

SERVICE BULLETIN

SB04-4A

Compliance Will Enhance Safety

Technical Portions FAA
Approved

**SUBJECT: REPLACEMENT OF MANIFOLD VALVE
SPRING P/N 630184**

PURPOSE: To provide instructions for the replacement of manifold valve spring P/N 630184 with spring P/N 627378.

COMPLIANCE: At the next scheduled engine maintenance or preventive maintenance event.

**ENGINES
AFFECTED:** IO-240-B Series Engines.

Reason For Revision: Revised Warranty Statement and Manual References. See Revision Bars.

General Information

TCM has received reports of engine instability and occasional engine stoppage at low idle speeds during rollout. These conditions have been addressed by correctly setting idle speed and correctly adjusting the fuel system. However, the change to the manifold valve spring as addressed in this SB will enhance engine stability under low idle speed conditions. Note: This is NOT an alternative to correctly adjusting the fuel system and idle rpm of the engine as these adjustments are important to proper engine operation and performance.

CAUTION

After installation of the manifold valve spring the fuel system must be set up in accordance with the latest revision of SID97-3 and the latest revision of the engine Maintenance Manual TCM Form X30621A

A. INSPECTION


1. Inspect the manifold valve and determine manifold valve part number.
2. If manifold valve P/N 656151-1A5 or subsequent is installed, or the letter "S" is vibro-etched into the upper left corner of the manifold valve data plate, no further action is required. Make an engine logbook entry stating SB04-4A previously complied with, P/N 656151-1A5 manifold valve installed.
3. Any manifold valve installed that does not meet the criteria in step 2 above, proceed to part "B".

B. REPLACEMENT OF MANIFOLD VALVE SPRING

- Ensure that the ignition switch is in the OFF position.
- Ensure that the master switch is in the OFF position.
- Ensure that the throttle is CLOSED and mixture control is in IDLE CUT-OFF.
- Turn the aircraft fuel selector valve to the OFF position.
- Refer to Figure 1, page 3, for expanded view of the manifold valve assembly.

CAUTION: *The following procedure must be accomplished by a properly certified mechanic or repair station. The work area must be clean and free of debris.*

1. If not already removed, remove the top cowling in accordance with the aircraft manufacturer's instructions.

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2. Locate the fuel injection system manifold valve located aft of the induction plenum.
3. Clean all “torque Putty” from manifold valve fittings prior to loosening and removing any manifold valve fitting.
4. Install protective plugs or caps on all lines and fittings as removed to prevent fuel system contamination.
5. Loosen the “B” nut that secures the fuel supply line to the manifold valve body and remove the line.
6. Loosen the “B” nut that secures the overboard vent line to the manifold valve cover and remove the vent tube.
7. Loosen the “B” nut that secures the fuel pressure gauge line to the manifold valve body and remove the line.
8. Loosen the fuel injection line “B” nuts at each of the four cylinder fuel injection nozzles.
9. Loosen the fuel injection line fittings at the manifold valve and remove the fuel injection lines from the manifold valve.
10. Loosen and remove the nuts from the two backbone bolts that secure the manifold valve bracket to the engine.
11. Remove the two backbone bolts that secure the manifold valve to engine and remove the manifold valve.
12. Using a permanent marker, identify the assembled position of the manifold valve body, cover and bracket prior to disassembly.
13. Remove the lockwire from the four screws that secure the manifold valve cover and bracket to the manifold valve body.
14. To remove the manifold valve bracket and cover, loosen and remove two screws, lock washers and plain washers diagonally across from each other. Then loosen and remove the other two screws, lock washers and plain washers while holding the manifold valve bracket and cover in place with slight hand pressure.
15. Slowly release hand pressure from the manifold valve bracket and cover and lift the cover from the manifold valve body. Do not remove the manifold valve diaphragm and plunger assembly.
16. Remove manifold valve spring P/N 630184, one coil dyed green, which is positioned between the manifold valve diaphragm and plunger assembly and the manifold valve cover.
17. Install manifold valve spring P/N 627378, which does not have a color coded coil, with the large diameter of the spring against the manifold valve diaphragm retainer.
18. Re-install the manifold valve bracket and cover in the reverse order of removal. Make sure the cover vent fitting is correctly orientated with the vent tube. Install the manifold valve bracket and cover with four screws, lock washers and plain washers.

