



SERVICE LETTER

No. 758

Piper Aircraft Corporation

Lock Haven, Pennsylvania, U.S.A.

May 17, 1976 S

Subject:

Inspection of Bendix Ignition Switches (Rotary Action, Key of Lever Actuated, Twist to Start, Push to Start, Twist to Start/Push to Prime Types). Reference: Bendix Electrical Components Division, Service Bulletin No. 583 (copy attached).

Models Affected:

PA-24-180, PA-24-250
Commanche
PA-24-260 Commanche
PA-24-400 Commanche
PA-28-140 Cherokee
PA-28-151 Cherokee
PA-28-180 Cherokee
PA-28-181 Cherokee
PA-28R-180 Cherokee Arrow
PA-28R-200 Cherokee Arrow
PA-28-235 Cherokee
PA-32-260 Cherokee Six
PA-32-300 Cherokee Six
PA-32R-300 Cherokee Lance

Serial Numbers Affected:

24-1 to 24-3641 Inclusive, 24-3643 to 24-3687 Inclusive.
24-3643, 24-4000 to 24-5047 Inclusive.
26-2 to 26-148 Inclusive.
28-25000 to 28-7625278 Inclusive.
28-7415001 to 28-7615217 Inclusive.
28-4378 to 28-7505259 Inclusive.
28-7690001 to 28-7690254 Inclusive.
28R-30001 to 28R-7130013 Inclusive.
28R-35001 to 28R-7635245 Inclusive.
28-11040 to 28-7610104 Inclusive.
32-1111 to 32-7600014 Inclusive.
32-40565 to 32-7640085 Inclusive.
32R-7680001 to 32R-7680225 Inclusive.

Compliance Time:

Reference attached copy of Bendix Service Bulletin No. 583 (printed April 1976), Compliance Section.

Purpose:

This service release provides distribution of the attached copy of Bendix Electrical Components Division Service Bulletin No. 583, (printed April 1976), the main purpose of which is described under Part I, Possible Hazard Description, contained on pages 1 and 2 (of Bendix bulletin).

Instructions:

1. Refer to attached copy of Bendix Electrical Components Division Service Bulletin No. 583, Table I, page 1 for identification of affected ignition switches.
2. Refer to attached copy of Bendix Electrical Components Division Service Bulletin No. 583, Part II, page 2, Switch Fault detection procedures for determination of faulty switch units.

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Instructions: (continued)

3. Refer to attached copy of Bendix Electrical Components Division Service Bulletin No. 583, Part III, Repair or Replacement, pages 3 to 7 inclusive for remedial procedures.

Material Required:

One (1) each per aircraft Bendix Ignition Switch Repair Kit, Piper part number 761 065V @ suggested unit price \$9.81E, only if required per Part III Repair or Replacement, Bendix Service Bulletin No. 583.

Availability of Parts:

Your Piper Field Service Facility.

Effectivity Date:

This Service Release is effective upon receipt.

Summary:

The operational inspection (reference Bendix Electrical Components Division Service Bulletin No. 583) Part II, Switch Fault Detection Procedures - Procedure A may be performed (and appropriate log book entry made) by the owner/operator providing no further action (i.e., repair or replacement) is required. Should a suspect switch be determined, please contact your Piper Field Service Facility to make arrangements for compliance with the provisions of this service release.

AIRCRAFT

SUBJECT: Ignition Switches, Rotary Action, Key or Lever Actuated, Twist-To-Start, Push-To-Start, Twist-To-Start/Push-To-Prime Types.

REASON FOR BULLETIN:

- I To alert all users of above Bendix Switch Types of possible personnel hazard.
- II To provide a check procedure to detect a faulty Switch.
- III To provide Field Repair and Replacement Instructions and Identification.

EQUIPMENT AFFECTED: Ignition Switches; Refer to Table I.

