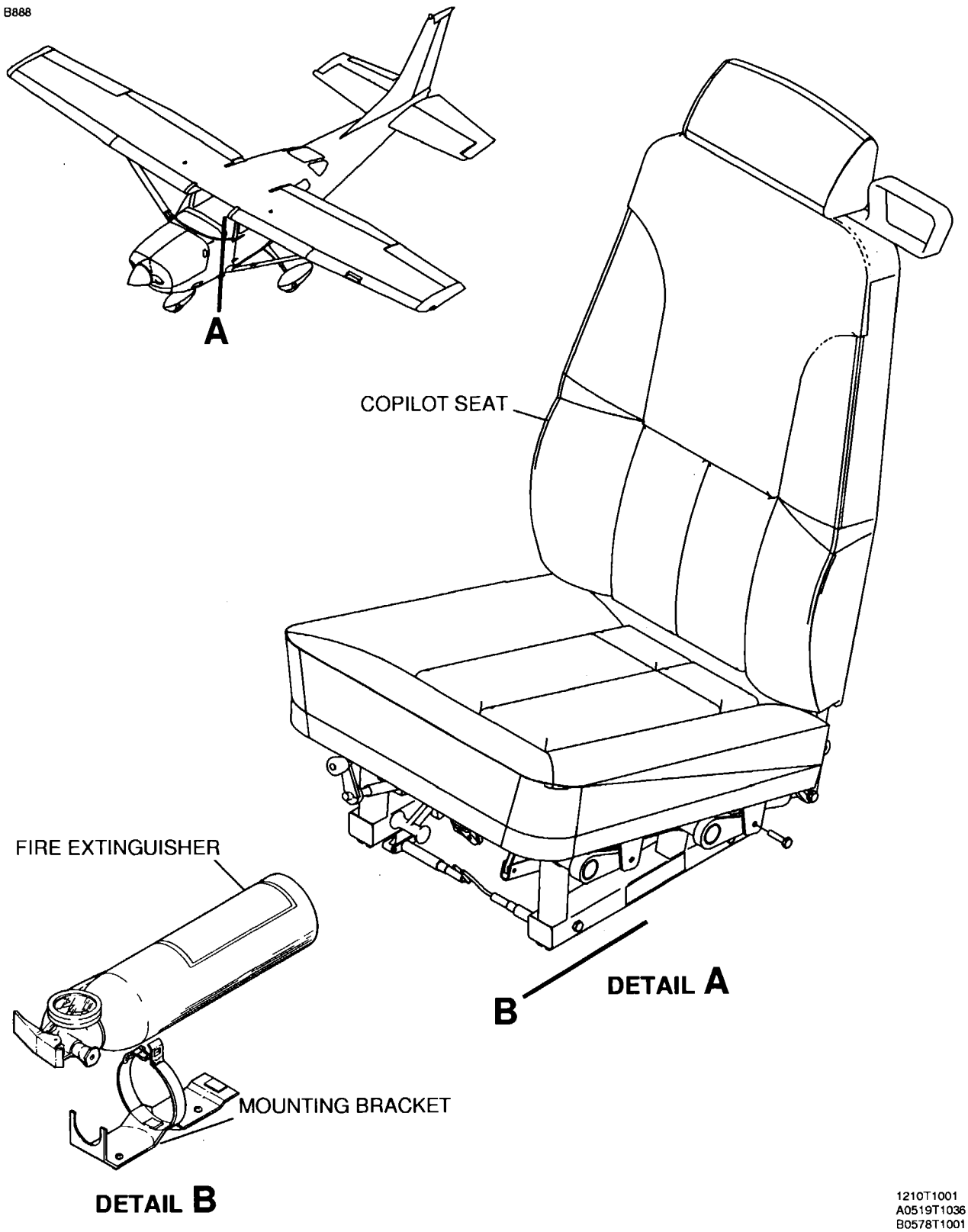
1. Scope and Definition

A. This chapter contains a single section which describes the portable fire extinguisher used in the cabin.

HAND FIRE EXTINGUISHER - DESCRIPTION AND OPERATION

1. Description and Operation

A. A portable, hand operated fire extinguisher is mounted on the floor between the pilot and copilot seats for use in the event of a fire. The extinguishing agent is Halon 1211 and may be used on solid combustible, electrical or liquid fires. Servicing of the extinguisher can be handled by most fire equipment dealers. The fire extinguisher is mounted within a quick release, clamp-type bracket assembly. (Refer to Figure 1).



Fire Extinguisher Installation
Figure 1 (Sheet 1)

CHAPTER

27

FLIGHT CONTROLS

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
27-Title		
27-List of Effective Pages		
27-Record of Temporary Revisions		
27-Table of Contents		
27-00-00	Page 1	Dec 2/2002
27-10-00	Pages 101-103	Dec 2/2002
27-10-00	Pages 201-210	Jul 1/2007
27-20-00	Pages 101-103	Dec 2/2002
27-20-00	Pages 201-208	Jul 3/2006
27-21-00	Pages 101-102	Dec 2/2002
27-21-00	Pages 201-203	Dec 2/2002
27-30-00	Pages 101-103	Dec 2/2002
27-30-00	Pages 201-209	Jul 3/2006
27-31-00	Pages 101-104	Dec 2/2002
27-31-00	Pages 201-211	Jul 3/2006
27-32-00	Pages 201-203	Dec 2/2002
27-50-00	Pages 101-104	Dec 2/2002
27-50-00	Pages 201-211	Jul 1/2007
27-51-00	Pages 201-204	Dec 2/2002

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

FLIGHT CONTROLS - GENERAL

1. General

A. This chapter provides maintenance of components which furnish a means of manually controlling the flight attitude characteristics of the airplane, including flaps.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the following items:

NAME	NUMBER	MANUFACTURER	USE
Tensiometer	T52002101	Pacific Scientific Electro Kinetics Div. 402 E. Guitierrez St. Santa Barbara, CA 93102	To measure and obtain cable tension.
Inclinometer	SE716	Cessna Aircraft Company Cessna Parts Distribution Department 701, CPD 2 5800 East Pawnee Road Wichita, KS 67218-5590	To measure control surface travel.

3. Definition

A. This chapter is divided into sections and subsections to assist maintenance personnel in locating specific systems and information. The following is a brief description of each section. For locating information within the chapter, refer to the Table of Contents at the beginning of the chapter.
   (1) The aileron section provides information on control wheels, cables, linkage and aileron assemblies.
   (2) The rudder section provides information on rudder pedals, cables, linkage and rudder assembly.
   (3) The elevator section provides information on control column, cables, linkage and elevator assemblies.
   (4) The flap section provides information on the flap actuator, cables, linkage, and the flap assemblies.

AILERON CONTROL SYSTEM - TROUBLESHOOTING

1. General

A. A troubleshooting chart has been developed to aid the maintenance technician in system understanding. Refer to Figure 101.

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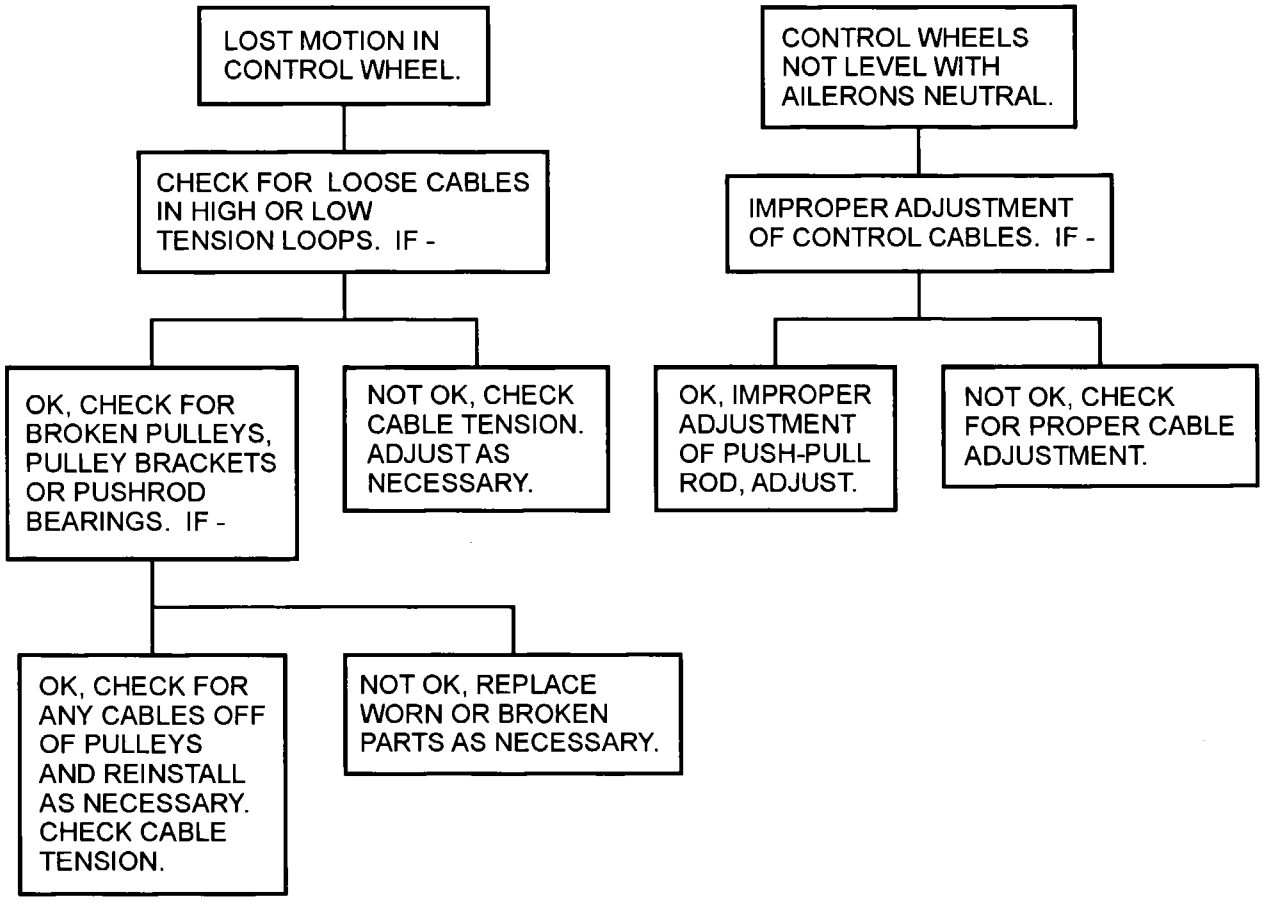
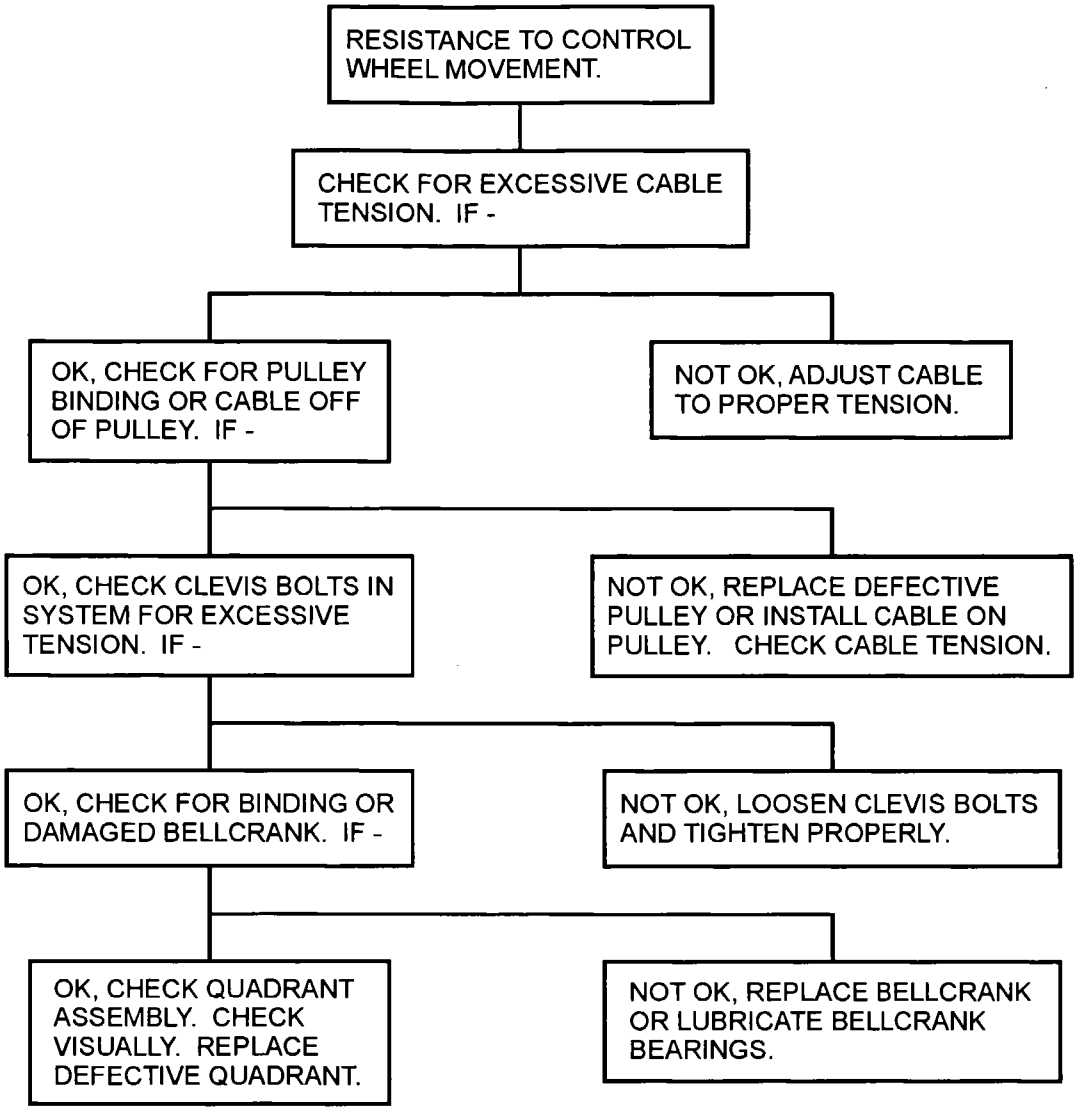


Aileron System Troubleshooting Chart
Figure 101 (Sheet 1)

B890



Aileron System Troubleshooting Chart
Figure 101 (Sheet 2)

AILERON CONTROL SYSTEM - MAINTENANCE PRACTICES

1. General

A. The ailerons receive input from the pilot or copilot control wheel through a series of cables, bellcranks and pushrods.

B. Rotation of the control wheel rotates four bearing roller assemblies on the end of the control wheel tube, which in turn, rotates a square control tube assembly inside and extending from the control wheel tube. Attached to this square tube is a quadrant which operates the aileron system. This same arrangement is provided for both control wheels. Synchronization of the control wheels is obtained by the interconnect cable, turnbuckle and adjustment terminals. The forward end of the square control tube is mounted in a bearing block on firewall and does not move fore-and-aft, but rotates with the control wheel. The four bearing roller assemblies on the end of the control wheel tube reduce friction as the control wheel is moved fore-and-aft for elevator system operation. A sleeve weld assembly containing the bearings which permit the control wheel tube to rotate within it, is secured to the control wheel tube by a sleeve and retaining ring in such a manner it moves fore-and-aft with the control wheel tube. This movement allows the push-pull tube attached to the sleeve weld assembly to operate an elevator arm assembly, to which one elevator cable is attached. A torque tube connects this arm assembly to the one on the opposite end of the torque tube, to which the other elevator cable is attached. When dual controls are installed, the copilot's control wheel is linked to the aileron and elevator control systems in the same manner as the pilots control wheel.

2. Control Wheel Removal/Installation

NOTE: Pilot and copilot control wheel removal/installation is typical.

A. Remove Control Wheel (Refer to Figure 201).
(1) Disconnect electrical connector P1 from control wheel.
(2) Remove screws and washers securing control wheel to control tube.
(3) Remove control wheel.

B. Install Control Wheel (Refer to Figure 201).
(1) Position control wheel in control tube and install screws and washers.
(2) Connect electrical connector to control wheel.

3. Control Column Removal/Installation

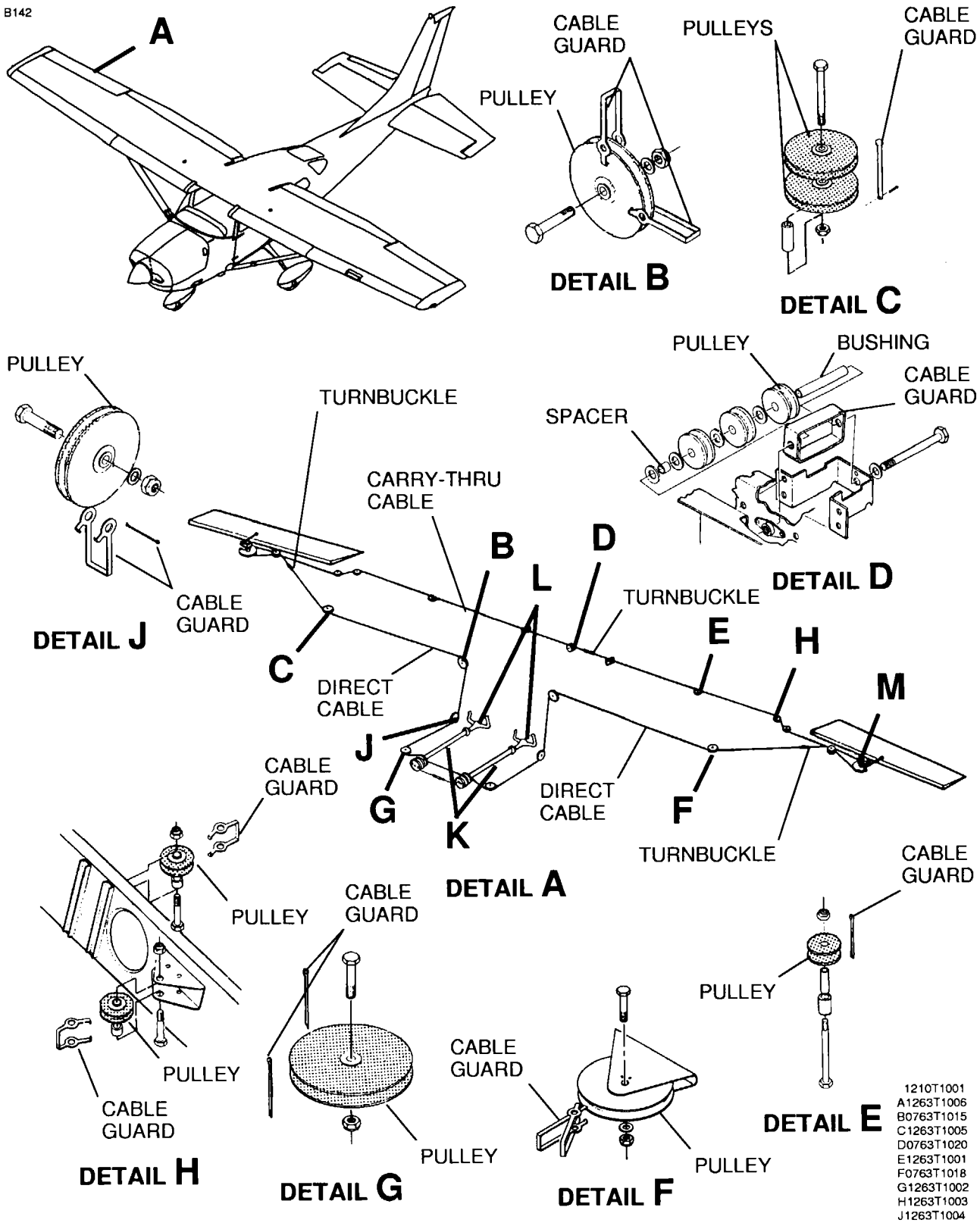
A. Remove Control Column (Refer to Figure 201).
(1) Remove control wheel.
(2) Remove screw securing glide plug to control tube assembly and remove plug and glide assembly.
(3) Disconnect push-pull tube at sleeve assembly.
(4) Remove screws securing column support bracket assembly at instrument panel.

NOTE: To ease removal of control wheel tube assembly, snap ring may be removed from its locking groove to allow sleeve assembly additional movement.

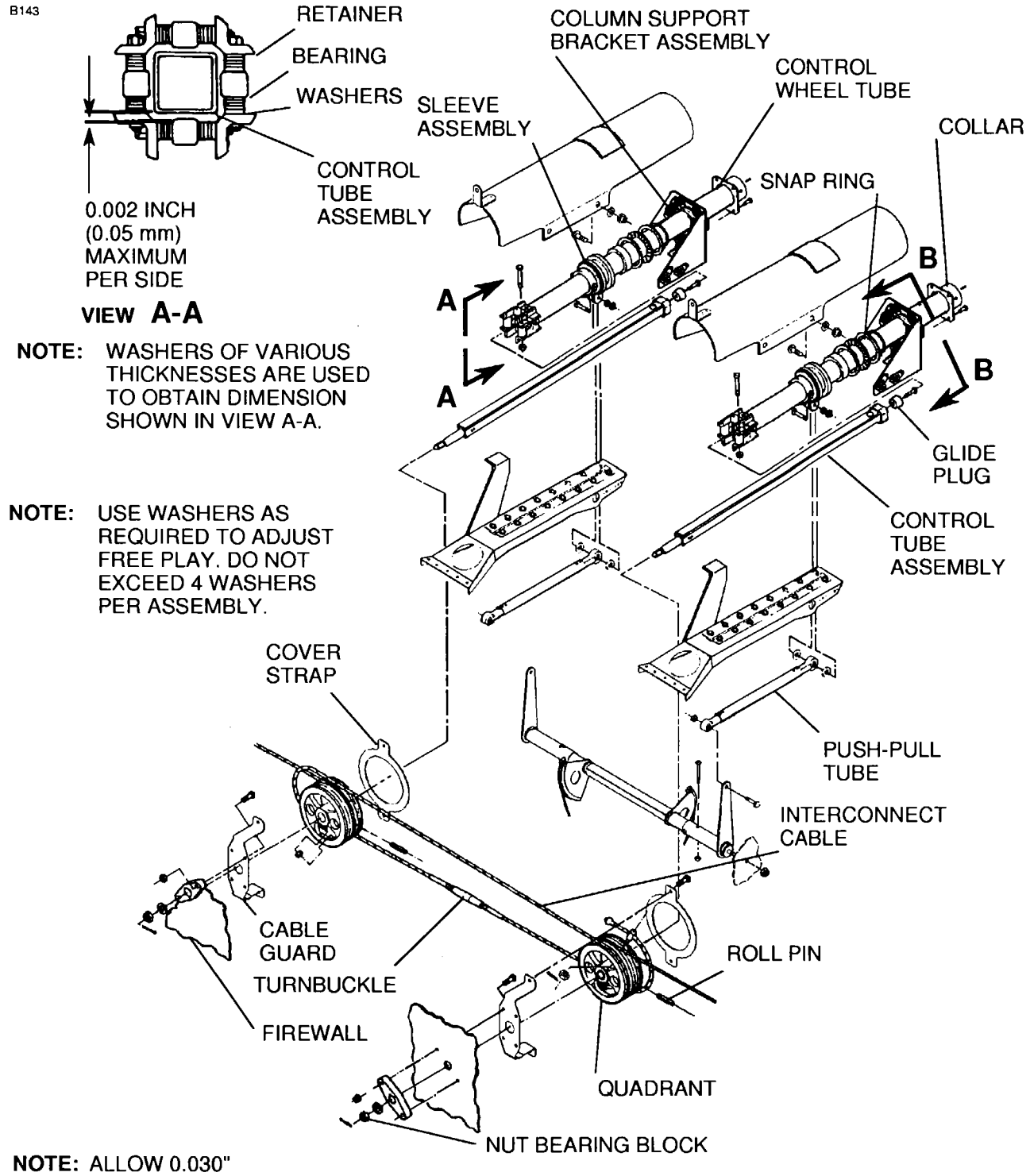
(5) Using care, pull control wheel tube assembly aft and work assembly out through instrument panel.

NOTE: If removal of control tube assembly is necessary, proceed to step (6).

(6) Remove the column support bracket assembly and safety clips and release direct cable tension at turnbuckles.
(7) Remove safety wire and relieve interconnect cable tension at turnbuckle.
(8) Remove safety wire and remove roll pin through quadrant and control tube assembly.
(9) Remove cotter pin, nut and washer from control tube assembly from bearing block on the forward side of the firewall.
(10) Using care, pull control tube assembly aft and remove quadrant.



Aileron Control System Installation
Figure 201 (Sheet 1)



Aileron Control System Installation
Figure 201 (Sheet 2)

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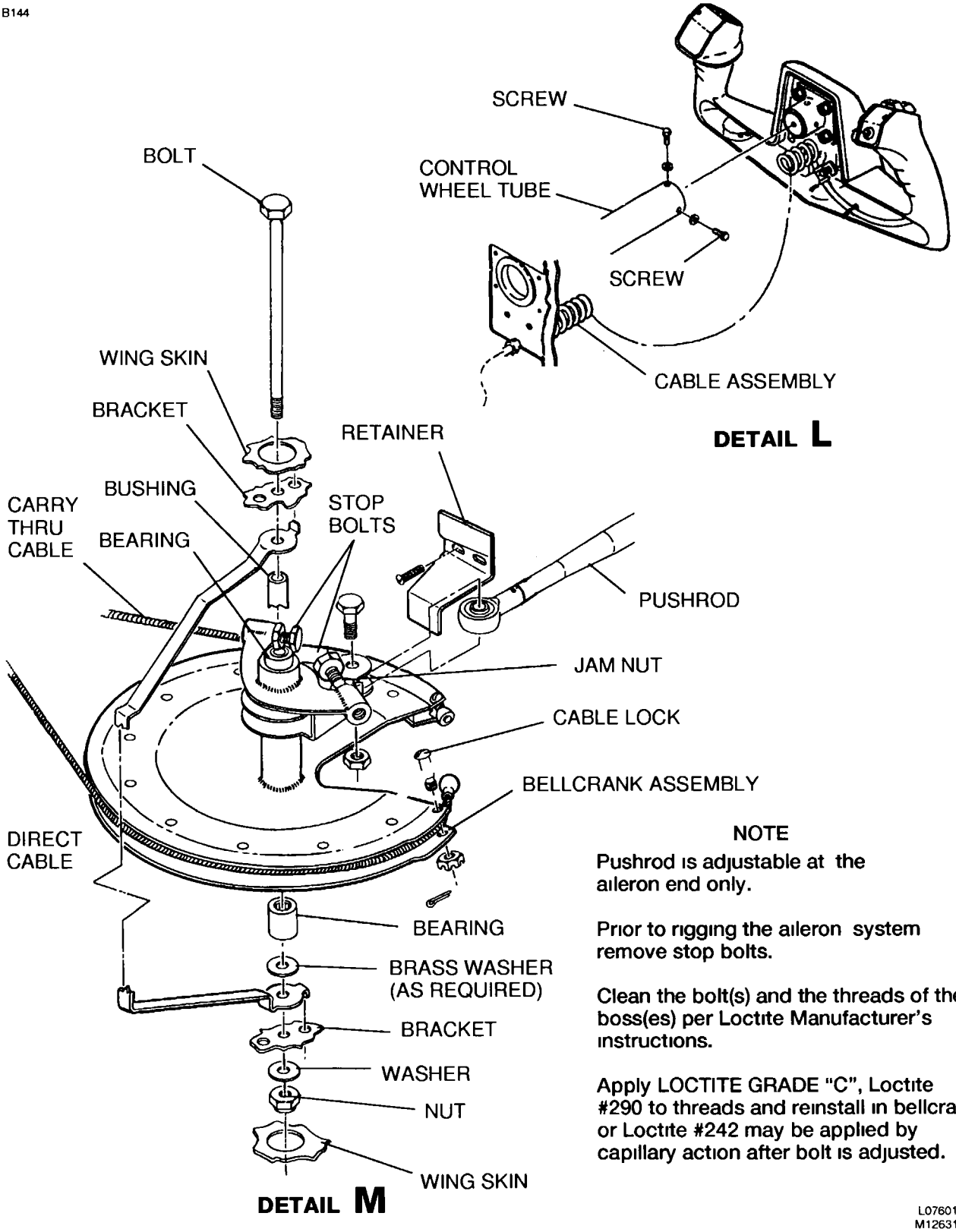

DETAIL L

DETAIL M

NOTE

Pushrod is adjustable at the aileron end only.

Prior to rigging the aileron system remove stop bolts.

Clean the bolt(s) and the threads of the boss(es) per Loctite Manufacturer's instructions.

Apply LOCTITE GRADE "C", Loctite #290 to threads and reinstall in bellcrank or Loctite #242 may be applied by capillary action after bolt is adjusted.

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Aileron Control System Installation
Figure 201 (Sheet 3)

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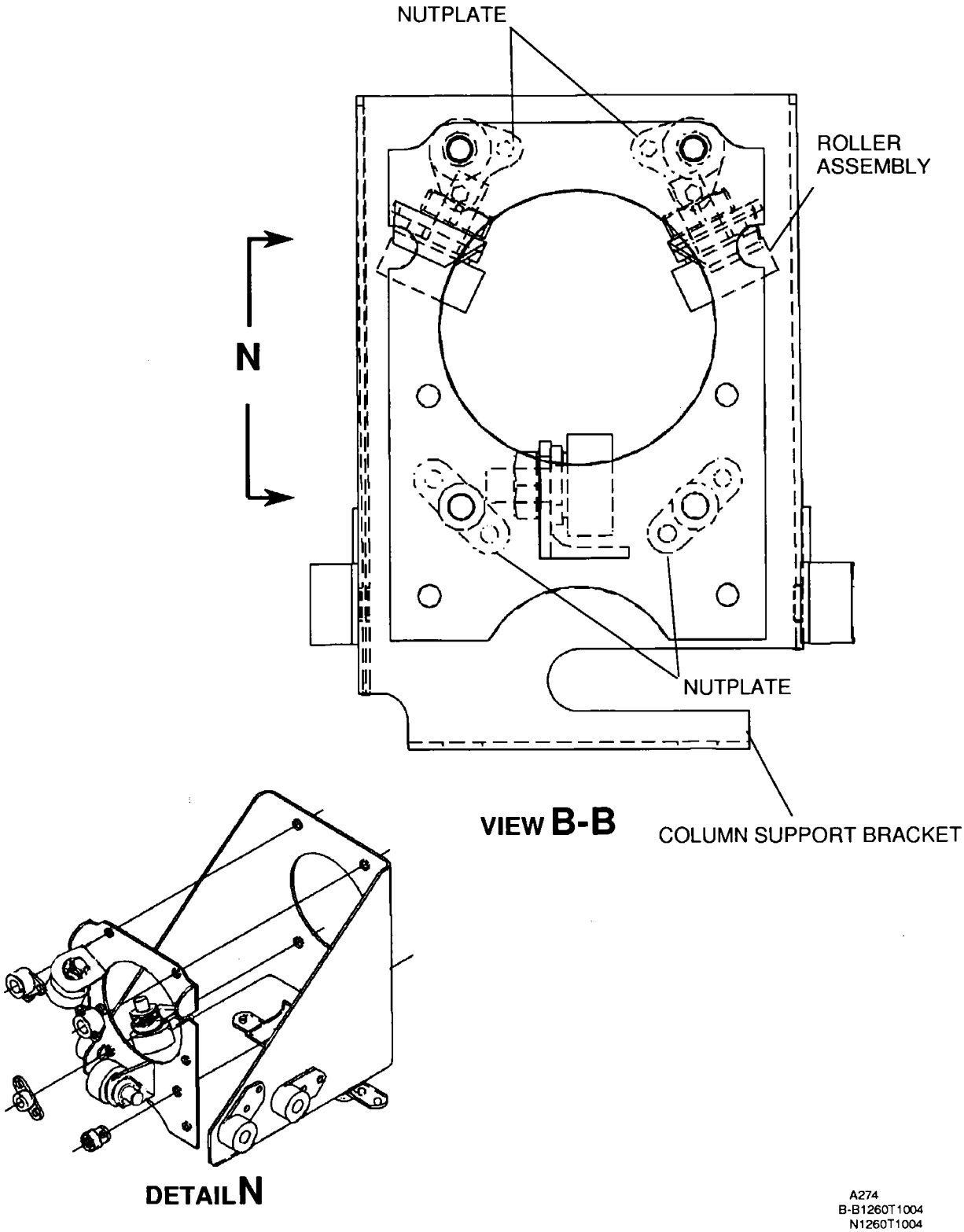

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Aileron Control System Installation
Figure 201 (Sheet 4)

B. Install Control Column (Refer to Figure 201).

NOTE: If control tube assembly was not removed, proceed to step (2).

(1) Position control tube assembly through instrument panel and install quadrant.
(2) Install roll pin through quadrant and control tube assembly. Safety wire roll pin.
(3) Install column support bracket assembly on instrument panel.
(4) With control through bearing block on firewall, install washer, nut, and cotter pin.

NOTE: Allow 0.030" minimum clearance between bearing block and nut after tightening

(5) If snap ring was removed from sleeve assembly, reinstall.
(6) Connect push-pull tube to sleeve assembly.
(7) Install glide plug assembly, secure with screw, and adjust the control column for freeplay.
(a) Tighten the screw sufficiently to eliminate lateral freeplay in the control column, yet not so tight as to produce any detectable fore-aft drag friction throughout the entire elevator control travel.

NOTE: Do not leave the screw loose when adjusting drag. This adjustment is similar to a typical wheel bearing adjustment, for example, tighten until all freeplay is removed and drag can be detected. Gradually back off (loosen) the adjustment screw in small steps of about 1/8th of a revolution per step until the point where minimum freeplay and no drag is obtained.

(8) Install control wheel.
(9) For rigging system. Refer to Adjustment/Test.

4. Bearing Roller Adjustment

NOTE: Each bearing assembly has an 0.062" eccentric adjustment when installed, for aligning the control tube weld assembly and push-pull tube with the guide assembly.

A. Adjust Bearing Rollers (Refer to Figure 201).
(1) Remove control wheel assembly.
(2) Install column support bracket assembly (bearings on aft side) and leave loose with instrument panel.
(3) Align control wheel tube assembly for free travel of push-pull tube along full length of guide assembly.
(4) Center column support bracket assembly over tube and bearing assembly and secure plate to instrument panel.
(5) Adjust each bearing to control wheel tube assembly and tighten bearings in place.
(6) Remove column support bracket assembly and reinstall with bearings facing forward.

5. Aileron Removal/Installation

A. Remove Aileron (Refer to Figure 201).
(1) Disconnect aileron pushrod at aileron.
(2) Disconnect electrical bonding straps.
(3) Remove screws and nuts attaching aileron hinges to trailing edge of wing.
(4) Using care, pull aileron out and down to slide hinges from under wing skin and auxiliary spar reinforcements.

B. Install Aileron (Refer to Figure 201).
(1) Position aileron hinges between skin and auxiliary spar reinforcements and install screws and nuts attaching hinges to trailing edge of wing.
(2) Reconnect electrical bonding straps.
(3) Attach aileron pushrod to aileron.
(4) Check aileron travel. Refer to Adjustment/Test below.

6. Aileron Bellcrank Removal/Installation

NOTE: Left and right aileron bellcrank removal/installation is typical.

A. Remove Aileron Bellcrank (Refer to Figure 201).
   (1) Remove access plates (520AB, 520BB, 620AB, and 620BB) inboard of bellcrank on underside of each wing. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
   (2) Remove safety clip from carry through cable turnbuckle and relieve control cable tension by loosening turnbuckle.
   (3) Disconnect control cables from bellcrank.
   (4) Remove safety clip from direct cable turnbuckle and relieve control cable tension by loosening turnbuckle.
   (5) Disconnect control cables from bellcrank.
   (6) Disconnect aileron pushrod at bellcrank.
   (7) Remove nuts, washers and bolts securing bellcrank to wing structure.
   (8) Remove bellcrank through access opening, using care that bearing bushing is not dropped from bellcrank.

      NOTE: Brass washers may be used as shims between lower end of bellcrank and lower bracket. Retain these shims. Tape open ends of bellcrank to prevent dust and dirt from entering bellcrank needle bearings.

B. Install Aileron Bellcrank (Refer to Figure 201).
   (1) Install bellcrank to structure, ensuring bushing is in place.
   (2) Install brass washers between lower end of bellcrank and wing channel to shim out excess clearance.
   (3) Connect aileron pushrod to bellcrank.
   (4) Connect control cables to bellcrank. Ensure required spacers and bushings are properly installed.
   (5) Adjust cable tension and rig system. Refer to Adjustment/Test.
   (6) Install safety clips on turnbuckles. Refer to Chapter 20, Safetying - Maintenance Practices.
   (7) Install access plates (520AB, 520BB, 620AB, and 620BB) inboard of bellcrank on underside of each wing. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

7. Adjustment/Test

A. Rig Aileron Cables (Refer to Figure 201, Figure 202, and Figure 203).
   (1) Remove the safety clips from the turnbuckles and release the cable tension on the direct and the carry-thru cables at the bell cranks in the wings.
   (2) Disconnect the push-pull rods at the ailerons.

      CAUTION: Maintain specified control tension.

   (3) Remove safety clip from turnbuckle and adjust interconnect cable tension to 40 pounds, +10 or -10 pounds (177.93 N, +44.48 or -44.48 N) at 70 °F (21 °C.). Refer to the Charts in Figure 203 for the correct tensions at other temperatures. Position control wheels level (synchronized).

      NOTE: Prior to rigging the aileron system remove stop bolts. Clean the bolt(s) and the threads of the boss(es) per Loctite Manufacturer's instructions.

   (4) Tape a bar across both control wheels to hold them in neutral position.

      CAUTION: Maintain specified control tension.

   (5) Adjust direct cable turnbuckles and carry–thru cable turnbuckle to position bellcranks approximately in neutral with 40 pounds, +10 or -10 pounds tension (177.93 N, +44.48 or -44.48 N) at 70 °F (21 °C) on carry-thru cable. Refer to the Charts in Figure 203 for the correct tensions at other temperatures. Disregard tension on direct cables.

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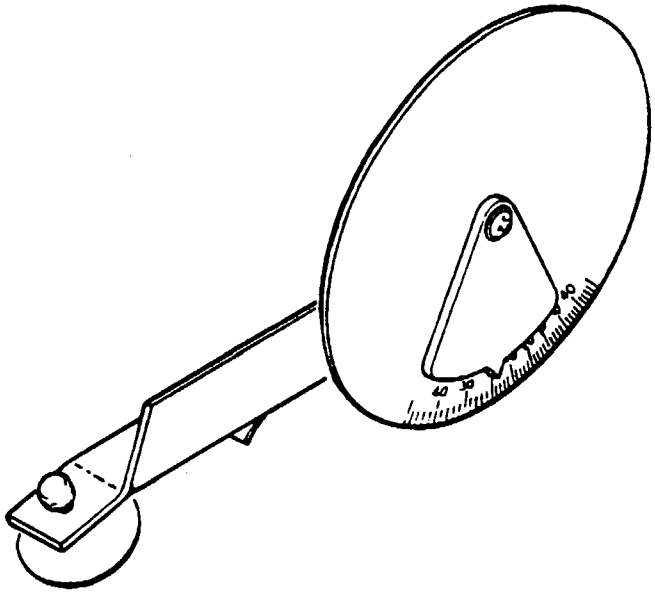
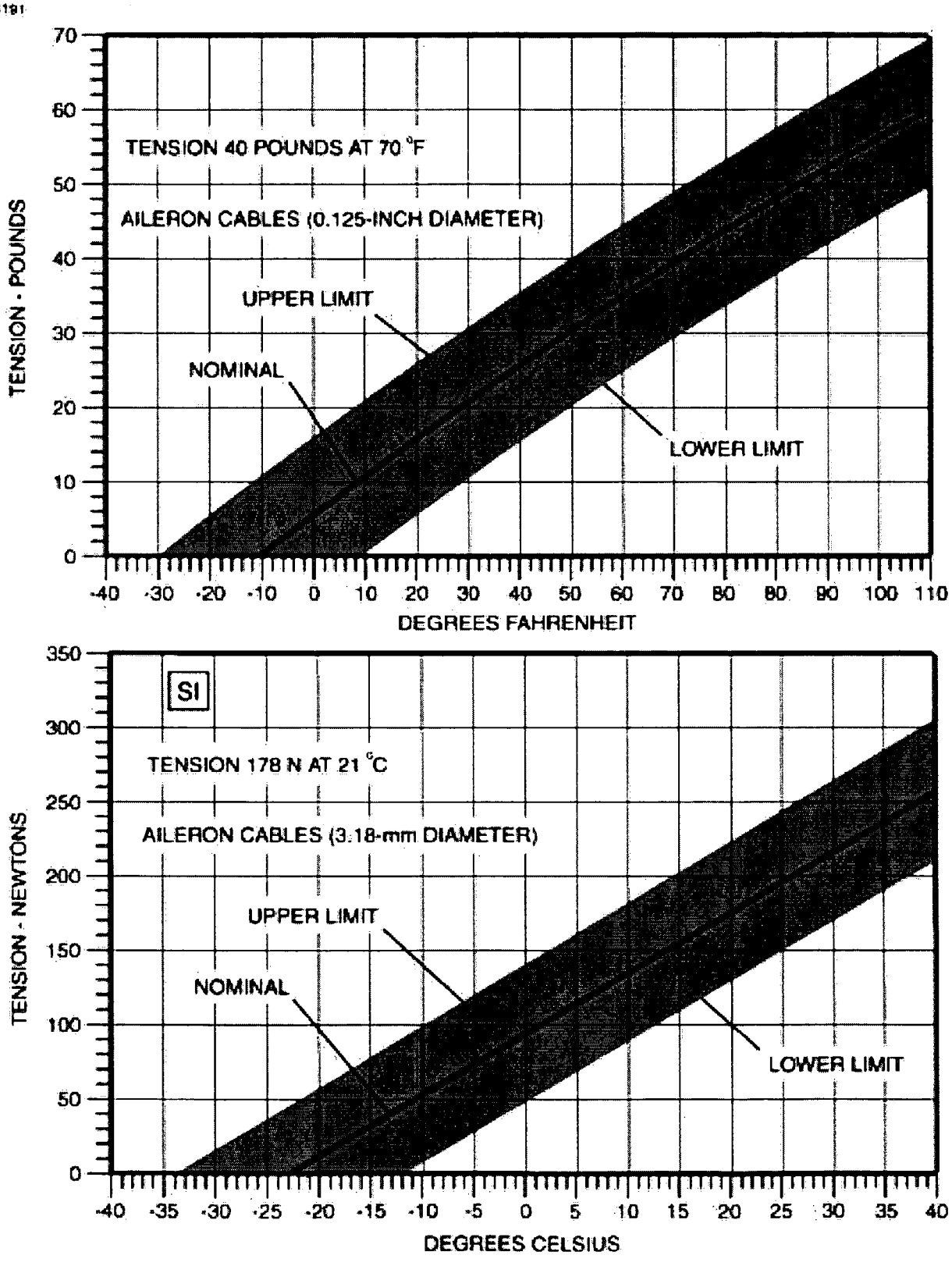


TOOL NUMBER SE716

0780T1001

Inclinometer for Measuring Control Surface Travel
Figure 202 (Sheet 1)



Aileron Cable Tension
Figure 203 (Sheet 1)

(6) Adjust push-pull rods at each aileron until ailerons are neutral with reference to trailing edge of wing flaps. Ensure wing flaps are full UP when making this adjustment.

NOTE: Pushrod is adjustable at the aileron end only.

(7) With ailerons in neutral position (streamlined), mount an inclinometer on trailing edge of both ailerons and set to 0 degrees.

(8) Remove bar from control wheels and adjust aileron stop bolts to obtain the proper aileron travel, 21 degrees, +2 or -2 degrees up and 14 degrees 30 minutes, +2 or -2 degrees down.

NOTE: Apply LOCTITE GRADE "C", Loctite #290 to threads and reinstall in bellcrank, or Loctite #242 may be applied by capillary action after bolt is adjusted.

WARNING: Make sure ailerons move in the correct direction when operated by the control wheel.

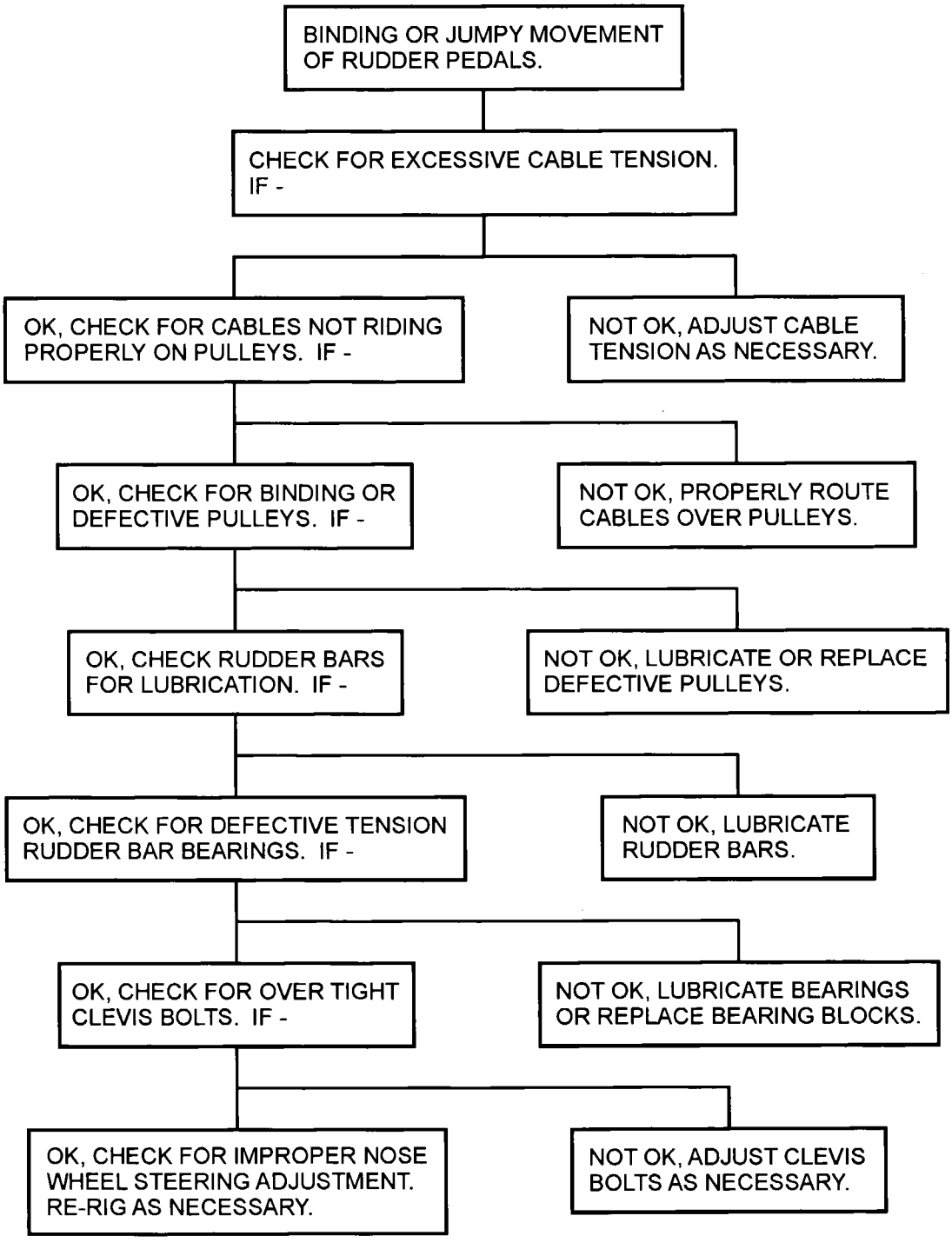
(9) Make sure safety clips are installed in all turnbuckles, all cables and cable guards are properly installed, all jam nuts are tight, and that you replace all items removed for access.

RUDDER CONTROL SYSTEM - TROUBLESHOOTING

1. General

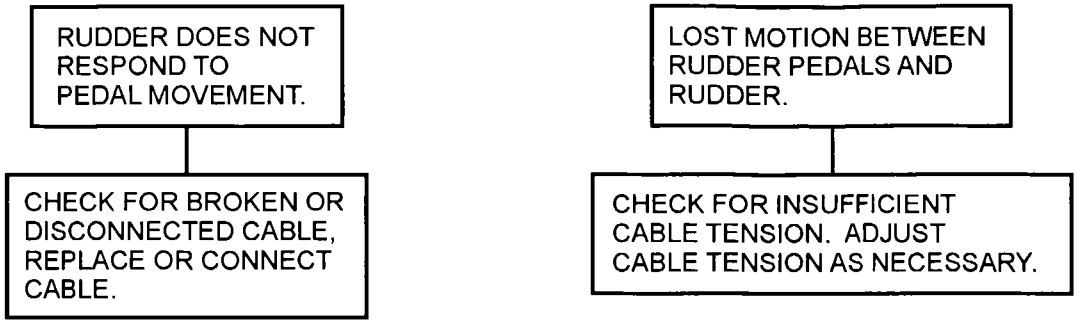
A. A troubleshooting chart has been developed to aid the maintenance technician in system understanding. Refer to Figure 101.

B895



Rudder System Troubleshooting Chart
Figure 101 (Sheet 1)

B896



Rudder System Troubleshooting Chart
Figure 101 (Sheet 2)

RUDDER CONTROL SYSTEM - MAINTENANCE PRACTICES

1. General

A. Rudder control is maintained through use of conventional rudder pedals which also control nose wheel steering. The system is comprised of rudder pedals, rudder bars, torque tubes, bearings, cables and pulleys, all of which link the pedals to the rudder and nose wheel steering.

2. Rudder Pedal Assembly Removal/Installation

A. Remove Rudder Pedal Assembly (Refer to Figure 201).
(1) Remove pilot's and copilot's seats. Refer to Chapter 25, Front Seats - Maintenance Practices.
(2) Remove carpet and shield assemblies. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(3) Disconnect master cylinders and parking brake cables at pilot rudder pedals.
(4) Remove rudder pedals and brake links.
(5) Remove fairings (340AL and 340AR) for access to rudder cable turnbuckles. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(6) Remove safety clips from turnbuckles and relieve cable tension.
(7) Disconnect right forward and left forward cables from rudder bar arms.
(8) Disconnect nose gear steering bungee from rudder bar arm. The bungee serves for both rudder trim and nosewheel steering.
(9) Disconnect the whiffletree link rod assemblies at arms.
(10) Remove bolts securing bearing blocks and work rudder bars out of tunnel area.

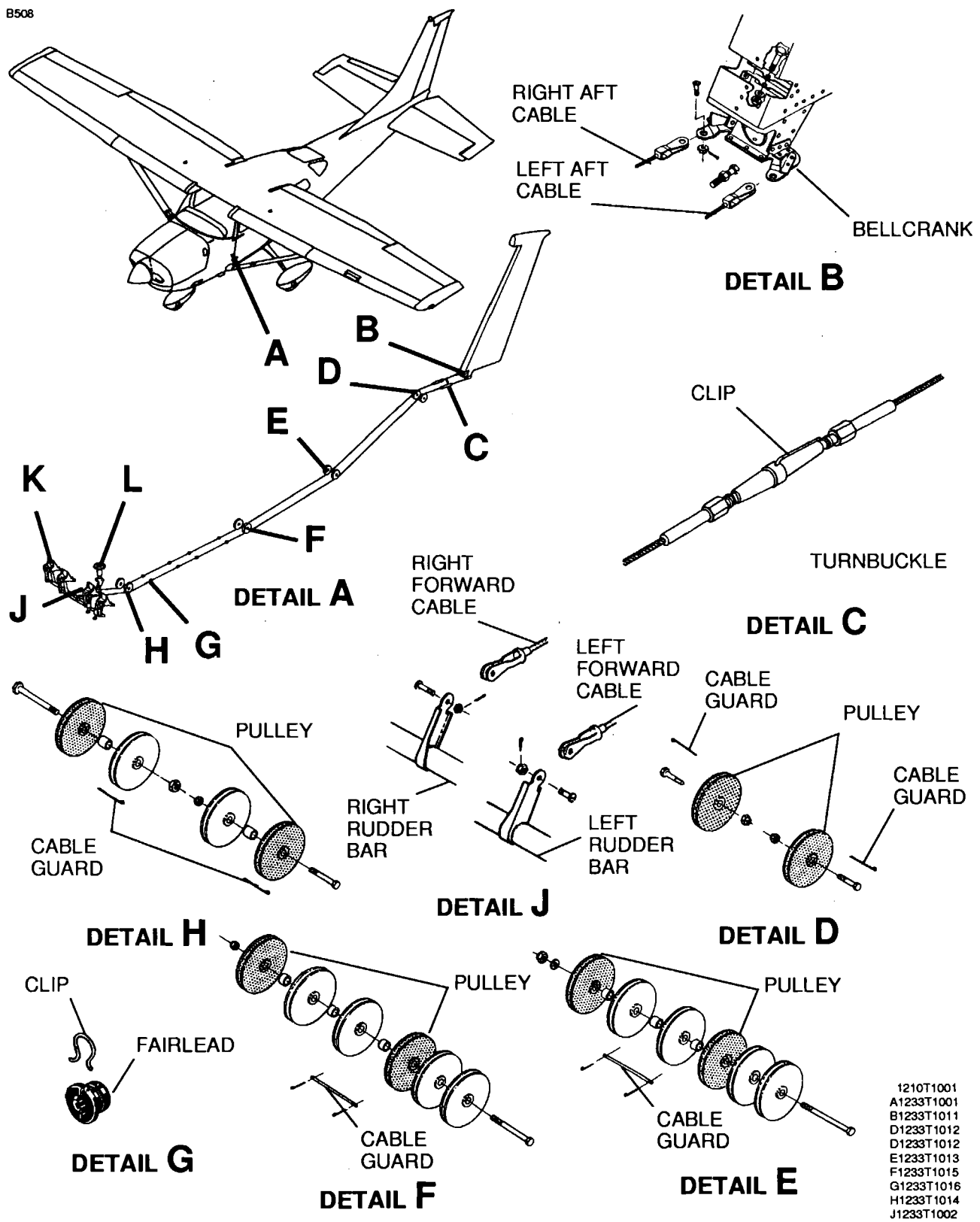
NOTE: The two inboard bearing blocks contain clearance holes for the rudder bars at one end and a bearing hole at the other. Tag these bearing blocks for reference on reinstallation.

B. Install Rudder Pedal Assembly (Refer to Figure 201).
(1) Lubricate the rudder bar assemblies. Refer to Chapter 12, Flight Controls - Lubrication.
(2) Position rudder bars in area below instrument panel and secure bearing blocks with bolts.
(3) Connect whiffletree link rod assemblies at arms.
(4) Connect nose gear steering bungee to rudder bar arm.
(5) Connect left forward and right forward cables to rudder bar arms.
(6) Install rudder pedals and brake links.
(7) Connect parking brake cables and master cylinders to pilot rudder pedals.
(8) Re-rig rudder system and install safety clips. Refer to Adjustment/Test.
(9) Install pilot's and copilot's seats. Refer to Chapter 25, Front Seats - Maintenance Practices.
(10) Install carpet and shield assemblies. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(11) Install fairings (340AL and 340AR). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

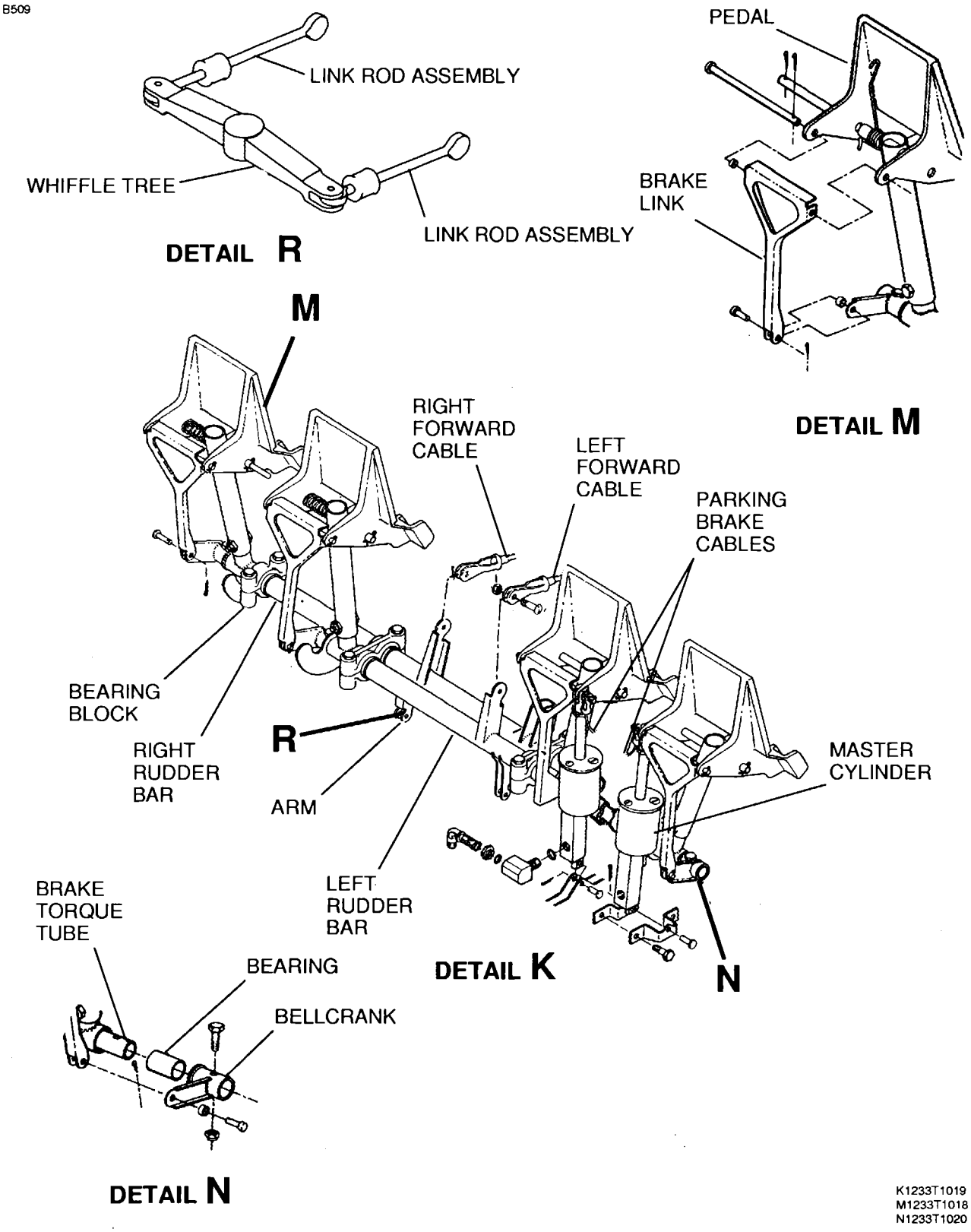
3. Rudder Removal/Installation

A. Remove Rudder (Refer to Figure 201).
(1) Remove stinger.
(2) Disconnect tail navigation light quick-disconnect JV001 at bottom of rudder.
(3) Remove fairing from either side of vertical fin, remove safety wire and relieve cable tension by loosening turnbuckles.
(4) Disconnect cables from rudder bell crank.
(5) With rudder supported, remove hinge bolts (including electrical bonding strap) and, using care, lift rudder free of vertical fin.

B. Install Rudder (Refer to Figure 201).
(1) With rudder supported, install hinge bolts (including electrical bonding strap) securing rudder to vertical fin. Torque nuts to 50 to 70 inch pounds plus free running torque.



Rudder Control System Installation
Figure 201 (Sheet 1)



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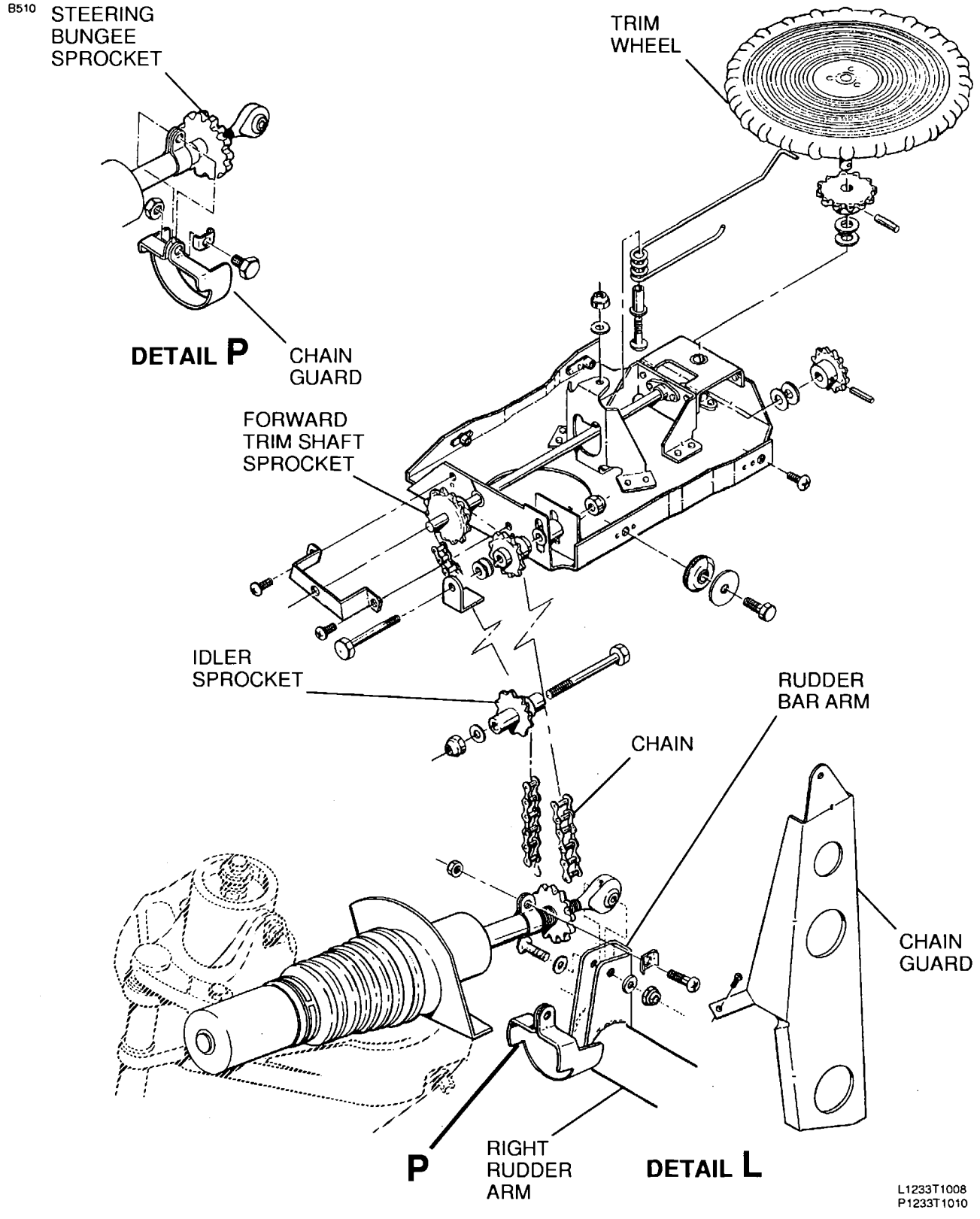
Rudder Control System Installation
Figure 201 (Sheet 2)



Rudder Control System Installation
Figure 201 (Sheet 3)

(2) Connect cables to rudder bell crank.

NOTE: Do not overtighten. Shackle must pivot freely.

(3) Rig rudder system and safety wire turnbuckles. Lubricate system. Refer to Chapter 12, Flight Controls - Lubrication.
(4) Connect tail navigation light quick-disconnect JV001 at bottom of rudder.
(5) Install stinger.

4. Rudder Control Cables Removal/Installation

A. Remove Rudder Cables (Refer to Figure 201).
(1) Remove pilot's and copilot's seats. Refer to Chapter 25, Front Seats and Rails - Maintenance Practices.
(2) Remove center seats. Refer to Chapter 25, Center Seats and Rails - Maintenance Practices.
(3) Remove rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(4) Remove shield assemblies, carpet and baggage wall. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(5) Remove plates (231AB, 231BB, 231DB, 231EB, 231HB, 231JB, and 310AR). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(6) Remove fairings (340AL and 340AR). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(7) Remove safety clips from turnbuckles and relieve tension on rudder cables.
(8) Disconnect left and right rudder cables from rudder bell crank.
(9) Disconnect left and right rudder cables from rudder bar arms.
(10) Remove pulleys and cable guards as necessary to remove cables.

NOTE: To ease routing of cables, a length of wire may be attached to the end of the cable before being withdrawn from airplane. Leave wire in place, routed through structure; then attach cable being installed and pull the cable into position.

(11) Remove rudder cables.

B. Install Rudder Cables (Refer to Figure 201).
(1) If installed, attach cables to wires and pull cables through airplane structure.
(2) Attach left and right rudder cables to rudder bell crank.
(3) Attach left and right rudder cables to rudder bar arms.
(4) Install pulleys and pulley guards. Ensure that cables are in pulley groves before installing cable guards.
(5) Rig rudder system in accordance with Rudder Control Adjustment/Test.
(6) Install plates (231AB, 231BB, 231DB, 231EB, 231HB, 231JB, and 310AR). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(7) Install carpet and baggage wall. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(8) Install pilot's and copilot's seats. Refer to Chapter 25, Front Seats and Rails - Maintenance Practices.
(9) Install center seats. Refer to Chapter 25, Center Seats and Rails - Maintenance Practices.
(10) Install rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(11) Install fairings (340AL and 340AR). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

5. Rudder Control Adjustment/Test

A. Rig Rudder Controls (Refer to Figure 201 and Figure 203).
(1) Remove fairings (340AL and 340AR). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(2) Tie down or weight tail to raise nosewheel free of ground.
(3) Extend strut and ensure nose gear is centered against the external centering stop.

(4) Remove pilot's shield assembly. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(5) Disconnect nose gear steering bungee from rudder bar arm.
(6) Clamp rudder pedals in neutral position.
(7) Remove safety clips on rudder cable turnbuckles.

CAUTION: Maintain specified control tension.

(8) Keep the rudder pedals in the neutral position and adjust the turnbuckles on the left and the right rudder cables. The correct tension adjustment is 30 pounds, +10 or -10 pounds (133.45 N, +44.48 or -44.48 N) at 70 °F (21 °C) with the rudder offset one degree to the right. Refer to Figure 203 for the correct tensions at other temperatures.
(9) Remove clamps from rudder pedals.
(10) Adjust rudder stop bolts to obtain 24 degrees, ±1 degree, travel left and right, measured parallel to water line, or 27 degrees 13 minutes, ±1 degree, travel left and right, measured perpendicular to hinge line.

NOTE: Figure 202 may be used as a guide to attain correct rudder travel.

(11) Install safety clips on rudder cable turnbuckles.
(12) Check rudder travel as follows: Refer to Figure 202.
  (a) Establish neutral position of rudder by clamping straightedge (such as wooden 2 X 4, 50 mm X 100 mm) on each side of fin and rudder, and block trailing edge of rudder half the distance between straightedges.
  (b) Tape a length of soft wire to the stinger in such a manner that it can be bent to index at the lower corner of the rudder trailing edge.
  (c) Using soft lead pencil, mark rudder at the point corresponding to soft wire indexing point (neutral).
  (d) Remove straightedges and blocks.
  (e) Hold rudder against right, then left, rudder stop. Measure distance from pointer to pencil mark on rudder, in each direction of travel. Distance should be between 8.12 inches to 8.72 inches.
(13) Connect nose gear steering bungee to rudder bar arm.
(14) Rig rudder trim system. Refer to Rudder Trim Adjustment/Test.
(15) Install safety clips on rudder cable turnbuckles.
(16) Install fairings (340AL and 340AR). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(17) Install shield assembly. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(18) Install pilot's and copilot's seats. Refer to Chapter 25, Front Seats - Maintenance Practices.
(19) Lower nosewheel to ground.

WARNING: Make sure that the rudder moves in the correct direction when operated by the rudder pedals.

(20) Operate rudder system to check for ease of movement and full travel.

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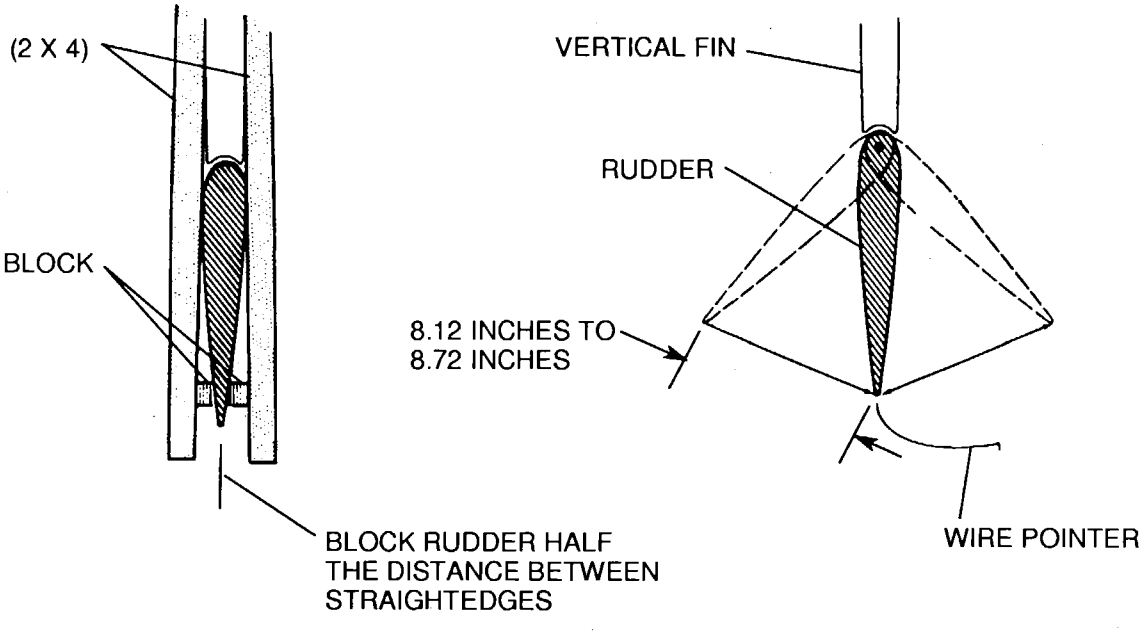
STEP 1: ESTABLISHING NEUTRAL POSITION OF RUDDER.

STEP 2: MEASURING RUDDER TRAVEL.



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Rudder Travel Adjustment
Figure 202 (Sheet 1)

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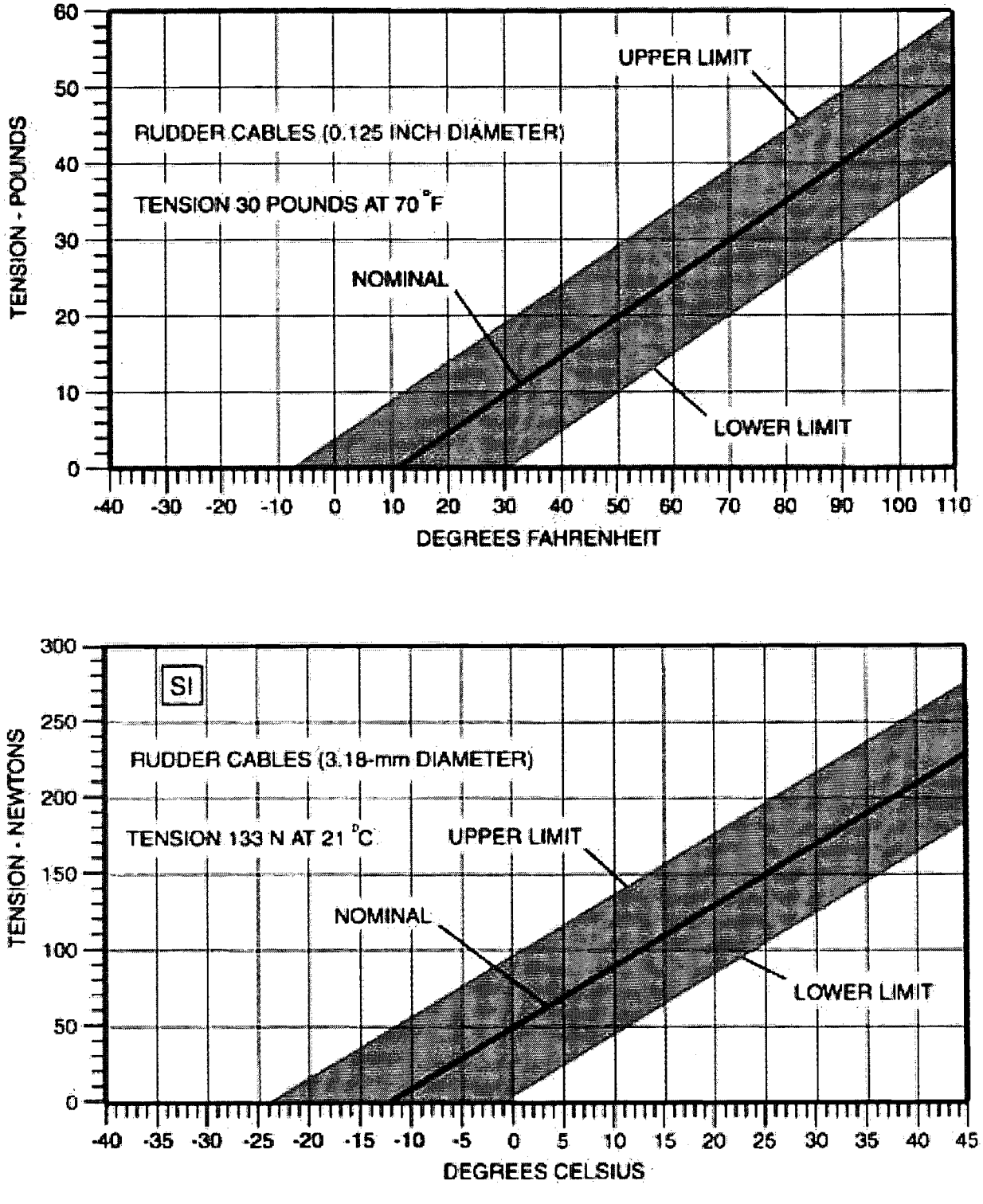

Rudder Cable Tension
Figure 203 (Sheet 1)

RUDDER TRIM - TROUBLESHOOTING

1. General

A. A troubleshooting chart has been developed to aid the maintenance technician in system understanding. Refer to Figure 101.

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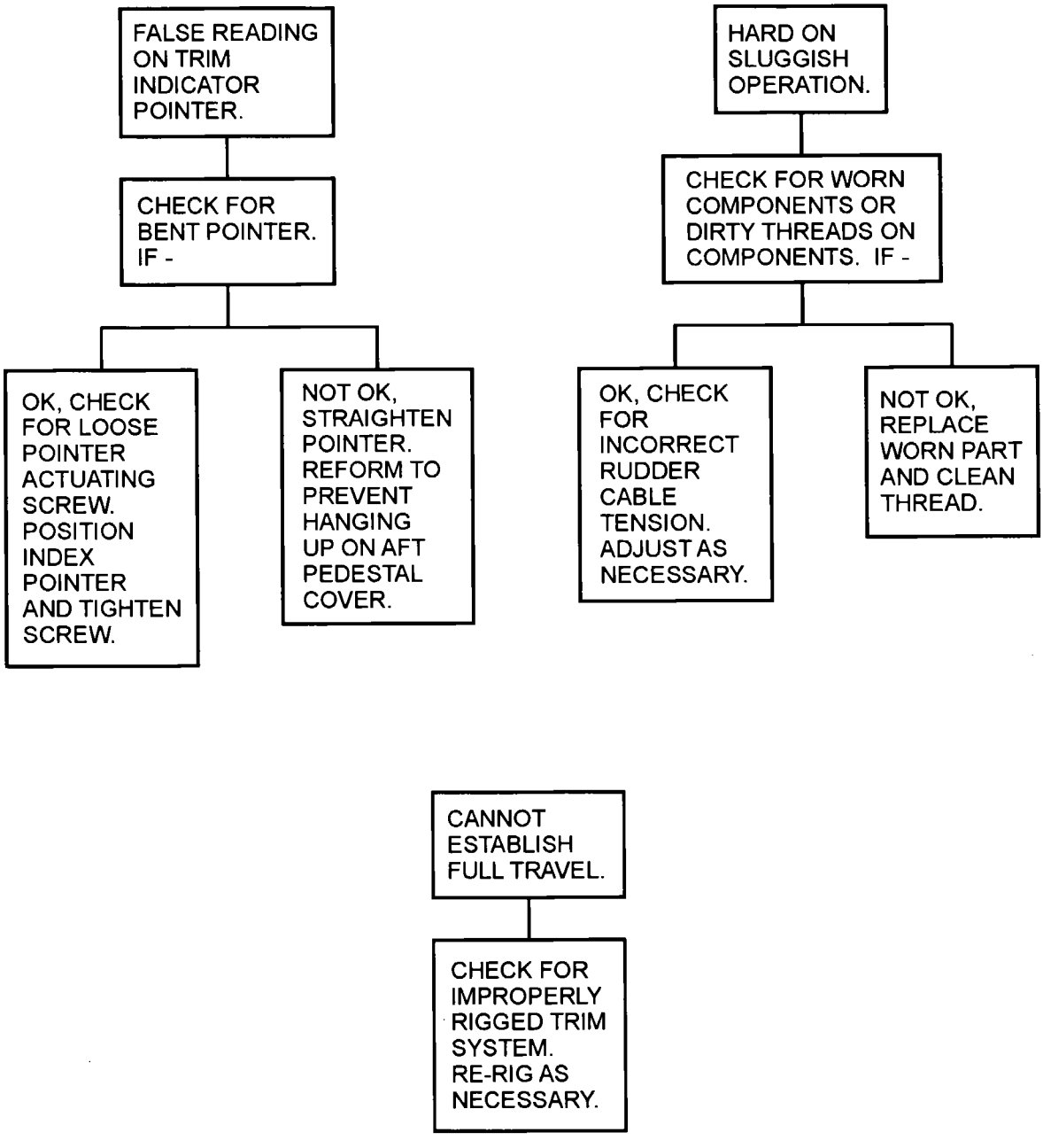


Rudder Trim System Troubleshooting Chart
Figure 101 (Sheet 1)

RUDDER TRIM CONTROL SYSTEM - MAINTENANCE PRACTICES

1. General

A. Rudder trim system maintenance practices consists of rudder trim system removal/installation and rudder trim system rigging.

2. Rudder Trim System Removal/Installation

A. Remove Rudder Trim System (Refer to Figure 201).
(1) Remove pilot's and copilot's seats. Refer to Chapter 25, Front Seats and Rails - Maintenance Practices.
(2) Remove pedestal cover, carpet and shield assemblies. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(3) Loosen bolt securing idler sprocket and relieve tension on chain.
(4) Disconnect steering bungee from rudder bar arm.
(5) Remove chain guard from steering bungee sprocket.
(6) Remove chain from steering bungee sprocket and forward trim shaft sprocket.
(7) Remove clamp from nose gear steering bungee.
(8) Remove nose gear for access to steering bungee. Refer to Chapter 32, Nose Landing Gear - Maintenance Practices.

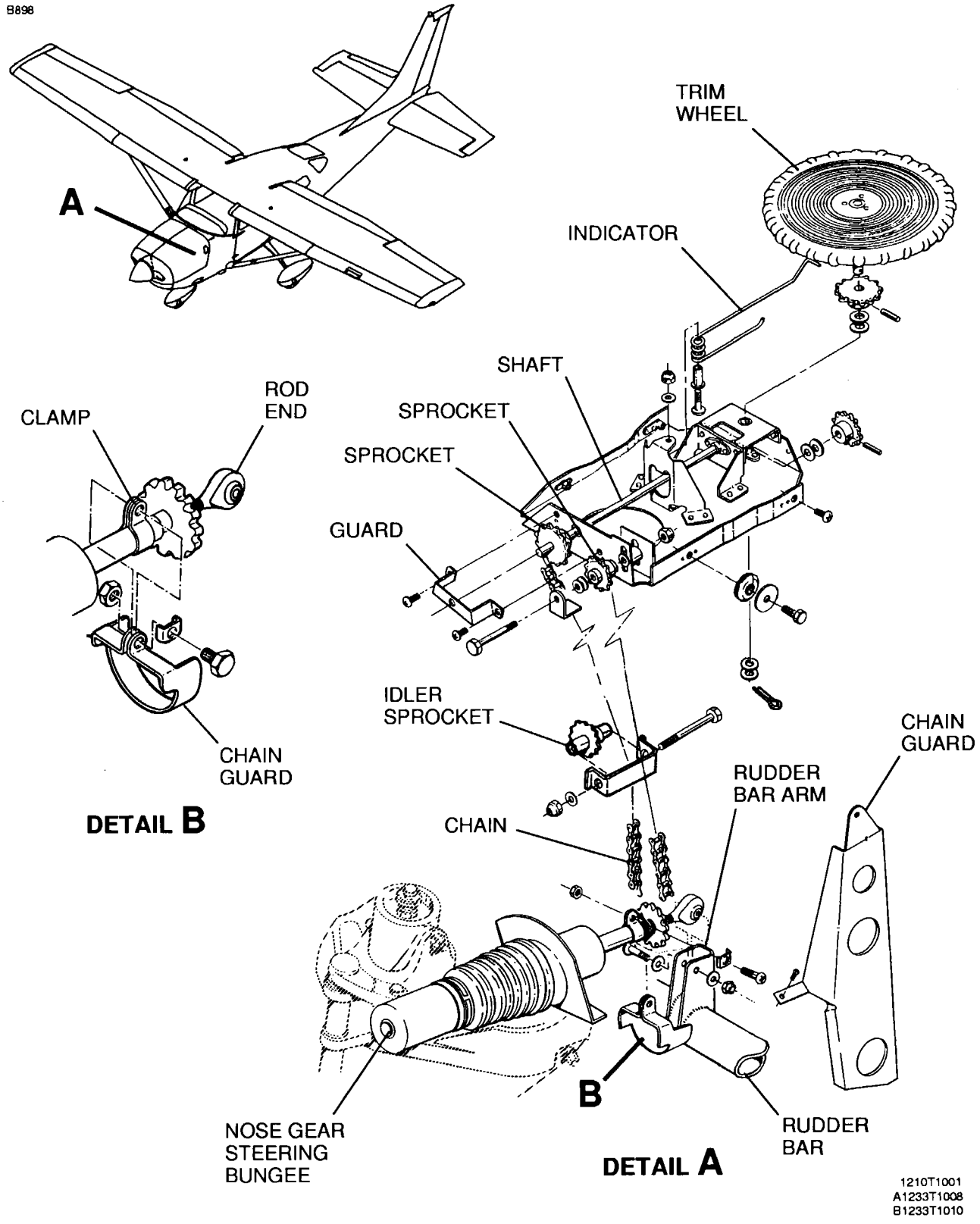
B. Install Rudder Trim System (Refer to Figure 201).
(1) Install nose gear. Refer to Chapter 32, Nose Landing Gear - Maintenance Practices.
(2) Install clamp on nose gear steering bungee.
(3) Install chain on steering bungee sprocket and forward trim shaft sprocket.
(4) Connect steering bungee to rudder bar arm.
(5) Position chain on idler sprocket
(6) Rig trim system. Refer to Rudder Trim Adjustment/Test.
(7) Install chain guard on steering bungee sprocket.
(8) Install pedestal cover, carpet and shield assemblies. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(9) Install pilot's and copilot's seats. Refer to Chapter 25, Front Seats - Maintenance Practices.

3. Rudder Trim Adjustment/Test

A. Rig Rudder Trim System (Refer to Figure 201).

NOTE: Rudder control system must be rigged prior to rigging rudder trim system.

(1) Remove pilot's and copilot's seats. Refer to Chapter 25, Front Seats and Rails - Maintenance Practices.
(2) Remove pedestal cover, carpet and shield assemblies. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(3) Disconnect nose gear steering bungee from rudder bar arm.
(4) Tie down or weight airplane tail section to raise nose wheel free of the ground.
(5) Extend nose gear strut and ensure nose gear is centered against external centering stop.
(6) Loosen bolt securing idler sprocket, and slide idler sprocket in the adjustment slot and disengage chain from sprocket.
(7) Clamp rudder pedals in neutral position,
(8) Screw nose gear steering bungee sprocket in against bungee shaft, then screw rod end in against sprocket to obtain bungee shortest length.
(9) Holding rod end to prevent turning, rotate sprocket until hole in rod end aligns exactly with sprocket hole on rudder bar arm. Connect rod end to rudder bar arm.
(10) Engage chain on sprockets and tighten idler sprocket so chain is taut but not tight.
(11) Remove clamps from rudder pedals.



Rudder Trim Installation
Figure 201 (Sheet 1)

WARNING: Ensure rudder moves in the correct direction when operated by the rudder trim control wheel.

(12) Run rudder trim wheel through full range of travel, observing full indicator travel is reached before full bungee extension or contraction.
(13) Lower nose wheel to ground.
(14) Install pedestal cover, carpet and shield assemblies, Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(15) Install pilot's and copilot's seats. Refer to Chapter 25, Front Seats - Maintenance Practices.

ELEVATOR SYSTEM - TROUBLESHOOTING

1. General

A. A troubleshooting chart has been developed to aid maintenance technician in system understanding. Refer to Figure 101.

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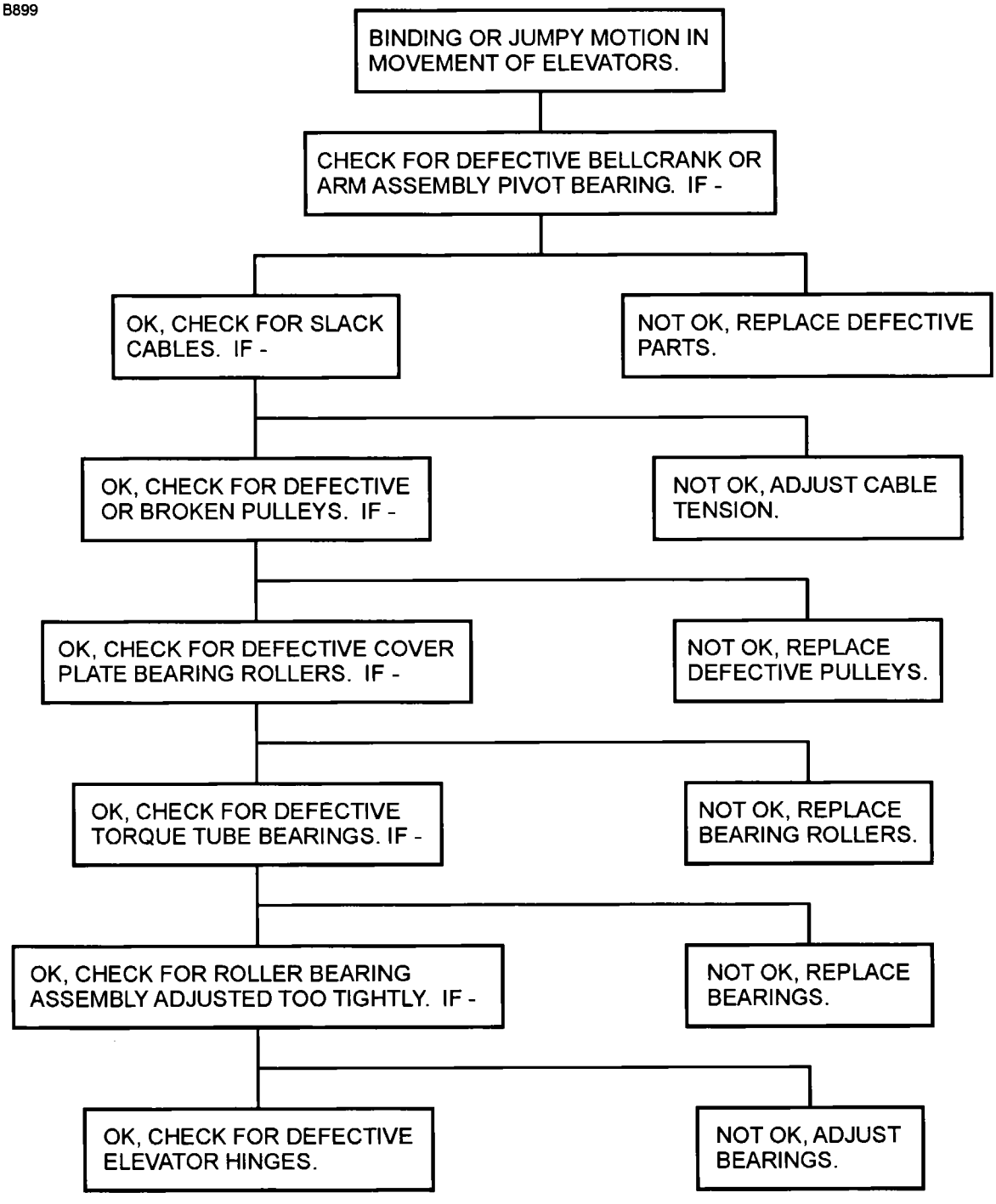

Elevator System Troubleshooting Chart
Figure 101 (Sheet 1)

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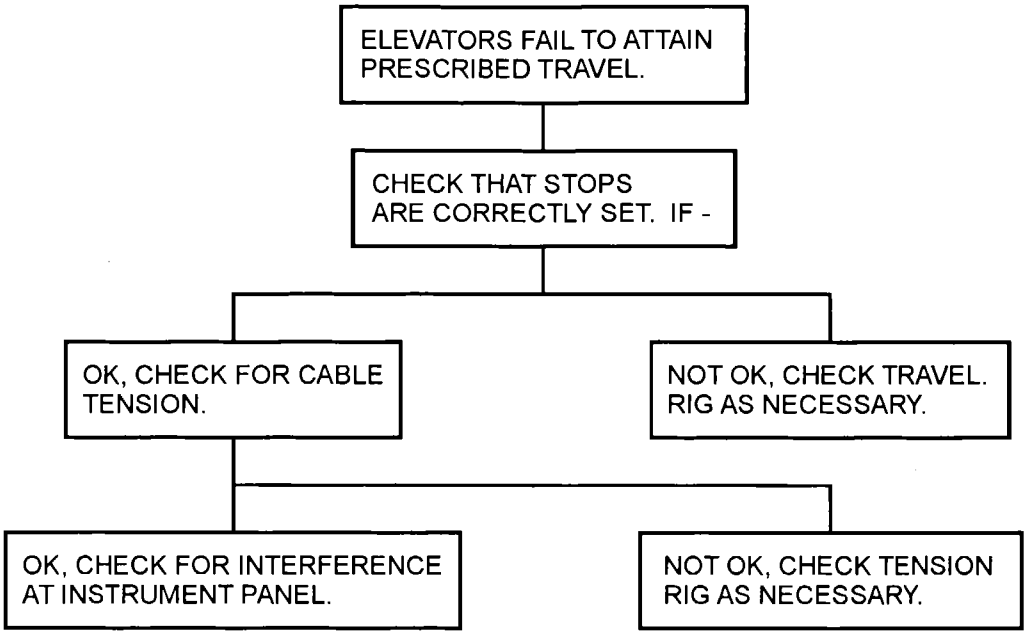


Elevator System Troubleshooting Chart
Figure 101 (Sheet 2)

ELEVATOR CONTROL SYSTEM - MAINTENANCE PRACTICES

1. General

A. Elevators are operated by forward and aft movement of the control wheels. This movement is transferred to the elevators through the control linkage, control columns, and a series of cables, pulleys, bell cranks, links and pushrods.

2. Elevator Removal/Installation

A. Remove Elevator (Refer to Figure 201).
(1) Remove Stinger.
(2) Disconnect trim tab push-pull tube at tab actuator.

NOTE: If removing left elevator, omit this step.

NOTE: If trim system is not moved and actuator screw is not turned, re-rigging of trim system should not be necessary after reinstallation of elevator.

(3) Remove bolts securing elevator torque tubes to arm assembly.

NOTE: Bolts are installed using EA9309-25GR adhesive. It may be necessary to apply heat in the area of the bolt shank to soften the epoxy prior to removing bolts.

(4) Remove bolts from elevator hinges and electrical bonding straps.
(5) Using care, remove elevator.

B. Install Elevator (Refer to Figure 201).
(1) Using care, install elevator.
(2) Install elevator hinge bolts and electrical bonding straps.
(3) Insert bolts into elevator torque tubes and arm assembly with a washer under the head of each bolt and under each nut. Apply Adhesive EA9309-25GR from Hysol Division, Dexter Corp., or its equivalent. Apply only to the shanks of bolts. Wipe off excess adhesive after installation.

NOTE: Set right hand elevator maintaining 0.18 inch dimension specified in Figure 202.

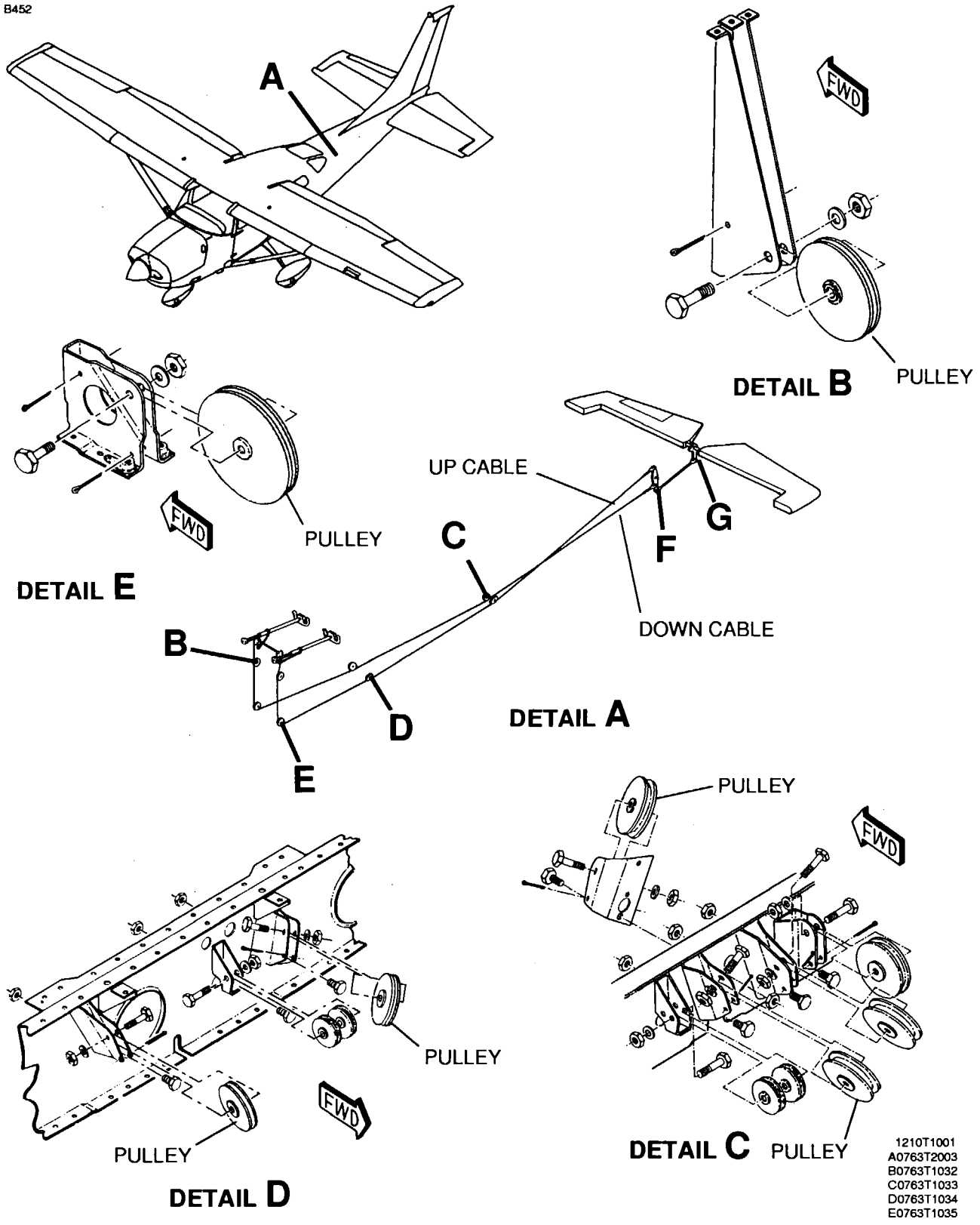
(4) If necessary, Install trim tab push-pull tube at tab actuator and re-rig trim system.
(5) Install stinger.

3. Cables and Pulleys Removal/Installation

A. Remove Cables and Pulleys (Refer to Figure 201).
(1) Remove pilot's and copilot's seats. Refer to Chapter 25, Front Seats and Rails - Maintenance Practices.
(2) Remove Center seats. Refer to Chapter 25. Center Seats and Rails - Maintenance Practices.
(3) Remove rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(4) Remove carpet. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(5) Remove access plates (310BB, 230EB, 230HB, 231CB, 231FB, 231JB, 231MB and 310AB) Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

CAUTION: Position a support stand under tail tiedown ring to prevent the tailcone from dropping while working inside.

(6) Remove safety clips/safety wire to relieve cable tension at turnbuckles and disconnect cables from cable links.
(7) Disconnect cables from torque tube at control arm assemblies, left and right.



Elevator Control System
Figure 201 (Sheet 1)

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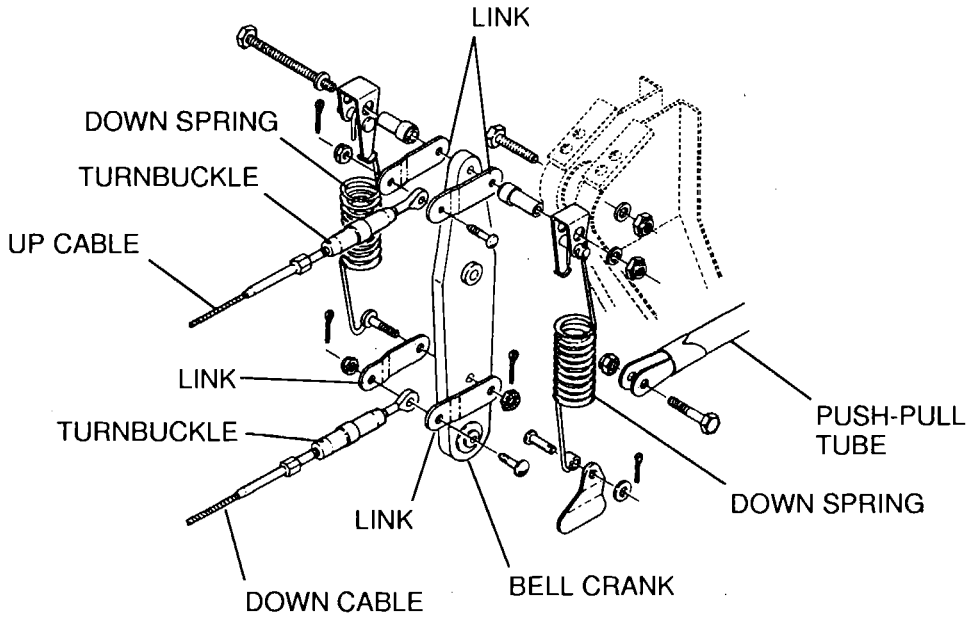
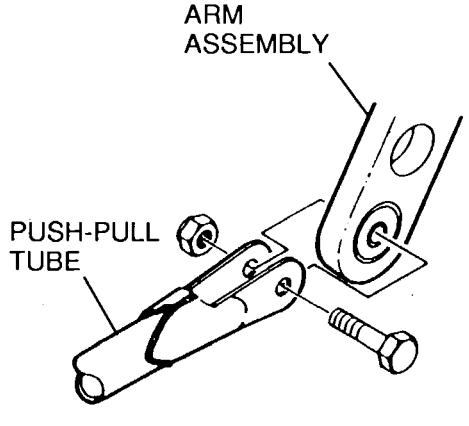
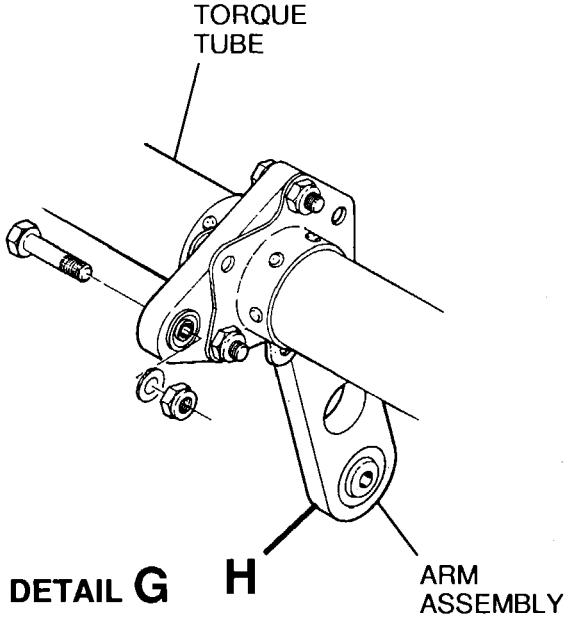


DETAIL F



DETAIL H



DETAIL G

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Elevator Control System
Figure 201 (Sheet 2)

(8) Remove cable guards and pulleys as necessary to work cables free of airplane.

NOTE: To ease routing of cables, a length of wire may be attached to the end of the cable before being withdrawn from airplane. Leave wire in place, routed through structure, then attach cable being installed and pull the cable into position.

(9) Remove cables.

B. Install Cables and Pulleys (Refer to Figure 201).
(1) Route cables through structure.
(2) Install pulleys and pulley guards. Ensure cables are positioned in pulley grooves before installing guards.
(3) Connect cables to torque tube at control arm assemblies, left and right.
(4) Connect cables to cable links.
(5) Rig elevator system and safety turnbuckles. Refer to Elevator Control Adjustment/Test.

WARNING: Ensure elevators travel in the proper direction when operated by the control column.

(6) Install access plates.
(7) Install carpet. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(8) Install rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(9) Install center seats. Refer to Chapter 25. Center Seats and Rails - Maintenance Practices.
(10) Install pilot's and copilot's seats. Refer to Chapter 25, Front Seats and Rails - Maintenance Practices.

4. Elevator Bell Crank Removal/Installation

A. Remove Elevator Bell Crank (Refer to Figure 201).
(1) Remove access plates (231JB and 310AB) Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(2) Remove safety clips/safety wire to relieve cable tension at turnbuckles and disconnect cables from cable links.
(3) Remove bolt and washer securing push-pull tube to bell crank.
(4) Remove nut, washers, spacers, elevator down springs, cable links and bolt from upper end of bell crank.
(5) Remove nut, bolt and cotter pin securing cable links to lower end of bell crank.
(6) Remove pivot bolt attaching bell crank to brackets.
(7) Remove bell crank.

B. Install Elevator Bell Crank (Refer to Figure 201).
(1) Place bell crank in position and install pivot bolt. Replace any extra components removed to facilitate arm assembly removal.
(2) Install bolt, nut and cotter pin securing cable links to lower end of bell crank.
(3) Install nut, washer, spacers, elevator down springs and cable links to upper end of bell crank.
(4) Secure push-pull tube to arm assembly with bolt, washer and nut.
(5) Connect cables to cable links and set cable tension. Refer to Elevator Control Adjustment/Test.
(6) Safety turnbuckles.

WARNING: Ensure elevators travel in the proper direction when operated by the control column.

(7) Install access plates.

5. Aft Elevator Arm Assembly Removal/Installation

A. Remove Aft Elevator Arm Assembly (Refer to Figure 201).
(1) Remove stinger.
(2) Remove bolt securing push-pull tube to arm assembly.

(3) Remove bolts securing elevator torque tubes to arm assembly. A heat gun may be required to soften epoxy adhesive on bolts.
(4) Remove pivot bolt securing arm assembly and slide assembly from between elevator torque tubes.

B. Install Aft Elevator Arm Assembly (Refer to Figure 201).
(1) Slide arm assembly between elevator torque tubes and secure with pivot bolts.
(2) Install bolts securing elevator torque tubes to arm assembly. When reinstalling bolts install a washer under the head of each bolt and under each nut. Apply adhesive EA9309-25GR from Hysol Division, Dexter Corp., or its equivalent, only to the shanks of bolts. Wipe off excess adhesive after installation.

NOTE: Set right hand elevator maintaining 0.18-inch dimension specified in Figure 202.

(3) Secure push-pull tube to arm assembly using bolt.
(4) Install stinger.

6. Elevator Control Adjustment/Test

A. Rig Elevator (Refer to Figure 202 and Figure 203).
(1) Fabricate a Neutral Rigging Tool from 0.125 inch (3.18 mm) steel plate, 0.209 inch (5.3 mm) diameter drill rod, and 0.250 inch (6.35 mm) diameter drill rod. (Refer to Detail B).
(2) Remove access plate (310BB) and fairings (340AL and 340AR). Refer to Chapter 6, Access/ Inspection Plates - Description and Operation.

CAUTION: Position a support stand under tail tie-down to prevent the tailcone from dropping while working inside.

(3) Install the neutral rigging tool to lock the elevator control in the neutral position.
(4) Streamline the left elevator to neutral with horizontal stabilizer.

NOTE: Do not attempt to align the elevator trailing edges as there is a 0 degree 54' twist designed into the connecting torque tube. This twist causes the right elevator to be higher than the left.

NOTE: Disregard counterweight areas of the elevator when streamlining. These areas are contoured to be streamlined at cruising speed (elevators approximately 3 degrees down).

CAUTION: Maintain specified control cable tension.

(5) While you hold the elevators in the neutral position, adjust the turnbuckles equally to 30 pounds, +10 or -10 pounds (133.45 N, +44.48 or -44.48 N), of cable tension at 70 °F (21 °C). Refer to the Charts in Figure 203 for the correct tensions at other temperatures.

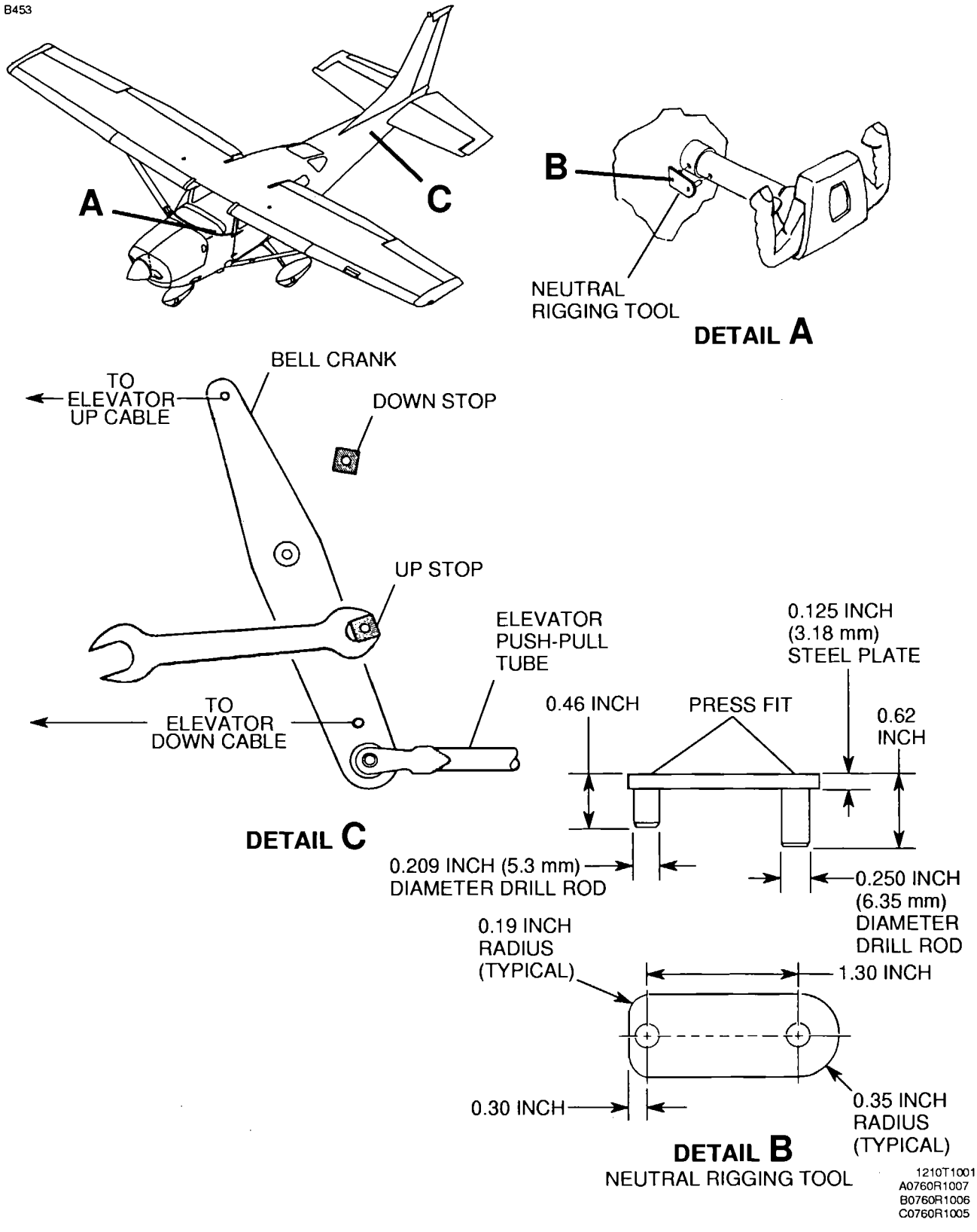
NOTE: The elevators must be supported to obtain correct cable tension.

(6) Mount an inclinometer on elevator and, keeping elevator streamlined with stabilizer, set inclinometer to 0 degrees.
(7) Remove neutral rigging tool.
(8) Adjust bell crank up stop to attain 21 degrees, +1 or -1 degree, up travel.

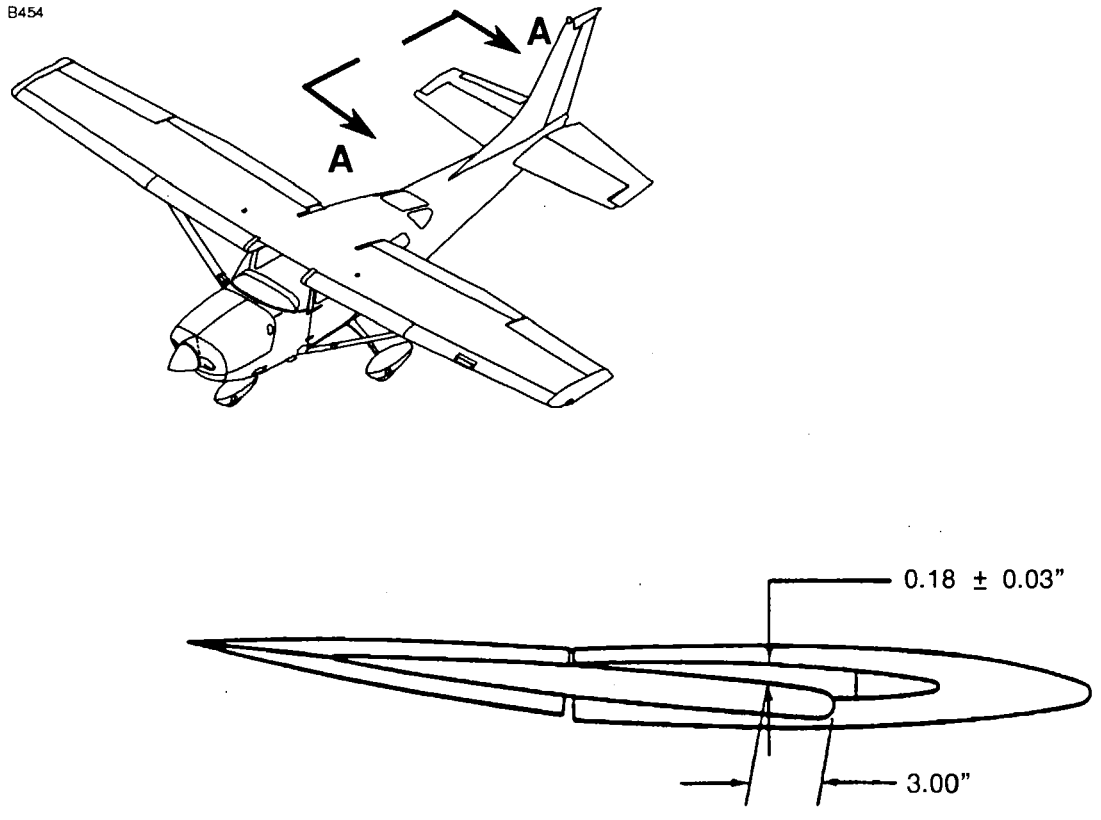
NOTE: The holes in the bell crank stops are off center to give elevator travel adjustment.

NOTE: The bell crank stops can be turned in 90-degree increments to give approximately 1 degree of elevator travel.

(9) Adjust bell crank down stop to attain 17 degrees, +1 or -1 degree, down travel.



Elevator Control System Rigging
Figure 202 (Sheet 1)



VIEW A-A
THIS VIEW APPLIES TO THE RIGHT ELEVATOR
WHEN THE LEFT ELEVATOR IS STREAMLINED

NOTE: DO NOT ATTEMPT TO ALIGN THE ELEVATOR TRAILING EDGES AS THERE IS A 0° 54' TWIST DESIGNED INTO THE CONNECTING TORQUE TUBE. THIS TWIST CAUSES THE RIGHT ELEVATOR TO BE HIGHER THAN THE LEFT.

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Elevator Control System Rigging
Figure 202 (Sheet 2)

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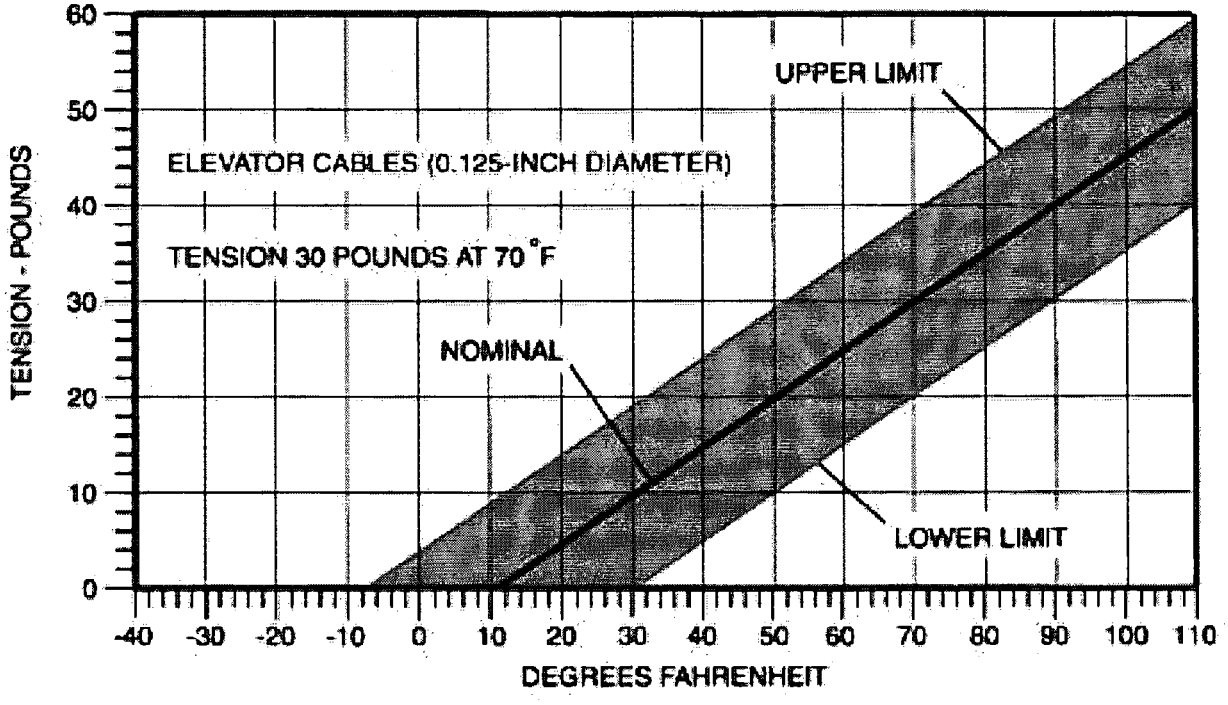

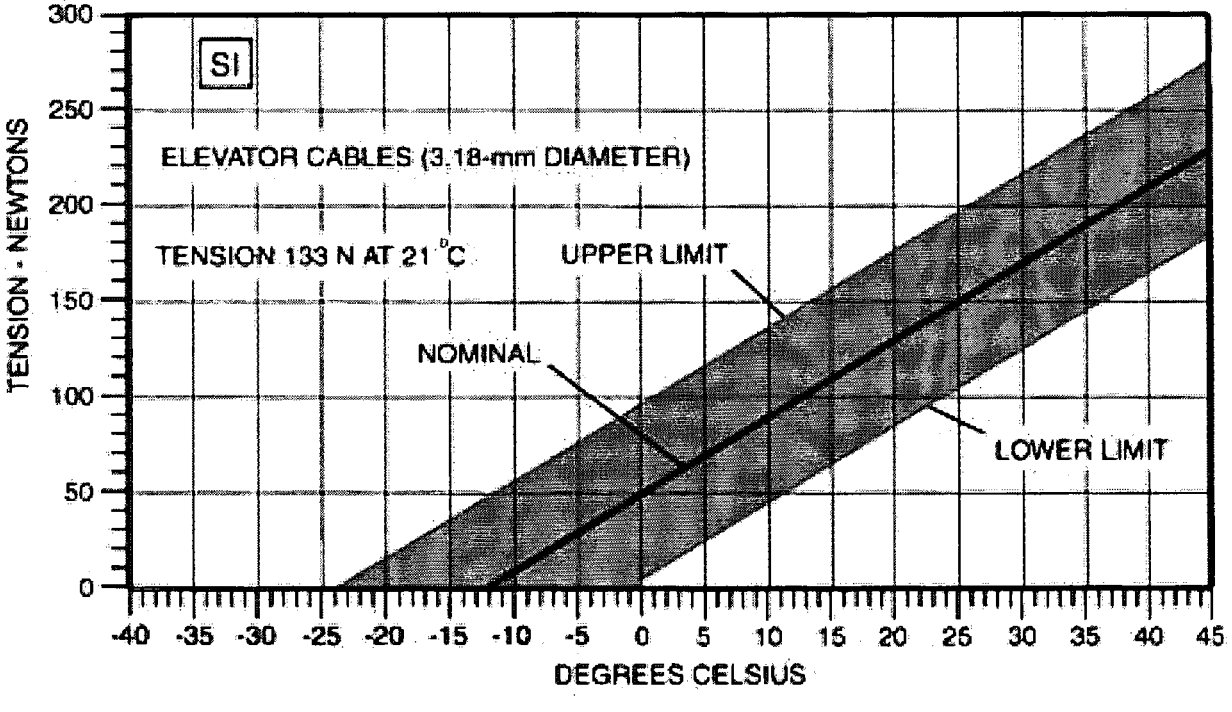

Elevator Cable Tension
Figure 203 (Sheet 1)

WARNING: Ensure that elevators travel in the proper direction when operated by the control column.

(10) Check sponge at control column in both up and down positions, and if necessary, readjust turnbuckles to prevent control column from hitting the instrument panels or firewall.
(11) Safety turnbuckles.
  (a) Use the single wrap preferred procedure with 0.040 inch (1.0 mm) stainless steel or monel safety wire. Refer to Chapter 20, Safetying - Maintenance Practices.
(12) Install access plates (310BB) and fairings (340AL and 340AR). Refer to Chapter 6, Access/ Inspection Plates - Description and Operation.
(13) Remove support stand.

ELEVATOR TRIM CONTROL - TROUBLESHOOTING

1. General

A. A troubleshooting chart has been developed to aid the maintenance technician in system understanding. Refer to Figure 101.

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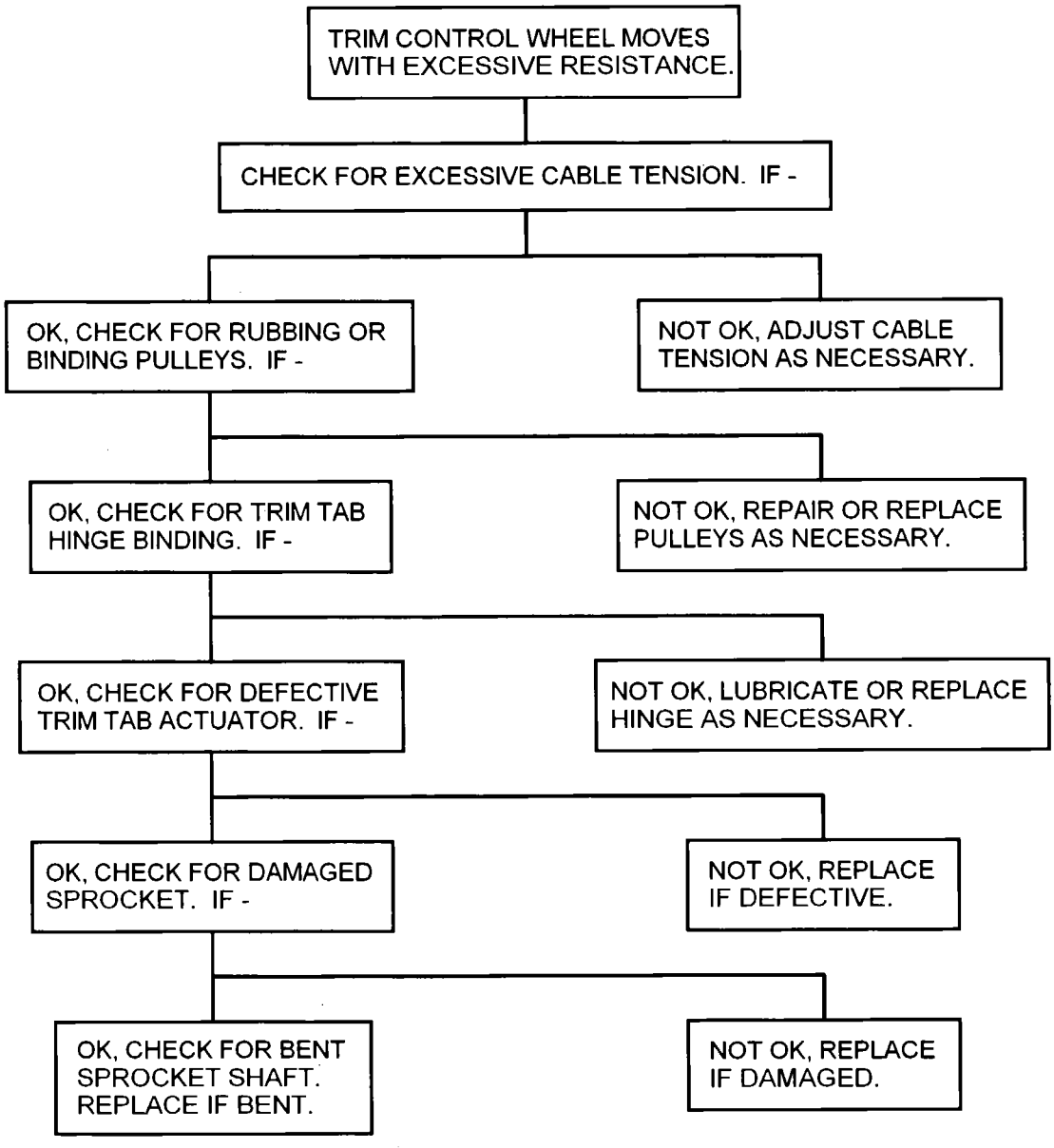

Elevator Trim System Troubleshooting Chart
Figure 101 (Sheet 1)

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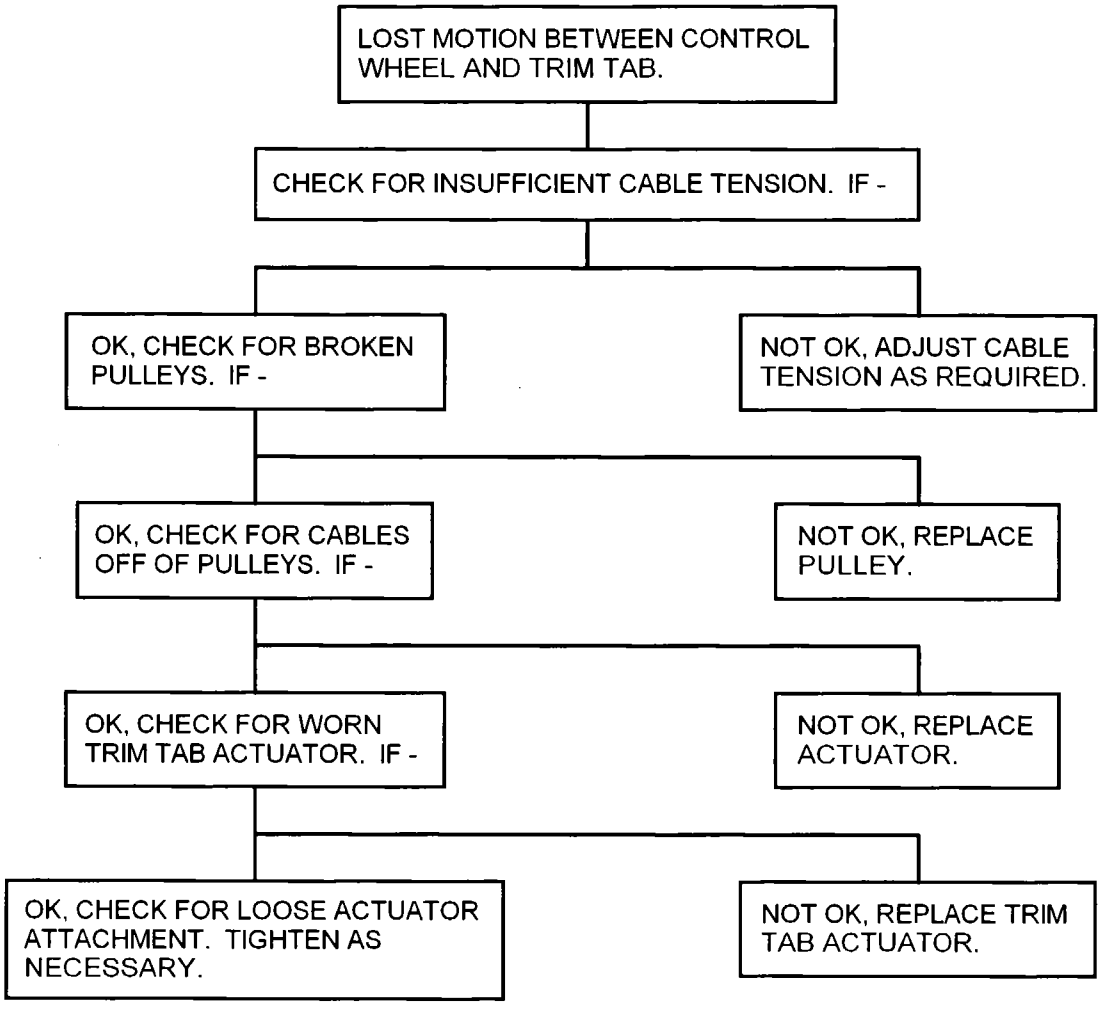

Elevator Trim System Troubleshooting Chart
Figure 101 (Sheet 2)

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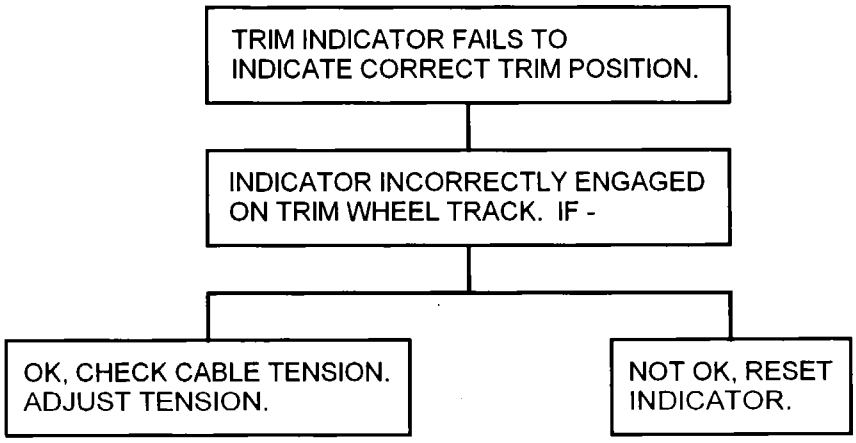


Elevator Trim System Troubleshooting Chart
Figure 101 (Sheet 3)

ELEVATOR TRIM CONTROL - MAINTENANCE PRACTICES

1. General

A. The elevator trim tab, located on the right elevator, is controlled by a trim wheel mounted in the pedestal. Power to operate the tab is transmitted from the trim control wheel by means of chains, cables, an actuator, and a push-pull tube. A mechanical pointer, adjacent to the trim wheel, indicates tab position. A nose up setting results in a tab down position.

2. Trim Tab Actuator Removal/Installation

A. Remove Trim Tab Actuator (Refer to Figure 201).
(1) Position a support stand under tail tiedown ring to prevent tailcone from dropping while person is working inside. Refer to Chapter 7, Jacking - Maintenance Practices.
(2) Remove access plate (310CB) from lower side of right stabilizer. Refer to Chapter 6, Access/ Inspection Plates - Description and Operation.
(3) Remove rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(4) Remove baggage curtain for access to elevator trim control cable stop blocks. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(5) Remove safety clip and relieve cable tension at turnbuckle.
(6) At the elevator hinge gap, disconnect push-pull tube from actuator.
(7) Remove chain guard.
(8) Remove chain from actuator sprocket.
(9) Remove screws attaching actuator to bracket, and carefully work actuator out through access opening.

B. Install Trim Tab Actuator (Refer to Figure 201).
(1) Place actuator in position and attach actuator to bracket using screws.
(2) Install chain to actuator sprocket.
(3) Install chain guard.
(4) At the elevator hinge gap, connect push-pull tube from actuator.
(5) Set cable tension at turnbuckle and install safety clip. Refer to Trim Tab Control Adjustment/Test.

WARNING: Be sure trim tab moves in correct direction when operated by trim control wheel. Nose down trim corresponds to tab up position.

(6) Install access plate.
(7) Install baggage curtain . Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(8) Install rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(9) Remove support stand.

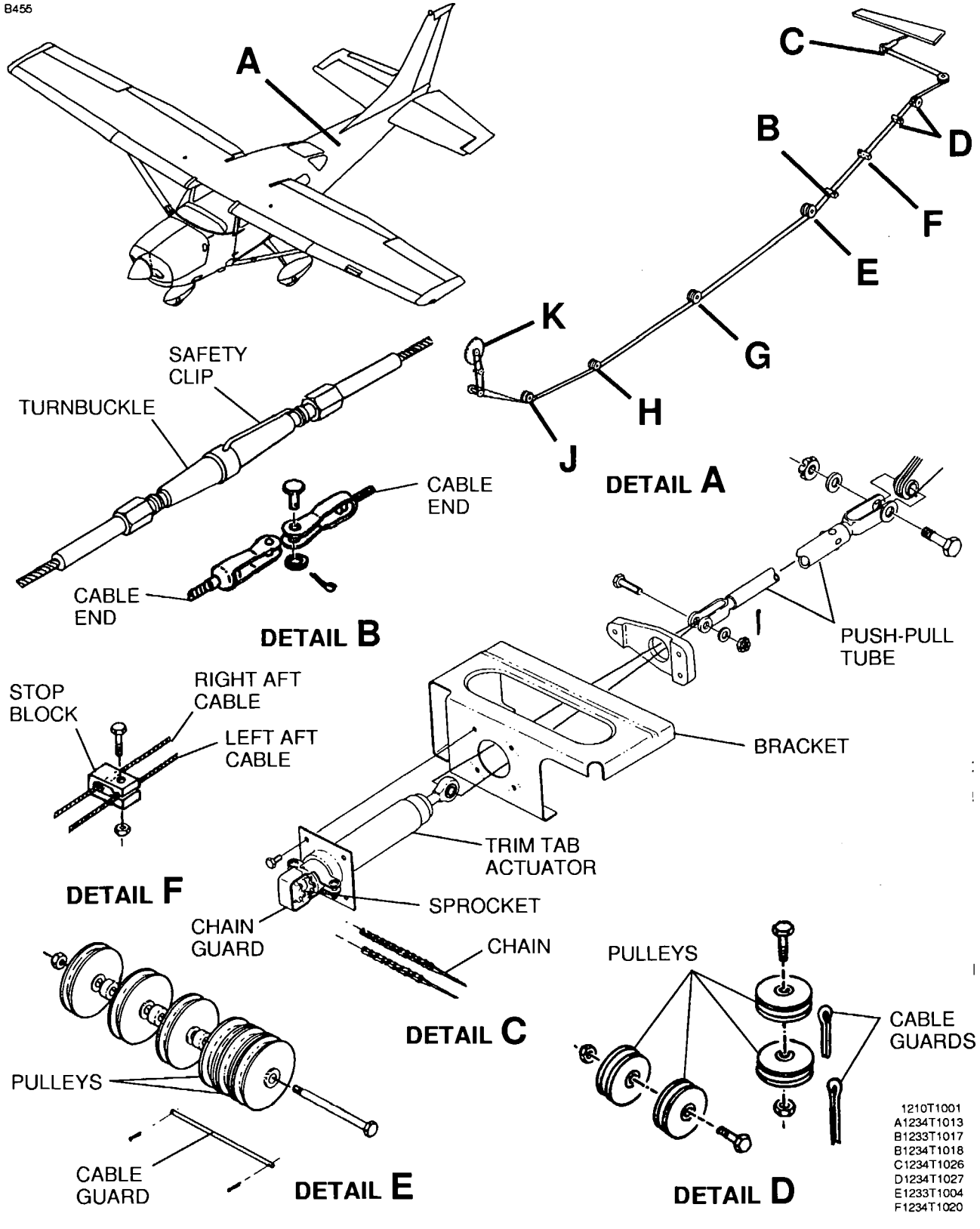
3. Trim Tab Actuator Disassembly/Assembly

A. Disassemble Trim Tab Actuator (Refer to Figure 202).
(1) Remove the trim tab actuator. Refer to Tim Tab Actuator Removal/Installation.
(2) Turn the screw assembly to loosen and remove it from the actuator.

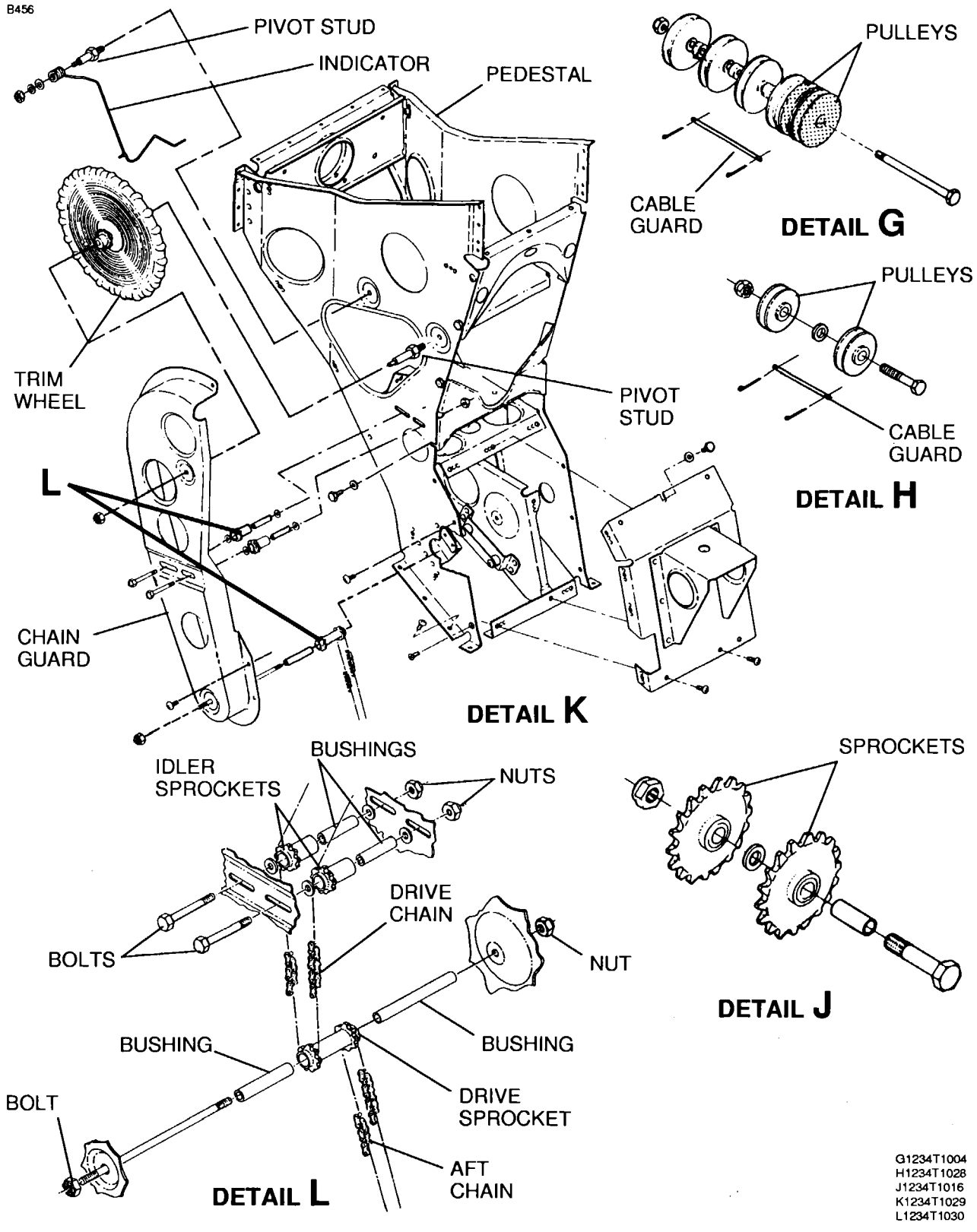
B. Assemble Trim Tab Actuator (Refer to Figure 202).
(1) If a new bearing is necessary, press it into the boss on the screw assembly. Make sure that the force pushes against the outer race of the bearing.
(2) Install the screw assembly into the actuator as follows:
(a) Pack the internal housing with MIL-G-21164C grease.

NOTE: This supplies the lubrication for the screw assembly.

(b) Install the screw assembly in the housing.
(c) If necessary, clean the unwanted grease from the housing.



Elevator Trim Tab Control System
Figure 201 (Sheet 1)



Elevator Trim Tab Control System
Figure 201 (Sheet 2)

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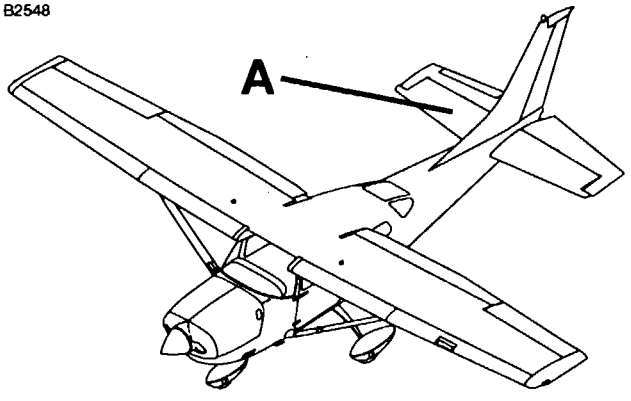
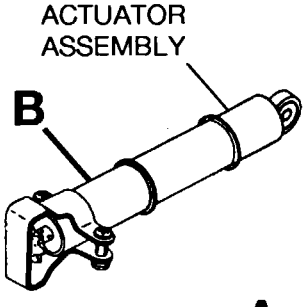
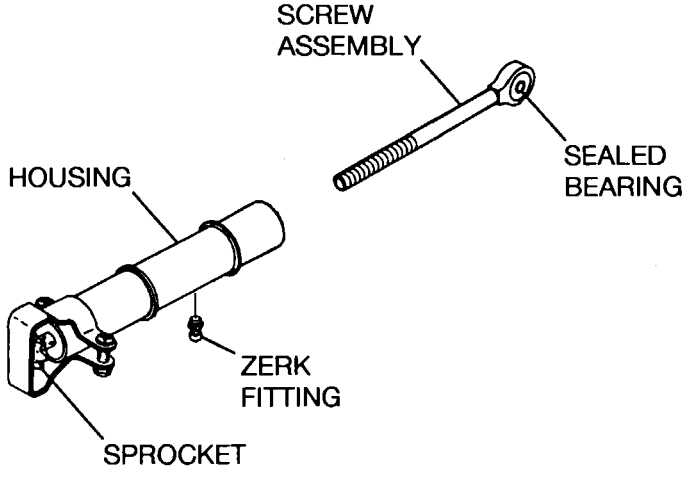




DETAIL A



DETAIL B

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Elevator Trim Tab Actuator Cleaning and Inspection
Figure 202 (Sheet 1)

(3) Hold the screw assembly and turn the sprocket by hand to do a test of the actuator assembly.

NOTE: The screw assembly must move smoothly in the actuator.

4. Trim Tab Actuator Cleaning and Inspection

A. Complete a Trim Tab Actuator Cleaning and Inspection (Refer to Figure 202).
(1) Remove the screw assembly from the housing. Refer to Trim Tab Actuator Disassembly/Assembly.
(a) Do not remove the sealed bearing from the screw assembly unless the bearing replacement is necessary.
(2) Wash the screw assembly, except the sealed bearing, in Stoddard solvent or equivalent. Do not clean the sealed bearing.
(3) Examine the sealed bearing and screw assembly for wear and for parts that have scores. Check bearings, screw and threaded rod end for excessive wear and scoring. Refer to Table 201 for dimensions.

Table 201. Actuator Wear Limits

COMPONENT	MAXIMUM DIMENSION	MINIMUM DIMENSION
Aft End Bearing Inside Diameter	0.249 Inch	0.248 Inch
Screw Assembly Outside Diameter	0.246 Inch (Shank)	0.245 Inch (Shank)

(4) Examine the screw assembly and the screw for threads that have damage or dirt particles that can cause the assembly to operate incorrectly.
(5) Examine the screw assembly sealed bearing for smoothness of operation.
(6) Examine the housing components for stripped threads, cracks, deep nicks, dents, and other signs of damage.
(7) Examine the sprocket for broken, chipped, and/or worn teeth.
(8) Examine the linear free play at the sprocket end of the housing.

NOTE: The linear free play at the sprocket end must not be more than 0.010 inch maximum.

(a) If the free play is more than the permitted limits, replace the actuator.
(9) Do not try to repair the actuator assembly parts that have damage or wear.
(10) Install the screw assembly into the housing. Refer to Trim Tab Actuator Disassembly/Assembly.

5. Trim Tab Free Play Inspection

A. Inspect Trim Tab Free Play (Figure 203).
(1) Place elevator and trim tab in neutral position, and with elevator gust lock (gust lock goes in 1.30 inches from neutral), secure elevator from movement.
(2) Determine maximum amount of allowable free play.
(a) Measure chord length at extreme inboard end of trim tab.
(b) Multiply chord length by 0.025 to obtain maximum allowable free play.
(c) Measure free play at same point on trim tab that chord length was measured.
(d) Total free play must not exceed maximum allowable.
(3) Using moderate hand pressure (up and down), measure free play at trailing edge of trim tab.
(4) If trim tab free play is less than maximum allowable, the system is within prescribed limits.
(5) If trim tab free play is more than maximum allowable, check the following items for looseness while moving trim tab up and down.
(a) Check push-pull tube to trim tab horn assembly attachment for looseness.
(b) Check push-pull tube to actuator assembly threaded rod end attachment for looseness.
(c) Check actuator assembly threaded rod end for looseness in the actuator assembly.
(6) If looseness is apparent while checking steps (a) and (b), repair by installing new parts.

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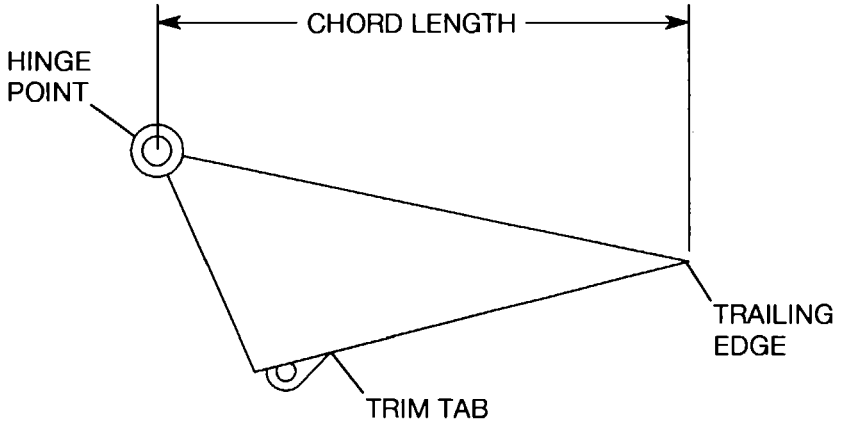
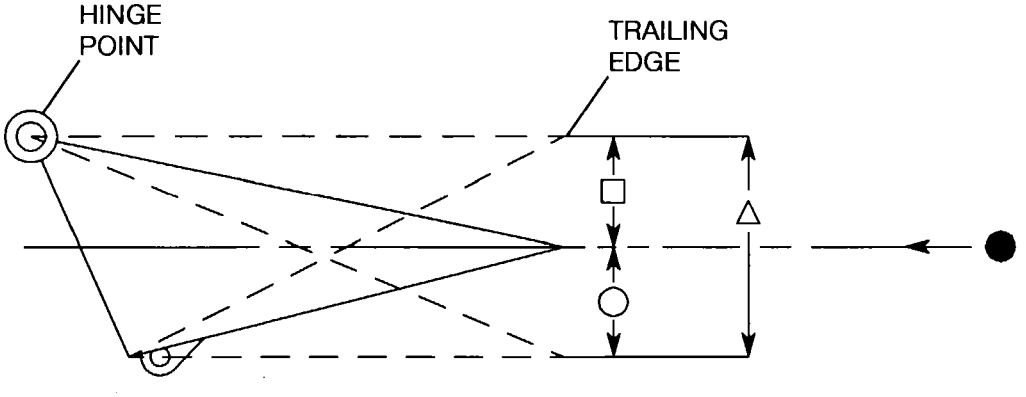


DETAIL C



□ FREE PLAY UP

● NEUTRAL POSITION

○ FREE PLAY DOWN

△ TOTAL FREE PLAY

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Trim Tab Free Play Inspection
Figure 203 (Sheet 1)

(7) If looseness is apparent while checking step (c), threaded rod end is out of tolerance and must be replaced.

6. Trim Tab Control Cables and Pulleys Removal/Installation

A. Remove Cables and Pulleys (Refer to Figure 201).
(1) Position a support stand under tail tie-down ring to prevent tailcone from dropping while person is working inside. Refer to Chapter 7, Jacking - Maintenance Practices.
(2) Remove pilot and copilot seats. Refer to Chapter 25, Front Seats - Maintenance Practices.
(3) Remove center seats. Refer to Chapter 25, Center Seats and Rails - Maintenance Practices.
(4) Remove rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(5) Remove carpet and baggage curtain. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(6) Remove pedestal cover. Refer to, Remove Pedestal Cover.
(7) Remove access plates (230DB, 230GB, 231LB, 310BB, and 310CB), and fairings (340AL and 340AR) Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(8) Remove stop blocks from control cables
(9) Remove cable guard from actuator.
(10) Remove safety clip from turnbuckle and disconnect cable.
(11) Disconnect cables at cable ends.

NOTE: To ease routing of cables, a length of wire may be attached to the end of the cable before being withdrawn from airplane. Leave the wire in place, routed through the structure; then attach cable being installed and pull the cable into position.

(12) Remove cable guards and pulleys.
(13) Disengage chains from sprockets and remove cables from airplane structure.

B. Install Cables and Pulleys (Refer to Figure 201).
(1) Attach cables to wires routed through airplane structure and pull cables into position.
(2) Engage chains on sprockets and install chain guard on actuator.
(3) Install pulleys and pulley guards.
(4) Connect cable ends and install turnbuckle.

WARNING: Be sure trim tab moves in correct direction when operated by trim control wheel. Nose down trim corresponds to tab up position.

(5) Rig system. Refer to Trim Tab Control Adjustment/Test.
(6) Install access plates.
(7) Install carpet and baggage curtain. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(8) Install pedestal cover. Refer to, Install Pedestal Cover.
(9) Install rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(10) Install center seats. Refer to Chapter 25, Center Seats and Rails - Maintenance Practices.
(11) Install pilot and copilot seats. Refer to Chapter 25, Front Seats - Maintenance Practices
(12) Remove support stand.

7. Trim Tab Control Wheel Removal/Installation

A. Remove Trim Tab Control Wheel (Refer to Figure 201).
(1) Remove pilot and copilot seats. Refer to Chapter 25, Front Seat And Rails - Maintenance Practices.
(2) Remove pedestal cover. Refer to Pedestal Cover Removal/Installation.
(3) Remove screws and nuts securing chain guard to pedestal.
(4) Remove nut securing indicator to pivot stud. Retain washers.
(5) Loosen bolts securing idler sprockets to pedestal structure, slide idler sprockets in slotted holes and disengage drive chain from sprockets.

(6) Remove bolts and remove chain guard using care not to bend pointer or drop parts into tunnel area.
(7) Remove drive chain from trim wheel sprocket and carefully slide trim wheel from pivot stud.

B. Install Trim Tab Control Wheel (Refer to Figure 201).
(1) Slide trim wheel on to pivot stud.
(2) Engage drive chain on trim wheel sprocket.
(3) Position bolts through chain guard and install washers, sprocket assemblies, and bushings on bolts.
(4) Position drive chain on sprockets.
(5) Engage aft chain on drive sprocket.
(6) Position chain guard on pedestal, insert bolts through pedestal and install nuts, do not tighten idler sprockets nuts.
(7) Install screws securing chain guard to pedestal.
(8) Ensure drive chain is installed properly, then position idler sprockets in adjustment slots making drive chain taught but not tight and tighten nuts.
(9) Install pedestal cover. Refer to Pedestal Cover Removal/Installation.
(10) Install pilot and copilot seats. Refer to Chapter 25, Front Seat And Rails - Maintenance Practices.

8. Pedestal Cover Removal/Installation

A. Remove Pedestal Cover
(1) Turn fuel selector valve to OFF position and drain fuel from strainer and lines.
(2) Remove fuel selector handle and placard.
(3) Remove cowl flap handle knob and microphone mounting bracket.
(4) Fold carpet back as necessary and remove screws securing cover to floor and pedestal.
(5) Disconnect electrical wiring to pedestal lights.
(6) Carefully work cover from pedestal to prevent damage.

B. Install Pedestal Cover.
(1) Position cover on pedestal
(2) Connect electrical wiring to pedestal lights.
(3) Install screws securing cover to floor and pedestal.
(4) Install cowl flap knob and microphone mounting bracket.
(5) Install fuel selector placard and handle.
(6) Install carpet.

9. Trim Tab Control Adjustment/Test

A. Set Trim Tab Control Cable Tension (Refer to Figure 201 and Figure 205).
(1) Position a support stand under tail tiedown ring to prevent tailcone from dropping while person is working inside. Refer to Chapter 7, Jacking - Maintenance Practices.
(2) Remove rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(3) Remove baggage curtain. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(4) Remove access plates (230DB, 230GB, 231LB, 310BB) and fairings (340AL and 340AR).
(5) Remove pedestal cover.
(6) Loosen travel stop blocks on cables.
(7) Disconnect actuator from trim tab push-pull tube.

CAUTION: Maintain specified control cable tension.

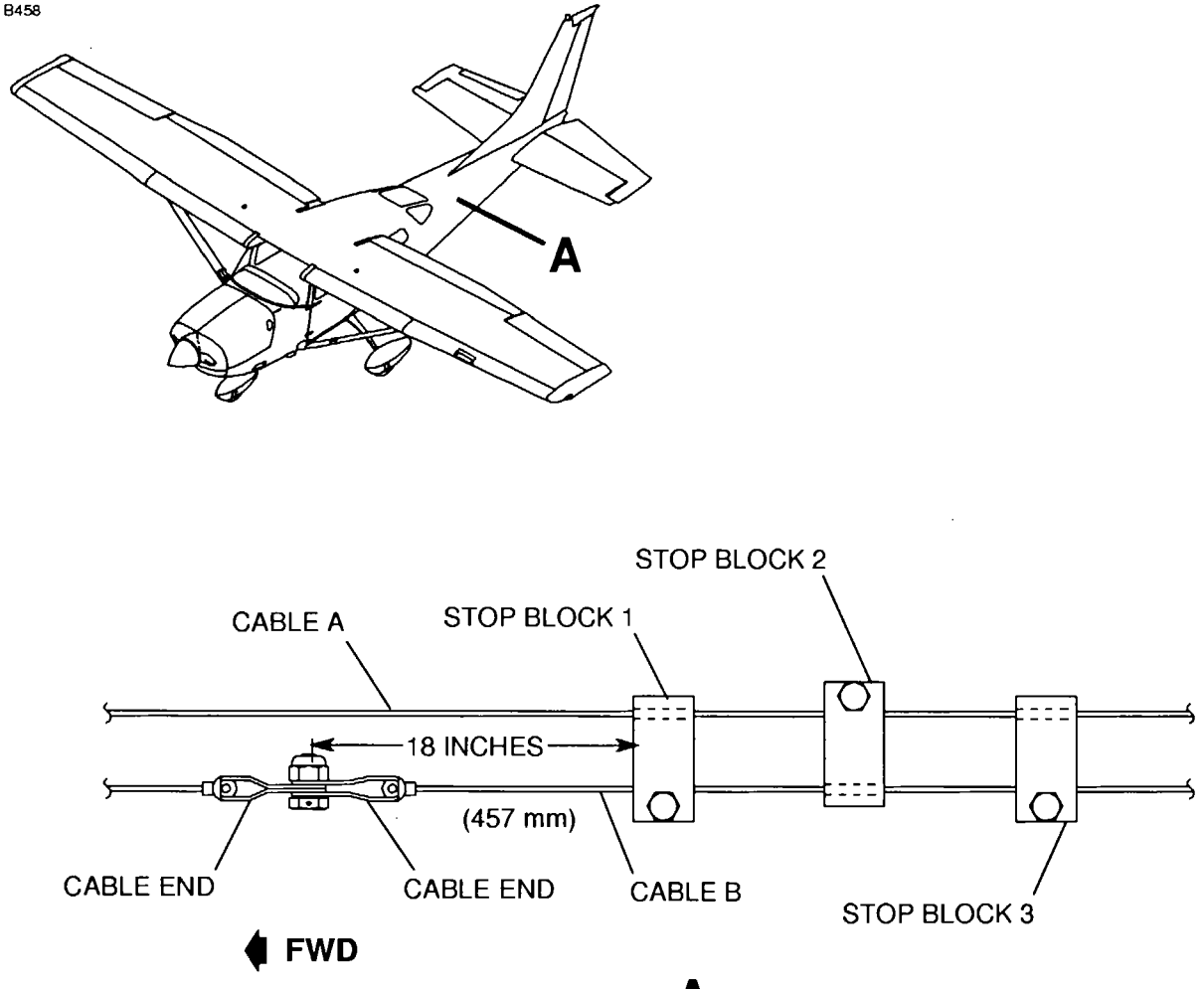
(8) Adjust the turnbuckle as necessary to get 15 to 20 pounds (66.72 to 88.96 N) of cable tension at 70°F (21°C). Refer to Figure 205 for the correct tensions at other temperatures.

NOTE: If chains or cables are being installed, permit actuator screw to rotate freely as chains and cables are connected.

(9) Rotate trim wheel full forward. Ensure pointer does not restrict wheel movement. If necessary, reposition pointer.
   (a) Loosen nut at trim wheel pivot stud.
   (b) Loosen screws securing chain guard far enough that trim wheel can be moved approximately 1/8 inch, then reposition pointer using a thin screwdriver to pry trailing leg of pointer out of groove in trim wheel. Reposition pointer as required.
   (c) Tighten nut and screws, but do not reinstall pedestal cover until rigging is complete.
(10) With elevator and trim tab both in neutral (split the nonfaired difference between the inboard and outboard ends), place inclinometer on tab and set at zero.
(11) Rotate actuator screw in or out as required to place tab up with a maximum of two degrees over travel, with actuator screw connected to push-pull tube.
(12) Rotate trim wheel to position tab up and down, readjusting actuator screws required to obtain over travel in both directions.
(13) Position stop blocks. (Refer to Figure 204).
   (a) Lower trim tab to 5 degrees, +1 or -0 degree.
   (b) Position stop block (1) 18 inches (457.2 mm) aft of clevis on cable B and secure to cable B.
   (c) Position stop block (2) aft of and against stop block (1) and secure to cable A.
   (d) Run trim tab up to 25 degrees, +1 or -0 degree, place stop block (3) against stop block (2) and secure to cable B.
(14) Install pedestal cover and adjust trim tab pointer. Refer to, Install Pedestal Cover.
   (a) Rotate trim control wheel to place tab at 10 degrees up position.
   (b) Locate the pointer at the "TAKE-OFF" triangle as viewed from the pilot seat. (Refer to step (9) and reposition pointer if necessary.)
   (c) Bend pointer as required to clear pedestal cover.

   NOTE: Pointer must NOT rub against pedestal cover or clear cover more than .125 inch maximum.

(15) Safety turnbuckle.
(16) Ensure that trim tab moves in correct direction when operated by trim wheel. Nose down trim corresponds to tab UP position.
(17) Install baggage curtain. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(18) Install rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(19) Install access plates (230DB, 230GB, 231LB, 310BB) and fairings (340AL and 340AR).
(20) Remove support stand.



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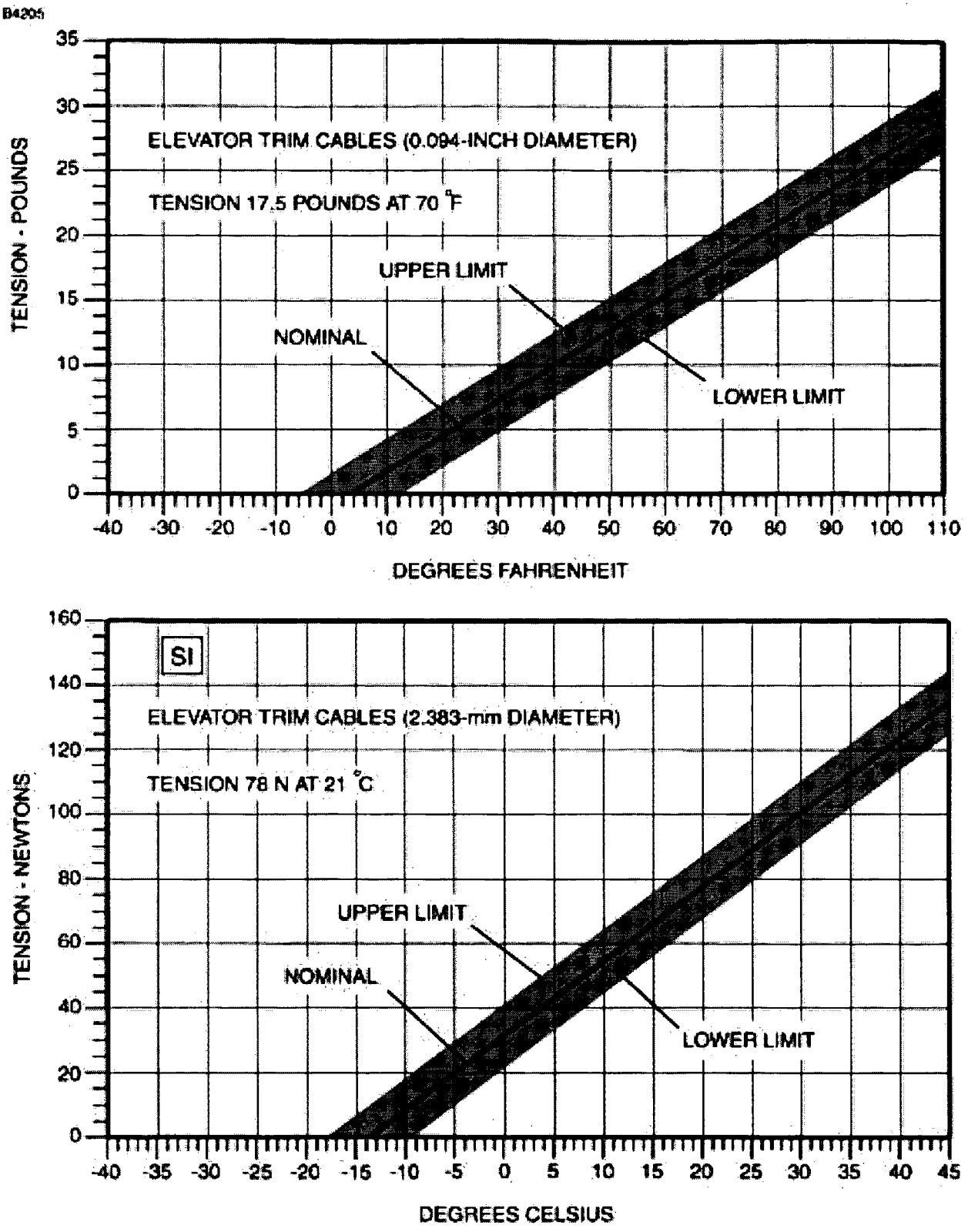
Elevator Trim Tab Travel Stop Adjustment
Figure 204 (Sheet 1)



Elevator Trim Cable Tension
Figure 205 (Sheet 1)

(14) Install pedestal cover and adjust trim tab pointer. Refer to, Install Pedestal Cover.
   (a) Rotate trim control wheel to place tab at 10 degrees up position.
   (b) Locate the pointer at the "TAKE-OFF" triangle as viewed from the pilot seat. (Refer to step (9) and reposition pointer if necessary.)
   (c) Bend pointer as required to clear pedestal cover.

   NOTE: Pointer must NOT rub against pedestal cover or clear cover more than .125 inch maximum.

(15) Safety turnbuckle.
(16) Ensure that trim tab moves in correct direction when operated by trim wheel. Nose down trim corresponds to tab UP position.
(17) Install baggage curtain. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(18) Install rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(19) Install access plates (230DB, 230GB, 231LB, 310BB) and fairings (340AL and 340AR).
(20) Remove support stand.

STALL WARNING SYSTEM - MAINTENANCE PRACTICES

1. General

A. The stall warning system includes a stall warning horn and stall detector. The stall warning horn is located inside the cabin behind the headliner, on the fuselage rib, overhead and to the outboard side of the pilot. The (heated) stall detector is mounted on the leading edge of the left wing at WS 91.25. The PITOT HEAT/OFF switch on the circuit panel assembly provides power to the heating element of the stall detector.

B. The stall detector is actuated by airflow over the surface of the wing. The stall detector internal switch will close as a stall condition is approached, actuating the stall warning horn. The stall detector should actuate the stall warning horn approximately 4.5 to 9.0 knots above airplane stall speed.

2. Stall Warning Horn Assembly Removal and Installation

A. Remove Stall Warning Horn Assembly (Refer to Figure 201).
(1) Remove electrical power from airplane. Disengage WARN circuit breaker on circuit panel assembly.
(2) Remove headliner to access stall warning horn assembly. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(3) Disconnect stall warning horn wiring at stall warning horn connector.
(4) Remove nuts and washers securing stall warning horn assembly to adapter plate.
(5) Remove stall warning horn assembly from airplane.

B. Install Stall Warning Horn Assembly (Refer to Figure 201).
(1) Position stall warning horn on adapter plate and secure with nuts and washers.
(2) Connect stall warning horn wiring at stall warning horn connector.
(3) Install headliner. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(4) Restore electrical power to airplane. Engage WARN circuit breaker on circuit panel assembly.

3. Stall Detector Removal and Installation

A. Remove Stall Detector (Refer to Figure 201).
(1) Remove electrical power from airplane. Disengage WARN circuit breaker on circuit panel assembly and place PITOT HEAT/OFF switch to OFF.
(2) Remove access plate 510GB to access stall detector. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(3) Identify, tag, and disconnect electrical wiring from stall detector and disconnect stall warning connector.
(4) Remove screws and nuts securing stall detector to wing leading edge.
(5) Remove stall detector from airplane.

B. Install Stall Detector (Refer to Figure 201).
(1) Place stall detector at access plate opening and connect electrical wiring to stall detector and connect stall warning connector.
(2) Position stall detector at wing leading edge and secure with screws and nuts.

NOTE: The lip of the stall detector needs to be approximately 0.06 of an inch (1.52 mm) below the centerline of the wing skin cutout.

(3) Install access plate.
(4) Restore electrical power to airplane. Engage WARN circuit breaker on circuit panel assembly.
(5) Adjust stall detector. Refer to Stall Detector Adjustment.

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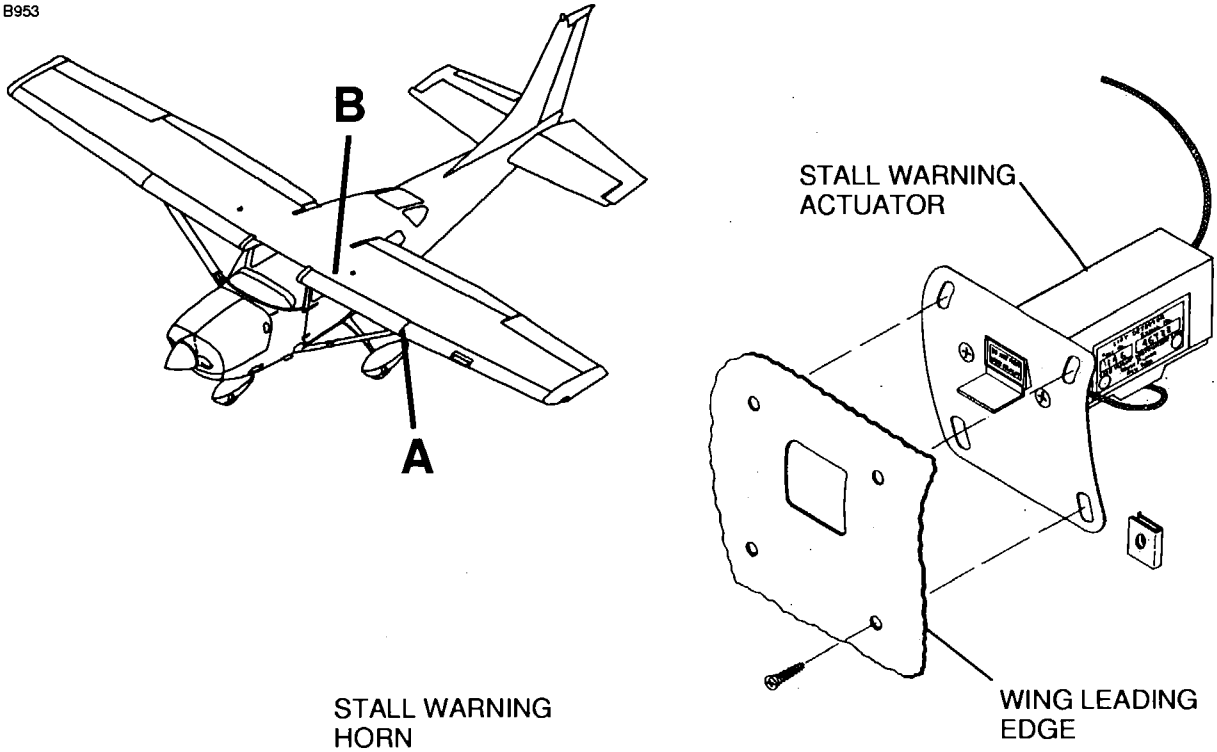


1210T1001
A0718T1022
B0718T1021

Stall Warning Horn and Detector Installation
Figure 201 (Sheet 1)

4. Stall Detector Adjustment

A. Adjust Stall Detector.

(1) It is necessary to test fly the airplane to determine if the stall detector actuates the stall warning horn at the desired speed. Make the following adjustments to stall detector based on results of test flight.

(a) If stall warning horn sounds at speeds in excess of 9.0 knots above stall speed, then loosen stall detector mounting screws and move stall detector slightly down. Refer to Stall Detector Removal and Installation.

WARNING: Do not allow airspeed to drop below airplane stall speed.

(b) If stall warning horn does not sound before reaching stall speed plus 4.5 knots (4.5 knots above stall speed), then loosen stall detector mounting screws and move stall detector slightly up. Refer to Stall Warning System - Maintenance Practices, Stall Detector Removal and Installation.

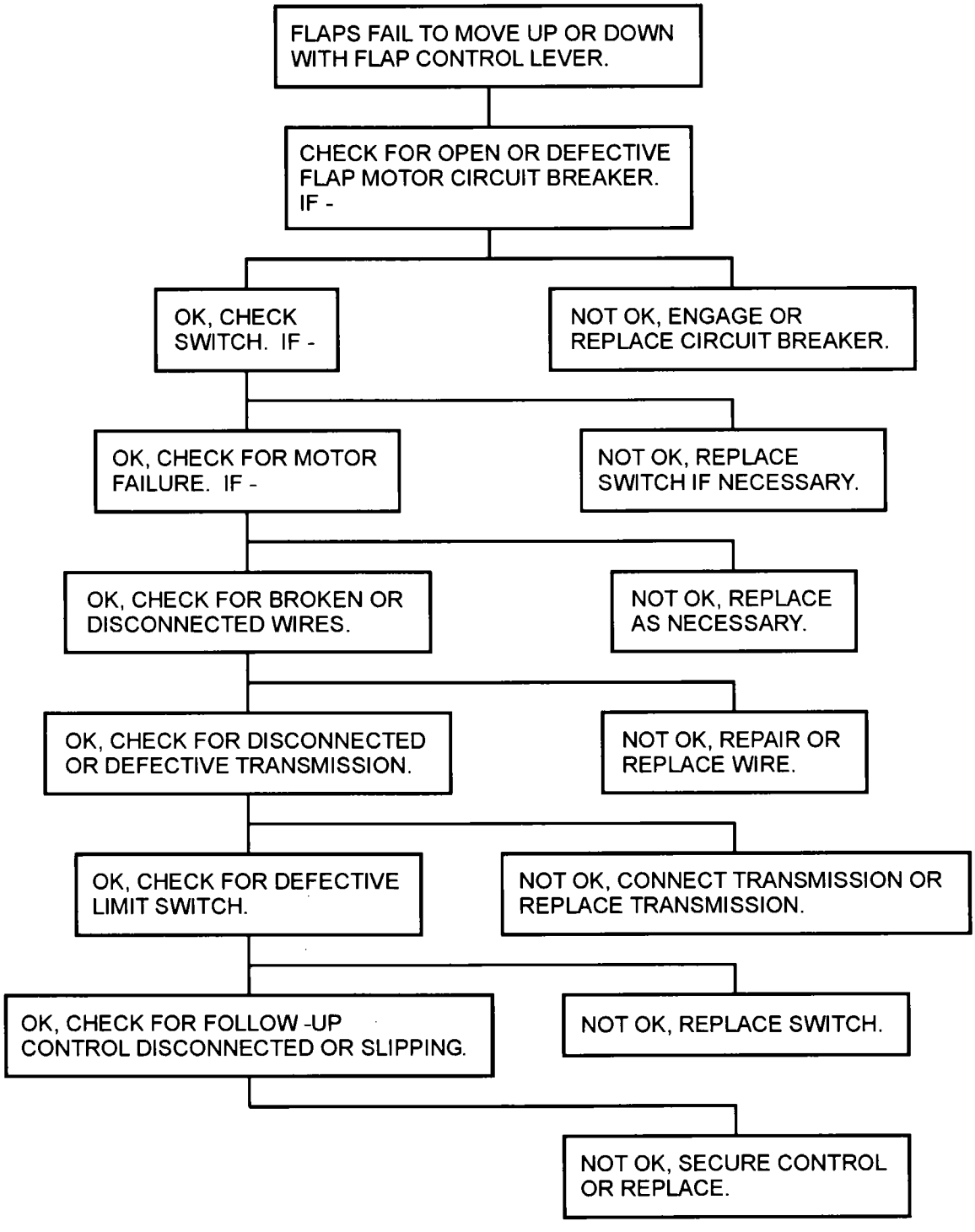
(2) A successful test of the stall warning system will cause the stall warning horn to sound at 4.5 to 9.0 knots above airplane stall speed.

FLAP CONTROL SYSTEM - TROUBLESHOOTING

1. General

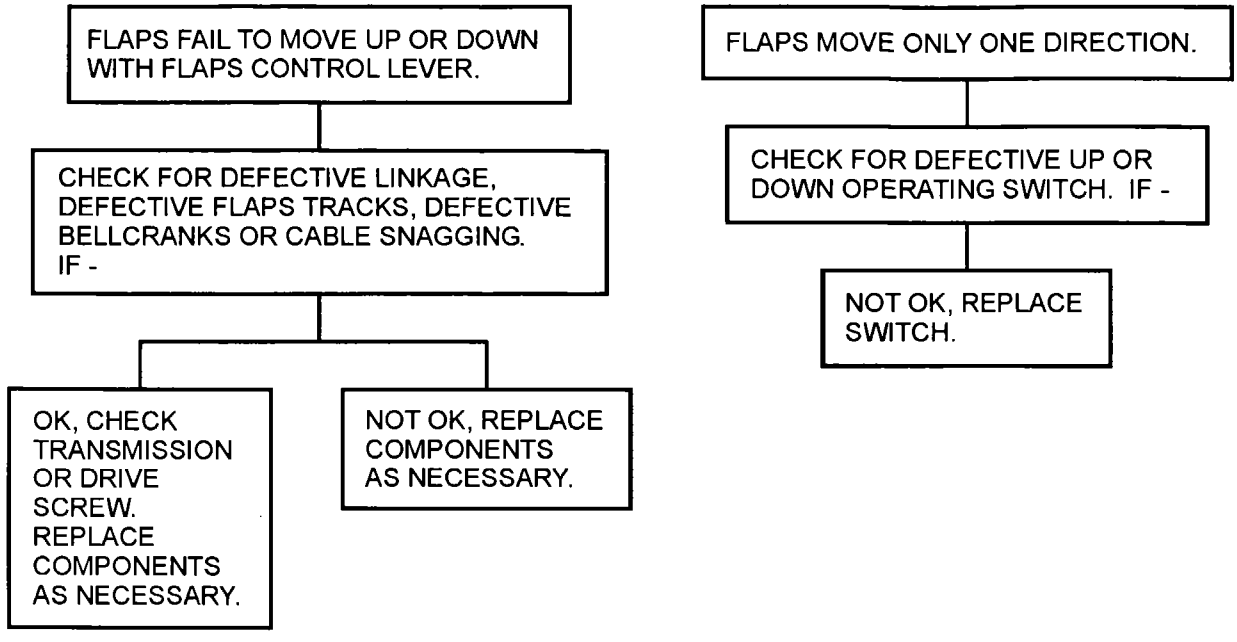
A. A troubleshooting chart has been developed to aid the maintenance technician in system understanding. Refer to Figure 101.

B904



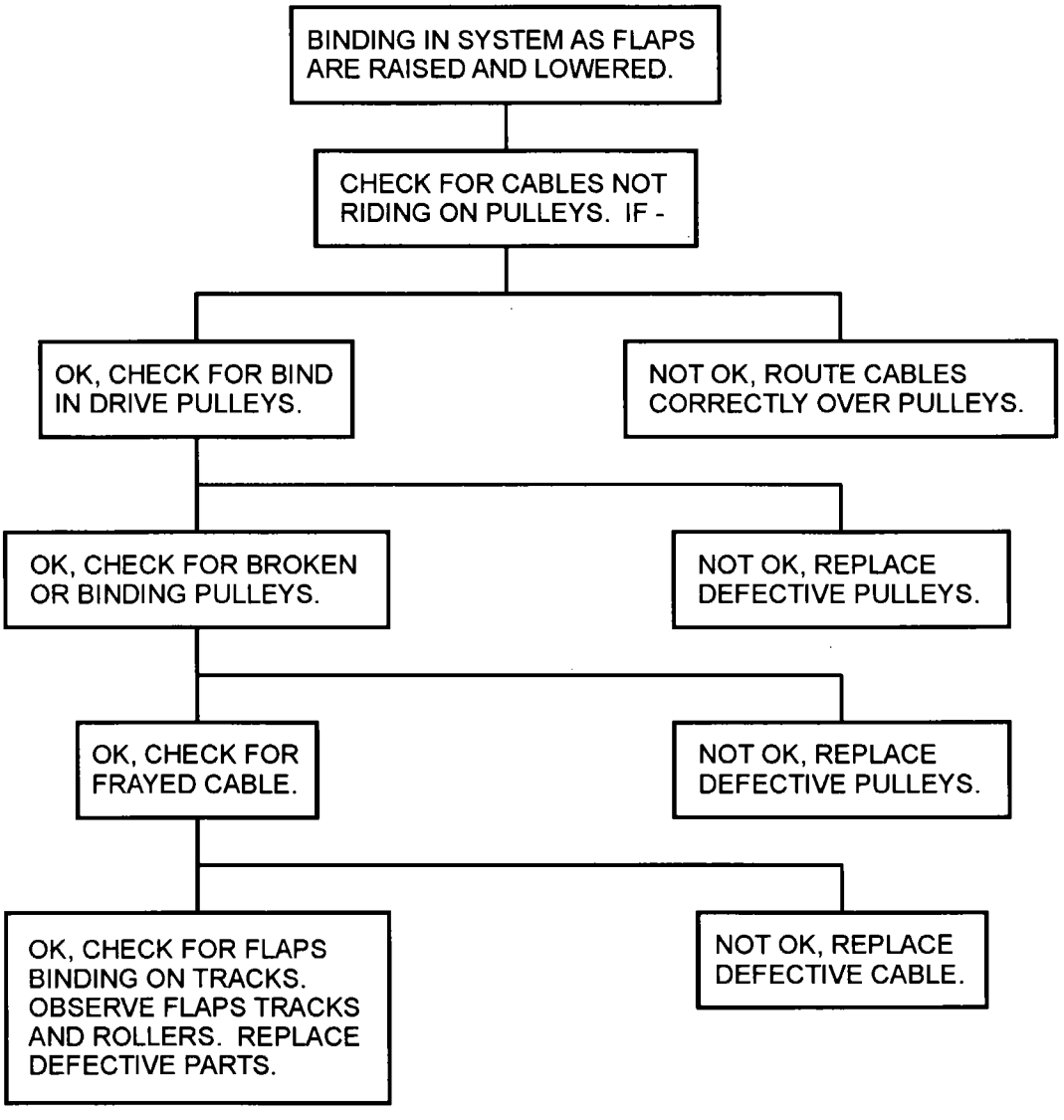
Flap System Troubleshooting Chart
Figure 101 (Sheet 1)

B905



Flap System Troubleshooting Chart
Figure 101 (Sheet 2)

B906



Flap System Troubleshooting Chart
Figure 101 (Sheet 3)

FLAP CONTROL SYSTEM - MAINTENANCE PRACTICES

1. General

A. The wing flap control system has an electric motor and transmission assembly, drive pulleys, push-pull rods, cables and a follow-up control. Power from the motor and transmission assembly is transmitted to the flaps by a system of drive pulleys, cables and push-pull rods. Electrical power to the motor is controlled by two microswitches attached to a floating arm assembly, a cam lever and a follow-up control.

