Service Bulletin

October 28, 2002

TITLE
AIRBORNE AIR & FUEL PRODUCTS CHECK VALVE MANIFOLD INSPECTION

EFFECTIVITY

<table>
<thead>
<tr>
<th>Model</th>
<th>Serial Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>172R</td>
<td>17280001 and On</td>
</tr>
<tr>
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<td>172S8001 and On</td>
</tr>
<tr>
<td>182S</td>
<td>18280001 thru 18280944</td>
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<tr>
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<td>18280945 and On</td>
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<tr>
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<td>T18208001 and On</td>
</tr>
<tr>
<td>206H</td>
<td>20608001 and On</td>
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</tr>
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REASON
To transmit Airborne Air & Fuel Products Service Letter Number 39A: Mandatory Inspection Intervals And Replacement Times For Airborne Check Valve Manifolds, Check Valves And Regulator Check Valve Manifolds. This service bulletin also includes additional inspection criteria to assist in determining if the check valve manifold is serviceable. Service Letter Number 39A supersedes Product Reference Memo Number 39 dated January 31, 1996.

DESCRIPTION
Check valve manifolds supplied by Airborne for use in aircraft pneumatic systems have parts manufactured from an elastomeric material that can deteriorate with age due to environmental conditions such as heat. As these components age, it is increasingly important to perform mandatory inspections at specified intervals to ensure their proper operation, thus reducing the potential for pneumatic system failure which could result in the loss of the pneumatic powered gyro flight instruments, and de-ice system if installed.
COMPLIANCE

Mandatory as follows for the check valve manifold:

Initial Inspection: At the next scheduled upper cowl removal, not to exceed 100 hours of operation or 12 months, whichever occurs first.

Initial serviceability test: Five years from date of manufacture, 1,000 hours of operation, or upon finding loose rivets in the check valve manifold, whichever occurs first.

Recurring serviceability test: Each 12 months or 600 hours of operation, whichever occurs first.

Replacement of manifold: Upon finding broken rivets on check valve manifold, ten years from date of manufacture, or upon not meeting manufacturer's serviceability test.

NOTE: Additional inspection criteria has been added to the Airborne requirements to assist in determining if the check valve manifold is in a serviceable condition.

APPROVAL

FAA approval has been obtained on technical data in this publication that affects airplane type design.

MANPOWER

Approximately 0.1 man-hour for inspection of the check valve manifold when accomplished concurrently with regular scheduled cowling removal.

Approximately 1.0 man-hour to accomplish serviceability test

REFERENCES

Airborne Air & Fuel Products Service Letter Number 39A (or latest revision)

NOTE: Make sure all publications used are complete and current.

NOTE: This information shall be considered an amendment to the Cessna Manufacturer's Service/Maintenance Manual or Instructions for continued airworthiness and must be accomplished for ongoing airworthiness compliance as required per 14 CFR Part (FAR) 43.13.

OTHER PUBLICATIONS AFFECTED

Model 172R & Model 172S Illustrated Parts Catalog
Model 182S/182T/T182T Illustrated Parts Catalog
Model 206H & Model T206H Illustrated Parts Catalog

NOTE: Make sure all publications used are complete and current.

