Response to Dated 12/16/25

Airworthiness Concern Letter

ENGINE IDLE & FUEL VAPOR IN CESSNA 172R / 172S

A Historical Compilation of Service Publications

A consolidated reference for Cessna, Lycoming, and FAA service publications addressing fuel vapor, idle mixture, and low power engine operation characteristics in the Cessna 172R and 172S aircraft.

All referenced service publications predate AVStar Fuel Systems sale of its first fuel servo by approximately 8-yrs.

All Servos were manufactured by Precision Airmotive during this period.

(1996-2004 Service History)

January 12,2026

Dear Valued AVStar Customer:

We would like to provide documented historical context regarding low-power and idle-related engine behavior or sometimes described as "Engine Rollback" that has been observed in certain Cessna 172 aircraft equipped with the Lycoming IO-360-L2A engine.

Clarification on the Term "Engine Rollback"

In general aviation piston aircraft, the term *"engine rollback"* is not a defined mechanical failure mode, but rather an operational description commonly used to describe an un-commanded reduction in power or a failure of the engine to respond when power is reapplied at low throttle settings. In the Cessna 172R/S fleet, this behavior has historically been associated with **over-rich idle mixture settings and fuel vapor formation during low-power or hot-weather operation**, as documented in Lycoming Service Instructions, Cessna Service Bulletins, FAA Airworthiness Directive 2001-06-17, and NTSB investigations. When present, this condition is procedural and configuration-dependent, not the result of a mechanical rollback of engine components, and it has been addressed industry-wide through operating guidance, idle adjustment criteria, and fuel system configuration enhancements implemented well before AVStar became a fuel system manufacturer.

A comprehensive review of **Lycoming Service Instructions, Cessna Service Bulletins, FAA regulatory action, and NTSB investigation records** clearly shows that fuel vaporization and rich idle characteristics at low power settings have been a **well-recognized operational issue within the Cessna 172R/S fleet for more than two decades**, and that these matters were addressed extensively **well before AVStar became a manufacturer of aircraft fuel systems**.

Early Recognition of Low-Power / Idle Issues (1998–1999)

Lycoming Service Instruction No. 1489 (originally issued November 20, 1998) introduced a higher-pressure (4 psi) fuel manifold flow divider spring specifically to improve idle characteristics, especially in hot weather, for IO-360-L2A engines installed in Cessna 172R and 172S aircraft.

Lycoming Service Instruction No. 1497 (issued August 13, 1999) identified flight training and prolonged low-power operation as conditions that make the engine more susceptible to spark plug fouling, excessive fuel consumption, and degraded efficiency. This instruction provided revised leaning and idle operating procedures beyond those originally published in the POH.

Lycoming Service Instruction No. 1498 (issued August 18, 1999) specifically addressed fuel vapor formation during ground operations, identifying symptoms such as fluctuating idle speed, poor throttle response, and engine roughness at low RPM, along with corrective procedures to purge vapor from the fuel system.

These early publications establish that **low-RPM, hot-weather, and extended ground-operation fuel behavior was recognized and documented during the initial production years of the 172R/S aircraft**.

Incorporation into Aircraft Operating Documentation (2000)

Cessna Service Bulletin SB00-11-03 (May 22, 2000) revised the 172R Pilot's Operating Handbook to incorporate fuel vapor procedures consistent with Lycoming guidance.

Cessna Service Bulletin SB00-11-04 (August 14, 2000) issued similar POH revisions for the 172S, reinforcing procedural mitigation of vapor-related and low-power operation concerns.

Hardware Mitigations Introduced (2000–2001)

Lycoming Service Instruction No. 1502 / 1502A (December 19, 2000) introduced the inverted fuel flow divider configuration, stating that it was intended to reduce the possibility of vapor-related problems in IO-360-L2A engines.

Cessna Service Bulletin SB01-71-01 (January 22, 2001) formally transmitted Lycoming SI 1502 to the fleet. This inverted flow divider later became the standard production configuration on newly manufactured Cessna 172 aircraft.

FAA Regulatory Action and Accident Investigation Findings

FAA Airworthiness Directive 2001-06-17 (effective April 20, 2001) mandated a one-time inspection and adjustment of engine idle speed and fuel mixture, along with mandatory POH inserts addressing idle-power engine roughness caused by over-rich fuel flow. The AD

explicitly identifies improper idle fuel flow as a condition that could result in rough engine operation or engine stoppage when power is reduced or reapplied.

NTSB Accident Report NYC00LA155 examined a loss-of-power event during a low-power phase of flight in a Cessna 172R and documented excessively rich idle mixture settings, elevated idle fuel flow, and sensitivity during approach operations. No mechanical failure of engine components was identified, and the report further notes that procedural changes and configuration updates later reduced similar events across training fleets.

Continued Refinement and Optional Enhancements (2002–2004)

Cessna Service Bulletin SB99-73-01 Revision 1 (September 30, 2002) reiterated the importance of compliance with the 4-psi flow divider spring change, noting that non-compliance may allow rough engine idle conditions to occur.

Cessna Service Bulletin SB03-71-01 (May 26, 2003) introduced a fuel system modification kit, including revised hose routing and thermal protection, described as being designed to enhance engine operation at low power settings during hot weather conditions. This bulletin is presented as an optional enhancement rather than a baseline defect correction.

Cessna Service Bulletin SB04-28-03 (August 30, 2004) introduced an engine fuel return system to further reduce fuel vapor formation during extended ground operations in high ambient temperatures.

Cessna Service Bulletin SB04-73-02 (October 11, 2004) transmitted Lycoming Service Instruction 1489B and confirmed that the 4-psi flow divider spring had become the standard delivered configuration for later-production aircraft.

Summary and Clarification

The collective record shows a clear, multi-year progression of procedural guidance, hardware changes, and regulatory action addressing low-power, idle, and hot-weather fuel vapor characteristics in Cessna 172R/S aircraft.

All the service instructions, service bulletins, FAA directives, and NTSB findings cited above were issued well before AVStar became a manufacturer of aircraft fuel systems. The operational characteristics described are therefore not unique to AVStar components, nor are they newly identified issues within the Cessna 172R/S fleet.

Regarding the installations for the Piper Archer III and Pilot 100i, on August 16, 2022, Piper began offering "High Temperature Operation Modification Kits" under Service Spares Letter 504. Included in these optional modifications is a fuel return system kit for both applications. It is AVStar's understanding this has now become standard equipment for both aircraft.

AVStar Fuel Systems is also actively working with Lycoming Engines to help determine the triggering event which induces an engine rollback, as the rollback itself cannot always be duplicated.

AVStar Fuel Systems are manufactured, calibrated, and tested in accordance with applicable specifications and regulatory requirements. As with all fuel-injected aircraft, satisfactory low-power operation depends on aircraft configuration, service bulletin compliance, correct idle adjustment, proper operating procedures, and ambient conditions.

We appreciate the opportunity to provide this historical context and remain available to support our customers with technical guidance and best practices. Fuel vapors and/or air within the fuel system of an aircraft can have a multitude of effects, and depending upon where this is introduced, it can affect engine performance in different ways. Vapor entering a fuel pump can yield erroneous fuel pressures and can also cause vapor lock. Symptoms may include hard starting, engine stalls, rough idling, misfiring, or hesitation.

Vapor entering the servo fuel injector can adversely affect its proper metering. At its core, the servo serves to balance two input signals – air flow and fuel pressure. While the servo can function under a wide range of fuel pressures, air or fuel vapor within the fuel control adversely affects its metering capabilities. Fuel in its liquid form is incompressible, whereas fuel vapor or air within the fuel control is compressible. This directly affects the servo's proper function. Internal testing at AVStar has demonstrated, with the introduction of air into the fuel, the servo does have an adverse reaction and can yield erroneous and unpredictable fuel metering.

While most of the documents attached to this letter address vapor and ways to mitigate it (both with hardware changes and operating recommendations) introducing air into the fuel can be just as detrimental. It is important that following any maintenance activities which disconnect fuel lines, the entire fuel system should be purged of any air before operating the engine. Simply disconnect the fuel line which enters the inlet of the fuel manifold at the top of the engine, engage the aircrafts emergency or boost fuel pump, and cycle both the throttle and mixture levers to aide in displacing any air trapped within the fuel servo. It is also recommended for any initial engine start-up to move the aircraft to a safe location and run the engine up to a minimum of 1800 to 2000 rpm for at least 30 seconds to further purge the system of any residual air or vapor which may have accumulated throughout the fuel system. As always, ensure engine oil temperature is sufficiently warmed up prior to performing any idle or idle mixture checks.

Recognizing the operating environments under which vapor can be generated - extended ground runs with minimal engine cooling air, high ambient air temperatures, and fuel lines in close proximity to heat sources – is a crucial step in maintaining proper engine performance. Recognizing the symptoms of vapor and following the prescribed corrections to mitigate it as outlined in the aircraft POH or engine manufacturers recommendations is a procedure all owners, operators, and maintenance staff should review and be prepared to employ when these conditions present themselves.

Sincerely,

Ronald J. Weaver

Ronald J. Weaver

President
AVStar Fuel Systems

Attachments:

1) Timeline of service bulletins, Service instruction letters, FAA related documents
2) Cessna Pilot Operating Handbook pages 3-15, 3-33, 3-34, 4-27, 4-39, 7-43, 7-44
3) Cessna Service Bulletin SB00-11-03
4) Cessna Service Bulletin SB00-11-04
5) Cessna Service Bulletin SB01-11-02
6) Cessna Service Bulletin SB01-71-01
7) Cessna Service Bulletin SB03-71-01
8) Cessna Service Bulletin SB04-28-03
9) Cessna Service Bulletin SB04-73-02
10) Cessna Service Bulletin SB99-73-01 rev-1
11) Lycoming Service Instruction 1489C
12) Lycoming Service Instruction 1497A
13) Lycoming Service Instruction 1498B
14) Lycoming Service Instruction 1502A
15) FAA Airworthiness Directive Docket Number 2001-06-17
16) NTSB Final Report on accident number NYC00LA155

March 19, 1996: IO-360-L2A Engine Type Certified by Lycoming

June 21, 1996: 172R Type Certified by Cessna

May 1, 1998: 172S Type Certified by Cessna

November 20, 1998: Lycoming issues **Service Instruction 1489** introducing "4psi" fuel manifold spring change to improve idle characteristics especially in hot weather.

August 13, 1999: Lycoming issues **Service Instruction 1497** providing engine procedures for flight training operations using the IO-360-L2A.

August 18, 1999: Lycoming issues **Service Instruction 1498** providing recommended engine procedures for purging vapor during ground operations, originally written specifically for the IO-360-L2A application.

May 22, 2000: Cessna issues **Service Bulletin SB00-11-03** to provide revisions to the POH which includes "...fuel vapor procedures" for the 172R model.

August 14, 2000: Cessna issues Service Bulletin **SB00-11-04** to provide revisions to the POH which includes "...fuel vapor procedures" for the 172S model.

December 19, 2000: Lycoming issues **Service Instruction 1502A** providing instructions for the installation of inverted flow divider (manifold) to reduce the possibility of vapor related problems in aircraft with the IO-360-L2A.

January 22, 2001: Cessna issues **Service Bulletin SB01-71-01** to transmit Lycoming Service Instruction 1502.

March 5, 2001: Cessna issues Service Bulletin **SB01-11-02** to provide revisions to the POH which includes "...procedures to ensure that the engine is idling correctly" for the 172R & S models.

April 20, 2001: FAA **AD 2001-06-17** becomes effective, which requires a one-time inspection for proper engine idle speed and fuel control mixture setting and adjustment, as necessary.

September 30, 2002: Cessna issues **Service Bulletin SB99-73-01 Revision 1** to transmit Lycoming Service Instruction 1489A, noting "non-compliance with this service bulletin may allow a rough engine idle condition to occur" and recommends accomplishing within the next 100 hours of operation or 12 months, whichever occurs first.

May 26, 2003: Cessna issues **Service Bulletin SB03-71-01** providing instructions for the engine fuel supply system modification, this includes new fuel hoses and sleeves for the fuel supply line (firewall forward) going to the engine driven fuel pump, and a new sleeved

hose between the engine driven pump and fuel injection servo, among other alterations. This kit is "...designed to assist in enhancing engine operation at low power settings during hot weather conditions."

August 30, 2004: Cessna issues **Service Bulletin SB04-28-03** to provide parts and instructions for installing an engine fuel return system to "...helps to minimize the amount of fuel vapor generated in the fuel lines during high ambient temperature extended ground operations."

October 11, 2004: Cessna issues **Service Bulletin SB04-73-02** to transmit Lycoming Service Instruction 1489B. This bulletin *supersedes SB99-73-01 Revision 1* (fuel manifold spring change).

Relevant Notes:

It appears *some* aircraft being delivered from Cessna began using the 4psi spring beginning in 1998-1999.

The inverted flow divider (manifold) change appears to have become the "stock/as delivered configuration" for all 172 aircraft in 2001.

The fuel return system appears to have become the "stock/as delivered configuration" for all 172 aircraft in 2003.

The 4psi spring change for the flow divider (manifold) appears to have become the "stock/as delivered configuration" for all 172 aircraft in 2004.

STATIC SOURCE BLOCKAGE
(ERRONEOUS INSTRUMENT READING SUSPECTED)

1. **ALT STATIC AIR Valve - ON (pull full out)**
2. Cabin Vents - CLOSED
3. CABIN HT and CABIN AIR Control Knobs - ON (pull full out)
4. Airspeed - Refer to Section 5, Figure 5-1 (Sheet 2) Airspeed Calibration, Alternate Static Source correction chart.

EXCESSIVE FUEL VAPOR

FUEL FLOW STABILIZATION PROCEDURES
(If flow fluctuations of 1 GPH or more, or power surges occur.)

1. FUEL PUMP Switch - ON
2. Mixture Control - ADJUST (as necessary for smooth engine operation)
3. Fuel Selector Valve - SELECT OPPOSITE TANK (if vapor symptoms continue)
4. FUEL PUMP Switch - OFF (after fuel flow has stabilized)

ROUGH ENGINE OPERATION OR LOSS OF POWER

SPARK PLUG FOULING

A slight engine roughness in flight may be caused by one or more spark plugs becoming fouled by carbon or lead deposits. This may be verified by turning the MAGNETOS switch momentarily from BOTH to either L or R position. An obvious power loss in single magneto operation is evidence of spark plug or magneto trouble. Since spark plugs are the more likely cause, lean the mixture to the recommended lean setting for cruising flight. If the problem does not clear up in several minutes, determine if a richer mixture setting will produce smoother operation. If not, proceed to the nearest airport for repairs using the BOTH position of the MAGNETOS switch unless extreme roughness makes the use of a single MAGNETO position necessary.

MAGNETO MALFUNCTION

Sudden engine roughness or misfiring is usually a sign of a magneto problem. Changing the MAGNETOS switch from BOTH to the L and R switch positions will identify which magneto is malfunctioning. Select different power settings and enrichen the mixture to determine if continued operation on BOTH magnetos is possible. If not, change to the good magneto and continue to the nearest airport for repairs.

IDLE POWER ENGINE ROUGHNESS

(As Required by AD 2001-06-17, Paragraph (d)(3))

An excessively rich idle fuel flow may cause low speed engine roughness during flight. During most in-flight low engine speeds (power off stalls, approach to landing, etc.), the mixture control is normally in the full-rich position. However, to improve engine roughness (caused by an improperly adjusted fuel servo) during low engine speeds while in flight, you should rotate the vernier mixture control (leaning of fuel mixture). You may also have to lean the fuel mixture if this low engine speed results in power loss and you need to restart the engine during flight. In all cases, you should land the airplane at the nearest airport for repairs if low speed engine roughness requires you to adjust the fuel mixture control to improve engine operation.

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ROUGH ENGINE OPERATION OR LOSS OF POWER
(Continued)

ENGINE-DRIVEN FUEL PUMP FAILURE

Failure of the engine-driven fuel pump will be shown by a sudden reduction in the fuel flow indication (FFLOW GPH) **immediately before a loss of power** while operating from a fuel tank containing adequate fuel.

If the engine-driven fuel pump fails, immediately set the FUEL PUMP switch to the ON position to restore the engine power. The flight should be terminated as soon as practical and the engine-driven fuel pump repaired.

EXCESSIVE FUEL VAPOR

Fuel vapor in the fuel injection system is most likely to occur on the ground, typically during prolonged taxi operations, when operating at higher altitudes and/or in unusually warm temperatures.

Excessive fuel vapor accumulation is shown by fuel flow indicator (FFLOW GPH) fluctuations greater than 1 GPH. This condition, with leaner mixtures or with larger fluctuations, can result in power surges, and if not corrected, may cause power loss.

To slow vapor formation and stabilize fuel flow on the ground or in the air, set the FUEL PUMP switch to the ON position and adjust the mixture as required for smooth engine operation. If vapor symptoms continue, select the opposite fuel tank. When fuel flow stabilizes, set the FUEL PUMP switch to the OFF position and adjust the mixture as desired.

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FUEL VAPOR PROCEDURES

The engine fuel system can cause fuel vapor formation on the ground during warm weather. This will generally occur when the outside ambient air temperature is above 80°F. Vapor formation may increase when the engine fuel flows are lower at idle and taxi engine speeds. The following procedures are recommended when engine idle speed and fuel flow fluctuations show that fuel vapor may be present:

1. With the mixture full rich, set the throttle at 1800 RPM to 2000 RPM. Maintain this power setting for 1 to 2 minutes or until smooth engine operation returns.
2. Retard the throttle to the idle stop to verify normal engine operation.
3. Advance the throttle to 1200 RPM and lean the mixture as described under FUEL SAVINGS PROCEDURES FOR FLIGHT TRAINING OPERATIONS.
4. In addition to the above procedures, the auxiliary fuel pump may be turned ON with the mixture adjusted as required to aid vapor suppression during ground operations. The auxiliary fuel pump should be turned OFF prior to takeoff.
5. Just prior to TAKEOFF, apply full throttle for approximately 10 seconds to verify smooth engine operation for takeoff.

NOTE

When the engine is operated above 1800 RPM, the resulting increased fuel flow results in lower fuel temperatures throughout the engine fuel system. This increased flow purges the fuel vapor and the cooler fuel minimizes vapor formation.

In addition to the previous procedures, the sections below should be reviewed, and where applicable, adhered to:

Section 3 -Take note of the excessive fuel vapor procedures in both the checklist and the amplified procedures sections.

Section 4 -Take note of the hot weather operational notes and procedures in both the checklist and the amplified procedures sections.

CRUISE (Continued)

FUEL SAVINGS PROCEDURES FOR FLIGHT TRAINING OPERATIONS

For best fuel economy during flight training operations, the following procedures are recommended.

1. After engine start and for all ground operations, set the throttle to 1200 RPM and lean the mixture for maximum RPM. After leaning, set the throttle to the appropriate RPM for ground operations. Leave the mixture at this setting until beginning the BEFORE TAKEOFF checklist. After the BEFORE TAKEOFF checklist is complete, lean the mixture again as described above until ready to perform the TAKEOFF checklist.
2. Lean the mixture for maximum RPM during full throttle climbs above 3000 feet. The mixture may remain leaned (maximum RPM at full throttle) for practicing maneuvers such as stalls and slow flight.
3. Lean the mixture for maximum RPM during all operations at any altitude, including those below 3000 feet, when using 75% or less power.

NOTE

- When cruising or maneuvering at 75% power or less, the mixture may be further leaned until the EGT indicator peaks and is then enrichened 50°F. This is especially applicable to cross-country training flights, but should be practiced during transition flight to and from the practice area as well.
- Using the above recommended procedures can provide fuel savings in excess of 5% when compared to typical training operations at full rich mixture. In addition, the above procedures will minimize spark plug fouling since the reduction in fuel consumption results in a proportional reduction in tetraethyl lead passing through the engine.

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FUEL SYSTEM (Continued)

AUXILIARY FUEL PUMP OPERATION

The auxiliary fuel pump is used primarily for priming the engine before starting. Priming is accomplished through the fuel injection system. The engine may be flooded if the auxiliary FUEL PUMP switch is accidentally placed in the ON position for prolonged periods, with MASTER Switch ON and mixture rich, with the engine stopped.

The auxiliary fuel pump is also used for vapor suppression in hot weather. Normally, momentary use will be sufficient for vapor suppression; however, continuous operation is permissible if required. Turning on the auxiliary fuel pump with a normally operating engine-driven fuel pump will result in only a very minor enrichment of the mixture.

It is not necessary to operate the auxiliary fuel pump during normal takeoff and landing, since gravity and the engine-driven fuel pump will supply adequate fuel flow. In the event of failure of the engine-driven fuel pump, use of the auxiliary fuel pump will provide sufficient fuel to maintain flight at maximum continuous power.

Under hot day, high altitude conditions, or conditions during a climb that are conducive to fuel vapor formation, it may be necessary to utilize the auxiliary fuel pump to attain or stabilize the fuel flow required for the type of climb being performed. In this case, turn the auxiliary fuel pump on, and adjust the mixture to the desired fuel flow. If fluctuating fuel flow (greater than 1 GPH) is observed during climb or cruise at high altitudes on hot days, place the auxiliary fuel pump switch in the ON position to clear the fuel system of vapor. The auxiliary fuel pump may be operated continuously in cruise.

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FUEL SYSTEM (Continued)

FUEL RETURN SYSTEM

A fuel return system was incorporated to improve engine operation during extended idle operation in hot weather environments. The major components of the system include an orifice fitting located in the top of the fuel-air control unit (fuel servo), fuel return line, with check valve, and a fuel reservoir tank. The fuel return system is designed to return a metered amount of fuel/vapor back to the fuel reservoir tank. The increased fuel flow, due to the fuel return system, results in lower fuel operating temperatures at the engine inlet, which minimizes the amount of fuel vapor generated in the fuel lines during hot weather operations. Refer to Section 4 for Hot Weather operating information.

