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[Pages 79051-79054]
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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2007-0218; Directorate Identifier 92-ANE-56-AD; Amendment 39-16894; AD 2011-26-04]

RIN 2120-AA64

Airworthiness Directives; Lycoming Engines, Fuel Injected Reciprocating Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are superseding an existing airworthiness directive (AD) for certain fuel injected reciprocating engines manufactured by Lycoming Engines. That AD currently requires inspection, replacement if necessary, and proper clamping of externally mounted fuel injector fuel lines. That AD also states that it is not applicable to engines that have a Maintenance and Overhaul Manual with an Airworthiness Limitations Section that requires inspection and replacement, if necessary, of externally mounted fuel injector lines. This new AD requires the same actions. This AD was prompted by Lycoming Engines revising their Mandatory Service Bulletin (MSB) to add engine models requiring inspections. We are issuing this AD to prevent failure of the fuel injector fuel lines that would allow fuel to spray into the engine compartment, resulting in an engine fire.

DATES: This AD is effective January 25, 2012.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in the AD as of January 25, 2012.

ADDRESSES: For service information identified in this AD, contact Lycoming Engines, 652 Oliver Street, Williamsport, PA 17701, or go to www.lycoming.textron.com. You may review copies of the referenced service information at the FAA, Engine Certification Office, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call (781) 238-7125.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and

other information. The address for the Docket Office (phone: (800) 647-5527) is Document Management Facility, U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Norm Perenson, Aerospace Engineer, New York Aircraft Certification Office, FAA, Engine & Propeller Directorate, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590; phone: (516) 228-7337; fax: (516) 794-5531; email: Norman.perenson@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2008-14-07, Amendment 39-15602 (73 FR 39574, July 10, 2008). That AD applies to the specified products. The NPRM published in the Federal Register on February 15, 2011 (76 FR 8661). That NPRM proposed to inspect, replace if necessary, and properly clamp externally mounted fuel injector fuel lines. That AD also states that it is not applicable to engines that have a Maintenance and Overhaul Manual with an Airworthiness Limitations Section that requires inspection and replacement, if necessary, of externally mounted fuel injector lines.

Comments

We gave the public the opportunity to participate in developing this AD. The following presents the comment received on the proposal and the FAA's response to the comment.

Question

One commenter asked why the AD requirements are only for Lycoming engines, and not also for Teledyne Continental Motors (TCM) engines. The commenter inferred that we write ADs, just to make owners maintain their aircraft.

In response, any AD made applicable to TCM engines with externally mounted fuel injector lines, would have to be written by the Atlanta Aircraft Certification Office (ACO), because that office has oversight of TCM. The Atlanta ACO has informed us that at this time, there is insufficient data to justify an AD for TCM engines with externally mounted fuel injector lines, however, they realize there may be justification for issuing a Special Airworthiness Information Bulletin (SAIB), for TCM engines on this subject. They are looking into possibly issuing an SAIB.

Conclusion

We reviewed the relevant data, considered the comment received, and determined that air safety and the public interest require adopting the AD as proposed.

Costs of Compliance

We estimate that this AD affects 21,180 four-cylinder engines, 21,449 six-cylinder engines, and 256 eight-cylinder engines installed on aircraft of U.S. registry. We also estimate that it will take about 0.2 work-hour to inspect all lines on a four-cylinder engine, 0.5 work-hour to inspect all lines on a six-cylinder engine, and 0.7 work-hour to inspect all lines on an eight-cylinder engine. We also estimate that the average labor rate is \$85 per work-hour. We do not anticipate any additional costs on U.S. operators, as the inspection would be done in conjunction with other work performed

concurrently. We anticipate no parts to be required. Based on these figures, the total cost of the AD to U.S. operators for one inspection of the fleet is \$1,286,875.

Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in subtitle VII, part A, subpart III, section 44701, "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

We have determined that this AD will not have federalism implications under Executive Order 13132. This AD 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.