B. As the flap control lever is moved to the necessary flap setting, the attached cam closes one of the microswitches, which operates the flap motor. As the flaps move to the position that was selected, the floating arm is turned by the follow-up control until the active microswitch clears the cam breaking the circuit and stops the motor.

C. To reverse the flap direction, the control lever is moved in the opposite direction, causing the cam to close the second microswitch, which reverses the flap motor. The follow-up control moves the cam until it is clear of the second switch, stopping the flap motor. Limit switches at the flap actuator assembly control flap travel as the flaps get to the full UP or DOWN positions.

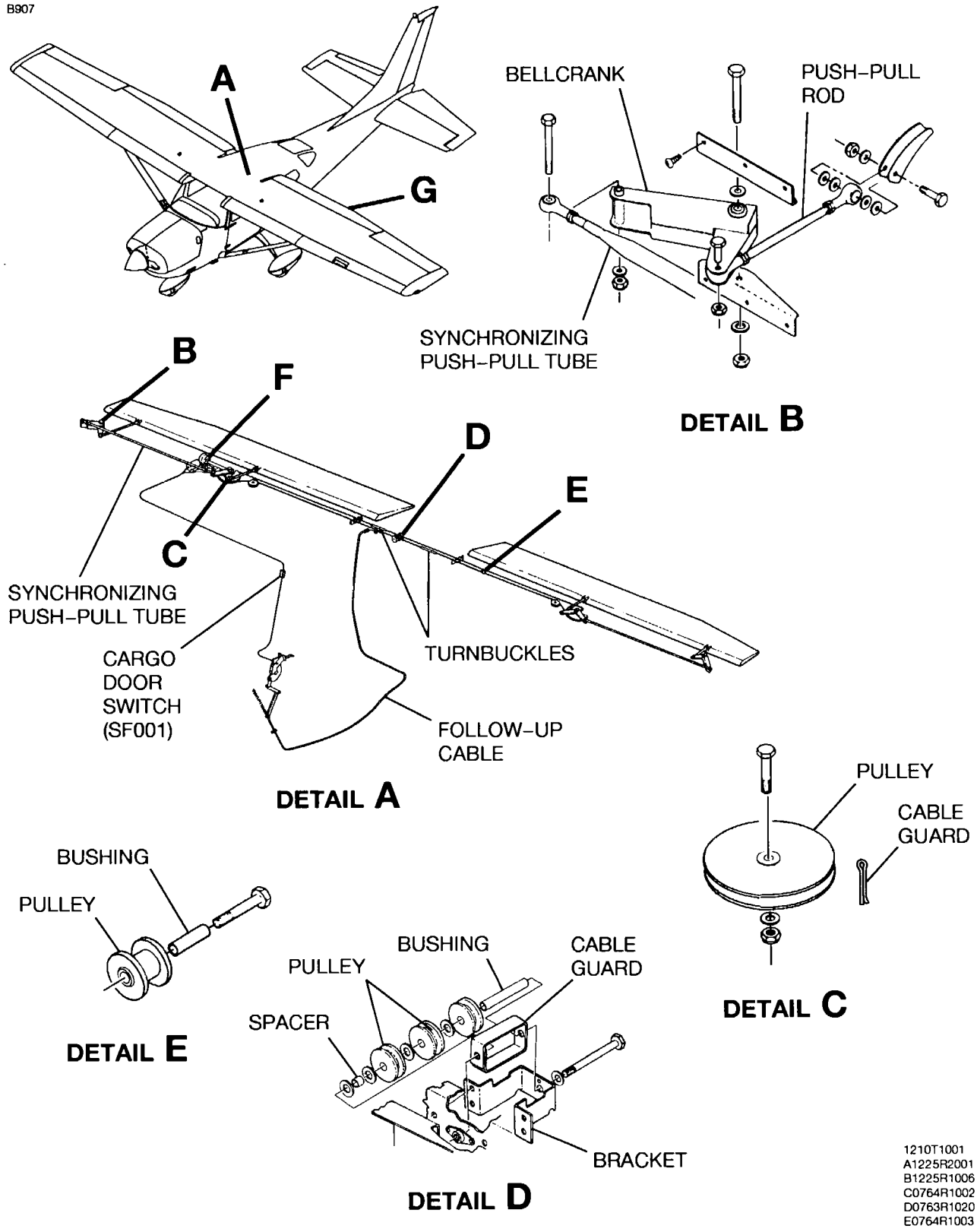
2. Flap Motor and Transmission Assembly Removal/Installation

A. Remove the Flap Motor and Transmission Assembly (Refer to Figure 201).
(1) Lower the flaps.
(2) Disconnect the electrical power.
(3) Remove access plate 610JB. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(4) Remove the bolt that attaches the actuating tube to the drive pulley.
(5) Turn the actuating tube in toward transmission as far as possible by hand.
(6) Remove the bolt that attaches the flap motor hinge to the wing. Keep the brass washer between the hinge and the wing structure for use on installation.
(7) Disconnect the electrical connectors from the motor, and the limit switches.
(8) Carefully remove the assembly from the wing through the access opening.

B. Install the Flap Motor and Transmission Assembly (Refer to Figure 201).
(1) Carefully install the assembly into the wing through the access opening. Make sure that the short end of the hinge is installed toward the top if you removed the hinge assembly from the transmission for any reason.
(2) Connect the electrical connectors to the motor and limit switches.
(3) Secure flap motor hinge to wing with bolt and brass washer.
(4) Turn the actuating tube out toward the bell crank.
(5) Install the bolt that attaches the actuating tube to the drive pulley.
(6) Connect electrical power.
(7) Make sure that the flaps operate correctly. Refer to Flap System - Adjustment/Test for rigging instructions.
(8) Install access plate 610JB. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

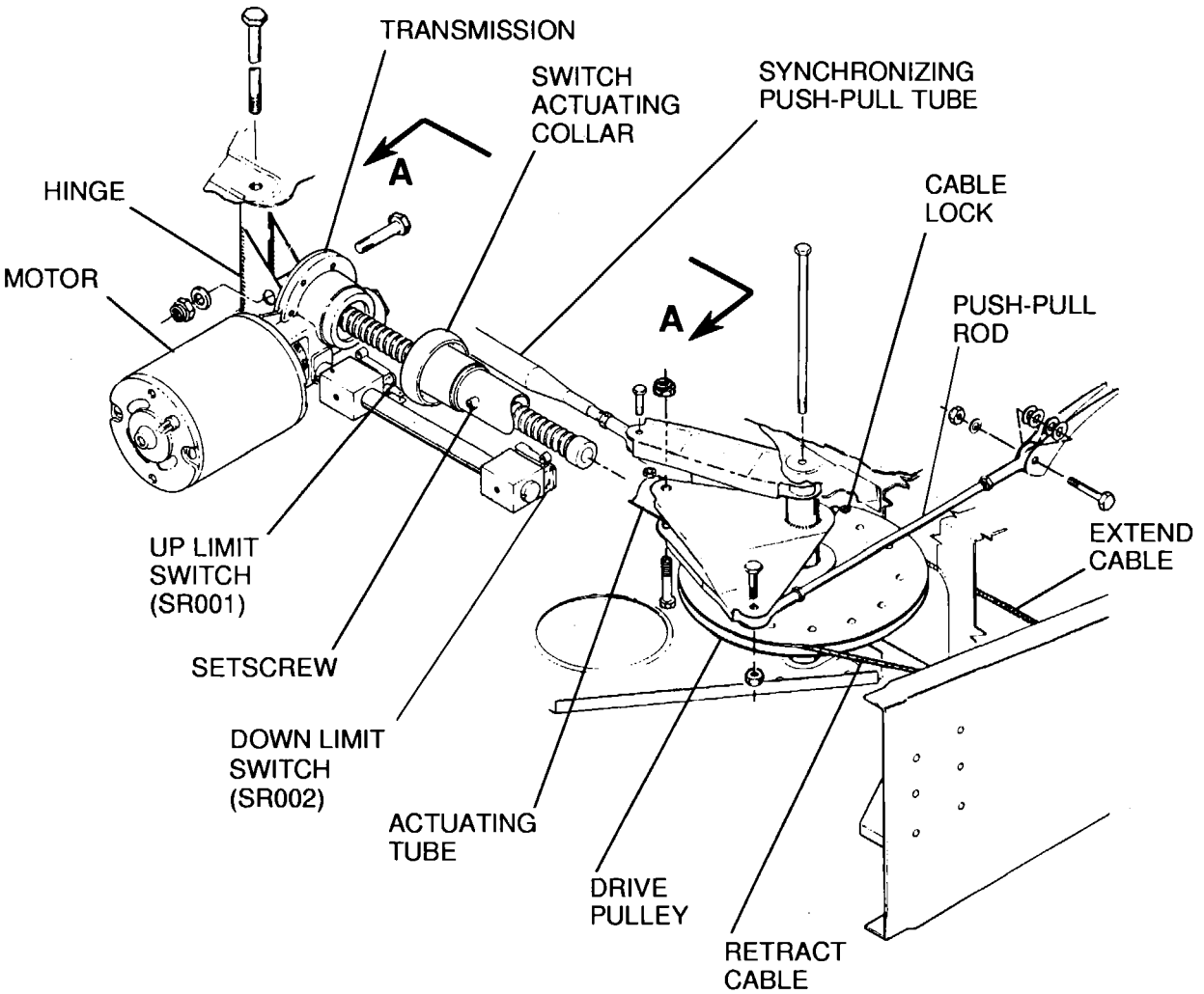
3. Flap Removal/Installation

A. Remove the Flaps (Refer to Figure 201).
(1) Put the Master Switch (SI009) to ON.
(2) Lower the flaps using flap selector switch (SI008).
(3) Put the BAT portion of the Master Switch to BAT (off).
(4) Remove the access plates 511AT (611AT), 511BT (611BT), 511CT (611CT), 511DT (611DT), and 511ET (611ET) from the leading edge of the flap.
(5) Disconnect the push-pull rod at the flap bracket.
(6) Remove the bolts at each flap track. As the flap is removed from the wing, all of the washers, rollers and bushings will fall. Keep this hardware for installation.

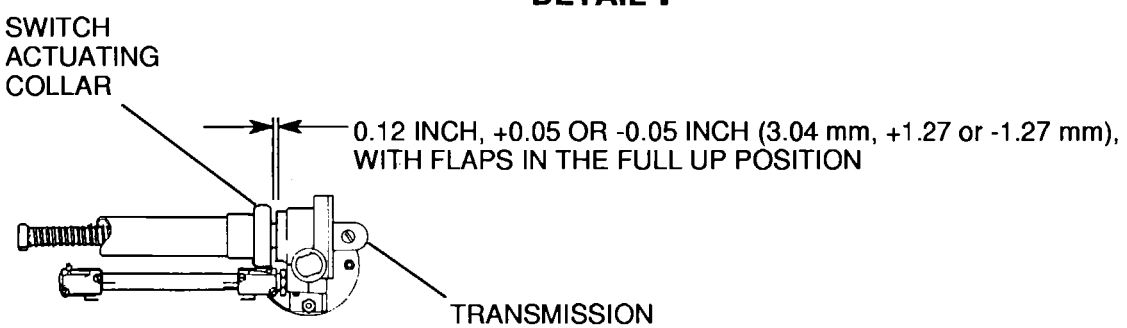


Wing Flap Control System Installation
Figure 201 (Sheet 1)

B908



DETAIL F

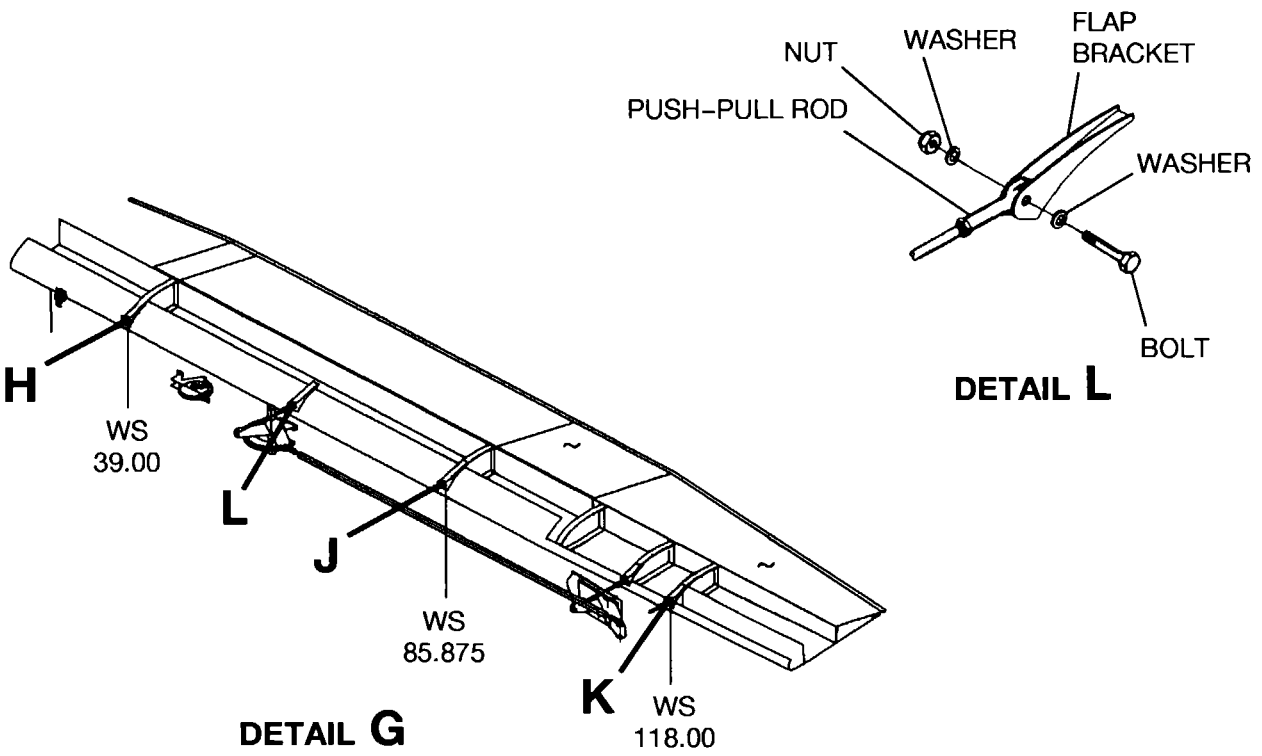


VIEW A-A

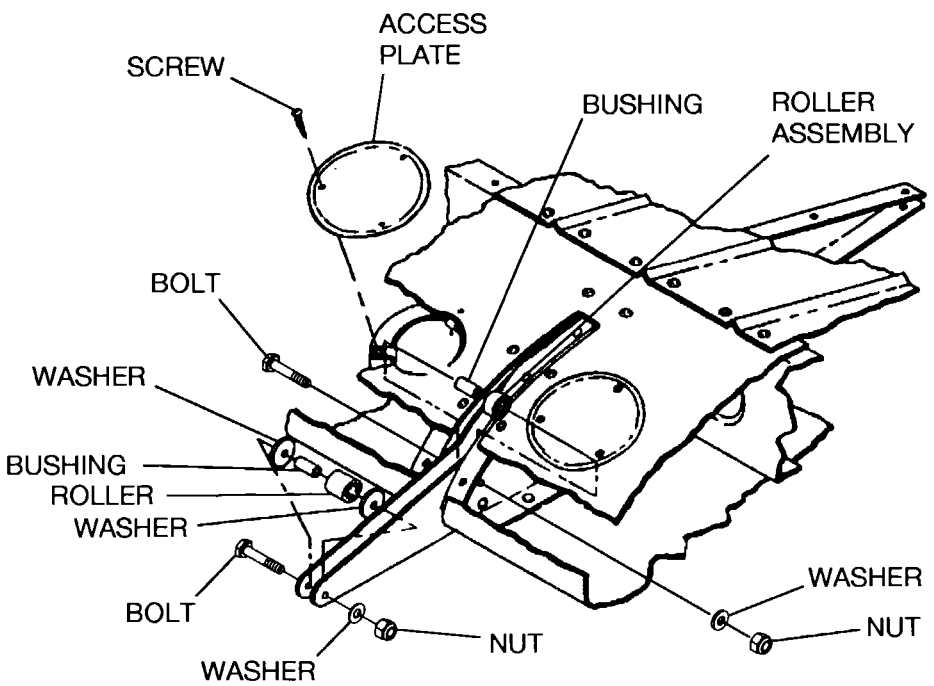
F12641002
AA12641003

Wing Flap Control System Installation
Figure 201 (Sheet 2)

B924



LEFT FLAP SHOWN, RIGHT FLAP TYPICAL



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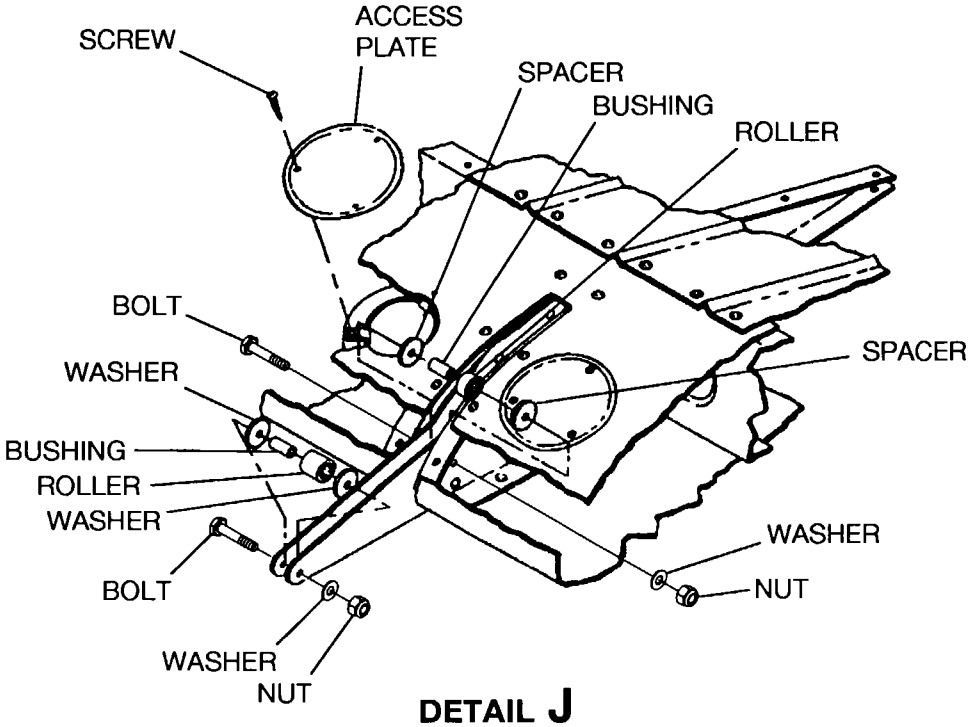
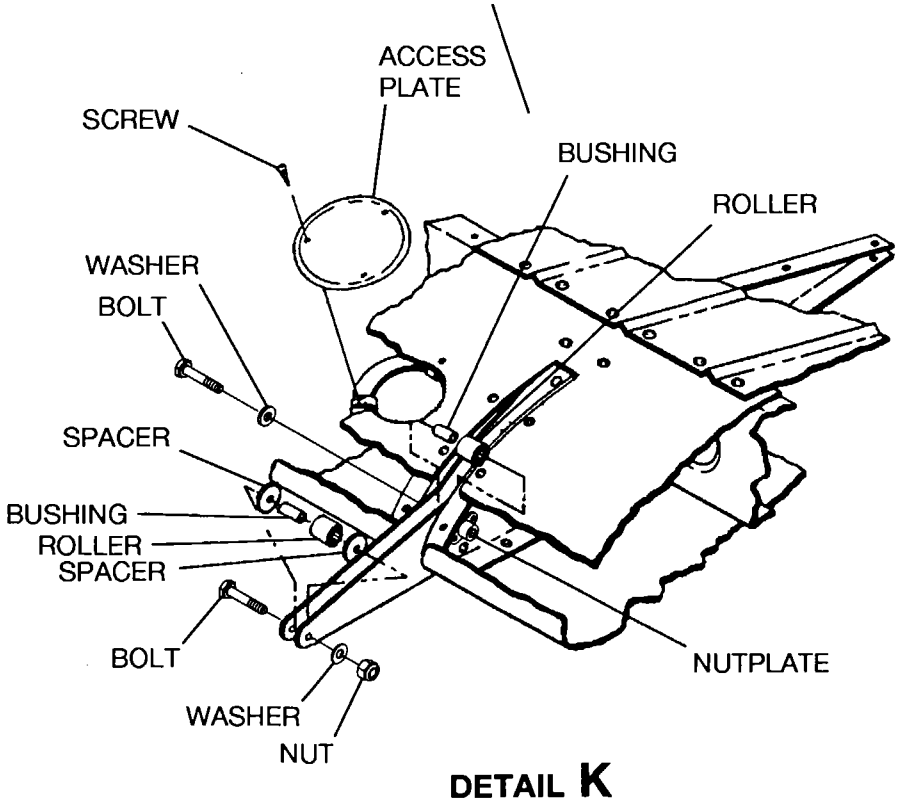
Wing Flap Control System Installation
Figure 201 (Sheet 3)

B975



DETAIL J



DETAIL K

J0725R1002
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Wing Flap Control System Installation
Figure 201 (Sheet 4)

B. Install the Flaps (Refer to Figure 201).

NOTE: It is permitted to apply 3M Y8671 or equivalent polyurethane tape on upper flap skins as necessary to prevent chafing against the wing trailing edge.

(1) Make sure that the flap track slot width is 0.6 inches, +0.03 or -0.03 inches (14.5 mm, +0.76 or -0.76 mm).
   (a) When there is any width not within these limits, replace the flap track.
(2) Install the flap to flap tracks using hardware kept from when the flap track was removed.
(3) Connect push-pull rod to flap bracket.
(4) Rig flaps. Refer to Flap Control System Adjustment/Test.

NOTE: If push-pull rod adjustment was not disturbed, flap rigging will not be required.

(5) Install the access plates 511AT (611AT), 511BT (611BT), 511CT (611CT), 511DT (611DT), and 511ET (611ET) from the leading edge of the flap.
(6) Put the Master Switch (SI009) in the ON position.
(7) Raise the flaps using flap selector switch (SI007).
(8) Put the BATT portion of the Master Switch to the BAT (off) position.

4. Flap Drive Pulleys Removal/Installation

A. Remove the Flap Drive Pulleys (Refer to Figure 201).

NOTE: Left and right are typical except as noted.

(1) In the cockpit/cabin area, remove overhead center console. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(2) Remove the safety clips and loosen the flap adjustment turnbuckles.
(3) Remove access plates 610JB and 610FB for the right flap, and 510JB and 510FB for the left flap. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(4) Remove the bolt that attaches the flap push-pull rod to the drive pulley.
(5) Remove the bolt that attaches the synchronizing push-pull tube to the drive pulley, and gently lower the right flap.
(6) Remove the bolt that attaches the actuating tube to the drive pulley and lower right flap.

NOTE: The actuating tube is only on the right wing flap.

(7) Remove the cable locks that attach the control cables to the drive pulley.
(8) Tag the cables for identification.
(9) Remove the bolt that attaches the drive pulley to the wing structure.
(10) Remove the drive pulley through the access opening, without dropping the bushing. Keep the brass washer between the drive pulley and wing structure for use during installation.
(11) Tape the open ends of the drive pulley after removal to prevent the bearings from being damaged.

B. Install the Flap Drive Pulleys (Refer to Figure 201).
(1) In the left and right wing, install the drive pulley and bushing through the access opening, install the brass washer and attach it to the wing structure with a bolt.
(2) In the left and right wing, remove the identification tags.
(3) Install the cable locks that attach the control cables to the drive pulleys on left and right wing.
(4) In the right wing, install the bushing and bolt that attach the actuating tube to the drive pulley.
(5) Raise the flaps with the Flap switch (SI007).
(6) Connect the synchronizing push-pull tube to drive pulley.
(7) Connect the push-pull rod to the drive pulley.
(8) In the cockpit/cabin area, adjust the flap drive cables as necessary. Refer to Flap Control Adjustment/Test.
(9) Install access plates 610JB and 610FB for the right flap, and 510JB and 510FB for the left flap. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

(10) Install the overhead center console. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

5. Cables and Pulleys Removal/Installation

NOTE: Airplanes 20608001 thru 20608173, and Airplanes T20608001 thru T20608361 have a 0.094-inch diameter cable. Airplanes 20608174 and On, and Airplanes T20608362 and On have a 0.125 inch diameter cable.

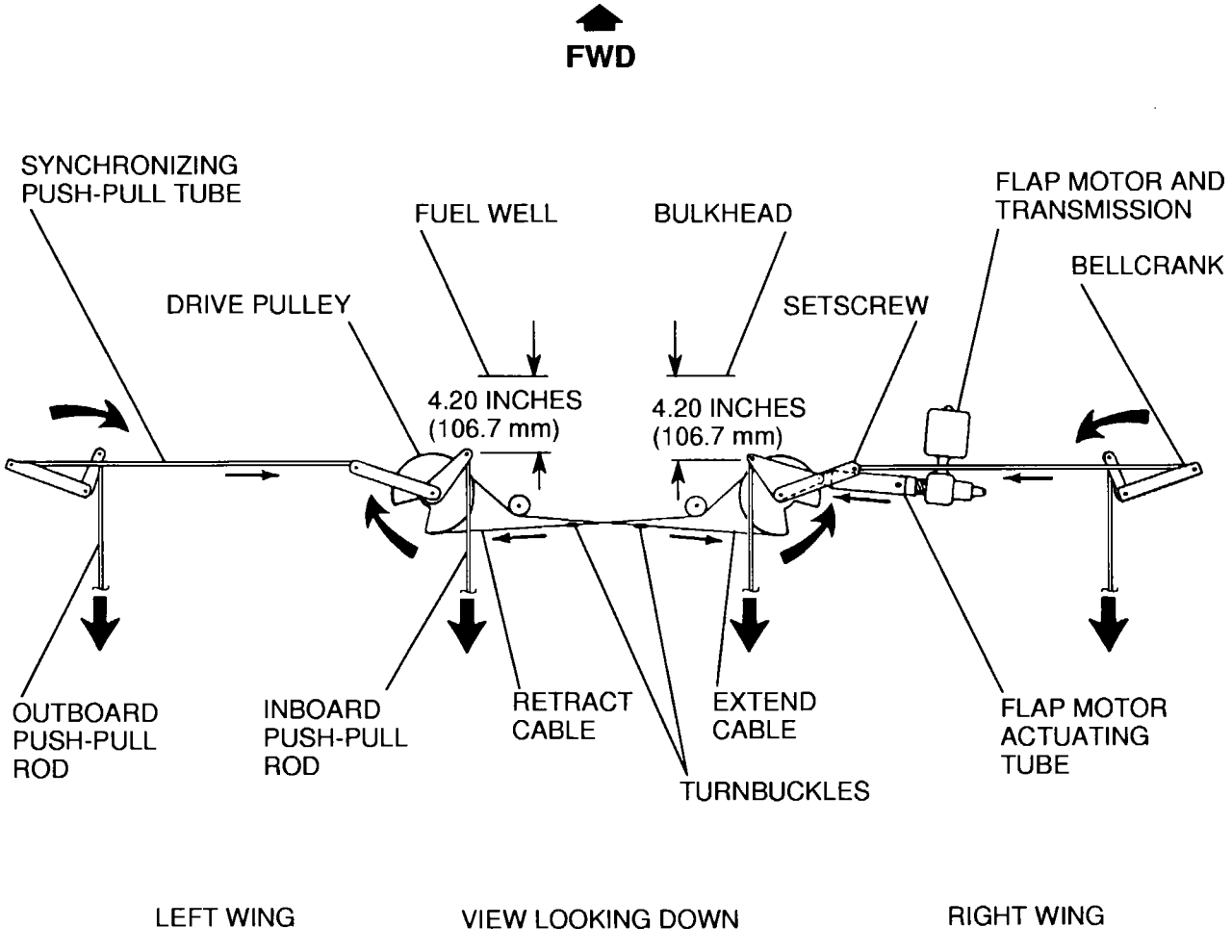
A. Remove the Cables and Pulleys (Refer to Figure 201).
(1) Remove the overhead center console. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(2) Remove access plates 610CB, 610DB, 610FB, 610HB, 610JB, 610LB, 610NB, 610QB, 610SB, 610WB on the right flap, and 510CB, 510DB, 510FB, 510HB, 510JB, 510LB, 510NB, 510QB, 510SB, 510WB on the left flap. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(3) Disconnect the flap follow-up cable from the retract cable.
(4) Remove the safety clips from the forward retract cable and aft extend cable turnbuckles.
(5) Relieve the cable tension by carefully lowering the left flap.
(6) Remove the cable guards and pulleys.
(7) Attach a length of wire long enough to go through the structure, to the end of the cable being withdrawn from the airplane.
(8) Remove the cables.
(9) Leave the wire in place, routed through structure.

B. Install the Cables and Pulleys (Refer to Figure 201).
(1) Attach the new cables to wires, and pull cables into position.
(2) Install the pulleys and pulley guards.
(3) Connect the cables to the drive pulleys using cable locks.
(4) Adjust the cable tension.
(a) Airplanes 20608001 through 20608173, and Airplanes T20608001 thru T20608361, adjust cable tension to 70 pounds, +10 or -10 pounds (311 N +44 or -44 N).
(b) Airplanes 20608174 and On, and Airplanes T20608362 and On, adjust cable tension to 130 pounds, +10 or -10 pounds (578 N, +44 or -44 N) at 70 °F (21 °C). Refer to Figure 203 for the correct tensions at other temperatures.
(5) Rig the flap system. Refer to Flap Control System Adjustment/Test.
(6) Connect the flap follow-up cable to the retract cable.
(7) Adjust the flap follow-up cable system. Refer to Flap Follow-Up and Indicating System Adjustment/Test.
(8) Install the access plates.
(9) Install the center overhead console. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

6. Flap Control System Adjustment/Test

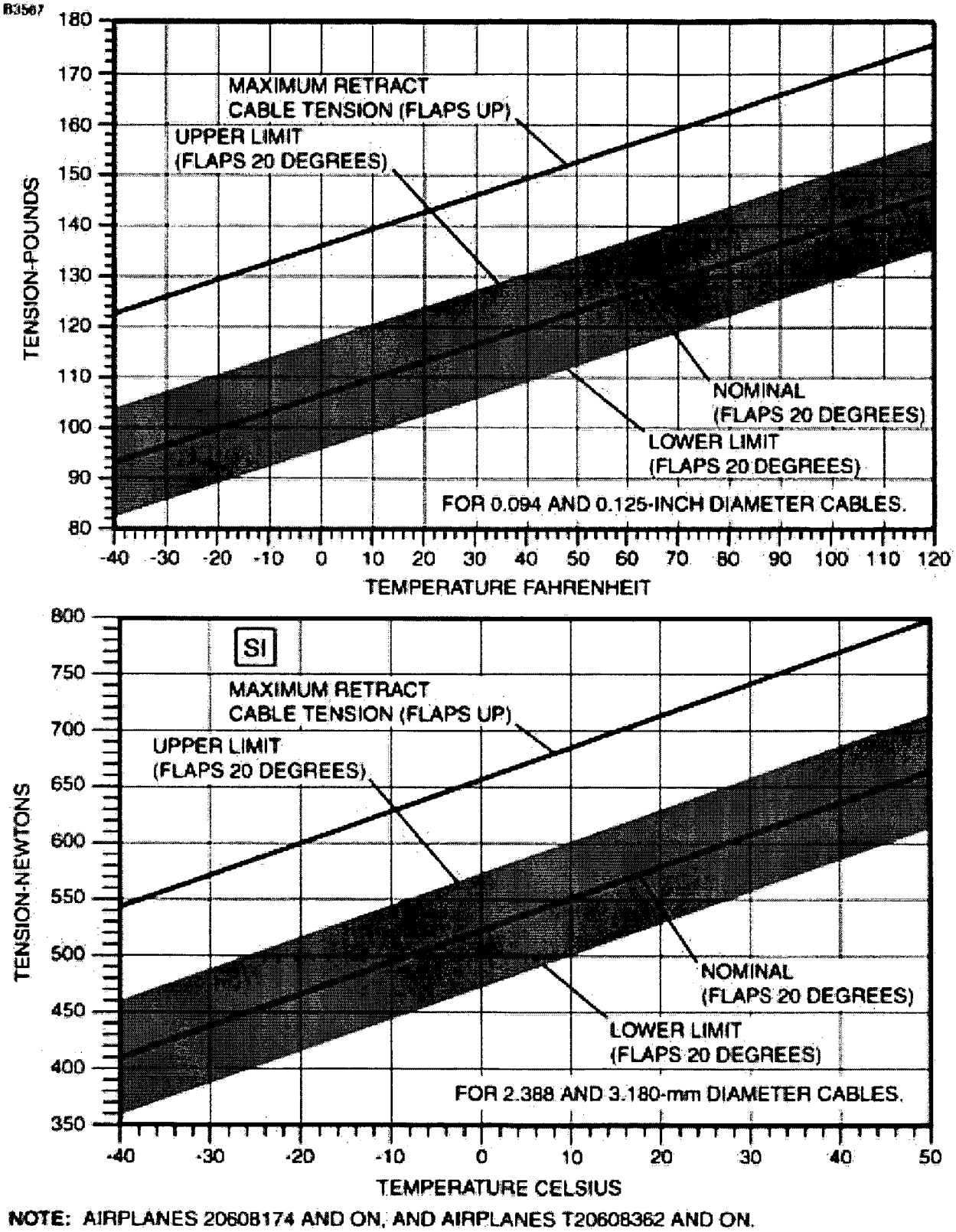
A. Adjust the Flap Control System (Refer to Figure 201, Figure 202, and Figure 203).
(1) Let the airplane temperature stabilize for four hours before you measure the cable tension.
(2) In the cockpit/cabin area, remove the overhead console. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(3) Remove access plates 610CB, 610DB, 610FB, 610HB, 610JB, 610LB, 610NB, 610QB, 610SB, 610WB for the right flap, and 510CB, 510DB, 510FB, 510HB, 510JB, 510LB, 510NB, 510QB, 510SB, 510WB for the left flap. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(4) Remove the safety clips from the turnbuckles.
(5) Relieve the cable tension by turning the turnbuckles.
(6) Disconnect the turnbuckles and then carefully lower left flap.
(7) Disconnect the push-pull rods at the drive pulleys in both wings and then carefully lower right flap.

B909



1225R1007

Flap System Schematic
Figure 202 (Sheet 1)



NOTE: AIRPLANES 20608174 AND ON, AND AIRPLANES T20608362 AND ON.

Flap Cable Tension
Figure 203 (Sheet 1)

(8) Remove the bolt that attaches the synchronizing push-pull tube to the drive pulley in the left wing.
(9) Disconnect the outboard flap push-pull rods from the bell cranks in both wings.
(10) Disconnect the actuating tube in the right wing only, from the drive pulley.
(11) Make sure that the retract cable is connected to the forward side of the right drive pulley and to the aft side of the left drive pulley.
(12) Make sure that the extend cable is connected to the aft side of the right drive pulley and to the forward side of the left drive pulley.
(13) Make sure that the right drive pulley rotates clockwise, when viewed from below, as the flaps are extended.
(14) Adjust the synchronizing push-pull tube in the right wing to 48.7 inches (1.2 m) between the centers of the rod end holes.
(15) Tighten the jam nuts and connect the push-pull tube to the bell crank and drive pulley.
(16) Adjust the travel on the flap motor so the centerline of the bolt hole for the inboard push-pull rod is 4.2 inches (106.7 mm) aft of the fuel well bulkhead.
(17) Turn the actuating tube inward toward the transmission by hand until there is a measurement of 0.1 inch (3.0 mm) between the switch actuating collar and the transmission.
(18) Loosen the setscrew on the actuating collar.
(19) Hold the actuating collar to maintain 0.1 inch (3.0 mm), and adjust the actuating tube in or out as necessary to get 11.2 inches (283.46 mm) from centerline to centerline of the actuating tube attach bolt and the flap motor transmission attach bolt.
(20) Apply Loctite sealant, Grade CV, to the threads of the setscrew, and torque to 40 inch-pounds (4.52 Nm).
(21) Attach the actuating tube to the drive pulley with a bolt and nut.
(22) Hold the right flap full up, and adjust the push-pull rods to align with the drive pulley and bell crank attachment holes.
(23) Connect push-pull rods and tighten lock nuts.

NOTE: The right flap and actuator must be correctly rigged before cables and left flap can be rigged.

(24) Attach an inclinometer on the trailing edge of the right flap.
(25) With the right flap in the full up position, loosen the setscrew and move the up limit switch adjustment block to operate the switch and turn off electrical power to the motor at full up position.
(26) Tighten the setscrew.
(27) Lower the right flap, and adjust the down limit switch block to operate the switch and turn off the electrical power to the motor at 40 degrees, +1 or -2 degrees of travel.
(28) Tighten the setscrew.
(29) Raise the right flap.
(30) Adjust the synchronizing push-pull tube in the left wing to 48.7 inches (1.2 m) between the centers of the rod end holes, and tighten the jam nuts.
(31) Connect push-pull tube to the bell crank and drive pulley.
(32) Connect the control cables at the turnbuckles.
(33) Make sure the cables are in the pulley grooves and the cable ends are installed correctly at the drive pulleys before tightening the turnbuckles.
(34) Rig the flap control cable tension.
   (a) On the Airplanes 20608001 thru 20608173, and Airplanes T20608001 thru T20608361, adjust the turnbuckles to position the left drive pulley so that the centerline of the bolt hole for the inboard push-pull rod attachment is 4.2 inches (106.7 mm) aft of the fuel well bulkhead. Make sure that you keep the centerline of the bolt hole for the inboard push-pull rod attachment at 4.2 inches (106.7 m) in the right wing. Make sure that you keep 70 pounds, +10 or -10 pounds (311 N +44 or -44 N) cable tension at 70 °F (21 °C).
      1 Adjust the cable tension. Adjust the retract cable first.
      2 Install safety clips in the turnbuckles. Refer to Chapter 20, Safetying - Maintenance Practices.
   (b) On the Airplanes 20608174 and On, and Airplanes T20608362 and On, adjust the turnbuckles to position the left drive pulley so that the centerline of the bolt hole for the inboard push-pull rod attachment is 4.2 inches (106.7 mm) aft of the fuel well bulkhead.

Make sure that you keep the centerline of the bolt hole for the inboard push-pull rod attachment at 4.2 inches (106.7 mm) in the right wing. Make sure that you keep 130 pounds, +10 or -10 pounds (578 N, +44 or -44 N) cable tension at 70 °F (21 °C). Refer to Figure 203 for the correct tensions at other temperatures.

1 Adjust the cable tension. Refer to Figure 203. Adjust the retract cable first.

2 Install safety clips in the turnbuckles. Refer to Chapter 20, Safetying - Maintenance Practices.

(35) Hold the left flap full up, and adjust the push-pull rods to align with the drive pulley and bell crank attachment holes.

(36) Connect the push-pull rods and tighten the lock nuts.

(37) Operate the flaps several times, and make sure the flap motor goes off after each cycle.

(38) Connect and rig the flap follow-up system. Refer to Flap Follow-Up and Indicating System - Maintenance Practices.

(39) Do a check for the specified flap travel with the inclinometer attached to each flap separately.

NOTE: Since the flap rollers may not touch the bottom in the flap tracks with the flaps fully extended, some free play can be noticed in this position.

(40) Do an operational check.
   (a) Make sure that all of the items are safety wired correctly.

(41) Install the access plates 610CB, 610DB, 610FB, 610HB, 610JB, 610LB, 610NB, 610QB, 610SB, 610WB for the right flap, and 510CB, 510DB, 510FB, 510HB, 510JB, 510LB, 510NB, 510QB, 510SB, 510WB for the left flap. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

(42) Install the overhead console. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

B. Install the Flaps (Refer to Figure 201).

NOTE: It is permitted to apply 3M Y8671 or equivalent polyurethane tape on upper flap skins as necessary to prevent chafing against the wing trailing edge.

(1) Make sure that the flap track slot width is 0.6 inches, +0.03 or -0.03 inches (14.5 mm, +0.76 or -0.76 mm).
   (a) When there is any width not within these limits, replace the flap track.
(2) Install the flap to flap tracks using hardware kept from when the flap track was removed.
(3) Connect push-pull rod to flap bracket.
(4) Rig flaps. Refer to Flap Control System Adjustment/Test.

NOTE: If push-pull rod adjustment was not disturbed, flap rigging will not be required.

(5) Install access plates on the leading edge of the flap.
(6) Put the Master Switch (SI009) in the ON position.
(7) Raise the flaps using flap selector switch (SI007).
(8) Put the BATT portion of the Master Switch to the BAT (off) position.

4. Flap Drive Pulleys Removal/Installation

A. Remove the Flap Drive Pulleys (Refer to Figure 201).

NOTE: Left and right are typical except as noted.

(1) In the cockpit/cabin area, remove overhead center console. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(2) Remove the safety clips and loosen the flap adjustment turnbuckles.
(3) Remove access plates 610JB and 610FB for the right flap, and 510JB and 510FB for the left flap. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(4) Remove the bolt that attaches the flap push-pull rod to the drive pulley.
(5) Remove the bolt that attaches the synchronizing push-pull tube to the drive pulley, and gently lower the right flap.
(6) Remove the bolt that attaches the actuating tube to the drive pulley and lower right flap.

NOTE: The actuating tube is only on the right wing flap.

(7) Remove the cable locks that attach the control cables to the drive pulley.
(8) Tag the cables for identification.
(9) Remove the bolt that attaches the drive pulley to the wing structure.
(10) Remove the drive pulley through the access opening, without dropping the bushing. Keep the brass washer between the drive pulley and wing structure for use during installation.
(11) Tape the open ends of the drive pulley after removal to prevent the bearings from being damaged.

B. Install the Flap Drive Pulleys (Refer to Figure 201).
(1) In the left and right wing, install the drive pulley and bushing through the access opening, install the brass washer and attach it to the wing structure with a bolt.
(2) In the left and right wing, remove the identification tags.
(3) Install the cable locks that attach the control cables to the drive pulleys on left and right wing.
(4) In the right wing, install the bushing and bolt that attach the actuating tube to the drive pulley.
(5) Raise the flaps with the Flap switch (SI007).
(6) Connect the synchronizing push-pull tube to drive pulley.
(7) Connect the push-pull rod to the drive pulley.
(8) In the cockpit/cabin area, adjust the flap drive cables as necessary. Refer to Flap Control Adjustment/Test.
(9) Install access plates 610JB, and 610FB for the right flap, and 510JB and 510FB for the left flap. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(10) Install the overhead center console. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

5. Cables and Pulleys Removal/Installation

NOTE: Airplanes 20608001 thru 20608173, and Airplanes T20608001 thru T20608361 have a 0.094-inch diameter cable. Airplanes 20608174 and On, and Airplanes T20608362 and On have a 0.125 inch diameter cable.

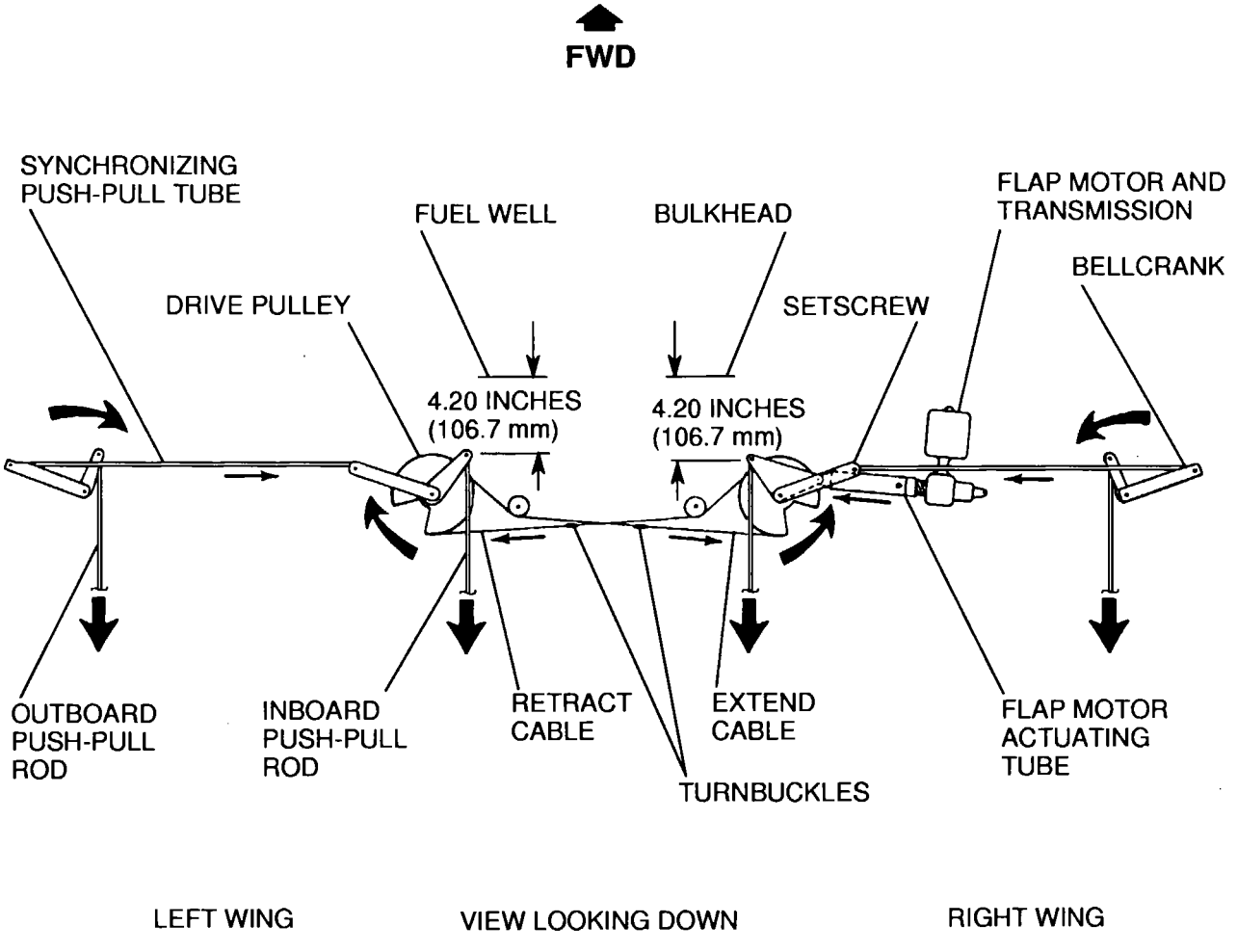
A. Remove the Cables and Pulleys (Refer to Figure 201).
   (1) Remove the overhead center console. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
   (2) Remove access plates 610CB, 610DB, 610FB, 610HB, 610JB, 610LB, 610NB, 610QB, 610SB, 610WB on the right flap, and 510CB, 510DB, 510FB, 510HB, 510JB, 510LB, 510NB, 510QB, 510SB, 510WB on the left flap. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
   (3) Disconnect the flap follow-up cable from the retract cable.
   (4) Remove the safety clips from the forward retract cable and aft extend cable turnbuckles.
   (5) Relieve the cable tension by carefully lowering the left flap.
   (6) Remove the cable guards and pulleys.
   (7) Attach a length of wire long enough to go through the structure, to the end of the cable being withdrawn from the airplane.
   (8) Remove the cables.
   (9) Leave the wire in place, routed through structure.

B. Install the Cables and Pulleys (Refer to Figure 201).
   (1) Attach the new cables to wires, and pull cables into position.
   (2) Install the pulleys and pulley guards.
   (3) Connect the cables to the drive pulleys using cable locks.
   (4) Adjust the cable tension.
      (a) Airplanes 20608001 through 20608173, and Airplanes T20608001 thru T20608361, adjust cable tension to 70 pounds, +10 or -10 pounds (311 N +44 or -44 N).
      (b) Airplanes 20608174 and On, and Airplanes T20608362 and On, adjust cable tension to 130 pounds, +10 or -10 pounds (578 N, +44 or -44 N) at 70 °F (21 °C). Refer to Figure 203 for the correct tensions at other temperatures.
   (5) Rig the flap system. Refer to Flap Control System Adjustment/Test.
   (6) Connect the flap follow-up cable to the retract cable.
   (7) Adjust the flap follow-up cable system. Refer to Flap Follow-Up and Indicating System Adjustment/Test.
   (8) Install the access plates.
   (9) Install the center overhead console. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

6. Flap Control System Adjustment/Test

A. Adjust the Flap Control System (Refer to Figure 201, Figure 202, and Figure 203).
   (1) Let the airplane temperature stabilize for four hours before you measure the cable tension.
   (2) In the cockpit/cabin area, remove the overhead console. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
   (3) Remove access plates 610CB, 610DB, 610FB, 610HB, 610JB, 610LB, 610NB, 610QB, 610SB, 610WB for the right flap, and 510CB, 510DB, 510FB, 510HB, 510JB, 510LB, 510NB, 510QB, 510SB, 510WB for the left flap. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
   (4) Remove the safety clips from the turnbuckles.
   (5) Relieve the cable tension by turning the turnbuckles.
   (6) Disconnect the turnbuckles and then carefully lower left flap.
   (7) Disconnect the push-pull rods at the drive pulleys in both wings and then carefully lower right flap.
   (8) Remove the bolt that attaches the synchronizing push-pull tube to the drive pulley in the left wing.
   (9) Disconnect the outboard flap push-pull rods from the bell cranks in both wings.

B909



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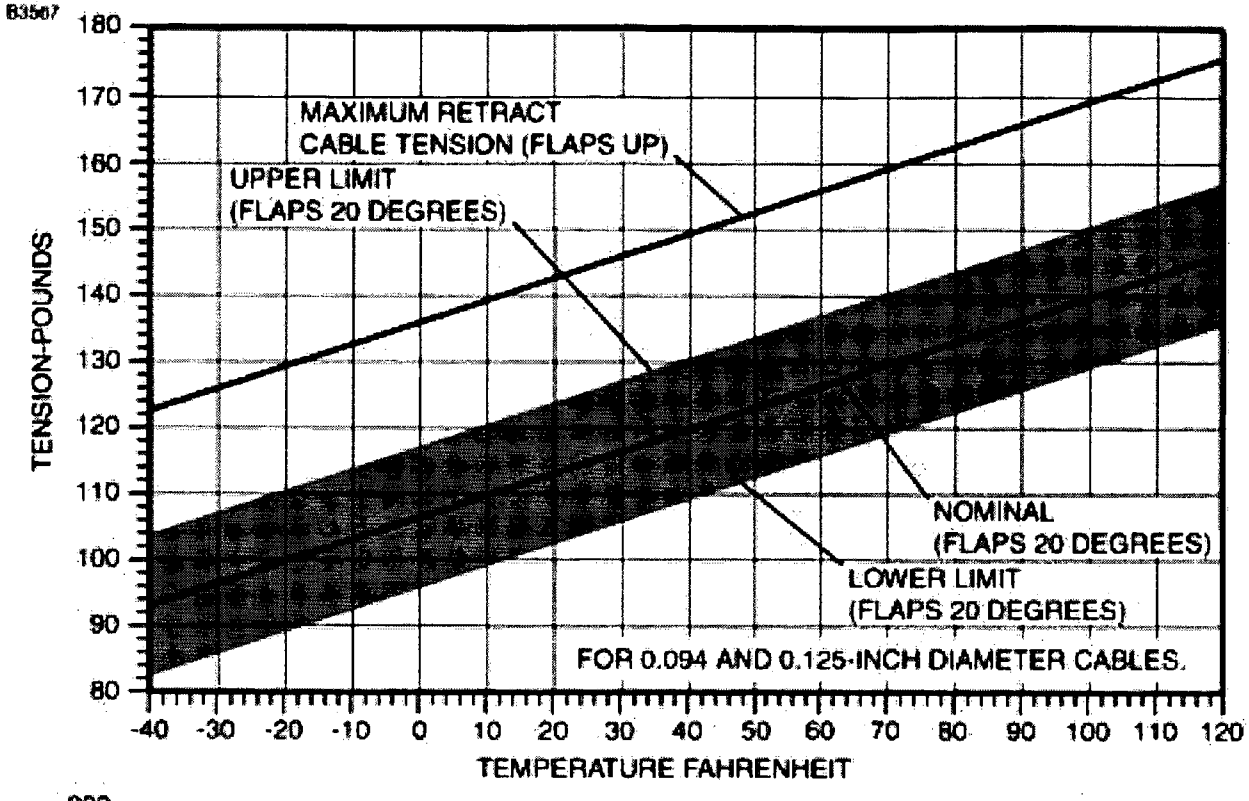
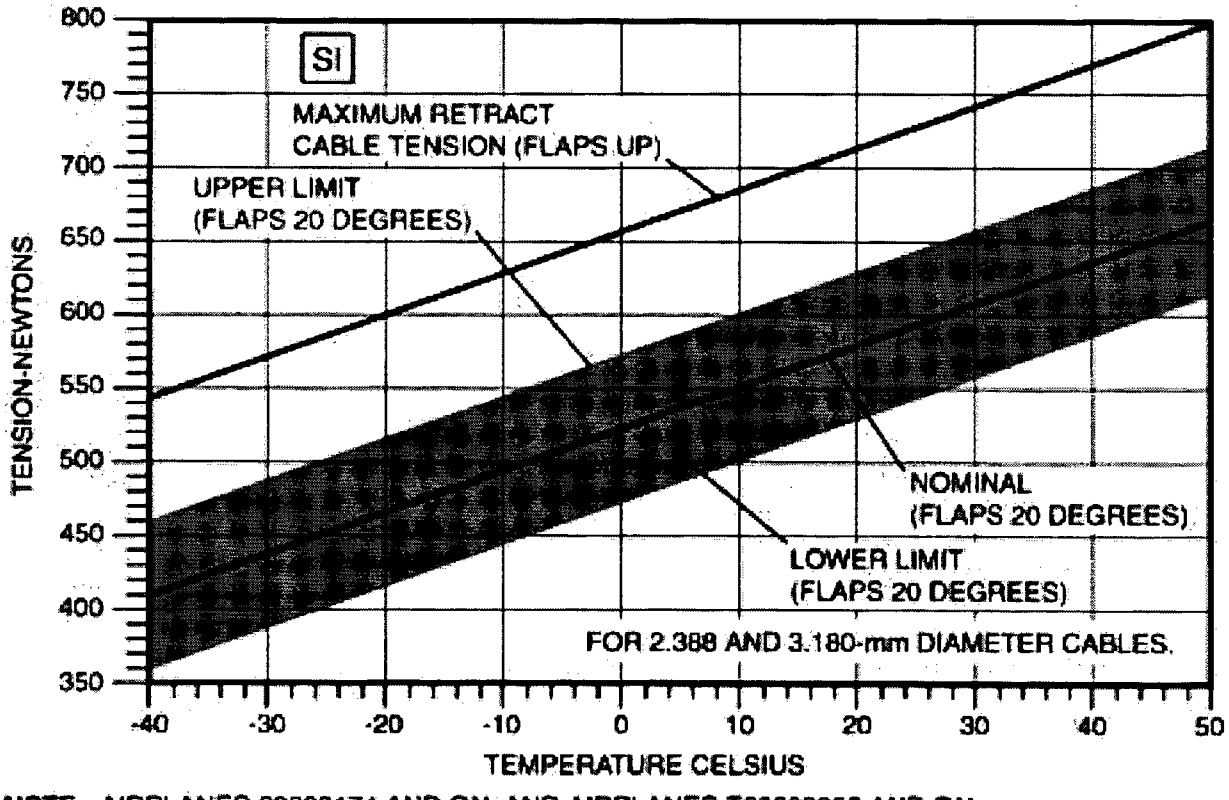
Flap System Schematic
Figure 202 (Sheet 1)





NOTE: AIRPLANES 20608174 AND ON, AND AIRPLANES T20608362 AND ON.

Flap Cable Tension
Figure 203 (Sheet 1)

(10) Disconnect the actuating tube in the right wing only, from the drive pulley.
(11) Make sure that the retract cable is connected to the forward side of the right drive pulley and to the aft side of the left drive pulley.
(12) Make sure that the extend cable is connected to the aft side of the right drive pulley and to the forward side of the left drive pulley.
(13) Make sure that the right drive pulley rotates clockwise, when viewed from below, as the flaps are extended.
(14) Adjust the synchronizing push-pull tube in the right wing to 48.7 inches (1.2 m) between the centers of the rod end holes.
(15) Tighten the jam nuts and connect the push-pull tube to the bell crank and drive pulley.
(16) Adjust the travel on the flap motor so the centerline of the bolt hole for the inboard push-pull rod is 4.2 inches (106.7 mm) aft of the fuel well bulkhead.
(17) Turn the actuating tube inward toward the transmission by hand until there is a measurement of 0.1 inch (3.0 mm) between the switch actuating collar and the transmission.
(18) Loosen the setscrew on the actuating collar.
(19) Hold the actuating collar to maintain 0.1 inch (3.0 mm), and adjust the actuating tube in or out as necessary to get 11.2 inches (283.46 mm) from centerline to centerline of the actuating tube attach bolt and the flap motor transmission attach bolt.
(20) Apply Loctite sealant, Grade CV, to the threads of the setscrew, and torque to 40 inch-pounds (4.52 Nm).
(21) Attach the actuating tube to the drive pulley with a bolt and nut.
(22) Hold the right flap full up, and adjust the push-pull rods to align with the drive pulley and bell crank attachment holes.
(23) Connect push-pull rods and tighten lock nuts.

NOTE: The right flap and actuator must be correctly rigged before cables and left flap can be rigged.

(24) Attach an inclinometer on the trailing edge of the right flap.
(25) With the right flap in the full up position, loosen the setscrew and move the up limit switch adjustment block to operate the switch and turn off electrical power to the motor at full up position.
(26) Tighten the setscrew.
(27) Lower the right flap, and adjust the down limit switch block to operate the switch and turn off the electrical power to the motor at 40 degrees, +1 or -2 degrees of travel.
(28) Tighten the setscrew.
(29) Raise the right flap.
(30) Adjust the synchronizing push-pull tube in the left wing to 48.7 inches (1.2 m) between the centers of the rod end holes, and tighten the jam nuts.
(31) Connect push-pull tube to the bell crank and drive pulley.
(32) Connect the control cables at the turnbuckles.
(33) Make sure the cables are in the pulley grooves and the cable ends are installed correctly at the drive pulleys before tightening the turnbuckles.
(34) Rig the flap control cable tension.
  (a) On the Airplanes 20608001 thru 20608173, and Airplanes T20608001 thru T20608361, adjust the turnbuckles to position the left drive pulley so that the centerline of the bolt hole for the inboard push-pull rod attachment is 4.2 inches (106.7 mm) aft of the fuel well bulkhead. Make sure that you keep the centerline of the bolt hole for the inboard push-pull rod attachment at 4.2 inches (106.7 m) in the right wing. Make sure that you keep 70 pounds, +10 or -10 pounds (311 N +44 or -44 N) cable tension at 70 °F (21 °C).
    1 Adjust the cable tension. Adjust the retract cable first.
    2 Install safety clips in the turnbuckles. Refer to Chapter 20, Safetying - Maintenance Practices.
  (b) On the Airplanes 20608174 and On, and Airplanes T20608362 and On, adjust the turnbuckles to position the left drive pulley so that the centerline of the bolt hole for the inboard push-pull rod attachment is 4.2 inches (106.7 mm) aft of the fuel well bulkhead. Make sure that you keep the centerline of the bolt hole for the inboard push-pull rod

attachment at 4.2 inches (106.7 mm) in the right wing. Make sure that you keep 130 pounds, +10 or -10 pounds (578 N, +44 or -44 N) cable tension at 70 °F (21 °C). Refer to Figure 203 for the correct tensions at other temperatures.

1 Adjust the cable tension. Refer to Figure 203. Adjust the retract cable first.

2 Install safety clips in the turnbuckles. Refer to Chapter 20, Safetying - Maintenance Practices.

(35) Hold the left flap full up, and adjust the push-pull rods to align with the drive pulley and bell crank attachment holes.

(36) Connect the push-pull rods and tighten the lock nuts.

(37) Operate the flaps several times, and make sure the flap motor goes off after each cycle.

(38) Connect and rig the flap follow-up system. Refer to Flap Follow-Up and Indicating System - Maintenance Practices.

(39) Do a check for the specified flap travel with the inclinometer attached to each flap separately.

NOTE: Since the flap rollers may not touch the bottom in the flap tracks with the flaps fully extended, some free play can be noticed in this position.

(40) Do an operational check.

(a) Make sure that all of the items are safety wired correctly.

(41) Install the access plates 610CB, 610DB, 610FB, 610HB, 610JB, 610LB, 610NB, 610QB, 610SB, 610WB for the right flap, and 510CB, 510DB, 510FB, 510HB, 510JB, 510LB, 510NB, 510QB, 510SB, 510WB for the left flap. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

(42) Install the overhead console. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

attachment at 4.2 inches (106.7 mm) in the right wing. Make sure that you keep 130 pounds, +10 or -10 pounds (578 N, +44 or -44 N) cable tension at 70 °F (21 °C). Refer to Figure 203 for the correct tensions at other temperatures.

1 Adjust the cable tension. Refer to Figure 203. Adjust the retract cable first.

2 Install safety clips in the turnbuckles. Refer to Chapter 20, Safetying - Maintenance Practices.

(35) Hold the left flap full up, and adjust the push-pull rods to align with the drive pulley and bell crank attachment holes.

(36) Connect the push-pull rods and tighten the lock nuts.

(37) Operate the flaps several times, and make sure the flap motor goes off after each cycle.

(38) Connect and rig the flap follow-up system. Refer to Flap Follow-Up and Indicating System - Maintenance Practices.

(39) Do a check for the specified flap travel with the inclinometer attached to each flap separately.

NOTE: Since the flap rollers may not touch the bottom in the flap tracks with the flaps fully extended, some free play can be noticed in this position.

(40) Do an operational check.

(a) Make sure that all of the items are safety wired correctly.

(41) Install the access plates 610CB, 610DB, 610FB, 610HB, 610JB, 610LB, 610NB, 610QB, 610SB, 610WB for the right flap, and 510CB, 510DB, 510FB, 510HB, 510JB, 510LB, 510NB, 510QB, 510SB, 510WB for the left flap. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

(42) Install the overhead console. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

FLAP FOLLOW-UP AND INDICATING SYSTEM - MAINTENANCE PRACTICES

1. General

A. The flap follow-up and indicating system consists of a sheathed cable assembly, pointers and microswitches. One end of the cable is attached to the flap operating switch operating arm. The other end is clamped to the flap extend cable, above the headliner in the rear cabin area. Motion of the flap cable is transmitted through the follow-up control to the pointer, attached to the switch mounting arm. Pointer moves along a scale as the flaps are extended or retracted. When the motion of the switch mounting arm with the attached operating switches positions the "active" operating switch to clear the cam on flap lever, flap motor circuit is broken and flaps stop at selected position.

2. Flap Follow-Up and Indicating System Removal/Installation

A. Remove Flap Control Lever. (Refer to Figure 201).
(1) Remove pedestal cover.
(2) Remove flap UP and DOWN operating switches from switch mounting arm. Do not disconnect electrical wiring at switches.

NOTE: Insulators are installed between switches and switch mounting arm.

(3) Disconnect spring from bellcrank assembly.
(4) Remove knob from control lever.
(5) Remove cotter pin, washers, and pin securing switch mounting arm to bellcrank assembly. Discard cotter pin.
(6) Remove remaining washers, bushings, switch mounting arm, and control lever by removing mounting bolt. Use care not to drop parts into tunnel area.

B. Install Flap Control Lever. (Refer to Figure 201).
(1) Install mounting bolt, assembling washers, bushings, switch mounting arm, and control lever.

NOTE: Before installing knob on control lever, clean threads on control lever with methyl n-propyl ketone or equivalent. After threads have thoroughly dried, prime with grade T primer. Allow primer to flash off or dry for three to five minutes. Apply grade CU Loctite (MIL-S-22473), Loctite 271, STA-LOK Catalog No. 700, or equivalent to threads of control lever.

(2) Install knob and allow Loctite to cure for five to twenty minutes before service.
(3) Install flap UP and DOWN operating switches on switch mounting arm, making sure to install insulators.
(4) Secure switch mounting arm on bellcrank assembly using pin, washers and new cotter pin.
(5) Connect spring to bellcrank assembly.
(6) Rig system. Refer to Flap Follow-Up and Indicating System Adjustment/Test.
(7) Install pedestal cover.

3. Flap Follow-Up and Indicating System Adjustment/Test

A. Rig Flap Follow-Up and Indicating System. Refer to Figure 201.
(1) Run flaps to full up position.
(2) Remove overhead center console. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(3) Pull all slack from follow-up control cable, and with indicator in full up position, secure follow-up cable to retract cable with clamp assembly.
(4) Torque clamp nut to 45 inch-pounds, +5 or -5 inch- pounds (5.08 N.m, +0.56 or -0.56 N.m) and lock with a second nut.
(5) Connect spring to arm assembly.
(6) Make minor cable length adjustments at brackets by adjusting nuts.

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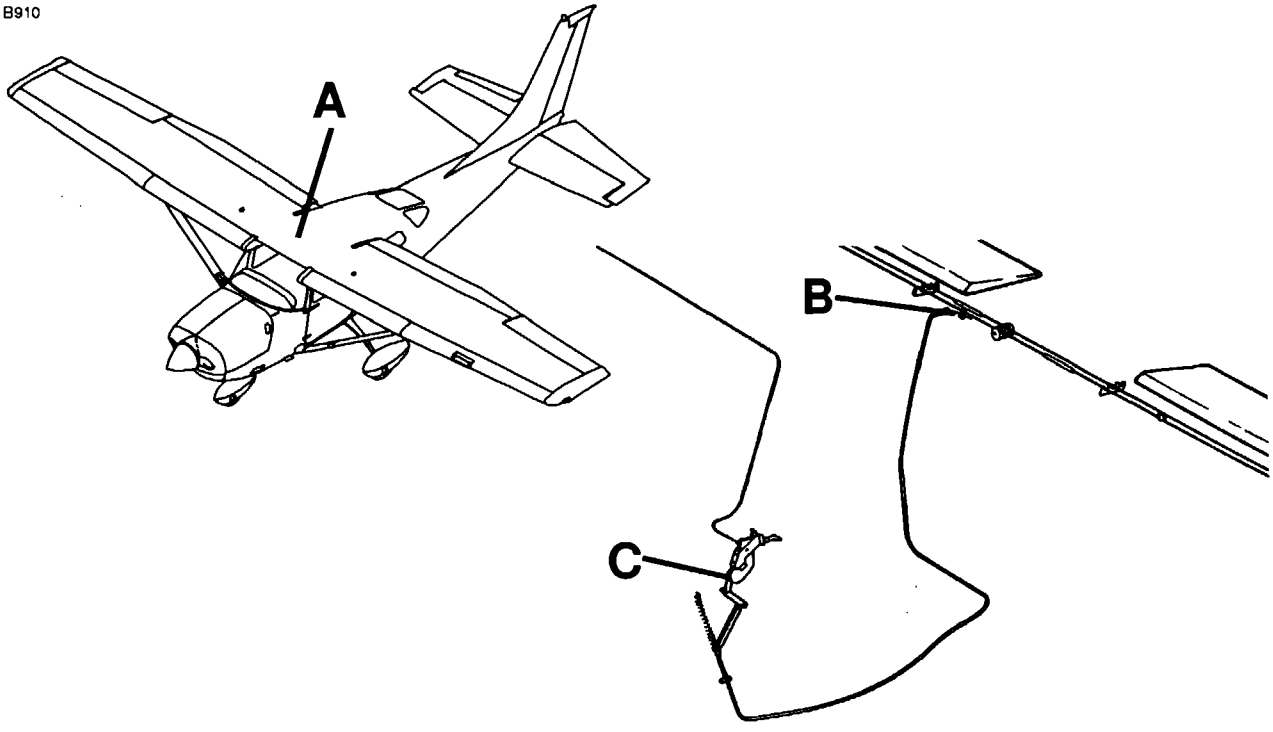
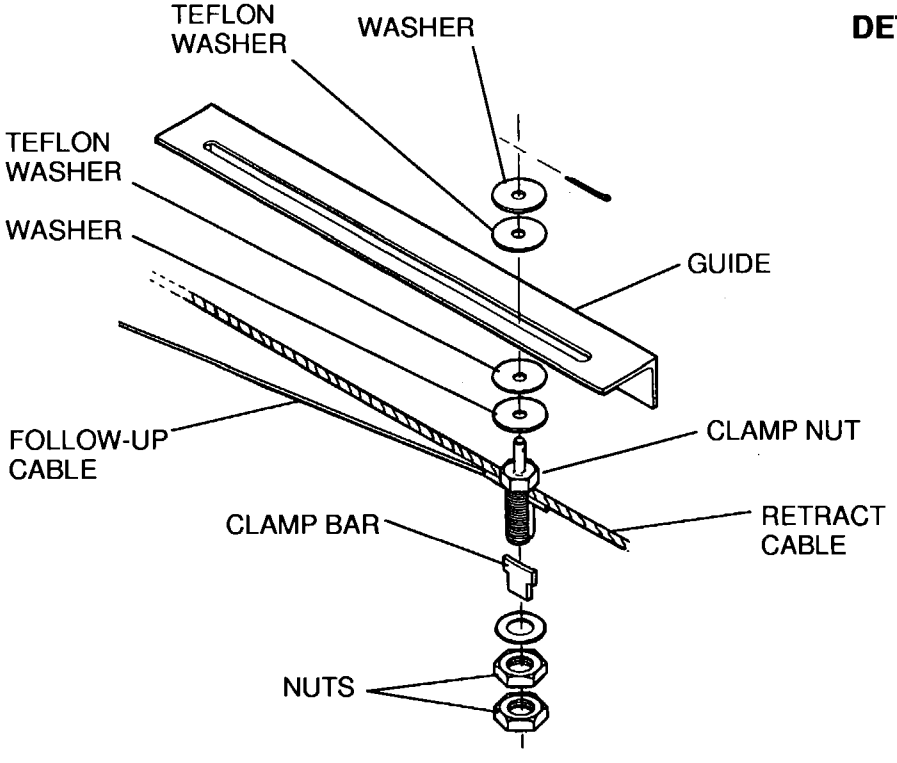


DETAIL A



DETAIL B

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Wing Flap Control and Follow-Up System
Figure 201 (Sheet 1)

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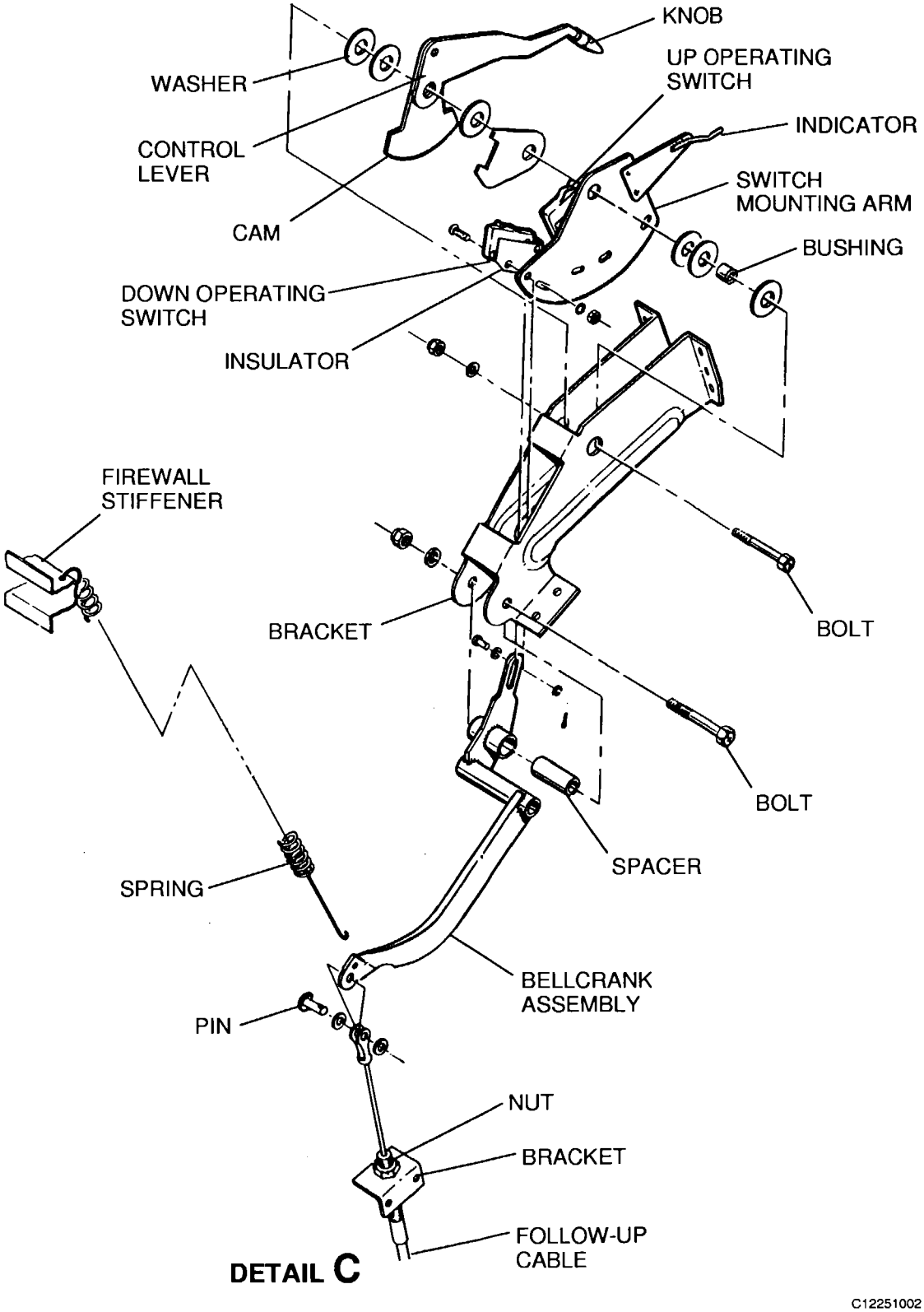

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Wing Flap Control and Follow-Up System
Figure 201 (Sheet 2)

(7) With control lever in the full UP position, adjust operating switch up and operating switch down, in slotted holes until cam is centered between switch rollers. Ensure control lever is in full UP position during this adjustment.
(8) Mount inclinometer on trailing edge of one flap and set to 0 Degrees.
(9) Turn master switch ON and move control lever to 10-degree position.
(10) If flaps travel is more than 10 Degrees, +2 or -2 degrees, adjust flap DOWN, operating switch away from cam and recycle flaps.
(11) Adjust flaps up operating switch in slotted holes for 0.062 inch (1.51 mm) clearance between switch roller and cam when the flaps down operating switch has just opened in the 10-degree and 20-degree position.

NOTE: Flap travel on UP cycle may deviate a maximum of 4 degrees from indicated position.

(12) Turn master switch ON and run flaps through several cycles, stopping at various midrange settings and checking that cable tension is within limits. Retract cable tension may increase to 90 pounds (400 N) when flaps are fully retracted.
(13) Check all rod ends and clevis ends for sufficient thread engagement, and all jamnuts are tight.
(14) Install overhead center console. Refer to Chapter 25. Interior Upholstery - Maintenance Practices.
(15) Install pedestal cover. Refer to, Remove Pedestal Cover.

CHAPTER

28

FUEL

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
28-Title		
28-List of Effective Pages		
28-Record of Temporary Revisions		
28-Table of Contents		
28-00-00	Page 1	Dec 2/2002
28-20-00	Pages 1-2	Dec 2/2002
28-20-00	Pages 201-218	Jul 1/2007
28-20-00	Pages 501-506	Jul 1/2007
28-21-00	Pages 201-203	Apr 1/2005

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

FUEL - GENERAL

1. Scope

A. This chapter provides information on systems and components associated with fuel storage, fuel distribution, refueling and fuel quantity indicating.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the following items:

NAME	NUMBER	MANUFACTURER	USE
Fuel Quantity Test Box	0580001-1	Cessna Aircraft Company Cessna Parts Distribution Department 701, CPD 2 5800 East Pawnee Road Wichita, KS 67218-5590	To calibrate fuel quantity system.
Pressure Regulator		Commercially Available	To regulate input pressue.
Thermometer		Commercially Available	To monitor test area temperature.
Leak Detector	ElDorado LD-4	ElDorado Chemical Co. Inc. 14350 Lookout Road P. O. Drawer 34837 San Antonio, TX 78265-4837	To locate source of leak.
Methyl n-Propyl Ketone		Commercially Available	To clean surfaces prior to sealing.
ScotchBrite Pad	N/A	Commercially Available	To remove loose primer.

3. Definition

A. This chapter is divided into sections and subsections to assist maintenance personnel in locating specific systems and information. For locating information within the chapter, refer to the Table of Contents at the beginning of the chapter.

FUEL STORAGE AND DISTRIBUTION - DESCRIPTION AND OPERATION

1. General

A. The airplane is equipped with a wet wing fuel storage system. The system consists of two integral fuel tanks (one each wing), two reservoirs, a three position selector valve, an electrically driven auxiliary fuel pump, fuel strainer, and a fuel quantity indicating system.

B. Components beyond the fuel strainer include the engine driven fuel pump, the fuel/air control unit and the fuel distribution valve. These components are considered part of the power plant and are covered in Chapter 73, Fuel Injection System - Description and Operation.

C. A schematic of the entire fuel system is shown to aid in system understanding. Refer to Figure 1.

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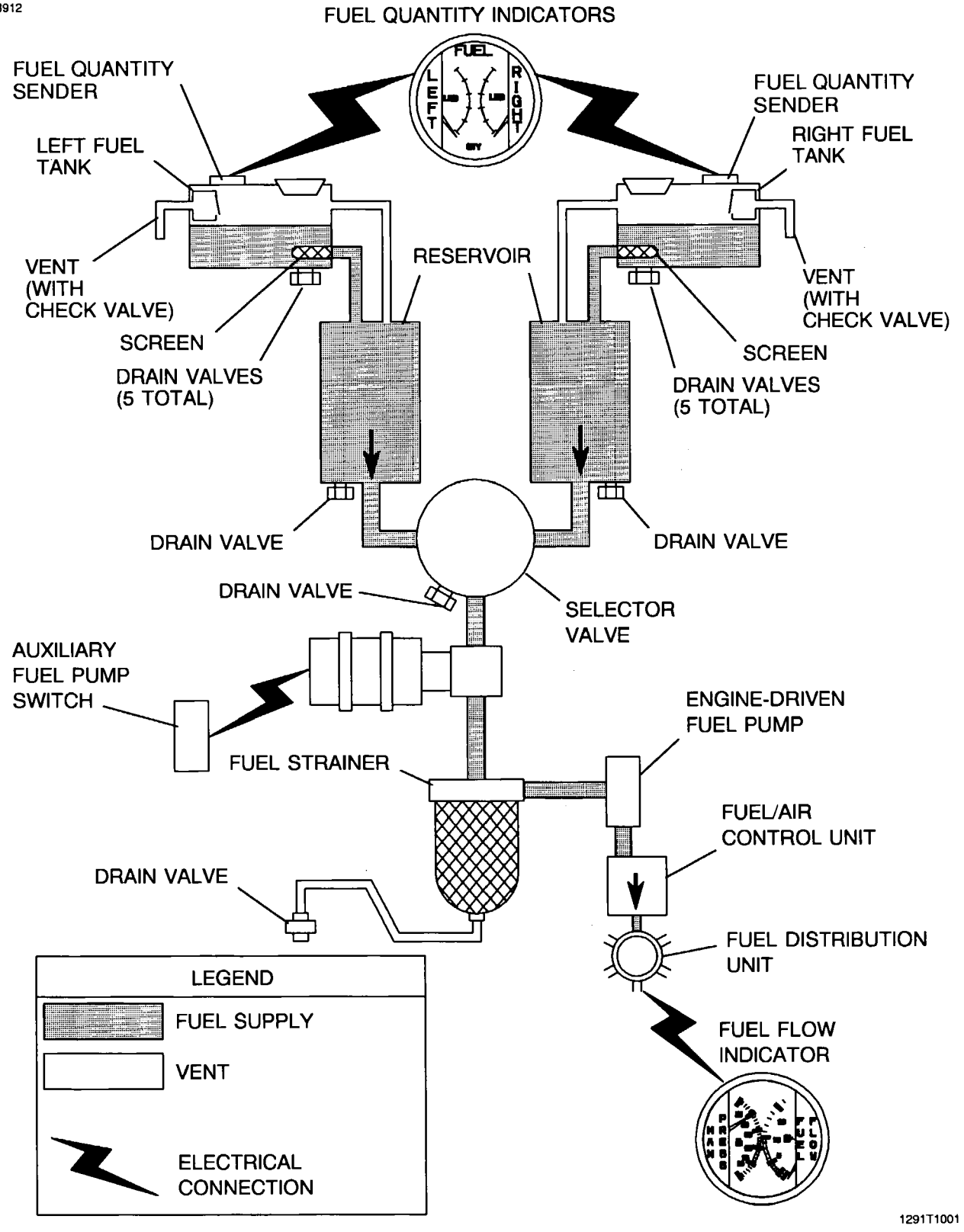


Fuel System Schematic
Figure 1 (Sheet 1)

FUEL STORAGE AND DISTRIBUTION - MAINTENANCE PRACTICES

1. General

A. The fuel storage and distribution maintenance practices consist of fuel bay component removal/installation and adjustment/test (Refer to Figure 201).

2. Precautions

A. Obey these general precautions and rules when you refuel, defuel, clean the fuel tank, repair, assemble or disassemble system components, and do electrical system tests and repairs on the airplane fuel system.
   (1) Put covers or caps on all disconnected hoses, lines, and fittings to prevent residual fuel drainage, thread damage, or the entrance of dirt or unwanted material into the fuel system.
   (2) When the fuel system is opened, use the fuel boost pump to flush the system with 1/2 gallon of fuel at the inlet of the servo and flow divider.
   (3) When you do work on fuel injection system, keep all parts clean and free from contamination.

3. Fuel Drain Valve Removal/Installation

NOTE: The left and right fuel drain valve removal/installation is typical. Five fuel drains are installed in each wing.

A. Remove the Fuel Drain Valve (Refer to Figure 202).
   (1) Remove the fuel from the airplane. Refer to Chapter 12, Fuel - Servicing.
   (2) Use a fuel sampler cup and press the fuel drain valve up to make sure the fuel bay is empty of fuel.
   (3) Remove the safety wire from the fuel drain valve.
   (4) Remove the fuel drain valve from the fuel bay.

B. Install the Fuel Drain Valve (Refer to Figure 202).
   (1) Install the fuel drain valve in the fuel bay and attach safety wire to the clip. Refer to Chapter 20, Safetying - Maintenance Practices.
   (2) Add a sufficient quantity of fuel to cover the bottom of the fuel bays.
   (3) Do a check of the fuel drain valves for leaks.

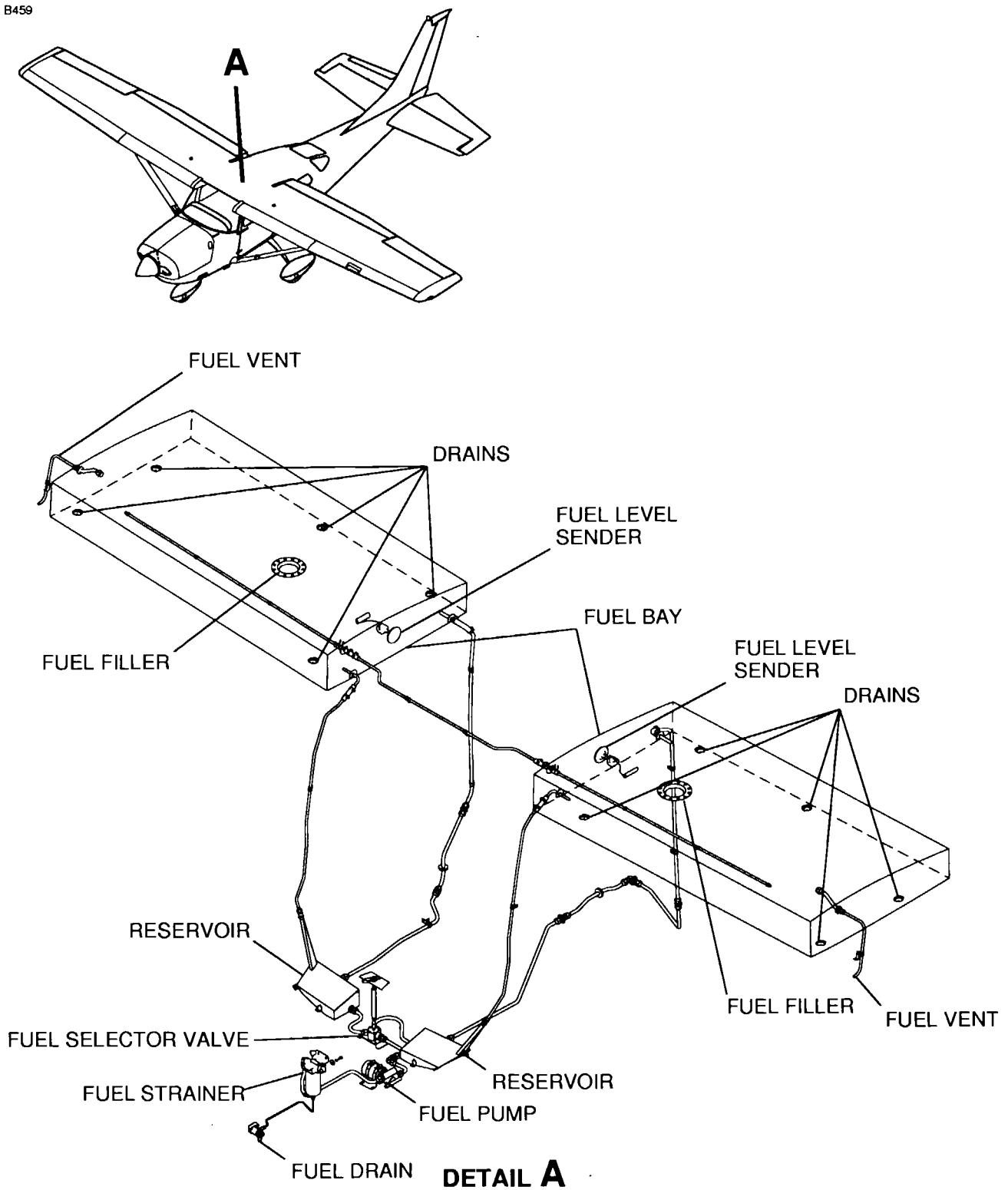
4. Fuel Reservoirs Removal/Installation

NOTE: The fuel reservoir removal/installation is typical for the left and right reservoirs.

A. Remove the Fuel Reservoir (Refer to Figure 203).
   (1) Set the fuel shutoff valve to the OFF position.
   (2) Defuel the fuel tanks. Refer to Chapter 12, Fuel - Servicing.
   (3) Remove the pilot and copilot seat and carpet. Refer to Chapter 25, Front Seats - Maintenance Practices.
   (4) Remove the carpet from the forward cabin. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
   (5) Remove the access panels 230CB and 230DB to get access to the reservoirs. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
   (6) Set a container under the fuel drain in the bottom of the fuselage and drain the fuel from the reservoir.

      NOTE: Each fuel reservoir holds 0.41 gallons (1.55 liters).

   (7) Disconnect the reservoir vent tube.
   (8) Disconnect the reservoir inlet tube.
   (9) Disconnect the reservoir outlet tube.
   (10) Remove the screws installed in the reservoir to the airplane structure.
   (11) Remove the reservoir from the airplane.



DETAIL A

AIRPLANES 20608001 THRU 20608173
AND AIRPLANES T20608001 THRU T20608361

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Fuel System Installation
Figure 201 (Sheet 1)

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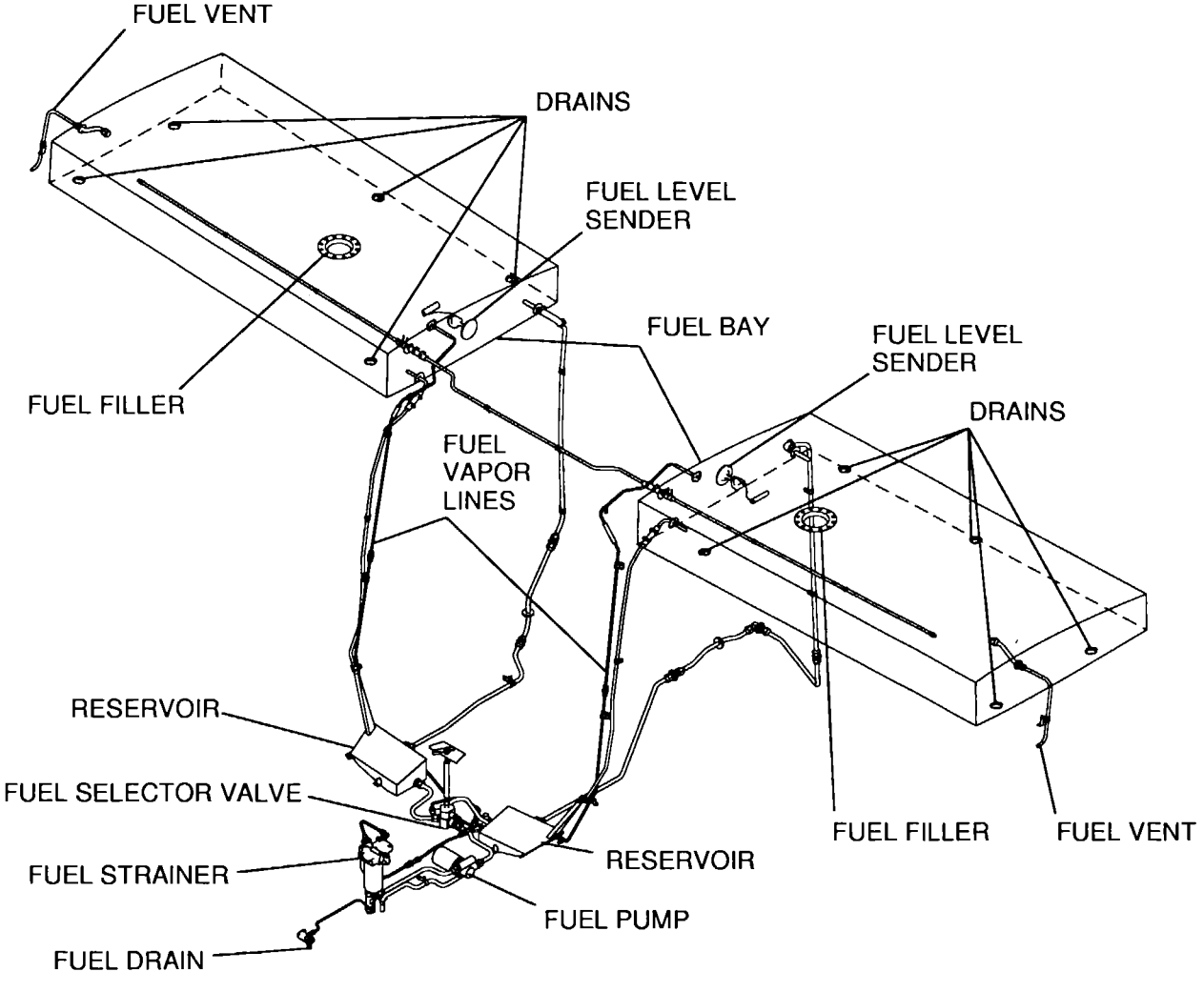

DETAIL A

AIRPLANES 20608174 AND ON
AND AIRPLANES T20608362 AND ON

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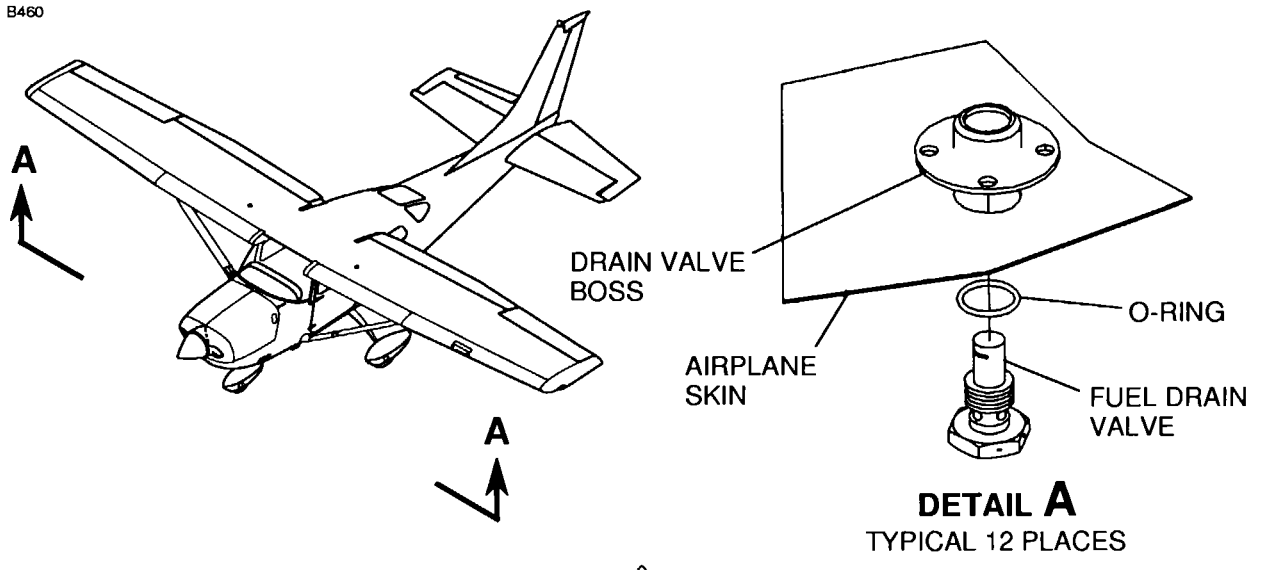
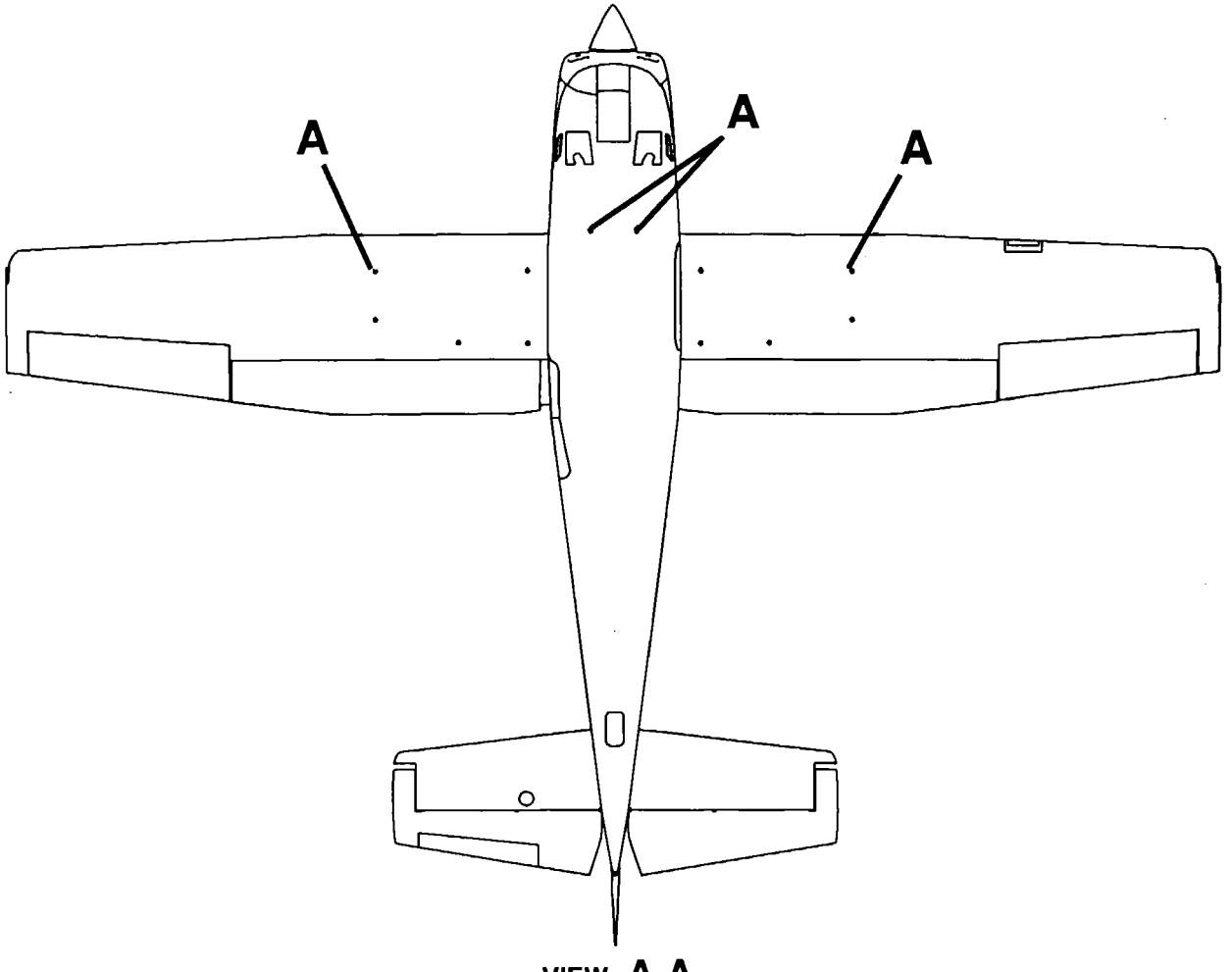
Fuel System Installation
Figure 201 (Sheet 2)



DETAIL A
TYPICAL 12 PLACES



VIEW A-A
LOOKING UP

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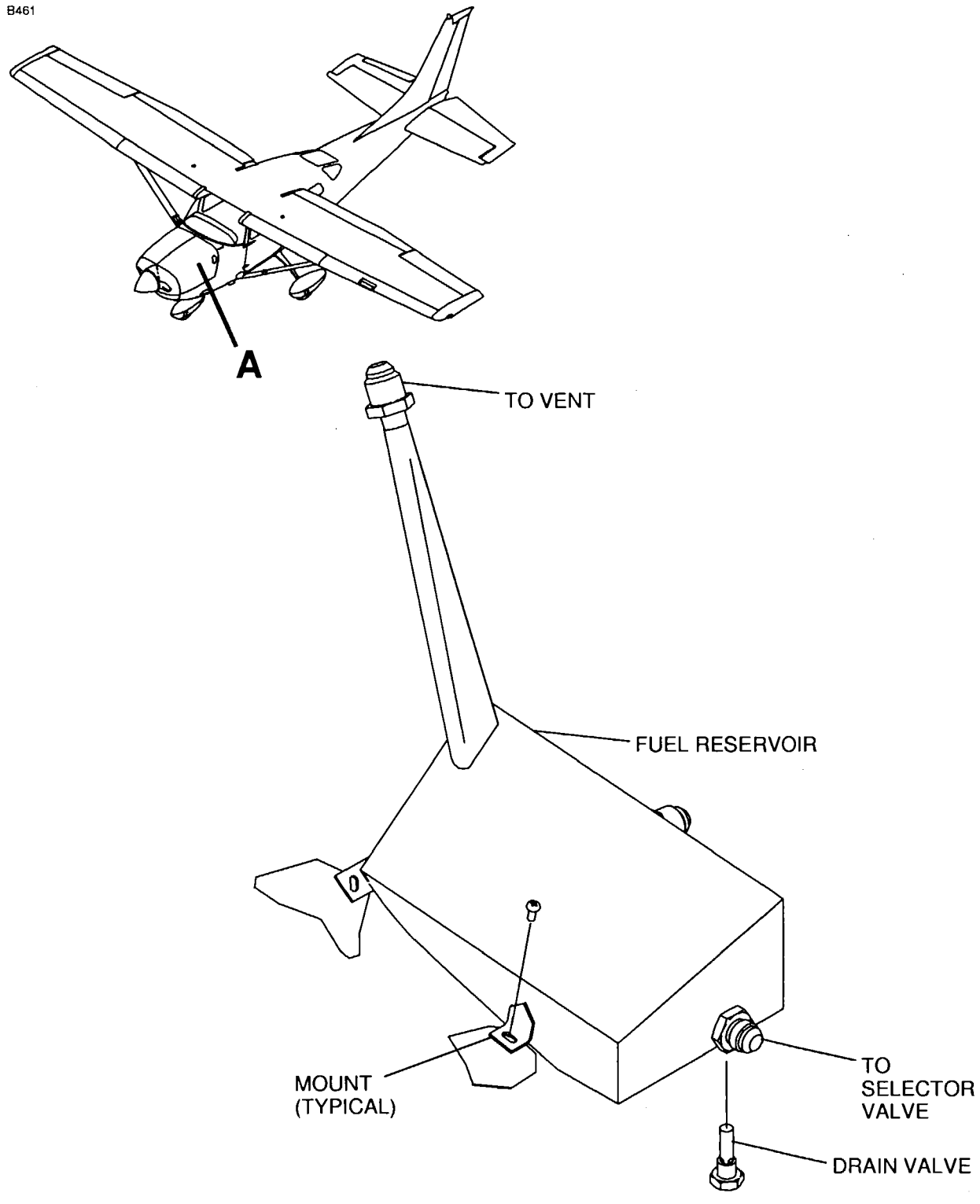
External Fuel Drains
Figure 202 (Sheet 1)



DETAIL A

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Fuel Reservoir Installation
Figure 203 (Sheet 1)

B. Install the Fuel Reservoir (Refer to Figure 203).
(1) Put the fuel reservoir in the airplane and install with screws.
(2) Connect the reservoir outlet tube.
(3) Connect the reservoir inlet tube.
(4) Connect the reservoir vent tube.
(5) Make sure the fuel reservoir drain is closed.
(6) Put the fuel shutoff valve in the ON position.
(7) Do a check on the fuel reservoir connections for any fuel leaks.
(8) Turn on the auxiliary fuel pump and exam for positive fuel pressure on the fuel pressure gage.
(9) Install the access panels 230CB and 230DB. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(10) Install the carpet. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(11) Install the pilot and copilot seats. Refer to Chapter 25, Front Seats - Maintenance Practices.

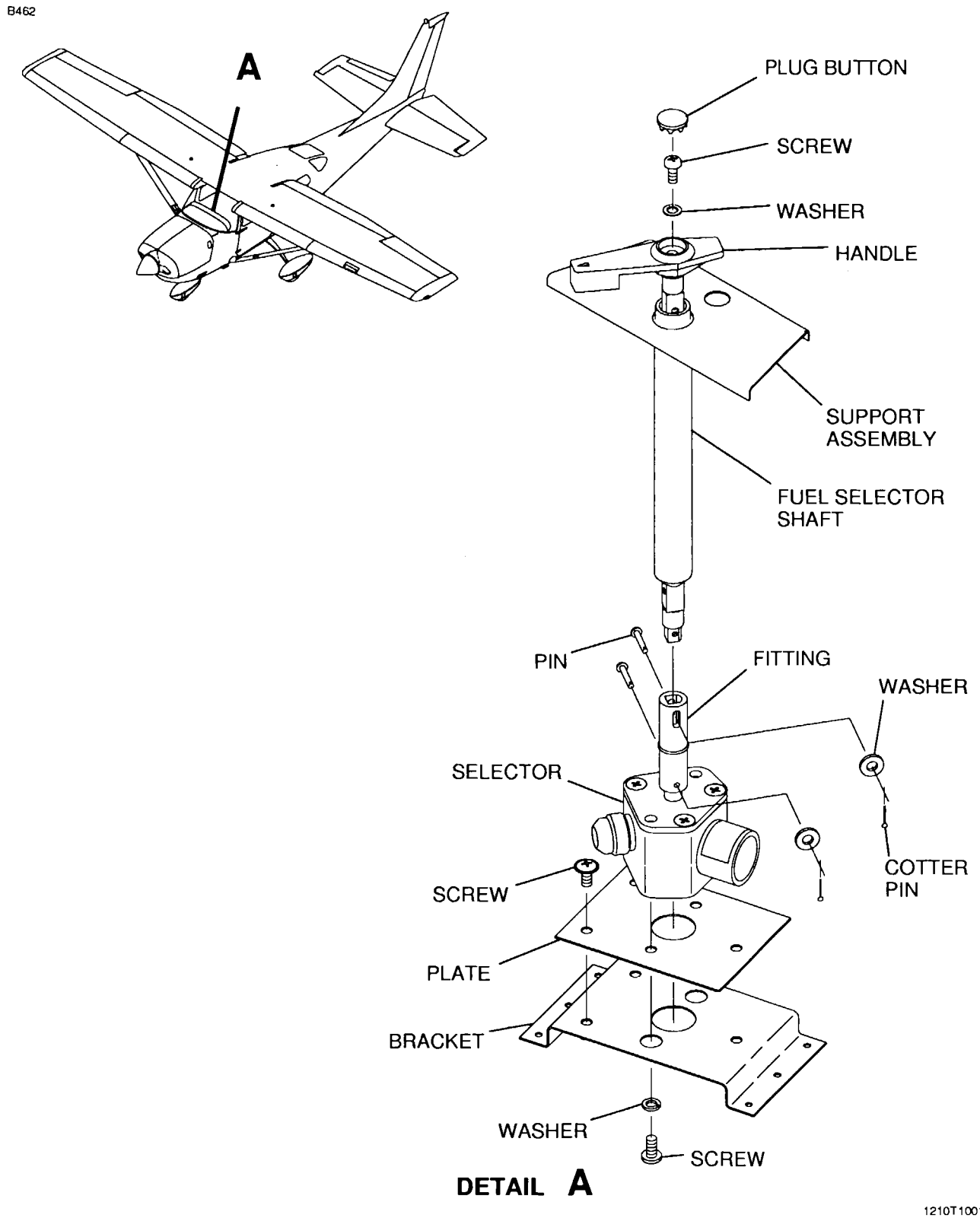
5. Fuel Selector Shaft Removal/Installation

A. Remove the Fuel Selector Shaft (Refer to Figure 204).
(1) Remove the button plug on the top of the fuel selector valve handle to show the screw in the handle.
(2) Remove the screw and lift up on the handle to disconnect it from the fuel selector shaft.
(3) Remove the metal placard from the pedestal.
(4) Remove the pedestal cover. Refer to Chapter 27, Pedestal Cover.
(5) Remove the carpet as required. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(6) Remove the support assembly.
(7) Remove the floor access plate 230BB. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(8) Remove and discard the cotter pin from the pin that attaches the fuel selector shaft to the fitting.
(9) Remove the washer and pin from the fuel selector shaft.
(10) Remove the fuel selector shaft from the fitting.

B. Install the Fuel Selector Shaft.
(1) Put the fuel selector shaft into the fitting and install the pin, washer and a new cotter pin.
(2) Install the floor access plate 230BB. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(3) Lay the carpet back into place and install the support assembly.
(4) Install the pedestal cover. Refer to Chapter 27, Pedestal Cover.
(5) Install the placard on the pedestal.
(6) Attach the selector handle onto the fuel selector shaft with the washer, screw and plug button.
(7) Make sure of the correct rotation of the fuel selector handle through the LEFT, RIGHT, and BOTH selector positions.
(8) Make sure that the selector handle can be pushed down and rotate to the OFF position.

6. Fuel Selector Valve Removal/Installation

A. Remove the Fuel Selector Valve (Refer to Figure 204).
(1) Defuel the airplane. Refer to Chapter 12, Fuel - Servicing.
(a) Set an applicable container under the fuel selector quick drain.
(b) Make sure the fuel selector valve is in the OFF position and remove the drain plug from the fuel selector valve.
(c) Turn the fuel selector valve to the BOTH position and drain the fuel from the door post fuel lines.
(d) Install the drain plug in the fuel selector valve and install safety wire. Refer to Chapter 20, Safetying - Maintenance Practices.
(2) Remove the button plug on the top of the fuel selector valve handle to show the screw.
(3) Remove the screw and lift up on handle to disconnect it from the fuel selector valve shaft.
(4) Remove the metal placard from the pedestal to get access to the valve, plumbing and universal joints.
(5) Remove the pedestal cover. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices.



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Fuel Selector Valve Installation
Figure 204 (Sheet 1)

(6) Remove the support assembly.
(7) Remove the pilot and copilot seat. Refer to Chapter 25, Front Seats - Maintenance Practices.
(8) Remove the forward carpet as required to get to the access plate 230BB that is aft of the pedestal. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(9) Remove access plate 230BB.
(10) Disconnect the lower universal joint at the selector valve shaft.
(11) Disconnect and put a cap on the fuel lines to selector valve, fuel supply and fuel return.
(12) Remove the screws attaching the selector valve to the mounting plate and remove the valve from the airplane.

B. Install the Fuel Selector Valve (Refer to Figure 204).
(1) Attach the selector valve to the mounting plate.
(2) Connect the fuel lines to the valve.
(3) Connect the lower universal joint to the valve shaft.
(4) Install the access plate 230BB and carpet. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(5) Install the support assembly.
(6) Install the pedestal cover. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices.
(7) Install the metal placard to the pedestal.
(8) Install the fuel selector valve handle to the selector shaft with the screw.
(9) Install the button plug on the fuel selector handle.
(10) Make sure of the correct rotation of the fuel selector handle through the Left, Right, and Both positions.
(11) Refuel the airplane. Refer to Chapter 20, Fuel - Servicing.
(12) Examine the selector valve for leaks.

7. Fuel Level Sender Removal/Installation

NOTE: The fuel level sender removal and installation are typical for the left and right fuel bays.

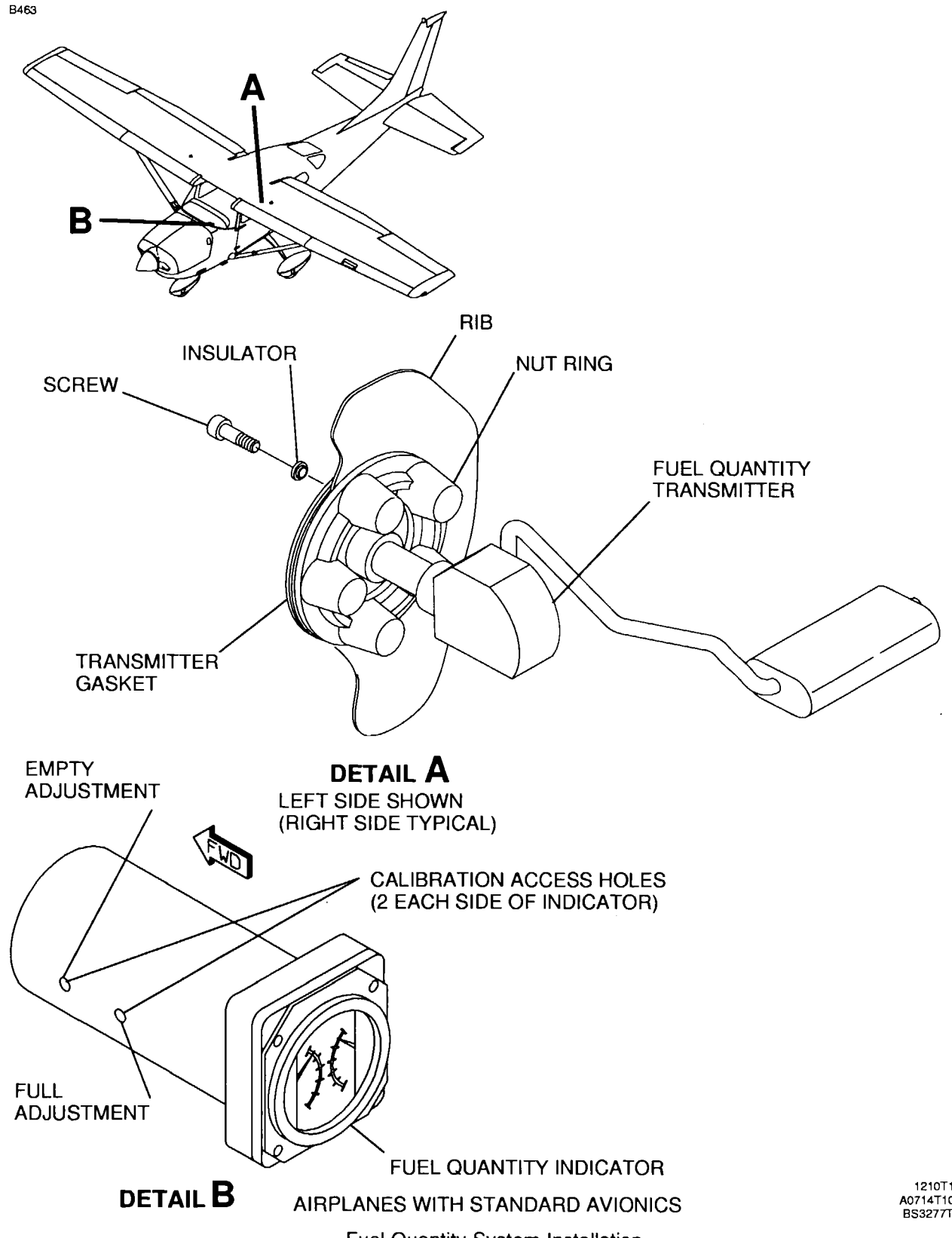
A. Do a check of the fuel level sender for correct operation before you replace the fuel quantity indicator. The resistance must be 6 ohms +5 or -5 when empty, and 90 ohms +5 or -5 when full. If the resistance does not show the correct values, then replace the fuel level sender.

B. Remove the Fuel Level Sender (Refer to Figure 205).
(1) Drain the fuel from the airplane. Refer to Chapter 12, Fuel - Servicing.
(2) Remove the headliner to get access to the wing root. Refer to Chapter 25, Cabin Panels - Removal/Installation.
(3) Disconnect the wire ring terminals from the fuel level sender.

CAUTION: Do not bend the fuel level sender float arm.

(4) Remove the screws that attach the fuel level sender to the nut ring and retain for installation.
(5) Carefully remove the fuel sender and gasket from the fuel bay.

C. Install the Fuel Level Sender (Refer to Figure 205).
(1) Do an inspection of the gasket for cracks, splits or other damage that will keep the gasket from a correct seal. If the gaskets are damaged or there are fuel leaks, install a new gasket. Install a new gasket when you install a new fuel level sender.



Fuel Quantity System Installation
Figure 205 (Sheet 1)

CAUTION: Do not bend the fuel level sender float arm.

CAUTION: Do not attach the screw to the nut ring without the insulator. The fuel level sender can operate incorrectly without the insulator.

(2) Carefully install the fuel quantity sender into the fuel bay and attach the nut ring with screws and insulator.

NOTE: If this is a new fuel quantity sender, use the new screws and insulators that came with the fuel quantity sender.

(3) Connect the wire ring terminals to the fuel level sender.
(4) Install the headliner. Refer to Chapter 25, Cabin Panels - Removal/Installation.
(5) Fill the fuel cell with fuel. Refer to Chapter 12, Fuel - Servicing.
  (a) If the fuel sender is new, you must do a fuel quantity calibration check.
(6) Make sure there are no leaks.
(7) Do a fuel quantity calibration and check. Refer to Fuel Quantity Calibration and Check.

8. Fuel Bay Vents Adjustment/Test

NOTE: A vent line is installed in the outboard end of each fuel bay. The vent line extends overboard through the lower wing skin near the point where the lift struts attach to the underside of the wings.

A. Adjust the Fuel Bay Vents. (Refer to Figure 207 and Figure 206).

WARNING: Blocked vent lines and bleed holes will cause insufficient fuel or the pressurization of tanks by fuel expansion. Any fuel vent found blocked or restricted must be corrected before you return the airplane to service.

NOTE: Fuel vents may become blocked and not supply the engine with sufficient fuel. If the bleed hole in the vent valve becomes blocked, then pressurization can occur due to normal temperature variation. This would usually occur when the airplane engine is not operating. The procedures that follow must be used to do a check of the fuel vent and bleed system.

(1) For a check of the serviceability of the fuel vent check valve, do the procedures that follow.
(2) Attach a rubber tube to the end of the vent line under the wing.
(3) Block the vent on the opposite wing from the one that is tested.
(4) Blow into tube to slightly pressurize the tank. If any air can enter the tank, the vent line is open.
(5) After the tank is slightly pressurized, insert the end of a rubber tube into a container of water and watch for a continuous stream of bubbles. The bubbles will indicate the bleed hole in the valve assembly is open which relieves the tank pressure.
(6) After completing step B.(3), blow into the tube again to slightly pressurize the tank. Crimp rubber tube to keep the pressure in the tank.
  (a) Loosen but do not remove the filler cap on the opposite wing to do a check of the cell crossover line.
  (b) If the pressure escapes from the filler cap, the crossover line is open. Remove the rubber tube from the end of the vent line under the wing.
(7) Complete steps B.(1) through B.(5) on the opposite wing.

NOTE: A serviceable wing fuel vent check valve will let positive pressure bleed through the bypass port from the fuel tank. An unserviceable wing fuel vent check valve will not let positive pressure to bleed through the bypass port from the fuel tank.

(8) If the fuel vent check valve does not correctly operate, do the procedures that follow.
  (a) Drain the fuel from the airplane. Refer to Chapter 12, Fuel - Servicing.

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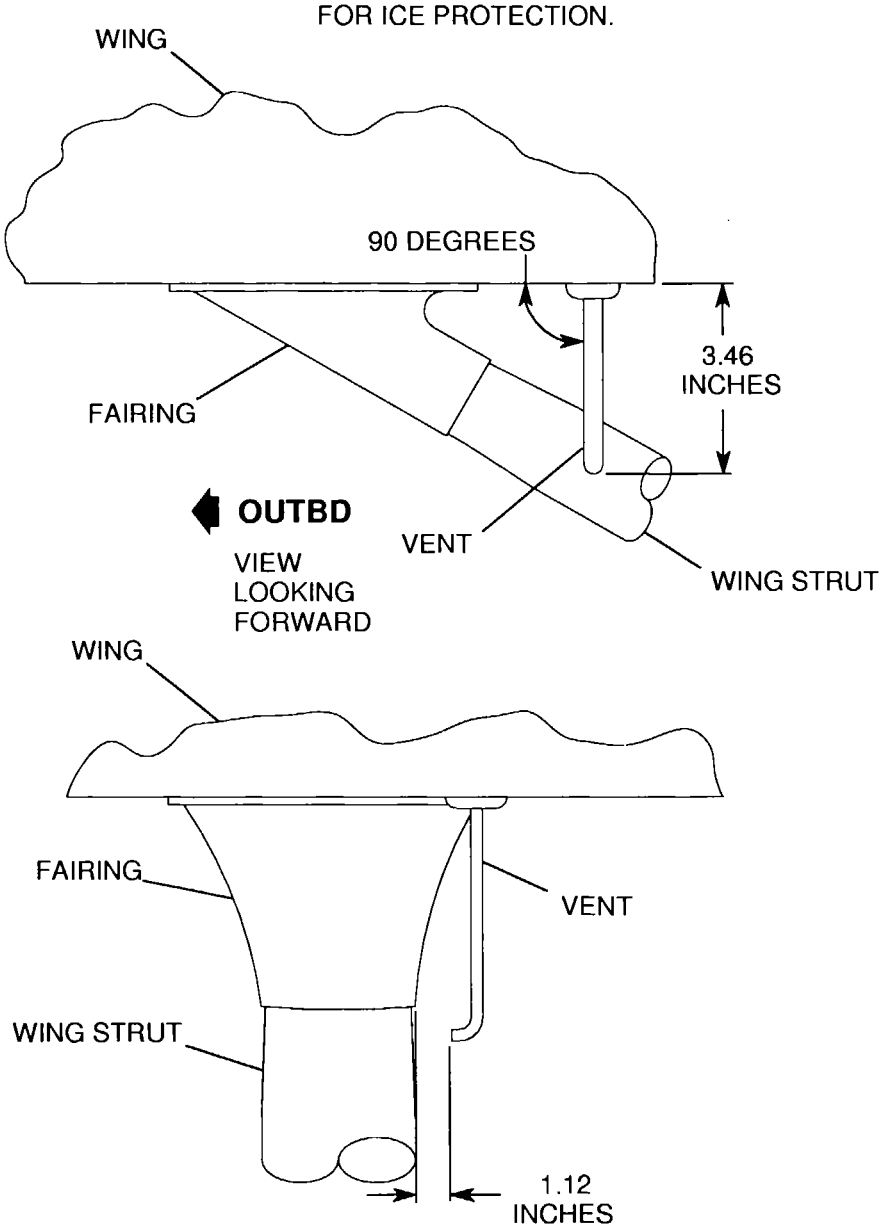
NOTE: IT IS PERMITTED TO POSITION THE LEFT OR RIGHT VENT OUTBOARD FROM POSITION SHOWN TO BALANCE THE TANK. ONE VENT MUST REMAIN IN THE POSITION SHOWN FOR ICE PROTECTION.



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Fuel Vent Location
Figure 206 (Sheet 1)

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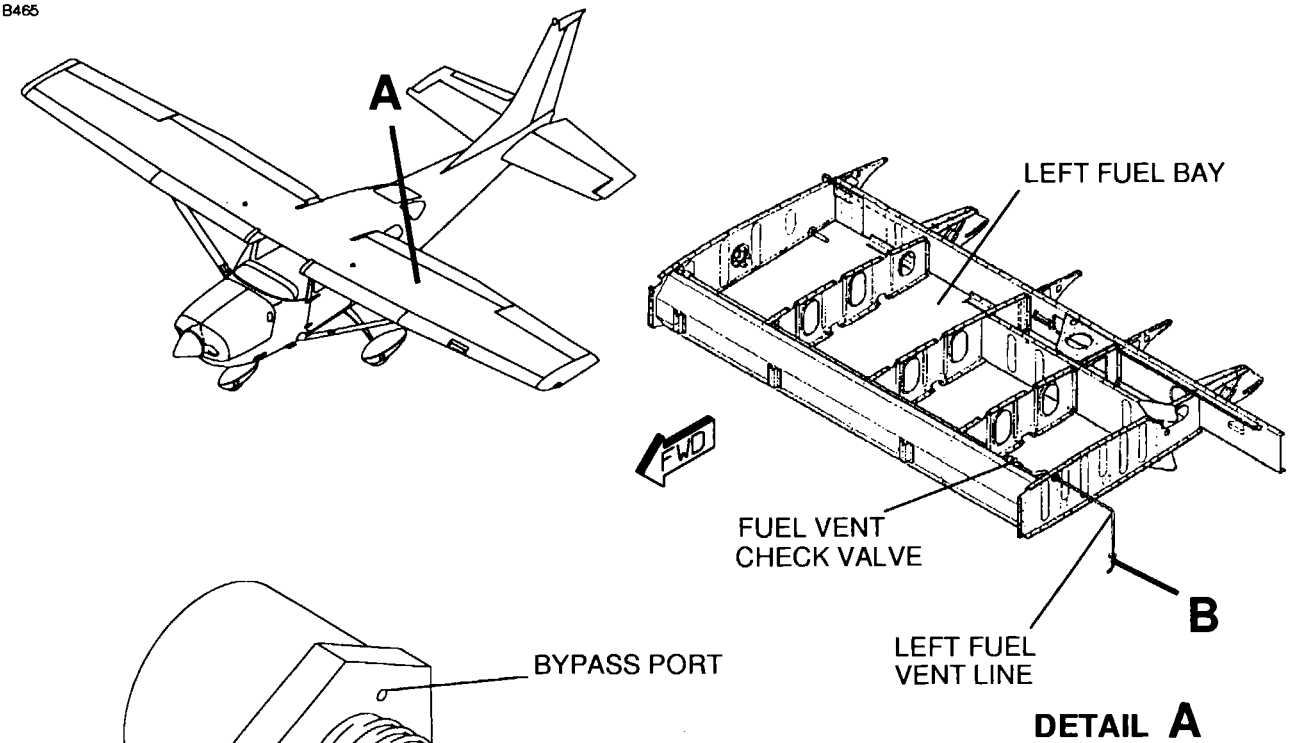
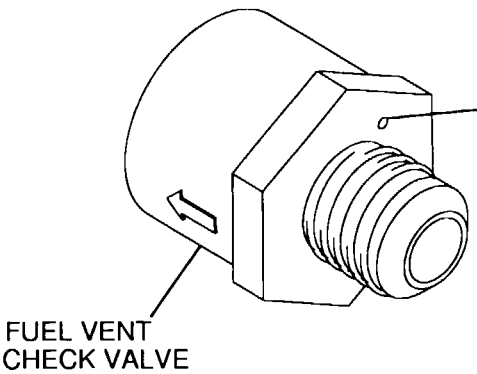
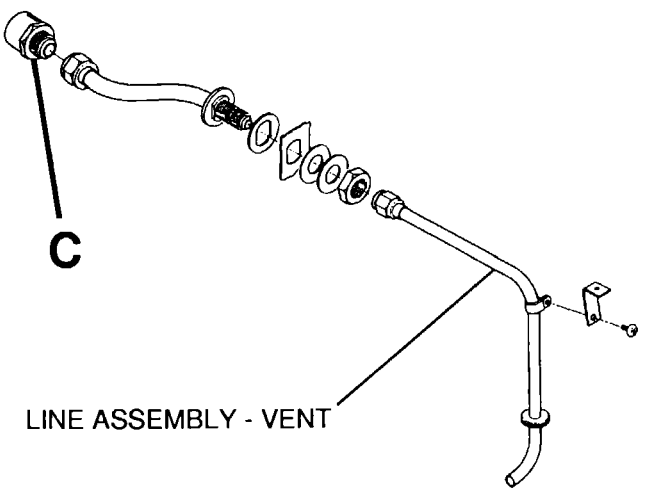


DETAIL A



DETAIL C

NOTE: IF THE PRESSURE TEST SHOWS THE BYPASS PORT IS BLOCKED, THE FUEL VENT CHECK VALVE MUST BE REPLACED. INSTALL A NEW FUEL VENT CHECK VALVE WITH THE BYPASS PORT TO THE TOP OF THE FUEL BAY.



DETAIL B

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Wing Fuel Tank Vent Check Valve
Figure 207 (Sheet 1)

(b) Open the applicable wing access panel 510KB or 610KB to get access the wing fuel vent check valve. Refer to Chapter 6, Inspection/Access Plates - Description and Operation.
(c) Remove the unserviceable wing fuel vent check valve.
(d) Replace the fuel vent check valve with a new one. Make sure the bypass hole on the valve flap is installed at the top of the fuel bay.
(e) Install and seal the applicable wing fuel bay access plate 510KB or 610KB. Make sure there is a complete seal of the access plate. Refer to Chapter 28, Fuel Bay Sealing - Maintenance Practices.
(f) Do a test to make sure the new fuel vent check valve operates correctly. Refer to steps 8.B.(1) through 8.B.(6).
(g) Fill the fuel tank with fuel. Refer to Chapter 12, Fuel - Servicing.
(h) Do an inspection for leaks.
1 If there are leaks, drain the fuel. Refer to Chapter 12, Fuel - Servicing.
2 Remove the wing access panels and seal until no leaks are evident. Refer to Chapter 28, Fuel Bay Sealing - Maintenance Practices.
3 Fill the fuel tank with fuel and do an inspection for leaks. Refer to Chapter 12, Fuel - Servicing.

(9) Make sure the fuel vent line is in the correct position in relation to the wing struts.

WARNING: One of the fuel vent lines must be positioned behind a lift strut. Use the dimensions called out in Figure 206. This position will supply protection from ice in at least one vent tube.

(a) Set a six-inch scale perpendicular to the wing skin and measure the distance from the wing skin to the end of the fuel vent line.
1 Removal of the strut cuff may be necessary to get a correct measurement when you use a scale.
2 The distance from the wing skin to the bottom of the fuel vent line must be 3.50 inches +0.03 or -0.03 (88.90mm +0.762 or -0.762).
(b) Use a six-inch scale to measure the straight line distance from the back of the wing strut to the end of the fuel vent line.

NOTE: The distance from the strut to the end of the fuel vent line must be 1.12 inches +0.03 or -0.03 (28.45mm +0.762 or -0.762).

(10) Complete the procedures that follow if adjustments are required for the fuel vent line.
(a) Remove the access/inspection plates 510KB or 610KB. Refer to Chapter 6, Inspection/ Access Plates - Description and Operation.
(b) Loosen the clamp that attach the fuel vent line in position.
(c) Adjust by hand the fuel vent line to the correct dimensions.
(d) Tighten the clamp to attach the fuel vent line in position.
(e) Install the access/inspection plates 510KB or 610KB. Refer to Chapter 6, Inspection/ Access Plates - Description and Operation.

B. Adjust the Fuel Tank Feed Rate.

NOTE: Uneven fuel feed may occur with the fuel selector valve set in the BOTH position. This is caused by unequal pressure that act on the each of the fuel tank vents. This may be corrected if you use the procedures that follow.

NOTE: The procedures that follow can be completed during a sequence of routine flight operations. Flights for the only purpose of a check and to adjust the fuel tank feed rates is not recommended due to the amount of time required.

(1) Complete an inspection of the vent system.
(a) Make sure the ventilation lines are open.
(b) Make sure all connections are attached.
(c) Make sure that the system operates correctly.

(2) Park the airplane on level ground and set the fuel selector to the BOTH position. Refer to Chapter 10, Parking - Maintenance Practices.
(3) Leave the airplane parked until the fuel tank levels are equal, or fill both tanks. Refer to Chapter 12, Fuel - Servicing.
(4) Fly the airplane with the fuel selector in the BOTH position and climb to an altitude where the air is smooth.
(5) Trim the airplane for a straight and level flight.
  (a) Trim the rudder to center the ball of the turn coordinator to make sure the airplane is free of any yaw. Fly at the top of the green band on manifold pressure for a period of at least one hour.
(6) At the end of the hour and while you are in a straight and level flight, write the fuel tank levels that show on the fuel quantity indicator.
(7) If there is a fuel tank level difference of more than 5.0 gallons (19.0 liters), land the airplane, do a visual check of the fuel tank levels and then and complete one of the steps that follow.

CAUTION: One of the vents must remain positioned behind the strut as illustrated in Figure 206 for ice protection.

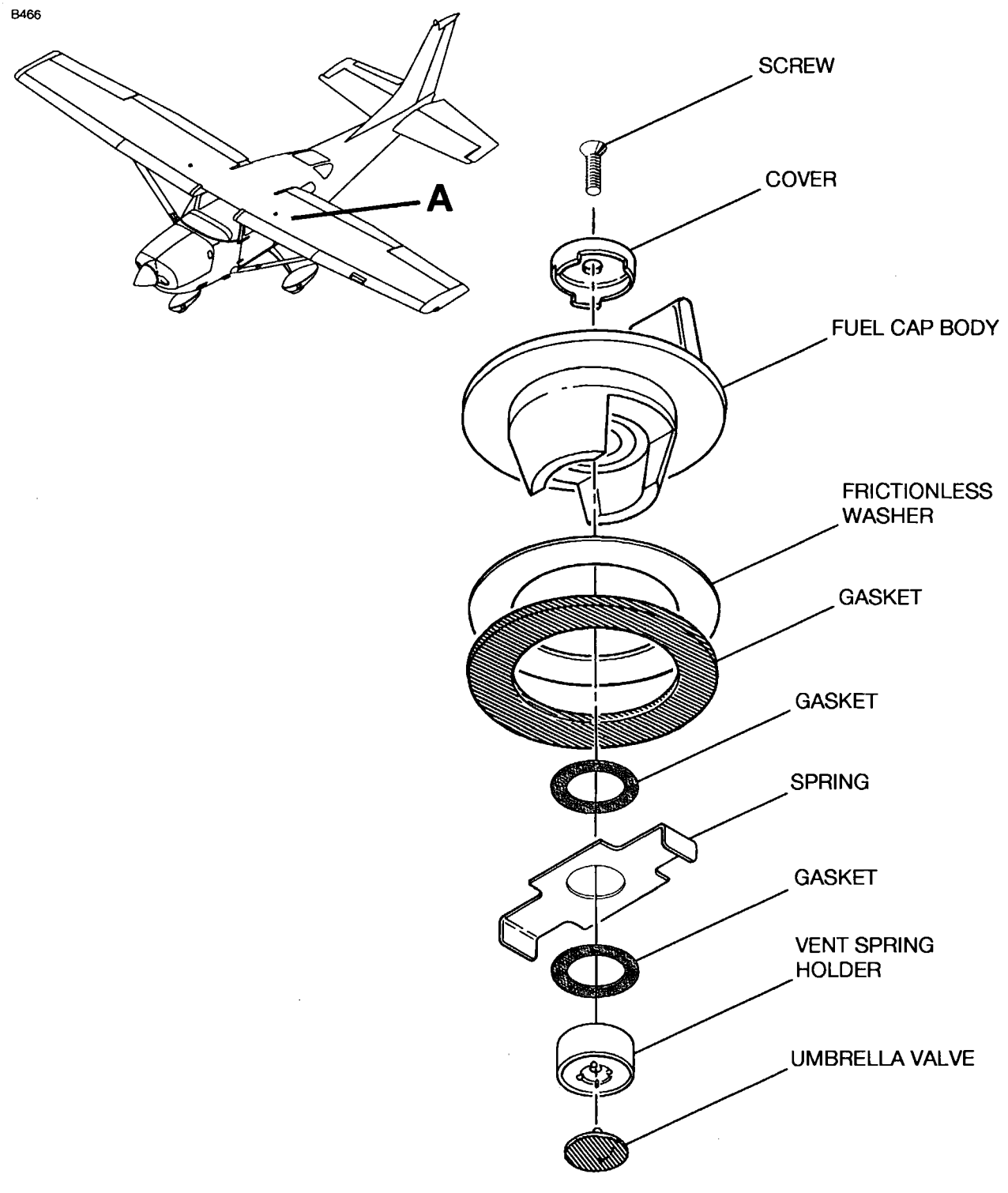
  (a) Carefully bend by hand, outboard 0.25 inch (6.35mm) the underwing vent of the tank that has the highest level.
  (b) Carefully bend by hand, inboard 0.25 inch (6.35mm) the underwing vent of the tank that has the lowest level, providing the vent is not squarely behind the strut.
(8) Repeat steps 8.C.(1) through 8.C.(7) during routine flights until the fuel feed rates for the tanks are within 5.0 gallons/hour of each other.

9. Vented Fuel Filler Cap Adjustment/Test

A. Examine, Clean and Repair the Vented Fuel Filler Cap (Refer to Figure 208).
(1) Remove the vented fuel filler cap from the adapter assembly.
(2) Disconnect the safety chain (if installed) and use a cover or plug on the open tank to keep out foreign material.
(3) Examine the large gasket and frictionless washer for condition and replace if necessary.
(4) Carefully lift the edges of the umbrella to clean it and the bottom of the vent spring holder with cotton swabs and solvent to remove all contaminates. Use a second swab to clean and remove all cotton fibers on the bottom of the vent spring holder and umbrella valve.
  (a) Do this step until the cotton swabs do not show discoloration.
(5) Replace the umbrella if it continues to leak or is deteriorated.
  (a) To help prevent a tear in the umbrella stem during removal, lubricate it with MIL-PRF-5606 hydraulic fluid.
  (b) Lubricate the stem with MIL-PRF-5606 hydraulic fluid when you install the new umbrella.
  (c) Use a small blunt tool to install the umbrella valve into the vent spring holder.
(6) Connect the fuel cap to the safety chain (if installed).
(7) Install the fuel cap in the adapter assembly.

10. Electric Auxiliary Fuel Pump Removal/Installation

A. Remove the Electric Auxiliary Fuel Pump (Refer to Figure 209).
(1) Make sure the ALT/BAT MASTER switch is set in the OFF position.
(2) Disconnect the battery ground cable from the battery. Refer to Chapter 24, Battery - Maintenance Practices.
(3) Set the fuel selector in the OFF position.
(4) Remove the pilot seat. Refer to Chapter 25, Front Seats - Maintenance Practices.
(5) Remove the carpet as necessary. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(6) Remove access plate 230AB to get access to the pump. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(7) Disconnect the fuel lines.
(8) Disconnect the electrical connection (JN003) from the electric auxiliary fuel pump (UN007).



DETAIL A
LEFT SIDE SHOWN
(RIGHT SIDE TYPICAL)

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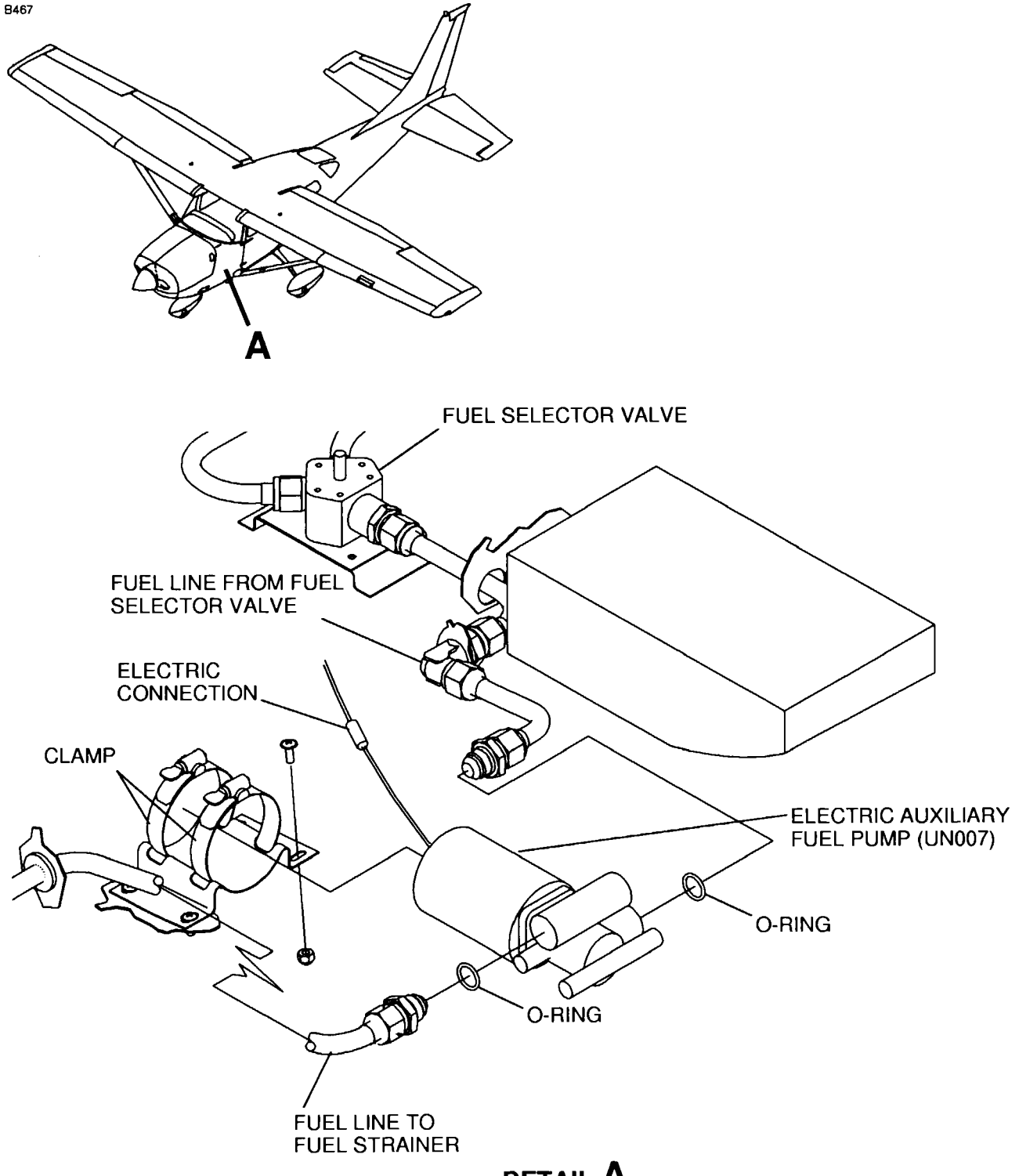
Vented Fuel Filler Cap
Figure 208 (Sheet 1)



DETAIL A

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Electric Auxiliary Fuel Pump
Figure 209 (Sheet 1)

(9) Loosen the clamps to the pump and remove the pump from the airplane.

B. Install the Electric Auxiliary Fuel Pump (Refer to Figure 209).
(1) Set the pump in the clamps and tighten the clamps.
(2) Connect the electrical connection (JN003) to the electric auxiliary fuel pump (UN007).
(3) Connect all the fuel lines.
(4) Install the access plate 230AB. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(5) Install the carpet. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(6) Install the pilot seat. Refer to Chapter 25, Front Seats - Maintenance Practices.
(7) Turn the fuel selector to BOTH.
(8) Attach the battery ground cable to the battery. Refer to Chapter 24, Battery - Maintenance Practices.
(9) Set the ALT/BAT MASTER switch to ON.
(10) Operate the pump and do a check for leaks and correct operation.

11. Fuel Strainer Disassembly/Cleaning/Assembly

A. Disassemble and Clean the Fuel Strainer (Refer to Figure 210).
(1) Turn the fuel selector to the OFF position.
(2) Disconnect the strainer drain tube.
(3) Remove the safety wire, nut, washer and O-ring at the bottom of filter bowl and remove the bowl.
(4) Carefully loosen the standpipe and remove the standpipe from the airplane.
(5) Remove the filter assembly, O-ring and gasket.
(6) Wash the filter assembly and bowl with soap and water, then dry them with compressed air.

B. Assemble the Fuel Strainer (Refer to Figure 210)
(1) Install a new gasket between the filter screen and top assembly.
(2) Install the standpipe with the screen assembly and a new O-ring. Tighten the standpipe only finger tight.
(3) Install the bowl with the nut, washer and a new O-ring. Torque the nut to 25 to 30 inch pounds (2.825 to 3.390 Nm).

NOTE: The step-washer at the bottom of bowl is installed so that the step fits against the O-ring.

(4) Attach the strainer drain tube.
(5) Close the strainer drain.
(6) Set the fuel selector to BOTH.
(7) Do a check for leaks.
(8) Do a check for proper operation.
(9) Attach a safety wire from the bottom nut to the top assembly. The safety wire must have a right hand wrap at least 45 degrees. Refer to Chapter 20, Safetying - Maintenance Practices.

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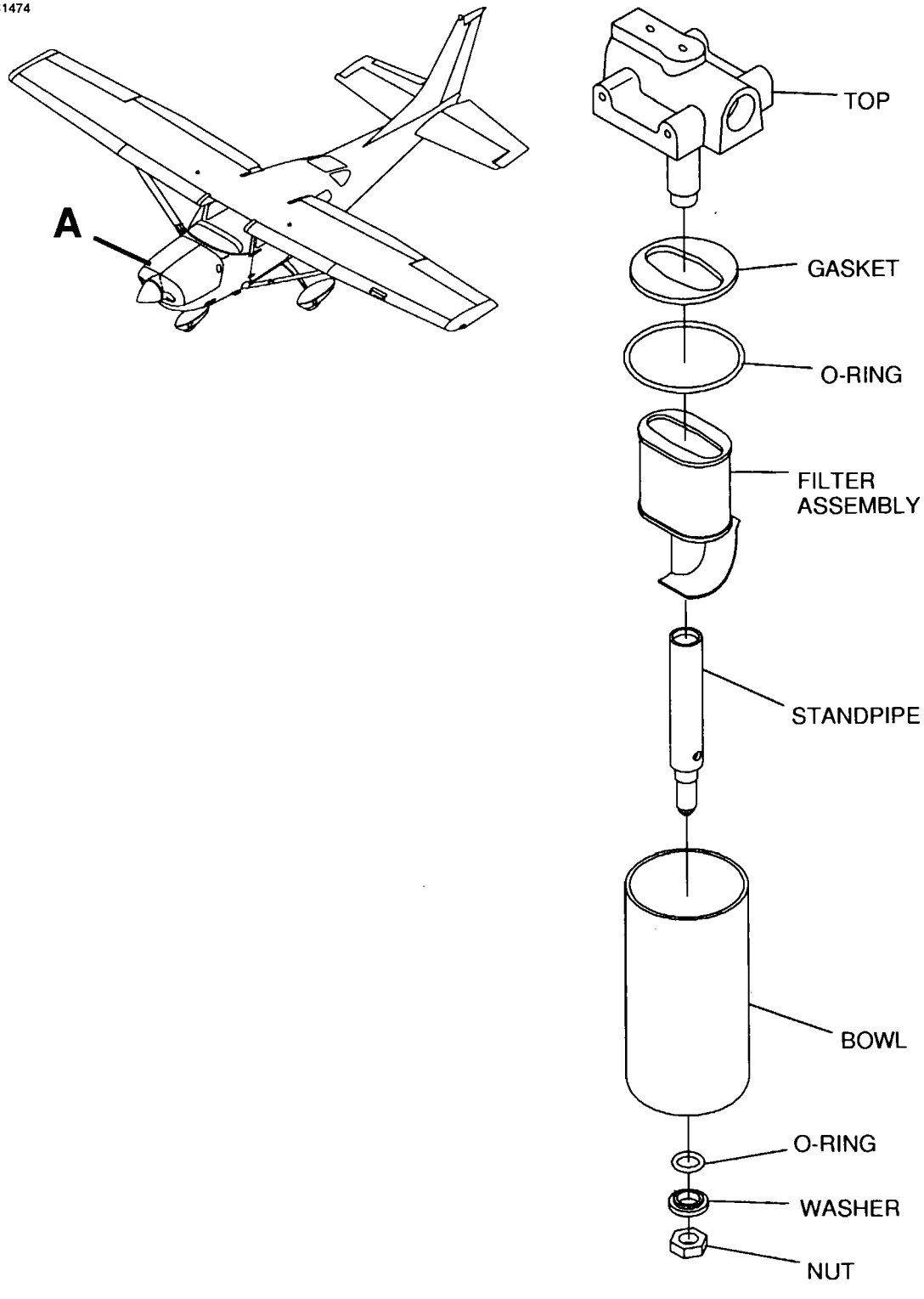

DETAIL A

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A1216R1024

Fuel Strainer Assembly
Figure 210 (Sheet 1)

12. Electric Auxiliary Fuel Pump Removal/Installation

A. Remove the Electric Auxiliary Fuel Pump (Refer to Figure 209).
(1) Make sure the ALT/BAT MASTER switch is set in the OFF position.
(2) Disconnect the battery ground cable from the battery. Refer to Chapter 24, Battery - Maintenance Practices.
(3) Set the fuel selector in the OFF position.
(4) Remove the pilot seat. Refer to Chapter 25, Front Seats - Maintenance Practices.
(5) Remove the carpet as necessary. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(6) Remove access plate 230AB to get access to the pump. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(7) Disconnect the fuel lines.
(8) Disconnect the electrical connection (JN003) from the electric auxiliary fuel pump (UN007).
(9) Loosen the clamps to the pump and remove the pump from the airplane.

B. Install the Electric Auxiliary Fuel Pump (Refer to Figure 209).
(1) Set the pump in the clamps and tighten the clamps.
(2) Connect the electrical connection (JN003) to the electric auxiliary fuel pump (UN007).
(3) Connect all the fuel lines.
(4) Install the access plate 230AB. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(5) Install the carpet. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(6) Install the pilot seat. Refer to Chapter 25, Front Seats - Maintenance Practices.
(7) Turn the fuel selector to BOTH.
(8) Attach the battery ground cable to the battery. Refer to Chapter 24, Battery - Maintenance Practices.
(9) Set the ALT/BAT MASTER switch to ON.
(10) Operate the pump and do a check for leaks and correct operation.

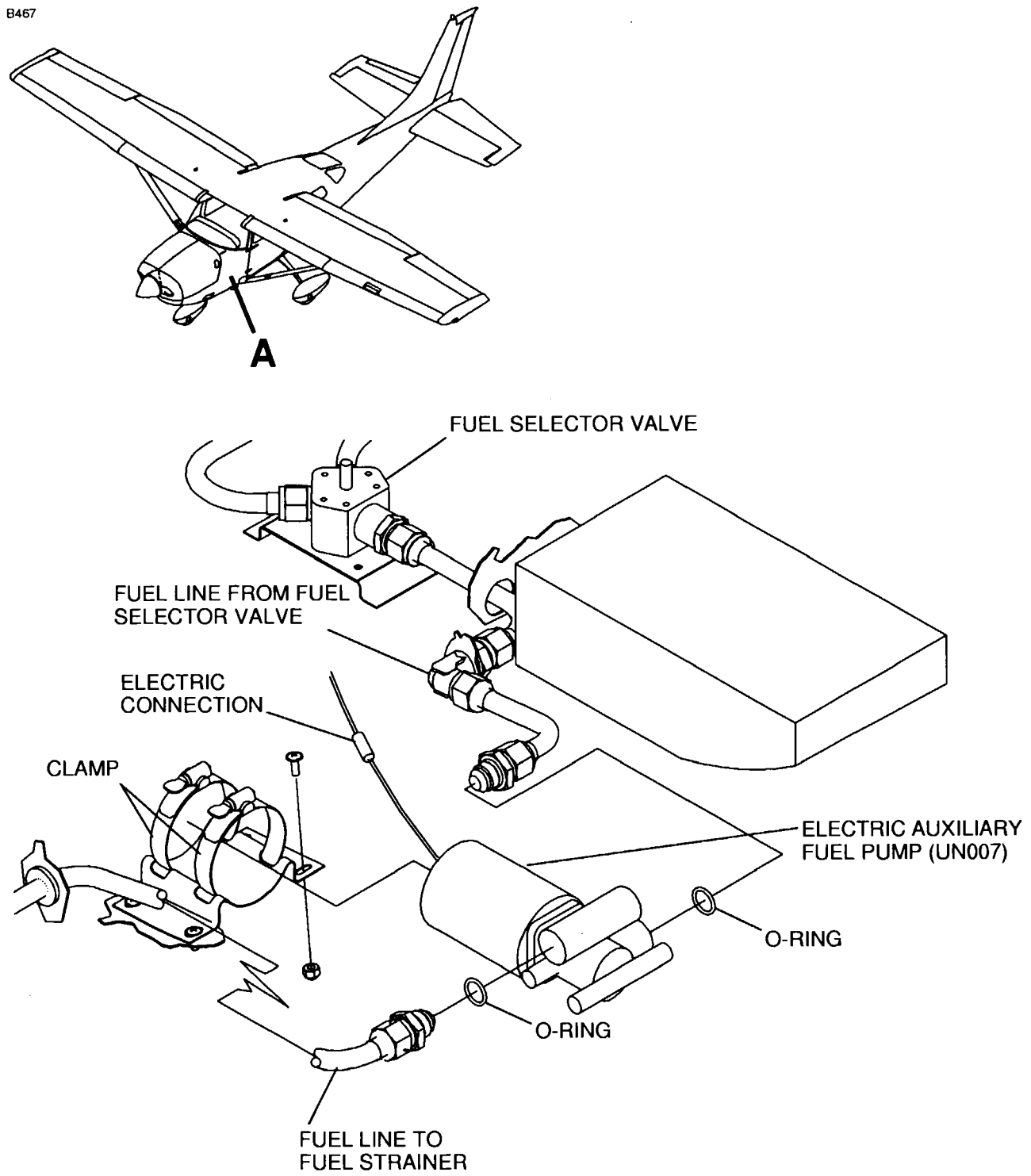
13. Fuel Strainer Disassembly/Cleaning/Assembly

A. Disassemble and Clean the Fuel Strainer (Refer to Figure 210).
(1) Turn the fuel selector to the OFF position.
(2) Disconnect the strainer drain tube.
(3) Remove the safety wire, nut, washer and O-ring at the bottom of filter bowl and remove the bowl.
(4) Carefully loosen the standpipe and remove the standpipe from the airplane.
(5) Remove the filter assembly, O-ring and gasket.
(6) Wash the filter assembly and bowl with soap and water, then dry them with compressed air.

B. Assemble the Fuel Strainer (Refer to Figure 210)
(1) Install a new gasket between the filter screen and top assembly.
(2) Install the standpipe with the screen assembly and a new O-ring. Tighten the standpipe only finger tight.
(3) Install the bowl with the nut, washer and a new O-ring. Torque the nut to 25 to 30 inch pounds (2.825 to 3.390 Nm).

NOTE: The step-washer at the bottom of bowl is installed so that the step fits against the O-ring.

(4) Attach the strainer drain tube.
(5) Close the strainer drain.
(6) Set the fuel selector to BOTH.
(7) Do a check for leaks.
(8) Do a check for proper operation.
(9) Attach a safety wire from the bottom nut to the top assembly. The safety wire must have a right hand wrap at least 45 degrees. Refer to Chapter 20, Safetying - Maintenance Practices.



DETAIL A

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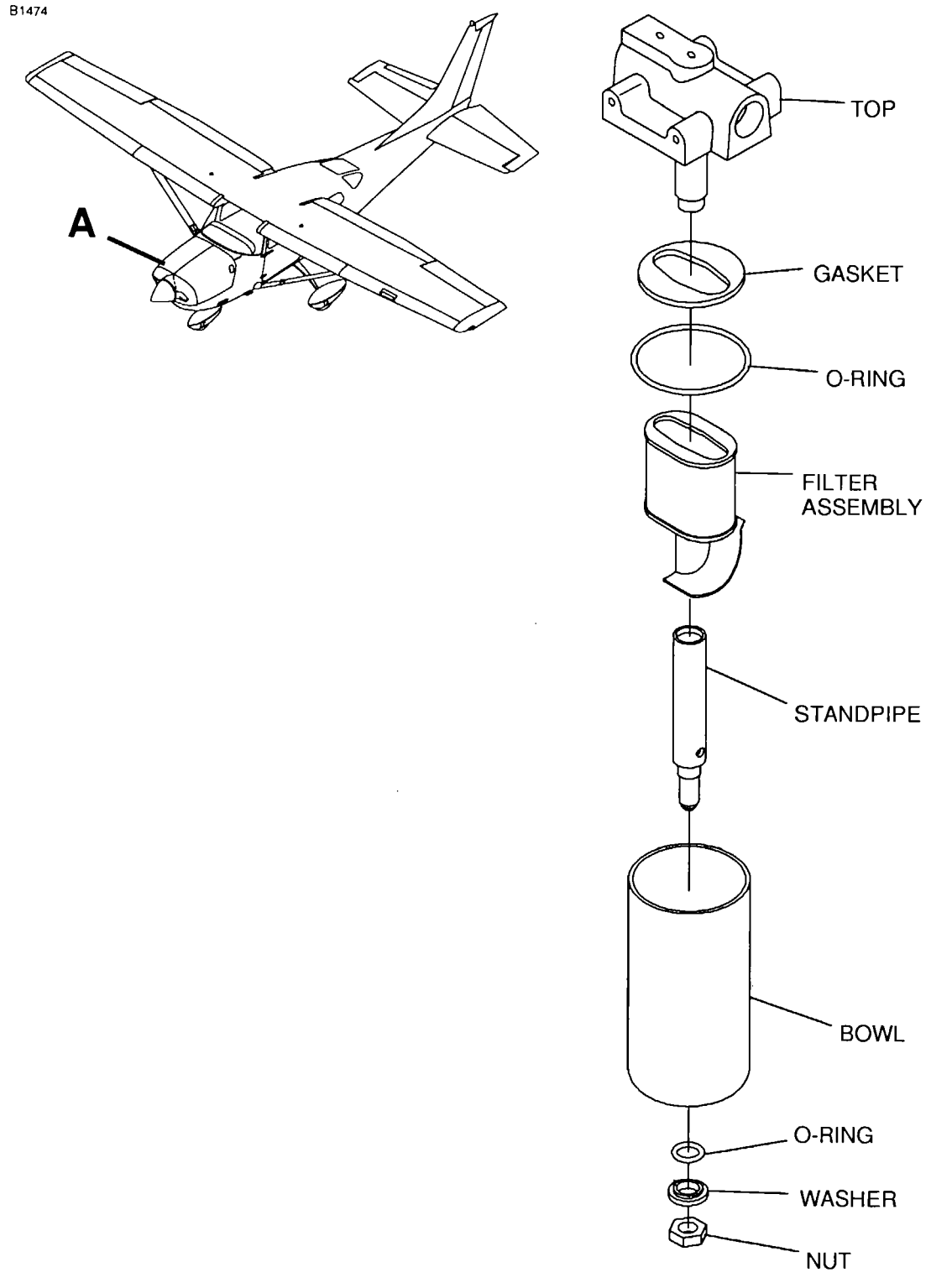
Electric Auxiliary Fuel Pump
Figure 209 (Sheet 1)



DETAIL A

1210T1001
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Fuel Strainer Assembly
Figure 210 (Sheet 1)

FUEL BAY SEALING - MAINTENANCE PRACTICES

1. General

A. The fuel bays need to be resealed if a leak has started or if the wing has been repaired. These procedures give instructions on how to seal the fuel bays, classify fuel leaks and test the fuel bays after repair.

2. Tools and Equipment

A. Refer to Fuel - General, for tools and equipment.

3. Classification of Fuel Leaks

A. Fuel leaks are put into four classes based on the observed size and condition of the leak. Immediate corrective action can be necessary prior to flight if the leak is found in some spots. The four classes of leaks are as follows and as shown in Figure 201:
   (1) Stains - An area of 0.75 inch (19.05 mm) or less in diameter.
   (2) Seep - An area from 0.75 inch to 1.50 inches (19.05 mm to 38.1 mm) in diameter.
   (3) Heavy Seep - An area from 1.50 inches to 4.00 inches (38.1 mm to 101.6 mm) in diameter.
   (4) Running Leak - Size changes with spot and intensity of leak.

B. Corrective action before flight is necessary for the leaks that follow.
   (1) Running leaks in any area.
   (2) Stains, seeps or heavy seeps in a closed area.

   NOTE: A closed area is defined as the wing leading edge and the section of wing inboard or outboard of the fuel bays.

C. Corrective action is necessary when the airplane is grounded for other maintenance for the leaks that follow.
   (1) Stains, seeps or heavy seeps not in a closed area.

4. Sealing Fuel Leaks

A. Find the Source of the Leak.

   NOTE: Fuel can flow along a seam or structure of the wing for several inches which can make the leak source difficult to find. A stained area is an indication of the leak source.

   (1) Find fuel leaks in the fuel bay. Refer to Test the Integral Fuel Bay.
   (2) Another procedure to find the source of a fuel leak is to remove the access doors and blow with an air nozzle from the inside of the bay in the area of the leak while a soap-bubble solution is applied to the outside wing skin.

B. Repair the Leak.
   (1) Remove the sealant in the area of the leak.
   (2) Clean the area and apply a filet seal. Push the sealant into the area with the leak with a small paddle. Make sure to remove all of the air bubbles.
   (3) If a leak occurs around a rivet or bolt, replace the rivet or loosen the bolt, torque and seal around the nut plate.
   (4) Apply Type VIII sealant to the correct areas. Refer to Chapter 20, Fuel, Weather and High-Temperature Sealing - Maintenance Practices.
   (5) Let the sealant cure completely.
   (6) Do a test of the fuel bay for leaks. Refer to Test the Integral Fuel Bay.

5. Test the Integral Fuel Bay

A. The fuel system has two vented, integral fuel tanks (one in each wing). The procedure that follows must be used only after the sealant has fully cured.
   (1) Remove the vent line from the vent fitting and cap fitting.

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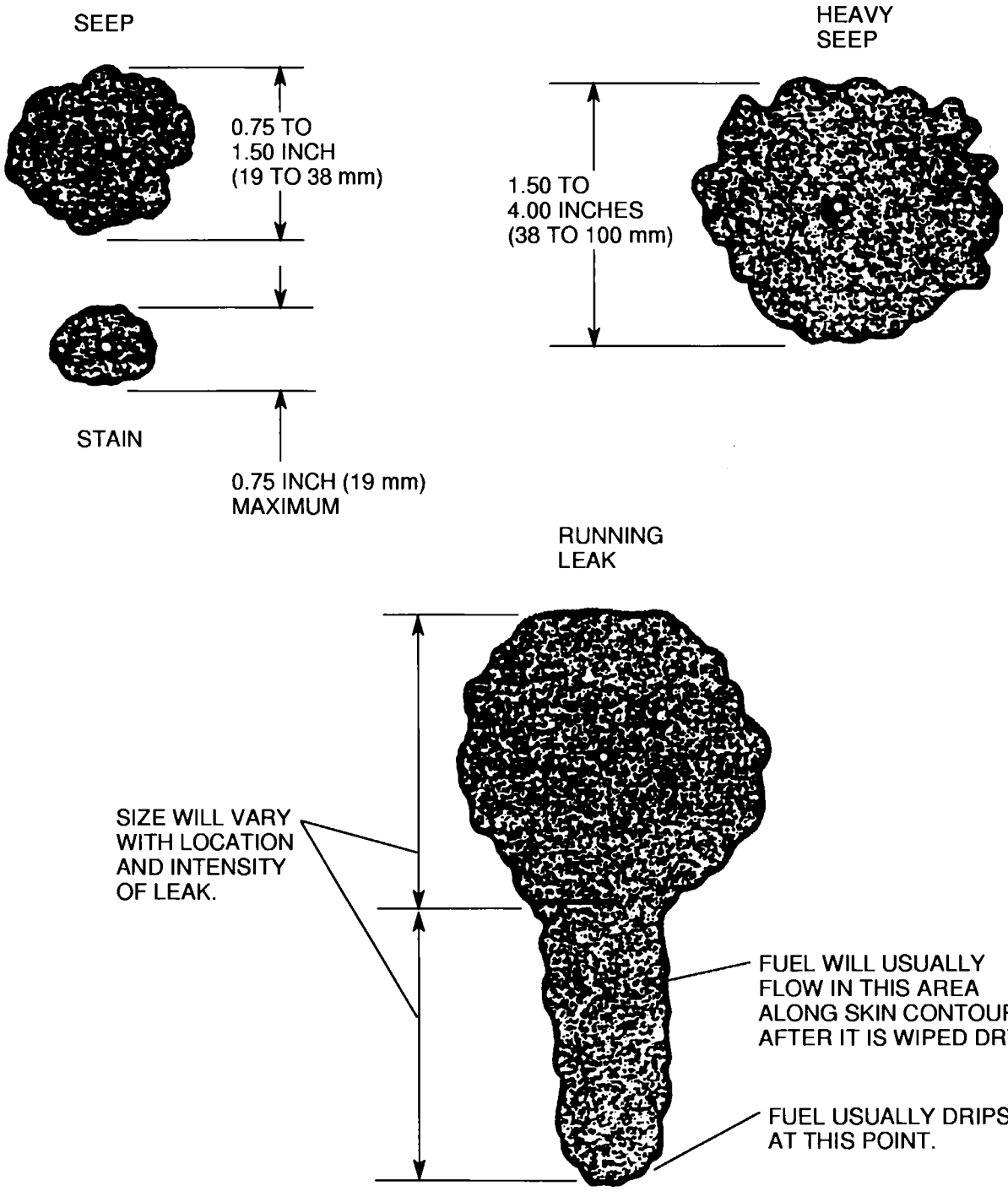

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Classification of Fuel Leaks
Figure 201 (Sheet 1)

(2) Disconnect the fuel lines from the bay.
(3) Attach a water manometer that can measure 20 inches (0.508 m) of water to one of the bay fittings
(4) Connect a well-regulated supply of air (0.5 PSI 415 Pa maximum) or 13.8 (0.351 m) inches of water to the other bay fitting. Nitrogen can be used where the bay is exposed to temperature changes during the test.
(5) Make sure that the filler cap is installed and sealed.
(6) Apply pressure slowly until there is 0.5 PSI (415 Pa).
(7) Monitor the pressure. If it the pressure does not stay at 0.5 PSI (415 Pa), apply a soap solution as necessary to see where there is a leak.
(8) Let the pressure stabilize for 15 to 30 minutes.
(9) If the bay holds for 15 minutes without pressure loss, the seal is satisfactory.
(10) Seal and do the test again if any leaks are found.

FUEL STORAGE AND DISTRIBUTION - ADJUSTMENT/TEST

1. General

A. This section gives the adjustment/test procedures for the fuel storage and distribution system.

2. Fuel Quantity Calibration And Check (Airplanes without Garmin G1000)

A. Fuel Indicator Calibration
(1) Put the fuel selector valve in the BOTH position.
(2) Defuel the airplane. Refer to Chapter 12, Fuel - Servicing.
(a) Open all the wing drain valves and drain the fuel bays until both are empty.
(b) Drain the fuel selector valve until empty.
(3) Put the fuel selector valve in the OFFposition.
(4) Remove the fuel quantity indicator from the instrument panel.
(5) Install a 0580001-1 test box between the wire harness connector and the fuel quantity indicator connector.

NOTE: The internal light for the fuel quantity indicator will not work when the test box is connected.

(6) Make the airplane level.
(a) Make the wings level to 0.00 degree, +0.25 degree or -0.25 degree. Use blocks under the wheels or adjust the tire pressure to make the wings level. Refer to Chapter 8, Leveling - Maintenance Practices.
(b) Make the airplane level to 2.00 degrees, +0.25 or -0.25 degrees nose up position. Refer to Chapter 8, Leveling - Maintenance Practices.
(7) Use an external power source to apply 28 VDC, +0.5 or -0.5 VDC, to the airplane, and put the master switch in the ON position. Put both switches on the test box to the NORM position.
(8) Add unusable fuel to each fuel bay. Refer to Pilots' Operating Handbook for the amount of usable fuel unusable fuel.
(9) Move the wing tips approximately 5 inches up and down for approximately 10 seconds.
(10) Let the airplane become stable for approximately 30 seconds.
(11) Make sure that the airplane is still at 2 degrees nose up and the wings are still level.
(12) Adjust the "EMPTY" potentiometer, on the fuel quantity indicator, for the left and right gages until the indicator pointer is in the middle of the red radial line.

NOTE: A nonmagnetic screwdriver must be used when you adjust the potentiometers on the fuel quantity indicator.

(13) Make sure that the low-fuel warning-lamps come on.
(14) Fill both fuel bays.
(15) Adjust the "FULL" potentiometer for the left and right gages until the pointer is in the middle of the white radial line at the full indication.
(16) Make sure the low-fuel warning-lamps go off.
(17) Proceed to the Fuel Warning System Check.

B. Fuel Warning System Check.
(1) Configure the airplane for the Fuel Warning System Check.
(a) Apply 28 VDC to the airplane.
(b) Set the master switch to ON.
(c) Move the test box switches to NORM.
(d) Make sure the fuel gages read FULL.
(e) Make sure the low-fuel annunciator is OFF.

(2) Turn the NORM/OPEN switch on the text box to the OPEN position and start the timer.

NOTE: The airplane's digital clock can be used in the timer mode to measure the time of the annunciators. The interval for this test is from switch operation until the annunciator begins to flash. The annunciators will flash for approximately 10 seconds before they come continuously on without a flash.

(3) Monitor the fuel quantity indicator.
  (a) Make sure the pointer goes to the power off position below the first graduation.
  (b) The annunciators must come on within 75 seconds.
(4) Put the NORM/OPEN switch to the NORM position.
  (a) The indicators must read full and the annunciators must go off.
  (b) Set the timer again.
(5) Turn the SHORT/NORM/100+ OHM switch to the 100+ OHM position. Start the timer.
(6) Monitor the fuel quantity indicator.
  (a) Make sure the pointer goes to the power off position below the first graduation.
  (b) The annunciators must come on within 75 seconds.
(7) Turn the SHORT/NORM/100+ OHM switch to the NORM position.
  (a) The indicators must read full and the annunciators must go off.
  (b) Set the timer again.
(8) Turn the SHORT/NORM/100+ OHM switch to the SHORT position. Start the timer.
(9) Monitor the fuel quantity indicator.
  (a) Make sure the pointer goes to the power off position below the first graduation.
  (b) The annunciators must come on within 75 seconds.
(10) Turn the SHORT/NORM/100+ OHM switch to the NORM position.
  (a) The indicators must read full and the annunciators must go off.
(11) Set the airplane digital clock back to the clock mode.
(12) Set the master switch to OFF.
(13) Remove the test box.
(14) Install the fuel quantity indicator in the instrument panel.
(15) Set the master switch to ON.
(16) Make sure the fuel quantity indicators show FULL and the annunciators are off.
(17) Set the master switch to OFF.

3. Fuel Quantity Calibration and Fuel Flow Test (Airplanes with Garmin G1000 with software version 563.01 or earlier)

NOTE: The software version is shown on the upper right corner of the MFD on the first page displayed after power is applied the MFD in normal operation.

NOTE: If the fuel quantity indicator on the Garmin G1000 system has a red X on it during normal operation, examine the sender and wiring and refer to the Garmin G1000 Line Maintenance Manual for more Garmin system troubleshooting. If the values given on the Primary Flight Display (PFD) are not the same as the values given in the calibration procedure, refer to the Garmin G1000 Line Maintenance Manual for troubleshooting.

A. Do a Fuel Quantity Calibration and Fuel Flow Test.
  (1) Put the selector valve in the BOTH position.
  (2) Defuel the airplane. Refer to Chapter 12, Fuel - Servicing.
    (a) Drain the fuel tanks with all wing drain valves until the two tanks are empty.
    (b) Drain the fuel-selector drain valve until it is empty.
  (3) Put the fuel selector valve in the OFF position.
  (4) Make the airplane level.
    (a) Make the wings level to 0.0 degrees, +0.25 or -0.25 degree. Use blocks under the wheels or adjust the tire pressure to make the wings level. Refer to Chapter 8, Leveling - Maintenance Practices.
    (b) Make the airplane level to 2.00 degrees, +0.25 or -0.25 degree, in the nose up position. Refer to Chapter 8, Leveling - Maintenance Practices.

(5) Add unusable fuel to each fuel tank. Refer to the Pilot's Operating Handbook for the amount of usable fuel.
(6) Move the wing tips approximately 5 inches up and down for approximately 10 seconds.
(7) Let the airplane become stable for approximately 30 seconds.
(8) Put the BAT MASTER switch to the ON position while you push the ENT button on the PFD.
(9) Release the ENT button after the words INITIALIZING SYSTEM show on the PFD.

NOTE: The PFD is now in the configuration mode.

(10) Use the Flight Management System (FMS) outer knob to go to the CAL page group.
(11) Use the FMS inner knob to go to the FUEL CALIBRATION page.
(12) Put the AVIONICS master switch in the ON position while you hold down the ENT button on the MFD.
(13) Release the ENT button after the words INITIALIZING SYSTEM show on the MFD.

CAUTION: Before you do the calibration procedure, you must turn on the G1000 system and let it become stable for a minimum of three minutes.

NOTE: The MFD is now in the configuration mode.

(14) Push the softkeys on the FUEL CALIBRATION page of the PFD, in the sequence that follows, to enter the password.
  (a) Push Softkey 12 (far right softkey).
  (b) Push Softkey 11.
  (c) Push Softkey 10.
  (d) Push Softkey 9.
(15) Make sure that the FUEL FLOW ENG 1 SCALE value is 1.00000.
  (a) If the FUEL FLOW ENG 1 SCALE value is not 1.00000, use the FMS knobs to make it 1.00000. Push in the inner FMS knob to activate the cursor. Use the outer FMS knob to select FUEL FLOW ENG 1 SCALE. Use the inner FMS knob to change the value.
(16) Push the L RESET softkey to set the left calibration parameters to the default values.

NOTE: When L RESET is pushed, the system shows the warning message "WARNING! Pressing 'OK' will cause the calibration to revert to the default settings."

(17) Push ENT to make the OK selection.
(18) Make sure that the airplane is level at 2.0 degrees nose up position and 0.0 degrees wings level attitude.
(19) Make sure that the CAL VAL value shown for the LEFT 1 SUB-TANK is stable.
(20) Push the L EMPTY softkey.
(21) Push the R RESET softkey to set the right calibration parameters to the default values.

NOTE: When R RESET is pushed, the system shows the warning message "WARNING! Pressing 'OK' will cause calibration to revert to default settings."

(22) Push ENT to make the OK selection.
(23) Make sure that the CAL VAL value shown for the RIGHT 1 SUB-TANK is stable.
(24) Push the R EMPTY softkey.
(25) Make sure that the CAL VAL values are between -0.10 and +0.10 gallon (-0.38 and +0.38l) for the LEFT 1 SUB-TANK.
(26) Make sure that the CAL VAL values are between -0.10 and +0.10 gallon (-0.38 and +0.38l) for the RIGHT 1 SUB-TANK.
(27) Put the AVIONICS master switch in the OFF position.
(28) Put the BAT MASTER switch in the OFF position.
(29) After a minimum of 10 seconds, put the BAT MASTER switch in the ON position.
(30) Make sure that the left, L, and right, R, fuel quantity pointers are on the red line.

(31) Put the BAT MASTER switch in the OFF position.
(32) Put the BAT MASTER switch to the ON position while the ENT button on the PFD is held down.
(33) Release the ENT button after the words INITIALIZING SYSTEM show on the PFD.
(34) Use the FMS outer knob to go to the CAL page group.
(35) Use the FMS inner knob to go to the FUEL CALIBRATION page.
(36) Put the AVIONICS master switch to the ON position while the ENT button on the MFD is held down.
(37) Release the ENT button after the words INITIALIZING SYSTEM show on the MFD.

CAUTION: Before you do the calibration procedure, you must turn on the G1000 system and let it become stable for a minimum of three minutes.

(38) Add 5 gallons of fuel (low fuel level) to the left fuel tank. Refer to Chapter 12, Fuel - Servicing.
(39) Make sure the fuel is sensed in the LEFT 1 SUB-TANK.
(40) Add 5 gallons of fuel (low fuel level) to the right fuel tank. Refer to Chapter 12, Fuel - Servicing.
(41) Make sure the fuel is sensed in the RIGHT 1 SUB-TANK.
(42) Move the wing tips approximately 5 inches up and down for approximately 10 seconds.
(43) Let the airplane become stable for approximately 30 seconds.
(44) Make sure that the airplane is level at 2.0 degrees nose up position and 0.0 degrees wings level attitude.
(45) Make sure the CAL VAL values are stable for the LEFT 1 SUB-TANK and RIGHT 1 SUB-TANK on the PFD.
(46) Make sure the CAL VAL value for the LEFT 1 SUB-TANK is between 6.5 to 9 gallons.
(47) Make sure the CAL VAL value for the RIGHT 1 SUB-TANK is between 6.5 to 9 gallons.
(48) If the values are in the tolerance range, the procedure is complete.
(49) If the CAL VAL values are not in tolerance:
  (a) Move the wing tips approximately 5 inches up and down for approximately 10 seconds.
  (b) Let the airplane become stable for approximately 30 seconds.
  (c) Make sure that the airplane is level at 2.0 degrees nose up position and 0.0 degrees wings level attitude.
  (d) Make sure the CAL VAL values are stable for the LEFT 1 SUB-TANK and RIGHT 1 SUB-TANK on the PFD.
  (e) Make sure the CAL VAL value for the LEFT 1 SUB-TANK is between 6.5 to 9 gallons.
    1 If the CAL VAL is still not in the tolerance range, drain the fuel from the tanks and do the fuel calibration procedure again.
  (f) Make sure the CAL VAL value for the RIGHT 1 SUB-TANK is between 6.5 to 9 gallons.
    1 If the CAL VAL is still not in the tolerance range, drain the fuel from the tanks and do the fuel calibration procedure again.
(50) Inflate the tire to the correct pressure.
(51) Put the AVIONICS switch to the OFF position.
(52) Put the BAT MASTER switch to the OFF position.

4. Fuel Quantity Calibration and Fuel Flow Test (Airplanes with Garmin G1000 with software version 563.02 or later)

NOTE: The software version is shown on the upper right corner of the MFD on the first page displayed after the MFD is powered on in normal operation.

NOTE: If the fuel quantity indicator on the Garmin G1000 system has a red X on it during normal operation, examine the fuel quantity sender and wiring and refer to the Garmin G1000 Line Maintenance Manual for more Garmin system troubleshooting. If the values given on the PFD are not the same as the values given in the calibration procedure, refer to the Garmin G1000 Line Maintenance Manual for troubleshooting.