FUEL VENTING

Fuel system venting is essential to system operation. Complete blockage of the fuel venting system will result in decreasing fuel flow and eventual engine stoppage. The fuel venting system consists of an interconnecting vent line between the fuel tanks and a check valve equipped overboard vent in the left fuel tank assembly. The overboard vent protrudes from the bottom surface of the left wing, just inboard of the wing strut upper attachment point. The fuel filler caps are vacuum vented; the fuel filler cap vents will open and allow air to enter the fuel tanks in case the overboard vents become blocked.

REDUCED TANK CAPACITY

The airplane may be serviced to a reduced capacity to permit heavier cabin loadings. This is accomplished by filling each tank to the bottom edge of the fuel filler indicator tab, thus giving a reduced fuel load of 17.5 gallons usable in each tank.

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Cessna
A Textron Company

Service Bulletin

May 22, 2000

SB00-11-03

TITLE

PILOT'S OPERATING HANDBOOK AND PILOT'S CHECKLIST REVISIONS

EFFECTIVITY

Models	Serial Numbers
172R	17280001 thru 17280893

REASON

To provide Revision 4 for the Pilot's Operating Handbook and Revision 3 for the Pilot's Checklist.

DESCRIPTION

The revisions are being issued to incorporate the following information:

1. Changes Standard Empty Weight and Maximum Useful Load in Section 1-7.
2. Add Fuel Savings And Fuel Vapor Procedures Information to Section 4-27 thru 4-28.
3. Adds new temperatures to chart in Section 8-14.
4. Changes induction air filter replacement requirements from 100 to 500 hours in Section 8.
5. Miscellaneous changes as required.

COMPLIANCE

Mandatory: the revisions shall be reviewed and incorporated as soon as possible, but no later than the next 100 hours of operation or 4 months, whichever occurs first.

APPROVAL

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

To obtain satisfactory results, procedures specified in this publication must be accomplished in accordance with accepted methods and prevailing government regulations. The Cessna Aircraft Company cannot be responsible for the quality of work performed in accomplishing the requirements of this publication.

The Cessna Aircraft Company, Product Support, P.O. Box 7706, Wichita, Kansas 67277, U.S.A. (316) 517-5800, Facsimile (316) 942-9006

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MANPOWER

Not applicable

REFERENCES

Not applicable

MATERIAL PRICE AND AVAILABILITY

Additional copies of the Pilot's Operating Handbook and Pilot's Checklist revisions are available from Cessna Parts Distribution as shown below.

Part Number	Description	Price
172RPHUSR04	Revision 4, Model 172R Pilot's Operating Handbook	$ 56.00 (F) ea.
172RCLUSR03	Revision 3, Model 172R Pilot's Checklist	$ 8.00 (F) ea.

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CREDIT INFORMATION

The Pilot's Operating Handbook and Pilot's Checklist revisions are being sent to applicable owners of record at no charge.

ACCOMPLISHMENT INSTRUCTIONS

Review and incorporate the Pilot's Operating Handbook and Pilot's Checklist revisions.

NOTE: This information shall be considered an amendment to the Cessna Manufacturer's Maintenance Manual or Instructions for continued airworthiness, and must be accomplished for ongoing airworthiness compliance as required per FAR43.13.

OWNER NOTIFICATION

On May 22, 2000 the following Owner Advisory message will be sent to applicable owners of record in SB00-11-03A.

Dear Cessna Owner:

Revision 4 to the Pilot's Operating Handbook and Revision 3 to the Pilot's Checklist are enclosed and include the following information:

1. Changes Standard Empty Weight and Maximum Useful Load in Section 1-7.
2. Add Fuel Savings And Fuel Vapor Procedures Information to Section 4-27 thru 4-28.
3. Adds new temperatures to chart in Section 8-14.
4. Changes induction air filter replacement requirements from 100 to 500 hours in Section 8.
5. Miscellaneous changes as required.

Compliance is mandatory; the revisions shall be reviewed and incorporated as soon as possible, but no later than the next 100 hours of operation or 4 months, whichever occurs first.

The information contained in Cessna Service Bulletins shall be considered an amendment to the Cessna Manufacturer's Maintenance Manual or Instructions for continued airworthiness, and must be accomplished for ongoing airworthiness compliance as required per FAR43.13.

Please contact a Cessna Single Engine Service Station in the event you have any questions concerning compliance with Cessna Service Bulletin SB00-11-03 by incorporation of these revisions.

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Cessna
A Textron Company

Service Bulletin

August 14, 2000

SB00-11-04

TITLE

PILOT'S OPERATING HANDBOOK AND PILOT'S CHECKLIST REVISIONS

EFFECTIVITY

Models	Serial Numbers
172S	172S8001 thru 172S8531

REASON

To provide Revision 1 for the Pilot's Operating Handbook and Pilot's Checklist.

DESCRIPTION

The revisions are being issued to incorporate the following information:

1. Changes Standard Empty Weight and Maximum Useful Load in Section 1-7.
2. Add Fuel Savings And Fuel Vapor Procedures Information to Section 4-27 thru 4-35.
3. Miscellaneous changes as required.

COMPLIANCE

Mandatory: the revisions shall be reviewed and incorporated as soon as possible, but no later than the next 100 hours of operation or 4 months, whichever occurs first.

APPROVAL

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

MANPOWER

Not applicable

REFERENCES

Not applicable

To obtain satisfactory results, procedures specified in this publication must be accomplished in accordance with accepted methods and prevailing government regulations. Cessna Aircraft Company cannot be responsible for the quality of work performed in accomplishing the requirements of this publication.

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MATERIAL PRICE AND AVAILABILITY

Additional copies of the Pilot's Operating Handbook and Pilot's Checklist revisions are available from Cessna Parts Distribution as shown below.

Part Number	Description	Price
172SPHUSR01	Revision 1, Model 172S Pilot's Operating Handbook	$ 56.00 (F) ea.
172SCLUSR01	Revision 1, Model 172S Pilot's Checklist	$ 8.00 (F) ea.

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CREDIT INFORMATION

The Pilot's Operating Handbook and Pilot's Checklist revisions are being sent to applicable owners of record at no charge.

ACCOMPLISHMENT INSTRUCTIONS

Review and incorporate the Pilot's Operating Handbook and Pilot's Checklist revisions.

NOTE: This information shall be considered an amendment to the Cessna Manufacturer's Maintenance Manual or Instructions for continued airworthiness, and must be accomplished for ongoing airworthiness compliance as required per FAR43.13.

OWNER NOTIFICATION

On August 14, 2000 the following Owner Advisory message will be sent to applicable owners of record in SB00-11-04A.

Dear Cessna Owner:

Revision 1 to the Pilot's Operating Handbook and Pilot's Checklist are enclosed and include the following information:

1. Changes Standard Empty Weight and Maximum Useful Load in Section 1-7.
2. Add Fuel Savings And Fuel Vapor Procedures Information to Section 4-27 thru 4-28.
3. Miscellaneous changes as required.

Compliance is mandatory; the revisions shall be reviewed and incorporated as soon as possible, but no later than the next 100 hours of operation or 4 months, whichever occurs first.

The information contained in the referenced Cessna Service Bulletin shall be considered an amendment to the Cessna Manufacturer's Maintenance Manual or Instructions for continued airworthiness, and must be accomplished for ongoing airworthiness compliance as required per FAR43.13.

Please contact a Cessna Single Engine Service Station in the event you have any questions concerning compliance with Cessna Service Bulletin SB00-11-04 by incorporation of these revisions.

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Cessna
A Textron Company

Service Bulletin

March 5, 2001

SB01-11-02

TITLE

PILOT'S OPERATING HANDBOOK AND PILOT'S CHECKLIST REVISIONS

EFFECTIVITY

Models	Serial Numbers
172R	17280001 thru 17280988, 17280990, 17280991, 17280996, 17280998, 17281000 and 17281005
172S	172S8001 thru 172S8643, 172S8645 thru 172S8662, 172S8664, 172S8666 thru 172S8673, 172S8675 thru 172S8686, 172S8694 thru 172S8697, 172S8699 thru 172S8703, 172S8705 thru 172S8707, 172S8709 thru 172S8712, 172S8714 thru 172S8717, 172S8720 thru 172S8723, 172S8725 thru 172S8728, 172S8730, 172S8731, 172S8733, 172S8739, 172S8741 and 172S8750

REASON

To provide a revision to the Pilot's Operating Handbook and Pilot's Checklist.

DESCRIPTION

A revision to the applicable Pilot's Operating Handbook and Pilot's Checklist are being issued to incorporate the following information:

1. Modifies the "BEFORE TAKEOFF" checklist and amplified procedures to ensure that the engine is idling correctly.
2. Miscellaneous changes as required.

COMPLIANCE

Mandatory: the revisions shall be reviewed and incorporated prior to further flight.

APPROVAL

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

To obtain satisfactory results, procedures specified in this publication must be accomplished in accordance with accepted methods and prevailing government regulations. Cessna Aircraft Company cannot be responsible for the quality of work performed in accomplishing the requirements of this publication.

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MANPOWER

Not applicable

REFERENCES

Not applicable

MATERIAL PRICE AND AVAILABILITY

Additional copies of the POH revisions and Log Of Approved Supplements are available from Cessna Parts Distribution as shown below.

Part Number	Description	Price
172RPHUSR06	Revision 6, Model 172R Pilot's Operating Handbook	$ 58.00 (F) ea.
172RCLUSR04	Revision 4, Model 172R Pilot's Checklist	$ 8.00 (F) ea.
172RUSLOG04	172R Log Of Approved Supplements	$ 15.00 (F) ea.
172R180PHUSR01	* Revision 1, Model 172R 180HP Pilot's Operating Handbook	$ 58.00 (F) ea.
172R180CLUSR01	* Revision 1, Model 172R 180HP Pilot's Checklist	$ 8.00 (F) ea.
172R180USLOG00	* 172R 180HP Log Of Approved Supplements	$ 15.00 (F) ea.
172SPHUSR03	Revision 3, Model 172S Pilot's Operating Handbook	$ 58.00 (F) ea.
172SCLUSR02	Revision 2, Model 172S Pilot's Checklist	$ 8.00 (F) ea.
172SUSLOG04	172S Log Of Approved Supplements	$ 15.00 (F) ea.

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

* Applicable to 172R airplanes modified by MK172-72-01 only.

CREDIT INFORMATION

The appropriate Pilot's Operating Handbook and Pilot's Checklist Revisions and current Log Of Approved Supplements are being sent to applicable owners of record at no charge.

ACCOMPLISHMENT INSTRUCTIONS

1. Review and incorporate the Pilot's Operating Handbook and Checklist revisions.
2. Review Log Of Approved Supplements and compare with the existing supplements and revision dates in the POH.
3. Obtain and incorporate into the POH applicable supplement revisions, as required.

NOTE: If engine roughness occurs at idle, taxi and/or at full throttle with the mixture control in the full rich position, refer to and accomplish the POH Section 4 Fuel Vapor Procedures. If after accomplishing these procedures the engine is still operating rough, then maintenance action is required. The engine fuel injector unit shall be checked as specified in the Model 172 Series 1996 And On Maintenance Manual, Chapter 73, Fuel Injection System - Maintenance Practices. Scheduled inspections of airplane engine operation by qualified personnel, including engine idle RPM and idle mixture are required in accordance with the above referenced Maintenance Manual and by Federal Aviation Administration Regulation FAR43.15.

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 FAR43.13.

OWNER NOTIFICATION

On March 5, 2001 a copy of this service bulletin and appropriate Pilot's Operating Handbook and Pilot's Checklist revisions and current Log Of Approved Supplements will be sent to applicable owners of record.

* * * * * * *

Cessna
A Textron Company

Service Bulletin

January 22, 2001

SB01-71-01

TITLE

ENGINE FUEL FLOW DIVIDER INSTALLATION MODIFICATION

EFFECTIVITY

Model	Serial Numbers
172R	17280001 thru 17280990
172S	172S8001 thru 172S8720

REASON

To transmit Textron/Lycoming Service Instruction No.1502; Installation of Inverted Flow Divider.

DESCRIPTION

To aid in reducing possible fuel vapor during ground operations, the engine fuel flow divider installation may be modified by inverting the flow divider.

COMPLIANCE

Optional, may be accomplished whenever engine fuel vapor conditions are experienced during ground operations, or sooner if desired.

APPROVAL

Refer to Textron/Lycoming Service Instruction No.1502 (or latest revision)

MANPOWER

4.4 man-hours to modify the installation of the engine fuel flow divider.

REFERENCES

Textron/Lycoming Service Instruction No.1502 (or latest revision)
Model 172 Series 1996 And On Maintenance Manual

NOTE: Ensure all publications used are complete and current.

NOTE: This information shall be considered an amendment to the Cessna Manufacturer's Service/Maintenance Manual and should be accomplished within the specified time requirement.

To obtain satisfactory results, procedures specified in this publication must be accomplished in accordance with accepted methods and prevailing government regulations. Cessna Aircraft Company cannot be responsible for the quality of work performed in accomplishing the requirements of this publication.

Cessna Aircraft Company, Product Support, P.O. Box 7706, Wichita, Kansas 67277, U.S.A. (316) 517-5800, Facsimile (316) 942-9006

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OTHER PUBLICATIONS AFFECTED

Model 172R And Model 172S Illustrated Parts Catalog

NOTE: Ensure all publications used are complete and current.

MATERIAL PRICE AND AVAILABILITY

The following are available from Cessna Parts Distribution through an appropriate Cessna Service Station for the suggested list price shown.

Part Number	Description	Qty/Airplane	Price
05K23084	Kit, Inverted Flow Divider	1	$ 491.63 (LM) ea.
0556033-1	Fuel Line Assembly	1	$ 190.00 (S) ea.
MS21919WDG6	Clamp	2	$ 0.72 (PS) ea.
MS21919WDG9	Clamp	1	$ 1.03 (PS) ea.
MS21042L3	Locknut	1	$ 0.17 (PS) ea.
MS35207-263	Screw	1	$ 0.10 (PS) ea.
NAS1149D0332K	Washer	2	$ 0.07 (PS) ea.
S2209-1	Tie Strap	1	$ 3.00 (VR) pkg.
S2209-5	Tie Strap	1	$ 4.00 (VR) pkg.

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CREDIT INFORMATION

Applicable parts credit and a labor allowance credit of 4.4 man-hours per airplane will be provided to modify the installation of the engine fuel flow divider as directed by Textron/Lycoming Service Instruction No.1502 (or latest revision).

To receive credit, the work must be completed and a Quick Claim submitted by a Cessna Single Engine Service Station before the dates shown below.

Domestic . . . . . January 22, 2002
International . . . . . January 22, 2002

ACCOMPLISHMENT INSTRUCTIONS

Weight And Balance Information

MODEL 172R/172S

WEIGHT CHANGE . . . . . Negligible

The following parts will be required to complete this service bulletin:

NEW P/N	QUANTITY	DESCRIPTION	OLD P/N	DISPOSITION
0556033-1	1	Fuel Line Assembly	0500118-169	Discard
MS21919WDG6	1	Clamp	None	None
MS21919WDG9	1	Clamp	None	None
MS21042L3	1	Locknut	None	None
MS35207-263	1	Screw	None	None
NAS1149D0332K	2	Washer	None	None
S2209-1	1	Nylon Tie	None	None
S2209-5	1	Nylon Tie	None	None

Instructions

1. Electrically ground the airplane and turn all switches to the "OFF" position.
2. Remove upper and lower engine cowling. (Refer to the Model 172 Series 1996 And On Maintenance Manual, Chapter 71, Cowling - Maintenance Practices.)
3. Disconnect electrical power from the airplane by disconnecting the battery and external power. Attach maintenance warning tags to the battery and external power receptacle stating: **DO NOT CONNECT ELECTRICAL POWER - MAINTENANCE IN PROGRESS.**
4. (Refer to Figure 1, Sheet 1 and Sheet 2.) Modify the engine fuel flow divider as directed by Textron/Lycoming Service Instruction No.1502 (or latest revision).

   NOTE: While accomplishing Step 8. of the Lycoming Service Instruction, remove and discard the existing 0500118-169 Fuel Line Assembly and install the new 0556033-1 Fuel Line Assembly.

   NOTE: Proceed to Step 4.A. if hose assembly does not provide enough length for connection to the fuel flow divider.

   A. (Refer to Figure 2, Sheet 1 and Sheet 2.) Re-position hose assembly over intake manifold and up to fuel flow divider.

   B. Secure line with one (1) MS21919WDG6 Clamp, one (1) MS2191WDG9 Clamp, two (2) NAS1149D0332K Washers, one (1) MS35207-263 Screw and one (1) MS21042L3 Locknut to the throttle support.

      NOTE: Ensure hose assembly is clear of the throttle control assembly when securing line.

   C. (Refer to Figure 2, Sheet 1.) Secure hose assembly to intake manifold with one (1) each S2209-5 and S2209-1 Nylon Tie.
5. Check and adjust the idle speed and mixture control as required. (Refer to the Model 172 Series 1996 And On Maintenance Manual, Chapter 73, Idle and Mixture Adjustment.)
6. Reinstall engine cowling. (Refer to the Model 172 Series 1996 And On Maintenance Manual, Chapter 71, Cowling - Maintenance Practices.)
7. Remove maintenance warning tags and reconnect the airplane battery.

8. Make appropriate entries in the engine and airframe logbooks stating compliance with Service Bulletin SB01-71-01/Textron/Lycoming Service Instruction No.1502 (or latest revision).

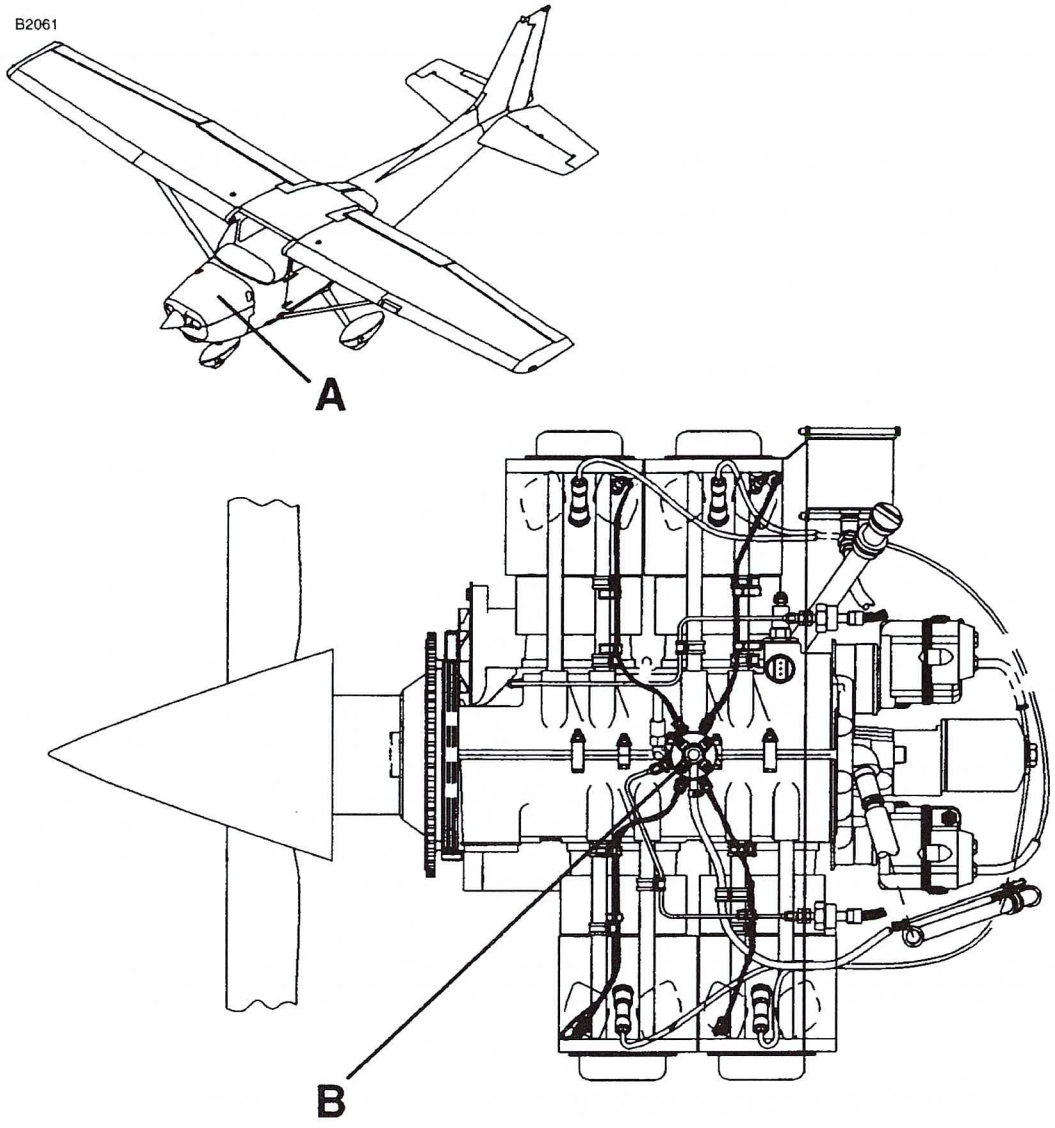


Figure 1. Fuel Flow Divider (Sheet 1)