TABLE I. BENDIX AIRCRAFT IGNITION SWITCHES, ROTARY ACTION, KEY OR LEVER ACTUATED.

| Switch Function | Key | Lever | Switch Part Number |
|---------------------------------|-----|-------|---|
| Twist-To-Start | X | X | 10-357200-1 |
| | X | | 10-357230-1, -2, 10-357260-1 10-126630-1 10-126690-1 |
| Push-To-Start | X | X | 10-357210-1 |
| | X | | 10-357240-1, 10-357270-1 10-126680-2 10-157440-1, -2, -3, -4, -21 |
| Twist-To-Start Push-To-Prime | X | X | 10-357220-1 |
| | X | | 10-357250-1, 10-357280-1 10-126680-1 10-126660-1, -4 |

NOTE: "SWITCH FUNCTION," TABLE I ABOVE, IS USED AS AN APPLICABLE MEANS FOR INITIAL FRONT VIEW SWITCH IDENTIFICATION SINCE ACTUAL PART NUMBERS ARE ON THE SWITCH HOUSING AND BECOME VISIBLE ONLY AFTER SWITCH BECOMES ACCESSIBLE FOR EXAMINATION.

Maintenance (Spare) Parts Affected:

Same as in Table I above.

Compliance:

Parts I and II Immediate

Part III - As soon as practicable after accomplishment of Part II.

Detailed Instructions:

This bulletin (I) alerts all users and holders of Bendix Aircraft Ignition Switches listed by function and Part

Numbers in Table I to a possible personnel hazard, (II) provides a way by which a faulty switch can be detected and (III) provides instructions to cover field repair/replacement of the switch and identification of switches once repaired or replaced.

PART I. Possible Hazard Description.

Field reports indicate that occasionally switches performing the "Switch Function" listed in Table I have been found to leave the right magneto "Live" or "Hot."



The condition may exist when the switch Key/Lever is rotated slightly past the normal indicated "OFF" position. It has also been reported that the switch may stick in this position.

WARNING

Should the propeller be moved by hand (as during pre-flight) and a "Hot" magneto condition exist, the engine may fire and cause injury to personnel.

All appropriate precautions shall be exercised by all personnel associated with an aircraft having the switch

condition described until the switch has been replaced or repaired.

As an added precautionary measure, positive ignition grounding prior to correction of a switch fault can be accomplished by fabricating a jumper lead and temporarily installing it between the magneto primary ground outlet or terminal of the magneto to a clean engine ground point.

Using the applicable primary grounding terminal kit selected from Table II, assemble a grounding lead.

TABLE II. APPLICABLE PRIMARY GROUNDING TERMINAL KITS.

| Magneto Series | Repair Kit Part Number or Wire. |
|---------------------|---|
| S-20 Series | Use Kit P/N <u>10-52305</u> for magneto P/N's <u>10-51365-1</u> , -2, -7, -13, -14, -15, -16, -17, -20, -25, -26, -27, -28, -29, -30, -31, -32, -33, -34, -35, -40, -42, -43, -44, -46, -47, -48, -53, -54. <u>10-79020-5</u> , -6, -8, -10, -13, -14, -16. |
| | Use Kit P/N <u>10-52305-1</u> for magnetos P/N's <u>10-51360-1</u> , -10, -11, -25, -26, -29. |
| | Use Kit P/N <u>10-52306</u> for magnetos P/N's <u>10-51365-2</u> , -5, -6, -7, -8, -15, -17, -18, -19, -20, -21, -22, -23, -24, -25, -41. |
| | Use Kit P/N <u>10-157209</u> for magneto P/N's <u>10-51360-45</u> , -47, -48, -49. <u>10-51365-57</u> . <u>10-79020-11</u> , -17, -18, -19. |
| S-200, S-600 Series | Use Kit P/N <u>10-157209</u> all magneto P/N's. |
| S-700 Series | Use Kit P/N <u>10-171192</u> all magneto P/N's. |
| S-1200 Series | Use jumper wire with No. 10 eyed terminal at magneto end, alligator clip at engine ground end. |
| D-2000 Series | Use Kit P/N <u>10-382698</u> all magneto P/N's. |

Remove the regular aircraft switch lead at the magneto. Install the jumper lead to the magneto and connect the other end to a convenient clean engine grounding point. The engine will now be inoperative until the jumper leads

are removed and the regular switch leads reinstalled.