WARNING: *Always use calibrated torque equipment. Failure to properly torque fasteners and fittings may result in fuel leaks, loss of engine power, possible engine fire, forced landing, possible bodily injury that may result in death.*

19. Torque manifold valve cover screws to 24 inch pound \pm 2 inch pounds. Safety wire the screws in pairs.
20. Re-install the manifold valve and bracket on the engine using the two bolts, washers and nuts. Torque the backbone bolt and nut to 100 to 125 inch pounds.
21. Remove protective plugs and caps, installed in step 4 above, as each system line or hose is reattached.
22. Re-install the fuel injection lines to the manifold valve. Do not torque at this time.
23. Re-install the fuel injection lines to the four fuel injection nozzles in each cylinder. Ensure fuel injection nozzle lines are correctly routed and supported. Torque each fuel injection nozzle line “B” nut at nozzles to 40 to 45 inch pounds.

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24. Torque each fuel injection nozzle line fittings at manifold valve to 55 to 60 inch pounds.
25. Connect the manifold valve cover vent tube "B" nut to the manifold valve cover fitting and torque to 100 to 140 inch pounds.
26. Connect the fuel supply line "B" nut to the manifold valve fitting and torque to 100 to 140 inch pounds. Connect the fuel gauge line "B" to its fitting and torque to 100 to 140 inch pounds.
27. Turn the aircraft fuel selector to the ON position.
28. Turn the aircraft master switch ON.
29. Position the throttle to full OPEN and mixture control to FULL RICH. Turn the fuel boost pump ON and inspect all lines and fittings for signs of leakage. Correct any discrepancies prior to proceeding. **Perform a complete fuel injection system set up in accordance with the latest revision of TCM service bulletin SID97-3 and the latest revision of the IO-240 Aircraft Engine Maintenance Manual TCM Form X30621A.**
30. Re-install engine cowling in accordance with the aircraft manufacturer's instructions.
31. Make a logbook entry indicating compliance with SB04-4A and installation of fuel manifold valve spring P/N 627378. Vibro-etch the letter "S" on the upper left corner of the manifold valve data plate.

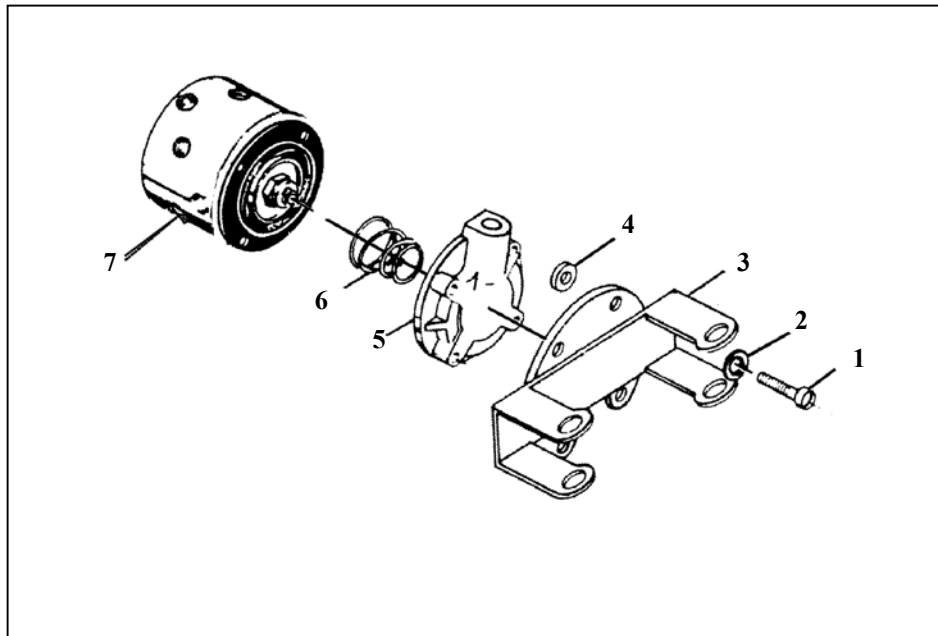


FIGURE 1
MANIFOLD VALVE EXPANDED VIEW

ITEM	PART NUMBER	NOMENCLATURE	QUANTITY
1	AN 503-8-12	SCREW	4
2	MS 35338-42	WASHER, LOCK	4
3	653887	BRACKET	1
4	AN960-8	WASHER	4
5	634325	COVER	1
6	627378	SPRING-2 PSI	1
7	N/A	BODY-MANIFOLD VALVE	1

WARRANTY:

TCM will cover the replacement manifold valve spring and up to 1.0 hour labor for replacement of the manifold valve spring. Warranty claims for parts and labor must be filed through a TCM distributor.

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