MATERIAL PRICE AND AVAILABILITY

None

CREDIT INFORMATION

Not applicable
ACCOMPLISHMENT INSTRUCTIONS

Weight And Balance Information

WEIGHT CHANGE ............................ Negligible

Material Information
None

Instructions
1. Electrically ground the airplane and turn all switches to the "OFF" position. If external power is connected to the airplane, disconnect external power from receptacle.
2. Remove cowlng or battery access panel as required and disconnect the battery. (Refer to the Maintenance Manual, Chapter 24, Electrical Power.)
3. Attach maintenance warning tags to the battery and external power receptacle stating: DO NOT CONNECT ELECTRICAL POWER - MAINTENANCE IN PROGRESS.
4. Remove the engine cowlng as required to gain access to the check valve manifold. (Refer to the Maintenance Manual, Chapter 71, Cowling - Maintenance Practices.)
5. Inspect the flanged housing of the check valve manifold for loose or broken rivets. Replace any manifold found to have broken rivets with a serviceable manifold. Perform the applicable serviceability check detailed in Airborne Service Letter Number 39A for any manifold found with loose rivets.
   NOTE: When hoses or vacuum switches are removed from the manifold, the manifold should be supported with an appropriately-sized wrench on the square bosses that the switches are threaded into in order to prevent transmitting excessive loads to the check valve flange rivets.
6. Refer to Airborne Service Letter Number 39A and record in the airplane maintenance records the check valve manifold date of manufacture and time in operation making note of when the mandatory initial serviceability test is required. Perform the serviceability test when required per Airborne Service Letter 39A.
7. Remove maintenance warning tags from battery and external power receptacle.
8. Reconnect the battery. (Refer to the Maintenance Manual, Chapter 24, Electrical Power.)
9. Reinstall the engine cowlng. (Refer to the Maintenance Manual, Chapter 71, Cowling - Maintenance Practices.)
10. Make an entry in the airplane maintenance records stating compliance and method of compliance of this service bulletin and when the next inspection is due.
   NOTE: This Service Bulletin will be superseded by the next revision to the applicable airplane Maintenance Manuals concerning the inspection and replacement intervals of check valve manifolds.
OWNER NOTIFICATION

On October 28, 2002 the following Owner Advisory message will be sent to applicable owners of record in SB02-37-04A.

Dear Cessna Owner:

This Owner Advisory is to inform you that SB02-37-04 has been issued to transmit Airborne Air & Fuel Products Service Letter Number 39A: Mandatory Inspection Intervals And Replacement Times For Airborne Check Valve Manifolds, Check Valves And Regulator Check Valve Manifolds. Service Bulletin SB02-37-04 also includes additional inspection criteria to assist in determining if the check valve manifold is serviceable.

Check valve manifolds supplied by Airborne for use in aircraft pneumatic systems have parts manufactured from an elastomeric material that can deteriorate with age due to environmental conditions such as heat. As these components age, it is increasingly important to perform mandatory inspections at specified intervals to ensure their proper operation, thus reducing the potential for pneumatic system failure which could result in the loss of the pneumatic powered gyro flight instruments, and de-ice system if installed.

Compliance is mandatory as follows for the check valve manifold:

Initial Inspection: At the next scheduled upper cowl removal, not to exceed 100 hours of operation or 12 months, whichever occurs first.

Initial serviceability test: Five years from date of manufacture, 1,000 hours of operation, or upon finding loose rivets in the check valve manifold, whichever occurs first.

Recurring serviceability test: Each 12 months or 600 hours of operation, whichever occurs first.

Replacement of manifold: Upon finding broken rivets on check valve manifold, ten years from date of manufacture, or upon not meeting manufacturer's serviceability test.

NOTE: Additional inspection criteria has been added to the Airborne requirements to assist in determining if the check valve manifold is in a serviceable condition.

The information contained in the referenced Cessna Service Bulletin shall be considered an amendment to the Cessna Manufacturer's Service/Maintenance Manual or Instructions for continued airworthiness, and must be accomplished for ongoing airworthiness compliance as required per 14 CFR Part (FAR) 43.13.

Please contact a Cessna Single Engine Service Station for detailed information and arrange to have Cessna Service Bulletin SB02-37-04/Airborne Air & Fuel Products Service Letter Number 39A (or latest revision) accomplished on your airplane.
Service Letter Number: 39A

Date: May 31, 2002 (Supersedes Product Reference Memo Number 39 dated January 31, 1996)

Subject: Mandatory Inspection Intervals and Replacement Times for Airborne Check Valve Manifolds, Check Valves and Regulator Check Valve Manifolds.