B2062

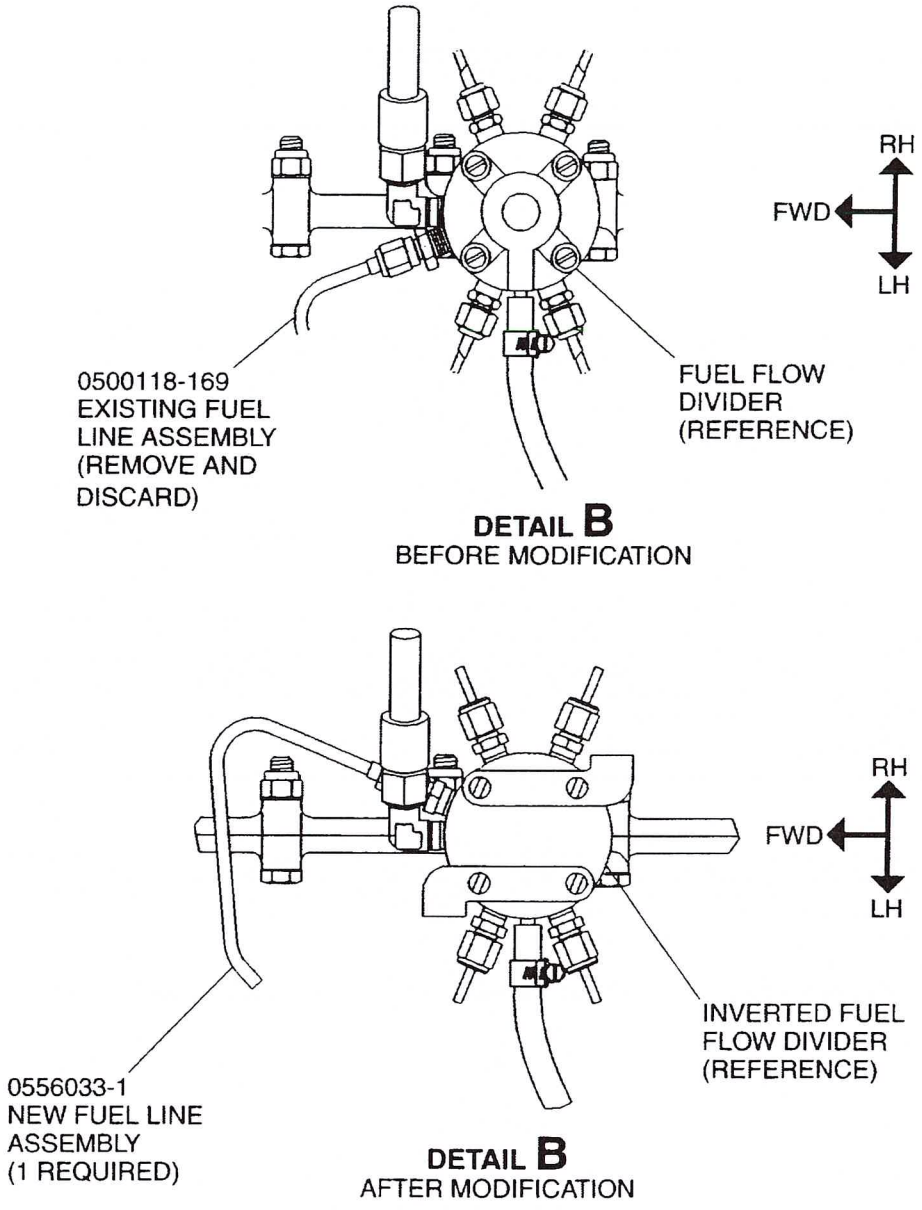
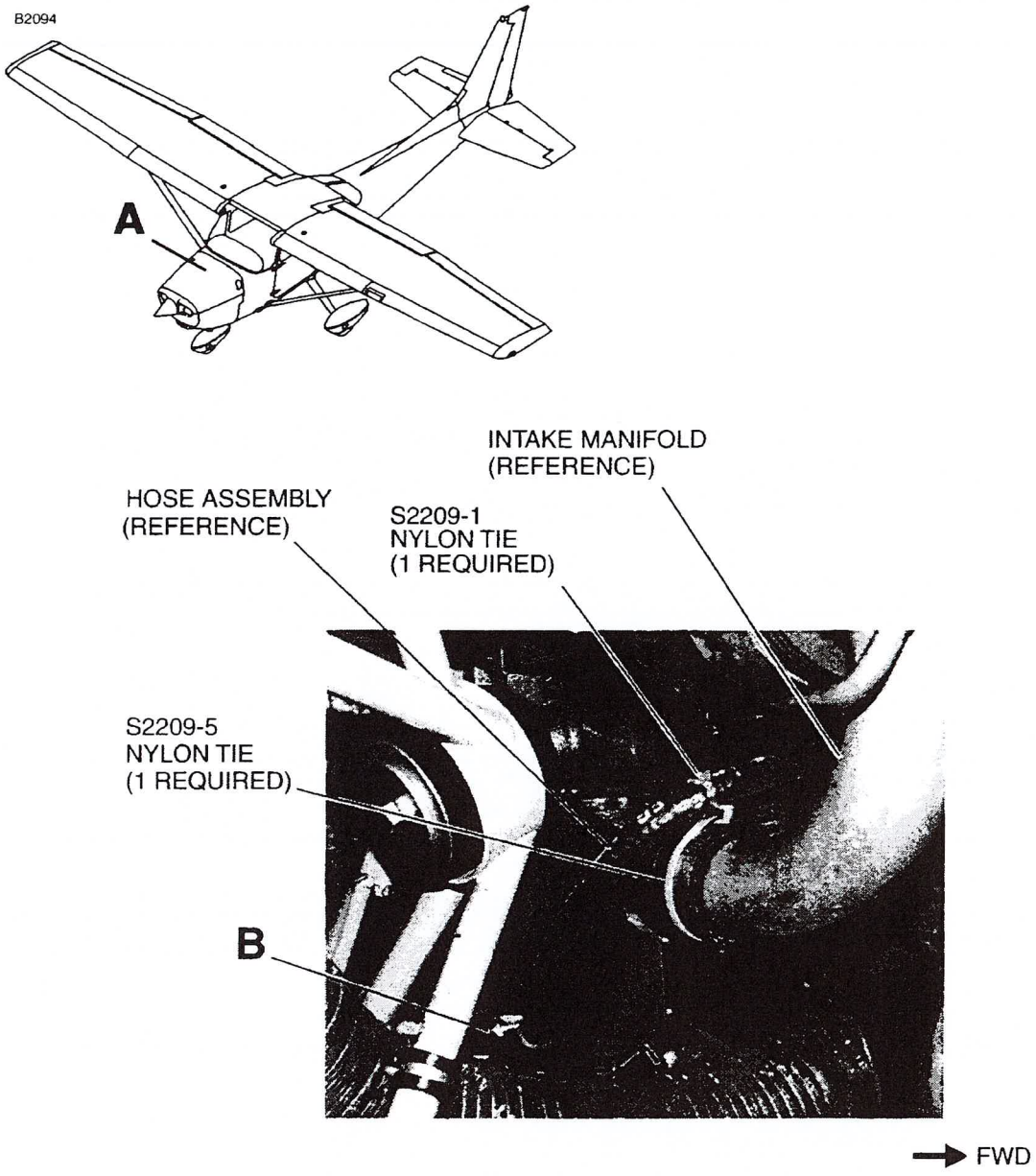


Figure 1. Fuel Flow Divider (Sheet 2)

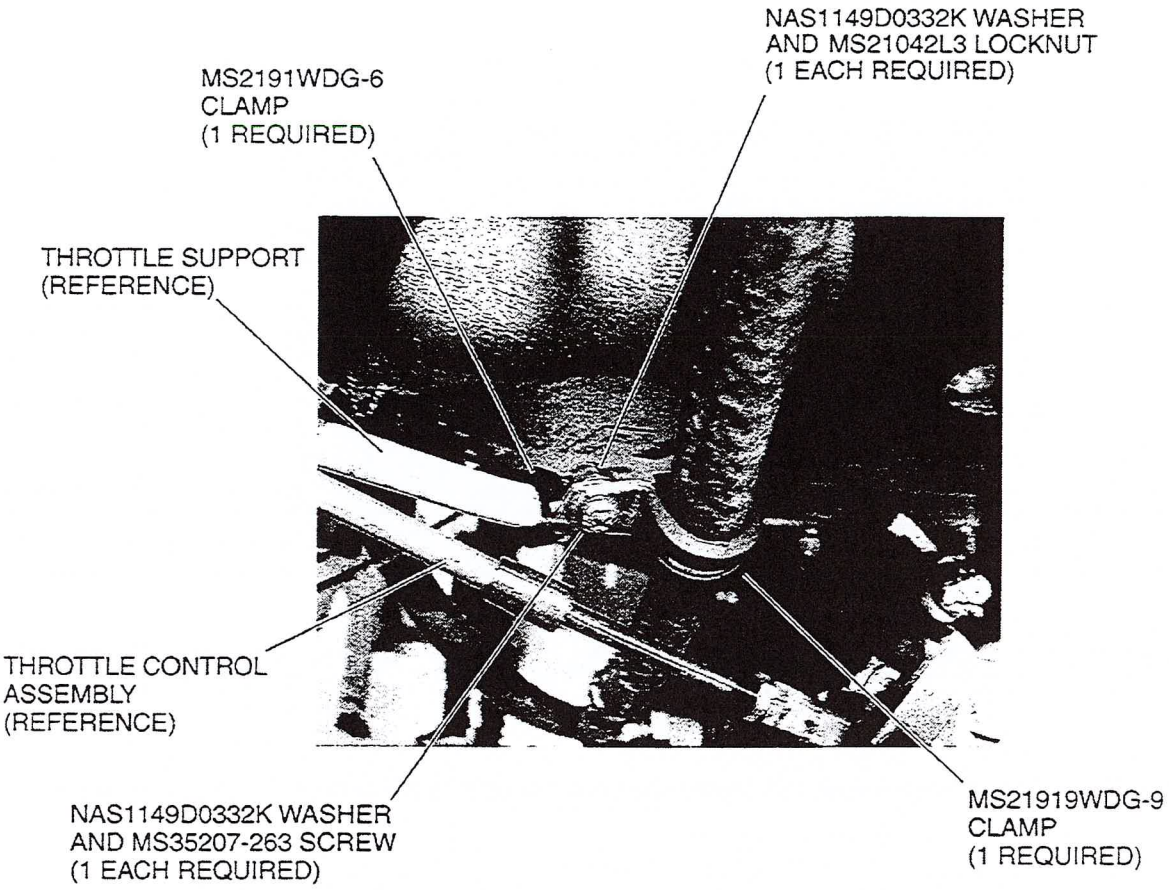


DETAIL A

VIEW LOOKING INBOARD AT RIGHT SIDE

Figure 2. Fuel Flow Divider Hose Routing (Sheet 1)

B2102



DETAIL B

Figure 2. Fuel Flow Divider Hose Routing (Sheet 2)

OWNER NOTIFICATION

On February 5, 2001 the following Owner Advisory message will be sent to applicable owners of record in SB01-71-01A.

Dear Cessna Owner:

This Owner Advisory is to inform you that Textron/Lycoming has issued Service Instruction No.1502 which provides a modification for the installation of the engine fuel flow divider.

To aid in reducing possible fuel vapor during ground operations, the engine fuel flow divider installation may be modified by inverting the flow divider.

Compliance is optional, may be accomplished whenever engine fuel vapor conditions are experienced during ground operations, or sooner if desired.

The information contained in the referenced Cessna Service Bulletin shall be considered an amendment to the Cessna Manufacturer's Service/Maintenance Manual.

Applicable parts credit and a labor allowance credit of 4.4 man-hours per airplane will be provided to modify the installation of the engine fuel flow divider as directed by Textron/Lycoming Service Instruction No.1502 (or latest revision).

To receive credit, the work must be completed and a Quick Claim submitted by a Cessna Single Engine Service Station before the dates shown below.

Domestic	January 22, 2002
International	January 22, 2002

Please contact a Cessna Single Engine Service Station for detailed information and arrange to have Cessna Service Bulletin SB01-71-01/Textron/Lycoming Service Instruction No.1502 (or latest revision) accomplished on your airplane.

* * * * * * *

TEXTRON Lycoming

652 Oliver Street
Williamsport, PA 17701 U.S.A.
570/323-6181

SERVICE INSTRUCTION

DATE: December 19, 2000

Service Instruction No. 1502A
(Supersedes Service Instruction No. 1502)
Engineering Aspects are
FAA Approved

SUBJECT: Installation of Inverted Flow Divider

MODELS AFFECTED: All Textron Lycoming IO-360-L2A aircraft engines.

TIME OF COMPLIANCE: Whenever the engine has vapor related problems, or at owner's discretion.

To reduce the possibility of vapor related problems in aircraft employing IO-360-L2A model engines, the flow divider should be modified into an inverted flow divider.

The modification of the flow divider is accomplished as follows using Kit P/N 05K23084:

1. Remove top cowling.
2. Remove all fuel lines and the hose connected to the flow divider.
3. Remove the bolts, washers, two spacers and two brackets which secure the flow divider to the engine.
4. Remove the mounting brackets from the flow divider.
5. Modify the flow divider assembly as follows making sure that no foreign material is introduced into the part and the diaphragm is not damaged:

NOTE

During the modification procedure, the fuel inlet elbow fitting faces the front.

a. Remove the lockwire, screws and washers from the top of the flow divider assembly. (Figure 1.)

b. With the cap vent pointing left, slightly lift the manifold cap, making sure that it is separated from the diaphragm. Then carefully rotate it until cap vent points right. (180° from original position.) (Figure 1.) Be sure that the spring held in place by the cap is not dislodged.

c. Reinstall the flat washers and screws. (Torque the four screws to 20-30 in.lbs. Retighten after 20 minutes.) Lockwire the screws together as before.

d. To allow removal and installation of the 90° fuel inlet elbow, first remove the fuel gage fitting close to the elbow on the forward side of the flow divider. (Figure 2.)

e. Holding the flow divider with the manifold cap up, remove the 90° elbow P/N MS20822-4 and install the new 90° elbow with the elbow positioned below the gage fitting port pointed left and tilted approximately 20° below horizontal. Reinstall gage nipple. The angle allows clearance for hose connections. Before reinstalling the fittings, apply Loctite Hydraulic Sealant or an equivalent fuel soluble sealant sparingly. Do not apply sealant to the first two lead threads. (Figure 2.)

f. Vibropeen "INV" following the P/N 63B22623 which is located on the outside diameter of the flow divider assembly base.

General Aviation Manufacturers Association

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6. Install the new mounting brackets P/N 07A22995 and P/N 07A22996 on the flow divider assembly using the new screws and lockwashers P/N STD-82 and P/N STD-251 respectively. Torque to 49 in.-lbs. With the flow divider assembly positioned with the cap down and the 90° elbow toward the front of the engine, P/N 07A22995 should be installed on the right and P/N 07A22996 on the left. (Figure 3.) With new brackets installed, lockwire screws. (Figure 4.)

7. Install flow divider brackets on the engine using the bolts, washer, and spacers that were removed initially and new STD-160 washers. Torque to 96 in.-lbs. (Figure 3.)

8. Reconnect all hoses.

9. Check the idle speed and mixture and reset to specified values if necessary.

10. Enter compliance in the airframe and/or maintenance records as required.

Kit P/N 05K23084 contains:

1	07A22995	Bracket
1	07A22996	Bracket
4	STD-82	Screw
4	STD-251	Washer
1	MS20822-4	Elbow
2	STD-160	Washer

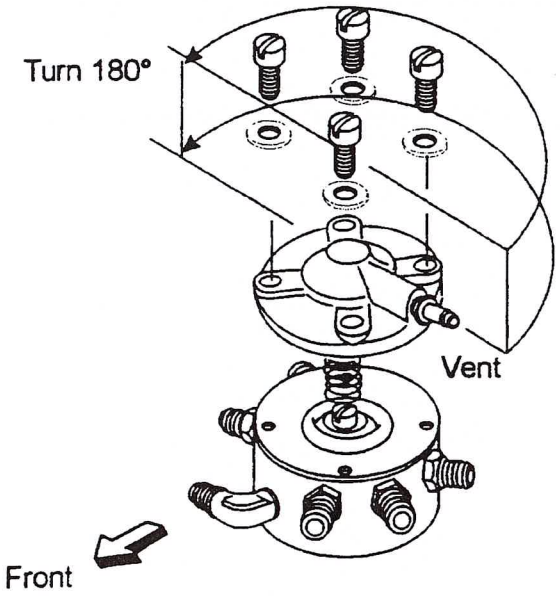

Figure 1.

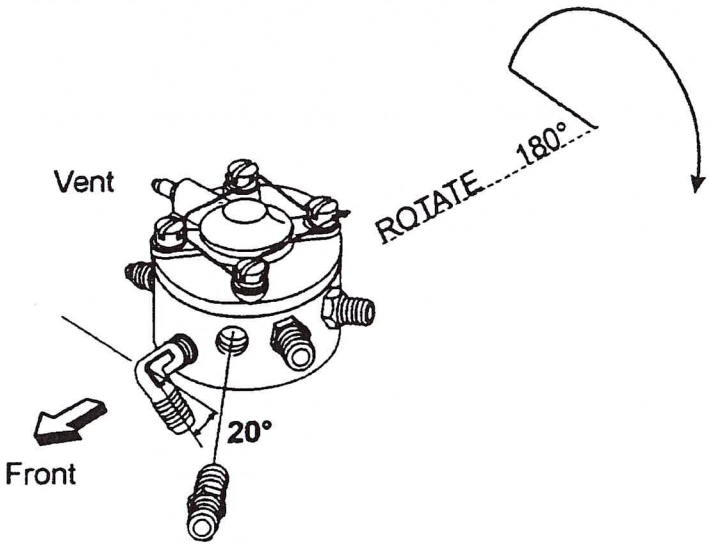

Figure 2.

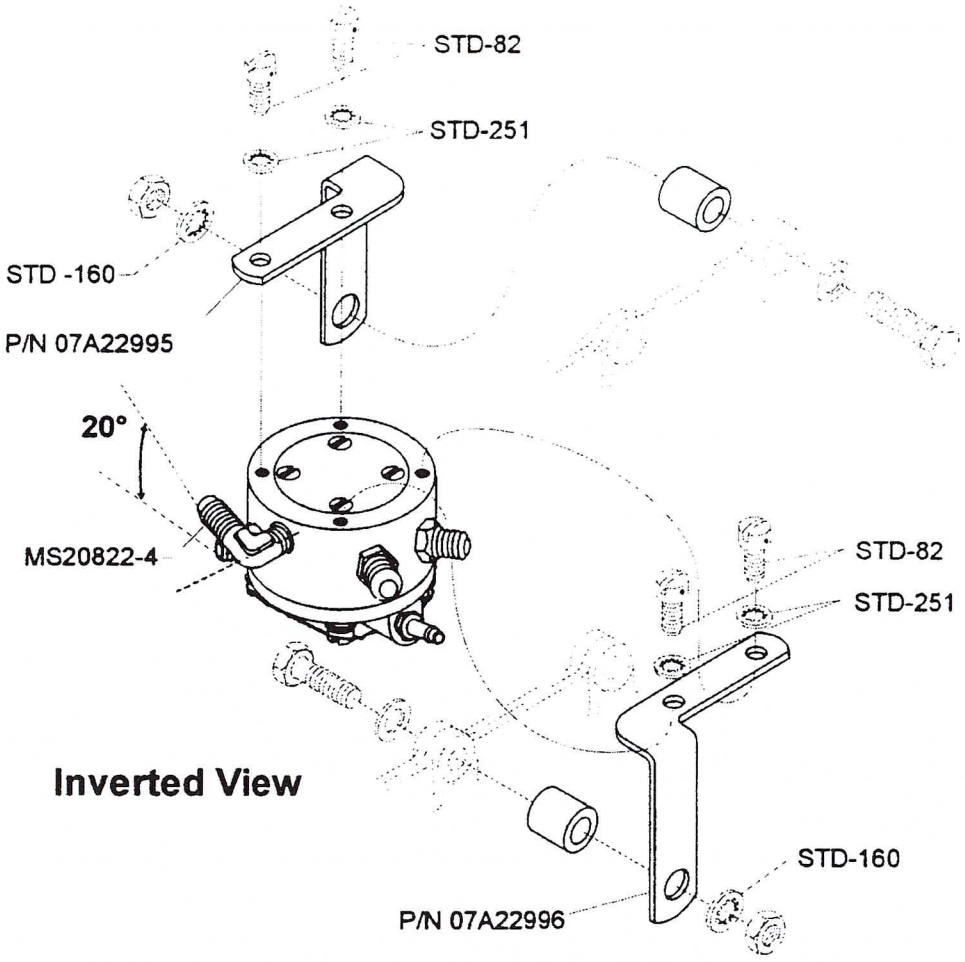

Figure 3.

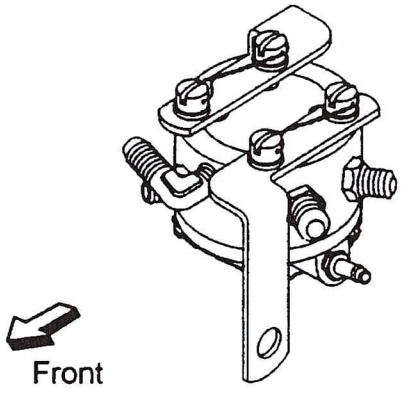

Figure 4.

NOTE: Revision "A" to this Service Instruction changes the torque requirements in step 7.

