



# SERVICE BULLETIN

No. 399

Piper Aircraft Corporation

Lock Haven, Pennsylvania, U.S.A.

"FAA DOA EA-1 Approved"

October 29, 1973

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Subject: Ignition System for High Altitude Operation; reference attached Avco Lycoming Service Instruction No. 1291, dated November 2, 1973.

Models Affected: PA-31-350 Navajo Chieftain  
Serial Numbers Affected: 31-5001 to 31-7305101 incl.

Compliance Time: The caution notice contained in Purpose, below, is effective immediately upon receipt of this Service Bulletin; compliance with the ignition system modification described on the attached Avco Lycoming Service Instruction No. 1291 is to be performed in accordance with the provisions of the Time of Compliance section.

Purpose: To provide distribution of the attached Avco Lycoming Service Instruction No. 1291, dated November 2, 1973 to owners and operators of affected PA-31-350 Navajo Chieftain aircraft.

## CAUTION

As a temporary measure pending compliance with the provisions of Avco Lycoming Service Instruction No. 1291, the maximum operating altitude of aircraft referenced above shall be limited to 21,000 feet.

A copy of this Service Bulletin with the attached Avco Lycoming Service Instruction No. 1291 should be retained with the aircraft operating documentation until compliance with Lycoming Service Instruction No. 1291 has been completed.

Instructions:

1. Recommended maximum altitude operation limitation: as explained in the CAUTION section of Purpose, above.
2. Ignition System Modification instructions: refer to the Avco Lycoming Service Instruction No. 1291.

Material Required: Refer to attached Avco Lycoming Service Instruction No. 1291

Availability of Parts: Your Piper Dealer.

Effectivity Date: This Service Bulletin is effective November 9, 1973.

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Summary:

Compliance with the cautionary provisions of this service release should be placed in effect immediately by the aircraft owner/operator.

Please contact your Piper Dealer to make arrangements for compliance with the modification provisions set forth on the attached Avco Lycoming Service Instruction No. 1291, dated November 2, 1973.

BULLETIN SUPPLEMENT - PROCEDURAL OPERATING INFORMATION

<u>Material Allowance:</u>	Refer to Avco Lycoming Service Instruction No. 1291, dated November 2, 1973.
<u>Labor Allowance:</u>	Refer to Avco Lycoming Service Instruction No. 1291.
<u>Disposition of Parts in Stock:</u>	Refer to Avco Lycoming Service Instruction No. 1291.
<u>Disposition of Replaced Parts:</u>	Refer to Avco Lycoming Service Instruction No. 1291.

# AVCO LYCOMING DIVISION

WILLIAMSPORT, PENNSYLVANIA 17701

## Service Instruction



DATE: NOVEMBER 2, 1973

Service Instruction No. 1291  
Engineering Aspects are  
FAA (DEER) Approved

SUBJECT: Ignition System for High Altitude Operation

MODELS AFFECTED: TIO-540-J2BD engines with serial numbers L-2369-61A thru L-2771-61A, L-2773-61A thru L-2779-61A, L-2781-61A thru L-2783-61A, L-2785-61A thru L-2794-61A.  
LTIO-540-J2BD engines with serial numbers L-101-68A thru L-217-68A.

TIME OF COMPLIANCE: During next 100 hour engine inspection or earlier at owners discretion.

During periods of high altitude and high cruise power operation, rough engine operation is a distinct possibility of the ignition systems if the engines are not meticulously maintained. This is due to breakdown of electrical resistance because of low atmospheric pressure. To eliminate this condition and permit efficient magneto performance under these conditions, a pressurized magneto has been introduced in current production which can be easily identified by its gray color instead of customary black. A modification kit to incorporate the new pressurized magneto on earlier engines is available on a no cost exchange basis for all operators of applicable engines. A labor allowance of \$70.00 per engine will be allowed on applications for warranty claim. Maintenance support will not be available for the non-pressurized black magnetos, therefore installation of the new pressurized system is recommended as early as possible. All replacement and exchange engines will be equipped with new pressurized magneto systems.

In addition to replacing the magneto and ignition harness, this modification essentially required the addition of an air pressure control system and a new ground terminal kit. Specific instructions for procurement and installation are as follows:

1. Remove no. 1 spark plug and rotate the engine in direction of normal rotation until the compression stroke is reached. Remove black magneto and harness from engine being careful not to loose magneto cushions in the engine.

2. Install magneto ignition system LW-385046-109 (TIO-540-J) or LW-385046-110 (LTIO-540-J) using new magneto cushions LW-12136 and magneto gasket LW-12681. Time magneto to 20° BTC and after completed, torque magneto hold-down clamps to 150 inch pounds. Install magneto ground terminal kits.

