VSP-37
July 7, 1982

VENDOR SERVICE PUBLICATION

To: All Piper Distributors and CORPAC's

Subject: Bendix Service Bulletins 615, 620, 621

The attached publications may affect Bendix equipment installed in Piper airplanes.

Refer to each publication for identification of specific equipment affected and for detailed information regarding compliance.

Bendix **Engine Products Division**

SERVICE BULLETIN NO. 615

Printed December 1981

AIRCRAFT

SUBJECT: Key actuated ignition switches.

REASON FOR BULLETIN:

1. To alert all users of the above type Bendix switches that some switches allow removal of the key in other than the "OFF" position, resulting in possible hazard to personnel.

2. To provide an inspection procedure to detect a faulty switch.

3. To provide removal and replacement instructions for the ignition switch.

EQUIPMENT AFFECTED: All Bendix Ignition Switches identified in Table I of this service bulletin.

NOTE: The key PK number is located on the key as indicated in figure 1.

TABLE I. Bendix Aircraft Ignition Switches, Rotary Action, Key Actuated.

Switch Function	Key	Switch Part Number	Key PK Numbers
Twist-To-Start	X X	10-357200-XX 10-126690-XX	PK-502, 503, 504, 506, 507, 511, 512, 513, 523, 524, 525, 528, 530, 532, 533, 536, 537, 539, 544, 551, 553, 563, 565, 572, 573 PK-605, 606, 613, 616, 617, 618, 627, 639, 641, 642, 643, 646, 648, 650, 653, 657, 660, 667, 682 PK-722, 729, 731, 734, 735, 736, 738, 743, 744, 745, 755, 756, 758, 760, 763, 765, 766, 767, 773, 774, 777, 784, 786, 798 PK-800, 805, 807, 814, 846, 848, 850, 852, 853, 855, 860, 862, 869, 872, 873, 876, 880, 881, 882, 884, 887, 889, 890, 891, 894 PK-901, 914, 916, 921, 922, 923, 930, 956, 963, 966, 967, 968, 970, 971, 978, 985, 990, 992, 996, 997, 999
Push-To-Start	X X	10-357210-XX 10-126680-XX	
Twist-To-Start Push-To-Prime GM GBM	X X X X	10-357220-XX 10-126680-XX 10-357290-XX 10-357310-XX	

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:

As indicated in Table I

Compliance:

The inspection procedure described in Detailed Instructions must be performed immediately upon receipt of this Service Bulletin.

Any switch found to be defective per the inspection requirements of this bulletin must be replaced immediately.

Key PK number stamped in this area.

Have to remove black rubber from top of key to expose the PK number.

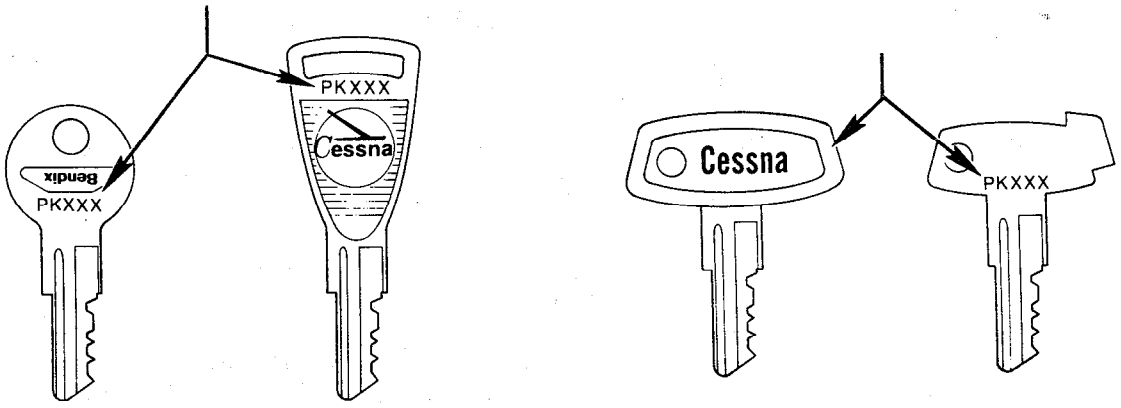


Figure 1

At owner's/operator's option, any switch that passes this inspection may remain in service, but must be inspected after every flight per the instructions of this bulletin.