For the reasons discussed above, I certify that this AD:

- (1) Is not a "significant regulatory action" under Executive Order 12866,
- (2) Is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska, and
- (4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 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. The FAA amends § 39.13 by removing airworthiness directive (AD) 2008-14-07, Amendment 39-15602 (73 FR 39574, July 10, 2008), and adding the following new AD:



2011-26-04 Lycoming Engines (formerly Textron Lycoming Division, AVCO Corporation):
Amendment 39-16894; Docket No. FAA-2007-0218; Directorate Identifier 92-ANE-56-AD.

(a) Effective Date

This airworthiness directive (AD) is effective January 25, 2012.

(b) Affected ADs

This AD supersedes AD 2008-14-07, Amendment 39-15602 (73 FR 39574, July 10, 2008).

(c) Applicability

(1) This AD applies to fuel injected reciprocating engines manufactured by Lycoming Engines that incorporate externally mounted fuel injection lines (engines with an "I" in the prefix of the engine model designation) as listed in the following Table 1:

Table 1—Engine Models Affected

Engine	Model
AEIO-320	-D1B, -D2B, -E1B, -E2B
AIO-320	-A1B, -B1B, -C1B
IO-320	-B1A, -B1C, -C1A, -D1A, -D1B, -E1A, -E1B, -E2A, -E2B
LIO-320	-B1A, -C1A
AEIO-360	-A1A, -A1B, -A1B6, -A1D, -A1E, -A1E6, -B1F, -B2F, -B1G6, -B1H, -B4A, -H1A, -H1B
AIO-360	-A1A, -A1B, -B1B
HIO-360	-A1A, -A1B, -B1A, -C1A, -C1B, -D1A, -E1AD, -E1BD, -F1AD, -G1A
IO-360	-A1A, -A1B, -A1B6, -A1B6D, -A1C, -A1D, -A1D6, -A2A, -A2B, -A3B6, -A3B6D, -B1B, -B1D, -B1E, -B1F, -B1G6, -B2F, -B2F6, -B4A, -C1A, -C1B, -C1C, -C1C6, -C1D6, -C1E6, -C1F, -C1G6, -F1A, -J1A6D, -M1B, -L2A, -M1A
IVO-360	-A1A
LIO-360	-C1E6, -M1A
TIO-360	-A1B, -C1A6D
IGO-480	-A1B6
AEIO-540	-D4A5, -D4B5, -D4D5, -L1B5, -L1B5D, -L1D5
IGO-540	-B1A, -B1C

IO-540	-A1A5, -AA1A5, -AA1B5, -AB1A5, -AC1A5, -AE1A5, -B1A5, -B1C5, -C1B5, -C4B5, -C4D5D, -D4A5, -E1A5, -E1B5, -G1A5, -G1B5, -G1C5, -G1D5, -G1E5, -G1F5, -J4A5, -V4A5D, -K1A5, -K1A5D, -K1B5, -K1C5, -K1D5, -K1E5, -K1E5D, -K1F5, K1H5, -K1J5, -K1F5D, -K1G5, -K1G5D, -K1H5, -K1J5D, -K1K5, -K1E5, -K1E5D, -K1F5, -K1J5, -L1C5, -M1A5, -M1B5D, -M1C5, -N1A5, -P1A5, -R1A5, -S1A5, -T4A5D, -T4B5, -T4B5D, -T4C5D, -V4A5, -V4A5D, -W1A5, -W1A5D, -W3A5D
IVO-540	-A1A
LTIO-540	-F2BD, -J2B, -J2BD, -N2BD, -R2AD, -U2A, -V2AD, -W2A
TIO-540	-A1A, -A1B, -A2A, -A2B, -A2C, -AE2A, -AH1A, -AA1AD, -AF1A, -AF1B, -AG1A, -AB1AD, -AB1BD, -AH1A, -AJ1A, -AK1A, -C1A, -E1A, -G1A, -F2BD, -J2B, -J2BD, -N2BD, -R2AD, -S1AD, -U2A, -V2AD, -W2A
TIVO-540	-A2A
IO-720	-A1A, -A1B, -D1B, -D1BD, -D1C, -D1CD, -B1B, -B1BD, -C1B

(2) Engine models in Table 1 of this AD are installed on, but not limited to, Piper PA-24 Comanche, PA-30 and PA-39 Twin Comanche, PA-28 Arrow, and PA-23 Aztec; Beech 23 Musketeer; Mooney 20, and Cessna 177 Cardinal airplanes.