A log book entry must then be made signifying that the condition has been corrected.



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PART II. Switch Fault Detection Procedures.

Procedure to accomplish compliance and detection of the problem described in Part I is as follows. Procedure A may be accomplished by observing engine operation during switch positioning. Procedure B may be accomplished by checking, using a continuity device such as an ohmmeter or timing light.

Procedure A – Check using engine reactions.

1. Observing the engine manufacturers ground run-up procedures allow the engine to reach operating temperatures and perform a normal magneto check.
2. With the engine at normal idle, rotate the switch key or lever through the "OFF" detent to the extreme limit of its travel in the "OFF" position direction.
3. If the engine continues to run with the switch manually held in the "Past OFF" position, it is an indication that one magneto is still "Hot" or ungrounded.
4. When the switch key or lever is released from the manually held "Past OFF" position, it should automatically return to the normal "OFF" position where the "Hot" magneto condition should no longer exist and the engine should die.
5. Any switch exhibiting a "Hot" magneto condition when in the "Past OFF" position should be repaired or replaced (Ref: Part III) at the earliest possible opportunity.

Procedure B – Using Continuity Device.

1. Remove the switch (magneto primary) leads from both magnetos.

WARNING

During switch continuity checks, removal, repair, or replacement, both magnetos are "Hot." Should the propeller be moved by hand during this time, the engine may fire and cause injury to personnel.

2. Connect a continuity device between each switch (magneto primary) lead at the magneto end and a good ground on the engine.

3. Rotate the switch key or lever to the extreme limit of its travel in the "OFF" position direction. (This may be slightly past the normal "OFF" position of the switch.) Manually hold the switch control there and observe the continuity device indication.
4. Reaction of the continuity device should indicate that continuity exists between ground and each individual switch (magneto primary) lead.
5. When the switch key or lever is released from the manually held "Past OFF" position, it should automatically return to the normal "OFF" position. Each switch (magneto primary) lead should indicate continuity from the lead to ground.

Any switch exhibiting a "Hot" magneto condition detected using either Procedure A or B, should be repaired or replaced at the earliest opportunity.

Light Aircraft Ignition Switches of the rotary action type are primarily mechanical in construction, consisting of springs, contactors, a contact plate and rotating parts within a housing. As is true with most mechanical assemblies, switches are subject to wear. Use of either Procedure A or B will detect a switch wear malfunction as well as provide a check on switch-to-magneto circuitry. The procedures therefore would be appropriate for inclusion in aircraft operating routines at periodic check periods.

Part III. Repair or Replacement.

- A. Switches identified by 10-126XXX and 10-157XXX Series Part Numbers are no longer manufactured and are superseded by the 10-357XXX series switches.

Field repair of any of these series switches is not recommended beyond replacement of the support plate and switch contacts. It is also recommended that if a new support plate is installed, new contacts (3 required per switch) also be installed at the same time.



Table III provides superseding Switch Assembly Part Numbers as well as Repair Kit Numbers.

Each Repair Kit contains a new support plate and three new contacts.

TABLE III. PART NUMBER APPLICABILITY.