Cessna
A Textron Company

Service Bulletin

May 26, 2003

SB03-71-01

TITLE

ENGINE FUEL SUPPLY SYSTEM MODIFICATION

EFFECTIVITY

Model	Serial Numbers
172R	17280001 and On
172S	172S8001 and On

REASON

To announce the availability of a modification kit that is designed to assist in enhancing engine operation at low power settings during hot weather conditions.

DESCRIPTION

This modification may be installed on an airplane that is exhibiting rough engine idle or less than satisfactory engine acceleration from low power settings. The modification should not be installed unless all normal maintenance and troubleshooting actions have been accomplished and have failed to resolve the above stated conditions.

COMPLIANCE

Optional; may be accomplished if desired.

APPROVAL

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

To obtain satisfactory results, procedures specified in this publication must be accomplished in accordance with accepted methods and prevailing government regulations. Cessna Aircraft Company cannot be responsible for the quality of work performed in accomplishing the requirements of this publication.

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MANPOWER

Approximately 2.0 man-hours per airplane

REFERENCES

Model 172 Series 1996 And On Maintenance Manual

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.

OTHER PUBLICATIONS AFFECTED

Model 172R and Model 172S Illustrated Parts Catalog

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

MATERIAL PRICE AND AVAILABILITY

The following are available from Cessna Parts Distribution through an appropriate Cessna Service Station for the suggested list price shown.

Part Number	Description	Qty/Airplane		Price
MK172-71-03	Engine Fuel Supply System Modification Kit	1	$	628.00 (S) ea.
RTV106RED2.8OZ (Alternate U064014)	Sealant (2.8 oz Tube)	(as required)	$	33.50 (PS) ea.
LOCTITE569 (Alternate LOCTITE569-31)	Sealant (1.69 oz Bottle)	(as required)	$	85.30 (PS) ea.

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CREDIT INFORMATION

Not applicable

ACCOMPLISHMENT INSTRUCTIONS

MK172-71-03 Engine Fuel Supply System Modification instructions are attached.

OWNER NOTIFICATION

On June 9, 2003 the following Owner Advisory message will be sent to applicable owners of record (airplanes delivered from the factory prior to the date of SB03-71-01) in SB03-71-01A.

Dear Cessna Owner:

This Owner Advisory is to inform you that Service Bulletin SB03-71-01 has been issued to announce the availability of a modification kit that is designed to assist in enhancing engine operation at low power settings during hot weather conditions. This modification may be installed on an airplane that is exhibiting rough engine idle or less than satisfactory engine acceleration from low power settings. The modification should not be installed unless all normal maintenance and troubleshooting actions have been accomplished and have failed to resolve the above stated conditions.

Compliance is optional, may be accomplished if desired.

The information contained in the referenced Cessna Service Bulletin shall be considered an amendment to the Cessna Manufacturer's Service/Maintenance Manual.

Please contact a Cessna Single Engine Service Station for detailed information and if desired, arrange to have Cessna Service Bulletin SB03-71-01 accomplished on your airplane.

* * * * * * *

Single Engine

MODIFICATION KIT

Cessna
A Textron Company

MK172-71-03

TITLE

ENGINE FUEL SUPPLY SYSTEM MODIFICATION

EFFECTIVITY

Model	Serial Numbers
172R	17280001 and On
172S	172S8001 and On

DESCRIPTION

This modification kit provides parts and instructions to install modifications to the fuel system located in the engine compartment.

APPROVAL

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

REFERENCE

SB03-71-01

CHANGE IN WEIGHT AND BALANCE

Negligible

To obtain satisfactory results, procedures specified in this publication must be accomplished in accordance with accepted methods and prevailing government regulations. Cessna Aircraft Company cannot be responsible for the quality of work performed in accomplishing the requirements of this publication.

Cessna Aircraft Company, Product Support, P.O. Box 7706, Wichita, Kansas 67277, U.S.A. (316) 517-5800, Facsimile (316) 942-9006

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MATERIAL INFORMATION

NOTE: The parts included in this modification kit cover installation for one airplane.

New P/N	Quantity	Description	Old P/N	Disposition
MK172-71-03	1	**Kit,** consisting of the following parts:		
AE102-14-225ED	21.68 inches	Sleeving	None	
AE102-14-180ED	16.96 inches	Sleeving	None	
AE2463532G0180 (Aeroquip)	1	Hose	AE3663161G0164	Discard
AE2463532G0225 (Aeroquip)	1	Hose	LW-12799-6S180	Discard
AN816-6-6D	1	Union (straight)	MS20822-6-6D	Discard
MS20470AD3-6A	2	Rivet	None	
MS21042L3	1	Nut	None	
MS21919WDG3	1	Clamp	None	
MS21919WDG40	1	Clamp	None	
MS3367-2-9	8	Tie Strap	None	
MS35207-267	1	Screw	None	
S1053K20T36.00	1	Duct	None	
S1781-2	4	Sta Strap Connector	None	
S1891-40	1	Clamp	None	
S2357-2	4	Clamp	None	
0550368-1	1	Warm Air Duct	None	
75739 (Lycoming)	1	Fitting (straight)	72377	Discard
	1	Instructions		

In addition to the above kit, the following material is necessary.

New P/N	Quantity	Description	Use	Disposition
RTV106RED2.8OZ	As needed	Sealant	Warm Air Duct to Valve Body Sealant	Obtain from Cessna Parts Distribution
LOCTITE569 (Alternate LOCTITE569-31)	As needed	Sealant	Seal Fuel Fitting Threads	Obtain from Cessna Parts Distribution

ACCOMPLISHMENT INSTRUCTIONS

Instructions

1. Electrically ground the airplane and turn all switches to the "OFF" position.
2. Disconnect external power if it is connected to the airplane.

3. Pull fuel shutoff valve to the "OFF" position.

4. Remove the engine cowl. (Refer to the Model 172 Series 1996 And On Maintenance Manual, Chapter 71, Cowling - Maintenance Practices.)

5. Disconnect the airplane battery. (Refer to the Model 172 Series 1996 And On Maintenance Manual, Chapter 24, Battery - Maintenance Practices.)

6. Attach maintenance warning tags to the battery and external power receptacle with the instructions that follow: **DO NOT CONNECT ELECTRICAL POWER - MAINTENANCE IN PROGRESS.**

7. (Refer to Figure 1.) Attach the 0550368-1 Warm Air Duct to the 0453017 Valve Body.

   A. Bend the 0550368-1 Warm Air Duct flanges to match the upper contour of the 0453017 Valve Body and then align the warm air duct with the upper hole in the valve body.

   B. Attach the 0550368-1 Warm Air Duct to the upper contour of the 0453017 Valve Body with MS20470AD-3-6 Rivets as shown.

      NOTE: It is permissible to use equivalent structural blind fasteners.

   C. Fillet seal the 0550368-1 Warm Air Duct to the upper contour of the 0453017 Valve Body with RTV106 Sealant.

   D. Attach the lower end of the S1053K20T Duct outlet four inches above the bottom edge of the firewall with the outlet directed toward the lower cowl opening.

      (1) Fit and attach the lower end of the S1053K20T Duct with the MS21919WDG3 Clamp, MS21042L3 Nut, MS21919WDG40 Clamp and the MS35207-267 Screw.

   E. Fit and attach the upper end or the S1053K20T Duct to the 0550368-1 Warm Air Duct with one S1891-40 Clamp and position it as shown.

   F. Install S1781-2 Sta Strap Connectors and MS3367-2-9 Tie Straps as needed to isolate the S1053K20T duct from the cabin heat control cables, the vacuum hose, and the engine controls.

      NOTE: It may be necessary to adjust the vacuum pump hose fitting to prevent a preloaded condition against the S1053K20T duct.

WARNING: OBEY ALL FUEL SYSTEM FIRE AND SAFETY PROCEDURES.

8. Install the AE2463532G0180 Hose and the AN816-6-6D Union between the firewall fuel strainer and the engine driven fuel pump. (Refer to the Model 172/R/172S Illustrated Parts Catalog, Chapter 28, Fuel System, and to the Model 172 Series 1996 And On Maintenance Manual, Chapter 71, Powerplant, and Chapter 28, Fuel.)

   A. Remove the hose that connects the firewall fuel strainer to the engine driven fuel pump.

   B. Remove the existing 90° elbow from the firewall fuel strainer outlet.

   C. Apply LOCTITE569 to the threads of the AN816-6-6D Union and install it into the firewall fuel strainer outlet.

      CAUTION: TO ELIMINATE THE POSSIBILITY OF EXCESS SEALANT ENTERING THE PUMP, APPLY THREAD SEALANT SPARINGLY WITH NO SEALANT ON THE FIRST TWO THREADS.

   D. Install the AE102-14-180ED Sleeving over the full length of the new Aeroquip AE2463532G0180 Hose.

      (1) Slide the AE102-14-180ED Sleeving over the full length of a new AE2463532G0180 Hose.

         NOTE: LOW PRESSURE shop air applied to the inside of the sleeving will help in installation of the sleeving over the hose.

      (2) Attach the AE102-14-180ED Sleeving to the AE2463532G0180 Hose at each end with S2357-2 Clamps.

   E. Install the AE2463532G0180 Hose between the firewall mounted fuel strainer and the engine driven fuel pump with the curved fitting installed at the fuel strainer.

9. Install a AE2463532G0225 Hose and 75739 Fitting between the fuel injection servo and the engine driven fuel pump. (Refer to the Model 172/R/172S Illustrated Parts Catalog, Chapter 28, Fuel System, and to the Model 172 Series 1996 And On Maintenance Manual, Chapter 71, Powerplant, and Chapter 28, Fuel.)

   A. Remove and discard the hose that connects the engine driven fuel pump to the fuel injection servo.

   B. Remove and discard the 90° fitting from the engine driven fuel pump outlet.

   C. Apply LOCTITE569 to the threads of the 75739 Fitting and install it into the outlet of the engine driven fuel pump.

      CAUTION: TO ELIMINATE THE POSSIBILITY OF EXCESS SEALANT ENTERING THE PUMP, APPLY THREAD SEALANT SPARINGLY WITH NO SEALANT ON THE FIRST TWO THREADS.

   D. Install the AE102-14-225ED Sleeving over the full length of the new AE2463532G0225 Hose.

      (1) Slide the AE102-14-225ED Sleeving over the full length of a new AE2463532G0225 Hose.

      NOTE: LOW PRESSURE shop air applied to the inside of the sleeving will help in installation of the sleeving over the hose.

      (2) Attach the AE102-14-225ED Sleeving to the AE2463532G0225 Hose at each end with a S2357-2 Clamp.

   E. Install the AE2463532G0225 Hose between the engine driven fuel pump and the fuel injection servo with the curved fitting positioned at the fuel pump.

10. Reconnect the airplane battery. (Refer to the Model 172 Series 1996 And On Maintenance Manual, Chapter 24, Battery - Maintenance Practices.)

WARNING: OBEY ALL FUEL SYSTEM FIRE AND SAFETY PROCEDURES.

11. Bleed the air from the fuel system and check for leaks.

   A. Set the mixture control to OFF.

   B. Set the throttle control to IDLE STOP.

   C. Loosen the fuel supply hose at the fuel injection servo inlet fitting.

   D. Turn the fuel valve on.

   E. Set the MASTER switch and then the FUEL PUMP switch to ON.

   F. Operate the electric auxiliary fuel pump until the air is removed from the fuel lines.

   G. Set the FUEL PUMP switch and then the MASTER switch to OFF.

   H. Tighten the fuel pump supply hose at the fuel injection servo inlet.

   I. Set the MASTER switch and then the FUEL PUMP switch to ON.

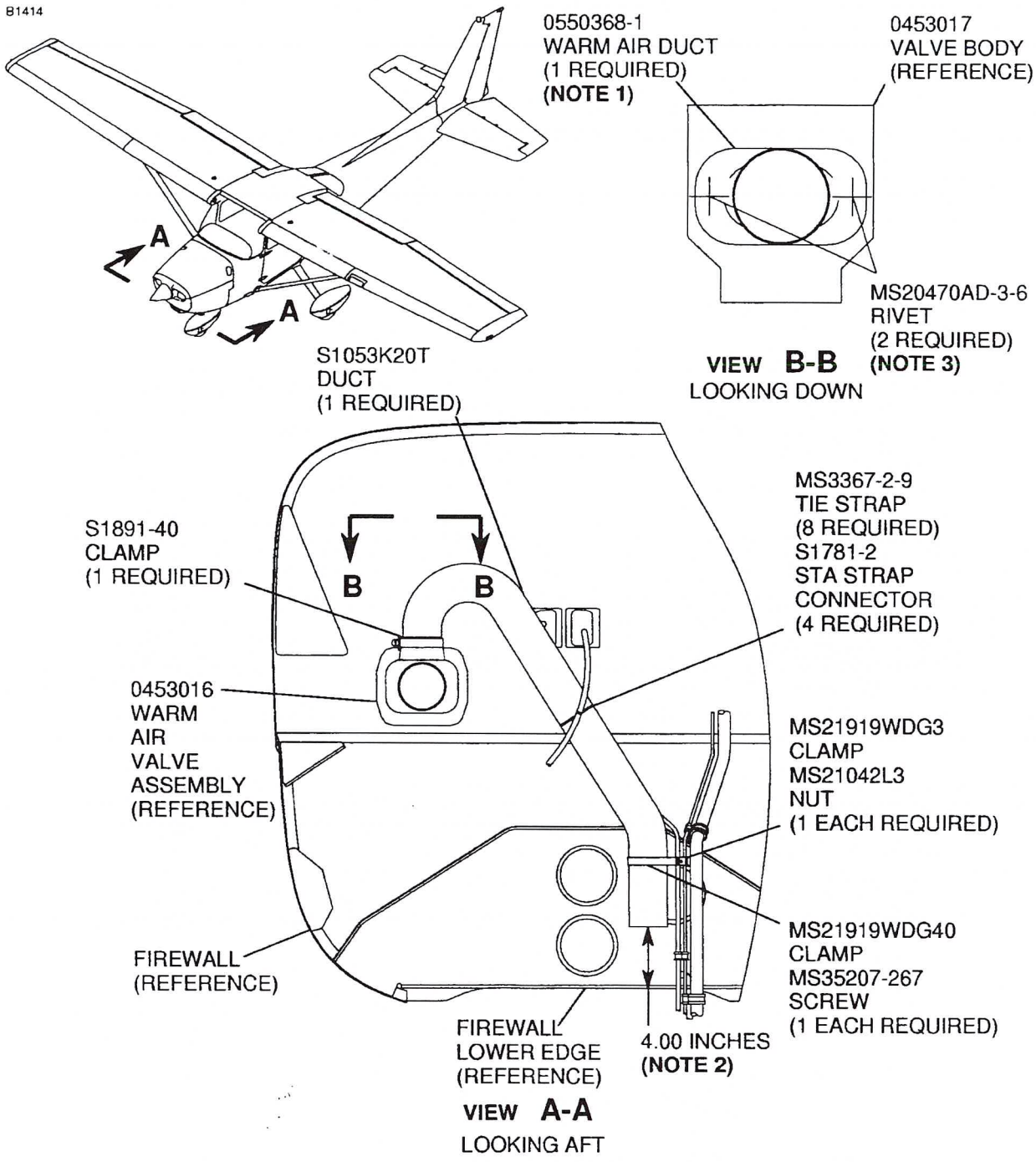
   J. Check and make sure all fuel lines and fittings changed in this Modification Kit do not leak.

   K. Set the FUEL PUMP switch and then the MASTER switch to OFF.

12. Remove maintenance warning tags from battery and external power receptacle.

13. Install the engine cowl.

14. Make an entry in the airplane logbook stating that this modification kit has been installed.



NOTE 1: FILLET SEAL THE 0550368-1 WARM AIR DUCT TO THE 0453017 VALVE BODY WITH RTV106 SEALANT.

NOTE 2: INSTALL S1053K20T DUCT 4.00 INCHES ABOVE THE FIREWALL LOWER EDGE.

NOTE 3: IT IS PERMISSIBLE TO USE EQUIVALENT STRUCTURAL BLIND FASTENERS.

0510T1007
AA0550T369
BB0550T369

Figure 1. Warm Air Duct Modification (Sheet 1)

Cessna
A Textron Company

Service Bulletin

August 30, 2004

SB04-28-03

TITLE

ENGINE FUEL RETURN SYSTEM INSTALLATION

EFFECTIVITY

Model	Serial Numbers
172R	17280001 thru 17281187
172S	172S8001 thru 172S9490

REASON

To provide parts and instructions to install an engine fuel return system.

DESCRIPTION

The engine fuel return system carries a metered amount of fuel from the engine fuel-air control unit to the fuel reservoir tank. The increased fuel flow due to the return system results in lower fuel temperatures at the engine inlet and helps to minimize the amount of fuel vapor generated in the fuel lines during high ambient temperature extended ground operations.

COMPLIANCE

Optional: may be accomplished if desired.

APPROVAL

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

To obtain satisfactory results, procedures specified in this publication must be accomplished in accordance with accepted methods and prevailing government regulations. Cessna Aircraft Company cannot be responsible for the quality of work performed in accomplishing the requirements of this publication.

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MANPOWER

Approximately 5.0 man-hours to install MK172-28-01

REFERENCES

Model 172 Series 1996 and On Maintenance Manual

NOTE: This information shall be considered an amendment to the Cessna Manufacturer's Service/Maintenance Manual.

OTHER PUBLICATIONS AFFECTED

Model 172R and Model 172S Illustrated Parts Catalog

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

MATERIAL PRICE AND AVAILABILITY

The part below is available from Cessna Parts Distribution through an appropriate Cessna Service Station for the suggested list price shown.

Part Number	Description	Qty/Airplane		Price
MK172-28-01	Engine Fuel Return System Installation Kit	1	$	1,297.00 (A) ea
172RPHUSR09 (See Note)	Revision 9, Model 172R Pilot's Operating Handbook	1 (as required)	$	56.00 (F) ea
172SPHUSR05 (See Note)	Revision 5, Model 172S Pilot's Operating Handbook	1 (as required)	$	56.00 (F) ea
172R180PHUSR03 (See Note)	Revision 3, Model 172R 180HP Pilot's Operating Handbook	1 (as required)	$	56.00 (F) ea

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

NOTE: This revision has been sent to applicable owners of record. Refer to SB04-11-02 for detailed information.

CREDIT INFORMATION

Not applicable

ACCOMPLISHMENT INSTRUCTIONS

Modification Kit MK172-28-01: Engine Fuel Return System Installation instructions are attached.

OWNER NOTIFICATION

On September 13, 2004 the following message will be sent to applicable owners of record in SB04-28-03A.

Dear Cessna Owner:

This Owner Advisory is to inform you that Service Bulletin SB04-28-03 has been issued to provide parts and instructions to install an engine fuel return system.

The engine fuel return system carries a metered amount of fuel from the engine fuel-air control unit to the fuel reservoir tank. The increased fuel flow due to the return system results in lower fuel temperatures at the engine inlet and helps to minimize the amount of fuel vapor generated in the fuel lines during high ambient temperature extended ground operations.

NOTE: Section 4 of the Pilot's Operating Handbook contains standard fuel vapor procedures.

Compliance is optional: may be accomplished if desired.

The information contained in the referenced Cessna Service Bulletin shall be considered an amendment to the Cessna Manufacturer's Service/Maintenance Manual.

Please contact a Cessna Single Engine Service Station for detailed information and arrange to have Cessna Service Bulletin SB04-28-03 accomplished on your airplane.

* * * * * * *

Single Engine

MODIFICATION KIT

Cessna
A Textron Company

MK172-28-01

TITLE

ENGINE FUEL RETURN SYSTEM INSTALLATION

EFFECTIVITY

Model	Serial Numbers
172R	17280001 thru 17281187
172S	172S8001 thru 172S9490

DESCRIPTION

To provide parts and instructions to install the fuel return system modification.

APPROVAL

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

REFERENCE

SB04-28-03

CHANGE IN WEIGHT AND BALANCE

Model	172R/172S
Weight Change	+1.0 Pound
ARM	0
Resultant Moment	0
Moment/1000	0

To obtain satisfactory results, procedures specified in this publication must be accomplished in accordance with accepted methods and prevailing government regulations. Cessna Aircraft Company cannot be responsible for the quality of work performed in accomplishing the requirements of this publication.

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MATERIAL INFORMATION

The following parts will be necessary:

NEW P/N	QUANTITY	DESCRIPTION	OLD P/N	DISPOSITION
MK172-28-01	1	**Kit,** consisting of the following parts:		
AE3663163E0240	1	Hose Assembly	None	None
AN832-4	1	Union	None	None
AN924-4	1	Nut	None	None
MS21062L3	1	Nut	None	None
MS2191WDG5	1	Clamp	None	None
MS21929WDG10	1	Clamp	None	None
MS35207-264	1	Screw	None	None
NAS1149F0332P	1	Washer	None	None
MS29512-04	1	O-Ring	MS29512-04	Discard
S2218-4	1	Check Valve	None	None
02G22973	1	Orificed Fitting	Existing Plug	Discard
0500118-49	1	Line Assembly	None	None
0500118-53	1	Line Assembly	None	None
0516009-24	1	Fuel Reservoir Assembly	0516009-18	Discard
MK172-28-01	1	Instructions		

In addition to the MK172-28-01 Kit, the following (or later revision) will be necessary.

Part Number	Description
172RPHUSR09 (See Note)	Revision 9, Model 172R Pilot's Operating Handbook
172SPHUSR05 (See Note)	Revision 5, Model 172S Pilot's Operating Handbook
172R180PHUSR03 (See Note)	Revision 3, Model 172R 180HP Pilot's Operating Handbook

NOTE: This revision has been sent to applicable airplane owners of record. Refer to SB04-11-02 for detailed information.