(3) This AD is not applicable to engines having internally mounted fuel injection lines, which are not accessible. Those engine models are not included in Table 1 of this AD.

(4) This AD is not applicable to engines that have a Maintenance and Overhaul Manual with an Airworthiness Limitations Section that requires inspection of externally mounted fuel injector lines. Those engine models are not included in Table 1 of this AD.

(d) Unsafe Condition

This AD was prompted by Lycoming Engines revising their Mandatory Service Bulletin (MSB) to add engine models requiring inspection. We are issuing this AD to prevent failure of the fuel injector fuel lines that would allow fuel to spray into the engine compartment, resulting in an engine fire.

(e) Compliance

Comply with this AD within the compliance times specified, unless already done.

(f) Engines That Have Had Initial Inspections

For engines that have had initial inspections in accordance with Textron Lycoming MSB No. 342, dated March 24, 1972; Textron Lycoming MSB No. 342A, dated May 26, 1992; Textron Lycoming MSB No. 342B, dated October 22, 1993; Supplement No. 1 to MSB No. 342B, dated April 27, 1999; Textron Lycoming MSB No. 342C, dated April 28, 2000; Textron Lycoming MSB No. 342D, dated July 10, 2001; Lycoming Engines MSB No. 342E, dated May 18, 2004, or Lycoming Engines MSB 342F, dated June 4, 2010, inspect in accordance with paragraph (h) of this AD.

(g) Engines That Have Not Had Initial Inspections

For engines that have not had initial inspections previously done in accordance with Textron Lycoming MSB No. 342, dated March 24, 1972; Textron Lycoming MSB No. 342A, dated May 26,

1992; Textron Lycoming MSB No. 342B, dated October 22, 1993; Supplement No. 1 to MSB No. 342B, dated April 27, 1999; Textron Lycoming MSB No. 342C, dated April 28, 2000; Textron Lycoming MSB No. 342D, dated July 10, 2001; Lycoming Engines MSB No. 342E, dated May 18, 2004, or Lycoming Engines MSB 342F, dated June 4, 2010, inspect as follows:

(1) For engines that have not yet had any fuel line maintenance done, or have not had any fuel line maintenance done since new or since the last overhaul, inspect in accordance with paragraph (i) of this AD within 50 hours time-in-service (TIS) after the effective date of this AD.

(2) For all other engines, inspect in accordance with paragraph (i) of this AD within 10 hours TIS after the effective date of this AD.

(h) Repetitive Inspections

Thereafter, inspect at intervals of 100 hours TIS (not to exceed 110 hours), at each engine overhaul, and after any maintenance has been done on the engine where any clamp (or clamps) on a fuel injector line (or lines) has been disconnected, moved, or loosened, in accordance with paragraph (i) of this AD.

(i) Inspection Criteria

Inspect the fuel injector fuel lines and clamps between the fuel manifold and the fuel injector nozzles, and replace as necessary any fuel injector fuel line and clamp that does not meet all conditions specified in Lycoming Engines MSB No. 342F, dated June 4, 2010.

(j) Alternative Methods of Compliance (AMOCs)

The Manager, New York Aircraft Certification Office, FAA, has the authority to approve AMOCs for this AD if requested using the procedures found in 14 CFR 39.19. AMOCs approved previously in accordance with AD 2008-14-07, Amendment 39-15602, are approved as AMOCs for the corresponding requirements in paragraph (h) of this AD.

(k) Related Information

(1) For more information about this AD, contact Norm Perenson, Aerospace Engineer, New York Aircraft Certification Office, FAA, Engine & Propeller Directorate, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590; phone: (516) 228-7337; fax: (516) 794-5531; email: Norman.perenson@faa.gov.