| Switch Function | Switch P/N | Superseded By | Repair Kit P/N |
|---------------------------------|-----------------|---------------|----------------|
| Twist-To-Start | 10-357200-1 | ----- | } 10-357510 |
| | 10-357230-1, -2 | ----- | |
| | 10-357260-1 | ----- | |
| | 10-126690-1 | 10-357200-1 | |
| | 10-126630-1 | 10-357230-1 | |
| Push-To-Start | 10-357210-1 | ----- | } 10-357515 |
| | 10-357240-1 | ----- | |
| | 10-357270-1 | ----- | |
| | 10-126680-2 | 10-357210-1 | |
| | 10-157440-1 | 10-357270-1 | |
| | 10-157440-2 | 10-357270-2 | |
| | 10-157440-3 | 10-357270-2 | |
| | 10-157440-4 | 10-357240-1 | |
| | 10-157440-21 | 10-357270-1 | |
| Twist-To-Start Push-To-Prime | 10-357220-1 | ----- | } 10-357510 |
| | 10-357250-1 | ----- | |
| | 10-357280-1 | ----- | |
| | 10-126680-1 | 10-357220-1 | |
| | 10-126660-1 | 10-357250-1 | |
| 10-126660-4 | 10-357280-2 | | |

B. To install a new Support Plate and Contacts, proceed as follows using Figure 1 as a guide for parts identification.

1. Disassembly and Inspection.

- a. Hold switch in a vertical position, support plate up.
- b. Using firm finger pressure, hold the support plate against the switch housing while removing the two self tapping screws. Retain screws for use during reassembly.

- c. Directly beneath the support plate are three contacts, spring loaded against the support plate. Carefully separate the support plate from the main switch assembly and remove the three contacts and springs (3 or 9).
- d. Retain the springs for use during reassembly. Discard old support plate and contacts.
- e. Inspect remainder of switch assembly for smoothness of operation

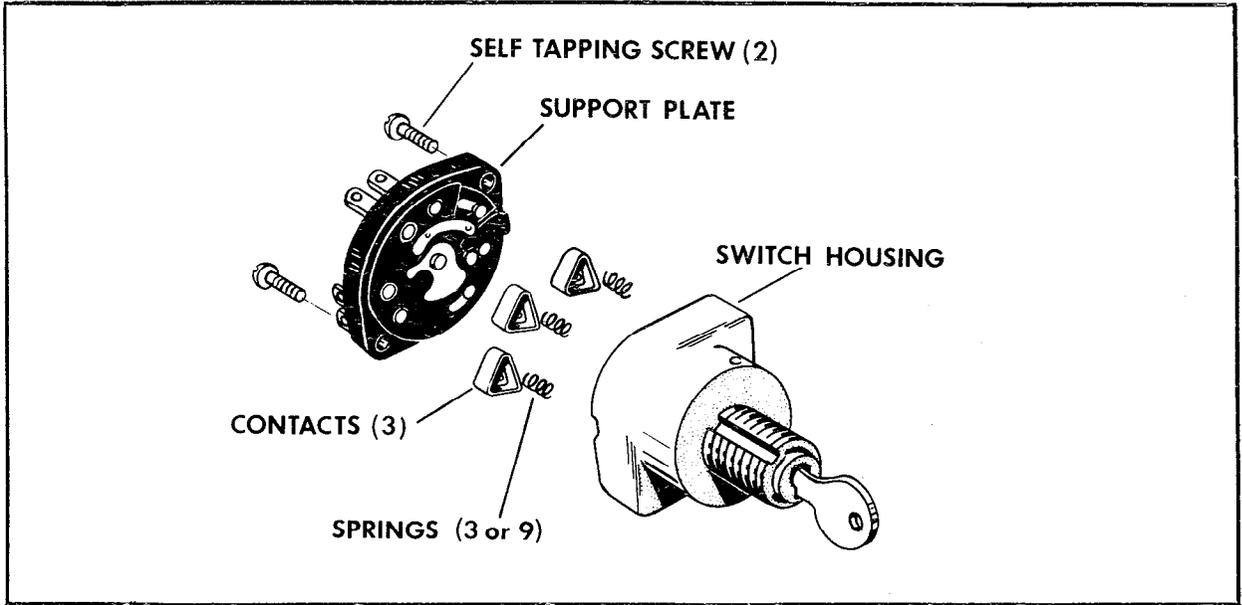


Figure 1. Identification of Switch Parts.

and check the rotor for any visible defects. If any faults are found, replacement of the complete switch assembly is recommended using Table III for replacement part number information.