It is suggested that any switch with PK number listed in Table I be replaced at the first opportune time. Replacing the switch will prevent any possible mishap and will eliminate the need for repeated inspections.

General Information:

This bulletin alerts users and holders of Bendix Aircraft Ignition Switches identified in Table I by function, part number and PK key number to a possible fault which could result in personnel hazard should the propeller be pulled through by hand without taking proper precautions. Additionally, it provides a procedure for detecting a faulty switch and replacing the switch as required.

Reports indicate that it may be possible to remove certain PK numbered keys, listed in Table I, from the ignition switch in other than the "OFF" position, leaving the magneto ungrounded or operational. The engine could fire if rotated.

WARNING

Should the propeller be pulled through by hand (as during preflight) and an ungrounded magneto condition exists,the engine may fire and cause injury to personnel.

All appropriate precautions shall be excerised by all personnel associated with an aircraft having the switch condition described herein, until the switch has been replaced.

Detailed Instructions:

Part I

Inspection Procedure for Detection of Faulty Switch

If you have one of the switch key PK numbers listed in Table I, perform the following procedure to determine if the key/switch combination is faulty.

1. Insert the key into the ignition switch and rotate the key to each switch position.

2. Try to remove the key by pulling straight out. If the key comes out with the switch in any position other than "OFF" the switch is faulty and must be replaced by a switch not having one of the PK numbers listed in Table I.

Part II

Replacing a Faulty Switch

A. Removal of Switch Assembly

(See appropriate airframe maintenance manual for switch removal/replacement procedures.)

WARNING

During switch removal or replacement, both magnetos are ungrounded. Should the propeller be moved during this time the engine may fire.

1. Disconnect all electrical power in the aircraft prior to beginning this procedure.

2. Remove the round knurled nut from the threaded portion of the switch.

3. Remove the indicating dial from the threaded portion of the switch.

4. Remove the switch assembly from the hole through the rear of the panel or mounting surface.

5. Identify and disconnect all wires from the wire terminals on the switch assembly.

B. Installation of Switch Assembly

1. Connect all wires to their proper terminals using screws and lockwashers. Whenever the switch is used with a retard breaker magneto, or when only the left magneto is impulse coupled, attach the jumper strip provided between the unmarked terminal and the "R" terminal.

2. Install switch in panel or mounting surface in accordance with instructions in airframe maintenance manual.

Logbook Entry:

Make an appropriate logbook entry to indicate that this service bulletin has been complied with. If the switch has been inspected, but not replaced, this should be indicated in the logbook each time the switch is inspected. If the switch is replaced, the logbook entry should so indicate.

Special Tools Required:

None

Man Hours Required:

1. Inspection Procedure – Negligible
2. Removal and Replacement Procedure – 1.0 hour

Weight Change:

None

AIRCRAFT

SUBJECT: Retiming of distributor gears in 6 cylinder S-20 and S-200 series magnetos not incorporating a retard breaker.

REASON FOR BULLETIN: To improve the electrode coverage within the distributor block, increasing the magneto altitude capability.

EQUIPMENT AFFECTED: All 6 cylinder S-20 and S-200 series magnetos not incorporating a retard breaker and with serial number below S/N 8121251 blue label and S/N A278242 red label magnetos.

Maintenance (Spare) Parts Affected:
None

Compliance:
At owners discretion, but not later than magneto overhaul.

General Information:
Test results with the magneto distributor gear timed to the normal position rather than the booster position indicate an improved ignition system altitude capability.

Detailed Instructions:
(Refer to S-20 and S-200 Series Magneto Overhaul Instructions, Bendix Publications L-205-10 and L-527-4 respectively.)

Note:
Magnetos incorporating a retard breaker shall continue to be timed to the booster position.

1. Follow published procedures for distributor gear removal and inspection.
2. If old distributor gear, P/N 10-157197, which incorporated two different molded timing identification marks was used (see figure 1), proceed as follows:
   a. Remove paint from booster timing positions with suitable solvent.
   b. Locate normal timing tooth between CW and CCW booster chamfered teeth and paint this tooth and the applicable inner timing mark with red Dykem or red lacquer in accordance with figure 2 or figure 4 for appropriate gear.

