



## VENDOR SERVICE PUBLICATION

March 8, 1976

TO:  All Piper Distributors  
 All Piper CORPAC's  
 Affected Aircraft Owners/Operators  
 All of the above

SUBJECT: Oil Pump Impeller and Drive Replacement; AVCO Lycoming Service Bulletin No. 385C dated October 3, 1975 (attached).

Models Affected:

Serial Numbers Affected:

Refer to Engine Model and Serial Numbers of Applicable Engines information contained on page 3 of the subject service release.

Purpose: To provide distribution of the attached Service Publication (identified in SUBJECT, above) to Piper Field Service Facilities and, if applicable, to affected Piper owners/operators.

Detailed instructions relative to compliance action are specified on the attached Service Publication; any additional/supplemental data, if necessary, is contained in the following "Special Instructions" section.

Special Instructions:

1. Advise affected Piper owners in your area re the contents of the attached AVCO Lycoming bulletin.
2. Parts/labor credit allowance provisions are discussed in the body of the attached AVCO Lycoming bulletin.

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# AVCO LYCOMING DIVISION

WILLIAMSPORT, PENNSYLVANIA 17701

## Service Bulletin



DATE: October 3, 1975

Service Bulletin No. 385C  
(Supersedes Service Bulletin No. 385B)  
Engineering Aspects are  
FAA (DEER) Approved

SUBJECT: Oil Pump Impeller and Drive Replacement

MODELS AFFECTED AND TIME OF COMPLIANCE: See chart on page 3.

REFERENCE: During April, 1970 newly designed oil pump impellers, made of sintered iron and featuring a Woodruff key in the drive shaft were introduced in production of some four and six cylinder Avco Lycoming engines: this change was offered to owners of earlier built engines by Service Instruction No. 1230. However, it became evident that although not subject to failure, the wear characteristics of the new drive were not comparable to the earlier design and a further change was introduced in December, 1972 to provide a hardened drive impeller; this is described in Service Instruction No. 1272. In addition to the hardened sintered iron drive impeller, a steel impeller was also used in some engines. It is now evident that the area of the Woodruff keyway in the hardened drive impeller and the steel impeller is subject to severe wear and eventual failure and consequently the drive components are now further modified as herein described.

This modification consists of replacing the oil pump drive shaft and drive impeller to eliminate the Woodruff key drive which has proven to be the cause of excessive wear in the keyway of the hardened drive impeller. Therefore, it is recommended that all of the applicable engines listed in the chart, as well as any others that may have been modified in accordance with Service Instruction No. 1272, use the following procedure for parts replacement.

### NOTE

The modifications shown in Service Instruction No. 1272 are no longer recommended and the instruction may be considered as inactive and non-applicable. Actually, engines that were never modified to incorporate the hardened sintered iron impellers as described in Service Instruction No. 1272, are not subject to the modification required by this bulletin.

INSPECTION: Applicable remanufactured engines shipped after December 21, 1972 should be inspected to determine if this modification is required: first of all, if the engine log book indicates the engine has not been modified in accordance with Service Instruction No. 1230 or No. 1272, proceed to remove the accessory drive cover from the mounting pad at the lower right side of the accessory housing to obtain access to the area between the crankcase and the accessory housing. On some engines this accessory drive pad is not machined, in this event it will be necessary to remove either the left magneto or the \*fuel pump to obtain access to the area between the crankcase and the accessory housing. Regardless of which accessory pad is used, determine if the oil pump idler gear is secured with a cotter pin at the location shown in figure 1. This can be accomplished using an inspection mirror, preferably an illuminated one. If the cotter pin is visible, it is unnecessary to perform the modification required by this bulletin.

### PROCEDURE:

Essentially this modification consists of replacing the oil pump drive shaft and drive impeller; since this necessitates removal of the accessory housing the procedure varies by engine model and airframe installation. Usually, this can be accomplished by removing only the accessory housing; however, on engines where the accessory housing is attached to the sump with studs and nuts instead of capscrews it will be necessary also to remove the sump.