A. Do a Fuel Quantity Calibration and Fuel Flow Test.
  (1) Put the selector valve in the BOTH position

(2) Defuel the airplane. Refer to Chapter 12, Fuel - Servicing.
  (a) Drain the fuel tanks with all wing drain valves until the two tanks are empty.
  (b) Drain the fuel-selector drain valve until it is empty.
(3) Put the fuel selector valve in the OFF position.
(4) Make the airplane level.
  (a) Make the wings level to 0.0 degrees, +0.25 or -0.25 degree. Use blocks under the wheels or adjust tire pressure to make the wings level. Refer to Chapter 8, Leveling - Maintenance Practices.
  (b) Make the airplane level to 2.00 degrees, +0.25 or -0.25 degrees nose up position. Refer to Chapter 8, Leveling - Maintenance Practices.
(5) Add unusable fuel to each fuel tank. Refer to the Pilot's Operating Handbook for the unusable fuel quantity.
(6) Move the wing tips approximately 5 inches up and down for approximately 10 seconds.
(7) Let the airplane become stable for approximately 30 seconds.
(8) Put the BAT MASTER switch to the ON position while you push the ENT button on the PFD.
(9) Release the ENT button after the words INITIALIZING SYSTEM show on the PFD.

NOTE: The PFD is now in the configuration mode.

(10) Use the Flight Management System (FMS) outer knob to go to the CAL page group.
(11) Use the FMS inner knob to go to the FUEL CALIBRATION page.
(12) Put the AVIONICS master switch in the ON position while you hold down the ENT button on the Multi-Function Display (MFD).
(13) Release the ENT button after the words INITIALIZING SYSTEM show on the MFD.

CAUTION: Before you do the calibration procedure, you must turn on the G1000 system and let it become stable for a minimum of three minutes.

NOTE: The MFD is now in the configuration mode.

(14) Use the FMS outer knob to go to the GRS page group on the MFD.
(15) Use the FMS inner knob to go to the GRS/GMU CALIBRATION page on the MFD.
(16) Push the softkeys on the FUEL CALIBRATION page of the PFD, in the sequence that follows, to enter the password.
  (a) Push Softkey 12 (far right softkey).
  (b) Push Softkey 11.
  (c) Push Softkey 10.
  (d) Push Softkey 9.
(17) Make sure that the FUEL FLOW ENG 1 SCALE value is 1.00000.
  (a) If the FUEL FLOW ENG 1 SCALE value is not 1.00000, use the FMS knobs to make it 1.00000. Push in the inner FMS knob to activate the cursor. Use the outer FMS knob to select FUEL FLOW ENG 1 SCALE. Use the inner FMS knob to change the value.
(18) Push the TNK SEL softkey to highlight the CURRENT TANK field.
(19) Turn the inner FMS knob to select LEFT.
(20) Make sure that the airplane is level at 2.0 degrees nose up and 0.0 degrees wings level attitude.
(21) Make sure that the CALIBRATED TOTAL value shown for the LEFT TANK is stable.
(22) Push the EMPTY softkey and press the enter (ENT) button to add the calibration point to the CALIBRATION TABLE.
(23) Make sure that the CALIBRATED TOTAL values are between -0.10 and +0.10 gallon (-0.38 and +0.38l) for the LEFT TANK.
(24) Push the TNK SEL softkey to highlight the CURRENT TANK field.
(25) Turn the inner FMS knob to select RIGHT.
(26) Make sure that the CALIBRATED TOTAL value shown for the RIGHT TANK is stable.
(27) Push the EMPTY softkey and press the ENT button to add the calibration point to the CALIBRATION TABLE.

(28) Make sure that the CALIBRATED TOTAL values are between -0.10 and +0.10 gallon (-0.38 and +0.38l) for the RIGHT TANK.
(29) Make sure there is only one calibration point in the CALIBRATION TABLE. Under ACTUAL QUANTITY you must have "0.00 GL" and you must have one number under CALIBRATED VALUE. If you have more points in the CALIBRATION TABLE highlight them and push the DELETE softkey.
(30) Make sure that the left, L, and right, R, fuel quantity pointers are on the red line on the MFD on the GRS group GRS/GMU CALIBRATION page.
(31) Add 5 gallons of fuel (low fuel level) to the left fuel tank. Refer to Chapter 12, Fuel - Servicing.
(32) Make sure fuel is sensed in the LEFT TANK.
(33) Add 5 gallons of fuel (low fuel level) to the right fuel tank. Refer to Chapter 12, Fuel - Servicing.
(34) Make sure fuel is sensed in the RIGHT TANK.
(35) Move the wing tips approximately 5 inches up and down for approximately 10 seconds.
(36) Let the airplane become stable for approximately 30 seconds.
(37) Make sure that the airplane is level at 2.0 degrees nose up and 0.0 degrees wings level attitude..
(38) Make sure the CALIBRATED TOTAL value for the LEFT TANK is stable and between 6.5 to 9 gallons.
(39) Make sure the CALIBRATED TOTAL value for the RIGHT TANK is stable and between 6.5 to 9 gallons.
(40) If the values are in tolerance, the procedure is complete.
(41) If the CALIBRATED TOTAL values are not in the range:
    (a) Move the wing tips approximately 5 inches up and down for approximately 10 seconds.
    (b) Let the airplane become stable for approximately 30 seconds.
    (c) Make sure that the airplane is level at 2.0 degrees nose up and 0.0 degrees wings level attitude.
    (d) Make sure the CALIBRATED TOTAL value for the LEFT TANK is stable and between 6.5 to 9 gallons.
        1 If the CALIBRATED TOTAL is still not in the tolerance range, drain the fuel from the tanks and do the fuel calibration procedure again.
    (e) Make sure the CALIBRATED TOTAL value for the RIGHT TANK is stable and between 6.5 to 9 gallons.
        1 If the CALIBRATED TOTAL is still not in the tolerance range, drain the fuel from the tanks and do the fuel calibration procedure again.
(42) Inflate the tire to the correct pressure.
(43) Put the AVIONICS switch to the OFF position.
(44) Put the BAT MASTER switch to the OFF position.

CHAPTER

30

ICE AND RAIN PROTECTION

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
30-Title		
30-List of Effective Pages		
30-Record of Temporary Revisions		
30-Table of Contents		
30-00-00	Page 1	Dec 2/2002
30-20-00	Pages 201-202	Dec 2/2002
30-60-00	Page 1	Jan 2/2006
30-60-00	Pages 101-110	Jan 1/2007
30-60-00	Pages 201-203	Apr 5/2004

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

ICE AND RAIN EQUIPMENT - GENERAL

1. Scope

A. This chapter describes the procedures and components used to prevent or dispose of the formation of ice and rain on various parts of the aircraft.

2. Definition

A. This chapter is divided into sections and subsections to aid maintenance personnel in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief definition of the sections incorporated in this chapter is as follows.

(1) The section on winterization provides procedures and techniques for the installation of the winterization kit.

(2) The section on propeller heat provides procedures and techniques for the installation and removal of the propeller heat timer and indicator.

WINTERIZATION KIT - MAINTENANCE PRACTICES

1. General

A. The winterization kit consists of two coverplates (with placards) which attach to the air intakes in the cowling nosecap and a placard silkscreened on the instrument panel. This equipment should be installed for operations in temperatures consistently below 20 degrees F (-7 degrees C).

B. The winterization kit may be installed when temperatures are consistently below 20 degrees F (-7 degrees C). This procedure provides instructions for the installation and removal of the winterization kit.

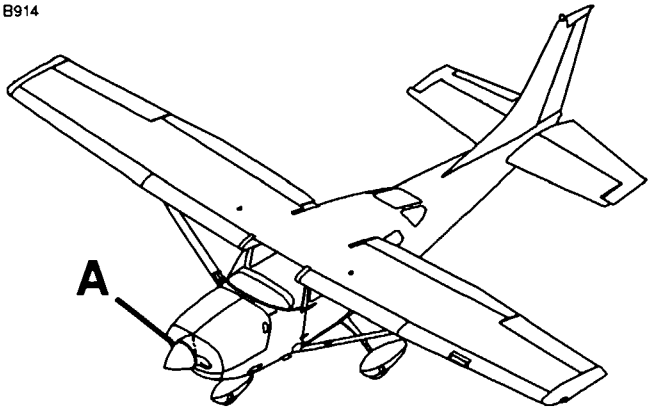
2. Winterization Kit Installation

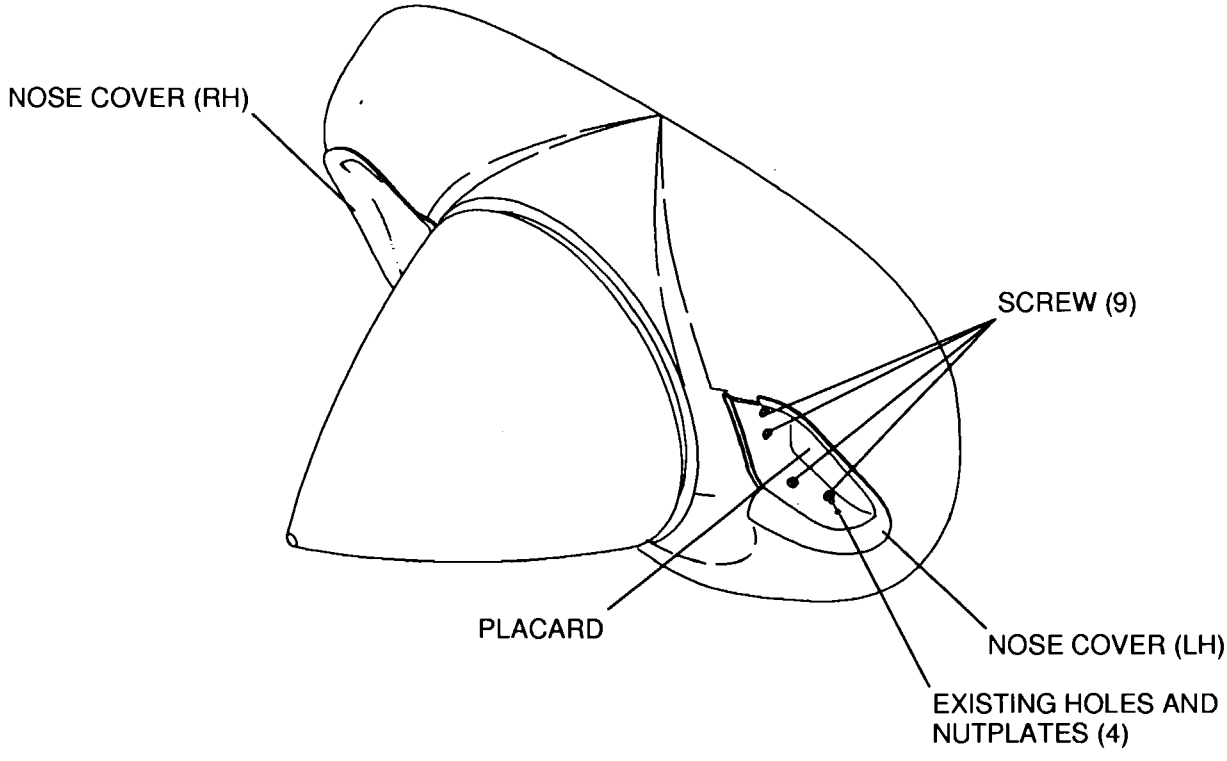
A. Winterization Cover Installation (Refer to Figure 201).
(1) Position Nose Covers in the air intake openings of the nosecap and mark the positions of the holes.

NOTE: Be sure existing holes on nose covers align with existing holes in nosecap.

(2) Using the newly made marks, drill nonexisting holes through the nosecap.
(3) Remove engine cowling and upper and lower nosecaps from the aircraft.
(4) Using the nutplates as a template, mark and drill holes. Countersink holes on the forward side of the nosecap.
(5) Install and secure nutplates on the aft side of the nosecap with rivets.
(6) Install covers, secure with screws.

B914





DETAIL A

1210T1001
A1216T1030

Winterization Equipment
Figure 201 (Sheet 1)

PROPELLER HEAT - DESCRIPTION AND OPERATION

1. General

A. The Model 206/T206 propeller is protected from ice by an optional electrical propeller heat system.

2. Description and Operation

A. The propeller heat system is electrothermal. It has electrically heated boots bonded to each propeller blade. There is a slip ring assembly for power distribution to the propeller boots and a brush block assembly to transfer electrical power to the rotating slip ring. A propeller heat timer/monitor cycles electrical power to the boots in the correct sequence and monitors the boot's heater current. There is propeller heat indication for either correct or failed system operation. A toggle switch labeled PROP HEAT controls the engine propeller heat system.

The propeller heat system also includes a larger alternator for additional current capacity. It has a higher Amp/Hour Battery to support the additional current load required by the propeller heat system.

The propeller heat system applies heat to the surfaces of the propeller blades where ice would normally adhere. This heat, plus centrifugal force and the blast from the airstream, removes accumulated ice.

When the PROP HEAT switch is placed in the ON position, the timer controls electrical power through the brush block and slip ring to the three propeller heat boots in intervals of 90 seconds on and 90 seconds off. The propeller heat system is off when the switch is placed in the OFF position. Operation of the propeller heat system can be checked through the propeller heat annunciation. If the correct amount of current does not flow to all three elements, the timer/monitor recognizes the condition, removes current flow to all heating boots, and turns on the amber Prop Heat annunciation. The green Prop Heat annunciation is on during the correct operation of the propeller heat system.

PROPELLER HEAT - TROUBLESHOOTING

1. General

A. Troubleshooting charts have been developed to help the maintenance technician in troubleshooting procedures. Refer to Figure 101 for airplanes without Garmin G1000 and Figure 102 for airplanes with Garmin G1000.

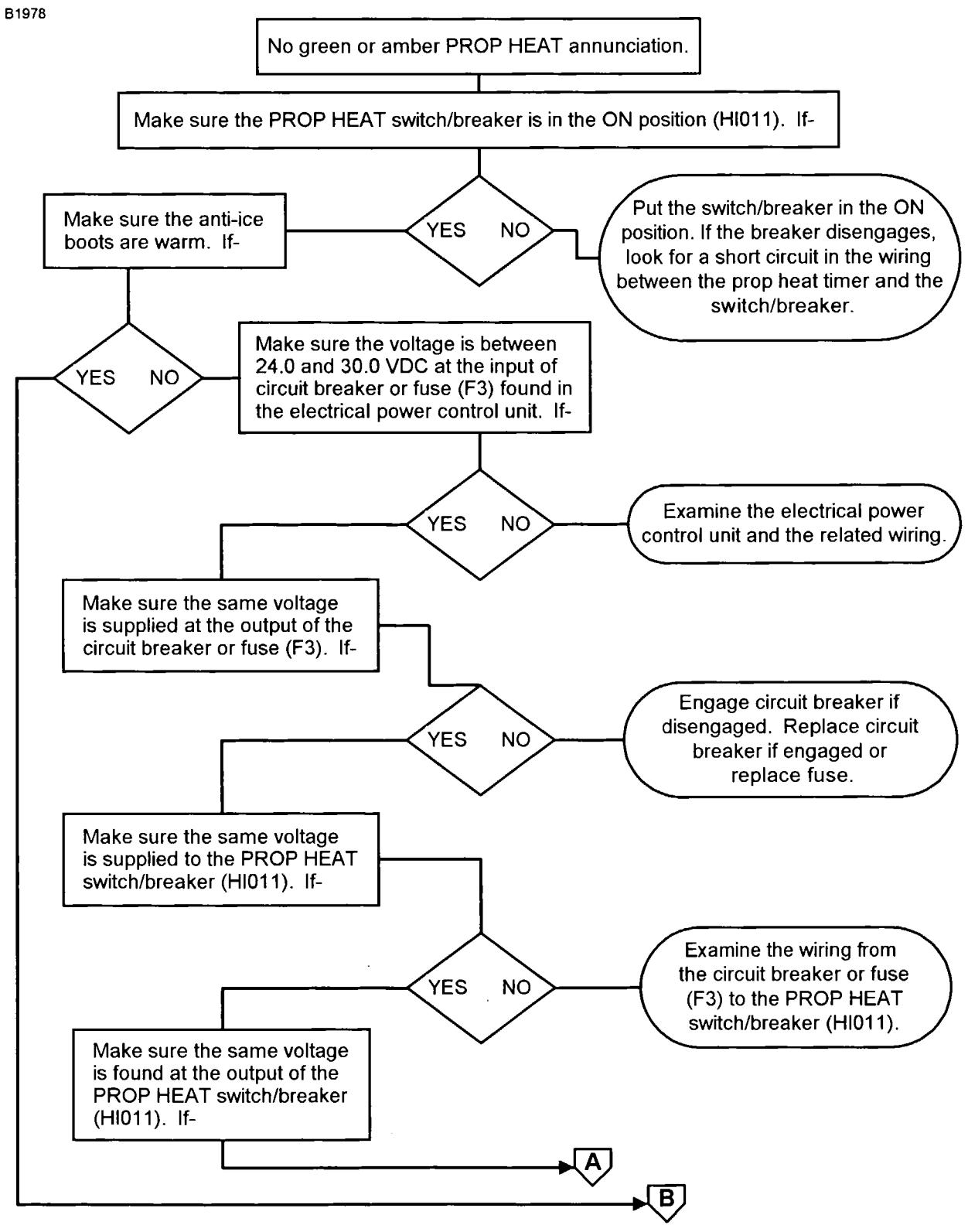
B. The propeller heat timer has a 90-second ON cycle and a 90-second OFF cycle. The timer measures the 90-second cycle interval of the de-icing boots and the correct electrical current (12.5 to 19 amps) delivered to the de-icing boots. If the 90-second cycle interval or the electrical current delivered to the de-icing boots is not in permitted limits, the timer causes these to show as faults.

The timer also monitors pin 6 and pin 8 for electrical grounds. If a ground is not applied to pin 6, the timer causes this to show as a fault. If a ground is applied to pin 8, as occurs when one of the crew sets the PROP HEAT switch to TEST, the timer causes this to show as a fault and also resets.

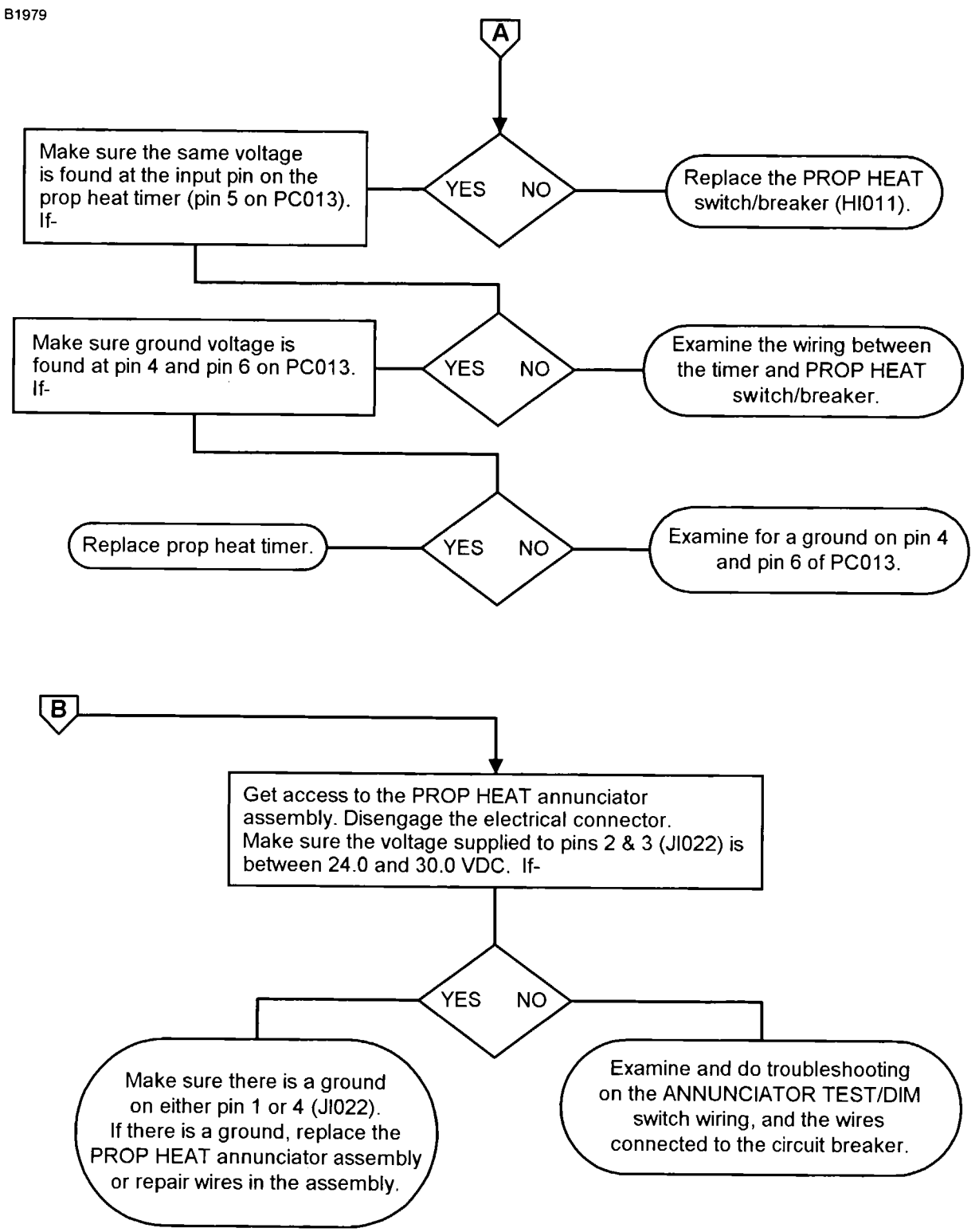
When there are faults, the timer disconnects the power that is supplied to the de-icing boots on pin 1, supplies a ground on pin 3 to start the amber alert, and removes a ground from pin 2 to stop the green alert.

NOTE: Operation of the propeller heat system for longer than 60 seconds without the propeller rotation can cause damage to the de-icing boots.

NOTE: Operation of the propeller heat system at below 24 volts can result in less than sufficient power for normal operation.

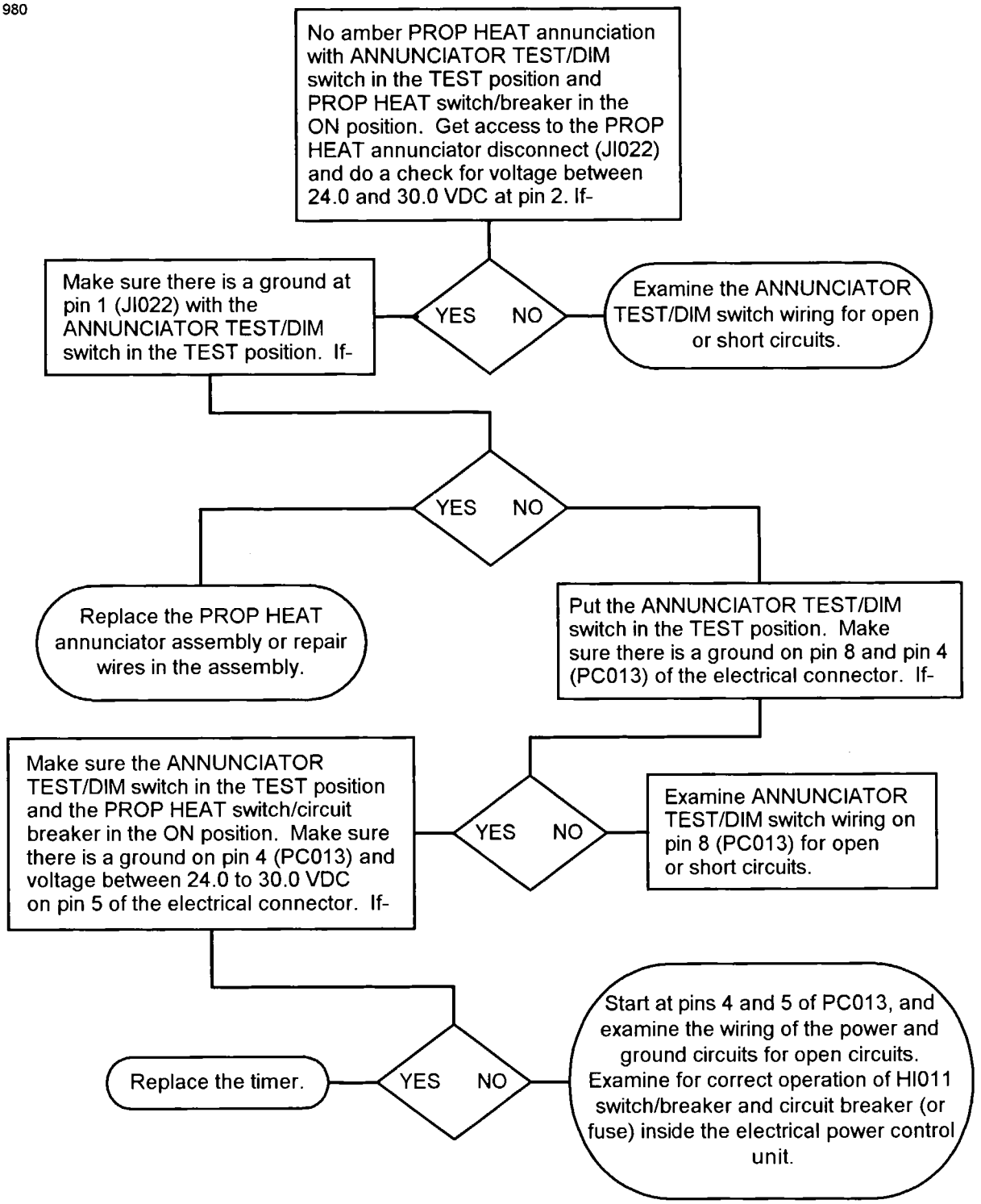


Propeller Heat Troubleshooting for Airplanes without Garmin G1000
Figure 101 (Sheet 1)



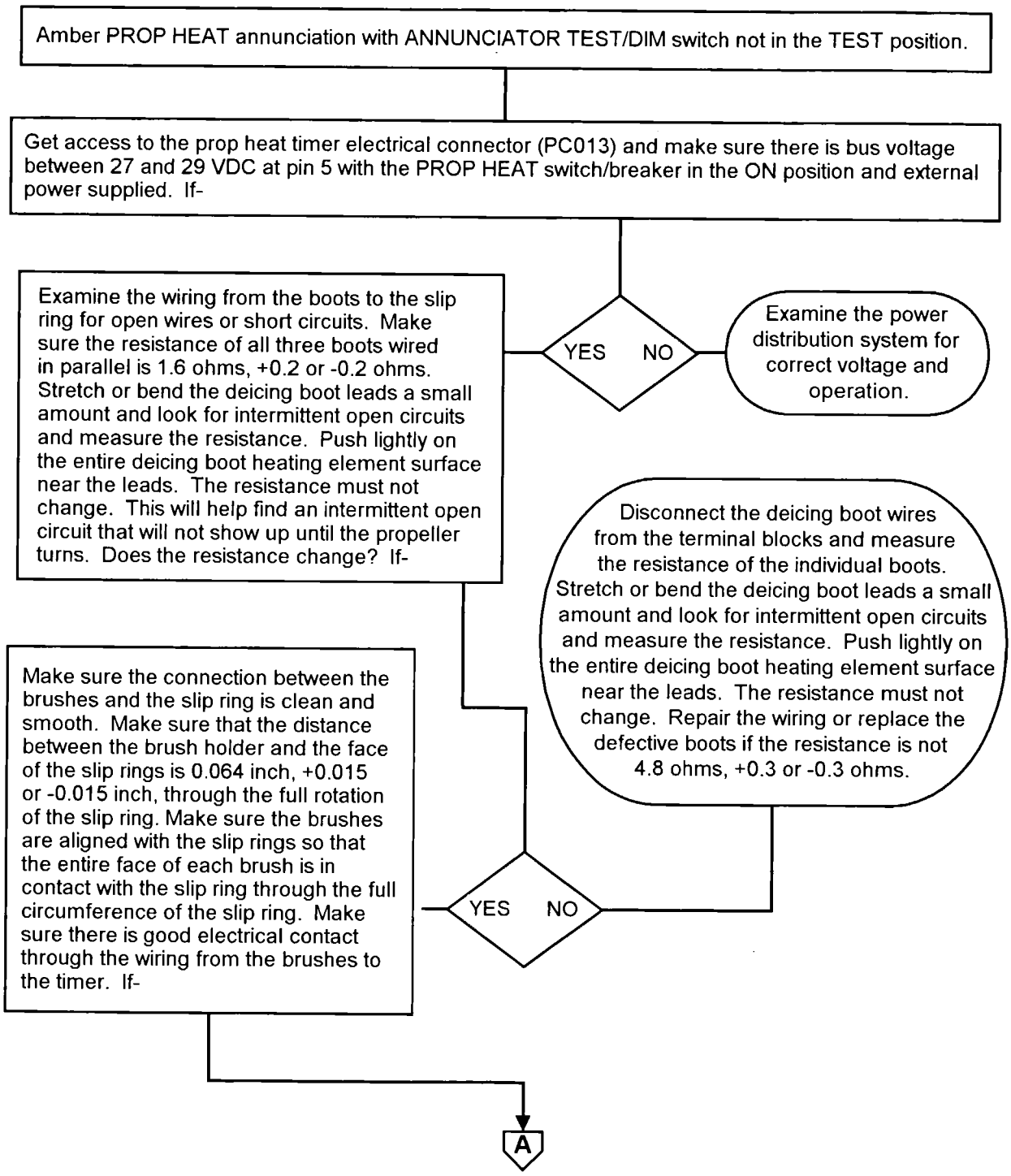
Propeller Heat Troubleshooting for Airplanes without Garmin G1000
Figure 101 (Sheet 2)

B1980

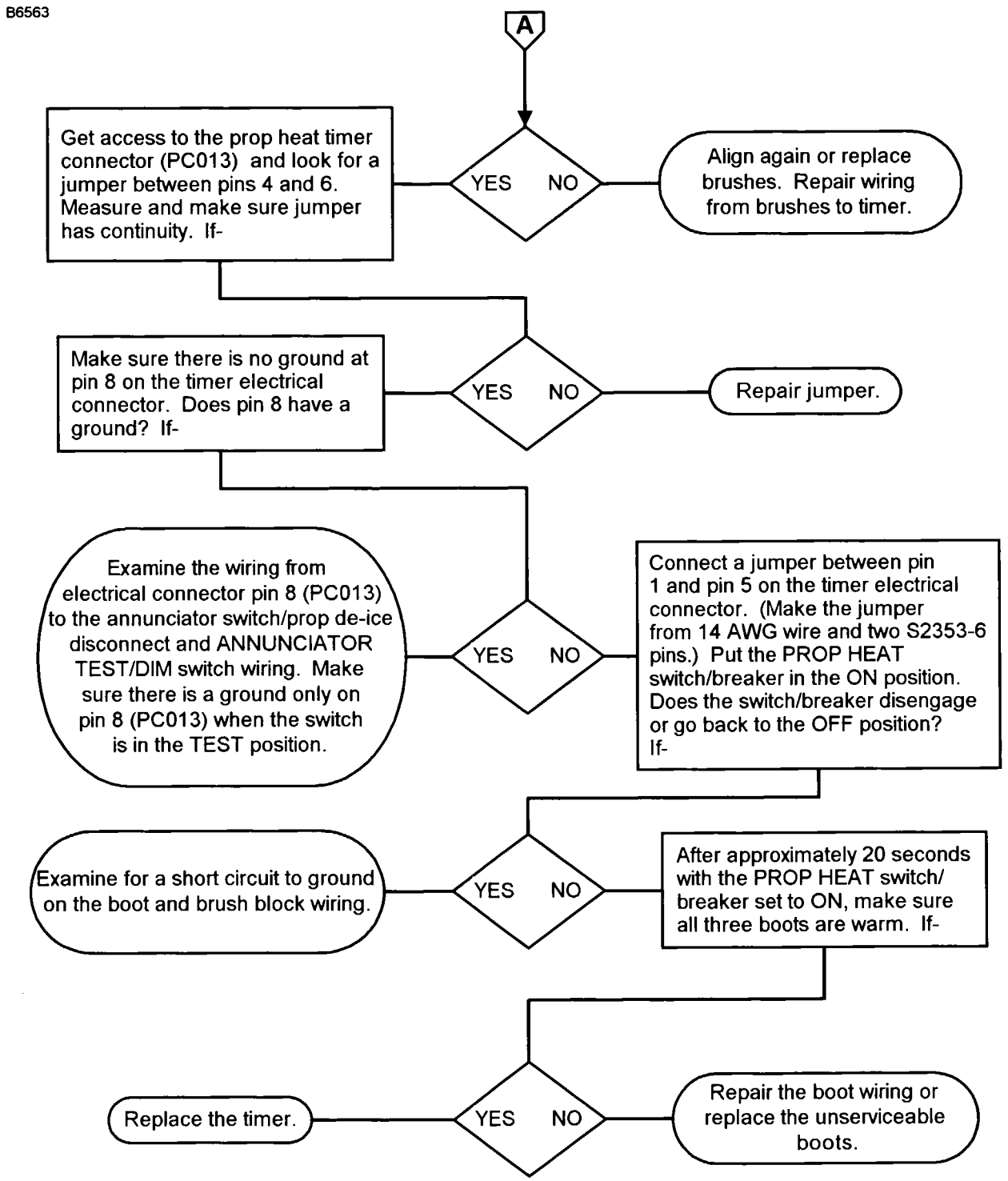


Propeller Heat Troubleshooting for Airplanes without Garmin G1000
Figure 101 (Sheet 3)

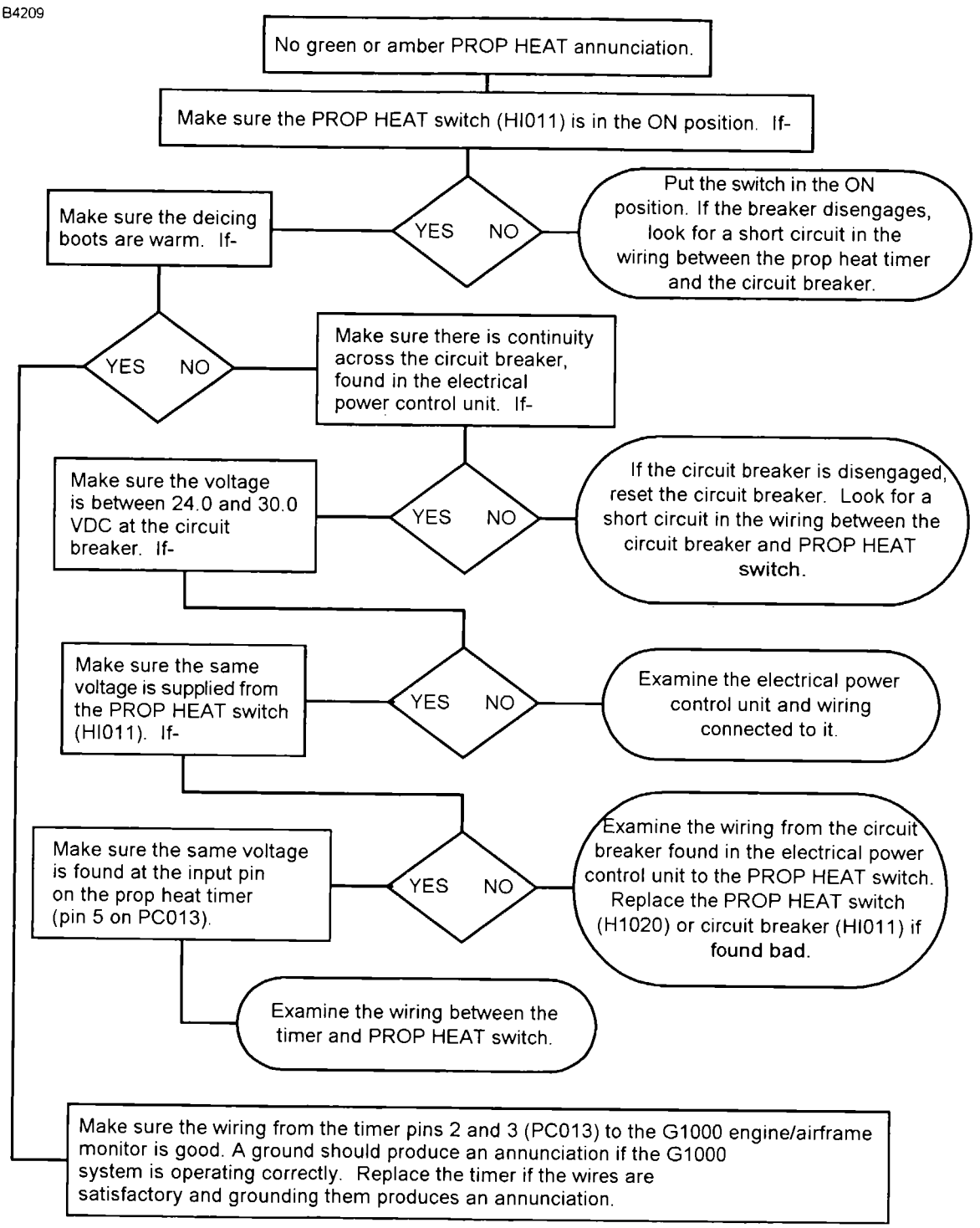
B4208



Propeller Heat Troubleshooting for Airplanes without Garmin G1000
Figure 101 (Sheet 4)

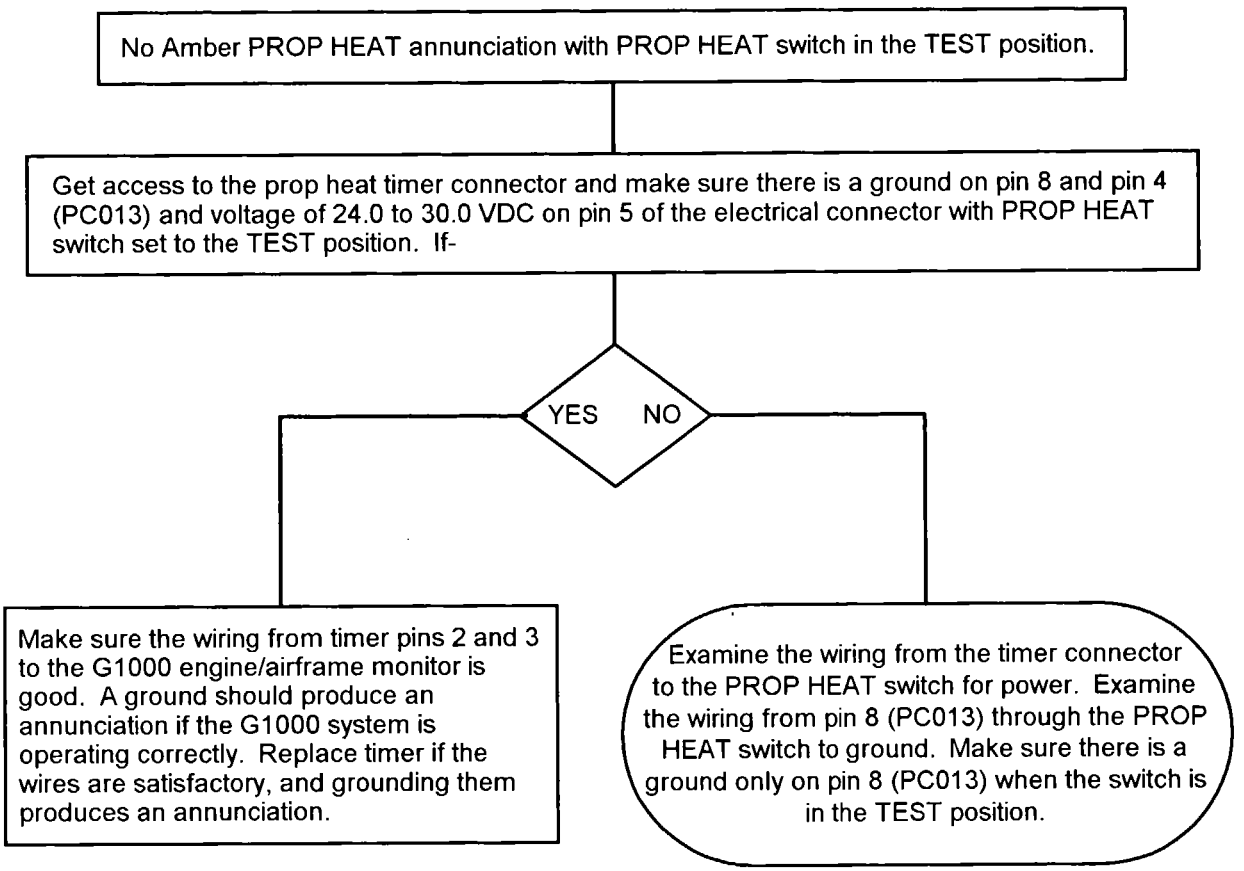


Propeller Heat Troubleshooting for Airplanes without Garmin G1000
Figure 101 (Sheet 5)

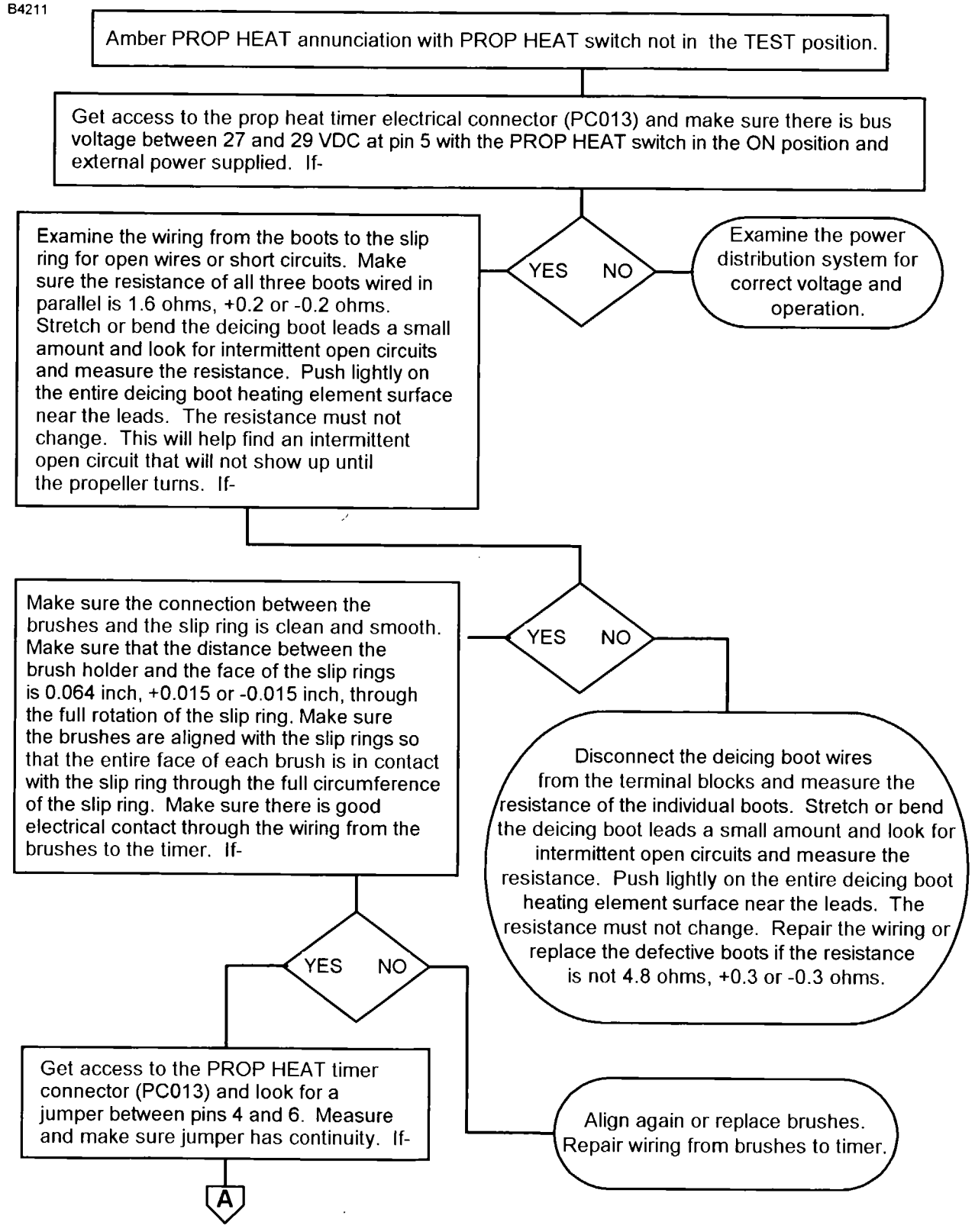


Propeller Heat Troubleshooting for Airplanes with Garmin G1000
Figure 102 (Sheet 1)

B4210

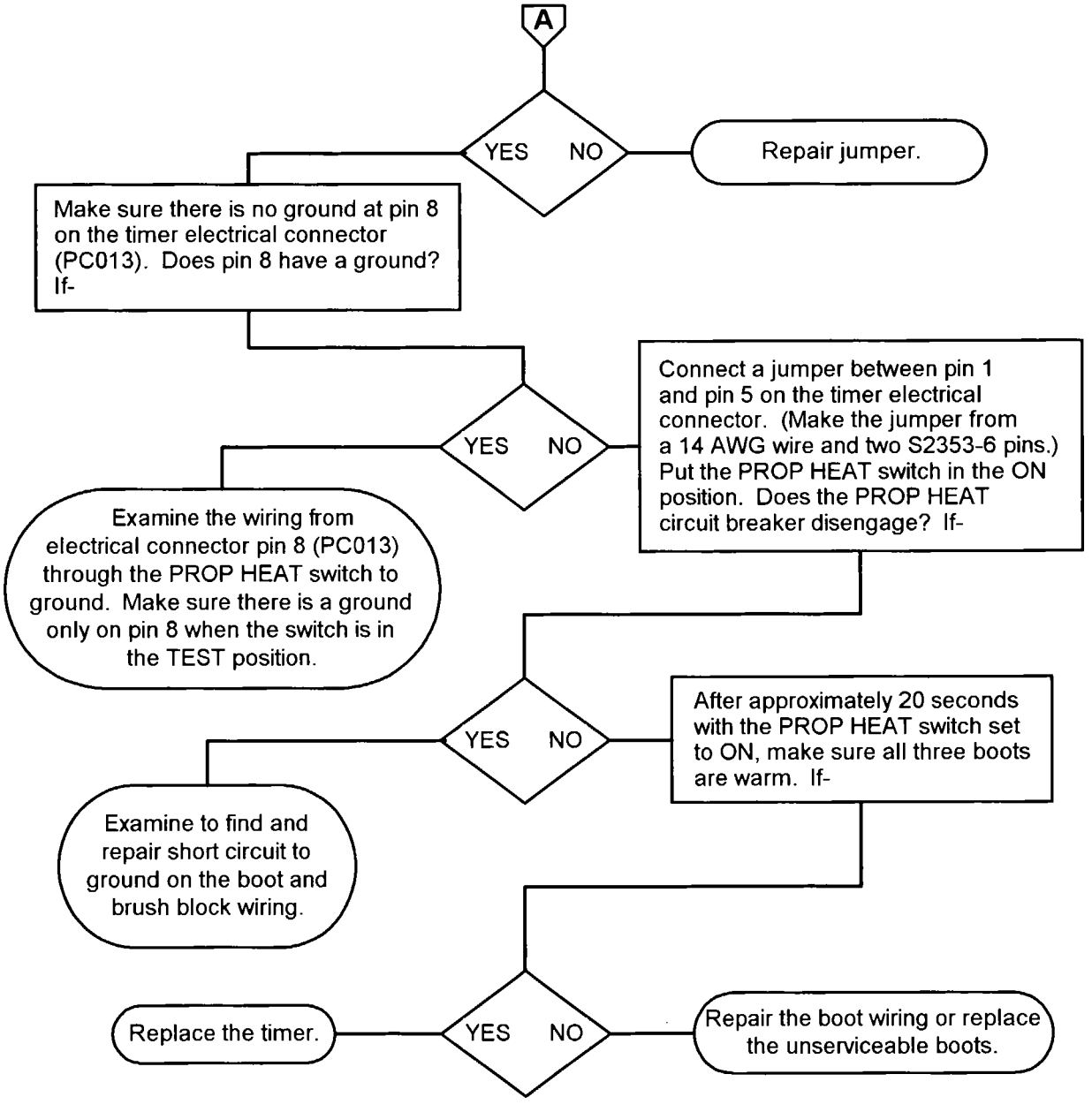


Propeller Heat Troubleshooting for Airplanes with Garmin G1000
Figure 102 (Sheet 2)



Propeller Heat Troubleshooting for Airplanes with Garmin G1000
Figure 102 (Sheet 3)

B4212



Propeller Heat Troubleshooting for Airplanes with Garmin G1000
Figure 102 (Sheet 4)

PROPELLER HEAT - MAINTENANCE PRACTICES

1. General

A. The maintenance practices for the propeller heat have propeller de-ice timer removal/installation and indicator removal/installation procedures.

2. Propeller Heat Timer Removal/Installation

A. Remove the Timer for the Propeller Heat.
   (1) Make sure the electrical power is off.
   (2) Disconnect the electrical plug from the timer.
   (3) Remove the four screws that attach the timer to the bracket.
   (4) Remove the timer from the airplane.

B. Install the Timer for the Propeller Heat Timer.
   (1) Make sure the airplane electrical power is off.
   (2) Install the timer to the nutplates with screws.
   (3) Connect the electrical plug to the timer.

3. Propeller Heat Indicator Removal/Installation

NOTE: The procedures that follow are for airplanes with standard avionics.

A. Remove the Propeller Heat Indicator.
   (1) Make sure the airplane electrical power is off.
   (2) Remove the screws that attach the annunciator panel to the instrument panel.
   (3) Pull the annunciator panel forward.
   (4) Disconnect the electrical plug from the indicator.
   (5) Remove the screws that attach the indicator to the mounting clip.
   (6) Pull the mounting clip from indicator.
   (7) Pull the indicator from the annunciator panel.

B. Propeller Heat Indicator Installation.
   (1) Make sure the airplane electrical power is off.
   (2) Install the indicator into the annunciator panel.
   (3) Install the mounting clip to the indicator with screws.
   (4) Connect the electrical plug to the indicator.
   (5) Install the annunciator panel to the instrument panel with screws.

4. Deice Boots Removal/Installation

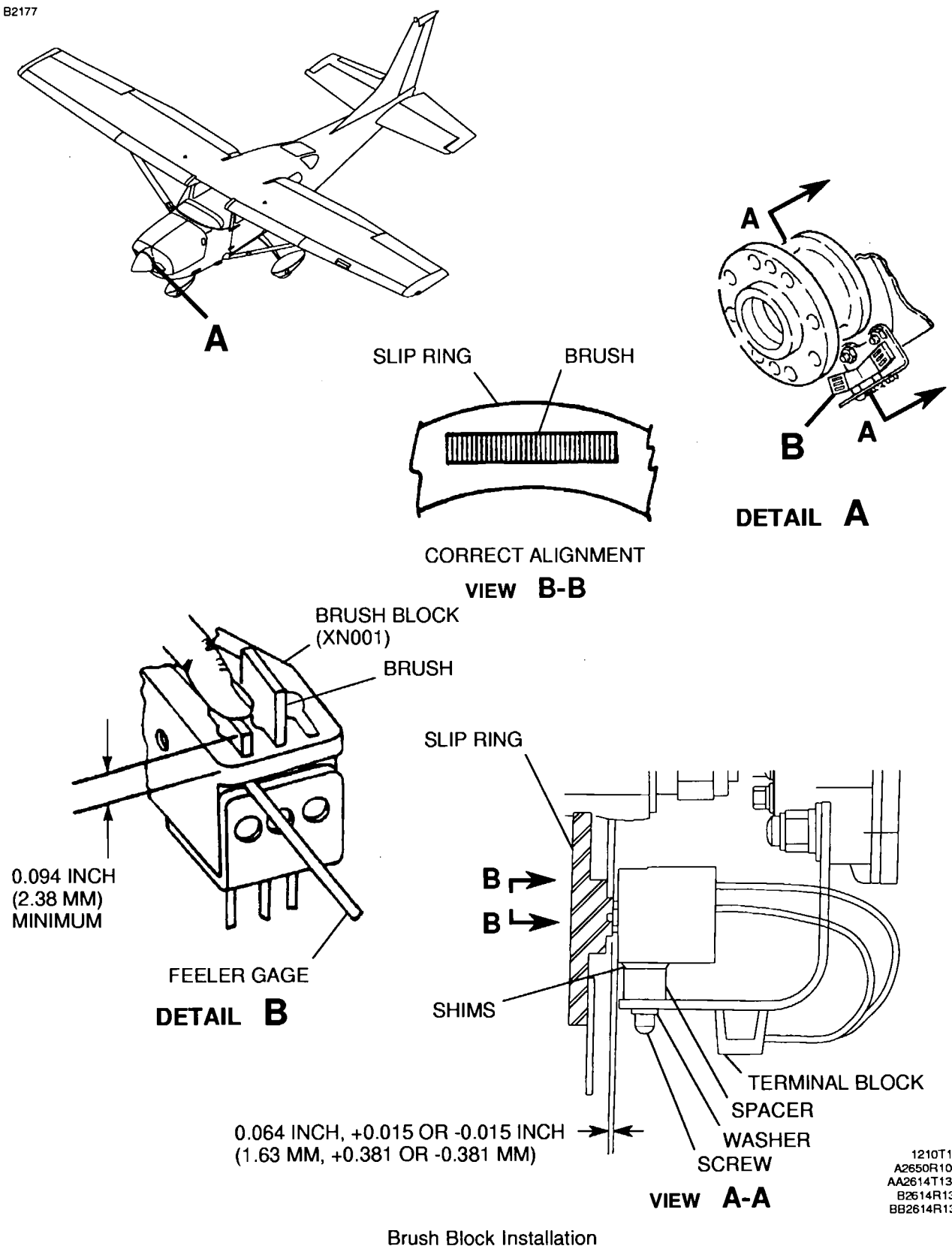
A. For deice boots removal/installation, refer to the List of Manufacturers Technical Publications, Chapter 30 - Ice and Rain Equipment.

5. Brush Length Inspection

A. Complete an Inspection of the Brush Length on the Brush Block (Refer to Figure 201).

WARNING: Make sure all electrical power is removed from the airplane when work is done near the propeller.

   (1) Disengage the Prop Deice circuit breaker.
   (2) Remove the nose cap. Refer to Chapter 71, Cowling - Maintenance Practices.
   (3) Remove the nuts and washers which are installed on the bracket to the engine.
   (4) Put a small diameter feeler gage into the slots on the sides of the brush block (XN001).
   (5) Push down on the brush until it touches the gage at the bottom.
   (6) Measure the distance between the brush block and the top surface of the brush.
      (a) Replace the brush and brush block if the brush measures 0.094 inch or less.
   (7) Install the brush block on the engine with the washers and nuts.



Brush Block Installation
Figure 201 (Sheet 1)

(8) Tighten the nuts to a torque of 28 to 32 inch pounds (3 to 3.5 N-m).
(9) Install the nose cap. Refer to Chapter 71, Cowling - Maintenance Practices.

6. Brush Block Removal/Installation

WARNING: Make sure all electrical power is removed from the airplane when work is done near the propeller.

A. Remove the Brush Block (Refer to Figure 201).
(1) Disengage the Prop Deice circuit breaker.
(2) Remove the nose cap. Refer to Chapter 71, Cowling - Maintenance Practices.
(3) Identify and attach tags to the electrical leads (I) and (G) from the brush block (XN001).
(4) Disconnect the electrical leads (I) and (G).
(5) Remove the screws, washers, nuts, spacers and shims that are attached with the brush block to the bracket and remove the brush block.

B. Install the Brush Block (Refer to Figure 201).
(1) Set the brush block in position and attach it to the bracket with the shims, spacers, washers, screws and nuts
(2) Complete the procedures for the brush block to slip ring alignment. Refer to Brush Block to Slip Ring Alignment.

7. Brush Block to Slip Ring Alignment

A. Align the Brush Block to the Slip Ring (Refer to Figure 201).

WARNING: Make sure all electrical power to the airplanes is removed when you work near the propeller.

(1) Disengage the Prop Deice circuit breaker.
(2) Disconnect the electrical leads (I) and (G) from the brush block (XN001).
(3) Loosen and lift up the screw from the bracket to install or remove shims and align the brushes to the center of the slip ring.
(4) Make sure the brushes on the brush block touch the slip ring. Each brush must touch the slip ring through the full 360 degree turn of the slip ring.
(a) To make sure the brushes touch the slip ring, loosen the screws and adjust the brush block in the slotted holes in the bracket.
(5) Make sure the distance between the face of the brush block and slip ring is 0.064 inch +0.015 or -0.15 inch (1.63 mm +0.381 or - 0.381 mm).
(6) Tighten the screws to a torque of 25 to 30 inch pounds (2.82 to 3.34 N-m).
(7) Connect the electrical leads to the brush block.
(8) Install the nose cap. Refer to Chapter 71, Cowling - Maintenance Practices.
(9) Engage the Prop Deice circuit breaker.

CHAPTER

31

INDICATING/ RECORDING SYSTEMS

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
31-Title		
31-List of Effective Pages	Page 1	Jan 2/2006
31-Record of Temporary Revisions		
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31-00-00	Page 1	Dec 2/2002
31-10-00	Pages 201-202	Dec 2/2002
31-10-10	Pages 201-203	Jan 2/2006
31-20-00	Page 201	Dec 2/2002
31-30-00	Pages 201-202	Dec 2/2002
31-50-00	Pages 201-203	Apr 1/2005

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

INDICATING/RECORDING SYSTEMS - GENERAL

1. Scope

A. This chapter contains information on those systems and components used to indicate and/or record various parameters of the engine, airframe or related flight operations. Also included in this chapter is information on the instrument panels that house the indicating/recording systems.

2. Definition

A. This chapter is divided into sections to aid maintenance personnel in locating information. Consulting the Table of Contents will assist in locating a particular subject. A brief definition of the sections incorporated in this chapter is as follows:
   (1) The section on instrument and control panels provides general removal and installation instructions for the various panels used in the cockpit.
   (2) The section on indicating provides information on the digital clock.
   (3) The section on recording provides information on the hour meter.
   (4) The section on annunciation provides information on the multi-system panel annunciator.

INSTRUMENT AND CONTROL PANELS - MAINTENANCE PRACTICES

1. General

A. This section covers the removal and installation of individual panels comprising the instrument panel

2. Pilot's Center Panel Removal/Installation

A. Remove Pilot's Center panel. (Refer to Figure 201).
   (1) Disconnect negative cable from airplane battery. Refer to Chapter 24, Battery - Maintenance Practices.
   (2) Remove screws securing control column collar.
   (3) Remove screws securing center panel to pilot's outboard and inboard panels.
   (4) Disconnect all electrical leads from instruments and tag for reinstallation.
   (5) Disconnect all lines from instruments. Cap all fittings and plug all lines.
   (6) Remove panel assembly.

B. Install Pilot's Center panel. (Refer to Figure 201).
   (1) Remove caps and plugs and connect lines to instruments.
   (2) Connect all electrical leads and remove tags.
   (3) Position center panel and install screws.
   (4) Install screws securing control column collar.
   (5) Connect battery negative cable. Refer to Chapter 24, Battery - Maintenance Practices.

3. Pilot's Inboard/Outboard Panel Removal/Installation

A. Remove Pilot's Inboard/Outboard Panel. (Refer to Figure 201).
   (1) Disconnect negative cable from airplane battery. Refer to Chapter 24, Battery - Maintenance Practices.
   (2) Remove screws securing control column collar.
   (3) Remove screws securing center panel to the pilot's inboard/outboard panel.
   (4) Disconnect all electrical leads from instruments and tag for reinstallation.
   (5) Disconnect all lines from instruments. Tag, cap and plug all lines.
   (6) Remove panel assembly.

B. Install Pilot's Inboard/Outboard Panel. (Refer to Figure 201).
   (1) Connect all electrical leads to instruments and remove tags.
   (2) Connect all lines to instruments and remove tags.
   (3) Position inboard/outboard panel and install screws.
   (4) Install screws securing control column collar.
   (5) Connect battery negative cable. Refer to Chapter 24, Battery - Maintenance Practices.

4. Copilot's Panel Removal/Installation

A. Remove Copilot's Panel. (Refer to Figure 201).
   (1) Disconnect negative cable from airplane battery. Refer to Chapter 24, Battery - Maintenance Practices.
   (2) Remove screws securing control column collar.
   (3) Remove screws securing panel.
   (4) Disconnect all electrical leads from instruments and tag for reinstallation.
   (5) Remove panel assembly.

B. Install Copilot's Panel. (Refer to Figure 201).
   (1) Connect all electrical leads and remove tags.
   (2) Position copilot's panel and install screws.
   (3) Install screws securing control column collar.
   (4) Connect battery negative cable. Refer to Chapter 24, Battery - Maintenance Practices.

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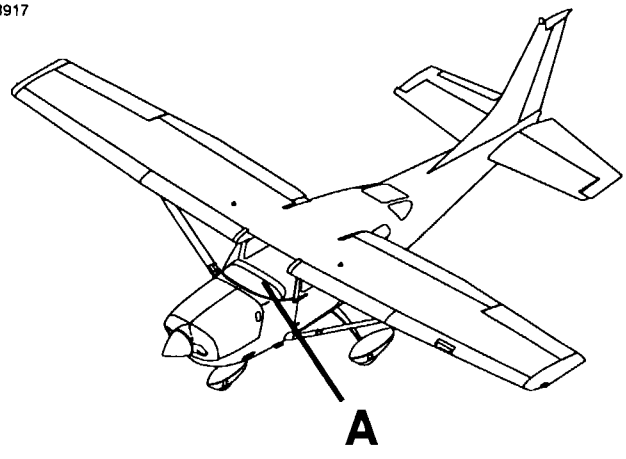

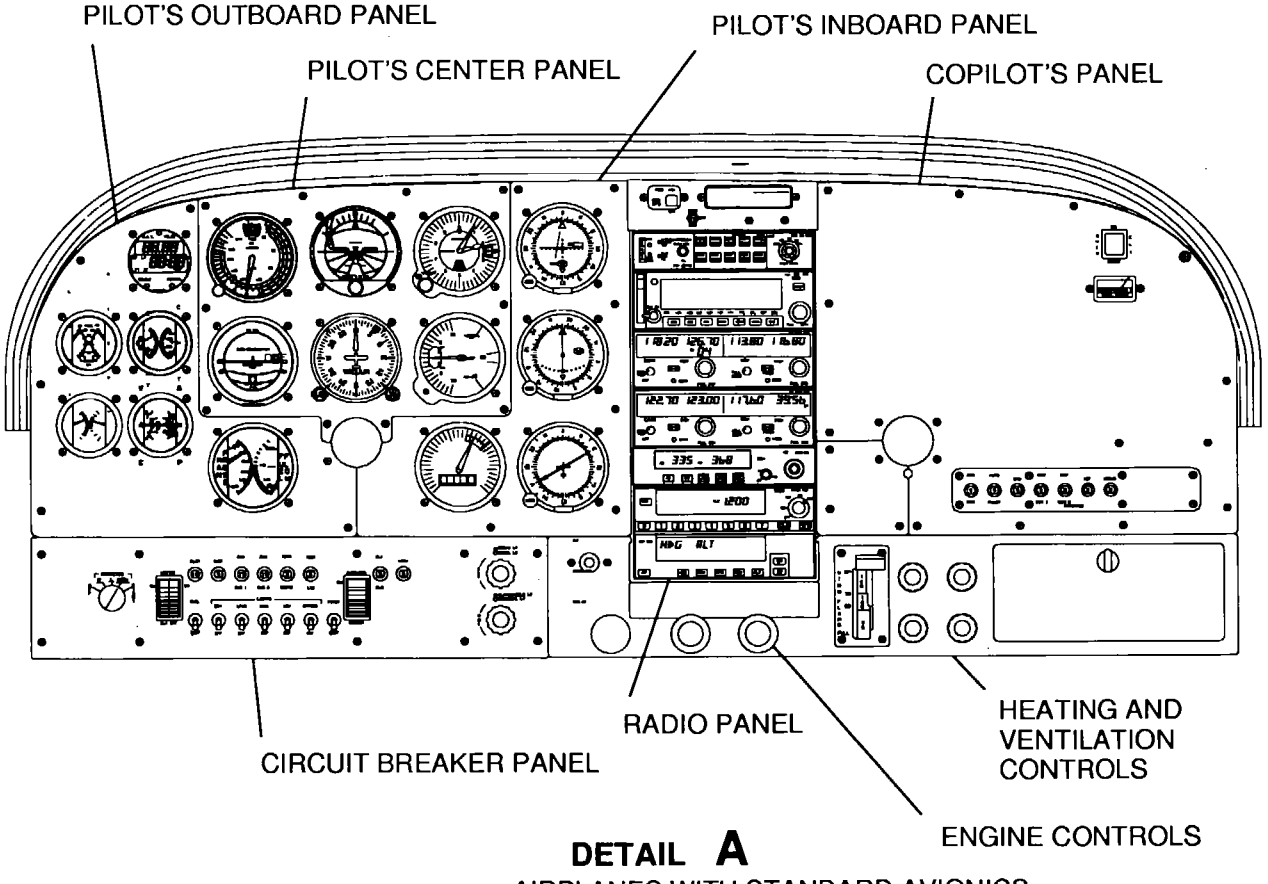

DETAIL A
AIRPLANES WITH STANDARD AVIONICS

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A1218T1001

Instrument Panels
Figure 201 (Sheet 1)

INSTRUMENT AND CONTROL PANELS - MAINTENANCE PRACTICES
Airplanes with Garmin G1000

1. General

A. This section covers the removal and installation for the center panel, switch panel, throttle/flap panel, and instrument panel.

2. Center Panel Removal/Installation

A. Remove the Center Panel (Refer to Figure 201).
(1) Make sure the MASTER ALT/BAT and Avionics switch is in the off position.
(2) Disengage the STDBY IND-LTS circuit breaker.
(3) Remove the screws that attach the center panel to the instrument panel.
(4) Carefully pull out the center panel as necessary to get access behind the panel.
(5) Install tags for identification on the electrical connectors and hoses and disconnect them from the instruments.

B. Install the Center Panel (Refer to Figure 201).
(1) Connect the electrical connectors and hoses to the applicable instruments.
(2) Remove the tags from the electrical connectors and hoses.
(3) Carefully put the center panel in the instrument panel.
(4) Install the screws that attach the center panel.
(5) Engage the STDBY IND LTS circuit breaker.
(6) Put the MASTER ALT/BAT and Avionics switch in the on position.

3. Switch Panel Removal/Installation

A. Remove the Switch Panel (Refer to Figure 201).
(1) Make sure the Master ALT/BAT switch is in the off position.
(2) Remove the screws that attach the switch panel to the instrument panel.
(3) Carefully pull the switch panel out from the instrument panel to get access to the aft side of the panel.
(4) Disconnect the switches from the electrical connections.

B. Install the Switch Panel (Refer to Figure 201).
(1) Connect the electrical connections to the switches.
(2) Put the switch panel in the instrument panel.
(3) Attach the switch panel with the screws.

4. Throttle/Flap Panel

A. Throttle/Flap Panel Removal (Refer to Figure 201).
(1) Disconnect the negative cable from airplane battery. Refer to Chapter 24, Battery - Maintenance Practices.
(2) Make sure the MASTER ALT/BAT and AVIONICS switches are in the off position.
(3) Remove the screws that attach the throttle/flap panel to the instrument panel.
(4) Carefully pull the throttle/flap panel out from the instrument panel to get access behind the panel.
(5) Disconnect the switches from the electrical connections.

B. Throttle/Flap Panel Installation (Refer to Figure 201).
(1) Connect the electrical connections to the switches.
(2) Put the throttle/flap panel in the instrument panel.
(3) Attach the throttle/flap panel with the screws.
(4) Connect the negative battery cable. Refer to Chapter 24, Battery - Maintenance Practices.

5. Instrument Panel Removal/Installation

A. Remove the Instrument Panel (Refer to Figure 201).
(1) Disconnect electrical power to the airplane.
(a) Make sure the AVIONICS switch is in the off position.

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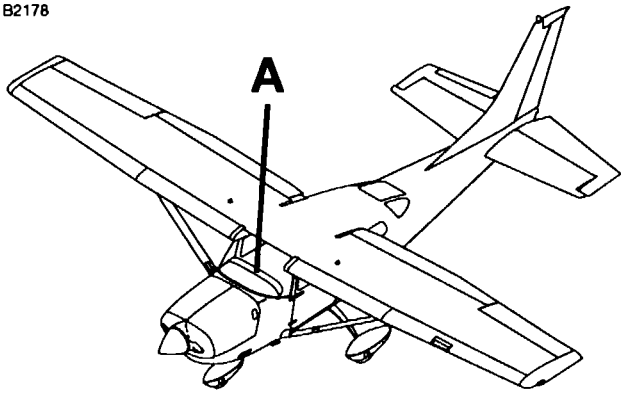

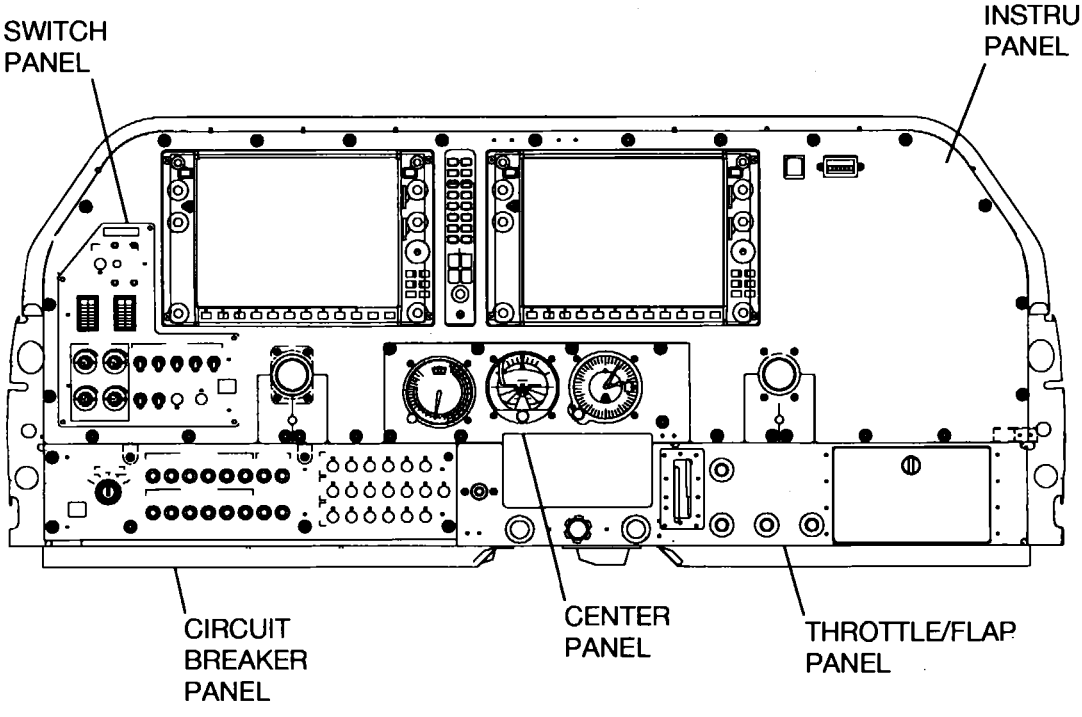

DETAIL A

AIRPLANES WITH GARMIN G1000

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Instrument and Control Panel Installation
Figure 201 (Sheet 1)

(b) Disengage the two PFD circuit breakers, the MFD, STDBY BATT, STDBY IND-LTS AUDIO circuit breakers.

(2) Remove the center panel. Refer to Center Panel - Removal/Installation.
(3) Remove the switch panel. Refer to Switch Panel - Removal/Installation.
(4) Remove the throttle/flap panel. Refer to Throttle/Flap Panel - Removal/Installation.
(5) Remove the Audio Panel.
(6) Remove the screws that attach the control column collars the instrument panel.
(7) Remove the hourmeter to the instrument panel.
  (a) Remove the screws for the hourmeter.
  (b) Pull the hourmeter out and disconnect the connector.
(8) Remove the Control Display Units (CDU).
  (a) Disengage the quick release fasteners.
  (b) Carefully pull the CDU away from the instrument panel and disconnect the electrical connector.
(9) Remove the screws from the instrument panel.

NOTE: The ELT switch can only be removed from the forward side of the instrument panel.

(10) Disconnect and remove the ELT switch from the instrument panel.
(11) Remove the instrument panel.

B. Install the Instrument Panel (Refer to Figure 201).
(1) Set the instrument panel in position.
(2) Install the ELT switch and connect the electrical connector.
(3) Install the instrument panel screws.
  (a) Make sure to put the electrical connector for the hourmeter through the panel hole for the hourmeter installation.
(4) Connect the electrical connector to the hourmeter.
(5) Install the hourmeter.
(6) Attach the collar for the control column to the instrument panel.
(7) Set the throttle/flap panel in position and connect the electrical connections to the switches.
(8) Install the throttle/flap panel to the instrument panel with the screws.
(9) Set the switch panel in position and connect the electrical connections to the switches.
(10) Install the switch panel to the instrument panel with the screws.
(11) Set the center panel in position and connect the electrical connectors and vacuum hoses to the instruments.
(12) Install the center panel to the instrument panel with the screws.
(13) Set the Control Unit Displays (CDU's) in position and connect the electrical connector.
(14) Install the CDU's with the quick release fasteners to the instrument panel.
(15) Engage the two PFD circuit breakers, the MFD, STDBY BATT, STDBY IND-LTS AUDIO circuit breakers.

DIGITAL CLOCK - MAINTENANCE PRACTICES

1. Description and Operation

A. The digital clock is located in upper left side of the instrument panel and incorporates clock, temperature and voltage readings in a single unit. For removal/installation of the OAT/Clock, refer to Chapter 34, Outside Air Temperature Gauge - Maintenance Practices.

HOUR METER - MAINTENANCE PRACTICES

1. Description and Operation

A. The hour (Hobbs) meter is located in the upper right corner of the instrument panel and provides indication of flight hours based on engine operation.

B. The hour meter receives power through the WARN circuit breaker located on the lower instrument panel. The hour meter is grounded through the Oil Pressure Switch, and anytime oil pressure exceeds 20 PSI a ground is sent from the switch to the hour meter, completing a circuit and activating the hour meter.

2. Hour Meter Removal/Installation

A. Remove Hour Meter (Refer to Figure 201).
   (1) Gain access to backside of instrument panel and hold nuts while loosening screws.
   (2) Disconnect electrical connectors leading into hour meter.

B. Install Hour Meter (Refer to Figure 201).
   (1) Connect electrical connectors to hour meter.
   (2) Install hour meter to panel and secure using screws and nuts.

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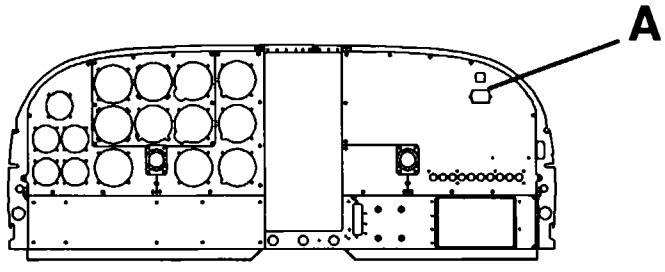

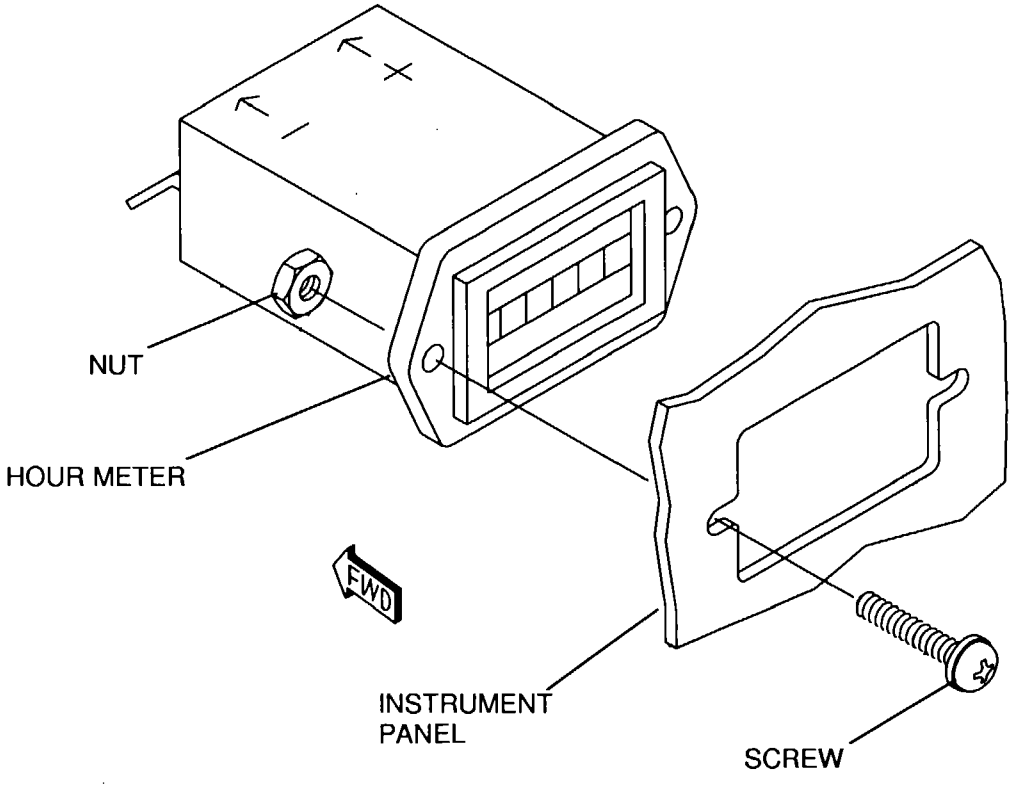

DETAIL A

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Hour Meter Installation
Figure 201 (Sheet 1)

ANNUNCIATOR PANEL - MAINTENANCE PRACTICES

1. Description and Operation

A. The annunciator panel is a multi-system display that gives visual warning and caution information for some systems and fuel levels for the airplane. The annunciator shows this visual information in amber (caution) or red (warning) messages. Refer to Table 201 for a general description of the messages and sources.

B. Table 201 gives a general description of the annunciator system and its inputs. Use this table with the Wiring Diagram Manual to help in system troubleshooting.

Table 201. Annunciator Panel Messages and Inputs

MESSAGE	COLOR	MEANING	SOURCE OF SIGNAL
L LOW FUEL	Amber	Low fuel condition found in the left tank.	Left fuel quantity system.
LOW FUEL R	Amber	Low fuel condition found in the right tank.	Right fuel quantity system.
L LOW FUEL R	Amber	Low fuel condition found in the left and right fuel tanks.	Left and right fuel quantity systems.
L LOW FUEL and left fuel gage needle stay below 0	Amber	Short, open or increasing resistance during a period of time.	Left fuel transmitter or electrical line between the transmitter and fuel gage.
LOW FUEL R and right fuel gage needle stay below 0	Amber	Short, open or increasing resistance during a period of time.	Right fuel transmitter or electrical line between the transmitter and fuel gage.
L LOW FUEL R and both fuel gage needles stay below 0	Amber	Short, open or increasing resistance during a period of time.	Left and right transmitters or electrical lines between the transmitters and fuel gage.
OIL PRESS	Red	Oil pressure less than 20 PSI.	Oil pressure switch that supplies a ground to the annunciator.
L VAC	Amber	Vacuum less than 3.0 In.Hg.	Left vacuum switch (SN012) that supplies a ground to the annunciator.
VAC R	Amber	Vacuum less than 3.0 In.Hg.	Right vacuum switch that supplies a ground to the annunciator.
L VAC R	Amber	Vacuum less than 3.0 In.Hg.	Right vacuum switch and left vacuum switch that supply a ground to the annunciator.

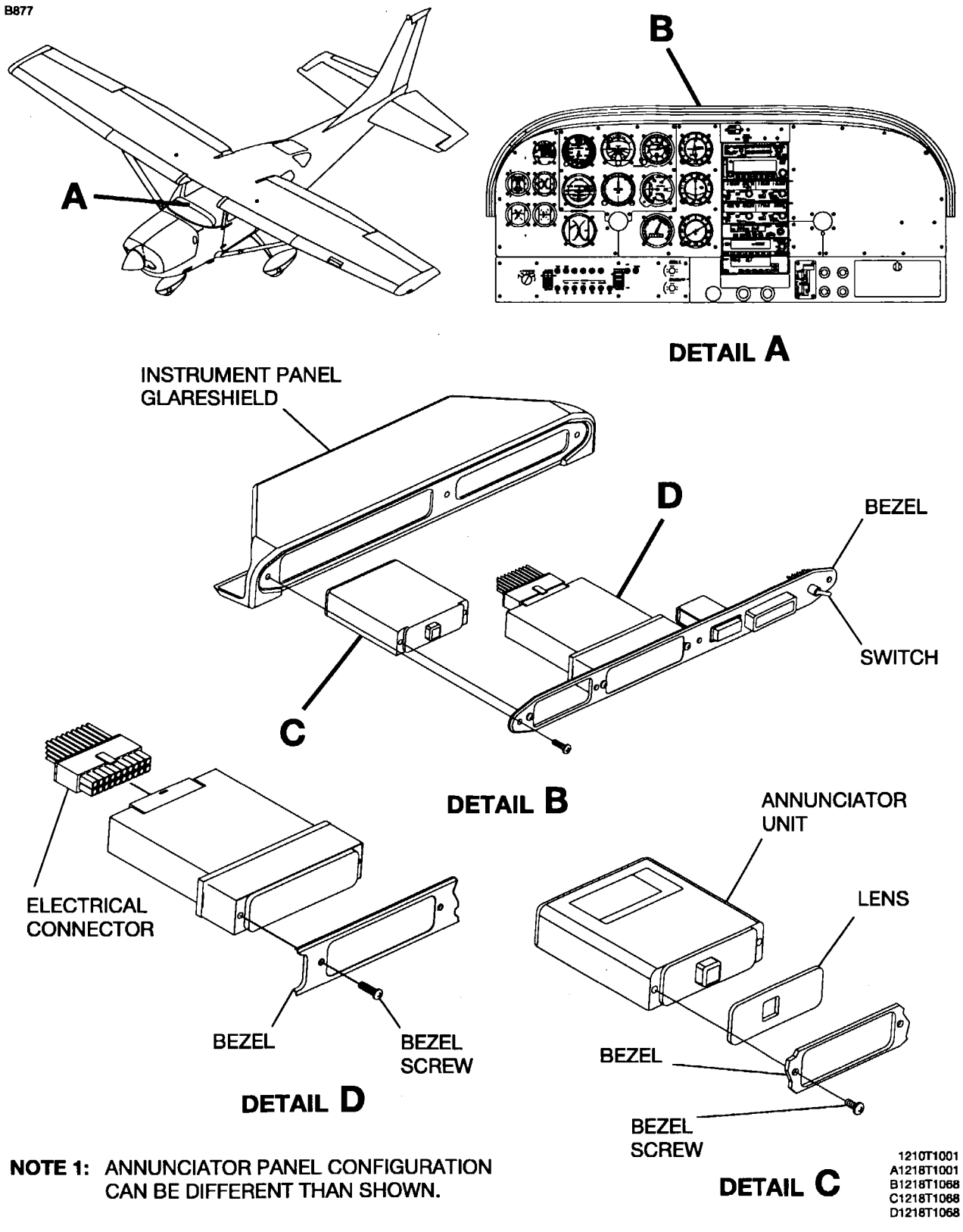
Table 201. Annunciator Panel Messages and Inputs (continued)

MESSAGE	COLOR	MEANING	SOURCE OF SIGNAL
VOLTS	Red	Voltage less than 24.5 VDC, ±0.35 VDC.	Ground from the alternator control unit to the annunciator panel.
PITCH TRIM	Red	Autopilot pitch trim failure.	Autopilot flight computer.
TERR N/A	Amber	Ground proximity warning.	KAC 502 EGPWS module installed in the KMD-540 multi function display.

2. Annunciator Panel Removal/Installation

A. Remove the Annunciator Panel. Refer to Figure 201.
(1) Disconnect the main battery. Refer to Chapter 24, Battery - Maintenance Practices.
(2) Get access to the back side of the annunciator panel.
(3) Disconnect the electrical connectors from the annunciator.
(4) Remove the screws that attach the annunciator panel to the instrument panel.
(5) Carefully remove the annunciator from the airplane.

B. Install Annunciator Panel (Refer to Figure 201).
(1) Connect the electrical connectors to the annunciator panel.
(2) Put the annunciator panel in the glareshield and install the screws.
(3) Connect the main battery. Refer to Chapter 24, Battery - Maintenance Practices.
(4) Do a check of the annunciator panel for correct operation.



NOTE 1: ANNUNCIATOR PANEL CONFIGURATION CAN BE DIFFERENT THAN SHOWN.

Annunciator Panel Installation
Figure 201 (Sheet 1)

CHAPTER

32

LANDING GEAR

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
32-Title		
32-List of Effective Pages		
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RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

LANDING GEAR - GENERAL

1. Scope

A. This chapter contains maintenance information concerning the landing gear and associated components which provide means of supporting, braking, and steering the airplane.

2. Definition

A. This chapter is divided into sections to aid maintenance personnel in locating information. Consulting the Table of Contents will assist in locating a particular subject. A brief definition of the sections incorporated in this chapter is as follows:

(1) The section on main landing gear provides troubleshooting, maintenance practices and adjustment instructions for the main landing gear.
(2) The section on nose landing gear provides troubleshooting, maintenance practices and inspection/checks for the nose landing gear.
(3) The section on wheels and brakes provides troubleshooting, maintenance practices and adjustment/test instructions for the main gear brake system.
(4) The section on main landing gear wheel and axle provides maintenance practices and inspection/checks.
(5) The section on nose landing gear wheel provides maintenance practices and inspection/checks.
(6) The section on the brake system provides troubleshooting, maintenance practices and inspection/checks.

3. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the following items:

NAME	NUMBER	MANUFACTURER	USE
Wrench	Proto Stanley Part No. C418	Watkins Inc. 711 West 2 nd. Wichita, Kansas 67203	To remove cover from brake master cylinder.
Tape	Polyurethane Y8671	Commercially Available	To cover main gear strut at upper end where strut fairing could cause chafing.
Shims	1241660-1, 1241660-3, .125 inch 1241660-2, 1241660-4, .250 inch	Cessna Aircraft Company Cessna Parts Distribution Department 701, CPD 2 5800 East Pawnee Road Wichita, Kansas 67218-5590	To center heavy duty fairing on wheel when wheel alignment shims are installed.
Rivet Setting Kit	199-1	Cessna Aircraft Company	To rivet brake linings to back plate.
Wheel Balancing Equipment		Comercially Available	To balance landing gear wheels.

MAIN LANDING GEAR - TROUBLESHOOTING

1. Troubleshooting

A. A troubleshooting chart has been developed to aid the maintenance technicians in system understanding. Refer to Figure 101.

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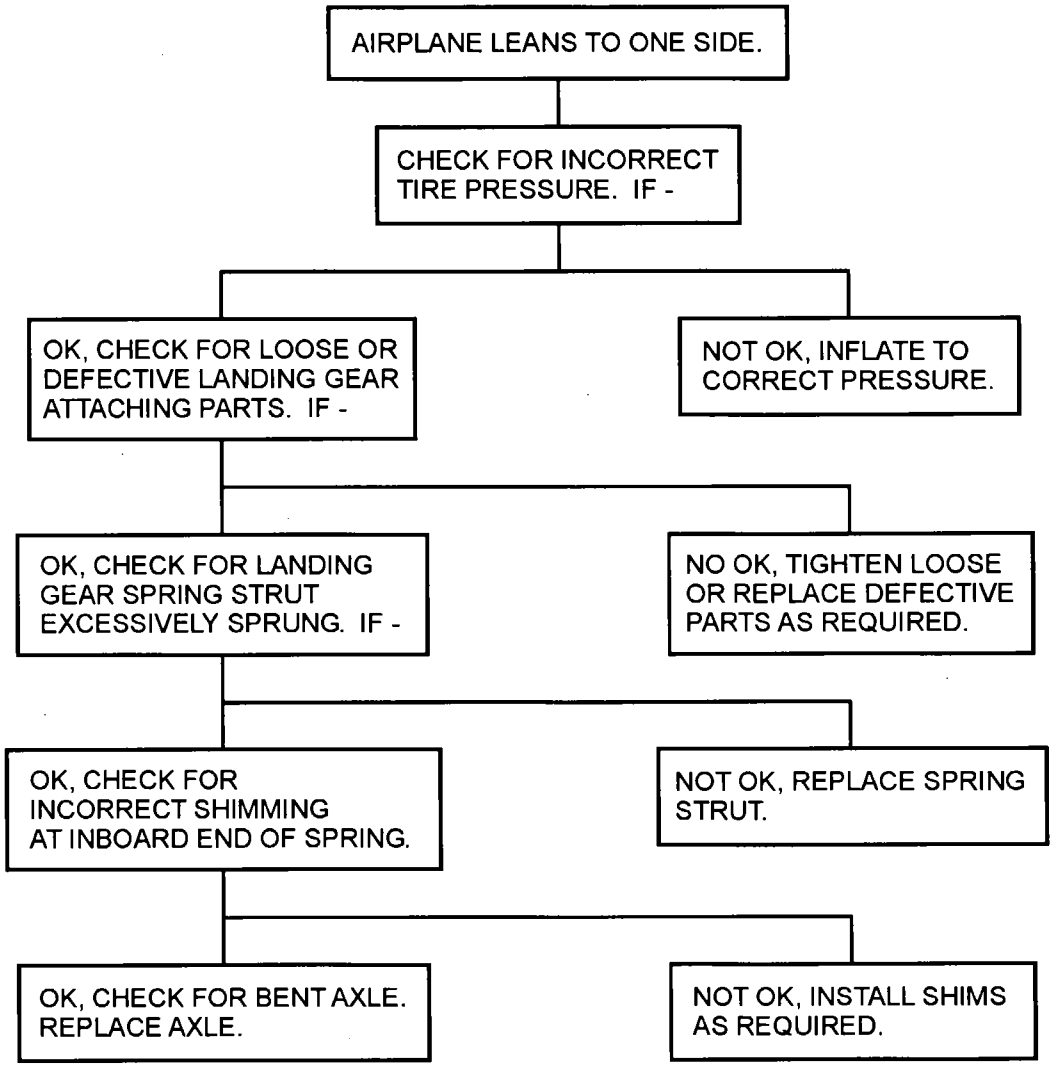

Main Landing Gear Troubleshooting Chart
Figure 101 (Sheet 1)

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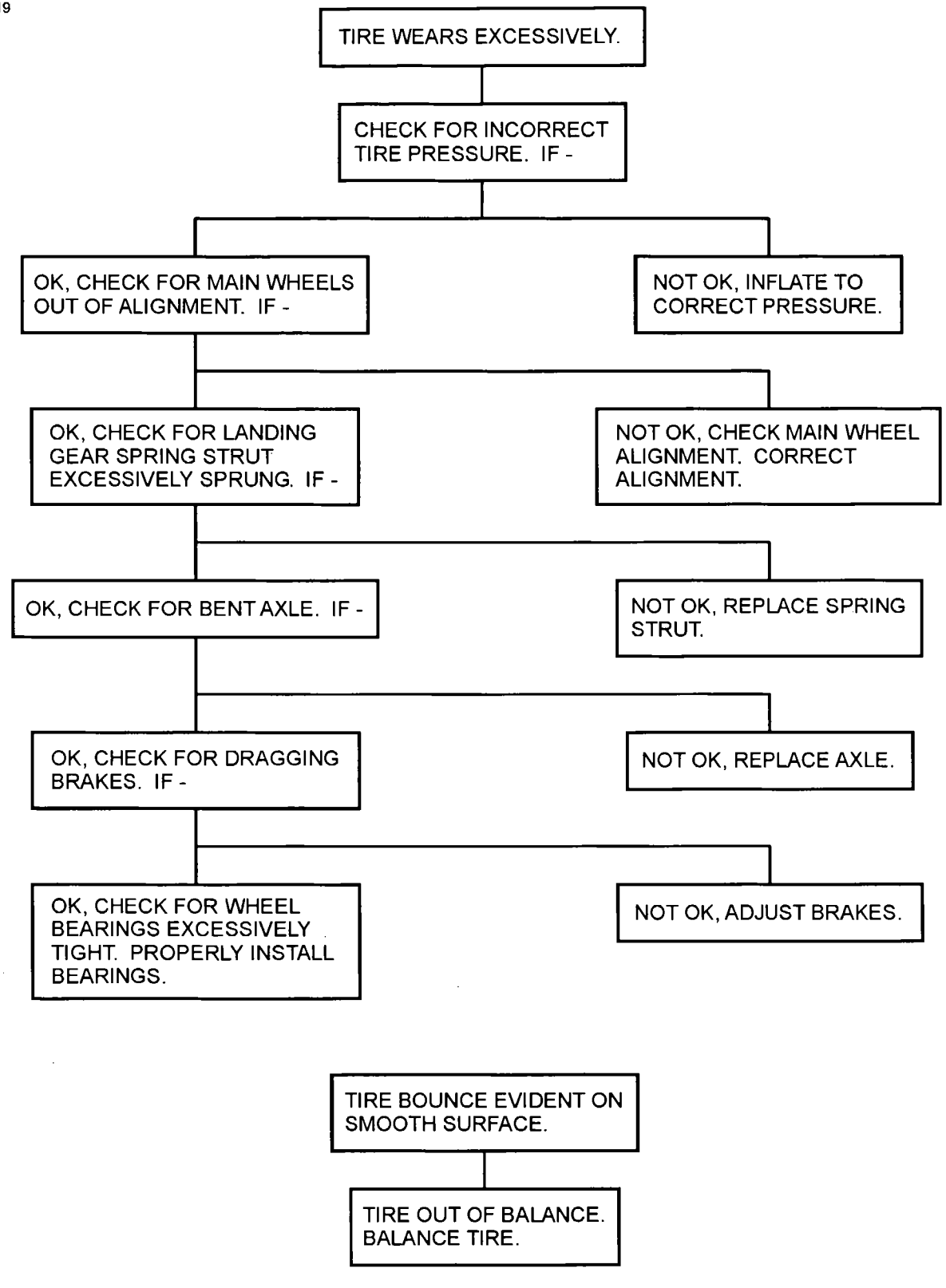


Main Landing Gear Troubleshooting Chart
Figure 101 (Sheet 2)

MAIN LANDING GEAR - MAINTENANCE PRACTICES

1. General

A. The main landing gear maintenance practices give removal/installation instructions for the left main landing gear. The removal/installation for the right main landing gear is typical unless differently specified.

B. Standard or heavy-duty size main wheel speed fairings can be installed. The fairings are installed over the wheels and attach to mount plates that attach to the axle mounting flange. The wheel fairings are installed with adjustable scrapers that are installed in the lower aft part of the fairing, behind the wheels. A brake fairing is installed over the lower strut and is attached to the speed fairing.

C. The flat spring main landing gear struts attach to the airplane at the inboard and outboard forgings. The forgings are located at the center of the fuselage. A hydraulic brake line is routed down the aft side of each spring strut and is enclosed by a fairing.

2. Main Landing Gear Speed Fairing Removal/Installation

A. Remove the Main Landing Gear Speed Fairing (Refer to Figure 201).
(1) Remove the screws that attach the brake fairing to the main wheel speed fairing.
(2) Remove the screws that attach the speed fairing to the mounting plate.
(3) If the heavy-duty main wheel speed fairings are installed, record the part number, position, and location of shims between the fairing and mounting plate.

NOTE: Shims are necessary to set the fairing on the wheel to center when wheel alignment shims are installed.

(4) Remove the bolt that connects the outboard side of the main-wheel speed-fairing to the axle nut.
(5) Loosen the scraper if necessary, and remove the main-wheel speed-fairing from the wheel.

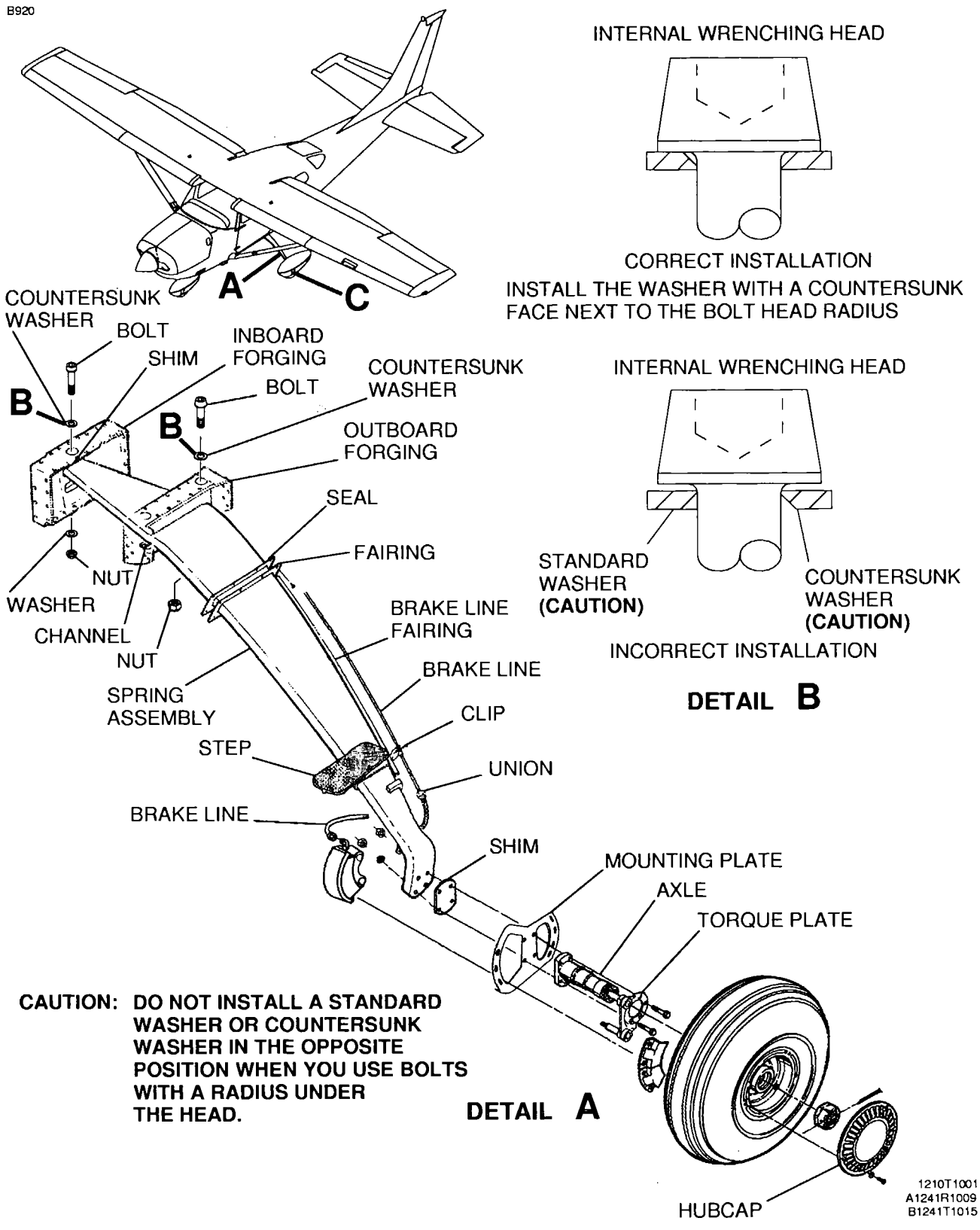
B. Install the Main Landing Gear Speed Fairing (Refer to Figure 201).
(1) Set the speed fairing in position over the wheel.
(2) Install the bolt through the outboard side of the speed fairing to the axle nut.
(a) If you have the heavy-duty main wheel speed fairing to install, install the shims in the same position as they were when removed.
(3) Install the screws that attach the speed fairing to the mounting plate which is bolted to the axle.
(4) Install the screws that attach the brake fairing to the speed fairing.

CAUTION: You must do a check of the clearance every time the scraper has been moved, the tire changed and when you install the speed fairings. Damage can occur if the correct clearance is not set between the tire and scraper. If any mud, snow or ice collects on the scraper, it will prevent the tire from correct rotation. You must clean the scraper for correct tire rotation.

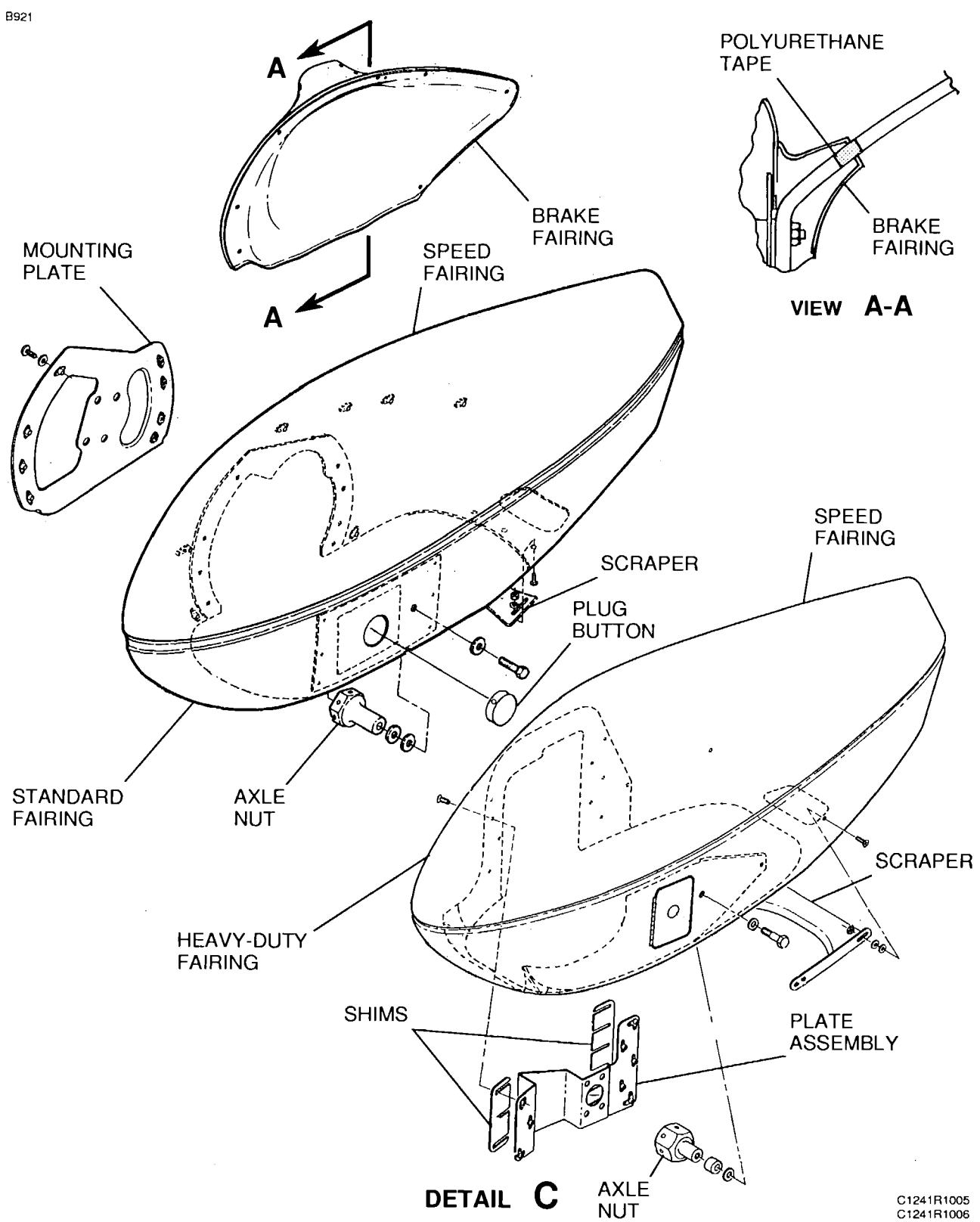
(5) Do a check of the clearance between the tire and scraper.
(a) Clean off any dirt or ice that has collected on the scraper.
(b) Adjust the clearance as necessary to have a minimum of 0.55 inch (13.97 mm) to a maximum of 0.80 inch (20.32 mm).
(6) Clean off any fuel and oil from the speed fairings to prevent stains and deterioration.

CAUTION: Set the tire pressure to the correct pressure. Damage can occur to the fairings if the tire pressure is not correct.

(7) Do a check of the tire pressure and adjust as necessary. Refer to Chapter 12, Tires - Servicing.



Main Landing Gear Installation
Figure 201 (Sheet 1)



Main Landing Gear Installation
Figure 201 (Sheet 2)

3. Main Landing Gear Brake Fairing Removal/Installation

A. Remove the Main Landing Gear Brake Fairing (Refer to Figure 201).
   (1) Remove the screws from the perimeter of the brake fairing.
   (2) Remove the screws from the nutplates that hold the fairing together.
   (3) Remove the brake fairing from the landing gear.

B. Install the Main Landing Gear Brake Fairing (Refer to Figure 201).
   (1) Set the brake fairing over the landing gear.
   (2) Install screws in the nutplates that hold the fairing together.
   (3) Install screws around the perimeter of the brake fairing.

4. Main Landing Gear Removal/Installation

A. Remove the Main Landing Gear (Refer to Figure 201).

NOTE: This procedure is for the removal of the landing gear as a complete assembly.

   (1) Remove the pilot and copilot seats. Refer to Chapter 25, Front Seats - Maintenance Practices.
   (2) Remove access plate 230JB or 230KB. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
   (3) Jack the airplane. Refer to Chapter 7, Jacking - Maintenance Practices.
   (4) Remove the screws that connect the fuselage fairing to the fuselage.
   (5) Remove the brake bleeder screw and drain the hydraulic fluid from the brake line on the strut.
   (6) Disconnect the hydraulic brake line at the fitting where the brake line comes out of the fuselage skin.
      (a) Put a cover on or put a plug in the disconnected fittings to prevent contamination.
   (7) Remove the bolt, countersunk washer, flat washer, and nut that connects the spring strut and to the inboard forging.
   (8) Remove any shims and record the position and location of shims, if removed.
   (9) Remove the bolts, washers, and nuts that attach the spring strut and channel to the outboard forging.

CAUTION: Make sure that you are careful when the channel is removed so that damage does not occur to it.

   (10) Remove the spring strut from the fuselage forgings.
      (a) Record the shims put below the inboard end of the spring.
      (b) Identify the shims to be sure they are replaced correctly after the installation of the landing gear.

B. Install The Main Landing Gear (Refer to Figure 201).
   (1) Install the channel in outboard forging.

NOTE: The convex surface of the channel is installed against the lower side of the strut. The concave side of the channel is to be installed pointed down, so that it touches the lower edge of the slot in the forging.

   (2) Install the seal and external fairing plate over the upper end of the landing gear spring.
   (3) Install the spring into place and put the shims in position at the inboard end of the spring.
      (a) Install the bolt and countersunk washer in the top of the inboard end of the spring at the inboard forging. Make sure that the bolt with the countersunk washer is correctly installed.
      (b) Install the washer and nut on the bottom of the inboard forging.

NOTE: Aluminum shims are installed at the inboard end of the spring, as necessary, to make the wings level within a total tolerance of 3.00 inches. The maximum number of shims permitted is two. Do not use steel washers for shims.

(c) Torque the inboard bolt to 160 to 190 inch-pounds.
(4) Install the bolts with the countersunk washers in the top of the outboard forging and channel. Make sure that the bolt with the countersunk washer is correctly installed.
(5) Install the nuts on the bottom of the outboard forging.
(6) Torque the outboard bolts to 660 to 750 inch-pounds.
(a) Make sure that when the outboard bolts are torqued, no less than 80% of the channel touches the lower side of the strut.
(7) Install the access plate 230JB or 230KB. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(8) Remove the caps and connect the hydraulic brake line to the fitting.
(a) Install the bleeder screw.
1 Fill and bleed the brake system. Refer to Brake System - Maintenance Practices.
(9) Install the fuselage fairing with the screws to the fuselage.
(10) Remove the airplane from jacks. Refer to Chapter 7, Jacking - Maintenance Practices.
(11) Install the pilot and copilot seats. Refer to Chapter 25, Front Seats - Maintenance Practices.
(12) Complete a check of the wheel alignment. Refer to Main Wheel Alignment.

5. Brake Line Fairing Removal/Installation

A. Remove the Brake Line Fairing (Refer to Figure 201).
(1) Remove the brake fairing. Refer to Remove Main Landing Gear Brake Fairing.
(2) Disconnect the brake line at the brake assembly.
(a) Put a cap on or a plug in the line and fitting to prevent contamination.
(3) Remove the brake line out of the clip and move the line away from the strut.
(4) Remove the brake line fairing from the airplane.
(5) Remove all of the original adhesive, as well as any rust, paint or scale, with a wire brush and sandpaper.
(6) Sand the inner surface of the brake fairing.
(a) Move the sandpaper marks lengthwise to leave primer on the strut.

CAUTION: Solvent must not be used on vinyl fairing.

(7) Thoroughly clean the bonding surfaces.
(a) Remove all of the solvent with a clean, dry cloth if a solvent is used.

NOTE: It is important for the surfaces to be dry and clean.

(8) Let the surfaces be slightly roughed or abraded, and prevent deep scratches or nicks.

B. Install the Brake Line Fairing (Refer to Figure 201).
(1) Mix adhesive EA-9309.3NA. Refer to the manufacturer's directions.
(2) Apply a thin coat of adhesive to each of the bonding surfaces.
(3) Press the brake line into the groove of the fairing.
(a) Raise the fairing to attach it to the aft side of the strut.
(b) Fit the brake line into the clip.
(4) Immediately Wind masking tape around the fairing and strut in five equally spaced places.
(a) Remove too much adhesive with solvent.
(5) Let the adhesive to fully cure, refer to the manufacturer's directions, before flexing the gear.
(6) After the recommended curing time, remove the tape and connect the brake line.
(7) Prime the strut.
(8) Paint the strut to the original color if necessary.
(9) Fill and bleed the brake system. Refer to Brake System - Maintenance Practices.
(10) Install the brake fairing. Refer to Install Main Landing Gear Brake Fairing.

6. Main Wheel Alignment Check

A. Align the Main Wheel (Refer to Figure 202, Table 201 and Table 202).

NOTE: You can get main wheel alignment through the use of tapered shims between the flange of the axle and axle mounting fitting.

(1) Set the toe-in and camber within the tolerances listed in Table 201, Camber Adjustment, while the cabin and fuel cells are empty to get approximately zero toe-in and zero camber at gross weight.

NOTE: The setting is zero toe-in and zero camber at normal operating weight.

Table 201. Camber Adjustment

SHIM PART NUMBER	POSITION OF THICKEST CORNER OR EDGE OF SHIM	TOE-IN	TOE-OUT	POSITIVE CAMBER	NEGATIVE CAMBER
0541157-1	Aft	0.063 Inch	---	0°4'	---
	Forward	---	0.063 Inch	---	0°4'
0541157-2	Up	---	0.008 Inch	0°28'	---
	Down	0.008 Inch	---	---	0°28'
1241061-1	Up and Forward	---	0.006 Inch	2°44'	---
	Up and Aft	0.028 Inch	---	2°46'	---
	Down and Forward	---	0.028 Inch	---	2°46'
	Down and Aft	0.006 Inch	---	---	2°44'
0441139-5	Up and Forward	---	0.125 Inch	0°10'	---
	Up and Aft	0.117 Inch	---	0°25'	---
	Down and Forward	---	0.117 Inch	---	0°25'
	Down and Aft	0.125 Inch	---	---	0°10'
0441139-6	Up and Forward	---	0.253 Inch	0°21'	---
	Up and Aft	0.235 Inch	---	0°51'	---
	Down and Forward	---	0.235 Inch	---	0°51'
	Down and Aft	0.253 Inch	---	---	0°21'
0541157-3	Aft	0.12 Inch	---	---	0°7'
	Forward	---	0.12 Inch	0°7'	---

Table 202. Shim Chart

SHIM PART NUMBER	CORRESPONDING AND TOTAL ALLOWABLE SHIM					
	1241061-1	0441139-6	0441139-5	0541157-2	0541157-1	0541157-3
1241061-1	0	0	0	0	0	0
0441139-6	0	0	0	1	1	0
0441139-5	0	0	1	1	2	0
0541157-2	0	1	1	2	2	0
0541157-1	0	1	1	2	2	0
0541157-3	0	0	1	2	1	0

(a) If the airplane is normally operated at less than gross weight and abnormal tire wear occurs, align the wheels to get the setting for the load conditions under which the airplane normally operates.

NOTE: Always use the least number of shims possible to get the desired result.

(2) Make sure that the floor is level in the work area.
(3) Hang a plumb bob from the tie down ring and from the forward inspection cover plate. The plumb bob must be attached to the forward screw of the inspection plate.

NOTE: The cover plate is located aft of the nose gear on the bottom of the fuselage.

7. Main Landing Gear Step Removal/Installation

A. Remove The Main Landing Gear Step (Refer to Figure 201).
(1) Tap the main landing gear step out of position to remove it. Use a non-metallic tool.

CAUTION: Do not finish sand the parts. A slightly roughened surface is necessary to achieve a good bond.

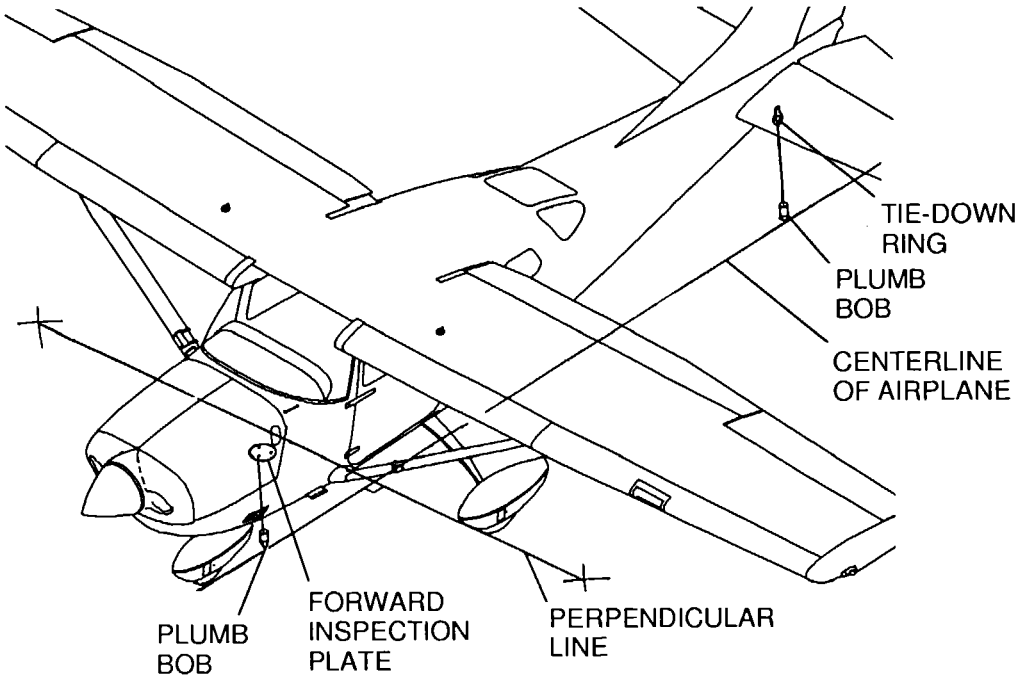
(2) Use 180 grit aluminum oxide sandpaper or cloth to remove all the corrosion and old adhesive from the step.
(3) Use 180 grit aluminum oxide sandpaper or cloth to remove the old adhesive and any corrosion from the area on the main landing gear spring that the step will be bonded to.
(4) Remove all the deep nicks or scratches.

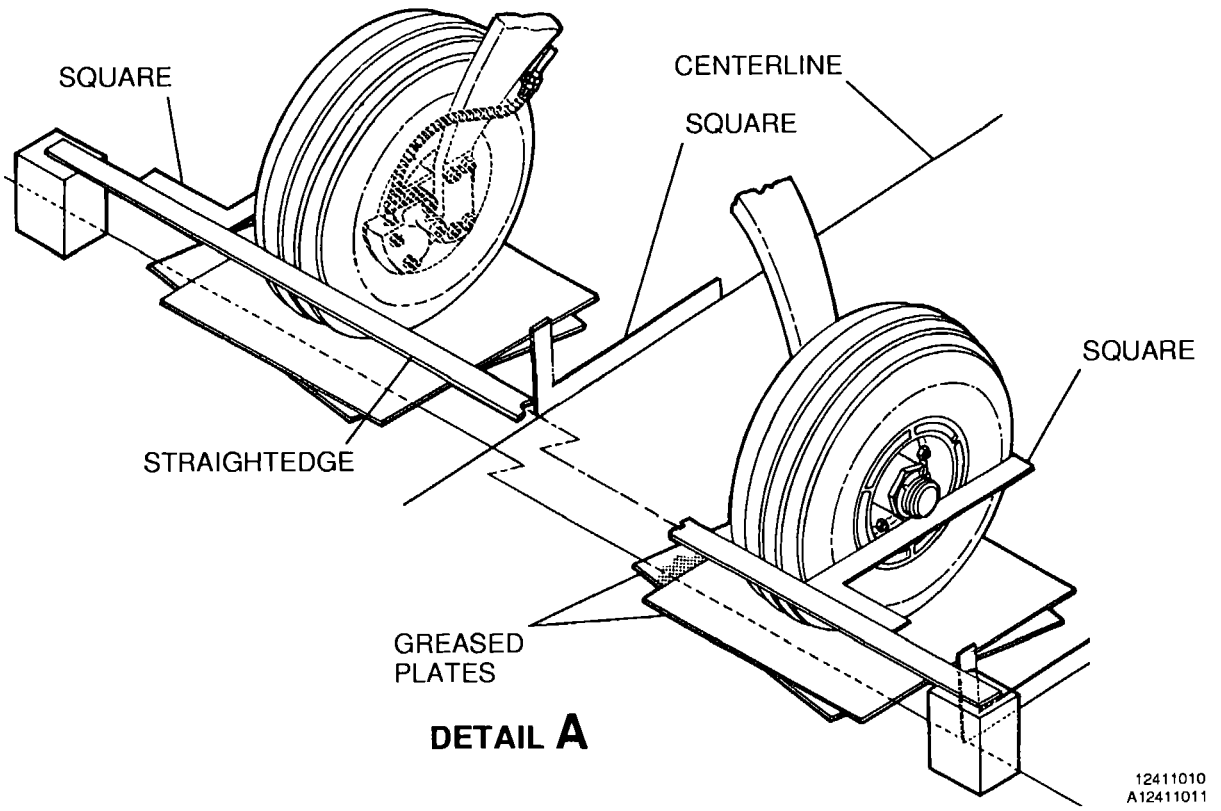
B. Install The Main Landing Gear Step (Refer to Figure 201).
(1) Make sure that you prime the landing gear step and spring separately for increased corrosion protection.
(2) Apply primer to the main landing gear step. Refer to Chapter 20, Interior and Exterior Finish - Cleaning/Painting.
(3) Apply primer to the main landing gear spring. Refer to Chapter 20, Interior and Exterior Finish - Cleaning/Painting.
(4) Bond the primed step to the primed landing gear spring with EA9309 adhesive.
(5) Tap the step firmly into the attach point to make a tight fit.
(6) Do not place any weight on the step until the sealant has cured.
(7) Apply a small fillet of adhesive at all edges of the attach point.

8. Main Landing Brake Clip Removal/Installation

A. Remove The Main Landing Gear Brake Clip (Refer to Figure 201).
(1) Tap the brake clip out of position with a non-metallic tool.

B922

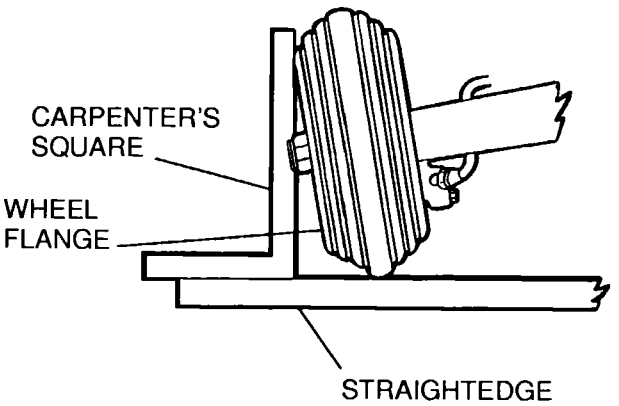




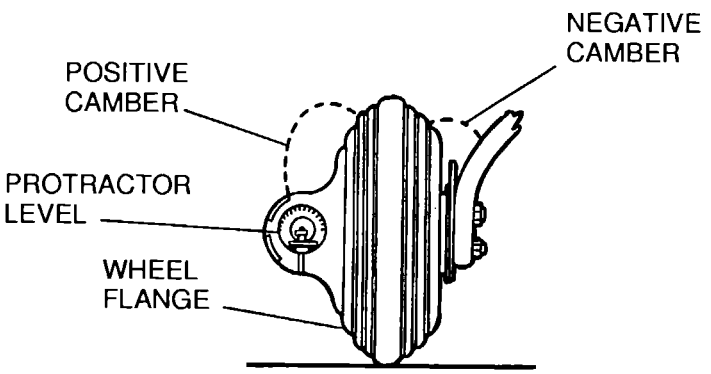
Main Wheel Alignment Check
Figure 202 (Sheet 1)

B923

TOP VIEW OF TOE-IN CHECK



FRONT VIEW OF CAMBER CHECK



12411012
12411013

Main Wheel Alignment Check
Figure 202 (Sheet 2)

CAUTION: Do not finish sand the parts. A slightly roughened surface is necessary to achieve a good bond.

(2) Remove all corrosion and old adhesive by hand sanding. Use 180 grip aluminum oxide cloth or paper.
(3) Remove all deep nicks or scratches.

B. Install The Main Landing Gear Brake Clip (Refer to Figure 201).
(1) Apply EA9309.3NA adhesive or equivalent epoxy adhesive to the brake clip.
(2) Install the brake clip to the mount. Attach it firmly with a clamp until the sealant has cured.
(3) Apply a small fillet of adhesive at all edges of the brake clip at the mount area.

9. Main Landing Gear Corrosion Inspection

A. Inspect the main landing gear spring assembly for corrosion (Refer to Figure 201).

NOTE: The bottom surface of the gear leg has a 0.012 Inch compressive distance to prevent stress risers and to extend the spring fatigue life.

(1) Inspect the main landing gear spring assembly for corrosion and damage.
(a) Find the corrosion damage. Refer to Chapter 51, Corrosion - Description and Operation.
1 Remove the step. Refer to Main Landing Gear Removal/Installation.
2 Make sure that the corrosion and damage does not extend more than the shot peened compressive layer unless the landing gear strut is correctly shot peened to an Almen intensity of 0.012A to 0.016A with 330 steel shot.
(2) Remove the corrosion. Refer to the Single Engine Models 172, 182, T182, 206 and T206 1996 and On Structural Repair Manual, Chapter 51, Corrosion and Corrosion Control - Description and Operation.

CAUTION: Do not use chemical strippers as they are not approved for use on high strength steels due to hydrogen embrittlement.

CAUTION: Do not use a power sander as it is not approved on high strength steels because of the possibility of heat.

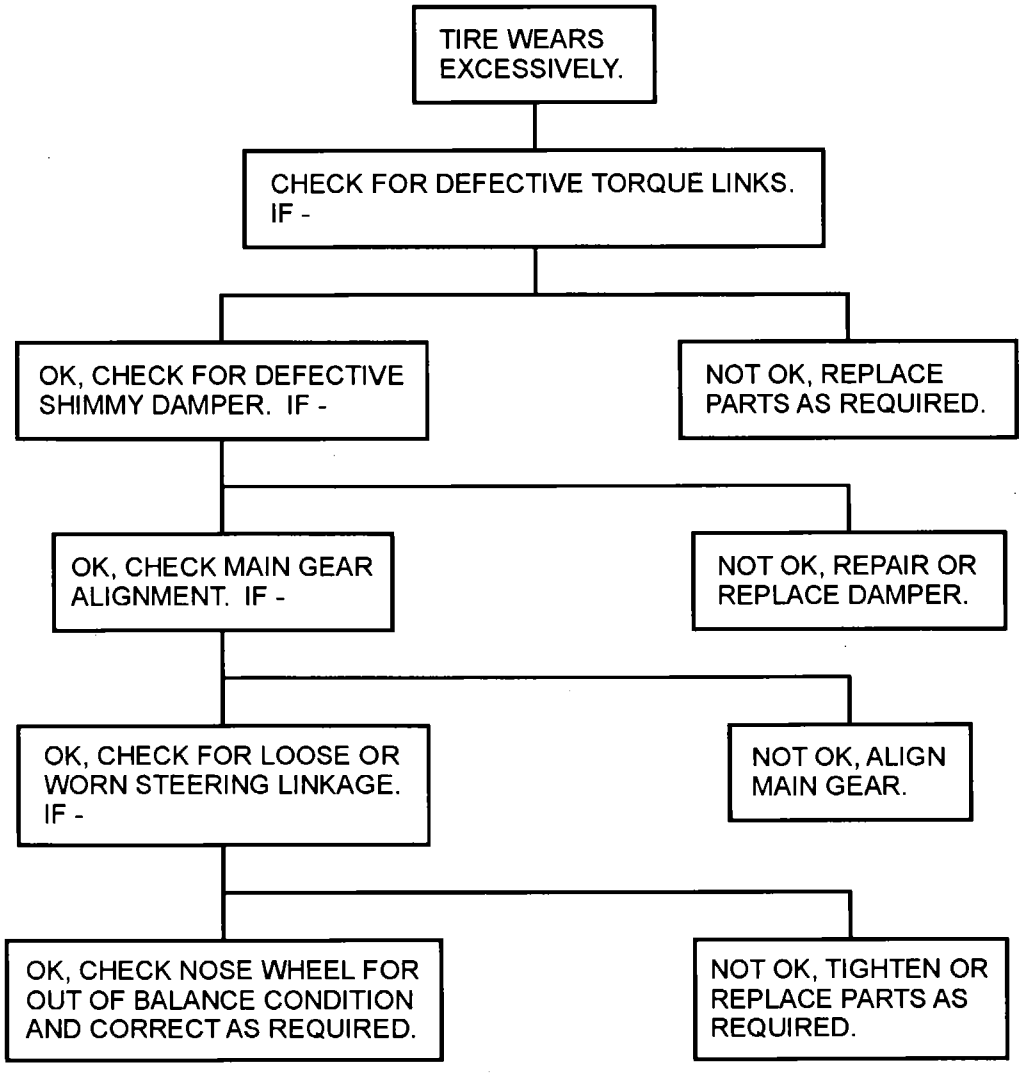
(a) Use a 180 grit or finer aluminum oxide sandpaper or cloth to sand the main landing gear fairing.
(b) Use a 400 grit aluminum oxide sandpaper or cloth to sand the finish on the main landing gear fairing.
(c) Use a dry abrasive blast to remove the corrosion in the pitted areas.
(3) Use a solvent to clean the main landing gear fairing. Refer to Chapter 20, General Solvents/ Cleaners - Maintenance Practices.
(4) Install the step. Refer to Main Landing Gear Removal/Installation.
(5) Apply a primer and paint the main landing gear fairing as soon as possible to prevent oxidation. Refer to Chapter 20, Interior and Exterior Finish - Cleaning/Painting.
(a) Apply Matterhorn white 830 series Acry Glo polyurethane topcoat.

NOSE LANDING GEAR - TROUBLESHOOTING

1. General

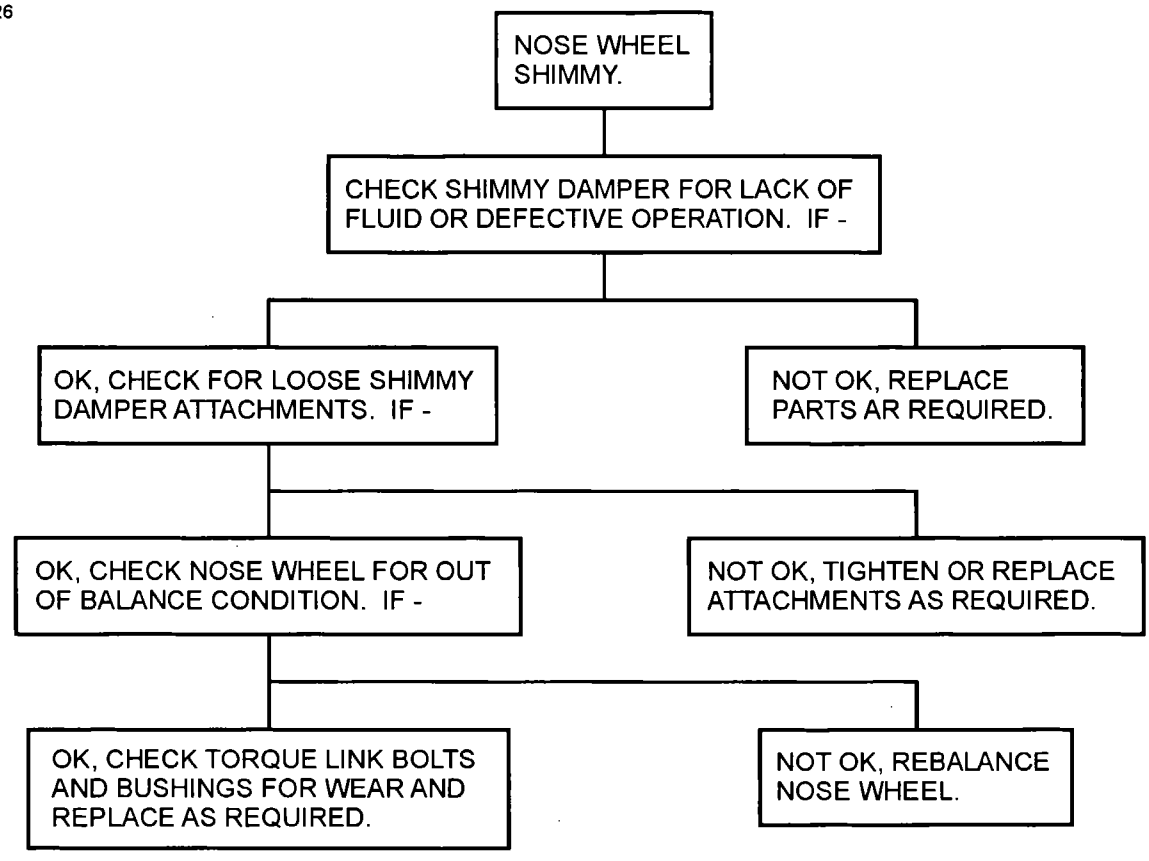
A. A troubleshooting chart has been provided to aid maintanance technician in system troublrshooting. Refer to Figure 101.

B925



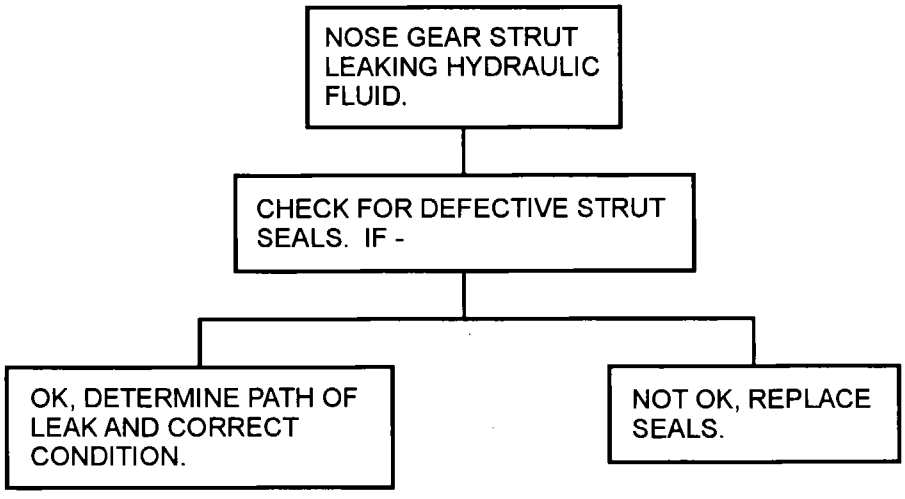
Nose Landing Gear Troubleshooting Chart
Figure 101 (Sheet 1)

B926



Nose Landing Gear Troubleshooting Chart
Figure 101 (Sheet 2)

B927



Nose Landing Gear Troubleshooting Chart
Figure 101 (Sheet 3)

NOSE LANDING GEAR - MAINTENANCE PRACTICES

1. General

A. The nose landing gear is mounted in a fork that is attached to an air/oil (oleo) shock strut. The rudder pedals control the nose wheel. The nose wheel steering system links the rudder pedals to the nose wheel steering arm, affording steering control through the use of the rudder pedals and brakes. When the airplane is moved by hand, never turn the nose wheel more than 35 degrees from each side of the center. A nose wheel speed fairing can be installed.

B. Torque links keep the lower strut aligned with the nose gear steering system and permit shock strut action.

C. Shimmy Damper (for airplanes that do not have the Lord Shimmy Damper) - A hydraulic fluid-filled shimmy dampener is supplied to keep nose wheel shimmy to a minimum. The shimmy damper forces hydraulic fluid through small orifices in a piston to offer resistance to shimmy. The damper piston shaft is attached to the nose gear steering shaft, and the housing is attached to a bracket on the lower trunnion.

D. Shimmy Damper (for airplanes with the Lord Shimmy Damper) - The shimmy damper uses rubber with a lubricant to absorb nosewheel vibration. The damper piston shaft is attached to the nose gear steering shaft, and the housing is attached to a bracket on the lower trunnion.

2. Nosewheel Speed Fairing Removal/Installation

A. Remove the Nose Wheel Speed Fairing (Refer to Figure 201).
(1) Deflate the nose gear strut completely.
(2) Weight or tie down tail of airplane to raise nose wheel from floor.
(3) Remove the nose wheel axle stud.

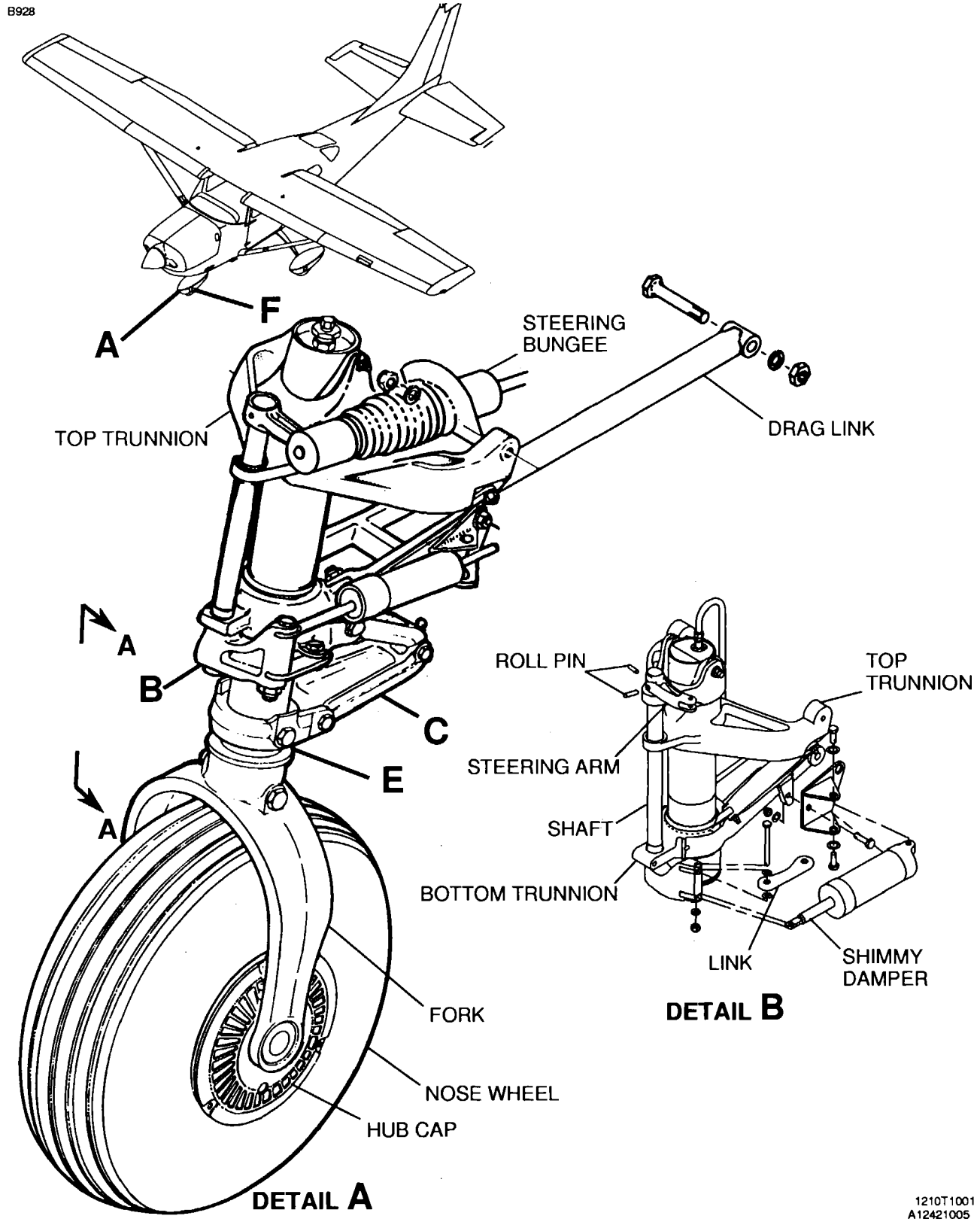
WARNING: Ensure strut is deflated completely before removing bolt that attaches speed fairing to strut or disconnecting torque link.

(4) Disconnect the lower torque link from the lower strut. Let the strut extend.
(5) Remove the bolt that attach the speed fairing, cover plate and tow bar spacers to the strut.
(6) Slide the speed fairing up and remove the nose wheel. Loosen the scraper as necessary.
(7) Turn the speed fairing 90 degrees to the center line of the airplane and move the fairing down over the fork to remove.

B. Install the Nose Wheel Speed Fairing (Refer to Figure 201).
(1) With speed fairing 90 degrees to center line of airplane, work fairing up over nose gear fork.
(2) Slide fairing up and install nose wheel in fork. Install ferrules.
(3) Install bolt, tow bar spacers, washers and nut attaching fairing and cover plate to strut.
(4) Connect lower torque link to lower strut.
(5) Install nose wheel axle stud.
(6) Tighten axle stud until a slight bearing drag is obvious when wheel is turned. Back off nut to the nearest castellation and install cotter pin.

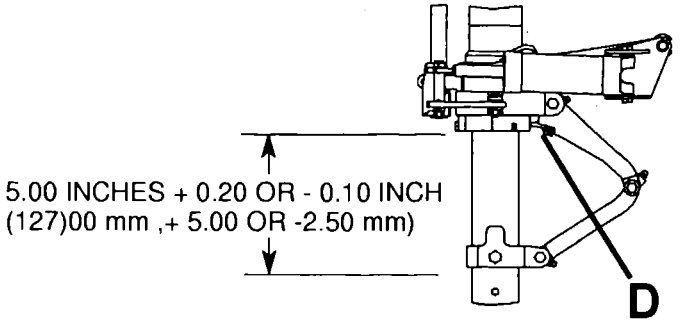
CAUTION: Damage will result if correct clearance is not set between the tire and scraper. You must do a check of the clearance every time the scraper has been disturbed or the tire is changed and when you install the speed fairings. If any mud, snow or ice collects on the scraper, it will prevent the tire from correct rotation. You must clean the scraper for correct tire rotation.

(7) Make sure the clearance between the tire and scraper is correct.
(a) Clean off any dirt or ice that has collected on the scraper.
(b) Adjust the clearance as necessary to have a minimum of 0.55 inch (13.97 mm) to a maximum of 0.80 inch (20.32 mm).

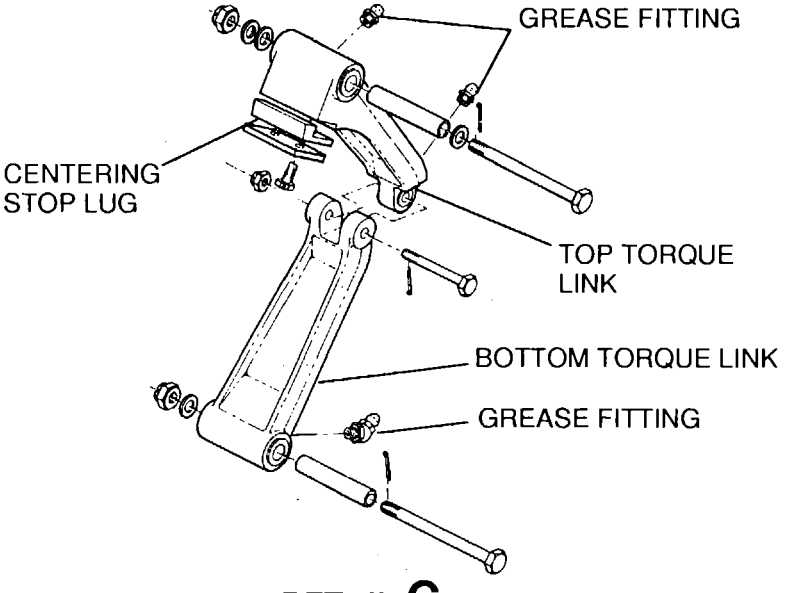


Nose Landing Gear Installation
Figure 201 (Sheet 1)

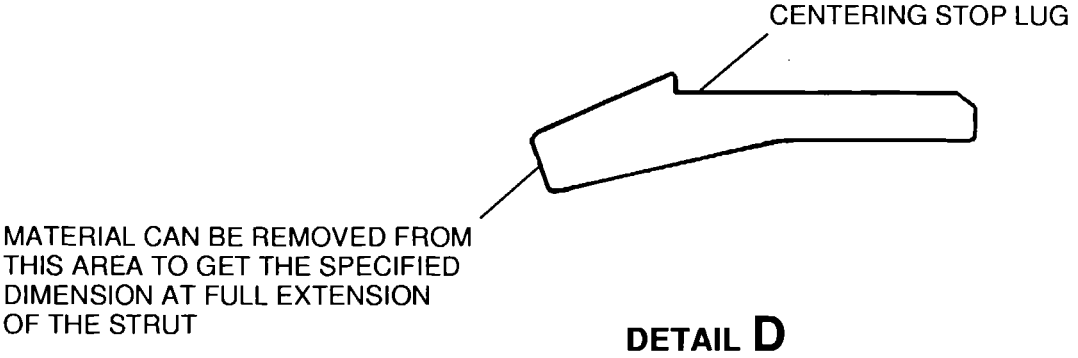
B929



VIEW A-A



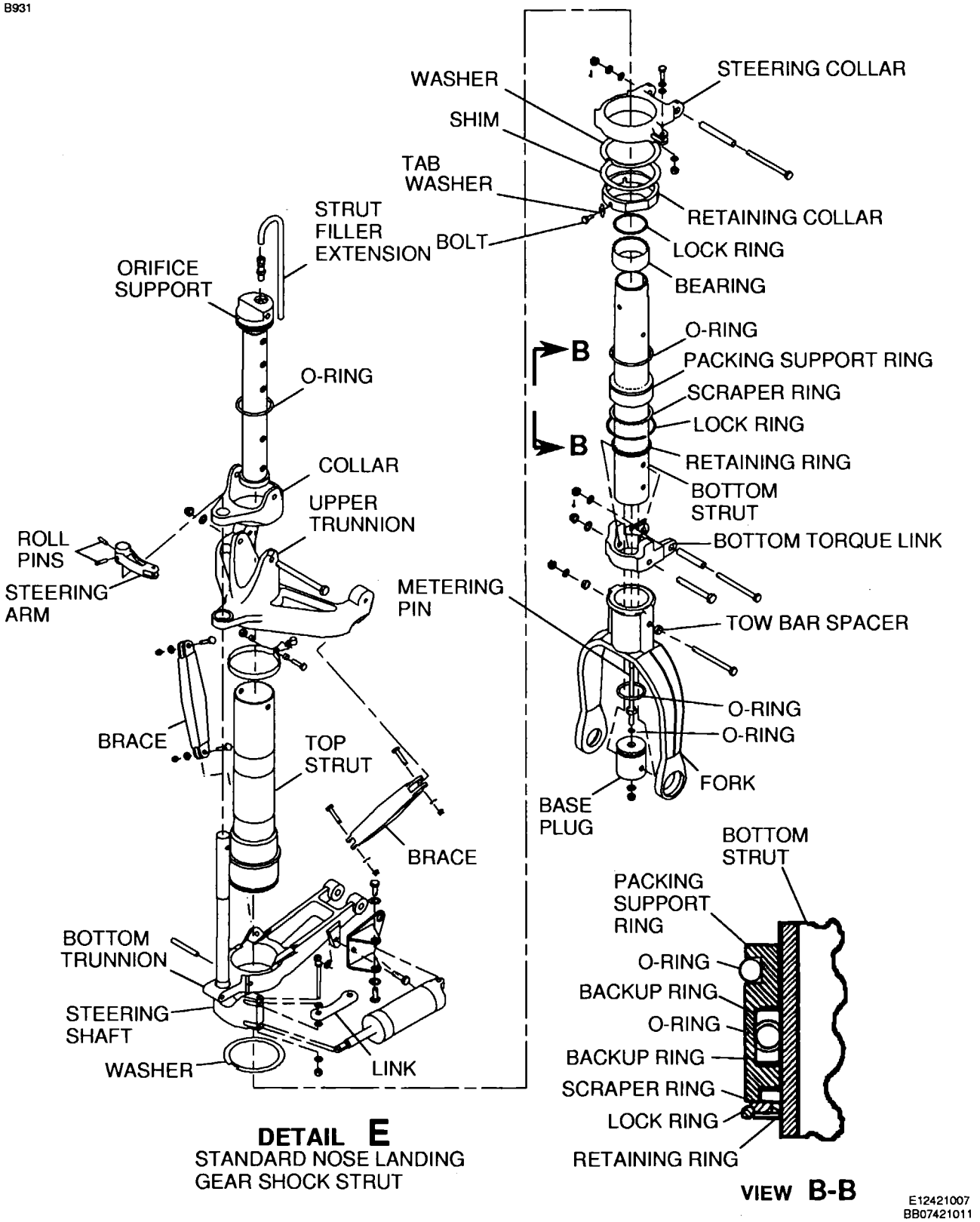
DETAIL C



DETAIL D

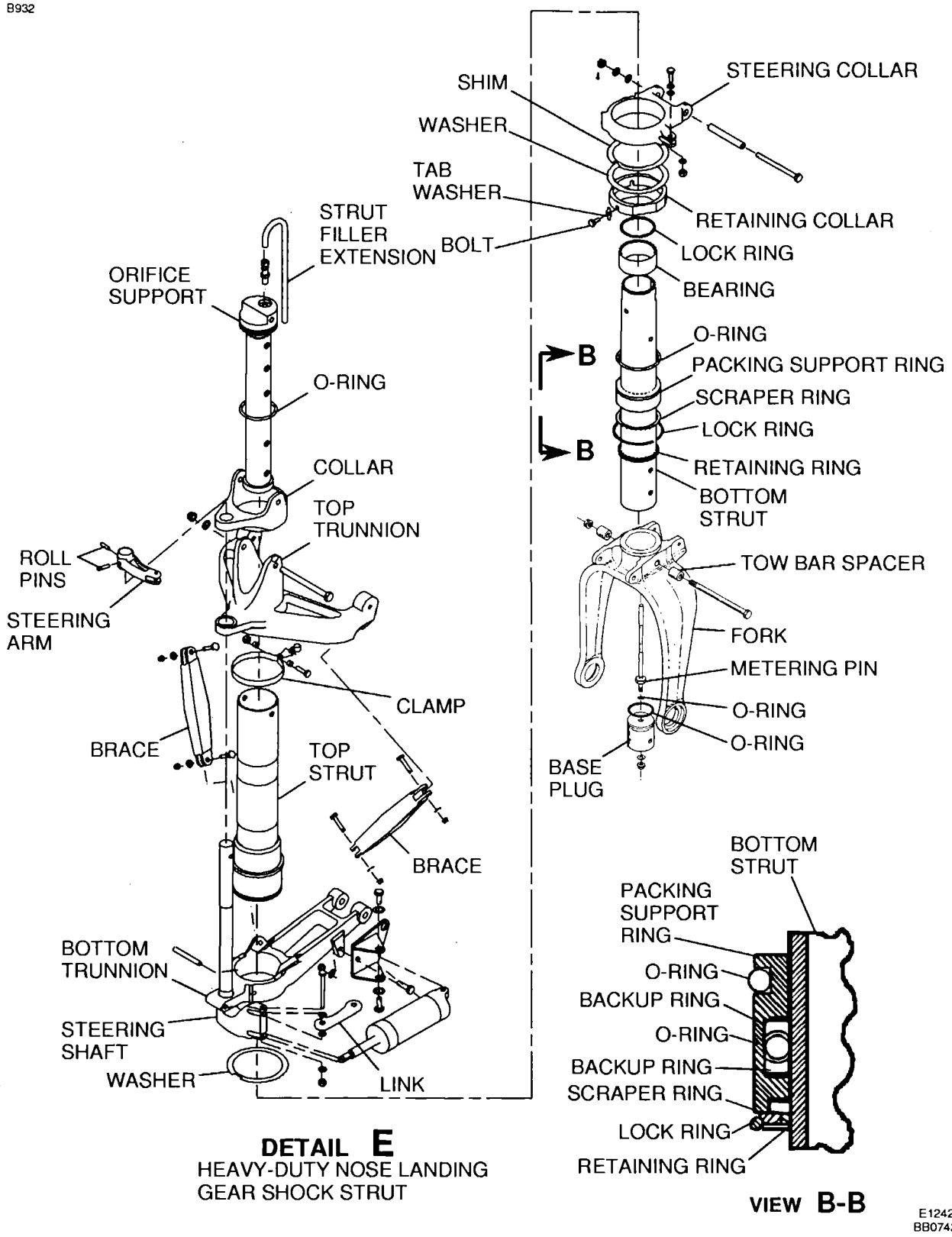
12101001
A-A 12421013
C12421014
D12421010

Nose Landing Gear Installation
Figure 201 (Sheet 2)



Nose Landing Gear Installation
Figure 201 (Sheet 3)

B932

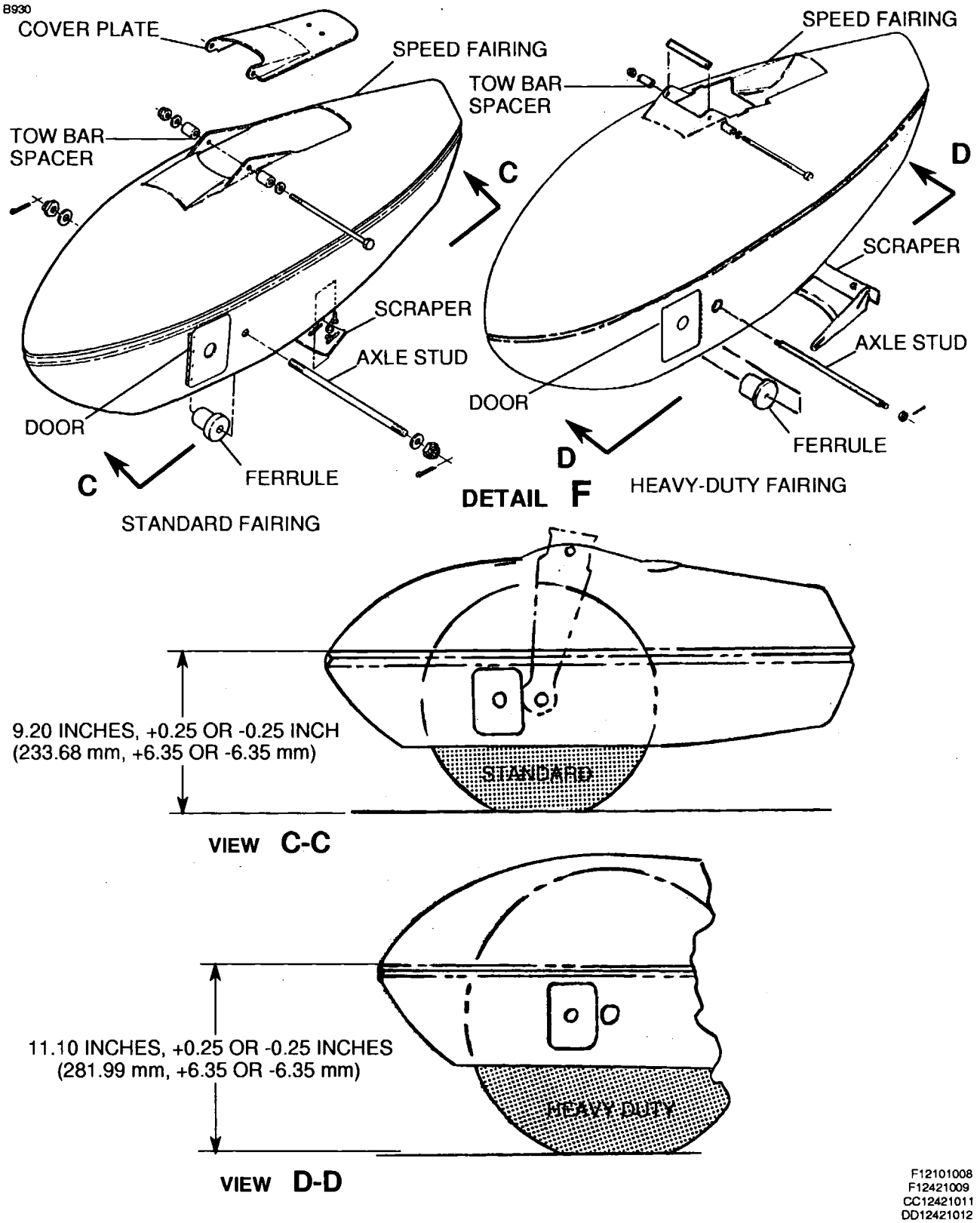


DETAIL E
HEAVY-DUTY NOSE LANDING GEAR SHOCK STRUT

VIEW B-B

E12421007
BB07421011

Nose Landing Gear Installation
Figure 201 (Sheet 4)



F12101008
F12421009
CC12421011
DD12421012

Nose Landing Gear Installation
Figure 201 (Sheet 5)

(8) Lower the nose of airplane to floor.
(9) Inflate nose gear strut. Refer to Chapter 12, Nose Landing Gear Shock Strut - Servicing.

CAUTION: Damage can result to the fairings if the tire pressure is not correct.

(10) Make sure of the correct tire pressure and adjust as necessary. Refer to Chapter 12, Tires - Servicing.

C. Remove the Heavy Duty Nose Wheel Speed Fairing (Refer to Figure 201).
(1) Weight or tie down tail of airplane to raise nose wheel from floor.
(2) Remove nose wheel axle stud.

WARNING: Ensure strut is deflated completely before removing bolt that attaches speed fairing to strut or disconnecting torque link.

(3) Deflate nose gear strut completely.
(4) Disconnect lower torque link from aft fork fitting and allow strut to extend.
(5) Remove bolt securing speed fairing, long spacer and tow bar spacers to forward fork fitting.
(6) Slide speed fairing up and remove nose wheel. Loosen scraper as necessary.
(7) Use a rod or long punch inserted through one ferrule to tap the opposite ferrule out of the fork. Remove both ferrules and remove nose wheel from fork.
(8) Remove lock ring from inside of lower end of upper strut. A small hole is provided in the lock ring groove to facilitate removal. Refer to Heavy-Duty Nose Gear Shock Strut Disassembly/ Assembly.

NOTE: Hydraulic fluid will drain from strut as lower strut is pulled from upper strut.

(9) Using a straight, sharp pull, remove lower strut from upper strut.
(10) Remove speed fairing up over lower strut.

D. Install the Heavy-Duty Nose Wheel Speed Fairing (Refer to Figure 201).
(1) Slide speed fairing down over lower strut.
(2) Install upper strut over lower strut.
(3) Install lock ring inside ring groove in lower end of upper strut. Refer to Heavy-Duty Nose Gear Shock Strut Disassembly/Assembly.
(4) When installing lock ring, position lock ring so that one end covers the small access hole in the lock ring groove.
(5) Install nose wheel in fork and install ferrules.
(6) Install long spacer between forward lugs of fork and speed fairing. Install tow bar spacers, washers, bolt, and nut.
(7) Connect lower torque link to aft fork fitting.
(8) Install nose wheel axle stud.
(9) Tighten axle stud until a slight bearing drag is obvious when wheel is turned. Back off nut to nearest castellation and install cotter pin.

CAUTION: Damage will result if correct clearance is not set between the tire and scraper. You must do a check of the clearance every time the scraper has been disturbed or the tire is changed and when you install the speed fairings. If any mud, snow or ice collects on the scraper, it will prevent the tire from correct rotation. You must clean the scraper for correct tire rotation.

(10) Make sure the clearance between the tire and scraper is correct.
(a) Clean off any dirt or ice that has collected on the scraper.
(b) Adjust the clearance as necessary to have a minimum of 0.55 inch (13.97 mm) to a maximum of 0.80 inch (20.32 mm).

(11) Complete maintenance of the shock strut. Refer to Chapter 12, Nose Landing Gear Shock Strut - Servicing.

CAUTION: Damage will result to the fairings if the tire pressure is not correct.

(12) Make sure the tire pressure is correct and adjust it as necessary. Refer to Chapter 12, Tires - Servicing.

3. Nose Landing Gear Removal/Installation

A. Remove the Nose Landing Gear (Refer to Figure 201).
(1) Weight or tie down tail of airplane to raise nose wheel from floor.
(2) Remove engine cowl. Refer to Chapter 71, Cowl - Maintenance Practices.
(3) Disconnect nose wheel steering bungee from steering arm.
(4) Remove bolt and washers to disconnect drag link where it attaches to lower trunnion. Note position of washers during removal of bolt for reinstallation.
(5) Remove carpet on each side of tunnel at firewall for access to upper trunnion bolts. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(6) Remove bolts to disconnect upper trunnion from fittings in tunnel structure.
(7) Remove nose gear.

B. Install the Nose Landing Gear (Refer to Figure 201).
(1) Place nose gear in wheel well.
(2) Install bolts securing upper trunnion in fittings in tunnel structure.
(3) Install bolt and washers and connect drag link where it attaches to lower trunnion. Ensure washers are installed in positions from which they were removed.
(4) Connect nose gear steering bungee at steering arm.
(5) Install engine cowl.
(6) Install carpet to tunnel area. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(7) Remove weights or tie-down from tail, and lower nose wheel to floor.

4. Standard Nose Gear Shock Strut Disassembly/Assembly

A. Disassemble the Standard Nose Gear Shock Strut (Refer to Figure 201).
(1) Remove nose wheel speed fairing. Refer to Nose Wheel Speed Fairing.
(2) Remove nose gear. Refer to Nose Landing Gear.

WARNING: Make sure the strut is fully deflated before removing bolt through collar and upper trunnion, lock ring from lower strut, or bolt securing fork to lower strut.

(3) Deflate strut completely.
(4) Remove torque links. Note position of washers, shims, spacers, and bushings.
(5) Remove shimmy damper. Refer to Shimmy Damper Removal/Installation.
(6) Remove steering shaft by driving out roll pins, and removing steering arm.
(7) Remove lock ring from groove inside lower end of upper strut. A small hole is provided at the lock ring groove to facilitate removal of the lock ring.

NOTE: Hydraulic fluid will drain from strut as lower strut is pulled from upper strut.

(8) Use a straight, sharp pull to separate upper and lower struts. Invert lower strut and drain remaining hydraulic fluid.
(9) Remove lock ring and bearing at top of lower strut.
(10) Slide packing support ring, scraper ring, lock ring and retaining ring from lower strut, noting relative position and top side of each ring, wire together if desired.
(11) Remove and discard O-Rings and backup rings from packing support ring.
(12) Remove bolt securing torque link fitting and remove torque link fitting from lower strut.

(13) Push metering pin and base plug assembly from lower strut. Remove O-Rings and metering pin from base plug.

NOTE: Lower strut and fork are press fit, drilled on assembly. Separation of these parts is not recommended, except for installation of new parts.

(14) Remove bolt and tab washer from retaining collar.
(15) Unscrew retaining collar and remove shims, washers, and steering collar from upper strut.
(16) Remove clamp attaching filler extension valve to strut, and disconnect from filler valve at top of strut.
(17) Remove bolt at top of strut, and remove collar and orifice support. Remove O-ring and valve from orifice support.
(18) Bushings and bearings in lower trunnion, upper trunnion and collar may be replaced as required. Needle bearing in steering collar should not be replaced, replace entire steering collar if needle bearing is defective.

B. Assemble the Standard Nose Gear Shock Strut (Refer to Figure 201).
(1) Before you assembly the nose gear shock strut, all of the parts must be clean and examined. Refer to Nose Gear Shock Strut Inspection/Repair.
(2) Lubricate needle bearings in steering collar. Refer to Chapter 12, Landing Gear and Parking Brake - Lubrication.
(3) Lubricate the steering collar and retaining collar during installation with a layer of Petrolatum VV-P-236, hydraulic fluid MIL-PRF-5606 or Dow Corning DC-7.
(4) Install top washer, steering collar, shim(s), and retaining collar.
(5) Install the retaining collar on the bottom end of the top strut.
(6) Tighten the retaining collar until it is flush with the bottom end of strut.
(7) Check steering collar for snug fit against washer. Shims of variable thickness are available from Cessna Aircraft Company, Cessna Parts Distribution, Department 701, CPD 2, 5800 East Pawnee Road, Wichita KS 67218- 5590.
(8) If shims are required, remove retaining ring and steering collar and add shims as necessary to provide a snug fit with steering collar retaining ring in place. Table 201 lists part number and thickness of available shims:

Table 201. Shims

PART NUMBER	THICKNESS
1243030-5	0.006 INCH
1243030-6	0.012 INCH
1243030-7	0.020 INCH

(9) Install O-ring on base plug.
(10) Install O-ring on metering pin and install in base plug.
(11) Install base plug assembly in lower strut fork assembly.
(12) Install tow bar spacer under head of bolt and install bolt through holes in fork and base plug. Install tow bar spacer, washer, and nut on bolt.
(13) Install scraper ring, lock ring and retaining ring, making sure they are installed in the same positions from which they were removed.

NOTE: Install backup rings with concave surface next to O-ring.

(14) Install O-Rings and backup rings in packing support ring.
(15) Install packing support ring, O-ring, bearing and lock ring at upper end of lower strut assembly. Note top side of bearing.

NOTE: Ensure that beveled edge of bearing is installed up next to lock ring.

(16) Install upper strut assembly over lower strut assembly.

(17) Install lock ring in groove in lower end of upper strut. Position lock ring so that one end covers the small access hole in the lock ring groove.
(18) Install steering shaft up through hole in lower trunnion and hole in upper trunnion.
(19) Install steering arm over steering shaft and secure with roll pins.
(20) Install link to bottom of steering shaft and attach opposite end to steering collar.
(21) If braces were removed, they should be installed, connecting upper trunnion and lower trunnion.
(22) Attach lower torque link to torque link fitting and upper torque link to steering collar.
(23) Install O-ring and filler valve in orifice piston support, and install orifice piston support in upper strut; install bolt.
(24) Service shock strut. Refer to Chapter 12, Nose Landing Gear Shock Strut - Servicing.
(25) Install strut filler valve extension.

5. Nose Gear Shock Strut Inspection/Repair

A. Inspect and Repair the Nose Gear Shock Strut (Refer to Figure 201).
(1) Thoroughly clean all parts in cleaning solvent and inspect carefully.
(2) All worn or defective parts and all O-Rings and backup rings must be replaced with new parts.
(3) Sharp metal edges must be smoothed with No. 40 emery paper, then cleaned with solvent.

6. Heavy Duty Nose Gear Shock Strut Disassembly/Assembly

A. Disassemble the Heavy Duty Nose Gear Shock Strut (Refer to Figure 201).
(1) Remove nose wheel speed fairing. Refer to Remove Heavy Duty Nose Wheel Speed Fairing.
(2) Remove nose gear. Refer to Nose Landing Gear.

WARNING: Make sure strut is fully deflated before removing bolt through collar and upper trunnion, lock ring from lower strut, or bolt securing fork to lower strut.

(3) Deflate strut completely.
(4) Remove torque links. Note position of washers, shims, spacers, and bushings.
(5) Remove shimmy damper. Refer to Shimmy Damper Removal/Installation.
(6) Remove steering shaft by driving out roll pins and removing steering arm.
(7) Remove steering shaft from upper and lower trunnion.
(8) Remove lock ring from groove inside lower end of upper strut. A small hole is provided at the lock ring grove to facilitate removal of the lock ring.

NOTE: Hydraulic fluid will drain from strut as lower strut is pulled from upper strut.

(9) Use a straight, sharp pull to separate upper and lower struts.
(10) Invert lower strut and drain remaining hydraulic fluid.
(11) Remove lock ring and bearing at top of lower strut.
(12) Slide O-ring, packing support ring, scraper ring, lock ring, lock ring and retaining ring from lower strut, noting relative position and top side of each ring, wire together if desired.
(13) Remove and discard O-Rings and backup rings from packing support ring.
(14) Remove bolt securing tow bar spacers, base plug and metering pin.
(15) Remove O-Rings and metering pin from base plug.
(16) Remove bolt and tab washer from retaining collar.
(17) Unscrew retaining collar and remove shims, washers, and steering collar from upper strut.
(18) Remove clamp attaching filler extension valve to strut, and disconnect from filler valve at top of strut.

NOTE: Lower strut and fork are press fit, drilled on assembly. Separation of these parts is not recommended, except for installation of new parts.

(19) Remove bolt at top of strut, and remove collar and orifice support from upper trunnion.
(20) Remove O-ring and valve from orifice support.

(21) Bushings and bearings in lower trunnion, upper trunnion and collar can be replaced as required. Do not replace the needle bearing in the steering collar. Replace entire steering collar if needle bearing is defective.

B. Assemble the Heavy-Duty Nose Gear Shock Strut. (Refer to Figure 201).
(1) Lubricate needle bearings in steering collar. Refer to Chapter 12, Landing Gear and Parking Brake - Lubrication.
(2) Lubricate the steering collar and retaining collar during installation with a layer of Petrolatum VV-P-236, hydraulic fluid MIL-PRF-5606 or Dow Corning DC-7.
(3) Install filler valve and O-ring on orifice support.
(4) Insert orifice support in upper strut.
(5) Install collar and secure orifice support, upper strut, and collar to upper trunnion.
(6) Install top washer, steering collar, shim(s), and retaining collar.
(7) Screw retaining collar on lower end of upper strut until it is flush with lower end of strut.
(8) Check steering collar for snug fit against washer. Shims of variable thickness are available from Cessna Aircraft Company, Cessna Parts Distribution, Department 701, CPD 2, 5800 East Pawnee Road Wichita, KS 67218-5590.
(9) If shims are required, remove retaining ring and steering collar and add shims as necessary to provide a snug fit with steering collar retaining ring in place. Table 202 lists part number and thickness of available shims:

Table 202. Shims

PART NUMBER	THICKNESS
1243030-5	0.006 INCH
1243030-6	0.012 INCH
1243030-7	0.020 INCH

(10) Install O-ring on base plug.
(11) Install O-ring on metering pin and install in base plug.
(12) Install base plug assembly in lower strut fork assembly.
(13) Install tow bar spacer under head of bolt and install bolt through holes in fork and base plug. Install tow bar spacer, washer, and nut on bolt.
(14) Install scraper ring, lock ring and retaining ring down over lower strut. Make sure they are installed in the same positions as they were removed.
(15) Install O-Rings and backup rings in packing support ring. The backup rings must be installed with the concave surface next to the O-ring.
(16) Install packing support ring, O-ring, bearing and lock ring at upper end of lower strut assembly. Note top side of bearing.

NOTE: Ensure that beveled edge of bearing is installed up next to lock ring.

(17) Install upper strut assembly over lower strut assembly.
(18) Install lock ring in groove in lower end of upper strut. Position lock ring so that one end covers the small access hole in the lock ring groove.
(19) Install steering shaft up through hole in lower trunnion and hole in upper trunnion.
(20) Install steering arm over steering shaft and secure with roll pins.
(21) Install link to bottom of steering shaft and attach opposite end to steering collar.
(22) If braces were removed, they must be installed, connecting upper trunnion and lower trunnion.
(23) Attach lower torque link to aft lugs of fork and upper torque link to steering collar.
(24) Service shock strut. Refer to Chapter 12, Nose Landing Gear Shock Strut - Servicing.
(25) Install strut filler valve extension.
(26) Install nose gear. Refer to Nose Landing Gear.
(27) Install nose wheel speed fairing. Refer to Install Heavy-Duty Nose Wheel Speed Fairing.

7. Shimmy Damper Removal/Installation

A. Shimmy Damper Removal (Refer to Figure 201).
(1) Remove cotter pin, nut, bolt, and washers from the damper piston rod end.
(2) Remove the safety wire, bolts, and washers that attach the barrel to the nose wheel steering torque arm.
(3) Remove the shimmy damper. For airplanes with the Lord Shimmy Damper installed, discard the Lord Shimmy Damper. Do not do a disassembly/assembly of the Lord Shimmy Damper.

B. Shimmy Damper Installation (Refer to Figure 201).
(1) Before you install the shimmy damper, do the maintenance that follows.
(a) If a Lord Shimmy Damper has been in storage for a long period, make sure that the shaft moves freely before you install it. Refer to Chapter 12, Nose Landing Gear Shimmy Damper - Servicing.
(b) Make sure that the tire is in good condition, is balanced, and has no tears or unwanted material in it.
(c) Examine the interface between the bottom of the steering collar and the top of the nose gear fork. If there is looseness here, replace or add more shims under the collar.
(d) Examine the assembly hardware for wear, and replace as necessary.
(e) Examine the shimmy damper arm attach points on the landing gear and the structure for wear and replace as necessary.
(2) Install the washers and the bolts to connect the shimmy damper to the steering torque. Refer to Chapter 20, Torque Data - Maintenance Practices, Table 201.
(3) Install 0.032-inch stainless steel safety wire. Refer to Chapter 20, Safetying - Maintenance Practices.
(4) Connect the shimmy damper rod with the bolt, washers, and nut.
(5) Install the cotter pin through the nut and the bolt.
(6) To clean and service the shimmy damper, refer to Chapter 12, Nose Landing Gear Shimmy Damper - Servicing.

8. Shimmy Damper Disassembly/Assembly (For airplanes that do not have the Lord Shimmy Damper)

A. Disassemble the Shimmy Damper (Refer to Figure 202).

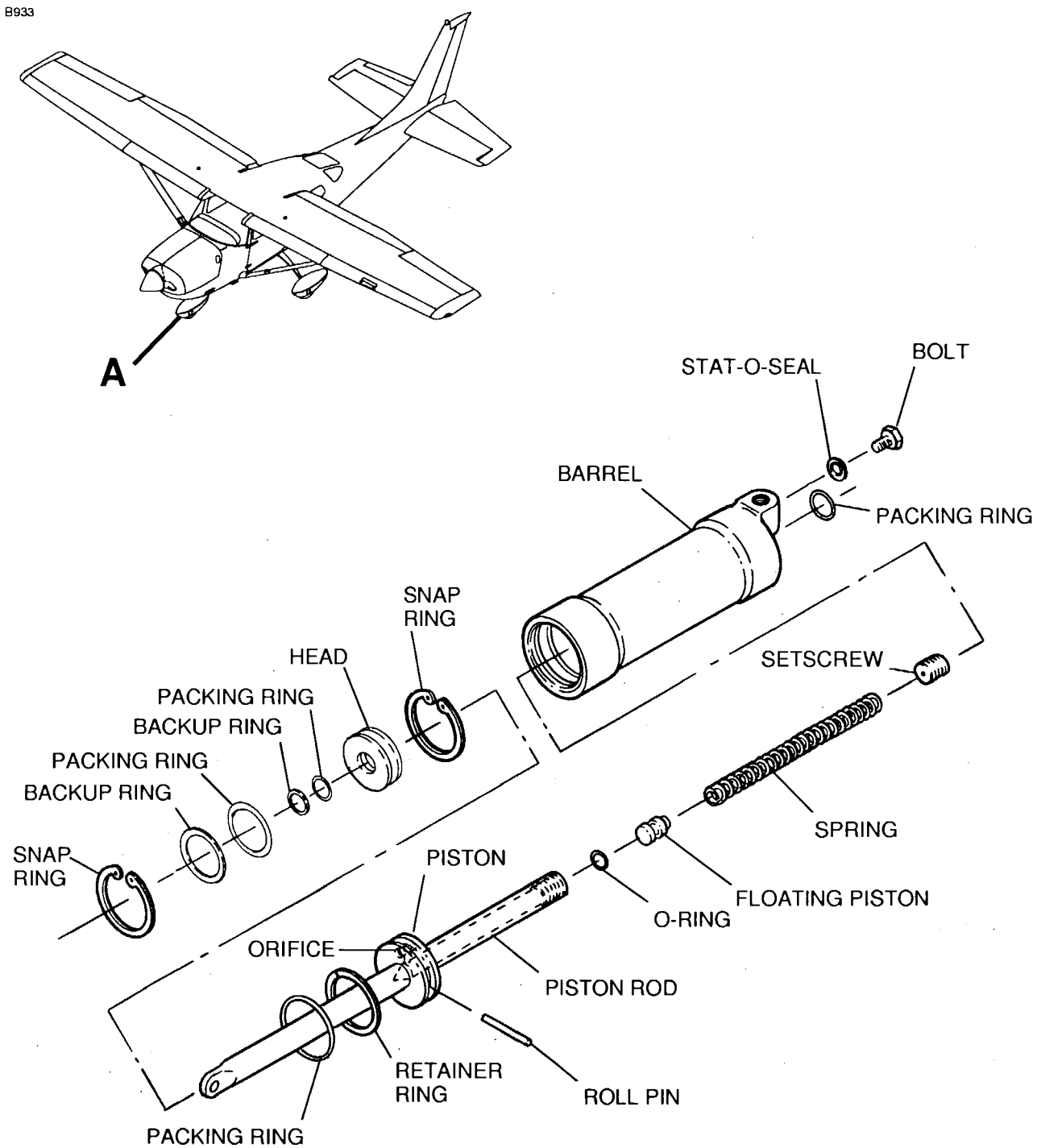
NOTE: There is no inspection or overhaul requirement for the Lord Shimmy Damper.

(1) Remove shimmy damper on nose landing gear. Refer to Shimmy Damper.
(2) Remove filler plug and drain hydraulic fluid from shimmy damper.
(3) Remove setscrew, spring, and floating piston from rod assembly.

NOTE: Shop low pressure air applied to the filler port may be needed to force floating piston from rod assembly. Care must be exercised to prevent too much air being applied, shooting the piston out of the rod and creating a safety hazard. It is advisable to provide a means to catch or otherwise stop the piston before it completely exits the rod assembly.

(4) Remove snap ring, head, and second snap ring from barrel.
(5) Pull rod assembly from barrel.
(6) Check all O-Rings and packing ring for serviceability.
(7) Check piston, rod, and floating piston for serviceability.
(8) Check inside surface of barrel.
(9) Check backup ring and retainer ring for serviceability.
(10) Replace any defective parts.

B. Assemble the Shimmy Damper (Refer to Figure 202).
(1) Make sure there are no sharp edges that can damage the O-rings or packing rings before the assembly of the shimmy damper.
(2) Lubricate the parts that follow during installation with hydraulic fluid MIL-PRF-5606.
(3) Install the O-ring in the end of the barrel.



DETAIL A

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Shimmy Damper
Figure 202 (Sheet 1)

(4) Install the O-ring and retainer ring on the piston.
(5) Install the O-ring on the floating piston, then install the floating piston, spring, and setscrew in the rod.
(6) Install the rod assembly in the barrel.
(7) Install the packing and backup ring in the head if removed.
(8) Install the O-ring on the head if removed.
(9) Install the snap ring in the barrel.
(10) Install the head assembly and outer snap ring.
(11) Service shimmy damper, refer to Chapter 12, Nose Landing Gear Shimmy Damper - Servicing.
(12) Install shimmy damper on nose landing gear. Refer to Shimmy Damper.

9. Nose Wheel Steering Removal/Installation

A. Remove the Nose Wheel Steering (Refer to Figure 203).
(1) Remove pilot's and copilot's seats. Refer to Chapter 25, Front Seats - Maintenance Practices.
(2) Remove pedestal cover.
(3) Loosen rudder trim chain on lower idler sprocket, on forward side of pedestal.
(4) Remove nut, bolt, stop, and chain guard.
(5) Remove cable guard from steering bungee sprocket.
(6) Remove nut, washer, and bolt securing steering bungee to rudder bar arm.
(7) Remove chain from steering bungee sprocket.
(8) Remove clamp securing boot to steering bungee.
(9) Remove nut, washer, and bolt securing bungee to nose gear steering arm and remove bungee.