Note:
Normal timing tooth is always located between outer booster chamfered teeth regardless of gear configuration.

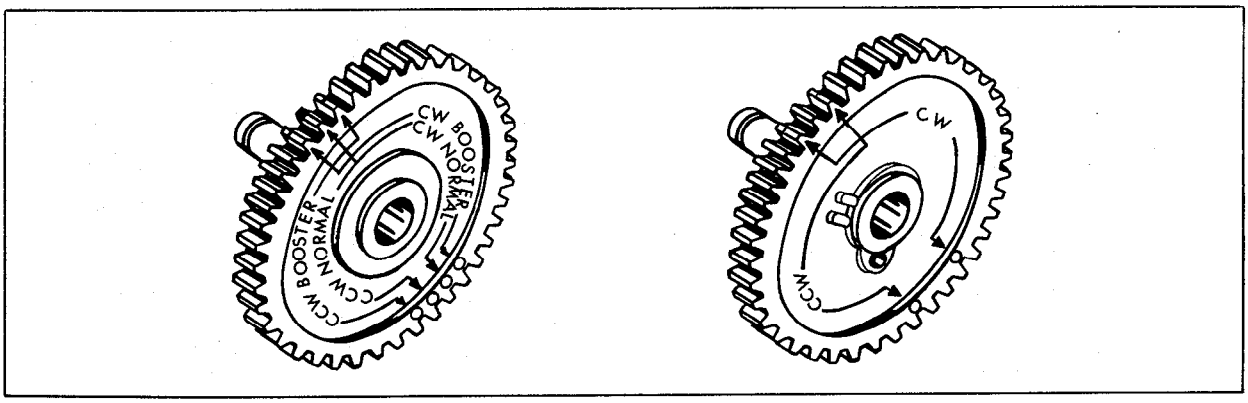


Figure 1. 10-157197 Distributor Gears with Different Timing Marks

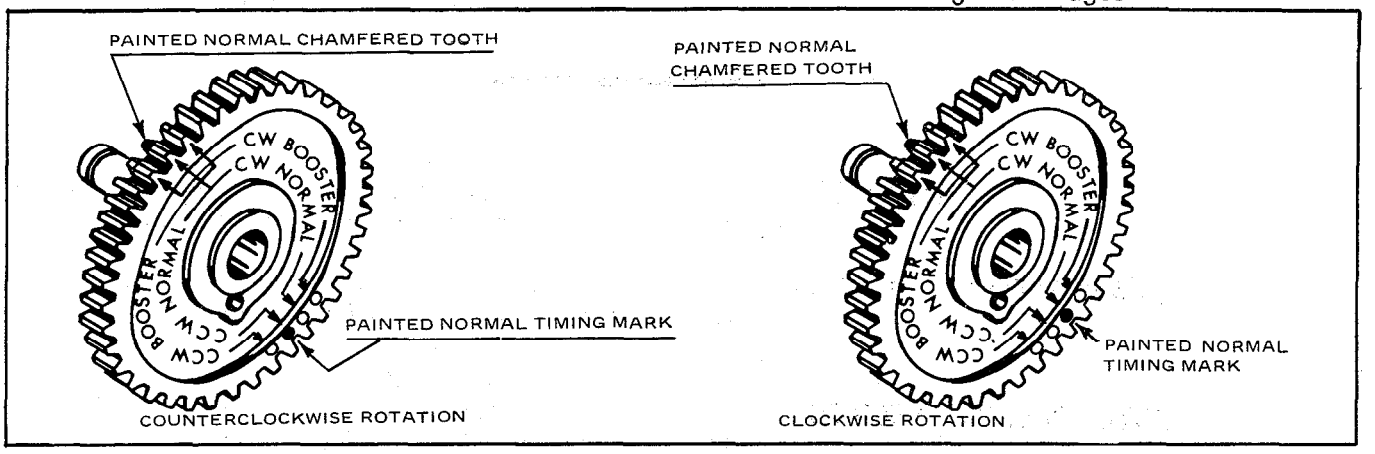


Figure 2. Modified 6 Cylinder Gears P/N 10-157197

3. If present production distributor gear as supplied in kit P/N 10-357586 is used (see figure 3) *proceed as follows*:

   a. Remove paint from booster timing positions with suitable solvent.

   b. Locate normal timing tooth between CW and CCW booster chamfered teeth and paint this tooth and the applicable inner timing mark with red Dykem or red lacquer in accordance with figure 4.