\*1. Unless the entire sump is to be removed it is very important during removal of the accessory housing to not damage the gasket between the sump

\* - Before removing the fuel pump, be sure the cam on the hub of the idler gear is not in position to exert force on the arm of the fuel pump; if it is, damage to the mounting threads will occur when the fuel pump is removed.

and the accessory housing; if it is damaged, the partial gasket supplied with the kit may be installed as described in step 4.

2. After the accessory housing has been removed, disassemble the oil pump and carefully inspect both the housing and oil pump cover for damage.

3. Reassemble the oil pump using the new drive shaft and drive impeller supplied with the kits shown in the following "Parts Data" section. See figure 2. Be sure all of the parts are lubricated thoroughly during assembly.

**CAUTION**

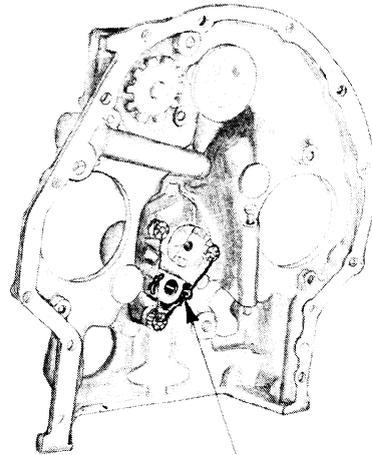
After assembly turn the drive shaft several revolutions to determine if it moves freely; if not, open the pump and correct the cause before the unit is reassembled on the engine.

4. Before returning the accessory housing to the engine it is necessary to replace the gasket on the mating flange between the sump and the accessory housing if it has been damaged. (If the sump has been removed the entire sump gasket is replaced.) To replace the rear portion of the sump gasket, lay the gasket on the sump flange and cut it diagonally with a sharp knife to obtain a line to line match between the ends of the old and new gaskets. Use POB gasket compound for sealant.

5. When reassembling the accessory housing align the idler gears in their exact position for engagement with the timing gear on the camshaft. See no. 60294-7 overhaul manual for assembly procedure.

6. After reassembly, time the magnetos to the engine and run the engine to check oil pressure and magneto drop-off; check for any noticeable variance from normal oil pressure and significant change from normal magneto drop-off.

7. Compliance with this modification should be noted in the aircraft records.



IF IDLER SHAFT IS SECURED WITH A COTTER PIN AT THIS LOCATION MODIFICATION IS NOT REQUIRED

Figure 1. Interior View of Accessory Housing Showing Location of Cotter Pin in Oil Pump Idler Shaft

Full credit allowance for parts and labor will be made in accordance with the following schedule for compliance with this bulletin. Claims must be filed with nearest Avco Lycoming Distributor and be accompanied with engine serial numbers.

Engines with	0 to 400 hours service time	. . . . .	\$50.00
Engines with	400 to 800 hours service time	. . . . .	\$35.00
Engines with	800 to 1200 hours service time	. . . . .	\$20.00
Engines with	1200 or more hours service time	. . . . .	materials only

**PARTS DATA:**

- LW-14129                    Gasket Kit, Oil Pump Shaft Replacement (4 cylinder engines)  
consists of: (1) 60096 fuel pump gasket, (3) 62224 magneto gasket, (1) 73818 accessory housing gasket, (2) LW-12681, -1200 series magneto gasket, (1) LW-13353 oil sump gasket
  
- LW-14130                    Gasket Kit, Oil Pump Shaft Replacement (6 cylinder engines)  
consists of: (1) 60096 fuel pump gasket, (3) 62224 magneto gasket, (1) 73818 accessory housing gasket, (2) LW-12681, -1200 series magneto gasket, (1) LW-14128 oil sump repair gasket
  
- LW-14131                    Oil Pump Shaft Replacement Kit (4 cylinder engines)  
consists of: (1) 61174 oil pump drive shaft, (1) LW-14038 or 60746 drive impeller
  
- LW-14132                    Oil Pump Shaft Replacement Kit (4 cylinder, dual drive magneto engines)  
consists of: (1) LW-14040 oil pump drive gear, (1) LW-14038 or 60746 drive impeller
  