(2) FAA Special Airworthiness Information Bulletin No. NE-07-49, dated September 20, 2007, is not mandatory, but has additional information on this subject.

(l) Material Incorporated by Reference

(1) You must use Lycoming Engines Mandatory Service Bulletin No. 342F, dated June 4, 2010, to perform the actions required by this AD.

(2) The Director of the Federal Register approved the incorporation by reference of this service bulletin in accordance with 5 U.S.C. 552(a) and 1 CFR part 51.

(3) Contact Lycoming Engines, 652 Oliver Street, Williamsport, PA 17701, or go to www.lycoming.textron.com for a copy of this service information. You may review copies at the FAA, New England Region, 12 New England Executive Park, Burlington, MA.

(4) You may also review copies of the service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at an NARA facility, call (202) 741-6030, or go to http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

Issued in Burlington, Massachusetts, on December 5, 2011.
Peter A. White,
Manager, Engine & Propeller Directorate,
Aircraft Certification Service.

MANDATORY SERVICE BULLETIN

DATE: June 4, 2010 Service Bulletin No. 342F
(Supersedes Service Bulletin No. 342E)
Engineering Aspects are
FAA Approved

SUBJECT: Fuel Line (Stainless Steel Tube Assy.) and Support Clamp Inspection and Installation

MODELS AFFECTED: All fuel injected Lycoming engines indicated in fuel line and clamping diagrams.

TIME OF COMPLIANCE: Check every 100 hours, annual inspection, overhaul and any time fuel lines or clamps are serviced, removed or replaced.

There have been instances of fuel line breakages where support clamps have been omitted during field overhaul or repair. The support clamps dampen line vibration due to the impact of cooling air and vibration from the engine and/or aircraft. Also, the fuel supply lines between the fuel injector manifold and the nozzles can become damaged and leak if they are severely bent or kinked during engine maintenance.

As a means of minimizing the hazards of fuel line damage, the following inspection of fuel lines and clamps is required.

1. The fuel lines to the nozzles are made from 1/8 inch tubing. A separate line supplies fuel to the intake port of each cylinder. Check each line visually for any evidence of physical damage such as:
 - Dents
 - Pits
 - Nicks
 - Stains caused by fuel leakage
2. Remove any line that appears faulty. Do not attempt to repair any line that leaks. Bent lines may be straightened; however, any line with an inside radius less than 5/8 inch must be replaced. Do not reuse any line that is dented; cracks can develop at the site of a dent. Also inspect solder joints at ends of lines for cracks. Replace cracked lines, they cannot be repaired. See the latest revision of Service Instruction No. 1301 for superseded fuel line identification, bending requirements and replacement information.
3. Examine the location of the clamps that secure the lines to the engine and compare them with the diagrams shown in this bulletin. If clamps are missing, replace the fuel line and install clamps as indicated. Do not use plastic tie straps. Also, examine the lines to ensure the clamps securely support the line. Also look for signs of chafing. Replace fuel lines that show indications of chafing and/or have loose clamps.
4. Older engines that used metal clamps with no cushion must use the P/N LW-12598 fuel line sleeve at each of those clamping locations. The fuel line sleeve is not used with the cushioned clamps. Any cushioned clamp, where the cushion has deteriorated or is missing, must be replaced with a new cushion clamp.
5. Compliance with the bulletin must be noted in the aircraft log book.

NOTE: If difficulty is experienced when installing clips on a cylinder fuel injector line due to aircraft baffling, the clips may be installed in positions that provide clearance. Do not permit fuel lines to contact engine or airframe baffle hardware; maintain minimum clearance of 3/16 inch between a fuel line and any engine or airframe surface.