Applicability:

All Airborne Check Valve Manifolds, Check Valves and Regulator Check Valve Manifolds. These valves which are listed below are typically installed on single-engine and multi-engine piston aircraft equipped with dual pneumatic power sources to power the gyro flight instruments and de-ice systems.

1H5 Series (all dash numbers) — Check Valve Manifolds (Vacuum System)
1H24 Series (all dash numbers) and 2H24-8 — Check Valve Manifolds (Pressure System)
1H37 Series (all dash numbers) — Check Valves (Vacuum/Pressure System)
2H3-39 and 2H3-47 — Regulator Check Valve Manifolds (Vacuum System)

The date of manufacture is encoded on the nameplate of these components. The numbers (1 through 12) indicate the month (January through December) of manufacture. The following letter combinations indicate the year of manufacture:


Background:

The above referenced components supplied by Airborne for use in aircraft pneumatic systems have parts manufactured from an elastomeric material that can deteriorate with age due to environmental conditions such as heat. As these components age, it is increasingly important to perform mandatory inspections at specified intervals to ensure their proper operation, thus avoiding pneumatic system failure.

WARNING: Failure of the pneumatic system will result in the loss of the pneumatic powered gyro flight instruments and de-ice system.

(Page 1 of 14)
Service Letter Number: 39A (continued)

All maintenance personnel should familiarize themselves with the pneumatic system components listed above and perform both visual and operational checks to identify any deterioration in the performance of these components.

Compliance:

Compliance with the following is mandatory.

A mandatory initial inspection to determine date of manufacture of applicable Airborne Check Valve Manifolds, Check Valves and Regulator Check Valve Manifolds must be accomplished within the next one hundred (100) hours of operation or twelve (12) months, whichever comes first.

Mandatory Inspection Intervals*

Beginning five (5) years from date of manufacture, the serviceability of these components must be verified every twelve (12) months in accordance with the procedure provided in the mandatory testing instructions in this document.

Mandatory Replacement Times*

These pneumatic system check valve manifolds, check valves and regulator check valve manifolds must be replaced ten (10) years from date of manufacture.

Any authorized technician can inspect, test and/or replace these check valve manifolds, check valves and regulator check valve manifolds in accordance with the instructions provided in this document. Upon completion of the mandatory inspection, testing or replacement, ensure an entry has been added in the aircraft’s logbook identifying compliance with this Service Letter Number 39A.

*NOTE: The above components must not be operated beyond the Airframe Manufacturer’s specification for mandatory inspection intervals or mandatory replacement times or Airborne’s mandatory inspection intervals or mandatory replacement times, whichever comes first.

The following pages contain the Mandatory Testing Instructions:

Pages 3 thru 5  1H5 Series (all dash numbers) — Check Valve Manifolds (Vacuum System)
Pages 6 thru 8  1H24 Series (all dash numbers) and 2H24-8 — Check Valve Manifolds (Pressure System)
Pages 9 thru 11 1H37 Series (all dash numbers) — Check Valves (Vacuum/Pressure System)
Pages 12 thru 14 2H3-39 and 2H3-47 — Regulator Check Valve Manifolds (Vacuum System)

(Page 2 of 14)
Service Letter Number: 39A (continued)

Mandatory Testing Instructions

1H5 Series (all dash numbers) — Check Valve Manifolds (Vacuum System)

![Diagram of Check Valve Manifold]

Figure 1
(1H5-2 Shown)

Description

The 1H5 series check valve manifold depicted in Figure 1 provides a means of coupling dual pneumatic vacuum sources. More importantly, the 1H5 check valve manifold provides a means of isolating these dual vacuum sources in the event that one of the sources is not in operation.

Operation

The "flapper-type" check valves are spring loaded in the closed position. As airflow is pulled through the manifold, the check valves open allowing airflow through the gyro flight instruments. If airflow through a check valve is stopped (i.e., vacuum source taken out of operation), the check valve will close in order to allow the pneumatic system to properly function utilizing the lone operating vacuum source.