- LW-14133                    Oil Pump Shaft Replacement Kit (6 cylinder engines)  
consists of: (1) 74641 oil pump drive shaft, (1) LW-14038 or 60746 drive impeller

MODELS AFFECTED AND TIME OF COMPLIANCE

*Engine Model	**Serial Numbers of Applicable Engines	Serial Numbers of Engines Not Applicable to this Bulletin	Time of Compliance
O-235 Series O-320 Series  O-320-B and -D IO-320-B1A LIO-320 Series O-360 Series  IO-360-B, -E, -F AEIO-360-B IO-360-A, -C, -D IO-360-A1B6D AEIO-360-A AIO-360 Series LIO-360 TIO-360 +O-540 Series  +IO-540 Series	11268-15 thru 12098-15 and 12100-15 33329-27 thru 41054-27  6809-39 thru 6971-39 4953-55 thru 5270-55 292-66 thru 296-66 17427-36 and 17440-36 thru 19846-36 10146-51 thru 13540-51 10179-51 thru 13616-51 10146-51 thru 13540-51 10115-51 thru 13529-51 10179-51 thru 13616-51 171-63 thru 208-63 634-67 thru 1059-67 116-64 thru 145-64 15327-40 thru 17105-40  10536-48 thru 12896-48	12099-15, 12101-15 and up  41055-27 and up O-320-E2D: 41029-27 and up O-320-E3D: 41017-27, 41021-27 and up 6972-39 and up 5271-55 and up 297-66 and up 19817-36, 19818-36, 19847-36 and up  13541-51 and up 13617-51 and up 13541-51 and up 13530-51 and up 13617-51 and up 209-63 and up 1060-67 and up 146-64 and up 17106-40 and up; 17098-40, 17103-40 and engines modified in accordance with Service Bulletin No. 381. 12897-48 and up; engines modified in accordance with Service Bulletin No. 381. All IO-540-P1A5 and -S1A5 models; also 10623-48, 10624-48, 10813-48, 10814-48, 11246-48, 11247-48, 11266-48, 11267-48, 12144-48, 12145-48, 12146-48, 12147-48, 12231-48, 12287-48 thru 12298-48, 12371-48 thru 12378-48, 12463-48, 12464-48, 12636-48, 12637-48, 12684-48, 12685-48, 12711-48, 12712-48, 12713-48, 12726-48 thru 12729-48, 12734-48 thru 12739-48, 12744-48 thru 12753-48, 12806-48, 12821-48 thru 12823-48, 12840-48 thru 12844-48, 12859-48 thru 12867-48, 12888-48.	Engines that have accumulated 400 or more hours of service since new, remanufactured or overhauled, must be modified in accordance with this bulletin within next 50 hours of operation.
<p>* - All of the engines listed in this column that were remanufactured at Avco Lycoming and shipped between December 21, 1972 and December 10, 1974 are subject to the modification described in this bulletin. However, during remanufacture many of these engines were built with oil pump drive components that are satisfactory for continued service and not subject to the modification herein required, see inspection paragraph to determine if compliance is required.</p> <p>** - In addition to the engines listed by serial numbers in this column, all engines modified at overhaul to incorporate hardened impellers in accordance with Service Instruction No. 1272, including O-235, O-290, O-320, IO-320, LIO-320, O-340, O-360, HIO-360, VO-360, IO-360, TIO-360, LIO-360, O-540 and IO-540 are subject to compliance with this bulletin. Serial numbers of many engines shown in this list have the suffix "A"; this letter suffix has no significance insofar as this bulletin is concerned and therefore has been omitted.</p> <p>+ - O-540 and IO-540 engines built with large capacity oil pumps and dual magnetos are designated with the term "5D" in the model description and they are exempt from the requirements of this bulletin. They include O-540-H1A5D, -H1B5D, -H2A5D, and -H2B5D; IO-540-K1A5D, -K1B5D, -K1E5D, -K1F5D, -M2A5D, and -T4A5D.</p>			