### NOTE

Do not attempt to reuse old magneto ground terminal cables; pressurization of magneto cannot be maintained. Also, on new or replacement engines equipped with pressurized magnetos make sure ground terminal kit P/N LW-382698 and P/N LW-382613 are installed.

3. TIO-540-J2BD engines with serial numbers L-2751-61A thru L-2760-61A, L-2771-61A thru L-2773-61A, L-2780-61A, L-2782-61A thru L-2784-61A and LTIO-540-J2BD engines with serial numbers L-202-68A thru L-217-68A were manufactured with the hole drilled, tapped and plugged at the location shown in figure 1. Inspect the air inlet housing for the tapped 3/8-16 hole, if present remove bolt STD-1947, lockwasher STD-697 and washer STD-33. Proceed to step 13 for the installation of magneto pressure adapter.

4. Remove air inlet housing LW-12466 from engine.

5. Remove pressure controller from inlet housing.

6. Place the inlet housing down on a flat surface with the injector end pointing to the left and the pressure controller mounting pad facing upward.

7. Locate the drill fixture, ST-373 on the lower two mounting holes of pressure controlled pad with two STD-1566 (10-24) screws, so that the hole to be drilled is on the inside curve of the air inlet housing. See figure 1.

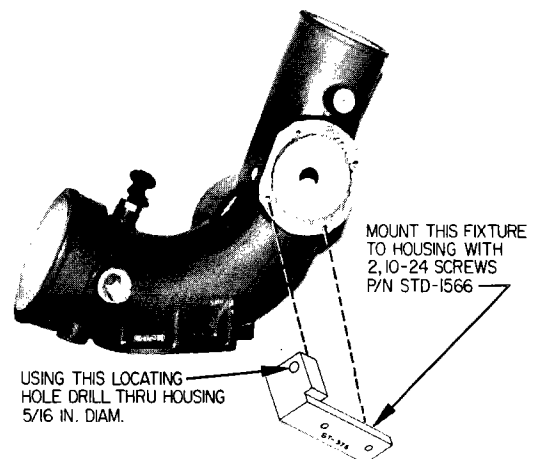


Figure 1. Air Inlet Housing Showing Location for Drilling

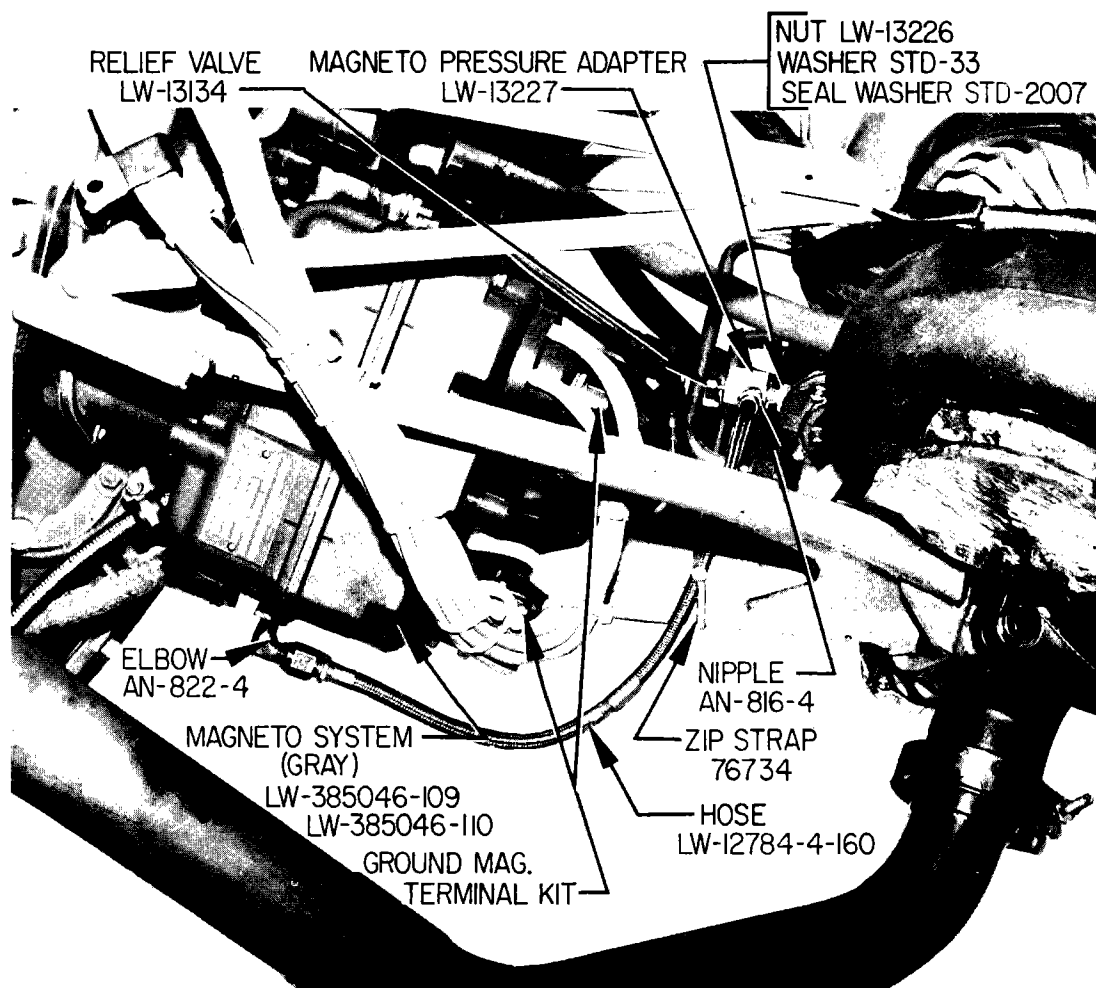


Figure 2. Top View of Engine Showing Details for Pressurized Magneto Installation

8. Using a hand drill and 5/16 drill bit, drill through one side of air inlet housing.

9. Remove drill fixture and hand counterbore the drilled hole to a maximum depth of .09/.13 inch x .390 in. dia.

10. Tap hole with 3/8-16 tap.

11. Remove all raised metal and burrs from hole.

12. Reinstall air inlet housing on engine.

13. Install AN-822-4 elbow in left side of magneto.

14. Install relief valve LW-13134 using MS29512-04 o-ring in adapter and safety wire, also, install nipple AN-814-4.