Note

The molded timing marks incorporated in new present production nylon spare part gears, as supplied in kit, P/N 10-357586, are for the booster timing position. Before installation of a new gear kit, the applicable normal timing mark and center tooth must be marked with red Dykem or red lacquer as illustrated in figure 4.

4. Reassemble the magneto using the applicable **normal** timing mark on distributor gear.

5. After magneto has been reassembled, identify the magneto by stamping the letter "R" in the upper left hand corner of the identification plate using a 1/16 inch metal stamp.

6. Make an appropriate engine Log Book entry indicating that this Service Bulletin has been complied with, recording magneto serial number.

Special Tools Required:
Refer to applicable manuals

Man Hours Required:
1.0 hour

Weight Change:
None

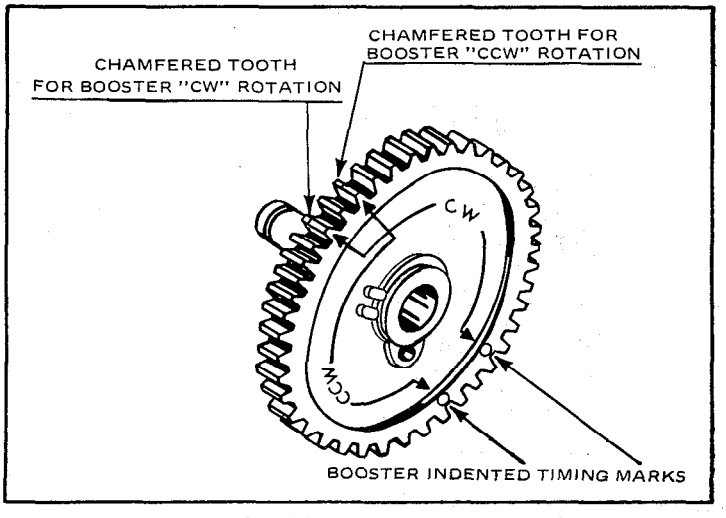


Figure 3. Timing Marks on Present Production Distributor Gear Kit Assembly 10-357586

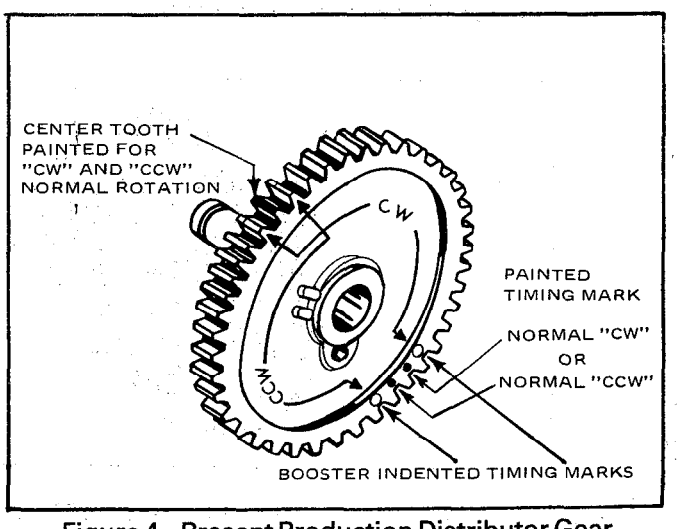


Figure 4. Present Production Distributor Gear Assembly with Additional Timing Marks Painted

AIRCRAFT

SUBJECT:

Replacement of plain steel washer, P/N 10-349511 used in conjunction with nylon insulating washer P/N 10-391309, in certain 6 cylinder S-20/200 series magnetos and distributor gear kits P/N 10-357586.

REASON FOR BULLETIN:

To alert users of a possible electrical flash-over in the distributor that could cause engine roughness at altitude.

EQUIPMENT AFFECTED:

1. S6-20/200 series magnetos, with red identification (data) plates, new production units S/N A278055 through S/N A288540.

2. Remanufactured magnetos with blue identification (data) plates, S/N 8121001 through S/N 8144001 incorporating washers P/N 10-349511, used in conjunction with nylon insulating washer 10-391309.