ACCOMPLISHMENT 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. Disconnect the airplane battery. (Refer to the Model 172 Series 1996 and On Maintenance Manual, Chapter 24, Electrical Power.)
3. Attach maintenance warning tags to the battery and external power receptacle with the following instruction: **DO NOT CONNECT ELECTRICAL POWER - MAINTENANCE IN PROGRESS.**
4. Remove the upper and lower engine cowls. (Refer to the Model 172 Series 1996 and On Maintenance Manual, Chapter 71, Powerplant.)

WARNING: DURING ALL FUEL SYSTEM SERVICING PROCEDURES, FIRE FIGHTING EQUIPMENT MUST BE AVAILABLE. TWO GROUND WIRES FROM TIE DOWN RINGS ON THE AIRPLANE TO APPROVED GROUND STAKES SHALL BE USED IN CASE OF ACCIDENTAL DISCONNECTION OF ONE GROUND WIRE.

5. Defuel the airplane. (Refer to the Model 172 Series 1996 and On Maintenance Manual, Fuel - Servicing.)

6. Remove the copilot seat and carpet. (Refer to Chapter 25, Front Seats and Rails - Maintenance Practices and Chapter 25, Interior Upholstery - Maintenance Practices.)

   A. Remove the copilot side 0515075-40 Panel to get to the fuel reservoir assembly.

   B. Remove the copilot side 0513512-9 Forward Floorboard and the access panel behind the rudder pedals to get to the fuel reservoir.

7. (Refer to Figure 1.) Remove the safety wire and plug in the forward top side of the fuel servo and install a 02G22973 Orificed Fitting with a MS29512-04 O-Ring.

   CAUTION: INSTALL A PROTECTIVE CAP ON THE ORIFICED FITTING UNTIL THE HOSE IS INSTALLED TO THE FITTING.

   CAUTION: BEFORE YOU DRILL INTO THE FIREWALL, MAKE SURE THAT THE AREA BEHIND THE FIREWALL, WHERE THE NEW HOLE WILL BE DRILLED, IS CLEAR OF ANY AIRPLANE STRUCTURE OR ANY OTHER ITEMS THAT MAY PREVENT THE INSTALLATION OF THE NEW FUEL LINE AND FITTINGS.

8. (Refer to Figure 2, Sheet 1 and 2.) Drill 0.438 inch diameter fuel return hole in the firewall as shown.

9. (Refer to Figure 3, Sheet 2.) Install a AN832-4 Union, NAS1149F0932P Washer, and AN924-4 Nut in the firewall fuel return hole as shown.

10. (Refer to Figure 1, View A-A.) Install a AE3663163E0240 Hose Assembly between the fuel servo orificed fitting and the firewall AN832-4 Union.

    A. Remove the protective cap on the 02G22973 Orificed Fitting installed in Step 7 and install the AE3663163E0240 Hose Assembly nut to the orificed fitting. Leave the nut loose until the hose is positioned and clamped to the brace as shown.

       NOTE: The AE3663163E0240 Hose Assembly must be in a relaxed and smooth position before the nuts are tightened.

    B. Install the other end of the AE3663163E0240 Hose Assembly nut to the firewall AN832-4 Union. Leave the nut loose until the hose is positioned and clamped to the brace as shown.

    C. Attach the AE3663163E0240 Hose Assembly to the 0750625-4 Brace with clamps and hardware as shown.

    D. Tighten the AE3663163E0240 Hose Assembly nuts but make sure it is in a relaxed and smooth condition after the nuts are tightened.

11. (Refer to Figure 3, Sheet 1.) Install the 0500118-49 Line Assembly from the aft side of the firewall AN832-4 Union to the S2218-4 Check Valve. Install the S2218-4 Check Valve and make sure the check valve flow arrow points to the reservoir.

    WARNING: BEFORE THE FUEL RESERVOIR IS REMOVED, MAKE SURE TO DRAIN THE FUEL FROM THE SUMP DRAIN ON THE RESERVOIR TO KEEP FUEL SPILLAGE TO A MINIMUM.

12. Remove the 0516009-18 Fuel Reservoir Assembly that is installed in the airplane, keep all hardware. (Refer to the Model 172 Series 1996 and On Maintenance Manual, Chapter 28, Storage and Distribution-Maintenance Practices.)

13. Install a new 0516009-24 Fuel Reservoir Assembly into the airplane with the kept hardware.

14. Install a new 0500118-53 Line Assembly from the aft end of the S2218-4 Check Valve to the new 0516009-24 Fuel Reservoir Assembly. (Refer to the Model 172 Series 1996 and On Maintenance Manual, Chapter 28, Storage and Distribution- Maintenance Practices.)

15. Fuel the airplane and do a fuel leak inspection.

16. Install the floorboards and the side panels removed in Step 6.

    CAUTION: MAKE SURE THE ATTACH SCREWS DO NOT TOUCH THE NEW INSTALLED FUEL LINE WHEN THE FLOORBOARDS AND ACCESS PANELS ARE INSTALLED.

17. Install the copilot's seat and carpet. (Refer to Chapter 25, Front Seats and Rails - Maintenance Practices and Chapter 25, Interior Upholstery - Maintenance Practices.)

18. Reconnect the airplane battery. (Refer to the Model 172 Series 1996 and On Maintenance Manual, Chapter 24, Electrical Power.)

19. Install the upper and lower engine cowls. (Refer to the Model 172 Series 1996 and On Maintenance Manual, Chapter 71, Powerplant.)

20. Remove maintenance warning tags from battery and external power receptacle.

21. (Refer to the Pilot's Operating Handbook) Do a "before takeoff engine operation check".

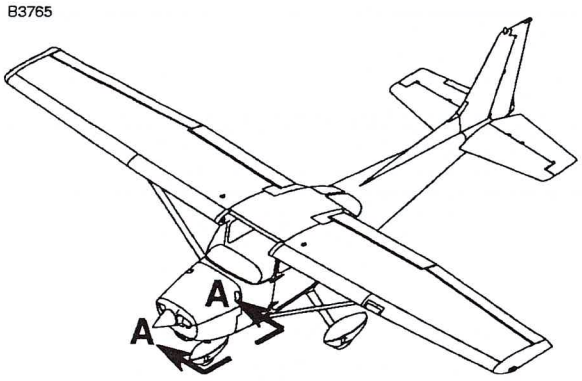
22. Put the applicable revision into the Pilot's Operating Handbook if it has not previously been incorporated.

    NOTE: Model 172R Pilot's Operating Handbook and FAA Approved Airplane Flight Manual, Revision 9, or latest revision.

    Model 172S Pilot's Operating Handbook and FAA Approved Airplane Flight Manual, Revision 5, or latest revision.

    Model 172R 180HP Pilot's Operating Handbook and FAA Approved Airplane Flight Manual, Revision 3, or latest revision.

23. Make an entry in the airplane logbook that states this Modification Kit has been installed.



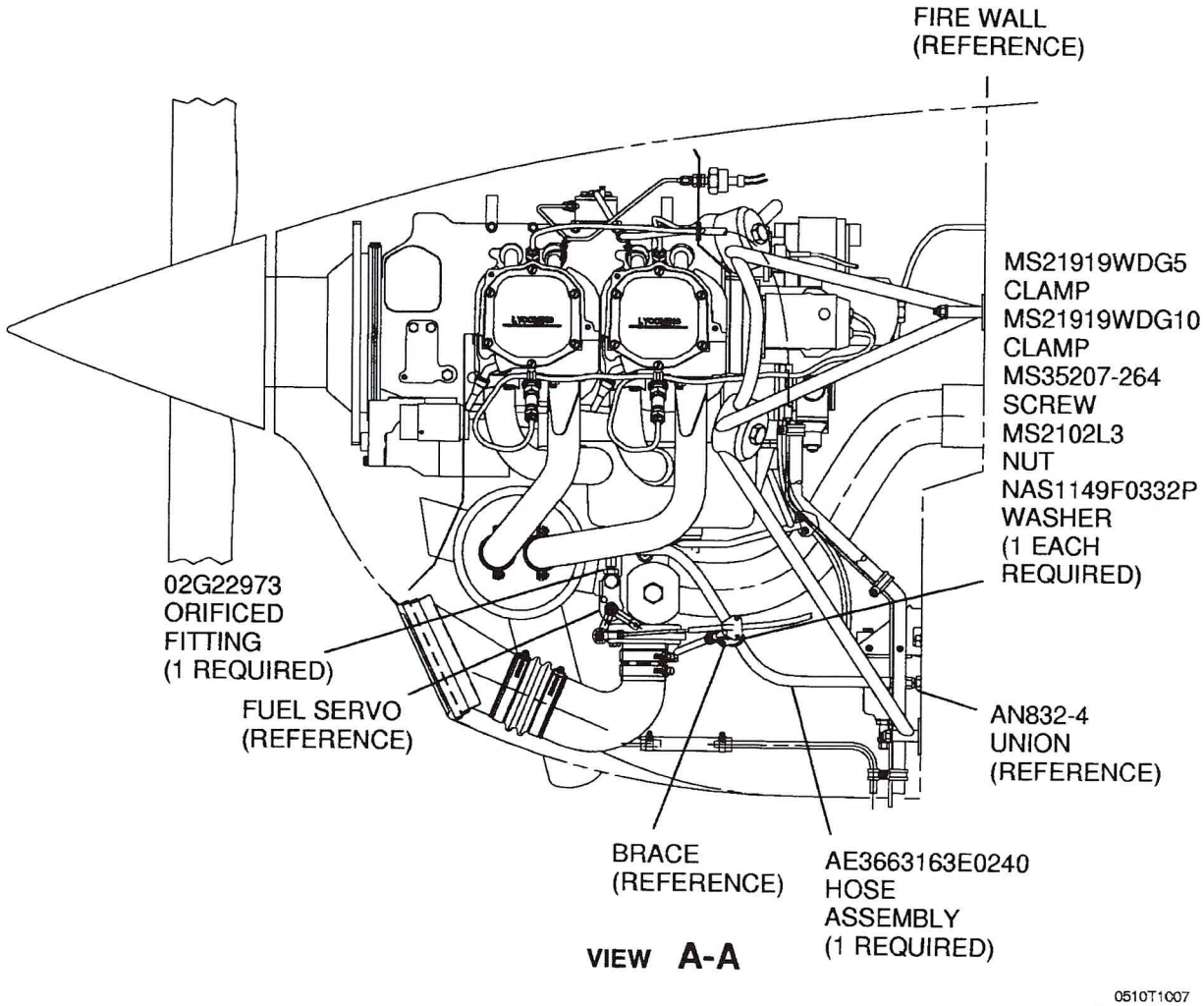


Figure 1. Fuel Return System Installation (Sheet 1)

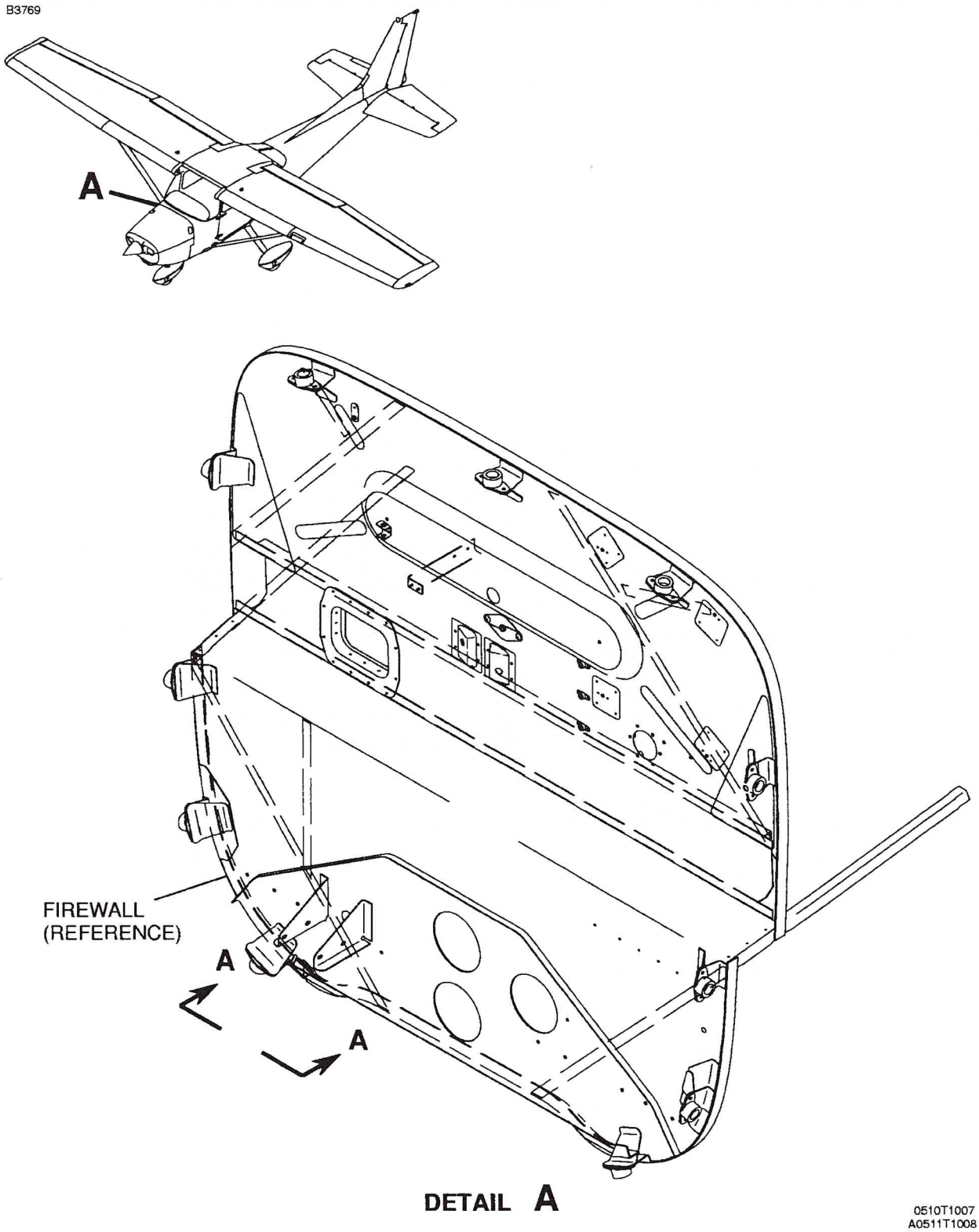
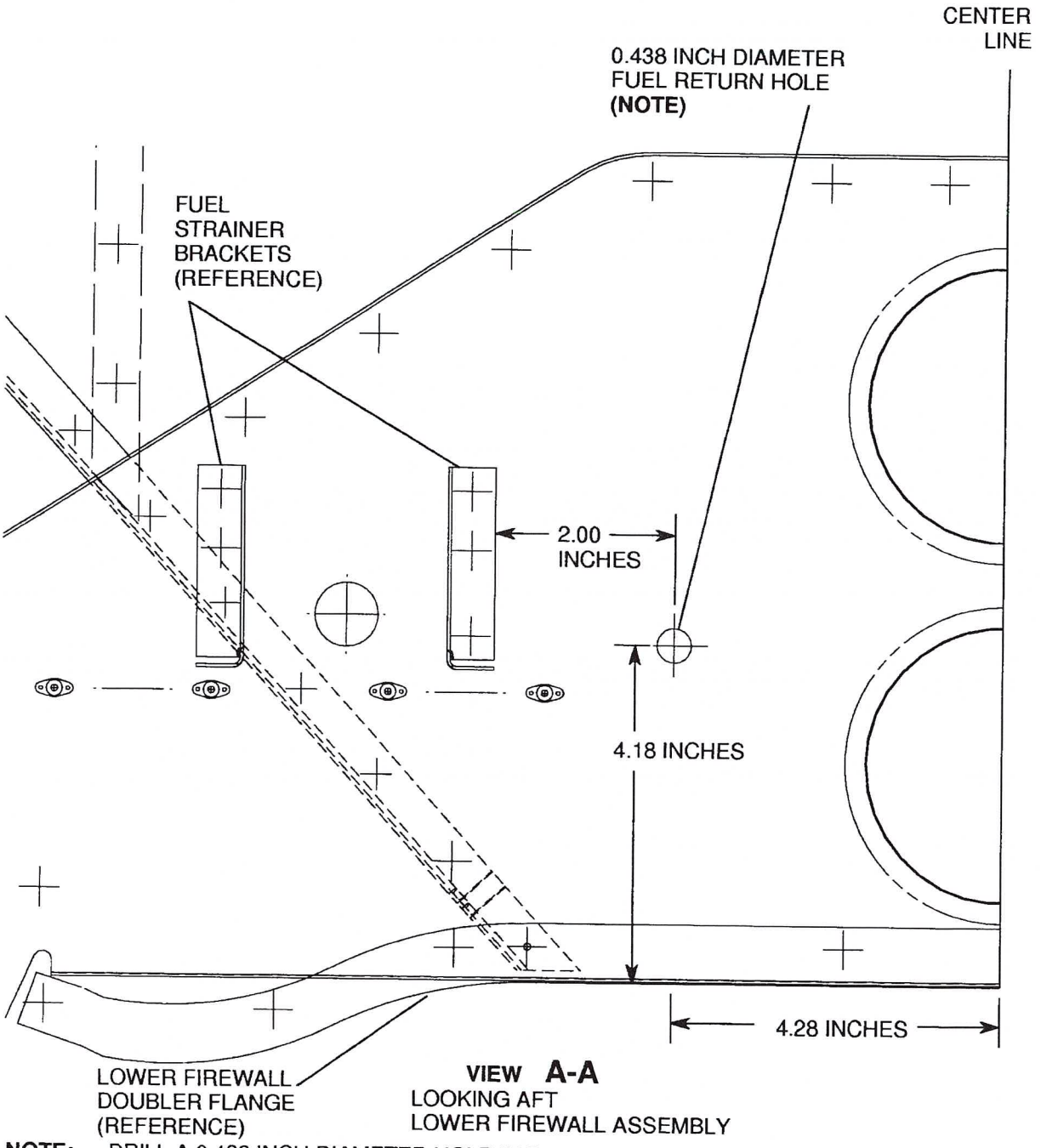


Figure 2. Fuel Return Firewall Hole Installation (Sheet 1)



NOTE: DRILL A 0.438 INCH DIAMETER HOLE IN THE LOCATION SHOWN AND MAKE SURE YOU DO NOT DRILL INTO ANY OBSTRUCTIONS OR STRUCTURE ON THE AFT SIDE OF FIREWALL.