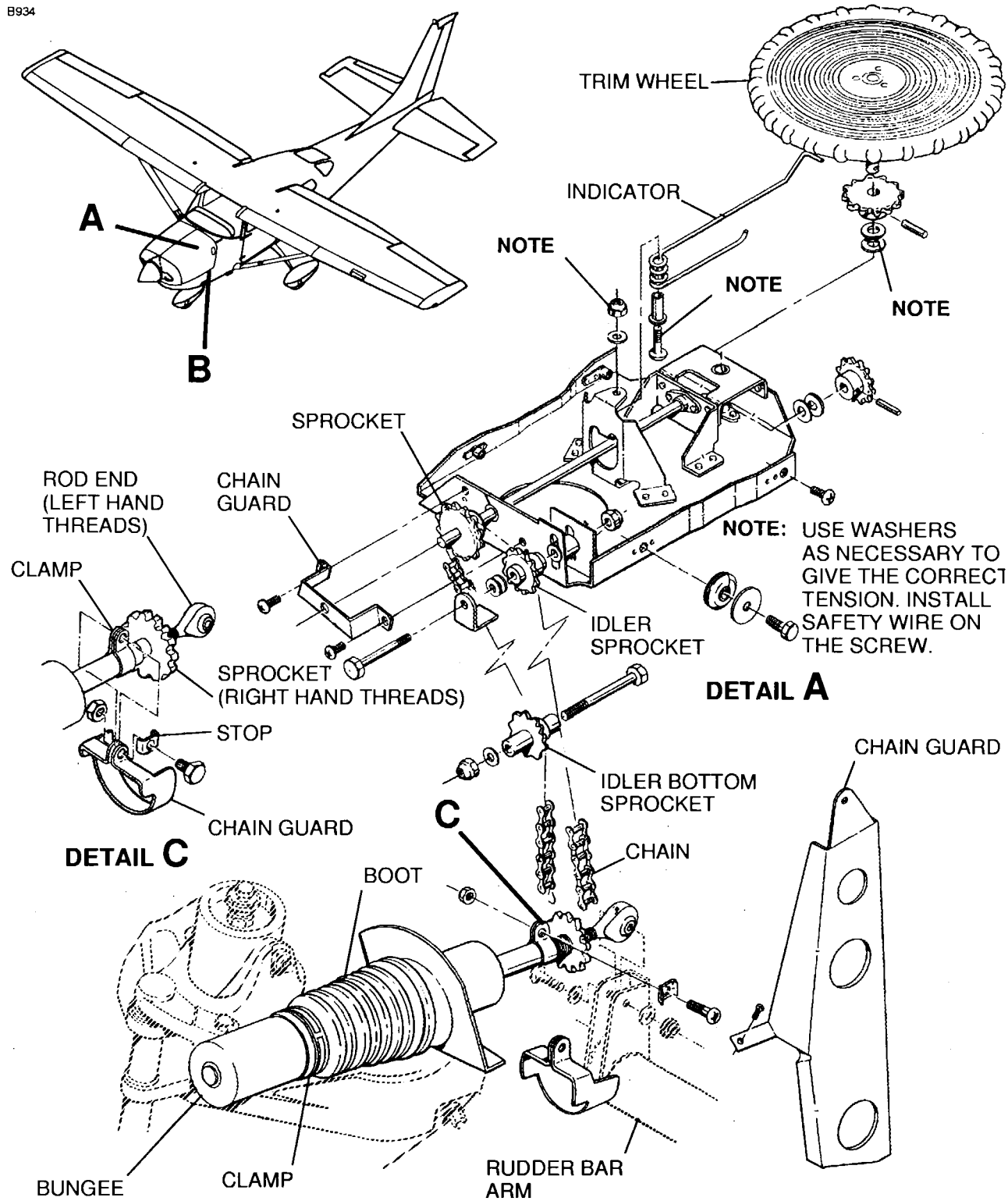
B. Install the Nose Gear Steering (Refer to Figure 203).
(1) Place steering bungee through boot on firewall.
(2) Connect steering bungee to nose gear steering arm with bolt, washer and nut.
(3) Place chain over steering bungee sprocket and connect steering bungee to rudder bar arm with bolt, do not install washer and nut at this time.
(4) Rig nose gear steering. Refer to Rigging Nose Wheel Steering.
(5) Install nut, bolt, stop, and chain guard.
(6) Install clamp on nose wheel steering bungee boot.
(7) Install pedestal cover.
(8) Install pilot and copilot seats. Refer to Chapter 25, Front Seats - Maintenance Practices.

10. Rigging Nose Wheel Steering

A. Rig the Nose Wheel Steering (Refer to Figure 203).
(1) Remove pedestal cover. Refer to Chapter 27, Pedestal Cover Removal/Installation.
(2) Remove pilot rudder bar shield.
(3) Disconnect steering bungee rod end at rudder bar arm.
(4) Tie down or weight tail to raise nosewheel free of ground.
(5) Extend strut and ensure nose gear is centered against the external centering stop.
(6) Loosen bolt securing idler sprocket, slide idler sprocket in the adjustment slot and disengage chain from sprocket.
(7) Clamp rudder pedals in neutral position.

CAUTION: Rig the rudder control system before you rig the trim system.

(8) Screw bungee sprocket in against bungee shaft, then screw rod end in against sprocket to obtain bungee shortest length.
(9) Holding rod end to prevent turning, rotate sprocket until hole in rod end aligns exactly with attaching hole on rudder bar arm and connect.
(10) Engage chain on sprockets and tighten idler sprocket so chain is taut but not tight.
(11) Remove clamps and run trim wheel through its full range of travel, observing full indicator travel is reached before full bungee extension or contraction.



DETAIL B

Nose Wheel Steering Installation
Figure 203 (Sheet 1)

WARNING: Make sure rudder moves in the correct direction when you operate the trim wheel.

(12) Lower nose gear to ground and install all parts removed for access.

MAIN LANDING GEAR WHEEL - MAINTENANCE PRACTICES

1. General

A. The main landing gear wheel maintenance practices give removal/installation instructions for the left main wheel. Removal/installation for the right main wheel is typical unless otherwise noted.

2. Main Wheel Removal/Installation

NOTE: The wheel removal is not necessary to reline the brakes or to remove the brake parts, other than the brake disc on the torque plate.

A. Remove the Main Wheel (Refer to Figure 201).
   (1) Jack the airplane. Refer to Chapter 7, Jacking - Maintenance Practices.
   (2) Remove the speed fairing if installed. Refer to Main Landing Gear - Maintenance Practices.
   (3) Remove the hub caps (if installed), cotter pin and axle nut.
   (4) Remove the bolts that attach the brake back plate to the brake cylinder and remove the back plate.
   (5) Pull the wheel from the axle.

B. Install the Main Wheel (Refer to Figure 201).
   (1) Set the wheel assembly on the axle.
   (2) Install the axle nut and tighten the axle nut until a slight bearing drag is obvious when the wheel is rotated. Back off nut to nearest castellation and install cotter pin.
   (3) Set the brake back plate in position and install the bolts.
   (4) Install the hub cap if it was originally installed.
   (5) Install speed fairing if it was originally installed. Refer to Main Landing Gear - Maintenance Practices.
   (6) Lower the jacks and remove them from the airplane. Refer to Chapter 7, Jacking - Maintenance Practices.

CAUTION: Damage will result if the correct clearance is not set between the tire and scraper. You must do a check of the clearance every time the scraper is disturbed, the tire is changed, or when you install the speed fairings. If any mud, snow or ice collects on the scraper, it will prevent the tire from correct rotation. You must clean the scraper for correct tire rotation.

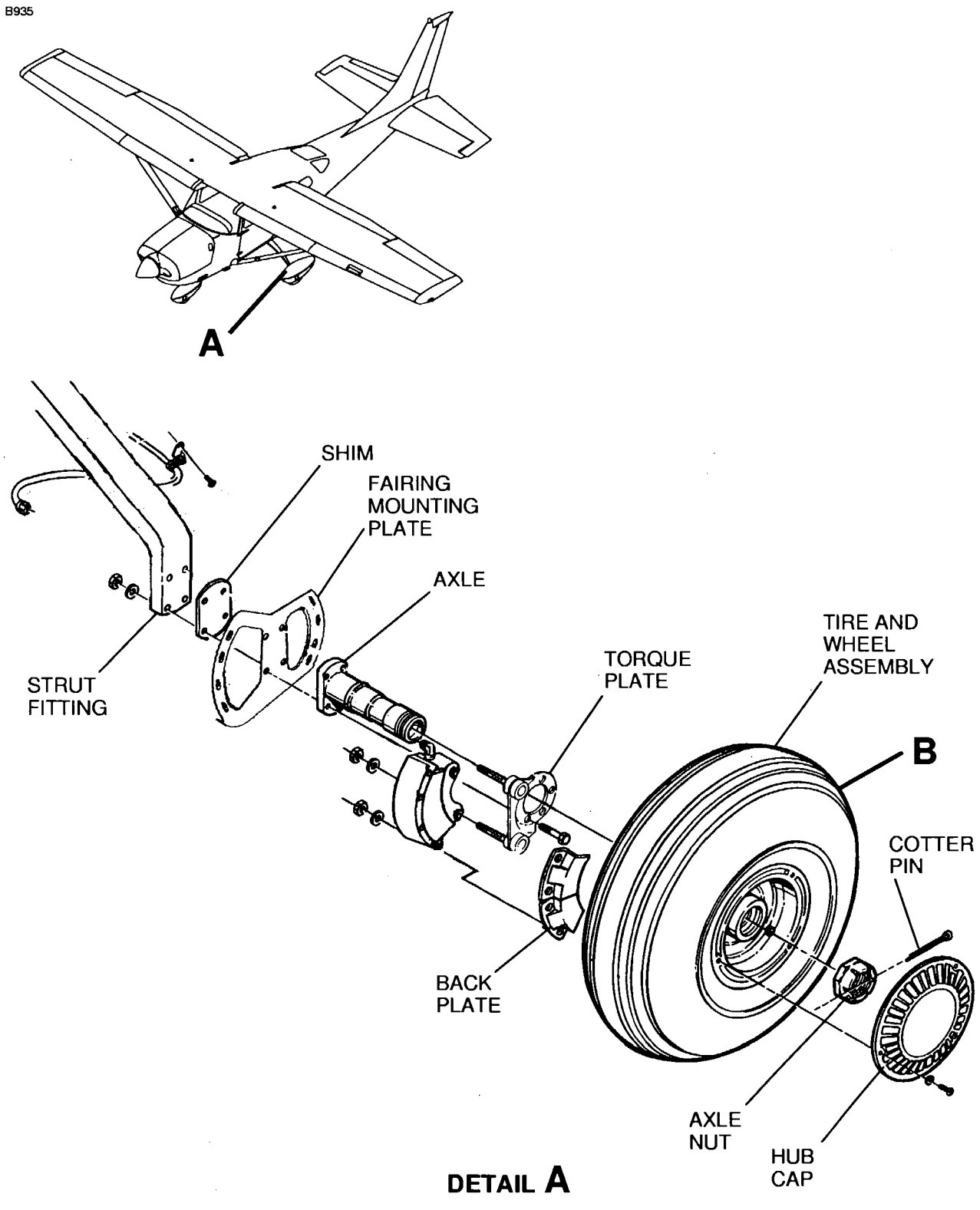
   (7) Do a check of the clearance between the tire and scraper.
      (a) Clean off any dirt or ice that is on the scraper.
      (b) Adjust the clearance as necessary to have a minimum of 0.55 inch (13.97 mm) to a maximum of 0.80 inch (20.32 mm).

CAUTION: Damage can result to the fairings if the tire pressure is not correct.

   (8) Do a check of the tire pressure and adjust as necessary. Refer to Chapter 12, Tires - Servicing.

3. Main Wheel Axle Removal/Installation

A. Remove the Main Wheel Axle (Refer to Figure 201).
   (1) Jack the airplane. Refer to Chapter 7, Jacking - Maintenance Practices.
   (2) Remove the main wheel speed fairing and brake fairing. Refer to Main Landing Gear - Maintenance Practices.
   (3) Remove main landing gear wheel. Refer to Main Wheel Removal/Installation.
   (4) Disconnect, drain and put a cap or plug on the hydraulic brake line at the wheel brake cylinder.
   (5) Write the number and position of the wheel alignment shims between axle and fitting when you remove the axle from the strut fitting.



Main Landing Gear Wheel and Axle Installation
Figure 201 (Sheet 1)

(6) Mark the shims or tape together so they can be installed in the same position to make sure the wheel alignment is not disturbed.
(7) Remove nuts, washers, and bolts that attach the shims, axle, brake components, and speed fairing mounting plate from the strut.

B. Install Main Wheel Axle (Refer to Figure 201).

NOTE: Make sure the wheel alignment shims are installed in the same position from where they where removed.

(1) Install the shims, axle, brake components, and speed fairing mounting plate to strut.
(2) Install the wheel on the axle. Refer to Main Wheel Removal/Installation.
(3) Connect the hydraulic brake line to the wheel brake cylinder.
(4) Fill and bleed the hydraulic brake system. Refer to Brake System - Maintenance Practices.
(5) Install the main wheel speed fairing. Refer to Main Landing Gear - Maintenance Practices.
(6) Remove the airplane from the jacks. Refer to Chapter 7, Jacking - Maintenance Practices.

4. Main Wheel Disassembly/Assembly

A. Disassemble the Main Wheel (Refer to Figure 202).

WARNING: Do not separate the wheel halves with the tire and tube inflated or serious injury will result.

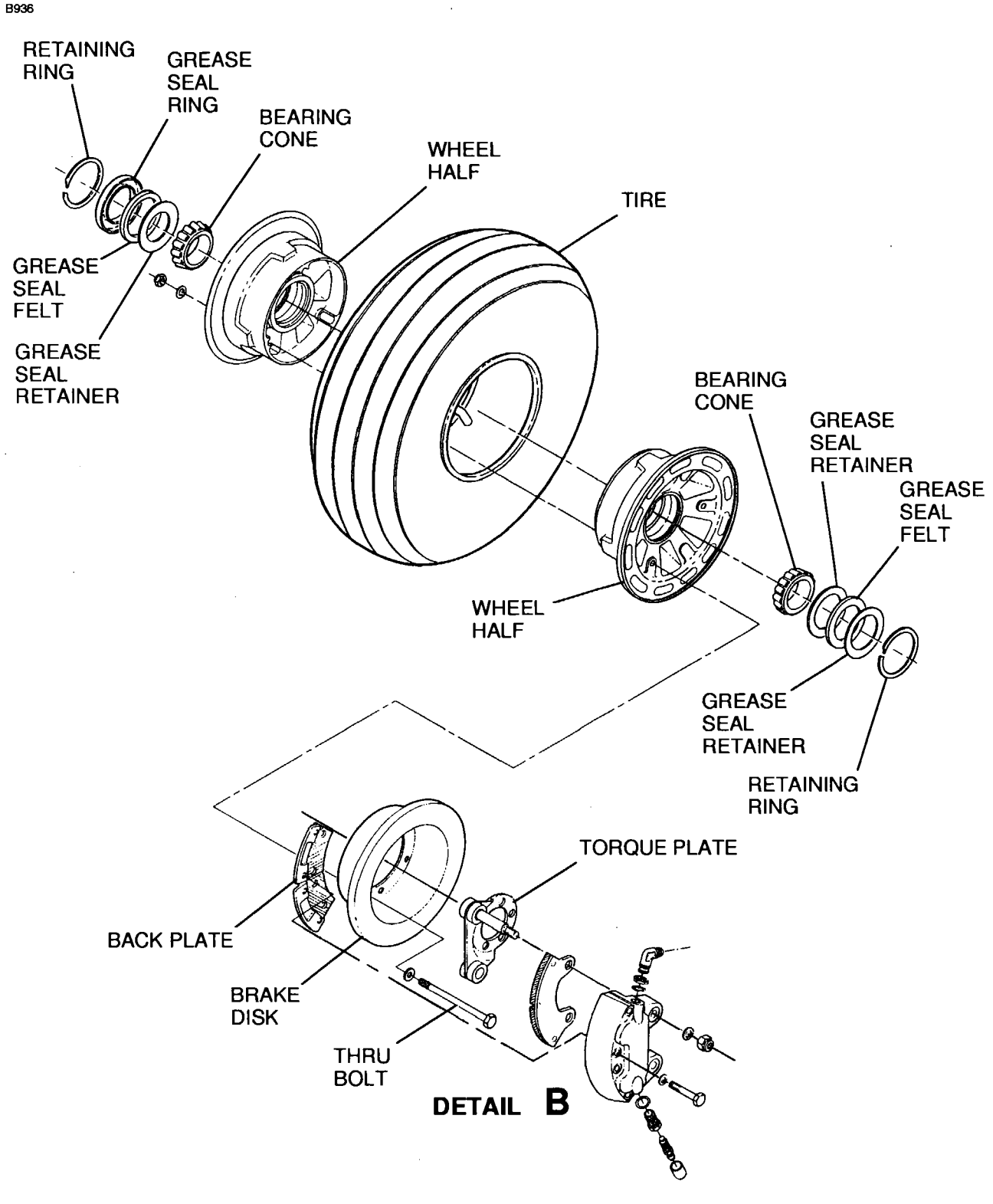
CAUTION: You must be careful to prevent tire tool damage when you remove the tire from the wheel halves.

(1) You must deflate the tire and tube and break loose tire bead.
(2) Remove the thru-bolts hold wheel halves together.
(3) Separate and remove the wheel halves from the tire and tube.
(4) Remove the retaining rings, grease seal retainers, grease seal felts, grease seal ring and bearing cones from each wheel half.

CAUTION: Bearing cups (races) are a press fit in wheel halves, and must not be removed unless a new part is to be installed.

(5) To remove the bearing cups, heat the wheel half in boiling water for 30 minutes or in an oven that is no more than 250°F (121°C).
(a) If available use an arbor press to press out the bearing cup and press in a new bearing cup while the wheel half is still hot.

B. Assemble the Main Wheel (Refer to Figure 202).
(1) Apply a small quantity of SAE 10 oil for lubrication on the grease seal felt.
(2) Install the bearing cone, grease seal ring, grease seal felt, grease seal retainer and retaining ring into each wheel half.
(3) Install the tube in the tire. Make sure to align the index marks on the tire and tube.
(4) Set the wheel half into the tire and tube (side opposite valve stem).
(5) With the washer under the head of thru-bolt, install the bolt through the wheel half.
(6) Set the other wheel half into the other side of the tire and tube. Make sure to align the valve stem in the valve slot.
(a) Make sure the tube is not pinched between the wheel halves before you torque the nuts.



Main Wheel Assembly
Figure 202 (Sheet 1)

CAUTION: Incorrect torque of the nuts will cause failure of the bolts and wheel.

CAUTION: Do not use impact wrenches on thru-bolts or nuts.

(7) Install the washers and nuts on thru-bolts, and dry torque alternately to 150 inch-pounds (16.94 N.m).
(8) Inflate tire to seat tire beads, deflate and inflate to 42 PSI (289 kPa) air pressure.

5. Main Wheel Inspection/Check

A. Complete an Inspection of the Main Wheel (Refer to Figure 202).
(1) Clean all metal parts and the grease seal felts in solvent, and dry thoroughly.

NOTE: A soft bristle brush can be used to remove hardened grease, dust or dirt.

(2) Inspect the wheel halves for cracks or damage.
(3) Inspect the bearing cones, cups, retaining rings, grease seal retainers, grease seal felts and grease seal rings for wear or damage.
(4) Apply a small quantity of SAE 10 oil for lubrication on the grease seal felt.
(5) Inspect the thru-bolts for cracks in the bolt head.
(6) Replace the cracked or damaged wheel half.
(7) Replace the damaged retainer rings and seals.
(8) Replace the worn or damaged bearing cups and cones.
(9) Replace any worn or damaged thru-bolts.
(10) Remove any corrosion or small nicks.
(11) Repair the reworked areas of the wheel by cleaning thoroughly, then applying one coat of clear lacquer paint.
(12) Pack the bearings with MIL-PRF-81322 wheel bearing grease.
(13) Complete an inspection of the brakes. Refer to Chapter 5, Inspection Time Limits.

6. Wheel Balance

A. Incorrect tire wear is usually the cause of wheel unbalance. Replacement of the tire will usually correct this condition.

NOTE: The tire and tube manufacturing process tolerance lets a specified quantity of static unbalance.

B. The light weight point of the tire is marked with a red dot on the tire sidewall and the heavy weight point of the tube is marked with a color line (usually near the inflation valve stem). When you install a new tire, set the marks adjacent to each other. If a wheel shows evidence of unbalance when servicing it can be statically balanced but not dynamically balanced.

NOSE LANDING GEAR WHEEL - MAINTENANCE PRACTICES

1. General

A. Nose landing gear wheel maintenance practices consist of nose wheel removal/installation, nose wheel disassembly/assembly and nose landing gear wheel inspection/check.

2. Nose Landing Gear Wheel Removal/Installation

A. Remove Nose Landing Gear Wheel (Refer to Figure 201).
(1) Weight or tie down tail of airplane to raise nose wheel from floor.
(2) Airplanes equipped with speed fairing remove speed fairing. Refer to Nose Wheel Speed Fairing Removal/Installation.
(3) Remove nose wheel axle stud.
(4) Remove furrels from nose wheel and pull nose wheel assembly from fork.

B. Install Nose Landing Gear Wheel (Refer to Figure 201).
(1) Install nose wheel assembly in fork and install furrels.
(2) Install nose wheel axle stud.
(3) Tighten axle stud until a slight bearing drag is obvious when wheel is rotated. Back the nut off to the nearest castellation and insert cotter pins.
(4) Airplanes equipped with speed fairings, install speed fairings. Refer to Nose Wheel Speed Fairing Removal/Installation.

3. Nose Landing Gear Wheel Disassembly/Assembly

A. Disassemble Nose Landing Gear Wheel (Refer to Figure 201).

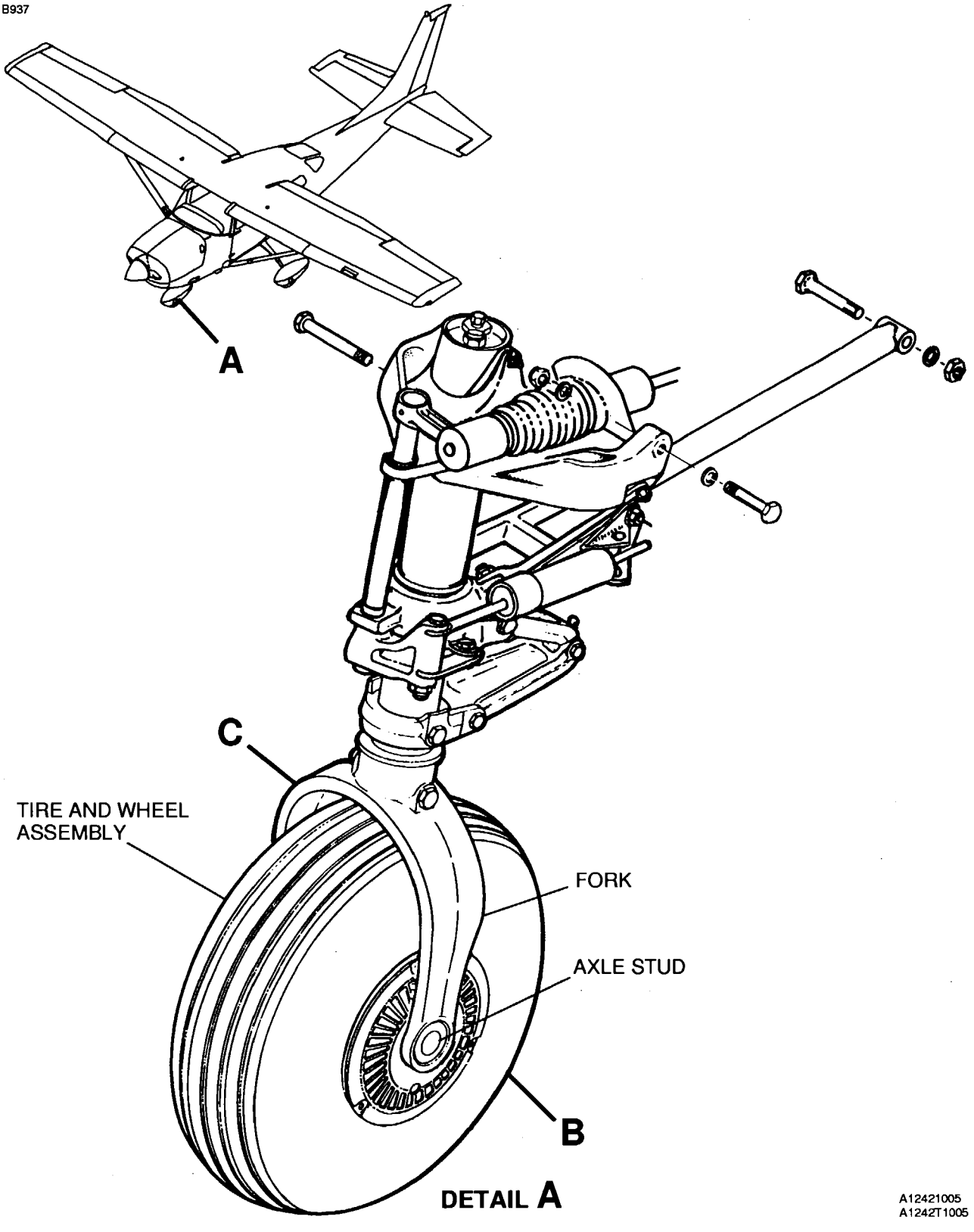
WARNING: Serious injury can result from attempting to separate wheel halves with tire and tube inflated.

(1) Completely deflate tire and tube and break loose tire beads. Extreme care must be exercised to prevent tire tool damage when removing tire from wheel halves.
(2) Remove nuts, thru-bolts and washers.
(3) Separate and remove wheel halves from tire and tube.
(4) Remove retaining rings, grease seal retainer, felt grease seal, grease seal rings and bearing cone from each wheel half.

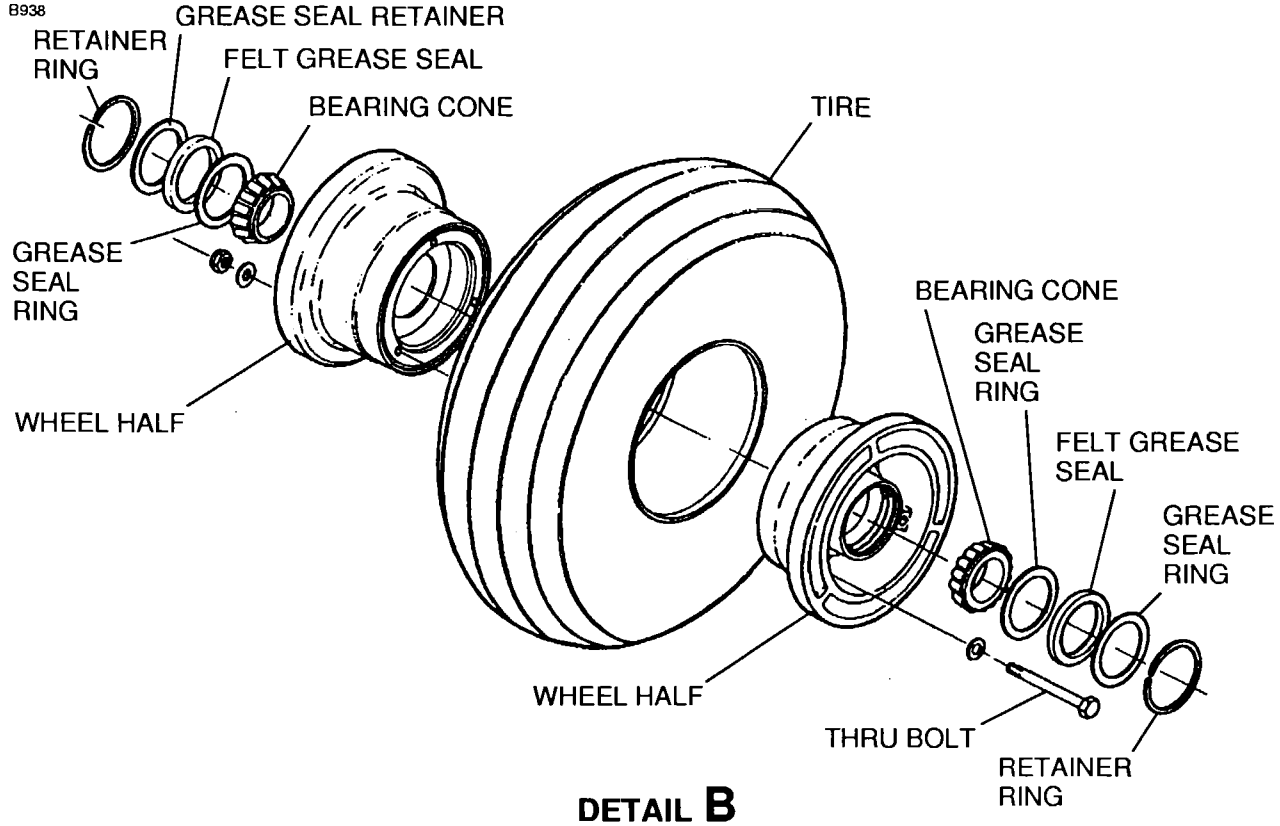
NOTE: Bearing cups are a press fit in wheel half and should not be removed unless a new part is to be installed.

(5) To remove bearing cups, heat wheel half in boiling water for 30 minutes, or in an oven, not to exceed 250℉ (120℃). Using an arbor press, press out bearin g cup and press in new bearing cup while wheel half is still hot.

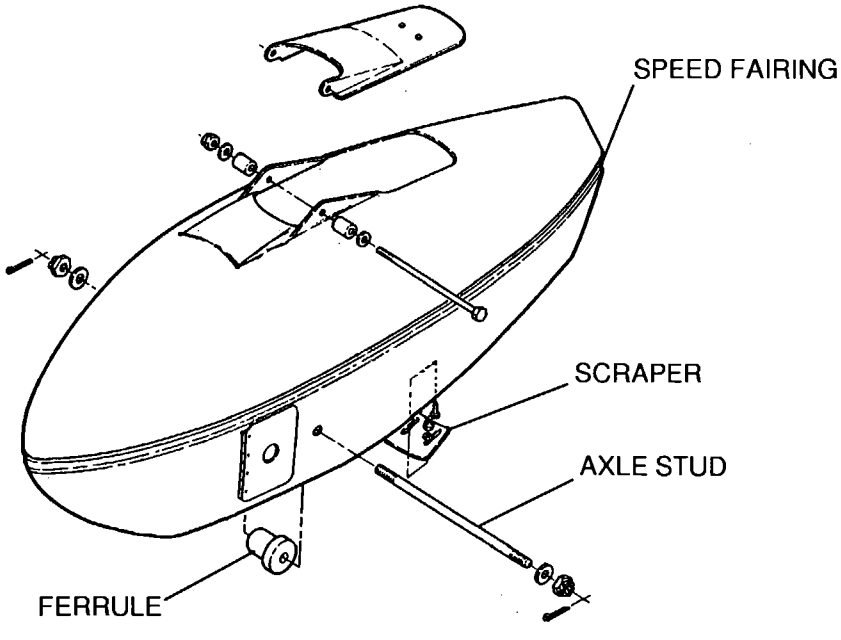
B. Assemble Nose Landing Gear Wheel (Refer to Figure 201).
(1) Apply a small quantity of SAE 10 oil for lubrication on the grease seal felt.
(2) Install bearing cones, grease seal retainers, felt grease seals, grease seal rings and retaining rings into both wheel halves.
(3) Insert tube in tire, aligning index marks on tire and tube.
(4) Place wheel half into tire and tube. With washer under head of thru bolt, insert bolt through wheel half.
(5) Place wheel half into other side of tire and tube, aligning valve stem in valve slot.
(a) Ensure tube is not pinched between wheel halves before torquing nuts.



Nose Landing Gear Wheel Installation
Figure 201 (Sheet 1)



DETAIL B



DETAIL C

B1242T1001
C1242T1008

Nose Landing Gear Wheel Installation
Figure 201 (Sheet 2)

CAUTION: Uneven or improper torque of the nuts can cause failure of the bolts with resultant wheel failure.

CAUTION: Do not use impact wrenches on thru-bolts or nuts.

(6) Insert washers and nuts on thru- bolts, and dry torque alternately to 145 inch-pounds, +5 or -5 inch-pounds (16.38 N.m, +0.56 or -0.56 N.m).
(7) Inflate tire to seat tire beads, deflate and inflate to 49 PSI (338 kPa) air pressure.

4. Nose Landing Gear Wheel Inspection/Check

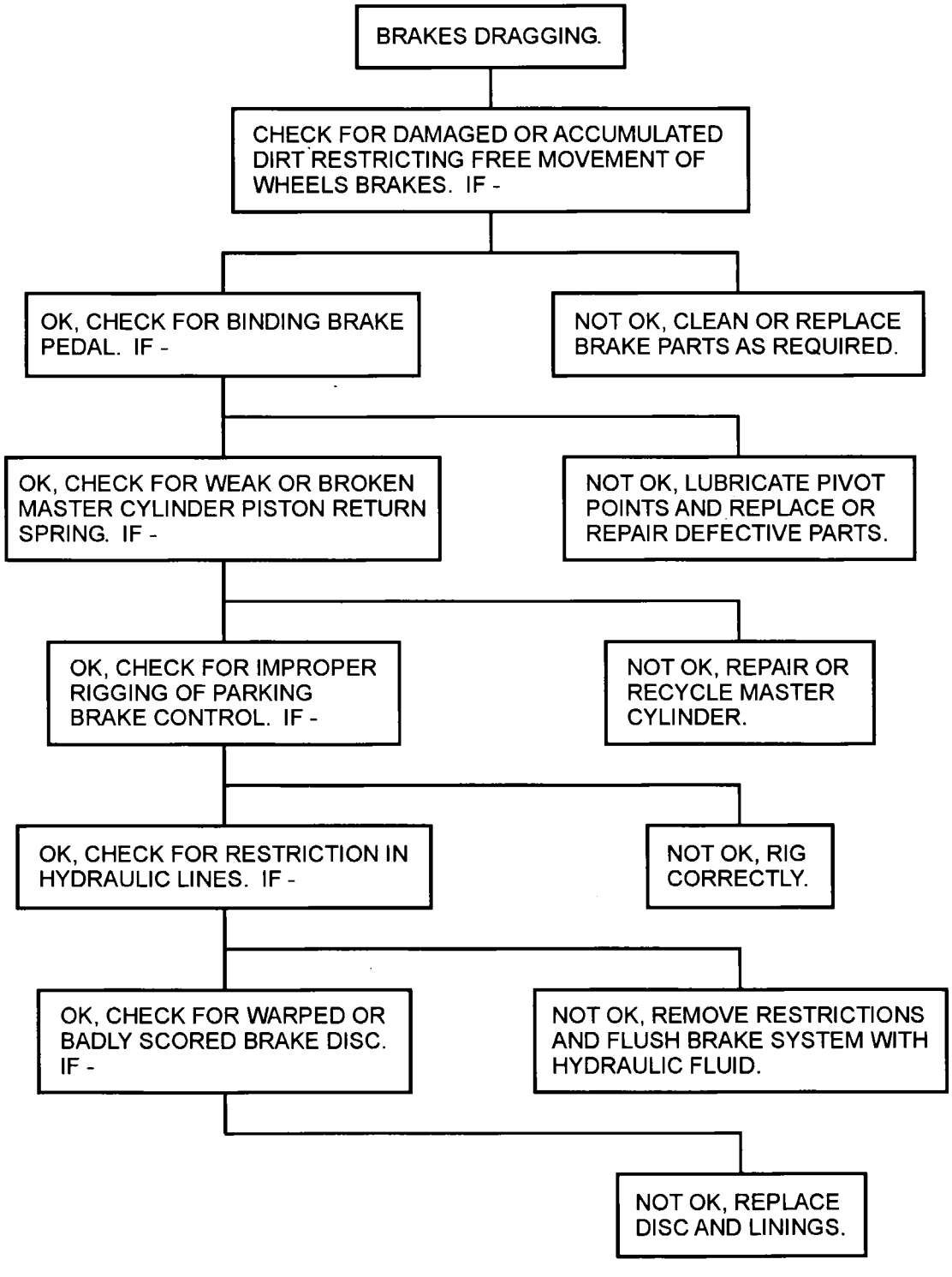
A. Inspect Nose Landing Gear Wheel (Refer to Figure 201).
(1) Clean all metal parts and felt grease seals in Stoddard solvent or equivalent, and dry thoroughly.
(2) Inspect wheel halves for cracks or damage.
(3) Inspect bearing cones, cups, retaining rings, and seals for wear or damage.
(4) Apply a small quantity of SAE 10 oil for lubrication on the grease seal felt.
(5) Inspect thru-bolts and nuts for cracks in threads or radius of bolt heads.
(6) Replace cracked or damaged wheel half.
(7) Replace damaged retaining rings and seals.
(8) Replace any worn or cracked thru-bolts or nuts.
(9) Replace worn or damaged bearing cups or cones.
(10) Remove any corrosion or small nicks.
(11) Repair reworked areas of wheel by cleaning thoroughly, then apply one coat of clear lacquer paint.

BRAKE SYSTEM - TROUBLESHOOTING

1. Troubleshooting

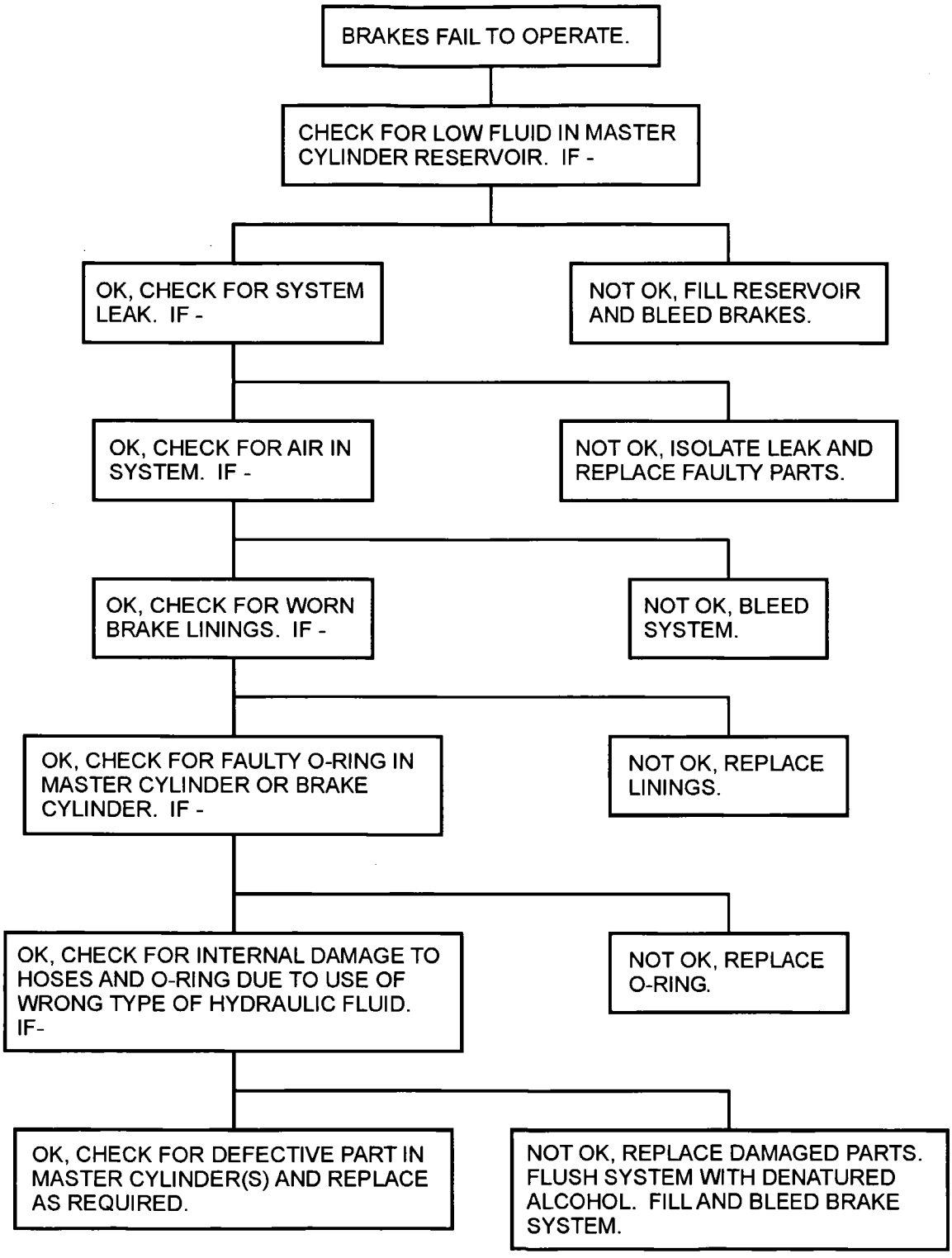
A. A troubleshooting chart has been provided to aid the maintenance technician in system troubleshooting. Refer to Figure 101.

B939



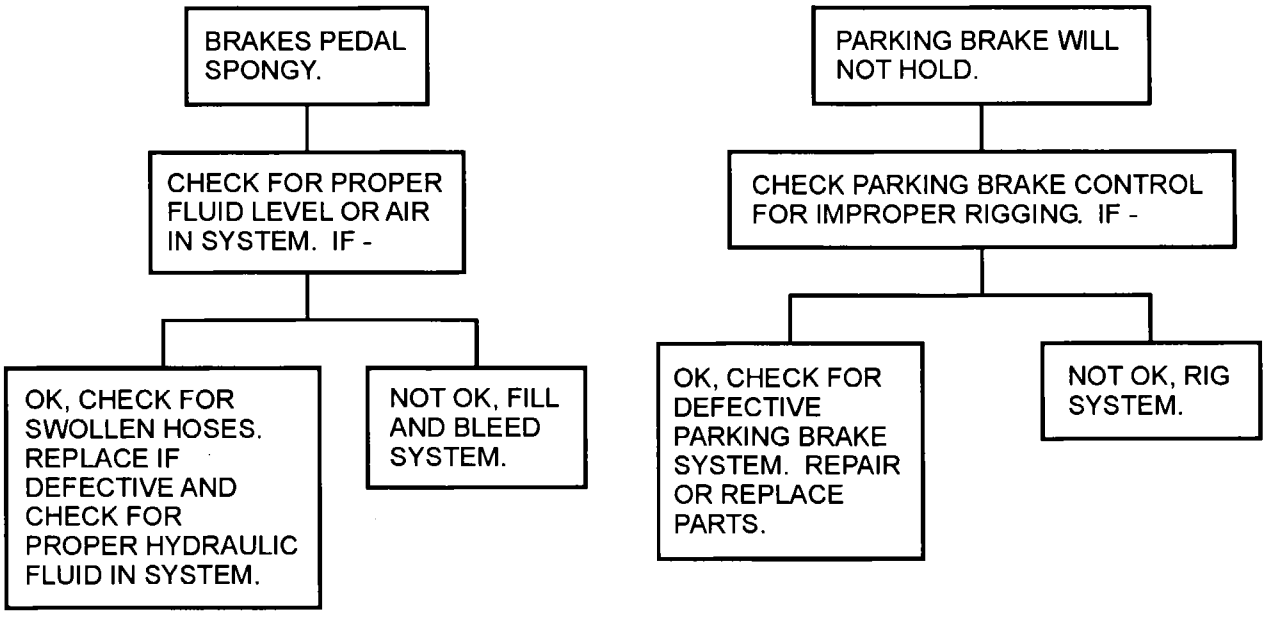
Brake System Troubleshooting Chart
Figure 101 (Sheet 1)

B940



Brake System Troubleshooting Chart
Figure 101 (Sheet 2)

B941



Brake System Troubleshooting Chart
Figure 101 (Sheet 3)

BRAKE SYSTEM - MAINTENANCE PRACTICES

1. General

A. Brake system maintenance practices provide removal/installation and inspection/repair of the brake master cylinders; removal/installation, inspection/repair, and rigging of the parking brake system.

NOTE: Brake assemblies described are normally for left hand-reverse fittings and torque plate bushings for right hand installation.

B. The hydraulic brake system is comprised of two master cylinders, located immediately forward of the rudder pedals; brake lines, connecting each master cylinder to its wheel brake cylinder, and the single-disc, floating cylinder-type brake assembly, located at each main landing gear wheel.

C. The brake master cylinders, located immediately forward of the pilot's rudder pedals, are actuated by applying pressure at the top of the rudder pedals. A small reservoir is incorporated into each master cylinder for the fluid supply. When dual brakes are installed, mechanical linkage permits the copilot pedals to operate the master cylinders.

D. The parking brake system is essentially a ratchet held handle which depresses and holds the brake master cylinders in the compressed position.

2. Brake Master Cylinders Removal/Installation

A. Remove Brake Master Cylinders (Refer to Figure 201).
(1) Remove brake fairings for access to brake bleeder screws.
(2) Drain hydraulic fluid from brake master cylinders.
(3) Remove pilot's seat. Refer to Chapter 25, Front Seats - Maintenance Practices
(4) Remove shield assembly from pilot's rudder pedals.
(5) Disconnect hoses from master cylinders and cap or plug hoses.
(6) Disconnect master cylinders at pilot's rudder pedals.
(7) Remove cotter pins and pins securing lower end of brake master cylinders and remove brake master cylinders.

B. Install Brake Master Cylinders (Refer to Figure 201).
(1) Secure lower end of brake master cylinders using pins and new cotter pins.
(2) Secure upper end of brake master cylinders to rudder pedals. Use new cotter pins.
(3) Remove plugs or caps from hoses and connect hoses to brake master cylinders.
(4) Remove the filler plug.
(5) Fill the brake master cylinders with MIL-PRF-5606 hydraulic fluid.
(6) Bleed brake system. Refer to Brake System Bleeding.
(7) Install brake fairings.
(8) Install shield assembly on pilot's rudder pedals.
(9) Install pilot's seat. Refer to Chapter 25, Front Seats - Maintenance Practices.

3. Brake Master Cylinder Disassembly/Assembly

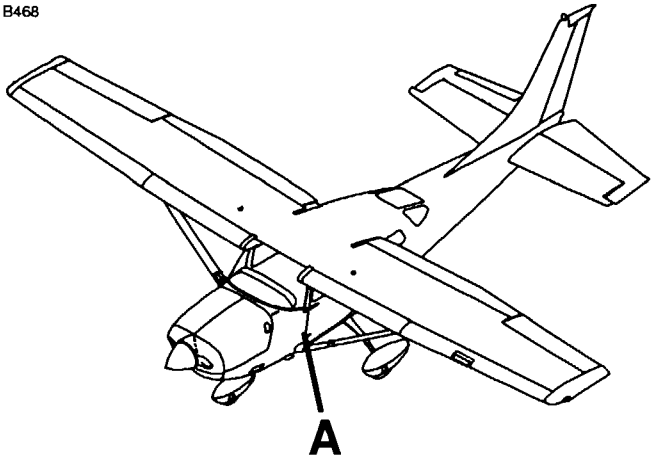
A. Disassemble Brake Master Cylinder (Refer to Figure 202).
(1) Remove brake master cylinder. Refer to Brake Master Cylinder Removal/Installation.
(2) Remove clevis and jamnut from piston rod.
(3) Remove filler plug.

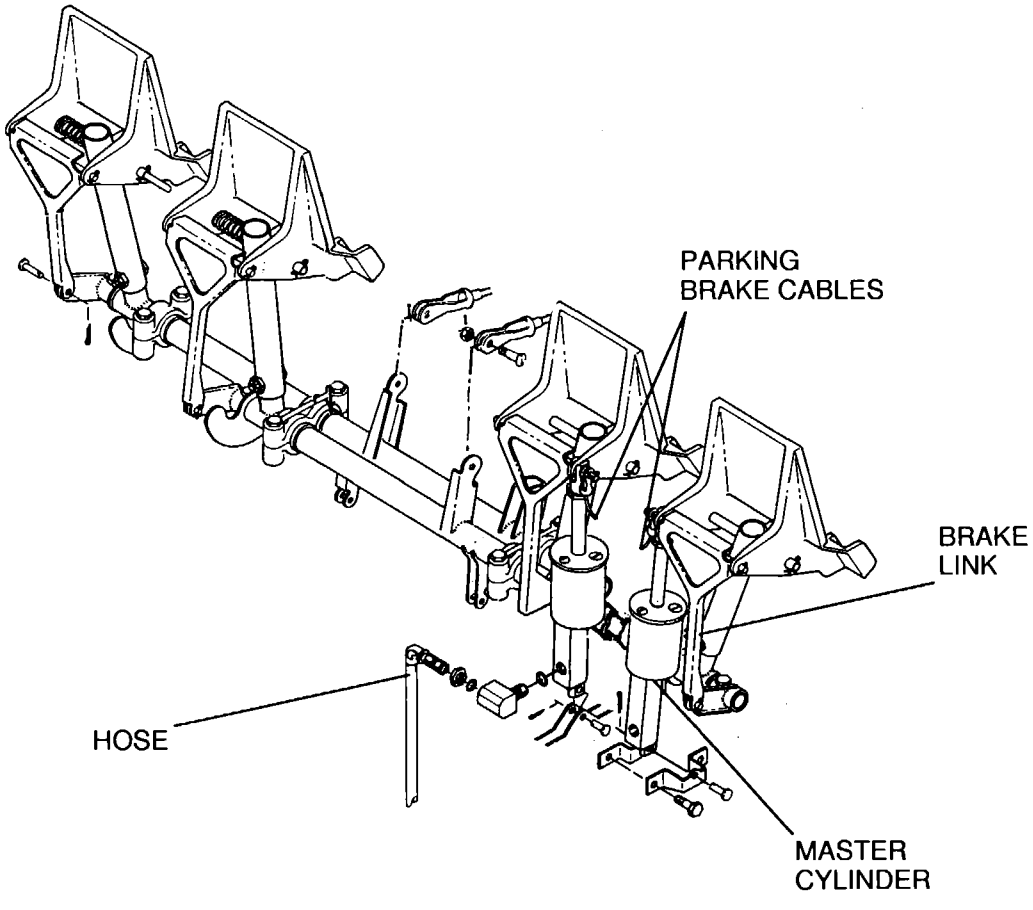
NOTE: A special tool, brake master cylinder wrench Proto Stanley Par No. C418 to remove brake master cylinder cover.

(4) Unscrew cover and remove up over piston rod.
(5) Remove piston rod and spring.
(6) Remove packing and backup ring from piston.

B. Assemble Brake Master Cylinder (Refer to Figure 202).
(1) Lubricate all parts with hydraulic fluid MIL-PRF-5606 before you assemble the parts that follow.

B468





DETAIL A

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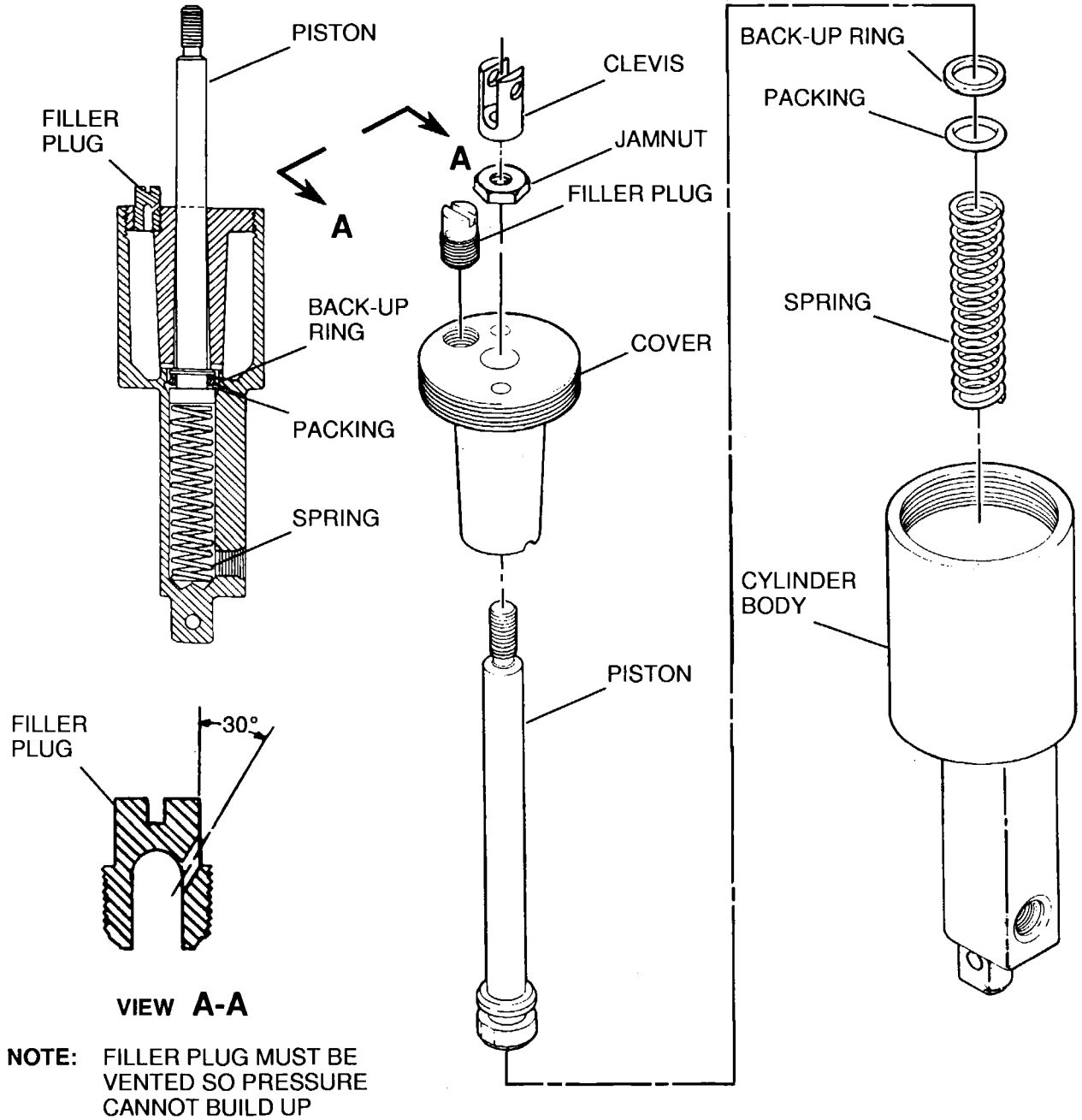
A1217T1004

Brake Master Cylinder Installation
Figure 201 (Sheet 1)

B470



NOTE: FILLER PLUG MUST BE VENTED SO PRESSURE CANNOT BUILD UP IN THE RESERVOIR DURING BRAKE OPERATION.

1217T1001
1217T1003
A-A1217T1002

Brake Master Cylinder Assembly
Figure 202 (Sheet 1)

(2) Install spring in cylinder body.
(3) Install backup ring and packing in groove of piston.
(4) Install piston in cylinder body.
(5) Install cover over piston and screw cover into cylinder body.
(6) Install jamnut and clevis on piston rod.
(7) Install filler plug making sure vent hole is open.
(8) Install brake master cylinder. Refer to Brake Master Cylinder Removal/Installation.

4. Brake Master Cylinders Inspection/Repair

A. Check all parts for damage or wear. Repair is limited to replacement of worn or damaged parts.

5. Brake Lining Wear Check

A. Check Brake Lining.
(1) A new brake lining should be installed when existing lining has worn to a thickness of 3/32-inch. A 3/32-inch thick strip of material, held adjacent to each lining, can be used to determine amount of wear. The shank end of a drill bit, of the correct size, can also be used to determine wear of the brake linings.

6. Brake Lining Replacement

A. Remove Brake Lining.
(1) Remove brake fairing and speed fairing. Refer to Main Landing Gear - Maintenance Practices.
(2) Remove bolts securing back plate and remove back plate.
(3) Pull brake cylinder out of torque plate and slide pressure plate off anchor bolts.
(4) Place back plate on a table with lining side down flat.
(5) Center a 9/64-inch (or slightly smaller) punch in the rolled rivet and hit the punch sharply with a hammer. Punch out all rivets securing the linings to the back plate and pressure plate in the same manner.

B. Install Brake Lining.

NOTE: A rivet setting kit is available from Cessna Aircraft Company.

(1) Clamp the flat side of the anvil in a vise.
(2) Align new lining on back plate and place brake rivet in hole with rivet head in the lining. Place the head against the anvil.
(3) Center rivet setting punch on lips of rivet. While holding back plate down firmly against lining, hit punch with a hammer to set the rivet. Repeat blows on punch until lining is firmly against back plate.
(4) Realign the lining on the back plate and install rivets in the remaining holes.
(5) Install a new lining on pressure plate in the same manner.
(6) Position pressure plate on anchor bolts and place cylinder in position so that anchor bolts slide into torque plate.
(7) Install back plate with bolts and washers. Torque bolts to 90 inch-pounds.
(8) Install brake fairing and speed fairing. Refer to Main Landing Gear - Maintenance Practices.
(9) Perform brake lining burn-in. Refer to Brake Lining Burn-In.

7. Brake System Bleeding

A. Bleed Brake System.
(1) Remove brake master cylinder filler plug and screw flexible hose with appropriate fitting into filler hole.
(2) Immerse opposite end of flexible hose into a container with enough hydraulic fluid to cover end of hose.
(3) Connect a clean hydraulic pressure source, such as a hydraulic hand pump or Hydro-Fill unit, to the bleeder valve on the wheel brake cylinder.

(4) As fluid is pumped into the system, observe the immersed end of the hose from the master brake cylinder for evidence of air bubbles being forced from the brake system. When bubbling has ceased, remove bleeder source from wheel brake cylinder and tighten bleeder valve.
(5) Remove hose from master cylinder and install filler plug.

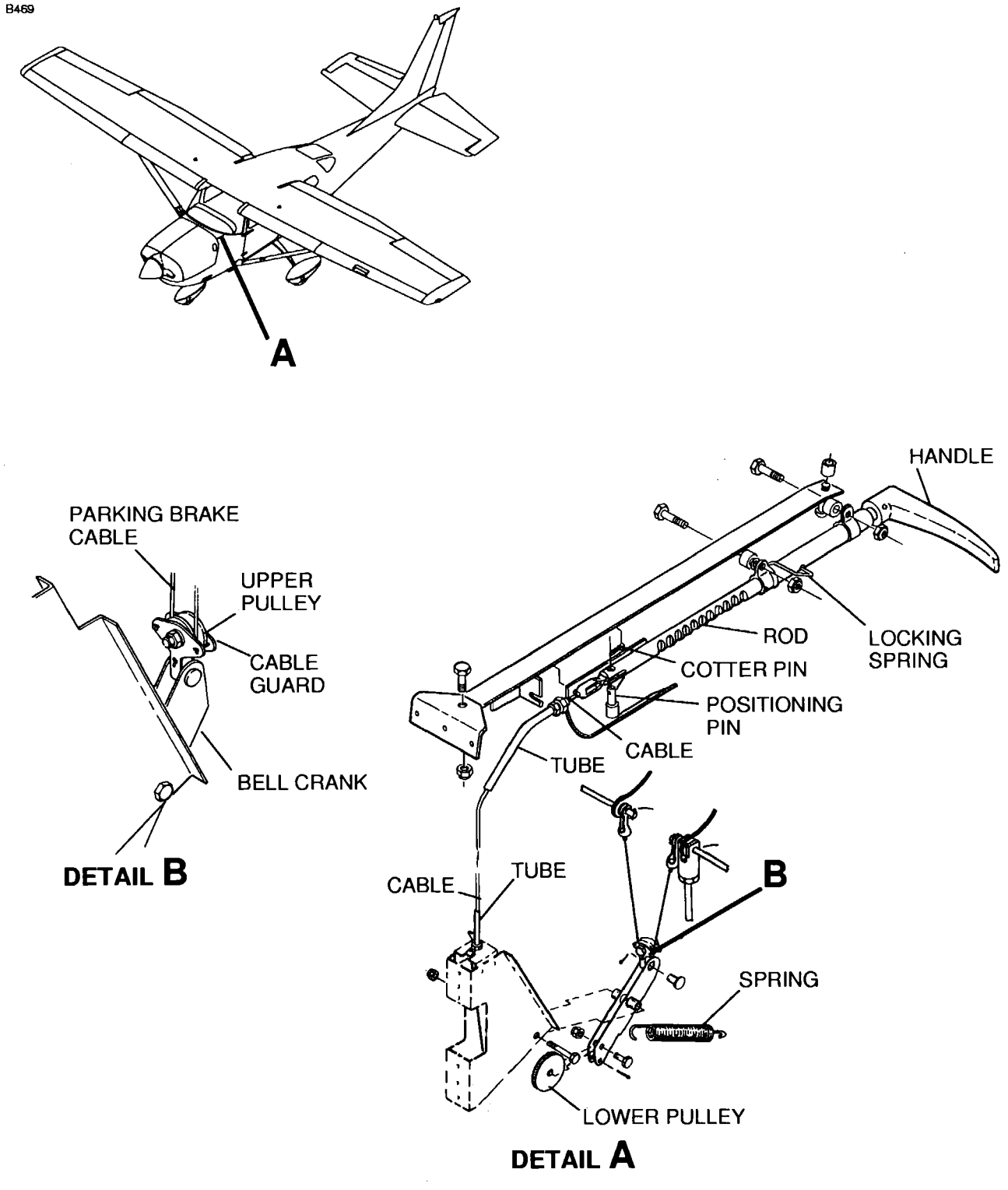
8. Brake Lining Conditioning

A. Condition new brake linings.
(1) Taxi aircraft for 1500 feet with engine at 1700 rpm applying brake pedal force as needed to develop a 5-10 mph taxi speed.
(2) Allow the brakes to cool for 10 to 15 minutes.
(3) Apply brakes and check for restraint at full throttle. If brakes hold, conditioning is complete.
(4) If brakes cannot hold aircraft during static run up, allow brakes to completely cool, and repeat steps (1) through (3).

9. Parking Brake System

A. Remove parking Brake System. (Refer to Figure 203).
(1) Remove pilot's seat. Refer to Chapter 25, Front Seats - Maintenance Practices.
(2) Remove shield assembly from pilot's rudder pedals.
(3) Disconnect spring from bellcrank.
(4) Remove cotter pin from positioning pin and remove pin and cable from rod.
(5) Remove nut, bolt, and pulley from lower end of bellcrank.
(6) Remove nuts from both ends of tube and remove tube and cable assembly.
(7) Remove cotter pins and disconnect park brake cable from rudder pedals.
(8) Remove nut, washer, and bolt and remove pulley and brake cable from upper end of bellcrank.

B. Install parking Brake System. (Refer to Figure 203).
(1) Connect brake cable to rudder pedals using new cotter pins.
(2) Position brake cable around upper pulley and install pulley, bolt, washer, and nut.
(3) Install tube and cable assembly upper end.
(4) Connect upper end of cable to rod using positioning pin and new cotter pin.
(5) Position cable around lower pulley and install pulley, bolt, and nut.
(6) Connect Cable and tube to bracket.
(7) Install spring.
(8) Ensure that cables are in grooves of pulleys and all cable guards are installed.
(9) Install shield assembly on pilot's rudder pedals.
(10) Install pilot's seat. Refer to Chapter 25, Front Seats - Maintenance Practices
(11) Check park brake operation.



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Parking Brake Installation
Figure 203 (Sheet 1)

CHAPTER

33

LIGHTS

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
33-Title		
33-List of Effective Pages		
33-Record of Temporary Revisions		
33-Table of Contents		
33-00-00	Page 1	Dec 2/2002
33-10-00	Pages 201-205	Jan 2/2006
33-11-00	Pages 201-204	Dec 2/2002
33-12-00	Pages 201-202	Dec 2/2002
33-13-00	Pages 201-205	Apr 1/2005
33-14-00	Pages 201-202	Dec 2/2002
33-15-00	Pages 201-202	Dec 2/2002
33-40-00	Pages 201-204	Dec 2/2002
33-41-00	Pages 201-202	Jan 2/2006
33-42-00	Pages 101-102	Jan 2/2006
33-42-00	Pages 201-205	Jan 2/2006
33-43-00	Pages 201-202	Dec 2/2002

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

LIGHTING - GENERAL

1. Scope

A. This chapter describes those units and components which provide for external and internal illumination such as landing lights, taxi lights, position lights, dome lights, etc. This chapter does not include warning lights for individual systems or self-illuminating signs.

B. It is intended to use the information in this chapter in conjunction with wiring diagrams to provide data required to maintain the lighting systems that illuminate the interior and exterior of the airplane. An understanding of the function of the components, electrical circuits, electrical wiring, and switches is necessary to perform effective troubleshooting beyond lamp replacement. See the Model 206/T206 Wiring Diagram Manual for electrical diagrams of specific systems.

C. This chapter is divided into sections to aid maintenance personnel to find information. The sections provide maintenance procedures for individual exterior and interior lighting systems of the airplane.

(1) Exterior lighting.
- (a) Flashing beacon light assembly located on the vertical fin tip assembly.
- (b) Tail navigation light.
- (c) Underwing courtesy lights.
- (d) Wing tip strobe lights.
- (e) Landing and taxi lights located on the left wing.
- (f) Left (red) and right (green) navigation lights.

(2) Interior lighting.
- (a) Three dome lights provide flood lighting.
- (b) Map light is located on the pilot control wheel.
- (c) Pedestal (console) lighting is provided by an upper and lower pedestal light.
- (d) Instrument lighting and a glareshield light provide lighting for flight instruments. Control of light brightness is provided through dimming circuitry.

FLOOD LIGHTING - MAINTENANCE PRACTICES

1. General

A. Cabin flood lighting is mounted in the aft and the forward parts of the overhead console. Each flood light has a switch. The forward and the aft lights are reading lights. On airplanes with Garmin G1000 and equipped with oxygen, there is a light mounted on the oxygen panel. Dimming of the oxygen panel light is controlled by the STBY IND dimmer switch located on the switch panel on the pilot instrument panel.

WARNING: Obey all oxygen safety precautions on airplanes that have the oxygen panel installed in the overhead console. Refer to the oxygen maintenance practices for correct procedures to use when you must do maintenance on or near the oxygen lines.

2. Floodlight Bulb Removal/Installation

CAUTION: The floodlight bulb can break if too much pressure is applied when you remove and install it.

NOTE: Removal/Installation is typical for all floodlight bulbs.

A. Floodlight Bulb Removal (Refer to Figure 201)
   (1) Press the lens holder up and turn it counterclockwise.
   (2) Remove the lens holder.
   (3) Carefully push the bulb up and turn it counterclockwise.
   (4) Remove the bulb.

B. Floodlight Bulb Installation (Refer to Figure 201)
   (1) Put the bulb in position.
   (2) Carefully push the bulb up and turn it clockwise.
   (3) Put the lens in position.
   (4) Push the lens holder up and turn it clockwise.

3. Light Assembly Removal/ Installation

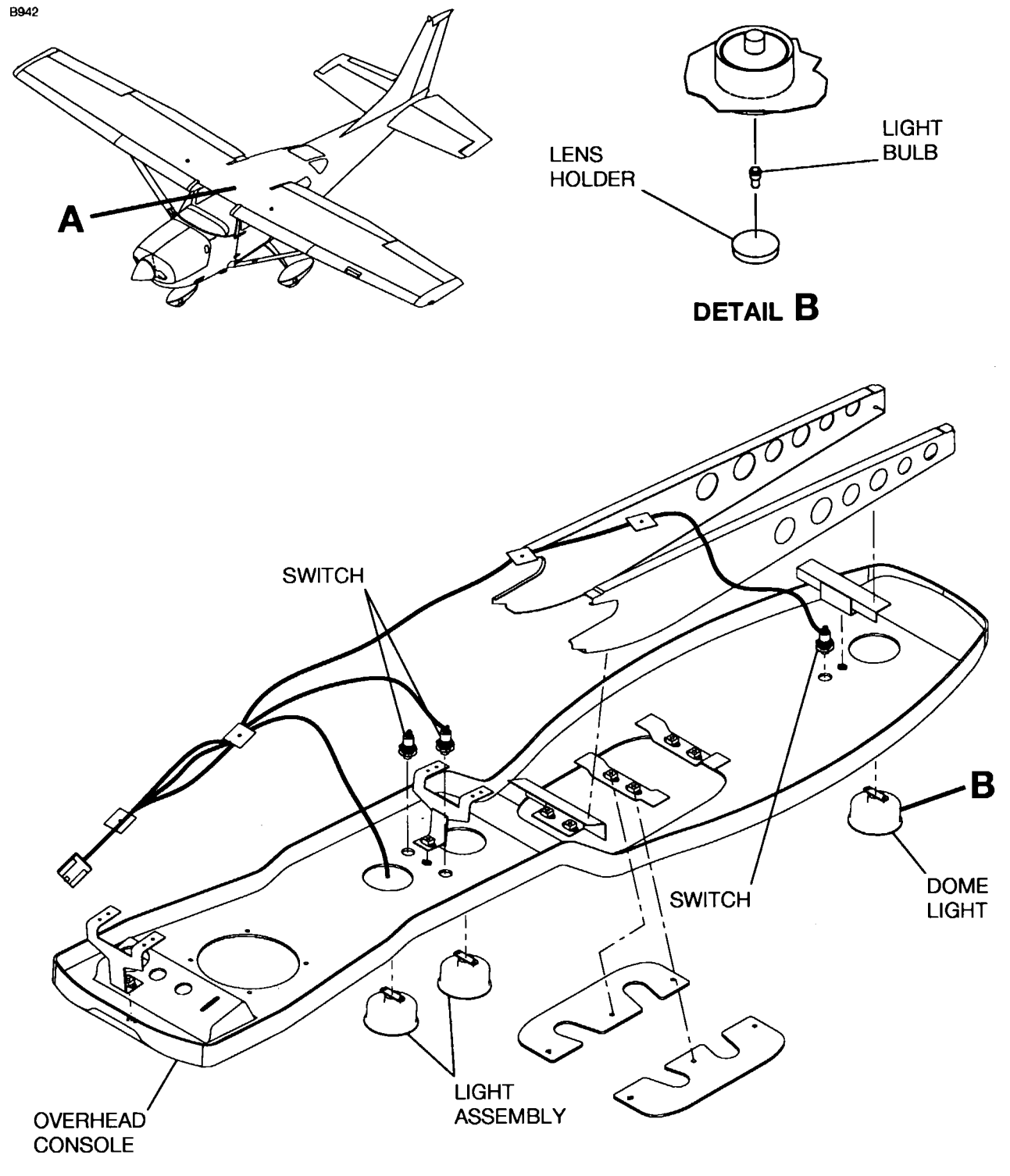
NOTE: Removal and installation is typical for the three overhead dome light assemblies.

A. Light Assembly Removal (Refer to Figure 201).
   (1) Put the ALT/BAT MASTER switch in the off position.

CAUTION: Support the overhead console when you remove the screws to prevent damage to the electrical wiring in the overhead console.

   (2) Remove the screws that attach the overhead console to the attach brackets.
   (3) Identify, tag, and disconnect the electrical wires from the light assembly.
   (4) Remove the light assembly from the overhead console.

B. Light Assembly Installation (Refer to Figure 201).
   (1) Put the light assembly in position.
   (2) Attach the light assembly to the overhead console.
   (3) Connect the electrical wires to the light assembly.
   (4) Attach the overhead console to the attach brackets with the screws.
   (5) Put the ALT/BAT MASTER switch in the ON position.



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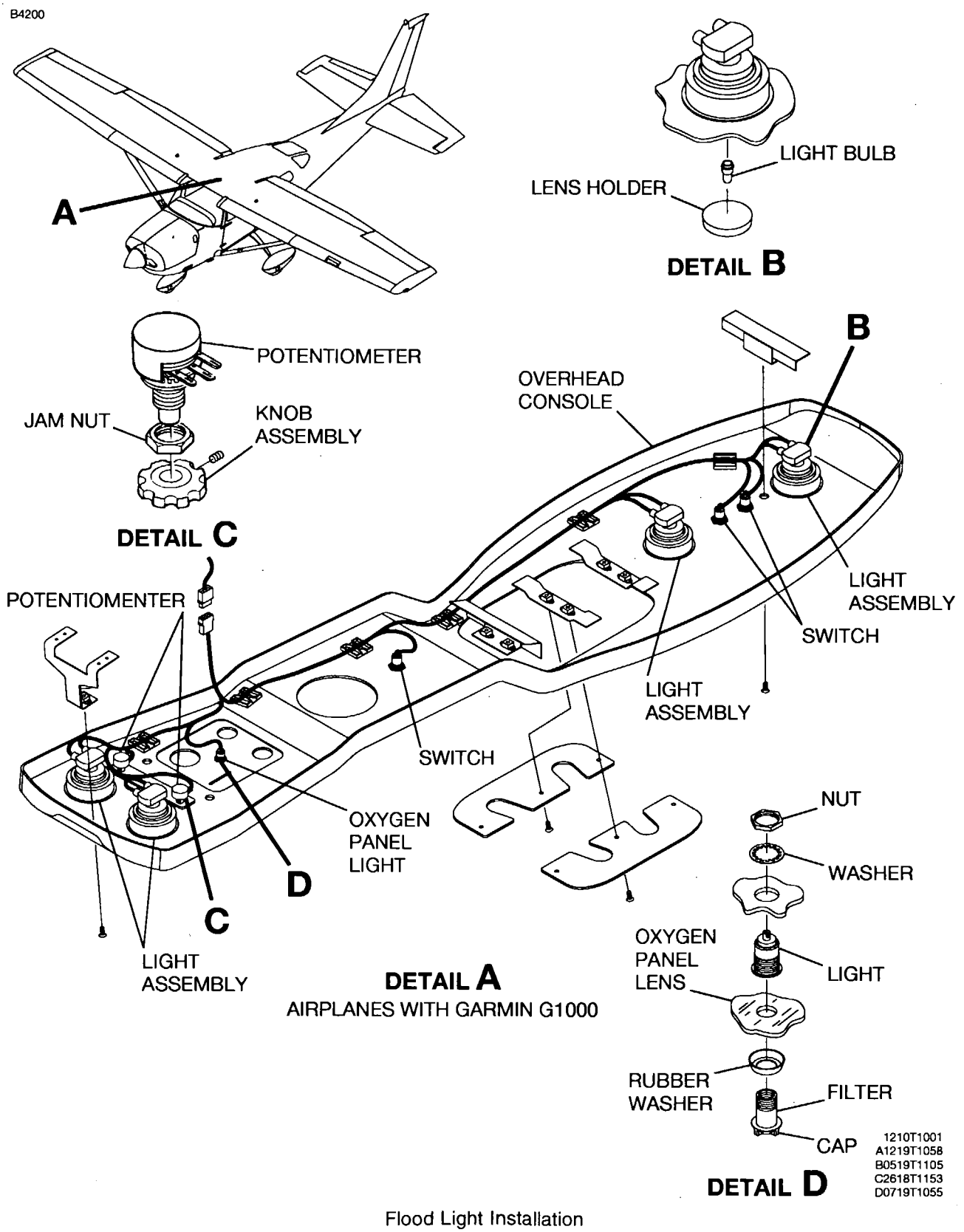
Flood Light Installation
Figure 201 (Sheet 1)



Flood Light Installation
Figure 201 (Sheet 2)

4. Light Assembly Switch Removal/Installation

NOTE: Removal and installation of the overhead dome light assembly switches is typical. The switch for the rear light assembly also controls lighting for the under wing courtesy lights.

A. Light Assembly Switch Removal (Refer to Figure 201).
(1) Put the ALT/BAT MASTER switch in the off position.

CAUTION: Support the overhead console when you remove the screws to prevent damage to the electrical wiring in the overhead console.

(2) Remove the overhead console from the attach brackets.
(3) Identify, tag, and disconnect the wires from the switch.
(4) Remove the switch from the overhead console.

B. Light Assembly Switch Installation (Refer to Figure 201).
(1) Install the switch in the overhead console.
(2) Connect the electrical wires to the switch.
(3) Attach the overhead console to the attach brackets with the screws.
(4) Put the ALT/BAT MASTER switch in the ON position.

5. Potentiometer Removal/Installation

A. Potentiometer Removal (Refer to Figure 201).
(1) Put the ALT/BAT MASTER switch in the off position.

CAUTION: Support the overhead console when you remove the screws to prevent damage to the electrical wiring in the overhead console.

(2) Remove the overhead console from the attach brackets.
(3) Identify, tag, and disconnect the wires from the switch.
(4) Remove the knob assembly and the jam nut from the potentiometer.
(5) Remove the potentiometer from the overhead console.

B. Potentiometer Installation (Refer to Figure 201).
(1) Install the jam nut and the knob assembly.
(2) Connect the electrical wires to the potentiometer.
(3) Attach the overhead console to the attach brackets with the screws.
(4) Put the ALT/BAT MASTER switch in the ON position.

6. Oxygen Panel Light Bulb Removal/ Installation (Airplanes with Garmin G1000)

CAUTION: The floodlight bulb can break if too much pressure is applied when you remove and install it.

A. Oxygen Panel Light Bulb Removal (Refer to Figure 201).
(1) Put the ALT/BAT MASTER switch in the off position.
(2) Remove the oxygen panel light assembly.
(3) Carefully turn the bulb counterclockwise.
(4) Remove the bulb from the light assembly.

B. Oxygen Panel Light Bulb Installation (Refer to Figure 201).
(1) Put the bulb in position.
(2) Carefully turn the bulb clockwise.
(3) Install the oxygen panel light assembly.
(4) Put the ALT/BAT MASTER switch in the ON position.

7. Oxygen Panel Light Assembly Removal/ Installation (Airplanes with Garmin G1000)

A. Oxygen Panel Light Assembly Removal (Refer to Figure 201).
(1) Put the ALT/BAT MASTER switch in the off position.
(2) Turn the cap on the oxygen panel light assembly counterclockwise.
(3) Remove the cap, washer, and light assembly from the oxygen panel.

B. Oxygen Panel Light Assembly Installation (Refer to Figure 201.)
(1) Put the washer and light assembly in position on the oxygen panel.
(2) Put the cap in position on the light assembly.
(3) Turn the cap clockwise to tighten.
(4) Put the ALT/BAT MASTER switch in the ON position.

GLARESHIELD LIGHT - MAINTENANCE PRACTICES

1. General

A. A light source installed under the glareshield gives light for the instrument panel. A glareshield light dim control is mounted on the right side of the circuit panel assembly. The glareshield light is powered by a variable AC from the light inverter that is attached to and located behind the copilot instrument panel.

2. Glareshield Light Removal and Installation (For Airplanes 20608001 thru 20608138 and Airplane T20608001 thru T20608259)

A. Remove the Glareshield Light (Refer to Figure 201).
(1) Set the MASTER ALT/BAT switch to the off position.
(2) Remove the screws in the copilot instrument panel to get access to the glareshield light connector. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.

NOTE: Note location of the two spacers installed between the panel and bulkhead for installation of copilot instrument panel assembly.

(3) Disconnect the glareshield light connector.
(4) Remove the screws that attach the lens to the glareshield.

NOTE: Velcro strips are located on the edge of the lens to prevent light leakage around the lens.

(5) Remove the light from the light clips.

B. Install the Glareshield Lamp (Refer to Figure 201).
(1) Position the lamp in the glareshield with the electrical wire and connector on the right side of the airplane.
(2) Attach the lamp with the light clips.
(3) Install the glareshield lens to glareshield with the screws.

NOTE: Apply the Velcro strips to the edge of the lens as necessary to prevent light leakage around lens.

(4) Connect the glareshield light connector (J2) to the power supply connector (P2).
(5) Install the copilot instrument panel to with screws. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.

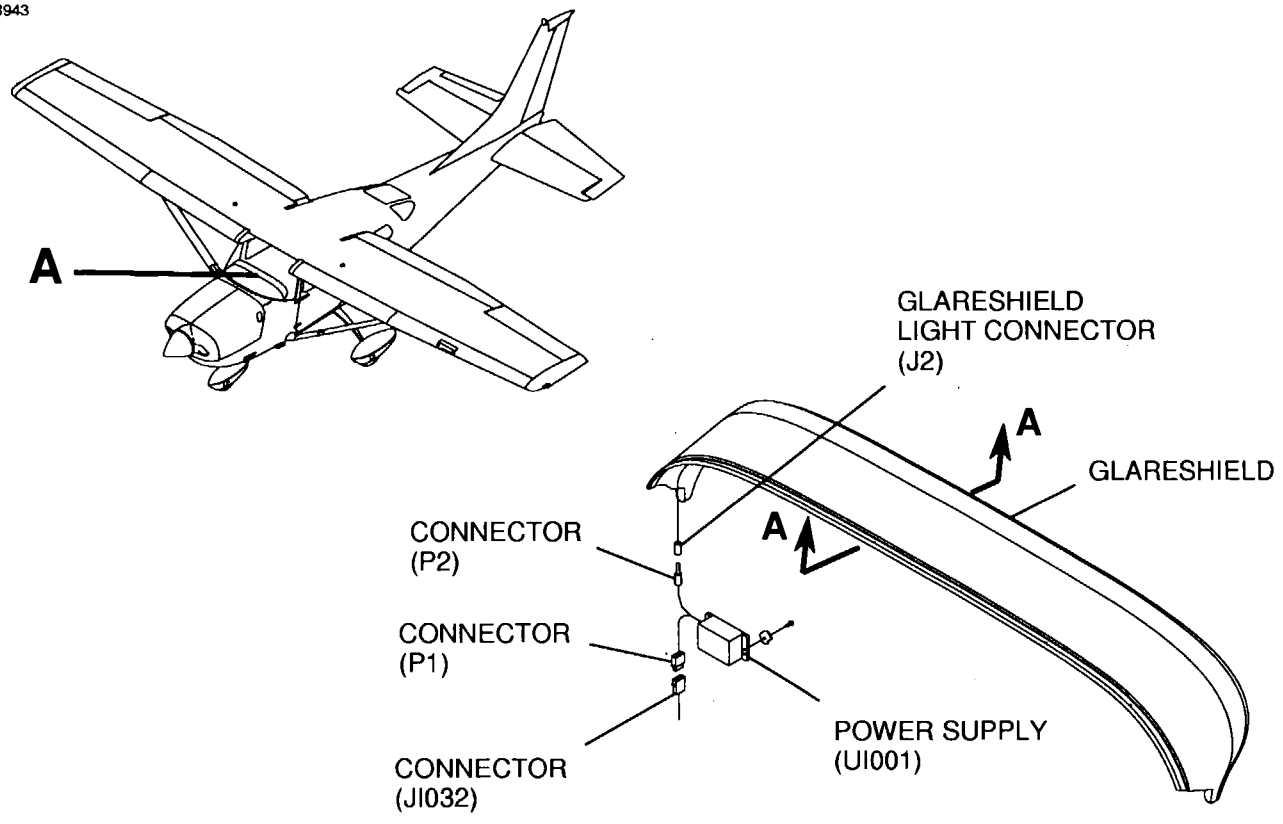
NOTE: Two spacers are installed between the panel and bulkhead that use two screws which attach the right side of the panel.

(6) Connect electrical power to the airplane.
(7) Make sure the glareshield light operates correctly.

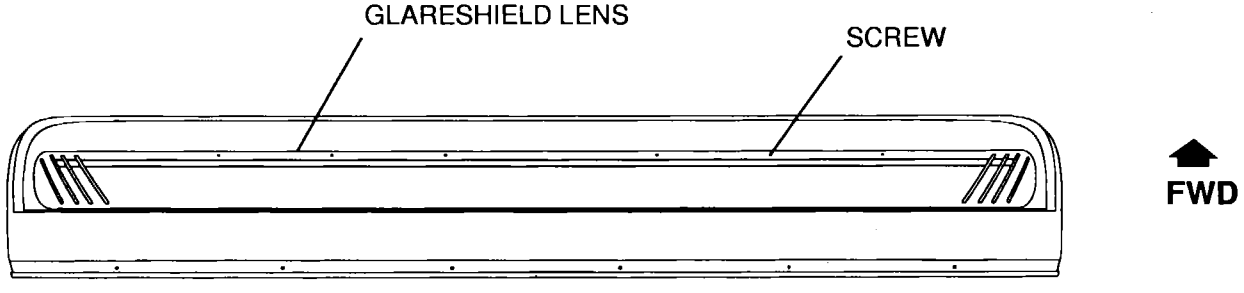
3. Glareshield Light Removal and Installation (For Airplanes 20608139 and On and Airplane T20608260 and On)

A. Remove the Glareshield Light (Refer to Figure 202).
(1) Set the MASTER ALT/BAT switch to the off position.
(2) Remove the screws that attach the light strip to the glareshield.
(3) Remove the front screw in each outboard offset plate.
(4) Loosen the aft screw installed in each outboard offset plate so that the offset plate can turn.

B943



DETAIL A
AIRPLANES 20608001 THRU 20608138 AND
AIRPLANES T20608001 THRU T20608259

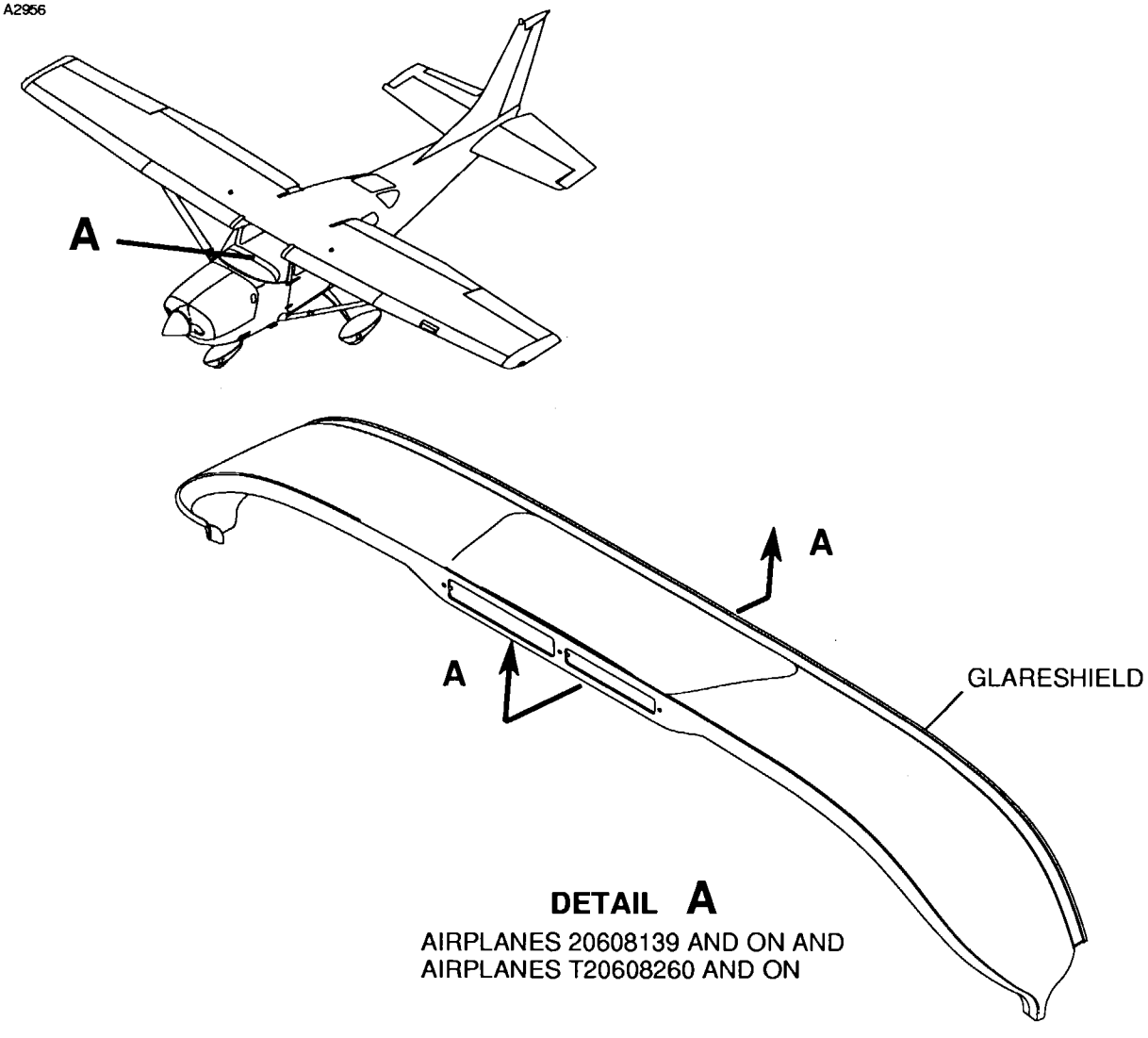


VIEW A-A
LOOKING UP FROM UNDER GLARESHIELD

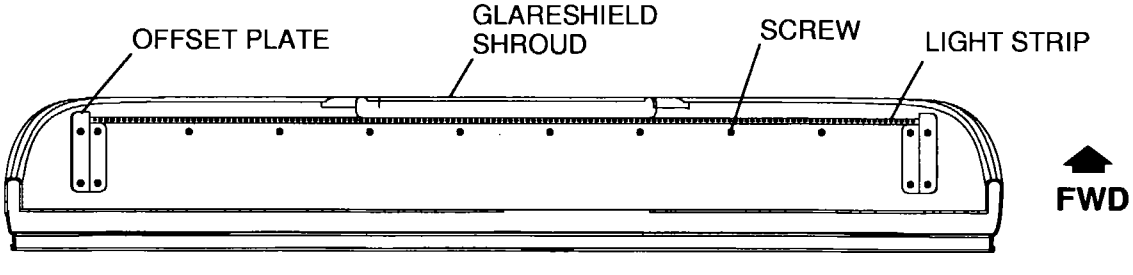
1210T1001
A1219T1015
AA1218T1038

Glareshield Light
Figure 201 (Sheet 1)

A2956



DETAIL A
AIRPLANES 20608139 AND ON AND
AIRPLANES T20608260 AND ON



VIEW A-A
LOOKING UP FROM UNDER GLARESHIELD

1210T1001
A1214T1033
AA0719T1015

Glareshield Light
Figure 202 (Sheet 1)

CAUTION: Do not bend the light strip. The light strip will be easily damaged when it is not supported in the glareshield.

(5) Carefully remove the light strip from the glareshield.

B. Install the Glareshield Lamp (Refer to Figure 202).

CAUTION: Do not bend the light strip. The light strip will be easily damaged when it is not supported in the glareshield.

(1) Set the light strip in the glareshield and turn the each outboard offset plate so that it supports the light strip.
(2) Install and tighten the screws in each offset plate.
(3) Install the screws in the light strip.
(4) Set the MASTER ALT/BAT switch to the ON position.
(5) Make sure the glareshield light operates correctly.

4. Power Supply Removal/Installation (UI001) (For Airplanes 20608001 thru 20608138 and Airplane T20608001 thru T20608259)

A. Remove the Power Supply (UI001) (Refer to Figure 201).
(1) Set the MASTER BAT/ALT switch to the off position.
(2) Remove the copilot instrument panel. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.
(3) Disconnect the glareshield light connector (J2) and the glareshield power supply connector (P2).
(4) Disconnect the connectors (P1) and (JI032).
(5) Remove the screws that attach the power supply (UI001) and remove it from the airplane.

B. Install the Power Supply (UI001) (Refer to Figure 201).
(1) Attach the power supply (UI001) with the screws to the back of the copilot instrument panel.
(2) Attach the connector (P1) to connector (JI032).
(3) Attach the glareshield light connector (J2) and the power supply connector (P1).
(4) Install the copilot instrument panel. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.
(5) Set the MASTER BAT/ALT switch to ON.
(6) Make sure the glareshield operates correctly.

5. Glareshield Lighting Dimming Control Removal and Installation

A. For the removal and installation procedures on the Dim Control for the Glareshield Light, refer to Radio Lighting - Maintenance Practices.

PEDESTAL LIGHTING - MAINTENANCE PRACTICES

1. General

A. Three single bulb-type lights are installed on the pedestal cover assembly. Two lights are upper pedestal lights and the third is a lower pedestal light. The upper pedestal lights are located on the bottom side of the instrument panel protected by a light cover. The lower pedestal light is centered in the pedestal cover assembly above the fuel selector valve. A pedestal lighting dimming control (PEDESTAL LT) is mounted on the right side of the circuit panel assembly.

B. General maintenance is limited to lamp replacement. See Model 206 Wiring Diagram Manual for troubleshooting associated electrical wiring and lamp holders. The upper and lower pedestal light disconnects are located in the pedestal assembly behind the pedestal cover assembly.

2. Pedestal Light Lamp Replacement

A. Replace Upper Pedestal Light Lamps (Refer to Figure 201).
(1) Remove electrical power from airplane. Position MASTER BAT/ALT switch to OFF.
(2) Remove screws securing light cover to the panel assembly.
(3) Rotate lamp to free lamp from lamp holder. Remove lamp from lamp holder.
(4) Install new lamp in lamp holder.

CAUTION: For proper heat dissipation, attaching tab of reflector must be sandwiched between panel assembly and light cover assembly.

(5) Ensure reflector is properly positioned and secure light cover to panel assembly with screws.
(6) Restore electrical power to airplane.

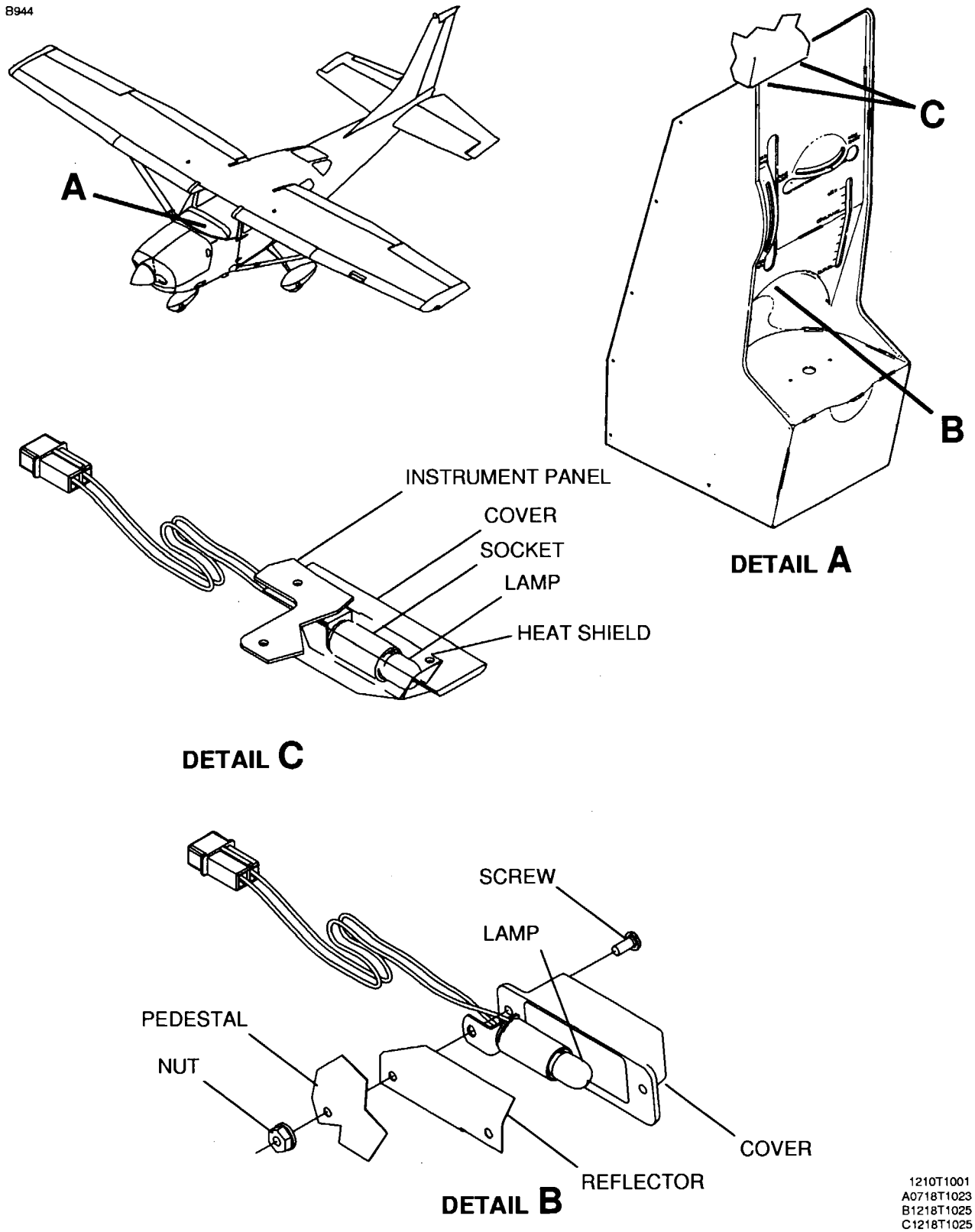
B. Replace Lower Pedestal Light Lamp (Refer to Figure 201).
(1) Remove electrical power from airplane. Position MASTER BAT/ALT switch to OFF.
(2) Remove screws securing light cover to the pedestal cover assembly.
(3) Rotate lamp to free lamp from lamp holder. Remove lamp from lamp holder.
(4) Install new lamp in lamp holder.

CAUTION: For proper heat dissipation, attaching tab of reflector must be sandwiched between pedestal cover assembly and light cover assembly.

(5) Ensure reflector is properly positioned and secure light cover to pedestal cover assembly with screws.
(6) Restore electrical power to airplane.

3. Pedestal Lighting Dimming Control Removal and Installation

A. For Pedestal Lighting Dimming Control Removal and Installation, refer to Radio Lighting - Maintenance Practices, Radio Lighting Dimming Control Removal and Installation.



Pedestal Lighting Installation
Figure 201 (Sheet 1)

INSTRUMENT LIGHTING - MAINTENANCE PRACTICES

1. General

A. Flight instruments are individually lighted by a replaceable light bar installed at the top of the instrument. Engine instruments are individually lighted by replaceable light bulbs. Both flight and engine instruments are connected to a dimming assembly and an instrument lighting dimming control. The dimming assembly is located behind (forward of) the copilot instrument panel assembly at RBL 18.00 and WL 15.00. The instrument lighting dimming control (PANEL LT) is mounted on the right side of the circuit panel assembly.

2. Flight Instrument Light Bar Replacement

A. Replace Flight Instrument Light Bar (Refer to Figure 201).
   (1) Remove electrical power from airplane. Position MASTER BAT/ALT switch to OFF. Position all LIGHTS switches on circuit panel assembly to the OFF position.
   (2) Remove necessary instrument panel assemblies to gain access to flight instrument. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.
   (3) Remove flight instrument.
   (4) Remove screws securing light bar to flight instrument.
   (5) Replace light bar and secure with screws.
   (6) Install flight instrument.
   (7) Install instrument panel assemblies previously removed. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.
   (8) Restore electrical power to airplane. Position LIGHTS switches on circuit panel assembly as required.

3. Engine Instrument Light Bulb Replacement

A. Replace Engine Instrument Light Bulbs (Refer to Figure 201).
   (1) Remove electrical power from airplane. Position MASTER BAT/ALT switch to OFF. Position all LIGHTS switches on circuit panel assembly to the OFF position.
   (2) Remove necessary instrument panel assemblies to gain access to engine instrument. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.
   (3) Remove engine instrument.
   (4) Remove screws securing light cover plate to bottom of instrument.
   (5) Replace light bulbs.
   (6) Secure light cover plate to bottom of instrument with screws.
   (7) Install engine instrument.
   (8) Install instrument panel assemblies previously removed. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.
   (9) Restore electrical power to airplane. Position LIGHTS switches on circuit panel assembly as required.

4. Dimming Assembly Removal/Installation

A. Remove the Dimming Assembly (Refer to Figure 202).
   (1) Remove electrical power from airplane.
   (2) Set the MASTER ALT BAT switch to the OFF position.
   (3) Remove the copilot instrument panel assembly to get access to the dimming assembly. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.
   (4) Disconnect the electrical connectors (J1003 and J1026).
   (5) Remove the screws that attach the dimming assembly to the support assembly.
   (6) Remove the dimming assembly from the airplane.

B. Install the Dimming Assembly (Refer to Figure 202).
   (1) Put the dimming assembly on the support assembly and attach it with screws.
   (2) Connect the electrical connectors (J1003 and J1026)..
   (3) Install the copilot instrument panel assembly. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.

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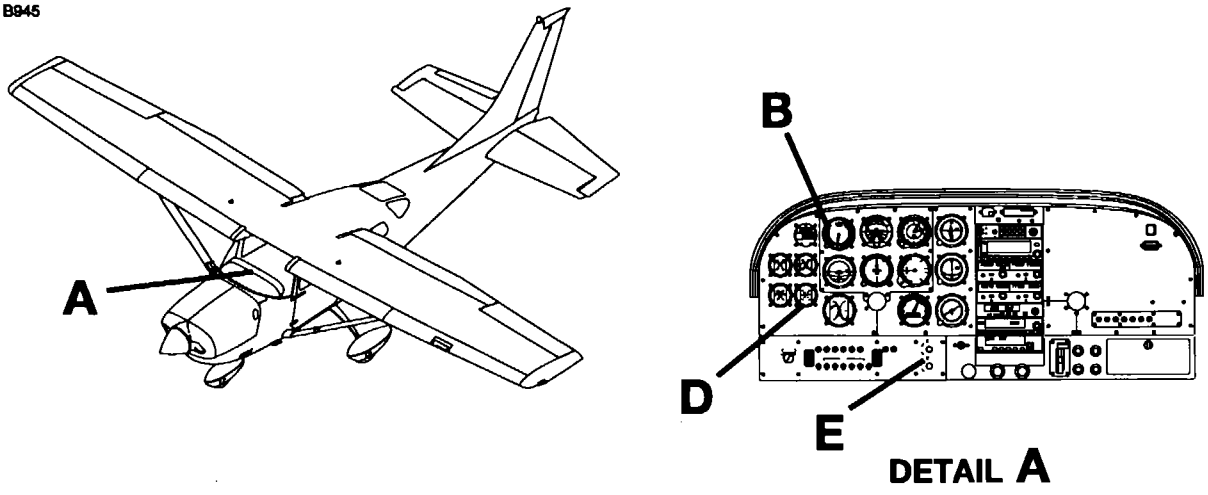
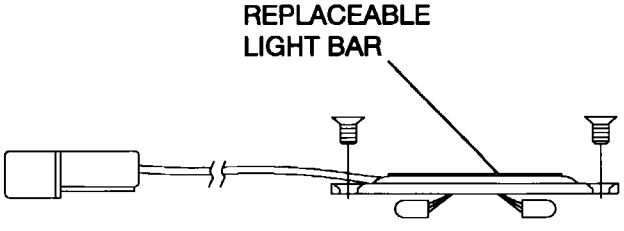
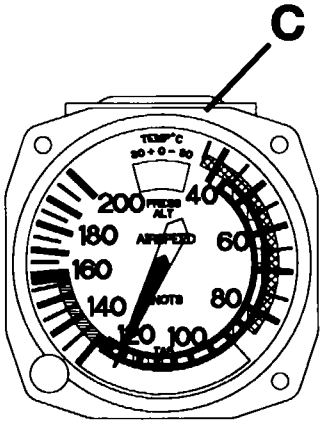


DETAIL A



DETAIL C



DETAIL B

TYPICAL FLIGHT INSTRUMENT LIGHTING

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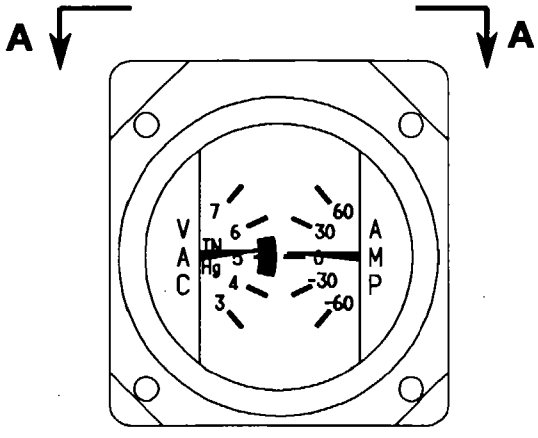
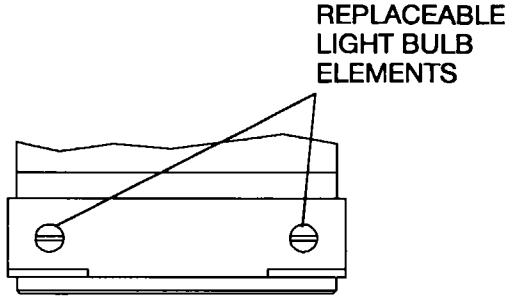
A1218T1001
B0518T1036
C0518T1036

Instrument Lighting Installation
Figure 201 (Sheet 1)

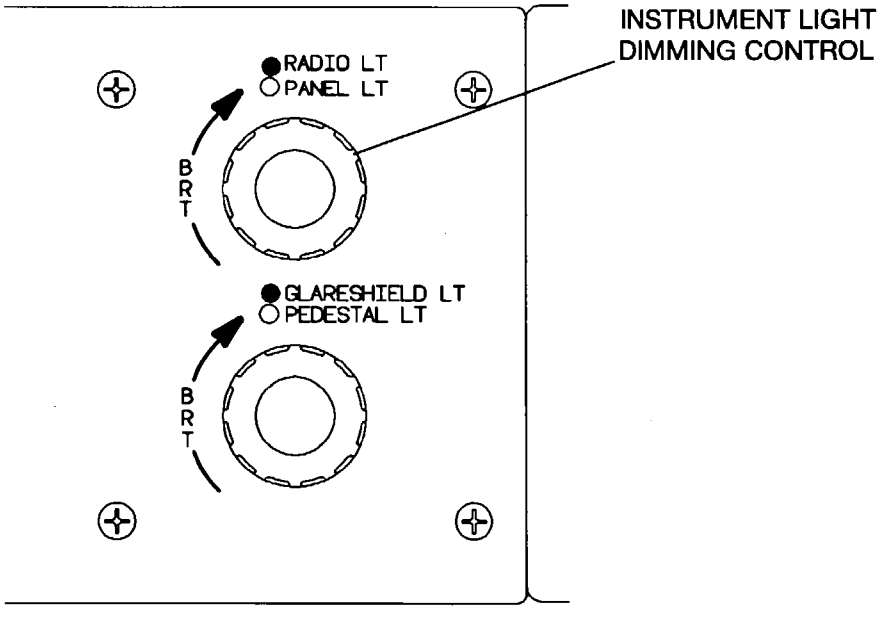
B948



DETAIL D
TYPICAL ENGINE
INSTRUMENT LIGHTING



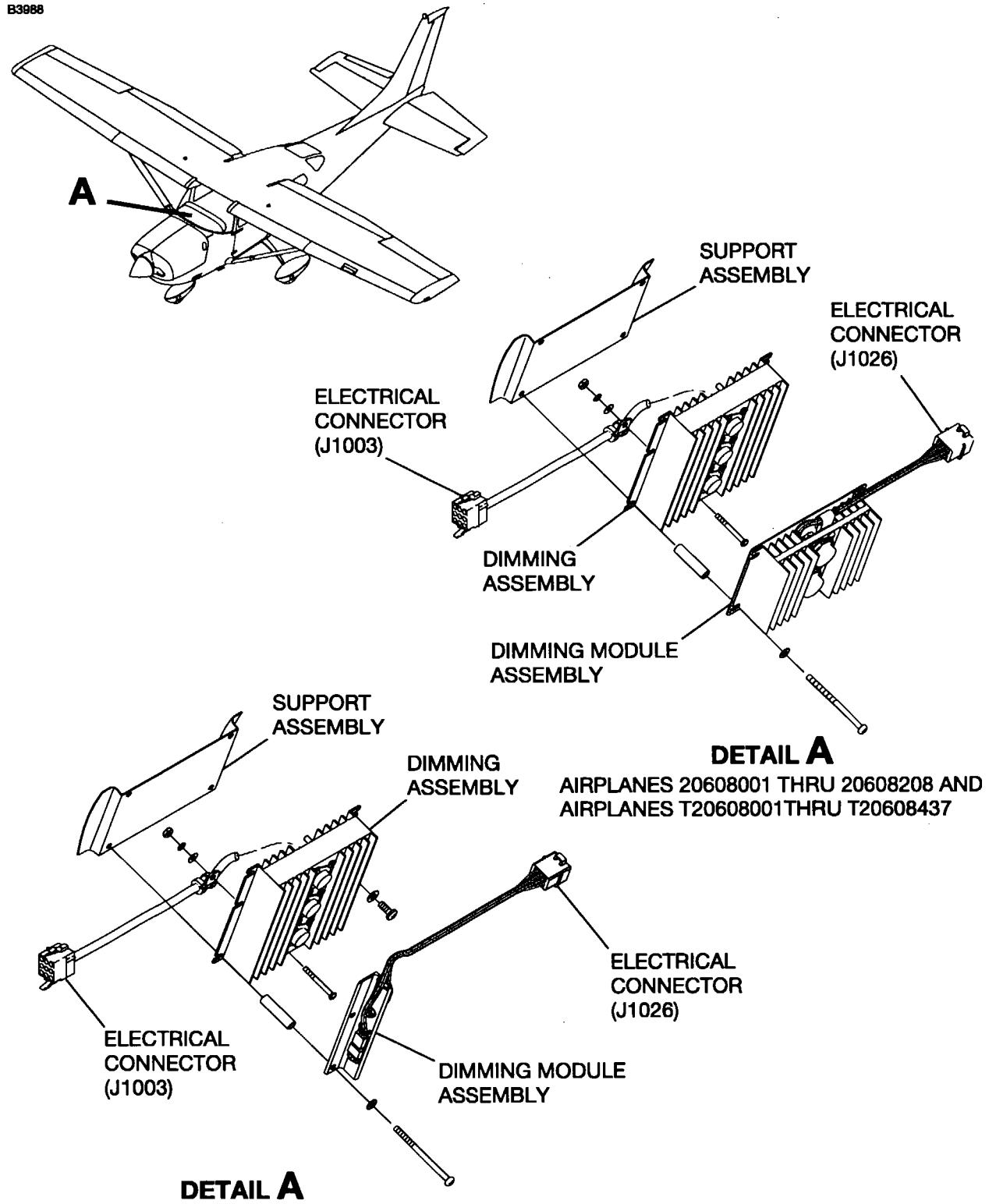
VIEW A-A



DETAIL E

AA0518T1037
D0518T1037
E0718T1001

Instrument Lighting Installation
Figure 201 (Sheet 2)



Dimming Module Assembly Installation
Figure 202 (Sheet 1)

(4) Connect electrical power to the airplane.

5. Instrument Lighting Dimming Control Removal/Installation

A. For Instrument Lighting Dimming Control Removal and Installation, refer to Radio Lighting - Maintenance Practices, Radio Lighting Dimming Control Removal and Installation.

RADIO LIGHTING - MAINTENANCE PRACTICES

1. General

A. Radio lighting consists of internally lighted radios, a dimming assembly, and a radio lighting (RADIO LT) dimming control. Maintenance practices consist of removal and installation for the dimming assembly and radio lighting dimming control.

2. Dimming Assembly Removal and Installation

A. For Dimming Assembly Removal and Installation, refer to Instrument Lighting - Maintenance Practices, Dimming Assembly Removal and Installation.

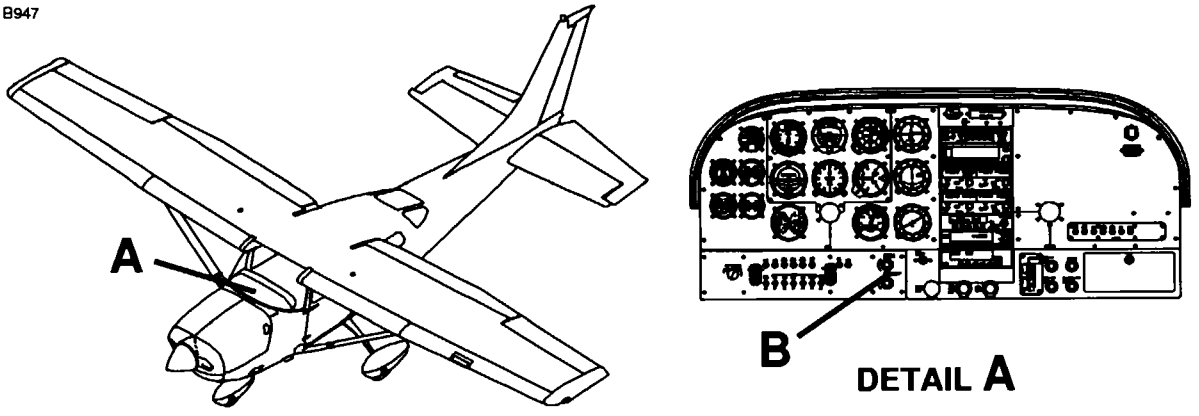
3. Radio Lighting Dimming Control Removal and Installation

NOTE: Two dimming control potentiometers are located on the circuit panel assembly. One dimming control serves as the radio lighting (RADIO LT) and instrument lighting (PANEL LT) dimming control, the second dimming control serves as the glareshield lighting (GLARESHIELD LT) and pedestal lighting (PEDESTAL LT) dimming control. Removal and Installation for both dimming controls are typical.

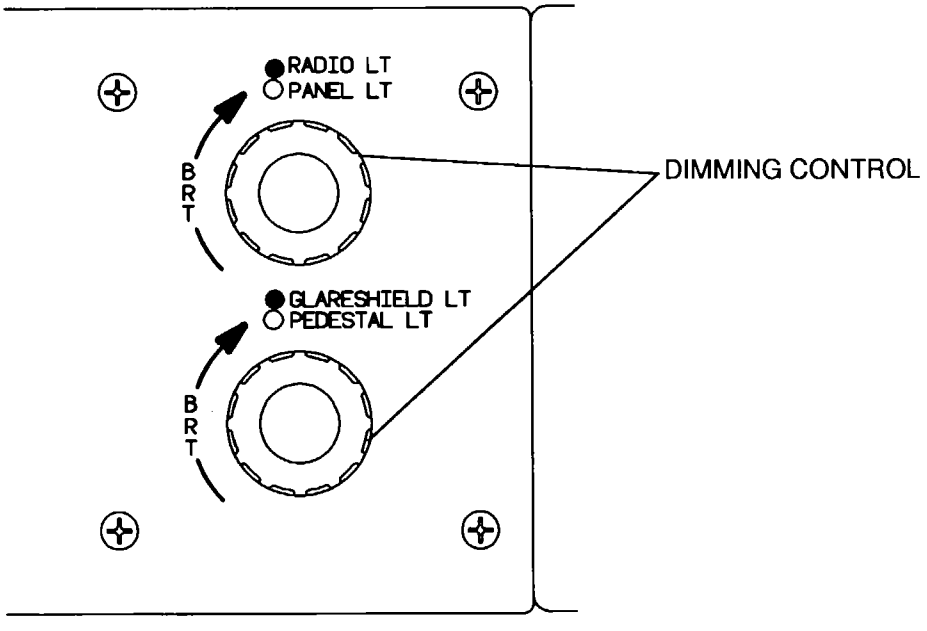
A. Remove Dimming Control (Refer to Figure 201).
   (1) Remove electrical power from airplane. Position MASTER BAT/ALT switch to OFF.
   (2) Remove circuit panel assembly. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.
   (3) Loosen setscrew on knob and remove knob to access nut securing dimming control to circuit panel assembly.
   (4) Remove nut securing dimmer control to circuit panel assembly.
   (5) Identify, tag, and unsolder wires connected to dimming control.
   (6) Remove dimming control from airplane.

B. Install Dimming Control (Refer to Figure 201).
   (1) Position dimming control and solder labeled wires to proper pins. See Model 172 Wiring Diagram Manual.
   (2) Place dimming control through circuit panel assembly and secure with nut.
   (3) Position knob on dimming control and set with setscrew.
   (4) Install circuit panel assembly. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.
   (5) Restore electrical power to airplane.

B947



DETAIL A



DETAIL B

1210T1001
A1218T1001
B0718T1001

Dimming Control Installation
Figure 201 (Sheet 1)

PILOT CONTROL WHEEL LIGHTING - MAINTENANCE PRACTICES

1. General

A. A map light is installed in the bottom center surface of the pilot's control wheel. Light brilliance is controlled by a potentiometer located in the bottom right side of the pilot's control wheel. A knob is attached to the potentiometer and accessible on the bottom of the control wheel for map light adjustment.

2. Map Light Assembly Removal and Installation

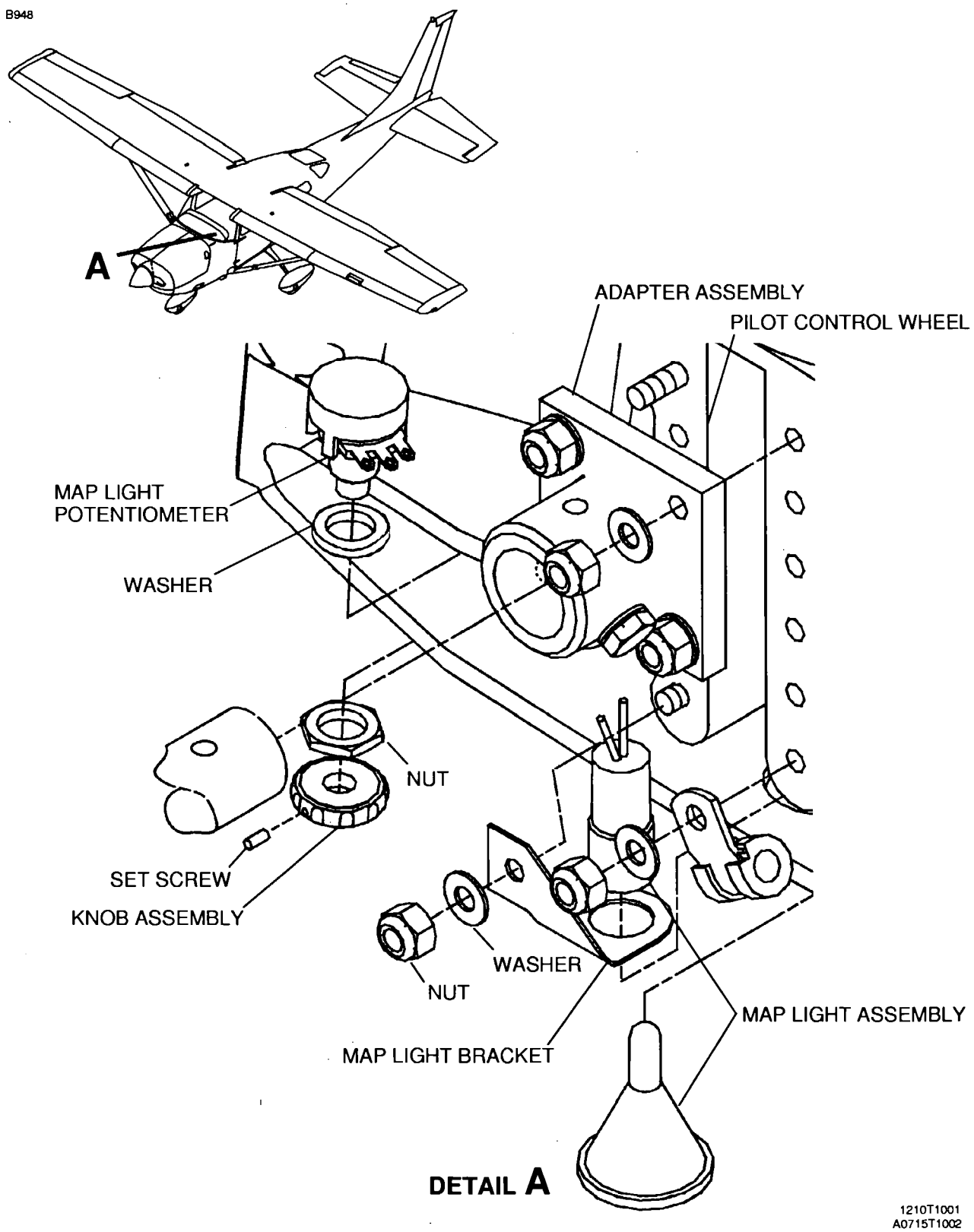
A. Remove Map Light Assembly (Refer to Figure 201).
(1) Remove electrical power from airplane. Position the LIGHTS NAV switch to the OFF position.
(2) Remove nut, washer, and bolt securing map light bracket to control wheel.
(3) Remove map light assembly from control wheel.
(4) Identify, tag, and disconnect map light assembly wiring.
(5) Remove map light assembly from airplane.

B. Install Map Light Assembly (Refer to Figure 201).
(1) Position map light assembly to pilot control wheel and connect map light assembly wiring.
(2) Place bracket and map light assembly in control wheel and secure with bolt, washer, and nut.
(3) Restore electrical power to airplane. Position LIGHTS NAV switch to desired position.

3. Map Light Potentiometer Removal and Installation

A. Remove Map Light Potentiometer (Refer to Figure 201).
(1) Remove electrical power from airplane. Position the LIGHTS NAV switch to the OFF position.
(2) Loosen setscrew securing knob assembly to map light potentiometer. Remove knob assembly.
(3) Remove nut and washer securing map light potentiometer to control wheel.
(4) Pull map light potentiometer out of control wheel to access electrical wires.
(5) Identify, tag, and disconnect wires from map light potentiometer.
(6) Remove map light potentiometer from airplane.

B. Install Map Light Potentiometer (Refer to Figure 201).
(1) Position map light potentiometer at pilot control wheel and connect electrical wires to map light potentiometer.
(2) Place map light potentiometer in control wheel and secure with washer and nut.
(3) Position knob assembly on map light potentiometer and secure with set screw.
(4) Restore electrical power to airplane. Position LIGHTS NAV switch to desired position.



Map Light Assembly and Potentiometer Installation
Figure 201 (Sheet 1)

NAVIGATION AND STROBE LIGHTS - MAINTENANCE PRACTICES

1. General

A. The airplane is equipped with both fixed intensity navigation lights and pulsing strobe lights.
   (1) Navigation lights are located on the left wing tip, right wing tip, and tailcone. The navigation lights in the wing tips are co-located with the strobe lights, and the navigation light in the tailcone is located in its own housing.
      (a) Bulbs for all three navigation lights are clear. The lens assembly on the right wing tip is colored green, the lens assembly on the left wing tip is colored red, and the lens assembly on the tailcone is clear.
      (b) The navigation lights are activated by placing the LIGHTS NAV/OFF switch on the circuit panel assembly to the NAV position. This position supplies power concurrently to all three lights.
   (2) Strobe lights are co-located with navigation lights in the wing tip housing.
      (a) The strobe tube (light) and lens are both clear. The strobe lights are activated by placing the LIGHTS STROBE/OFF switch to the STROBE position. This position supplies power to the right and left strobe power supplies located in the wing tips, providing pulsed energy to the strobe tube assemblies.
   (3) General maintenance is limited to lamp/tube replacement and removal and installation of the strobe light power supplies. See the Model 206/T206 Wiring Diagram Manual for troubleshooting light assemblies and associated electrical wiring.

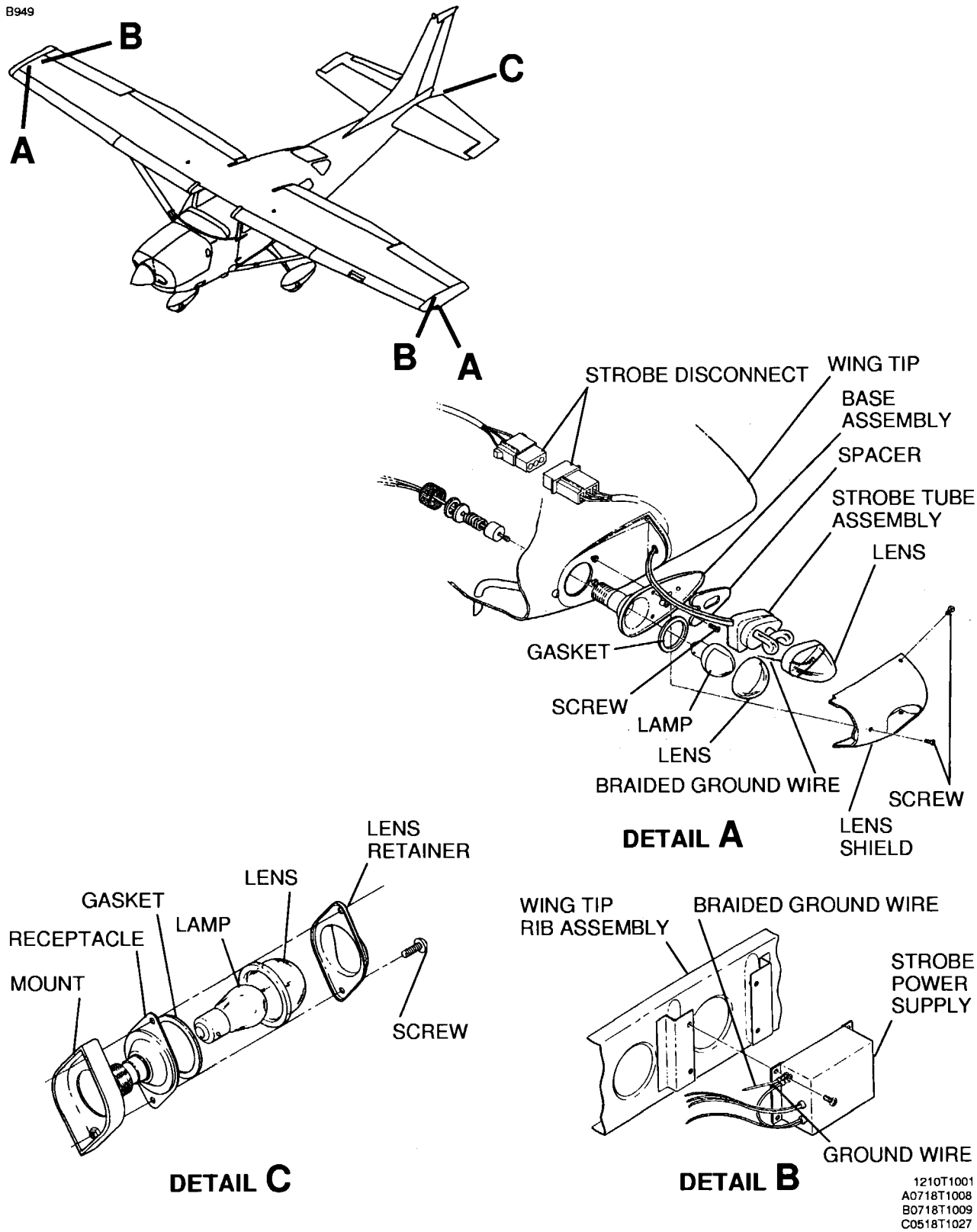
2. Navigation Light Lamp Removal and Installation

A. Wing Tip Navigation Light Lamp Removal and Installation.

   NOTE: Removal and installation is typical for the left and right wing tip navigation light lamps.

   (1) Remove Wing Tip Navigation Light Lamp (Refer to Figure 201).
      (a) Remove electrical power from airplane. Position LIGHTS NAV/OFF switch on circuit panel assembly to OFF.
      (b) Remove screws securing lens shield to wing tip.
      (c) Remove lens from navigation light assembly.
      (d) Grasp lamp, depress slightly and turn counterclockwise to release and remove lamp from bayonet mount.
   (2) Install Wing Tip Navigation Light Lamp (Refer to Figure 201).
      (a) Place lamp in bayonet socket, depress, and gently turn clockwise until lamp seats in socket.
      (b) Position lens and gasket in place.
      (c) Secure lens by installing lens shield to wing tip with screws.
      (d) Restore electrical power to airplane. Position LIGHTS NAV/OFF switch to NAV.
      (e) Check operation of wing tip navigation light.

B. Tail Navigation Light Lamp Removal and Installation.
   (1) Remove Tail Navigation Light Lamp (Refer to Figure 201).
      (a) Remove electrical power from airplane. Position LIGHTS NAV/OFF switch on circuit panel assembly to OFF.
      (b) Remove screws securing lens retainer to mount.
      (c) Remove lens to gain access to lamp.
      (d) Grasp lamp, depress slightly and turn counterclockwise to release and remove lamp from bayonet mount.
   (2) Install Tail Navigation Light Lamp (Refer to Figure 201).
      (a) Place lamp in bayonet socket, depress, and gently turn clockwise until lamp seats in socket.
      (b) Position lens and gasket over lamp.
      (c) Secure lens by installing lens retainer with screws.
      (d) Restore electrical power to airplane. Position LIGHTS NAV/OFF switch to NAV.
      (e) Check operation of tail navigation light.



Navigation and Strobe Light Installation
Figure 201 (Sheet 1)

3. Strobe Tube Assembly Removal and Installation

NOTE: Removal and installation is typical for both the right and left strobe tube assemblies.

A. Remove Strobe Tube Assembly (Refer to Figure 201).
   (1) Remove electrical power from airplane. Position LIGHTS STROBE/OFF switch on circuit panel assembly to OFF.
   (2) Remove screws securing lens shield to wing tip.

      NOTE: Following removal of lens shield and prior to removing the strobe light lens, note the placement of the braided ground wire positioned on the inside of the lens between the lens and strobe tube assembly.

   (3) Remove lens from front of strobe tube assembly.

      CAUTION: If strobe tube assembly is being removed to facilitate other maintenance and not being replaced with new strobe tube assembly, then use protective gloves or cotton wrap to ensure fingertip oil does not come in contact with strobe tube assembly.

   (4) Carefully pull the strobe light assembly wiring to retrieve the strobe connector from inside the wing tip. Disconnect strobe connector.

      NOTE: If the strobe connector cannot be retrieved from inside of wing tip, it will be necessary to remove wing tip to gain access to strobe connector.

   (5) Remove strobe tube assembly from base assembly and remove from wing tip.

B. Install Strobe Tube Assembly (Refer to Figure 201).

   CAUTION: Use protective gloves or cotton wrap to ensure fingertip oil does not come in contact with strobe tube assembly.

   (1) Position strobe tube assembly and connect strobe connector.
      (a) If access to the strobe connector required removal of the wing tip, then perform the following:

         CAUTION: Use protective gloves or cotton wrap to ensure fingertip oil does not come in contact with strobe tube assembly.

         1 Position wing tip and strobe tube assembly at wing.
         2 Feed strobe connector and strobe light assembly wiring through wing tip and connect to strobe connector.
         3 Install wing tip.

   (2) Feed strobe connector and access strobe light assembly wiring into wing tip.

      NOTE: If wing tip was removed to access strobe connector, then strobe connector will already be positioned in the wing tip.

      CAUTION: Use protective gloves or cotton wrap to ensure fingertip oil does not come in contact with strobe tube assembly.

   (3) Position spacer and install strobe tube assembly to base assembly.
   (4) Position lens at strobe tube assembly and place braided ground wire inside of lens.

CAUTION: Following placing lens unto strobe tube assembly, verify that braided ground wire is properly positioned inside of lens and between the lens and strobe tube assembly.

(5) Place lens on strobe tube assembly.
(6) Secure lens by installing lens shield with screws.
(7) Restore electrical power to airplane. Position LIGHTS STROBE/OFF switch to STROBE position.
    (a) Check strobe light for proper operation.

4. Strobe Power Supply Removal and Installation

NOTE: Removal and installation is typical for both the left and right strobe power supplies.

A. Remove Strobe Power Supply (Refer to Figure 201).
(1) Remove electrical power from airplane. Position LIGHTS STROBE/OFF switch on circuit panel assembly to OFF.
(2) Remove wing tip to access strobe power supply.
(3) Disconnect the strobe connector and strobe power supply connector.
(4) Remove screws securing strobe power supply to wing tip rib assembly.

NOTE: Note the screw location used for installation of the strobe power supply ground wire and the braided ground wire from the lens for the strobe tube assembly.

(5) Remove strobe power supply from airplane.

B. Install Strobe Power Supply (Refer to Figure 201).
(1) Position strobe power supply to wing tip rib assembly.
    (a) Secure by using all required screws, except for the screw used for the two ground wires.
    (b) Position ground wire and braided ground wire and secure with remaining screw used to secure strobe power supply.
(2) Connect strobe connector and strobe power supply connector.
(3) Install wing tip.
(4) Restore electrical power to airplane. Position LIGHTS STROBE/OFF switch on circuit panel assembly to STROBE.
(5) Check strobe for proper operation.

VERTICAL FIN FLASHING BEACON - MAINTENANCE PRACTICES

1. General

A. The vertical fin flashing beacon is located on top of the vertical fin tip assembly and provides a flashing red light to aid in airplane recognition.

B. Put the LIGHTS BCN/OFF switch to the BCN position to start the flashing beacon. This position supplies power to the light. Internal circuitry makes the light flash on and off at approximately 50 cycles per minute.

2. Flashing Beacon Lamp Removal and Installation

A. Remove Flashing Beacon Lamp (Refer to Figure 201).
(1) Remove electrical power from airplane. Position LIGHTS BCN/OFF switch to OFF.
(2) Loosen screw on clamp around flashing beacon light assembly and remove clamp.
(3) Remove lens from flasher base assembly.

CAUTION: Use protective gloves or cotton wrap to ensure fingertip oil does not come in contact with lamp assembly.

(4) Remove lamp assembly from flasher base assembly.

B. Install Flashing Beacon Lamp (Refer to Figure 201).

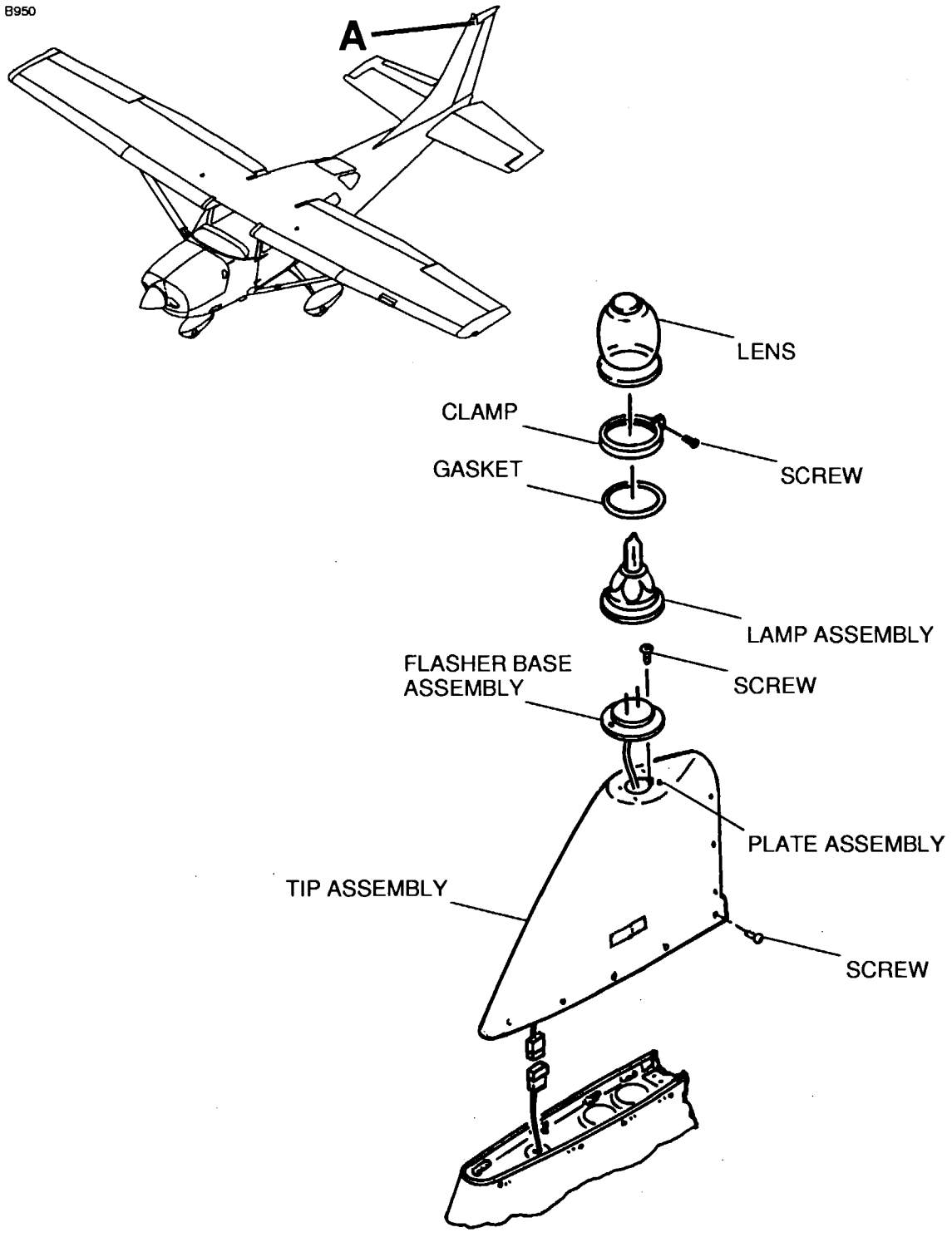
CAUTION: Use protective gloves or cotton wrap to ensure fingertip oil does not come in contact with lamp assembly.

(1) Align lamp assembly to flasher base assembly electrical pins and slide lamp assembly into flasher base assembly.
(2) Ensure gasket is positioned on flasher base assembly and place lens on flasher base assembly.
(3) Position lens so black masking on the inside of lens is facing forward.
(4) Place clamp around lens and secure lens by tightening clamp with screw.
(5) Restore electrical power to airplane. Position LIGHTS BCN/OFF switch to BCN.
(6) Check operation of flashing beacon.

3. Flashing Beacon Light Assembly Removal and Installation

A. Remove Flashing Beacon Light Assembly (Refer to Figure 201).
(1) Remove lens and lamp assembly to access screws securing flasher base assembly to plate assembly. Refer to Vertical Fin Flashing Beacon - Maintenance Practices, Flashing Beacon Lamp Removal and Installation.
(2) Remove screws securing flasher base assembly to plate assembly.
(3) Lift flasher base assembly to access flashing beacon electrical wiring.
(4) Carefully pull on electrical wiring until beacon light connector is accessible.
(5) Using tie strap or string, secure electrical wiring to prevent beacon light connector from falling into the fin tip assembly after disconnecting.
(6) Disconnect the beacon light connector.
(7) Remove flasher base assembly from airplane.

B. Install Flashing Beacon Light Assembly (Refer to Figure 201).
(1) Position flasher base assembly at fin tip assembly and connect beacon light connector.
(2) Remove tie strap or string securing beacon light connector and feed connector and excess electrical wiring into fin tip assembly.
(3) Secure flasher base assembly to plate assembly with screws.
(4) Install lamp assembly and lens. Refer to Vertical Fin Flashing Beacon - Maintenance Practices, Flashing Beacon Lamp Removal and Installation.



DETAIL A

1210T1001
A0718T1018

Flashing Beacon Light Installation
Figure 201 (Sheet 1)

LANDING/TAXI LIGHTS - TROUBLESHOOTING

1. High-Intensity Discharge (HID) Landing and Taxi Lights Troubleshooting

A. The troubleshooting flow chart that follows is for Airplanes 20608227 and On and T20608507 and On, and Airplanes 20608001 thru 20608226 and Airplanes T20608001 thru T20608506 incorporating MK206-33-01 that have high-intensity discharge (HID) lighting installed.

NOTE: The troubleshooting procedure is typical for the landing light and taxi light.

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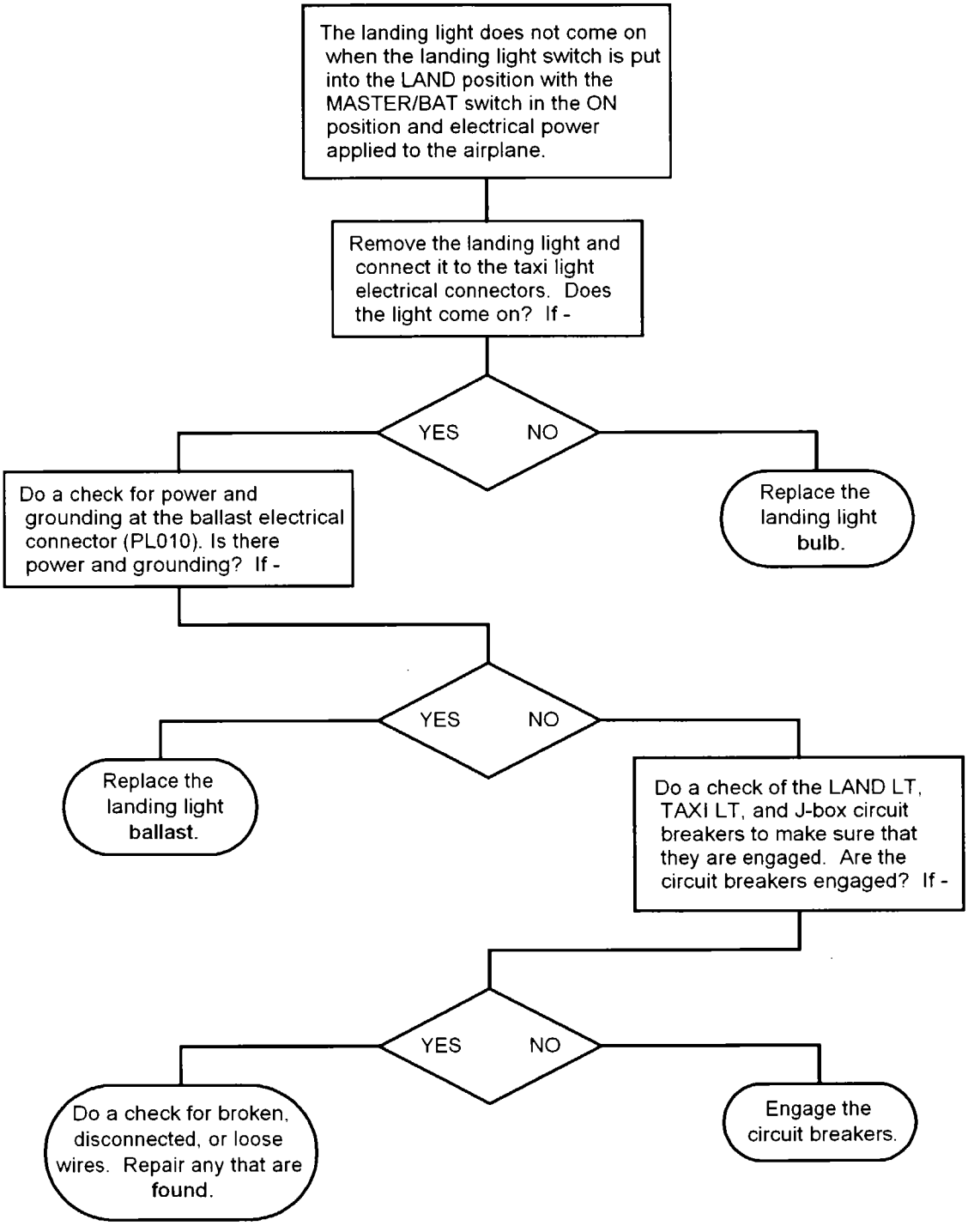


Landing/Taxi Light Troubleshooting
Figure 101 (Sheet 1)

LANDING/TAXI LIGHTS - MAINTENANCE PRACTICES

1. General

A. Airplanes 20608001 thru 20608226 and Airplanes T20608001 thru T20608506 not incorporating MK206-33-01 have incandescent landing and taxi lights installed. The landing and taxi lights are installed on the left wing leading edge between WS 136.00 and WS 154.00. The landing and taxi lights are controlled by two switches on the circuit panel assembly. The landing light is operated by the landing light switch and the taxi light is operated by the taxi light switch.

B. Airplanes 20608227 and On and Airplanes T20608507 and On, and Airplanes 20608001 thru 20608226 and Airplanes T20608001 thru T20608506 incorporating MK206-33-01 have high-intensity discharge (HID) landing and taxi lights installed. The landing and taxi lights have an igniter installed on the back side of each light. A ballast is necessary for the operation of the HID bulbs. The ballast for the landing light HID bulb (inboard bulb) is installed on a bracket that is attached to a wing leading-edge rib inboard of the bulb. The ballast for the taxi light HID bulb (outboard bulb) is installed on a bracket that is attached to a wing leading-edge rib outboard of the bulb. The wiring is almost the same as the incandescent bulb installation, but there is one more cable necessary to connect the ballast to the HID bulbs. The landing and taxi light switches, and the landing and taxi light circuit breakers for the HID lighting system are the same as those for the incandescent lighting system.

2. Troubleshooting

A. For troubleshooting of the HID landing and taxi light installation, refer to Landing/Taxi Lights - Troubleshooting.

3. Light Adjustment

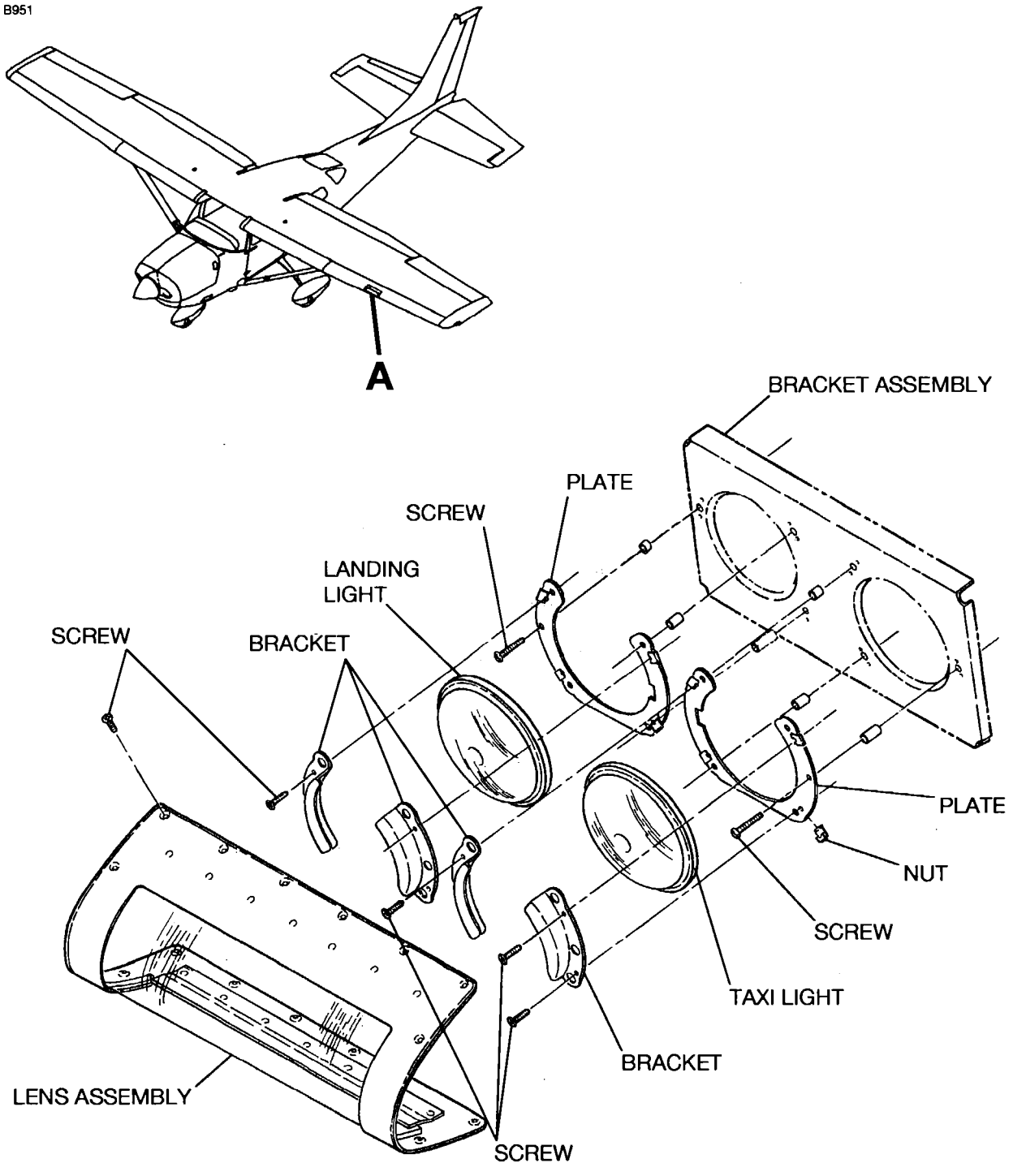
A. The landing and taxi lights are set to specified positions, but you can adjust them as necessary. The procedures that follow give information on the correct landing and taxi light adjustment procedure. The procedures that follow are typical for incandescent and HID lights.
   (1) Park the airplane on a flat, level surface with the landing and taxi lights in front of a light-reflecting object. Make sure that the waterline of the airplane is level and that the wings are level. Refer to Chapter 8, Leveling - Maintenance Practices.
   (2) Park the airplane so that the distance from the light-reflecting object to the rivet line on the bottom of the front spar is approximately 3 feet.
   (3) Set the landing light switch to the LAND position.
   (4) Measure the distance from the floor to the center of the beam that shines on the light-reflecting object. The correct distance is 74.41 inches.
   (5) Set the landing light switch to the OFF position
   (6) Set the taxi light switch to the TAXI position.
   (7) Measure the distance from the floor to the center of the beam that shines on the light-reflecting object. The correct distance is 73.29 inches.
   (8) Set the taxi light switch to the OFF position.
   (9) To adjust the beam to the correct position, add or remove washers between the spacers and the plate.

4. Light Removal and Installation

NOTE: Removal and installation is typical for incandescent and HID landing and taxi lights.

A. Remove the Light. (Refer to Figure 201).
   (1) Disconnect the main battery from the airplane. Refer to Chapter 24, Battery - Maintenance Practices.
   (2) Set the landing light and the taxi light switches to OFF.
   (3) Remove the screws that attach the lens assembly to the leading edge of the wing.
   (4) Remove the screws, brackets, and nuts which hold the light in position against the plate.

NOTE: Some airplanes that have the HID landing and taxi lights will have an aluminum ring installed between the HID landing and taxi lights and the bracket.



DETAIL A

AIRPLANES 20608001 THRU 20608226 AND
AIRPLANES T20608001 THRU T20608506
NOT INCORPORATING MK206-33-01

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Landing and Taxi Light Installation
Figure 201 (Sheet 1)

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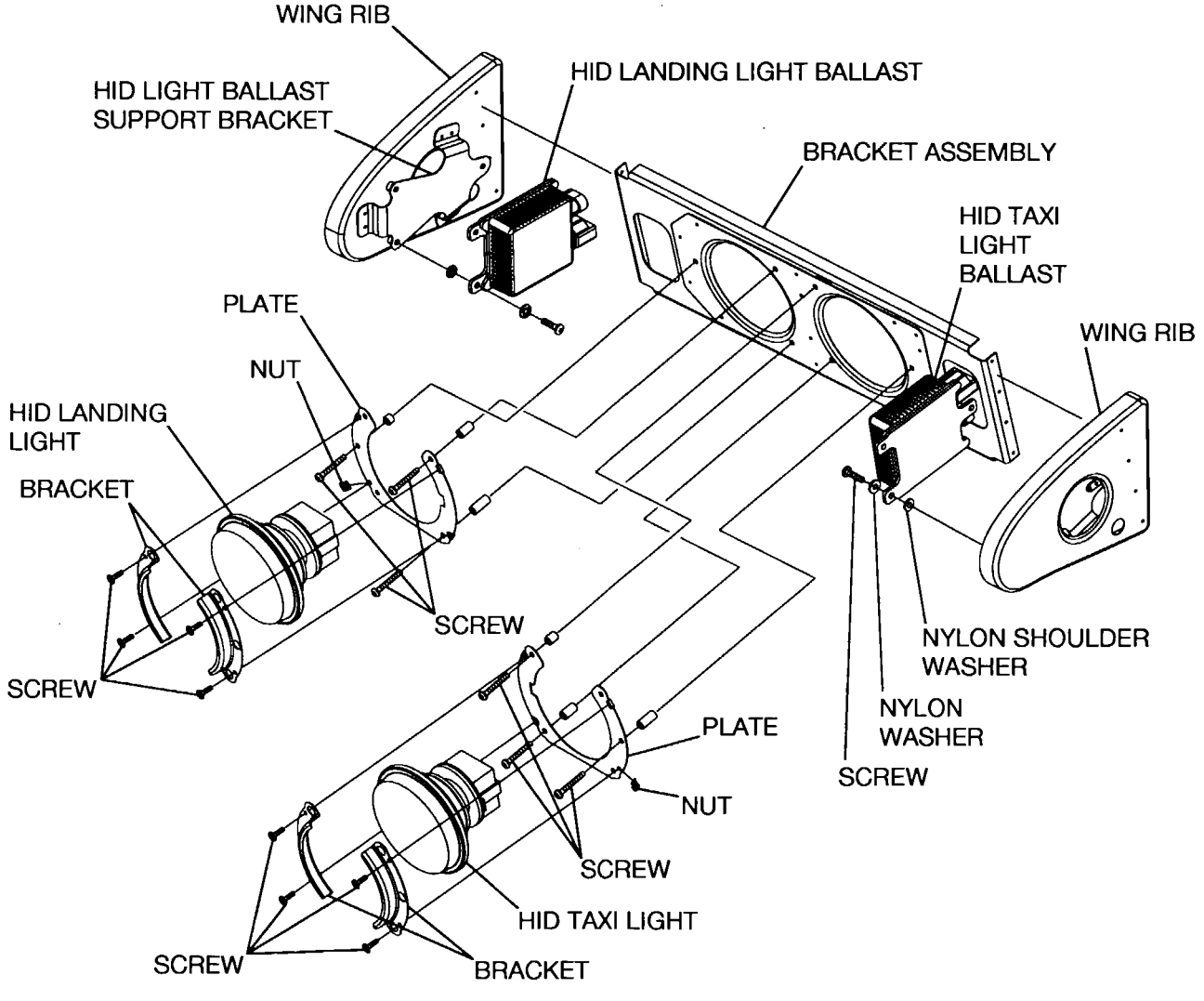

DETAIL A

AIRPLANES 20608227 AND ON AND
AIRPLANES T20608507 AND ON AND
AIRPLANES 20608001 THRU 20608226 AND
AIRPLANES T20608001 THRU T20608506
INCORPORATING MK206-33-01

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Landing and Taxi Light Installation
Figure 201 (Sheet 2)

(5) Disconnect the electrical wires from the back side of the light and remove the light from the airplane.

B. Install the Light. (Refer to Figure 201).
(1) Put the light at the correct wing location (between WS 136.00 and WS 154.00) and connect the electrical wires to the light.
(2) With screws and nuts, attach the light to the bracket so the light is attached tightly against the plate.

NOTE: The tops of the nuts are not flush with the lip of the plate. The remaining parts of the nuts are behind the plate at the screw opening.

NOTE: Some airplanes that have the HID landing and taxi lights will have an aluminum ring installed between the HID landing and taxi lights and the bracket.

(3) Install the lens assembly to the leading edge of the wing.
(4) Connect the main battery to the airplane. Refer to Chapter 24,Battery - Maintenance Practices.
(5) Set the landing light switch to LAND and the taxi light switch to TAXI.
(6) Do a check of the operation of the landing and taxi lights.

5. High-Intensity Discharge (HID) Ballast Removal and Installation

NOTE: The procedures that follow are for airplanes that have the HID landing and taxi light installation.

A. Remove the HID ballast. (Refer to Figure 201).

NOTE: Removal and installation procedures are typical for the HID landing and taxi lights.

(1) Disconnect the main battery from the airplane. Refer to Chapter 24, Battery - Maintenance Practices.
(2) Put the landing and taxi light switches in the OFF position.
(3) Remove the HID landing and taxi lights. Refer to Light Removal and Installation.
(4) Remove the screws and nylon washers that attach the HID ballast to the support bracket on the wing leading-edge rib.
(5) Disconnect the electrical connectors from the HID ballast.
(a) Landing light connectors: PL010 and UL005.
(b) Taxi light connectors: PL011 and UL006
(6) Remove the HID ballast from the airplane.

B. Install the HID ballast. (Refer to Figure 201).
(1) Disconnect the main battery from the airplane. Refer to Chapter 24, Battery - Maintenance Practices.
(2) Put the landing and taxi light switches in the OFF position.
(3) Put the ballast at the correct wing location.
(a) Landing light: outboard side of the wing rib found at WS 136.00.
(b) Taxi light: inboard side of the wing rib found at WS 154.00.
(4) Connect the electrical connectors to the HID ballast.
(a) Landing light connectors: PL010 and UL005.
(b) Taxi light connectors: PL011 and UL006

CAUTION: Do not install the HID ballast to the support bracket without the nylon shoulder washers between the HID ballast and the support bracket and the nylon washers between the HID ballast and the screw head. If the HID ballast is installed without the nylon washers, an electromagnetic field in the wing structure can cause incorrect operation of the magnetometer.

(5) Install the screws and nylon washers that attach the HID ballast to the support bracket on the wing leading-edge rib.
(6) Install the HID landing and taxi lights. Refer to Light Removal and Installation.
(7) Connect the battery to the airplane. Refer to Chapter 24,Battery - Maintenance Practices.
(8) Set the landing light switch to LAND and the taxi light switch to TAXI.
(9) Do a check of the operation of the landing and taxi lights.

COURTESY LIGHTS - MAINTENANCE PRACTICES

1. General

A. Each wing is equipped with an under wing courtesy light located near the strut/wing intersection. The left wing courtesy light, the right wing courtesy light, and the rear dome light assembly are connected in parallel on a single circuit. Pressing the overhead light assembly switch supplies power to all three lights. Pressing the overhead light assembly switch again removes power from all three lights.

B. See Model 206/T206 Wiring Diagram Manual for diagrams for use in troubleshooting the courtesy light lamp socket and associated electrical wiring.

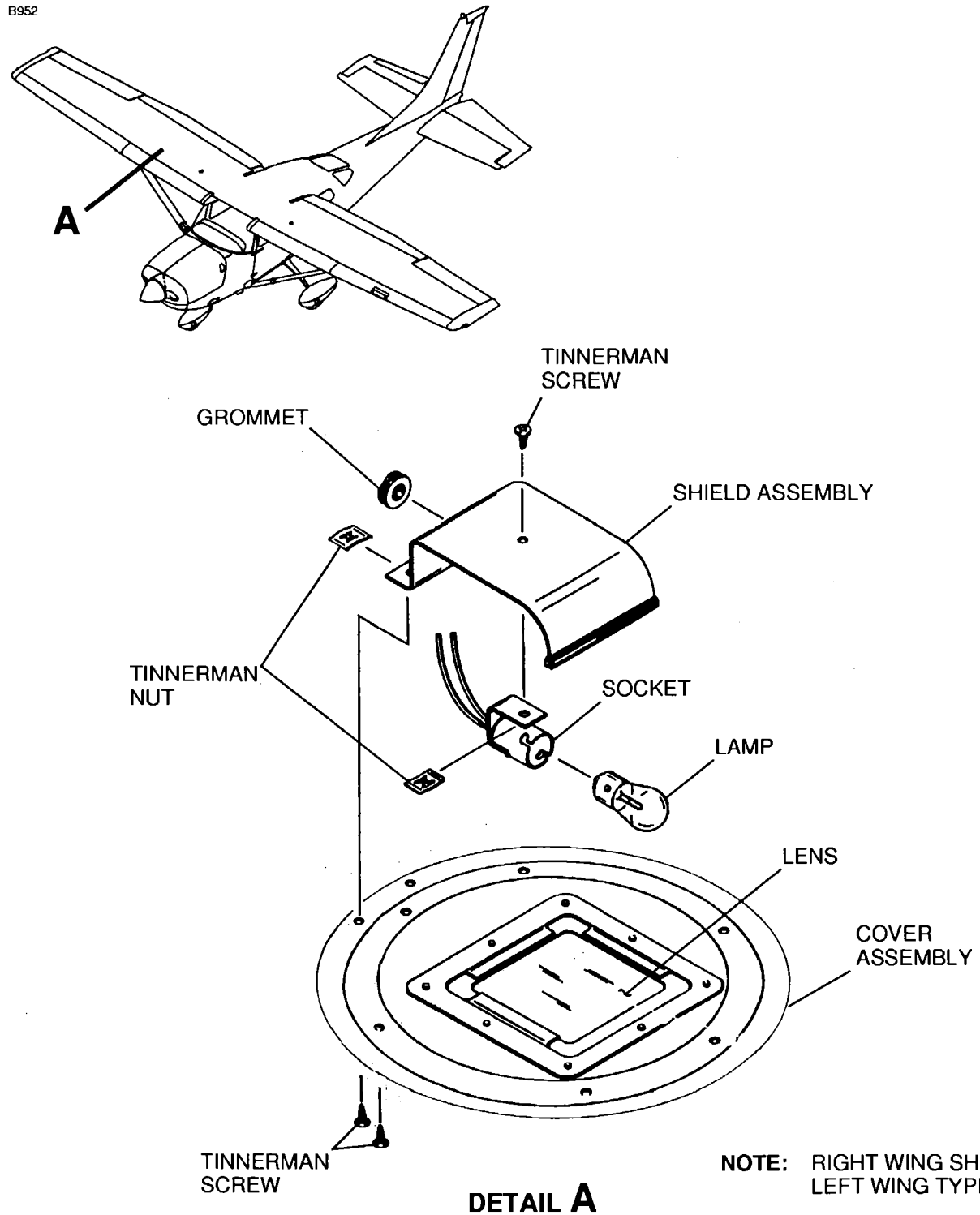
2. Courtesy Light Lamp Removal and Installation

A. Remove Courtesy Light Lamp (Refer to Figure 201).

NOTE: Removal and Installation is typical for the left and right wing courtesy light lamps.

(1) Remove electrical power from airplane. Disengage INST LTS circuit breaker on circuit panel assembly.
(2) Remove screws securing cover assembly to underside of wing.
(3) Push in on lamp, rotate counterclockwise and remove lamp from bayonet socket.

B. Install Courtesy Light Lamp (Refer to Figure 201).
(1) Insert lamp into bayonet socket. Turn clockwise until lamp seats in socket.
(2) Reinstall cover assembly to underside of wing and secure with screws.
(3) Restore electrical power to airplane. Engage INST LTS circuit breaker.
(a) Check operation of courtesy light.



Courtesy Light Installation
Figure 201 (Sheet 1)

CHAPTER 34

NAVIGATION

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
34-Title		
34-List of Effective Pages		
34-Record of Temporary Revisions		
34-Table of Contents		
34-00-00	Page 1	Dec 2/2002
34-11-00	Pages 201-208	Jul 3/2006
34-12-00	Pages 201-202	Dec 2/2002
34-13-00	Pages 201-202	Apr 1/2005
34-20-00	Pages 1-2	Jan 2/2006
34-21-00	Pages 201-209	Jan 2/2006
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34-60-01	Pages 201-202	Jan 2/2006
34-60-10	Pages 201-202	Apr 1/2005

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

NAVIGATION - GENERAL

1. Scope

A. This chapter describes the navigation systems, units, and components which provide airplane navigational information. Included are pitot and static systems, air temperature, gyros, magnetic compass, VOR, global positioning, and indicators. For Bendix/King KAP-140 Autopilot information, refer to Chapter 22, Autopilot - Maintenance Practices, and the manufacturer's manual listed in the Introduction, List of Manufacturers Technical Publications.

2. Definition

A. This chapter is divided into sections to aid maintenance personnel in locating information. Consulting the table of contents will further assist in locating a particular subject. A brief definition of the sections incorporated in this chapter is as follows:

(1) The flight environmental data section describes systems that sense environment conditions and uses the data to influence navigation. This includes systems that depend on pitot/static information and outside air temperature information.

(2) The attitude and direction section describes systems which use magnetic or inertia forces to sense and display the direction or attitude of the airplane. This includes items like gyros, magnetic compass, magnetic heading, and turn and bank.

(3) The landing and taxiing aids section include systems, such as the marker beacon system, which provide guidance during approach, landing, and taxiing.

(4) The dependent position determining section describes systems which provide information to determine position and are mainly dependent on ground installations. This includes systems like VOR, ADF, global positioning, and transponders.

PITOT AND STATIC SYSTEMS - MAINTENANCE PRACTICES

1. General

A. The pitot system supplies ram air pressure to the airspeed indicator from an "L" shaped heated pitot tube assembly in the left wing at approximately WS 62.00. The heating element of the pitot body is controlled by the PITOT HEAT/OFF switch on the circuit panel assembly.

B. The static system supplies atmospheric pressure for the blind encoder (if installed), airspeed indicator, altimeter indicator, autopilot flight computer (if installed), and vertical speed indicator through tubing connected to a left and right static port. A static line sump assembly, which collects condensation from the ambient air in the static system, is installed at each static port. An alternate static source from the cockpit is for use when the external static source is not serviceable. This alternate source is controlled with the alternate static source valve and is selected when you pull the ALT STATIC AIR PULL ON knob on the stationary panel assembly. An opening in the side of the alternate static source valve body is used to get static pressure data from the cockpit area. See the Pilot's Operating Handbook for flight operation with the alternate static source. Refer to Figure 201 for pitot and static systems flow diagram.

NOTE: For airplanes with the optional KAP-140 Two Axis Autopilot but without Garmin G1000, an additional static tube is connected to the autopilot from a tee from the blind encoder.

C. Correct maintenance of the pitot and static systems is necessary for correct operation of the altimeter, vertical speed, and airspeed indicators. Leaks, moisture, and obstructions will affect readings of all three instruments. Under instrument flight conditions, these instrument errors can be dangerous. Cleanliness, security, and integrity of components and tubing are necessay for system maintenance. The pitot tube assembly and static ports must be kept clean and all system components are to be free of obstructions and leaks.

D. For more data and maintenance requirements of the blind encoder, refer to the manufacturer's manual recorded in the Introduction, List of Manufacturers Technical Publications.

2. Pitot Tube Assembly Removal/Installation

A. Pitot Tube Assembly Removal (Refer to Figure 202).
(1) Remove electrical power from the airplane. Put the PITOT HEAT/OFF switch in the OFF position.
(2) Get access to the pitot tube assembly in the left wing.
(3) Remove the screws that attach the pitot tube assembly to the wing structure.
(4) Disconnect the ram air tube from the pitot tube assembly nipple.
(5) Disconnect the electrical wires for the pitot tube heater at the pitot disconnects.
(6) Remove the pitot tube assembly from the airplane.

B. Pitot Tube Assembly Installation (Refer to Figure 202).
(1) Put the pitot tube assembly in position and connect the ram air tube to the pitot tube assembly nipple.
(2) Connect the electrical wires to the pitot tube heater at the pitot disconnects.
(3) Attach the pitot tube assembly to the wing structure with the screws.
(4) Connect electrical power to the airplane.
(5) Do a check for leaks. Refer to Static Pressure System Inspection and Leak Test.

3. Sump Assembly Removal/Installation

NOTE: Removal and installation is typical for the left and the right sump assembly.

A. Sump Assembly Removal (Refer to Figure 202).
(1) Get access to the sump assembly at FS 18.00.
(2) Loosen the nut that attaches the static tube to the sump assembly nipple.
(3) Turn the sump assembly to remove the sump assembly from the elbow.
(4) Remove sump assembly from airplane.

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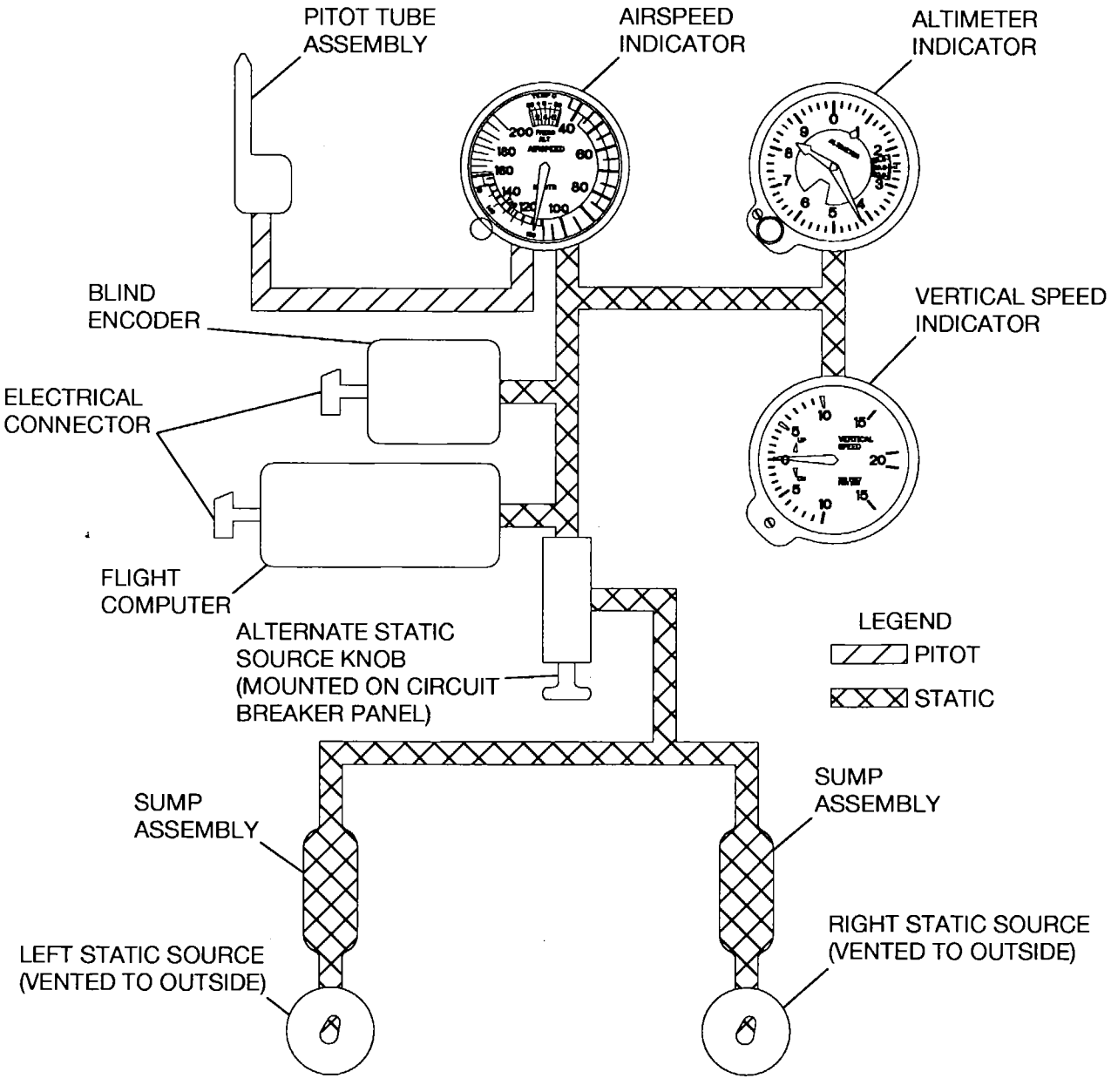

AIRPLANES WITHOUT GARMIN G1000

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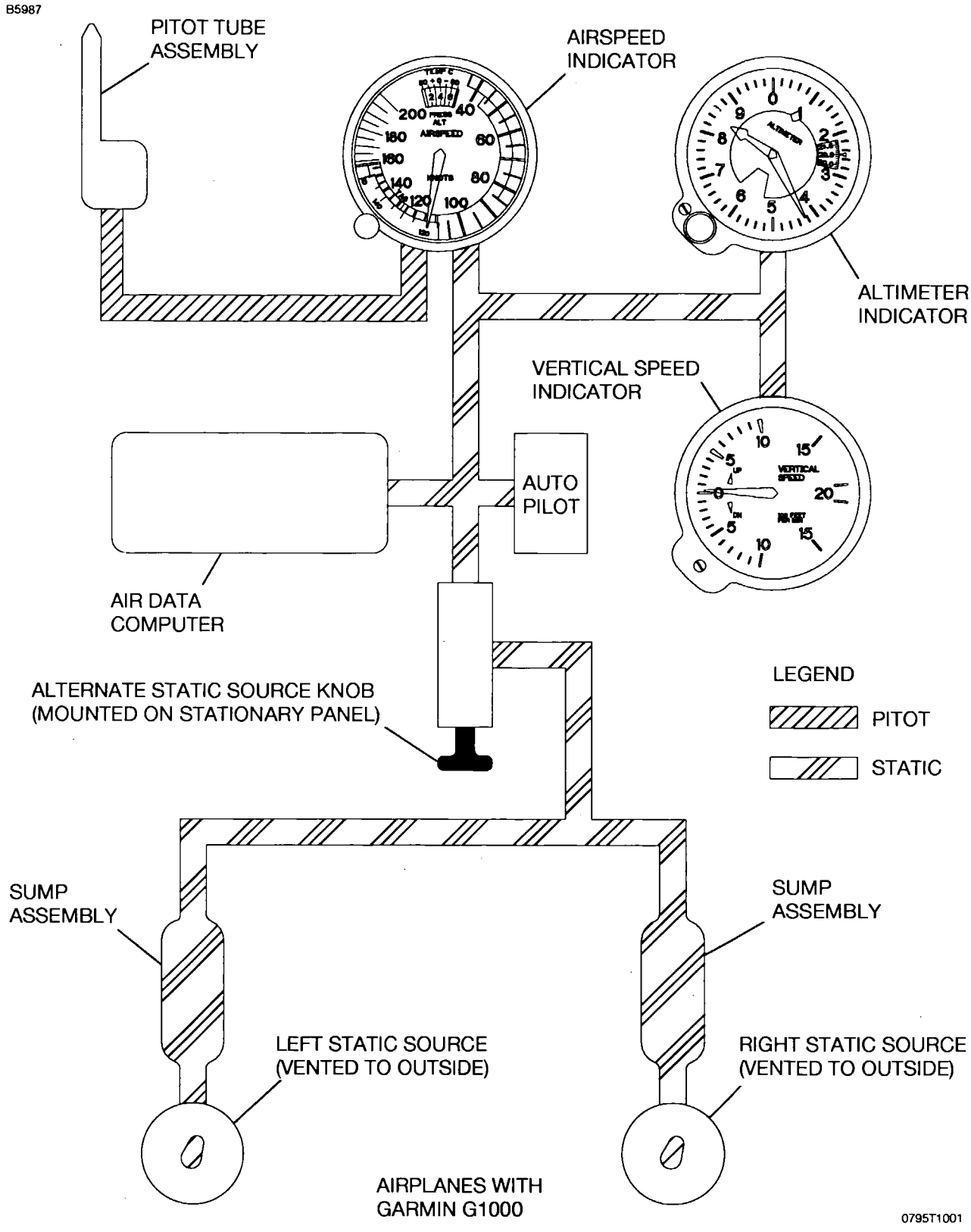
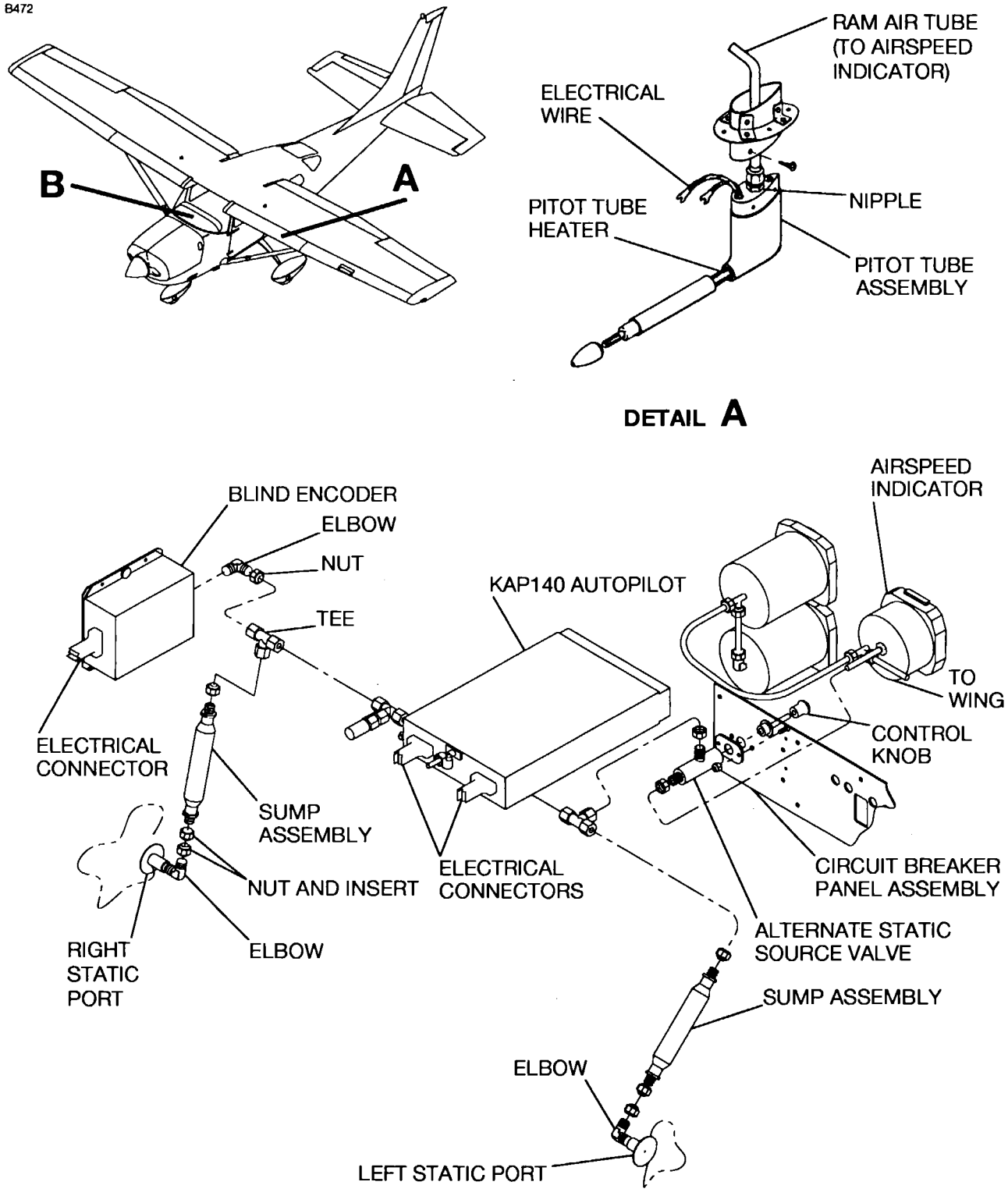
Pitot and Static System Flow Diagram
Figure 201 (Sheet 1)



Pitot and Static System Flow Diagram
Figure 201 (Sheet 2)



AIRPLANES WITHOUT GARMIN G1000

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Pitot and Static Systems Installation
Figure 202 (Sheet 1)

B. Sump Assembly Installation (Refer to Figure 202).

NOTE: Apply tape as necessary where plastic and metal connections interface.