ISSUED			REVISED			PAGE NO.	REVISION
MO	DAY	YEAR	MO	DAY	YEAR	1 of 42	F
03	24	72	06	04	10		

LEGEND FOR PARTS ON DIAGRAMS 1 TO 33

(Fuel Lines, Clamps, Brackets, Attaching Hardware as shown in the following Engine Diagrams)

CALL OUT	PART NUMBER	PART NAME
1	76356	TUBE ASSY., Manifold to nozzle fuel line
2	76357	TUBE ASSY., Manifold to nozzle fuel line
3	76358	TUBE ASSY., Manifold to nozzle fuel line
4	76359	TUBE ASSY., Manifold to nozzle fuel line
5	76360	TUBE ASSY., Manifold to nozzle fuel line
6	76361	TUBE ASSY., Manifold to nozzle fuel line
7	76362	TUBE ASSY., Manifold to nozzle fuel line
8	LW-12098-0-100	TUBE ASSY., Manifold to nozzle fuel line
9	LW-12098-0-140	TUBE ASSY., Manifold to nozzle fuel line
10	LW-12098-0-150	TUBE ASSY., Manifold to nozzle fuel line
11	LW-12098-0-160	TUBE ASSY., Manifold to nozzle fuel line
12	LW-12098-0-170	TUBE ASSY., Manifold to nozzle fuel line
13	LW-12098-0-180	TUBE ASSY., Manifold to nozzle fuel line
14	LW-12098-0-190	TUBE ASSY., Manifold to nozzle fuel line
15	LW-12098-0-200	TUBE ASSY., Manifold to nozzle fuel line
16	LW-12098-0-210	TUBE ASSY., Manifold to nozzle fuel line
17	LW-12098-0-220	TUBE ASSY., Manifold to nozzle fuel line
18	LW-12098-0-230	TUBE ASSY., Manifold to nozzle fuel line
19	LW-12098-0-240	TUBE ASSY., Manifold to nozzle fuel line
20	LW-12098-0-260	TUBE ASSY., Manifold to nozzle fuel line
21	LW-12098-0-270	TUBE ASSY., Manifold to nozzle fuel line
22	LW-12098-0-280	TUBE ASSY., Manifold to nozzle fuel line
23	LW-12098-0-300	TUBE ASSY., Manifold to nozzle fuel line
24	LW-12098-0-310	TUBE ASSY., Manifold to nozzle fuel line
25	LW-12098-0-320	TUBE ASSY., Manifold to nozzle fuel line
26	LW-12098-0-340	TUBE ASSY., Manifold to nozzle fuel line
27	LW-12098-0-350	TUBE ASSY., Manifold to nozzle fuel line
28	LW-12098-0-390	TUBE ASSY., Manifold to nozzle fuel line
29	LW-12098-0-412	TUBE ASSY., Manifold to nozzle fuel line
30	LW-13995-0-202	TUBE ASSY., Manifold to nozzle fuel line
31	LW-13995-0-224	TUBE ASSY., Manifold to nozzle fuel line
32	LW-13995-0-271	TUBE ASSY., Manifold to nozzle fuel line
33	LW-13995-0-284	TUBE ASSY., Manifold to nozzle fuel line
34	AN735-26	CLAMP
35	LW-16226-10-03*	CLAMP
36	LW-16226-10-25	CLAMP
37	LW-16226-10-38*	CLAMP
38	LW-16226-10-44*	CLAMP
39	LW-16226-10-75*	CLAMP
40	LW-16226-25-13*	CLAMP
41	LW-16226-25-25*	CLAMP
42	LW-16226-25-38*	CLAMP

ISSUED			REVISED			PAGE NO.	REVISION	S.B. 342
MO	DAY	YEAR	MO	DAY	YEAR	2 of 42	F	
03	24	72	06	04	10			

LEGEND FOR PARTS ON DIAGRAMS 1 TO 33 (CONT.)