Verification of Serviceability

The following procedure is provided as a means of determining serviceability of the check valve manifold:

1) Remove the check valve manifold from the aircraft in accordance with the Airframe Manufacturer’s instructions.

2) Cap the two source indicator fittings (if present) of the check valve manifold.

3) Connect a hose from a regulated air source to one of the inlet fittings of the check valve manifold. Cap any additional inlet fittings. Reference Test Set-up #1.
NOTE: Orient the check valve manifold so the check valve disc is in the upright position as indicated by the "THIS SIDE UP" markings on the check valve manifold or the notches in the check valve disc depicted in Figure 2. The notches in the check valve disc are visible from the outside of the unit.

Figure 2
(Check Valve Disc)

4) Slowly apply air pressure up to 3 PSIG maximum to the check valve manifold and verify that air is released through both discharge fittings. If air is not released through both discharge fittings, replace the check valve manifold.

5) Disconnect the air source from the inlet fitting and then connect it to one of the discharge fittings. Remove the caps which were previously installed on the inlet fittings. Reference Test Set-up #2.
Service Letter Number: 39A (continued)

Test Set-up #2
(1H5-2 Shown)

6) Slowly apply 3 PSIG of air pressure to the check valve manifold and inspect for leaks at all caps and hose connections. Correct any leaks in test set-up before proceeding.

7) With air pressure remaining set at 3 PSIG, inspect for leaks across the internal check valve by noting any "audible" leakage out the inlet fittings or through the rivets on the housing of the check valve manifold. Any "audible" leakage at either one of these locations is cause for mandatory replacement of the check valve manifold.

8) Remove the air source from the check valve manifold and then repeat Steps 6 and 7 with the air source connected to the discharge fitting on the opposite side of the check valve manifold.

9) Remove all caps installed for the above testing. Reinstall the serviceable check valve manifold or replace the unserviceable check valve manifold in accordance with the Airframe Manufacturer's instructions. Upon completion of the mandatory inspection, testing or replacement, ensure an entry has been added in the aircraft's logbook identifying compliance with this Service Letter Number 39A.

Any questions concerning this Service Letter or requests for copies of any Airborne Service Letters (can also be printed from Airborne's website) should be directed to Airborne's Customer Support Team as follows:

Toll Free Phone Number: 800-382-8422
Direct Phone Number: 440-937-1315
FAX Number: 440-937-5409
E-mail: techhelp@parker.com
Website: www.parker.com/airborne

(Page 5 of 14)
Mandatory Testing Instructions

1H24 Series (all dash numbers) and 2H24-8 — Check Valve Manifolds (Pressure System)

Description

The 1H24 series and 2H24-8 check valve manifolds depicted in Figure 3 provide a means of coupling dual pneumatic pressure sources. More importantly, these check valve manifolds provide a means of isolating these dual pressure sources in the event that one of the sources is not in operation.

Operation

The "flapper-type" check valves are normally in the closed position. As airflow enters the manifold, the check valves open allowing airflow to the gyro flight instruments and/or de-ice systems. If airflow through a check valve is stopped (i.e., pressure source taken out of operation), the check valve will close in order to allow the pneumatic system to properly function utilizing the lone operating pressure source.

Verification of Serviceability

The following procedure is provided as a means of determining serviceability of the check valve manifold:

1) Remove the check valve manifold from the aircraft in accordance with the Airframe Manufacturer's instructions.
2) Cap the two source indicator fittings (if present) of the check valve manifold.

3) Connect a hose from a regulated air source to one of the inlet fittings of the check valve manifold. Reference Test Set-up #3.

![Test Set-up #3 (1H24-17 Shown)]

**NOTE:** Orient the check valve manifold so the check valve disc is in the upright position as indicated by the "THIS SIDE UP" markings on the check valve manifold or the notches in the check valve disc depicted in Figure 2 (Page 4). The notches in the check valve disc are visible from the outside of the unit.