(1) Turn the sump assembly until it is in the correct position in the elbow.
(2) Attach the static tube to the sump assembly nipple with the nut.
(3) Do a check for leaks. Refer to Static Pressure System Inspection and Leak Test.

4. Alternate Static Source Valve Removal/Installation

A. Alternate Static Source Valve Removal (Refer to Figure 202).
(1) Behind the stationary control panel, loosen the nuts that attach the two static tubes to the alternate static source valve. Disconnect the static tubes from the alternate static source valve.
(2) Remove the screws that attach the alternate static source valve to the stationary control panel.
(3) Remove the alternate static source valve from the airplane.

B. Alternate Static Source Valve Installation (Refer to Figure 202).
(1) Put the alternate static source valve in position behind the stationary control panel and attach the static tubes with the nuts.
(2) Attach the alternate static source valve to the stationary control panel with the screws.
(3) Do a check for leaks. Refer to Static Pressure System Inspection and Leak Test.

5. Blind Encoder Removal/Installation (On airplanes without Garmin G1000)

NOTE: The blind encoder is behind the stationary instrument panel on the the right forward fuselage at WL 6.50, at FS 12.35.

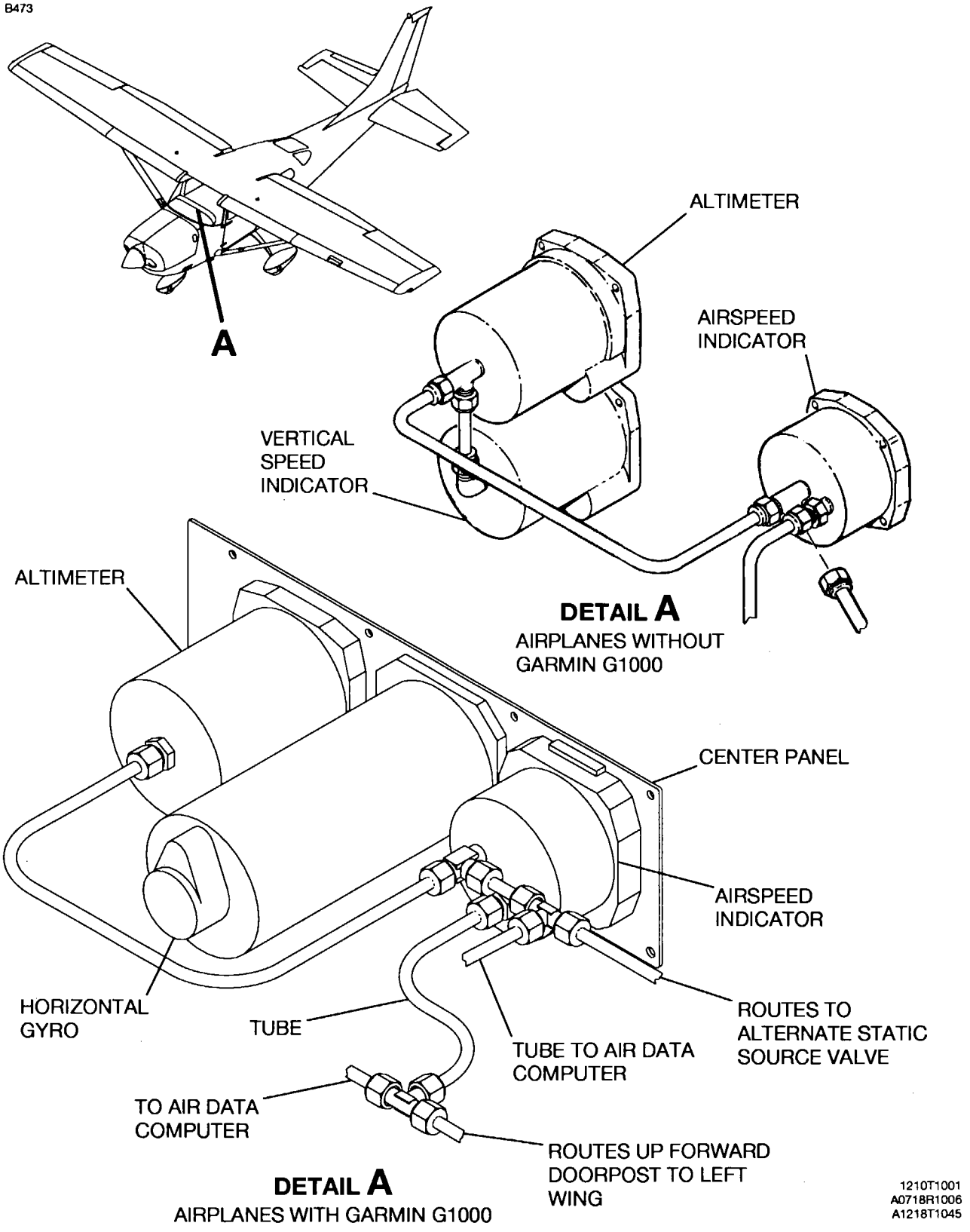
A. Blind Encoder Removal (Refer to Figure 202).
(1) Remove electrical power from the airplane. Disengage the XPNDR and GPS circuit breakers on the avionics circuit breaker panel.
(2) Disconnect the static tube from the blind encoder.
(3) Disconnect the electrical connector from the blind encoder.
(4) Loosen the knurl nut that attaches the blind encoder to the mounting tray.
(5) Remove the blind encoder from the airplane.

B. Blind Encoder Installation (Refer to Figure 202).
(1) Put the blind encoder in position in the mounting tray and attach it with the knurl nut.
(2) Connect the static tube to the blind encoder.
(3) Connect electrical connector to the blind encoder.
(4) Connect electrical power to the airplane. Engage the XPNDR and GPS circuit breakers on the avionics circuit breaker panel.
(5) Do a check for leaks. Refer to Static Pressure System Inspection and Leak Test.

6. Vertical Speed Indicator Removal/Installation

A. Vertical Speed Indicator (VSI) Removal (Refer to Figure 203).
(1) Remove electrical power from the airplane. Disengage the INST LTS circuit breaker on the circuit panel assembly.
(2) Remove the screws that attach the pilot center panel assembly to the structure to get access to the rear of the VSI. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.
(3) Disconnect the static tube and the vertical speed connector from the VSI.
(4) Remove the screws that attach the VSI to the pilot center panel assembly.
(5) Remove the VSI from the airplane.

B. Vertical Speed Indicator (VSI) Installation (Refer to Figure 203)
(1) Put the VSI in position behind the pilot center panel assembly and attach it with the screws.
(2) Connect the static tube and the vertical speed connector to the VSI.
(3) Attach the pilot center panel assembly to the structure with the screws. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.



Airspeed, Altimeter, and Vertical Speed Indicator Installation
Figure 203 (Sheet 1)

(4) Connect electrical power to the airplane. Engage the INST LTS circuit breaker on the circuit panel assembly.
(5) Do a check for leaks. Refer to Static Pressure System Inspection and Leakage Test.

7. Altimeter Indicator Removal/Installation

A. Altimeter Indicator Removal (Refer to Figure 203).
(1) Make sure that the MASTER and AVIONIC switches are in the off position.
(2) Disengage the INST LTS circuit breaker on the circuit panel.
(3) Remove the screws that hold the altimeter to the panel.
(4) Carefully pull the panel out to get access to the back of the altimeter.
(5) Disconnect the static tubes from the tee on the altimeter indicator.
(6) Disconnect the connector from the altimeter.
(7) Remove the screws that attach the altimeter to the panel.
(8) Remove the altimeter from the airplane.

B. Altimeter Indicator Installation (Refer to Figure 203).
(1) Install the altimeter to the panel with the screws.
(2) Connect the static tubes to the altimeter.
(3) Install the panel to the structure with the screws.
(4) Engage the INST LTS circuit breaker on the circuit panel.
(5) Do a check for leaks. Refer to Static Pressure System Inspection and Leakage Test.

8. Airspeed Indicator Removal/Installation

A. Airspeed Indicator Removal (Refer to Figure 203).
(1) Make sure that the MASTER and AVIONICS switches are in the off position.
(2) Disengage the INST LTS circuit breaker on the circuit breaker panel.
(3) Remove the screws that hold the airspeed indicator to the panel.
(4) Disconnect the pitot tube from the airspeed indicator.
(5) Disconnect the static tube from the airspeed indicator.
(6) Disconnect the electrical connector (JI009) from the airspeed indicator.
(7) Remove the screws that attach the airspeed indicator to the panel
(8) Remove the airspeed indicator from the airplane.

B. Airspeed Indicator Installation (Refer to Figure 203).
(1) Install the airspeed indicator to the panel with the screws.
(2) Connect the pitot tube to the airspeed indicator.
(3) Connect the static tubes to the airspeed indicator.
(4) Connect the connector to the airspeed indicator.
(5) Install the panel to the structure with the screws.
(6) Engage the INST LTS circuit breaker on the circuit panel assembly.
(7) Do a check for leaks. Refer to Pitot System Inspection and Leakage Test.

9. Static Pressure System Inspection and Leakage Test

A. The procedure that follows gives instruction for the inspection and the test of the static pressure system if the altimeter has been tested and inspected in accordance with current Federal Aviation Regulations.
(1) Make sure that the static system is free from entrapped moisture and restrictions.
(2) Make sure that no alterations or deformations of the airframe surface have been made that can affect the relation between air pressure in the static pressure system and the true ambient air pressure for a flight configuration.
(3) Seal one static source port with pressure sensitive tape. This seal must be air tight.
(4) Close the static pressure alternate source valve.

CAUTION: When you apply or release suction, do not exceed the range of the vertical speed indicator or the airspeed indicator.

(5) Attach a source of suction to the remaining static pressure port.

(6) Slowly apply suction until the altimeter shows a 1000-foot increase in altitude.
(7) Cut off the suction source to keep a closed system for one minute. Leakage must not exceed 100 feet of altitude loss as shown on the altimeter.
(8) If the leakage rate is in the permitted limits, slowly release the suction source and remove the tape from the static port.

NOTE: If the leakage rate is more than the maximum allowable, first tighten all connections, then do the leakage test again. If the leakage rate is still more than the maximum allowable, do the procedure that follows.

(9) Disconnect the static pressure lines from the airspeed indicator and the vertical speed indicator. Use the correct fittings to connect the lines to make the altimeter the only instrument still connected into the static pressure system.
(10) Do the leakage test again to see if the static pressure system or the bypassed instruments is the cause of the leakage. If instruments are damaged, they must be repaired by an applicable rated repair station or replaced. If the static pressure system is the cause of the leakage, use the procedure that follows to find the leakage.
(11) Attach a source of positive pressure to the static source opening.

CAUTION: Do not apply positive pressure with the airspeed indicator or the vertical speed indicator connected to the static pressure system.

(12) Slowly apply positive pressure until the altimeter shows a 500-foot decrease in altitude, and keep this altimeter indication while you do a check for leaks. Apply a layer of LEAK-TEC or a solution of mild soap and water to the line connections and the static source flange. Look for bubbles to find leaks.
(13) Tighten the connections where there are leaks, and repair or replace parts that are damaged.
(14) Connect the airspeed and the vertical speed indicators into the static pressure system and do the test for leaks again.

10. Pitot System Inspection and Leakage Test.

A. The procedure that follows gives the inspection and the test of the pitot system.
(1) Put a piece of tape over the small hole in the bottom aft end of the pitot tube.
(2) Attach a piece of rubber or plastic tubing over the end of the pitot tube.
(3) Close the opposite end of the tubing and slowly roll up the tube until the airspeed indicator shows the correct cruise range, and secure the tube.
(4) After a few minutes, do a check of the airspeed indicator again. Leakage will decrease the pressure in the system. This will result in a lower airspeed indication.
(5) Slowly unroll the tubing before you remove it to make sure that the pressure is decreased gradually. Otherwise, the instrument can be damaged.
(6) Remove the tape from the small hole at the aft end of the pitot tube.
(7) If the test shows a leak in the system, do a check to make sure that all of the connections are tight.

OUTSIDE AIR TEMPERATURE (OAT) INDICATING SYSTEM - MAINTENANCE PRACTICES

1. General

A. The OAT system consists of a dual function OAT/clock indicator, electrical wiring and a temperature probe.

2. Outside Air Temperature Indicator Removal and Installation

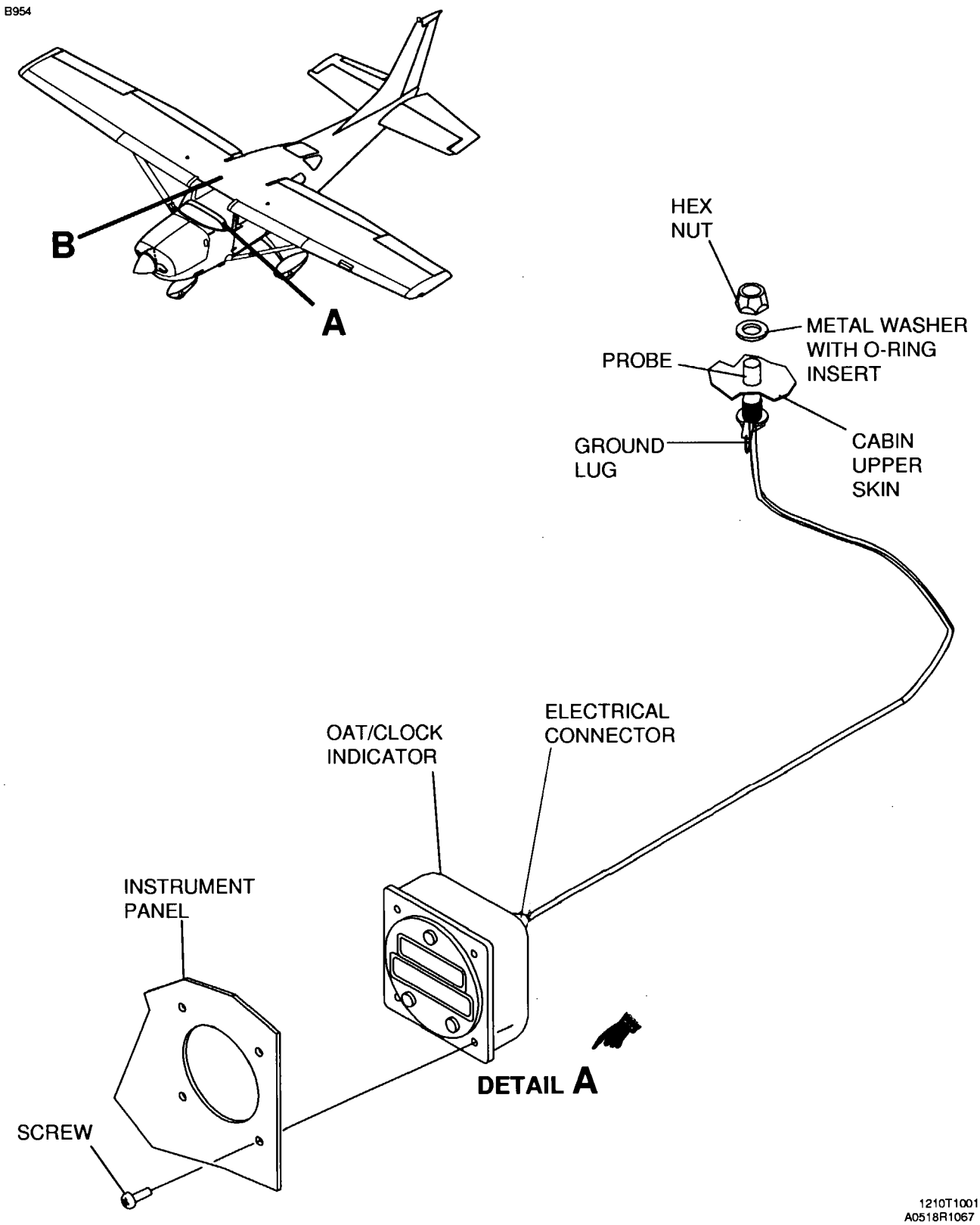
A. Remove Outside Air Temperature Indicator (Refer to Figure 201).
(1) Remove electrical power from airplane.
(2) Remove screws securing OAT indicator in instrument panel.
(3) Gently pull OAT indicator away from instrument panel and disconnect electrical connector.
(4) Remove OAT indicator from airplane.

B. Install Outside Air Temperature Indicator (Refer to Figure 201).
(1) Connect electrical connector to OAT indicator.
(2) Position indicator in instrument panel and secure with screws.
(3) Restore electrical power to airplane.

3. Outside Air Temperature Probe Removal and Installation

A. Remove Outside Air Temperature Probe (Refer to Figure 201).
(1) Remove electrical power from airplane.
(2) Remove headliner to gain access to oat probe. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(3) Disconnect electrical wiring at splices.
(4) Remove jamnut and o-ring from probe, outside of fuselage.
(5) Remove probe from airplane.

B. Install Outside Air Temperature Probe (Refer to Figure 201).
(1) Connect electrical wiring at splices.
(2) Position probe in fuselage opening.
(3) Install o-ring and jamnut on OAT probe, outside of fuselage.
(4) Install headliner. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(5) Restore electrical power to airplane.



Outside Air Temperature System Installation
Figure 201 (Sheet 1)

AIR DATA SYSTEM - MAINTENANCE PRACTICES

1. General

A. The Air Data System maintenance practices give procedures for the air data unit removal/installation.

B. The GDC-74 Air Data Unit calculates pitot, static, and outside air temperature functions. The air data unit is an interface of these functions within the integrated avionics system. The air data unit is forward of the Multi-Function Display (MFD).

2. GDC-74 Air Data Unit Removal/Installation

A. Remove the GDC-74 Air Data Unit (Refer to Figure 201).
(1) Make sure that the MASTER and AVIONICS switches are in the off position.
(2) Remove the MFD. Refer to Chapter 34, Control Display Unit - Maintenance Practices.
(3) Loosen the screws that hold the air data unit in position.
(4) Move the air data unit aft to get access to the hose and the electrical connector (P741).
(5) Disconnect the hose and the electrical connector from the air data unit.

B. Install the GDC-74 Air Data Unit (Refer to Figure 201).
(1) Connect the hose and the electrical connector (P741) to the air data unit.
(2) Move the air data unit forward into position.
(3) Tighten the screws that hold the air data unit in position.
(4) Install the MFD. Refer to Chapter 34, Control Display Unit - Maintenance Practices.
(5) Connect the negative lead from the battery terminal. Refer to Chapter 24, Battery - Maintenance Practices.
(6) Remove the warning label from the negative lead.
(7) If applicable, put the MASTER ALT/BAT and Avionics switches in the ON position.
(8) Make sure that a pitot and static system leakage rate test is done after the installation of the air data unit. Refer to Chapter 34, Pitot and Static Systems - Maintenance Practices.
(9) Do a check to make sure that the air data unit operates correctly. Refer to the Garmin G1000 Line Maintenance Manual.

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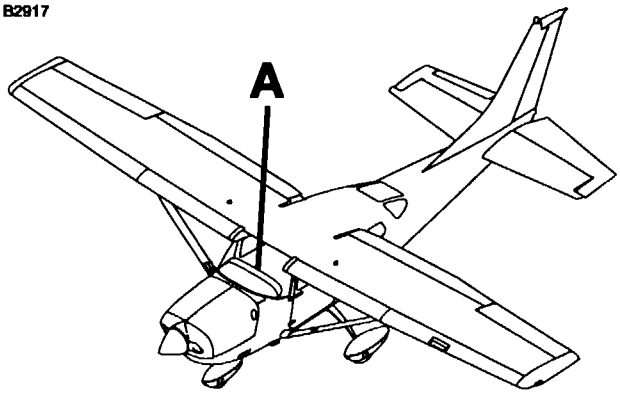

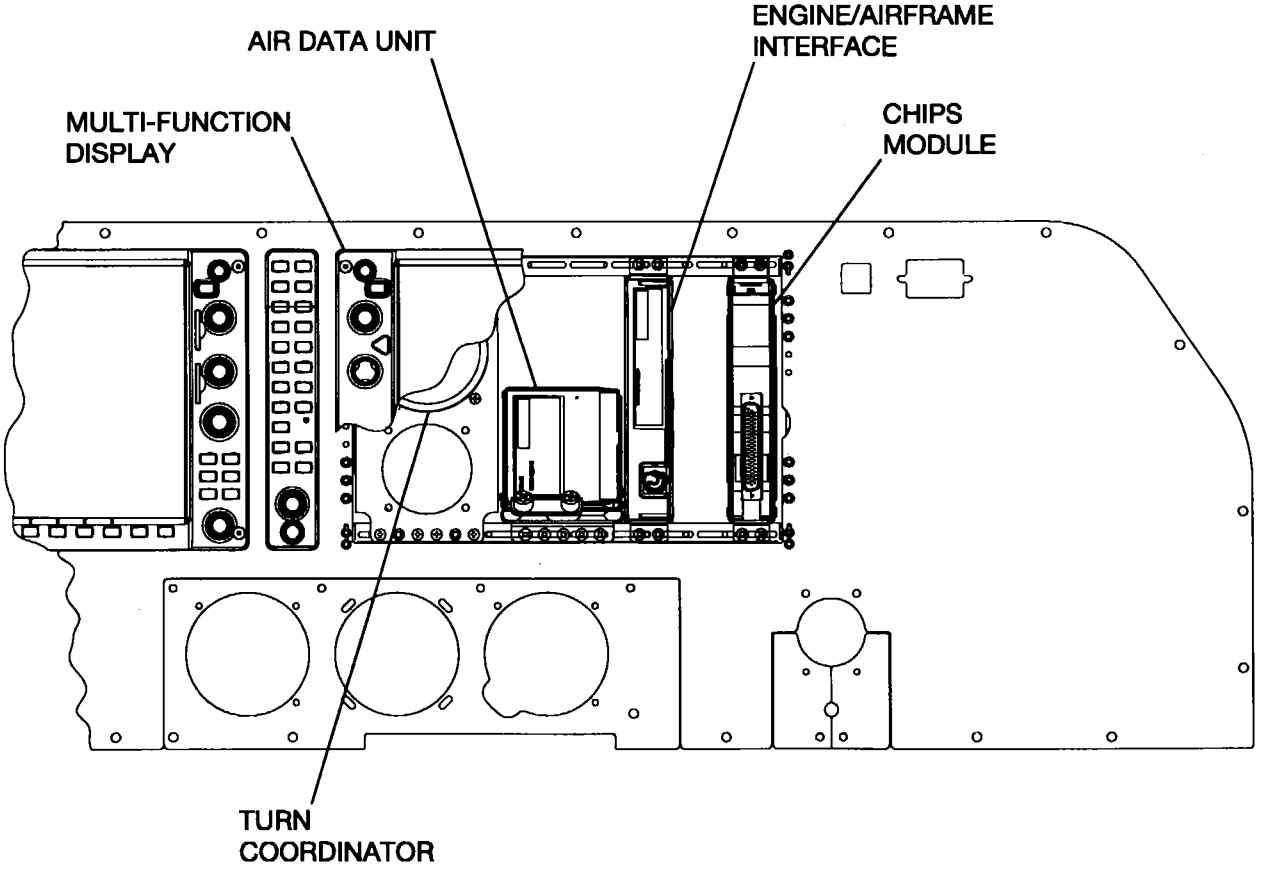

DETAIL A

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Air Data Installation
Figure 201 (Sheet 1)

ATTITUDE AND DIRECTION - DESCRIPTION AND OPERATION

1. General

A. Attitude and direction navigation systems are systems which use magnetic or gyroscopic forces to sense and display the direction or attitude of the airplane. This includes the magnetic compass, horizon gyro, directional gyro, and turn coordinator (roll rate gyro) indicator.

B. The magnetic compass is located on the airplane centerline of the upper forward windshield. The compass is independent of other navigation systems and does not supply information to other airplane systems.

C. The three gyroscopic instruments that indicate attitude and direction are mounted in the pilot center panel assembly. The directional gyro and turn coordinator provide information to the autopilot system.

2. Gyroscopic Instrument Precautions

A. Gyroscopic instruments are very sensitive. They have precision bearings on the gyroscope rotor, pivots, and yoke shaft. Careless handling while the instrument is out of the aircraft, and dirt and other contaminates can cause damage to the bearings. Special precautions must be followed when you handle, install, remove, or ship any gyroscopic instruments.

(1) Damage can occur to a gyro by moving it after electrical power, vacuum or air pressure is removed but before the gyro rotor stops. The gyro rotor will not come to a complete stop for approximately 15 minutes after electrical power, vacuum or air pressure is removed.

(2) During removal of the instruments, put soft material between the instruments and the control column.

(3) Do not vibrate or shake the panel or instruments.

(4) Do not drop, shake, put on hard surface, or hit the gyroscope against any other object.

CAUTION: If you lift one end of a gyroscopic instrument ¾ inch and let if fall on a hard surface, it is the equivalent of approximately a 20g shock to the gyro. This can cause damage to the instrument.

CAUTION: Always be very careful when you move or hold gyroscopic instruments, because damage can easily occur.

(5) Do not remove any wires, labels, tie straps, or any parts that came with the gyro.

(6) Do a visual check of the gyro for any external damage. There must be no scratches, dents, or dings on any part of the gyro. Do not install any gyros that have scratches, dents, or dings.

(7) Any instruments that are to be shipped, must have all female ports plugged with removable port plugs, and all male receptacles must have removable plastic caps on them.

(8) Protect all electrical pin connectors with tape or other wrap so that they are not bent or broken.

(9) Pack all gyros in Styrofoam or other soft material for storage and transportation. When shipping gyroscope pack in original box if possible.

(10) Shipping plugs should be kept in the air ports except when the instrument is installed in an aircraft or being tested.

3. Returning Gyroscopic Instruments for Warranty

A. All gyros that are returned for warranty credit must obey the instructions that follow:

(1) All ports and vents must be sealed and have plugs.

(2) All initial seals from the manufacturer must be intact and unbroken.

(3) All gyros must be carefully put in the same type of container in which the replacement gyro was received.

(4) Put connector caps or adhesive tape on all electrical pin connectors to make sure that they are not bent or broken.

4. Horizon Gyro General Operation Notes

A. The horizon gyro (attitude) uses air flow to move the gyro rotor for normal operation. The airflow is supplied by the vacuum system. Any problems (vacuum system or other) that has an effect on the function and the movement of the gyro rotor can have an effect on indicating accuracy and performance.

B. Approximately 4.5 to 5.5 inches Hg is necessary to adequately spin the rotor in the horizon gyro. The gyro is at rated performance in a minimum of 3 minutes of rotor spin time with rated vacuum applied.

C. The gyro rotor can continue to spin for approximately 15 minutes after air pressure to the system is removed. While the rotor speed decreases, it will normally start to show a change in the roll and/or pitch indication, and when completely stopped will remain in a roll and/or pitch indication until the system is started again.

D. If a gyro is shutdown and started again before the rotor has stopped, much more time will be necessary to become stable to the correct pitch and roll indication.

5. Directional Gyro General Operation Notes

A. The directional gyro uses airflow to move the gyro rotor for normal operation. The airflow is supplied by the vacuum system. Any problems (vacuum system or other) that has an effect on the function and the movement of the gyro rotor can have an effect on indicating accuracy and performance.

B. The directional gyro requires approximately 4.5 to 5.4 inches Hg to adequately spin the rotor. The directional gyro reaches rated performance in a minimum of 3 minutes.

C. The directional gyro rotor may continue to spin for approximately 15 minutes after vacuum (air) pressure to the system is removed. While the rotor spins down, it can start to show a change in the directional indication or the directional gyro dial may start to spin. When completely stopped the directional gyro will not respond correctly to changes in the aircraft direction until the system is started again.

D. If a gyro has been shut down and started again before the rotor has been allowed to stop, it requires considerably more time for the gyro to respond to aircraft directional changes.

E. The amount of drift of the direction gyro dial in either direction during any ten-minute period shall not exceed 4 degrees at any heading.

F. Continuous turns around a point and/or banks in excess of 55 degrees can cause the directional gyro card to spin. This is a limitation of the gyro and not a cause for removal.

GYROSCOPES - MAINTENANCE PRACTICES

1. General

A. Three gyroscopic instruments give attitude and direction. These instruments are the horizon gyro (attitude indicator), directional gyro, and turn coordinator (roll rate gyro).

2. Horizon Gyro Removal and Installation

A. Horizon Gyro Removal (Refer to Figure 201).

CAUTION: Make sure that the gyro rotor has fully stopped before you move the instrument. The gyro rotor will not stop for approximately 15 minutes after the electrical power or vacuum source is removed. Damage to the instrument will occur if the instrument is moved before the gyro rotor has stopped.

CAUTION: Be careful with the gyroscopic instruments. Do not hit, shake, or put the instruments on a hard surface. Put soft material between the gyroscopic instruments and any hard surface. Damage to the instruments will occur if the instruments are not carefully moved. The manufacturer's warranty can become void if the gyro is not kept in its initial condition as received from the manufacturer.

(1) Put the MASTER switch and the AVIONICS switch in the off position.
(2) Remove the screws from the center panel.

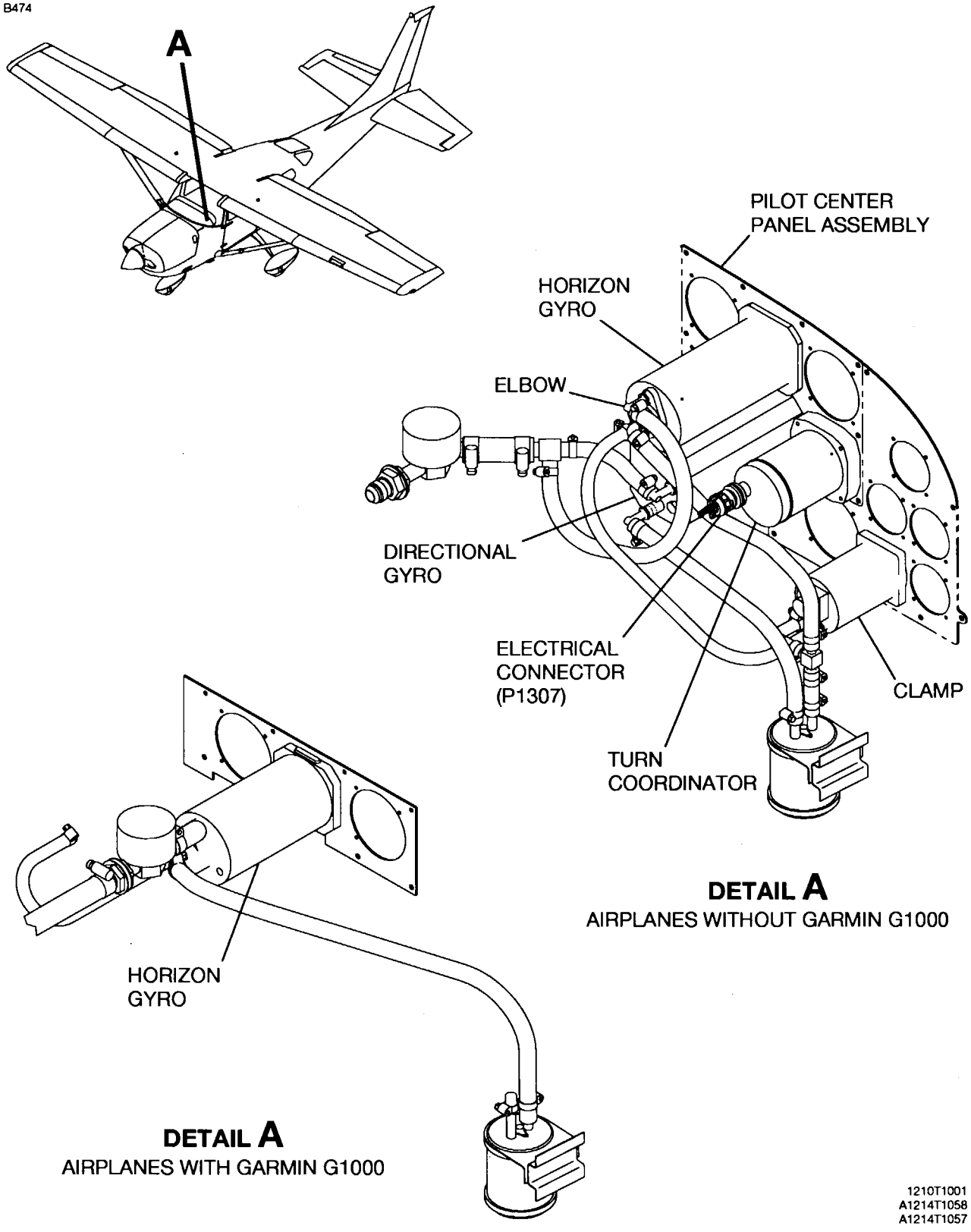
CAUTION: Make sure that you put soft material between the horizon attitude gyro and the control column before you remove the gyro. If you put the sub panel on the control column without any protection, you can damage the horizon attitude gyro and/or the other instruments in the sub panel. Be very careful when you remove the sub panel so that you do not hit the gyro.

(3) Carefully pull the panel out to get access to the back of the horizon gyro
(4) Identify and tag the hoses which are attached to the horizon gyro.
(5) Loosen the clamps and remove the hoses from the horizon gyro.
(6) Disconnect the horizon gyro connector.
(7) Put female plugs over the ports and put a connector cap on the electrical connector.
(8) Remove the screws that attach the horizon gyro to the center panel.

CAUTION: Put a cover on the applicable hose or port, or on the applicable electrical connector when the gyroscopic instrument is out of the airplane or is to be shipped. Damage to the instrument will occur from contamination if a cover is not used.

(9) Remove the horizon gyro from the airplane.

B. Horizon Gyro Installation (Refer to Figure 201).



Attitude and Direction Instrument Installation
Figure 201 (Sheet 1)

CAUTION: Do not remove the horizon attitude gyro from the box in which it was shipped until it is ready to be installed into the airplane. This will minimize the possibility of accidentally causing damage to the gyro.

CAUTION: Remove all plugs from the horizon attitude gyro before you install it in the airplane.

CAUTION: Be careful with the gyroscopic instruments. Do not hit, shake, or put the instruments on a hard surface. Put soft material between the gyroscopic instruments and any hard surface. Damage to the instruments will occur if the instruments are not carefully moved. The manufacturer's warranty can become void if the gyro is not kept in its initial condition as received from the manufacturer.

(1) Attach the horizon gyro to the center panel with the screws.
(2) Make sure that the horizon altitude gyro is installed level in the panel.
(3) Remove the female plugs from the ports and remove the connector cap from the electrical connector.
(4) Make sure that the vacuum lines and the static lines have no kinks in them.
(5) Identify and connect the hoses to the horizon gyro. Tighten the clamps to the elbows or adapter as necessary.
(6) Connect the horizon gyro connector.
(7) Install the center panel with screws.
(8) Put the MASTER switch and the AVIONICS switch in the ON position.
(9) Engage the INST LTS circuit breaker on the circuit breaker panel assembly.
(10) Do an operational check of the horizon attitude gyro to make sure that it operates correctly.

3. Horizon Attitude Gyro Operational Check

A. Horizon Attitude Gyro Operational Check.
(1) Start the airplane engine.
(2) Let the engine run for no less than 3 minutes.
(3) Make sure that the vacuum gage shows between 4.5 and 5.5 inches Hg.
(4) Make sure that the horizon bar becomes stable at the correct position for the attitude of the airplane, or becomes stable at the correct position, begins to vibrate, and then slowly stops vibration altogether.
(5) Taxi in a straight line. Make sure that the horizon bar stays in the horizontal position while you taxi.
(6) Do a 360-degree turn. Do not turn sharply as you make the turn. Make sure that the horizon bar does not tip more than 4 degrees from the horizontal during the turn.
(7) If the horizontal gyro precession is more than 4 degrees from a heading in either direction during a 10-minute period, or does not operate within one or more of the limits given in steps 4 through 6 of this operational check, you must repair the system and/or replace the gyro.

4. Directional Gyro Removal and Installation (Airplanes without Garmin G1000)

A. Directional Gyro Removal (Refer to Figure 201).

CAUTION: Make sure that the gyro rotor has fully stopped before you move the instrument. The gyro rotor will not stop for approximately 15 minutes after the vacuum source is removed. Damage to the instrument will occur if the instrument is moved before the gyro rotor has stopped.

CAUTION: Be careful with the gyroscopic instruments. Do not hit, shake, or put the instruments on a hard surface. Put soft material between the gyroscopic instruments and any hard surface. Damage to the instruments will occur if the instruments are not carefully moved. The manufacturer's warranty can become void if the gyro is not kept in its initial condition as received from the manufacturer.

(1) Put the MASTER switch and the AVIONICS switch in the off position.
(2) Disengage the INST LTS circuit breaker on circuit panel assembly and the AUTO PILOT circuit breaker on avionics circuit breaker panel.
(3) Remove the screws that connect the pilot center panel assembly to the structure to get access to the back of the directional gyro.

CAUTION: Make sure that you put soft material between the directional gyro and the control column before you remove the gyro. If you put the sub panel on the control column without any protection, you can damage the directional gyro and/or the other instruments in the sub panel. Be very careful when you remove the sub panel so that you do not hit the gyro.

(4) Identify and tag two hoses connected to directional gyro.
(5) Loosen the clamps and remove the hoses from the directional gyro.
(6) Disconnect the directional gyro connector and the electrical connector from the directional gyro.
(7) Put female plugs over the ports and put a connector cap on the electrical connector.
(8) Remove the screws that connect the directional gyro to the pilot center panel assembly.
(9) Remove the directional gyro from the airplane.

CAUTION: Put a cover on the applicable hose or port, or on the applicable electrical connector when the gyroscopic instrument is out of the airplane or is to be shipped. Damage to the instrument will occur from contamination if you do not use a cover.

(10) Remove the directional gyro from the airplane.

B. Directional Gyro Installation (Refer to Figure 201).

CAUTION: Do not remove the directional gyro from the box in which it was shipped until it is ready to be installed into the airplane. This will minimize the possibility of accidentally causing damage to the gyro.

CAUTION: Remove all plugs from the directional gyro before you install it in the airplane.

CAUTION: Be careful with the gyroscopic instruments. Do not hit, shake, or put the instruments on a hard surface. Use soft material between the gyroscopic instruments and any hard surface. Damage to the instruments will occur if the instruments are not carefully moved. The manufacturer's warranty can become void if the gyro is not kept in its initial condition as received from the manufacturer.

(1) Put the directional gyro on the back of the pilot center panel assembly and attach with screws.
(2) Remove the female plugs from the ports and remove the connector cap from the electrical connector.
(3) Identify and connect the hoses to the directional gyro. Tighten the clamps to attach the hoses to the elbows.
(4) Connect the directional gyro connector and the electrical connector to the directional gyro.
(5) Install the pilot center panel assembly and attach with screws.
(6) Put the MASTER switch and the AVIONICS switch in the ON position.
(7) Engage the INST LTS circuit breaker on the circuit breaker panel assembly and the AUTO PILOT circuit breaker on the avionics circuit breaker panel.
(8) Do an operational check of the directional gyro to make sure that it operates correctly. Refer to Directional Gyro Operational Check.

5. Directional Gyro Operational Check

A. Directional Gyro Operational Check.

NOTE: The permitted limits for gyro drift on the ground or in flight is 4 degrees from a fixed heading, during a 10-minute period.

(1) Start the airplane engine. The suction gage must read 4.5 to 5.5 in. Hg.
(2) Make sure that the vacuum system operates correctly.
  (a) The vacuum gage must show between 4.5 and 5.5 inches Hg.
(3) Align the airplane into the wind.
(4) Allow the directional gyro to stabilize for at least one minute.
(5) Set the directional gyro to the north (N).
(6) Make sure that the directional gyro dial drift is not more than 4 degrees in a 10-minute period.
(7) Do steps 5 through 6 again for each cardinal heading (North, West, South, and East).
(8) If the directional gyro dial drift is not satisfactory at any heading, repair the system and/or replace the gyro.
(9) Stop the airplane engine.

NOTE: After you stop operation of the airplane, it is usual for the directional gyro dial to continue to turn. This is not a cause to remove the gyro.

6. Turn Coordinator Removal and Installation (Airplanes without Garmin G1000)

A. Turn Coordinator Removal (Refer to Figure 201).

CAUTION: Make sure that the gyro rotor has fully stopped before you move the instrument. The gyro rotor will not stop for approximately 15 minutes after the vacuum source is removed. Damage to the instrument will occur if the instrument is moved before the gyro rotor has stopped.

CAUTION: Be careful with the gyroscopic instruments. Do not hit, shake, or put the instruments on a hard surface. Put soft material between the gyroscopic instruments and any hard surface. Damage to the instruments will occur if the instruments are not carefully moved. The manufacturer's warranty can become void if the gyro is not kept in its initial condition as received from the manufacturer.

(1) Put the MASTER switch and the AVIONICS switch in the off position.
(2) Disengage the INST LTS and the TURN COORD circuit breakers on circuit breaker panel assembly and the AUTO PILOT circuit breaker on the avionics circuit breaker panel.
(3) Remove the screws that attach the pilot center panel assembly to the structure to get access to the back of the turn coordinator.

CAUTION: Make sure that you put soft material between the turn coordinator and the control column before you remove the turn coordinator. If you put the sub-panel on the control column without any protection, you can damage the turn coordinator and/or the other instruments in the sub-panel. Be very careful when you remove the sub-panel so that you do not hit the turn coordinator.

(4) Disconnect the turn coordinator connector and the electrical connector from the turn coordinator.

CAUTION: Put a cover on the applicable electrical connector when the gyroscopic instrument is out of the airplane or is to be shipped. Damage to the instrument will occur from contamination if a cover is not used.

(5) Put connector caps on the turn coordinator avionics connector and electrical connector.
(6) Remove the screws that attach the turn coordinator to the pilot center panel assembly.
(7) Remove the turn coordinator from the airplane.

B. Turn Coordinator Installation (Refer to Figure 201).

CAUTION: Do not remove the turn coordinator from the box in which it was shipped until it is ready to be installed into the airplane. This will minimize the possibility of accidentally causing damage to the gyro.

CAUTION: Remove all plugs from the turn coordinator before you install it in the airplane.

CAUTION: Be careful with the gyroscopic instruments. Do not hit, shake, or put the instruments on a hard surface. Put soft material between the gyroscopic instruments and any hard surface. Damage to the instruments will occur if the instruments are not carefully moved. The manufacturer's warranty can become void if the gyro is not kept in its initial condition as received from the manufacturer.

(1) Put the turn coordinator on the back of the pilot center panel assembly and attach with screws.

(2) Remove the connector caps from the turn coordinator avionics connector and the electrical connector.
(3) Connect the turn coordinator connector and the electrical connector to the turn coordinator.
(4) Install the pilot center panel assembly and attach with screws.
(5) Put the MASTER switch and the AVIONICS switch in the ON position.
(6) Engage the INST LTS and the TURN COORD circuit breakers on the circuit breaker panel assembly and the AUTO PILOT circuit breaker on the avionics circuit breaker panel.

C. Set the Autopilot Roll Null (if autopilot is installed).
(1) Do the autopilot preflight test. Refer to the Pilot's Operating Handbook. If the autopilot does not complete the preflight test satisfactorily, do not continue to set the autopilot roll null.
(2) Disconnect the roll servo connector from the aircraft harness.
(3) Apply a ground to pin K of the harness connector.
(4) Connect the digital multimeter across the harness connector at pins D and L to monitor the servo drive voltage.
(5) Push the autopilot AP button on the autopilot flight computer to engage it.
(a) The default ROL mode must be selected. For example, the HDG, NAV, or APR modes are not engaged.
(b) Use a DMM to measure the DC voltage across pins D and L of the roll servo harness connector.
(c) Adjust the pot until a value of 0 volts +0.020 or -0.020 volts is measured.
1 If the pot movement is at its maximum stop before the servo drive is nulled, disengage the autopilot, turn the pot fully to the opposite stop, and engage the autopilot.
(d) The roll null adjustment range simulates a four-turn pot that lets the procedure of setting the pot adjustment range.

NOTE: This adjustment is for offsets in the roll axes, including the turn coordinator.

(e) Continue to turn the pot to null the voltage.
(6) Connect the airplane roll servo harness connector to the servo connector.

D. Do an operational check of the turn coordinator to make sure that it operates correctly.

7. Turn Coordinator Removal and Installation (Airplanes with Garmin G1000)

A. Turn Coordinator Removal (Refer to Figure 202).

CAUTION: Make sure that the gyro rotor has fully stopped before you move the instrument. The gyro rotor will not stop for approximately 15 minutes after the vacuum source is removed. Damage to the instrument will occur if the instrument is moved before the gyro rotor has stopped.

CAUTION: Be careful with the gyroscopic instruments. Do not hit, shake, or put the instruments on a hard surface. Use soft material between the gyroscopic instruments and any hard surface. Damage to the instruments will occur if the instruments are not carefully moved. The manufacturer's warranty can become void if the gyro is not kept in its initial condition as received from the manufacturer.

(1) Put the MASTER switch and the AVIONICS switch in the off position.
(2) Disengage the AUTO PILOT and STDBY INST LTS circuit breakers on the circuit breaker panel
(3) Remove the Multi-Function Display (MFD). Refer to Chapter 34, Control Display Unit - Maintenance Practices.
(4) Remove the screws that attach the turn coordinator to the structure.
(5) Move the turn coordinator to get access to the electrical connector (PI307).

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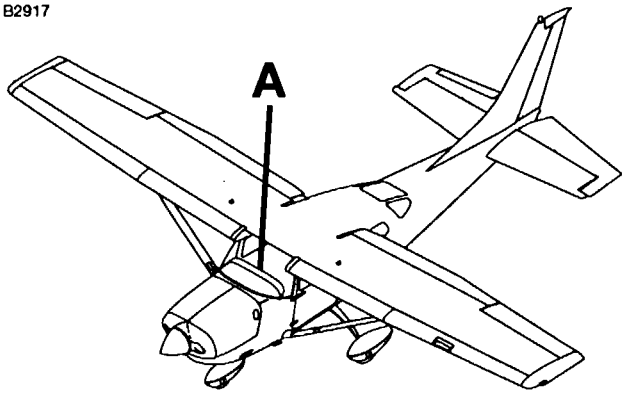
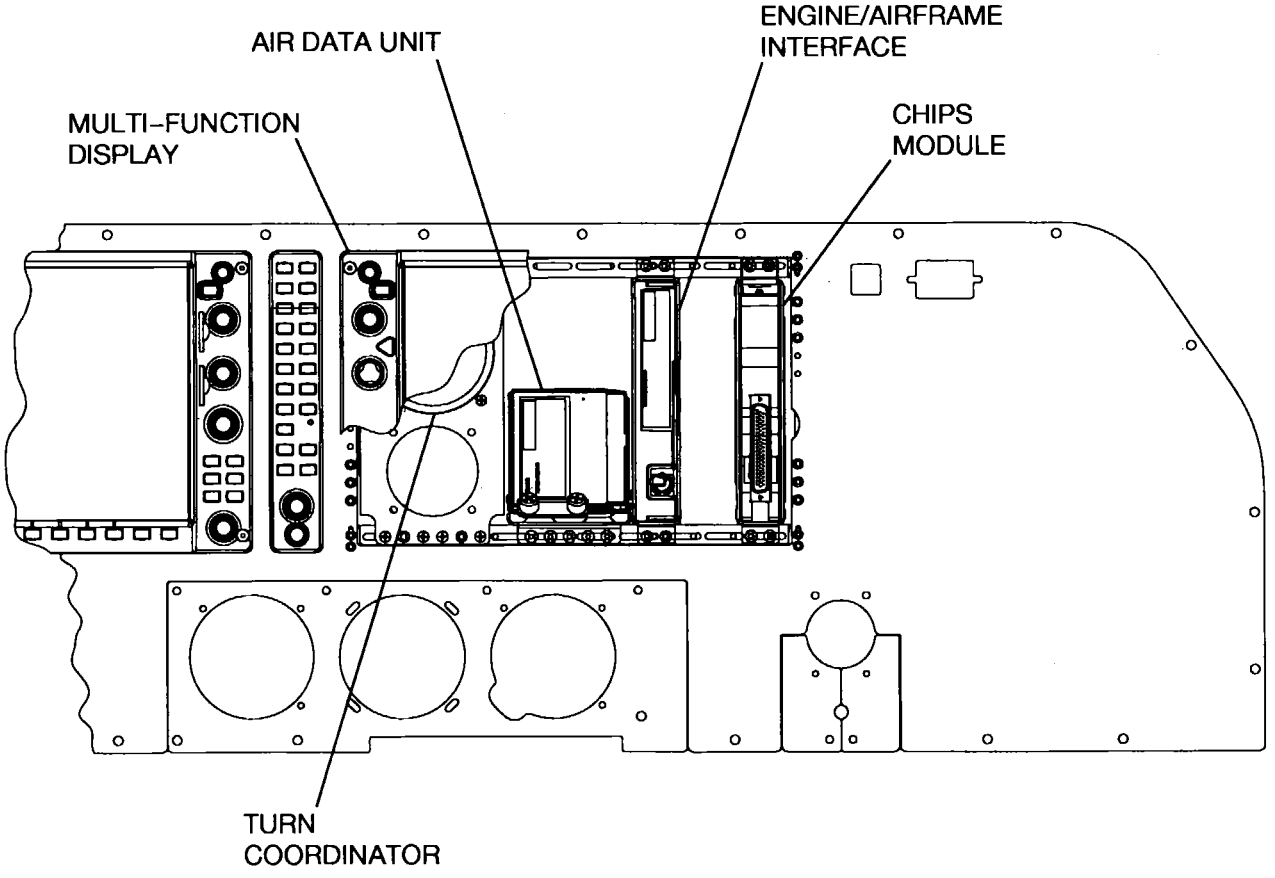




DETAIL A

AIRPLANES WITH GARMIN G1000

1210T1001
A1218T1044

Turn Coordinator Installation (Airplanes with Garmin G1000)
Figure 202 (Sheet 1)

CAUTION: Put a cover on the applicable electrical connector when the gyroscopic instrument is out of the airplane or is to be shipped. Damage to the instrument will occur from foreign object debris if a cover is not used.

(6) Disconnect the electrical connector and remove the turn coordinator from the airplane.
(7) Put connector caps on the avionics connector and the electrical connector

B. Turn Coordinator Installation (Refer to Figure 202).

CAUTION: Do not remove the turn coordinator from the box in which it was shipped until it is ready to be installed into the airplane. This will minimize the possibility of accidentally causing damage to the gyro.

CAUTION: Remove all plugs from the turn coordinator before you install it in the airplane.

CAUTION: Be careful with the gyroscopic instruments. Do not hit, shake, or put the instruments on a hard surface. Put soft material between the gyroscopic instruments and any hard surface. Damage to the instruments will occur if the instruments are not carefully moved. The manufacturer's warranty can become void if the gyro is not kept in its initial condition as received from the manufacturer.

(1) Remove the connector caps from the turn coordinator avionics connector and the electrical connector.
(2) Connect the electrical connector to the turn coordinator.
(3) Install the turn coordinator in position.
(4) Attach the turn coordinator with screws to the structure.
(5) Install the MFD. Refer to Chapter 34, Control Display Unit - Maintenance Practices.
(6) Put the MASTER switch and the AVIONICS switch in the ON position.
(7) Engage the AUTO PILOT and STDBY INST LTS circuit breakers on the circuit breaker panel

C. Set the autopilot roll null if autopilot is Installed. Refer to Autopilot - Maintenance Practices.

D. Do an operational check of the turn coordinator to make sure that it operates correctly.

COMPASS INSTALLATION - MAINTENANCE PRACTICES

1. General

A. A lighted, magnetic compass is installed on the upper windshield at the airplane centerline.

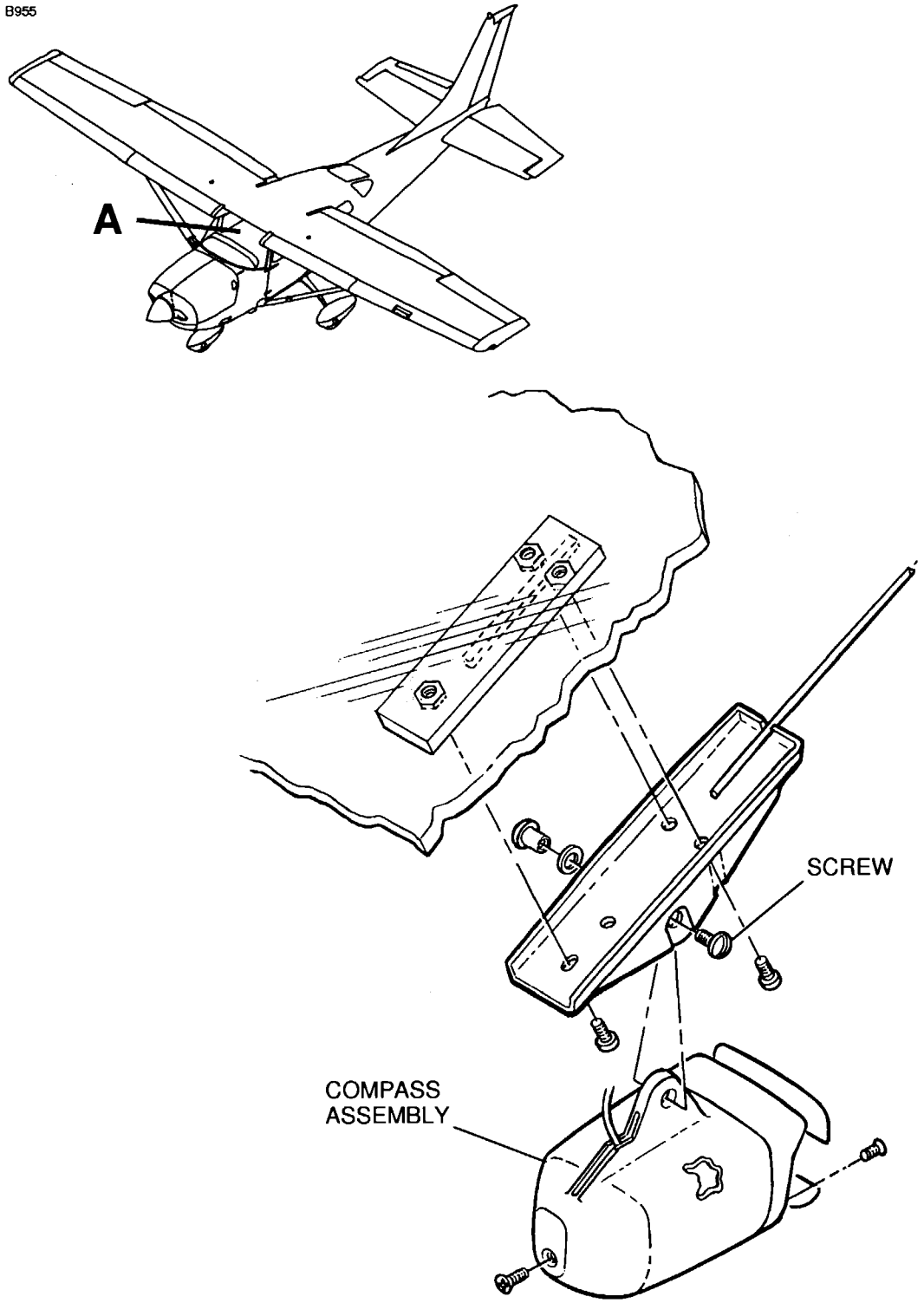
2. Compass Removal and Installation

A. Remove Compass (Refer to Figure 201).
   (1) Remove electrical power from airplane. Disengage INST LTS circuit breaker on circuit panel assembly.
   (2) Identify, tag, and disconnect electrical wires for compass lighting.

   NOTE: Splices are located under upper windshield trim.

   (3) Remove screw, post, and washer securing compass to compass base.
   (4) Remove compass from airplane.

B. Install Compass (Refer to Figure 201).
   (1) Secure compass to compass base with screw, post, and washer. Torque screw to 12.5 Inch pounds, +2.5 or - 2.5 Inch pounds (1.41 N.m, +0.27 or -0.28 N.m).
   (2) Connect electrical wires at splices.
   (3) Restore electrical power to airplane. Engage INST LTS circuit breaker on circuit panel assembly.
   (4) Check compass accuracy on compass rose.



DETAIL A

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Compass Installation
Figure 201 (Sheet 1)

MAGNETOMETER - MAINTENANCE PRACTICES
Airplanes with the Garmin G1000

1. General

A. The magnetometer maintenance practices give procedures for the magnetometer removal/ installation.

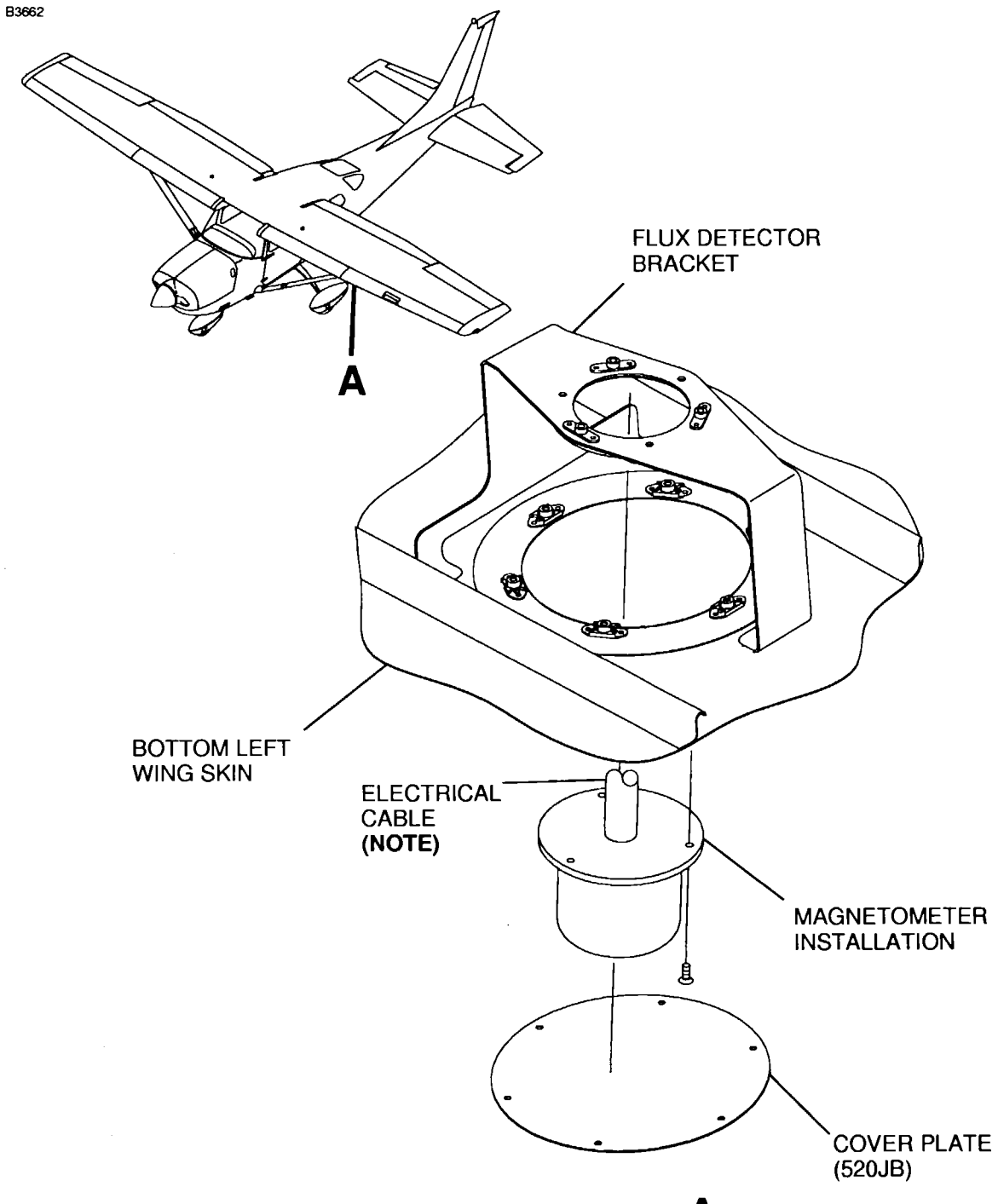
B. The magnetometer senses magnetic direction. The magnetometer uses this information to digitally interface with the integrated avionics system. The magnetometer is in the bottom of the left wing.

2. GMU-44 Magnetometer Removal/Installation

CAUTION: Do not use magnetic tools and screws when work is done on the magnetometer. Magnetic tools and screws will cause the magnetometer to malfunction.

A. Remove the Magnetometer (Refer to Figure 201).
   (1) Make sure the MASTER and AVIONICS switches are in the off position.
   (2) Remove the access/inspection plate (520DB) to get access to the magnetometer. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
   (3) Remove the screws that attach the magnetometer to the flux detector bracket.
   (4) Disconnect the electrical connector (PL302) from the magnetometer.

B. Install the Magnetometer (Refer to Figure 201).
   (1) Connect the electrical connector (PL302) to the magnetometer.
   (2) Attach the magnetometer to the flux detector bracket with the screws.
      (a) Put the magnetometer in position on the flux detector bracket, temporarily aligned parallel to the longitudinal axis of the airplane.
   (3) Install the access/inspection plate (520DB). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
   (4) Do a check to make sure the magnetometer operates correctly. Refer to the Garmin G1000 Line Maintenance Manual.



NOTE: ELECTRICAL CABLE THAT EXTENDS TO THE ELECTRICAL CONNECTOR. (PL302)

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A0714T1048

GMU-44 Magnetometer Installation
Figure 201 (Sheet 1)

ATTITUDE HEADING REFERENCE SYSTEM (AHRS) - MAINTENANCE PRACTICES

1. General

A. The Attitude Heading Reference System (AHRS) has the electronic sensors and hardware that read the aircraft's altitude and directional information and digitally interface this information in the integrated system. The AHRS unit is in the tailcone.

2. GRS-77 AHRS Removal/Installation

A. Remove the AHRS Unit (Refer to Figure 201).
   (1) Make sure the MASTER and AVIONICS switches are in the off position.

CAUTION: Make sure to use a tailcone stand when you get in the tailcone.

   (2) Remove the baggage divider to get access to the aft tailcone interior.
   (3) Disconnect the electrical connector (P771).
   (4) Remove the screws that attach the AHRS unit to the mounting tray.
   (5) Remove the AHRS unit from the airplane.

B. Install the AHRS Unit (Refer to Figure 201).
   (1) Put the AHRS unit in position in the mounting tray and attach to the tray with screws.
   (2) Connect the electrical connector (P771).
   (3) Install the baggage divider.
   (4) Remove the tailcone stand.
   (5) Do a check to make sure the AHRS operates correctly. Refer to the Garmin G1000 Line Maintenance Manual.

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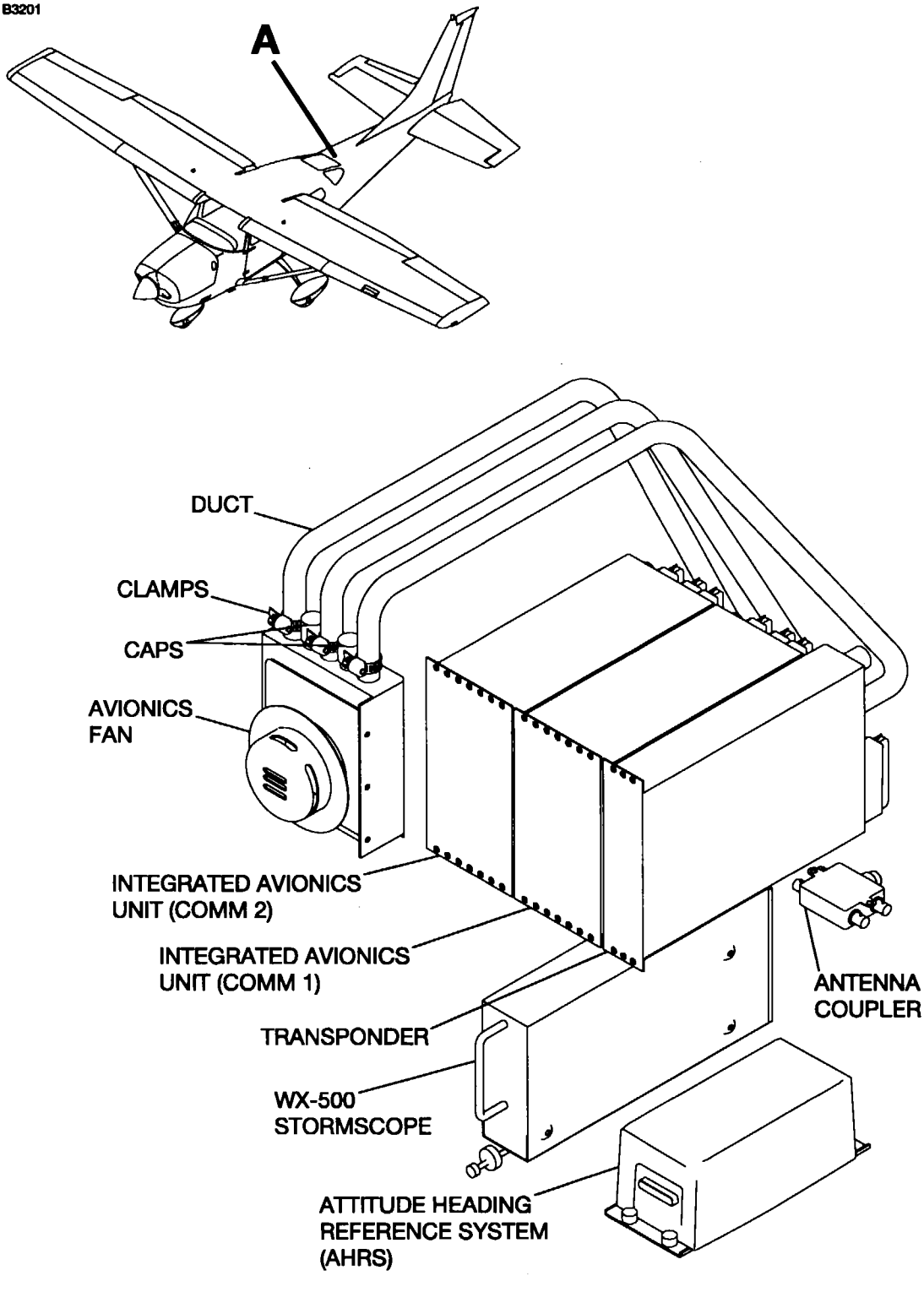


DETAIL A

1210T1001
A1218T1046

Tailcone Avionics Installation
Figure 201 (Sheet 1)

MARKER BEACON - DESCRIPTION AND OPERATION

1. General

A. Marker beacon functions are included in the integrated Bendix/King KMA-26 Audio Amplifier/Intercom/ Marker Beacon Receiver. This receiver is a solid state unit and contains a pushbutton audio selector panel, speaker and headphone isolation amplifiers, a six-station intercom, and a marker beacon receiver.

2. Description and Operation

A. As many as three transceivers and six receivers can be controlled by the KMA-26 Audio Amplifier/ Intercom/Marker Beacon Receiver. This receiver also has two unswitched and mutable auxiliary inputs, four unswitched and unmutable inputs, and two entertainment inputs.

B. Separate isolation amplifiers are provided for headphones and speaker to provide isolation even when the same source is selected for both headphones and speaker. Except for the unswitched, unmuted inputs, the speaker output is muted when the MIC key is pressed to transmit. In the PA MIC selector mode, all the audio inputs are muted to the speaker while the microphone is keyed. When the EMG position is chosen on the MIC selector, the pilot's headphones and microphone are connected directly to COM 1, continuing to operate even when power is lost to the KMA-26 receiver.

C. The KMA-26 marker beacon receiver presentation uses three colored lenses (blue, amber, and white) with the letter designations O-M-I engraved on the lens for visual station passage indication. The appropriate marker audio tone can also be selected. HI-LO sensitivity and lamp test is selected with the HI SENS/LO SENS/TEST switch adjacent to the marker beacon lights. A marker mute feature mutes the marker audio until after the beacon has been passed. The marker beacon lights are automatically dimmed to compensate for ambient cockpit lighting conditions.

D. For operating instructions of the KMA-26 Audio Amplifier/Intercom/Marker Beacon Receiver, refer to the manufacturer's manual listed in the Introduction, List of Manufacturers Technical Publications.

MARKER BEACON - MAINTENANCE PRACTICES

1. General

A. Maintenance practices have procedures for the removal/installation of the KMA-26 and GMA-1347 Audio Amplifier/Intercom/Marker Beacon Receiver and marker beacon antenna.

B. For a check of the KMA-26 and GMA-1347 receiver, refer to the manufacturer's manual in the Introduction, List of Manufacturers Technical Publications.

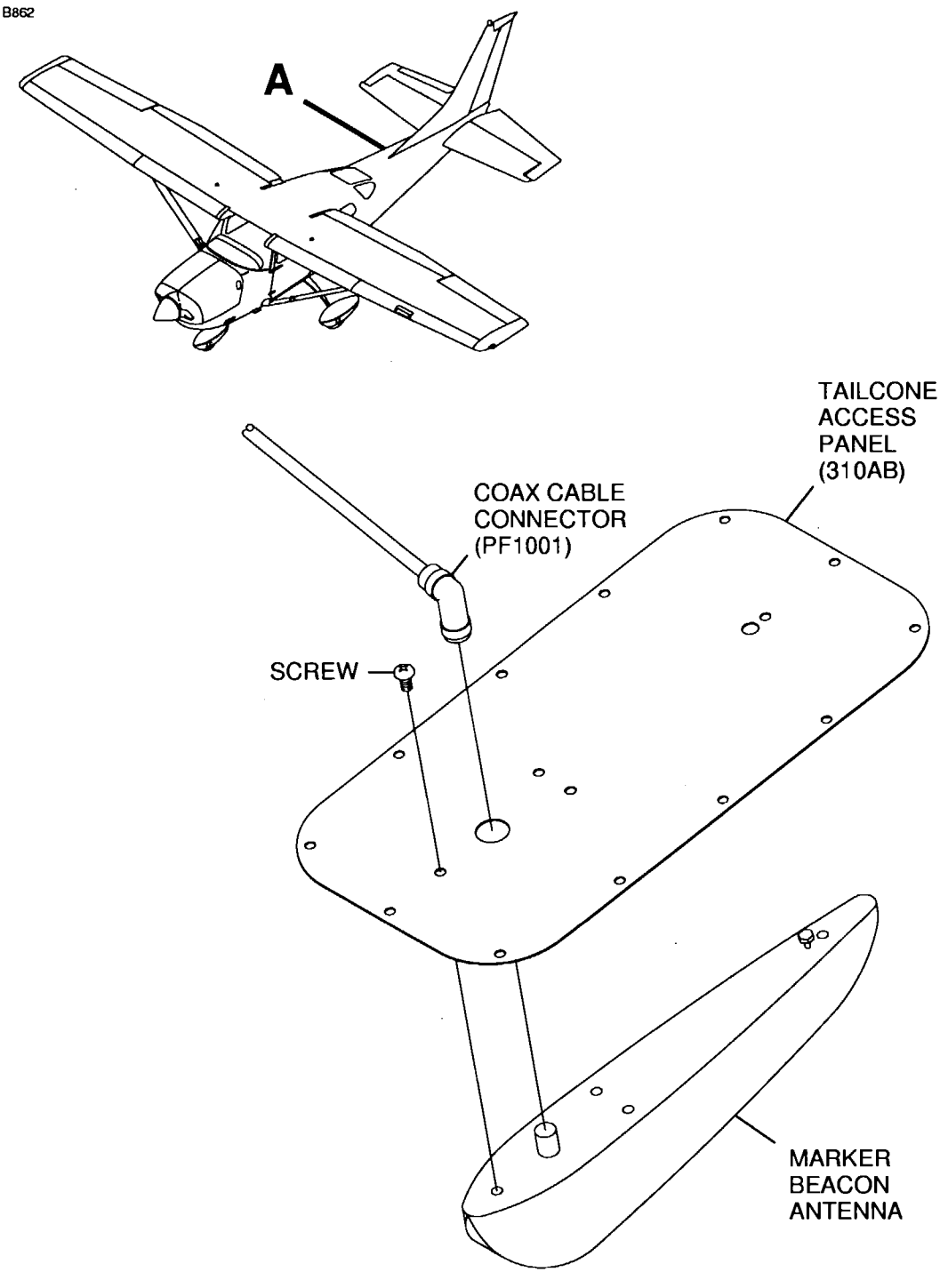
2. Marker Beacon Antenna Removal/Installation

A. Remove the Marker Beacon Antenna (Refer to Figure 201).
(1) Make sure the MASTER and AVIONIC switches are in the off position.
(2) Remove the tailcone access panel 310AB to get access to the marker beacon antenna connections. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(3) Disconnect the coaxial cable from the antenna.
(4) Remove the screws that attach the antenna to the panel.

B. Install the Marker Beacon Antenna (Refer to Figure 201).
(1) Install the marker beacon antenna to the panel with the screws.
(2) Do not install the gasket supplied with the new antenna if the antenna has been replaced.
(3) Apply a Type 1 electrical bond around the screw holes of the access panel. The bond must be 2-1/2 times the diameter of the screw hole.
(4) Connect the coaxial cable to the antenna.
(5) Install the access panel 310AB. Refer to Chapter 6, Access/Inspection Plates - Description and Operation.

3. KMA-26 Audio Amplifier/Intercom/Marker Beacon Receiver Removal/Installation

A. For removal and installation of the KMA-26 receiver, refer to Chapter 23, Audio Panel - Maintenance Practices.



DETAIL A

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Marker Beacon Antenna Installation
Figure 201 (Sheet 1)

INDEPENDENT POSITION DETERMINING - DESCRIPTION AND OPERATION

1. Description

A. The section that follows has the maintenance procedures for the airplane system that gives the position of the airplane. The airplane components of this system are mainly independent of ground installations or satellites such as weather radar.

2. Operation

A. KMH-880 Multi-Hazard Awareness System

(1) The Bendix/King KMH-880 Multi-Hazard Awareness System (MHAS) has Enhanced Ground Proximity Warning System (EGPWS), Terrain Awareness and Warning System (TAWS B), and Traffic Advisory System (TAS) functions. A processor is installed in the aft avionics (tailcone) area. The system also uses a TAS directional antenna that is installed on the top of the fuselage, and an omnidirectional antenna that is installed on the bottom of the fuselage.

B. KTA-870 Traffic Advisory System

(1) The KTA-870 TAS is installed on airplanes with the Garmin G1000. The KTA-870 TAS interfaces with the Garmin G1000 to track, analyze, and display to the flight crew the range and altitude data of traffic. A processor is installed in the tailcone area. The system also uses a TAS directional antenna that is installed on the top of the fuselage, and an omnidirectional antenna that is installed on the bottom of the fuselage.

C. WX-500 Stormscope

(1) The WX-500 Stormscope shows lightning data at ranges of 200 nautical miles. It can be used with Garmin's Control Display Unit (CDU) or Honeywell's Multi-Function Display (MFD). The Stormscope does an analysis of the radiated signals of electrical discharges from storm cells to find thunderstorms. The data is sent to the processor and the processor gives the location and intensity of dangerous thunderstorms.

KMH-880 MULTI-HAZARD AWARENESS SYSTEM - MAINTENANCE PRACTICES

1. General

A. The Bendix/King KMH 880 Multi-Hazard Awareness System (MHAS) has Enhanced Ground Proximity Warning System (EGPWS) and Traffic Advisory System (TAS) functions. The MHAS system has these main components installed in the tailcone area: a KMH-820 Multi-Hazard Awareness Processor, a Terrain Awareness Warning System (TAWS B), a Traffic Advisory System (TAS), and a KCM-805 Configuration Module. Altitude information for the system comes from the blind-encoding altimeter and is changed into a digital signal by the KCM-805 Configuration Module.

B. Two antennas are necessary for the operation of the MHAS system. An Omnidirectional Antenna is installed on the bottom side of the fuselage and a TAS Directional Antenna is installed on the top side of the fuselage.

C. The KMD-540 Mutli-Function Display controls and shows the TAS and EGPWS information. Aural warnings are given through the current audio system in the airplane. Other warnings for terrain are given by the annunciator unit with the TERR N/A lens kit installed.

2. KMH-820 Processor Removal and Installation

A. Remove the KMH-820 Processor. (Refer to Figure 201).
(1) Set the MASTER and AVIONICS switches to the off position.
(2) Disengage the IHAS circuit breaker on the circuit breaker panel.
(3) Remove the rear seat to get access to the aft baggage divider. Refer to Chapter 25, Rear Seat - Maintenance Practices.

CAUTION: Use a tailcone stand when you get in the tailcone. If you do not use a tailcone stand, the tail of the airplane can fall to the floor.

(4) Remove the aft baggage divider to get access to the tailcone.
(5) Disconnect the electrical connectors (J5, J6, and J8) from the forward side of the processor.
(6) Remove the screws that attach the rack assembly to the support bracket assembly.
(7) Remove the processor from the airplane.
(8) Remove the screws that attach the processor to the rack assembly.

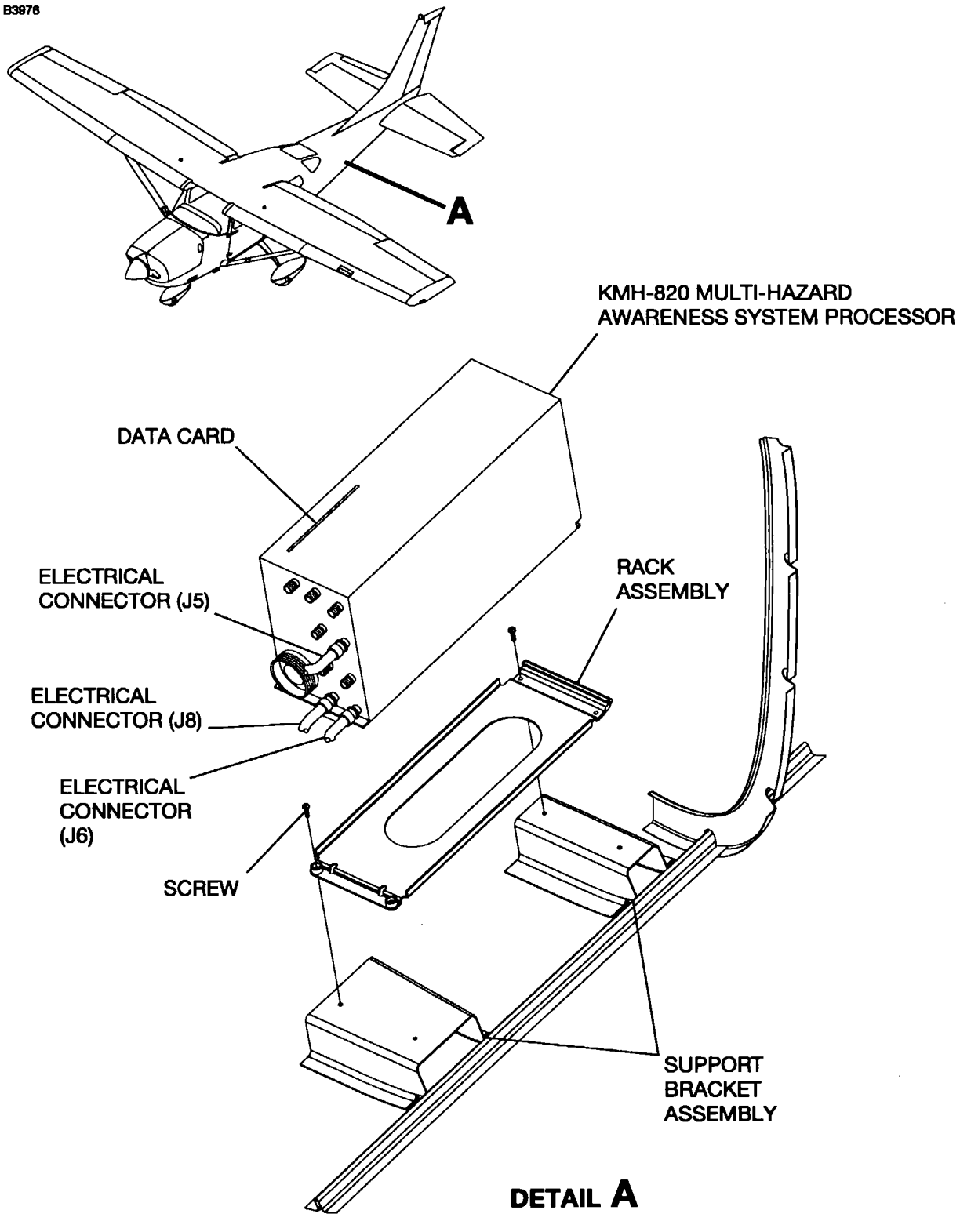
B. Install the KMH-820 Processor. (Refer to Figure 201).
(1) Put the processor at the correct location, on the left side of the tailcone.
(2) Install the screws that attach the rack assembly to the processor.
(3) Install the screws that attach the rack assembly to the support bracket assembly.
(4) Connect the electrical connectors (J5, J6 and J8) to the forward side of the processor.
(5) Install the baggage divider forward of the tailcone.
(6) Install the rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(7) Engage the IHAS circuit breaker on the circuit breaker panel.

3. KMH-880 Interface Adapter Removal and Installation

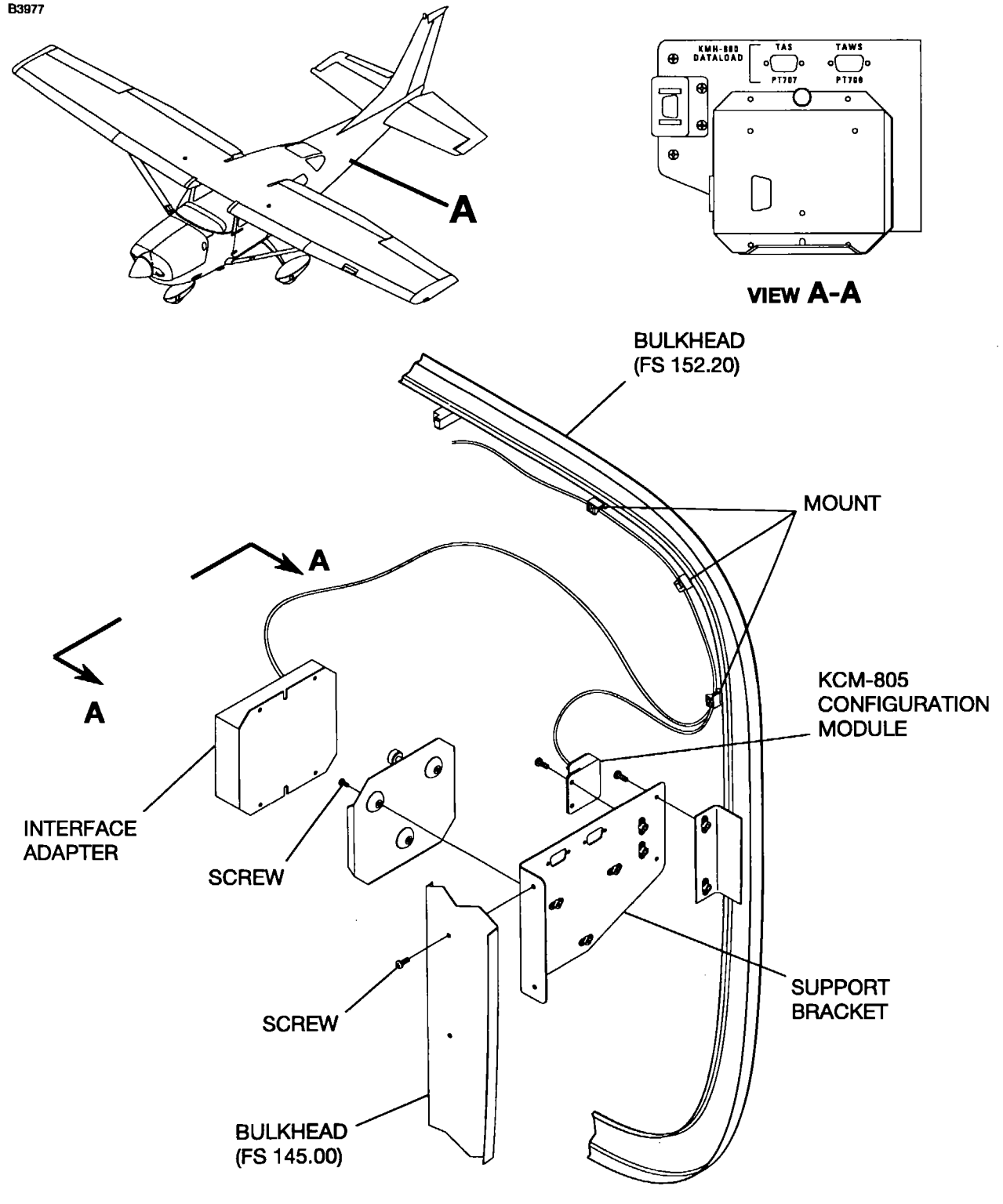
A. Remove the KMH-880 Interface Adapter. (Refer to Figure 202).
(1) Set the MASTER and AVIONICS switches to the off position.
(2) Disengage the IHAS circuit breaker on the circuit breaker panel.
(3) Remove the rear seat to get access to the aft baggage divider. Refer to Chapter 25, Rear Seat - Maintenance Practices.

CAUTION: Use a tailcone stand when you get in the tailcone. If you do not use a tailcone stand, the tail of the airplane can fall to the floor.

(4) Remove the aft baggage divider to get access to the tailcone.
(5) Disconnect the electrical connectors (PT703 and PT704) from the interface adapter.
(6) Disconnect the electrical connector (PT705) from the configuration module.
(7) Disconnect the electrical connectors (PT706 and PT707) from the support bracket assembly.



KMH-820 Processor Installation
Figure 201 (Sheet 1)



KMH-880 Interface Adapter Installation
Figure 202 (Sheet 1)

(8) Remove the screws that attach the support bracket to the airplane structure.
(9) Remove the support bracket from the airplane.
(10) Remove the screws that attach the interface adapter to the support bracket.
(11) Remove the screws that attach the configuration module to the support bracket.

B. Install the KMH-880 Interface Adapter. (Refer to Figure 202).
(1) Install the screws that attach the configuration module to the support bracket.
(2) Install the screws that attach the interface adapter to the support bracket.
(3) Put the support bracket at the correct location on the airplane structure on the let side of the tailcone.
(4) Install the screws that attach the support bracket to the airplane structure.
(5) Connect the electrical connectors (PT703 and PT704) to the interface adapter.
(6) Connect the electrical connector (PT705) to the configuration module.
(7) Connect the electrical connectors (PT706 and PT707) to the support bracket assembly.
(8) Install the aft baggage divider.
(9) Install the rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(10) Engage the IHAS circuit breaker on the circuit breaker panel.

4. Omnidirectional Antenna Removal and Installation

A. Remove the Omnidirectional Antenna. (Refer to Figure 203).
(1) Set the MASTER and AVIONICS switches to the off position.
(2) Disengage the IHAS circuit breaker on the circuit breaker panel.
(3) Remove the rear seat to get access to the aft baggage divider. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(4) Pull the interior upholstery back to get sufficient access to the rear access panels on the floorboard.
(5) Remove the access panel (231NB) to get access to the omnidirectional antenna installation.
(6) Disconnect the right-angle adapter (coax cable) from the omnidirectional antenna.
(7) Remove the screws that attach the omnidirectional antenna to the bottom of the fuselage.
(8) Remove the doubler and omnidirectional antenna from the airplane.

B. Install the Omnidirectional Antenna. (Refer to Figure 203).
(1) Put the doubler at the correct location.

NOTE: The correct location for the doubler is on the top side of the airplane skin below the floorboard on the left side of the airplane between FS 112.00 and FS 124.00.

(2) Put the omnidirectional antenna at the correct location on the bottom side of the fuselage so that the screw holes align with the doubler.
(3) Install the screws that attach the omnidirectional antenna and doubler to the airplane skin .
(4) Connect the right-angle adapter (coax cable) to the omnidirectional antenna.
(5) Install the access panel (231NB) to the floorboard.
(6) Put the interior upholstery back on top of the floorboard.
(7) Install the rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(8) Engage the IHAS circuit breaker on the circuit breaker panel.

5. Traffic Awareness System (TAS) Directional Antenna Removal and Installation

A. Remove the TAS Directional Antenna. (Refer to Figure 204).
(1) Set the MASTER and AVIONICS switches to the off position.
(2) Disengage the IHAS circuit breaker on the circuit breaker panel.
(3) Remove the headliner to get access to the directional antenna.
(4) Put a label on each (four) of the right-angle adapters and disconnect them from the directional antenna.
(5) Remove the screws that attach the directional antenna to the top of the fuselage.
(6) Remove the directional antenna and doubler from the airplane.

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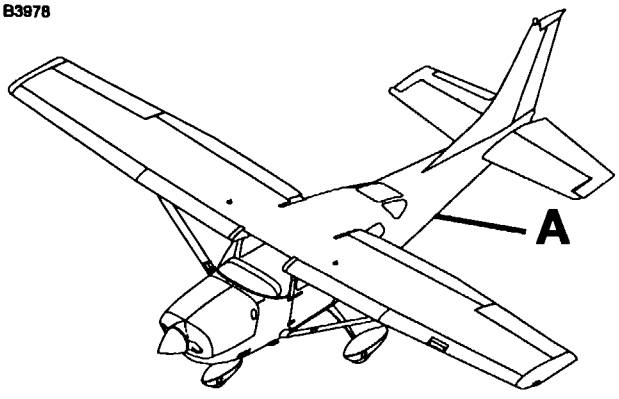

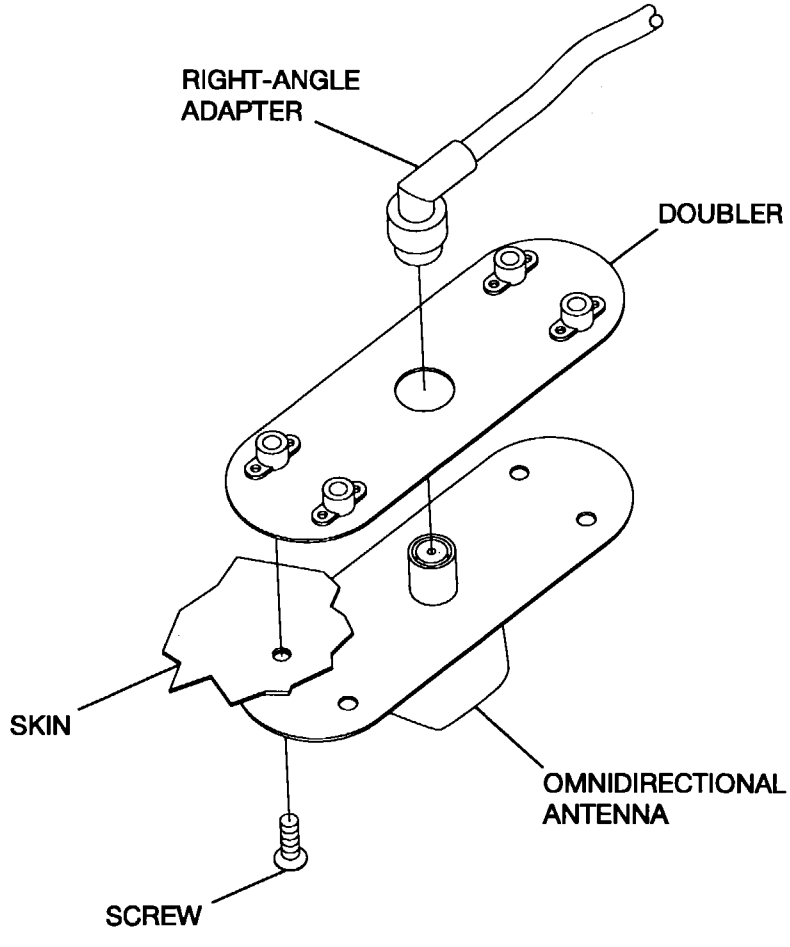

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Omnidirectional Antenna Installation
Figure 203 (Sheet 1)

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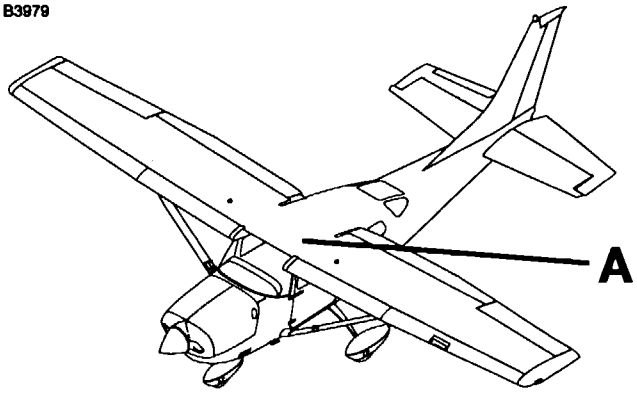

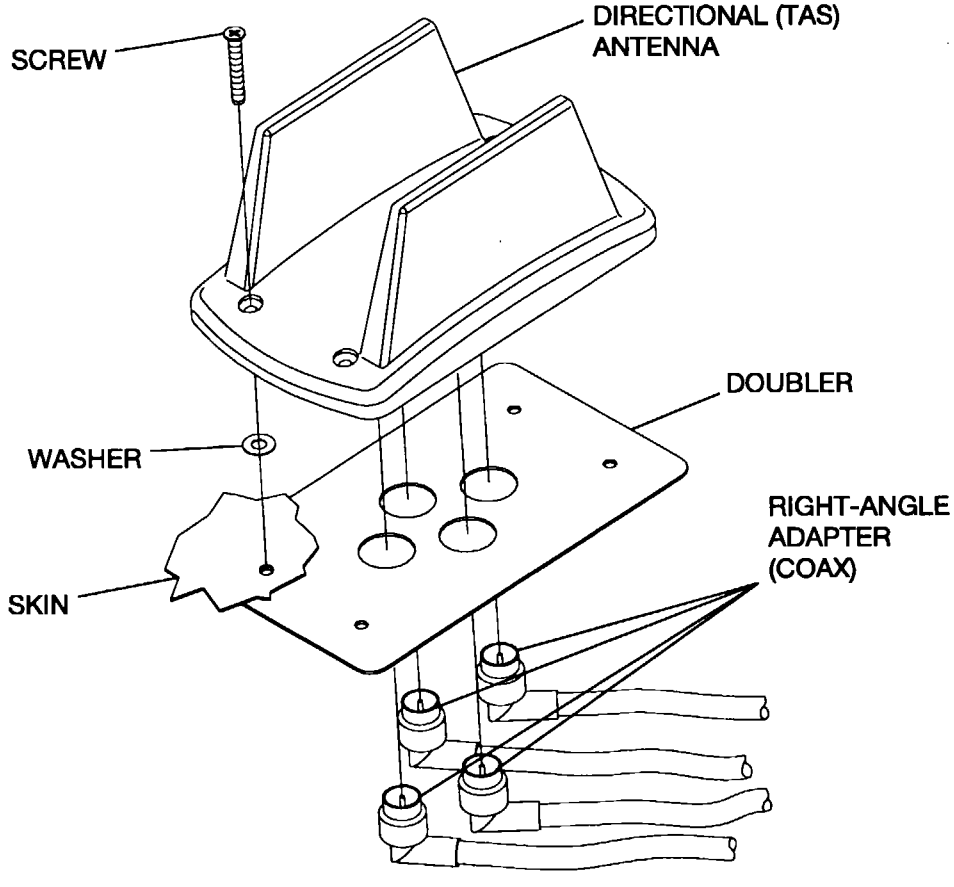

DETAIL A

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TAS Directional Antenna Installation
Figure 204 (Sheet 1)

B. Install the TAS Directional Antenna. (Refer to Figure 204).
   (1) Put the doubler and directional antenna on the fuselage so that the screw holes align through the airplane skin.
   (2) Install the screws that attach the directional antenna and doubler to the airplane skin.
   (3) Remove the labels and connect the right-angle adapters (four) to the correct receptacles on the directional antenna.
   (4) Install the headliner.
   (5) Engage the IHAS circuit breaker on the circuit breaker panel.

KTA-870 TRAFFIC ADVISORY SYSTEM (TAS) - MAINTENANCE PRACTICES

1. General

A. The KTA-870 Traffic Advisory System (TAS) is installed on airplanes with the Garmin G1000. The KTA-870 TAS interfaces with the Garmin G1000. This section gives removal and installation procedures for the KTA-810 processor and the KCM-805 configuration module. Two antennas are necessary for the operation of TAS. Refer to KMH-880 Multi-Hazard Awareness System - Maintenance Practices for the removal and installation procedures for the TAS directional antenna and the omnidirectional antenna.

2. KTA-810 Processor Removal/Installation

A. KTA-810 Processor Removal (Refer to Figure 201).
(1) Set the MASTER and AVIONICS switches to the OFF position.
(2) Disengage the TAS circuit breaker on the circuit breaker panel.
(3) Remove the rear seat to get access to the aft baggage divider. Refer to Chapter 25, Rear Seat - Maintenance Practices.

CAUTION: Use a tailcone stand when you get in the tailcone. If you do not use a tailcone stand, the tail of the airplane can fall to the floor.

(4) Remove the aft baggage divider to get access to the tailcone.
(5) Disconnect the electrical connectors (J1, J2, J3, J4, J7, and J10) from the forward side of the processor.
(6) Remove the 50-ohm terminations from J5, J6, and J8 electrical connections on the forward side of the processor.
(7) Loosen the two lock nuts that attach the processor to the rack assembly.
(8) Remove the processor from the rack assembly.
(9) Remove the screws that attach the rack assembly to the support bracket assembly.
(10) Remove the rack assembly from the airplane.

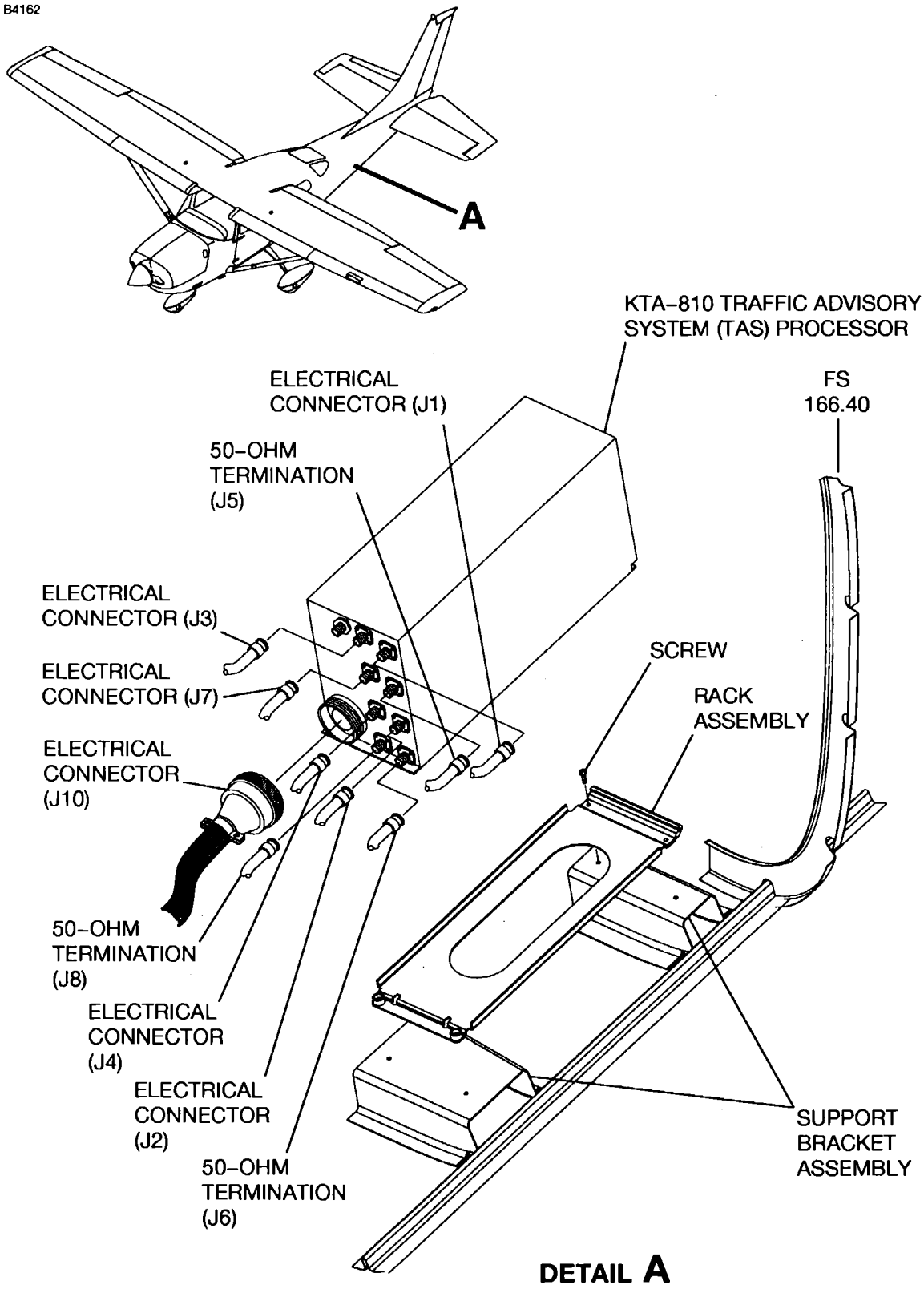
B. KTA-810 Processor Installation (Refer to Figure 201).
(1) Install the screws that attach the rack assembly to the support bracket assembly.
(2) Put the processor in the rack assembly and tighten the lock nuts that attach the processor to the rack assembly.
(3) Connect the electrical connectors (J1, J2, J3, J4, J7, and J10) to the forward side of the processor.
(4) Install the 50-ohm terminations in J5, J6, and J8 electrical connections on the forward side of the processor.
(5) Install the baggage divider forward of the tailcone.
(6) Install the rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(7) Engage the TAS circuit breaker on the circuit breaker panel.

3. KCM-805 Configuration Module Removal/Installation

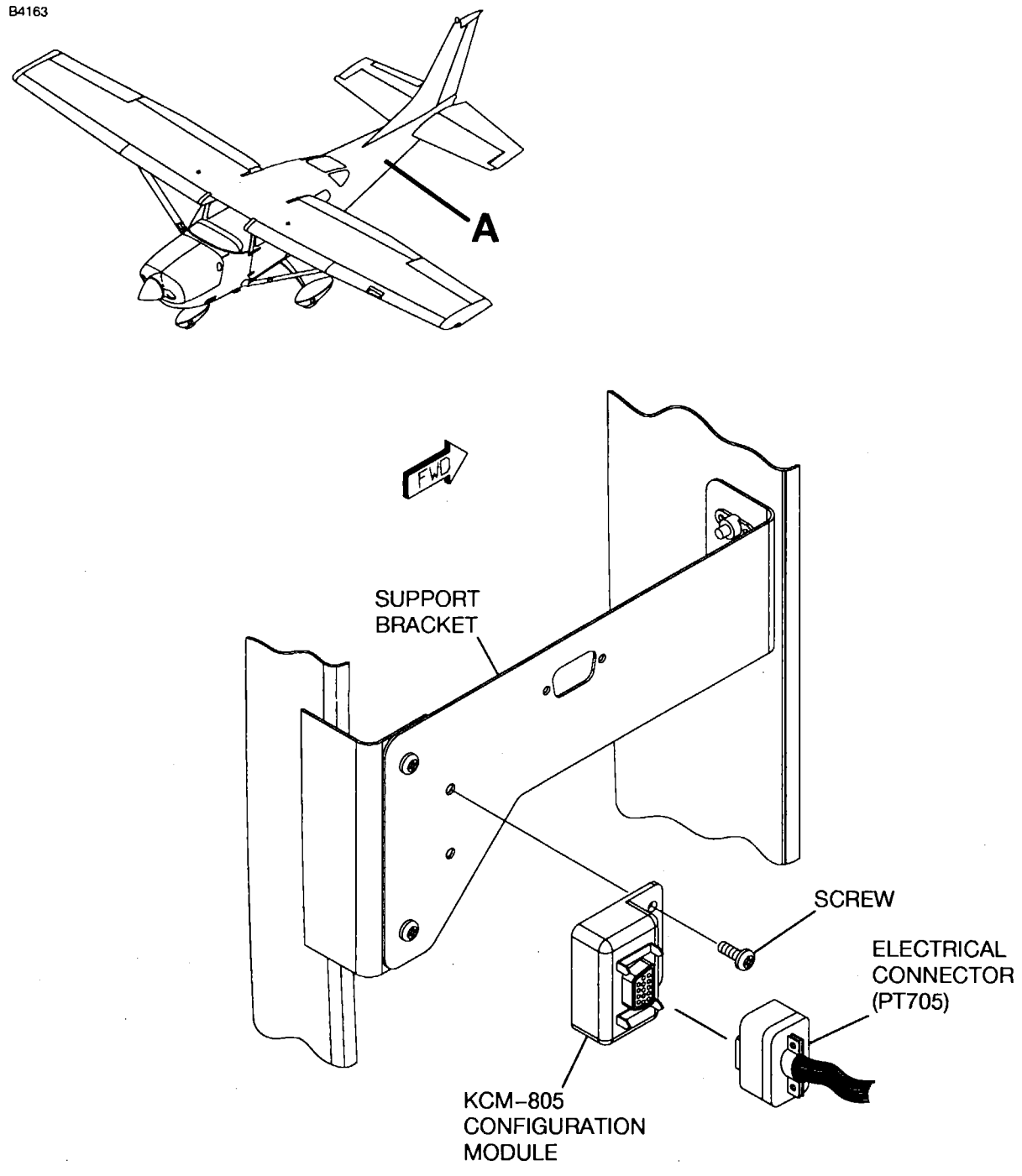
A. KCM-805 Configuration Module Removal (Refer to Figure 202).
(1) Set the MASTER and AVIONICS switches to the OFF position.
(2) Disengage the TAS circuit breaker on the circuit breaker panel.
(3) Remove the rear seat to get access to the aft baggage divider. Refer to Chapter 25, Rear Seat - Maintenance Practices.

CAUTION: Use a tailcone stand when you get in the tailcone. If you do not use a tailcone stand, the tail of the airplane can fall to the floor.

(4) Remove the aft baggage divider to get access to the tailcone.
(5) Disconnect the electrical connector (PT705) from the configuration module.
(6) Remove the screws that attach the configuration module to the support bracket.



KTA-810 Processor Installation
Figure 201 (Sheet 1)



DETAIL A

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KCM-805 Configuration Module Installation
Figure 202 (Sheet 1)

B. KCM-805 Configuration Module Installation (Refer to Figure 202).
   (1) Put the configuration module in position on the support bracket.
   (2) Install the screws that attach the configuration module to the support bracket.
   (3) Connect the electrical connector (PT705) to the configuration module.
   (4) Install the aft baggage divider forward of the tailcone.
   (5) Install the rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
   (6) Engage the TAS circuit breaker on the circuit breaker panel.

WX-500 STORMSCOPE - MAINTENANCE PRACTICES

1. General

A. The maintenance practices give the removal and installation procedures for the stormscope, which is installed in the tailcone, aft of the baggage divider.

2. WX-500 Stormscope Removal/Installation

A. Remove the Stormscope (Refer to Figure 201).
(1) Make sure the MASTER and AVIONICS switches are in the off position.

CAUTION: Make sure to use a tailcone stand when you get in the tailcone.

(2) Remove the baggage divider to get access to the aft tailcone interior.
(3) Disconnect the electrical connection.
(4) Remove the screws that hold the stormscope to the shelf.
(5) Remove the stormscope from the airplane.

B. Install the Stormscope (Refer to Figure 201).
(1) Set the stormscope in position on the tray and attach it with screws.
(2) Connect the electrical connection.
(3) Install the baggage divider.

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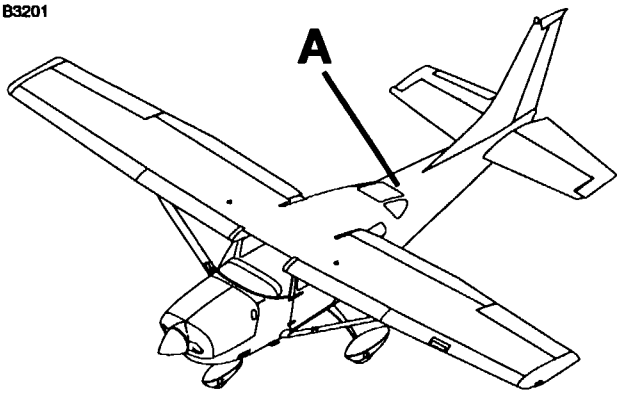

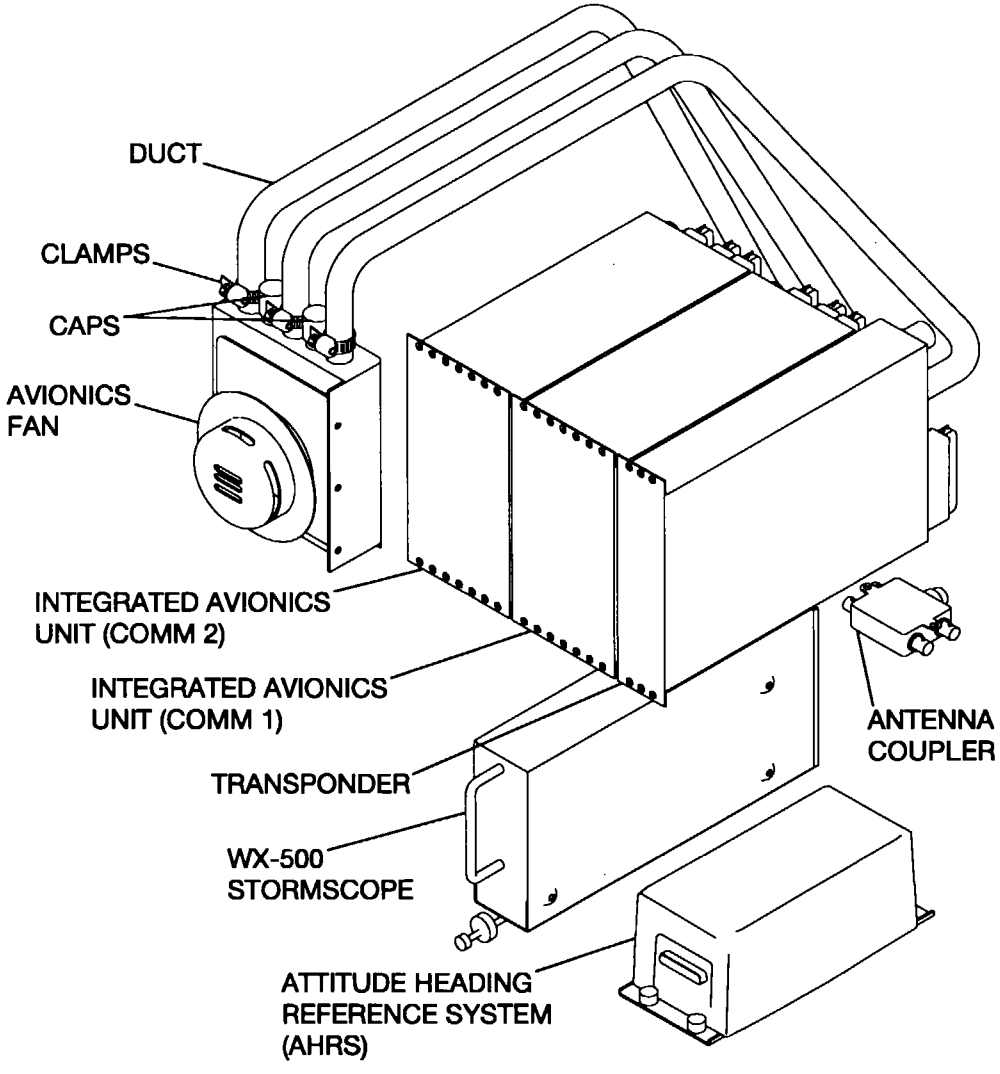

DETAIL A

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WX-500 Stormscope Installation
Figure 201 (Sheet 1)

KX-155A COMM/NAV SYSTEM - MAINTENANCE PRACTICES

1. General

A. KX-155A Comm/Nav System maintenance practices consist of removal and installation of system components. For additional system information and the post installation check, refer to the manufacturer's manuals listed in the Introduction, List of Manufacturers Technical Publications.

2. KX-155A/165A VHF COMM Transceiver/Navigation/VOR/LOC Glideslope Receiver Removal and Installation

CAUTION: Do not interchange the KX-155A and the KX-165A NAV/COM radios. The wiring is not the same for the two different radios. If these radios are interchanged and used with the same wiring, damage can occur to the KX-155A and/or the KX-165A NAV/COM radios.

A. For removal and installation of the KX-155A receiver, refer to Chapter 23, Communications - Maintenance Practices.

3. Omni (Nav) Antenna Removal and Installation

A. Remove Omni Antenna (Refer to Figure 201).
   (1) Remove electrical power from airplane. Disengage NAV COM 1 and NAV COM 2 circuit breakers on avionics circuit breaker panel.
   (2) Remove boots over antenna radiators.
   (3) Remove antenna radiators from antenna base by unscrewing radiators out of the self-locking hex nuts.
   (4) Gain access to omni antenna by removing fin tip.
   (5) Remove screws securing antenna base to fin rib.
   (6) Lift antenna base to gain access to coax connector. Disconnect coax connector from antenna base.
   (7) Remove omni antenna from airplane.

B. Install Omni (Nav) Antenna (Refer to Figure 201).
   (1) Position omni antenna at fin and connect coax connector to antenna base.
   (2) Secure antenna base to fin rib with screws.
   (3) Install fin tip.

CAUTION: When screwing antenna radiators into self-locking hex nuts, do not over-tighten antenna radiators.

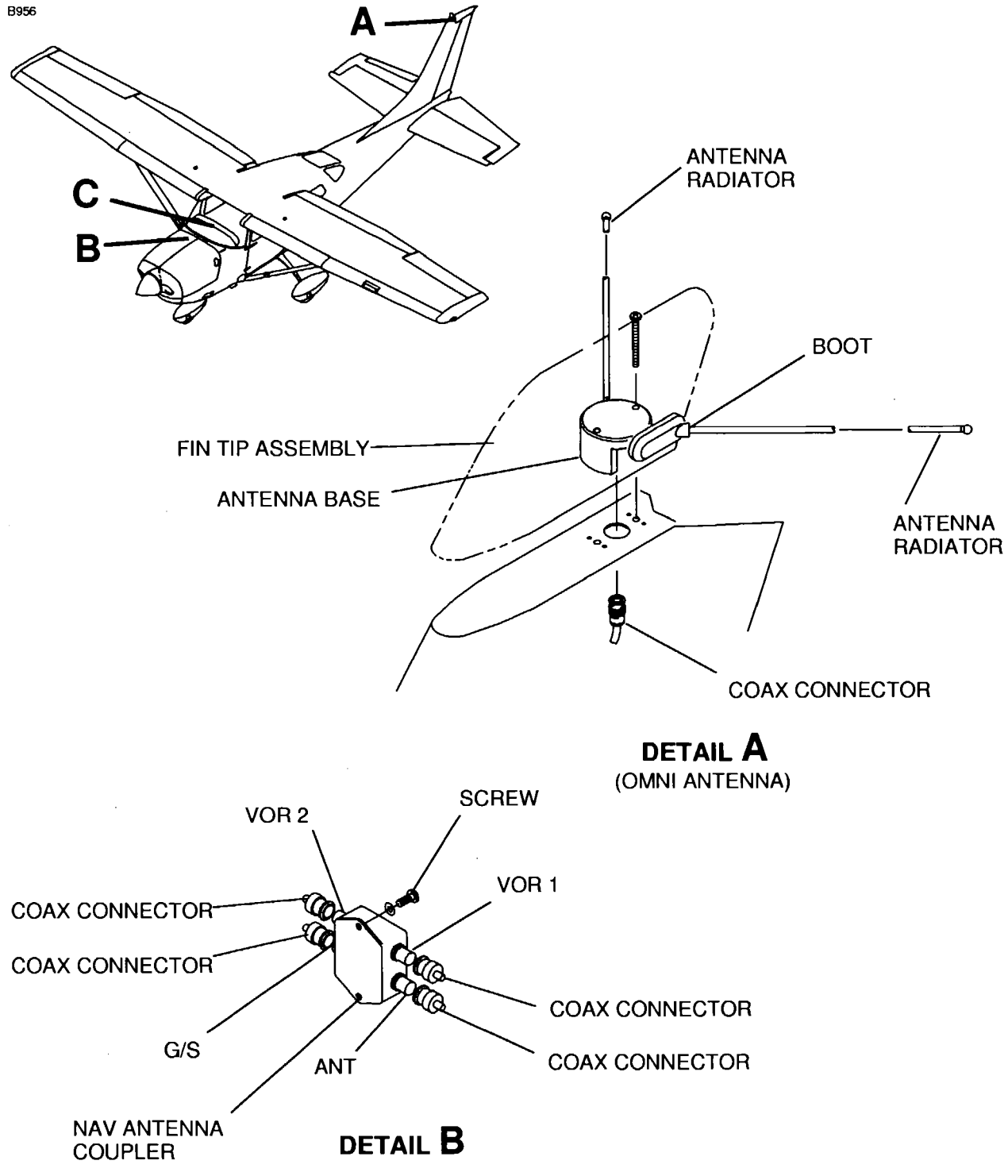
   (4) Screw antenna radiators into self-locking hex nuts of antenna base.
   (5) Install boots over antenna radiators.
   (6) Restore electrical power to airplane. Engage NAV COM 1 and NAV COM 2 circuit breakers on avionics circuit breaker panel.

4. Nav Antenna Coupler Removal and Installation

A. Remove Nav Antenna Coupler (Refer to Figure 201).

NOTE: The nav antenna coupler is located at RBL 4.51 and WL 18.58, on the aft side of the firewall.

   (1) Remove electrical power from airplane. Disengage NAV COM 1 and NAV COM 2 circuit breakers on avionics circuit breaker panel.
   (2) Gain access to nav antenna coupler.
   (3) Identify, tag, and disconnect antenna coax connectors from nav antenna coupler.
   (4) Remove screws and washers securing nav antenna coupler to firewall.
   (5) Remove nav antenna coupler from airplane.



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Navigation Components Installation
Figure 201 (Sheet 1)

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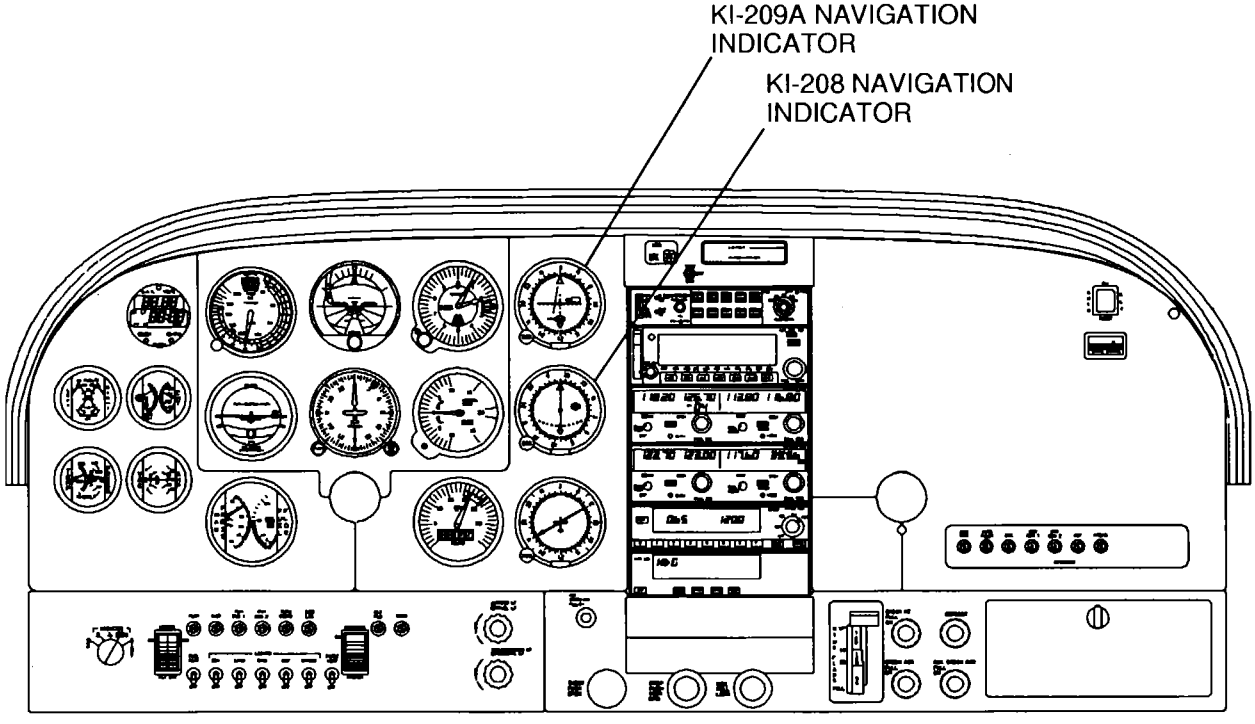

DETAIL C

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Navigation Components Installation
Figure 201 (Sheet 2)

B. Install Nav Antenna Coupler (Refer to Figure 201).
   (1) Position nav antenna coupler on firewall and secure with screws and washers.
   (2) Connect antenna coax connectors to nav antenna coupler.
   (3) Restore electrical power to airplane. Engage NAV COM 1 and NAV COM 2 circuit breakers on avionics circuit breaker panel.

5. KI-209A and KI-208 Navigation Indicators Removal and Installation

NOTE: KI-209A Navigation Indicator is the NAV 1 indicator and KI-208 is the NAV 2 indicator. Removal and installation are typical for the NAV 1 and 2 indicators.

A. Remove Navigation Indicator (Refer to Figure 201).
   (1) Remove electrical power from airplane. Disengage NAV COM 1 and NAV COM 2 circuit breakers on avionics circuit breaker panel and INST LTS circuit breaker on circuit panel assembly.
   (2) Remove pilot inboard panel assembly to gain access to rear of navigation indicator. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.
   (3) Disconnect electrical connector (NAV 1 or NAV 2) from navigation indicator.
   (4) Remove screws securing navigation indicator to pilot inboard panel assembly.
   (5) Remove navigation indicator from airplane.

B. Install Navigation Indicator (Refer to Figure 201).
   (1) Place navigation indicator on inboard pilot panel assembly and secure with screws.
   (2) Install electrical connector (NAV 1 or NAV 2) to navigation indicator.
   (3) Secure pilot inboard panel assembly to structure with screws. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.
   (4) Restore electrical power to airplane. Engage NAV COM 1 and NAV COM 2 circuit breakers on avionics circuit breaker panel and INST LTS circuit breaker on circuit panel assembly.

GIA - 63 INTEGRATED AVIONICS INSTALLATION - MAINTENANCE PRACTICES

1. General

A. Two GIA-63 Integrated Avionics Units (IAUs) are on the avionics shelf in the tailcone.

B. The units have the communication and navigation receiver/transmitter components to operate the GPS, NAV, COM, and Glideslope functions. The GIA 63W has the Wide Area Augmentation System (WAAS) installed. The units are integrated components of the Garmin G1000 avionics system.

2. GIA-63 NAV/COM Removal/Installation

A. Remove the Integrated Avionics Unit.
(1) Refer to Chapter 23, Communications - Maintenance Practices.

KLN-79/KLN-89B GPS - MAINTENANCE PRACTICES

1. General

A. Airplanes without the optional KR-87 ADF System are configured with a KLN-89 GPS Receiver (GPS-VFR) that includes a GPS database. The GPS receiver is located in the avionics radio panel rack. An MD41-230 GPS-NAV selector is located on the annunciator and GPS panel assembly located above the avionics radio panel.

B. Airplanes with the optional KR-87 ADF System are configured with a KLN-89B GPS Receiver (GPS-IFR) that includes a GPS data cartridge. The GPS receiver is located in the avionics radio panel rack. An MD41-228 GPS-NAV selector is located on the annunciator and GPS panel assembly, located above the avionics radio panel.

C. The GPS uses a KA-92 GPS Antenna located above the cabin, in the general proximity of the COMM antennas.

2. GPS Receiver Removal and Installation

A. Remove GPS Receiver (Refer to Figure 201).
(1) Remove electrical power from airplane. Disengage GPS circuit breaker on avionics circuit breaker panel and INST LTS circuit breaker on circuit panel assembly. Additionally, disengage the NAV COM 1 circuit breaker for airplanes with the KR-87 ADF System.
(2) Loosen single hex screw, located in recessed hole on face of GPS receiver, counterclockwise. Continue turning hex screw until unit is free to be removed from avionics radio panel rack.
(3) Pull GPS receiver from radio panel rack and remove from airplane.

B. Install GPS Receiver (Refer to Figure 201).
(1) Place GPS receiver in radio panel rack and slide forward, engaging fixed electrical connectors and coax connector.
(2) Secure unit to avionics radio panel rack by turning hex screw in a clockwise direction until tight.
(3) Restore electrical power to airplane. Engage GPS circuit breaker on avionics circuit breaker panel and INST LTS circuit breaker on circuit panel assembly. Additionally, engage NAV COM 1 circuit breaker for airplanes with the KR-87 ADF System.

3. KA-92 GPS Antenna Removal and Installation

A. Remove GPS Antenna (Refer to Figure 201).
(1) Remove electrical power from airplane. Disengage the GPS circuit breaker on the avionics circuit breaker panel.
(2) Remove screws securing GPS antenna to fuselage skin.
(3) Carefully lift GPS antenna and disconnect coax connector from GPS antenna.

NOTE: Secure coax cable using a tie strap, tape, or other suitable material, to prevent connector from slipping through the opening in the fuselage once it has been disconnected from GPS antenna.

(4) Remove GPS antenna and gasket from airplane.

B. Install GPS Antenna (Refer to Figure 201).
(1) Place GPS antenna gasket in position on fuselage skin.
(2) Position GPS antenna at coax connector opening in fuselage and connect coax connector to GPS antenna.
(3) Remove material used to secure coax cable.
(4) Secure GPS antenna to fuselage skin with screws.
(5) Restore electrical power to airplane. Engage the GPS circuit breaker on the avionics circuit breaker panel.

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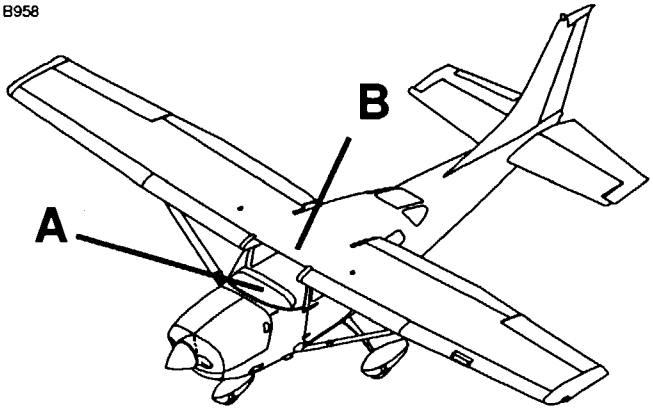
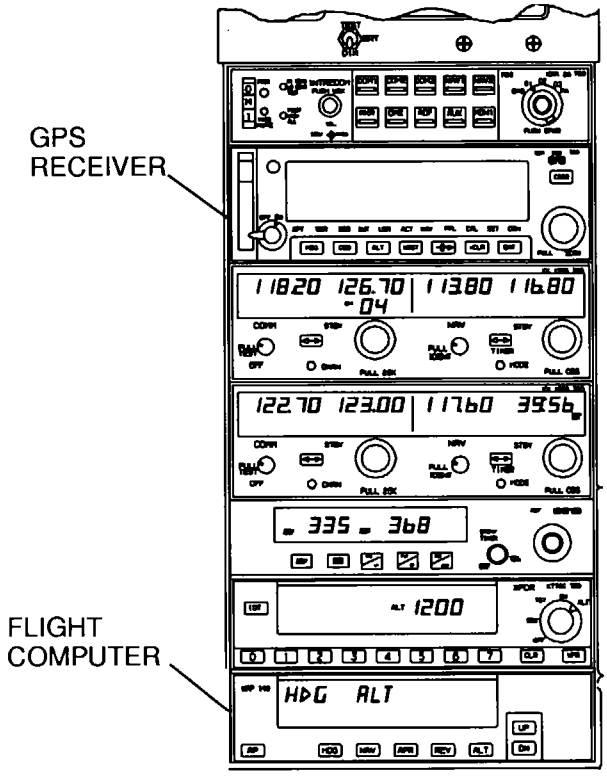
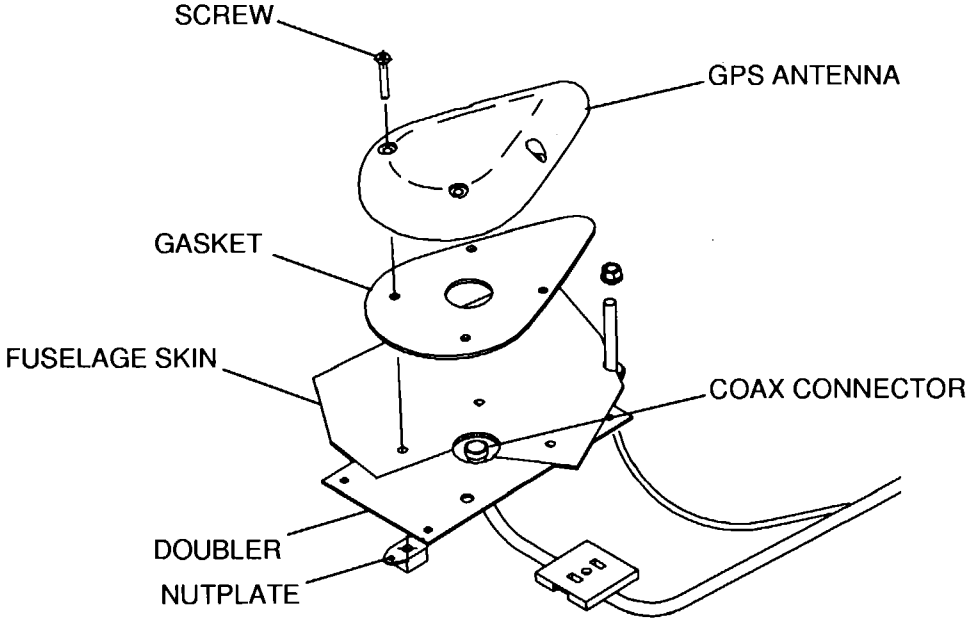




DETAIL A



DETAIL B

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KLN-89/KLN-89B GPS Installation
Figure 201 (Sheet 1)

KR-87 ADF SYSTEM - MAINTENANCE PRACTICES

1. General

A. This section gives removal and installation procedures for the KI-227 Automatic Direction Finder (ADF) indicator, KR-87 ADF receiver, and KA-44B ADF antenna.

B. On airplanes without Garmin G1000, the KR-87 ADF receiver is installed in the avionics panel radio rack. The KA-44B ADF antenna is installed on the bottom fuselage below the cabin at FS 152.20 and RBL 1.00. Use the KR-87 ADF receiver to tune the KR-87 system. Indications are shown on the KI-227 ADF indicator, located to the left of the receiver on the inboard pilot panel assembly below the navigation indicators.

C. On airplanes with Garmin G1000, the KR-87 ADF receiver is installed on the instrument panel to the right of the Multi-Function Display (MFD). The KA-44B ADF antenna is installed on the bottom fuselage below the cabin at FS 152.20 and RBL 1.00. To tune the KR-87 ADF system, use the KR-87 ADF receiver. All indications are shown on the G1000 Primary-Flight Display (PFD).

2. KR- 87 ADF Receiver Removal and Installation (Airplanes without Garmin G1000)

A. ADF Receiver Removal (Refer to Figure 201).
(1) Remove electrical power from airplane. Disengage ADF circuit breaker on avionics circuit breaker panel and INST LTS circuit breaker on circuit panel assembly.
(2) Loosen the single locking screw located in the recessed hole on the face of the receiver.
(3) Pull the ADF receiver from the radio rack and remove from airplane.

B. ADF Receiver Installation (Refer to Figure 201).
(1) Put the ADF receiver in the radio rack and slide it forward to engage the fixed electrical plug.
(2) Tighten the single locking screw located in the recessed hole on the face of the receiver.
(3) Connect electrical power to the airplane as needed and turn the master switch to ON. Engage the ADF circuit breaker on the avionics circuit breaker panel.
(4) Do an operational test of the ADF receiver.
(5) Remove electrical power from the airplane and turn the master switch to off. Disengage the ADF circuit breaker on the avionics circuit breaker panel.

3. KR-87 ADF Receiver Removal/Installation (Airplanes with Garmin G1000)

A. ADF Receiver Removal (Refer to Figure 202).
(1) Remove electrical power from the airplane and turn the master switch to off. Disengage the ADF circuit breaker on the avionics circuit breaker panel.
(2) Loosen the single locking screw located in the recessed hole on the face of the receiver.
(3) Carefully pull the ADF receiver and the bezel from the instrument panel to disengage the electrical connector (P1602) from the ADF receiver.
(4) Remove the ADF receiver, with the bezel, from the airplane.

B. ADF Receiver Installation (Refer to Figure 202).
(1) Carefully put the bezel on the rear of the ADF receiver and pull it forward evenly until it is in position directly behind the face of the ADF receiver.
(2) Put the ADF receiver in position in the instrument panel and slide it forward to engage the electrical connector (P1602) with the ADF receiver.
(3) Tighten the single locking screw located in the recessed hole on the face of the receiver.
(4) Connect electrical power to the airplane as needed and turn the master switch to ON. Engage the ADF circuit breaker on the avionics circuit breaker panel.
(5) Do an operational test of the ADF receiver.
(6) Remove electrical power from the airplane and turn the master switch to off. Disengage the ADF circuit breaker on the avionics circuit breaker panel.

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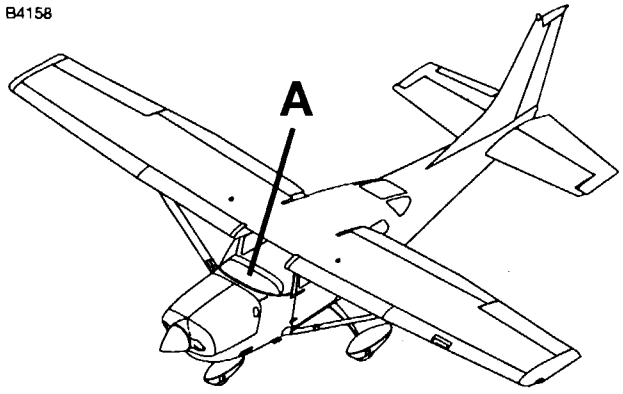

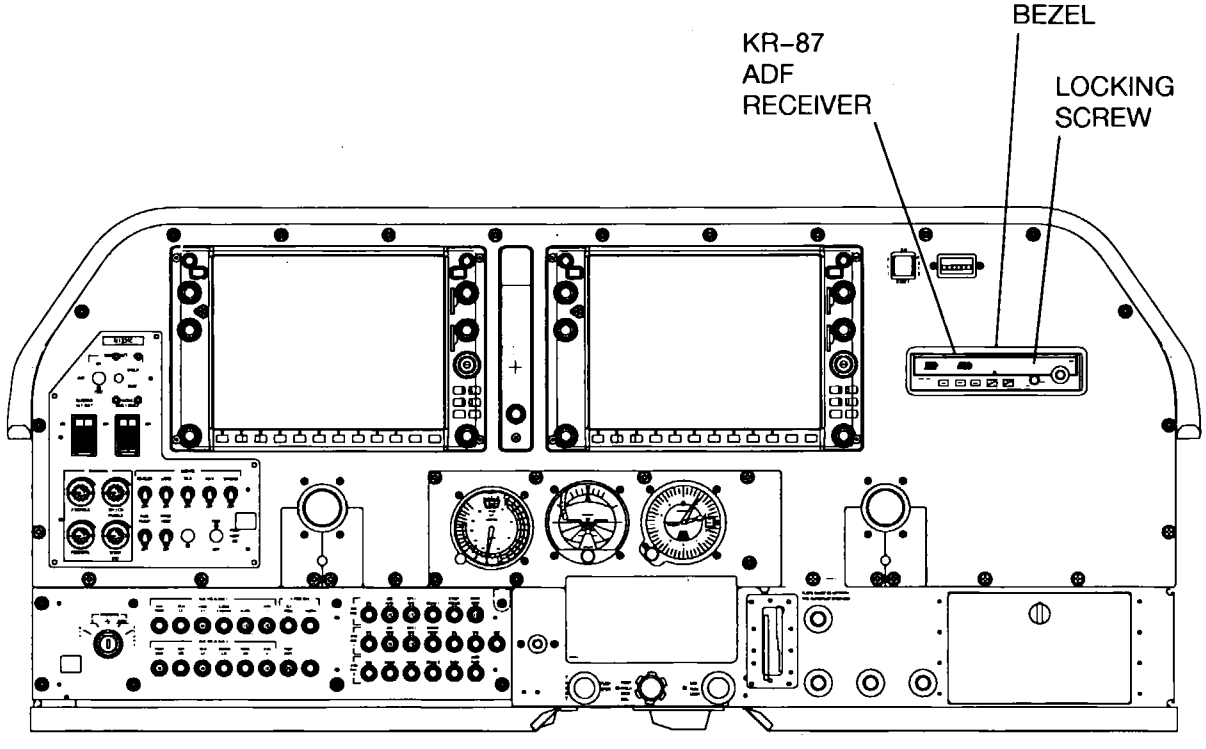

DETAIL A
AIRPLANES WITH THE
GARMIN G1000

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KR-87 ADF Installation
Figure 202 (Sheet 1)

4. KA-44B ADF Antenna Removal and Installation (For Airplanes With or Without Garmin G1000)

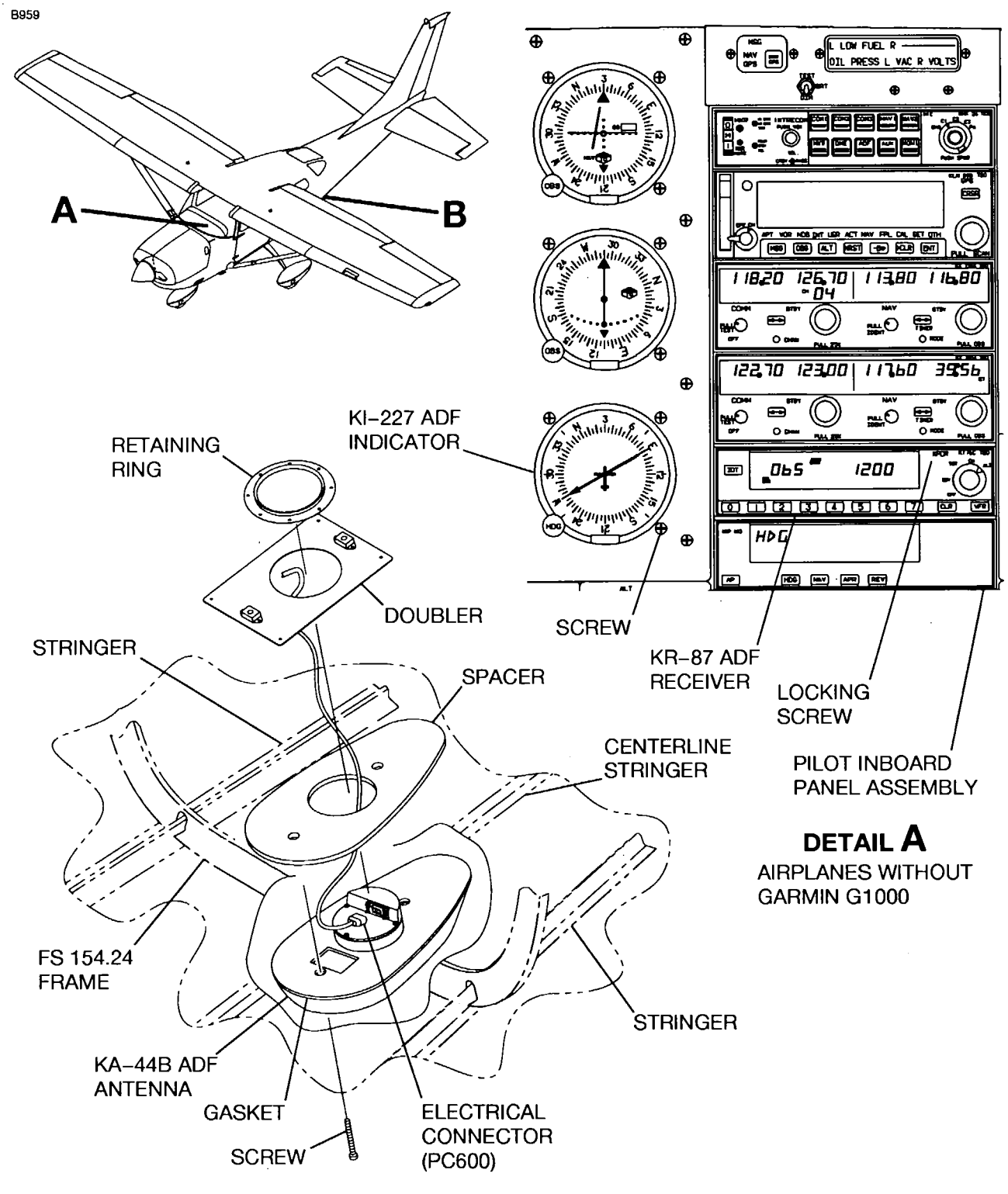
A. ADF Antenna Removal (Refer to Figure 201).
(1) Remove electrical power from airplane and turn the master switch to off. Disengage ADF circuit breaker on avionics circuit breaker panel.
(2) Remove the screws that attach the ADF antenna to the fuselage skin.
(3) Disconnect the antenna connector (PC600) from the ADF antenna.
(4) Remove the ADF antenna from the airplane.

B. ADF Antenna Installation (Refer to Figure 201).
(1) Connect the electrical connector (PC600) to the ADF antenna.
(2) Attach the ADF antenna to the fuselage skin with the screws.

5. KI-227 ADF Indicator Removal and Installation

A. ADF Indicator Removal (Refer to Figure 201).
(1) Remove electrical power from airplane and turn the master switch to off. Disengage ADF circuit breaker on avionics circuit breaker panel and INST LTS circuit breaker on circuit panel assembly.
(2) Remove the pilot inboard panel assembly to gain access to the ADF indicator. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.
(3) Disconnect the electrical connector (P1603) from the ADF indicator.
(4) Remove the screws that attach the ADF indicator to the inboard pilot panel assembly.
(5) Remove the ADF indicator from the airplane.

B. ADF Indicator Installation (Refer to Figure 201).
(1) Put the ADF indicator on the inboard pilot panel assembly and attach with the screws.
(2) Connect the electrical connector (P1603) to the ADF indicator.
(3) Attach the pilot inboard panel assembly to the structure with the screws. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.



KR-87 ADF Installation
Figure 201 (Sheet 1)

KT-76C TRANSPONDER - MAINTENANCE PRACTICES

1. General

A. The KT-76C (Mode C) Transponder is installed in the avionics panel radio rack. The CI-105 Transponder Antenna is installed on the bottom of the fuselage.

2. KT-76C Transponder Removal and Installation

A. Remove Transponder (Refer to Figure 201).
   (1) Remove electrical power from airplane. Disengage XPNDR circuit breaker on avionics circuit breaker panel and INST LTS circuit breaker on circuit panel assembly.
   (2) Loosen single hex screw, located in recessed hole on face of transponder, counterclockwise. Continue turning hex screw until unit is free to be removed from avionics radio panel rack.
   (3) Pull transponder from avionics radio panel rack and remove from airplane.

B. Install Transponder (Refer to Figure 201).
   (1) Place transponder in avionics radio panel rack and slide forward, engaging fixed electrical connector and coax connector.
   (2) Secure unit to avionics radio panel rack by turning hex screw in a clockwise direction until tight.
   (3) Restore electrical power to airplane. Engage XPNDR circuit breaker on avionics circuit breaker panel and INST LTS circuit breaker on circuit panel assembly.

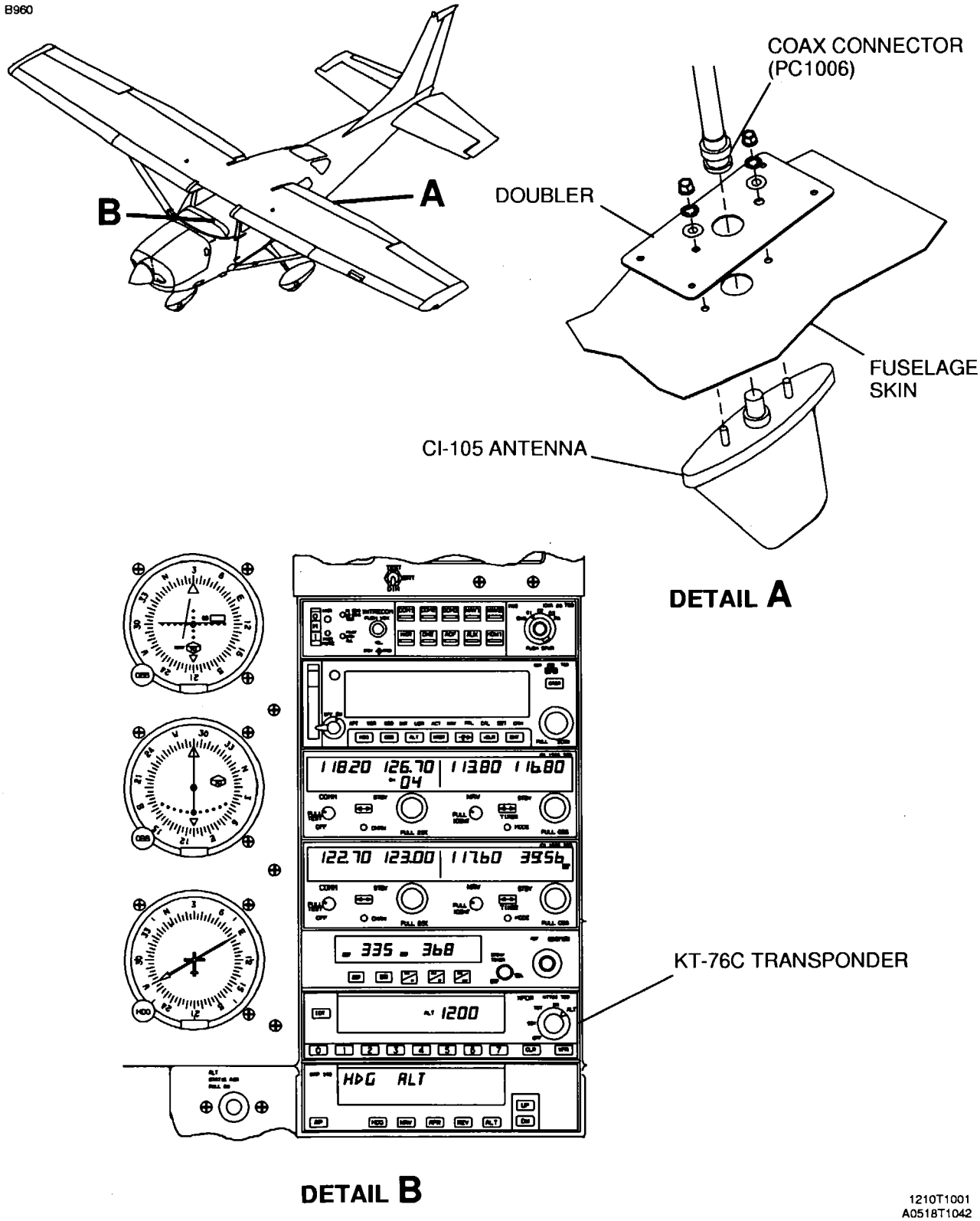
3. CI-105 Transponder Antenna Removal and Installation

A. Remove Transponder Antenna (Refer to Figure 201).
   (1) Remove electrical power from airplane. Disengage XPNDR circuit breaker on avionics circuit breaker panel.
   (2) Remove antenna access plate to gain access to antenna.
   (3) Remove nuts and washers securing transponder antenna to fuselage.

   NOTE: Identify locations of washers for use during transponder antenna installation.

   (4) From outside of airplane, support transponder antenna and remove coax connector from transponder antenna.
   (5) Remove transponder antenna from airplane.

B. Install Transponder Antenna (Refer to Figure 201).
   (1) Position transponder antenna at opening in fuselage for coax connector. Connect coax connector to transponder antenna.
   (2) Place transponder antenna studs through fuselage and secure to fuselage with nuts and washers.
   (3) Verify proper electrical bonding of doubler surface and transponder antenna.
   (4) Install antenna access plate.
   (5) Restore electrical power to airplane. Engage XPNDR circuit breaker on avionics circuit breaker panel.



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KT-76C Transponder Installation
Figure 201 (Sheet 1)

KT-73 MODE S TRANSPONDER - MAINTENANCE PRACTICES

1. General

A. The KT-73 (Mode S) Transponder is installed in the avionics-panel radio mounting-rack. The CI-105 Transponder Antenna is installed on the bottom of the fuselage. For removal and installation procedures on the CI-105 Transponder Antenna, refer to Chapter 34, KT-76C Transponder - Maintenance Practices.

2. KT-73 Mode S Transponder Removal and Installation

A. Remove the KT-73 Transponder (Refer to Figure 201).
   (1) Disconnect the main battery. Refer to Chapter 24, Battery - Maintenance Practices.
   (2) Disengage the XPNDR circuit breaker on the avionics circuit breaker panel and the INST LTS circuit breaker on the circuit breaker panel.
   (3) Turn the single hex-screw, found in the recessed hole on the face of the transponder, counterclockwise.
   (4) Remove the single hex-screw from the transponder.
   (5) Pull the transponder from the radio mounting rack.
   (6) Disconnect the coaxial cable and electrical connector from the transponder.
   (7) Remove the transponder from the airplane.

B. Install the KT-73 Transponder (Refer to Figure 201).
   (1) Disconnect the main battery. Refer to Chapter 24, Battery - Maintenance Practices.
   (2) Put the transponder in the avionics radio mounting rack.
   (3) Connect the electrical connector and the coaxial cable.
   (4) Put the single hex-screw in the recessed hold on the face of the transponder and turn it clockwise until it is tight.
   (5) Engage the XPNDR circuit breaker on the avionics circuit breaker panel and the INST LTS circuit breaker on the circuit breaker panel.
   (6) Do a test of the KT-73 transponder.

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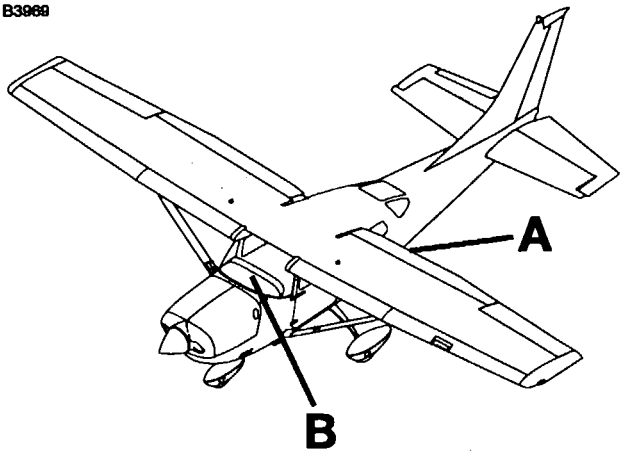
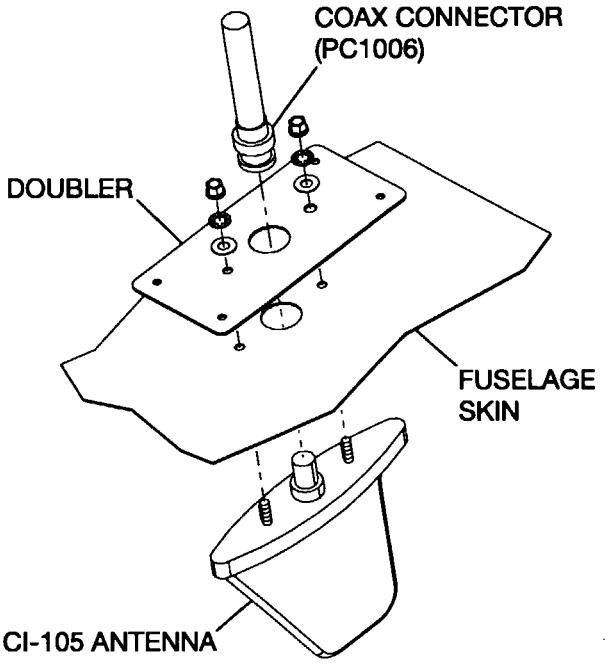
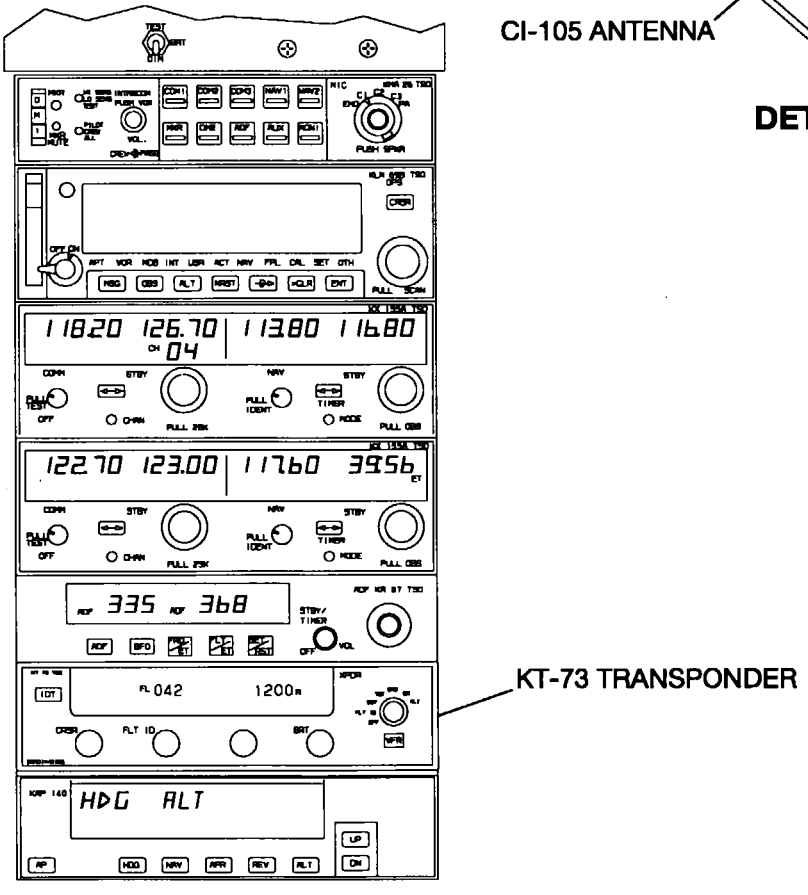




DETAIL A



DETAIL B

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KT-73 Mode S Transponder Installation
Figure 201 (Sheet 1)

GTX-33 TRANSPONDER - MAINTENANCE PRACTICES

1. General

A. The maintenance practices give the removal and installation procedures for the transponder, which is installed on the avionics shelf in the tailcone.

B. The GTX-33 Transponder is an integrated component with the Garmin G1000 avionics system. The transponder is operated and monitored through the use of the Control Unit Displays (CDU's).

2. GTX-33 Transponder Removal/Installation

A. Remove the Transponder (Refer to Figure 201).
(1) Disconnect electrical power to the airplane.
(2) Set the MASTER switch and AVIONICS switch to the off position.
(3) Disengage the circuit breaker.

CAUTION: Make sure to use a tailcone stand when you get into the tailcone.

(4) Get access to the avionics inside the tailcone.
(a) Remove the baggage divider.
(5) Disconnect the electrical connection.
(6) Remove the screws that hold the transponder on the avionics shelf.
(7) Remove the transponder from the airplane.

B. Install the Transponder (Refer to Figure 201).
(1) Set the transponder in the avionics shelf and attach it with screws.
(2) Connect the electrical connection.
(3) Install the baggage divider.
(4) Engage the circuit breaker.

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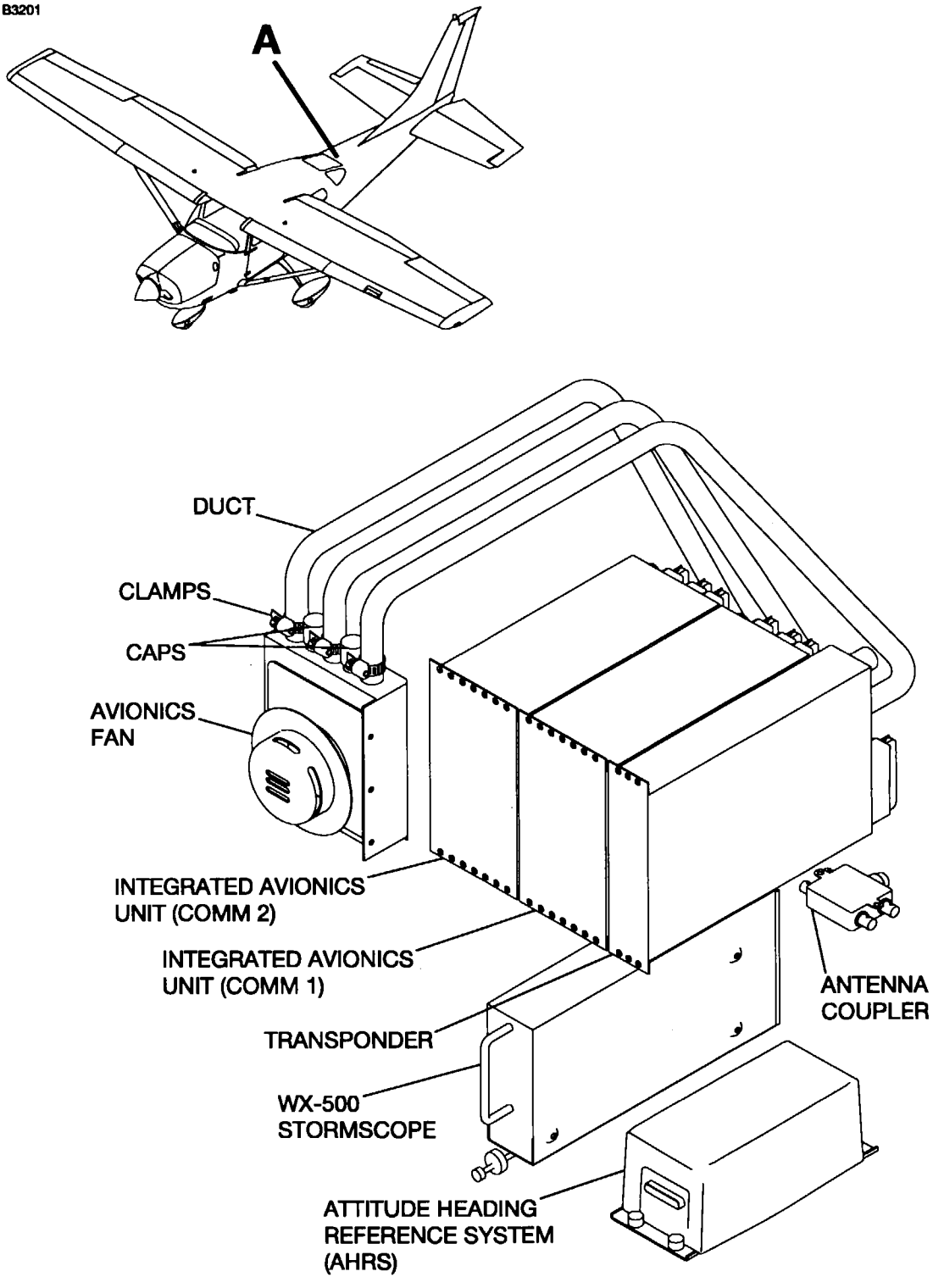

DETAIL A

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GTX-33 Transponder Installation
Figure 201 (Sheet 1)

GDL-69A FIS - DESCRIPTION AND OPERATION

1. General

A. The GDL-69A Flight Information System (FIS) is a remote-mounted component of the Garmin G1000 avionics system. The GDL-69A gives weather and FIS information to the pilot. The information is controlled and seen through the Multi-Function Display (MFD). Information is sent from the data link receiver to the MFD through the high-speed data bus ethernet data path.

With a current subscription, XM satellite radio service is available with the GDL-69A. The signals that the data link receives from satellites give better coverage than land-based transmissions. The XM radio is tuned through the MFD. Analog audio is sent to the audio panel and shares the AUX music input with the external audio entertainment input.

GDL-69A capabilities include:

- Graphical NEXRAD Data (NEXRAD)
- Graphical METAR Data (METAR)
- Textual METAR Data
- Textual Terminal Aerodrome Forecasts (TAF)
- City Forecast Data
- Graphical Wind Data (WIND)
- Graphical Echo Tops (ECHO TOP)
- Graphical Cloud Tops (CLD TOP)
- Graphical Lightning Strikes (XM LTNG)
- Graphical Storm Cell Movement (CELL MOV)
- NEXRAD Radar Coverage (displayed with NEXRAD data)
- SIGMETs/AIRMETs (SIG/AIR)
- Surface Analysis with City Forecasts (SFC)
- County Warnings (COUNTY)
- Freezing Levels (FRX LVL)
- Hurricane Track (CYCLONE)
- Temporary Flight Restrictions (TFR).

B. The GDL-69A XM Weather Data Link is the receiver for the FIS, and is installed behind the instrument panel. It is a remote sensor.

C. The CI-2480 antenna for the GDL-69A FIS is installed on the left upper surface of the fuselage at FS 65.33.

GDL-69A FIS - MAINTENANCE PRACTICES

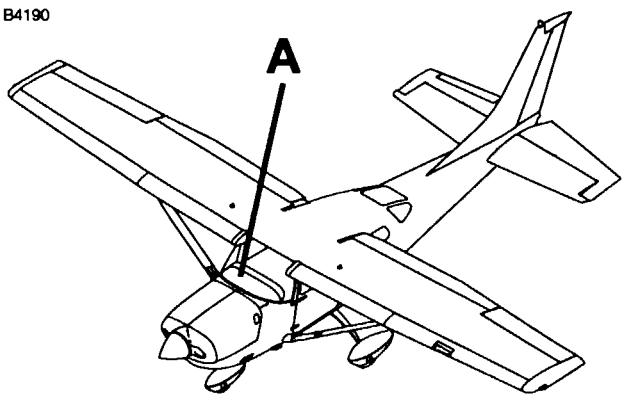
1. General

A. The maintenance practices give the removal and the installation procedures for the GDL-69A XM Weather Data Link. For removal and installation of the CI-2480 antenna for the GDL-69A Flight Information System (FIS), refer to Chapter 23, Communications - Maintenance Practices.

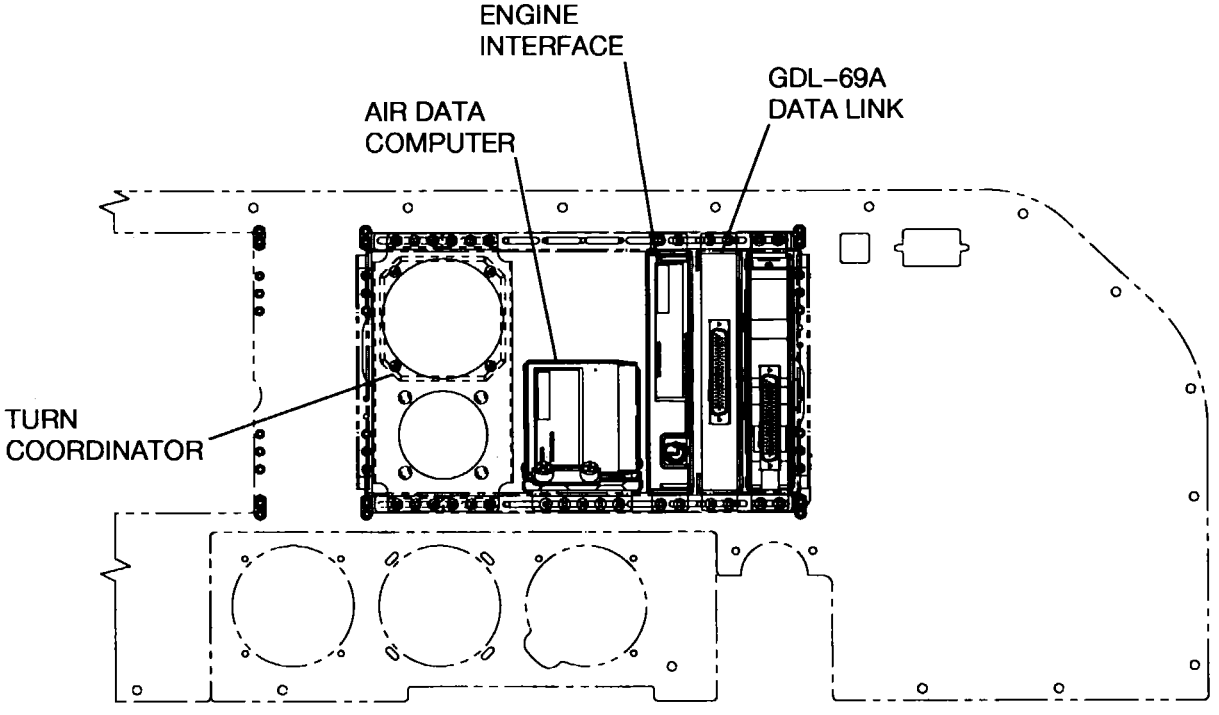
2. GDL-69A XM Weather Data Link Removal/Installation

A. Data Link Removal (Refer to Figure 201).
   (1) Set the MASTER switch and the AVIONICS switch to the off position.
   (2) Remove the GDU 1040 Multi-Function Display (MFD) unit. Refer to Chapter 34, Control Display Unit - Maintenance Practices.
   (3) Turn the quarter-turn fastener 90 degrees counterclockwise and lift the locking lever to disengage the data link.
   (4) Move the data link aft out of the mounting rack.
   (5) Remove the data link from the airplane.

B. Data Link Installation (Refer to Figure 201).
   (1) Inspect the connector for damaged pins.
   (2) Carefully push the data link into the rack to engage the connector.
   (3) Put the data link in position with the locking lever stud in the mounting rack slot.
   (4) Push the locking lever down and turn the quarter-turn fastener 90 degrees clockwise to attach the data link to the mounting rack.
   (5) Install the GDU 1040 MFD unit. Refer to Chapter 34, Control Display Unit - Maintenance Practices.
   (6) Set the MASTER switch and the AVIONICS switch to the ON position.
   (7) Do a check of the GDL-69A XM Weather Data Link FIS to make sure that it operates correctly. Refer to the Garmin G1000 Line Maintenance Manual, Revision D or later.



NOTE: THE INSTRUMENT PANEL IS SHOWN WITH THE MULTI-FUNCTION DISPLAY (MFD) SCREEN REMOVED.



DETAIL A

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GDL-69A XM Weather Data Link Installation
Figure 201 (Sheet 1)

DME - MAINTENANCE PRACTICES

1. General

A. On airplanes with Garmin G1000, the KN-63 Distance Measuring Equipment (DME) gives range, speed, and time-to-station information displayed through the G1000 display system. The KN-63 DME has a remote-mounted receiver in the rear fuselage aft of FS 152.20. The DME antenna is on the bottom fuselage below the cabin at FS 106.00.

2. KN-63 DME Receiver Removal/Installation

A. KN-63 DME Receiver Removal (Refer to Figure 201).
(1) Set the MASTER and the AVIONICS switches to the off position.
(2) Disengage the DME/ADF circuit breaker on the avionics circuit breaker panel.

CAUTION: Use a tailcone stand when you get in the tailcone. If you do not use a tailcone stand, the tail of the airplane can fall to the floor.

(3) Remove the rear seat to get access to the aft baggage divider. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(4) Remove the aft baggage divider to get access to the tailcone.
(5) Disconnect the electrical connector (PT1031) from the receiver.
(6) Disconnect the electrical connector (PT801) from the receiver.
(7) Loosen the hold down screw.
(8) Remove the screws that attach the mounting rack to the hold down bars.
(9) Remove the hold down bars, rack, DME unit, and attaching hardware from the airplane.

B. KN-63 DME Receiver Installation (Refer to Figure 201).
(1) Install the receiver with the connectors toward the front of the airplane.
(2) Install the receiver with the connectors on the same end of the mounting tray as the hold down clamp.
(3) Attach the hold down clamp, hold down screw, compression spring, and lock washer to one of the hold down bars.
(4) Put the two hold down bars under the mounting rack.
(5) Attach the mounting rack to the hold down bars with the screws.
(6) Tighten the hold down screw.
(7) Make sure that there is a correct electrical bond between the unit and the airplane structure.
(8) Attach the electrical connector (PT801) to the DME receiver.
(9) Attach the electrical connector (PT1031) to the DME receiver.
(10) Install the aft baggage divider.
(11) Install the rear seat. Refer to Chapter 25, Rear Seat - Maintenance Practices.
(12) Set the MASTER and the AVIONICS switches to the ON position.
(13) Engage the DME/ADF circuit breaker on the avionics circuit breaker panel.

3. DME Antenna Removal/Installation

A. DME Antenna Removal (Refer to Figure 202).
(1) Set the MASTER and the AVIONICS switches to the off position.
(2) Disengage the DME/ADF circuit breaker on the avionics circuit breaker panel.
(3) Remove noise-damping material as necessary to get access to the antenna installation.
(4) Remove the nuts and the washers that attach the DME antenna to the airplane at FS 106.00.
(5) Disconnect the electrical connector (PF1011) from the antenna.
(6) Remove the antenna from the airplane.

B. DME Antenna Installation (Refer to Figure 202).
(1) Solvent clean the surface of the airplane skin where you will install the antenna.
(2) Put the antenna in position on the airplane skin.
(3) Attach the antenna to the airplane skin with the nuts and the washers.
(4) Make sure that there is a correct electrical bond between the antenna connector and the skin.
(5) Connect the electrical connector (PF1011) to the antenna.

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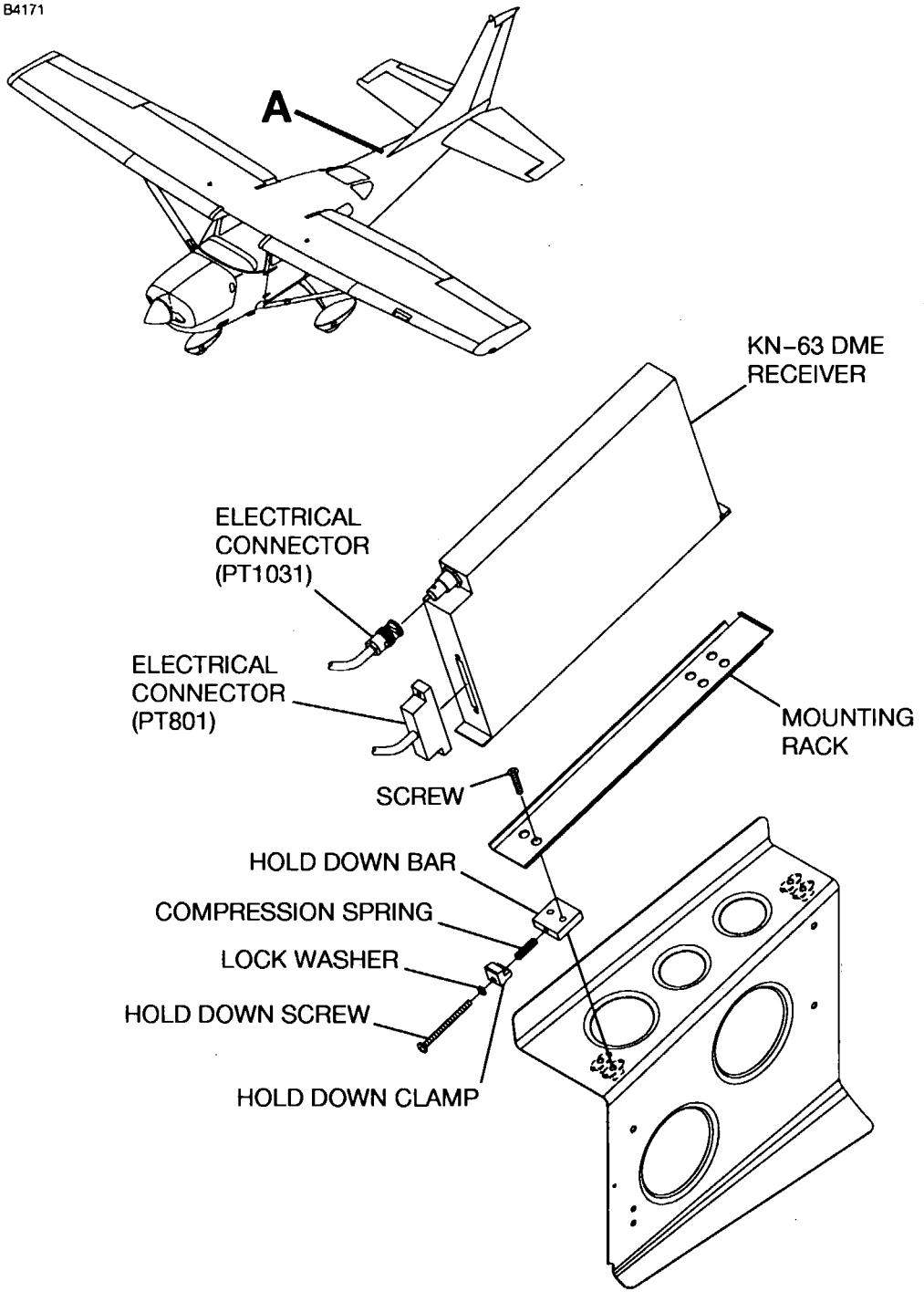

DETAIL A

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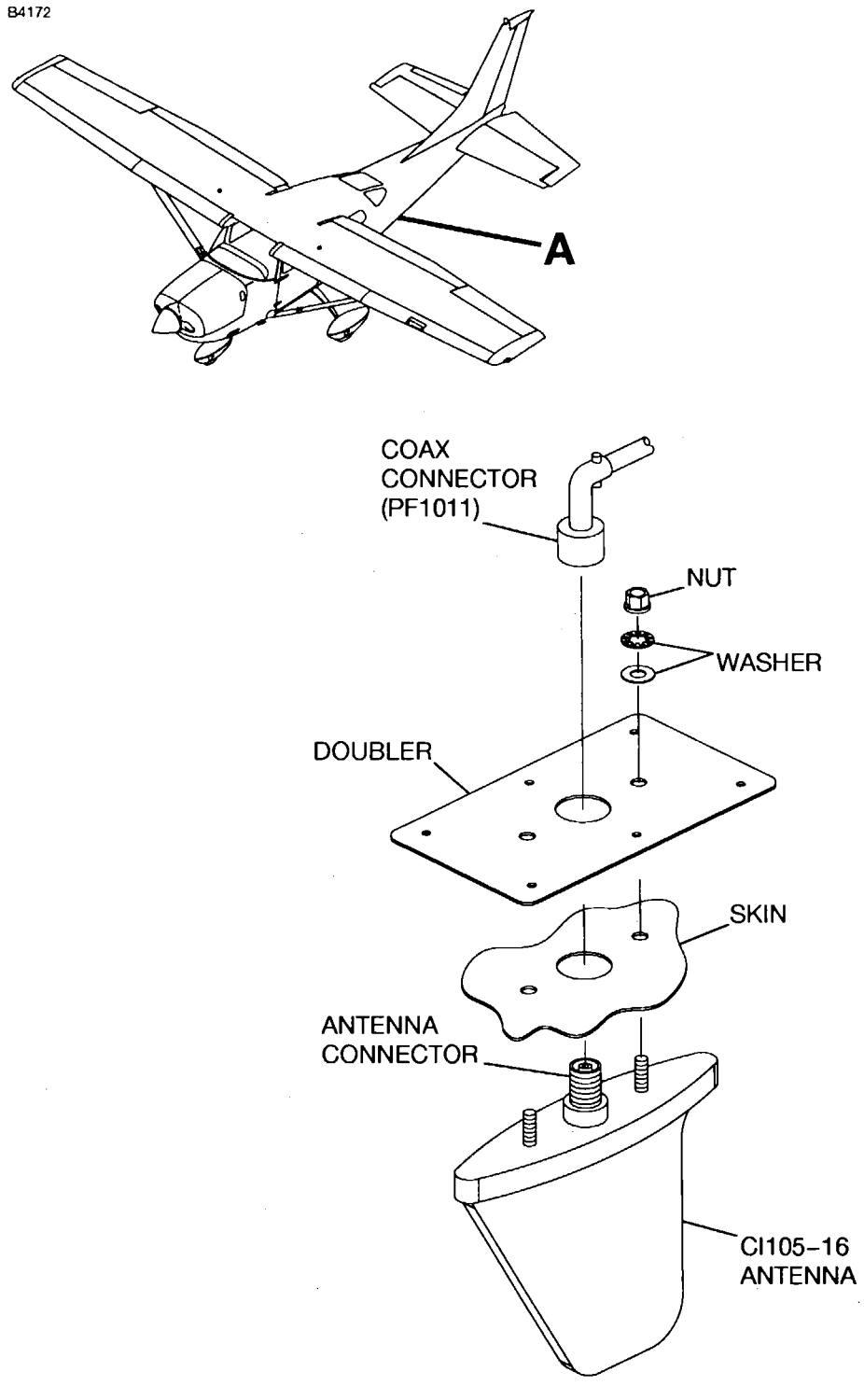
KN-63 DME Receiver Installation
Figure 201 (Sheet 1)



DETAIL A

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DME Antenna Installation
Figure 202 (Sheet 1)

(6) Set the MASTER and the AVIONICS switches to the ON position.
(7) Engage the DME/ADF circuit breaker on the avionics circuit breaker panel.