(Fuel Lines, Clamps, Brackets, Attaching Hardware as shown in the following Engine Diagrams)

CALL OUT	PART NUMBER	PART NAME
43	LW-16226-25-44*	CLAMP
44	LW-16266-25-50*	CLAMP
45	LW-16266-25-63*	CLAMP
46	LW-16266-25-75*	CLAMP
47	71824	CLAMP
48	73843**	CLAMP
49	74733	CLIP
50	STD-692	SCREW, No. 10-32 x 1/2 long
51	STD-860	SCREW, No. 10-32 x 5/8 long
52	STD-921	SCREW, No. 10-32 x 7/8 long
53	STD-1925	SCREW, 1/4-20 x 5/8 long
54	STD-425	WASHER, No. 10 plain
55	STD-28	WASHER, No. 10 plain
56	STD-670	NUT, No. 10-32 self-locking
57	72815	BRACKET, 90°, Twist
58	73136	BRACKET, 90°
59	73152	BRACKET, Support clamp
60	75837	BRACKET, Fuel line support
61	76735	BRACKET, 90°
62	LW-14875	BRACKET, 90°
63	75414	BRACKET, Fuel manifold
64	76868	BRACKET, Support clamp
65	74278	BRACKET ASSY., Fuel line support
66	73626	BRACKET, Extension
67	73318	BRACKET, Extension
68	LW-25-0.81	BOLT, 1/4-20 x 13/16 long
69	STD-8	WASHER, 1/4 plain
70	STD-160	WASHER, 1/4 lock
71	STD-1411	NUT, 1/4-20 plain
72	AN735-32	CLAMP
73	AN735-36	CLAMP
74	STD-969	SCREW, No. 10-32 x 1/2 long
75	STD-251	WASHER, No. 10 lock
76	73966	SPACER
77	STD-1916	SCREW, 1/4-20 x 1-1/8 long
78	LW-25-1.13	BOLT, 1/4-20 x 1-1/8 long
79	STD-1874	SCREW, 1/4-20 x 13/16 long
80	AN4-13A	BOLT, 1/4-28 x 1-13/32 long
81	LW-12598	SLEEVE
82	LW-25-0.50	BOLT, 1/4-20 x 1/2 long

* See page 4 for part number designation.

** P/N 73843 is superseded by P/N LW-16266-25-13

NOTE

Aircraft quality Phillips head screws of proper length may be used in place of specified Lycoming screws.

ISSUED			REVISED			PAGE NO.	REVISION	S.B. 342
MO	DAY	YEAR	MO	DAY	YEAR	3 of 42	F	
03	24	72	06	04	10			

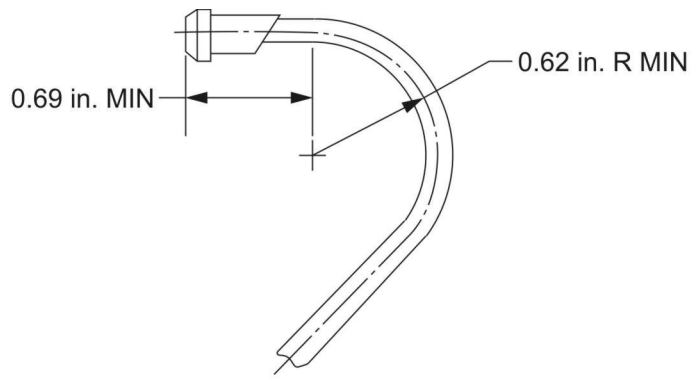


Figure 1. Fuel Line Showing Minimum Dimension for Bending

PLEASE Note ... When installing clamps, it does not matter whether the clamp is installed to the right or left of the shroud tube, only that it is clamped at that location and there is 3/16 inch clearance between the line and any engine surface.