4) Slowly apply air pressure up to 3 PSIG maximum to the check valve manifold and verify that air is released through both discharge fittings. If air is not released through both discharge fittings, replace the check valve manifold.

5) Remove the air source from the check valve manifold and then repeat Step 4 with the air source connected to the inlet fitting on the opposite side of the check valve manifold.

6) Cap the discharge fittings of the check valve manifold. Reference Test Set-up #4.

![Test Set-up #4 (1H24-17 Shown)]

(Page 7 of 14)
Service Letter Number: 39A (continued)

7) Slowly apply 3 PSIG of air pressure to the check valve manifold and inspect for leaks at all caps and hose connections. Correct any leaks in test set-up before proceeding.

8) With air pressure remaining set at 3 PSIG, check for leaks across the internal check valve by noting any "audible" leakage out the inlet fitting on the opposite side of the check valve manifold or through the rivets on the housing of the check valve manifold. Any "audible" leakage at either one of these locations is cause for mandatory replacement of the check valve manifold.

9) Repeat Step 8 with air pressure set at 20 PSIG.

10) Remove the air source from the check valve manifold and then repeat Steps 7 through 9 with the air source connected to the inlet fitting on the opposite side of the check valve manifold.

11) Remove all caps installed for the above testing. Reinstall the serviceable check valve manifold or replace the unserviceable check valve manifold in accordance with the Airframe Manufacturer's instructions. Upon completion of the mandatory inspection, testing or replacement, ensure an entry has been added in the aircraft's logbook identifying compliance with this Service Letter Number 39A.

Any questions concerning this Service Letter or requests for copies of any Airborne Service Letters (can also be printed from Airborne's website) should be directed to Airborne's Customer Support Team as follows:

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(Page 8 of 14)
6) With air pressure remaining set at 3 PSIG, inspect for leaks across the internal check valve by noting any "audible" leakage out the inlet fitting or through the rivets on the housing of the check valve. Any "audible" leakage at either one of these locations is cause for mandatory replacement of the check valve.

7) Repeat Step 6 with air pressure set at 20 PSIG.

8) Reinstall the serviceable check valve or replace the unserviceable check valve in accordance with the Airframe Manufacturer's instructions. Prior to installation, orientate the "flow" arrow on the check valve so that it is pointing in the same direction as that noted in Step 1 of this procedure. Upon completion of the mandatory inspection, testing or replacement, ensure an entry has been added in the aircraft's logbook identifying compliance with this Service Letter Number 39A.

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(Page 11 of 14)
2) Connect a hose from a regulated air source to the inlet fitting of the check valve. Reference Test Set-up #5.

![Test Set-up #5](image)

**NOTE:** Orient the check valve so the check valve disc is in the upright position as indicated by the "THIS SIDE UP" markings on the check valve or the notches in the check valve disc depicted in Figure 2 (Page 4). The notches in the check valve disc are visible from the outside of the unit.

3) Slowly apply air pressure up to 3 PSIG maximum to the check valve and verify that air is released through the discharge fitting. If air is not released through the discharge fitting, replace the check valve.

4) Disconnect the air source from the inlet fitting of the check valve and then connect it to the discharge fitting of the check valve. Reference Test Set-up #6.

![Test Set-up #6](image)

5) Slowly apply 3 PSIG of air pressure to the check valve and inspect for leaks at all hose connections. Correct any leaks in test set-up before proceeding.

(Page 10 of 14)
Service Letter Number: 39A (continued)

Test Set-up #7
(2H3-47 Shown)

2) Connect a hose from a regulated air source to one of the inlet fittings of the regulator check valve manifold. Cap any additional inlet fittings. Reference Test Set-up #7

NOTE: Orient the regulator check valve manifold so the check valve disc is in the upright position as indicated by the “THIS SIDE UP” markings on the regulator check valve manifold or the notches in the check valve disc depicted in Figure 2 (Page 4). The notches in the check valve disc are visible from the outside of the unit.