KMD-540 MULTI-FUNCTION DISPLAY - MAINTENANCE PRACTICES

1. General

A. The KMD-540 is a multi-function display (MFD) that can be installed to give the pilot more situational awareness during flight. Enhanced ground proximity warning system (EGPWS), and traffic advisory system (TAS) data is given on the color MFD display. Other data, such as global positioning system (GPS) data and weather data can be shown on the display. These displays can give the pilot more data that is easy to read in a short period of time.

2. KMD-540 Multi-Function Display (MFD) Removal/Installation

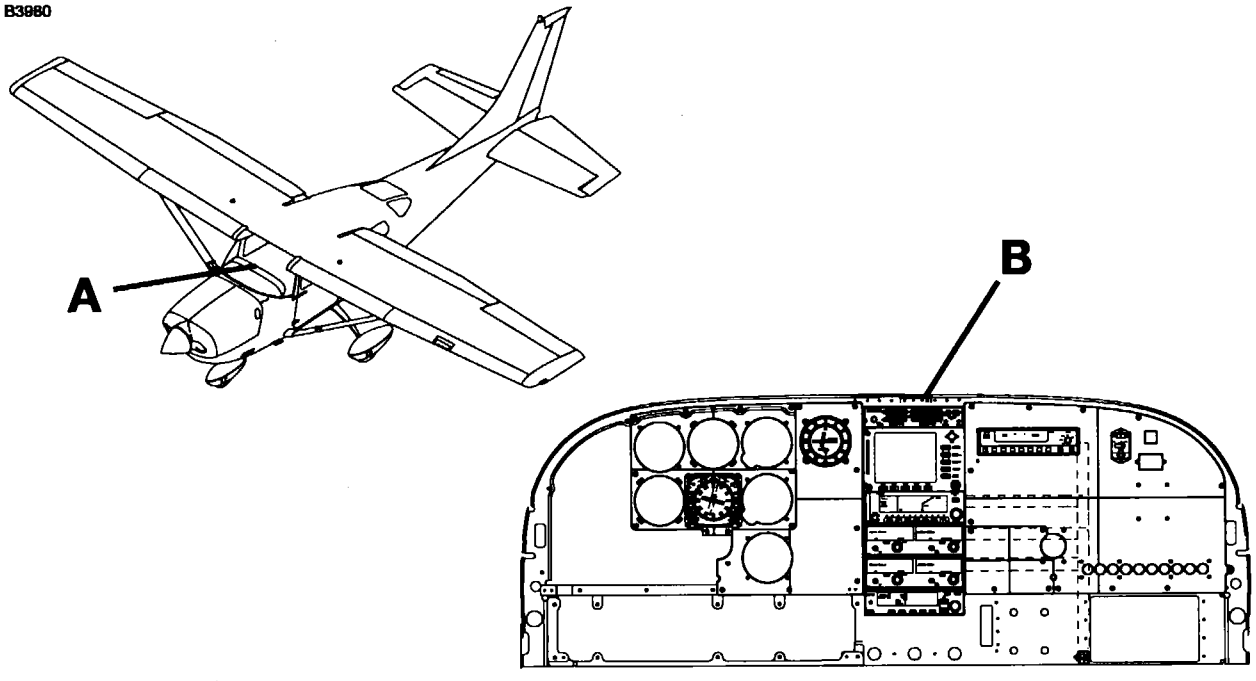
A. Remove the KMD-540 MFD. (Refer to Figure 201).
   (1) Disconnect the main battery. Refer to Chapter 24, Battery - Maintenance Practices.
   (2) Disengage the MFD circuit breaker on the circuit breaker panel.
   (3) Remove the screw in the face of the MFD.
   (4) Carefully, pull the unit out of the avionics rack.
   (5) Disconnect the electrical connector from the MFD.
   (6) Remove the MFD from the airplane.

B. Install the KMD-540 MFD. (Refer to Figure 201).
   (1) Put the MFD in the avionics rack.
   (2) Connect the electrical connector to the MFD.
   (3) Install the screw in the face of the MFD.
   (4) Engage the MFD circuit breaker on the circuit breaker panel.
   (5) Connect the main battery. Refer to Chapter 24, Battery - Maintenance Practices.
   (6) Do an operational check of the MFD.

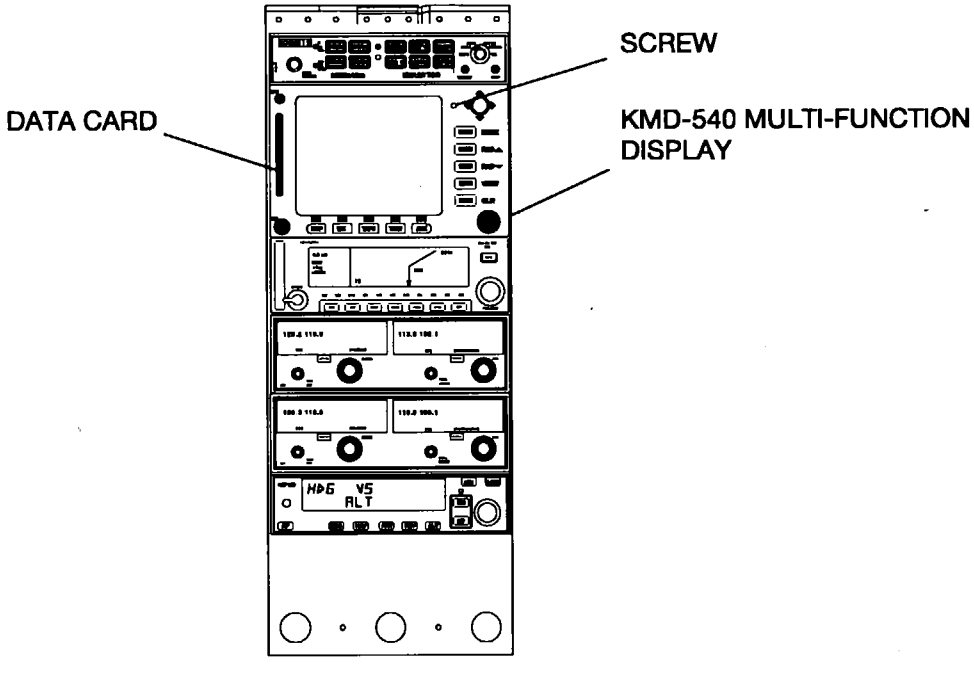
3. KMD 540 Multi-Function Display Operational Check

A. Do the MFD operational check.
   (1) Set the MASTER ALT/BAT switch to the on position.
   (2) Set the AVIONICS master switch to the on position.
   (3) Turn the ON/OFF knob on the KMD-540 MFD to the ON position.
   (4) Make sure that the KMD-540 title page comes on the screen.
   (5) Turn the ON/OFF knob on the KMD-540 MFD to the OFF position.
   (6) Set the AVIONICS master switch to the OFF position.
   (7) Set the MASTER ALT/BAT switch to the OFF position.

B3980



DETAIL A



DETAIL B

1210T1001
A1218T1069
A1218T1070

KMD-540 MFD Installation
Figure 201 (Sheet 1)

CONTROL DISPLAY UNIT - MAINTENANCE PRACTICES
Airplanes with Garmin G1000 Avionics

1. General

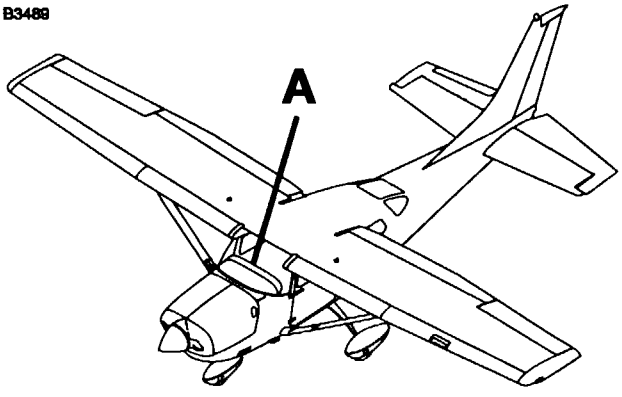
A. The control display unit (CDU) is a flat screen display which is removed and installed by quick release fasteners and an electrical connector attached to the back. A Garmin Display Unit (GDU-1040) operates as the CDU. The left display is the primary flight display (PFD). The right display is the multi-function display (MFD). The PFD and the MFD can give the same data as the other if necessary. The displays use the processors that move data through the different components of the integrated system.

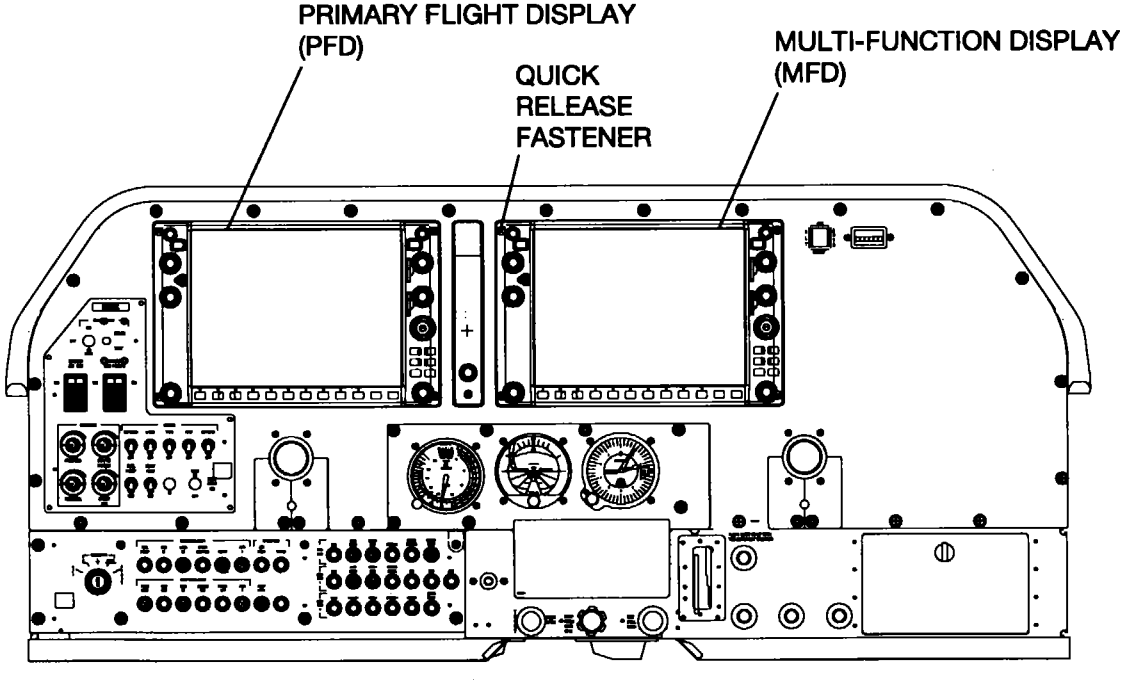
2. Control Display Unit Removal/Installation

A. Remove the Control Display Unit (CDU) (Refer to Figure 201).
   (1) Disengage the applicable PFD or MFD circuit breaker for the CDU.
   (2) Disconnect the quick release fasteners from the CDU.
   (3) Carefully pull the CDU from the instrument panel and disconnect the electrical connector that is attached to the back of the CDU.

B. Install the Control Display Unit (CDU) (Refer to Figure 201).
   (1) Connect the electrical connector to the back of the CDU and put the CDU in the instrument panel.
   (2) Attach the CDU to the instrument panel with the quick release fasteners.
   (3) Engage the applicable PFD or MFD circuit breaker.
   (4) Do a check to make sure that the CDU operates correctly. Refer to the Garmin G1000 Line Maintenance Manual.

B3489





DETAIL A

1210T1001
A12181044A

Control Display Unit Installation
Figure 201 (Sheet 1)

CHAPTER 35

OXYGEN

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
35-Title		
35-List of Effective Pages		
35-Record of Temporary Revisions		
35-Table of Contents		
35-00-00	Page 1	Dec 2/2002
35-01-00	Page 1	Dec 2/2002
35-01-00	Pages 201-210	Jan 2/2006

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

OXYGEN - GENERAL

1. Scope

A. This chapter gives information on components related with the storage and distribution of oxygen to the crew and passengers.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the items that following:

NAME	NUMBER	MANUFACTURER	USE
Teflon Lubricating Tape	S1465	Commercially Available	Lubrication of threads and fittings.
Trichloro-ethylene	ASTM D4070	Commercially Available	To clean oxygen lines.
Naptha	TT-N-95	Commercially Available	Flush oxygen lines.
Anti-Icing Fluid	TT-I-735	Commercially Available	Flush oxygen lines.
Sherlock Leak Detector	Type CG (MIL-L-25567A)	Puritain Bennett 10800 Pflumm Rd. Lenexa, KS 66215	To leak test oxygen system.
Flowrater (0 to 10 Liters per Minute LPM)		Commercially Available	Check pressure flow to passenger mask.
Pressure Gage (0-100 PSIG)		Commercially Available	For an oxygen flow check.
Oxygen Outlet Adapter		Commercially Available	Used with an pressure gage.
Merthiolate		Commercially Available	To clean oxygen mask's and hose.

3. Definition

A. This chapter is divided into sections and subsections to help maintenance personnel to locate specific systems and information. To locate information within the chapter, refer to the Table of Contents at the beginning of the chapter.

OXYGEN - DESCRIPTION AND OPERATION

1. Description and Operation

A. The system is comprised of an oxygen cylinder and regulator assembly, filler valve, pressure gage, pressure lines, outlets and mask assemblies. The oxygen cylinder is mounted aft of the baggage compartment. Locations of system components are shown in Figure 201. The pilot's mask supply line is designed to receive a greater flow of oxygen than the passengers. The pilot's mask is equipped with a microphone, keyed by a switch button on the pilot's control wheel. The filler valve is located on the tailcone on the left hand side.

WARNING: Oil, grease or other lubricants in contact with high-pressure oxygen, create a serious fire hazard and such contact should be avoided. Do not permit smoking or open flame in or near aircraft while work is performed on oxygen systems.

B. Oxygen flow to outlet ports is provided when the oxygen control valve knob, located in the overhead console, is placed in the ON position and mask hoses are plugged into the overhead oxygen ports.

NOTE: Each oxygen port contains a spring-loaded valve which prevents flow of oxygen until a mask hose is plugged in. Each mask hose contains an oxygen flow indicator for visual proof of oxygen flow.

C. The following information is permanently stamped on the shoulder, neck, or top head of the oxygen cylinder to aid in proper identification.

(1) Cylinder specification followed by service pressure such as ICC or DOT-E8162.
(2) Cylinder serial number is stamped below or directly following cylinder specification. The symbol of the purchaser, user, or maker, if registered with the Bureau of Explosives, may be located directly below or following the serial number. The cylinder serial number may be stamped in an alternate location on the cylinder top head.
(3) Inspectors official mark near serial number.
(4) Date of manufacture: This is the date of the first hydrostatic test (such as 6-98 for June 1998). The dash between the month and the year figures may be replaced with the mark of the testing or inspection agency (e.g., 6L98).
(5) Hydrostatic test date: The dates of subsequent hydrostatic tests shall be steel-stamped (month and year) directly below the original manufacturer date. the dash between month and year figures can be replaced with the mark of the testing agency.
(6) A Cessna identification placard is located near the center of the cylinder body.
(7) Halogen test stamp (if applicable): Halogen Tested, date of test (month, day, and year) inspector's mark appears directly underneath the Cessna identification placard.

OXYGEN - MAINTENANCE PRACTICES

1. General

A. Before you complete maintenance on the oxygen system, you must read and understand the following instructions. Use care when you follow these instructions and it will help to maintain a trouble-free oxygen system.

2. Precautions

WARNING: Do not smoke tobacco or let open flame near the airplane while maintenance is performed on the oxygen system. Make sure the electrical power is disconnected and that the airplane is correctly grounded. Oils, grease, and solvents may burn or explode spontaneously when contacted with oxygen under pressure.

A. Use care to make sure every port on the oxygen system is clean and does not contain any water, oil, grease, and solvent contamination.

B. Put a cap on all openings immediately upon removal of any component. Do not use tape or caps which will let in moisture.

C. The lines and fittings must be clean and dry. One of the following methods may be used to clean the lines.

CAUTION: A water-lubricated compressor must be used to blow the tubing clean only when nitrogen or argon are not available. The air must be clean, dry, and filtered. Most air compressors are oil-lubricated and a minimum amount of oil will be carried by the airstream into the system.

(1) Wash with a vapor-degrease solution of stabilized trichloroethylene that agrees with ASTM D4080.
(2) Blow the tube clean with a spray of nitrogen gas (BB-N-411) Type 1, Class 1, Grade A or Technical Argon (MIL-A-18455).
(3) Flush with Naptha that agrees with Specification TT-N-95, then blow clean and dry with clean, dry filtered air.
(4) Flush with anti-ice fluid that agrees with MIL-F-5566 or anhydrous ethyl alcohol. Fully rinse with fresh water and dry with a spray of nitrogen gas (BB-N-411) Type 1, Class 1, Grade A or Technical Argon (MIL-A-18455).
(5) Flush with hot inhibited alkaline cleaner until it is free from oil and grease.
(6) Rinse with fresh water and dry with a jet of nitrogen gas (BB-N-411) Type 1, Class 1, Grade A or Technical Argon (MIL-A-18455).
(7) Put a cap on all the lines immediately after drying.
(8) The lines must be replaced by part number with factory parts.
(9) Make sure your hands are clean from dirt and grease before you install any oxygen tubes or fittings.

CAUTION: Do not place the control in the on position with outlet ports (low pressure) open to atmosphere with the oxygen bottle charged. Damage to regulator metering poppet will occur.

CAUTION: You must do a leak check and purge of the oxygen system when a component of the oxygen system is removed, installed, replaced, or the system has been disassembled.

D. Use only S1465 Teflon lubricant tape on threads of male fittings. No lubricant tape is used on coupling sleeves or outside of flares. Use care to prevent contamination of the Teflon tape with oil, grease or other lubricants. The Teflon tape must be used in accordance with the instructions listed for the steps that follow.
(1) Lay the tape on the threads close to the end of the fitting.

NOTE: Clockwise on standard threads, counter-clockwise on left-hand threads.

(2) Apply sufficient tension when you apply the tape so the tape forms into the thread grooves.
(3) Maintain the tension and tear the tape by pulling apart in the direction it was applied. Do not cut the tape.

NOTE: Resulted ragged end is the key to the tape staying in place. The tape may unwind if it is cut.

(4) Press the tape down in the threads.
(5) Make connections.

WARNING: Use only non-sparking tools.

E. All tools used for installation of oxygen tubes or fittings must be free of dirt, grease and oils.

NOTE: A correct record of the number of charges must be maintained by the owner or his agent if the cylinder is charged an average of once every other day.

3. Component Replacement

A. Removal, Disassembly, Assembly and Installation of the System Components (Refer to Figure 201, Figure 202 or Figure 203).

NOTE: Oxygen cylinder and regulator assemblies may not always be installed in the field exactly as illustrated. Important points to remember are as follows.

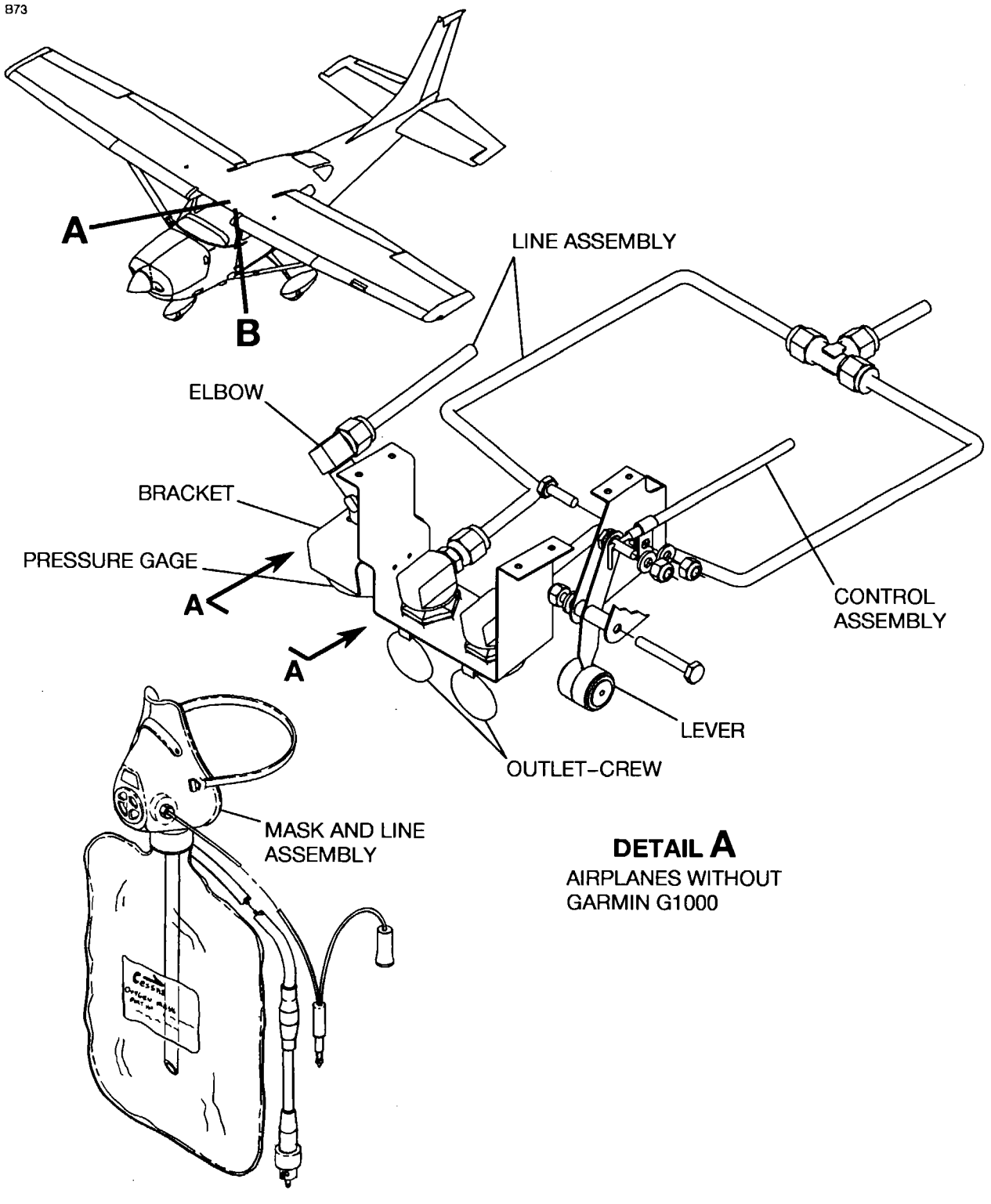
CAUTION: The pressure regulator, pressure gage and line, and filler valve must be removed and replaced only by personnel familiar with high-pressure fittings. Obey all maintenance precautions.

B. Before removing cylinder, release low-pressure line by opening cabin outlets. Disconnect push-pull control cable, filler line, pressure gage line and outlet line from regulator.

WARNING: Cap all lines immediately.

C. Remove the filler valve (Refer to Figure 203).
(1) Remove line from quick-disconnect valve at the regulator.
(2) Disconnect chain, but do not remove cap from filler valve.
(3) Remove screws securing valve and disconnect pressure line.
(4) Cap pressure line and seat.
(5) Remove filler valve.

D. Install the filler valve. (Refer to Figure 203).
(1) Install filler valve.



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Oxygen Controller Installation
Figure 201 (Sheet 1)

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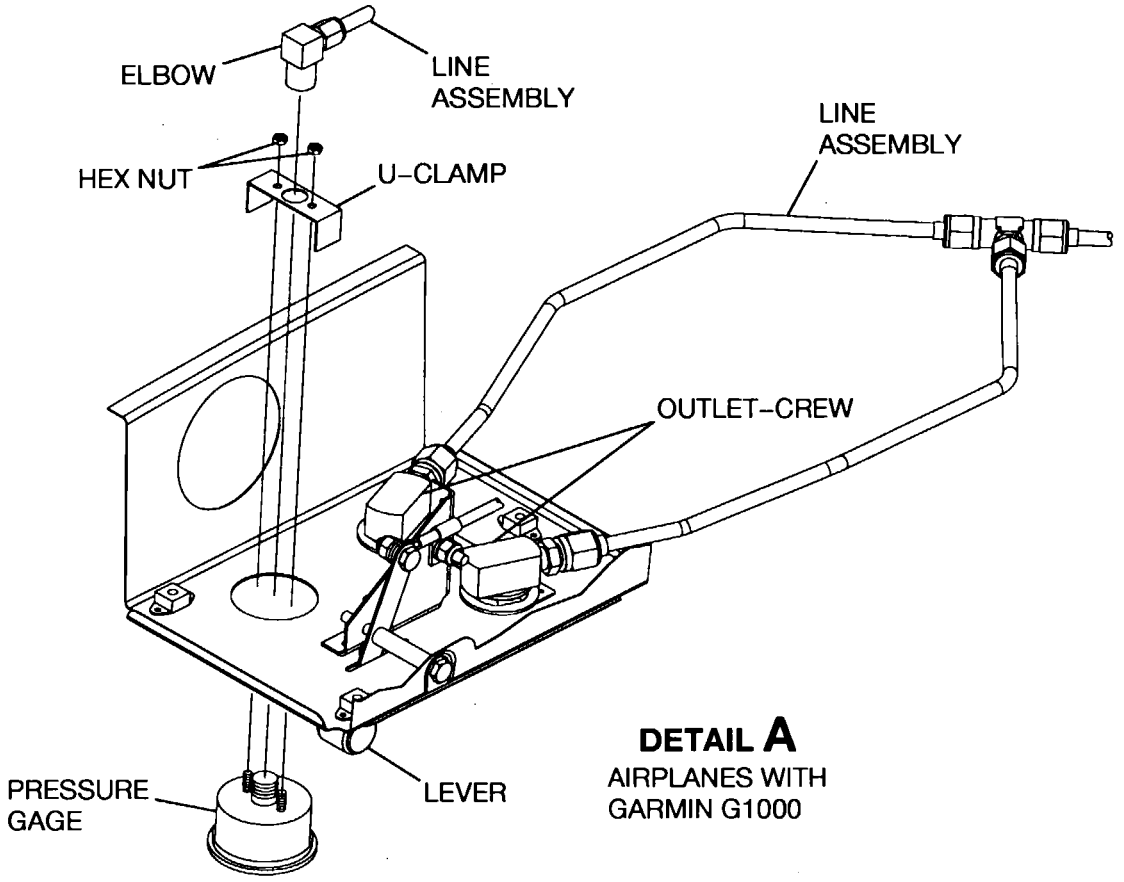
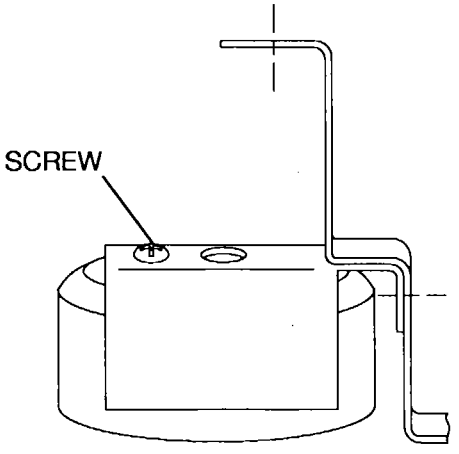


DETAIL A
AIRPLANES WITH GARMIN G1000



VIEW A–A

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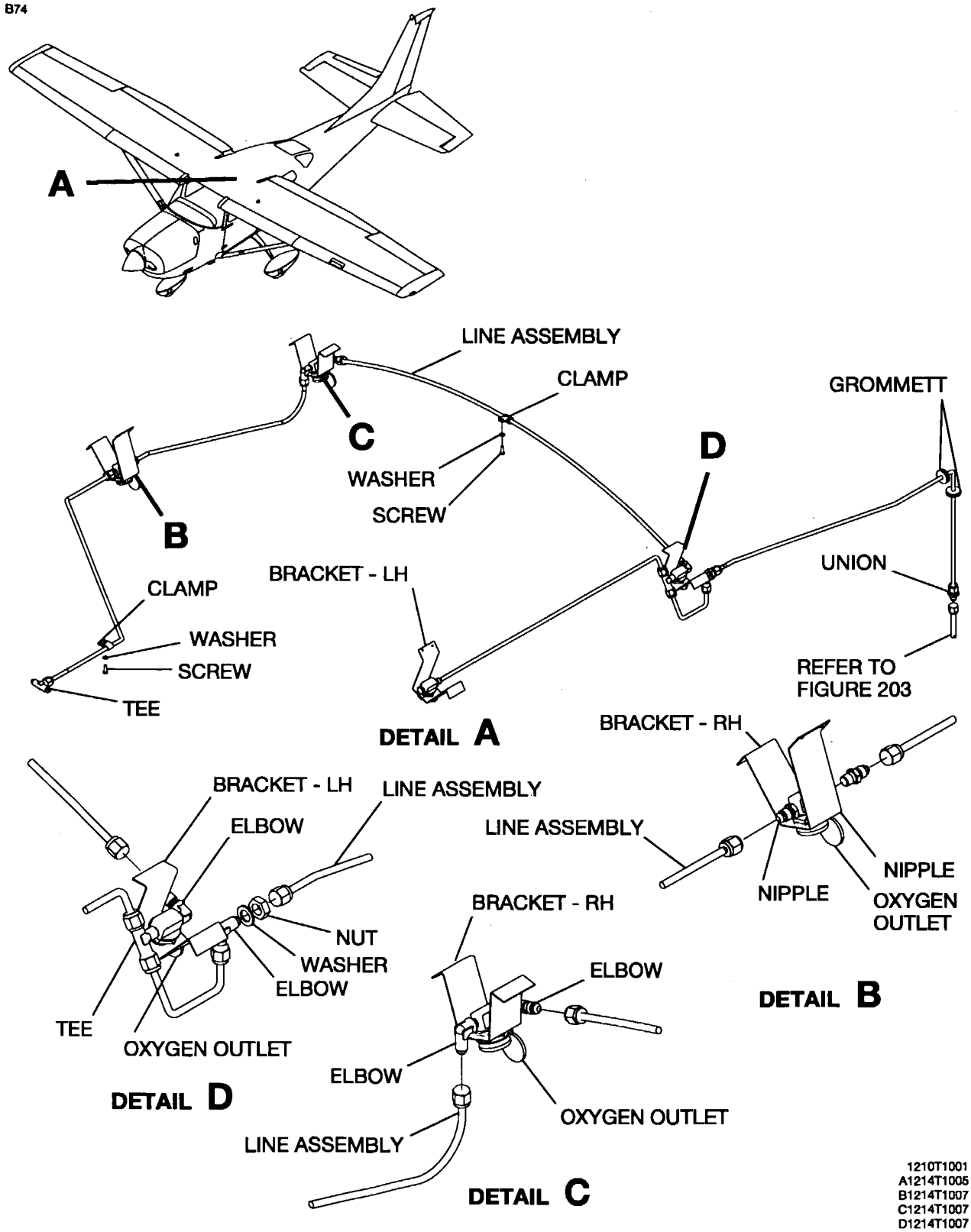
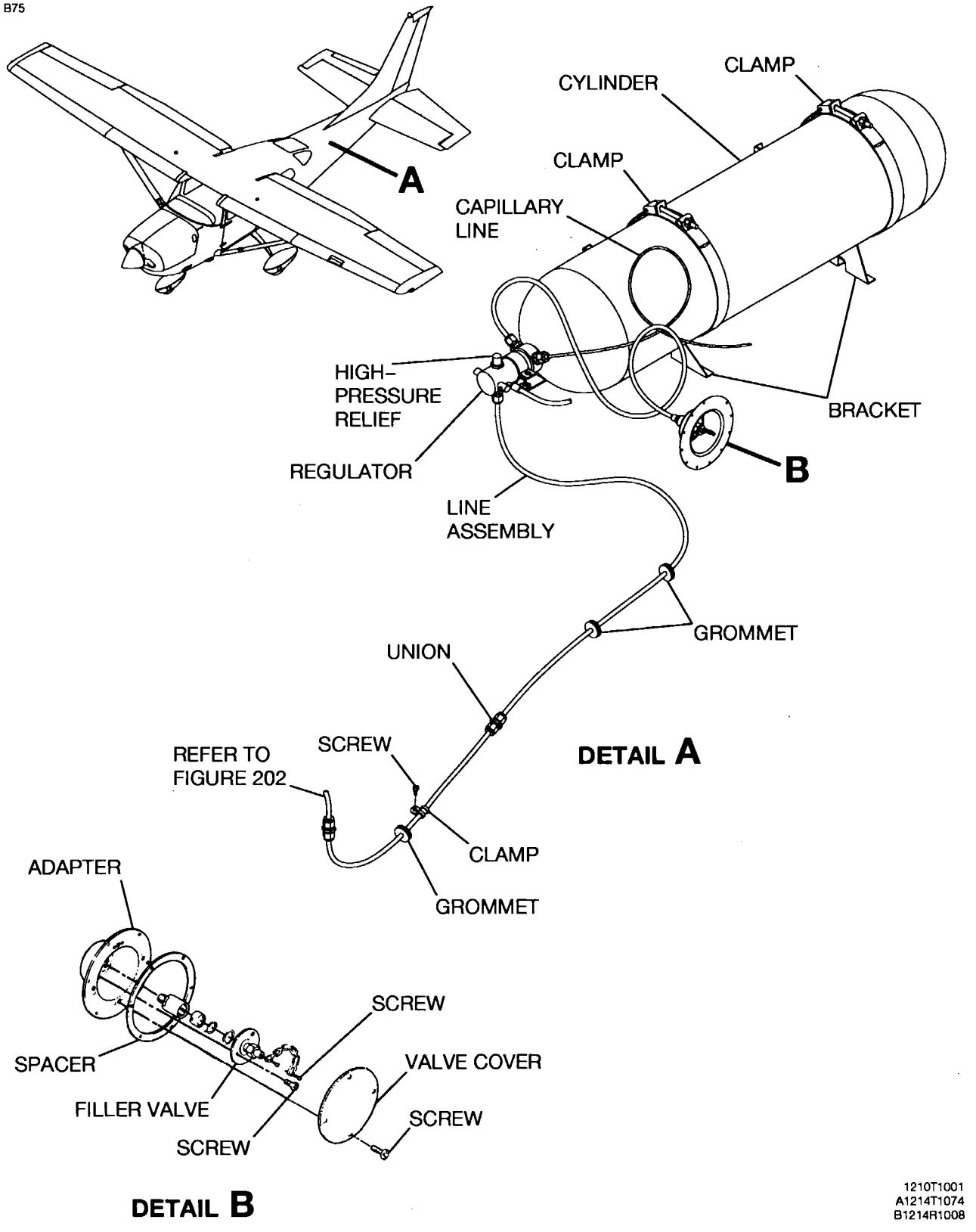
Oxygen Controller Installation
Figure 201 (Sheet 2)



Oxygen Distribution System
Figure 202 (Sheet 1)



Oxygen Cylinder Installation
Figure 203 (Sheet 1)

(2) Uncap pressure line and seat.
(3) Secure valve with screws and connect pressure line.
(4) Connect chain.
(5) Connect line to quick-disconnect valve at the regulator.

E. Pressure Gage Removal (Refer to Figure 201 and Figure 203).
(1) At the oxygen bottle, disconnect the capillary line from the regulator.
(2) Get access to the pressure gage through the center overhead console, headliner, and headliner trim. Refer to Interior Upholstery - Maintenance Practices.
(3) Disconnect the pressure gage from the oxygen pressure line at the elbow.
(4) Remove the hex nuts from the pressure gage.
(5) Remove the u-clamp from the pressure gage.
(6) Remove the pressure gage from the airplane.

F. Pressure Gage Installation (Refer to Figure 201 and Figure 203).
(1) Put the pressure gage in position in the console.
(2) Put the u-clamp in position on the pressure gage.
(3) Install the hex nuts on the pressure gage.
(4) Attach the pressure gage to the line at the elbow.
(5) Connect the capillary line to the regulator.
(6) Do the servicing of the oxygen system. Refer to Oxygen - Maintenance Practices.
(7) Make sure that there are no oxygen leaks at the pressure gage and at the connection of the oxygen bottle regulator and the capillary line. Refer to Oxygen - Maintenance Practices
(8) Install the center overhead console, headliner trim, and headliner to the structure. Refer to Interior Upholstery - Maintenance Practices.

G. To remove the entire oxygen system, headliner must be lowered and soundproofing removed to expose lines. Refer to Chapter 25, Equipment/Furnishings - Maintenance Practices.

4. Oxygen Cylinder Inspection Requirements

A. Inspect the Oxygen Cylinder (Refer to Figure 203).
(1) Inspect the entire exterior surface of the cylinder for indication of abuse, dents, bulges, and strap chafing. See chart and steps 1 through 8.

DISCREPANCIES	DEPTH	CYLINDER CLASSIFICATION DOT-3HT 1850
Isolated Pitting or Corrosion	0.010 Inches (0.254 mm)	Refer to steps 1 and 2 below
Local Pitting or Corrosion or Line Corrosion	0.005 Inches (0.127 mm)	Refer to steps 2 and 3 below
General Corrosion	Not Allowed	Refer to step 4 below
Cuts, Digs, Gouges	0.005 Inches (0.127 mm)	Refer to step 5 below
Dents	0.031 (0.7874 mm)	Refer to step 6 below
Fire Damage	Not Allowed	Refer to step 7 below
Bulges	Not Allowed	Refer to step 8 below

1. Isolated pits of small cross section involving loss of wall thickness by corrosive media. Small isolated pits with a maximum depth as shown are acceptable.
2. If depth exceeds figure shown, cylinder must be returned to the manufacturer for disposition.

3. Local pitting or corrosion or line corrosion involving loss of wall thickness by corrosive media with a pattern of pits which are connected to others in a band or line. A small area with a minimum depth as shown is applicable. Areas extending beyond 3 inches in diameter or 4 inches long must be considered general corrosion.
4. General corrosion (sometimes accompanied by pitting) involved loss of wall thickness by corrosive media covering a considerable area. Cylinder must be returned to the manufacturer for hydrostatic testing.
5. Deformations caused by contact with a sharp object cutting or upsetting the material of the cylinder, decreasing the wall thickness. Maximum defect permissible without corrective action. If this depth is exceeded, the cylinder must be returned to the manufacturer for removal of defects and verification of cylinder strength by hydrostatic testing.
6. Deformations caused by contact with blunt objects in such a manner that the thickness of the metal is not impaired. The major diameter of the dent must be equal to or greater than 32 times the depth of the dent. Sharper dents (or deeper dents) than this are considered too abrupt and must be returned to the cylinder manufacturer for disposition.
7. Fire damage is indicated by charred or burned metal, charred or burned paint, distortion of the cylinder, functioned safety relief devices, melting of valve parts, etc. Cylinders must be returned to the cylinder manufacturer for disposition.
8. Bulged cylinders are not acceptable. Cylinders must be returned to the cylinder manufacturer for disposition.

NOTE: The above data may be used to determine that oxygen cylinders are acceptable for service. This criteria must be used prior to charging cylinders.

(2) Examine the neck of cylinder for cracks, distortion, or damaged threads.
(3) Check the cylinders to determine if markings are legible.
(4) Check the date of last hydrostatic test. If the periodic retest date is past, do not return the cylinder to service until the test has been accomplished.
(5) Inspect the cylinder mounting bracket, bracket hold-down bolts, and cylinder holding straps for cracks, deformation, cleanliness, and security of attachment.
(6) In the immediate area where the cylinder is stored or secured, check for evidence of any types of interference, chafing, deformation, or deterioration.

5. Oxygen Mask Inspection

A. Inspect the Oxygen Mask (Refer to Figure 201).
(1) Check oxygen masks for fabric cracks and rough face seals.
(2) Flex the mask hose gently over its entirety and check for evidence of deterioration or dirt.
(3) Examine mask and hose storage compartment for cleanliness and general condition.

6. Oxygen Mask Maintenance

A. Oxygen Mask Cleaning and Care (Refer to Figure 201).
(1) Clean and disinfect mask assemblies after use, as appropriate.

NOTE: Use care to avoid damaging microphone assembly while cleaning and sterilizing.

(2) Wash mask and hose with a mild soap solution and rinse with clear water.
(3) To sterilize, swab mask and hose thoroughly with a gauze or sponge soaked in a water/merthiolate solution. This solution must contain 1/5 teaspoon of merthiolate per one quart of water. Wipe the mask and hose with a clean cloth and air dry.
(4) Observe that each mask breathing tube end is free of nicks and that the tube end will slip into the cabin oxygen receptacle with ease and will not leak.
(5) If a mask assembly is defective (leaks, does not allow breathing, or contains defective microphone) it is advisable to return the mask assembly to the manufacturer or a repair station.
(6) Replace hose if it shows evidence of deterioration.

7. Oxygen System Functional Testing

A. Whenever the regulator and cylinder assembly has been replaced or overhauled, perform the following flow and internal leakage tests to check that the system functions properly.

(1) Fully charge oxygen system in accordance with procedures outlined in this section.

(2) Disconnect line and fitting assembly from pilot's mask and line assembly. Insert outlet end of line and fitting assembly into cabin outlet and attach opposite end of line to a pressure gage (gage must be calibrated in one-pound increments from 0 to 100 PSI). Place control lever in ON position. Gage pressure must read 75 ±10 PSI.

(3) Insert mask and line assemblies into all remaining cabin outlets. With oxygen flowing from all outlets, test gage pressure must still be 75 ±10 PSI.

(4) Place oxygen control lever in OFF position and allow test gage pressure to fall to 0 PSI. Remove all adapter assemblies except the one with the pressure gage. The pressure must not rise above 0 PSI when observed for one minute. Remove pressure gage and adapter from oxygen outlet.

NOTE: If pressure specified in the foregoing procedures is not obtained, the oxygen regulator is not operating properly. Remove and replace cylinder-regulator assembly with another unit and repeat test procedure.

(5) Connect mask and line assemblies to each cabin outlet and check each mask for proper operation.

(6) Check pilot's mask microphone and control wheel switch for proper operation. After checking, return all masks to mask case.

(7) Recharge oxygen system in accordance with procedures outlined in this section.

8. System Leak Test

A. When oxygen is being lost from a system through leakage, a sequence of steps may be necessary to locate the opening. Leakage may often be detected by listening for the distinct hissing of escaping gas. If this check proves negative, it will be necessary to soap-test all lines and connections with a castile soap and water solution or specially compounded leak-test material. Make the solution thick enough to adhere to the contours of the fittings. At the completion of the leakage test, remove all traces of the leak detector or soap and water solution.

CAUTION: Do not attempt to tighten any connections while the system is charged.

9. Oxygen System Charging

A. Charge Oxygen System (Refer to Figure 201, 202 and 203).

NOTE: Use only aviator's breathing oxygen per MIL-0-27210.

WARNING: Be sure to ground aircraft and ground servicing equipment before charging oxygen system.

(1) Do not attempt to charge oxygen cylinders if servicing equipment fittings or filler valve are corroded or contaminated. If in doubt, clean with stabilized trichloroethylene and let air dry. Do not allow solvent to enter any internal parts.

(2) If cylinder is completely empty, do not charge, as the cylinder must then be removed, inspected and cleaned.

CAUTION: A cylinder which is completely empty may be contaminated. The regulator and cylinder assembly must then be disassembled, inspected and cleaned by an FAA approved facility, before filling. Contamination, as used here, means dirt, dust or any other foreign material, as well as ordinary air in large quantities. If a gage line or filler line is disconnected and the fittings capped immediately, the cylinder will not become contaminated unless temperature variation has created a suction within the cylinder. Ordinary air contains water vapor which could condense and freeze. Since there are very small orifices in the system, it is very important that this condition not be allowed to occur.

(3) Connect charging cylinder line from oxygen service cart to filler valve.
(4) Slowly open valve on oxygen service cart and charge airplane oxygen bottle to correct pressure. Refer to Table 1 for charging pressures at different temperatures.
(5) Ambient temperature listed in the chart is the air temperature in the area where the system is to be charged. Filling pressure refers to the pressure to which aircraft cylinders must be filled. This table gives approximations only and assumes a rise in temperature of approximately 25°F, due to heat of compression. This table also assumes the aircraft cylinders will be filled as quickly as possible and that they will only be cooled by ambient air; no water bath, or other means of cooling be used.

Table 201. Oxygen Cylinder Filling Pressures

Ambient Temp. (Degrees F)	**Filling Pressure (psig)**	**Ambient Temp. (Degrees F)**	**Filling Pressure (psig)**
0	1650	50	1875
10	1700	60	1925
20	1725	70	1975
30	1775	80	2000
40	1825	90	2050

Example: If ambient temperature is 70°F, fill aircraft cylinders to approximately 1,975 PSI or as close to this pressure as the gage may read. Upon cooling, cylinders must have approximately 1,850 PSI of pressure.

CHAPTER 37

VACUUM

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
37-Title		
37-List of Effective Pages		
37-Record of Temporary Revisions		
37-Table of Contents		
37-00-00	Page 1	Dec 2/2002
37-10-00	Pages 101-103	Dec 2/2002
37-10-00	Pages 201-209	Jan 2/2006

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

VACUUM SYSTEM - GENERAL

1. Scope

A. This chapter describes those units and components used to provide vacuum necessary to operate the artificial horizon and directional gyros.

2. Definition

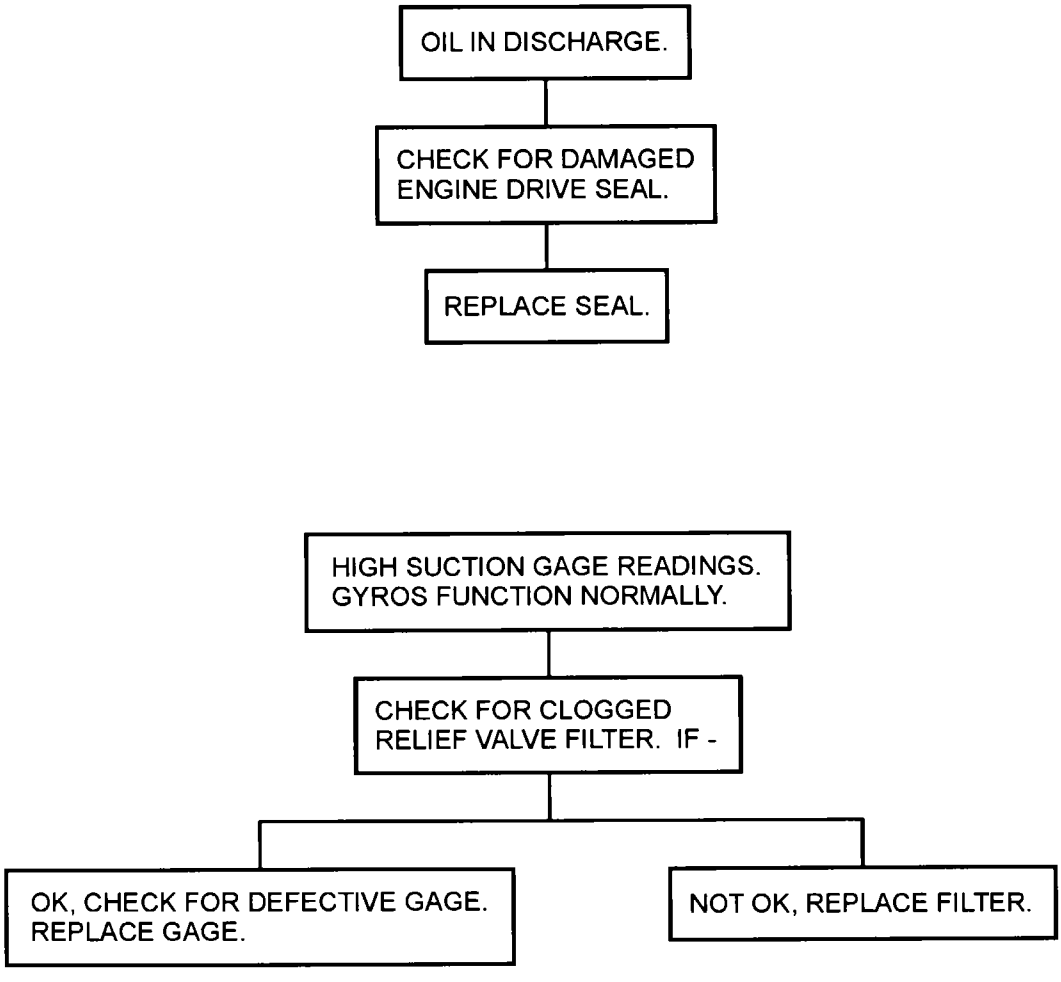
A. This chapter is divided into sections to aid maintenance personnel in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief definition of the sections incorporated in this chapter is as follows:
   (1) The section on distribution describes those components used in the distribution of vacuum air.
   (2) The section on indicating describes those components used to indicate relative vacuum pressure in the system.

VACUUM SYSTEM - TROUBLESHOOTING

1. General

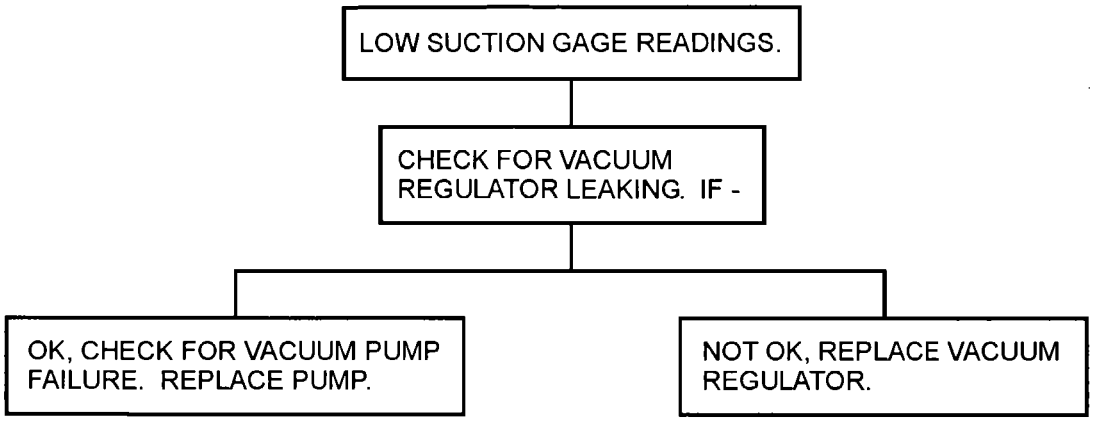
A. A troubleshooting chart has been provided to aid the maintenance technician in system troubleshooting. Refer to Figure 101.

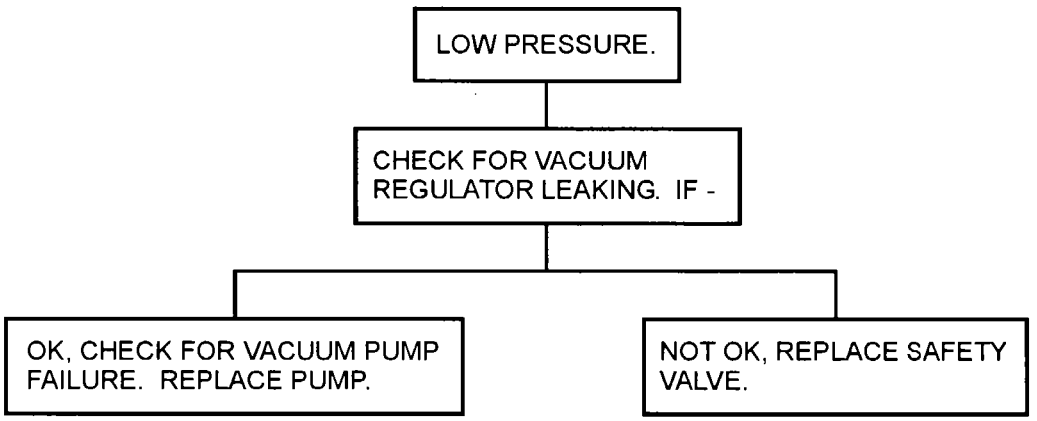
B961



Vacuum System Troubleshooting Chart
Figure 101 (Sheet 1)

B962





Vacuum System Troubleshooting Chart
Figure 101 (Sheet 2)

VACUUM SYSTEM - MAINTENANCE PRACTICES

1. Description and Operation

A. Description and Operation

(1) The vacuum system has a filter, vacuum gage, vacuum instruments, regulator valve, vacuum manifold, low vacuum annunciator switches, engine-driven vacuum pumps and related plumbing.

(2) On airplanes without Garmin G1000, the source of vacuum air is in the cabin and is pulled through the system by the engine-driven vacuum pumps. This air goes through the gyro filter at the cabin inlet source before it goes through the vacuum gage and gyro instruments. The vacuum is controlled by the regulator valve. The regulator valve is on the aft side of the firewall. The vacuum air is then pulled through the vacuum manifold and past the low vacuum annunciator switches and then into the vacuum pumps.

(3) On airplanes without Garmin G1000, vacuum pressure is measured by the low vacuum annunciator switches in the engine compartment. The vacuum gage in the instrument panel shows the vacuum pressure.

(a) The vacuum gage gives a direct indication of the system vacuum in inches of mercury (In. Hg.).

(b) The low vacuum annunciator switches are part of the panel annunciator warning system.

1 If the left vacuum switch (SN012) senses a vacuum below 3.0 In. Hg., the VAC annunciator will show L VAC.

2 If the right vacuum switch (SN011) senses a vacuum below 3.0 In. Hg., the VAC annunciator will show VAC R.

3 If both switches sense a vacuum below 3.0 In. Hg., the VAC annunciators will show L VAC R.

(c) For more information on the maintenance practices for the panel-mounted annunciator (UI005), refer to Chapter 31, Annunciator Panel - Maintenance Practices.

(4) On airplanes with Garmin G1000, the source of vacuum air is in the cabin and is pulled through the system by the engine-driven vacuum pump. The vacuum pressure is measured by a vacuum transducer. The air goes through the gyro filter at the cabin inlet source before it is goes through the horizon gyro indicator. The vacuum is controlled by the regulator valve. The regulator valve and the vacuum transducer are on the aft side of the firewall.

2. Vacuum Pump Removal/Installation

NOTE: The removal/installation is typical for each vacuum pump.

A. Remove the Vacuum Pump (Refer to Figure 201 and Figure 202).

(1) Remove the engine cowl. Refer to Chapter 71, Cowls - Maintenance Practices.

(2) Disconnect the hoses from the inlet and outlet ports of the vacuum pump.

(3) Cap the hoses and vacuum pump ports to keep out foreign material.

(4) Remove the nuts, lock washers, and flat washers that attach the shroud and vacuum pump to the engine.

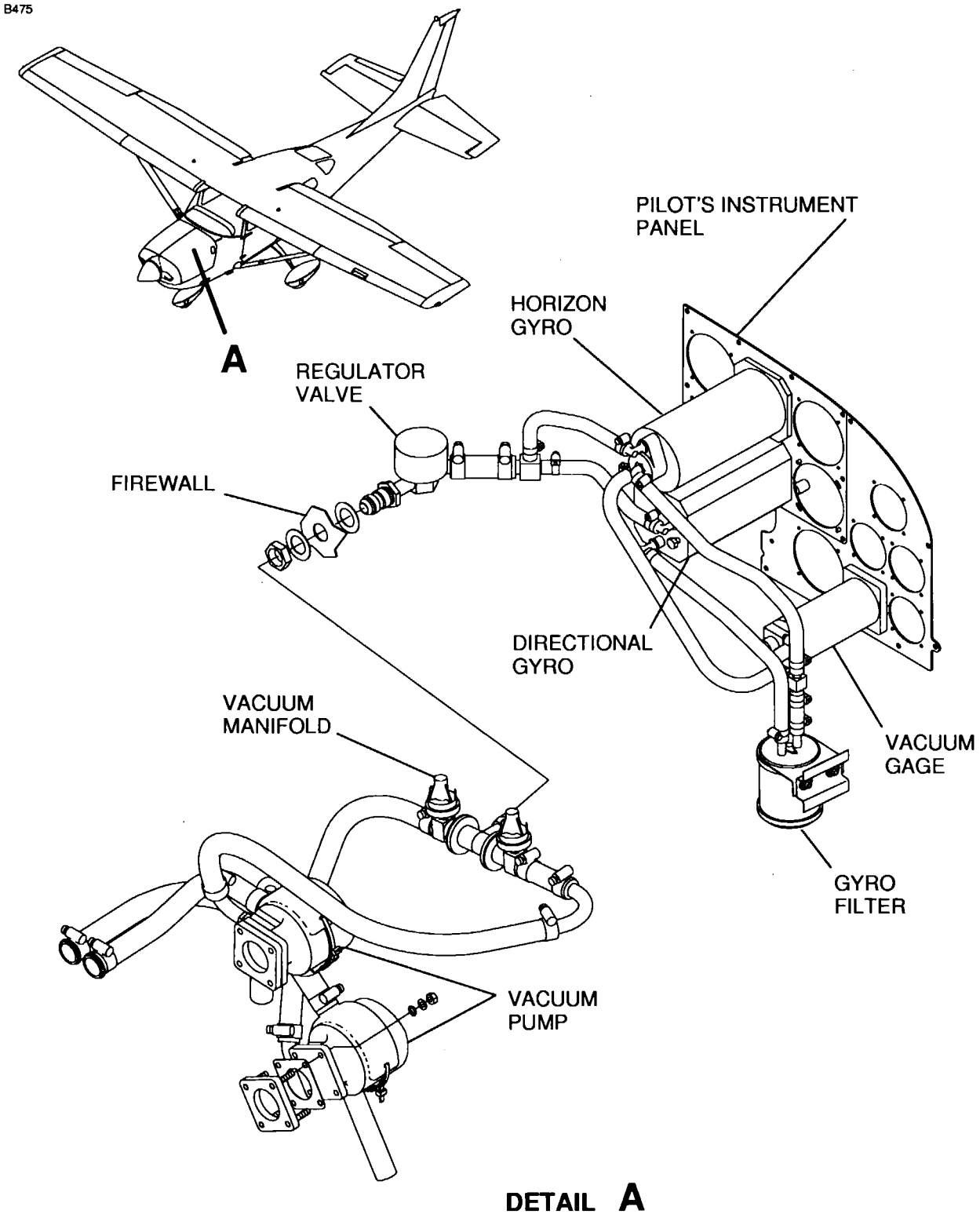
(5) Remove the shroud and vacuum pump from the studs on the engine.

(6) Remove the elbow from the pump.

(7) Discard any damaged fittings or nuts with rounded corners.

B. Install the Vacuum Pump (Refer to Figure 201).

(1) Before you install a new vacuum pump, purge the vacuum pump hoses in the system to remove foreign particles that may have been deposited in the hoses by the previous vacuum pump.



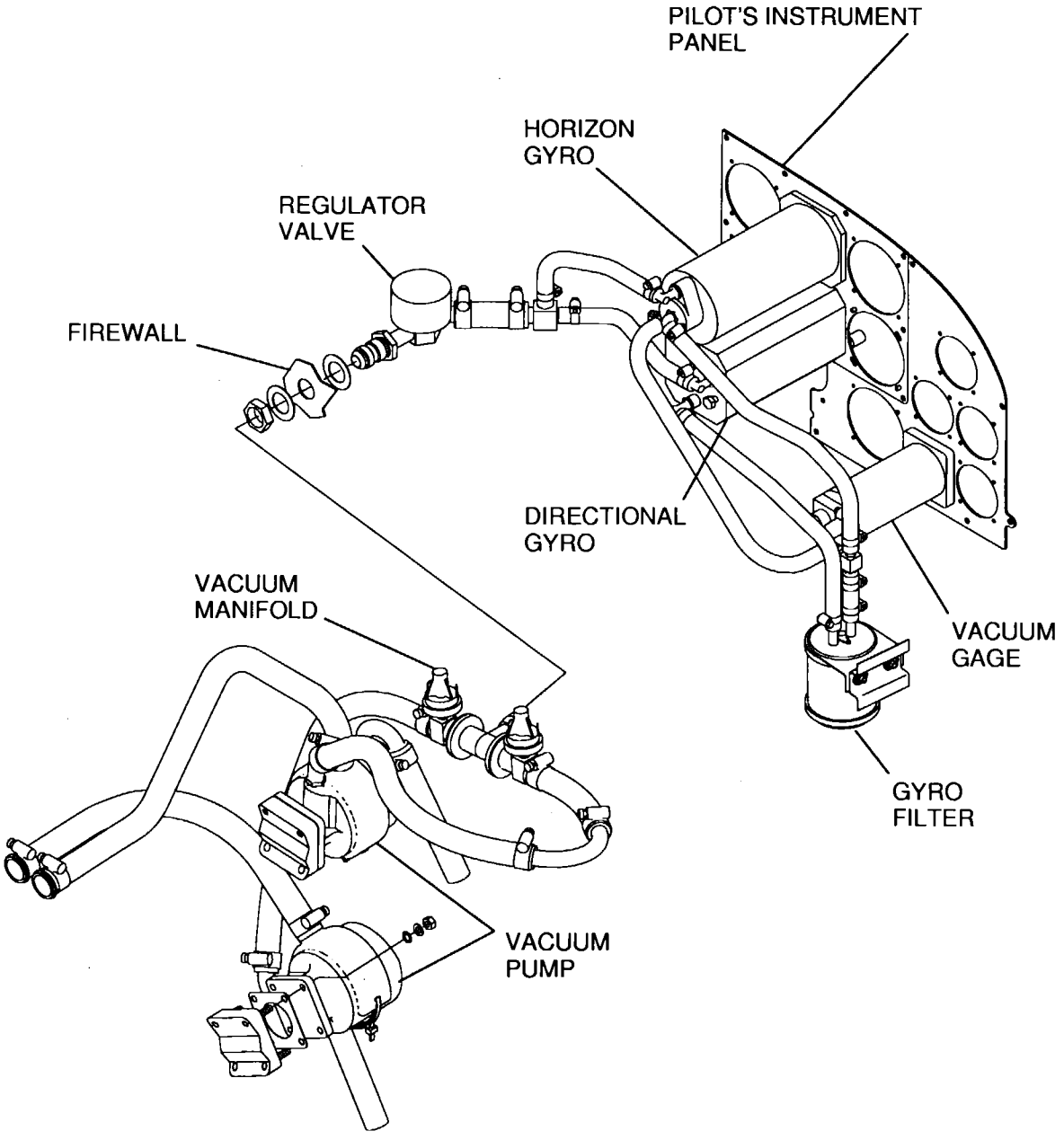
DETAIL A

AIRPLANES 20608001 AND ON

1210T1001
A1214T1016
A1214T1017

Vacuum System Installation
Figure 201 (Sheet 1)

B476

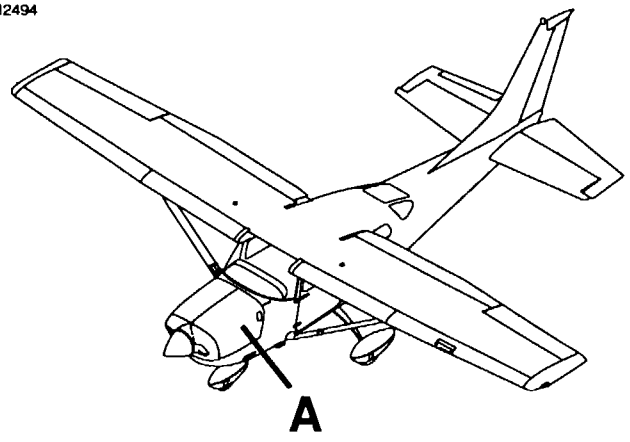


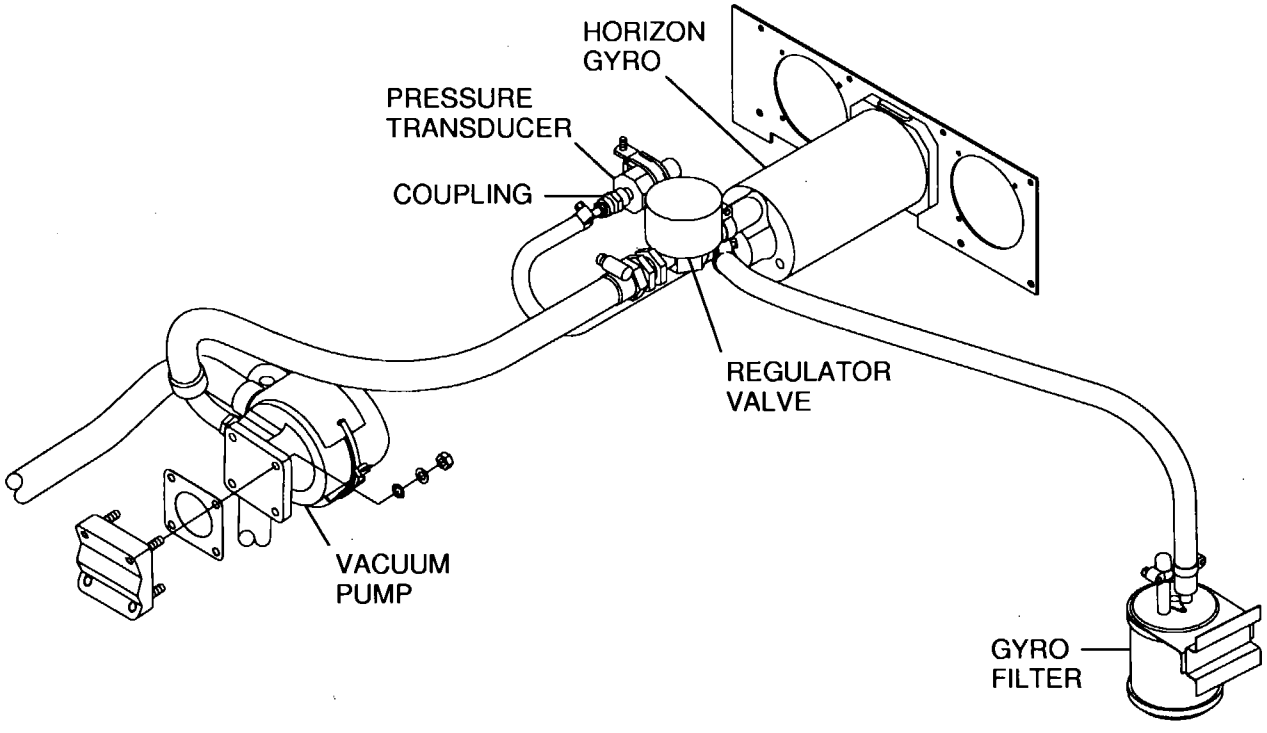
DETAIL A
AIRPLANES T20608001 AND ON

A1214T1016
A1214T1018

Vacuum System Installation
Figure 201 (Sheet 2)

B2494



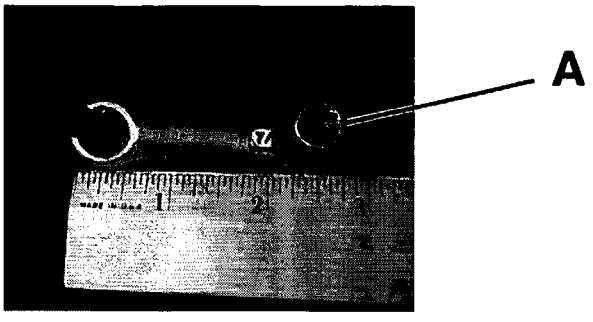


DETAIL A
AIRPLANES WITH GARMIN G1000

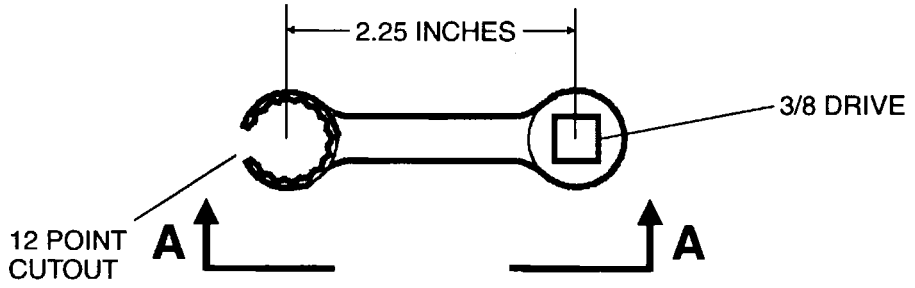
1210T1001
A1214T1059

Vacuum System Installation
Figure 201 (Sheet 3)

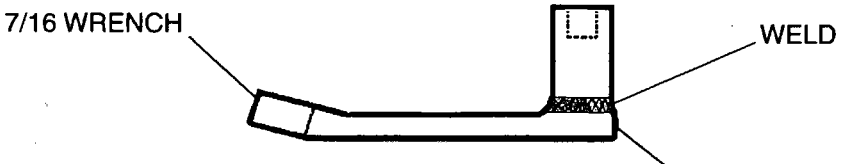
B204



FABRICATED TORQUE WRENCH ADAPTOR



DETAIL A



VIEW A-A

Vacuum Pump Torque Wrench Adapter
Figure 202 (Sheet 1)

CAUTION: Do not set the pump directly in a vise. If you clamp the vise across the center, the carbon rotor in the pump can be damaged. Protect the pump mount flange with soft metal or wood. Never install a vacuum pump that has been dropped.

(2) Use a jaw protected vise to set the vacuum pump in a position with the drive coupling turned down.

CAUTION: Do not use Teflon tape, pipe dope, or thread lubricants of any type.

(3) Install the elbow fitting in the pump hand tight.

CAUTION: Do not turn the elbow fitting more than 1.5 turns beyond the hand tight position.

(4) Use only a box end wrench to tighten fittings to desired position.

CAUTION: Do not use any cork-type gaskets when you install the vacuum pump.

(5) Set the new mount pad gasket on the studs.
(6) Make sure the surfaces are clean and free of any old gasket material.
(7) Set the vacuum pump and shroud on the studs.

CAUTION: Do not apply grease to the splines of the vacuum pump.

(8) Make a torque wrench to install the pump and shroud to the engine.
  (a) The wrench length must be 2.25 inches (57.15 mm) from the center of the box end to the center of the socket.
  (b) Weld a 0.375 inch (9.525 mm) drive to a 0.4375 inch (11.1125 mm) wrench with a 12 point cut-out in the box end of the wrench.
(9) Install the pump and shroud to the engine with the flat washers, new lockwashers, and nuts.
(10) Use the torque wrench adapter and torque the mount nuts in a cross pattern to 70 inch-pounds, +10 or -10 inch-pounds (6.8 N.m, +1.1 or -1.1 N.m).
(11) Connect the hoses to the inlet and outlet ports of the vacuum pump.
(12) Connect the drain hose to the elbow.
(13) Set the tube in a position so the exhaust is not directed toward the magnetos or electrical wires.
(14) Operate the engine and examine the indication on the vacuum gage. Refer to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.
(15) Adjust the indication on the vacuum gage, if necessary. Refer to the vacuum pressure adjustment/test.
(16) Install the upper engine cowls. Refer to Chapter 71, Cowls - Maintenance Practices.

3. Vacuum Manifold Removal/Installation

NOTE: The procedures that follow are for airplanes with standard avionics.

A. Remove the Vacuum Manifold (Refer to Figure 201).
  (1) Remove the engine cowls. Refer to Chapter 71, Cowls - Maintenance Practices.
  (2) Remove the hoses from the vacuum manifold.
  (3) Identify with a tag and disconnect electrical connectors from vacuum manifold.
  (4) Loosen the nut that attaches the vacuum manifold to the nipple in the firewall.
  (5) Remove the vacuum manifold from the airplane.

B. Install the Vacuum Manifold (Refer to Figure 201).
  (1) Set the vacuum manifold on the nipple in the firewall and attach it with the nut.
  (2) Connect the electrical connectors to the vacuum manifold.

(3) Connect the hoses to the vacuum manifold and attach it with the clamps.
(4) Install the upper engine cowling. Refer to Chapter 71, Cowls - Maintenance Practices.

4. Vacuum Regulator Filter Removal/Installation

A. Remove the Filter to the Vacuum Regulator (Refer to Figure 201).
(1) Remove the pilot seat. Refer to Chapter 25, Front Seats - Maintenance Practices.
(2) Reach behind the radio stack and stretch the foam element over the top retaining bezel to remove the filter.
(3) Remove the filter from the airplane.

B. Install the Vacuum Regulator Filter (Refer to Figure 201).
(1) Reach behind the radio stack and stretch the foam element over the top of the retaining bezel to install the filter.
(2) Make sure that the foam element is installed correctly on the retaining bezel.
(3) Install the pilot seat. Refer to Chapter 25, Front Seats - Maintenance Practices.

5. Gyro Filter Removal/Installation

A. Remove the Gyro Filter (Refer to Figure 201).
(1) Remove the bolt and retainer from the mount.
(2) Remove the gyro filter.

B. Install the Gyro Filter (Refer to Figure 201).
(1) Set the gyro filter and retainer on the mount and install the bolt.

6. Vacuum Gage Removal/Installation

NOTE: The procedures that follow are for airplanes with standard avionics.

NOTE: The vacuum gage and ammeter are incorporated into a single instrument.

A. Remove the Vacuum Gage (Refer to Figure 201).
(1) Disconnect the vacuum and air hoses from the vacuum gage.
(2) Disconnect the electrical connector from the ammeter.
(3) Remove the screws that attach the vacuum gage to the instrument panel and remove the vacuum gage.

B. Install the Vacuum Gage (Refer to Figure 201).
(1) Install vacuum gage to the instrument panel and attach with screws.
(2) Connect the electrical connector to the ammeter.
(3) Connect the vacuum and air hoses to the vacuum gage.

7. Vacuum Transducer Removal/Installation

NOTE: Only airplanes with the Garmin G1000 have a vacuum transducer.

A. Remove the Vacuum Transducer (Refer to Figure 201).
(1) Remove the center panel. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.
(2) Remove the screw and clamp that hold the vacuum transducer in position.
(3) Remove the vacuum transducer.

B. Install the Vacuum Transducer (Refer to Figure 201).
(1) Install the vacuum transducer.
(2) Install the screw and clamp that hold the vacuum transducer in position.
(3) Install the center panel. Refer to Chapter 31, Instrument and Control Panels - Maintenance Practices.

8. Vacuum Pressure Adjustment/Test (For airplanes with the Parker Airborne regulator valve or the Aero Accessories regulator valve)

NOTE: Before the adjustment procedure, the entire pneumatic system must be inspected and tested for leaks, restrictions, and unserviceable components. Failure to correct all system anomalies will lead to reduced dry air pump service life.

A. Prepare the System for the Test (Refer to Figure 201).
   (1) Remove the gyro (central air) filter.

B. Do a Check of the Regulator Valve.

CAUTION: Make sure that the temperature of the engine does not go above the maximum engine temperature during the adjustment/test of the regulator valve.

NOTE: At engine speeds between 1200 RPM and full throttle, suction must fall between 4.5 In. Hg. and 5.5 In. Hg. (green range on gage).

(1) Start the engine, warm up to the normal operating temperature, and run at static RPM. Refer to Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.
(2) Make sure the suction gage indication does not go above 5.5 In. Hg.
(3) Run the engine at 1200 RPM and make sure the gage indication does not go below 4.5 In. Hg.
(4) If the suction indication falls outside of the range, shut down the engine and adjust the regulator valve in the steps that follow.
   (a) Bend the locking tab upward on the lower surface of the regulator valve.

CAUTION: Be careful when you turn the adjustment screw. Do not turn it too much in either direction. When you turn it too much in either direction, damage can occur to the equipment.

   (b) Turn the adjustment screw on the lower surface of the regulator valve in the direction to increase or decrease the pressure as necessary.

NOTE: As you face the adjustment screw, when you turn it clockwise the pressure increases. When you turn it counterclockwise, the pressure decreases.

   (c) Tap the regulator after you adjust it to help reset the components.
   (d) Bend the locking tab downward to keep the adjustment screw in place when the correct pressure has been set.
(5) Run the engine at static RPM and make sure the gage indication does not go above 5.5 In. Hg.
(6) Run the engine at 1200 RPM and make sure the gage indication does not go below 4.5 In. Hg.
(7) Shut down the engine.
   (a) For airplanes without the Garmin G1000, make sure that the L VAC R lights come on.
   (b) For airplanes with the Garmin G1000, make sure that the low vacuum annunciator visual and aural warnings come on.
(8) Attach the filter element to the gyro (central air) filter.
(9) Before you start the engine, make sure that the low vacuum annunciations are on.
   (a) For airplanes without the Garmin G1000, make sure that the L VAC R lights are on.
   (b) For airplanes with the Garmin G1000, make sure that the low vacuum annunciator visual warning is on.
(10) Run the engine for a final time at static RPM and observe the indication on the suction gage.
   (a) If the indication falls noticeably after the filter is installed, replace the filter.
(11) Reduce the engine speed to 1200 RPM and make sure that the suction stays in the green range (does not fall below 4.5 In. Hg.). and that the low vacuum annunciations are off.
   (a) For airplanes without the Garmin G1000, make sure that the L VAC R lights go off.

(b) For airplanes with the Garmin G1000, make sure that the low vacuum annunciator visual and aural warnings go off.

(12) Shut down the engine.

CHAPTER 51

STANDARD PRACTICES - STRUCTURES

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
51-Title		
51-List of Effective Pages		
51-Record of Temporary Revisions		
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51-00-00	Page 1	Dec 2/2002
51-10-00	Page 1	Dec 2/2002
51-11-00	Pages 1-4	Dec 2/2002

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

STRUCTURES - GENERAL

1. Scope

A. This chapter provides a description of general airplane structures and corrosion characteristics. For repair of structural members and repair techniques used throughout the airplane, refer to the Single Engine Models 172, 172, 206, and T206 1996 and On Structural Repair Manual.

2. Definition

A. This chapter is divided into two sections briefly described below.
   (1) The section on structures provides an overall description of the airplane structure and methods of construction used on the airplane.
   (2) For a general description of corrosion characteristics, types of corrosion and typical corrosion areas, refer to the Single Engine Models 172, 182, 206, and T206 1996 and On Structural Repair Manual.

STRUCTURES - DESCRIPTION AND OPERATION

1. Description

A. The fuselage is of semimonocoque construction and consists of three major sections: forward section, center section, and tailcone section. Construction consists of formed bulkheads, longitudinal stringers, reinforcing channels and skin. Frame members of the cabin section are constructed of formed bulkhead channels. Bulkheads are formed "U" channel sections. Principal material is 2024-0 alclad aluminum alloy which, after forming, is heat treated to a 2024-T42 condition and painted with corrosion resistant primer. All bulkheads in the fuselage are constructed of formed sheet metal or reinforced sheet metal.

B. The wings are of all-metal, strut-braced, semimonocoque construction, utilizing two spars. Each wing consists of an outer wing panel with an integral fuel bay, an aileron and a flap. Flanged upper and lower edges of all ribs serve as cap-strips, in addition to providing rigidity to the rib. The skin, riveted directly to each rib flange, provides the cellular strength for each successive rib bay. The nose, center, and trailing edge rib segments are riveted together through the front and rear spars to form the basic airfoil sections. Alclad stringers stiffen the skin between ribs. Spars are comprised of machine milled, tapered extrusions riveted to sheet metal webs.

C. The full cantilever, all-metal tail group consists of a vertical stabilizer and rudder, and a horizontal stabilizer and elevators. The horizontal stabilizer is of one-piece construction, consisting of spars, ribs and skins. Elevators are constructed of aluminum spars, ribs and skin panels. The skin panels are riveted to ribs and spars. A balance weight is located in the outboard end of each elevator, forward of the hinge line. An elevator trim tab, attached to the elevator, is constructed of a spar, ribs, and skin; all riveted together. The vertical stabilizer is constructed of a forward spar, an aft spar, ribs and skin. The rudder is constructed of spars, ribs and skin panels. The rudder trim tab is constructed of a spar, ribs, and skin; all riveted together.

D. The main landing gear is constructed of 6150 alloy spring steel with attaching parts of high strength 7075-T73 aluminum alloy forgings. Nose gear components are 4130, 6150 alloy steel and 7075-T73 aluminum alloy forgings.

E. The engine cowling consists of upper formed aluminum sections. The upper section includes an oil inspection door.

CORROSION - DESCRIPTION AND OPERATION

1. General

A. This section describes corrosion so the maintenance technician can identify the various types of corrosion and apply preventative measures to minimize corrosion activity. For corrosion control and corrosion damage, refer to the Single Engine Models 172, 172, 206 and T206 1996 and On Structural Repair Manual.

2. Characteristics of Corrosion

A. Corrosion is a natural phenomenon which destroys metal by chemical or electrochemical action and converts it to a metallic compound, such as an oxide, hydroxide, or sulfate. All metals used in airplane construction are subject to corrosion. Attack may take place over an entire metal surface, if exposed, or it may be penetrating in nature, forming deep pits. It may follow grain boundaries or it may penetrate a surface at random. Corrosion may be accentuated by stresses from external loads or from lack of homogeneity in the metallic structure or from improper heat treatment. It is promoted by contact between dissimilar metals or with materials which absorb moisture, such as wood, rubber, felt, dirt, etc.

(1) The following conditions must exist for electrochemical corrosion to occur. Refer to Figure 1 for an illustration of electrochemical corrosion.
   (a) There must be a metal that corrodes and acts as the anode.
   (b) There must be a less corrodible metal that acts as the cathode.
   (c) There must be a continuous liquid path between the two metals which acts as the electrolyte, usually condensation and salt or other contamination.
   (d) There must be a conductor to carry the flow of electrons from the cathode to the anode. This conductor is usually in the form of a metal-to-metal contact (rivets, bolts, welds, etc.)

(2) The elimination of any one of the four conditions described above will stop the corrosion reaction process.

(3) One of the best ways to eliminate one of the four described conditions is to apply an organic film (such as paint, grease, plastic, etc.) to the surface of the metal affected. This will prevent the electrolyte from connecting the cathode to the anode, and current cannot flow, therefore, preventing corrosion reaction. Refer to Figure 1 for a typical organic film application.

(4) At normal atmospheric temperatures, metals do not corrode appreciably without moisture, but the moisture in the air is usually enough to start corrosive action.

(5) The initial rate of corrosion is usually much greater than the rate after a short period of time. This slowing down occurs because of the oxide film that forms on the metal's surface. This film tends to protect the metal underneath.

(6) When components and systems constructed of many different types of metals must perform under various climatic conditions, corrosion becomes a complex problem. Salt on metal surfaces (from sea coast operation) greatly increases the electrical conductivity of any moisture present and accelerates corrosion.

(7) Other environmental conditions which contribute to corrosion are:
   (a) Moisture collecting on dirt particles.
   (b) Moisture collecting in crevices between lap joints, around rivets, bolts and screws.

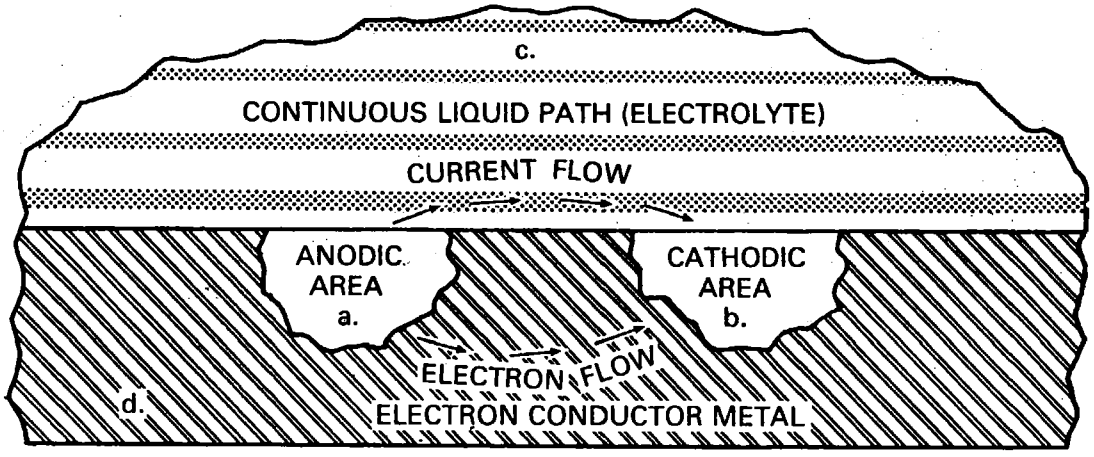
3. Types of Corrosion

A. Corrosion Types.

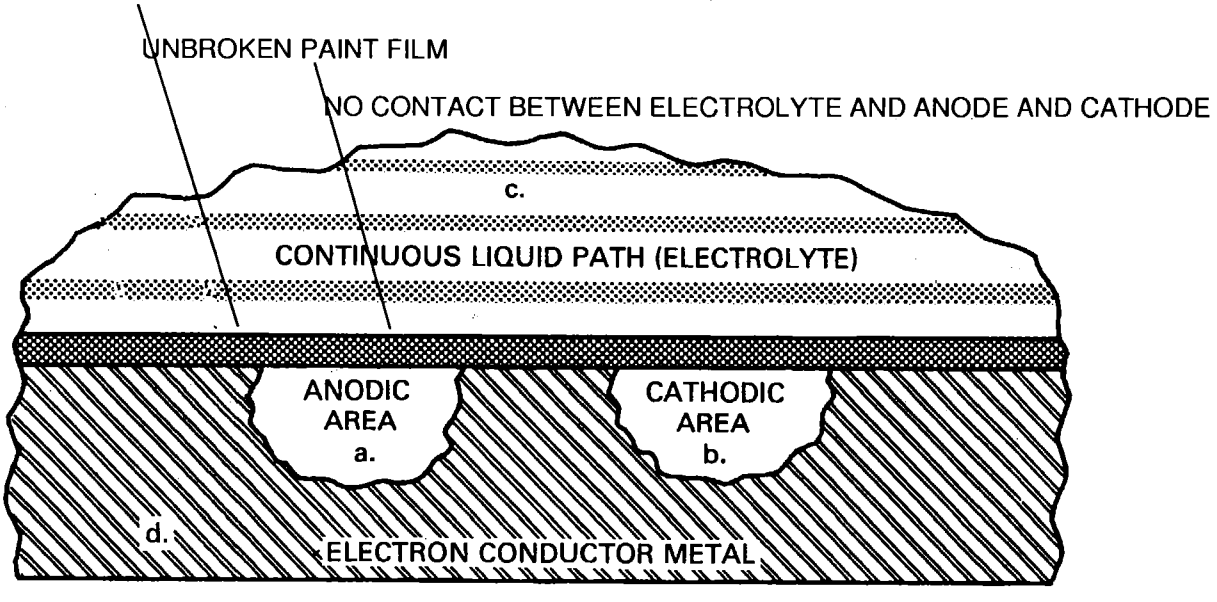
(1) Direct Surface Attack - The most common type of general surface corrosion results from direct reaction of a metal surface with oxygen in the atmosphere. Unless properly protected, steel will rust and aluminum and magnesium will form oxides. The attack may be accelerated by salt spray or salt-bearing air, by industrial gases or by engine exhaust gases.

(2) Pitting - While pitting can occur in any metal, it is particularly characteristic of passive materials, such as the alloys of aluminum, nickel and chromium. It is first noticeable as a white or gray powdery deposit similar to dust, which blotches the surface. When the deposits are cleaned away, tiny pits can be seen in the surface.

B1933



SIMPLIFIED CORROSION CELL



2682T1017

Corrosion Identification
Figure 1 (Sheet 1)

(3) Dissimilar Metal Corrosion - When two dissimilar metals are in contact and are connected by an electrolyte (continuous liquid or gas path), accelerated corrosion of one of the metals occurs. The most easily oxidized surface becomes the anode and corrodes. The less active member of the couple becomes the cathode of the galvanic cell. The degree of attack depends on the relative activity of the two surfaces; the greater the difference in activity the more severe the corrosion. Relative activity in descending order is as follows:
   (a) Aluminum alloys 1100, 3003, 5052, 6061, 220, 355, 356, cadmium and zinc.
   (b) Aluminum alloys 2014, 2017, 2024, 7075 and 195.
   (c) Iron, lead and their alloys (except stainless steel).
   (d) Stainless steels, titanium, chromium, nickel, copper, and their alloys.
   (e) Graphite (including dry film lubricants containing graphite).

(4) Intergranular Corrosion - Selective attack along the grain boundaries in metal alloys is referred to as intergranular corrosion. It results from lack of uniformity in the alloy structure. It is particularly characteristic of precipitation hardened alloys of aluminum and some stainless steels. Aluminum extrusions and forgings in general may contain nonuniform areas, which in turn may result in galvanic attack along the grain boundaries. When attack is well advanced, the metal may blister or delaminate, which is referred to as 'exfoliation'.

(5) Stress Corrosion - This results from the combined effect of static tensile stresses applied to a surface over a period of time. In general, cracking susceptibility increases with stress, particularly at stresses approaching the yield point, and with increasing temperature, exposure time and concentration of corrosive ingredients in the surrounding environment. Examples of parts which are susceptible to stress corrosion cracking are aluminum alloy bellcranks, landing gear shock struts with pipe thread-type grease fittings, clevis joints and shrink fits.

(6) Corrosion Fatigue - This is a type of stress corrosion resulting from the cyclic stresses on a metal in corrosive surroundings. Corrosion may start at the bottom of a shallow pit in the stressed area. Once attack begins, the continuous flexing prevents repair of protective surface coating or oxide films and additional corrosion takes place in the area of stress.

4. Typical Corrosion Areas

A. This section lists typical areas of the airplane which are susceptible to corrosion. These areas should be carefully inspected at periodic intervals to detect corrosion as early as possible.

(1) Engine Exhaust Trail Areas.
   (a) Gaps, seams and fairings on the lower left hand and right hand sides of the fuselage, aft of the engine exhaust stacks, are typical areas where deposits may be trapped and not reached by normal cleaning methods.
   (b) Around rivet heads, skin laps and inspection covers on the airplane lower fuselage, aft of the engine exhaust stack, should be carefully cleaned and inspected.

(2) Battery Box and Battery Vent Opening.
   (a) The battery, battery cover, battery box and adjacent areas, especially areas below the battery box where battery electrolyte may have seeped, are particularly subject to corrosive action. If spilled battery electrolyte is neutralized and cleaned up at the same time of spillage, corrosion can be held to a minimum by using a baking soda solution to neutralize the lead acid-type battery electrolyte. If baking soda is not available, flood the area with water.

(3) Stainless Steel Control Cables.
   (a) Checking for corrosion on control cables is normally accomplished during the preventative maintenance check. During preventative maintenance, broken wires and wear of the control cables are also checked.
   (b) If the surface of the cable is corroded, carefully force the cable open by reverse twisting and visually inspect the interior. Corrosion on the interior strands of the cable constitutes failure and the cable must be replaced. If no internal corrosion is detected, remove loose external rust and corrosion with a clean, dry, coarse-weave rag or fiber brush.

NOTE: Do not use metallic wools or solvents to clean installed cables. Use of metallic wool will embed dissimilar metal particles in the cables and create further corrosion. Solvents will remove internal cable lubricant, allowing cable strands to abrade and further corrode.

(c) After thorough cleaning of the exterior cable surface, apply a light coat of lubricant (VV-L-800) to the external cable surface.

(4) Internal Fuel Tanks.

(a) The presence of soil contamination (a brown slimy substance) and pitting-type corrosion may occur in the lower areas of the integral fuel tanks of certain airplanes. This condition can cause a general degradation of some top coating and some depolymerization and loosening of sealant materials in lower areas.

(b) The contaminants resemble normal aluminum corrosion products, including a considerable quantity of iron. The brown, slimy deposits are microbial in nature. Examination of the corrosion pits by metallurgical techniques indicate the presence of intergranular attacks.

5. Corrosion Detection

A. Corrosion Defoliation. The primary means of corrosion detection is visual, but in situations where visual inspection is not feasible, other techniques must be used. The use of liquid dye penetrant, magnetic particle, X-ray and ultra-sonic devices can be used, but most of these sophisticated techniques are intended for the detection of physical flaws within metal objects, rather than the detection of corrosion.

(1) Visual Inspection. A visual check of the metal surface can reveal the signs of corrosive attack, the most obvious of which is a corrosive deposit. Corrosion deposits of aluminum or magnesium are generally a white or grayish-white powder, while the color of ferrous compounds varies from red to dark reddish-brown.

(a) The indications of corrosive attack are small, localized discolorations of the metal surface. Surfaces protected by paint or plating may only exhibit indications of more advanced corrosive attack by the presence of blisters or bulges in the protective film. Bulges in lap joints are indications of corrosive build-up which is well advanced.

(b) In many cases the inspection area is obscured by structural members, equipment installations or, for other reasons, are awkward to check visually. In such cases, mirrors, borescope or similar devices can be used to inspect the obscured areas. Any means which allows a thorough inspection can be used. Magnifying glasses are valuable aids for determining whether or not all corrosive products have been removed during clean up operations.

(2) Liquid Dye Penetrant Inspection. Inspection for large stress-corrosion or corrosion fatigue cracks on nonporous or nonferrous metals may be accomplished using dye penetrant processes. The dye applied to a clean metallic surface will enter small openings or cracks by capillary action. After the dye has an opportunity to be absorbed by any surface discontinuity, the excess dye is removed and a developer is applied to the surface. The developer acts like a blotter and draws the dye from cracks or fissures back to the surface, giving visible indication of any fault that is present on the surface. The magnitude of the fault is indicated by the quantity of dye brought back to the surface by the developer.

6. Corrosion Damage Limits

A. Following cleaning and inspection of the corroded area, the actual extent of the damage may be evaluated using the following general guidelines and good, sound maintenance judgement. Determine the degree of corrosion damage (light, moderate, or severe) with a dial-type depth gage, if accessibility permits. If the area is inaccessible, clay impressions, or any other means which will give accurate results, should be used. In the event the corrosion damage is severe, contact Cessna Propeller Aircraft Product Support for assistance.

(1) Light Corrosion - Characterized by discoloration or pitting to a depth of approximately 0.001 inch maximum. This type of damage is normally removed by light hand-sanding or a minimum of chemical treatment.

(2) Moderate Corrosion - Appears similar to light corrosion except there may be blistering or some evidence of scaling or faking. Pitting depths may be as deep as 0.010 inch. This type of damage is normally removed by extensive hand-sanding or mechanical sanding.

(3) Severe Corrosion - General appearance may be similar to moderate corrosion with severe blistering exfoliation and scaling or flaking. Pitting depths may be as deep as 0.10 inch. This type of damage is normally removed by extensive mechanical sanding or grinding (if not complete part replacement).

CHAPTER 52

DOORS

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
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52-30-00	Pages 201-207	Jul 3/2006

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

DOORS - GENERAL

1. Scope

A. This chapter provides maintenance information on doors. Provided are removal/installation instructions and rigging procedures.

2. Definition

A. This chapter is divided into sections and subsections to assist maintenance personnel in locating specific systems and information. The following is a brief description of each section. For locating information within the chapter, refer to the Table of Contents at the beginning of the chapter.
(1) The cabin door section provides information on removal/installation and rigging of the doors.
(2) The cargo door section provides information on removal/installation and rigging of the door.

CABIN DOORS - MAINTENANCE PRACTICES

1. General

A. A cabin door is installed on the left side of the airplane. The door has an outer sheet skin chemically bonded to a formed inner pan assembly. A door latch assembly, a remote inside handle, a pair of external hinges, and an integral doorstop assembly are installed to this rigid structure. All procedures that follow refer to the left door.

B. The cabin door latch has a two-piece nylon latch base, exterior handle, spring-loaded latch bolt/pull-bar assembly, and a spring-loaded catch/trigger pin assembly. The interior handle base plate assembly is directly connected to the cabin door latch by an adjustable push rod assembly. This push rod assembly has two clamps, attached 180 degrees apart on the main rod. These clamps are used to operate a cable assembly that drives a cable pin from the upper aft end of the cabin door into the aft upper door sill. When the cabin door is open, the door latch exterior handle extends out. It is held in this position by means of the spring-loaded latch catch engaged with the latch bolt through the beveled hole in the bolt. The push rod assembly will be moved forward, and the attached cable assembly will be retracted from the upper door sill with the cable pin recessed in the pin guide in the upper aft corner of the door. The interior handle, connected by the push rod, will be moved approximately 15 degrees aft of the vertical position. When the cabin door closes, it drives the trigger pin over the nylon actuator attached to the cover plate on the rear door post. As the trigger pin is driven forward, it disengages the latch catch from the latch bolt. The extended extension springs, attached to the latch handle and bolt/pull-bar assembly, compress. This pulls the latch handle in and drives the latch bolt over the latch striker door post. When the exterior handle is pushed flush with the fuselage skin, the push rod assembly, attached to the latch bolt/pull-bar assembly, moves aft, which also drives the cable pin from the pin guide in the door into the upper aft door sill receptacle. The interior door handle has now moved from approximately 15 degrees aft of vertical to approximately 45 degrees forward of vertical. When the interior handle is pushed to the horizontal position, flush with the armrest, it will over center the door latch, and that secures the door for flight. The cabin door latch assembly also incorporates a locking arm and locking pin, used with a key lock to secure the aircraft after use. With the cabin door closed, and the exterior latch handle flush, actuation of the key lock drives the locking pin into the exterior latch handle. This locks the aircraft. It is important to note that since the cabin door latch assembly and the interior handle face plate assembly are directly connected by the push rod assembly, any amount of force applied to the outside handle is subsequently applied to the inside handle. If the push rod assembly is not correctly adjusted and you apply too much force to the exterior handle when you close the cabin door, you can lock yourself out of the airplane. Therefore, it is important to adhere to all of the rigging and adjustment specifications pertaining to the preload forces of the interior door handle. Refer to the rigging and adjusting procedures in the paragraphs that follow.

C. An optional Medeco lock is installed on the cabin door in some airplanes.

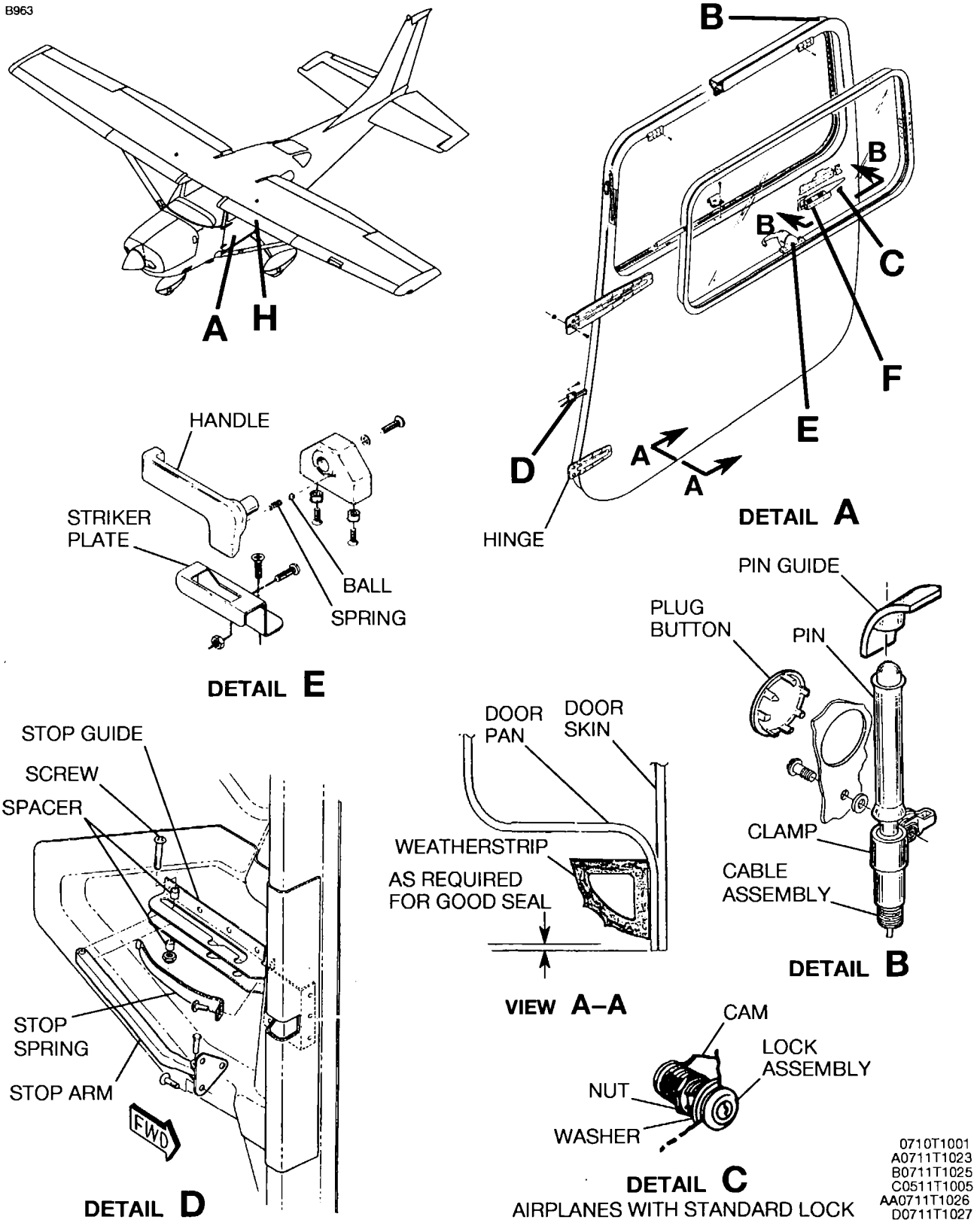
2. Cabin Door Removal/Installation

A. Cabin Door Removal (Refer to Figure 201).
   (1) Open the cabin door.
   (2) Remove the nut, screw, and spacers from the stop arm.
   (3) Remove the screws and nuts that attach the hinges to the fuselage.
   (4) Remove the cabin door from the airplane.

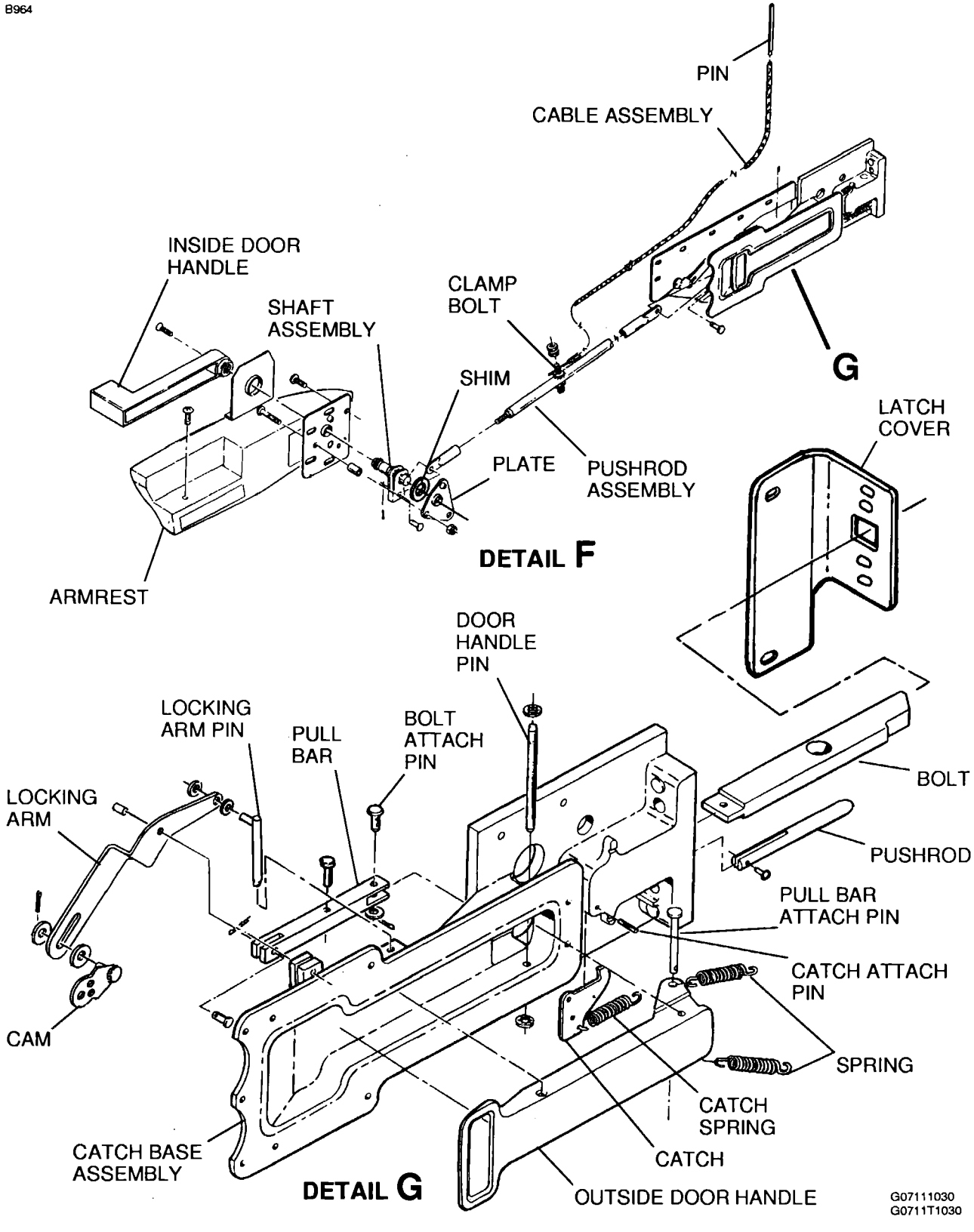
B. Cabin Door Installation (Refer to Figure 201).
   (1) Put the cabin door hinges in position and attach the door with the screws and nuts.
   (2) Install the screw, spacers, and nut on the stop arm.
   (3) Close and latch the cabin door. Check that the door is correctly adjusted. Refer to Cabin Door Adjustment/Test.

3. Cabin Door Weatherstrip Removal/Installation

A. Cabin Door Weatherstrip Removal (Refer to Figure 201).
   (1) Use a nonmetallic scraper to remove the weatherstrip and adhesive from the door assembly.

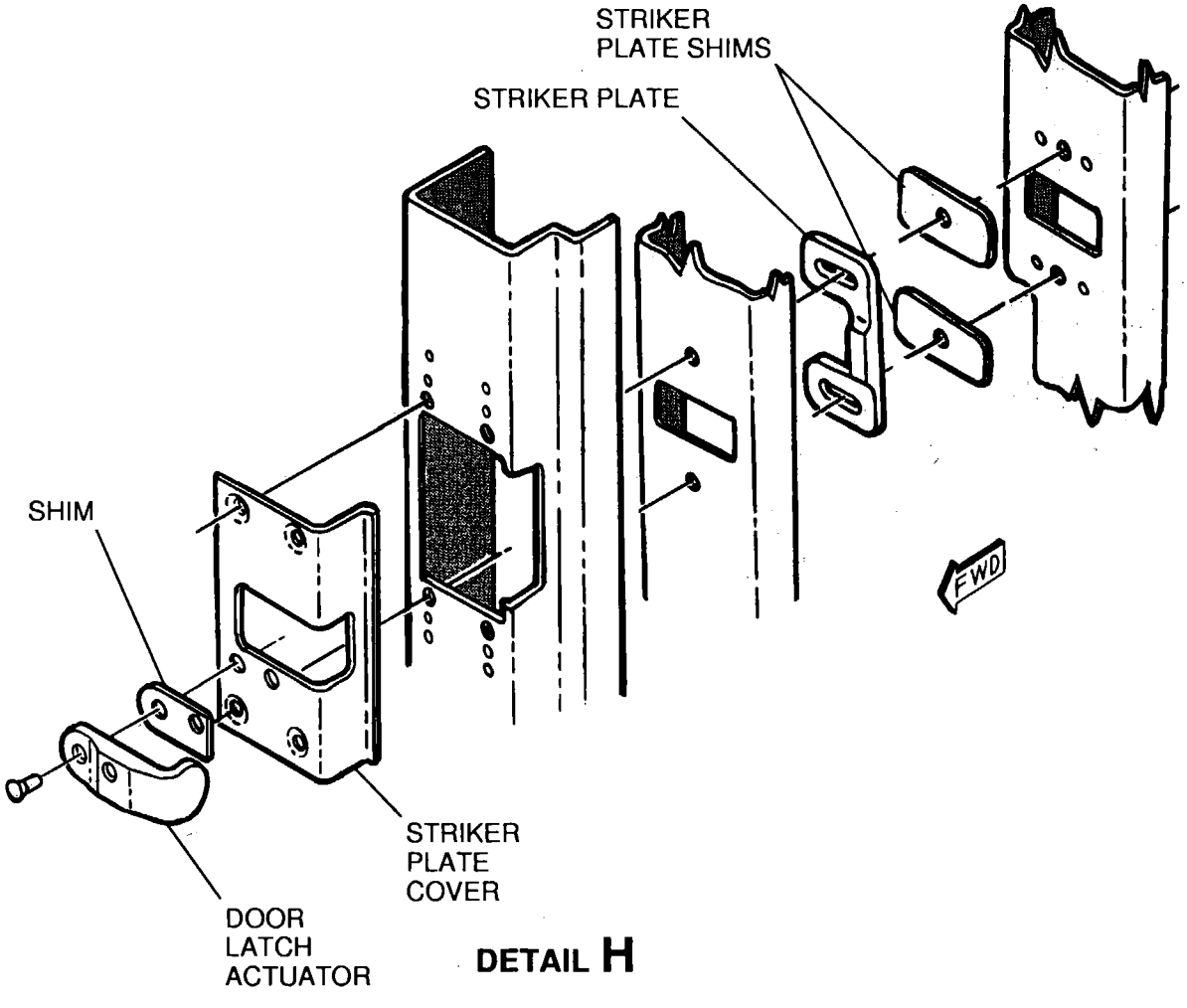


Cabin Door Installation
Figure 201 (Sheet 1)



Cabin Door Installation
Figure 201 (Sheet 2)

B965



DETAIL H

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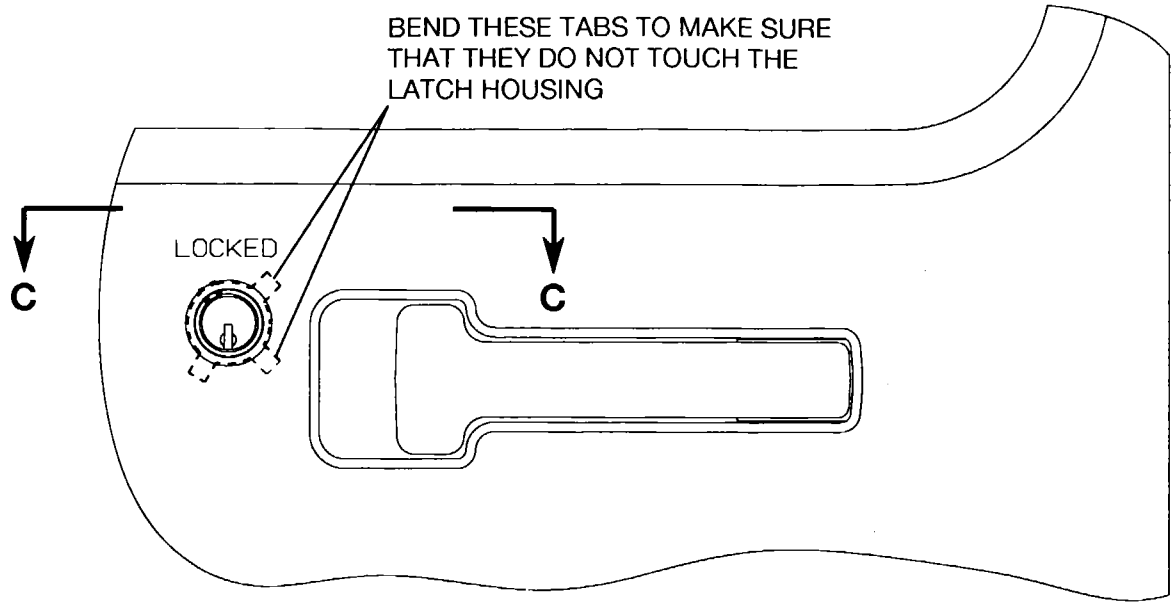
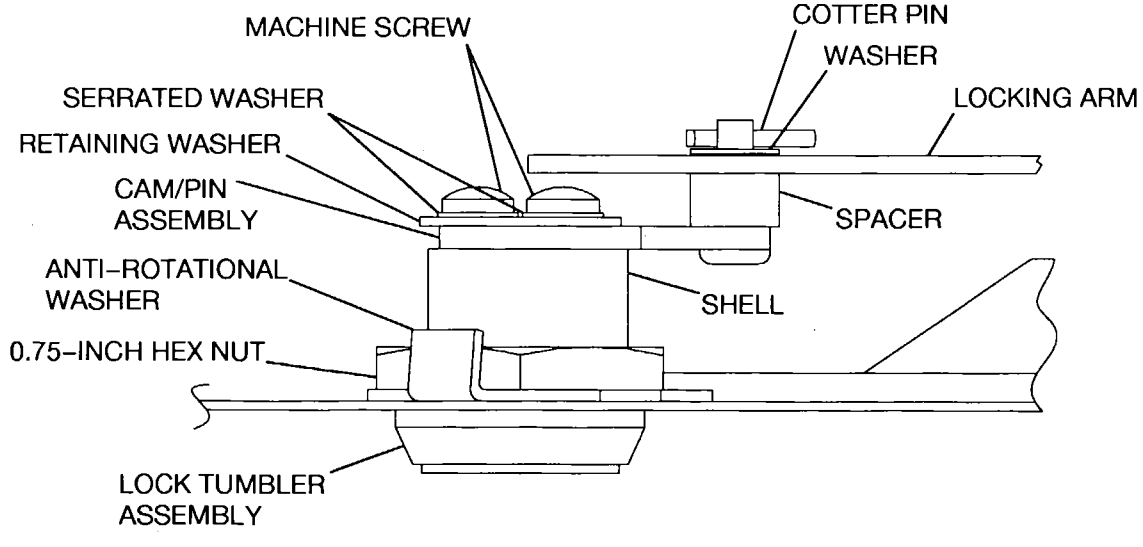
Cabin Door Installation
Figure 201 (Sheet 3)

B6023



VIEW B–B
AIRPLANES WITH MEDECO LOCK



VIEW C–C
LOCK SHOWN IN UNLOCKED POSITION

BB1211T1038
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Cabin Door Installation
Figure 201 (Sheet 4)

(2) Use solvent to remove all remaining adhesive from the door surface.

B. Cabin Door Weatherstrip Installation (Refer to Figure 201).
(1) Cut the new weatherstrip to the correct length with the used weatherstrip as a template.
(2) Cut a small notch in the butt ends of the new weatherstrip to let water drain.
(3) Put the weatherstrip in position with the notches at the low point of the door.
(4) Apply a thin, smooth layer of EC-1300L or equivalent adhesive to the two surfaces.
(5) Let the adhesive dry until it is tacky.
(6) Push the weatherstrip in position.
(7) Do not stretch the weatherstrip around the door corners.

4. Cabin Door Latch Lock Removal/Installation

A. Cabin Door Latch Lock Removal (Refer to Figure 201).
(1) Remove the cam from the latching side of the locking arm.
(2) Remove the washers between the cam and the locking arm.
(3) Remove the locking arm pin from the locking arm and the catch base assembly.

B. Cabin Door Latch Lock Installation (Refer to Figure 201).
(1) Assemble the locking arm with the locking arm pin.
(a) Put one washer on each side of the locking arm.
(b) Swage the locking arm pin until there is minimum movement between the parts.
(c) Cut the unwanted material from the pin.
(2) Put the locking arm pin into the 0.125 inch (3.2 mm) diameter hole at the catch base assembly.
(3) Align the hole in the locking arm with the hole in the latch base assembly and install the pin.
(4) Put three washers between the cam and the locking arm.
(5) Attach the cam to the latch side of the locking arm.

5. Cabin Door Latch Assembly Removal/Installation

A. Cabin Door Latch Assembly Removal (Refer to Figure 201).
(1) Remove the cabin door lock assembly. Refer to Cabin Door Lock Assembly Removal/ Installation.
(2) Remove the rivets that attach the latch base to the door skin.
(3) Remove the screws that attach the latch to the door pan.
(4) Remove the pushrod and bolt.
(5) Pull the latch handle through the cutout in the door skin.
(6) Remove the latch assembly from the airplane.

B. Cabin Door Latch Assembly Installation (Refer to Figure 201).
(1) Put the latch assembly in the closed position between the door pan and the door skin.
(2) Make sure the cable assembly is forward of the latch base attach plate and inboard of the latch base cup.
(3) Extend the latch handle through the cutout in the door skin.
(4) Push the latch assembly aft until the bolt and pushrod extend through their related holes.
(5) Release the pushrod until the bolt is fully extended and the handle is flush.
(6) Attach the latch to the door pan with the screws through the base assembly and through the aft flange of the door pan.
(7) Make sure the door skin dimension around the latch assembly is correct.

CAUTION: Do not make the holes oversize in the latch base.

(8) Drill eleven 0.128 inch (3.25 mm) diameter holes that align with the latch base.
(9) Make sure that the door skin fits correctly around the latch assembly, and then drill eleven 0.128 inch diameter holes to align with the latch base.

NOTE: Do not oversize holes in the latch base and do not rivet the base to the skin at this time.

(10) Make sure that you do the cabin door latch cable assembly rigging and the cabin door inside handle rigging before you attach the latch base to the skin. Refer to the Cabin Door Latch Cable Assembly Adjustment/Test and the Cabin Door Inside Handle Rigging.
(11) Attach the latch base to the door skin with the rivets.
(12) Install the cabin door lock assembly. Refer to the Cabin Door Lock Assembly Removal/ Installation.

6. Cabin Door Latch Cable Assembly Removal/Installation

A. Cabin Door Latch Cable Assembly Removal (Refer to Figure 201).
(1) Remove the screw and the clamp that attach the cable assembly to the door.
(2) Remove the plug button.
(3) Remove the pin from the pin guide.
(4) Pull the pin end of the cable from the top of the door.
(5) Remove the nut and clamp from the opposite end of the cable casing.
(6) Remove the cable assembly from the door.

B. Cabin Door Latch Cable Assembly Installation (Refer to Figure 201).
(1) Attach the clamp and the nut one inch (25 mm) from the end of the cable casing on the pin end of the cable assembly.
(2) Put the pin end of the cable between the door pan and the door skin at the aft end of the door.
(3) Push the pin end of the cable to the top of the door.
(4) Remove the plug button and align the pin of the cable with the pin guide.
(5) Put the pin through the pin guide.
(6) Align the clamp on the cable casing through the hole that is below the 0.875 inch (22.22 mm) access hole.
(7) Install the screw.
(8) Make sure the cable operates freely.
(a) Add washers as necessary if the cable does not operate freely.
(9) Do the cabin door latch cable assembly rigging. Refer to the Cabin Door Latch Cable Assembly Rigging.

7. Cabin Door Lock Assembly Removal/Installation (on airplanes with standard locks)

A. Cabin Door Lock Assembly Removal (Refer to Figure 201).
(1) Remove the lower door accent panel and main door panel to get access to the cabin door lock assembly. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(2) Remove the armrest door plugs, door panel insert at armrest, door handle, and cover plate from the door to get access to the cabin door lock assembly.
(3) Remove the nut and washer.
(4) Remove the cabin door lock assembly.

B. Cabin Door Lock Assembly Installation (Refer to Figure 201).
(1) Put the cabin door lock assembly in position.
(2) Install the washer and nut.
(3) Install the armrest door plugs, door panel insert at armrest, door handle and cover plate.
(4) Install the lower door accent panel and main door panel. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

8. Cabin Door Lock Assembly Removal/Installation (on airplanes with Medeco locks)

A. Cabin Door Lock Assembly Removal (Refer to Figure 201).
(1) Remove the lower door accent panel and main door panel to get access to the cabin door lock assembly. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(2) Remove the armrest door plugs, door panel insert, armrest, door handle, and cover plate from the door to get access to the cabin door lock assembly.
(3) Remove the cotter pin, washer, locking arm, and spacer from the lock assembly.
(4) Remove the hex nut and the anti-rotational washer that attach the lock tumbler assembly to the door structure and the cam assembly.
(5) Remove the lock assembly from the door.

B. Cabin Door Lock Assembly Installation (Refer to Figure 201).
(1) Put the cabin door lock assembly in position on the cabin door.
(2) Install the hex nut and the anti-rotational washer that attach the lock tumbler assembly to the door structure and the cam assembly. Install the anti-rotational washer under the hex nut.
(3) Torque the nut.
(4) Bend the applicable tab on the anti-rotation washer against the flat part of the nut.
(5) Install the spacer, locking arm, washer, and cotter pin that connect the lock assembly to the door handle.
(6) Bend the applicable tabs on the cam-pin assembly to make sure that they do not touch the latch housing.
(7) Install the armrest door plugs, door panel insert, armrest, door handle, and cover plate.
(8) Install the lower door accent panel and main door panel. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

9. Cabin Door Lock Cam Assembly Removal/Installation (on airplanes with standard locks)

A. Cabin Door Lock Cam Assembly Removal Refer to Figure 201).
(1) Remove the lower door accent panel and main door panel to get access to the cabin door lock cam assembly. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(2) Remove the armrest door plugs, door panel insert at armrest, door handle, and cover plate from the door to get access to the cabin door lock cam assembly.
(3) Remove the cam stop screw from the cabin door lock cam assembly.
(4) Remove the cam assembly.

B. Cabin Door Lock Cam Assembly Installation (Refer to Figure 201.).
(1) Put the cam assembly in position.
(2) Install the cam stop screw with Loctite 242.
(3) Install the armrest door plugs, door panel insert at armrest, door handle, and cover plate.
(4) Install the lower door accent panel and main door panel. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

10. Cabin Door Lock Cam Assembly Removal/Installation (on airplanes with Medeco locks)

A. Cabin Door Lock Cam Assembly Removal (Refer to Figure 201).
(1) Remove the lower door accent panel and main door panel to get access to the cabin door lock cam assembly. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(2) Remove the armrest door plugs, door panel insert, armrest, door handle, and cover plate from the door to get access to the cabin door lock cam assembly.
(3) Remove the machine screws, serrated washers, and retaining washer from the cabin door lock cam assembly.
(4) Remove the cam assembly.

B. Cabin Door Lock Cam Assembly Installation (Refer to Figure 201).
(1) Put the cam assembly in position.
(2) Install the machine screws, serrated washers, and retaining washer that attach the cam assembly to the cabin door lock. Install the machine screws with Loctite 242.
(3) Install the armrest door plugs, door panel insert, armrest, door handle, and cover plate.
(4) Install the lower door accent panel and the main door panel. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

11. Cabin Door Adjustment/Test

A. Adjust the new cabin doors.

CAUTION: Do not adjust the bonded door flange or the airplane structure with force. Damage to the bonded areas and the structural components can occur.

(1) Trim the door flange as necessary to get a gap between the door skin and the fuselage skin of 0.09 inch (2.3 mm) or less.

B. Adjust the cabin doors.

NOTE: The cabin doors must be smooth with the fuselage skin.

(1) Use the slots at the door latch plate to adjust the latch assembly and the bolt engagement with the rotary clutch on the door post.

12. Cabin Door Latch Cable Assembly Adjustment/Test

A. Do the Cabin Door Latch Cable Assembly Rigging (Refer to Figure 201).
(1) Pull the cable tight.
(2) Attach the clamp and the nut to the cable so it aligns with the 0.193-inch (4.9 mm) diameter hole in the door pan.
(3) Make sure the door latch is open.
(4) Cut the casing of the cable assembly approximately two inches (50 mm) from the clamp bolt on the push rod assembly.
(5) Put the core of the cable through the clamp.
(6) Pull the core of the cable through the clamp bolt until the pin extends approximately 0.125 inch (3.2 mm) from the door pan contour.
(7) Cut the core of the cable approximately one inch (25 mm) forward of the push rod clamp.
(8) Attach the two nuts to the push rod clamp bolt.
(9) Make sure the latch operates freely.
(a) Remove the cable core from the clamp and operate the latch if the latch binds and will not operate freely.
(b) Do a check of the cable for possible adjustments that will make the operation easier.
(10) Install the cover assembly and do another check of the cable operation.

13. Cabin Door Inside Handle Adjustment/Test

A. Do the Cabin Door Inside Handle Rigging (Refer to Figure 201).
(1) With the latch secured to the door pan, attach the push rod assembly to the pull bar and secure with the pin.

NOTE: Do not install a cotter pin.

(2) Make sure that the latch is in the closed position.
(3) Remove the pin that connects the push pull rod to the latch base assembly to rotate the rod in or out for adjustment. Adjust the rod until it takes a load of 6 to 12 pounds at the end of the inner handle to move it from the closed position to the over center position.

NOTE: The rod must be attached to the latch assembly before the rigging can be accomplished.

(4) For fine adjustment of the over centering latch assembly, proceed as follows:
(a) Make sure that the cabin door is installed and completely fitted to the fuselage.
(b) Make sure that the cabin door latch is in the OPEN position. Make sure that the latch operates smoothly and freely.

(c) Install the shims as necessary for a minimal clearance between the pull bar and the striker plate.

NOTE: This adjustment will make sure that when the door is opened from the outside, the push rod will engage the latch catch, and the exterior handle will stay open until the door is closed again.

NOTE: If the cabin door is too far forward and the door latch will not operate, the latch assembly push rod cannot ride up on the actuator and trigger the pull bar. Install shims as necessary below the actuator, which is on the cover assembly.

(d) Close the cabin door from inside the airplane. When the latch is over centered, the exterior handle should pull flush. If it does not, the connecting push pull rod from the door latch to the inside handle assembly should be adjusted out.

NOTE: When you make this adjustment on the over centering of the latch, there can be a sharp, loud canning noise when the inside handle is pushed down. It is preferred that the outside door handle be flush, even if the canning noise is noticeable.

(e) When you adjust the push pull rod, it possibly can need to be adjusted only one-half turn. To accomplish this, remove the base plate.
(f) To make the one-half turn adjustment, remove the smaller end of the push pull rod and turn it over. Then reinstall the base plate assembly.
(g) When you close the cabin door from the outside, with a large, sharp force on the outside handle, it is possible to over center the inside handle and inadvertently lock the door. To prevent this, adjust the push pull rod until there is sufficient force against the inside handle to prevent it from over centering when you close the door from the outside.
(h) Do not file, grind, or sand any portion of the pull bar.
(i) Check the clamps that secure the cable again. There must not be any slippage between the cable casing and the clamp.
(j) After the over center adjustment has been made, install the cotter pin in the clevis pin.

(5) Rivet the latch base to the door skin with rivets.
(6) Attach the lock assembly casing to the door skin with the nut.
(7) Install the tumblers and attach the cam to the tumblers with the attaching hardware.
(8) Operate the lock several times to make sure that all the components function correctly.

CARGO DOORS - MAINTENANCE PRACTICES

1. General

A. The 206 and T206 aircraft have two cargo doors on the right side of the fuselage. The aft door is hinged at fuselage station 112 and is a structural, load-carrying member when closed and locked. The aft door handle is in the forward edge of the door and is inaccessible with the forward door closed. This prevents inadvertent opening during flight. As the rear door handle is moved into the CLOSED position, hooks engage the latch plates on the upper and the lower door sills that hold the door tightly closed. Telescoping door stops, with detent positions, are used to hold the doors open. An entrance step is found on the fuselage, below the front cargo door.

NOTE: A flap interrupt switch is installed to prevent the operation of the flaps with the cargo doors open. The switch is adjusted through the slotted holes on the forward cargo door frame.

2. Cargo Door Removal/Installation

A. Cargo Door Removal (Refer to Figure 201).
(1) Open the cargo door.
(2) Disconnect the doorstop chain.
(3) Remove the cotter pins and remove the pins that attach the door.

B. Cargo Door Installation (Refer to Figure 201).
(1) Put the door in position and attach to the hinges with the pins and the cotter pins.
(2) Connect the door stop.
(3) Close the door and do a check for smooth operation.

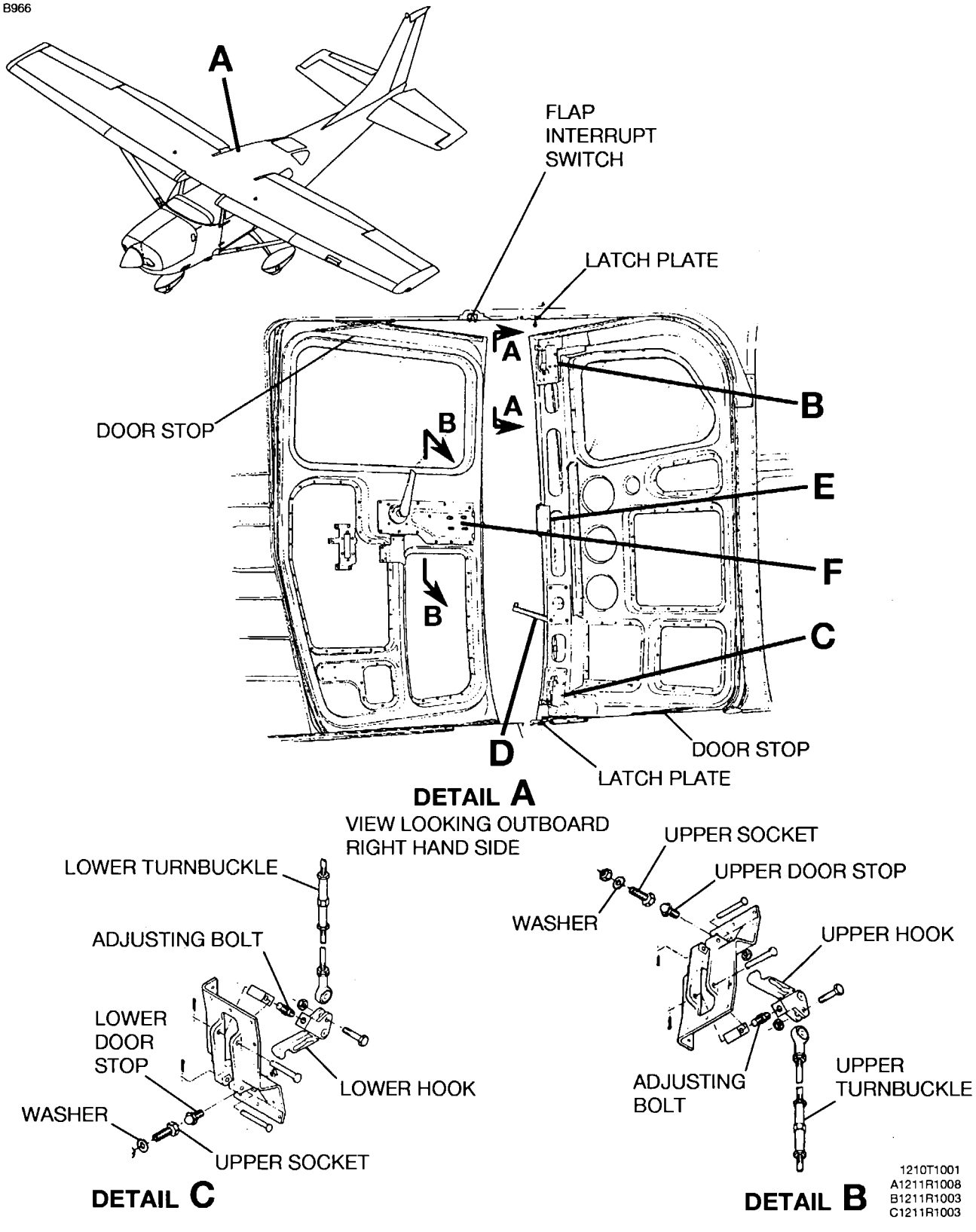
3. Forward Cargo Door Latch Assembly Removal/Installation

A. Cargo Door Latch Assembly Removal (Refer to Figure 202).
(1) Remove the clip, inside door handle, and washer.
(2) Remove the door upholstery panel. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(3) Remove the spring.
(4) Remove the screws that attach the door latch assembly and remove the door latch assembly.

B. Cargo Door Latch Assembly Installation. (Refer to Figure 202).
(1) Put the door latch assembly in position in the door and install the screws.
(2) Install the spring.
(3) Install the door upholstery panel. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(4) Install the washer, inside door handle, and clip.

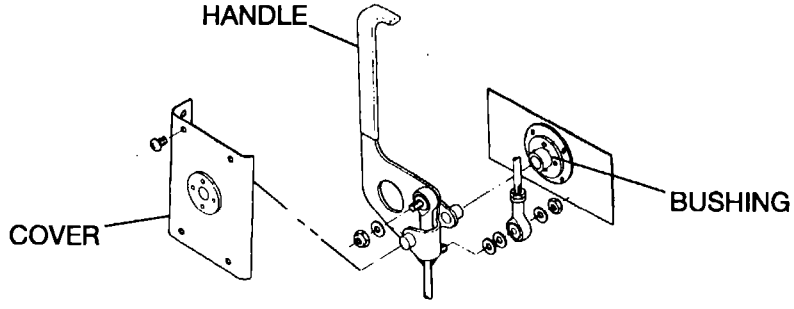
4. Cargo Door Latching Assembly

A. Do the Rigging of the Cargo Latching Assembly (Refer to Figure 201).
(1) The upper hook and the lower hook must fully engage the latch plate, but must clear the plates by 0.05 inch as the door is opened.
(2) The upper and the lower pins must fully engage the upper and the lower sockets when the door is locked.
(3) The door must be flush with the fuselage skin when the door is locked. If there are air leaks around the door seal, you can adjust the door to a small amount less than flush.
(4) To get the correct hook clearance as the door is opened, adjust the adjusting bolts to engage the hooks.
(5) Move the latch plates as necessary to get a full load-carrying pin engagement.
(6) Add or delete washers under the upper and the lower sockets to make the door flush with the fuselage skin.

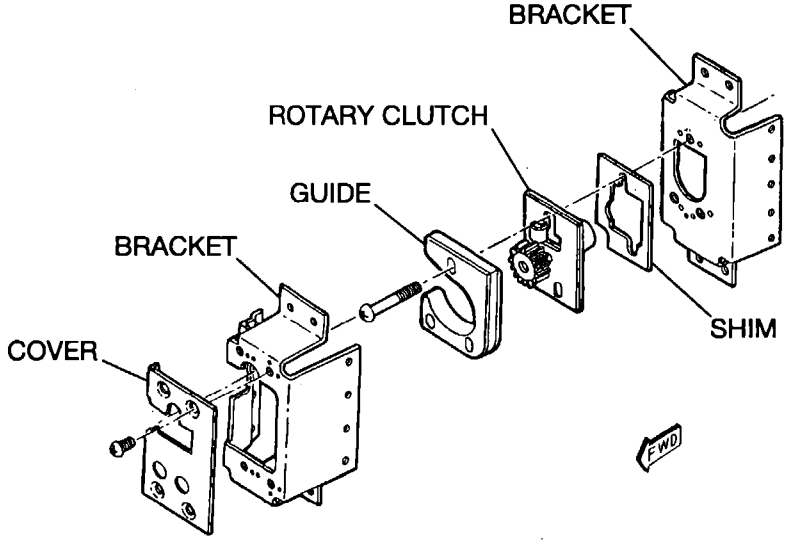


Cargo Door Installation
Figure 201 (Sheet 1)

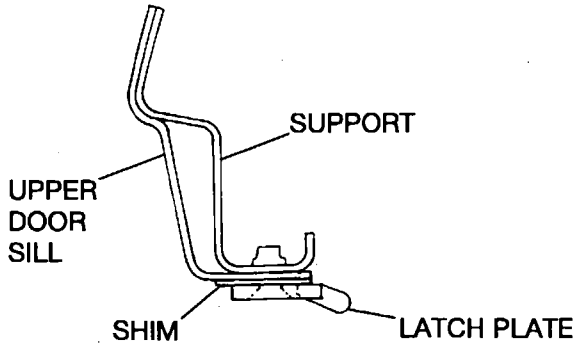
B3970



DETAIL D



DETAIL E



VIEW A-A

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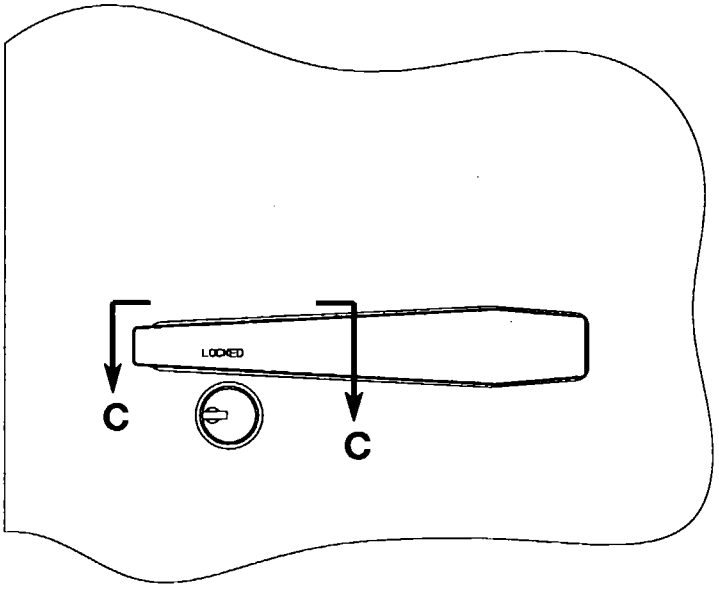
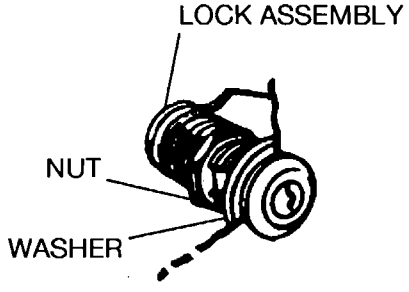
E1211R1007
AA1211R1005

Cargo Door Installation
Figure 201 (Sheet 2)

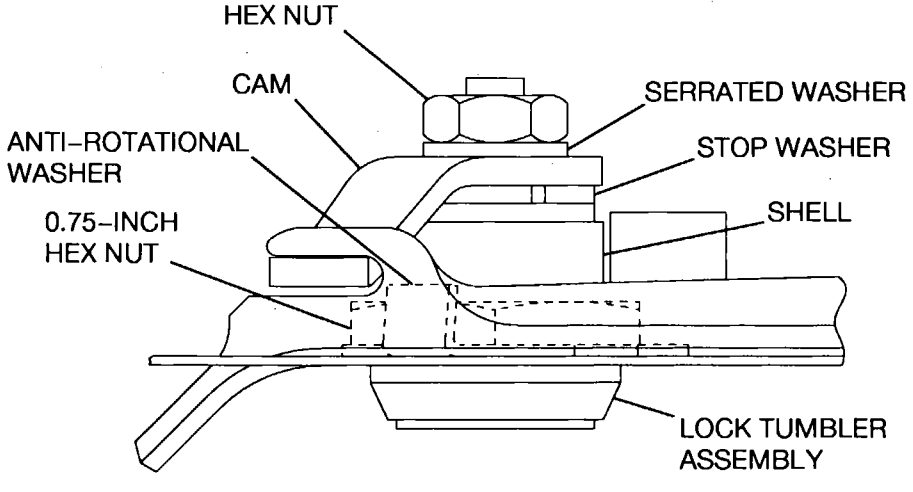
B6021



VIEW B–B
AIRPLANES WITH MEDECO LOCK
VIEW LOOKING INBOARD



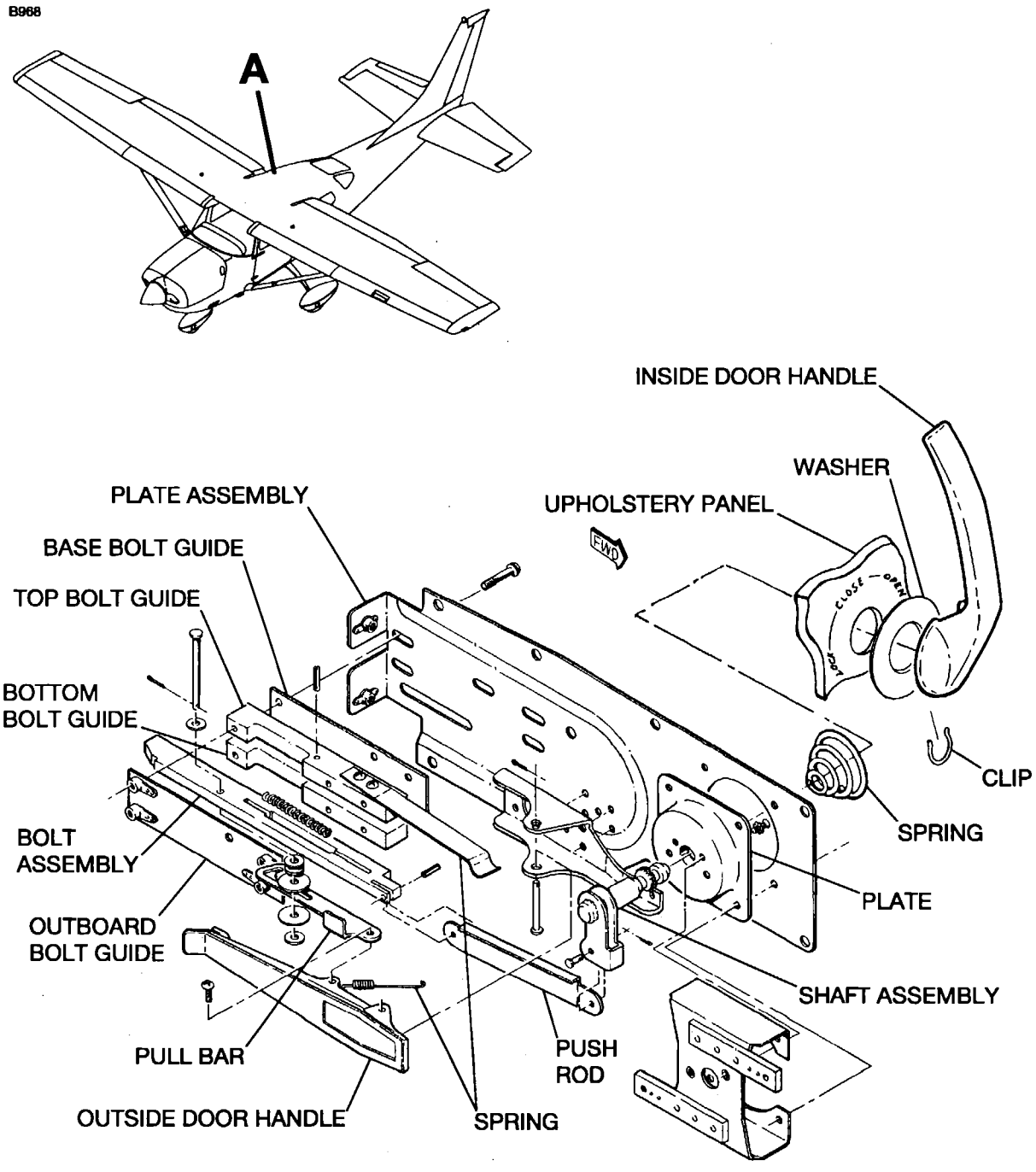
DETAIL F
AIRPLANES WITH
STANDARD LOCK



VIEW C-C

F0511R1005
BB1211T1037
CC1211T1037

Cargo Door Installation
Figure 201 (Sheet 3)



DETAIL A

1210T1001
A1211R1006

Cargo Door Latch Installation
Figure 202 (Sheet 1)

(7) Adjust the upper and the lower turnbuckles to pull the door tightly closed. The handle should snap over center tightly, but should not require too much force.

NOTE: Refer to Figure 202. The outside door handle on the forward cargo door can be used to close and lock the forward cargo door. Lift the handle out of the recess and grasp the vertical tab of the pull bar behind the handle. Pull the vertical tab outboard until the pull bar engages detent at its aft end. Then push the handle back into the recess while you look inside the handle as it turns toward the locked position. It will not turn fully forward.

CAUTION: If cargo door is closed and locked from the outside, the inside door handle must be turned fully forward to disengage the outside locking mechanism, and allow the door to be unlocked and opened from the inside.

5. Cargo Door Weatherstrip Removal/Installation

A. Cargo Door Weatherstrip Removal (Refer to Figure 201).
(1) Remove the cargo door.
(2) With a nonmetallic scraper, remove the seal and adhesive from the cargo door.
(3) Remove the adhesive residue and clean the door seal area with DeSoclean 110 Solvent.
(4) Install the cargo door.

B. Cargo Door Weatherstrip Installation (Refer to Figure 201).
(1) With the old seal or the door seal area of the cargo door as a guide, measure and cut the new seal to length.
(2) Apply a thin, even coat of EC1300L Adhesive around the circumference of the door seal area of the cargo door.
(3) Make sure that you do not stretch the seal around the corners of the door.
(4) Press the new seal into the adhesive. Allow the adhesive to cure in accordance with the manufacturer's instructions, and make sure that the seal is completely adhered to the door with no gaps between the seal and the door.

6. Cargo Door Weatherstrip Inspection

A. Do an Inspection of the Cargo Door Weatherstrip.
(1) Put a 4-inch by 11-inch piece of paper between the cargo door frame and the cargo door. Close the cargo door. Slowly pull on the paper to make sure there is seal tension. Move the paper around the perimeter of the door to test the door seal tension.
(2) Remove the paper from the door frame. Make sure that the cargo door is closed. Pour a gallon of water over the door and tailcone door frame. After the water no longer drips, open the door and do an inspection for leaks.
(3) If a leak is found, towel dry the upholstery with a clean, dry towel. Install the weatherstrip again as necessary to make sure that there are no leaks around the seal area of the cargo door.

7. Cargo Door Lock Assembly Removal/Installation (On Airplanes with Standard Locks)

A. Cargo Door Lock Assembly Removal (Refer to Figure 201).
(1) Remove the cargo door panel to get access to the cargo door lock assembly. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(2) Remove the nut and washer.
(3) Remove the cabin door lock assembly.

B. Cabin Door Lock Assembly Installation (Refer to Figure 201).
(1) Put the cabin door lock assembly in position.
(2) Install the washer and nut.
(3) Install the cargo door panel to the cargo door. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

8. Cargo Door Lock Assembly Removal/Installation (On Airplanes with Medeco Lock)

A. Cargo Door Lock Assembly Removal (Refer to Figure 201).
(1) Remove the cargo door panel to get access to the cargo door lock assembly. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(2) Remove the 0.75-inch hex nut and the anti-rotational washer that attach the lock tumbler assembly to the door structure and the cam assembly.
(3) Remove the lock assembly from the door.

B. Cargo Door Lock Assembly Installation (Refer to Figure 201).
(1) Put the cargo door lock assembly in position on the cargo door.
(2) Install the 0.75-inch hex nut and the anti-rotational washer that attach the lock tumbler assembly to the door structure and the cam assembly. Make sure that the anti-rotational washer is installed under the 0.75-inch hex nut.
(3) Torque the nut.
(4) Bend the applicable tab on the anti-rotational washer against the flat part of the nut.
(5) Install the cargo door panel to the cargo door. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

9. Cabin Door Lock Cam Assembly Removal/Installation (On Airplanes with Standard Locks)

A. Cabin Door Lock Cam Assembly Removal (Refer to Figure 201).
(1) Remove the cargo door panel to get access to the cargo door lock assembly. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(2) Remove the cam stop screw from the cabin door lock cam assembly.
(3) Remove the cam assembly.

B. Cabin Door Lock Cam Assembly Installation (Refer to Figure 201).
(1) Put the cam assembly in position.
(2) Install the cam stop screw with Loctite 242.
(3) Install the cargo door panel to the cargo door. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

10. Cargo Door Lock Cam Assembly Removal/Installation (On Airplanes with Medeco Lock)

A. Cargo Door Lock Cam Assembly Removal (Refer to Figure 201).
(1) Remove the cargo door panel to get access to the cargo door lock assembly. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
(2) Remove the hex nut and the serrated washer that attach the cam assembly to the cargo door lock.
(3) Remove the cam assembly.

B. Cargo Door Lock Cam Assembly Installation (Refer to Figure 201).
(1) Put the cam assembly in position.
(2) Install the hex nut and the serrated washer that attach the cam assembly to the cargo door lock. Install the hex nut with Loctite 242.
(3) Install the cargo door panel to the cargo door. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

CHAPTER

55

STABILIZERS

LIST OF EFFECTIVE PAGES

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CONTENTS

STABILIZERS - GENERAL

1. Scope

A. This chapter provides maintenance information on the horizontal and vertical stabilizer fin.

2. Definition

A. The section on horizontal stabilizer provides instructions for removal and installation of the horizontal stabilizer.

B. The section on vertical stabilizer fin provides instructions for removal and installation on the vertical fin.

HORIZONTAL STABILIZER - MAINTENANCE PRACTICES

1. General

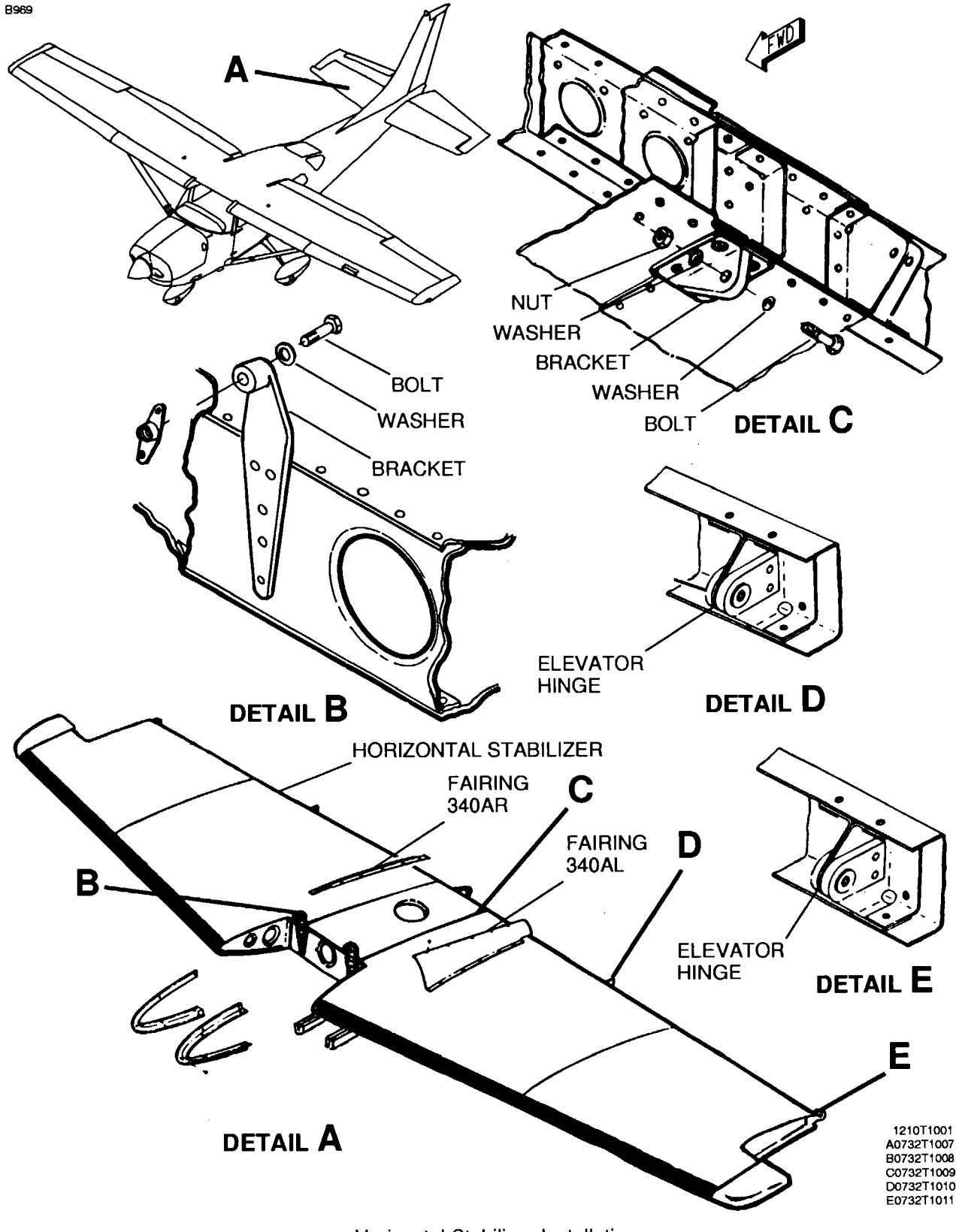
A. The horizontal stabilizer is of metal construction, consisting of ribs and spars covered with skin. A formed metal leading edge is riveted to the assembly to complete the structure. The elevator trim tab actuator is contained within the horizontal stabilizer. The underside of the stabilizer contains a covered opening which provides access to the actuator. Hinges are located on the rear spar assembly to support the elevators.

B. This section provides removal and installation instructions for the horizontal stabilizer.

2. Horizontal Stabilizer Removal/Installation

A. Remove Horizontal Stabilizer (Refer to Figure 201).
(1) Remove upper fairings (340AL and 340AR) and tailcone stinger (310BB). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(2) Remove elevators. Refer to Chapter 27, Elevator Control System - Maintenance Practices.
(3) Remove rudder. Refer to Chapter 27, Rudder Control System - Maintenance Practices.
(4) Remove vertical stabilizer fin. Refer to Vertical Stabilizer Fin - Maintenance Practices.
(5) Disconnect elevator trim control cables at clevis and turnbuckle inside tailcone.
(6) Remove pulleys which route the aft cables into horizontal stabilizer, and pull cables out of tailcone. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices.
(7) Remove bolts securing horizontal stabilizer to fuselage.
(8) Remove horizontal stabilizer.

B. Install Horizontal Stabilizer (Refer to Figure 201).
(1) Install horizontal stabilizer to fuselage using bolts.
(2) Reroute cables into tailcone and install pulleys.
(3) Reconnect elevator trim control cables at clevis and turnbuckle inside tailcone.
(4) Install vertical stabilizer fin. Refer to Chapter 27, Vertical Stabilizer Fin - Maintenance Practices.
(5) Install rudder. Refer to Chapter 27, Rudder Control System - Maintenance Practices.
(6) Install elevators. Refer to Chapter 27, Elevator Control System - Maintenance Practices.
(7) Rig elevator. Refer to Chapter 27, Elevator Control System - Maintenance Practices.
(8) Rig rudder. Refer to Chapter 27, Rudder Control System - Maintenance Practices.
(9) Rig elevator trim. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices.
(10) Install upper fairings and tailcone stinger.



Horizontal Stabilizer Installation
Figure 201 (Sheet 1)

VERTICAL STABILIZER FIN - MAINTENANCE PRACTICES

1. General

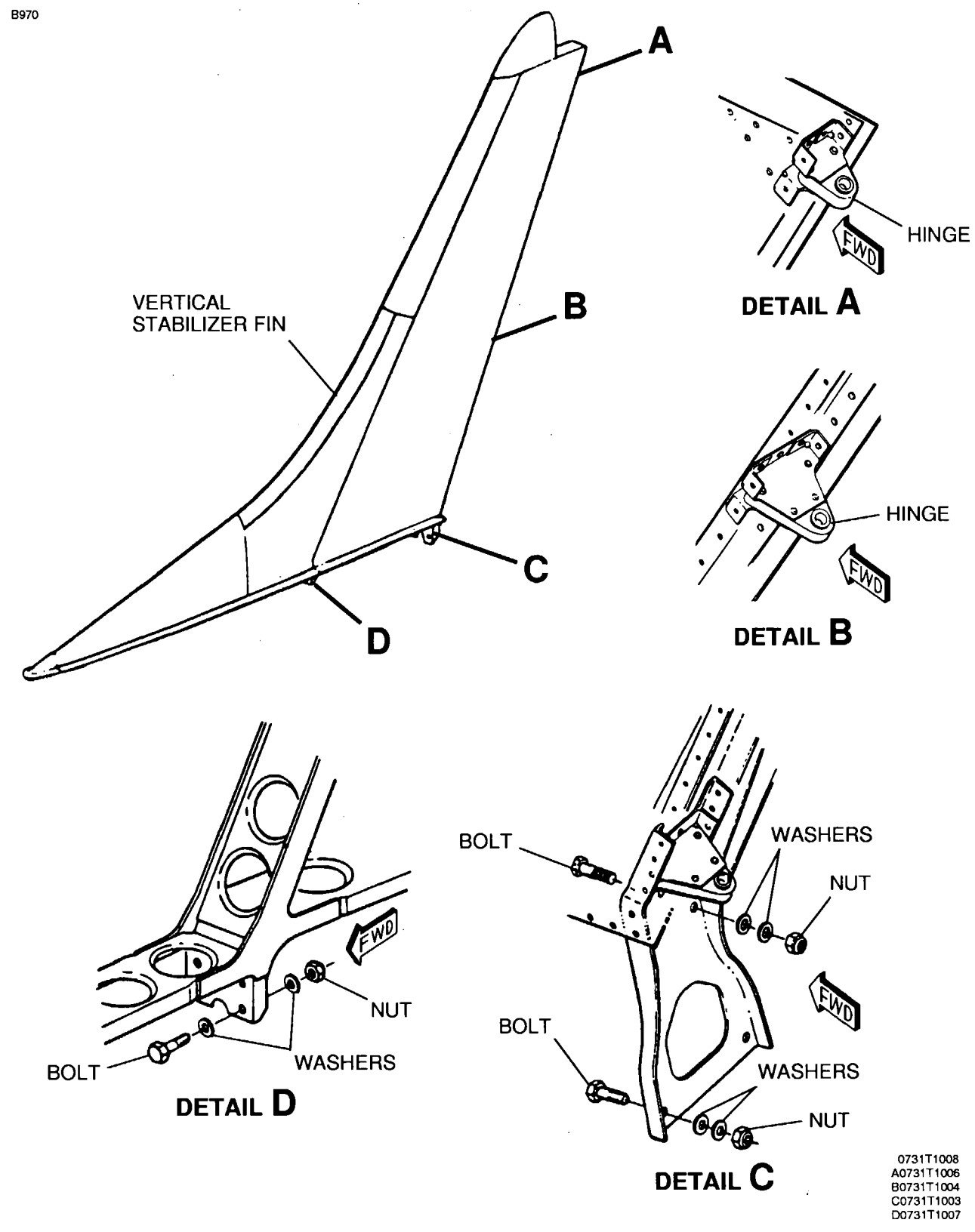
A. The vertical stabilizer fin is of metal construction, consisting of ribs and spars covered with aluminum skin. The trailing edge of the fin contains three hinges used to attach the rudder.

B. Maintenance practices consist of removal and installation of the vertical fin.

2. Vertical Stabilizer Fin Removal/Installation

A. Remove Vertical Stabilizer Fin (Refer to Figure 201).
(1) Remove rudder. Refer to Chapter 27, Rudder Control System - Maintenance Practices.
(2) Remove upper fairings (340AL and 340AR) and tailcone stinger (310BB). Refer to Chapter 6, Access/Inspection Plates - Description and Operation.
(3) Disconnect all electrical and navigation leads from base of fin area.
(4) Remove screws attaching dorsal to fin.
(5) Disconnect elevator cable from elevator bellcrank.
(6) Remove bolts attaching fin rear spar to fuselage fitting.
(7) Remove upper elevator stop bolts.
(8) Remove bolts attaching fin front spar to fuselage bulkhead and remove fin from fuselage.

B. Install Vertical Stabilizer Fin (Refer to Figure 201).
(1) Place fin on fuselage and secure front spar of fin to fuselage. Torque bolts 70 inch-pounds to 100 inch pounds.
(2) Install upper elevator stop bolts.
(3) Attach fin rear spar to fuselage fitting using bolts. Torque bolts 140 inch-pounds to 225 inch-pounds.
(4) Connect elevator cable to elevator bellcrank. Refer to Chapter 27, Elevator Control System - Maintenance Practices.
(5) Secure dorsal to fin using screws.
(6) Reconnect all electrical and navigation leads.
(7) Install rudder. Refer to Chapter 27, Rudder Control System - Maintenance Practices.
(8) Rig rudder. Refer to Chapter 27, Rudder Control System - Maintenance Practices.
(9) Rig Elevator. Refer to Chapter 27, Elevator Control System - Maintenance Practices.
(10) Install upper fairings and tailcone stinger.



Vertical Stabilizer Fin Installation
Figure 201 (Sheet 1)

CHAPTER 56

WINDOWS

LIST OF EFFECTIVE PAGES

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CONTENTS

WINDOWS - GENERAL

1. Scope

A. This chapter provides information on windows used throughout the airplane.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the following listed items:

NAME	NUMBER	MANUFACTURER	USE
Mild Soap or Detergent (hand dishwashing type without abrasives)		Commercially Available	To clean windshields and windows.
Aliphatic Naphtha	Type II Federal Specification TT-N-95	Commercially Available	To remove deposits from windshields and windows.
Novus	Number 1	Commercially Available	To clean acrylic windshields and windows.
Novus	Number 2	Commercially Available	To remove minor surface scratches in acrylic windshields and windows.
Novus	Number 3	Commercially Available	To remove heavy scratches and abrasions in acrylic windshields and windows.
Mirror Glaze	MGH-7	Meguiars Mirror Bright Polish 210 N First Ave. Arcadia, CA 91006	To clean and polish acrylic windshields and windows.
Soft cloth, such as, cotton flannel or cotton terry cloth		Commercially Available	To apply and remove wax and polish.
Windshield sealant tape	U000927S	Available from Cessna Parts Distribution Cessna Aircraft Company Department 701 5800 E. Pawnee Rd. Wichita, KS 67218-5590	To seal windshield.
Repcon rain repellent	6850-00-139-5297	Unelko Corporation 7428 East Karen Drive Scottsdale, Arizona 85260	To repel rain from windshield.
Wax	Paste type hard	Commercially Available	To wax windshield and windows.

3. Definition

A. This chapter is divided into sections and subsections to assist maintenance personnel in locating specific systems and information. The following is a brief description of each section. For locating information within the chapter, refer to the Table of Contents at the beginning of the chapter.

(1) The section on flight compartment windows provides maintenance instructions for repair and replacement of the windshield.

(2) The section on cabin windows provides maintenance instructions for the cabin side and cabin rear windows.

(3) The section on door windows provides maintenance instructions for openable windows located in the cabin doors.

WINDSHIELDS AND WINDOWS - DESCRIPTION AND OPERATION

1. General

A. This section provides instructions and tips for cleaning and installing windshields and windows used in the airplane.

B. The windshield and windows are single-piece, acrylic panels, set in sealing strips and held by formed retaining strips, secured to the fuselage with screws and rivets.

2. Tools, Equipment and Materials

A. For a list of required tools, equipment and materials, refer to Windows - General.

3. Cleaning Instructions

CAUTION: Windshields and windows (acrylic-faced) are easily damaged by improper handling and cleaning techniques.

CAUTION: Do not use methanol, denatured alcohol, gasoline, benzene, xylene, methyl n-propyl ketone, acetone, carbon tetrachloride, lacquer thinners, commercial or household window cleaning sprays on windshields or windows.

A. Instructions For Cleaning.
(1) Place airplane inside hangar or in shaded area and allow to cool from heat of suns direct rays.
(2) Using clean (preferably running) water, flood the surface. Use bare hands with no jewelry to feel and dislodge any dirt or abrasive materials.
(3) Using a mild soap or detergent (such as a dishwashing liquid) in water, wash the surface. Again, use only the bare hand to provide rubbing force. (A clean cloth may be used to transfer the soap solution to the surface, but extreme care must be exercised to prevent scratching the surface.)
(4) When contaminants on acrylic windshields and windows cannot be removed by a mild detergent, Type II aliphatic naphtha, applied with a soft clean cloth, may be used as a cleaning solvent. Be sure to frequently refold cloth to avoid redepositing contaminants and/or scratching windshield with abrasive particles.
(5) Rinse surface thoroughly with clean fresh water and dry with a clean cloth.
(6) Hard polishing wax should be applied to acrylic surfaces. (The wax has an index of refraction nearly the same as transparent acrylic and will tend to mask any shallow scratches on the windshield surface).
(7) Acrylic surfaces may be polished using a polish meeting Federal Specification P-P-560 applied per the manufacturers instructions.

NOTE: When applying and removing wax and polish, use a clean, soft cloth, such as cotton or cotton flannel.

4. Windshield and Window Preventive Maintenance

NOTE: Utilization of the following techniques will help minimize windshield and window crazing.

A. General Notes and Techniques For Acrylic Windshields.
(1) Keep all surfaces of windshields and windows clean.
(2) If desired, wax acrylic surfaces.
(3) Carefully cover all windshield and window surfaces during any painting, powerplant cleaning or other procedures that call for the use of any type of solvents or chemicals.
(4) Do not park or store airplane where it might be subjected to direct contact with or vapors from methanol, denatured alcohol, gasoline, benzene, xylene, Methyl Ppropyl Ketone, acetone, carbon tetrachloride, lacquer thinners, commercial or household window cleaning sprays, paint strippers, or other types of solvents.

(5) Do not leave sun visors up against windshield when not in use. The reflected heat from these items causes elevated temperatures on the windshield. If solar screens are installed on the inside of the airplane, make sure they are the silver appearing, reflective type.
(6) Do not use a power drill motor or other powered device to clean, polish, or wax surfaces.

5. Windshield and Window Installation Techniques

A. Installation Techniques.
(1) Special drills must be used when drilling holes in acrylic. Standard drills will cause the hole to be oversized, distorted, or excessively chipped.
(2) Whenever possible, a coolant such as a plastic drilling wax should be used to lubricate the drill bit.
(3) Drilled holes should be smooth with a finish of 125 rms (root mean square).
(4) The feed and speed of the drill is critical. Refer to Table 1 for thickness verses drill speed information.

Table 1. Material Thickness vs. Drill Speed

Thickness (inches)	Thickness (mm)	Drill Speed (RPM)
0.062 to 0.1875	1.57 to 4.76	1500 to 4500
0.250 to 0.375	6.35 to 9.52	1500 to 2000
0.4375	11.10	1000 to 1500
0.500	12.70	500 to 1000
0.750	19.05	500 to 800
1.00	25.4	500

(5) In addition to feed and speed of the drill bit, the tip configuration is of special importance when drilling through acrylic windows and windshields. Tip configuration varies with hole depth, and the following information applies when drilling through acrylic:
(a) Shallow Holes - When hole depth to hole diameter ratio is less than 1.5 to 1, the drill shall have an included tip angle of 55 degrees to 60 degrees and a lip clearance angle of 15 degrees to 20 degrees.
(b) Medium Deep Holes - When hole depth to hole diameter ratio is from 1.5 to 1 up to 3 to 1, the drill shall have an included tip angle of 60 degrees to 140 degrees and a lip clearance angle of 15 degrees to 20 degrees.
(c) Deep Holes - When hole depth to hole diameter ratio is greater than 3.0 to 1, the drill shall have an included tip angle of 140 degrees and a lip clearance of 12 degrees to 15 degrees.
(6) Parts which must have holes drilled shall be backed up with a drill fixture. Holes may be drilled through the part from one side. However, less chipping around holes will occur if holes are drilled by drilling the holes from both sides. This is accomplished by using a drill with an acrylic backup piece on the opposite side. Remove the drill from the hole and switch the backup plate and finish drilling from the opposite side.

6. Windshield Rain Repellent

A. Repcon is a rain repellent and surface conditioner that may be used to increase the natural beading of the windshield during rain. Apply in accordance with manufacturer's instructions.

WINDSHIELD - MAINTENANCE PRACTICES

1. General

A. This section provides instructions for removal and installation of the windshield as well as repair techniques applicable to acrylic windshields and windows.

2. Windshield Removal/Installation

A. Remove Windshield (Refer to Figure 201).
(1) Remove wing fairings.
(2) Remove magnetic compass. Refer to Chapter 34, Compass Installation - Maintenance Practices.
(3) Remove air vent tubes. Refer to Chapter 21, Fresh Air Distribution - Maintenance Practices.
(4) Drill out rivets securing front retainer strip.

CAUTION: If windshield is to be reinstalled, be sure to protect windshield during removal.

(5) Pull windshield straight forward, out of side and top retainers. Remove top retainer if necessary.
(6) Clean sealer from inner sidewalls and bottom of retainers.

B. Install Windshield (Refer to Figure 201).
(1) If windshield is to be reinstalled, clean off old sealer and felt, then install new felt around edges of windshield.
(2) If new windshield is to be installed, remove protective cover and clean.
(3) Apply new felt to edges of windshield.
(4) Apply windshield sealant tape along the sides and bottom of felt. Refer to Windows - General, for a list of sealant tape.
(5) Carefully position bottom edge of windshield into lower retainer.
(6) Starting at upper corner, gradually work windshield into position.

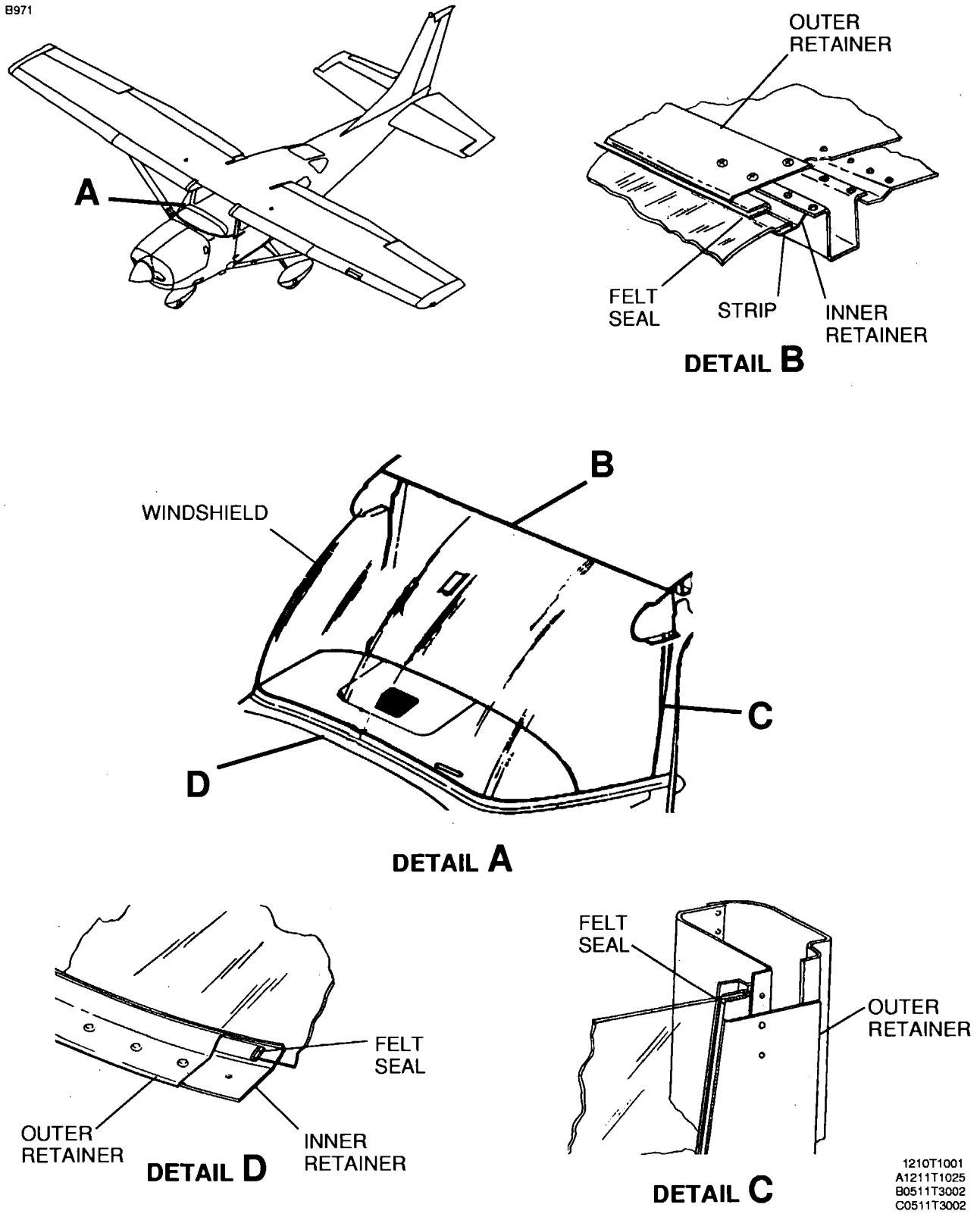
NOTE: Use care not to crack windshield when installing. If not previously removed, top retainer may be removed if necessary.

NOTE: Screws and self-locking nuts may be used instead of rivets which fasten front retaining strip to cowl deck. If at least No. 6 screws are used, no loss of strength will result.

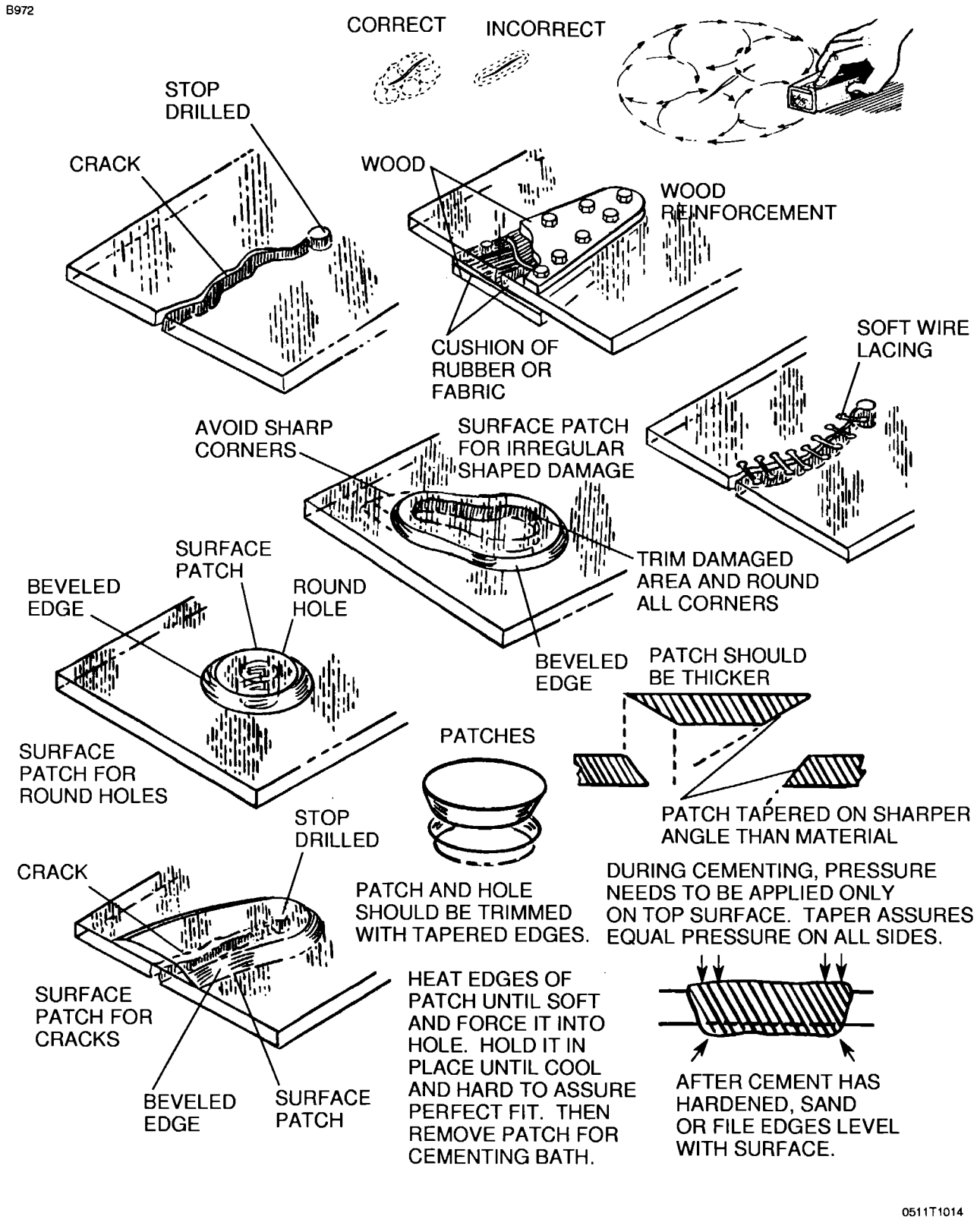
(7) Tighten or install windshield retainers as required.
(8) Install air vent tube. Refer to Chapter 21, Fresh Air Distribution - Maintenance Practices.
(9) Install magnetic compass. Refer to Chapter 34, Compass Installation - Maintenance Practices.
(10) Install wing fairings.

3. Temporary Repairs

A. Temporary repairs to windshields and windows can be accomplished using the following steps. Refer to Figure 202 for an illustration of repair techniques.
(1) When a crack appears, drill a hole at end of crack to prevent further spreading. Hole should be approximately 1/8 inch (3.2 mm) diameter, depending on length of crack and thickness of material.
(2) Temporary repairs to flat surfaces can be accomplished by placing a thin strip of wood over each side of the surface, and inserting small bolts through the wood and plastic. A cushion of sheet rubber or airplane fabric should be placed between wood and plastic on both sides.
(3) A temporary repair can be made by drilling small holes along both side of crack, 1/8 to 1/4 inch (3.2 to 6.4 mm) apart, and lacing edges together with soft wire. This type of repair is used as a temporary measure only, and as soon as facilities are available, panel should be replaced.