CLAMP P/N DESIGNATION

SCREW SIZE

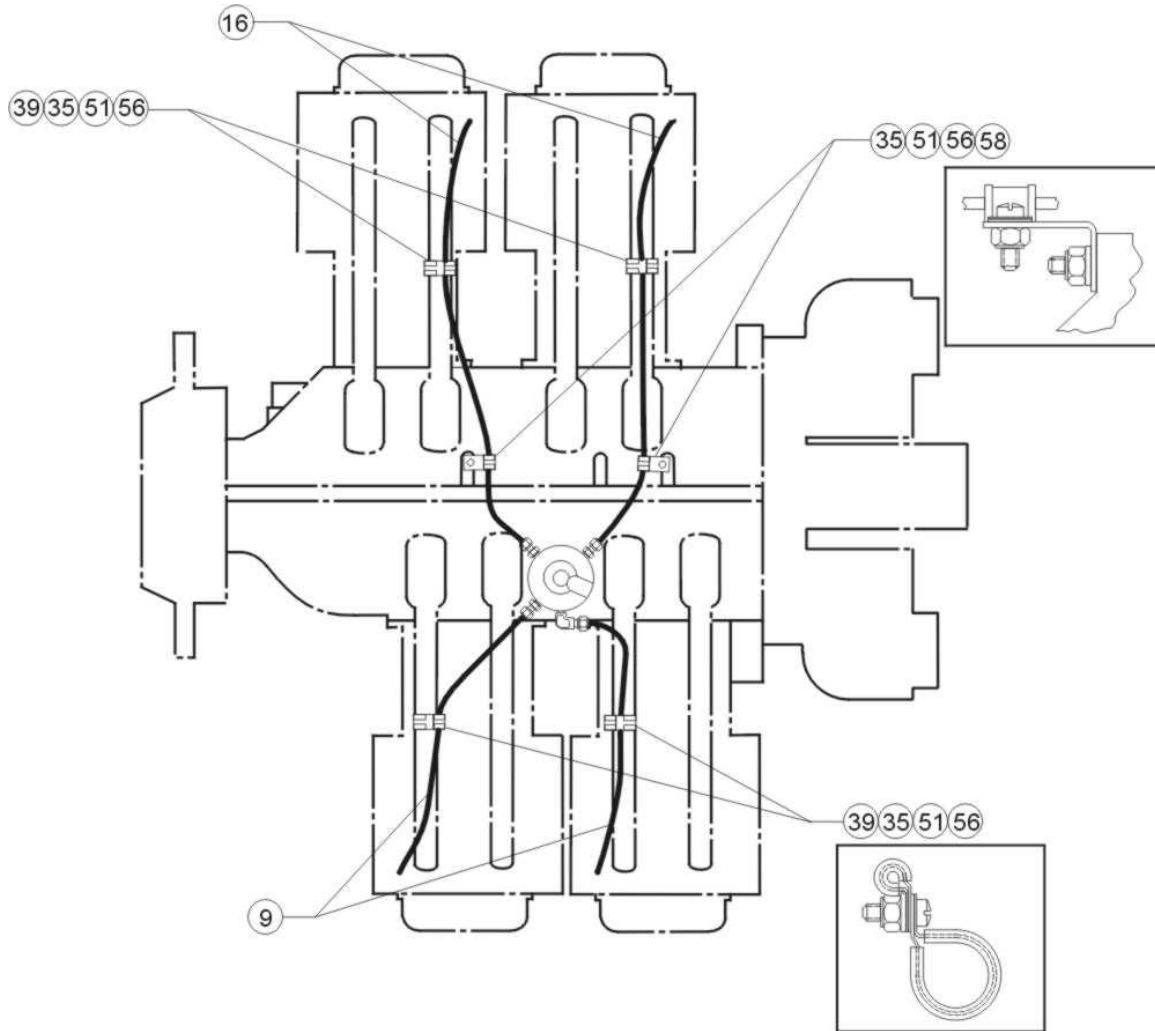
LW-16266-10-13

CLAMP DIAMETER

10 = #10 SCREW		-13 (.125)
		-25 (.250)
		-38 (.375)
		-44 (.438)
		-75 (.750)
25 = 1/4" SCREW		-13 (.125)
		-25 (.250)
		-38 (.375)
		-44 (.438)
		-50 (.500)
		-63 (.625)
		-75 (.750)

ISSUED			REVISED			PAGE NO.	REVISION	S.B. 342
MO	DAY	YEAR	MO	DAY	YEAR			
03	24	72	06	04	10	4 of 42	F	

Diagram No. 4 -- IO-360-B1E



ISSUED			REVISED			PAGE NO.	REVISION	S.B. 342
MO	DAY	YEAR	MO	DAY	YEAR			
03	24	72	06	04	10	8 of 42	F	