0553T031

Figure 2. Fuel Return Firewall Hole Installation (Sheet 2)

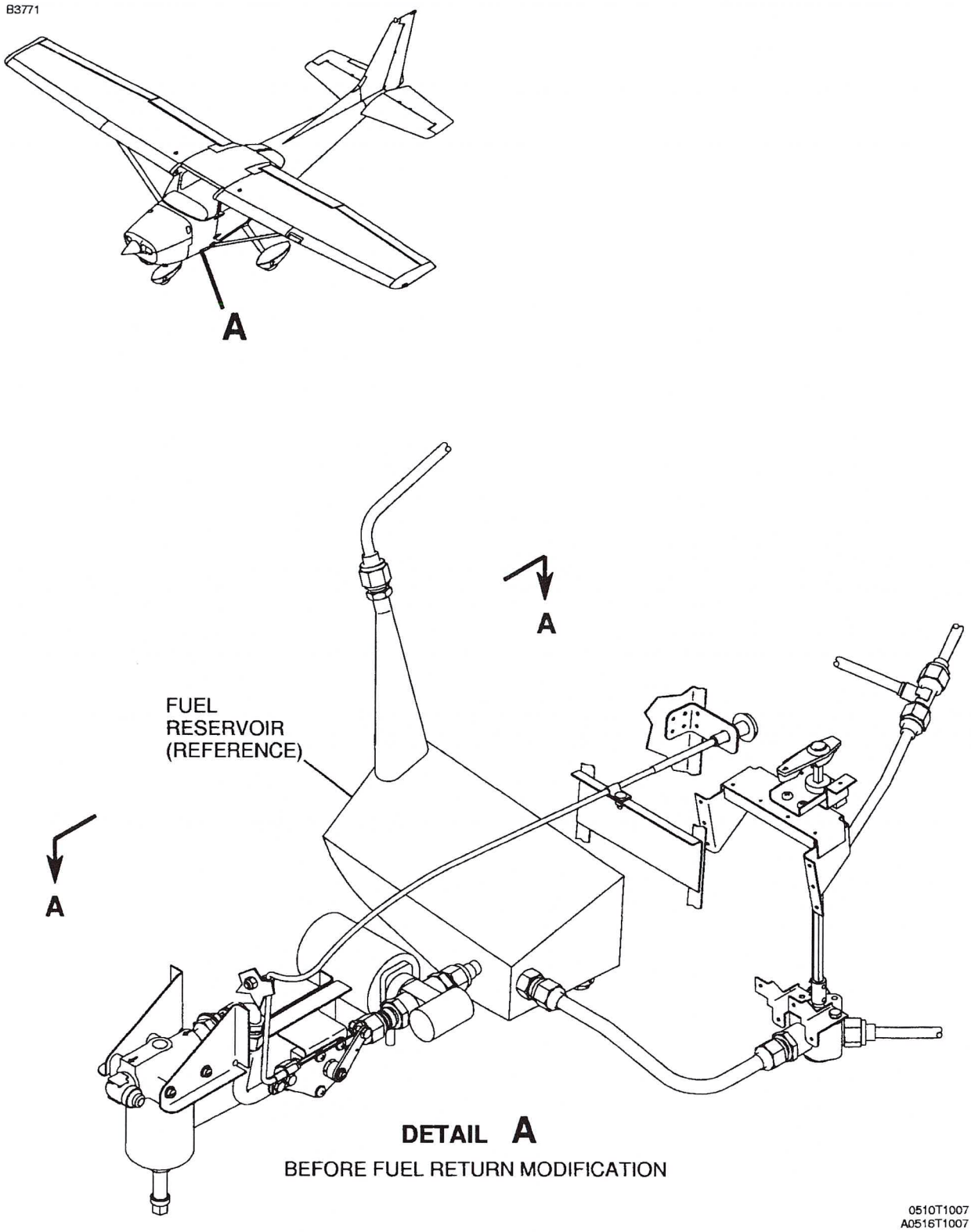


Figure 3. Fuel Return to Reservoir Installation (Sheet 1)

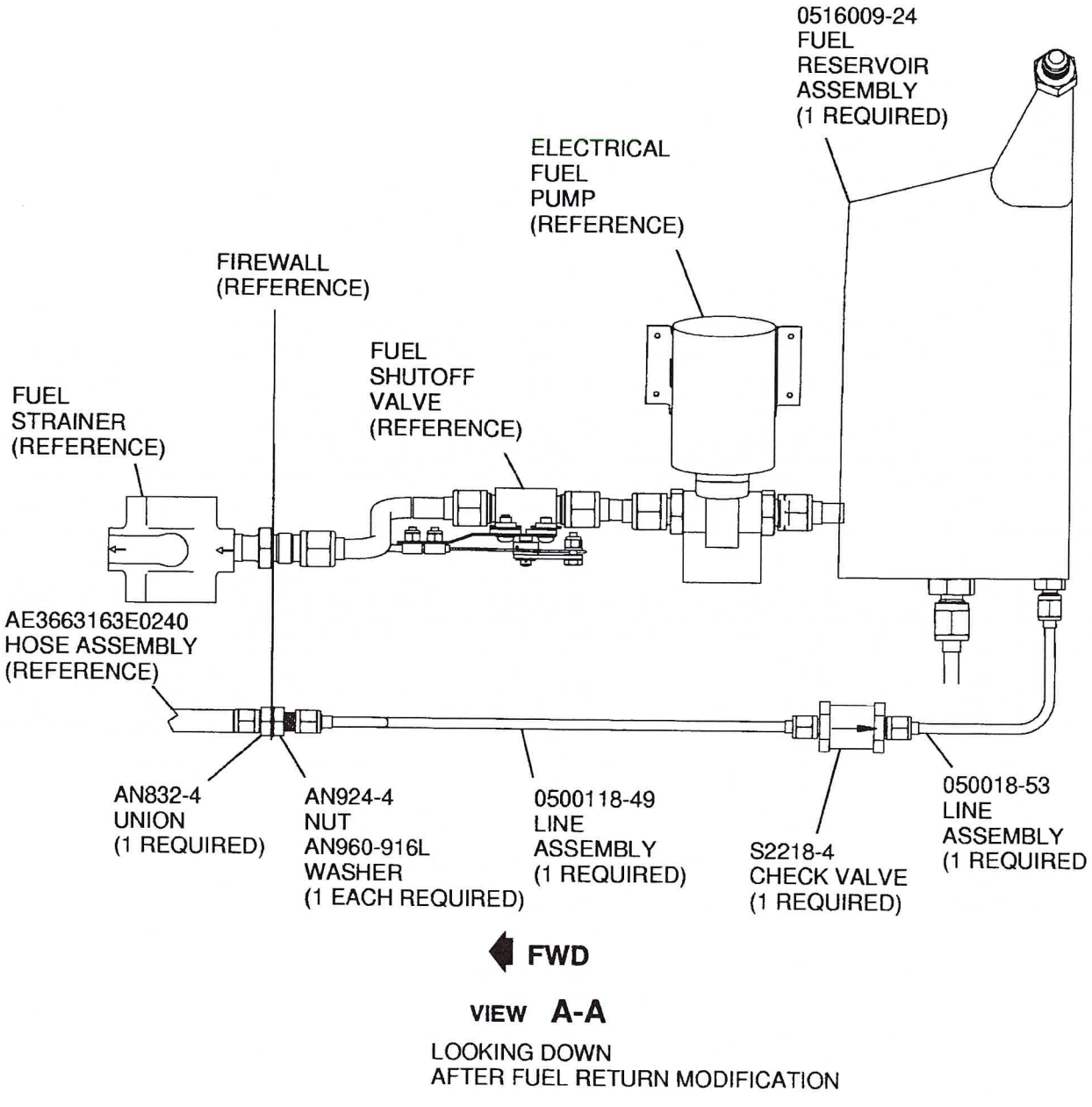


Figure 3. Fuel Return to Reservoir Installation (Sheet 2)

Cessna
A Textron Company

Service Bulletin

October 11, 2004 SB04-73-02

TITLE

ENGINE FUEL MANIFOLD SPRING REPLACEMENT

EFFECTIVITY

Model	Serial Numbers
172R	17280001 thru 17281224
172S	172S8001 thru 172S9684
206H	20608001 thru 20608178 and 20608181
T206H	T20608001 thru T20608039, T20608041 thru T20608367, T20608369 thru T20608379, T20608381, T20608382 and T20608385

NOTE: Airplane serial numbers 17281225 and On, 172S9685 and On, 18280001 and On, T18208001 and On, 20608179, 20608180, 20608182 and On, T20608040, T20608368, T20608380, T20608383, T20608384, T20608386 and On were delivered from Cessna with the 4 psi engine fuel manifold spring installed.

NOTE: This Service Bulletin supersedes SB99-73-01 and SB99-73-01 Revision 1.

REASON

To transmit Lycoming Service Instruction No. 1489B: Fuel Manifold Spring Change, which provides for replacement of the existing engine fuel manifold flow divider spring with a new spring designed to enhance engine idle characteristics during ground operations, especially in hot weather.

DESCRIPTION

The fuel flow divider spring in the engine fuel manifold should be replaced with a new spring as specified in Lycoming Service Instruction No. 1489B (or latest revision). Non-compliance with this Service Bulletin may allow a rough engine idle condition to occur.

COMPLIANCE

Optional; may be accomplished if desired

NOTE: Compliance with this Service Bulletin is not required for airplanes/engines in compliance with SB99-73-01 or SB99-73-01 Revision 1.

To obtain satisfactory results, procedures specified in this publication must be accomplished in accordance with accepted methods and prevailing government regulations. Cessna Aircraft Company cannot be responsible for the quality of work performed in accomplishing the requirements of this publication.

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APPROVAL

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

MANPOWER

Approximately 1.5 man-hours per airplane for spring replacement.

REFERENCES

Lycoming Service Instruction No. 1489B (or latest revision)

Model 172 Series 1996 And On Maintenance Manual

Model 206/T206 Series 1998 And On Maintenance Manual

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 and should be accomplished within the specified time requirement.

OTHER PUBLICATIONS AFFECTED

Model 172R and Model 172S Illustrated Parts Catalog

Model 206H & Model T206H Illustrated Parts Catalog

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

MATERIAL PRICE AND AVAILABILITY

The following is available from Cessna Parts Distribution through an appropriate Cessna Service Station for the suggested list price shown.

Part Number	Description	Qty/Airplane		Price
2577011	Spring	1	$	3.56 (LN) ea

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CREDIT INFORMATION

For affected 172R and 172S airplanes only:

Applicable parts credit and a labor allowance credit of 1.5 man-hours per airplane will be provided for spring replacement.

To receive credit, the work must be completed and a Warranty Claim submitted by a Cessna Single Engine Service Station within 30 calendar days of Service Bulletin compliance before the credit expiration dates shown below.

Domestic	October 11, 2005
International	October 11, 2005

ACCOMPLISHMENT INSTRUCTIONS

NOTE: Refer to appropriate sections of the applicable Maintenance Manual and Illustrated Parts Catalog as necessary to complete the following 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. Disconnect the airplane battery and attach maintenance warning tags to the battery and external power receptacle that have **"DO NOT CONNECT ELECTRICAL POWER - MAINTENANCE IN PROGRESS"** written on them. (Refer to the Model 206H/T206H Series 1998 And On Maintenance Manual, Chapter 24, Electrical Power.)
3. Gain access to the engine fuel manifold flow divider.
4. Replace the flow divider spring according to Steps 1 through 9 of the attached Lycoming Service Instruction No. 1489B (or latest revision).
5. Reconnect the airplane battery. (Refer to the Model 206H/T206H Series 1998 And On Maintenance Manual, Chapter 24, Electrical Power.
6. Do Step 10. of Lycoming Service Instruction No. 1489B (or latest revision).

   NOTE: Engine Oil operating temperature should be a minimum of 150 degrees Fahrenheit.

7. Do a leak test of any connections that were moved, disconnected, or otherwise changed.
8. Do Step 11. of Lycoming Service Instruction No. 1489B (or latest revision).
9. Install all items that were removed to gain access as necessary.
10. Make an entry in the appropriate logbooks stating compliance with this Service Bulletin/Lycoming Service Instruction No. 1489B (or latest revision).

OWNER NOTIFICATION

On October 25, 2004 the following Owner Advisory message was sent to applicable owners of record in SB04-73-02A.

Dear Cessna Owner:

This is to inform you that Cessna Service Bulletin SB04-73-02 has been issued to transmit Lycoming Service Instruction No. 1489B. Service Instruction No. 1489B provides for replacement of the existing engine fuel manifold flow divider spring with a new spring that is designed to enhance engine idle characteristics during ground operations, especially in hot weather. Non-compliance with SB04-73-02/Lycoming Service Instruction No. 1489B may allow a rough engine idle condition to occur during ground operations in hot weather.

Compliance is optional; may be accomplished if desired.

NOTE: Compliance with this Service Bulletin is not required for airplanes/engines in compliance with SB99-73-01 or SB99-73-01 Revision 1.

The information contained in the referenced Cessna Service Bulletin shall be considered an amendment to the Cessna Manufacturer's Service/Maintenance Manual.

For affected 172R and 172S airplanes only:

Applicable parts credit and a labor allowance credit of 1.5 man-hours per airplane will be provided for spring replacement.

To receive credit, the work must be completed and a Warranty Claim submitted by a Cessna Single Engine Service Station within 30 calendar days of Service Bulletin compliance before the credit expiration dates shown below.

Domestic	October 11, 2005
International	October 11, 2005

Please contact a Cessna Single Engine Service Station for detailed information and make arrangements to have Service Bulletin SB04-73-02/Lycoming Service Instruction No. 1489B (or latest revision) accomplished on your airplane.

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LYCOMING
A Textron Company

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SERVICE INSTRUCTION

DATE: October 27, 2003

Service Instruction No. 1489B
(Supersedes Service Instruction No. 1489A)

SUBJECT: Fuel Manifold Spring Change

MODELS AFFECTED: IO-360-L2A model engines installed in Cessna 172R and 172S aircraft; IO-540-AB1A5 model engines installed in Cessna 182 aircraft; IO-540-AC1A5 model engines installed in Cessna 206 aircraft; TIO-540-AJ1A model engines installed in Cessna T206 aircraft with a 2psi fuel flow divider spring (with detail P/N 2576532-1 or 2576556-1 marked on top of cover).

TIME OF COMPLIANCE: At owner's discretion.

To improve idle characteristics, especially in hot weather, a 2psi flow divider spring may be replaced with a new 4psi spring, Precision P/N 2577011 in IO-360-L2A, IO-540-AB1A5, IO-540-AC1A5 and TIO-540-AJ1A model engines.

The replacement of the spring is accomplished as follows:

1. Remove the top cowling.
2. Access the flow divider cover. If the divider is installed "cap down" it will have to be removed from the engine.
3. Remove the safety wire and the four screws securing the top of the flow divider.
4. Carefully remove the cover of the flow divider, using care not to damage the diaphragm. The diaphragm should not be removed from the body, and care should be taken not to allow the diaphragm to rotate in the body.
5. Remove the spring above the diaphragm and discard it.
6. Install the new Precision P/N 2577011 spring on top of the diaphragm insuring that it is seated in the metal cup on top of the diaphragm.
7. Reinstall the cover and torque the four screws to 20-30 in.-lbs. Retighten after 20 minutes. Insure the cover is reinstalled in the same position it was removed.
8. To show that the new 4psi spring has been installed, vibropeen "4psi" next to the Precision part number on the cover of the flow divider.
9. Lockwire the four cover screws with a single strand of .025" lockwire. Wire must pull screws clockwise and be twisted only at the ends.
10. Start the engine and warm it up to operating temperatures.
11. Check the idle speed and mixture and reset to the Cessna specified values if necessary.
12. Enter compliance in the airframe and/or maintenance records as required.

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Cessna
A Textron Company

Revision Transmittal

September 30, 2002

TO: Cessna Distributors, Single Engine Service Stations and CPC's

SUBJECT: Single Engine Service Bulletin SB99-73-01 Revision 1, Engine Fuel Manifold Spring Replacement

REASON FOR REVISION

To transmit Lycoming Service Instruction No. 1489A: Fuel Manifold Spring Change.

To add airplane serial numbers 20608001 thru 20608178 and T20608001 thru T20608385 to the Effectivity section.

Miscellaneous changes as required.

REQUIRED ACTION

Please replace any copy of SB99-73-01 with the attached copy of SB99-73-01 Revision 1 which is printed in its entirety.

NOTE: Compliance with this revision is not required if in compliance with the original issue of this service bulletin.

LOG OF EFFECTIVE PAGES

Page No.	Date
1	September 30, 2002
2	September 30, 2002
3	September 30, 2002

* * * * * * *

To obtain satisfactory results, procedures specified in this publication must be accomplished in accordance with accepted methods and prevailing government regulations. Cessna Aircraft Company cannot be responsible for the quality of work performed in accomplishing the requirements of this publication.

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Cessna
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Service Bulletin

September 30, 2002

SB99-73-01
Revision 1

TITLE

ENGINE FUEL MANIFOLD SPRING REPLACEMENT

EFFECTIVITY

Model	Serial Numbers
172R	17280001 thru 17280585, 17280587 thru 17280599, 17280601 thru 17280627, and 17280629 thru 17280671
172S	172S8001, 172S8074 and 172S8081
206H	20608001 thru 20608178 and 20608181
T206H	T20608001 thru T20608039, T20608041 thru T20608367, T20608369 thru T20608379, T20608381 thru T20608382 and T20608385

REASON

To transmit Lycoming Service Instruction No. 1489A: Fuel Manifold Spring Change, which provides for replacement of the existing engine fuel manifold flow divider spring with a new spring designed to assist in preventing the possibility of rough engine idle.

DESCRIPTION

The fuel flow divider spring in the engine fuel manifold should be replaced with a new spring as specified in Lycoming Service Instruction No. 1489A (or latest revision). Non-compliance with this service bulletin may allow a rough engine idle condition to occur.

COMPLIANCE

For affected 172R and 172S airplanes:

Recommended; should be accomplished within the next 100 hours of operation or 12 months, whichever occurs first.

NOTE: Compliance with this revision is not required if in compliance with the original issue of this service bulletin.

For affected 206H and T206H airplanes:

Optional; may be accomplished if desired

To obtain satisfactory results, procedures specified in this publication must be accomplished in accordance with accepted methods and prevailing government regulations. Cessna Aircraft Company cannot be responsible for the quality of work performed in accomplishing the requirements of this publication.

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APPROVAL

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

MANPOWER

1.5 man-hours per airplane for spring replacement.

REFERENCES

Lycoming Service Instruction No. 1489A (or latest revision)

Model 172 Series 1996 And On Maintenance Manual

Model 206/T206 Series 1998 And On Maintenance Manual

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 and should be accomplished within the specified time requirement.

OTHER PUBLICATIONS AFFECTED

Model 172R and Model 172S Illustrated Parts Catalog

Model 206H & Model T206H Illustrated Parts Catalog

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

MATERIAL PRICE AND AVAILABILITY

The following is available from Cessna Parts Distribution through an appropriate Cessna Service Station for the suggested list price shown.

Part Number	Description	Qty/Airplane		Price
2577011	Spring	1	$	39.72 (P) ea.

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CREDIT INFORMATION

For affected 172R and 172S airplanes:

Applicable parts credit and a labor allowance credit of 1.5 man-hours per airplane will be provided for spring replacement.

To receive credit, the work must be completed and a Warranty Claim submitted by a Cessna Single Engine Service Station before the dates shown below. Any removed spring must be returned with the Warranty Claim.

Domestic . . . . . January 18, 2000
International . . . . . January 18, 2000

For affected 206H and T206H airplanes:

Not applicable

ACCOMPLISHMENT INSTRUCTIONS

NOTE: Refer to appropriate sections of the applicable Maintenance Manual and Illustrated Parts Catalog as necessary to complete the following instructions.

1. Gain access to the engine fuel manifold flow divider.
2. Replace the flow divider spring according to the attached Lycoming Service Instruction No. 1489A (or latest revision).
3. Do Step 10. of Lycoming Service Instruction No. 1489A (or latest revision).

   NOTE: Engine Oil operating temperature should be a minimum of 150 degrees Fahrenheit.
4. Do Step 11. of Lycoming Service Instruction No. 1489A (or latest revision).
5. Make an entry in the appropriate logbooks stating compliance with this Service Bulletin/Lycoming Service Instruction No. 1489A (or latest revision).

OWNER NOTIFICATION

On January 18, 1999, the following Owner Advisory message was sent to applicable owners of record in SB99-73-01A.

Dear Cessna Owner:

This is to inform you that Textron Lycoming has issued Service Instruction No. 1489 which provides for replacement of the existing engine fuel manifold flow divider spring with a new spring that is designed to assist in preventing the possibility of rough engine idle. Non-compliance with Service Bulletin SB99-73-01/Textron Lycoming Service Instruction No. 1489 may allow a rough engine idle condition to occur.

Compliance is recommended; should be accomplished within the next 100 hours of operation or 12 months, whichever occurs first.

Applicable parts credit and a labor allowance credit of 1.5 man-hours per airplane will be provided for spring replacement. To receive credit, the work must be completed and a Quick Claim must be submitted by a Single Engine Service Station before the dates shown below.

Domestic	January 18, 2000
International	January 18, 2000

Please contact a Cessna Single Engine Service Station for detailed information and make arrangements to have Service Bulletin SB99-73-01/Textron Lycoming Service Instruction No. 1489 (or latest revision) accomplished on your airplane.

* * * * * * *

LYCOMING
A Textron Company

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SERVICE INSTRUCTION

DATE: June 11, 2002

Service Instruction No. 1489A
(Supersedes Service Instruction No. 1489)
Engineering Aspects are
FAA Approved

SUBJECT: Fuel Manifold Spring Change

MODELS AFFECTED: All IO-360-L2A model engines with serial numbers up to and including L-27982-51A installed in Cessna 172R aircraft; all IO-540-AC1A5 model engines shipped from the factory before June 10, 2002 installed in Cessna 206 aircraft; all TIO-540-AJ1A model engines shipped from the factory before June 10, 2002 installed in Cessna T206 aircraft.

TIME OF COMPLIANCE: At owner's discretion.

To improve idle characteristics, especially in hot weather, the flow divider spring is being replaced with a new 4psi spring, Precision P/N 2577011 in IO-360-L2A, IO-540-AC1A5 and TIO-540-AJ1A model engines.

The replacement of the spring is accomplished as follows:

1. Remove the top cowling.
2. Access the flow divider cover. If the divider is not installed "cap down" it will have to be removed from the engine.
3. Remove the safety wire and the four screws securing the top of the flow divider.
4. Carefully remove the cover of the flow divider, using care not to damage the diaphragm. The diaphragm should not be removed from the body, and care should be taken not to allow the diaphragm to rotate in the body.
5. Remove the spring above the diaphragm and discard it.
6. Install the new Precision P/N 2577011 spring on top of the diaphragm insuring that it is seated in the metal cup on top of the diaphragm.
7. Reinstall the cover and torque the four screws to 20-30 in.-lbs. Retighten after 20 minutes. Insure the cover is reinstalled in the same position it was removed.
8. To show that the new 4 psi spring has been installed, vibropeen "4psi" next to the Precision part number on the cover of the flow divider.

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9. Lockwire the four cover screws with a single strand of .025" lockwire. Wire must pull screws clockwise and be twisted only at the ends.

10. Start the engine and warm it up to operating temperatures.

11. Check the idle speed and mixture and reset to the Cessna specified values if necessary.

12. Enter compliance in the airframe and/or maintenance records as required.

NOTE: Revision "A" adds engine models IO-540-AC1A5 and TIO-540-AJ1A.

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SERVICE INSTRUCTION

DATE: March 9, 2011

Service Instruction No. 1489C
(Supersedes Service Instruction No. 1489B)
Engineering Aspects are
FAA (DER) Approved

SUBJECT: Fuel Manifold Spring Change

MODELS AFFECTED: IO-360-L2A model engines installed in Cessna 172R and 172S aircraft; IO-540-AB1A5 model engines installed in Cessna 182 aircraft; IO-540-AC1A5 model engines installed in Cessna 206 aircraft; TIO-540-AJ1A model engines installed in Cessna T206 aircraft with a 2 psi fuel flow divider spring (with detail P/N 2576532-1 or 2576556-1 marked on top of cover).

TIME OF COMPLIANCE: At owner's discretion.

NOTE

Incomplete review of all the information in this document can cause errors. Read the entire Service Instruction to make sure you have a complete understanding of the requirements.