#### NOTE

To test relief valve, connect relief valve adapter and elbow AN-822-4 using hose LW-12784-4-160. Install a pressure gage on magneto retard terminal. Apply 4 lbs. pressure at inlet to relief valve adapter. The gage on magneto should read 3 pounds  $\pm$  1/4 lbs. Increase the pressure to 8 pounds, the gage should then read 3 pounds  $\pm$  1/4. If pressure at magneto is not within the limits, replace relief valve LW-13134.

15. Install relief valve adapter LW-13227 using LW-13226 plain nut (.375-16), STD-33 plain washer, and STD-2007 seal washer in 3/8-16 hole. Position the adapter with nipple AN-814-4 toward the pressure controller mounting pad, tighten nut LW-13226. Reinstall the pressure controller on the inlet housing.

16. Install hose LW-12784-4-160 between elbow AN-822-4 in magneto and nipple AN-814-4 in relief

valve adapter. Fasten hose to lower strut of turbo-charger bracket with zip strap 76734.

# **PARTS DATA:**

Kit - LW-13631 - TIO-540-J2BD, consists of:-

Qty.	Part No.	Name
1	AN-816-4	Nipple
1	AN-822-4	Elbow
1	MS29512-04	Seal Oil
1	STD-33	Plain Washer
1	STD-2007	Seal Washer
1	76734	Zip Strap
1	LW-12784-4-160	Hose
1	LW-13134	Valve Assembly, Relief
1	LW-13226	Nut, .375-16 Plain
1	LW-13227	Adapter Magneto Pressure
2	LW-382698	Kit, Magneto Ground Terminal
1	LW-382813	Kit, Magneto Ground Terminal (Retard)
1	LW-385046-109	Magneto Ignition System
1	LW-12681	Magneto Gasket
2	LW-12136	Magneto Cushions

Kit - LW-13632 - LTIO-540-J2BD, consists of:-

Qty.	Part No.	Name
1	AN-816-4	Nipple
1	AN-822-4	Elbow
1	MS29512-04	Seal Oil
1	STD-33	Plain Washer
1	STD-2007	Seal Washer
1	76734	Zip Strap
1	LW-12784-4-160	Hose
1	LW-13134	Valve Assembly, Relief
1	LW-13226	Nut, .375-16 Plain
1	LW-13227	Adapter Magneto Pressure
2	LW-382698	Kit, Magneto Ground Terminal
1	LW-382813	Kit, Magneto Ground Terminal (Retard)
1	LW-385046-110	Magneto Ignition System
1	LW-12681	Magneto Gasket
2	LW-12136	Magneto Cushions

# **SPECIAL TOOL REQUIRED:**

1	ST-373	Drill Locating Fixture (one only required for both engines)
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The kits are available from Avco Lycoming, Williamsport, Pa.; include serial numbers of the engines with your request.