Windshield Installation
Figure 201 (Sheet 1)



Windshield/Window Repair
Figure 202 (Sheet 1)

CABIN WINDOWS - MAINTENANCE PRACTICES

1. General

A. The airplane is equipped with two side windows and a rear window, all located in the rear cabin area. Maintenance practices are limited to removal and installation of the windows. For instructions on temporary repair, refer to Windshield - Maintenance Practices.

2. Rear Window Removal/Installation

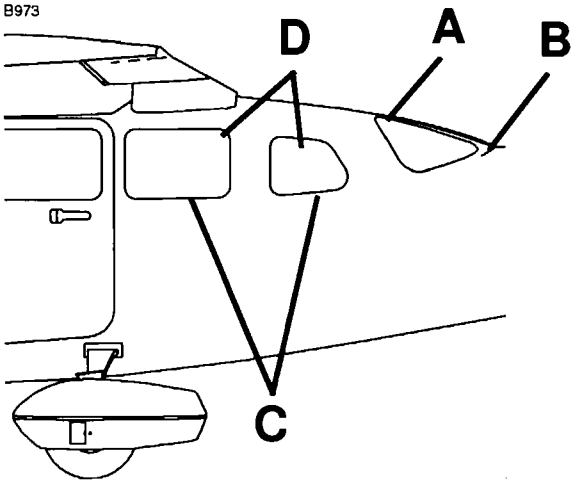
A. Remove Rear Window (Refer to Figure 201).
   (1) Remove upholstery as necessary to expose retainer strips inside cabin. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
   (2) Drill out rivets as necessary to remove outer retainer strip along aft edge of window.
   (3) Remove window by lifting aft edge and pulling window aft. If difficulty is encountered, rivets securing retainer strips inside cabin may also be drilled out and retainer strips loosened or removed.

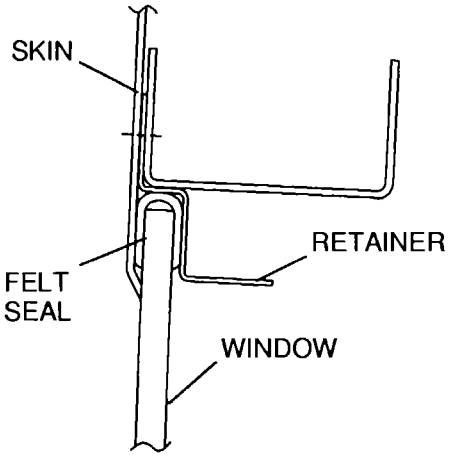
B. Install Rear Window (Refer to Figure 201).
   (1) If old window is being reinstalled, remove all traces of old sealant from window.
   (2) Clean out channels and retainers to remove all traces of old sealant.
   (3) Check fit and carefully file or grind away excess plastic.
   (4) Apply felt strip and sealant to all edges of window to prevent leaks.
   (5) Reinstall rear window to airplane and secure using retainer strips and rivets.
   (6) Install upholstery. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

3. Side Window Removal/Installation

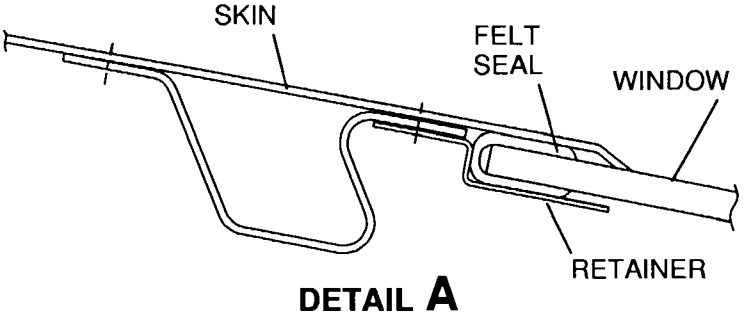
A. Remove Side Window (Refer to Figure 201).
   (1) Remove upholstery as required to gain access to retainer strips inside cabin. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.
   (2) Drill out rivets securing retainer strips to airplane.

B. Install Side Window (Refer to Figure 201).
   (1) If old window is being reinstalled, remove all traces of old sealant from window.
   (2) Clean out channels and retainers to remove all traces of old sealant.
   (3) Apply felt strip and sealant to all edges of window to prevent leaks.
   (4) Reinstall retainer strips using rivets.
   (5) Reinstall upholstery. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

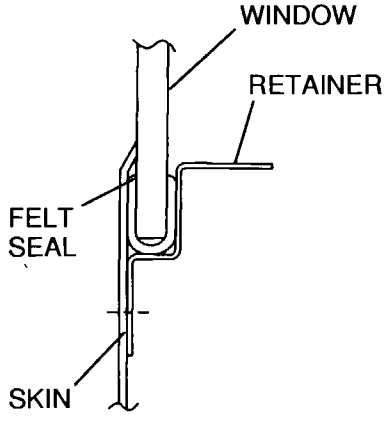




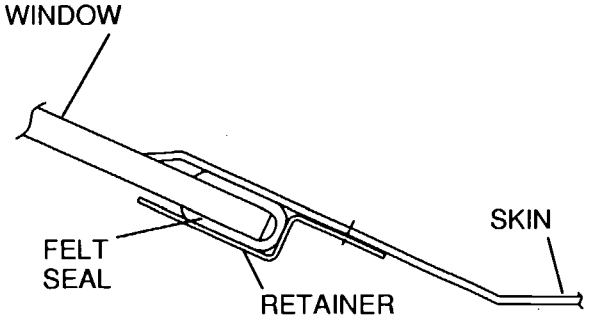
DETAIL D



DETAIL A



DETAIL C



DETAIL B

1210T1002
A0711T1003
B0711T1004
C0711T1005
D0711T1006

Cabin Windows Installation
Figure 201 (Sheet 1)

CABIN DOOR WINDOWS - MAINTENANCE PRACTICES

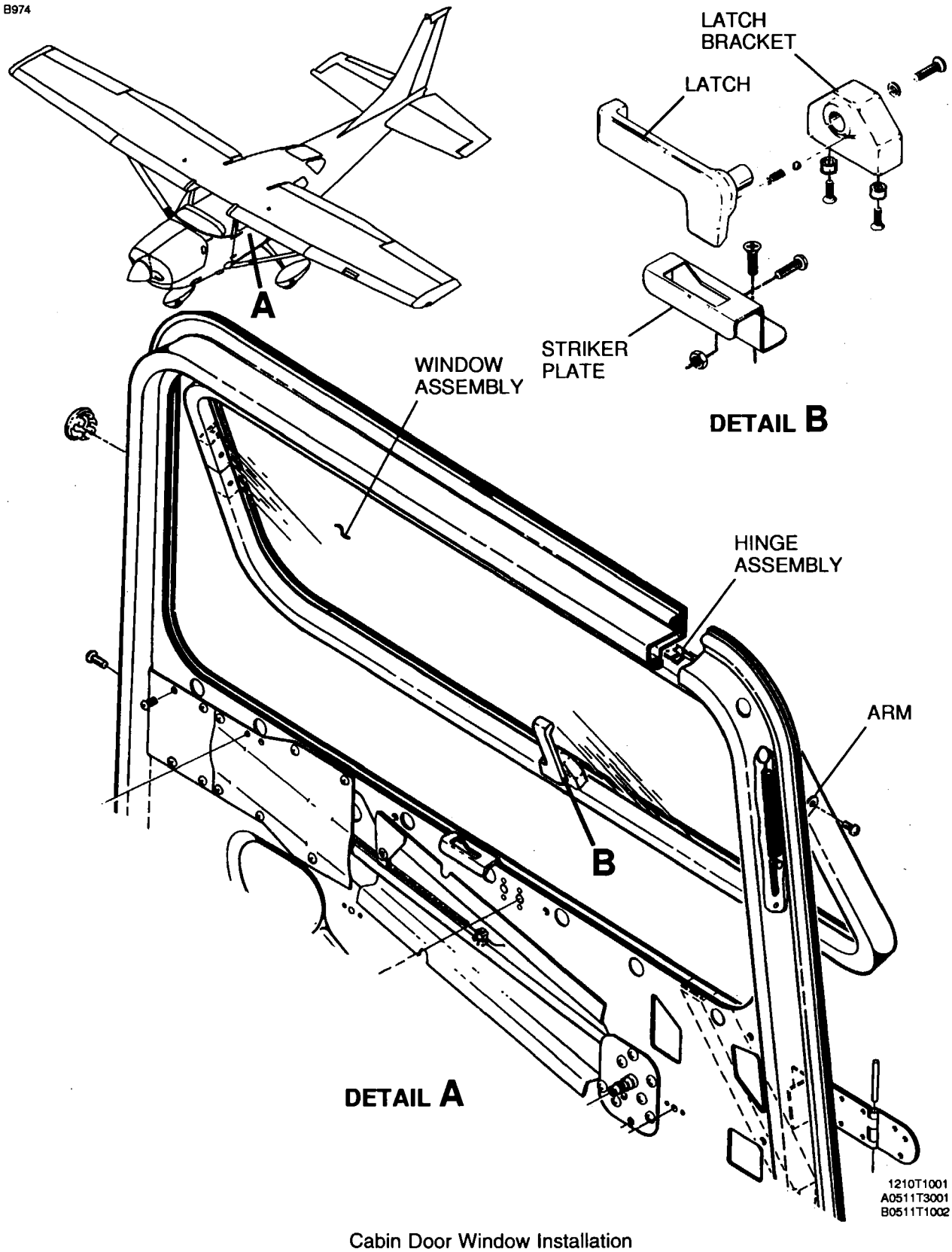
1. General

A. This maintenance practices section consists of removal and installation of the hinged windows located in each door. For instructions on temporary repair to the cabin door windows, refer to Windshield - Maintenance Practices.

2. Cabin Door Window Removal/Installation

A. Remove Cabin Door Window (Refer to Figure 201).
   (1) Disconnect arm from window assembly.
   (2) Remove hinge pins from hinge.

B. Install Cabin Door Window (Refer to Figure 201).
   (1) Position window assembly to door.
   (2) Secure window assembly to hinge using hinge pin.



Cabin Door Window Installation
Figure 201 (Sheet 1)

CHAPTER

57

WINGS

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CONTENTS

WINGS - GENERAL

1. Scope

A. This chapter provides instructions on wing removal and installation. Information and repair procedures beyond the scope of this chapter can be found in the Single Engine Models 172, 182, T182, 206 and T206 1996 and On Structural Repair Manual.

2. Tools, Equipment and Materials

NOTE: Equivalent substitutes may be used for the following listed items:

NAME	NUMBER	MANUFACTURER	USE
Grease	MIL-G-21164	E/M Corporation Box 2200 Highway 52 N.W. West Lafayette, IN 47906	To lubricate wing attach fittings and bolts upon reinstallation.
Polyurethane Tape	Y8671	3M Center Minneapolis, MN 55144	To eliminate chafing of wing struts from strut fairings.

3. Definition

A. This chapter contains a single section on wing removal, installation and adjustment.

WINGS AND WING STRUTS - MAINTENANCE PRACTICES

1. Description and Operation

WARNING: Some right wings have a spar cap 0.100 inches thick, and are not to be used on increased weight STC's (such as float planes).

A. Each all metal wing is a semicantilever, semimonocoque type, with two main spars and suitable ribs for the attachment of the skin. Skin panels are riveted to ribs, spars and stringers to complete the structure. An all metal, aileron, flap and detachable wing tip are mounted on each wing assembly. Each wing also incorporates an integral fuel bay located between the two spars at the inboard portion of the wing. Each wing is supported in position by a single lift strut which consists of a streamlined tube riveted to two end fittings for attachment at the wing and at the fuselage.

B. For a skeletal view of the wing assembly, refer to Chapter 6, Airplane Stations - Description and Operation.

2. Wing and Strut Removal/Installation

A. Remove Wing and Strut (Refer to Figure 201).

NOTE: Wings are most easily removed if four people are available to handle the wing. Otherwise, the wing should be supported with a sling or maintenance stand when the fasteners are loosened.

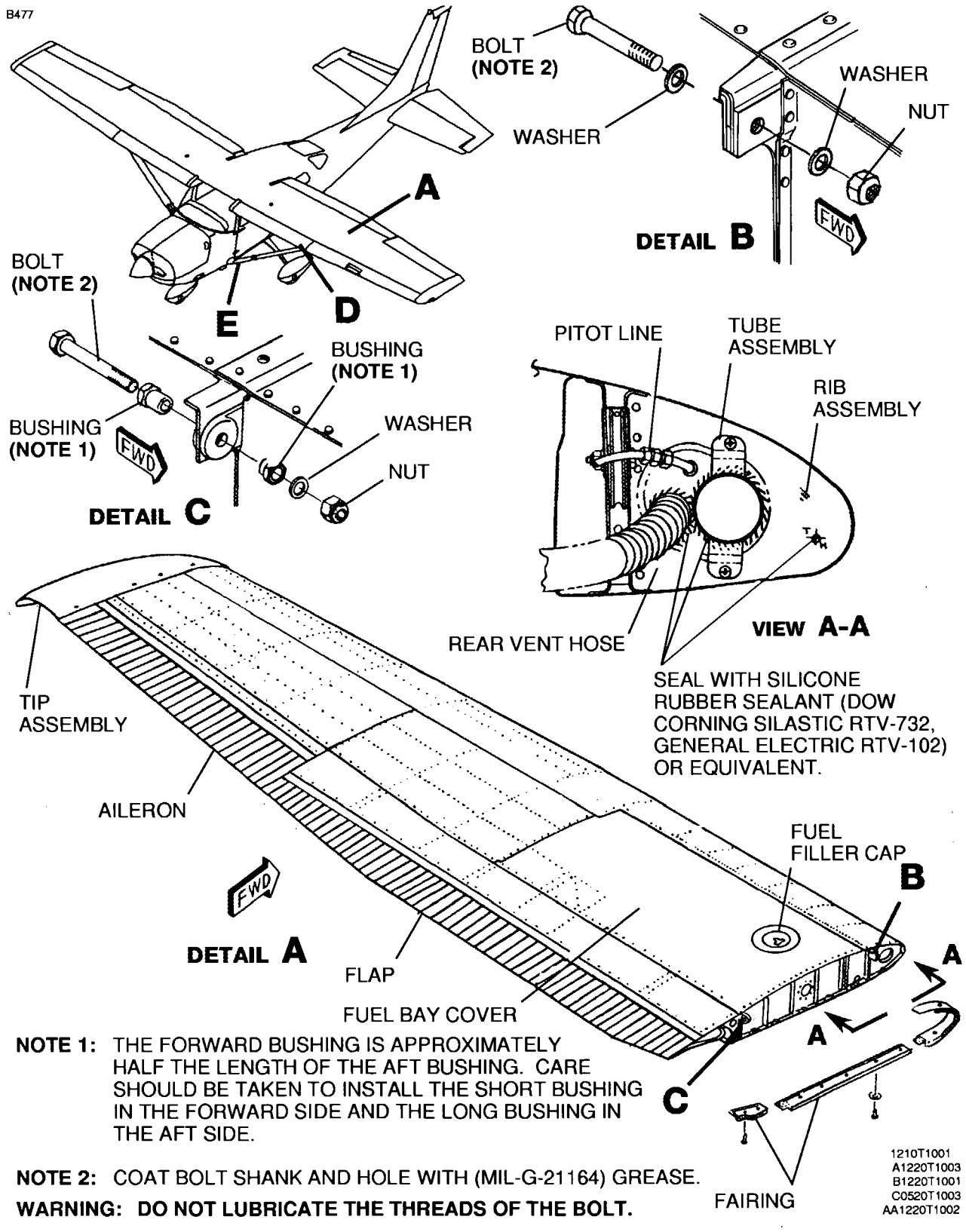
(1) Remove fairings from wing/fuselage intersection.
(2) Remove inspection plates as required to allow for disconnection of all electrical, mechanical and fuel connections.
(3) Drain fuel from wing bay. Refer to Chapter 12, Fuel Servicing.
(4) Disconnect electrical wires at wing root disconnects.
(5) Disconnect fuel lines at wing root.
(6) On left wing, disconnect pitot line.
(7) Disconnect fresh air distribution duct at wing root.
(8) Loosen turnbuckle and disconnect aileron cables at aileron bellcrank. Remove cable guard and pull cable from wing. Refer to Chapter 27, Aileron Control System - Maintenance Practices.
(9) Disconnect aileron carry-through cables at turnbuckle above cabin headliner, and pull cables into wing root area. Refer to Chapter 27, Aileron Control System - Maintenance Practices.
(10) Disconnect flap cables at turnbuckles above cabin headliner, and pull cables into wing root area. Refer to Chapter 27, Flap Control System - Maintenance Practices.

NOTE: To ease rerouting of cables, a guide wire may be attached to each cable before it is pulled free from the wing. Cable may then be disconnected from the guide wire. Leave the guide wire routed through the wing; it will be reattached to the cable during installation and used to pull the cable into place.

(11) Remove screws from strut fairings and slide fairings toward center of strut.
(12) Support wing at outboard end. Remove strut-to-wing attach bolt and strut-to-fuselage attach bolt.
(13) Remove strut from between wing and fuselage.

NOTE: Tape flaps in the streamlined position during wing removal. This will prevent flap movement during handling.

(14) Mark position of wing attachment eccentric bushings in relationship to fittings. These bushings are used to rig out wing heaviness, and if bushings are not marked, wings may have to be rerigged at installation.

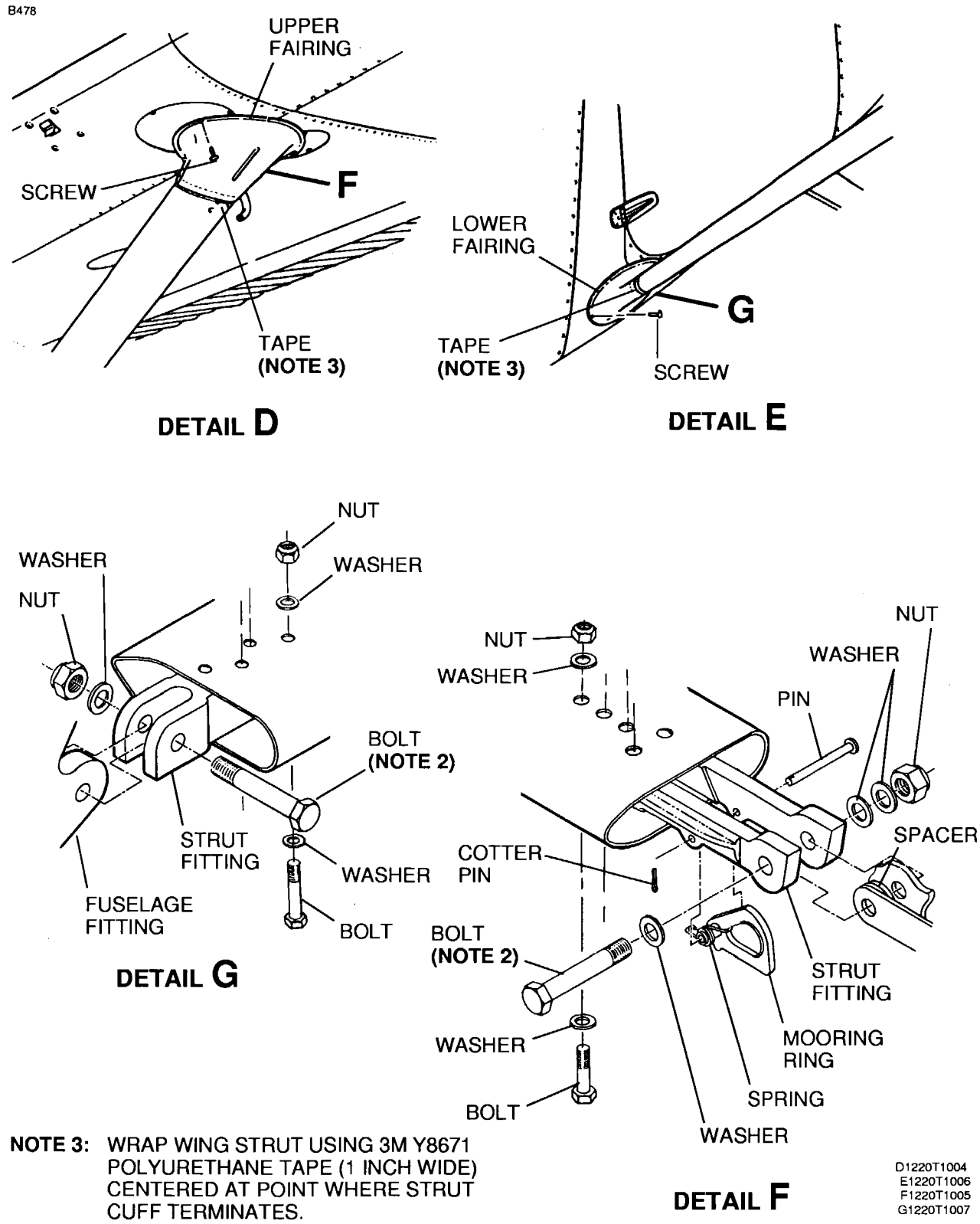


NOTE 1: THE FORWARD BUSHING IS APPROXIMATELY HALF THE LENGTH OF THE AFT BUSHING. CARE SHOULD BE TAKEN TO INSTALL THE SHORT BUSHING IN THE FORWARD SIDE AND THE LONG BUSHING IN THE AFT SIDE.

NOTE 2: COAT BOLT SHANK AND HOLE WITH (MIL-G-21164) GREASE.

WARNING: DO NOT LUBRICATE THE THREADS OF THE BOLT.

Wing and Strut Installation
Figure 201 (Sheet 1)



NOTE 3: WRAP WING STRUT USING 3M Y8671 POLYURETHANE TAPE (1 INCH WIDE) CENTERED AT POINT WHERE STRUT CUFF TERMINATES.

Wing and Strut Installation
Figure 201 (Sheet 2)

(15) Remove nuts, washers, bushings and bolts attaching wing spars to fuselage.

NOTE: It may be necessary to rock the wings slightly and/or to use a long drift punch to remove attaching bolts.

(16) Remove wing and lay on padded stand.

B. Install Wing and Strut (Refer to Figure 201).

(1) Hold wing in position and install bolts, bushings, washers and nuts attaching wing spars to fuselage fittings. Ensure eccentric bushings are positioned as marked.

NOTE: Lightly lubricate wing attach bolt shanks and holes with MIL-G-21164 grease before installing bolts.

CAUTION: Do not lubricate the threads of the bolts.

NOTE: Wrap wing strut using 1 inch wide 3M Y8671 polyurethane tape centered at point where strut cuff terminates.

(2) Torque front wing spar bolts from 290 inch-pounds to 410 inch-pounds. Torque rear wing spar bolts from 450 inch-pounds to 500 inch-pounds.
(3) Install bolts, spacers and nuts to secure upper and lower ends of wing strut to wing and fuselage fittings.
(4) Route flap and aileron cables, using guide wires.
(5) Reconnect all fuel, electrical and mechanical connections removed.
(6) Rig flap system. Refer to Chapter 27, Flap Control System - Maintenance Practices.
(7) Rig aileron system. Refer to Chapter 27, Aileron Control System - Maintenance Practices.
(8) Refuel wing bay. Refer to Chapter 12, Fuel Servicing.
(9) Check operation of fuel quantity system. Refer to Chapter 28, Fuel Storage and Distribution - Maintenance Practices.
(10) Install wing root fairings.
(11) Install all removed upholstery. Refer to Chapter 25, Interior Upholstery - Maintenance Practices.

3. Adjustment (Correcting Wing Heavy Conditions)

NOTE: If considerable control wheel pressure is required to keep the wings level in normal flight, a "wing heavy" condition exists and can be corrected by the following procedure.

A. Adjustment Procedures (Refer to Figure 201, Detail A).

(1) Remove wing fairing strip from the heavy side of the airplane.

CAUTION: Ensure the eccentric bushings are rotated simultaneously. Rotating them separately will destroy the alignment between the off-center bolt holes in the bushings, thus exerting a shearing force on the bolt, with possible damage to the hole in the wing spar.

NOTE: The eccentric cams should only be adjusted after all other systems have been adjusted and rigged.

(2) Loosen aft wing spar attach nuts and rotate eccentric bushings simultaneously until the bushings are positioned with the thick side of the eccentrics up. This will lower the trailing edge of the wing and decrease wing heaviness, by increasing angle of incidence of the wing.
(3) Torque front wing spar bolts from 290 inch-pounds to 410 inch-pounds, and torque rear wing spar bolts from 450 inch-pounds to 500 inch-pounds and reinstall fairing strip.
(4) Test fly the airplane. If the wing heavy condition still exists, remove fairing strip on the lighter wing, loosen nut and rotate bushings simultaneously until the bushings are positioned with the thick side of the eccentrics down. This will raise the trailing edge of the wing, thus increasing wing heaviness to balance heaviness in the opposite wing.

(5) Torque rear wing spar bolts from 450 inch-pounds to 500 inch-pounds, install fairing strip and repeat flight test.

4. Strut Damage and Repair Criteria

NOTE: If the strut is severely dented, cracked or deformed, it should be replaced. The following procedures are applicable only to the specific areas of the strut.

A. Damage Caused by Strut Fairings.
(1) If groove exceeds 0.010 inch in depth and is less then 0.75 inch from a rivet center, the strut should be replaced.
(2) If groove is more than 0.75 inch from a rivet center and groove depth exceeds 0.025 inch , strut should be replaced.
(3) If groove depth is less than 0.025 inch and is more than 0.75 inch from a rivet center, strut should be repaired by tapering gradually to the original surface and burnishing out to a smooth finish. The local area should be checked with dye penetrant to ensure that no crack has developed.

B. Damage Caused by Cabin Door.

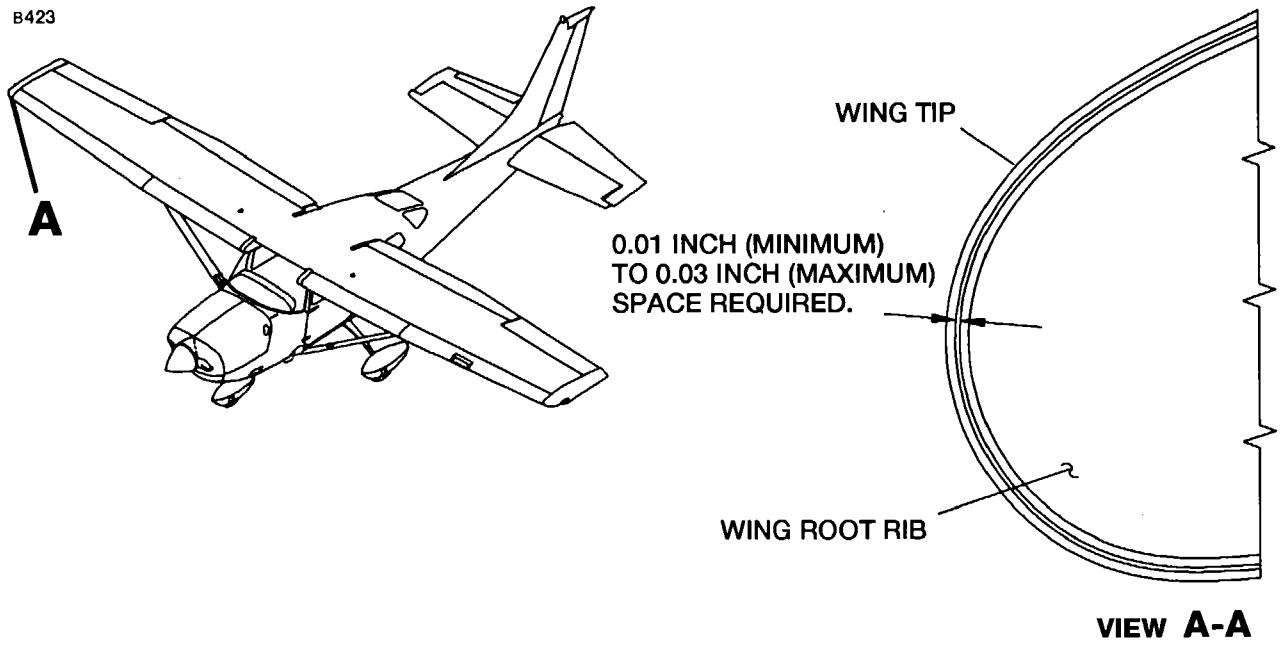
NOTE: The following applies to wing struts with grooves worn in the lower trailing edge. This type of damage can occur after extensive cabin door usage with a missing or improperly adjusted door stop, which allows the door to contact the aft edge of the strut at the lower end.

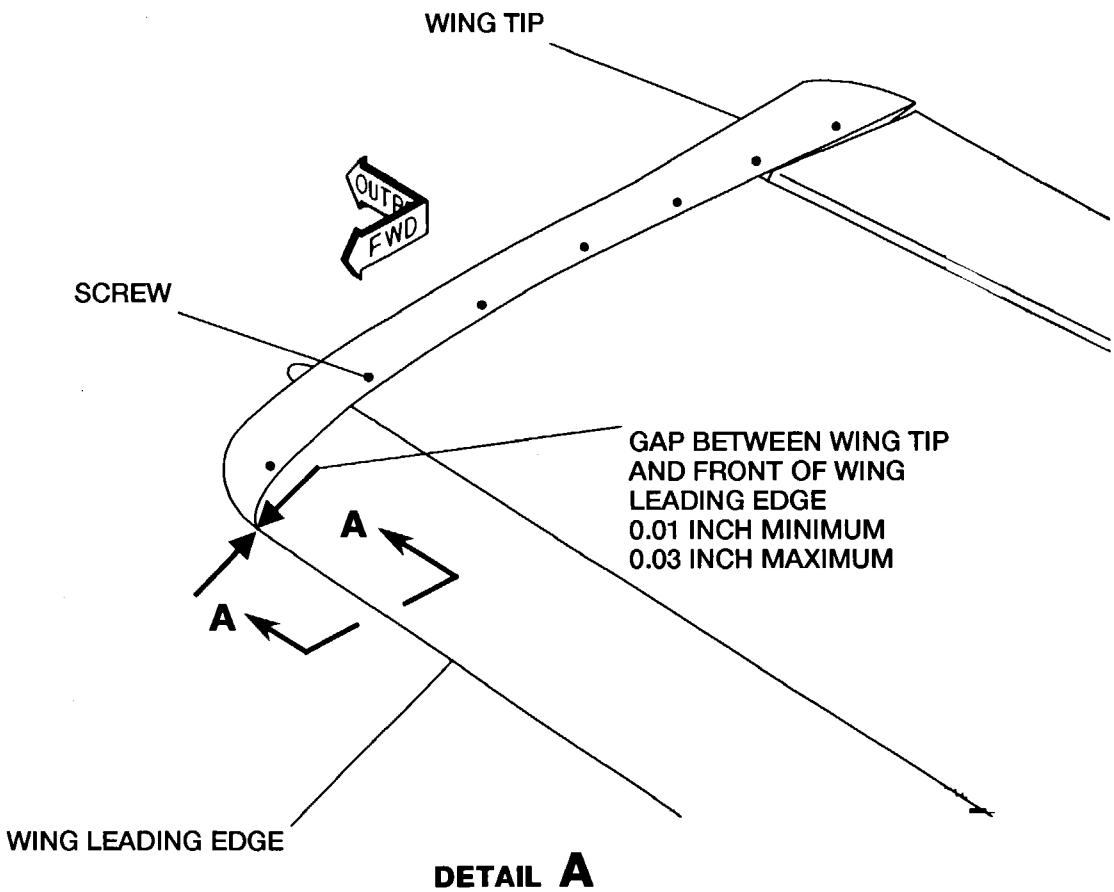
(1) If groove is deeper than 50 percent of the original material thickness, strut should be replaced.
(2) If groove is less than 50 percent of the original material thickness and less than two inches in length, repair as follows:
(a) Without making the damage deeper, remove strut material on each side of groove to reduce notch effect of damage. Smooth and blend the surface to provide a gradual transition of strut tube material thickness in damaged area. The local area should be checked with dye penetrant to ensure that no crack has developed.
(b) Apply alodine and repaint area.
(c) Rerig the door to prevent door from rubbing the strut tube.

5. Wing Tip Removal/Installation

A. Remove Wing Tip (Refer to Figure 202).
(1) Remove screws securing wing tip to wing.
(2) Remove screw securing strobe light and navigation light ground straps to power supply.
(3) Disconnect navigation light electrical connector.
(4) Disconnect strobe light electrical connector.
(5) Remove wing tip from wing.

B. Install Wing Tip (Refer to Figure 202).
(1) Connect strobe light electrical connector and connect navigation light electrical connector.
(2) Slide the wing tip into position over the wing tip rib ensuring the existing holes in the wing tip align with the attach holes in the wing skin/rib nutplates.
(3) Fabricate a curved spacer from phenolic or aluminum which is 0.01 (minimum) to 0.03 inch thick X 1.0 inch X 2.0 inches which matches the contour of the leading edge.
(4) Insert the spacer at the leading edge of the wing between the skin and the inside contour of the wing tip.
(5) Secure wing tip to wing using screws starting at the aft of the tip and working forward.
(6) When all screws are secure, remove the spacer to leave a gap of 0.01 inch to 0.03 inch between the skin and the inside contour of the wing tip.





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Wing Tip Installation
Figure 202 (Sheet 1)

CHAPTER

61

PROPELLERS

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
61-Title		
61-List of Effective Pages		
61-Record of Temporary Revisions		
61-Table of Contents		
61-00-00	Page 1	Dec 2/2002
61-10-00	Pages 201-203	Apr 5/2004
61-20-00	Pages 201-204	Jul 1/2007

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

PROPELLER - GENERAL

1. Scope

A. This chapter contains information for removal and installation of the propeller and propeller governor, and adjustment and rigging procedures for the propeller governor.

PROPELLER - MAINTENANCE PRACTICES

1. General

A. The airplane is installed with a three-bladed, constant-speed metal propeller. The maintenance practices that follow have the removal and installation procedures of the spinner and propeller. For additional information, troubleshooting, adjustments, and maintenance procedures not supplied in this section, refer to the applicable McCauley Service Manual. Refer to the List of Manufacturers Technical Publications in the introduction.

2. Spinner Removal/Installation

A. Remove the Spinner (Refer to Figure 201).
   (1) Disconnect all electrical power from the airplane.
   (2) Make sure the magneto switch is in the off position and is electrically grounded before you turn the propeller.

WARNING: Do not stand or let anyone stand close to the propeller. Do maintenance as if the power to the propeller is always on.

   (3) Remove the screws and washers that attach the spinner to the spinner bulkhead assembly.
   (4) Remove the spinner, spinner stabilizer and spacers from the propeller assembly.
      (a) Write the number of spacers that is removed for installation of the spinner.

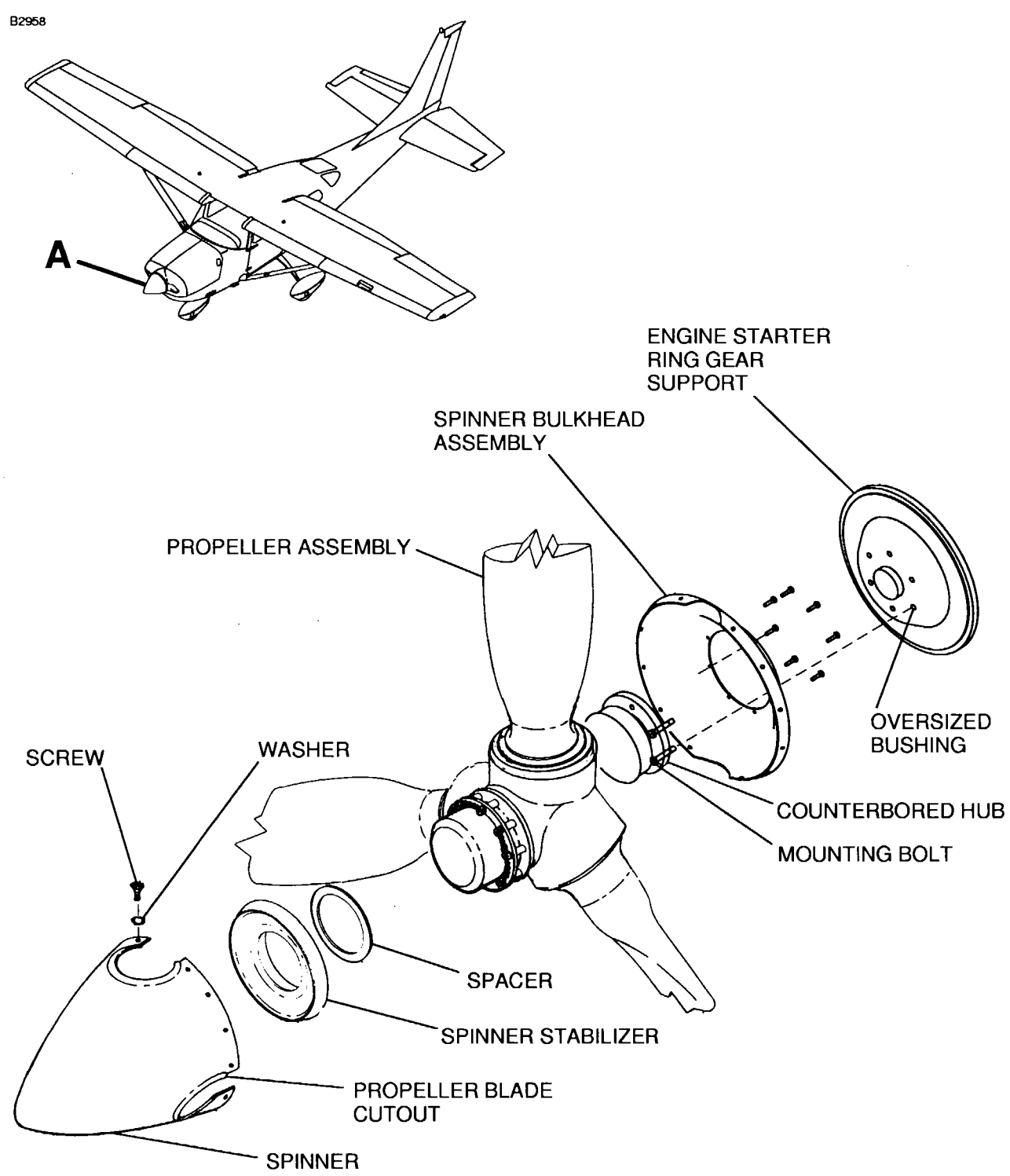
B. Install the Spinner (Refer to Figure 201).

WARNING: Do not stand or let anyone stand close to the propeller. Do maintenance as if the power to the propeller is always on.

   (1) Make sure the magneto switch is in the off position and is electrically grounded before you turn the propeller.
   (2) Put the spacers, spinner stabilizer and spinner on propeller assembly.
   (3) Lightly press the spinner against the spinner stabilizer.
   (4) Examine the alignment of the mounting holes in the spinner with the holes in the spinner bulkhead assembly.
      (a) Without an increase of pressure on the spinner, the mounting holes in the spinner must be set approximated 0.050 inch (1.30 mm) forward of the true center of the holes in the spinner bulkhead assembly. Add or remove spacers as necessary to set the holes in the correct position
   (5) Push on the spinner until the spinner mounting holes are aligned with the spinner bulkhead assembly holes and install four screws and washers equally spaced around the circumference of the spinner.
      (a) Use only the quantity of spacers that will let the correct alignment for the screws to be installed when you push against the spinner.
   (6) Release the force against the spinner and install the screws and washers that remain. Tighten all of the screws equally around the spinner.
   (7) Install the brush block if necessary.

CAUTION: Make sure you remove minimal spinner material as necessary to give minimum clearance between the spinner and the propeller blades.

   (8) File the spinner in the propeller blade cutout area to give a minimum clearance of 0.14 inch (3.56 mm) if necessary.
   (9) Sand the sharp edges with 400 grit abrasive paper or cloth and restore the corrosion protection.
   (10) Install the cowl assemblies.



DETAIL A

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Propeller and Spinner Installation
Figure 201 (Sheet 1)

3. Propeller Removal/Installation

A. Remove the Propeller (Refer to Figure 201).
(1) Disconnect all electrical power from the airplane.
(2) Make sure the magneto switch is in the off position and is electrically grounded before you turn the propeller.

WARNING: Do not stand or let anyone stand close enough to the propeller to be hit by it. Maintenance must be done as if the power to the propeller is always on.

(3) Remove the spinner. Refer to Spinner Removal/Installation.
(4) Remove the cowl assemblies as necessary to get access to the propeller mounting bolts.
(a) If the airplane is installed with a optional prop deice system, remove the brush block assembly before you remove the propeller to prevent possible damage to the brush.
(5) Remove the safety wire from the mounting bolts.
(6) Remove the mounting bolts.
(a) The propeller mounting bolts must be magnetic particle inspected per ASTM E-1414 or liquid penetrant inspected per ASTM E-1417 or replaced at every overhaul. Propeller mounting bolts must be replaced whenever the propeller is involved in a blade strike.
(b) Equally loosen the mounting bolts approximately 0.25 inch (6 mm).
(c) Pull the propeller assembly forward, using the 0.25 inch (6 mm) given from the loosened bolts.

NOTE: As the propeller assembly is separated from the engine crankshaft, oil will drain from the propeller and engine crankshaft cavities.

(d) Continue to equally loosen the bolts and pull the propeller assembly forward, 0.25 inch (6 mm) at a time, until all the nuts are removed.
(7) Remove the propeller assembly and O-ring from the engine propeller shaft.

B. Install the Propeller (Refer to Figure 201).
(1) Clean the mating surfaces of the propeller assembly, spinner bulkhead assembly, engine prop shaft.
(2) Apply a layer of MIL-L-7711 lubricant, or equivalent, to the new O-ring and engine prop shaft.
(3) Install the new O-ring.
(4) Carefully slide the propeller assembly onto the engine propeller shaft. Make sure to align the propeller assembly as you install it.
(5) Install the mounting bolts.
(6) Tighten the mounting bolts incrementally in a crossing pattern to a torque of 60 foot-pounds, +5 or -5 foot-pounds (81 N-m +7 or -7 N-m).
(7) Install safety wire to the mounting bolts in sets of two or three bolts. Refer to Chapter 20, Safetying - Maintenance Practices.
(8) Examine the engine oil and service as necessary.
(9) Install the spinner. Refer to Spinner Removal/Installation.

PROPELLER GOVERNOR - MAINTENANCE PRACTICES

1. General

A. The propeller governor is a single-acting, centrifugal type, which boosts oil pressure from the engine and directs it to the propeller where the oil is used to increase blade pitch. The governor is mounted on the forward, upper left side of the engine.

B. Maintenance practices consist of removal and installation of the propeller governor, high RPM stop adjustment, and rigging of the governor control. For additional information, troubleshooting, adjustments, and maintenance procedures not addressed in this section, see the applicable McCauley Service Manual. Refer to Introduction, List of Manufacturers Technical Publications.

2. Propeller Governor Removal and Installation

A. Remove Propeller Governor (Refer to Figure 201).
(1) Remove all power from airplane.

WARNING: Exercise care when working with the propeller. Always treat the propeller as if the ignition switch were on. Do not stand, nor allow anyone else to stand, within the arc of the propeller. Ensure magneto switch is in the off position before turning propeller.

(2) Remove cowl assemblies as required for access to propeller governor located forward on left side of engine.
(3) Remove cotter pin, nut, washers, and bolt securing control cable to control arm.

NOTE: Identify washers and position of washers for use when reconnecting control cable to control arm.

(4) Loosen bolts to restraint bracket securing control cable to control cable bracket. Remove control cable from bracket.
(5) Remove nuts and washers securing propeller governor to engine.
(6) Remove propeller governor and mount gasket.

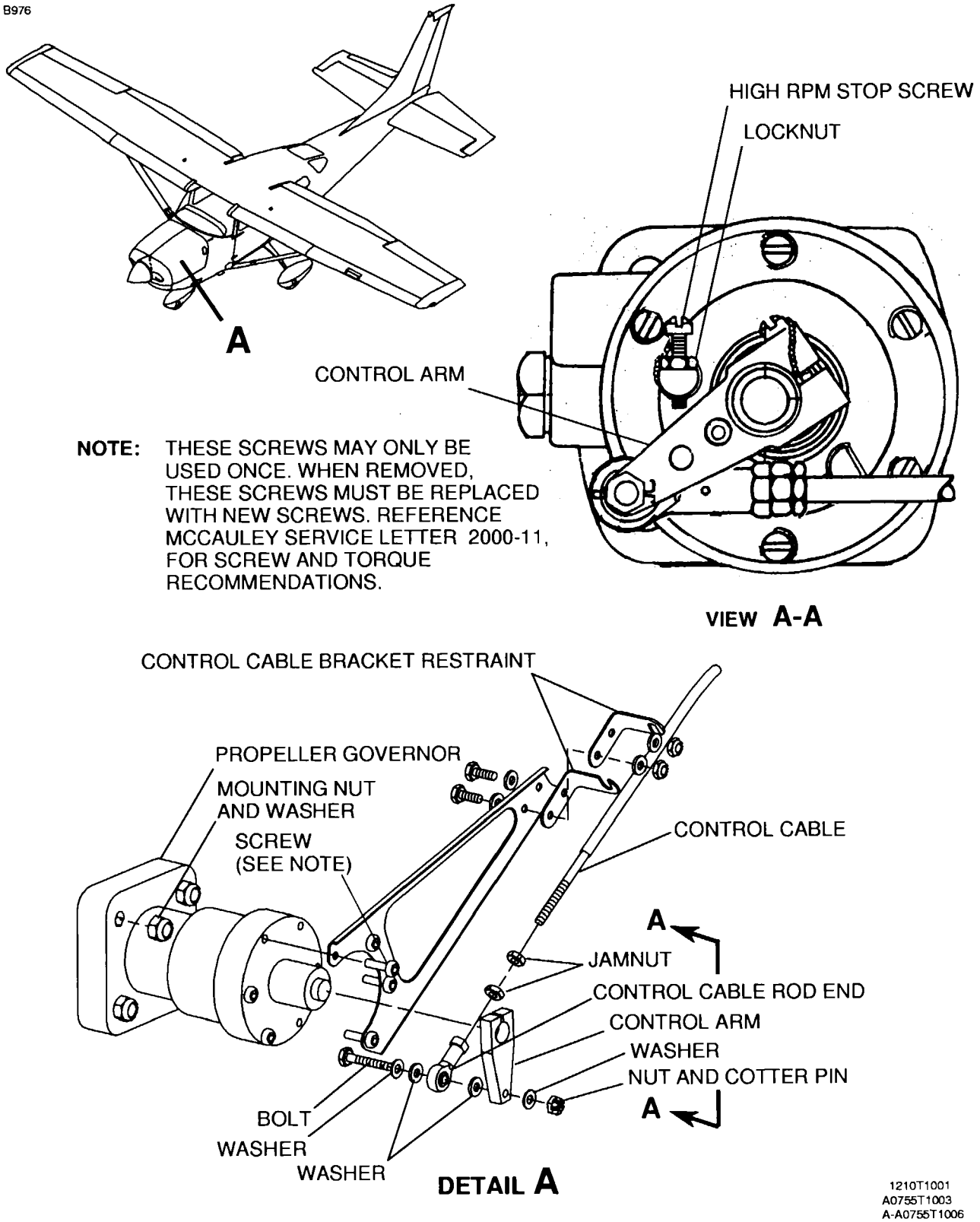
B. Install Propeller Governor (Refer to Figure 201).
(1) Clean mating surfaces of propeller governor and engine mounting surface.
(2) Install new mount gasket.

WARNING: Exercise care when working with the propeller. Always treat the propeller as if the ignition switch were on. Do not stand, nor allow anyone else to stand, within the arc of the propeller. Ensure magneto switch is in the off position before turning propeller.

WARNING: Ensure magneto is grounded before turning propeller.

CAUTION: Do not force spline engagement. Rotate crankshaft slightly and splines will mesh smoothly when properly aligned.

(3) Position propeller governor and secure to engine with washers and nuts.
(4) Position control cable in control cable bracket. Install restraint bracket and secure by tightening bolts.
(5) Secure control cable to control arm with bolt, washers, and nut.
(a) Torque nut to 30 inch-pounds.



Propeller Governor Installation
Figure 201 (Sheet 1)

CAUTION: Do not exceed 50 in-lbs when tightening nut to line up cotter pin hole with castellations in nut.

(b) Continue to torque nut past 30 inch-pounds until cotter pin hole lines up with castellations in nut.
(c) Install new cotter pin.
(6) Rig governor control. Refer to Governor Control Rigging.
(7) Install cowl assemblies.

3. High RPM Stop Screw Adjustment

WARNING: Exercise care when working with the propeller. Always treat the propeller as if the ignition switch were on. Do not stand, nor allow anyone else to stand, within the arc of the propeller. Ensure magneto switch is in the off position before turning propeller.

WARNING: Ensure magneto is grounded before turning propeller.

A. Adjust High RPM Stop Screw (Refer to Figure 201).
(1) Remove cowl assemblies as required to access propeller governor on left side of engine.
(2) Cut and remove safety wire from high RPM stop screw.
(3) Loosen high RPM stop screw locknut.
(4) Turn high RPM stop screw in (clockwise) for decrease in RPM and out (counterclockwise) to increase maximum RPM. One complete turn will cause a change of approximately 25 RPM.

NOTE: Due to climate conditions, field elevation, low pitch propeller blade angle, and other factors, an engine may not reach rated RPM on the ground. It may be necessary to readjust the governor high RPM stop screw after test flying to obtain maximum rated RPM when airborne.

(5) Tighten locknut.
(6) Adjust propeller governor control as necessary to maintain full travel. Ensure that governor control arm contacts the high RPM stop screw in both maximum and minimum settings (bottomed out against both high and low pitch stops) and that a cushion exists at both positions of control arm travel. Refer to Governor Control Rigging, Propeller Governor - Maintenance Practices.
(7) Safety wire high RPM stop screw.
(8) Install cowl assemblies.
(9) Test and operate governor propeller combination.

4. Propeller Control Cable

A. Remove Propeller Control Cable.
(1) Remove upper cowling. Refer to Chapter 71, Cowls Maintenance Practices.
(2) Remove cotter pin, nut, washers, and bolt securing control cable to control arm. Discard cotter pin.
(3) Remove control cable rod end.
(4) Loosen bolts securing cable restraint bracket to cable bracket. Remove cable.
(5) Remove nut, washer, bolt and clamp securing cable to manifold induction tube.
(6) Route cable through grommet in engine baffle.
(7) Remove control cable retaining nut and washer at firewall and pull control cable aft through firewall.
(8) Remove retaining nut and washer from control cable.
(9) Remove retaining nut and washer on forward side of instrument panel from control cable while pulling control cable from instrument panel.

B. Install Propeller Control Cable.
(1) Route control cable through instrument while placing instrument panel retaining washer and nut and inside firewall washer and retaining nut over control cable.

(2) Route control cable through firewall and install instrument panel washer and retaining nut.
(3) Install firewall inside washer and retaining nut.
(4) Route cable through grommet in engine baffle.
(5) Install bolt, washers, nut and clamp securing cable to manifold induction tube.
(6) Install cable in cable bracket and tighten bolts.
(7) Rig control. Refer to Governor Control Rigging.

5. Governor Control Rigging

WARNING: Exercise care when working with the propeller. Always treat the propeller as if the ignition switch were on. Do not stand, nor allow anyone else to stand, within the arc of the propeller. Ensure magneto switch is in the off position before turning propeller.

NOTE: The result of rigging of the governor control is full travel of the governor control arm (bottomed out against both high and low pitch stops) with some cushion at both ends of the control travel.

A. Rig Governor Control (Refer to Figure 201).
(1) Remove cowl assemblies as required for access to propeller governor located on left side of engine.
(2) Remove cotter pin, nut, washers, and bolt securing control cable to control arm.

NOTE: Identify washers and position of washers for use when reconnecting control cable to control arm.

(3) Place control, in cockpit, full forward. Pull control back approximately 0.125 inch and lock in this position.

NOTE: This allows cushion which will assure full contact with governor high RPM stop screw.

(4) Place governor control arm against high RPM stop screw.
(5) Loosen jamnuts on control cable rod end and adjust rod end to align with control arm.

NOTE: Maintain sufficient thread engagement during adjustments. It may be necessary to adjust the position of the control cable in the control cable bracket restraint to achieve proper alignment and thread engagement.

(6) Secure control cable to control arm with bolt, washers, and nut.
(a) Torque nut to 30 inch-pounds.

CAUTION: Do not exceed 50 in-lbs when tightening nut to line up cotter pin hole with castellations in nut.

(b) Continue to torque nut past 30 Inch pounds until cotter pin hole lines up with castellations in nut.
(c) Install new cotter pin.
(7) Tighten previously loosened jamnuts on control cable rod end.
(8) Operate the propeller control to see that governor control arm has full travel and contacts stops in both directions with proper cushion.
(9) Install cowl assemblies. Refer to Chapter 71, Cowls- Maintenance Practices.

CHAPTER 71

POWER PLANT

LIST OF EFFECTIVE PAGES

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71-Title		
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71-00-01	Pages 201-202	Dec 2/2002
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71-70-00	Pages 201-205	Dec 2/2002

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

POWER PLANT - GENERAL

1. Scope

A. This chapter contains maintenance information on the power plant and associated components. For engine related information not found in this chapter, refer to applicable Textron Lycoming maintenance manuals, listed in Introduction - List of Manufacturers Technical Publications.

2. Definition

A. This chapter is divided into sections to aid maintenance personnel in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief definition of the sections incorporated in this chapter is as follows:

(1) The section on power plant provides description, operation, troubleshooting and removal/ installation information for the engine.

(2) The section on engine cowlings provides removal and installation instructions for the engine cowlings.

(3) The section on mounts provides removal and installation procedures for the engine shock mounts.

(4) The section on air induction provides removal and installation procedures for the air induction part of the fuel system.

(5) The section on drain lines provides removal and installation instructions on the various drain lines used in the engine compartment.

ENGINE - DESCRIPTION AND OPERATION

1. Description and Operation

A. The Textron Lycoming IO-540-AC1A5 is a direct drive, six cylinder, fuel injected, horizontally opposed, air cooled engine. The TIO-540-AJ1A is a turbocharged version of the same design. The cylinders, numbered from front to rear, are staggered to permit a separate throw on the crankshaft for each connecting rod. The right front cylinder is number 1 and the other cylinders on the right side of the engine are identified by odd numbers 3 and 5. The left front cylinder is number 2 and the other cylinders on the left side are identified as 4 and 6.

B. For a technical description of the engine, refer to Table 1. For an illustration of the engine, refer to Figure 1.

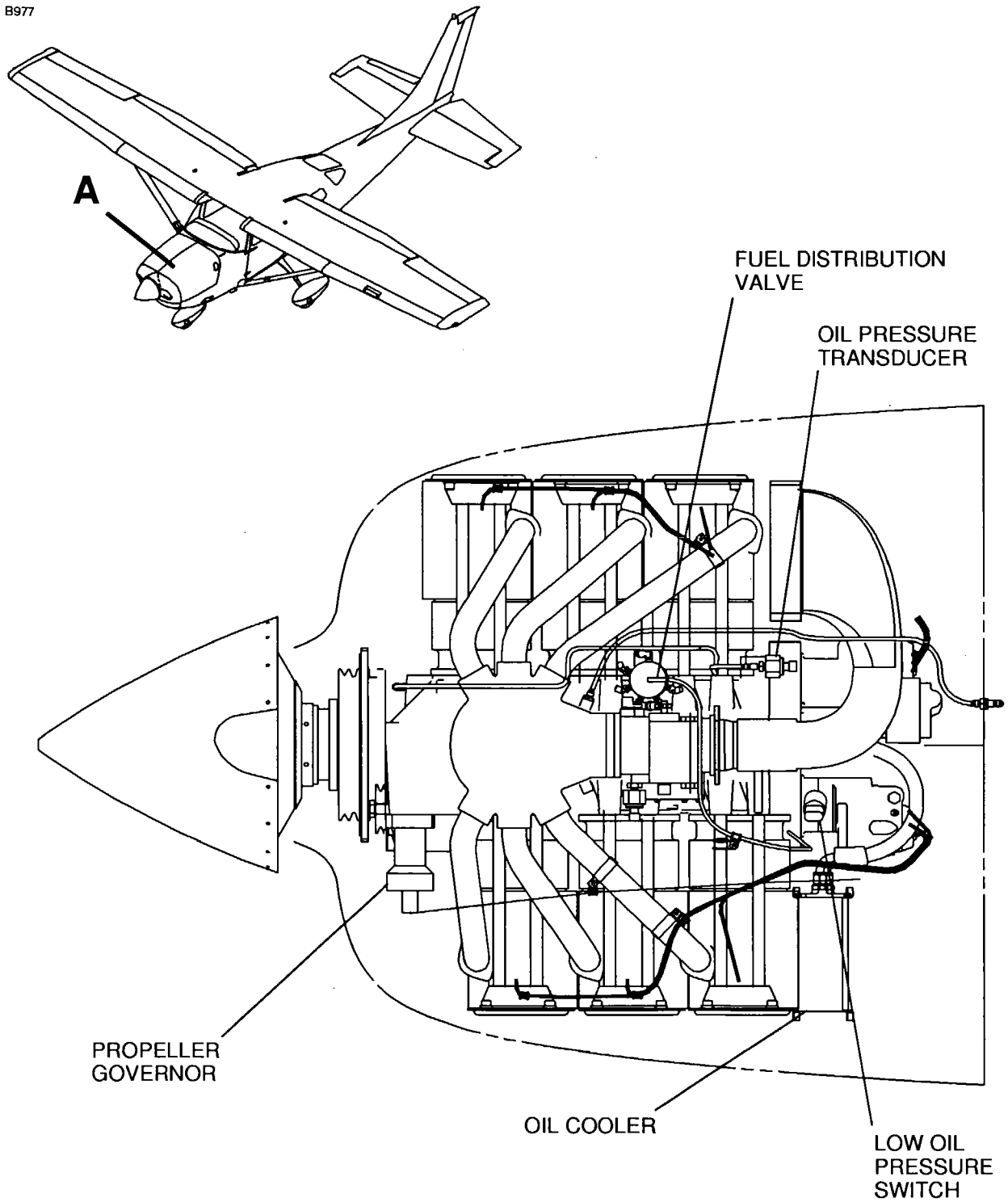
C. For information beyond the scope of this chapter, refer to applicable engine manuals listed in Introduction - List of Manufacturers Technical Publications.

Table 1. IO-540-AC1A5 Technical Description

Rated Horsepower at 2700 RPM	300
Number of Cylinders	6 Horizontally Opposed
Displacement	541.5 Cubic Inches (7.87 l)
Bore	5.125
Stroke	4.376
Compression Ratio	8.9:1
Firing Order	1-4-5-2-3-6
Magnetos:	
Right Magneto	Slick Model No. 6351 (fires at 20° BTDC)
Left Magneto	Slick Model No. 6351 (fires at 20° BTDC)
Spark Plugs	18MM
Torque	420 Inch-pounds
Valve Rocker Clearance (hydraulic tappets collapsed)	0.028 to 0.080 inch (0.7 to 2.0 mm)
Fuel Injector	PAC RSA-10ED1
Tachometer	Mechanical Drive
Oil Capacity	11.0 Quarts (10.41 l)
Oil Pressure	Minimum 25 PSI Normal 55 to 95 PSI Maximum 115 PSI
Oil Temperature	Normal 165 to 200°F (74 to 93.3°C) Maximum 245°F (118.3°C)
Dry Weight - with accessories	454 Lbs (205.93 kg)

Table 1: TIO-540-AJ1A Technical Description

Rated Horsepower at 2500 RPM	310
Number of Cylinders	6 Horizontally Opposed
Displacement	541.5 Cubic Inches (8.87 l)
Bore	5.125
Stroke	4.375
Compression Ratio	7.3:1
Firing Order	1-4-5-2-3-6
Magnetos:	
Right Magneto	Slick Model No. 6361 (fires at 20° BTDC)
Left Magneto	Slick Model No. 6361 (fires at 20° BTDC)
Spark Plugs	18MM
Torque	420 Inch-pounds
Valve Rocker Clearance (hydraulic tappets collapsed)	0.028 to 0.080 inch (0.7 to 2.0 mm)
Fuel Injector	PAC RSA-10ED1
Tachometer	Mechanical Drive
Oil Capacity	11.0 Quarts (10.41 l)
Oil Pressure	Minimum 25 PSI Normal 55 to 95 PSI Maximum 115 PSI
Oil Temperature	Normal 165 to 200℉ (74 to 93.3℃) Maximum 245℉ (118.3℃)
Dry Weight - with accessories	529 Lbs (239.95 kg)



DETAIL A
VIEW LOOKING DOWN

1210T1001
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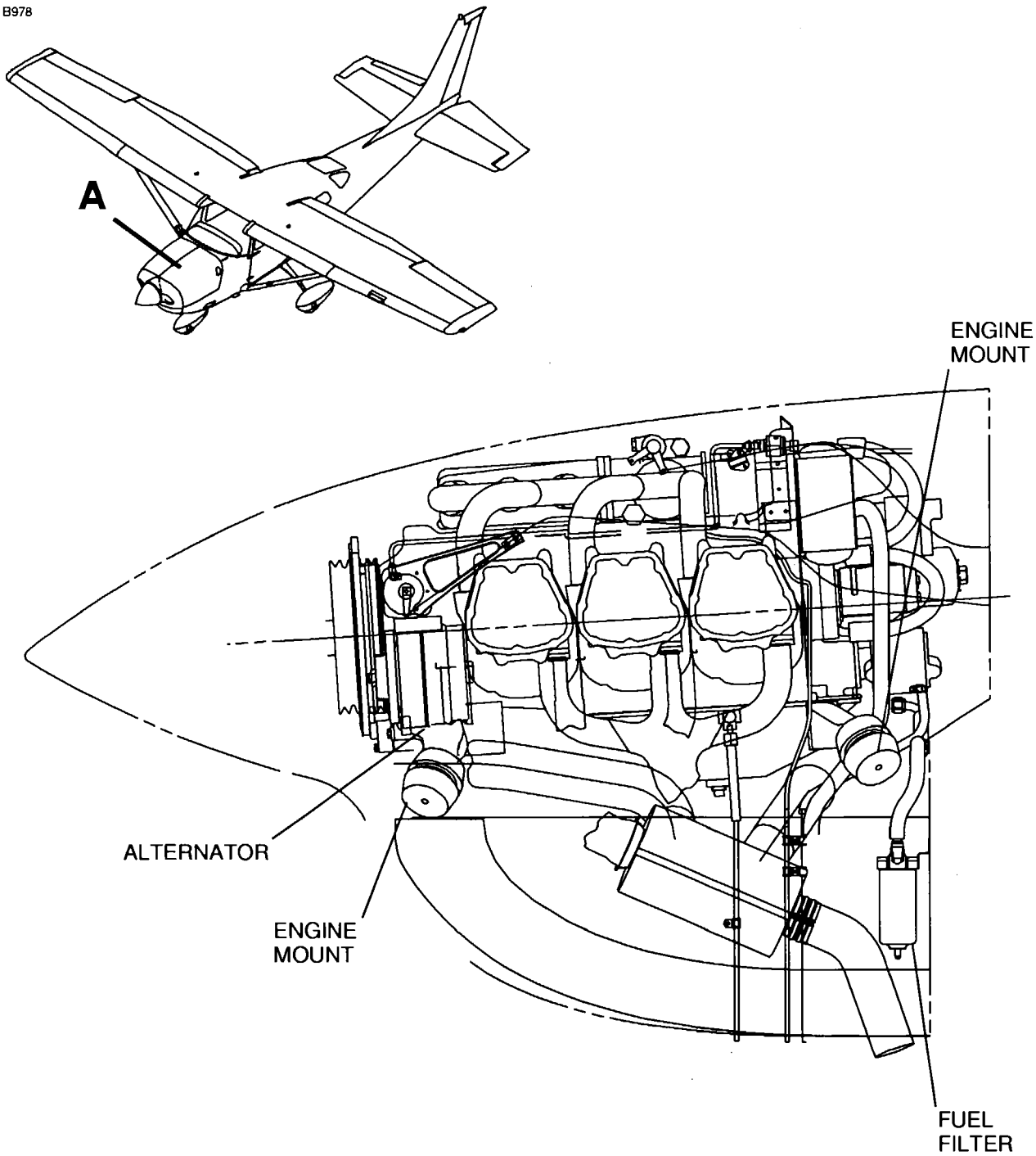
Engine Installation
Figure 1 (Sheet 1)



DETAIL A

VIEW LOOKING
INBOARD LEFT SIDE

1210T1001
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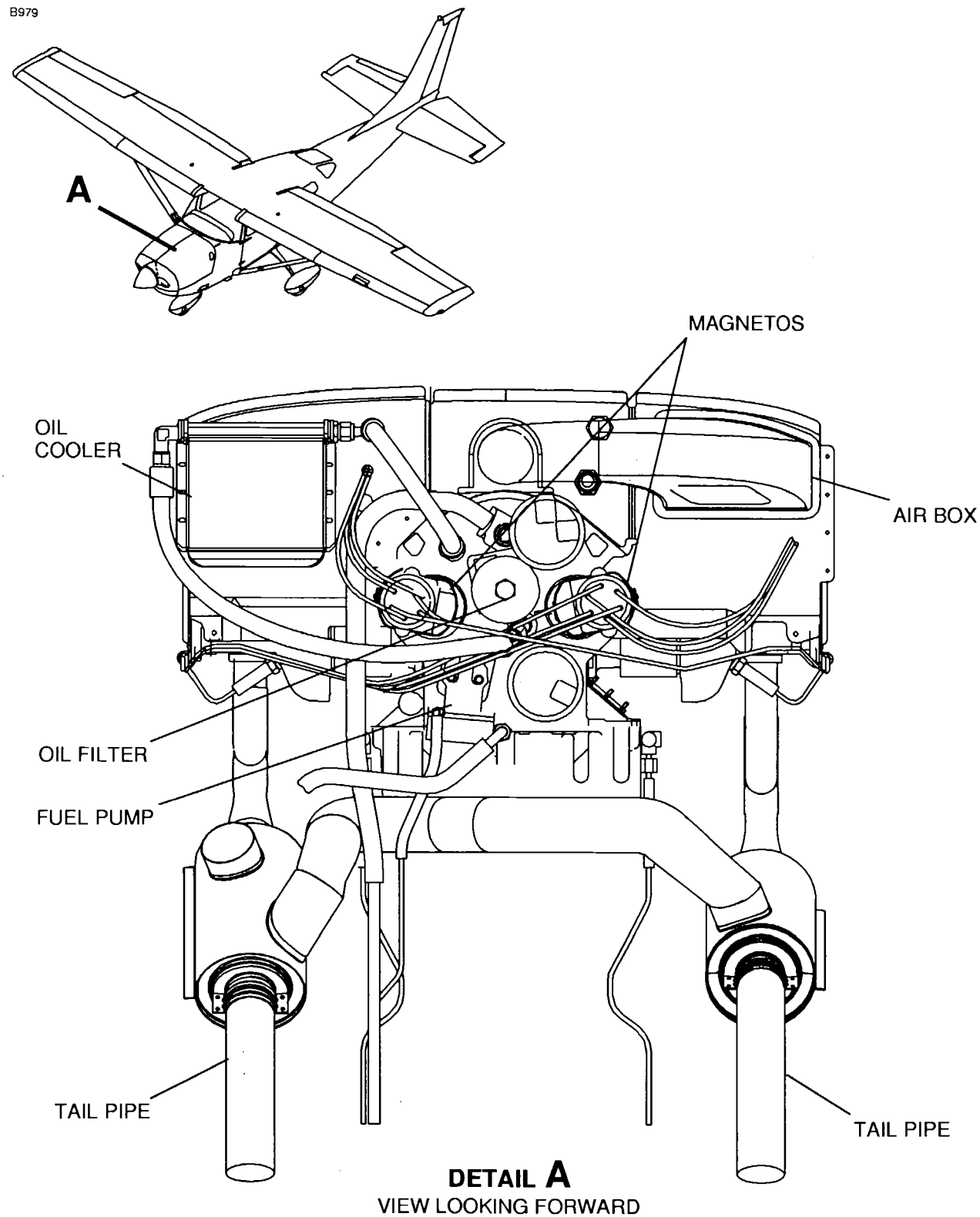
Engine Installation
Figure 1 (Sheet 2)



DETAIL A
VIEW LOOKING FORWARD

1210T1001
A1250T1002

Engine Installation
Figure 1 (Sheet 3)

ENGINE - TROUBLESHOOTING

1. Troubleshooting Chart

A. The following chart has been provided to aid maintenance technicians in system troubleshooting. This chart should be used in conjunction with Chapter 74, Ignition System - Troubleshooting, to provide a comprehensive look at solutions to engine problems. For information beyond the scope of this chapter, refer to applicable engine manuals and publications listed in Introduction, List of Manufacturers Technical Publications.

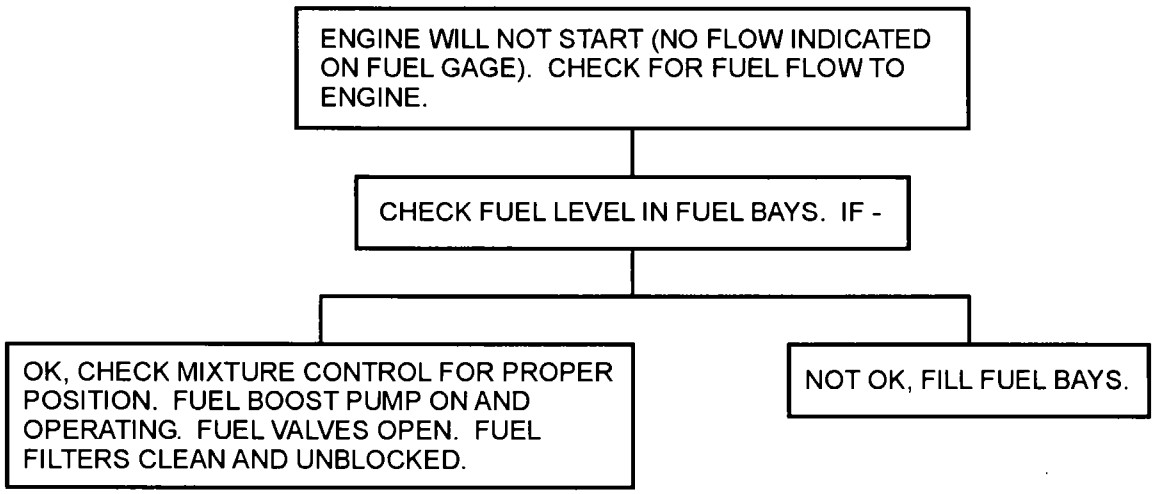
NOTE: If low power is suspected, the following static runup procedures may by used in conjunction with the troubleshooting chart to develop a diagnosis:

B. Static Runup Procedures.
(1) Align airplane 90 degrees to the right of wind direction.
(2) Run up engine at full throttle in accordance with procedures outlined in the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.
(3) Record RPM.
(4) Realign airplane 90 degrees to the left of wind direction and perform second runup.
(5) Record RPM from second runup.
(6) Average the results of the RPM obtained on the two runups. RPM should be within 50 RPM of 2675 RPM (206) and within 50 RPM of 2475 RPM (T206).

NOTE: Variances in atmospheric pressure, temperature and humidity can have a significant impact on runup RPM. Low static runup RPM information should be used only in conjunction with other troubleshooting procedures to determine if a problem actually exists.

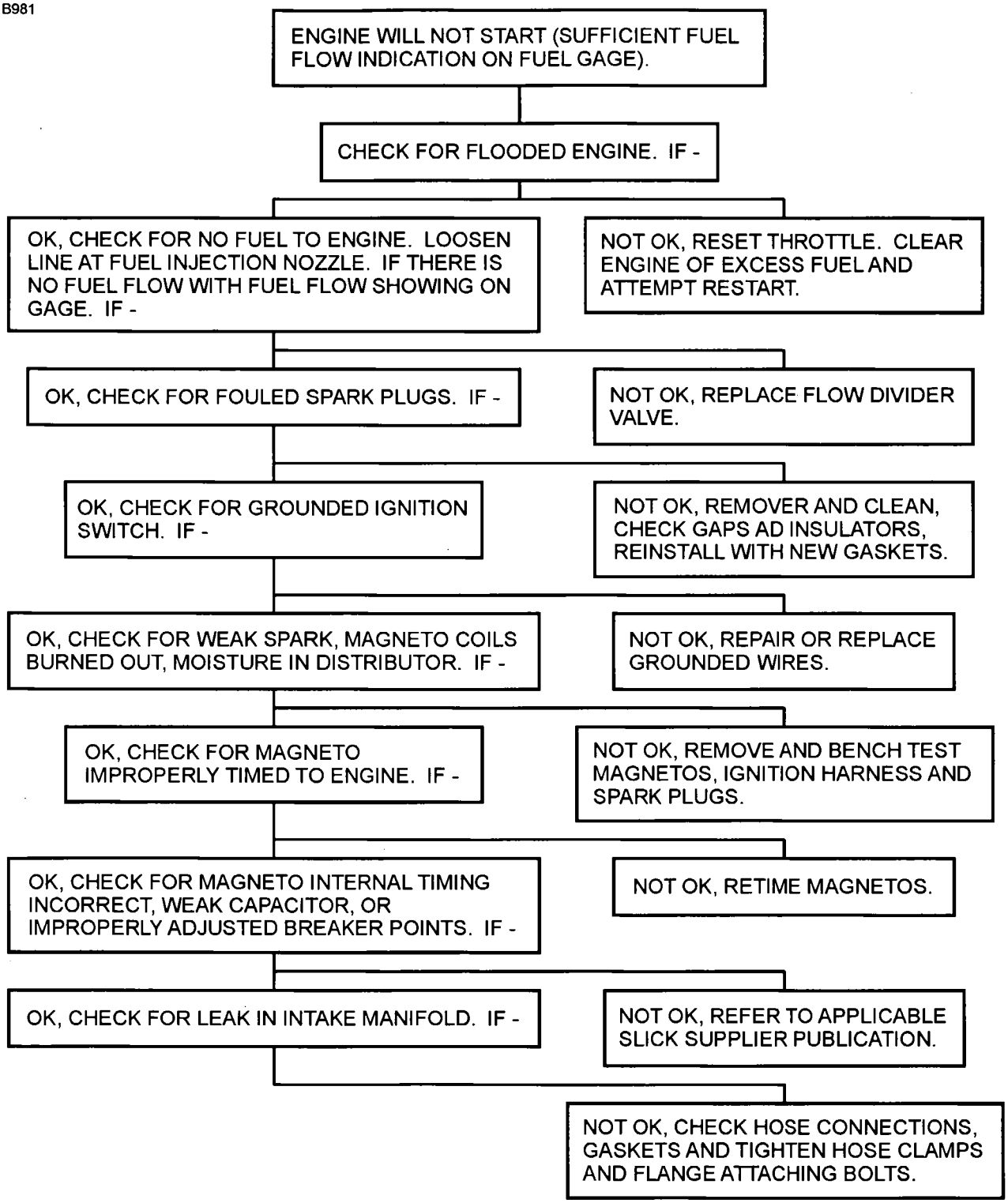
(7) If runup indicates low power, check the following items:
(a) Check operation of alternate air door and ensure door remains closed in normal operation.
(b) Check magneto timing, spark plugs and ignition harness for settings and condition.
(c) Check fuel injection nozzles for restriction and check for correct unmetered fuel flow.
(d) Check condition of induction air filter. Clean or replace as required.
(e) Perform engine compression check.

B980



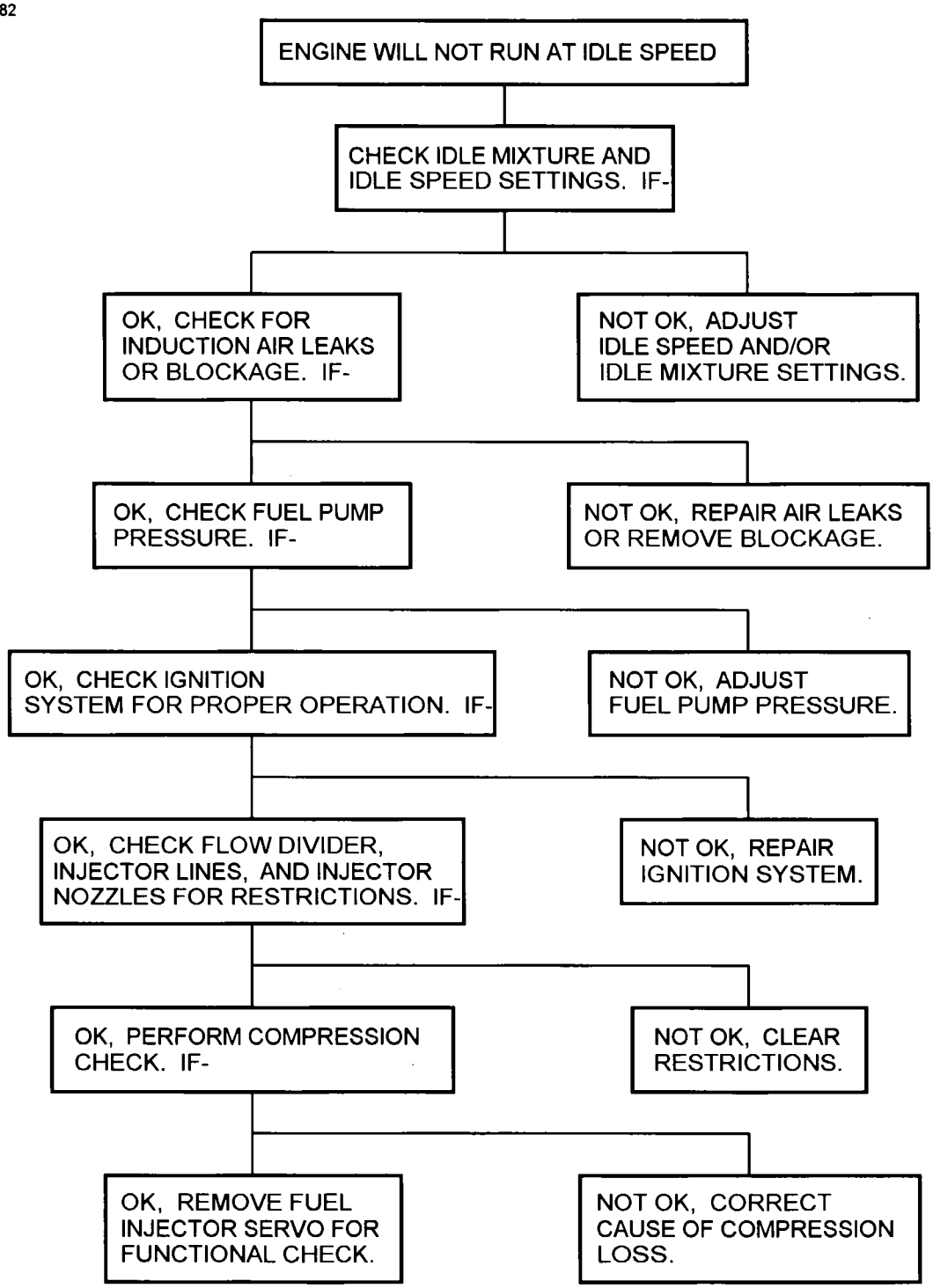
Engine Troubleshooting Chart
Figure 101 (Sheet 1)

B981



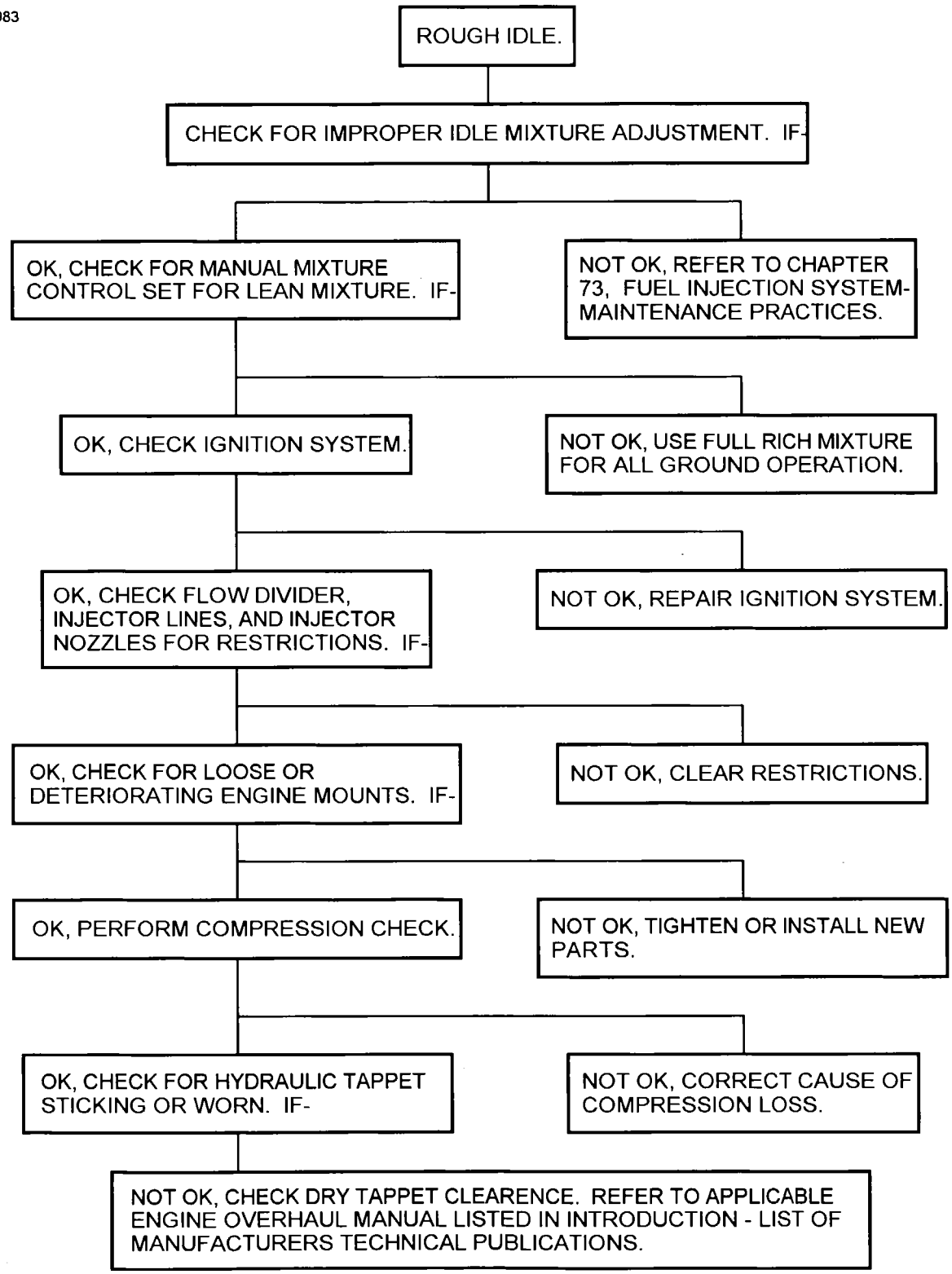
Engine Troubleshooting Chart
Figure 101 (Sheet 2)

B982



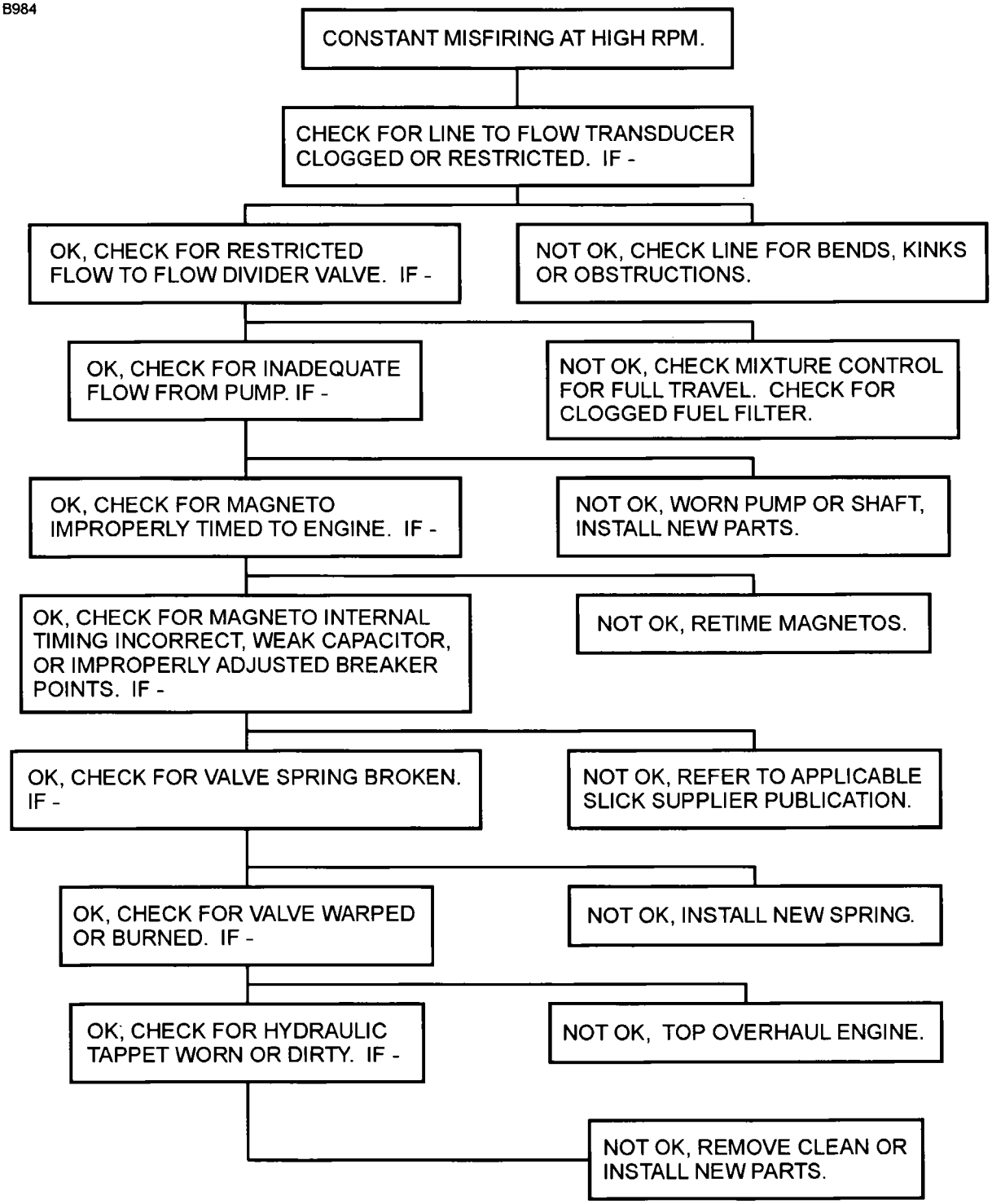
Engine Troubleshooting Chart
Figure 101 (Sheet 3)

B983



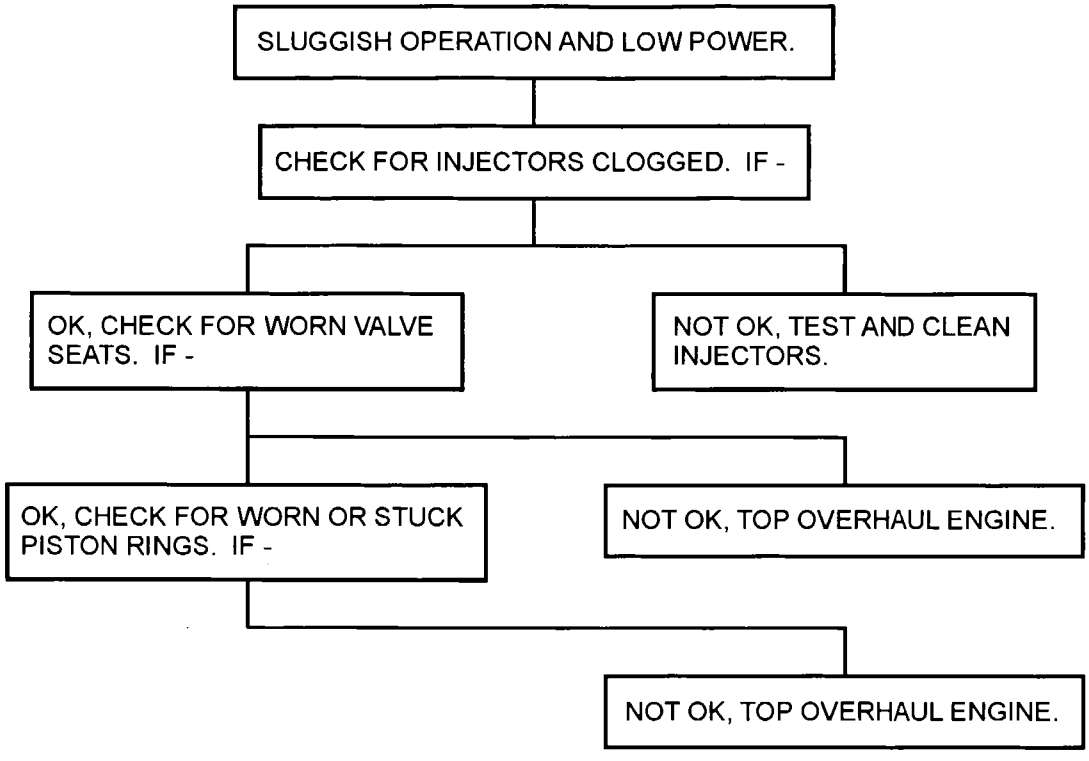
Engine Troubleshooting Chart
Figure 101 (Sheet 4)

B984



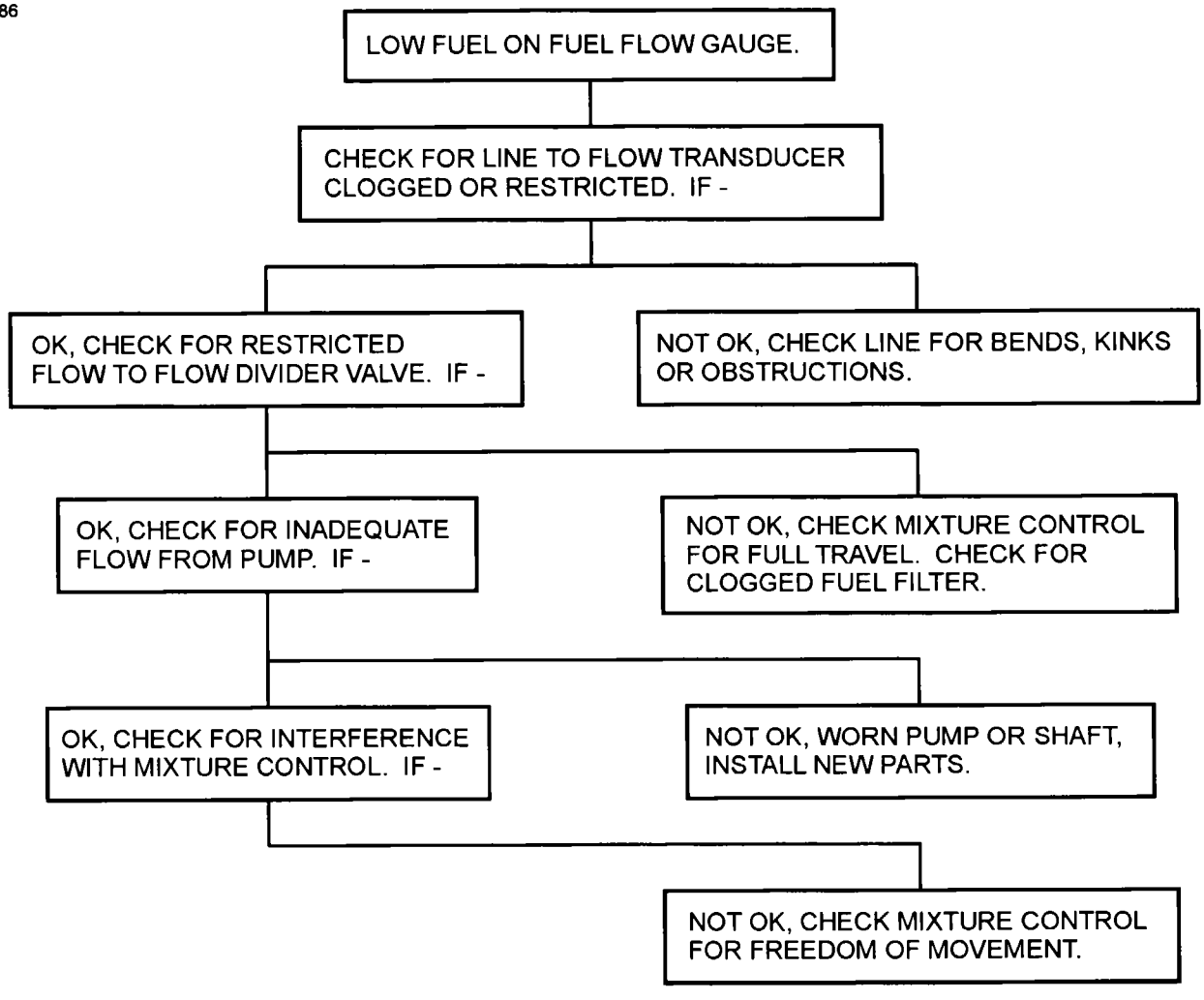
Engine Troubleshooting Chart
Figure 101 (Sheet 5)

B985



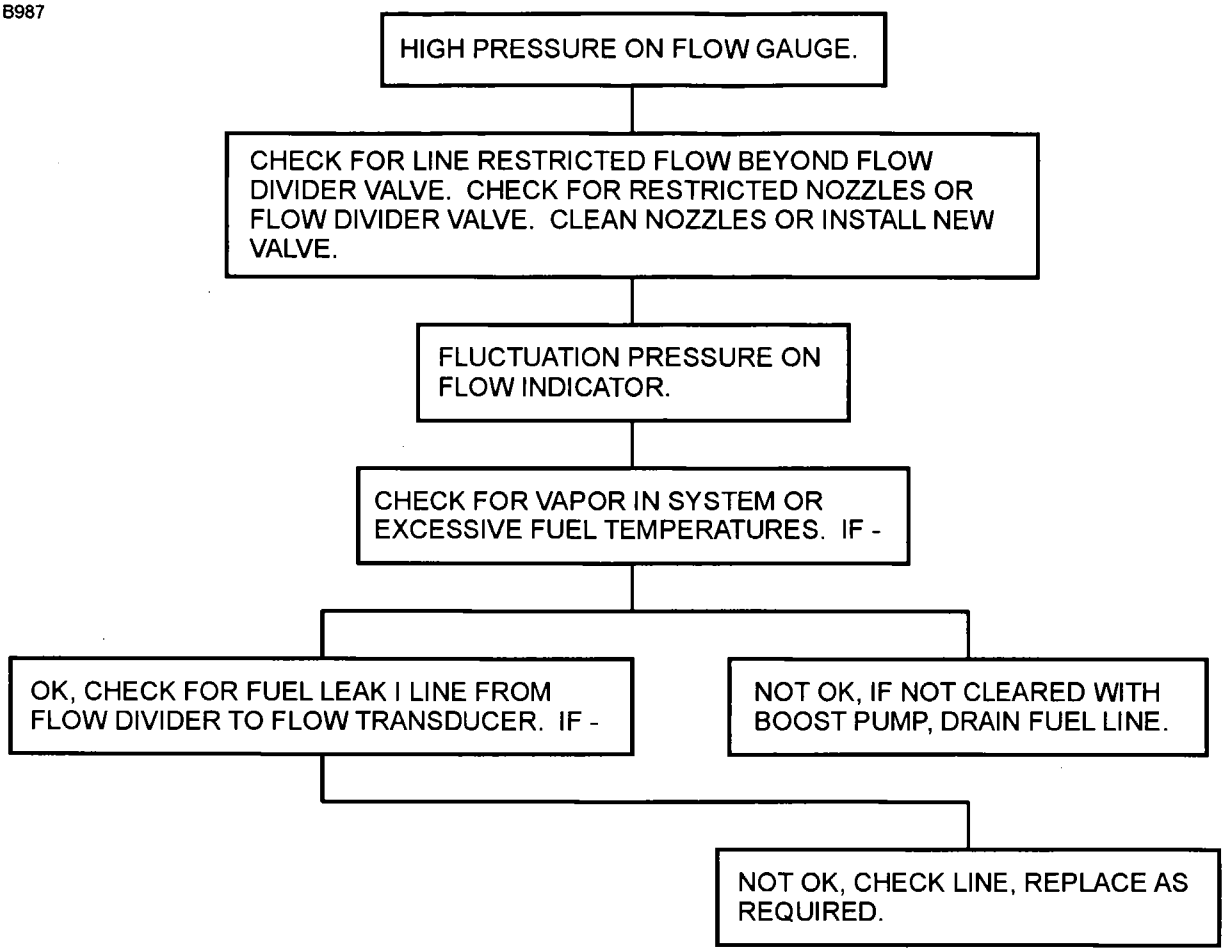
Engine Troubleshooting Chart
Figure 101 (Sheet 6)

B986



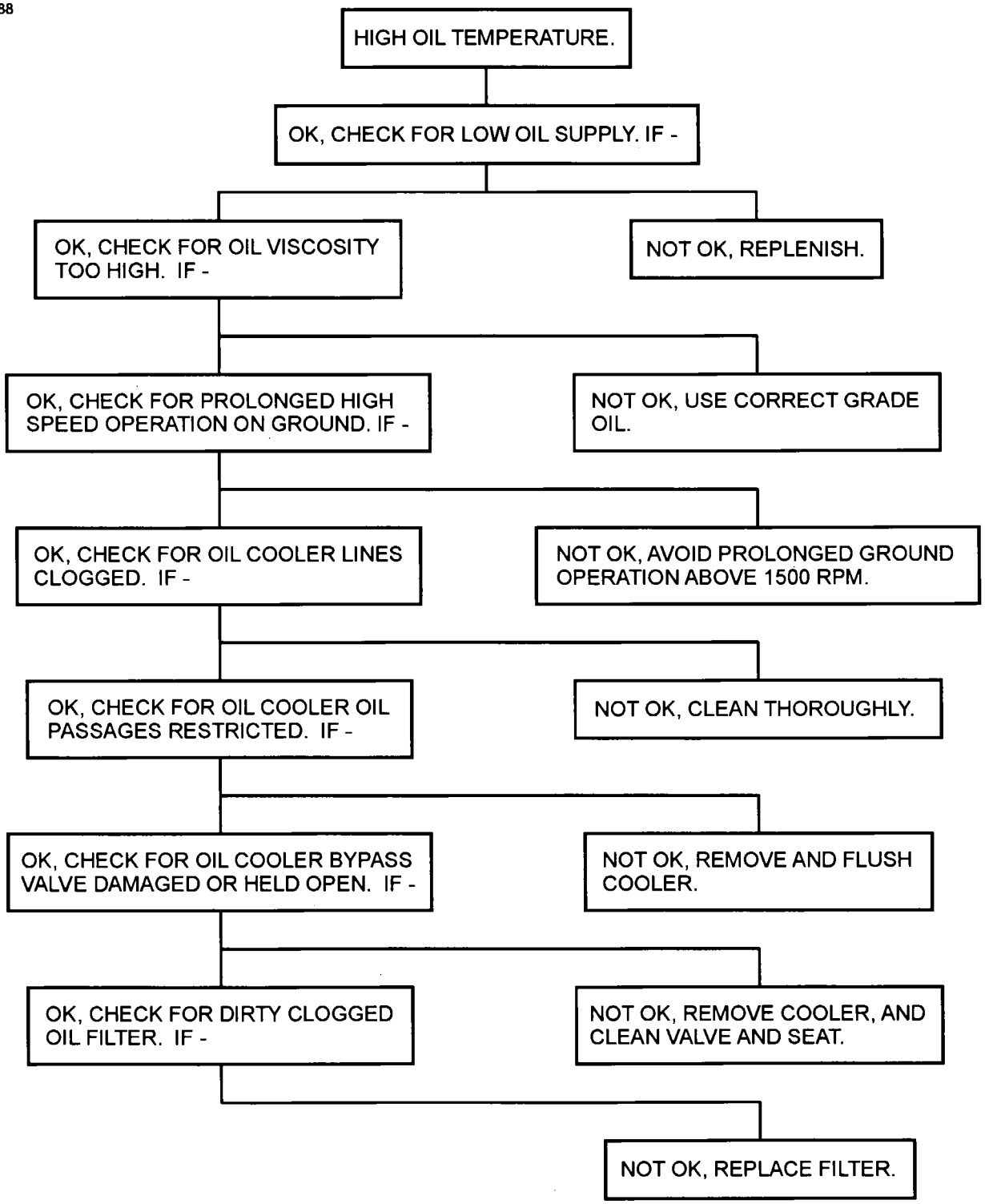
Engine Troubleshooting Chart
Figure 101 (Sheet 7)

B987



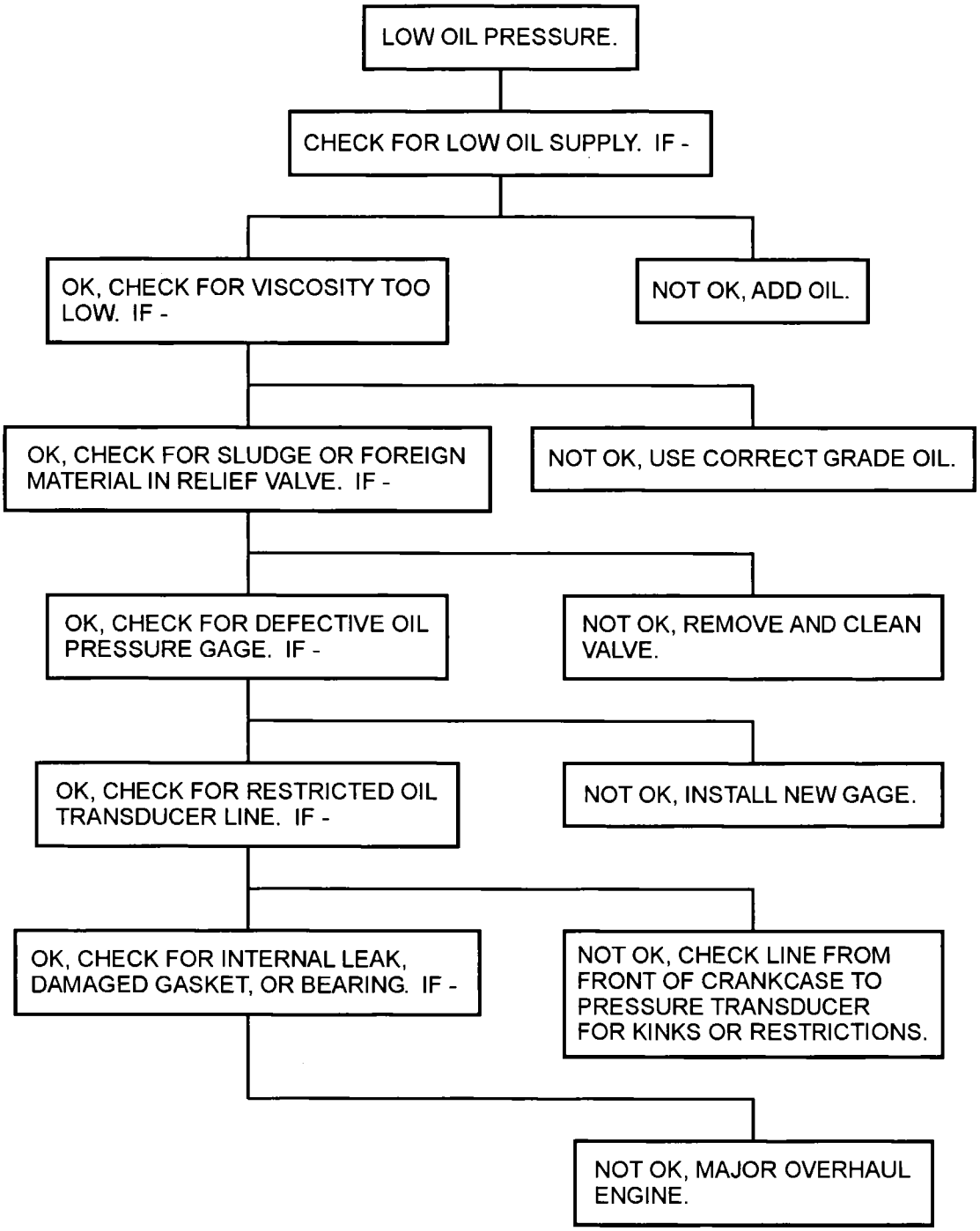
Engine Troubleshooting Chart
Figure 101 (Sheet 8)

B988



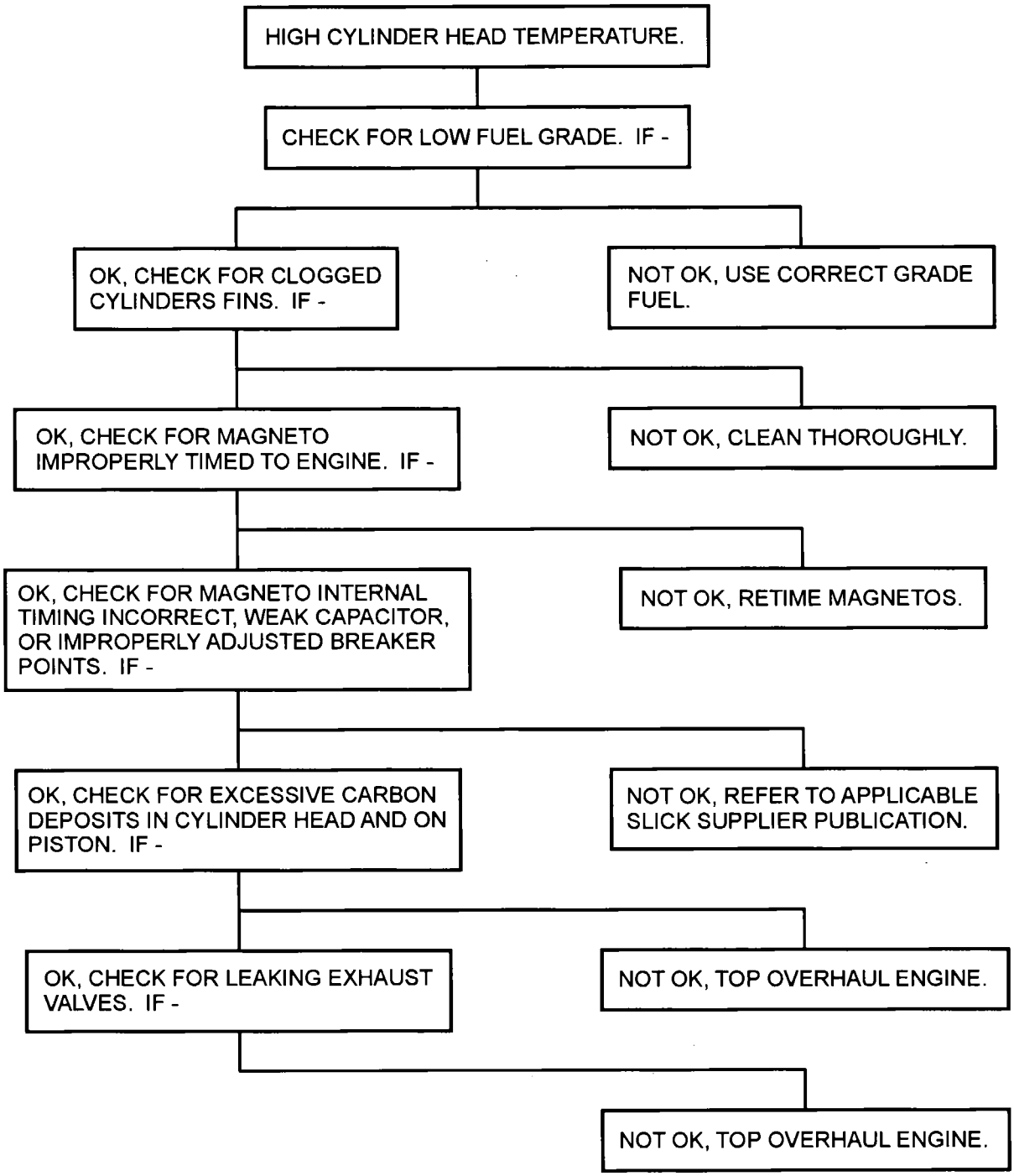
Engine Troubleshooting Chart
Figure 101 (Sheet 9)

B989



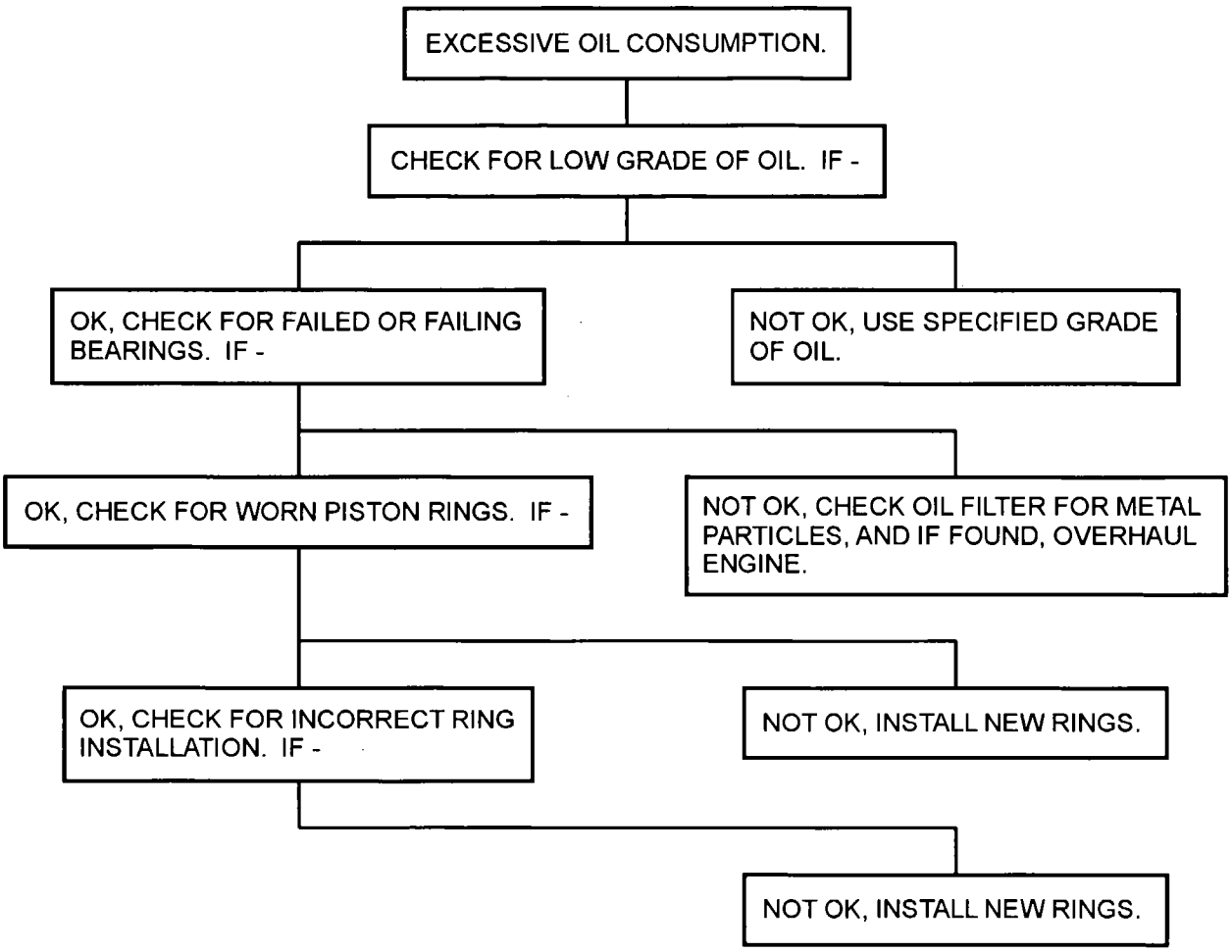
Engine Troubleshooting Chart
Figure 101 (Sheet 10)

B990



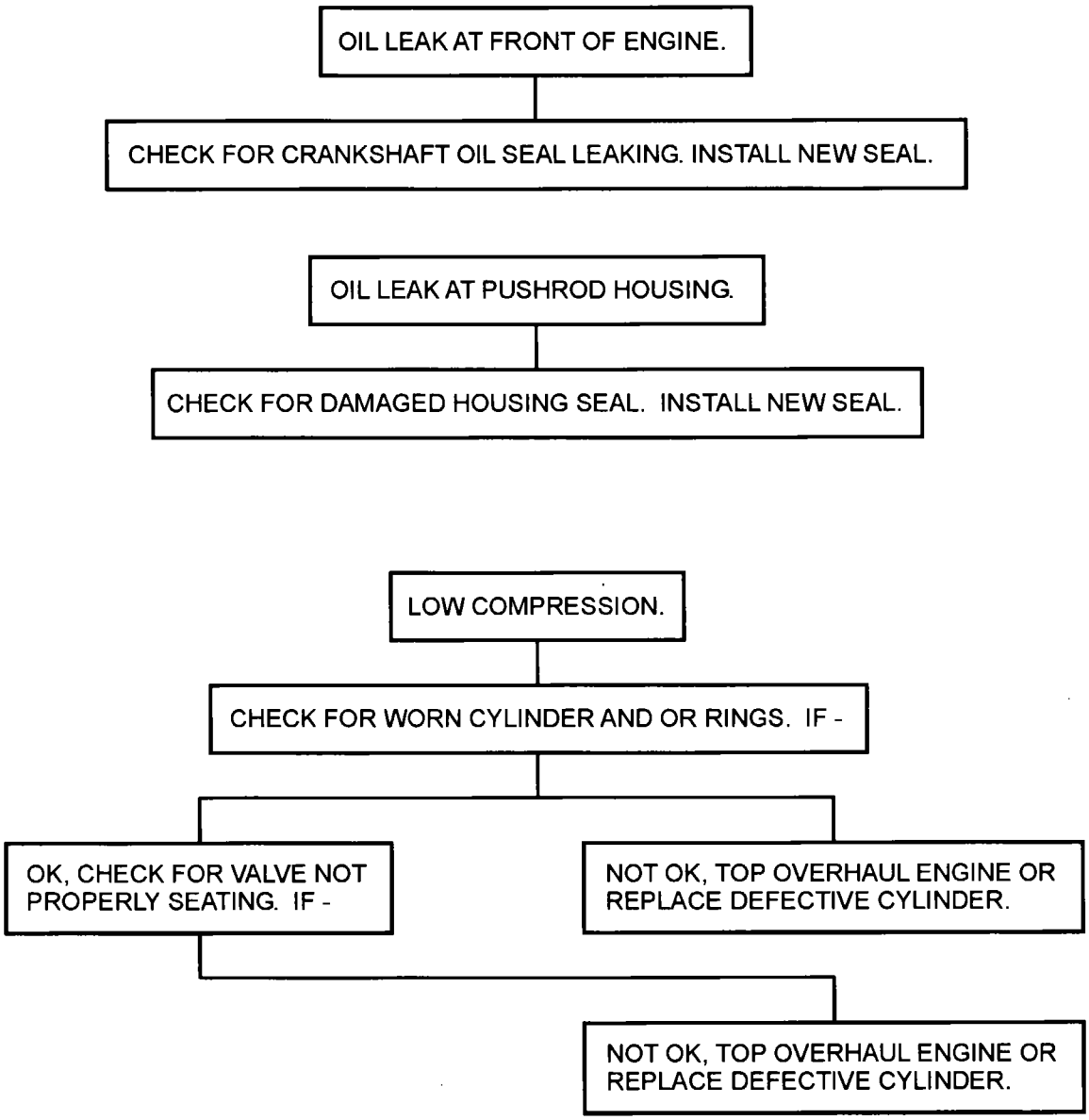
Engine Troubleshooting Chart
Figure 101 (Sheet 11)

B991



Engine Troubleshooting Chart
Figure 101 (Sheet 12)

B992



Engine Troubleshooting Chart
Figure 101 (Sheet 13)

ENGINE - MAINTENANCE PRACTICES

1. General

A. This section provides instructions to remove and install the engine. For maintenance beyond the scope of this chapter, refer to applicable engine publications which are listed in Introduction - List of Manufacturers Technical Publications.

2. Engine Removal/Installation

A. Remove Engine.
(1) Place all cabin switches and the fuel shutoff valve in the OFF position.
(2) Remove engine cowling.
(3) Disconnect positive and negative battery leads from battery.
(4) Loosen C-clamp securing flexible duct to nose cap. Remove flexible duct from nose cap.
(5) Loosen C-clamp securing flexible duct to firewall-mounted heater valve. Remove flexible duct from heater valve.
(6) On turbocharged airplanes, loosen clamp securing induction duct to turbocharger. Remove duct from turbocharger.

WARNING: Disconnecting the P-lead wire from the magnetos will remove the electrical ground from the magneto circuit, resulting in hot magnetos. A separate ground wire must be run to the magnetos or the high tension wires removed from the spark plugs to prevent accidental engine start when the propeller is rotated.

(7) Disconnect P lead wires on magnetos.
(8) Remove propeller governor. Refer to Chapter 61, Propeller Governor - Maintenance Practices.
(9) Disconnect electrical connector from EGT Probe (on non-turbocharged airplanes) or disconnect electrical connector from TIT Probe (on turbocharged airplanes).
(10) Disconnect electrical terminal from CHT probe.
(11) Disconnect fuel outlet line at the fuel strainer.
(12) Disconnect throttle and mixture cables at fuel/air control unit. Note position of washers and spacers for later reassembly.
(13) Disconnect throttle and mixture cables from cable attach bracket by removing screws, washers and nuts securing retaining clamps.
(14) On turbocharged airplanes, disconnect and cap oil lines from controller assembly.
(15) Disconnect drain lines and vent tubes.
(16) Disconnect vacuum hose at firewall connection.
(17) Disconnect manifold pressure line at firewall.
(18) On turbocharged airplanes, disconnect manifold pressure line (from induction plenum) and upper deck pressure line (from induction elbow) from the controller assembly.
(19) Disconnect and label electrical wires on vacuum switches.
(20) Loosen and remove tachometer drive cable clamps in engine area. Disconnect tachometer drive cable from rear of accessory case.
(21) Cut tie wraps (sta straps) securing the various wire bundles to the engine.
(22) Loosen and remove clamp securing starter and alternator wires to forward baffle.
(23) Remove starter wires from starter.
(24) Remove alternator wires from alternator.
(25) Loosen and remove clamp securing starter and alternator wires to forward baffle.
(26) Disconnect ground wire from engine mount.
(27) Disconnect electrical connector from fuel pressure transducer (on non-turbocharged airplanes) or disconnect electrical connector from fuel flow transducer and electrical connector from upper deck pressure transducer (on turbocharged airplanes).
(28) Disconnect electrical connector from low oil pressure switch.
(29) Disconnect electrical connector from oil pressure transducer.

(30) Disconnect electrical terminal from oil temperature sensor.
(31) Place stand under tail tie-down to allow for tail heavy condition, which will occur when engine is removed from airframe.
(32) Attach hoist to lifting strap on top of engine. Begin to take up engine weight using hoist.
(33) Remove bolts attaching engine shock mounts to engine mount assembly. Slowly raise engine using hoist until engine is free of structure.

B. Install Engine and Mount.
(1) Hoist engine into position and secure using hardware removed in above steps. Refer to Engine Mount - Maintenance Practices.
(2) Torque engine shock mount nuts from 450 to 500 inch- pounds.
(3) Remove stand from under tail tie-down.
(4) Connect electrical terminal to oil temperature sensor.
(5) Connect electrical connector to oil pressure transducer.
(6) Connect electrical connector to low oil pressure switch.
(7) Connect electrical connector to fuel pressure transducer, or on turbo charged airplanes connect electrical connector to fuel flow transducer and electrical connector to upper deck pressure transducer.
(8) Connect ground wire to engine mount.
(9) Secure starter wires and alternator wires to forward baffle using clamp.
(10) Install alternator wires to alternator.
(11) Install starter wires to starter.
(12) Secure various wire bundles to engine using tie wraps (sta straps).
(13) Connect tachometer drive cable to back of accessory case. Torque drive shaft to 100 inch-pounds.
(14) Reconnect tagged wires to respective vacuum switches.
(15) Reconnect vacuum line to firewall connection.
(16) Reconnect manifold pressure line at firewall.
(17) On turbocharged airplanes, connect manifold pressure (from induction plenum) and upper deck pressure (from induction elbow) lines from the controller assembly.
(18) Position throttle and mixture control cables on cable attach bracket. Install retaining clamp and secure, using screws, washers and nuts.
(19) Connect throttle and mixture control cables to fuel/air control unit.
(20) Reconnect fuel outlet line at the fuel strainer.
(21) Connect electrical connector to EGT Probe (on non- turbocharged airplanes) or connect electrical connector to TIT Probe (on turbocharged airplanes).
(22) Connect electrical terminal to CHT probe.
(23) Install propeller governor. Refer to Chapter 61, Propeller Governor - Maintenance Practices.
(24) Reconnect P leads to magnetos. If required, reconnect high tension wires to spark plugs.
(25) Connect flexible duct to firewall-mounted heater valve.
(26) Connect flexible duct to nose cap inlet.
(27) On turbocharged airplanes, install clamp securing induction duct to turbocharger.
(28) Check all controls and lines for security of installation and freedom of movement. Ensure all fuel fittings are tight and leak-free.
(29) Reconnect positive and negative leads to battery.
(30) Reinstall engine cowling.

3. Engine Cleaning

A. The engine may be cleaned using stoddard solvent or equivalent chemicals. Care should be taken to ensure that all openings are capped or plugged to prevent solvent entry into engine. All electrical accessories (starters, alternators, etc.) should be covered before cleaning solvent is applied.

4. Engine Storage

A. If the engine is being removed for storage purposes, it may need to be preserved. Refer to Chapter 10, Storage - Description and Operation, for preservation techniques.

COWLS - MAINTENANCE PRACTICES

1. Description and Operation

A. The engine cowl consists of upper sheet metal halves (also, on turbocharged airplanes, a removable lower right side cowl) and left and right composite nose cap. The cowl is attached using quick-release, quarter turn fasteners to allow for easy removal and installation. The nose pieces are attached to each other using screws and nutplates.

2. Cowl Removal/Installation

A. Remove Cowl (Refer to Figure 201).
(1) Release quick- release fasteners around perimeter of left and right upper cowl.
(2) Remove left and right upper cowls.
(3) Remove screws securing left nose cap assembly from right nose cap assembly.
(4) Remove screws securing left and right nose cap assemblies to lower cowl.
(5) Remove nose cap assemblies.
(6) On turbocharged airplanes, remove screws around sides and bottom of lower right cowl.
(7) Remove lower right cowl.

B. Install Cowl (Refer to Figure 201).
(1) On turbocharged airplanes, install lower right cowl to engine area and secure using screws.
(2) Attach left nose cap to right nose cap and lower cowl using screws.
(3) Install left and right upper cowls to engine area and secure using quick-release fasteners.

3. Cowl Repair

A. For repair procedures to the cowl, refer to the Single Engine Models 172,172, 206H/T206H 1996 and On Structural Repair Manual.

4. Cowl Flap Removal/Installation

A. Remove Cowl Flap (Refer to Figure 202).
(1) Place cowl flap control lever in the OPEN position.
(2) Disconnect cowl flap control clevises from cowl flap shock mounts.
(3) Remove safety wire securing hinge pins to cowl flaps, pull hinge pins and remove cowl flaps.

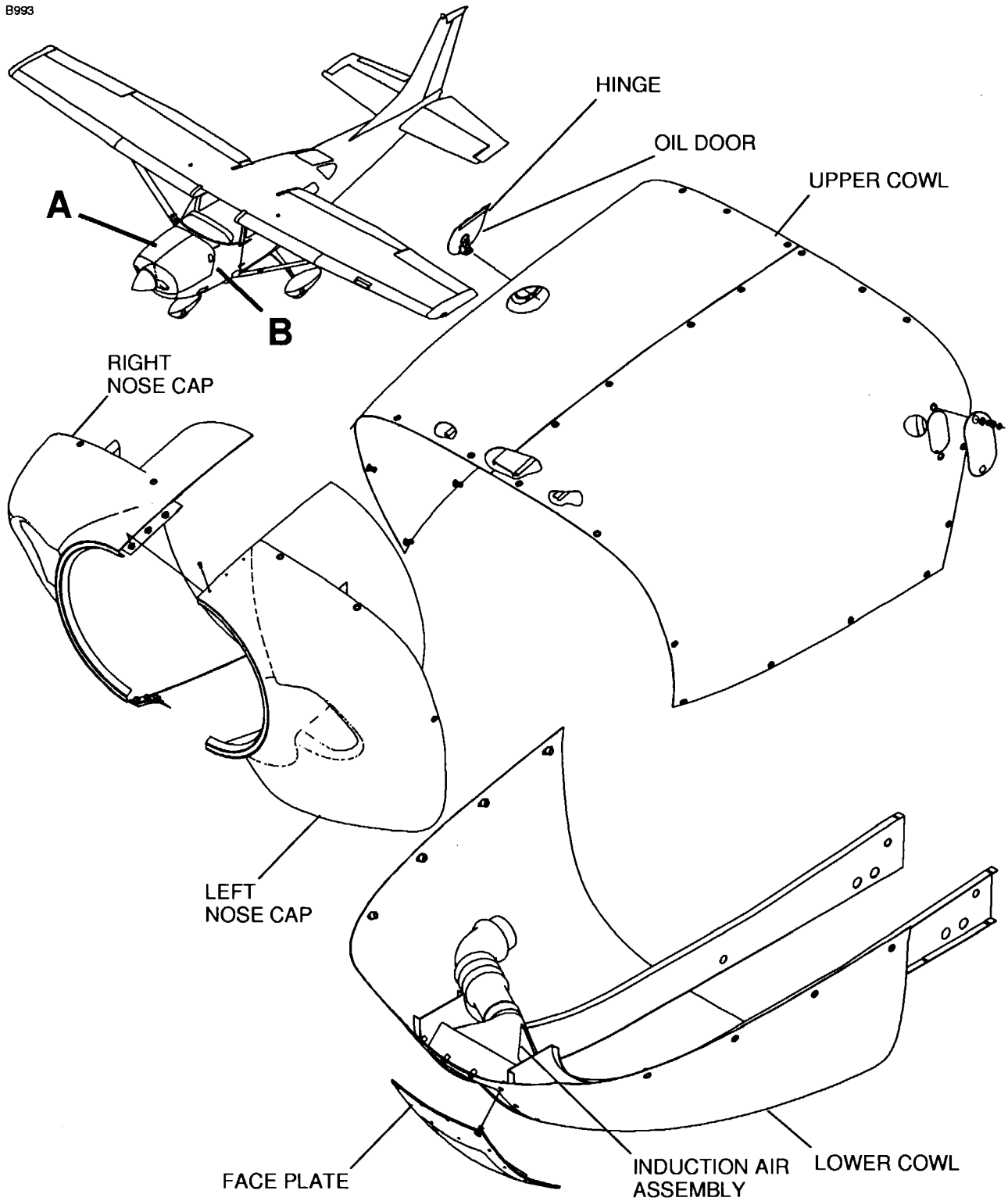
B. Install Cowl Flap (Refer to Figure 202).
(1) Install cowl flaps using hinge pins. Secure hinge pins to cowl flaps using safety wire.
(2) Connect cowl flap control clevises to cowl flap shock mounts.
(3) Rig cowl flaps, if necessary.

5. Cowl Flap Rigging (206H)

A. Rig Cowl Flap (Refer to Figure 202).
(1) Disconnect cowl flap control clevises from cowl flap shock mounts.
(2) Check to make sure that the flexible controls reach their internal stops in each direction. Mark controls so that full travel can be readily checked and maintained during the remaining rigging procedures.
(3) Place cowl flap control lever in the CLOSED position. If the control lever cannot be placed in the closed position, adjust controls at upper clevis to position control lever in bottom hole of position bracket.
(4) With the control lever in CLOSED position, hold one cowl flap closed, streamlined with trailing edge of lower cowl. Loosen jam nut and install bolt through clevis and shock-mount.

NOTE: Be sure threads are visible in clevis inspection holes.

(5) Repeat the preceding step for the opposite cowl flap.
(6) When cowl flaps are lowered they should be open 5.50 inches (minimum), and flush closed when measured in a straight line from the aft edge of cowl flap to lower edge of firewall.
(7) Check that all clamps and jam nuts are tight.



DETAIL A

Engine Cowl Installation
Figure 201 (Sheet 1)

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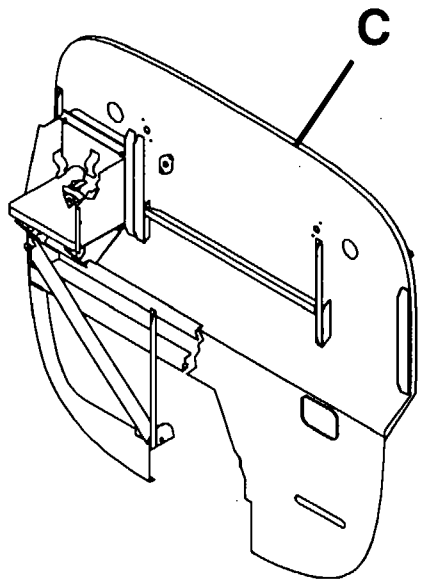
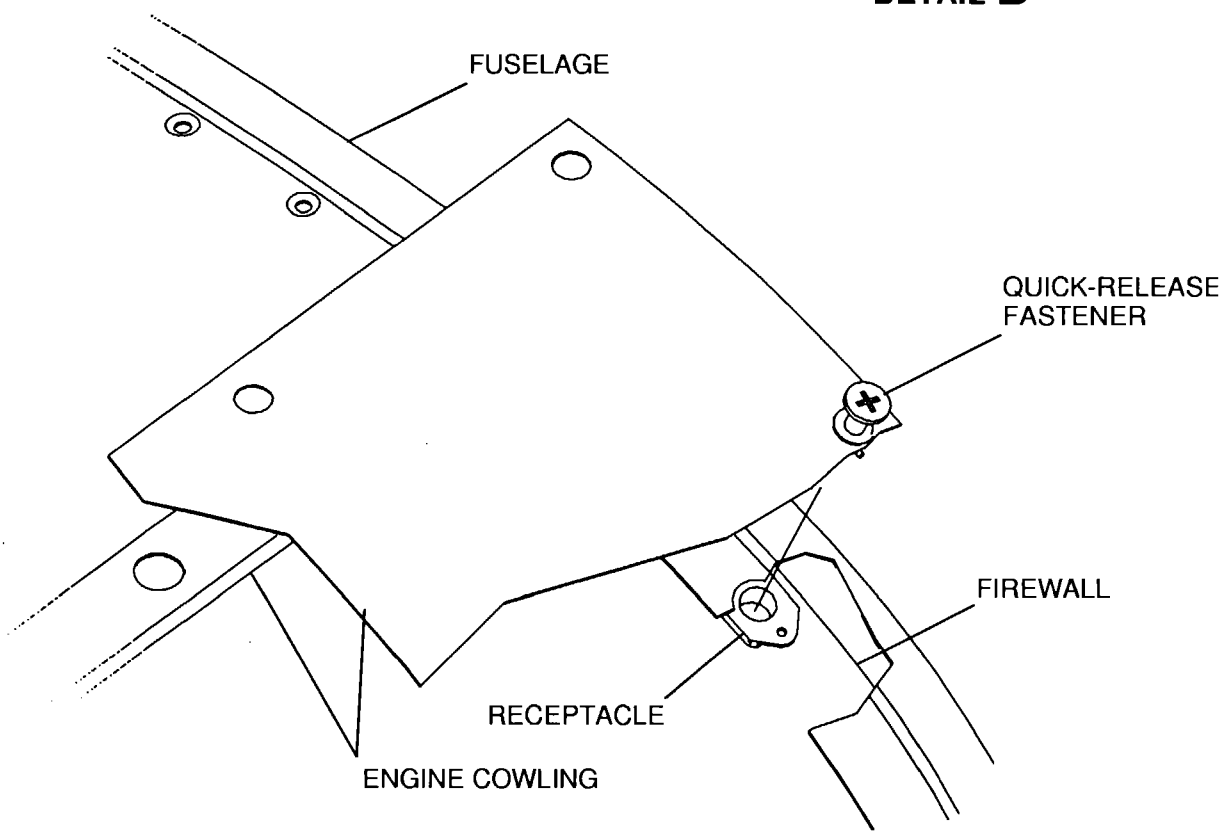


DETAIL B



DETAIL C

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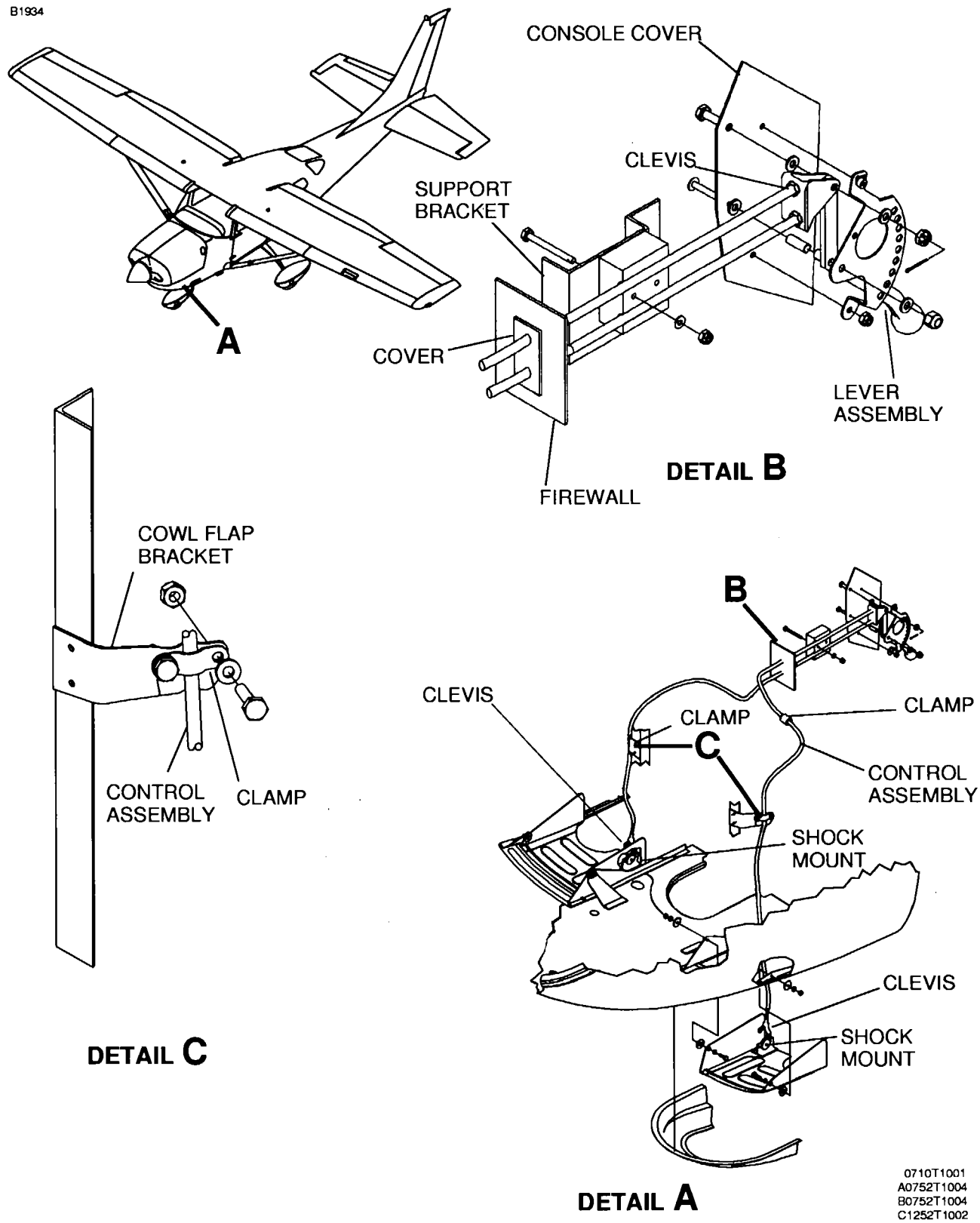
Engine Cowl Installation
Figure 201 (Sheet 2)



Engine Cowl Installation
Figure 202 (Sheet 1)

(8) Check for ease of operation.

6. Cowl Flap Rigging (T206H)

A. Rig Cowl Flap (Refer to Figure 202).
(1) Disconnect cowl flap control clevises from cowl flap shock mounts.
(2) Check to make sure that the flexible controls reach their internal stops in each direction. Mark controls so that full travel can be readily checked and maintained during the remaining rigging procedures.
(3) Place cowl flap control lever in the OPEN position. If the control lever cannot be placed in the open position, adjust controls at upper clevis to position control lever in top hole of position bracket.
(4) Adjust clevis at lower end of control to open cowl flap 7.0 inches (minimum) when in the open position and to remain open 1.0 inches in the closed position. This measurement is made in a straight line from centerline of the aft edge of the cowl flap to the lower edge of the firewall.
(5) Repeat the preceding step for the opposite cowl flap.
(6) If either control needs to be lengthened or shortened, the lower clamp may be loosened and housing slipped in the clamp, or lower clevis may be adjusted.

NOTE: Maintain sufficient thread engagement of clevis.

(7) Check that all clamps and jam nuts are tight.
(8) Check for ease of operation.

NOTE: In all cases, the flexible controls must reach their internal stops in each direction to assure full travel of the controls.

ENGINE MOUNT - MAINTENANCE PRACTICES

1. Description and Operation

A. The engine mount assembly uses four rubber mounts to isolate engine noise and vibration from the engine mount assembly.

2. Engine Mount Procedures

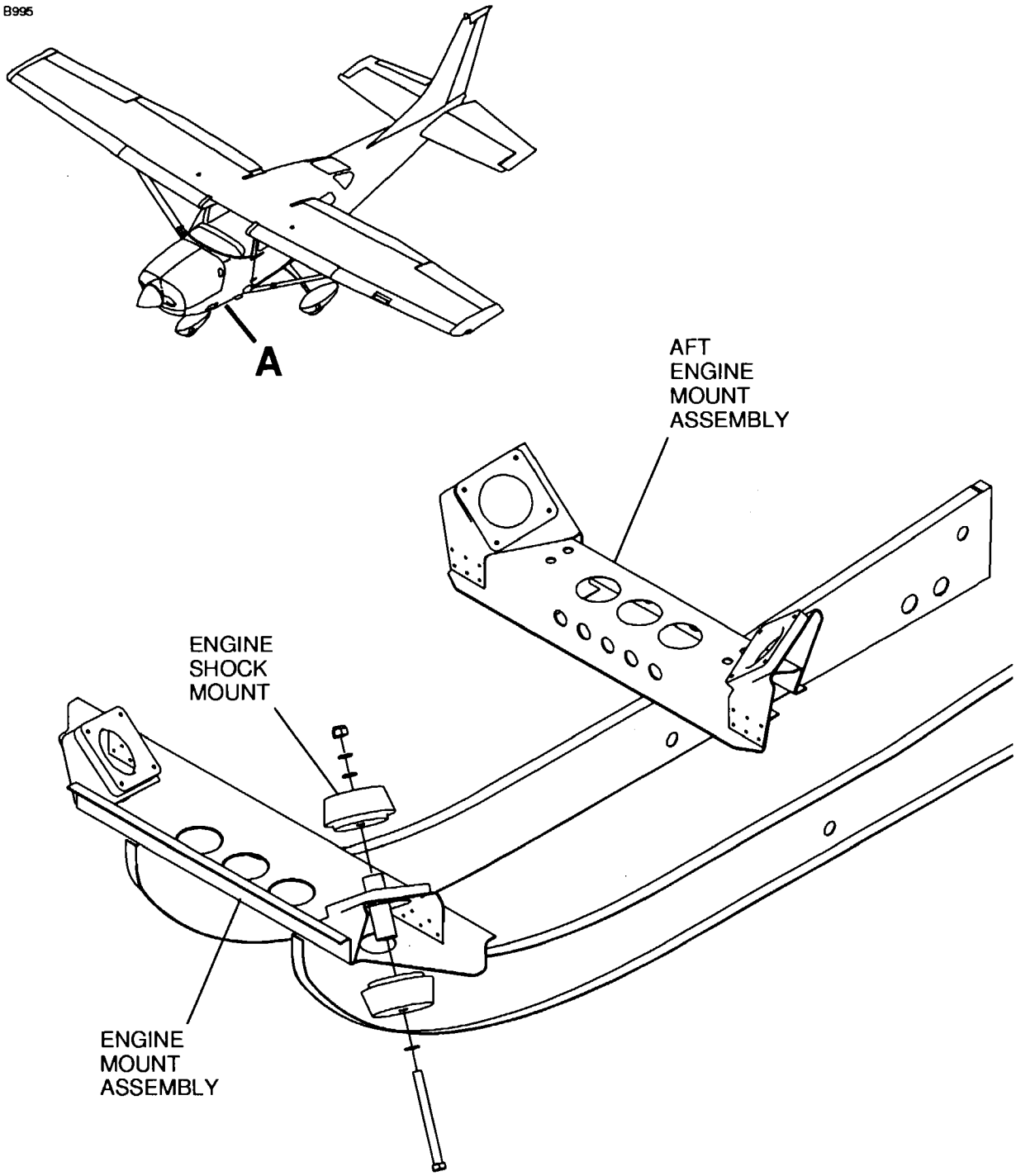
A. Shock Mount Procedures (Refer to Figure 201).

(1) The shock mounts, which connect the engine to the engine mount assembly, are of rubber and metal construction and are assembled in a sandwich to isolate noise and vibration from the cabin area. Shock mounts should be assembled as illustrated in Figure 201. Nuts should be torqued from 450 to 500 inch-pounds upon installation.

NOTE: Take caution to ensure that the bolts are not shanked out.

(2) The shock mounts should never be cleaned with any type of solvent. If shock mounts need cleaning, use a clean, dry cloth.

(3) Shock mounts should be inspected when removed. Metal components should be inspected for cracks and excessive wear due to aging and deterioration. Rubber components should be inspected for separation, swelling, cracking or a pronounced set of the pad. Shock mounts showing any of these signs should be replaced.



DETAIL A

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A1251T1001

Engine Shock Mount Installation
Figure 201 (Sheet 1)

AIR INDUCTION SYSTEM (NON-TURBOCHARGED) - MAINTENANCE PRACTICES

1. Description and Operation

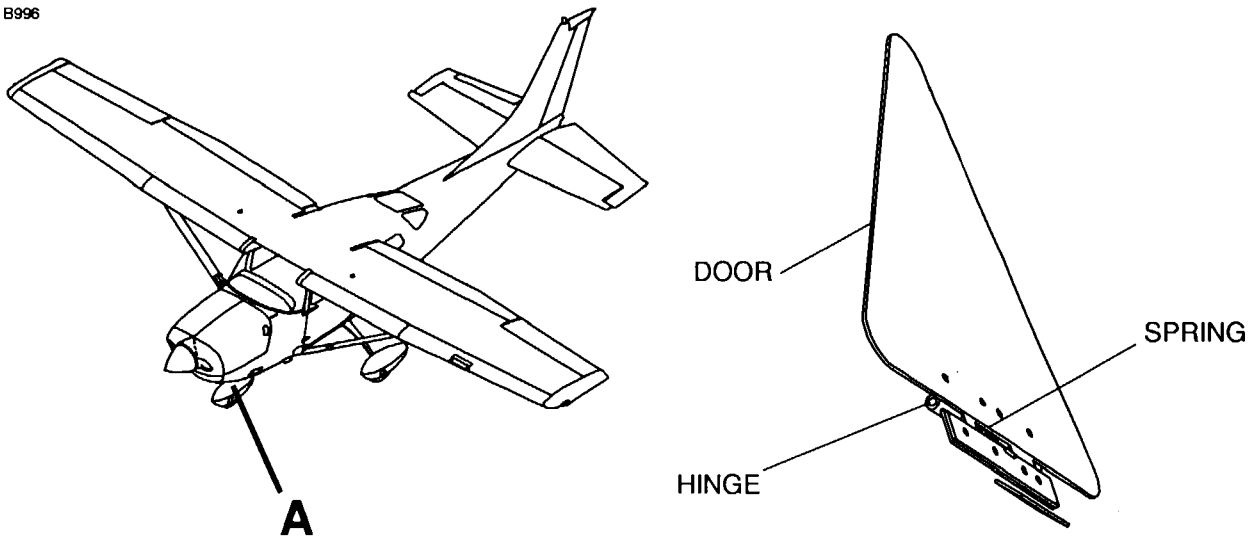
A. Ram air to the engine enters the induction air box through the induction air filter, located on the upper right side of the engine. From the induction air box, the air is directed to the inlet of the fuel/air control unit and, ultimately, through individual intake runners into their respective cylinders.

B. For a more comprehensive description of how the air induction system relates to fuel injection, refer to Chapter 73, Fuel Injection System - Description and Operation.

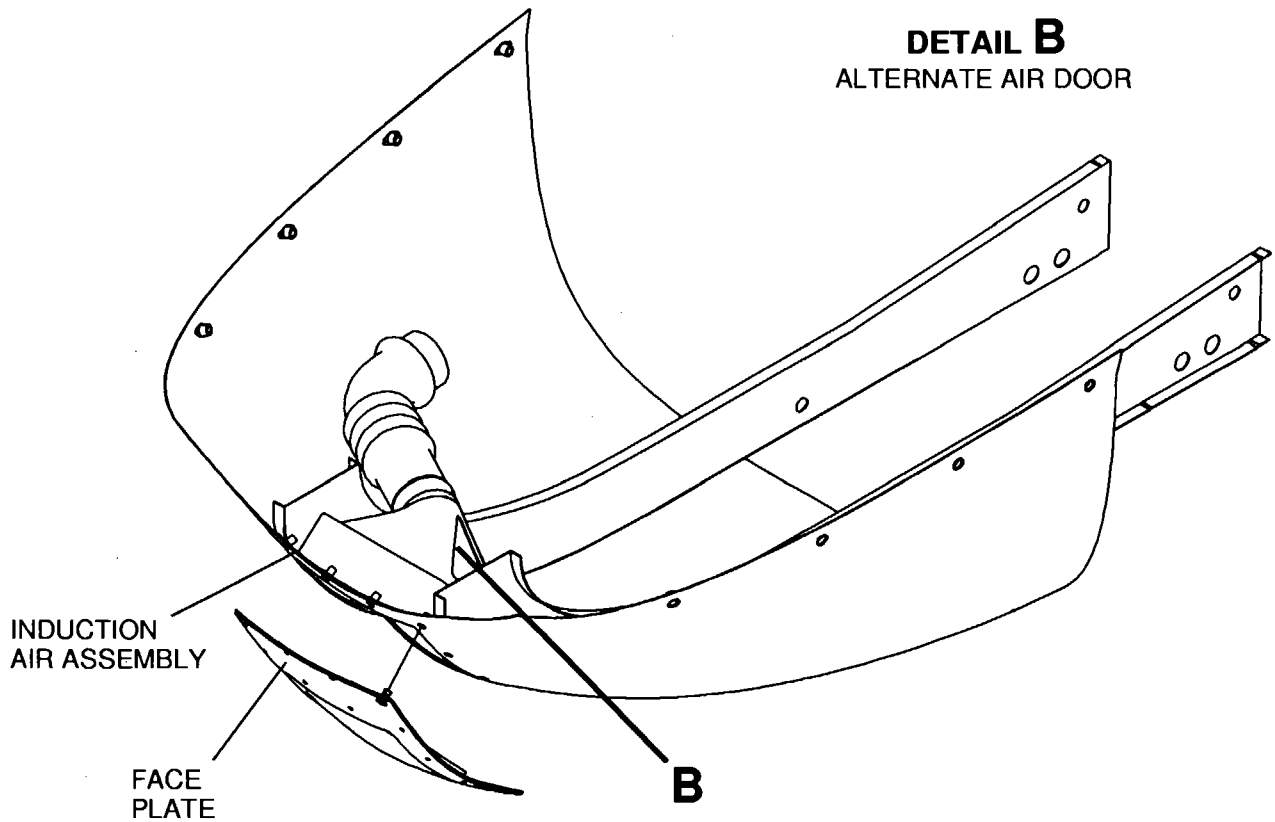
2. Air Induction System Removal/Installation

A. Remove System Components (Refer to Figure 201).
(1) Remove right side of upper cowling. Refer to Cowls - Maintenance Practices.
(2) Remove bolts securing air filter to air box assembly. Remove air filter.
(3) Loosen clamps on induction air box duct to disconnect induction air box from induction air manifold.

B. Install System Components (Refer to Figure 201).
(1) Position induction air box duct to induction manifold and secure using clamps.
(2) Secure air filter to air box assembly using bolts.
(3) Install right side of upper cowling. Refer to Cowls - Maintenance Practices.



DETAIL B
ALTERNATE AIR DOOR



DETAIL A

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Induction Air System
Figure 201 (Sheet 1)

DRAIN LINES - MAINTENANCE PRACTICES

1. Description and Operation

A. Different components in the engine compartment has drain lines to let fluid and/or fumes escape. The drain lines are attached with hose clamps and fittings. The routing of the drain lines are on the left and right sides of the lower cowl. Line removal and installation have clamps, fittings and hoses that are connected together to make the routing. You must examine the drain lines to make sure of the correct routing and condition when you remove and install the components. Some airplanes have an optional cylinder drain can installed. The cylinder drain can is designed to catch the fuel that drains from the engine cylinders at shut down. If a cylinder drain can has not been installed and you want to install one, you must obtain MK206-71-02 for instructions.

2. Drain Line Removal/Installation

NOTE: A non-turbocharged airplane installed with a cylinder drain can, will have one cylinder drain that extends out of the lower left cowl.

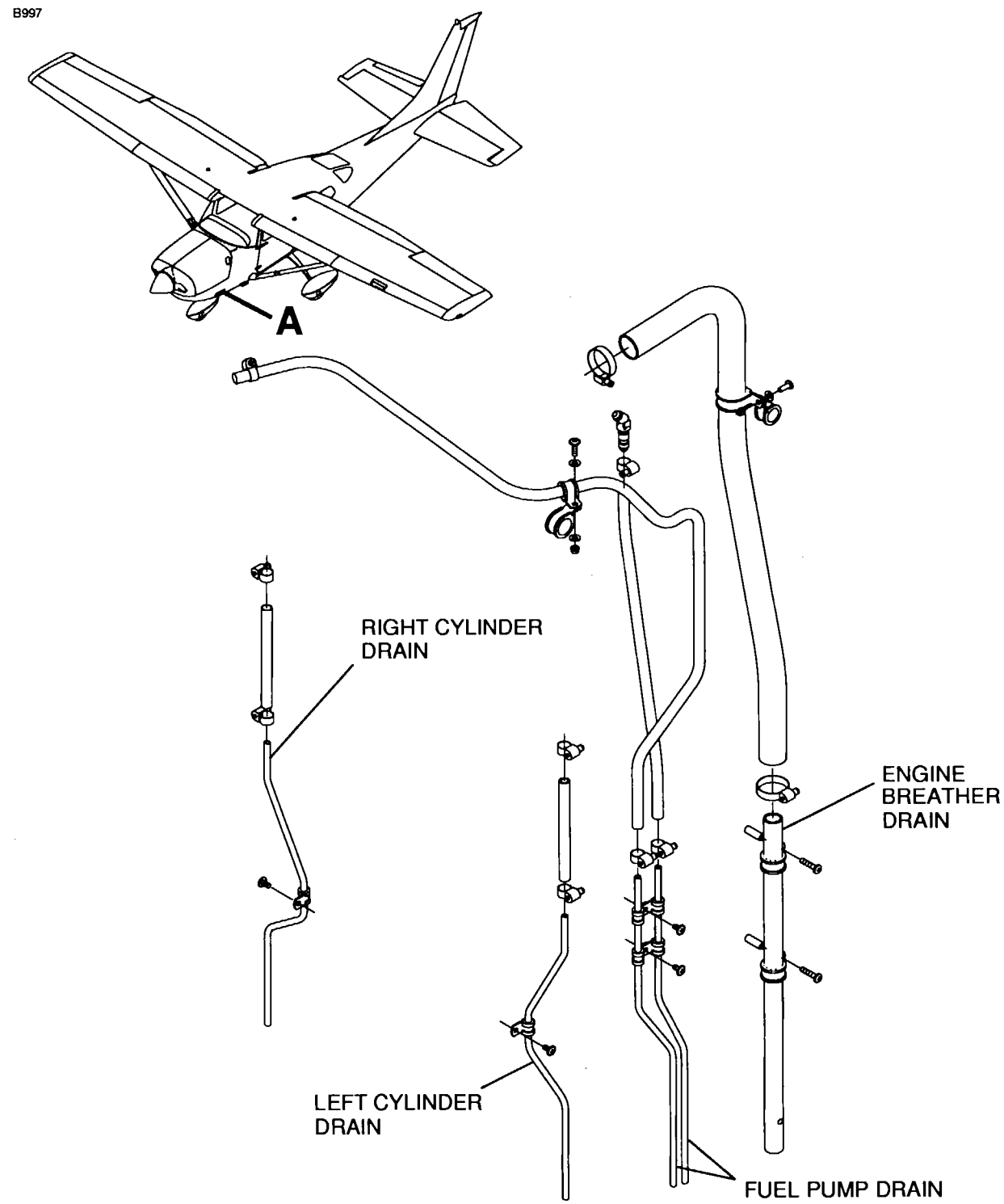
A. Remove the Drain Lines (Refer to Figure 201, Figure 202, Figure 203 or Figure 204).
   (1) Remove the cowls. Refer to Chapter 71, Cowls - Maintenance Practices.
   (2) Remove the applicable clamps, fittings and drain line.

B. Install the Drain Lines.
   (1) Attach the drain lines with the fittings and clamps.
      (a) Make sure of the correct routing and installation of drain lines.
   (2) Install the cowls. Refer to Chapter 71, Cowls - Maintenance Practices.

3. Cylinder Drain Can Removal/Installation

A. Remove the Cylinder Drain Can (Refer to Figure 202for Non-Turbocharged Airplanes or Figure 204 for Turbocharged Airplanes).
   (1) Remove the cowls to get access to the cylinder drain line. Refer to Chapter 71, Cowls - Maintenance Practices.
   (2) Remove the upper and lower clamps that attach the cylinder drain lines to the cylinder drain can.
   (3) Remove the two bolts that attach the cylinder drain can to the engine compartment and remove the cylinder drain can from the airplane.

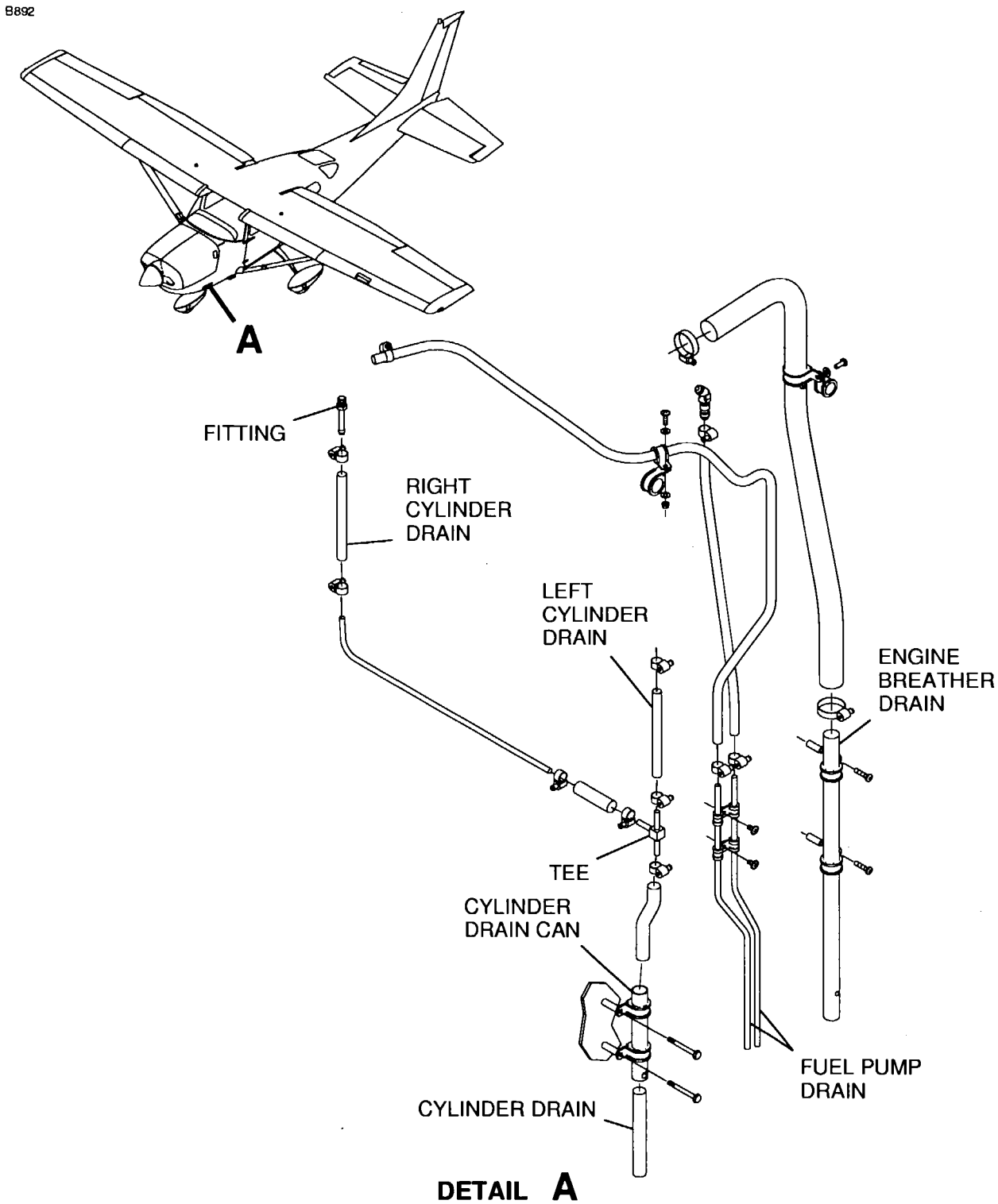
B. Install the Cylinder Drain Can.
   (1) Install with the two bolts the cylinder drain can to the engine compartment.
   (2) Connect the with the two clamps the upper and lower cylinder drain lines to the cylinder drain can.
   (3) Install the cowls. Refer to Chapter 71, Cowls - Maintenance Practices.



DETAIL A

1210T1001
A1250T1012

Non-Turbocharged Engine Drain Line Assembly
Figure 201 (Sheet 1)



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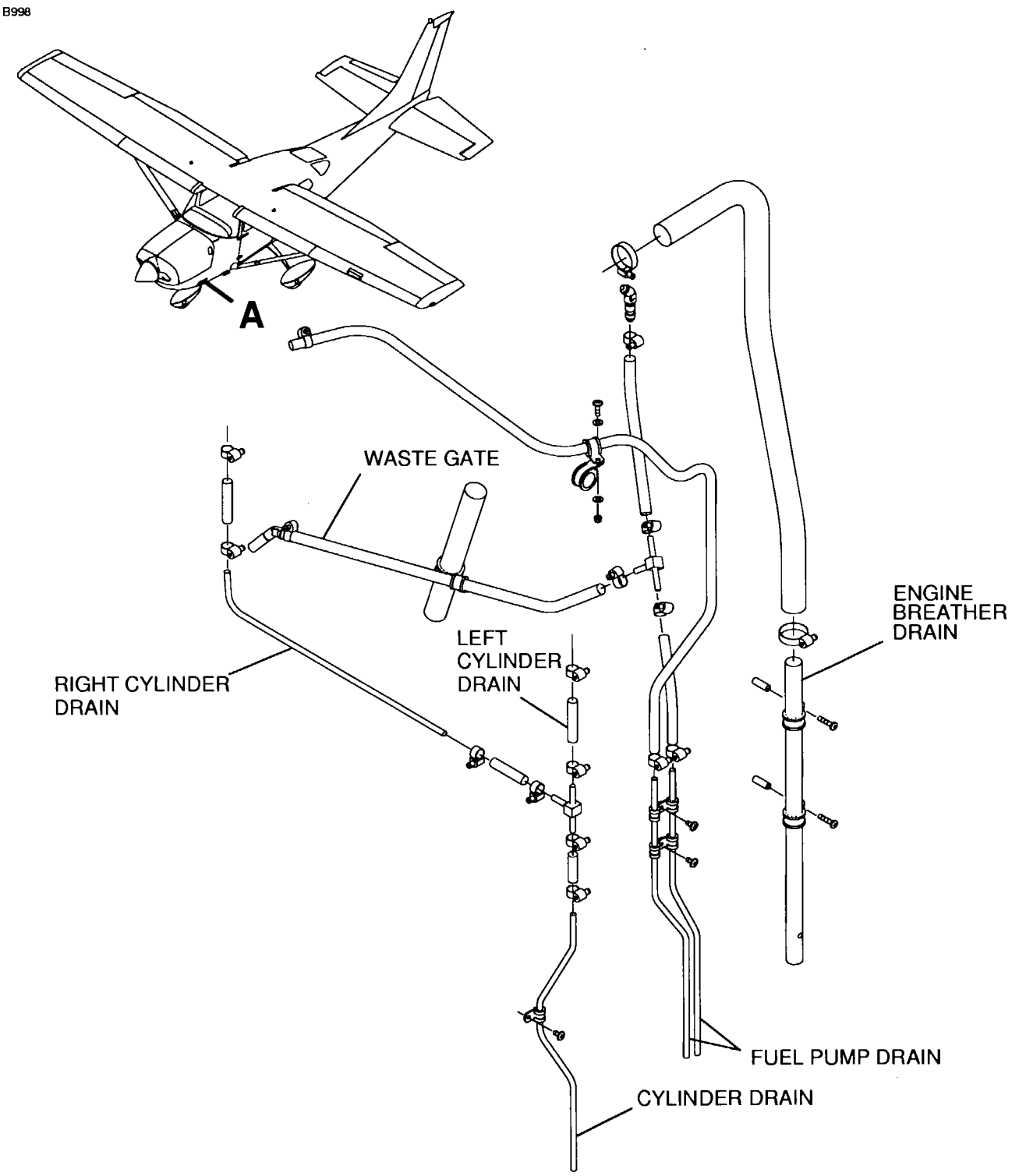
Non-Turbocharged Drain Line Assembly
Figure 202 (Sheet 1)



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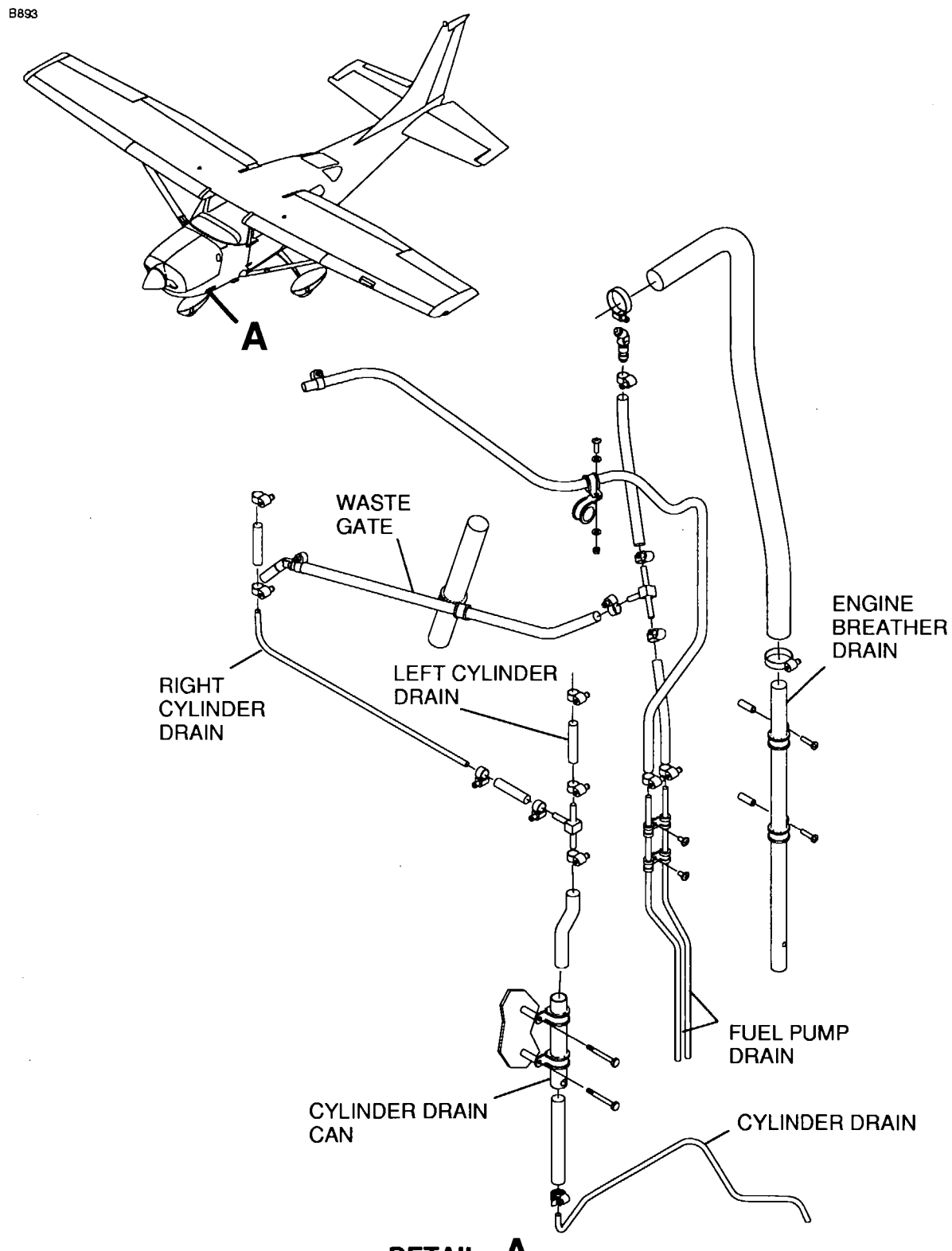
Turbo-Charged Drain Line Assembly
Figure 203 (Sheet 1)



Turbo Charged Drain Line Assembly
Figure 204 (Sheet 1)

CHAPTER 73

ENGINE FUEL AND CONTROL

LIST OF EFFECTIVE PAGES

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73-00-01	Pages 101-102	Jan 1/2007
73-00-01	Pages 201-207	Jan 1/2007
73-30-00	Pages 201-202	Apr 1/2005

RECORD OF TEMPORARY REVISIONS

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CONTENTS

ENGINE FUEL AND CONTROL - GENERAL

1. Scope

A. This chapter provides information on the fuel injection system used for the IO-540-AC1A5 and TIO-540-AJ1A engines. Information beyond the scope of this chapter can be found in Chapter 27, Fuel - General, and in various publications which are listed in Introduction - List of Manufacturers Technical Publications.

2. Definition

A. This chapter is divided into sections and subsections to assist maintenance personnel in locating specific systems and information. The following is a brief description of each section. For locating information within the chapter, refer to the Table of Contents at the beginning of the chapter.
   (1) The section on fuel injection covers procedures used to troubleshoot and maintain the fuel injection system.
   (2) The section on fuel flow indicator covers procedures used to maintain the indicating portion of the system.

FUEL INJECTION SYSTEM - DESCRIPTION AND OPERATION

1. General

A. This section covers the RSA Fuel Injection system used on the IO-540-AC1A5 (normally aspirated) and TIO-540-AJ1A (turbocharged) engine. For a schematic of the fuel injection system, refer to Figure 1.

2. Description

A. The fuel injection system is a low pressure, multinozzle, continuous flow system which injects raw fuel into the engine cylinder heads. The injection system is based on the principle of measuring engine air consumption to control fuel flow. More airflow through the venturi will result in more fuel being delivered to the engine, and less airflow through the venturi results in a decreased flow of fuel to engine.

B. System components consist of the fuel/air control unit, the fuel distribution valve (flow divider), injection nozzles (6 total) and lines used to connect the components. A description of the components is as follows:

(1) Fuel/Air Control Unit - The fuel/air control unit, also known as the servo regulator, is located on the top of the engine and integrates the functions of measuring airflow and controlling fuel flow. The control unit consists of an airflow sensing system, a regulator section and a fuel metering section. Also attached to the fuel/air control unit is a fuel pressure transducer. This transducer measures fuel pressure and translates that reading into fuel flow at the cockpit indicator. On turbocharged airplanes, a fuel flow transducer attached to the aft right baffle and connected to the fuel inlet line measures flow.

(2) Fuel Distribution Valve - The fuel distribution valve, also known as a spider or a flow divider, is located on top of the engine and serves to distribute fuel evenly to the cylinders once it has been regulated by the fuel/air control unit.

(3) Injection Nozzles - Each cylinder contains an injection nozzle, also known as an air bleed nozzle or a fuel injector. This nozzle incorporates a calibrated jet that determines, in conjunction with fuel pressure, the fuel flow entering each cylinder. Fuel entering the nozzle is discharged through the jet into an ambient air pressure chamber within the nozzle assembly. This nozzle assembly also contains a calibrated opening which is vented to the atmosphere, and allows fuel to be dispersed into the intake portion of the cylinder in an atomized, cone shaped pattern.

3. Operation

A. Fuel is stored in the wing tanks and is delivered to the fuel injection system via a series of lines, valves and pumps. From the engine driven fuel pump, fuel enters the fuel/air control unit, passes through the fuel distribution valve, and is routed to individual injection nozzles at each cylinder.

NOTE: For a schematic of the entire fuel system, refer to Chapter 27, Fuel Storage and Distribution - Description and Operation.

B. The heart of the injection system is the fuel/air control unit, which occupies the position ordinarily used by the carburetor at the engine intake manifold inlet. The fuel/air control unit is comprised of an integrated airflow sensing system, a regulator section and a fuel metering section. Operation of the fuel injection system is based on the principle of measuring airflow and using the airflow signal to operate a servo valve. The accurately regulated fuel pressure established by the servo valve, when applied across the fuel control system, makes fuel flow proportional to airflow.

(1) The airflow sensing system consists of a throttle body which houses the air throttle valve, the venturi, servo valve and fuel control unit. The differential pressure between impact air and the venturi throat pressure is a measurement of the velocity of the air entering the engine. These pressures are vented through drilled channels in the throttle body to both sides of an air diaphragm and create a force across the diaphragm. A change in air throttle position or a change in engine speed will change the air velocity, which in turn changes the force across the air diaphragm.

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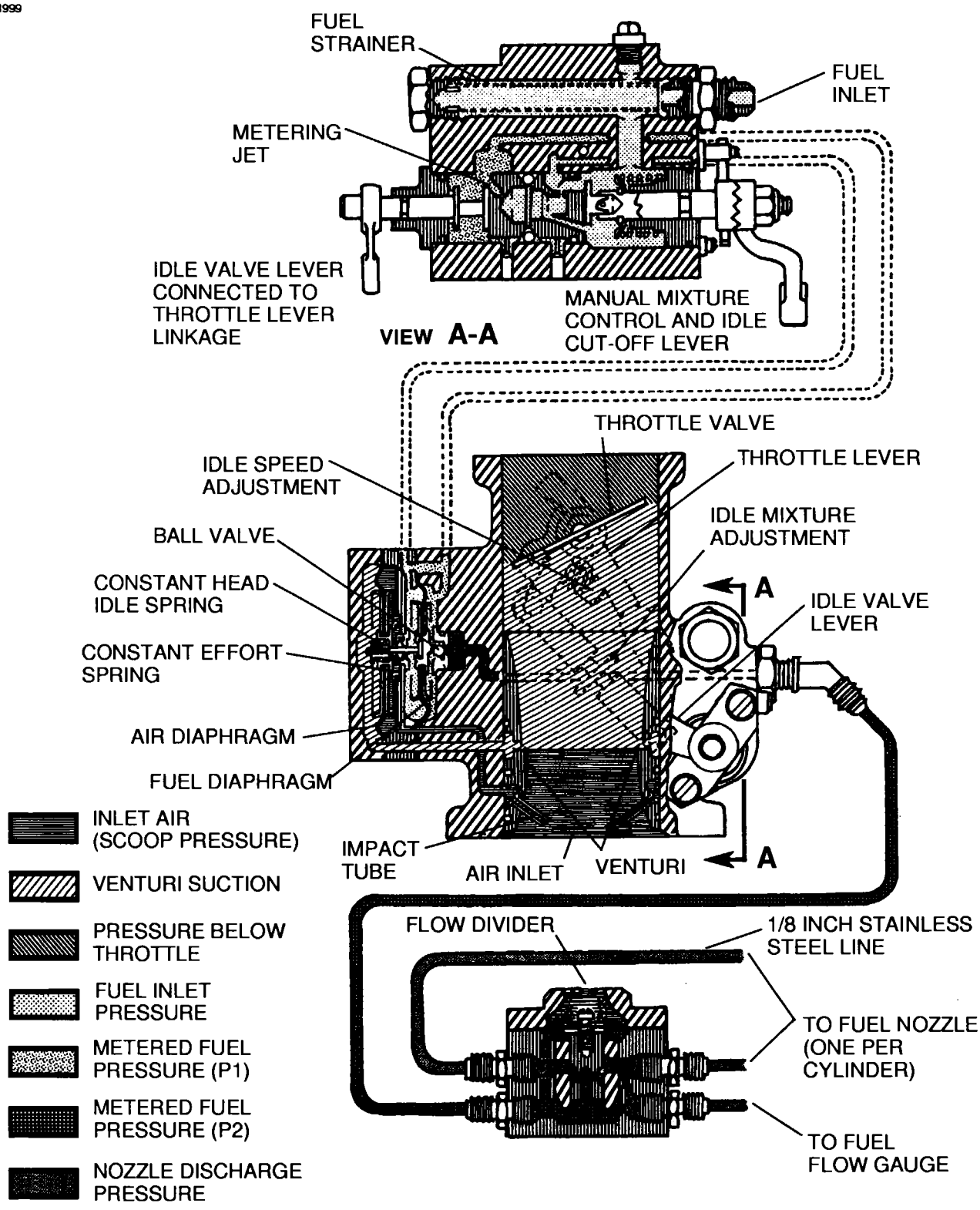

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Fuel Injection System Schematic
Figure 1 (Sheet 1)

(2) The regulator section contains the air diaphragm, mentioned in the preceding paragraph, and a fuel diaphragm. Fuel inlet pressure is applied to one side of the fuel diaphragm. The other side of the fuel diaphragm is exposed to fuel that has passed through the metering jet (metered fuel pressure). The differential pressure across the fuel diaphragm is referred to as the fuel metering force.
   (a) The air metering force applied to the air diaphragm is transmitted through the regulator stem and tends to move the ball valve in the opening direction. The fuel metering force across the fuel diaphragm acts to oppose the air metering force and tends to close the ball valve. Because the air forces are very low in the idle range, a constant head idle spring is provided to maintain an adequate fuel metering force at low RPM.
   (b) As the air metering force increases, the spring compresses until the spring retainer touches the air diaphragm and acts as a solid member. The constant effort spring produces a force which provides a smooth transfer from idle to low power cruise operation. Whenever the air metering, fuel metering and spring forces are balanced, the ball valve maintains a fixed position.

(3) The fuel metering section is contained within the throttle body casting and consists of an inlet fuel screen, a rotary idle valve and a rotary mixture valve. Both idle speed (closed throttle position) and idle mixture (relationship between throttle position and idle valve position) may be adjusted externally to meet individual engine requirements.
   (a) The idle valve is connected to the throttle valve by means of an external adjustable link. The idle valve controls fuel flow through the low speed range of operation and is adjustable to obtain good idling characteristics without affecting fuel metering in the high power range.
   (b) The mixture control valve gives full rich mixture on one stop and a progressively leaner mixture as it is moved toward idle cutoff. The full rich stop defines sea level requirements and the mixture control provides for altitude leaning.

FUEL INJECTION SYSTEM - TROUBLESHOOTING

1. General

A. This section gives troubleshooting information for the fuel injection system.

2. Fuel Injection System Troubleshooting

A. Do the troubleshooting procedures if the problem is found on the chart. Refer to Table 101.

Table 101. Fuel Injection System Troubleshooting

PROBLEM	PROBABLE CAUSE	SOLUTION
HIGH FUEL FLOW READING	Plugged nozzle if the high fuel flow reading is combined with a loss of power, roughness, or if you cannot set the idle mixture easily.	Remove and clean the nozzles. Soak the nozzles in Hoppes #9 Gun cleaning solvent for 20 minutes. Rinse the nozzles in a Stoddard solvent. Blow dry the nozzles. Do a check of the system for contamination.
	Faulty gage or pressure transducer. (Non-NAV 3 or non-turbo)	Use a mechanical gage and make sure the transducer pressure indication is correct. Replace the gage or pressure transducer as necessary.
UNSATISFACTORY FUEL CUTOFF	Incorrect installation of the aircraft linkage to the mixture control.	Adjust the linkage.
	Mixture valve leaks.	Refer to the servo mixture valve RS-16.
ENGINE WILL NOT INCREASE TO THE NECESSARY RPM	Contamination in the air chamber.	Refer to Precision Airmotive Corporation service information letter RS-40.
ROUGH IDLE	Small air leaks in the induction system through loose intake pipes or a damaged O-ring.	Do a check of the clamps and connectors. Repair leaks as necessary.
	Large air leaks in the induction system.	Repair leaks as necessary.
	Fuel hose fittings loose.	Tighten the fittings.
	Fuel vaporizes in the fuel lines or distributor. Found only in high ambient temperature conditions or after a long operation at a low RPM setting.	Keep temperatures low: Avoid long ground runs. During a hot engine restart: Operate the engine at 1,200 - 1,500 for several minutes to reduce residual heat in the engine compartment.