This Service Instruction identifies a new 4 psi flow divider spring Precision P/N 2577011 that is available as a replacement for the 2 psi flow divider spring for improved idle characteristics, especially in hot weather, for Lycoming engine models IO-360-L2A, IO-540-AB1A5, IO-540-AC1A5, and TIO-540-AJ1A. This Service Instruction is NOT a substitute for adjusting the fuel system and idle RPM. A check of the fuel adjustment must be done after the spring is installed.

To replace the flow divider spring:

1. Remove the top cowling.
2. Open the flow divider cover by removing the safety wire and the four screws that attach the top of the flow divider.
3. Carefully remove the cover of the flow divider. Use care not to damage the diaphragm. Do not remove the diaphragm from the body. Do not let the diaphragm rotate in the body.
4. Remove the spring above the diaphragm. Discard the spring.
5. Install the new 4 psi Precision flow divider spring P/N 2577011 on top of the diaphragm. Make sure the spring is installed in the metal cup on top of the diaphragm.

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6. Install the cover in the same position it was removed using the four screws. Torque the four screws 20 to 30 in.-lb. (2.6 to 3.4 Nm). After 20 minutes, re-torque the screws 20 to 30 in.-lb. (2.6 to 3.4 Nm).
7. Use a vibropeen tool and make a "4 psi" etch mark next to the Precision part number on the cover of the flow divider.
8. Safety the four cover screws with a single strand of 0.025 in. (0.64 mm) lockwire. The lockwire must pull screws clockwise, twisted only at the ends.
9. Start the engine and operate it to specified operating temperatures. Do a visual leak check.
10. Do a check of the idle speed and mixture; set to Cessna specified idle speed and mixture values if necessary.
11. Enter compliance with this Service Instruction in the airframe and/or maintenance logbook.

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SERVICE INSTRUCTION

DATE: April 12, 2011

Service Instruction No. 1497A
(Supersedes Service Instruction No. 1497)
Engineering Aspects are
FAA (DER) Approved

SUBJECT: Engine Procedures for Flight Training Operations

MODELS AFFECTED: Lycoming IO-360-L2A engines installed in Cessna C172R and 172S aircraft used in training operations

TIME OF COMPLIANCE: As required during aircraft operations

NOTE

Incomplete review of all the information in this document can cause errors. Read the entire Service Instruction to make sure you have a complete understanding of the requirements.

The flight training environment makes an engine more susceptible to spark plug fouling, decreased efficiency, and excessive fuel consumption. Some of the flight training profiles that cause these conditions include over-priming, prolonged idling, a taxi at low engine speeds, and extended operation at full rich mixture.

This Service Instruction identifies recommended procedures that can decrease the aforementioned effects on the engine.

NOTE

These procedures are in addition to Cessna's published operating procedures.

A. Start-up and Ground Operations

1. Start the engine in accordance with the procedures given in the aircraft Pilot's Operating Handbook (POH) or Airplane Flight Manual (AFM). Do not engage in over-priming the engine. Over-priming can cause a delay in starting the engine and spark plug fouling.
2. Set the throttle to 1200 RPM for warm-up.
3. Once temperatures are stable, make the mixture Lean to Best Power.

   Leaning Technique

   a. Slowly make the fuel mixture lean until the RPM decreases.

   b. Make the fuel mixture Rich until the engine operates smoothly.
4. Set the throttle to 1000 RPM.
5. Move the throttle as necessary to operate the engine as per specifications.

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6. Do a ground check in accordance with the POH or AFM.
7. After satisfactory ground check, set the engine power to 1200 RPM.
8. Do a check of the fuel mixture to make sure the engine is at Best Power.
9. Set the throttle to 1000 RPM and hold this setting until clearance for take-off.
10. For take-off, set the mixture to Full Rich. (For high elevation fields, fuel leaning could be necessary for smooth engine operation. Refer to the aircraft POH or AFM.)
11. Monitor engine indicators to make sure the engine is operating with specified limits in the aircraft POH or AFM.

B. Flight Operations

1. Climb

Below 3000 feet density altitude, use the Full Rich mixture.

Above 3000 feet density altitude, make the fuel mixture Lean to maximum RPM.

Leaning Technique

a. Slowly make the fuel mixture Lean until the RPM decreases.
b. Make the fuel mixture Rich until the engine operates smoothly.
c. Make the fuel mixture Rich by turning the mixture knob an additional 1/2 turn (approximately 180 degrees rotation).

2. Cruise

Make the fuel mixture Lean to maximum RPM (all altitudes).

Leaning Technique

a. Slowly make the fuel mixture Lean until the RPM decreases.
b. Make the fuel mixture Rich until the engine operates smoothly.
c. Make the fuel mixture Rich by turning the mixture knob an additional 1/2 turn (approximately 180 degrees rotation).

NOTE

Move engine controls smoothly and slowly. Always put the fuel mixture back to Full Rich before increasing power settings.

3. Landing

On approach, set the fuel mixture at Full Rich.

C. Ground Operation and Engine Shut Down

1. If an extended taxi is likely, make the fuel mixture Lean to Best Power during taxi.

Leaning Technique

a. Slowly make the fuel mixture Lean until the RPM decreases.
b. Make the fuel mixture Rich until the engine operates smoothly.

2. After engine temperature gages are stable within specified readings at 1000 to 1200 RPM, move the fuel mixture control to Idle Cut-Off.

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SERVICE INSTRUCTION

DATE: January 7, 2019

Service Instruction No. 1498B
(Supersedes Service Instruction No. 1498A)
Engineering Aspects are
FAA (DER) Approved

SUBJECT: Recommended Engine Procedures for Purge of Vapor During Ground Operations

MODELS AFFECTED: Lycoming engines equipped with fuel injection.

TIME OF COMPLIANCE: As necessary during aircraft operations when symptoms of fuel vaporization are encountered.

REASON FOR REVISION: Removed model specific references.

NOTE

Incomplete review of all the information in this document can cause errors. Read the entire Service Instruction to make sure you have a complete understanding of the requirements.

The fuel system is more susceptible to vapor formation and its effects during operation in warm weather. This Service Instruction identifies vapor symptoms and corrective action necessary to remove vapor from the fuel system.

NOTE

These procedures are in addition to AFM / POH published operating procedures.

A. Symptoms of Vapor in the Fuel System

Vapor can occur in the fuel system during ground operations at low RPM when the ambient temperature conditions are sufficient to cause the fuel to vaporize in the fuel injection lines. The symptoms of fuel vapor include:

1. Fluctuation of idle speed and fuel flow
2. Poor engine response to throttle movement
3. Engine will not operate when throttle is closed
4. High RPM drop (>175 RPM) during magneto check

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B. Corrective Action

NOTE

When the engine is operated above 1800 RPM, fuel flow increases and fuel temperatures throughout the fuel system are greatly decreased. The increased fuel flow removes any vapor and the cooler fuel stops vaporization.

If one or more symptoms of vapor in the fuel system occur during ground operation, do the following:

1. Advance the throttle to an engine speed of 1800 to 2000 RPM.
2. Continue operation at this speed for 1 to 2 minutes or until operation becomes smooth.
3. Make sure oil temperature stays within limits.
4. Move the throttle to idle to do a check for correct idle operation.
5. Move the throttle to 1200 RPM and operate at Lean for taxi.
6. Immediately before brake release for take-off roll:
   a. Set the mixture to Full Rich. (For high elevation fields, fuel leaning could be necessary to smooth engine operation. Refer to the POH or AFM.)
   b. Move to full throttle and hold the position of full throttle for 10 seconds (in coordination with ATC as necessary).

TEXTRON Lycoming

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SERVICE INSTRUCTION

DATE: December 19, 2000

Service Instruction No. 1502A
(Supersedes Service Instruction No. 1502)
Engineering Aspects are
FAA Approved

SUBJECT: Installation of Inverted Flow Divider

MODELS AFFECTED: All Textron Lycoming IO-360-L2A aircraft engines.

TIME OF COMPLIANCE: Whenever the engine has vapor related problems, or at owner's discretion.

To reduce the possibility of vapor related problems in aircraft employing IO-360-L2A model engines, the flow divider should be modified into an inverted flow divider.

The modification of the flow divider is accomplished as follows using Kit P/N 05K23084:

1. Remove top cowling.
2. Remove all fuel lines and the hose connected to the flow divider.
3. Remove the bolts, washers, two spacers and two brackets which secure the flow divider to the engine.
4. Remove the mounting brackets from the flow divider.
5. Modify the flow divider assembly as follows making sure that no foreign material is introduced into the part and the diaphragm is not damaged:

NOTE

During the modification procedure, the fuel inlet elbow fitting faces the front.

a. Remove the lockwire, screws and washers from the top of the flow divider assembly. (Figure 1.)

b. With the cap vent pointing left, slightly lift the manifold cap, making sure that it is separated from the diaphragm. Then carefully rotate it until cap vent points right. (180° from original position.) (Figure 1.) Be sure that the spring held in place by the cap is not dislodged.

c. Reinstall the flat washers and screws. (Torque the four screws to 20-30 in.lbs. Retighten after 20 minutes.) Lockwire the screws together as before.

d. To allow removal and installation of the 90° fuel inlet elbow, first remove the fuel gage fitting close to the elbow on the forward side of the flow divider. (Figure 2.)

e. Holding the flow divider with the manifold cap up, remove the 90° elbow P/N MS20822-4 and install the new 90° elbow with the elbow positioned below the gage fitting port pointed left and tilted approximately 20° below horizontal. Reinstall gage nipple. The angle allows clearance for hose connections. Before reinstalling the fittings, apply Loctite Hydraulic Sealant or an equivalent fuel soluble sealant sparingly. Do not apply sealant to the first two lead threads. (Figure 2.)

f. Vibropeen "INV" following the P/N 63B22623 which is located on the outside diameter of the flow divider assembly base.

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6. Install the new mounting brackets P/N 07A22995 and P/N 07A22996 on the flow divider assembly using the new screws and lockwashers P/N STD-82 and P/N STD-251 respectively. Torque to 49 in.-lbs. With the flow divider assembly positioned with the cap down and the 90° elbow toward the front of the engine, P/N 07A22995 should be installed on the right and P/N 07A22996 on the left. (Figure 3.) With new brackets installed, lockwire screws. (Figure 4.)

7. Install flow divider brackets on the engine using the bolts, washer, and spacers that were removed initially and new STD-160 washers. Torque to 96 in.-lbs. (Figure 3.)

8. Reconnect all hoses.

9. Check the idle speed and mixture and reset to specified values if necessary.

10. Enter compliance in the airframe and/or maintenance records as required.

Kit P/N 05K23084 contains:

1	07A22995	Bracket
1	07A22996	Bracket
4	STD-82	Screw
4	STD-251	Washer
1	MS20822-4	Elbow
2	STD-160	Washer

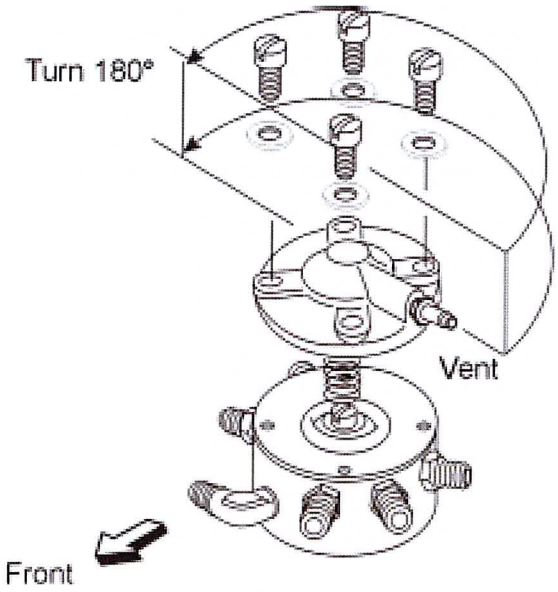

Figure 1.

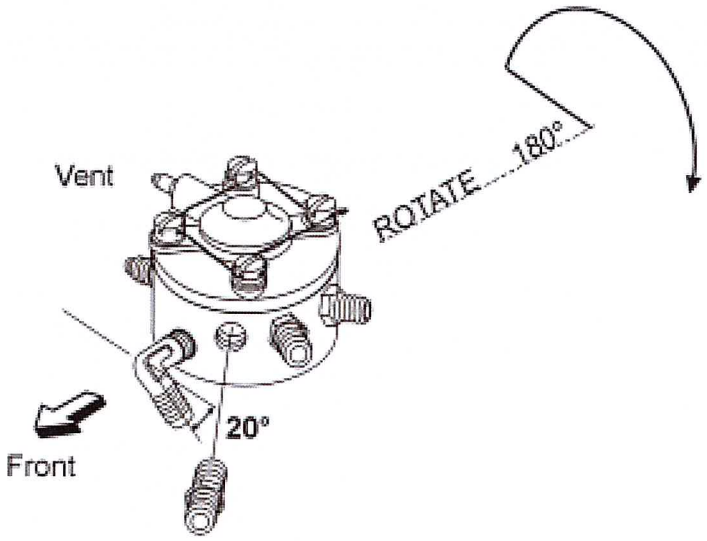

Figure 2.

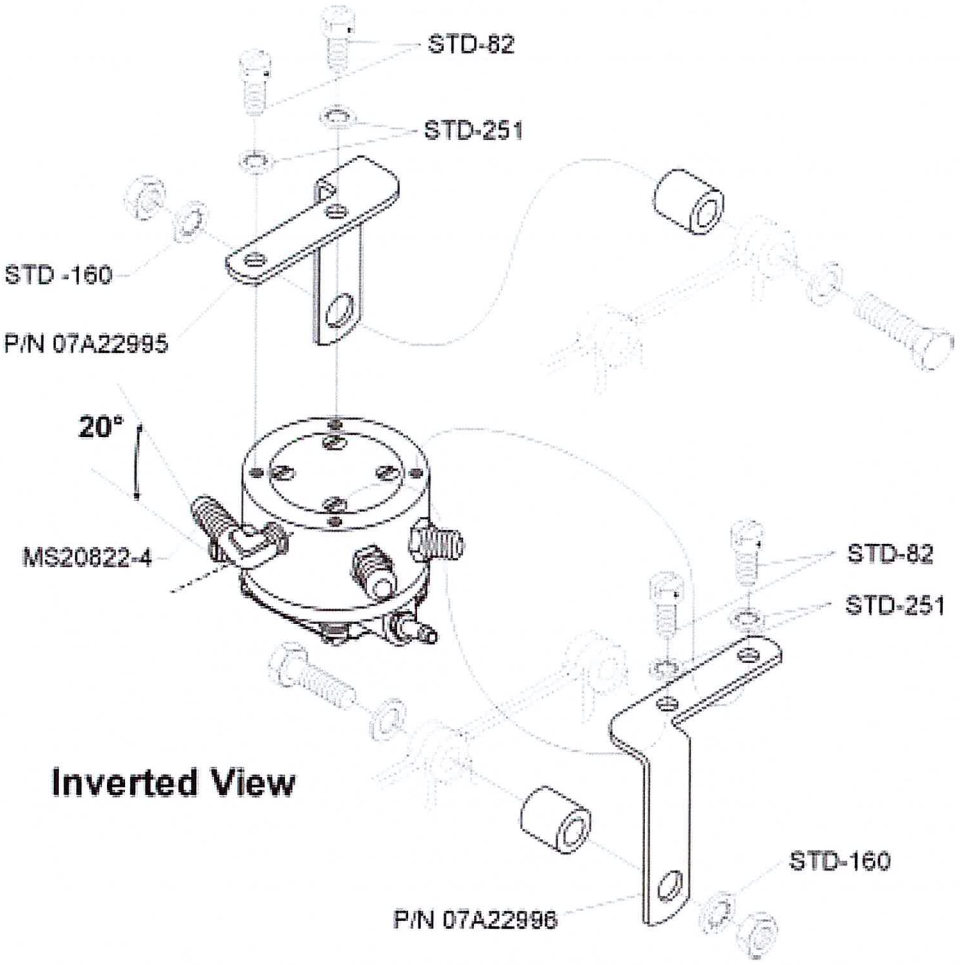

Figure 3.

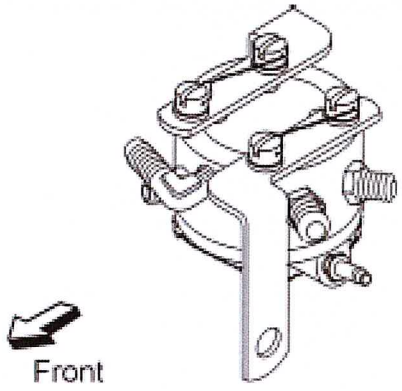

Figure 4.

NOTE: Revision "A" to this Service Instruction changes the torque requirements in step 7.

AIRWORTHINESS DIRECTIVES FINAL RULES: 2001-06-17

CITATION: [Federal Register: March 30, 2001]

PAGE NUMBER: [Page 17345]

DOCKET NUMBER: 2001-CE-14-AD

AMENDMENT: 39-12164

AD NUMBER: 2001-06-17

SUBJECT HEADING: Airworthiness Directives; Cessna Aircraft Company Models 172R and 172S Airplanes

ACTION: Final rule; request for comments.

SUMMARY: This amendment adopts a new airworthiness directive (AD) that applies to certain Cessna Aircraft Company (Cessna) Models 172R and 172S airplanes. This AD requires a one-time inspection for proper engine idle speed and fuel control mixture setting and adjustment, as necessary. This AD also requires incorporating engine operating procedures into the pilots operating handbook (POH) and FAA- approved airplane flight manual (AFM). This AD is the result of reports of rough engine operation because of an over-rich fuel mixture (improper fuel flow settings). The actions specified by this AD are intended to detect and correct such improper fuel flow settings, which could result in rough engine operation or engine stoppage. This over-rich fuel mixture also contributes to the engine not restarting during flight when using published in-flight restart procedures.

DATES: This AD becomes effective on April 20, 2001. The Federal Aviation Administration (FAA) must receive any comments on this rule on or before May 18, 2001.

ADDRESSES: Submit comments in triplicate to FAA, Central Region, Office of the Regional Counsel, Attention: Rules Docket No. 2001-CE-14-AD, 901 Locust, Room 506, Kansas City, Missouri 64106. You may examine information related to this AD at FAA, Central Region, Office of the Regional Counsel, Attention: Rules Docket No. 2001-CE-14-AD, 901 Locust, Room 506, Kansas City, Missouri 64106.

FOR FURTHER INFORMATION CONTACT: Mr. Paul Pendleton, Aerospace Engineer, Wichita Aircraft Certification Office, FAA, 1801 Airport Road, Mid-Continent Airport, Wichita, Kansas 67209; telephone: (316) 946-4143; facsimile: (316) 946-4407.

SUPPLEMENTARY INFORMATION:

Discussion

What events have caused this AD? The FAA has received several reports of improper engine fuel flow settings on Cessna Models 172R and 172S airplanes. These improper settings could prevent the engine from operating at idle speed when the pilot reduces power (i.e., landing approach, power off stalls, etc.). An over-rich fuel mixture is a reason why the engine may not operate at idle speed. This over-rich fuel mixture also contributes to the engine not restarting during flight when using published in-flight restart procedures.

The current pilot operating handbook (POH) and FAA-approved airplane flight manual (AFM) procedures for the Cessna Models 172R and 172S airplanes do not address the pilot bringing the throttle back to the hard idle stop (throttle full aft). The POH/AFM also does not address emergency engine restart procedures to enable

engine startup if a rich fuel mixture exists.

What are the consequences if the condition is not corrected? This condition, if not corrected, could result in rough engine operation or engine stoppage. The over-rich fuel mixture also contributes to the engine not restarting during flight when using published in-flight restart procedures.

FAA's Determination and an Explanation of the Provisions of this AD

What has FAA decided? The FAA has reviewed all available information and determined that:
- the unsafe condition referenced in this document exists or could develop on other Cessna Models 172R and 172S airplanes of the same type design;
- these airplanes should be inspected for proper engine idle speed and fuel control mixture setting, the engine idle speed or fuel control mixture setting should be adjusted as necessary, and engine operating procedures should be incorporated into the POH/AFM; and
- AD action should be taken in order to correct this unsafe condition.

Is there service information that applies to this subject? Cessna has issued Service Bulletin SB01-11- 02, dated March 5, 2001. This service bulletin:
- includes procedures for inspecting the engine idle speed; and
- specifies pilot operating procedure changes.

What does this AD require? This AD requires a one-time inspection for proper engine idle speed and fuel control mixture setting and adjustment, as necessary. This AD also requires incorporating engine operating procedures into the POH/AFM.

Procedures for accomplishing the inspection are included in the AD. We are not utilizing the procedures included in Cessna Service Bulletin SB01-11-02, dated March 5, 2001.

Why is FAA not requiring the actions specified in the service bulletin? The inspection procedures in Cessna Service Bulletin SB01-11-02 agree with the service manual procedures. The procedures we are including in this AD agree with the Cessna factory production procedures. After examining these procedures, FAA has determined that:
- the procedures in the service bulletin and service manual procedures are too restrictive for a pilot to accomplish in the field without using specialized equipment (portable electric tachometer);
- the pilot should be able to accomplish the inspection for proper engine idle speed and fuel control mixture setting; and
- the inspection procedures in this AD allow the pilot to both easily accomplish the inspection and address the safety intent of this AD.

Will I have the opportunity to comment prior to the issuance of the rule? Because the unsafe condition described in this could result in rough engine operation or engine stoppage, FAA finds that notice and opportunity for public prior comment are impracticable. Therefore, good cause exists for making this amendment effective in less than 30 days.