Exceptions to item 1 or 2 above:

Magnetos identified with a W in the lower left hand corner of the data plate have previously been complied with.

Remanufactured magnetos S/N 8121001 through S/N 8144001 may or may not incorporate the insulated distributor gear concept due to mixed production at the time of manufacture. These magnetos may incorporate the original design gears not utilizing the washer P/N 10-349511 or washer P/N 10-606505. These gears are identified in Figure 1 and are acceptable as is. Magnetos in this serial number range that have been inspected and do not require compliance with this Service Bulletin should be identified by stamping 1/16 in. letter O in lower left hand corner of data plate.

Note

Should compliance with this Service Bulletin be required prior to overhaul, an inspection can be performed to determine the presence of washer P/N 10-349511 by the procedures listed in General Information.

Spare Parts Affected:

Distributor gear kits P/N 10-357586, not incorporating washer P/N 10-606505.

Compliance:

At users discretion, but no later than the next magneto overhaul.

General Information:

It has been determined that plain steel washer P/N 10-349511 installed on the gear axle between the nylon insulating washer P/N 10-391309 and the distributor block bronze oil-lite bushing (see figure 2) can cause electrical flash-over in the distributor at altitude. Inspect for compliance as follows:

1. Remove the top timing plug.

2. Using a concentrated light beam (a pen light or equivalent) look into the timing hole at the area between the distributor gear and the distributor block parts for existing washer configuration.

3. Current configuration should be as shown in figure 3.

4. Rework magneto whenever configuration is as shown in figure 2.

5. An acceptable configuration is shown in figure 1.

Detailed Information:

Rework a magneto to the correct configuration as follows:

1. Remove magneto from engine.

2. Disassemble as required using procedures described in Bendix Overhaul Manual Form No. L-205-10 for S-20 and L-527-4 for S-200 series magnetos.

3. Remove retaining ring and plain washer. Discard retaining ring. Remove distributor gear from the distributor block.

4. Inspect the distributor block for burning or carbon tracking and serviceability. Replace if defective.

5. Remove old plain steel washer P/N 10-349511 (OD 0.750 in.) and nylon insulating washer P/N 10-391309 from the gear axle.

6. Reinstall nylon insulating washer P/N 10-391309 and install new plain washer P/N 10-606505 (OD 0.562 in.) on gear axle. See figure 4 for assembly order.

7. Wipe distributor gear axle clean, then reinstall it in the block. Place plain washer P/N 10-349511 on axle shaft and secure with new retaining ring P/N 10-92815-37.

8. Turn distributor gear 360° to insure there is no interference with gear rotation.

9. Reassemble the magneto using manuals referenced in step 2.

10. Inspect magneto for proper timing and assembly.

Identification:

Upon completion of requirements in this Service Bulletin:

1. Identify the magneto by metal stamping a 1/16 inch letter W in the lower left hand corner of the magneto identification (data) plate.

2. Make an appropriate engine log book entry recording the Serial Numbers of the magnetos involved.

Parts Required Per Magneto:

1 new plain steel flat washer P/N 10-606505 (OD 0.562 in.).

Parts Required Per Distributor Gear Kit:

1 new plain steel flat washer P/N 10-606505 (OD 0.562 in.).

Special Tools Required:

Refer to applicable Overhaul Manual (L-205 for S-20; L-527 for S-200).

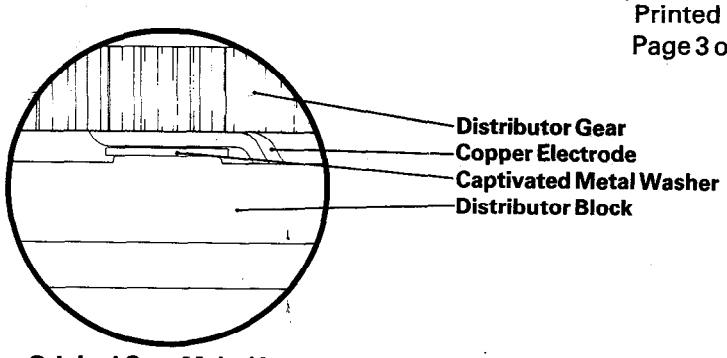
Man Hours Required:

1. For a magneto removed from the engine: 20 minutes.

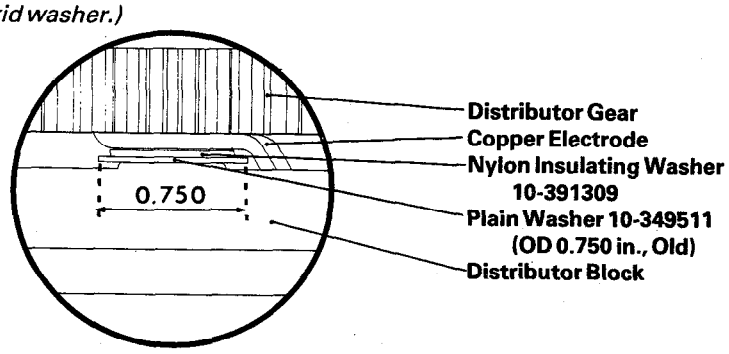
2. When removal from the engine is included; 1.0 hour.

Weight Change:

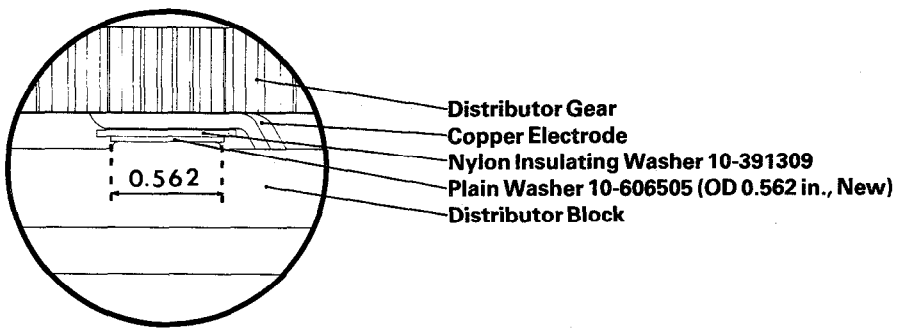
None



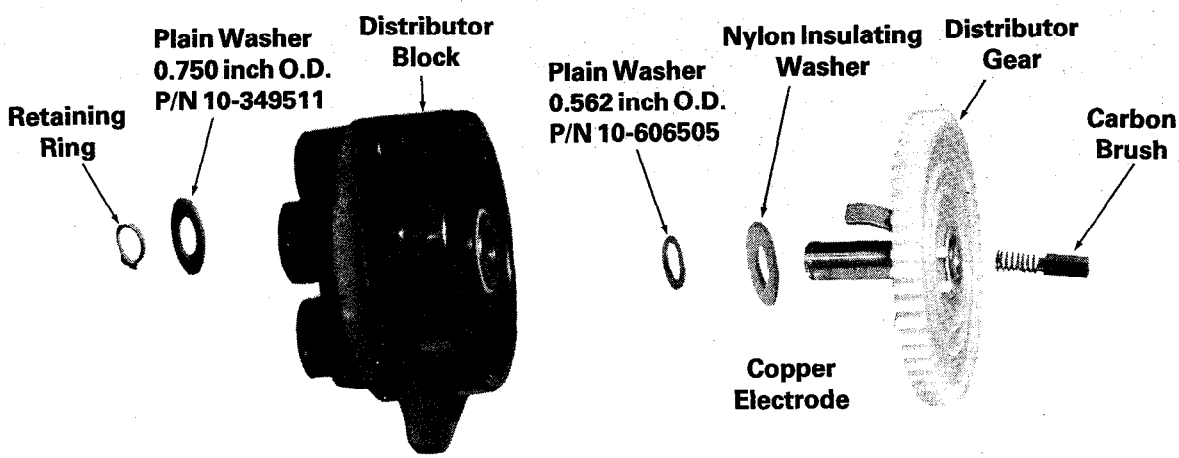
Original Gear Make Up
(Not incorporating insulating or plain steel skid washer.)
Figure 1



Insulated Gear Configuration
*(Incorporating 10-357586 Kit parts with **incorrect** washer.)*
Figure 2



Current Insulated Configuration
*(Incorporating 10-357586 Kit parts with **correct** washer.)*
Figure 3



Gear Block Assembly, Exploded View
Figure 4