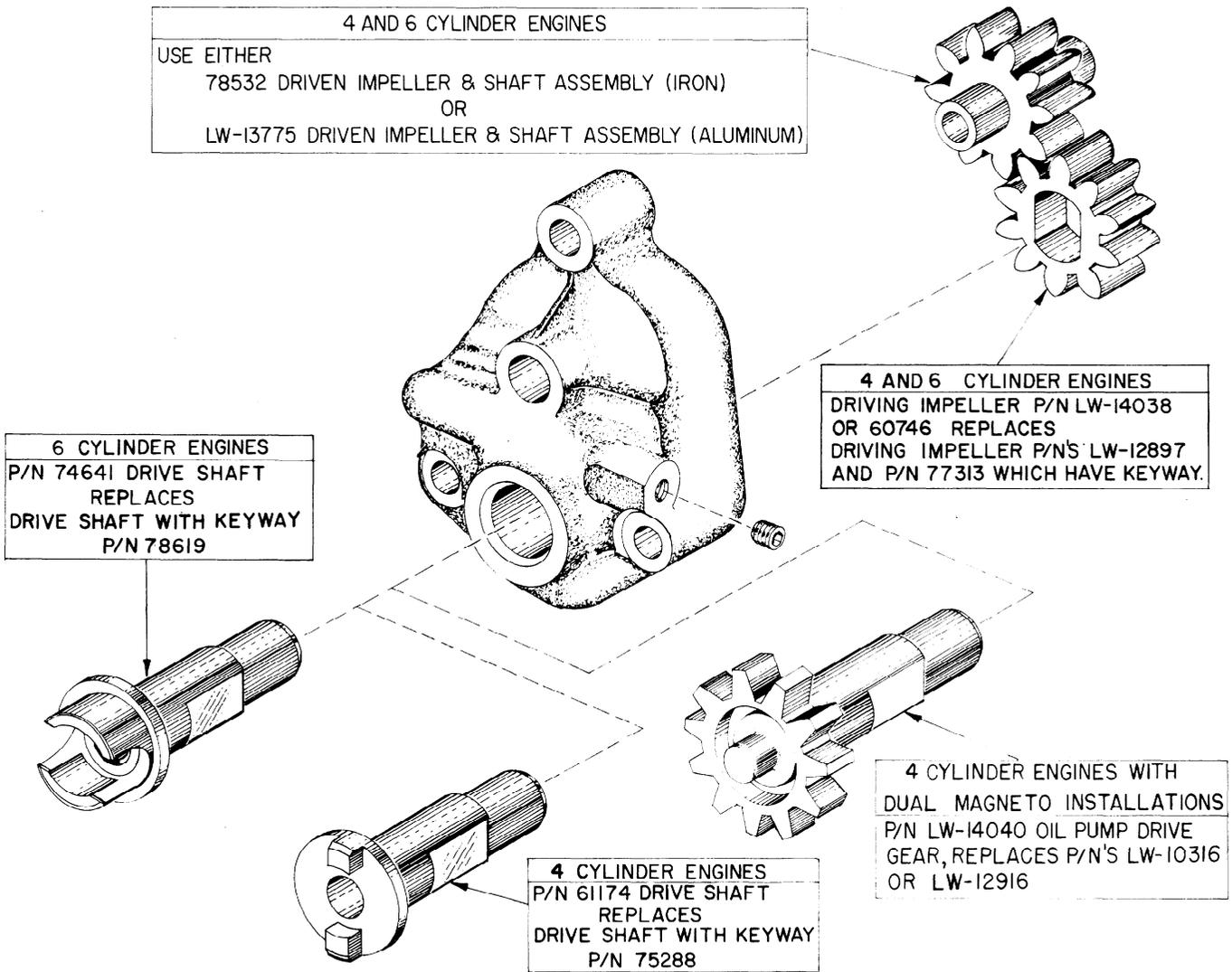


Figure 2. Oil Pump Drive Assembly

NOTE: Revision "C" adds part number 60746 drive impeller; removes Note from compliance column of chart which affects O-235, O-320, O-360 series engines.

19060 - This number for Avco Lycoming reference only.