Comments Invited

How do I comment on this AD? Although this action is in the form of a final rule and was not preceded by notice and opportunity for public comment, we invite your comments on the rule. You may submit whatever written data, views, or arguments you choose. You need to include the rule's docket number and submit your comments in triplicate to the address specified under the caption "ADDRESSES." We will consider all comments received on or before the closing date specified above. We may amend this rule in light of comments received. Factual information that supports your ideas and suggestions is extremely helpful in evaluating the effectiveness of the AD action and determining whether we need to take additional rulemaking action.

Are there any specific portions of the AD that FAA wants me to address? The FAA specifically invites comments on the overall regulatory, economic, environmental, and energy aspects of the rule that might suggest

a need to modify the rule. You may examine all comments we receive before and after the closing date of the rule in the Rules Docket. We will file a report in the Rules Docket that summarizes each FAA contact with the public that concerns the substantive parts of this AD.

We are reviewing the writing style we currently use in regulatory documents, in response to the Presidential memorandum of June 1, 1998. That memorandum requires federal agencies to communicate more clearly with the public. We are interested in your comments on whether the style of this document is clear, and any other suggestions you might have to improve the clarity of FAA communications that affect you. You can get more information about the Presidential memorandum and the plain language initiative at http://www.plainlanguage.gov.

How can I be sure FAA receives my comment? If you want us to acknowledge the receipt of your comments, you must include a self-addressed, stamped postcard. On the postcard, write "Comments to Docket No. 2001-CE-14-AD." We will date stamp and mail the postcard back to you.

Regulatory Impact

Does this AD impact various entities? These regulations will not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, FAA has determined that this final rule does not have federalism implications under Executive Order 13132. Does this AD involve a significant rule or regulatory action? The FAA has determined that this regulation is an emergency regulation that must be issued immediately to correct an unsafe condition in aircraft, and is not a significant regulatory action under Executive Order 12866. It has been determined further that this action involves an emergency regulation under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). If it is determined that this emergency regulation otherwise would be significant under DOT Regulatory Policies and Procedures, a final regulatory evaluation will be prepared and placed in the Rules Docket (otherwise, an evaluation is not required). A copy of it, if filed, may be obtained from the Rules Docket.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Safety.

Adoption of the Amendment

Accordingly, under the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (14 CFR part 39) as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701. § 39.13 [Amended]

2. FAA amends § 39.13 by adding a new airworthiness directive (AD) to read as follows:

REGULATORY TEXT:

2001-06-17 CESSNA AIRCRAFT COMPANY: Amendment 39-12164; Docket No. 2001-CE-14-AD.

(a) What airplanes are affected by this AD? This AD applies to Models 172R and 172S, all serial numbers, that are certificated in any category.

(b) Who must comply with this AD? Anyone who wishes to operate any of the above airplanes must comply with this AD.

(c) What problem does this AD address? The actions specified by this AD are intended to detect and correct an over-rich fuel mixture (improper fuel flow settings), which could result in rough engine operation or engine stoppage. This over-rich fuel mixture also contributes to the engine not restarting during flight when using published in-flight restart procedures.

(d) What must I do to address this problem? To address this problem, you must accomplish the following actions:

Action	Compliance Time	Special Instructions
(1) Accomplish one of the following inspections for proper engine idle speed and fuel control mixture setting: (i) Pilot Procedure: Accomplish the inspection with the engine oil temperature between 120 and 150 degrees Fahrenheit (F). Assure that the engine idle setting is between 575 and 625 revolutions per minute (RPM) and the mixture setting will produce a minimum 10 RPM rise and a maximum 50 RPM rise with the throttle at the hard ground idle stop. Screw the vernier mixture out slowly counterclockwise to obtain the RPM rise. (ii) Mechanic Procedure: Accomplish the inspection with the engine oil temperature between 120 and 150 degrees F. Assure that the fuel mixture setting is between 575 and 625 RPM and the mixture setting will produce a minimum 10 RPM rise and a maximum 20 RPM rise with the throttle at the hard ground idle stop. Screw the vernier mixture out slowly counterclockwise. The reason the limits are different than the pilot procedure is that the mechanic needs to establish a more accurate RPM indicator than the airplanes engine RPM gage. You will most likely need to use an electric tachometer to verify speed changes.	Within the next 10 hours time- in-service (TIS) after April 20, 2001(the effective date of this AD), unless already accomplished.	The owner/operator holding at least a private pilot certificate as authorized by section 43.7 of the Federal Aviation Regulations (14 CFR 43.7) may accomplish the inspection specified in paragraph (d)(1)(i) of this AD. Make an entry into the aircraft records showing compliance with this portion of the AD in accordance with section 43.9 of the Federal Aviation Regulations (14 CFR 43.9). You may need to accomplish seasonal adjustments of the engine idle speed setting. These seasonal adjustments should not be included in your already established 12-month scheduled adjustments.
(2) If, during any inspection required by this AD, proper engine idle speed and fuel control mixture setting cannot be met, accomplish the following:		
(i) Adjust the fuel servo. This adjustment or any replacement must be accomplished by an appropriately- rated mechanic or at an appropriately- rated repair station; and (ii) Repeat the inspection specified in paragraph (d)(1) of this AD.	Accomplish the adjustment (if required) prior to further flight after the inspection required by paragraph (d)(1) of this AD. Reinspect within 25 hours TIS after the fuel servo adjustment.	If you have to adjust the servo more than twice over a 12-month period, obtain the next course of action from the FAA at the address referenced in paragraph (f) of this AD. We recommend you use an electronic strobe to verify RPM settings when making any adjustment.

(3) Add the following information to the end of page 3-20, Section 3 Emergency Procedures of the Cessna 172R or 172S Pilot's Operating Handbook (POH) and FAA-approved Airplane Flight Manual (AFM): "IDLE POWER ENGINE ROUGHNESS An excessively rich idle fuel flow may cause low speed engine roughness during flight. During most in-flight low engine speeds (power off stalls, approach to landing, etc.), the mixture control is normally in the full-rich position. However, to improve engine roughness (caused by an improperly adjusted fuel servo) during low engine speeds while in flight, you should rotate the vernier mixture control (leaning of fuel mixture). You may also have to lean the fuel mixture if this low engine speed results in power loss and you need to restart the engine during flight. In all cases, you should land the airplane at the nearest airport for repairs if low speed engine roughness requires you to adjust the fuel mixture control to improve engine operation."	Within the next 10 hours TIS after April 20, 2001 (the effective date of this AD), unless already accomplished.	The owner/operator holding at least a private pilot certificate as authorized by section 43.7 of the Federal Aviation Regulations (14 CFR 43.7) may insert the information into the POH as specified in paragraph (d)(3) of this AD. You may insert a copy of this AD into the appropriate sections of the POH to comply with this action. Make an entry into the aircraft records showing compliance with portion of the AD in accordance with section 43.9 of the Federal Aviation Regulations (14 CFR 43.9).
(4) Insert the following information into the applicable Cessna Pilot's Operating Handbook (POH) and FAA-approved Airplane Flight Manual (AFM): "NORMAL PROCEDURES (Before Takeoff) item 13. Throttle: 1. Verify smooth engine operation at idle speed of 575 to 625 RPM. 2. 1000 RPM or LESS"	Within the next 10 hours TIS after April 20, 2001 (the effective date of this AD), unless already accomplished.	The owner/operator holding at least a private pilot certificate as authorized by section 43.7 of the Federal Aviation Regulations (14 CFR 43.7) may insert the information into the POH as specified in paragraph (d)(4) of this AD. You may insert a copy of this AD into the appropriate sections of the POH to comply with this action. Make an entry into the aircraft records showing compliance with portion of the AD in accordance with section 43.9 of the Federal Aviation Regulations (14 CFR 43.9).

(e) Can I comply with this AD in any other way? You may use an alternative method of compliance or adjust the compliance time if:

(1) Your alternative method of compliance provides an equivalent level of safety; and

(2) The Manager, Wichita Aircraft Certification Office (ACO), approves your alternative. Submit your request through an FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, Wichita ACO.

Note: This AD applies to each airplane identified in paragraph (a) of this AD, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For airplanes that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (e) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if you have not eliminated the unsafe condition, specific actions you propose to address it.

(f) Where can I get information about any already-approved alternative methods of compliance? Contact Mr. Paul Pendleton, Aerospace Engineer, Wichita Aircraft Certification Office, FAA, 1801 Airport Road, Mid-Continent Airport, Wichita, Kansas 67209; telephone: (316) 946-4143; facsimile: (316) 946-4407.

(g) What if I need to fly the airplane to another location to comply with this AD? The FAA can issue a special flight permit under sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate your airplane to a location where you can accomplish the requirements of this AD.

(h) When does this amendment become effective? This amendment becomes effective on April 20, 2001.

FOOTER: Issued in Kansas City, Missouri, on March 23, 2001.
David R. Showers,
Acting Manager, Small Airplane Directorate,
Aircraft Certification Service.

Aviation Investigation Final Report

Location:	WEST MILFORD, New Jersey	**Accident Number:**	NYC00LA155
Date & Time:	June 9, 2000, 11:20 Local	**Registration:**	N7274D
Aircraft:	Cessna 172R	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 Minor
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

After a normal pre-flight inspection and pre-takeoff engine check, the CFI and commercial pilot departed to practice some landings at nearby airports. The commercial pilot was flying, and both pilots described the flight to a local airport as uneventful. While turning onto the 'base leg' of the traffic pattern, at a power setting of 1,900 rpm, about 800 to 900 feet above ground level, the pilot attempted to increase engine power by moving the throttle forward; however, there was no response from engine. He then told the CFI 'there's no power.' The CFI confirmed that the throttle was unresponsive, and noticed that the engine rpm was slowly dropping. The CFI attempted to restart engine without success, and performed a forced landing to trees, which were located about 1/4 mile from the runway. Both pilots were wearing headsets, and said they did not hear any unusual noises or power changes prior to the loss of engine power. Examination of the wreckage did not reveal any pre-accident failures or malfunctions. The airplane had been operated for about 390 hours since new and was maintained under an approved manufacturer inspection program. Test-runs of the engine revealed a rich mixture operation in the idle and 400 pound airflow ranges, and an idle mixture rise of 120 rpm. Fuel flow checks of the fuel injector servo, flow divider, fuel nozzles and lines, revealed the flow divider and nozzles met new production test specifications and exhibited no unusual characteristics. Examination of the fuel servo did not reveal any physical malfunctions; however, a flow check of the fuel servo revealed a mixture that exceeded the rich test specification limits during several test points. Despite the rich mixture indication observed during testing, at no time was a loss of engine power experienced. The temperature and dewpoint reported at an airport about 18 miles south of the accident site, was 82 and 61 degrees F, respectively.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:
A loss of engine power for undetermined reasons.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: APPROACH - VFR PATTERN - BASE TURN

Findings
1. (C) REASON FOR OCCURRENCE UNDETERMINED
2. FUEL SYSTEM,FUEL CONTROL - EXCESSIVE FLOW/OUTPUT

Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: DESCENT - EMERGENCY

Findings
3. OBJECT - TREE(S)

Factual Information

On June 9, 2000, about 1120 Eastern Daylight Time, a Cessna 172R, N7274D, was substantially damaged during a forced landing at the Greenwood Lake Airport (4N1), West Milford, New Jersey. The certificated flight instructor (CFI) and a commercial pilot sustained minor injuries. Visual meteorological conditions prevailed and no flight plan had been filed for the flight that originated from the Westchester County Airport (HPN), White Plains, New York. The instructional flight was conducted under 14 CFR Part 91.

According to the CFI, after a normal pre-flight inspection and pre-takeoff engine check, they departed HPN, to practice some landings at nearby airports. The commercial pilot was flying, and both pilots described the flight to 4N1 as uneventful. When they arrived over 4N1, the commercial pilot entered the "left downwind" for Runway 24. While turning onto the "base leg," at a power setting of 1,900 rpm, about 800 to 900 feet above ground level, he attempted to increase engine power by moving the throttle forward; however, there was no response from the engine. He then told the CFI "there's no power." The CFI assumed control of the airplane, confirmed that the throttle was unresponsive, and noticed that the engine rpm was slowly dropping. The CFI stated she checked that the fuel selector was on "both", the fuel shut off valve was "in", the mixture control was "rich", turned the fuel pump "on," set the throttle to 1/4 inch open, and attempted to restart the engine, without success. She performed a forced landing to trees, which were located about 1/4 mile from the runway.

Both pilots stated they were wearing headsets, and they did not hear any unusual noises or power changes prior to the loss of engine power. Additionally, they reported the airplane's mixture control was not manipulated and remained in the full rich position for the entire flight.

The CFI reported 400 hours of total flight experience, with about 20 hours in make and model.

The commercial pilot reported he had accumulated over 3,600 hours of flight experience, which included about 100 hours in make and model.

Initial examination of the wreckage was performed at the accident site by a Federal Aviation Administration (FAA) inspector. The inspector stated he checked the fuel in the airplane's fuel strainer, which was blue in color and absent of contamination. He also removed two spark plugs from the engine, which were unremarkable, and checked that the air filter was unobstructed.

A FAA inspector, and representatives from Cessna Aircraft and Textron Lycoming, performed an examination of the airframe and engine on June 13, 2000. Prior to their examination, airport personnel without supervision, performed an unauthorized engine test-run without a propeller installed on the engine. The engine was later started and test-run with a propeller installed

under FAA supervision and no discrepancies were noted. On June 20, 2000, the wreckage was re-examined under the supervision of a Safety Board investigator, and no evidence of any pre-accident failures or malfunctions were observed. The engine was retained for further examination.

The airplane had been operated for about 390 hours since new. It was maintained under an approved manufacturer inspection program, and was inspected the day prior to the accident. According to maintenance records, the accident engine was manufactured on February 23, 1999, and installed in the accident airplane on April 14, 1999.

On July 6, 2000, the engine was test run at Textron Lycoming, Williamsport, Pennsylvania, under the supervision of the Safety Board investigator. Prior to the test-run, a significant amount of carbon build-up was observed in all cylinder exhaust ports. The engine exhaust system from the accident airplane was not shipped for testing, and subsequently not installed for the test run. The engine started without any hesitation, and several engine parameters were monitored at different rates of airflow. The test run revealed a rich mixture operation in the idle and 400 pound airflow ranges, and a "magneto drop" of 145 and 150 rpm. The idle fuel flow was observed at 11 lbs/hr and the idle mixture leaning rise was 120 rpm. The test run specification required the fuel flow at idle to be between 4 and 6 lbs/hr. In addition, the leaning rpm rise should have been between 10 and 20 rpm. The 400-airflow fuel flow was observed at 44 lbs/hr. The 400-airflow test specification required the fuel flow to be between 33.5 and 40 lbs/hr. In addition, after the engine was leaned, the magneto drop was observed at 120 and 125 rpm. It was noted that despite the rich mixture indications observed during testing, at no time was a loss of engine power experienced.

On August 29, 2000, the engine was test run after installation of the exhaust system from the accident airplane. A FAA inspector supervised the test run. The results of the test run were consistent with the results obtained from the test run performed on July 6.

Review of the engine's production test log, that was perform on February 21, 1999, revealed all fuel flow readings were within their respective test specification ranges.

The fuel injector servo, flow divider, fuel nozzles and lines, were retained for further testing at Precision Airmotive Corporation, Marysville, Washington. The tests were conducted under the supervision of an FAA inspector. The flow divider and nozzles met new production test specifications and exhibited no unusual characteristics. Examinations of the fuel servo did not reveal any physical malfunctions; however, a flow check of the fuel servo revealed a mixture that exceeded the rich test specification limits during several test points.

Review of FAA service difficulty reports (SDR's) revealed that a flight school which operated 53 Cessna 172R model aircraft filed several SDR's between May and August 1999, detailing "numerous unexplained power losses" in their fleet of 172R model airplanes; subsequently the fleet was temporarily grounded. According to the director of maintenance (DOM) for the flight school, after the airplanes were grounded, the school began to upgrade their fleet to 180

horsepower, 172S models. The flight school also implemented several changes to their operating procedures, which included, leaning the fuel mixture and "clearing" the engine during periods of long ground operations. At the time of this report, the DOM stated the school had experienced "almost no problems at all" with their Cessna 172 airplanes.

The Cessna 172R was manufactured with a Lycoming IO-360-L2A engine, which produced 160 brake horsepower at 2,400 rpm. According to Cessna Aircraft, the process of converting a Cessna 172R, to a 180 brake horsepower Cessna 172S, included, but was not limited to, changing the propeller, oil cooler, engine baffling, tachometer, and airspeed indicator. Additionally, the S model airplane utilized a different pilot-operating handbook (POH).

On August 13, 1999, Textron Lycoming issued Service Instruction (SI) N0. 1497, for the IO-360-L2A engine installed in Cessna 172R aircraft, which stated in part: "Flight training operations often present an environment that makes an engine more susceptible to spark plug fouling, reduced efficiency, and excessive fuel consumption. Some of the flight training profiles that cause these conditions are over priming, prolonged idling and taxing at low engine speeds, and extended operation at full rich mixture." The service instruction provided guidance for leaning the engine fuel mixture during ground and flight operations. The information contained in the SI constituted an expansion of Cessna's published operating procedures for the airplane.

On August 18, 1999, Textron Lycoming issued SI N0. 1498, for the IO-360-L2A engine installed in Cessna 172R aircraft, which stated in part: "The fuel system is more susceptible to vapor formation and its effects during operation in warm weather." The SI provided a list of symptoms, which indicated the presence of vapor in the fuel system and the corrective action to use to purge vapor from the system. The time of compliance was as required during aircraft operations. Additionally, the service instruction included the note, "When the engine is operated above 1800 rpm, fuel flow is increased and fuel temperatures throughout the fuel system are greatly reduced. The increased flow purges any vapor and the cool fuel stops vapor from forming." The information contained in the SI constituted an expansion of Cessna's published operating procedures for the airplane.

On December 19, 2000, Textron Lycoming issued SI N0. 1502A, for the IO-360-L2A engine installed in Cessna 172R aircraft which stated in part: " To reduced the possibility of vapor related problems in aircraft employing IO-360-L2A model engines, the flow divider should be modified into an inverted flow divider." The time of compliance was "whenever the engine has vapor related problems, or at owner's discretion." The inverted flow divider became the standard configuration for newly manufactured engines.

On March 5, 2001, Cessna Aircraft issued a Service Bulletin, which modified the 172R and S model airplane's "Before Takeoff" checklist to include, "Throttle - CHECK IDLE." The service bulletin included a note, which stated in part: "If engine roughness occurs at idle, taxi and/or at full throttle with the mixture control in the full rich position, refer to and accomplish the POH Section 4 Fuel Vapor Procedures. If after accomplishing these procedures the engine is still operating rough, then maintenance action is required...."

According to the accident airplane's maintenance manual, the airplane was equipped with a wet wing fuel storage system. The system consisted of an integral fuel tank in each wing, a three-position selector valve, a fuel reservoir tank, an electrically driven auxiliary fuel pump, a fuel shutoff valve and a fuel strainer. The airplane was equipped with 13 drain valves; five drain valves were located for each wing tank, and one drain valve each was provided for the selector valve, fuel reservoir, and fuel strainer.

Examination of the accident airplane's fuel tanks, fuel selector, fuel strainer, fuel servo, flow divider, and injectors did not reveal any evidence of fuel contamination. An estimated 20 milliliters of water was observed in the fuel reservoir. It was noted that the fuel line, which fed directly to the fuel reservoir had been compromised, and the airplane remained outdoors until June 11.

According to a Cessna Aircraft representative, while the airplane was on level ground, the fuel reservoir tank design and construction allowed for up to an estimated 50 milliliters of liquid contamination that could be separated from the fuel in the reservoir and prevented from feeding further in the aircraft fuel system.

The weather reported at an airport about 18 miles south of the accident site, at 1153 was: Winds from 240 degrees at 8 knots; Visibility 8 miles; Sky clear; Temperature 82 degrees F; Dewpoint 61 degrees F, Altimeter 30.00.

Pilot Information

Certificate:	Commercial; Private	**Age:**	37,Female
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	July 23, 1998
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	394 hours (Total, all aircraft), 20 hours (Total, this make and model), 246 hours (Pilot In Command, all aircraft), 51 hours (Last 90 days, all aircraft), 36 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N7274D
Model/Series:	172R 172R	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	17280712
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	June 8, 2000 AAIP	**Certified Max Gross Wt.:**	2450 lbs
Time Since Last Inspection:	1 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	390 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	IO-360-L2A
Registered Owner:	PANORAMA FLIGHT SERVICE	**Rated Power:**	160 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	CDW ,173 ft msl	**Distance from Accident Site:**	18 Nautical Miles
Observation Time:	11:53 Local	**Direction from Accident Site:**	170°
Lowest Cloud Condition:	Clear	**Visibility**	8 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	240°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	28°C / 16°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	WHITE PLAINS (HPN)	**Type of Flight Plan Filed:**	None
Destination:	(4N1)	**Type of Clearance:**	None
Departure Time:	10:50 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	GREENWOOD LAKE 4N1	**Runway Surface Type:**	Asphalt
Airport Elevation:	791 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	24	**IFR Approach:**	None
Runway Length/Width:	4000 ft / 60 ft	**VFR Approach/Landing:**	Forced landing;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	2 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Minor	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	Schiada, Luke
Additional Participating Persons:	RON KRANTZ; TETERBORO , NJ DAVE MOORE; ARDSLEY , PA EMILE J LOHMAN; WICHITA , KS
Original Publish Date:	May 9, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=49392

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available here.