Table 101. Fuel Injection System Troubleshooting (continued)

LOW TAKEOFF FUEL FLOW	Faulty gage or pressure transducer. (Non-NAV 3 or non-turbo)	Use a mechanical gage and make sure the transducer pressure indication is correct. Replace the gage or pressure transducer as necessary.
	Contamination in the flow divider.	Clean the flow divider.
	Fuel pump pressure is not correctly adjusted.	Adjust the fuel pump pressure.
ENGINE IS DIFFICULT TO START	Incorrect starting procedure.	Refer to the Pilot's Operating Handbook.
	Flooded engine.	Crank the engine to clear it with the throttle open and the mixture in the IDLE/CUTOFF position.
	Throttle valve is opened too far.	Open the throttle to approximately 800 RPM.
	A prime that is not sufficient (usually combined with a backfire).	Increase the quantity of priming.
ENGINE OPERATES ROUGH	Too rich or too lean mixture.	Adjust the mixture control. If the mixture is too rich, the engine will run smoothly when leaned. If the mixture is too lean, the engine will run smoothly when the mixture is enriched. Adjust idle mixture to give a 10 - 50 PRM rise at idle.
	Plugged nozzle(s) (usually combined with high takeoff fuel flow). (Non-NAV 3 or non-turbo)	Remove and clean the nozzles. Soak the nozzles in a Hoppes #9 Gun cleaning solvent for 20 minutes. Rinse the nozzles with a Stoddard solvent. Blow dry the nozzles. Do a check of the system for contamination.
	Air leak in the induction system.	Do a check for leaks.
	Air leak in the fuel line from the fuel tank to the servo.	Do a check for the leak. Connect clear tubing between the servo and the flow divider and look for air bubbles. Find and correct the source of the leak. This can include the boost pump, the engine-driven pump, or any hose or line connection.
	Flow divider sticks.	Do an inspection of the flow divider. Clean the flow divider.
NO FUEL FLOW INDICATION DURING PRIME	Flow divider sticks.	Send to repair station.

FUEL INJECTION SYSTEM - MAINTENANCE PRACTICES

1. General

A. This section provides instructions for removal/installation, adjustment and cleaning of various components used in the fuel injection system. For maintenance information beyond the scope of this section, refer to applicable fuel injection component maintenance manuals which are listed in Introduction - List of Manufacturers Technical Publications.

NOTE: If the fuel injection system was opened for maintenance, the system must be flushed with fuel prior to closing to purge the system of contamination.

2. Precautions

A. Observe the following general precautions and rules during fueling, defueling, fuel bay purging, repairing, assembly or disassembly of system components, and electrical system checks and repairs on the airplane fuel system.
   (1) Plugs or caps should be placed on all disconnected hoses, lines and fittings to prevent residual fuel drainage, thread damage, or entry of dirt or foreign material into fuel system.
   (2) Any time fuel system is opened, flush system with 1/2 gallon of fuel at the inlet of servo and flow divider using the fuel boost pump.
   (3) When working on fuel injection system, keep all parts clean and free of contaminants.

3. Fuel/Air Control Unit Removal/Installation

A. Remove Fuel/Air Control Unit.
   (1) Place cockpit mounted FUEL SELECTOR SHUTOFF valve in the OFF position.
   (2) Remove upper cowling. Refer to Chapter 71, Cowls - Maintenance Practices.
   (3) Remove clamps securing induction duct to inlet adaptor (on non-turbocharged airplanes) or remove bolts, washers and nuts securing induction duct to control unit (on turbocharged airplanes).
   (4) Disconnect fuel inlet and outlet lines from control unit.
   (5) Remove mixture and throttle control linkages from control unit. Note number and position of washers for reinstallation.
   (6) Remove bolts, washers and nuts securing inlet adaptor (on non-turbocharged airplanes) and control cable bracket to base of control unit.
   (7) Remove bolts, washers and nuts securing control unit to engine induction plenum. Cover induction plenum opening and place control unit in a sealed, dust free environment to prevent accumulation of foreign particles into unit.

B. Install Fuel/Air Control Unit.
   (1) Install control unit to induction plenum using bolts, washers, and nuts.
   (2) Install inlet adaptor (on non-turbocharged airplanes) and control cable bracket to base of control unit using hardware removed above.
   (3) Install mixture and throttle control linkages to control unit. Ensure all washers are in proper position and that cotter pins are installed where required.
   (4) Connect fuel inlet and outlet lines to control unit.
   (5) Secure induction duct to inlet adaptor using clamps, (on non-turbocharged airplanes) or install bolts, washers and nuts securing induction duct to control unit (on turbocharged airplanes).
   (6) Install upper cowling. Refer to Chapter 71, Cowls - Maintenance Practices.
   (7) Place cockpit mounted FUEL SELECTOR SHUTOFF valve in the ON position.
   (8) Do a leak check.

4. Fuel Distribution Valve Removal/Installation

A. Remove Fuel Distribution Valve.
   (1) Remove upper cowling. Refer to Chapter 71, Cowls - Maintenance Practices.
   (2) Disconnect all lines leading in to and out of fuel distribution valve.
   (3) Remove nuts, bolts, washers and spacers securing fuel distribution valve to engine case.

B. Install Fuel Distribution Valve.
   (1) Secure fuel distribution valve to engine case using nuts, bolts, washers and spacers.
   (2) Reinstall all lines leading in to and out of fuel distribution valve.
   (3) Install upper cowling. Refer to Chapter 71, Cowls - Maintenance Practices.

5. Injection Nozzles Removal/Installation

NOTE: The nozzles consist of two pieces. Make sure that the nozzle inserts stay with the nozzle bodies and that the nozzles are reinstalled in the same cylinder.

A. Remove Injection Nozzles.
   (1) Remove upper cowling. Refer to Chapter 71, Cowls - Maintenance Practices.
   (2) Remove rigid fuel lines leading to individual nozzles.
   (3) Remove nozzles from cylinders.

B. Install Injection Nozzles.

CAUTION: Use only fuel soluble lubricants (such as engine oil) on the nozzle threads during installation.

   (1) Install nozzles to intake cylinders. Torque from 55 to 60 inch- pounds.
   (2) Install rigid fuel lines to nozzles.
   (3) Install upper cowling. Refer to Chapter 71, Cowls - Maintenance Practices.

6. Injection Nozzle Flow Test

A. Check Injection Nozzles For Plugging.
   (1) If nozzle plugging is suspected, disconnect injector lines at the nozzles.
   (2) Cap nozzles with clean valve stem caps to protect nozzles from contamination during removal.
   (3) Remove nozzles. Refer to Injection Nozzles Removal/Installation.
   (4) Pull up injector lines taking care that lines are not kinked.
   (5) Install nozzles back into lines.
   (6) Using clear containers (bottles with graduations are preferred) flow fuel into containers using aircraft boost pump and observe nozzle discharge pattern.
   (7) When the mixture control is placed in the full rich position the nozzles should display a pencil stream pattern. The nozzles should also flow the same amount of fuel from cylinder to cylinder. If and unusual flow pattern or an unequal amount of fuel is noted in any of the containers the nozzles should be thoroughly cleaned. Refer to Injector Nozzle Cleaning.
   (8) After cleaning install clean protective valve stem caps. It is recommended that after cleaning the nozzles, they be reinstalled in the injector lines and a nozzle flow check is conducted to verify that the nozzles are clean.
   (9) Following a successful flow check reinstall the protective flow caps and reinstall the nozzles in the cylinders.
   (10) Remove protective caps and reinstall injector lines to the nozzles.

7. Idle and Mixture Adjustment

A. Airplanes with the RSA Fuel Injection System, refer to the Precision Airmotive Service Letter SIL RS-67.

B. Adjustment Procedures (Refer to Figure 201).

WARNING: During adjustment procedure stay clear of propeller and/or propeller blast to avoid possible injury or death.

NOTE: Ensure that the alternate air door is in the closed position during this adjustment.

(1) Run engine to warm the oil to 150° F.

NOTE: If the cowling is off it may not be possible to attain 150 degrees oil temperature at cooler ambient temperatures. In that case it will be necessary to set idle speed and mixture at a lower temperature.

(2) With the mixture control in the full rich position, set the idle speed to 650 RPM +50 or -50 RPM.
(3) Advance the throttle to approximately 1800 RPM and immediately return it to idle. Idle speed should be approximately the same as set above.

CAUTION: Adjust the fuel mixture control by rotating the knob briskly for approximately the first inch, then very slowly until the peak RPM is obtained and the engine speed starts to drop off. When the engine speed first starts to increase, a slight rise in RPM will be obtained. Then a speed hesitation will occur as the mixture control is continually moved toward the lean position. Do not mistake this as the total RPM rise. Continue the slow rotation movement of the mixture control until observing or sensing a drop in the engine RPM. This is the total RPM rise which indicates the mixture strength at the engine idle speed.

(4) Rotate the mixture control to lean the mixture. Note the rise in engine RPM. This rise should be set to 10 to 50 RPM.

NOTE: To aid in the adjustment of the fuel mixture, a stamp on one half of the clevis on the fuel servo indicates the direction the thumb wheel should be moved to enrichen the mixture and increase the RPM rise. Likewise, rotating the thumb wheel in the opposite direction will lean the mixture and decrease the RPM rise.

(5) After each adjustment is made, the engine speed should be increased to approximately 1800 RPM and held for about 10-15 seconds to clean the spark plugs and clear the cylinders of excess fuel.
(6) Return the throttle to the idle position. Repeat procedure until desired RPM rise at idle is obtained.

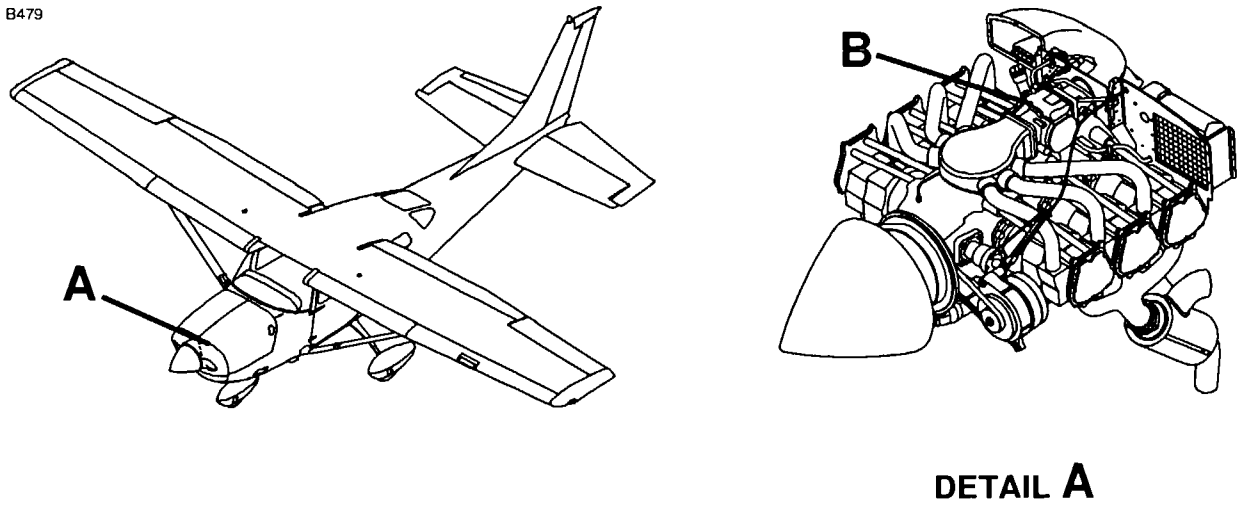
NOTE: If the mixture was excessively rich or lean when this procedure was started, the engine speed will require readjustment as the fuel mixture is adjusted to the desired value. Set the idle speed to the specified RPM after the mixture has been set to obtain the 10 to 50 RPM rise on lean out.

(7) Run engine to full throttle and back to idle to verify that the setting has not changed.
(8) Re-cowl engine and run until oil temperature is 150° F (minimum) to verify settings have not changed.

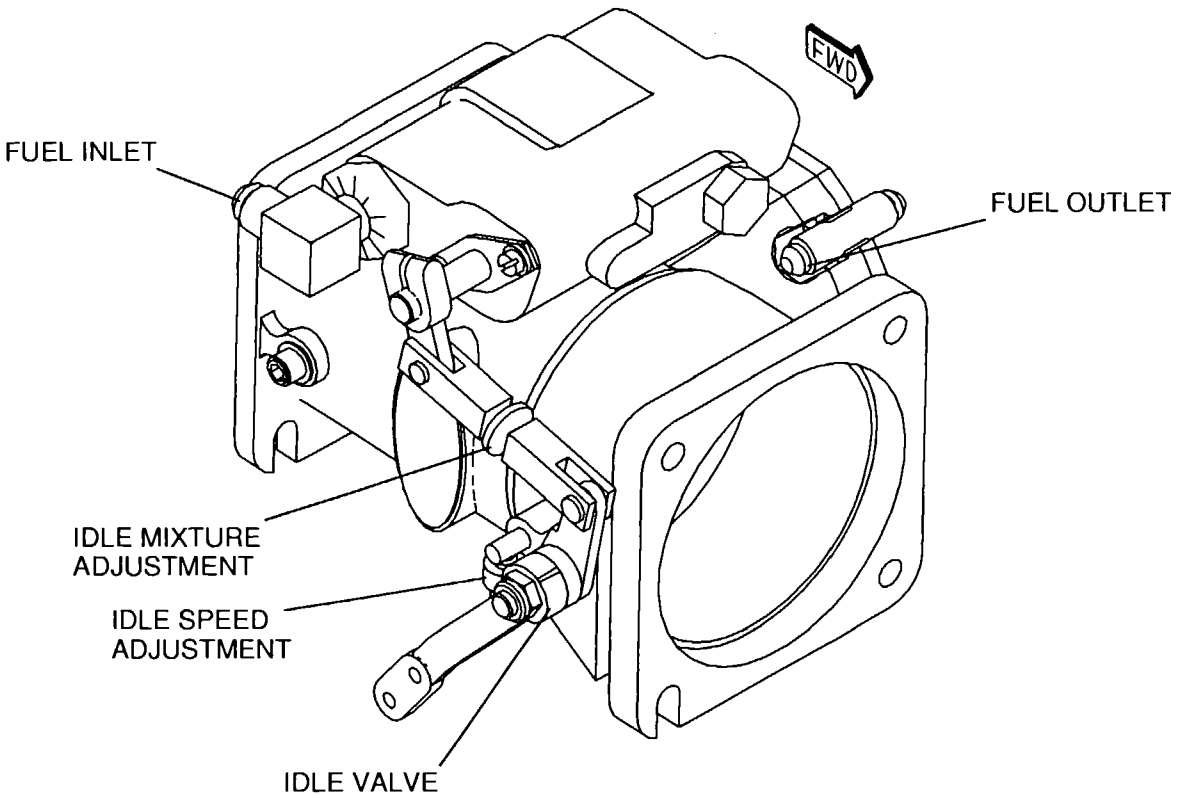
NOTE: Small changes in the idle speed and RPM are acceptable. Any large variations should be investigated.

8. Injector Nozzle Cleaning

A. The injector nozzles should be cleaned at time intervals set forth in Chapter 5, Inspection Time Limits.



DETAIL A



DETAIL B

1210T1001
A1250T1009
B1255T1007

Idle and Mixture Adjustment
Figure 201 (Sheet 1)

B. Cleaning Procedures.
   (1) Remove nozzles from engine. Refer to Injection Nozzles Removal/Installation.
   (2) Inspect carefully for evidence of varnish build up and/or contaminated screens.
   (3) Soak nozzles in Methyl Ethyl Ketone, Hopps #9 gun cleaner, or other suitable solvent to remove all contamination and varnish from nozzle. Stubborn deposits may benefit from ultrasonic cleaning methods.
   (4) Dry nozzles using compressed shop air not to exceed 30 PSI. Blow through nozzle in direction opposite of fuel flow.

9. Fuel Strainer Cleaning

A. The fuel strainer should be cleaned at time intervals set forth in Chapter 5, Inspection Time Limits.

B. Cleaning Procedures (Refer to Figure 201).
   (1) Remove fuel inlet line to access fuel strainer.
   (2) Remove and clean fuel strainer in unleaded gasoline or Stoddard solvent.
   (3) Using new O-rings, install fuel strainer to control unit.
   (4) Reinstall fuel inlet line.
   (5) Do a leak check.

10. Air Throttle Shaft Lubrication

A. The air throttle shaft should be lubricated at time intervals set forth in Chapter 5, Inspection Time Limits.

B. To lubricate air throttle shaft, apply a drop of engine oil to ends of air throttle shaft in such a manner that the oil can work into throttle shaft bushings.

11. Engine Driven Fuel Pump Pressure Setting (T206)

A. Set pressure of engine driven fuel pump (T206) (Refer to Figure 202).
   (1) Install the fuel pressure gage between the fuel-injection pump outlet and fuel-injection servo inlet.
      (a) Vent the gage to ambient atmospheric pressure.
   (2) Start the engine and run it to warm the oil to 150° F (83° C).
   (3) Operate the engine at full power, 39 inches MAP, maximum RPM and write the fuel pump pressure.
   (4) Operate the engine at 650 RPM +50 or -50 RPM idle speed and write the fuel pump pressure.
   (5) For airplanes T20608001 through T20608361 without a fuel return system, the fuel pressure specification must show 38 PSI +1 or - 1 PSI (262 kPa +7 or -7 kPa).
   (6) For airplanes T20608362 and On with a fuel return system, the fuel pressure specification must show 25 PSI +1 or -1 PSI (172 kPa +7 or -7 kPa) at an idle speed of 650 RPM +50 or -50 RPM and 30 to 50 PSI at 39 inches MAP, maximum RPM.

WARNING: You must turn off the engine to adjust the fuel pump pressure and restart it to continue a check of the fuel pressure.

   (7) If the fuel pump pressure is not in specification, stop the engine.
   (8) Loosen the locknut and turn the adjusting screw to set the fuel pressure to the required discharge pressure.
      (a) Turn the adjusting screw clockwise to increase the pressure or counterclockwise to decrease the pressure.
   (9) Start the engine and do a check of the fuel pressure.
      (a) For airplanes T20608001 through T20608361 without a fuel return system, the fuel pressure specification is 38 PSI +1 or - 1 PSI (262 kPa +7 or -7 kPa).
      (b) For airplanes T20608362 and On with a fuel return system, the fuel pressure specification is 25 PSI +1 or -1 PSI (172 kPa +7 or -7 kPa) at an idle speed of 650 RPM +50 or -50 RPM and 30 to 50 PSI at 39 inches MAP, maximum RPM.
   (10) After you get the correct pressure, hold the adjusting screw with a screwdriver and tighten the locknut to 23 to 30 inch-pounds (2.6 to 3.4 N.m) of torque.

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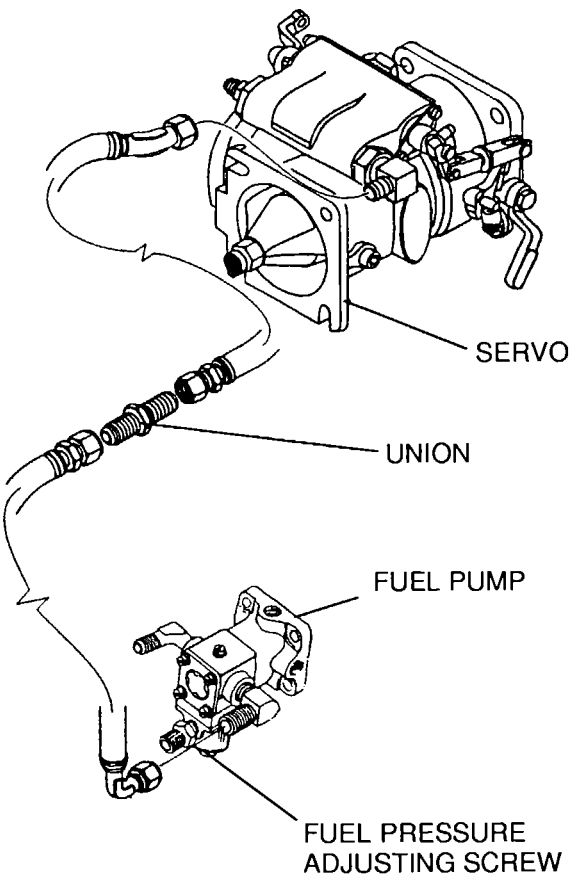


Engine Driven Fuel Pump Pressure Setting (T206)
Figure 202 (Sheet 1)

(11) Make sure the pressure setting has not changed after you tighten the locknut.
(12) Install safety wire on the locknut. Refer to Chapter 20, Safetying - Maintenance Practices.
(13) Operate the engine at idle speed and increase the engine speed to approximately 1800 RPM for 10 to 15 seconds.
(14) Complete a check of the fuel pressure at the idle speed.
  (a) If rapid fuel pressure fluctuations are more than 2 psi, you must contact Lycoming Customer Service.

FUEL FLOW INDICATOR - MAINTENANCE PRACTICES

1. General

A. Engine fuel flow is measured by use of an engine-mounted transducer and a cockpit-mounted indicator. The turbocharged model measures fuel flow by the use of a turbine wheel flow transducer. Components of the system include the fuel pressure transducer or turbine wheel flow transducer, the cockpit-mounted manifold pressure/fuel flow gauge, and wiring to connect the two electrical components.

B. Removal/installation of the components is the only required maintenance.

2. Manifold Pressure/Fuel Flow Gauge Removal/Installation

NOTE: The fuel flow gauge is found on the right half of the dual function Manifold Pressure/Fuel Flow gauge, found on the left side of the instrument panel.

NOTE: The fuel flow transducer used with the Garmin G1000 installation is the same as the fuel flow transducer used on all standard equipped airplanes.

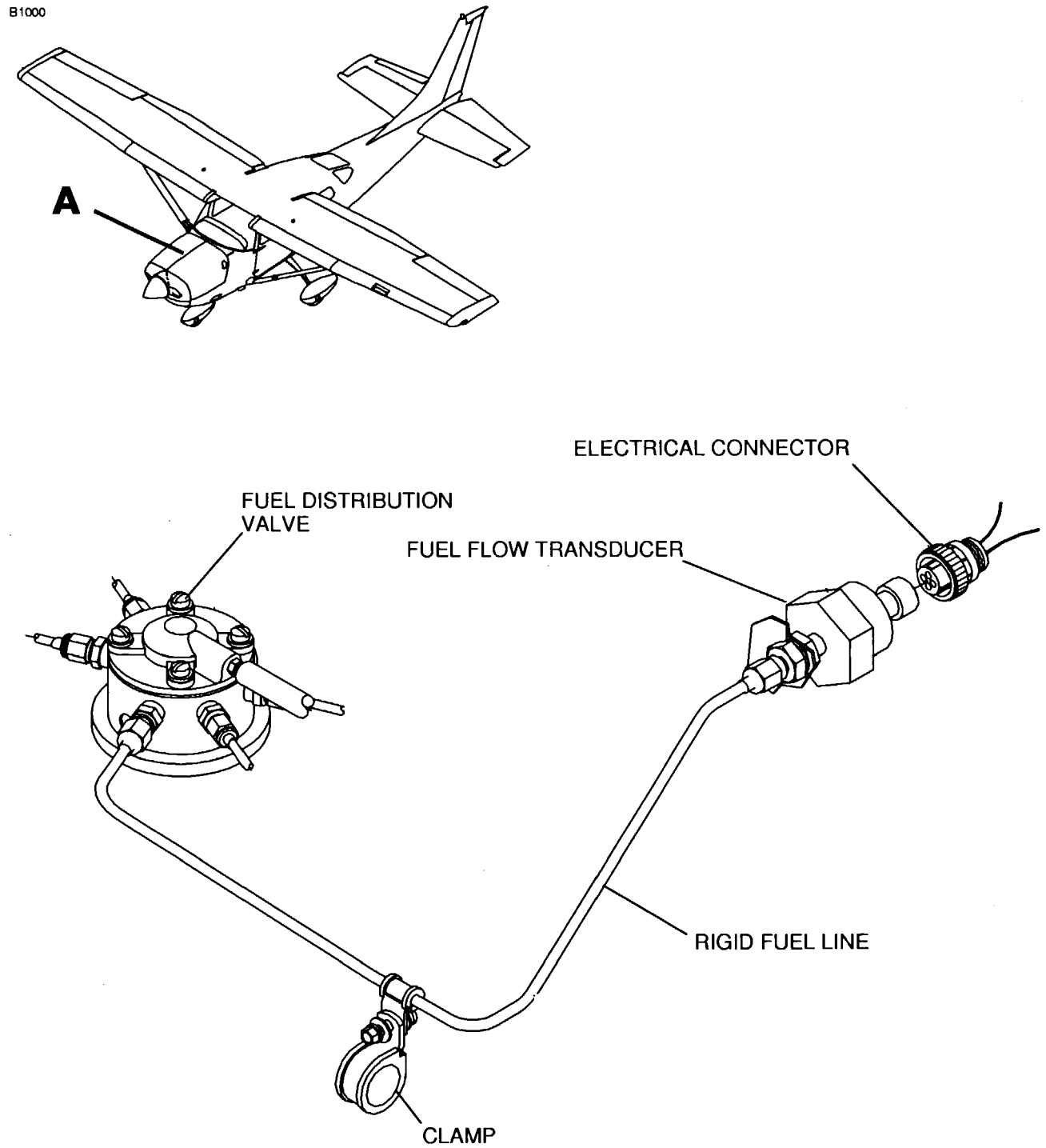
A. Remove the Fuel Flow Gauge.
   (1) Make sure that all electrical power to airplane is off.
   (2) Remove the screws that attach the gage to the instrument panel.
   (3) Carefully remove the gage from the bottom side of the instrument panel and disconnect the electrical connector from gage.

B. Install the Fuel Flow Gauge.
   (1) Connect the electrical connector to the gage.
   (2) Install the gage in the instrument panel with screws.
   (3) Apply electrical power to the airplane and make sure that the gage is connected and operates correctly.

3. Transducer and Line Removal/Installation

A. Remove the Transducer (Refer to Figure 201).
   (1) Make sure that all of the electrical power to airplane is off.
   (2) Remove the upper cowling. Refer to Chapter 71, Cowls - Maintenance Practices.
   (3) Disconnect the electrical connector from the fuel flow transducer.
   (4) Remove the fuel flow transducer from the fitting in the rear baffle.
   (5) On turbocharged models, remove the flow transducer from the fuel supply hose.

B. Install the Transducer (Refer to Figure 201).
   (1) Install the fuel flow transducer into the fitting in the rear baffle.
   (2) On turbocharged models, install the flow transducer into the fuel supply hose.
   (3) Connect the rigid line that leads from the fuel distribution valve to the transducer.
   (4) Connect the electrical connector to the fuel flow transducer.
   (5) Install the upper cowling. Refer to Chapter 71, Cowls - Maintenance Practices.
   (6) Apply electrical power to the airplane and make sure that the gage is connected and operates correctly.



DETAIL A

1210T1001
A0516T1009

Fuel Flow Indicating Installation
Figure 201 (Sheet 1)

CHAPTER 74

IGNITION

LIST OF EFFECTIVE PAGES

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CONTENTS

IGNITION SYSTEM - GENERAL

1. Scope

A. This chapter covers the ignition systems used on the IO-540-AC1A5 and TIO-540-AJ1A engines.

2. Tools, Equipment and Materials

NOTE: Refer to the following table for tools, equipment and material used throughout the chapter.

NAME	NUMBER	MANUFACTURER	USE
Ignition Switch Parts Kit	A3770	Cessna Aircraft	To rebuild ignition switch.

3. Definition

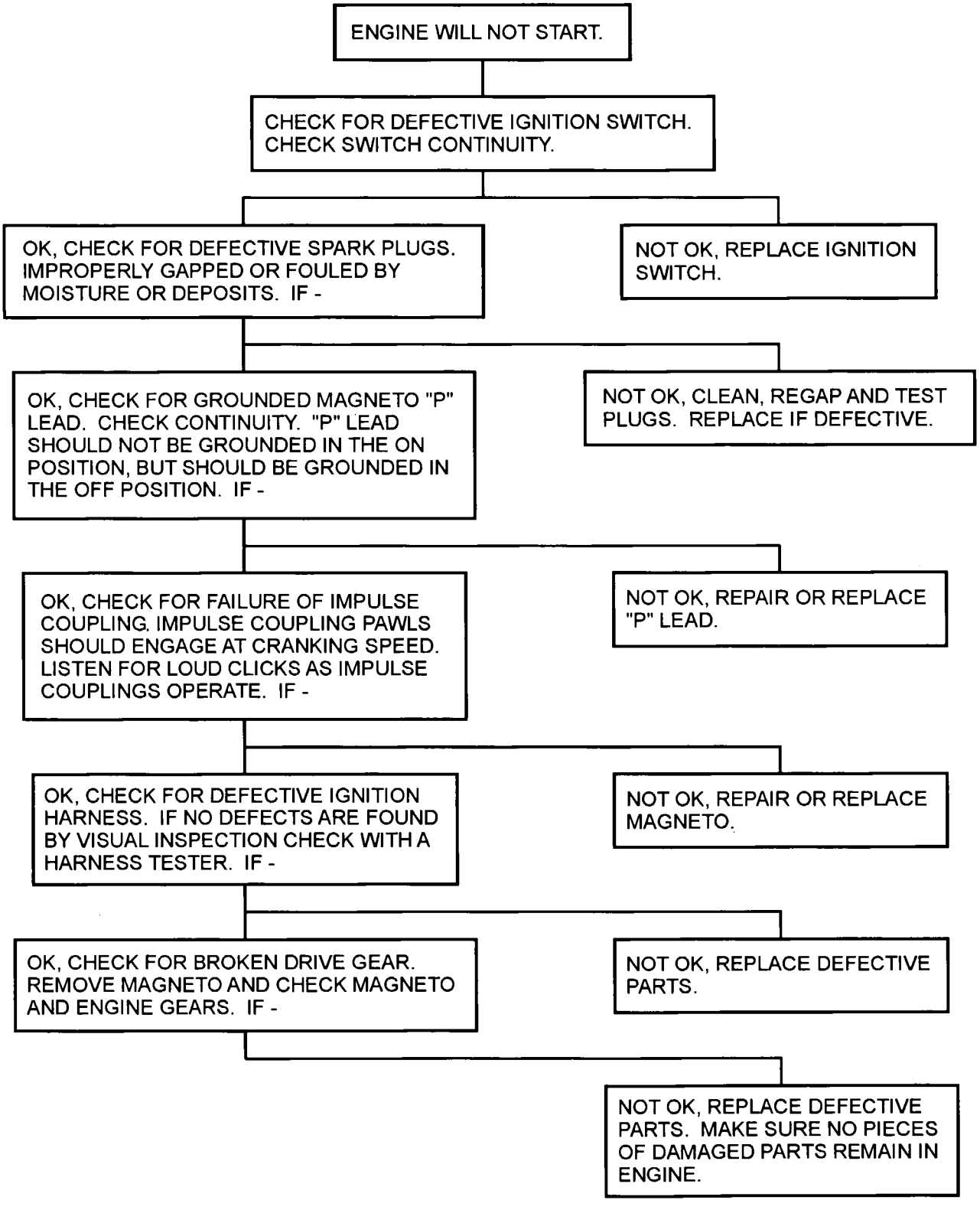
A. This chapter contains two sections on the ignition system. The first section provides a troubleshooting chart to aid in identifying common problems which may occur in the ignition system. The second section contains maintenance practices for the ignition system.

IGNITION SYSTEM - TROUBLESHOOTING

1. General

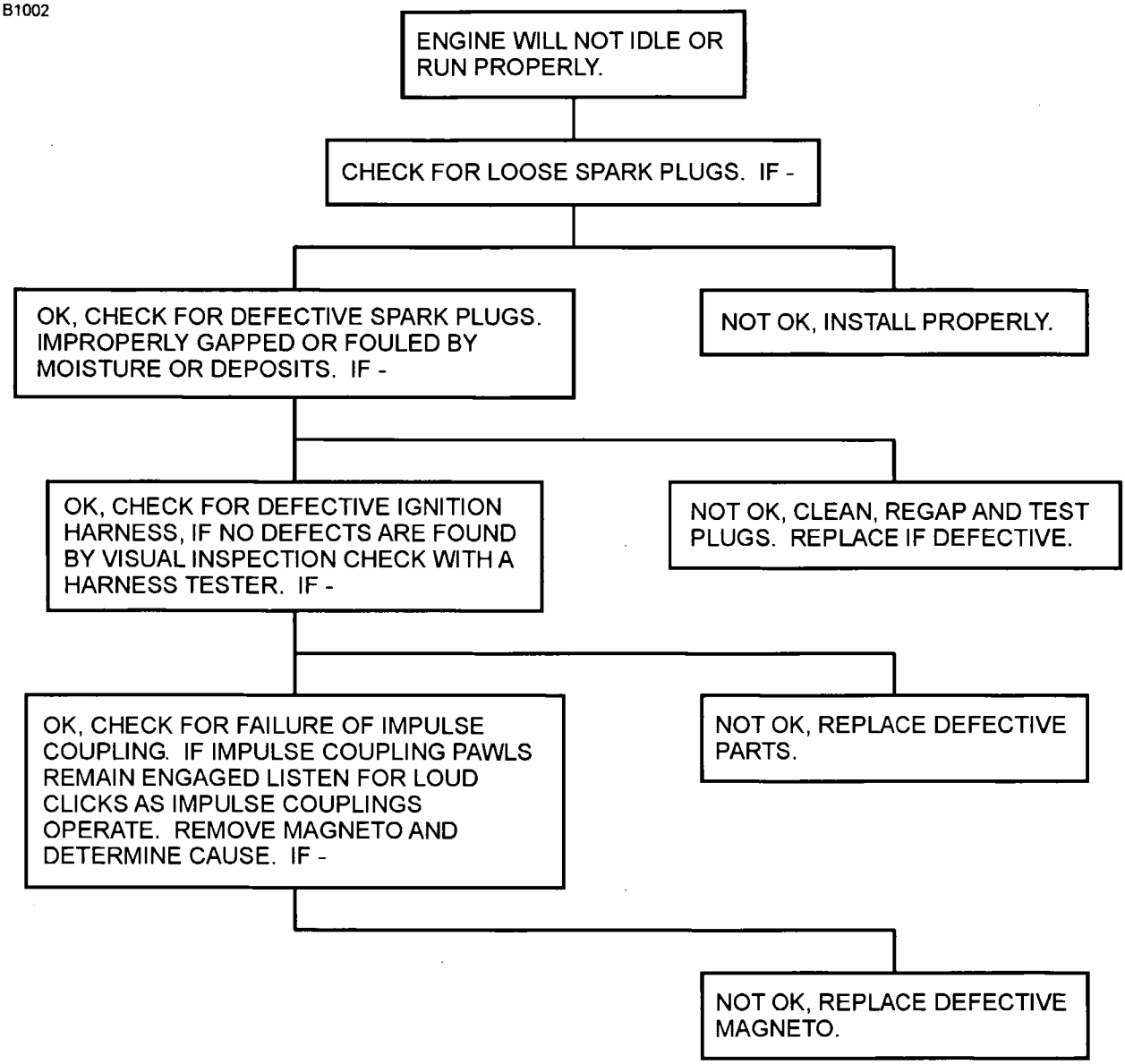
A. The following chart has been provided to aid maintenance technicians in system troubleshooting. Refer to Figure 101. This chart should be used in conjunction with Chapter 71, Engine - Troubleshooting to provide a comprehensive look at solutions to engine problems. For information beyond the scope of this chapter, refer to applicable engine and ignition system manuals and publications listed in Introduction - List of Manufacturers Technical Publications.

B1001



Ignition System Troubleshooting Chart
Figure 101 (Sheet 1)

B1002



Ignition System Troubleshooting Chart
Figure 101 (Sheet 2)

IGNITION SYSTEM - MAINTENANCE PRACTICES

1. Description and Operation

A. The IO-540-AC1A5 engine (non-turbocharged) utilizes two Slick 6351 series magnetos, the TIO-540-AJ1A engine (turbocharged) utilizes two Slick 6361 series (pressurized) magnetos, impulse coupled to fire dual plugs in each cylinder. Maintenance of the magnetos is limited to removal, installation and engine-to-magneto timing.

B. For complete description, operation, troubleshooting, maintenance, overhaul and lubrication requirements of the magnetos, refer to Unison 4300/6300 Series Magneto Maintenance and Overhaul Manual.

C. For inspection time requirements of the magnetos, refer to Chapter 5, Inspection Time Limits. For inspection procedures, refer to Unison 4300/6300 Series Magneto Maintenance and Overhaul Manual and latest revisions.

2. Magneto Removal/Installation

NOTE: The removal and installation procedures for each magneto are typical.

A. Remove the Magneto (Refer to Figure 201).
(1) Remove the engine cowl. Refer to Chapter 71, Engine Cowl - Maintenance Practices.

WARNING: Make sure that each magneto P-lead is grounded.

WARNING: Before you turn the propeller, remove a minimum of one spark plug from each cylinder to prevent the start of the engine at that time.

(2) Remove the screws that attach the high tension outlet cover to the magneto.
(3) Disengage the high tension cover from the magneto.
(4) For a reference point when you install the magneto, turn the propeller in the normal direction until each impulse coupling releases near Top Dead Center (TDC) on the number one cylinder compression stroke.

NOTE: You will hear a click sound from the impulse couplings when they release.

(5) You can find the crankshaft position by the marks on the front or aft face of the starter ring gear support. Refer to the Lycoming Service Instruction 1437 or latest revision for more instructions.
(a) When you use the marks on the front face of the ring gear, they must be aligned with the small hole that is found at the two o'clock position on the front face of the starter housing.
(b) When you use the marks on the aft face of the ring gear, they must be aligned with the engine case parting line.
(6) Turn the propeller in the opposite direction of the normal propeller operation to approximately 30 degrees BTDC (Before Top Dead Center) on the number one cylinder compression stroke.
(7) Turn the propeller in the normal direction slowly forward to 20 degrees BTDC for the 206, or 20 degrees BTDC for T206 on the number one cylinder compression stroke.
(8) Disconnect the P lead and ground wire from the magneto.
(9) Examine the magneto angle to help make sure you put it in the same position for installation.
(10) Remove the nuts, washers and clamps that attach the magneto to the engine housing.
(11) Remove the magneto from the housing.

B. Install the Magneto (Refer to Figure 201).

CAUTION: Make sure the gasket surfaces are clean to prevent oil leaks.

(1) Apply a small quantity of silicone grease such as DC4 to each side of the new magneto base gasket, which will help future timing adjustments.

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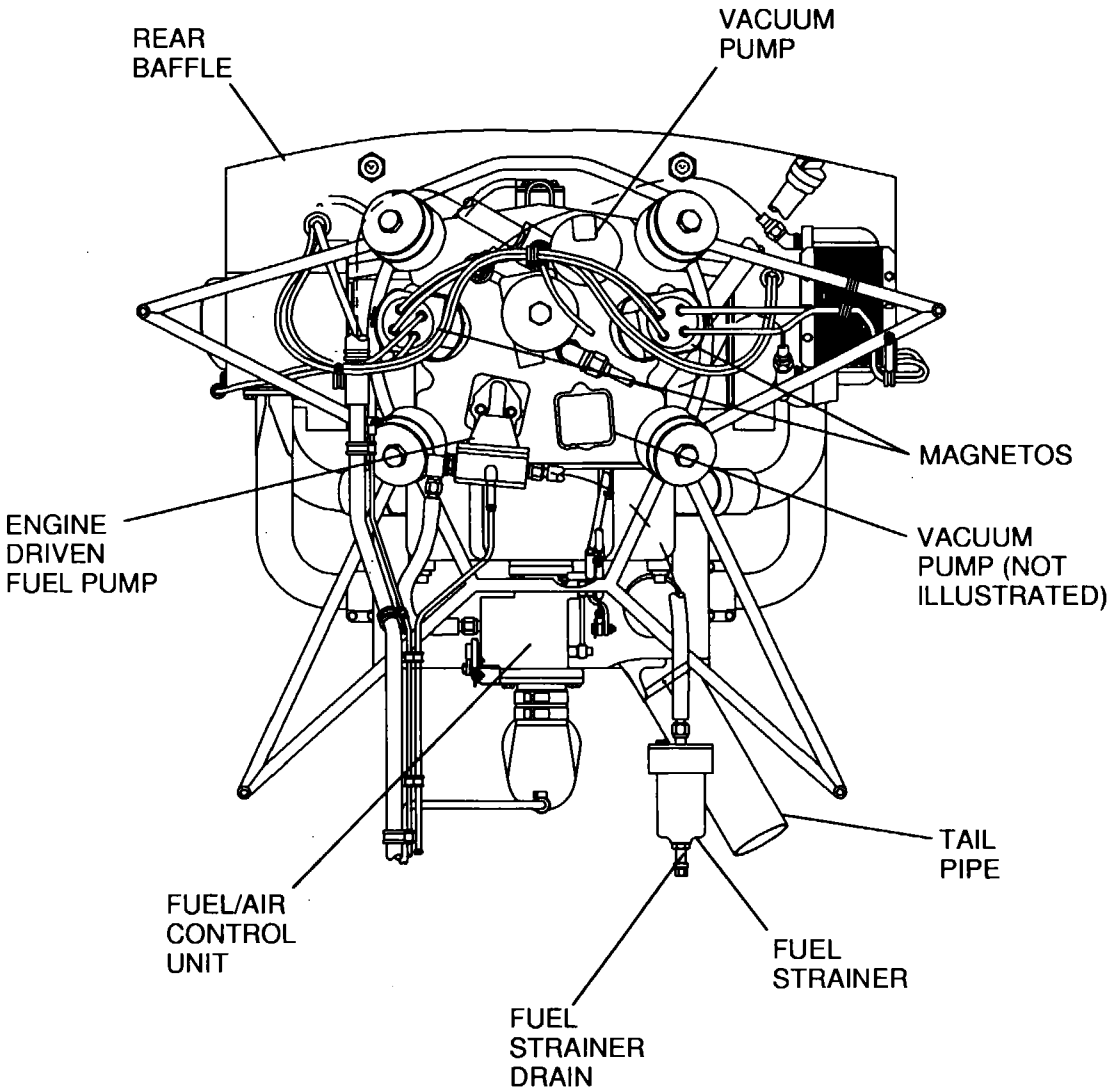

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Magneto Installation
Figure 201 (Sheet 1)

(2) Make sure the magneto drive gear is installed correctly, the nut is torqued correctly and the cotter pin is installed. Refer to the Lycoming Service Instructions 1437 or latest revision and the Unison 4300/6300 Magneto Maintenance and Overhaul Manual Instructions.

CAUTION: Make sure you remove the T-118 timing pin immediately after you attach the magneto to the accessory case and before the magneto or propeller is turned.

(3) Insert the T-118 timing pin into the L timing hole in the magneto distributor block.
(4) Turn the magneto rotor opposite of the normal direction until the timing pin is engaged fully into the distributor gear.
   (a) If the magneto rotor does not move freely and the pin will not go into the hole in the gear, the pin has hit the pointer on the gear.
   (b) Pull the pin out far enough to continue to turn the magneto freely in the opposite direction of normal movement until the pointer has passed the pin, then insert the pin.
      1 Turn the magneto rotor until the pin engages the gear.
(5) Do a check of the crankshaft to make sure the propeller has not moved and is still set in position with the number one cylinder at 20 degrees BTDC (Before Top Dead Center).
(6) If the propeller as been turned and only one magneto was removed, it will be necessary to engage the impulse coupling on the magneto that is installed, and establish the crankshaft position. Refer to step 2.A.(4) thru 2.A.(7) before you continue.
(7) With the number one cylinder at 20 degrees BTDC on the compression stroke, do the steps that follow.

CAUTION: Make sure you remove the T-118 timing pin immediately after you attach the magneto to the accessory case and before the magneto or propeller is turned.

   (a) Install the magneto with the new base gasket and the T-118 timing pin in position.
   (b) Engage the magneto drive gear with the engine gear, in a position that will give a range of magneto timing adjustments in each direction.
   (c) Hold the magneto in position against the accessory case and install the nuts, flat washers, clamps and new lock washers.
   (d) Finger tighten each nut by hand.
   (e) Remove the timing pin.
(8) Before you continue, you must adjust the magneto timing. Refer to Magneto-to Engine External Timing Adjustment.
(9) With the magneto set in position, first tighten each nut to 8 foot-pounds (10 N.m).
(10) Tighten each nut from one side to another, to a torque of 17 foot-pounds (23 N.m).
(11) Connect the P lead to the magneto.
(12) Attach a ground wire to the magneto.
(13) Attach the high tension outlet cover to the magneto.
(14) Tighten the P lead nut to a torque of 13 to 15 inch-pounds (17 to 20 N.m).

CAUTION: Make sure you remove the T-118 timing pin before the magneto or propeller is turned.

(15) Install the spark plugs.
(16) Install the cowl. Refer to Chapter 71, Engine Cowl - Maintenance Practices.
(17) Complete a engine preflight operational check of the ignition system. Refer to the Pilot's Operating Handbook.

3. Magneto-to-Engine External Timing Adjustment

A. Adjust the Magneto-to-Engine Timing.

NOTE: It is possible to adjust the Magneto-to-Engine timing a maximum total of 0.125 inch (3.17 mm) movement from the original factory position, or between each internal timing adjustment. The external timing movement of 0.125 inch (3.17 mm) approximately equals 5 degrees of internal timing change.

(1) Index the magneto and accessory case as necessary to monitor external timing adjustments before the first field adjustment of external timing.
   (a) The magneto must be removed and internal timing adjusted in accordance with Unison 4300/6300 Series Aircraft Magnetos Maintenance and Overhaul Instructions Form L-1363B or latest revision, when the external timing adjustments collect up to 0.125 inch (3.17 mm) movement change.
(2) Make sure the ignition is in the OFF position.
(3) Remove the engine cowl. Refer to Chapter 71, Engine Cowl - Maintenance Practices.
(4) Remove a minimum of one spark plug from each cylinder.
(5) Make sure that cylinder number one is at 20 degrees BTDC (Before Top Dead Center) on the compression stroke.
(6) Connect a standard aircraft magneto timing light between an acceptable engine ground and the P lead terminal of the magneto.

NOTE: Most standard aircraft magneto timing lights show open points with a Light On condition and/or a signal that you can hear.

(7) Loosen the mount clamps that attach the magneto to the accessory case so that the magneto will turn on the accessory case.
(8) Turn the ignition switch to the BOTH position.
   (a) Look at the magneto from the aft side of the engine.
      1 If the timing light is luminated, turn the magneto frame clockwise until the timing light shuts off.
      2 Turn the magneto frame counter-clockwise until the timing light comes on, which shows that the contact breaker points are open.

CAUTION: Do not torque the nuts more than 17 foot-pounds (23 n.m.) or the mounting flange can crack.

(9) With the magneto set in position, first tighten each nut to 8 foot-pounds (10 N.m).
(10) Tighten each nut from one side to another, to a torque of 17 foot-pounds (23 N.m).
(11) Complete a check of the magneto timing to make sure it has not changed. Refer to Magneto-to-Engine Timing Check.

4. Magneto-to-Engine Timing Check

A. Complete a Check of the Magneto-to-Engine Timing (Refer to Figure 201).
   (1) Make sure the ignition is in the OFF position.
   (2) Remove the engine cowl. Refer to Chapter 71, Engine Cowl - Maintenance Practices.
   (3) Remove a minimum of one spark plug from each cylinder.
   (4) Connect a standard aircraft magneto timing light between an acceptable engine ground and the P lead terminal of the magneto.

NOTE: Most standard aircraft magneto timing lights indicate open points with a Light On condition and/or an signal that you can hear.

   (5) Turn the ignition switch to the BOTH position.

(6) Turn the propeller in the normal direction of movement until each impulse coupling releases as the number one cylinder moves near TDC (Top Dead Center) on the compression stroke.

NOTE: You will hear a click sound from the impulse couplings when they release.

(7) Turn the propeller in the opposite direction of normal movement to approximately 25 degrees BTDC (Before Top Dead Center), then slowly forward to 20 degrees BTDC.
(8) Slowly turn the propeller in the normal direction of movement until the timing light comes on.
(9) Examine the crankshaft to make sure it is in the correct position.

NOTE: The timing light must indicate points open at 20 degrees BTDC, with the number one cylinder on the compression stroke.

(10) If the crankshaft is not in the correct position, you will have to make an adjustment. Refer to Magneto-to-Engine External Timing Adjustment.
(11) Turn the ignition switch to the OFF position.
(12) Install the spark plugs.
(13) Install the ignition leads on the spark plugs.
(14) Install the cowl. Refer to Chapter 71, Engine cowl - Maintenance Practices.
(15) Complete an engine preflight operational check of the ignition system. Refer to the pilot's operating handbook.

IGNITION SWITCH - INSPECTION/CHECK

1. Description

A. The following inspection and lubrication procedures are designed for the ACS brand ignition switch and should be accomplished every 2000 hours.

2. Tools, Equipment and Materials

A. Refer to Ignition System - General for a list of required tools, equipment and materials.

3. ACS Ignition Switch Inspection and Lubrication

NOTE: Refer to Figure 601 for the following steps.

A. Switch Removal.
   (1) Disconnect battery.
   (2) Remove switch assembly from instrument panel by loosening locknut on the forward side of panel and removing decorative nut on aft side of panel.

      NOTE: Wiring need not be removed from posts of switch if wiring is of sufficient length to allow switch assembly to be moved to a position where disassembly can be accomplished. If wiring is to be disconnected, tag or mark wires for reinstallation.

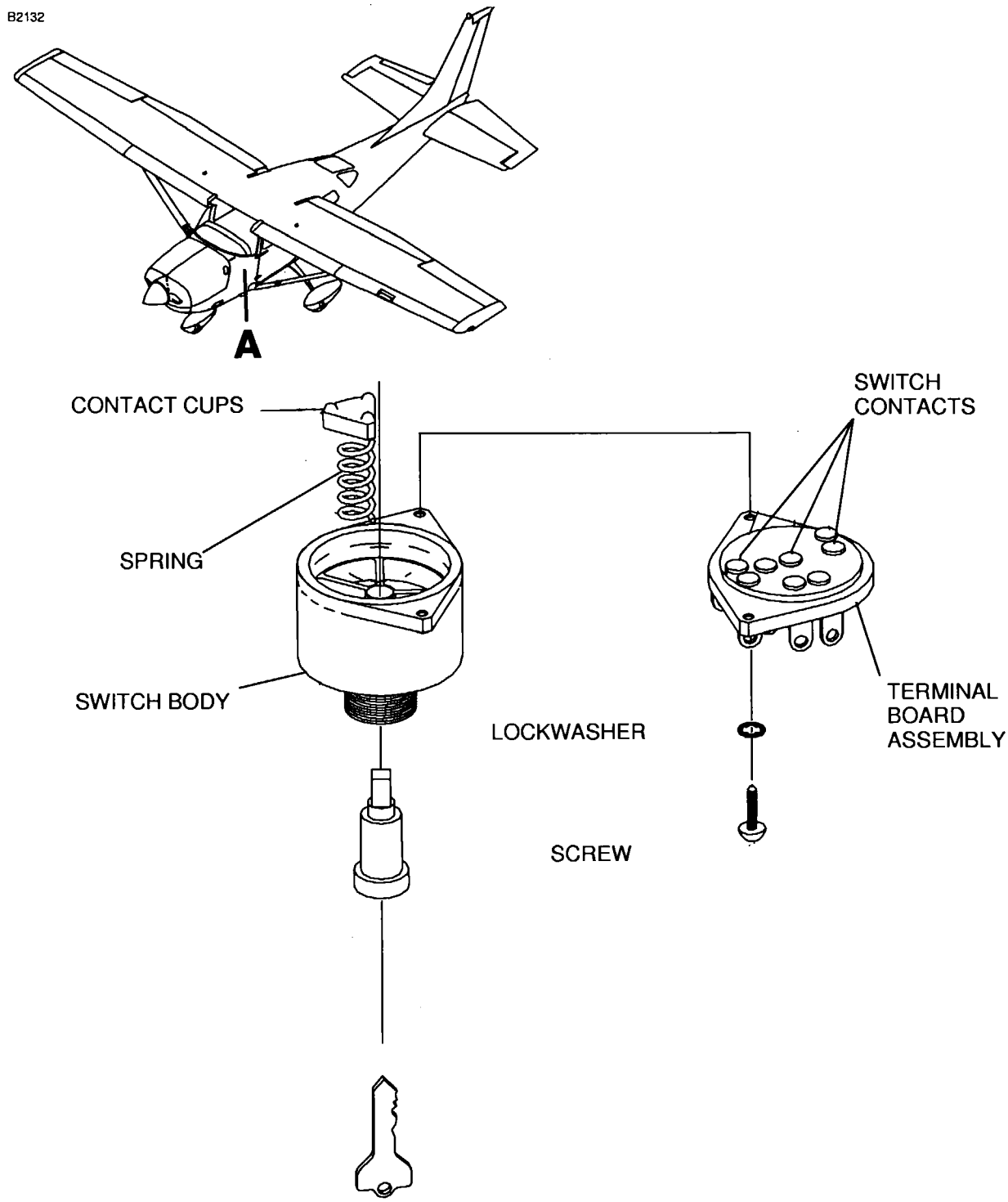
B. Switch Disassembly.
   (1) Hold switch body in position shown in Figure 601.
   (2) Remove screws and washers.
   (3) Lift terminal board assembly from body, being careful not to lose springs and cups.

C. Switch Cleaning.
   (1) Clean switch contacts and the three movable contact cups using alcohol on a cotton tip swab.

D. Switch Inspection.
   (1) Inspect movable contact cups and switch contacts on the terminal board assembly for excessive wear or corrosion and for loose contacts or terminals. If the silver plating on the contact cups is worn through to the brass material, or they are burned or pitted from arcing or are corroded, they should be replaced. If the contacts on the contact block exhibit any of the above conditions or the terminals are loose, the terminal board assembly should be replaced.

E. Switch Reassembly.
   (1) Apply a thin coating of Luberex 10-1206 lubricant to switch contacts and the three movable contact cups. Ensure all contact areas are covered with lubricant.
   (2) Reassemble switch using new parts, if required. Ensure that cups and springs are positioned in switch body so that no binding occurs. Secure terminal board assembly to switch body with retained washers and screws.
   (3) Mark switch with a dab of red paint on the terminal board retaining screws.
   (4) If removed, reconnect wiring to backside of switch.
   (5) Install switch in panel and secure using existing hardware.
   (6) Reconnect battery and perform an operational check of the switch.

F. Operational Check.
   (1) Start engine. Refer to Model 206 Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.
   (2) Check magnetos for normal engine RPM drop.
   (3) Verify that both magnetos are grounded when switch is in the OFF position.
      (a) Reduce engine RPM to idle, and turn switch to the OFF position. Engine should quit immediately, signifying that both magnetos have been grounded through the ignition switch.
   (4) After engine stops, move mixture control to idle cutoff position.



DETAIL A

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ACS Ignition Switch Inspection/Lubrication
Figure 601 (Sheet 1)

CHAPTER 76

ENGINE CONTROLS

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
76-Title		
76-List of Effective Pages		
76-Record of Temporary Revisions		
76-Table of Contents		
76-00-00	Page 1	Dec 2/2002
76-10-00	Pages 201-203	Jan 2/2006
76-11-00	Pages 201-203	Jan 2/2006

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

ENGINE CONTROLS - GENERAL

1. Scope

A. This chapter describes those controls used to regulate engine power.

2. Definition

A. This Chapter is divided into sections to aid maintenance technicians in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief description of the sections follows:
   (1) The section on throttle control describes the throttle handle, cable and linkage.
   (2) The section on fuel mixture control describes the mixture handle, cable and linkage.
   (3) Both sections include removal/installation, rigging and inspection requirements.

THROTTLE CONTROL - MAINTENANCE PRACTICES

1. General

A. The throttle control is a push-pull type that incorporates a knurled friction knob, which prevents vibration induced "creeping" of the control. The ball bearing type rod end on the throttle is secured to the engine with a predrilled steel AN bolt, castellated nut and cotter pin.

NOTE: Steel AN bolts with an undrilled shank are identified with an "A" suffix (AN3-6A). A steel bolt of the same size, with the shank drilled for castellated nut and cotter pin is identified as AN3-6. Aluminum AN bolts are not to be used in this application.

B. When adjusting the throttle control, it is important to check that throttle control slides smoothly throughout its full range of travel, that it locks securely with the friction lock and the throttle arm operates through its full arc of travel. Do not lubricate throttle control. If excessive binding is noticed, replace throttle control.

C. Whenever engine controls are being disconnected, pay particular attention to the exact position, size and number of attaching parts for reconnecting controls.

2. Throttle Control Removal/Installation

A. Remove Throttle Control (Refer to Figure 201).
(1) Remove engine cowl. Refer to Chapter 71, Cowl - Removal/Installation.
(2) Remove cotter pin, castellated nut, bolt, and washers securing throttle control rod end to fuel/air control unit throttle arm. Discard cotter pin.
(3) Remove rod end and jamnut from throttle control.
(4) Remove nuts, bolts, and clamp securing throttle control cable to cable bracket.
(5) Remove throttle control jamnut and lock washer from forward side of firewall.
(6) Inside the cockpit/cabin area, loosen throttle control jamnuts and lockwashers from forward side of instrument panel and aft side of firewall.
(7) Carefully pull throttle control through firewall and instrument panel removing lock washers and jamnuts, and remove from airplane.

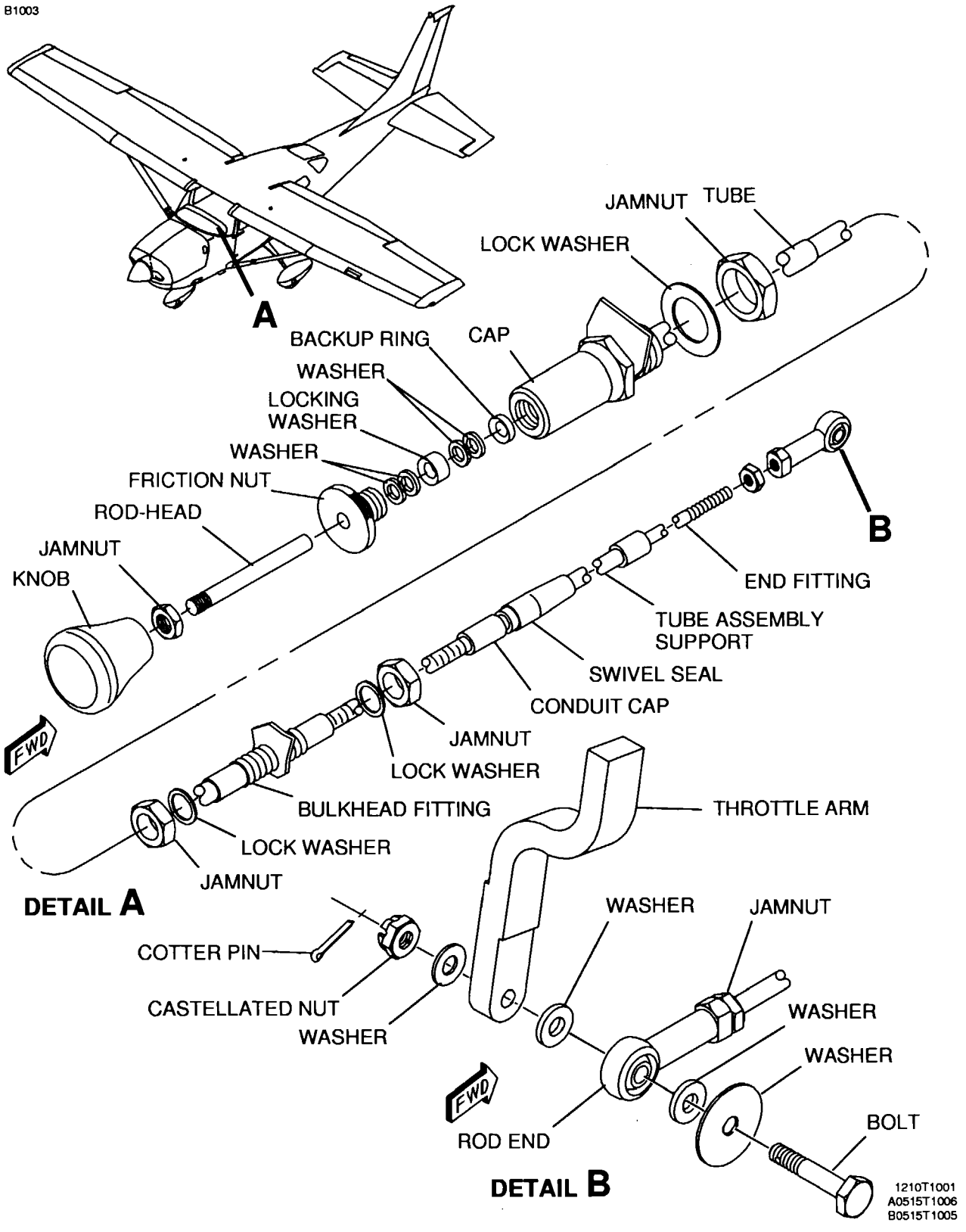
B. Install Throttle Control (Refer to Figure 201).

NOTE: When installing throttle control, ensure that control is routed exactly as previously installed. Ensure that no binding or preloading occurs from a too small bend radius.

(1) Inside the cockpit/cabin area, carefully route throttle control through instrument panel and then place lockwashers and jamnuts over throttle control.
(2) Route throttle control through firewall and position throttle control in instrument panel.
(3) Secure throttle control in instrument panel by tightening jamnut against lock washer at instrument panel.
(4) Position lockwasher and locknut on throttle control on aft side of firewall.
(5) In the engine compartment, place lockwasher and jamnut over throttle control and secure against firewall.
(6) Install jamnut and rod end on throttle control.
(7) Attach throttle control rod end to fuel/air control unit throttle arm with bolt, washers, castellated nut and new cotter pin.
(8) Install nuts, bolts, and clamp securing throttle control cable to cable bracket.
(9) Adjust throttle control as required. Refer to Throttle Control Adjustment/Test.
(10) Install engine cowl. Refer to Chapter 71, Cowls - Removal/Installation.

3. Throttle Control Adjustment/Test

A. Check Throttle Control (Refer to Figure 201).
(1) Pull throttle control knob full out and check that idle stop on throttle body is contacted.
(2) Push throttle control knob full in and check that full power stop on throttle body is contacted.



Throttle Control Installation
Figure 201 (Sheet 1)

(3) Do a check to make sure that the throttle has no less than 0.125-inch (3.18 mm) and no more than 0.25-inch (6.35 mm) cushion at each stop.
(4) Work throttle control in and out several times to check for binding.

B. Adjust Throttle Control (Refer to Figure 201).
(1) Disconnect throttle control rod end from the throttle arm.
(2) Loosen jamnut and adjust throttle control rod end to obtain desired setting.
(3) Tighten jamnut.
(4) Connect throttle control rod end to throttle arm. Torque nut to 30 inch-pounds then continue tightening nut until cotter pin hole lines up with castellations in nut. Do not exceed 50 inch-pounds. Install cotter pin.

4. Throttle Control Inspection/Check

A. Inspection of Throttle Control.
(1) The throttle control attachment to throttle body should be inspected in accordance with time limits established in Chapter 5, Inspection Time Limits. Do a check of the bolt, castellated nut, cotter pin, rod end, and rod end jam nut for security and condition.
(2) Do a check of the rod end witness hole for proper rod end engagement with the throttle control.
(3) Do a check to make sure that the throttle control slides smoothly throughout its full range of travel, that it locks securely with the friction lock, and that the throttle arm operates through its full arc of travel.

FUEL MIXTURE CONTROL - MAINTENANCE PRACTICES

1. General

A. The mixture control is a push-pull type that incorporates a knurled friction knob, which prevents vibration induced "creeping" of the control. The ball bearing type rod end on the throttle is secured to the engine with a predrilled steel AN bolt, castellated nut and cotter pin.

NOTE: Steel AN bolts with an undrilled shank are identified with an 'A' suffix (AN3-6A). A steel bolt of the same size, with the shank drilled for castellated nut and cotter pin is identified as AN3-6. Aluminum bolts and undrilled bolts must not be used in this application.

B. When adjusting the fuel mixture control, it is important to check that fuel mixture control slides smoothly throughout its full range of travel, that it adjusts through its full vernier range and the mixture arm operates through its full arc of travel. Do not lubricate fuel mixture control. If excessive binding is noticed, replace fuel mixture control.

C. Whenever engine controls are being disconnected, pay particular attention to the exact position, size and number of attaching parts for reconnecting controls.

2. Fuel Mixture Control Removal/Installation

A. Remove Fuel Mixture Control (Refer to Figure 201).
(1) Remove engine cowl. Refer to Chapter 71, Cowls - Removal/Installation.
(2) Remove cotter pin, nut, bolt and washers securing mixture control rod end to fuel/air control unit mixture arm. Discard cotter pin.
(3) Remove rod end, nut and jamnut from fuel mixture control.
(4) Remove nuts, bolts, and clamp securing fuel mixture control cable to cable bracket.
(5) Remove fuel mixture control nut and washer from forward side of firewall.
(6) In the cockpit/cabin area, remove fuel mixture control nuts and washers from forward side of instrument panel and aft side of firewall.
(7) Carefully pull fuel mixture control through firewall and instrument panel and remove from airplane.

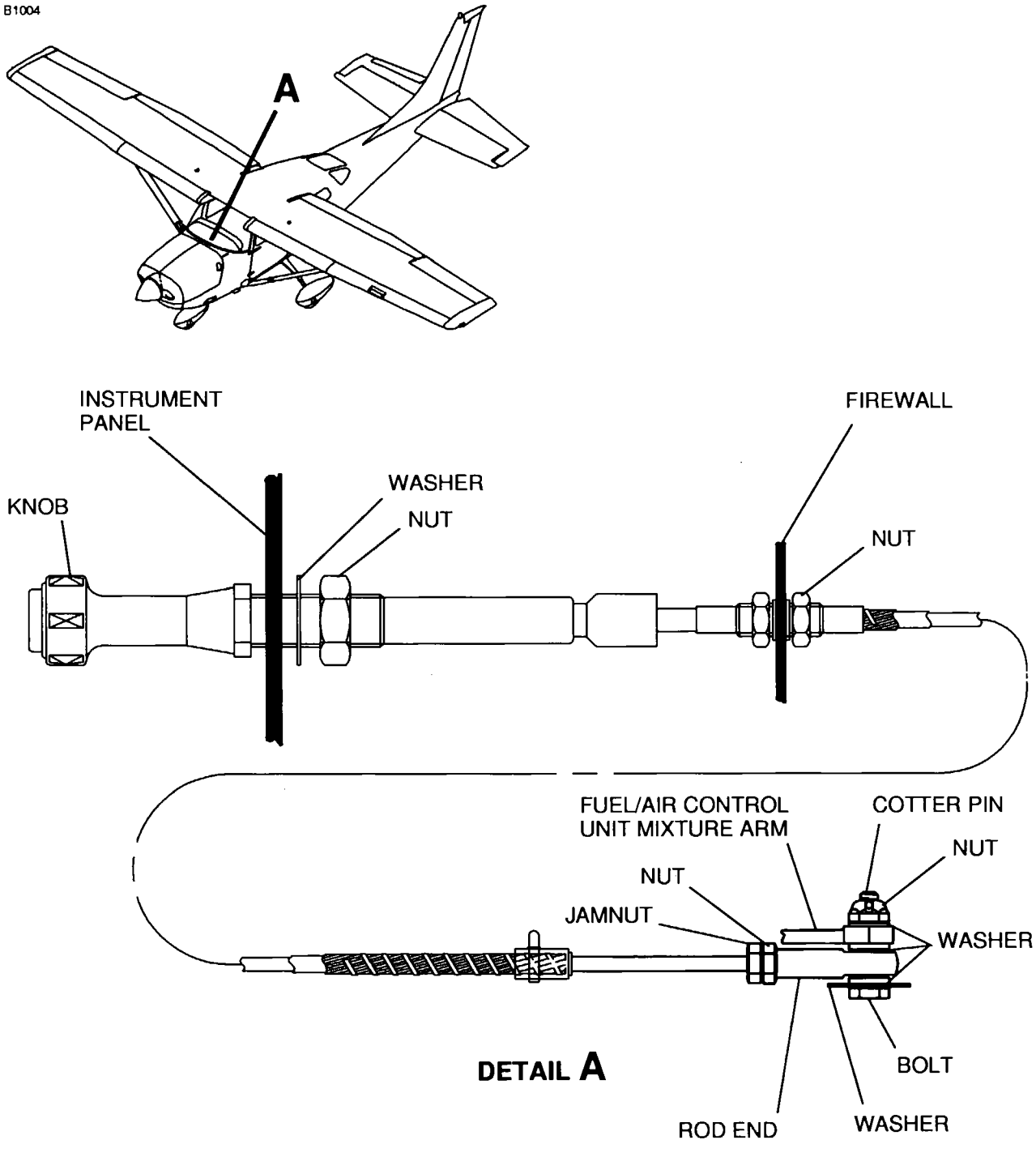
B. Install Fuel Mixture Control (Refer to Figure 201).

NOTE: When installing fuel mixture control, ensure that control is routed exactly as previously installed. Ensure that no binding or preloading occurs from a too small bend radius.

(1) In the cabin/cockpit area, carefully route fuel mixture control through instrument panel, and then place washers and nuts over fuel mixture control.
(2) Route fuel mixture control through firewall.
(3) Secure fuel mixture control to instrument panel by tightening nut against washer at instrument panel.
(4) Position washer and nut on fuel mixture control on the aft side of firewall.
(5) In the engine compartment, place washer and nut over fuel mixture and secure against firewall.
(6) Install jamnut, nut, and rod end on fuel mixture control and tighten.
(7) Attach mixture control rod end to fuel/air control unit mixture arm with bolt, washers, nut. Torque nut to 30 inch-pounds and then continue tightening nut until cotter pin hole lines up with castellations in nut. Do not exceed 50 inch-pounds. Install new cotter pin.
(8) Install nuts, bolts, and clamp securing fuel mixture control cable to cable bracket.
(9) Check mixture control adjustment. Refer to Fuel Mixture Control Adjustment/Test.
(10) Install engine cowl. Refer to Chapter 71, Cowls - Removal/Installation.

3. Fuel Mixture Control Adjustment/Test

A. Check Fuel Mixture Control.
(1) Push fuel mixture control full in and verify that mixture arm on fuel/air control unit is fully open (rich).



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Fuel Mixture Control
Figure 201 (Sheet 1)

(2) Pull fuel mixture control full out and verify that mixture arm on fuel/air control unit is fully closed (lean).
(3) Do a check to make sure that the fuel mixture control has no less than 0.125-inch (3.18 mm) and no more than 0.25-inch (6.35 mm) cushion at each stop.
(4) Work fuel mixture control in and out several times to check for binding.

B. Adjust Fuel Mixture Control.
(1) Disconnect fuel mixture control rod end from fuel/air control unit.
(2) Loosen jam nut and adjust rod end to obtain desired setting. The witness hole in the rod end must be covered with the mixture cable threads.
(3) Tighten jamnut.
(4) Connect rod end to fuel/air control unit. If necessary, you can reposition the mixture control housing in the mixture control bracket clamp. Torque nut to 30 inch-pounds and then continue tightening nut until cotter pin hole lines up with castellations in nut. Do not exceed 50 inch-pounds. Install cotter pin.

4. Fuel Mixture Control Inspection/Check

A. Inspect Fuel Mixture Control.
(1) Check fuel mixture control attachment to throttle body. Check bolt, castellated nut, cotter pin and rod end for security and condition. The witness hole in the rod end must be covered with the mixture cable threads. Check that fuel mixture control slides smoothly throughout its full range of travel, that it adjusts through its full vernier range and the mixture arm operates through its full arc of travel.

CHAPTER

77

ENGINE INDICATING

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
77-Title		
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77-00-00	Page 1	Dec 2/2002
77-10-00	Pages 201-203	Jul 1/2007
77-20-00	Page 1	Apr 1/2005
77-20-00	Pages 201-205	Apr 1/2005
77-30-00	Pages 201-202	Dec 2/2002
77-40-00	Pages 201-202	Jul 3/2006

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

ENGINE INDICATING - GENERAL

1. Scope

A. This chapter describes those components used to measure and indicate engine output.

2. Definition

A. This chapter is divided into sections to aid maintenance technicians in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief description of the sections follows:

(1) The section on tachometer describes the instrument used to measure engine speed (RPM).

(2) The section on engine indicating describes the system used to monitor and measure engine temperatures.

TACHOMETER - MAINTENANCE PRACTICES

1. Description and Operation

A. In airplanes that do not have the Garmin G1000, engine speed (RPM) is measured by a cockpit mounted indicator. Maintenance is only the removal/installation of the tachometer and drive cable.

2. Tachometer and Drive Cable Removal/Installation

NOTE: The procedures that follow are for airplanes with standard avionics.

A. Remove Tachometer and Drive Cable (Refer to Figure 201).
   (1) On the backside of the instrument panel, disconnect the drive cable from the tachometer.
   (2) Disconnect the electrical connector from the backside of the tachometer.
   (3) Remove the screws that attach the tachometer to the instrument panel and remove the tachometer.
   (4) Remove the upper engine cowling. Refer to Chapter 71, Cowls - Maintenance Practices.
   (5) Disconnect the drive cable at the rear of the accessory case.
   (6) Remove the two screws that attach the firewall shield to the firewall.
   (7) Remove the drive cable through the firewall.

B. Install the Tachometer and Drive Cable (Refer to Figure 201).
   (1) Install the drive cable through the firewall.
   (2) Connect the drive cable to the accessory case housing. Torque the tach drive shaft to 100 in-lbs.
   (3) Install the firewall shield to the firewall with screws.
   (4) Install the tachometer to the instrument panel with four screws.
   (5) Connect the electrical connector to the tachometer.
   (6) Connect the drive cable to the backside of the tachometer.
   (7) Install the upper engine cowling. Refer to Chapter 71, Cowls - Maintenance Practices.

3. Tachometer Sending Unit Removal/Installation

NOTE: The procedures that follow are for airplanes with Garmin G1000.

A. Remove the Tachometer Sending Unit (Refer to Figure 202).
   (1) Make sure that the MASTER switch is in the off position.
   (2) Remove the top cowl. Refer to Chapter 71, Cowl - Maintenance Practices.
   (3) Disconnect the electrical connector (PN025).
   (4) Loosen the knurled nut.
   (5) Remove the tachometer sending unit from the airplane.

B. Install the Tachometer Sending Unit (Refer to Figure 202).
   (1) Put the tachometer sending unit in position on the airplane.
   (2) Tighten the knurled nut.
   (3) Connect the electrical connector (PN025).

   NOTE: If irregular tachometer indications have occurred, the use of Stabilant 22 contact enhancer on the electrical connector (PN025) can possibly decrease the occurrence of these indications.

   (4) Install the side cowl. Refer to Chapter 71, Cowl - Maintenance Practices.

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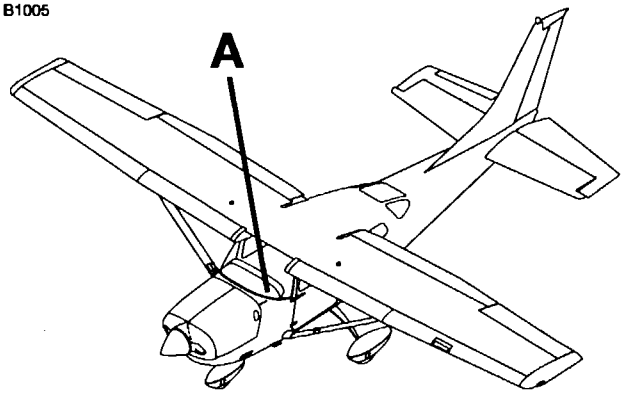

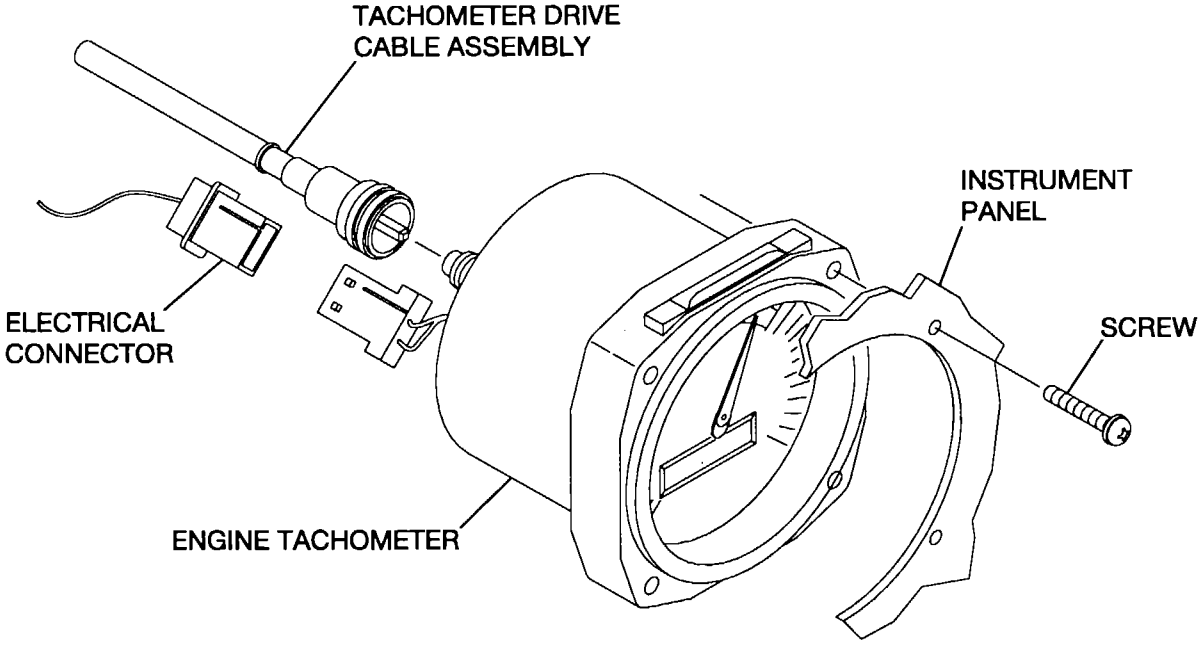

DETAIL A
AIRPLANES WITH STANDARD AVIONICS

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Tachometer Installation
Figure 201 (Sheet 1)

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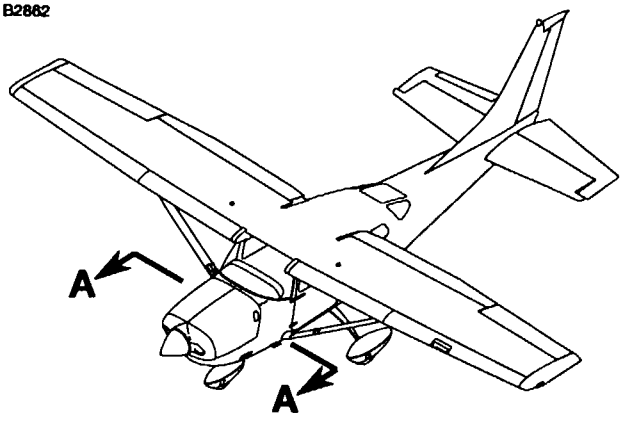
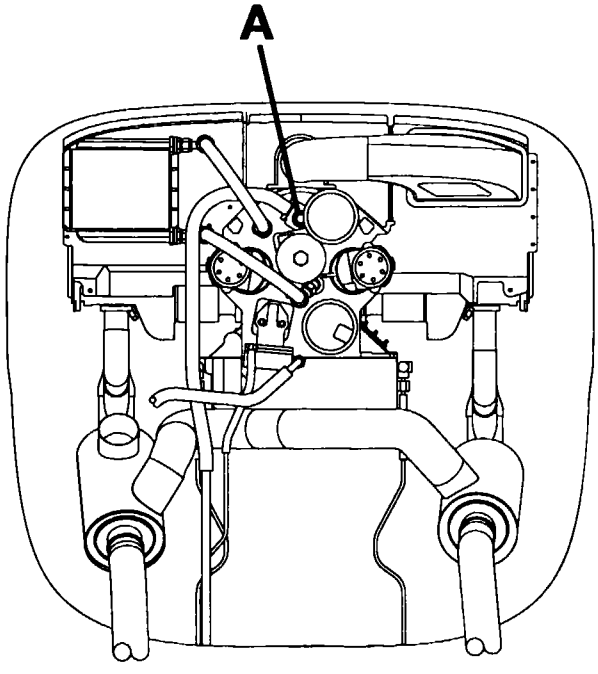
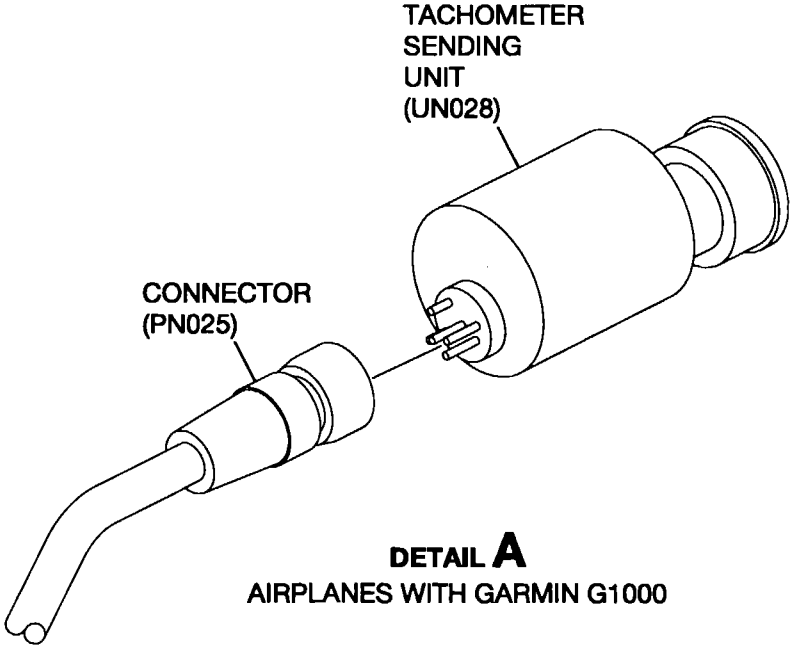


NOTE: NON-TURBO AIRPLANE SHOWN, TURBO AIRPLANE SIMILAR.



VIEW A-A



DETAIL A
AIRPLANES WITH GARMIN G1000

1210T1001
AA1258T1004
A0758T1003

Tachometer Sending Unit Installation
Figure 202 (Sheet 1)

ENGINE TEMPERATURE - DESCRIPTION AND OPERATION

1. Description

A. The section that follows has removal and installation procedures for the system which will show different temperatures in the engine. The system that shows the temperature for the engine includes the indicators and probes for the cylinder head temperature (CHT), exhaust gas temperature (EGT) for the non-turbo airplanes, oil temperature, and the turbine inlet temperature (TIT) for airplanes with a turbo engine. For airplanes that have the Garmin G1000 avionics system, the CHT, EGT, oil temperature, and TIT indications are given on the Multi Function Display (MFD).

2. Operation

A. Non-Turbocharged Airplanes.

(1) On the non-turbocharged airplanes, the EGT system is used to measure the temperature of the exhaust gas. The measurement gives an indication of the fuel/air mixture for the pilot. The system has one indicator installed in the instrument panel, which gives the two functions that show the EGT and CHT information. A probe installed in the exhaust and a probe installed in a cylinder, send the temperature information to the TIT/CHT indicator. The oil temperature sending unit is installed in the accessory case and gives the oil temperature in degrees Fahrenheit. On airplanes with Garmin G1000, each cylinder has EGT and CHT probes.

B. Turbocharged Airplanes.

(1) On turbocharged airplanes, the TIT system is used to measure temperature of the exhaust gas as it enters the turbine. The measurement gives an indication of the fuel/air mixture for the pilot. The system has one indicator installed in the instrument panel, which gives two functions that show the TIT and CHT information. A probe installed in the turbine inlet and a probe installed in a cylinder, send the temperature information to the TIT/CHT indicator. The oil temperature sending unit is installed in the accessory case and gives the oil temperature in degrees Fahrenheit. On airplanes with Garmin G1000, each cylinder has EGT and CHT probes.

ENGINE TEMPERATURE - MAINTENANCE PRACTICES

1. General

A. Maintenance of the engine temperature system is only the removal and installation of the different components.

2. EGT/CHT Indicator Removal/Installation

NOTE: The procedures that follow are for airplanes with standard avionics.

A. Remove the EGT/CHT Indicator (Refer to Figure 201).

NOTE: The EGT indicator has CHT readings on the right side of the instrument.

(1) Get access to the back side of the indicator.
(2) Disconnect the electrical connector from the indicator.
(3) Remove the screws that attach the indicator to the instrument panel and remove the indicator from the airplane.

B. Install EGT/CHT Indicator (Refer to Figure 201).
(1) Put the indicator in the instrument panel and install the screws.
(2) Connect the electrical connector to the indicator. Reset the socket connectors as necessary for a tight fit.

3. TIT/CHT Indicator Removal/Installation

NOTE: The procedures that follow are for airplanes with standard avionics.

A. Remove the TIT/CHT Indicator (Refer to Figure 201).

NOTE: The cockpit-mounted TIT indicator also has CHT readings on the right side of the instrument.

(1) Get access to the backside of the indicator.
(2) Disconnect the electrical connector from the indicator.
(3) Remove the screws that attach the indicator to the instrument panel and remove the indicator from the airplane.

B. Install the TIT/CHT Indicator (Refer to Figure 201).
(1) Put the indicator in the instrument panel and install the screws.
(2) Connect the electrical connector to the indicator. Reset the socket connectors as necessary for a tight fit.

4. EGT Probe Removal/Installation

A. Remove the EGT Probe (Refer to Figure 202).

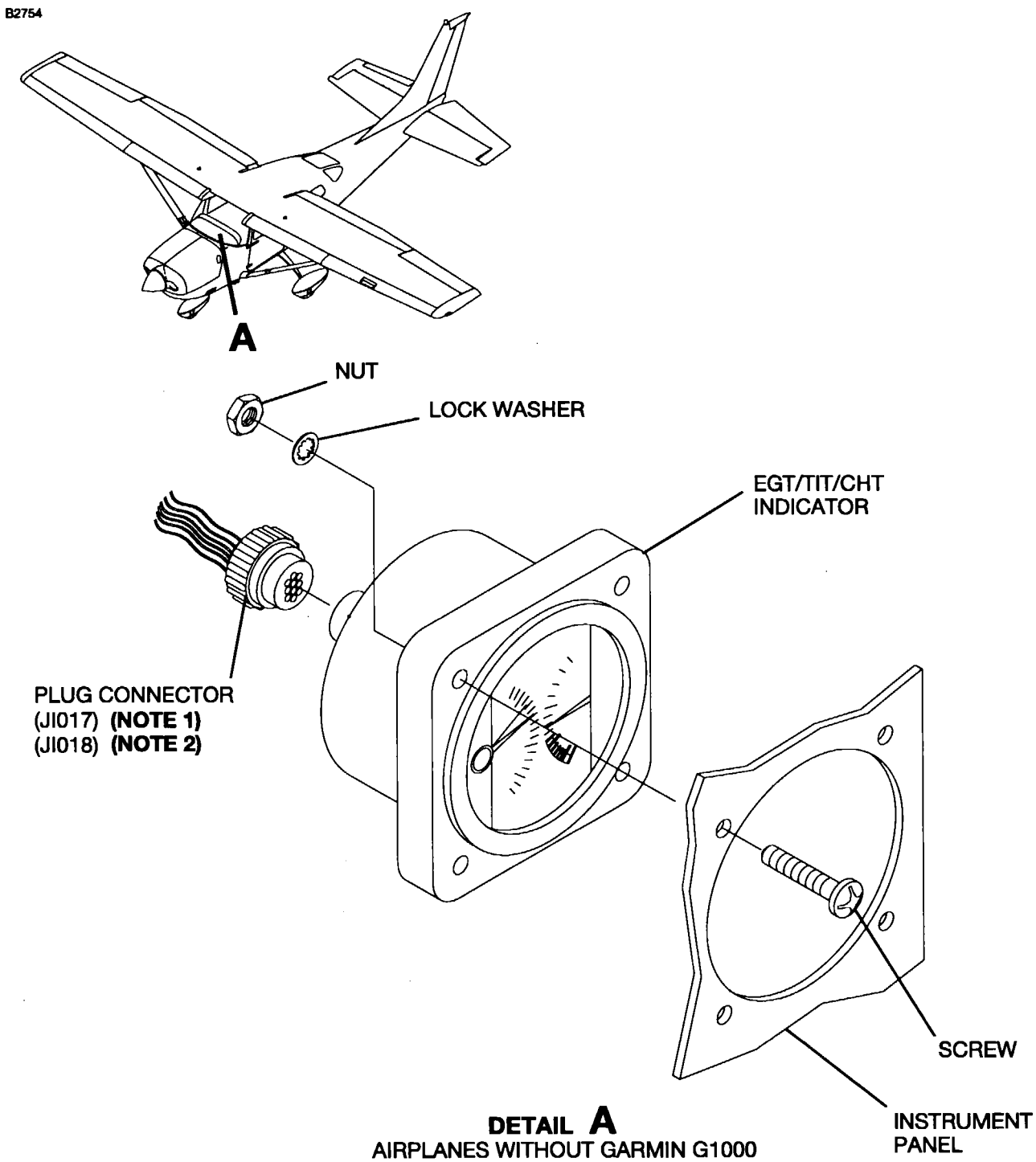
NOTE: Airplanes with the Garmin G1000 will have a probe for each exhaust riser.

NOTE: The EGT probe is welded to the clamp.

(1) Remove the engine cowling. Refer to Chapter 71, Cowls - Maintenance Practices.

CAUTION: Make sure that the exhaust system is cool before the probe is removed.

(2) Disconnect the electrical connector from the EGT probe.
(3) Cut and remove the safety wire from the EGT probe clamp and screw.
(4) Loosen the clamp screw.



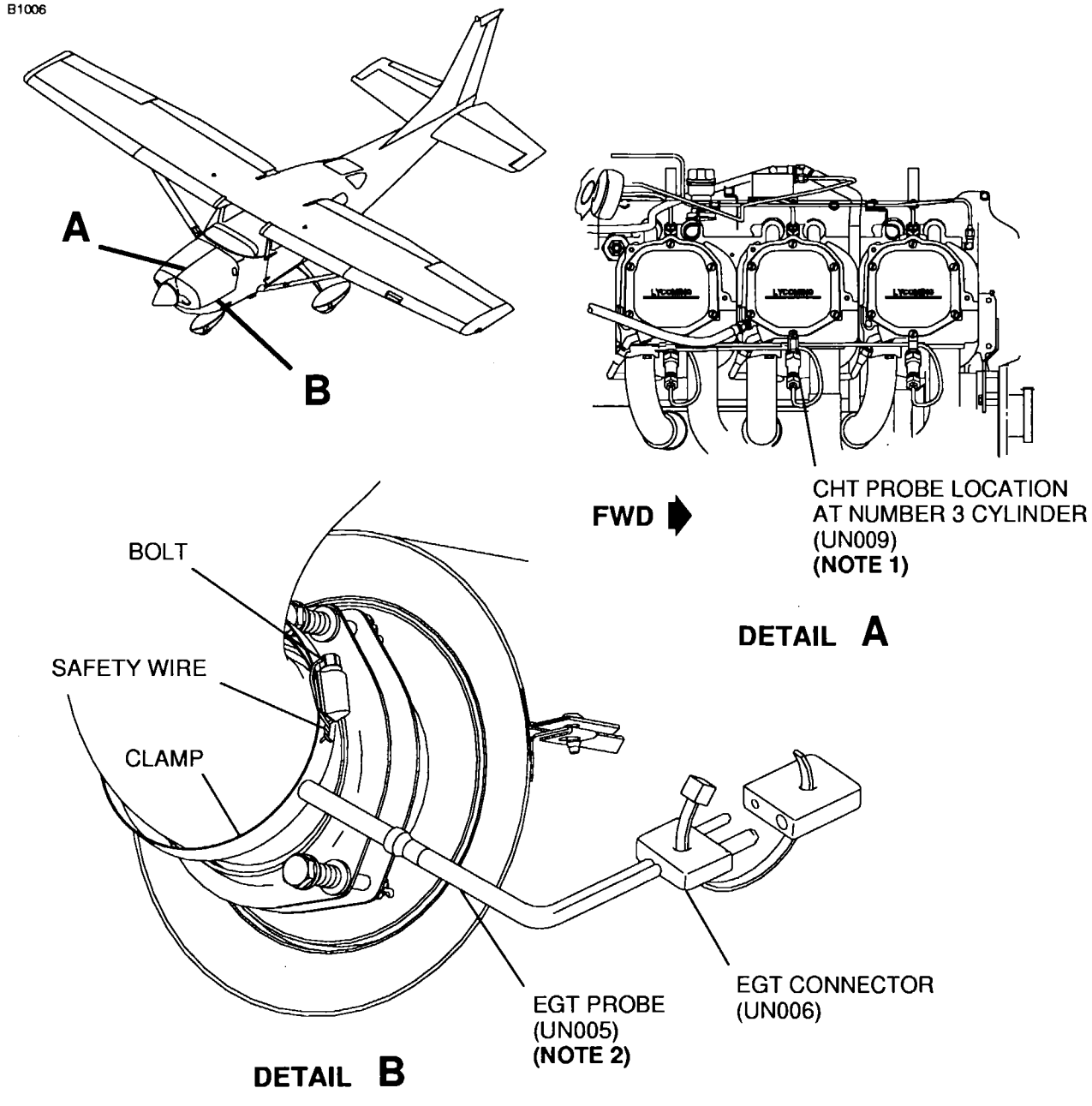
DETAIL A
AIRPLANES WITHOUT GARMIN G1000

NOTE 1: FOR AIRPLANES 20608001 AND ON

NOTE 2: FOR AIRPLANES T20608001 AND ON

1210T1001
A0718T1041

Exhaust Indicating System
Figure 201 (Sheet 1)



NOTE 1: AIRPLANES WITH GARMIN G1000 HAVE A CHT PROBE AT EACH CYLINDER.

NOTE 2: AIRPLANES WITH GARMIN G1000 HAVE AN EGT PROBE AT EACH CYLINDER.

1210T1001
A0755T1013
B1255T1020

EGT and CHT Probe Installation
Figure 202 (Sheet 1)

(5) Remove the clamp with the attached probe from the exhaust pipe.

B. Install EGT Probe (Refer to Figure 202).
(1) Attach the clamp with the EGT probe to the exhaust pipe.
(2) Tighten the screw for the clamp
(3) Attach safety wire to the EGT probe clamp and screw.
(4) Connect electrical connectors to EGT probe. Reset the socket connectors as necessary for a tight fit.
(5) Use a tie strap to keep all the connectors together.
(6) Install the engine cowling. Refer to Chapter 71, Cowls - Maintenance Practices.

5. TIT Probe Removal/Installation

A. Remove the TIT Probe (Refer to Figure 203).
(1) Remove the engine cowling. Refer to Chapter 71, Cowls - Maintenance Practices.

CAUTION: Make sure that the exhaust system is cool before the probe is removed.

(2) Disconnect the electrical connector from TIT probe.
(3) Remove the TIT probe from the turbine inlet.

B. Install the TIT Probe (Refer to Figure 203).
(1) Install the TIT probe to the turbine inlet.
(2) Connect the electrical connectors to the TIT probe. Reset the socket connectors as necessary for a tight fit.
(3) Use tie straps to keep the connectors together.
(4) Install the engine cowling. Refer to Chapter 71, Cowls - Maintenance Practices.

6. CHT Probe Removal/Installation

A. Remove the CHT Probe (Refer to Figure 202).

NOTE: On airplanes with Garmin G1000, the CHT probes use a bayonet style connector.

NOTE: Airplanes with the Garmin G1000 have a CHT probe at each cylinder. Removal and installation of the CHT probes is typical.

(1) Remove engine cowling. Refer to Chapter 71, Cowls - Maintenance Practices.

CAUTION: Make sure that the exhaust system and engine are cool before the probe is removed.

(2) Remove the nut and disconnect the terminal from the CHT probe.

NOTE: Airplanes with Garmin G1000 do not have a terminal to disconnect from the CHT probe.

(3) For non-turbo engines, Unscrew and remove the CHT probe from the Number 3 cylinder. For turbo engines, remove the CHT probe from the Number 5 cylinder.

B. Install the CHT Probe (Refer to Figure 202).
(1) For non-turbo engines, install the CHT probe to the Number 3 cylinder. For turbo engines, install the CHT probe to the Number 5 cylinder.
(2) Connect the terminal on the CHT probe. Install and tighten the nut.
(3) Install the engine cowling. Refer to Chapter 71, Cowls - Maintenance Practices.

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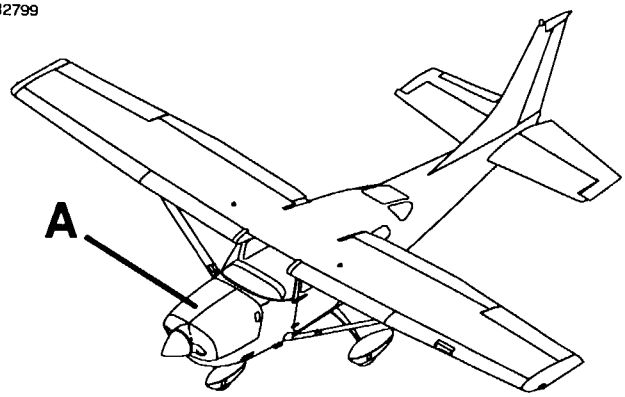
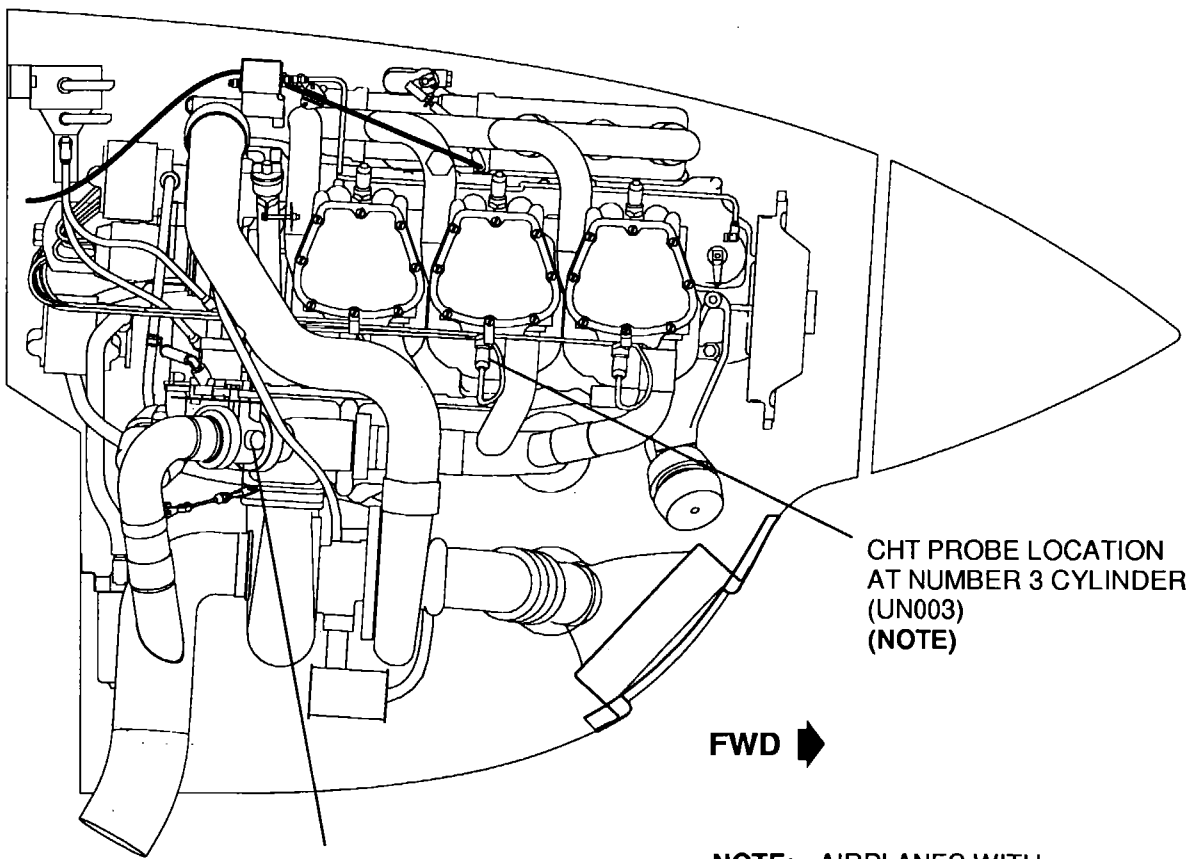




NOTE: AIRPLANES WITH GARMIN G1000 HAVE A CHT PROBE AT EACH CYLINDER.

DETAIL A

1210T1001
A1258T1005

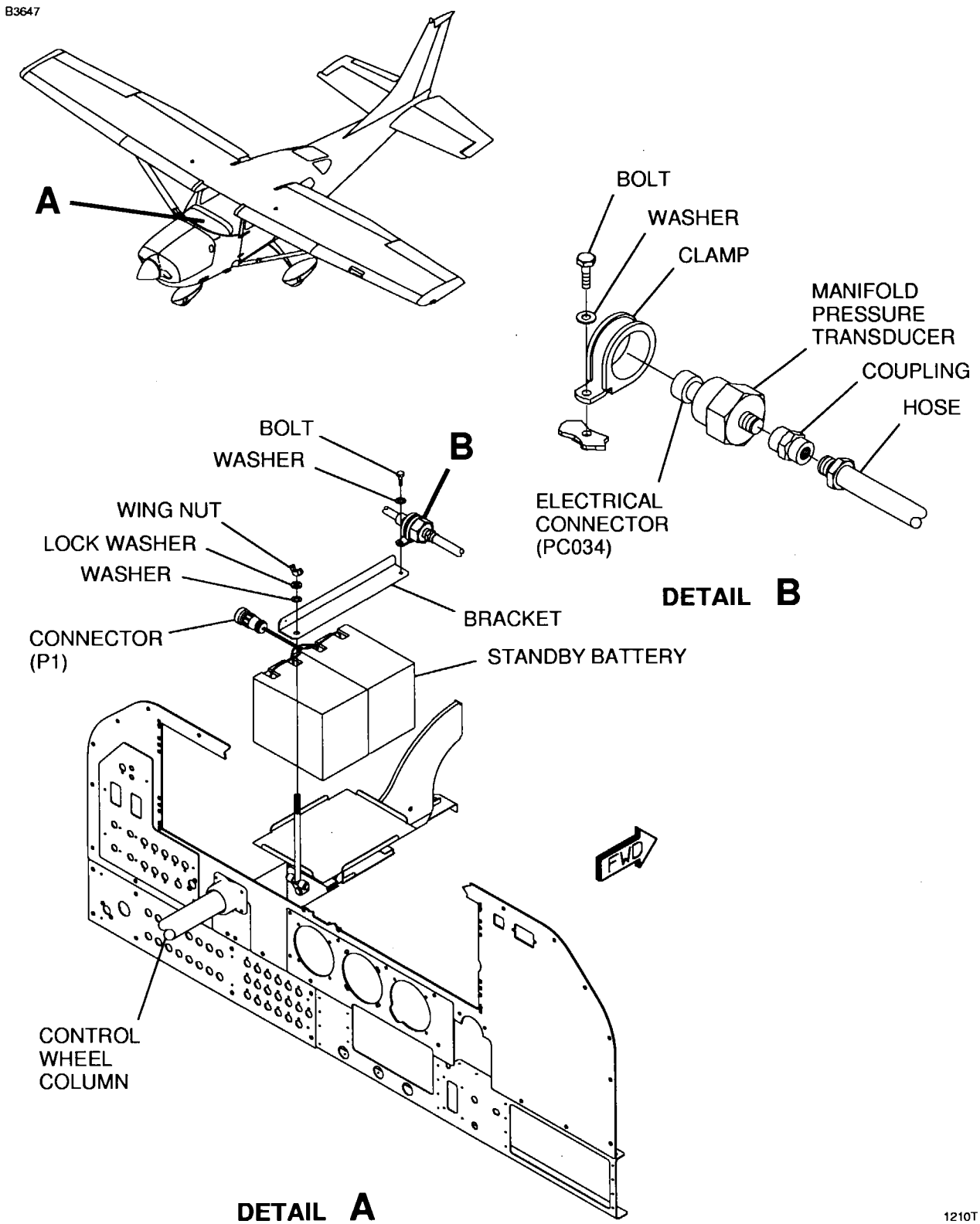
TIT and CHT Probe Installation
Figure 203 (Sheet 1)

MANIFOLD PRESSURE TRANSDUCER - MAINTENANCE PRACTICES
Airplanes with Garmin G1000

1. Manifold Pressure Transducer Removal/Installation

A. Remove the Manifold Pressure Transducer (Refer to Figure 201).
   (1) Remove the PFD. Refer to Chapter 34, Control Display Unit - Maintenance Practices.
   (2) Remove the bolt, washer and clamp that hold the manifold pressure transducer in position.
   (3) Disconnect the pressure line and electrical connector.
   (4) Remove the manifold pressure transducer.

B. Install the Manifold Pressure Transducer (Refer to Figure 201).
   (1) Connect the pressure line and electrical connector.
   (2) Put the manifold pressure transducer in position.
   (3) Install the bolt, washer and clamp that hold the manifold pressure transducer in position.
   (4) Install the PFD. Refer to Chapter 34, Control Display Unit - Maintenance Practices.



Manifold Pressure Transducer Installation
Figure 201 (Sheet 1)

GEA-71 ENGINE/AIRFRAME UNIT - MAINTENANCE PRACTICES

1. Description and Operation

A. The GEA-71 Engine/Airframe Unit is a microprocessor line replaceable unit (LRU). It is used to monitor sensor inputs and operate annunciator outputs for the airframe and engine systems.

B. The GEA-71 is an interface for different sensors on the airplane and gives airframe and engine information through a digital interface to the GIA-63 Integrated Avionics Units (IAUs). The GIA-63s are then an interface with the GDU 1040 Primary Flight Display (PFD) and Multi-Function Display (MFD). Typically, the MFD gives engine information while the PFD gives airframe alerts from the GEA-71. Engine and airframe information is also shown on the PFD and/or MFD, while the system is in the reversionary mode.

C. The PFD and MFD displays operate as the user interface for the GEA-71. All configuration adjustments are controlled by software adjustments through the MFD and PFD displays.

2. General

A. The maintenance procedures that follow are for the removal and installation of the engine/airframe unit.

3. GEA-71 Engine/Airframe Unit Removal/Installation

A. Engine/Airframe Unit Removal (Refer to Figure 201).
(1) Put the AVIONICS MASTER switch in the off position.
(2) Remove the MFD. Refer to Chapter 34, Control Display Unit - Maintenance Practices.
(3) Remove the screws that attach the engine/airframe unit to the structure.
(4) Remove the engine/airframe unit from the airplane.

B. Engine/Airframe Unit Installation (Refer to Figure 201).
(1) Put the engine/airframe unit in position.
(2) Attach the engine/airframe unit to the structure with the screws.
(3) Install the MFD. Refer to Chapter 34, Control Display Unit - Maintenance Practices.
(4) If applicable, put the AVIONICS MASTER switch in the ON position.
(5) Do a check to make sure the engine/airframe unit operates correctly. Refer to the Garmin G1000 Line Maintenance Manual.

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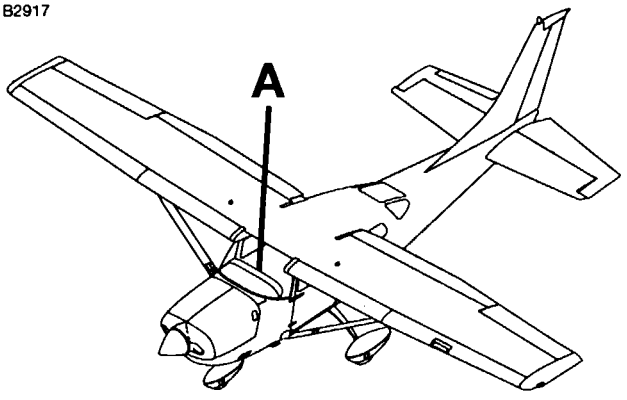

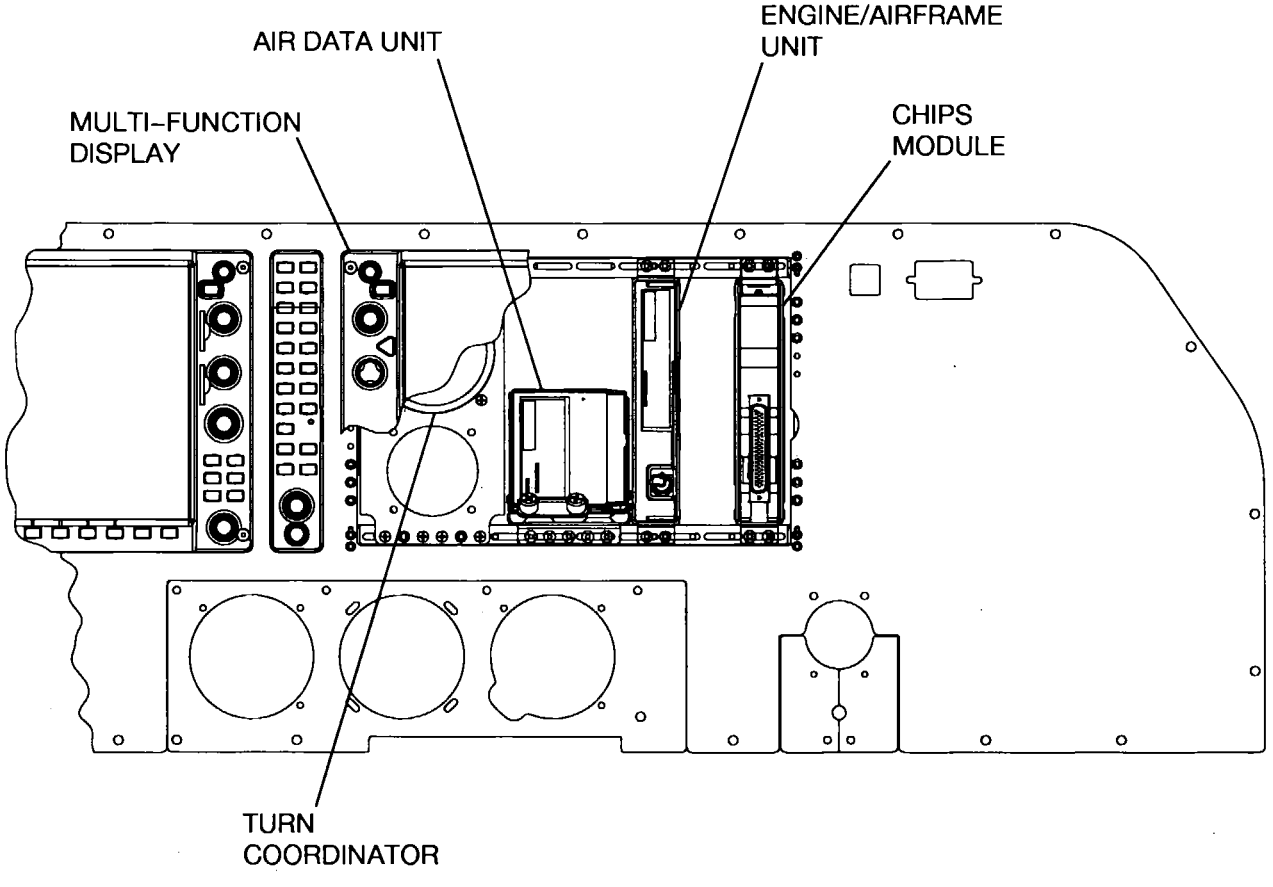

DETAIL A

AIRPLANES WITH GARMIN G1000

1210T1001
A1218T1044

Forward Avionics Equipment Installation
Figure 201 (Sheet 1)

CHAPTER 78

EXHAUST

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
78-Title		
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78-10-00	Pages 201-203	Dec 2/2002
78-10-01	Pages 201-206	Apr 1/2005

RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

EXHAUST - GENERAL

1. Scope

A. This chapter provides information for removal and installation of the components of the exhaust system.

EXHAUST SYSTEM (NON-TURBOCHARGED) - MAINTENANCE PRACTICES

1. General

A. This section provides instructions for removal, installation, and inspection of the exhaust system.

2. Description and Operation

A. The exhaust system consists of two exhaust stacks, two muffler assemblies, two tailpipes, and associated hardware. The muffler assemblies are equipped with a heat shroud to provide cabin heat. The right muffler shroud is equipped with a air intake duct connected to the upper right engine baffle. A duct interconnects the left and right heat shrouds. A duct connected to the left heat shroud is routed to the cabin heat control valve on the firewall. For cabin heat installation refer to Chapter 21, Heating/Defrosting (Non-Turbocharged) - Maintenance Practices.

3. Exhaust System Removal/Installation

A. Exhaust System Removal (Refer to Figure 201).
(1) Remove upper engine cowling.
(2) Remove clamp from right shroud intake duct and retain.
(3) Remove clamps from duct interconnecting the left and right heat shrouds, and remove duct and retain.
(4) Remove clamp from left heat shroud duct and retain.
(5) Remove nuts, washers and bolts from clamps securing tailpipes to shock mounts on the firewall and retain bolts and clamps, discard nuts and washers.

NOTE: If exhaust assemblies are to be removed as a unit proceed to step (8).

(6) Remove nuts, washers, and bolts from clamps securing tail pipes to mufflers and retain. Remove tailpipes.
(7) Remove cotter pins, nuts, washers, bolts, and springs securing mufflers to exhaust stack and retain bolts and springs, discard cotter pins, nuts and washers. Remove mufflers.
(8) Disconnect electrical lead from EGT thermocouple.
(9) Remove nuts and washers securing exhaust stack to engine cylinders and retain.
(10) Remove exhaust stacks and gaskets. Discard gaskets.

B. Exhaust System Installation (Refer to Figure 201).
(1) Using new gaskets, position exhaust stacks on engine cylinders and install washers and nuts.
(2) Torque nuts to 93 inch-pounds, +3 or -3 inch-pounds.

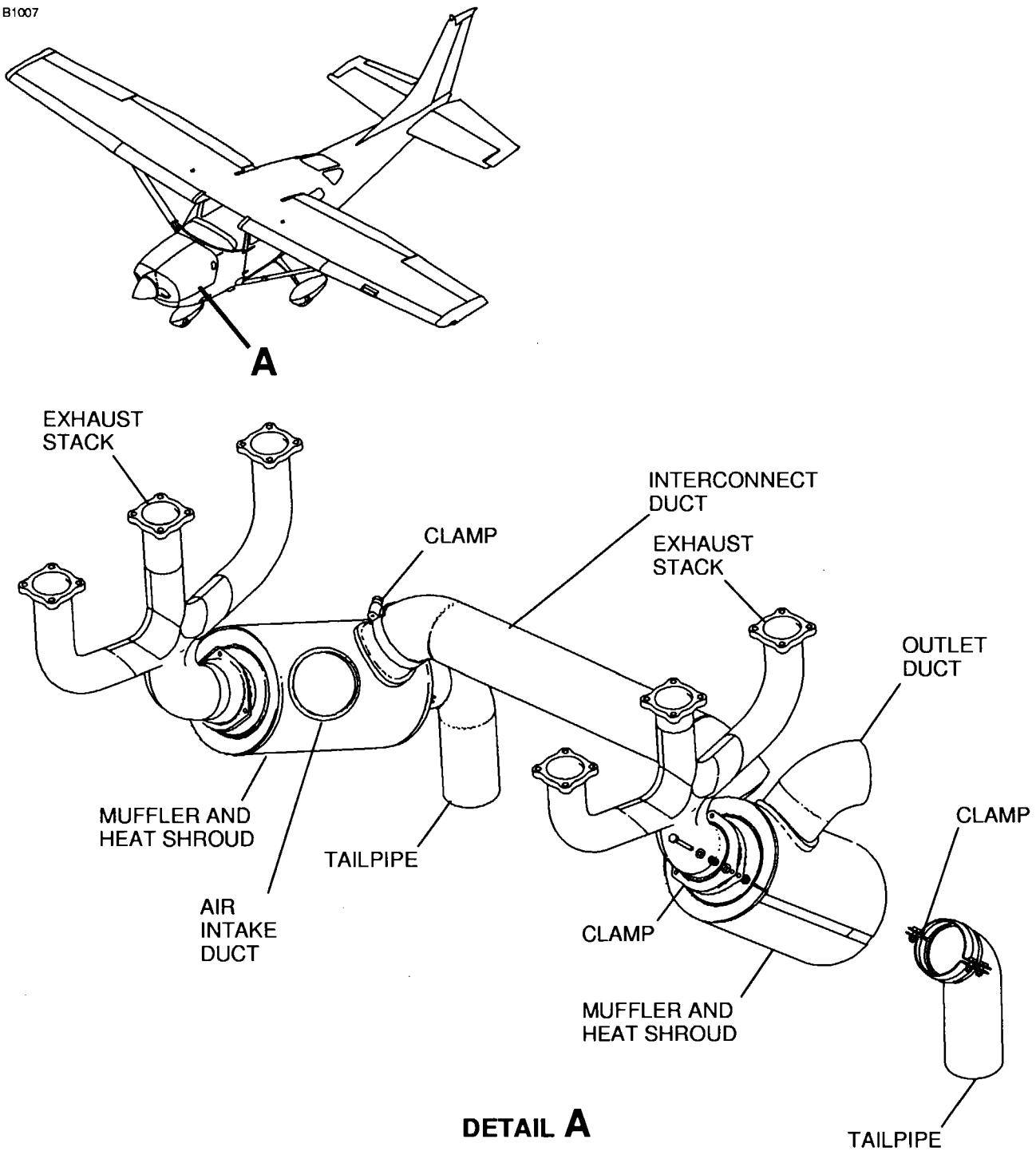
NOTE: If exhaust assemblies were removed as a unit proceed to step (4).

(3) Position muffler assemblies on exhaust stacks and install springs, bolts, washers, and castellated nuts securing mufflers to exhaust stacks.
(4) For both left and right exhaust systems, evenly tighten all ball joint hardware, ensuring that the attaching flanges are in alignment and attaching hardware is installed perpendicular with the attaching flanges. Nuts should be tightened with the minimum amount of clearance required for the cotter pin to pass through the nut and bolt.

NOTE: Ball joint flanges must not touch and must be approximately parallel.

NOTE: Use the same washer sequence for each attaching point to ensure equal adjustment of the springs. New washers must be used.

(5) Install tailpipes using clamps, bolts washers, and nuts.
(6) Install clamps, bolts, nuts, and washers securing tailpipes to shock mounts on the firewall.
(7) Using clamp secure right intake duct to shroud.
(8) Using clamps install duct interconnecting the left and right heat shrouds.
(9) Using clamp secure duct to left heat shroud.



Exhaust System Installation
Figure 201 (Sheet 1)

(10) Connect electrical lead on EGT thermocouple.
(11) Install upper engine cowling.

4. Exhaust System Inspection

A. Exhaust System Inspection and Leak Test. (Refer to Chapter 5, Time Limits/Maintenance Checks for inspection intervals).
(1) Remove upper and lower engine cowling.
(2) Check areas adjacent to welds and slip joints. Look for gas deposits in surrounding areas, indicating that exhaust gases are escaping through a crack, hole or around the slip joints.
(3) After visual inspection an air leak check should be made on the system as follows:
(a) Attach the pressure side of an industrial vacuum cleaner to the tailpipe opening, using a rubber plug to effect a seal as required.

NOTE: The inside of vacuum cleaner hose should be free of any contamination that might be blown into the engine exhaust system.

(b) With vacuum cleaner operating, all joints in the exhaust system may be checked manually by feel, or by using a soap and water solution and watching for bubbles. Forming of bubbles is considered acceptable; if bubbles are blown away, system is not considered acceptable.
(c) Repeat procedure for opposite exhaust.
(4) Where a surface is not accessible for a visual inspection, or for a more positive test, the following procedure may be used:
(a) Remove exhaust stack assemblies.
(b) Remove heat shrouds from mufflers.
(c) Use rubber expansion plugs to seal openings.
(d) Using a manometer or gage, apply approximately 1.5 PSI (three inches of mercury) (10.3 kPa) air pressure while each stack assembly is submerged in water. Any leaks will appear as bubbles and can be readily detected.
(e) Exhaust stacks found defective must be replaced before the next flight.
(5) Install exhaust system and perform inspection in step (3).

EXHAUST SYSTEM (TURBOCHARGED) - MAINTENANCE PRACTICES

1. General

A. This section provides instructions for the exhaust system.

2. Description and Operation

A. The tailpipe and heat shroud assemblies are Cessna components. The exhaust system (Turbocharged) is a Textron Lycoming assembly. Textron Lycoming has additional information for the removal, installation and any additional maintenance necessary for the exhaust system. For more information on the exhaust system, call a Textron Lycoming representative at (570) 323-6181. The exhaust system is an exhaust stack assembly, heat shroud, and associated hardware. The heat shroud gives heat to the cabin. The heat shroud is installed with an air intake duct, which connects to the top right engine baffle. The duct routing connects to the shroud and to the cabin heat control valve on the firewall. Refer to Chapter 21, Heating/Defrosting - Maintenance Practices for cabin heat installation.

3. Exhaust Tailpipe Assembly Removal/Installation

CAUTION: You must fully inspect the clamps each time they are removed.

NOTE: Each removal and installation of the clamps will decrease the service life.

A. Exhaust Tailpipe Assembly Removal (Refer to Figure 201 and Figure 202).
   (1) Remove the top right engine cowl. Refer to Chapter 71, Cowl - Maintenance Practices.
   (2) Remove the clamps that attaches the tailpipe to the turbocharger and wastegate.
   (3) Remove the clamp that attaches the lanyard to the wastegate overboard-pipe.

B. Exhaust Tailpipe Assembly Installation (Refer to Figure 201 and Figure 202).
   (1) If you install a multi-segment V-band clamps, make sure the exhaust flanges touch and are aligned.
   (2) Use a soft mallet to tap the clamp in a circular direction as the nut is tightened.
      (a) First measure the running torque of the clamp nut before you tighten it.
   (3) Install the clamp that attaches tailpipe assembly to the turbocharger.
      (a) Add 20 inch-pounds (2.3 N.m) to the running torque for the nut of the Aeroquip S1921-1 tailpipe clamp.
      (b) Add 50 inch-pounds (5.6 N.m) to the running torque for the nut of the NUCO S1921-1 tailpipe clamp.
   (4) Install the clamp that attaches the tailpipe assembly to the wastegate.
      (a) Add 70 to 90 inch-pounds (8 to 10 N.m) to the running torque for the nut of the S3262-6 wastegate clamp.
   (5) Install the clamp that attaches the lanyard to the wastegate overboard-pipe.
   (6) Install the cowl. Refer to Chapter 71, Cowl - Maintenance Practices.

4. Heat Shroud Removal/Installation

A. Heat Shroud Removal (Refer to Figure 201).
   (1) Remove the left and right top engine cowl. Refer to Chapter 71, Cowls - Maintenance Practices.
   (2) Remove nosecaps, left and right.
   (3) Remove screws from heat shroud intake duct and retain.
   (4) Remove clamp from heat shroud outlet duct and retain.
   (5) Remove screws securing the heat shroud assembly to the exhaust system and retain.

B. Heat Shroud Installation (Refer to Figure 201).
   (1) Install screws securing the heat shroud assembly to the exhaust system.
   (2) Using clamp secure outlet duct to heat shroud.
   (3) Using screws secure intake duct to heat shroud.
   (4) Install nosecaps, left and right.
   (5) Install the left and right top engine cowl. Refer to Chapter 71, Cowl - Maintenance Practices.

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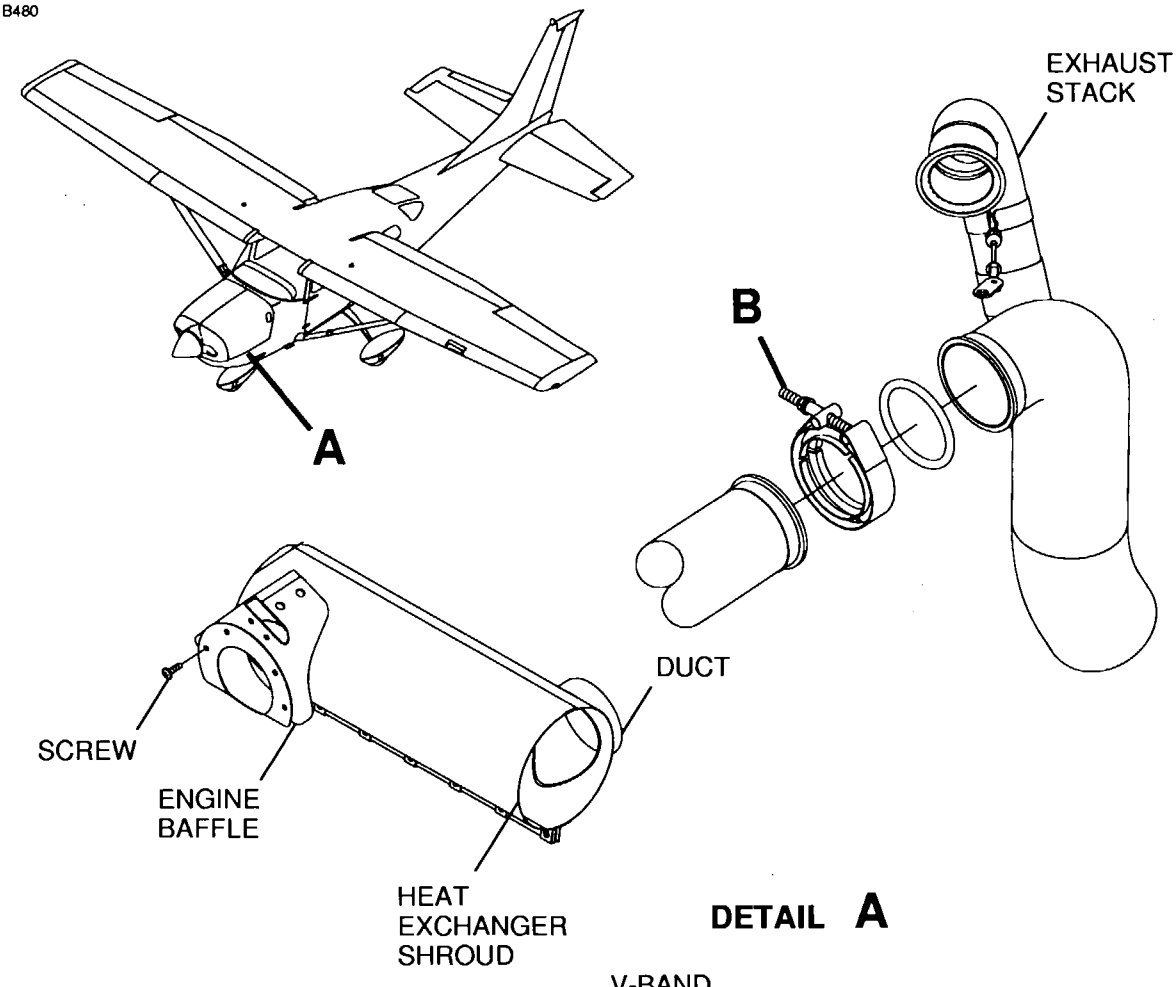

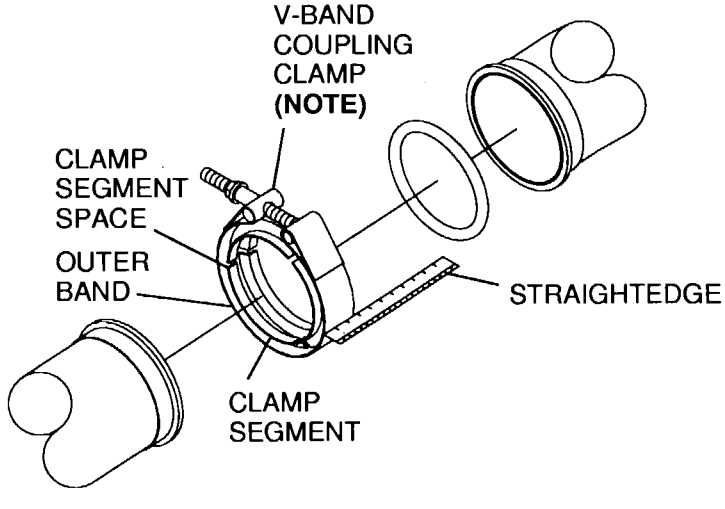

NOTE: LOOK CAREFULLY FOR CRACKS IN ALL VISUAL ACCESS AREAS OF THE INSTALLED CLAMP.

DETAIL B
(TYPICAL)

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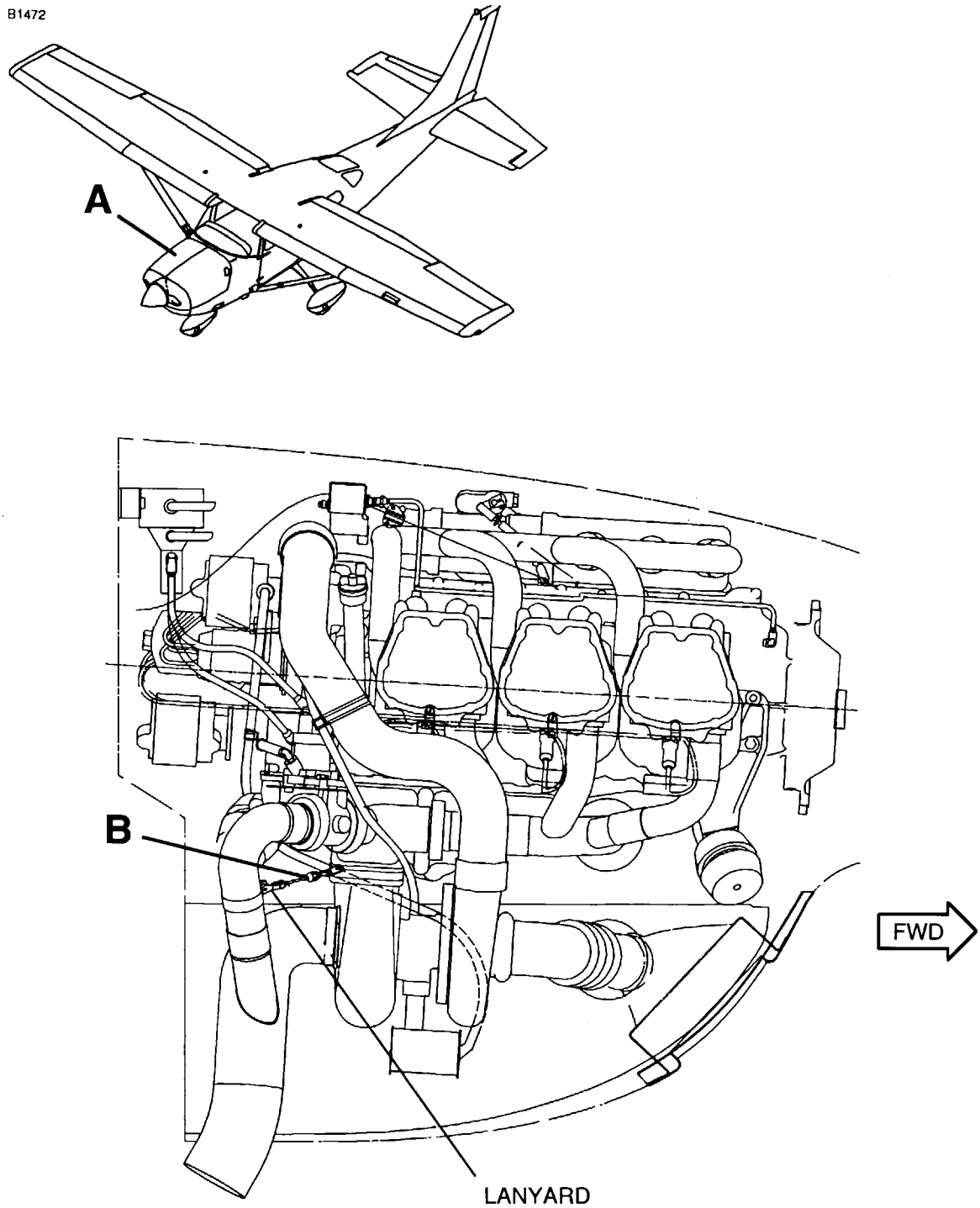
Exhaust System Installation
Figure 201 (Sheet 1)



DETAIL A
VIEW LOOKING INBOARD RIGHT SIDE

Exaust Pipe Installation
Figure 202 (Sheet 1)

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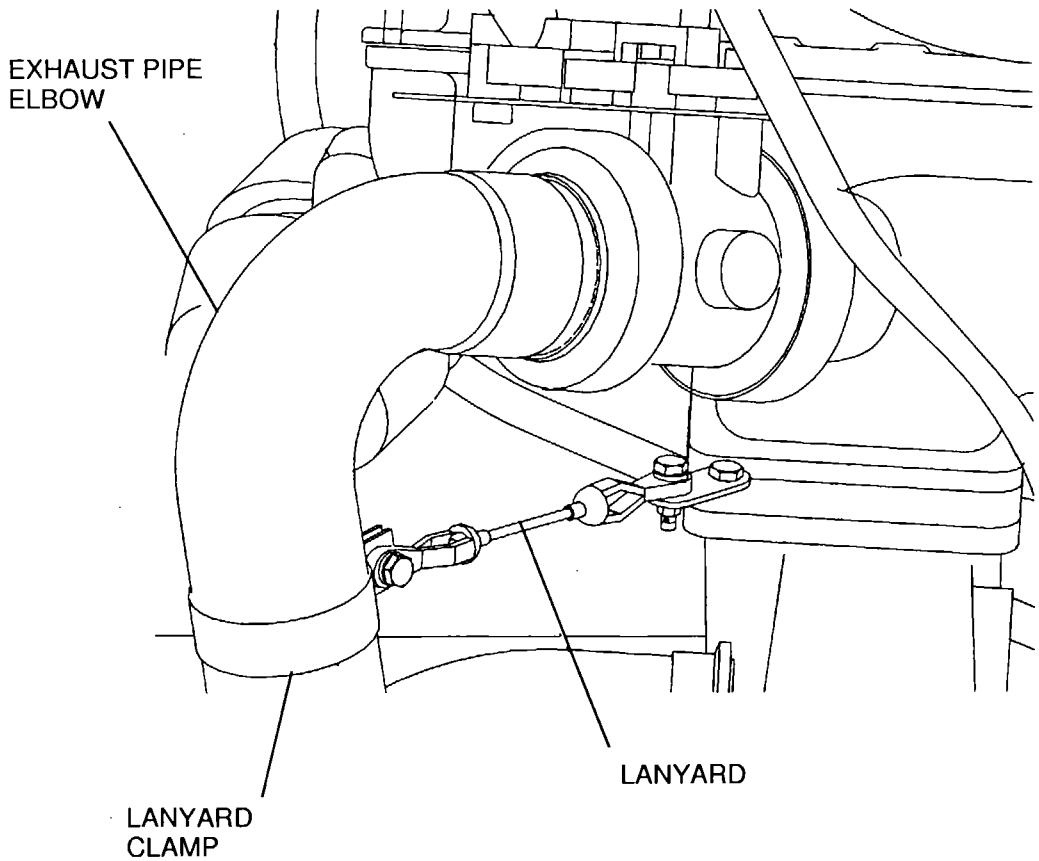

DETAIL B

Exaust Pipe Installation
Figure 202 (Sheet 2)

5. Exhaust System Inspection

A. Exhaust System Inspection and Leak Test. Refer to Chapter 5, Time Limits/Maintenance Checks for inspection intervals.
(1) Remove upper and lower right engine cowlings.
(2) Check areas adjacent to welds and slip joints. Look for gas deposits in surrounding areas, indicating that exhaust gases are escaping through a crack, hole or around the slip joints.
(3) After visual inspection an air leak check should be made on the system as follows:
(a) Attach the pressure side of an industrial vacuum cleaner to the exhaust stack opening, using a rubber plug to effect a seal as required.

NOTE: The inside of vacuum cleaner hose should be free of any contamination that might be blown into the engine exhaust system.

(b) With the operation of the vacuum cleaner, you can complete a check of all the joints in the exhaust system manually by touch, or with a soap and water solution as you examine for bubbles. Bubbles from the solution is acceptable. If the soap and water solution is blown away with no bubbles, then the system is not considered acceptable.

NOTE: Bubbles are acceptable at the slip joint but not acceptable at weld joints.

(c) Repeat procedure for opposite exhaust.
(4) Where a surface is not accessible for a visual inspection, or for a more positive test, the following procedure may be used:
(a) Remove exhaust stack assemblies.
(b) Remove heat shroud from muffler.
(c) Use rubber expansion plugs to seal openings.
(d) Using a manometer or gage, apply approximately 1.5 PSI (three inches of mercury) air pressure while each stack assembly is submerged in water. Any leaks will appear as bubbles and can be readily detected.
(e) Exhaust stacks found defective must be replaced before the next flight.
(5) Install exhaust system and perform inspection in step (3).

6. V-Band Coupling Clamp Inspection

CAUTION: You must fully inspect the clamps each time they are removed.

NOTE: Each removal and installation of the clamps will decrease the service life.

A. Remove the Top Cowl. Refer to Chapter 71, Cowls - Maintenance Practices.

B. Complete an Inspection of an Installed V-Band Coupling Clamp (Refer to Figure 201).
(1) Complete the inspection that follows.
(a) Use a flashlight with a mirror to examine the corner radii at the end of each segment of the clamp for cracks.
1 Make sure you examine all areas that you can see with the clamp installed.
(b) Examine the clamp to make sure there is space between each of the clamp segments.
1 If the ends of the clamp segments touch, then you must replace the clamp.
2 If there is too much deformation of the clamp, you must replace the clamp.

NOTE: Deformation of the clamp is when the straightedge does not touch a sufficient area across the clamp when you do a flatness check.

(c) Examine for loose or cracked spot welds.
(d) Use a staightedge such as a ruler to make sure the outer band surface is flat.
1 Make sure you carefully examine the area with the spot welded tabs for the T-bolt fastener.

(e) Make sure the outer band touches the clamp segments.
1 If there is any area that the outer band does not touch a clamp segment, you must replace the clamp. Refer to Exhaust Tailpipe Removal/Installation

(2) You must replace the clamp if you are not sure of its condition. Refer to Exhaust Tailpipe Removal/Installation.

CHAPTER 79

OIL

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CONTENTS

OIL - GENERAL

1. Scope

A. This chapter provides maintenance instructions for those components which distribute oil and which indicate oil condition. For information beyond the scope of this material, refer to appropriate Textron Lycoming Operator's and Overhaul Manuals, and to Chapter 71, Engine - Troubleshooting.

2. Definition

A. This chapter is divided into sections to assist maintenance personnel in locating specific information. The following is a brief description of each section. For locating information within the chapter, refer to the Table of Contents at the beginning of the chapter.

(1) The section on distribution provides information on removal and installation of the external oil cooler.

(2) The section on indicating provides information on gauges, transducers and switches used to indicate oil temperature and pressure.

OIL COOLER - MAINTENANCE PRACTICES

1. General

A. This section gives maintenance instructions for the removal and installation of the externally installed oil cooler.

2. Oil Cooler Removal/Installation

A. Remove the oil cooler. Refer to Figure 201.
   (1) Remove the upper cowling. Refer to Chapter 71, Cowls - Maintenance Practices.
   (2) Put a label on and disconnect the inlet and outlet hoses that are connected to the oil cooler. Put caps on the ends of the hoses.
   (3) For airplanes that do not have a turbocharger, remove the bolts, washers, and spacers that attach the oil cooler to the back of the engine baffle.
   (4) For airplanes that have a turbocharger, remove the bolts, washers, and spacers that attach the oil cooler to the air duct assembly.
   (5) Remove the oil cooler from the airplane.

B. Install the oil cooler. Refer to Figure 201.
   (1) Install an S2179 seal on the aft side of the baffle (top and bottom of the cutout) before the installation of the oil cooler.
   (2) For airplanes that have a turbocharger, install the oil cooler to the air duct assembly with bolts, washers, and spacers.
   (3) For airplanes that do not have a turbocharger, install the oil cooler to the rear of the engine baffle with bolts, washers, and spacers.

   NOTE: Add or remove washers as required so that the oil cooler flanges do not bend during installation.

   (4) Attach the inlet and outlet hoses to the oil cooler.
   (5) Install the upper cowling. Refer to Chapter 71, Cowls - Maintenance Practices.

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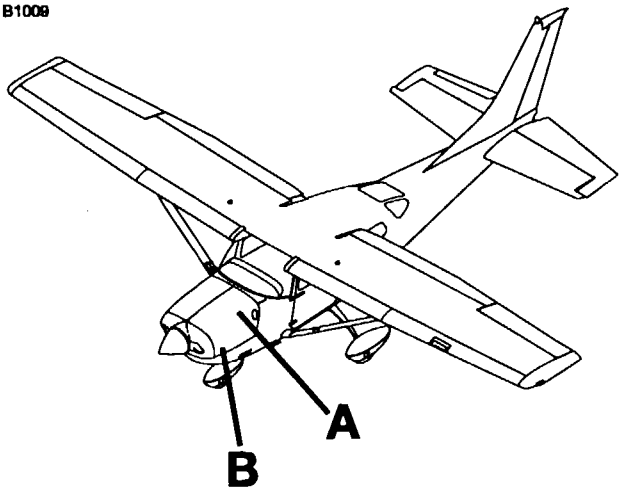

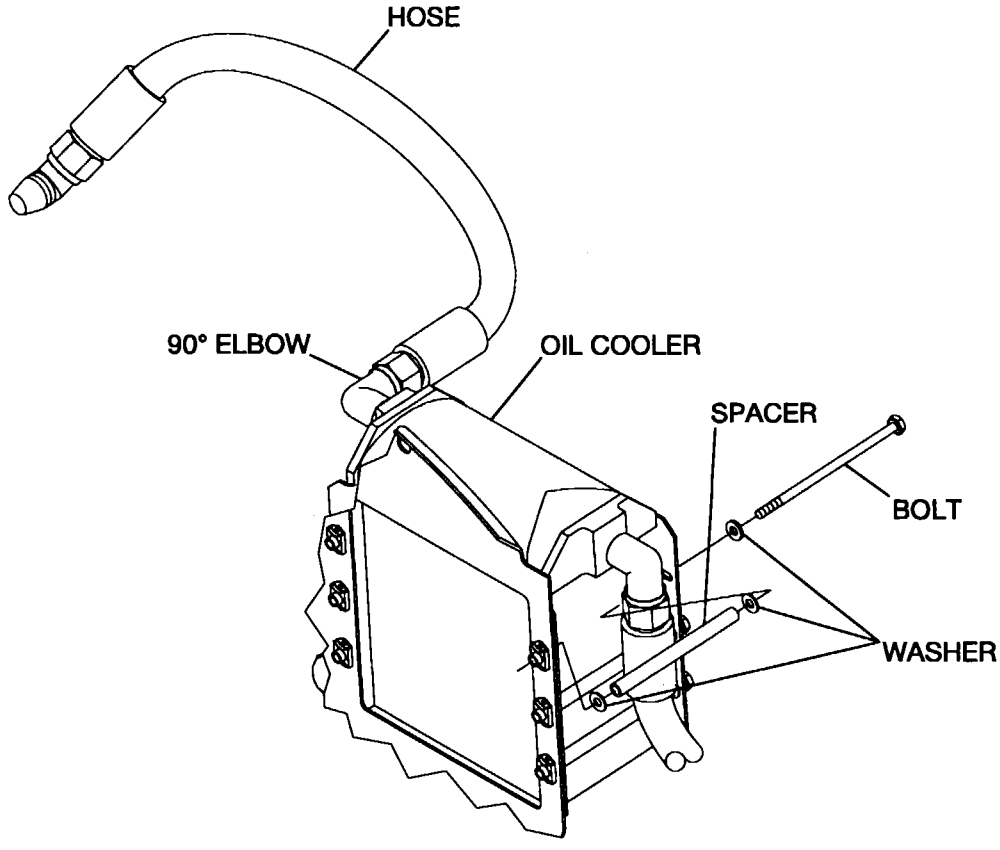

DETAIL A
AIRPLANE 206

1210T1001
A1256T1002

Oil Cooler Installation
Figure 201 (Sheet 1)

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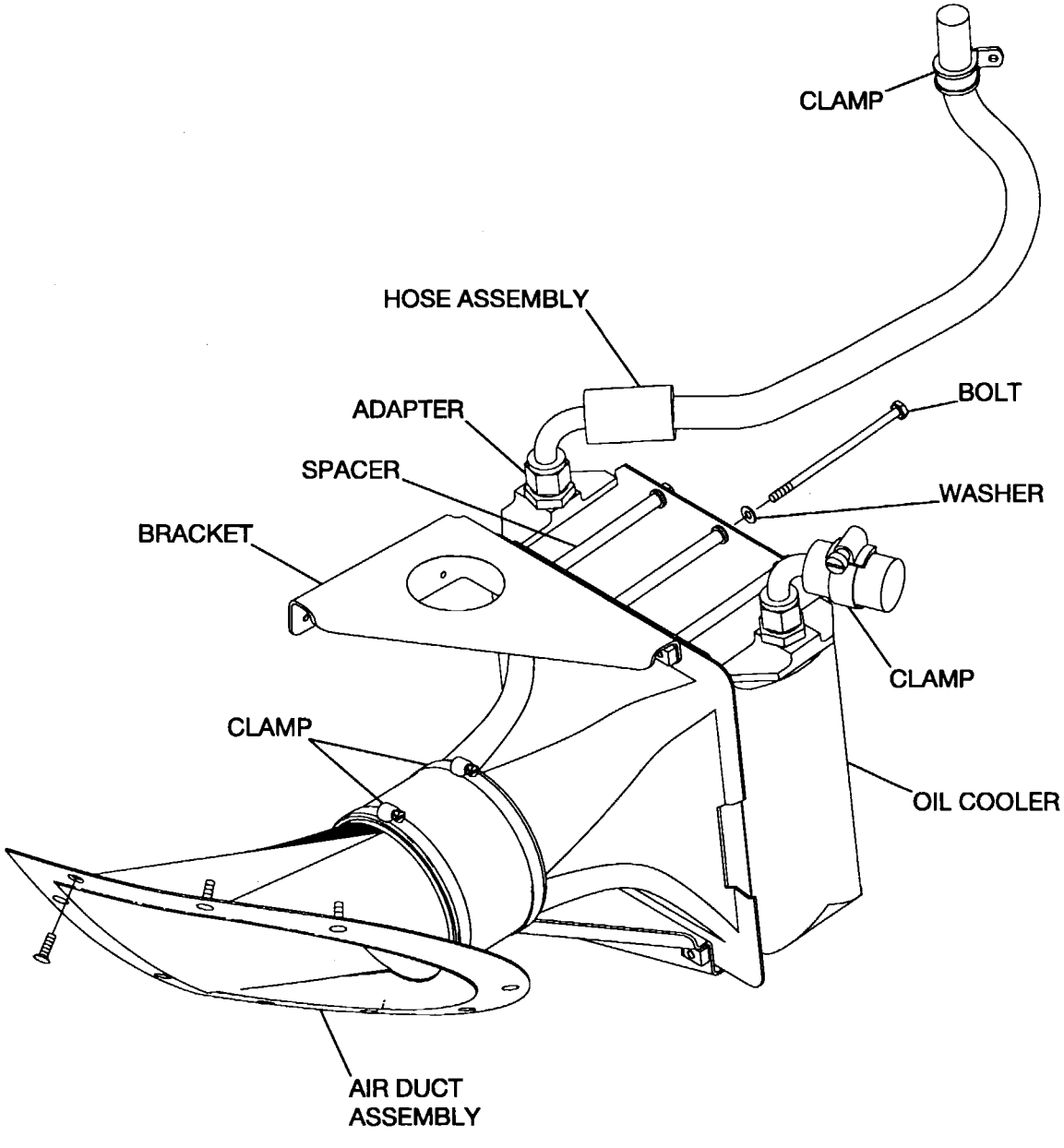


DETAIL B
AIRPLANE T206

A1216T1009

Oil Cooler Installation
Figure 201 (Sheet 2)

AIR/OIL SEPARATOR ASSEMBLY - MAINTENANCE PRACTICES

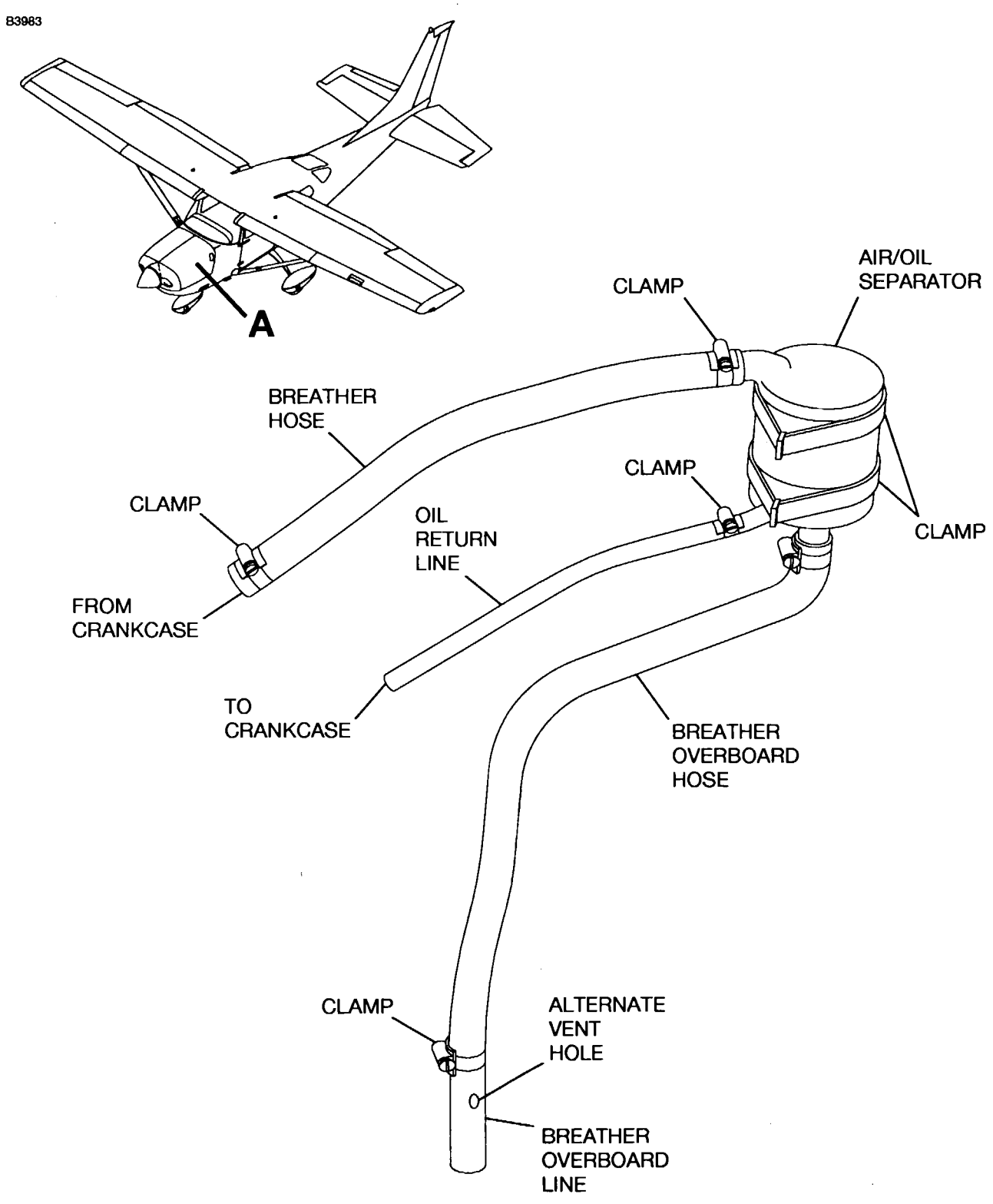
1. General

A. Turbocharged airplanes have an oil/air separator assembly installed in the breather system. During engine operation, air pressure collects in the crankcase and it is necessary to release that pressure. The air/oil separator removes oil from the air before it is released through the breather overboard line. After the air/oil separator removes the oil from the air, the oil is put back in the crankcase where it is used again. The separator assembly has three hoses. One connects the separator to the crankcase breather line, one connects the separator to the crankcase oil return line, and one connects the separator to the breather overboard line.

2. Air/Oil Separator Assembly Removal and Installation

A. Remove the Air/Oil Separator Assembly. Refer to Figure 201.
   (1) Remove the upper cowl to get access to the engine compartment. Refer to Chapter 71, Cowls - Maintenance Practices.
   (2) Turn the screws on the clamps that connect the hoses to the air/oil separator counterclockwise to loosen them.
   (3) Disconnect the hoses from the oil breather.
   (4) Turn the screws on the clamps that connect the air/oil separator to the engine baffle counterclockwise to loosen them.
   (5) Remove the air/oil separator from the airplane.

B. Install the Air/Oil Separator Assembly. Refer to Figure 201.
   (1) Put the air/oil separator in the clamps that attach it to the engine baffle.
   (2) Turn the screws on the clamps that connect the air/oil separator to the engine clockwise to tighten them.
   (3) Connect the hoses to the air/oil separator.
   (4) Turn the screws on the clamps that connect the hoses to the air/oil separator clockwise to tighten them.
   (5) Install the upper cowl. Refer to Chapter 71, Cowls - Maintenance Practices.



DETAIL A

1210T1001
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Air/Oil Separator Assembly Installation
Figure 201 (Sheet 1)

OIL PRESSURE INDICATORS - MAINTENANCE PRACTICES

1. Description and Operation

A. Oil pressure is measured at two points on the engine. One point gives the oil pressure indicator reading and one gives the low oil pressure annunciation.
   (1) The oil pressure indicator system has three components: an oil pressure line, a transducer and a cockpit-mounted combination pressure/temperature indicator. The system gets oil from the top right side of the case. The oil flows through a rigid line, to a transducer found on the rear baffle area. The transducer makes an electrical signal which is sent to the pressure-side of the cockpit-mounted oil pressure/oil temperature indicator.
   (2) The low oil pressure annunciation system has a pressure switch and the related wiring. The switch is installed on the top rear side of the engine case. It is set so that when oil pressure is less than 20 PSI, a ground is supplied to the instrument panel-mounted annunciator. This causes the OIL PRESS light on the annunciator to come on. When oil pressure is more than 20 PSI, the ground connects and starts the hobbs meter and extinguishes the OIL PRESS light.

B. Airplanes with the Garmin G1000 system use the same oil pressure transducer and oil pressure switch as standard equipped airplanes.

2. Oil Pressure Indicator and Transducer Removal/Installation

A. Remove the Oil Pressure Indicator (Refer to Figure 201).
   (1) Make sure that electrical power to airplane is off.
   (2) Remove the screws that attach the indicator to the instrument panel.
   (3) Remove the electrical connector from back of the indicator.
   (4) Carefully remove the indicator from back of the instrument panel.

B. Install the Oil Pressure Indicator (Refer to Figure 201).
   (1) Connect the electrical connector to the back of the indicator.
   (2) Install the indicator to the instrument panel.
   (3) Attach the indicator to the panel with screws.

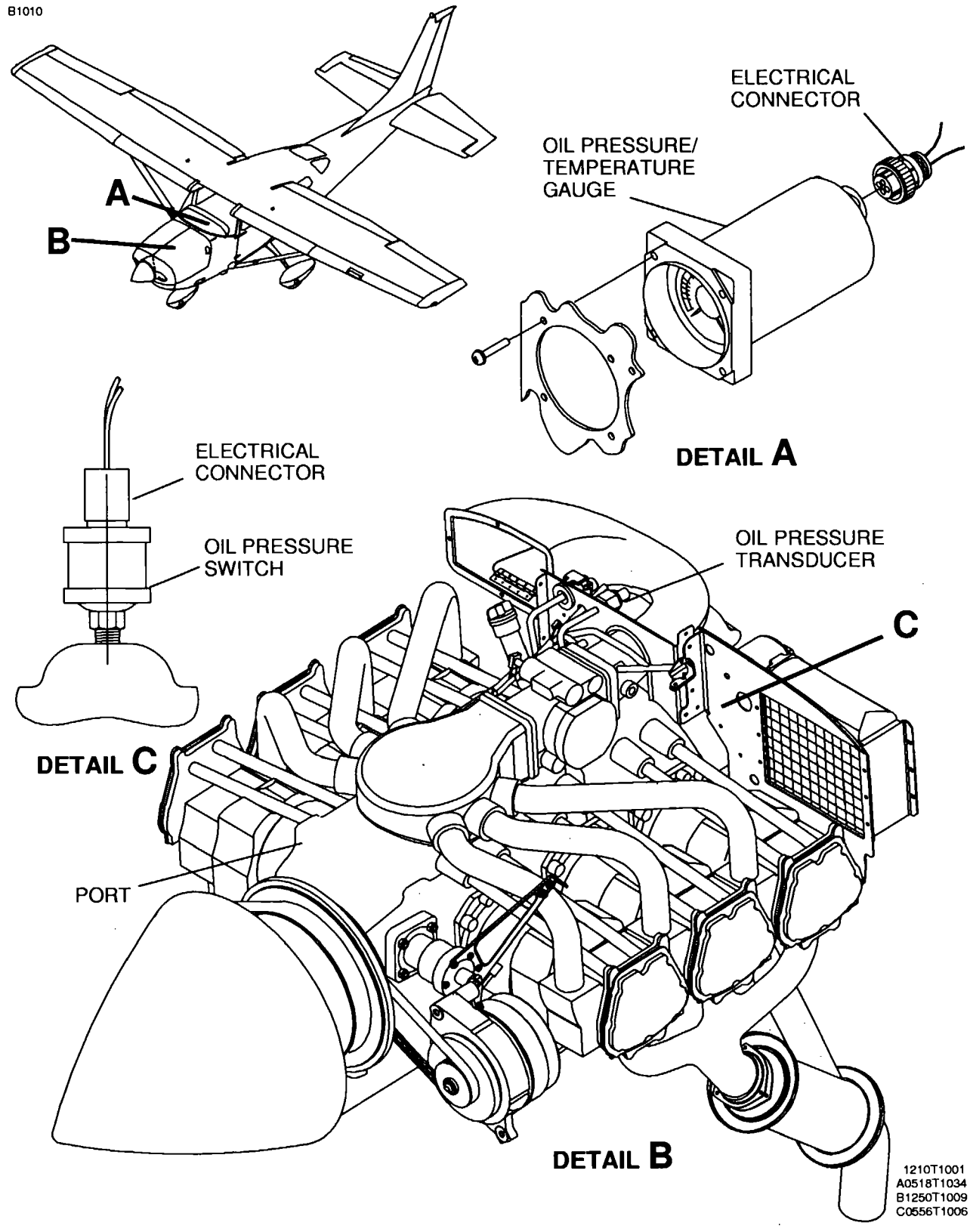
C. Remove the Transducer (Refer to Figure 201).
   (1) Remove the upper cowl. Refer to Chapter 71, Cowls - Maintenance Practices.
   (2) Disconnect and put caps on the oil pressure line at the transducer.
   (3) Disconnect the electrical connector from the transducer.
   (4) Remove the nut that connects the transducer to the rear of the baffle and remove the transducer.

D. Install the Transducer (Refer to Figure 201).
   (1) Install the transducer to the rear baffle and attach with the nut.
   (2) Connect the electrical connector to the transducer.
   (3) Remove the caps and connect the oil pressure line at the transducer.
   (4) Install the upper cowl. Refer to Chapter 71, Cowls - Maintenance Practices.

3. Low Oil Pressure Switch Removal/Installation

A. Remove the Switch (Refer to Figure 201).
   (1) Make sure that electrical power to airplane is off.
   (2) Remove the upper cowl. Refer to Chapter 71, Cowls - Maintenance Practices.
   (3) Disconnect the electrical connector from the switch.
   (4) Remove the switch from the engine case.

B. Install the Switch (Refer to Figure 201).
   (1) Tighten by hand the new switch with U544006 sealant (or equivalent) on the threads.



Oil Pressure Indication Installation
Figure 201 (Sheet 1)

CAUTION: Do not use Teflon tape.

CAUTION: Clean any sealer or other debris from the switch fitting before installation. Make sure that foreign material is removed and clear of the pressure hole in the end of the switch fitting.

(2) Use a 7/16 inch wrench to tighten the switch approximately 1 to 1 1/2 turns (not to exceed 60 inch pounds) tighter than by hand.

CAUTION: Do not use too much torque on the plastic switch connection housing when you tighten by hand.

CAUTION: Use only the hex fitting to tighten. Too much torque will cause damage to the switch.

(3) Connect the electrical connector to the switch.
(4) Install the upper cowl. Refer to Chapter 71, Cowls - Maintenance Practices.

OIL TEMPERATURE INDICATOR - MAINTENANCE PRACTICES

1. Description and Operation

A. The oil temperature system has three core components: a sending unit, a combination oil temperature/ oil pressure indicator and a wire that connects the two components. Oil temperature is measured in the accessory case area and gives cockpit readings in degrees Fahrenheit (℉).

B. Airplanes with the Garmin G1000 system use the same oil temperature sending unit as standard equipped airplanes.

2. Sending Unit Removal/Installation

A. Remove the Sending Unit (Refer to Figure 201).
   (1) Remove the upper engine cowl. Refer to Chapter 71, Cowls - Maintenance Practices.
   (2) Disconnect the ring terminal wiring at the sending unit.
   (3) Loosen and remove the sending unit from the accessory case.

B. Install the Sending Unit (Refer to Figure 201).
   (1) Install the sending unit to the accessory case.
   (2) Attach the ring terminal wire to the sending unit. Torque the jam nut to 20 inch-pounds, maximum.
   (3) Install the upper engine cowl. Refer to Chapter 71, Cowls - Maintenance Practices.

3. Pressure Indicator Removal/Installation

A. For removal and installation of the Oil Temperature/Oil Pressure Indicator, refer to Oil Pressure Indicators - Maintenance Practices.

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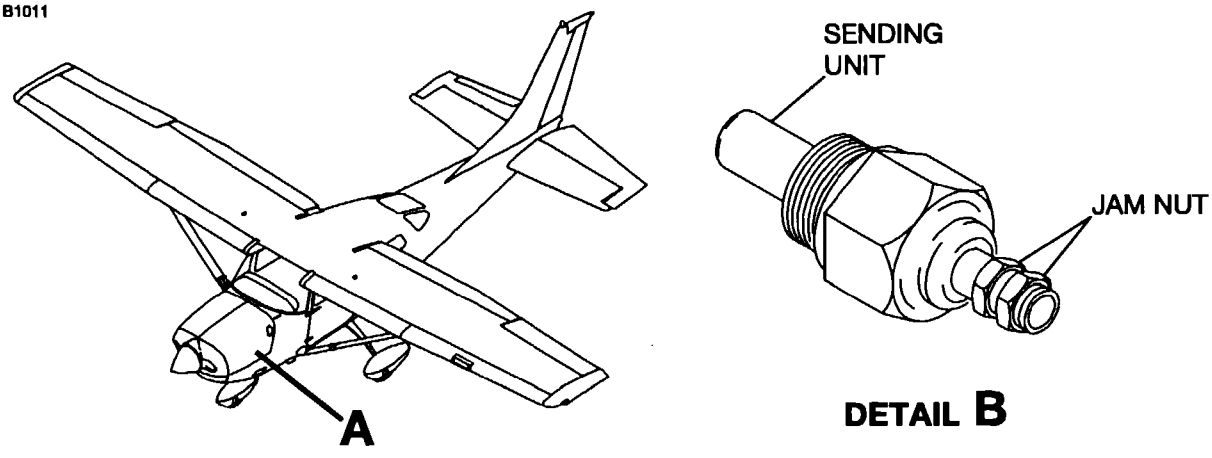

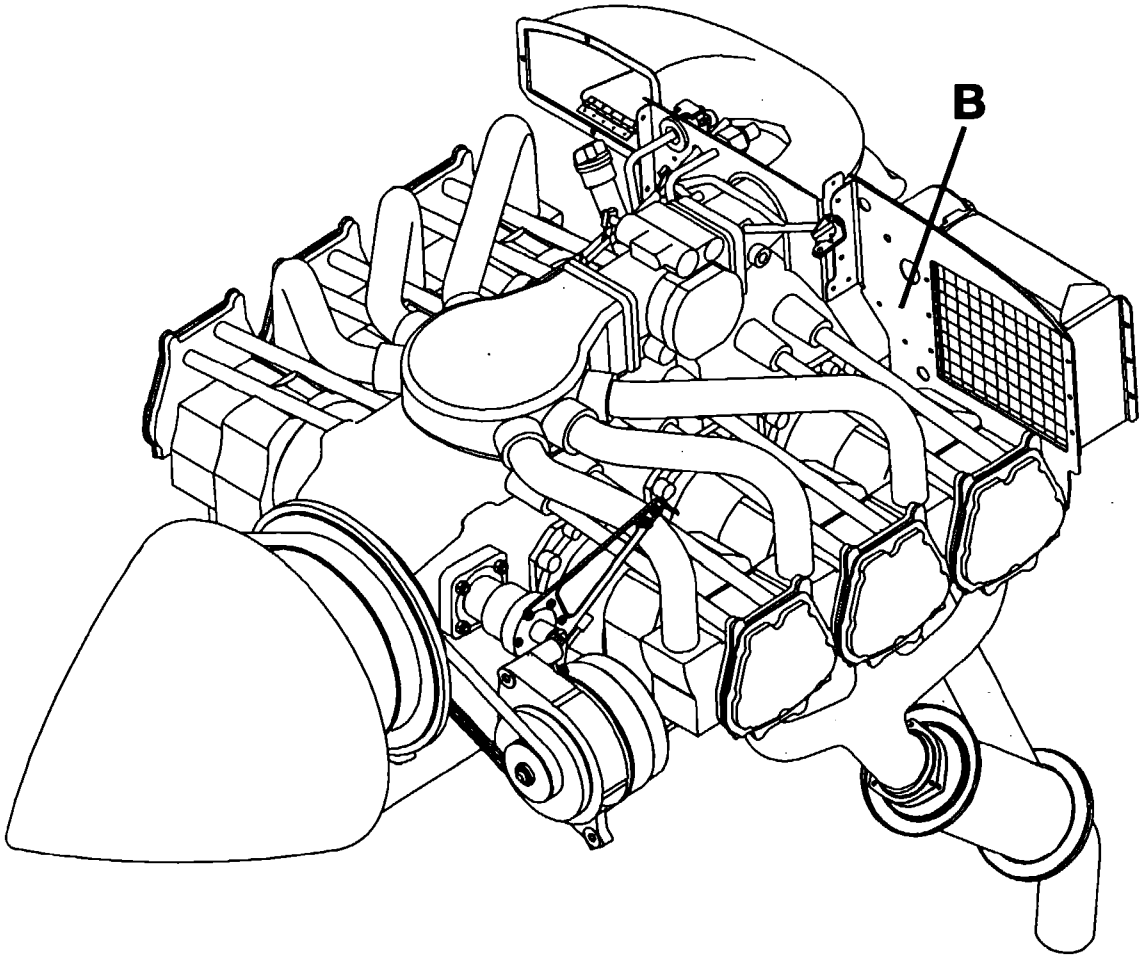

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Oil Temperature Installation
Figure 201 (Sheet 1)

CHAPTER 80

STARTING

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
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CONTENTS

STARTING - GENERAL

1. Scope and Definition

A. This chapter is comprised of a single section on the starting system. The section details removal and installation instructions for the engine starter.

STARTER - MAINTENANCE PRACTICES

1. Description and Operation

A. The airplane is equipped with a direct drive 24 VDC starter. The starter is attached to the front (propeller end) lower left side of the engine. The ignition key in the instrument panel operates the starter solenoid. When the solenoid is operated, its contacts close and electrical current energizes the starter. A pinion gear in the starter engages the crankshaft ring gear. When the engine reaches a given speed, centrifugal action decouples the starter pinion from the crankshaft ring gear.

2. Starter Removal/Installation

A. Remove the Starter (Refer to Figure 201).
   (1) Remove the upper engine cowling and the nose cap. Refer to Chapter 71, Engine Cowling - Maintenance Practices.
   (2) Disconnect the negative terminal from the battery.
   (3) Disconnect the large electrical wire (positive lead) at starter.
   (4) Remove the three nuts from the crankcase studs.
   (5) Remove the bolt from the starter and remove starter from the engine.

B. Install the Starter (Refer to Figure 201).
   (1) Attach the starter to the engine crankcase using the bolt and nuts.
   (2) Connect the positive lead to the starter. Make sure the protective boot fully covers the stud on the starter.
   (3) Connect the negative terminal to the battery.
   (4) Install the upper engine cowling and nose cap. Refer to Chapter 71, Engine Cowling - Maintenance Practices.

3. Bendix Drive Starter Assembly Cleaning And Lubrication

A. Clean the Bendix starter drive assembly (Refer to Figure 201).

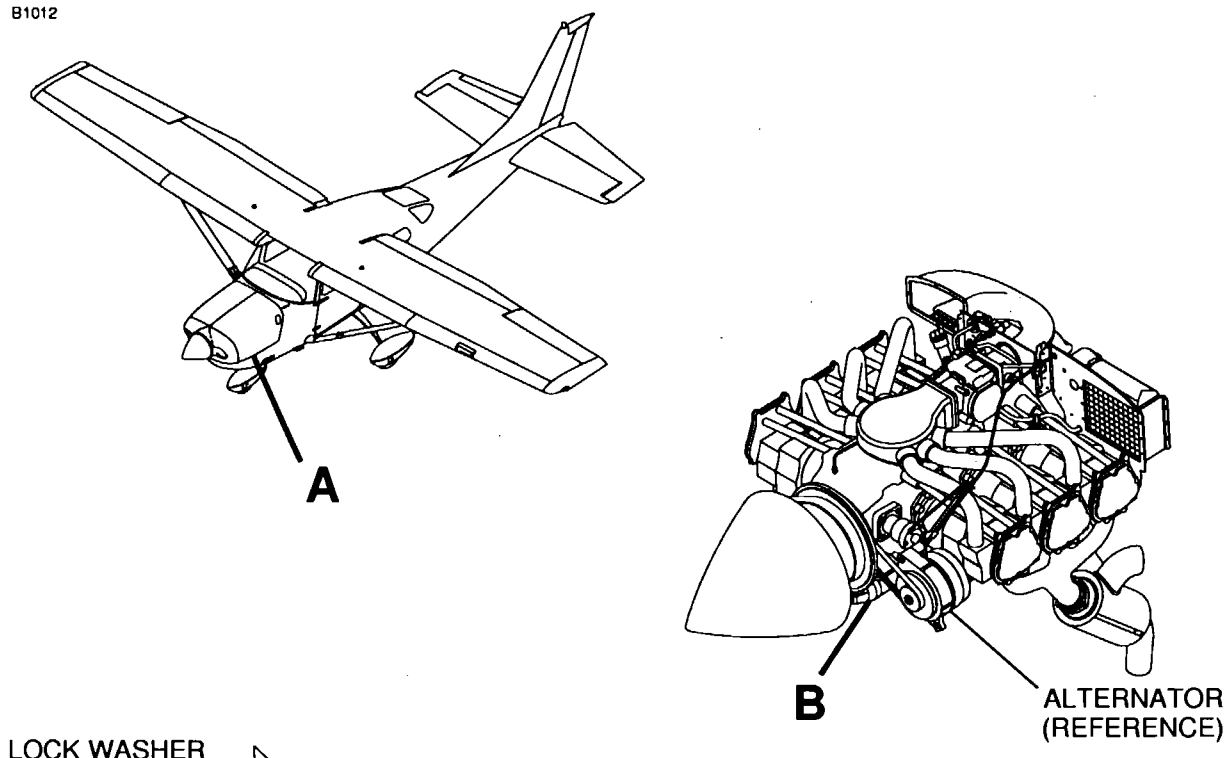
CAUTION: Use only a clean petroleum spirit. Do not use any other type of solvent.

   (1) Clean the starter drive with a clean petroleum spirit.

B. Lubricate the Bendix starter drive assembly. (Refer to Figure 201).

CAUTION: Do not use grease, oil or graphite lubricants. Use only silicone spray lubricants which are recommended for correct operation.

   (1) Lubricate the starter drive assembly with a silicone spray such as Crown Industrial Products silicone spray 8034.



Starter Installation
Figure 201 (Sheet 1)

CHAPTER 81

TURBINES

LIST OF EFFECTIVE PAGES

CHAPTER-SECTION-SUBJECT	PAGE	DATE
81-Title		
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Temporary Revision Number	Page Number	Issue Date	By	Date Removed	By

CONTENTS

TURBINES - GENERAL

1. Scope

A. This chapter describes procedures and components of the turbocharger.

2. Definition

A. This chapter is divided into sections and subsections to aid maintenance personnel in locating information. Consulting the Table of Contents will further assist in locating a particular subject. A brief definition of the sections incorporated in this chapter is as follows.

(1) The section on turbocharger provides procedures and techniques for the adjustment of the absolute pressure sloped controller and for the performance check of the turbocharger and sloped controller.

TURBOCHARGER CONTROLS - MAINTENANCE PRACTICES

1. General

A. The turbocharger is controlled by the wastegate assembly and absolute pressure sloped controller. The sloped controller is designed to maintain the rated deck pressure at wide open throttle, and to maintain a reduced deck pressure at part- throttle settings. The controller senses both deck and manifold pressure and monitors the differential between them. If either the deck pressure or differential pressure rises above pre-determined values for a given throttle setting, the controller opens the exhaust bypass valve, thus lowering compressor speed and output.

A pressure relief valve, set slightly in excess of maximum deck pressure, is installed to prevent excessive overboost in the event of a system malfunction. The pressure relief valve is set to open at 41.5 inches of Hg.

2. Sloped Controller Adjustment

A. Sloped Controller Adjustments.
(1) With engine oil temperature at middle of green arc slowly open throttle and note maximum manifold pressure obtainable. Do not exceed 39.5 inches Hg.
(2) Using a flat-bladed screwdriver rotate metering valve seat clockwise to increase manifold pressure and counterclockwise to decrease manifold pressure. Lightly tap the unit after each adjustment to seat internal parts. Set manifold pressure to 39 ±0.5 inches Hg.

NOTE: When adjusting rotate in VERY small increments as this is an extremely sensitive adjustment. Approximately 13 degrees rotation will change the manifold pressure reading about one inch Hg.

(3) Operate engine as in step 2A.(1) to verify that the controller adjustment provides a maximum manifold pressure of 39 ±0.5 inches of Hg.
(4) After final adjustment the aircraft must be flight tested to check results.
(5) Repeat this procedure until desired results are obtained.

3. Controller and Turbocharger Operational Flight Check

A. Cruise - Turbocharger Performance Check (Refer to Figure 201).
(1) Cowl Flaps - Fully closed.
(2) Airspeed - Level flight.
(3) Pressure Altitude - 17,000 feet.
(4) Engine Speed - 2400 RPM.
(5) Part-Throttle M.P. - 30 in Hg.
(6) Fuel Flow - Lean to 20.0 GPH.
(7) Propeller Control -
(a) Slowly decrease engine RPM until manifold pressure starts to drop, indication that the wastegate valve is closed. If the wastegate valve closes at engine speeds below the RPM shown in Figure 201, the turbocharger performance is normal.
(b) Note the outside air temperature and RPM where the manifold pressure begins to drop. Refer to the chart in Figure 201 with these values and assure that no bootstrapping occurs above the line.

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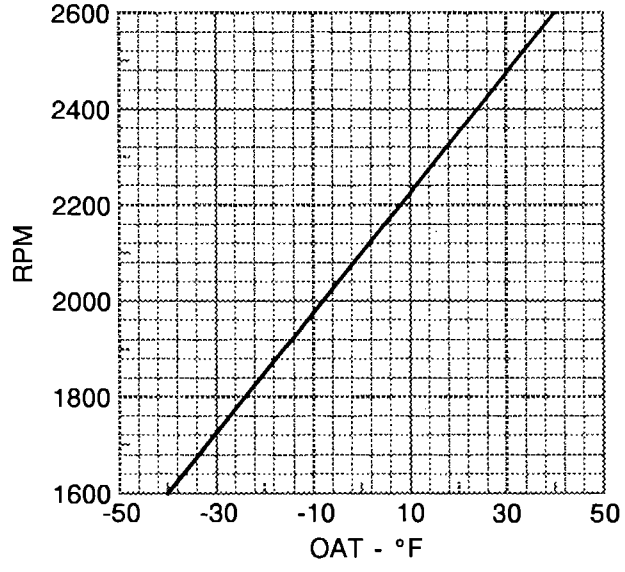
MODEL T206H
17000 FEET
30 inHg MAP

NO BOOTSTRAPPING ALLOWED ABOVE LINE



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Bootstrap Limit Chart
Figure 201 (Sheet 1)