3) Slowly apply air pressure up to 3 PSIG maximum to the regulator check valve manifold and verify that air is released through both discharge fittings. If air is not released through both discharge fittings, replace the regulator check valve manifold.

4) Disconnect the air source from the inlet fitting and then connect it to one of the discharge fittings. Remove the caps which were previously installed on the inlet fittings. Reference Test Set-up #8.

5) Slowly apply 3 PSIG of air pressure to the regulator check valve manifold and inspect for leaks at all hose connections. Correct any leaks in the test set-up before proceeding.

6) With air pressure remaining set at 3 PSIG, inspect for leaks across the internal check valve by noting any “audible” leakage out the inlet fittings or through the rivet on the housing of the check valve manifold. Any “audible” leakage at either one of these locations is cause for mandatory replacement of the regulator check valve manifold.

(Page 13 of 14)
Service Letter Number: 39A (continued)

Mandatory Testing Instructions

2H3-39 and 2H3-47—Regulator Check Valve Manifolds (Vacuum System)

Description

The 2H3-39 and 2H3-47 regulator check valve manifolds depicted in Figure 6 provides a means of coupling dual pneumatic vacuum sources as well as provide vacuum regulation. More important, the 2H3-39 and 2H3-47 regulator check valve manifold provides a means of isolating these dual vacuum sources in the event that one of the sources is not in operation.

Operation

The “flapper-type” check valves are spring loaded in the closed position. As airflow is pulled through the manifold, the check valves open allowing airflow through the gyro flight instruments. If airflow through a check valve is stopped (i.e., vacuum source taken out of operation), the check valve will close in order to allow the pneumatic system to properly function utilizing the lone operating vacuum source.

Verification of Serviceability

The following procedure is provided as a means of determining serviceability of the regulator check valve manifold:

1) Remove the regulator check valve manifold from the aircraft in accordance with the Airframe Manufacturer’s instructions.

(Page 12 of 14)
2) Connect a hose from a regulated air source to one of the inlet fittings of the regulator check valve manifold. Cap any additional inlet fittings. Reference Test Set-up #7

**NOTE:** Orient the regulator check valve manifold so the check valve disc is in the upright position as indicated by the “THIS SIDE UP” markings on the regulator check valve manifold or the notches in the check valve disc depicted in Figure 2 (Page 4). The notches in the check valve disc are visible from the outside of the unit.

3) Slowly apply air pressure up to 3 PSIG maximum to the regulator check valve manifold and verify that air is released through both discharge fittings. If air is not released through both discharge fittings, replace the regulator check valve manifold.

4) Disconnect the air source from the inlet fitting and then connect it to one of the discharge fittings. Remove the caps which were previously installed on the inlet fittings. Reference Test Set-up #8.

5) Slowly apply 3 PSIG of air pressure to the regulator check valve manifold and inspect for leaks at all hose connections. Correct any leaks in the test set-up before proceeding.

6) With air pressure remaining set at 3 PSIG, inspect for leaks across the internal check valve by noting any “audible” leakage out the inlet fittings or through the rivet on the housing of the check valve manifold. Any “audible” leakage at either one of these locations is cause for **mandatory** replacement of the regulator check valve manifold.
Service Letter Number: 39A (continued)

Test Set-up #8
(2H3-47 Shown)

7) Remove the air source from the regulator check valve manifold and then repeat Steps 5 and 6 with the air source connected to the discharge fitting on the opposite side of the regulator check valve manifold.

8) Reinstall the serviceable regulator check valve manifold or replace the unserviceable regulator check valve manifold in accordance with the Airframe Manufacturer's instructions. Upon completion of the mandatory inspection, testing or replacement, ensure an entry has been added in the aircraft's logbook identifying compliance with this Service Letter Number 39A.

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(Page 14 of 14)