2. Reassembly.

- a. Apply a light coating of Beacon P-290* non-conductive grease or equivalent to contact surfaces, contact wells in rotor and insulating surfaces over which contacts slide.
- b. Reinstall contact loading springs (3 or 9) in rotor. Position new contacts over springs so contacts will move into triangular recesses when pressure is applied.
- c. Locate boss on new support plate over locating slot in switch housing

and carefully install support plate to housing, observing that contacts move into recesses.

- d. Holding plate against housing, turn key or lever through all switch positions. If it does not turn freely through the detent positions, recheck contact, springs, and support assembly.
- e. Once switch operation is satisfactory, reinstall and tighten self tapping screws holding support plate to switch housing.
- f. After switch has been completely reassembled, check it for ease of operation. There shall be little or no drag between stops. Check for positive stops in all positions. Check switch action for a positive and free spring return from the "START" position to the "BOTH" position. The switch shall not

* Available from Esso Standard Oil Co.,
Johnson City, N. Y. 13790.



spring back beyond or "overtravel" the "BOTH" position.

- g. For switches with "Push" features, check lever or key for a free pushing action in proper switch positions and for proper spring return from pushed position.

3. Testing.

- a. Remove any wires or jumpers which may be present on the terminals at the rear of the switch.
- b. Using an ohmmeter, timing light or

other suitable electrical continuity indicating device, check the switch for proper electrical operation. Refer to Table IV, V, or VI for the switch type being tested. There must be a continuity indication between the terminals listed for each switch position. There must be **NO** continuity between these terminals and any other terminal, between any other terminals or between any terminal and the switch housing.

TABLE IV. CONTINUITY TEST, TWIST TO START.

| Switch Position | Continuity Only Between Terminals |
|------------------------|--|
| OFF | R and GRD L and GRD L and R S and PR |
| R | L and GRD R and unmarked |
| L | R and GRD R and unmarked GRD and unmarked |
| BOTH | R and unmarked |
| START (twist and hold) | GRD and unmarked S and BAT L and BO L and LR BO and LR |

TABLE V. CONTINUITY TEST, PUSH TO START.

| Switch Position | Continuity Only Between Terminals |
|-------------------------------------|---|
| OFF | R and GRD L and GRD |
| R | L and GRD R and unmarked next to R |
| L | R and GRD R and unmarked next to R GRD and unmarked next to R |
| BOTH | R and unmarked next to R |
| START (twist and hold, do not push) | GRD and unmarked next to R L and BO L and LR BO and LR |
| START (twist, push and hold) | Same as above, plus BAT and unmarked next to BO. |



**TABLE VI. CONTINUITY TEST, TWIST TO START—
PUSH TO PRIME.**

| Switch Position | Continuity Only Between Terminals |
|-------------------------------------|--|
| OFF | R and GRD L and GRD L and R S and PR |
| R | L and GRD R and unmarked |
| L | R and GRD R and unmarked GRD and unmarked |
| BOTH | R and unmarked |
| START (twist and hold, do not push) | GRD and unmarked S and BAT L and BO L and LR BO and LR |
| PRIME (twist, push and hold) | Same as above, plus BAT and PR |

4. Identification.
 - a. Switches checked and found satisfactory for continued use; make log book entry signifying compliance with this bulletin.

- b. Switches repaired under Part III utilizing Repair Kits, P/N 10-357510 or 10-357515 which have a white dot on the plate adjacent to the Bendix marking will be in compliance with this Bulletin and a log book entry signifying Bulletin compliance shall be made.
- c. New replacement switches are identified by a four digit date code stamped on the switch housing under the Bendix part number. Installation of a switch so identified should be noted by an accompanying log book entry as being in compliance.

Parts Required Per Article:

As required, Part III, Table III.

Special Tools Required:

None.

Man Hours Required:

1. Check Procedure — Negligible.
2. Repair Procedure— 1/2 Hour

Weight Change:

None.