



[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2018-1046; Product Identifier 2018-CE-049-AD]

RIN 2120-AA64

Airworthiness Directives; Piper Aircraft, Inc. Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: We propose to adopt a new airworthiness directive (AD) for certain Piper Aircraft, Inc. (Piper) Model PA-28-140, PA-28-150, PA-28-151, PA-28-160, PA-28-161, PA-28-180, PA-28-181, PA-28-235, PA-28R-180, PA-28R-200, PA-28R-201, PA-28R-201T, PA-28RT-201, PA-28RT-201T, PA-32-260, and PA-32-300 airplanes. This proposed AD was prompted by a report of a fatigue crack found in a visually inaccessible area of the lower main wing spar cap. This proposed AD would require calculating the factored service hours for each main wing spar to determine when an inspection is required, inspecting the lower main wing spar bolt holes for cracks, and replacing any cracked main wing spar. We are proposing this AD to address the unsafe condition on these products.

DATES: We must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: 202-493-2251.

- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2018-1046; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, the regulatory evaluation, any comments received, and other information. The street address for Docket Operations (phone: 800-647-5527) is listed above. Comments will be available in the AD docket shortly after receipt.

FOR FURTHER INFORMATION CONTACT: Dan McCully, Aerospace Engineer, Atlanta ACO Branch, FAA, 1701 Columbia Avenue, College Park, Georgia 30337; phone: (404) 474-5548; fax: (404) 474-5605; email: william.mccully@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

We invite you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2018-1046; Product Identifier 2018-CE-049-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of this NPRM. We will consider all comments received by the closing date and may amend this NPRM because of those comments.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive verbal contact we receive about this NPRM.

Discussion

We received a report of a fatigue crack found in the lower main wing spar cap on a Piper Model PA-28R-201 airplane. An investigation revealed that repeated high-load operating conditions accelerated the fatigue crack growth in the lower main wing spar cap. In addition, because of the structural configuration of the wing assembly, the cracked area was inaccessible for a visual inspection. Model PA-28-140, PA-28-150, PA-28-151, PA-28-160, PA-28-161, PA-28-180, PA-28-181, PA-28-235, PA-28R-180, PA-28R-200, PA-28R-201T, PA-28RT-201, PA-28RT-201T, PA-32-260, and PA-32-300 airplanes have similar wing spar structures as the Model PA-28R-201.

Airplanes used in training and other high-load environments are typically operated for hire and have inspection programs that require 100-hour inspections. We determined the number of 100-hour inspections an airplane has undergone is the best indicator of the airplane's usage history. Using the criteria in FAA Advisory Circular AC 23-13A, "Fatigue, Fail-Safe, and Damage Tolerance Evaluation of Metallic Structure for Normal, Utility, Acrobatic, and Commuter Category Airplanes," which you can find at http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/MainFrame?OpenFrameset, we developed a factored service hours formula based on the number of 100-hour inspections completed on the airplane. A review of the airplane maintenance records to determine the airplane's usage and the application of the factored service hours formula will identify when an airplane meets the criteria for the proposed eddy current inspection of the lower main wing spar bolt holes.

Only an airplane with a main wing spar that has a factored service life of 5,000 hours, has had either main wing spar replaced with a serviceable main wing spar (more than zero hours TIS), or has airplane maintenance records that are missing or incomplete, must have the eddy current inspection.

This condition, if not addressed, could result in the wing separating from the fuselage in flight.

Related Service Information

We reviewed Piper Aircraft Corporation Service Bulletin No. 886, dated June 8, 1988, and The New Piper Aircraft, Inc. Service Bulletin No. 978A, dated August 6, 1999. These service bulletins contain procedures for determining initial and repetitive inspection times based on the aircraft's usage and visually inspecting the wing lower spar caps and the upper wing skin adjacent to the fuselage and forward of each main spar for cracks. We also reviewed Piper Aircraft Corporation Service Letter No. 997, dated May 14, 1987. This service letter contains procedures for replacing airplane wings.

FAA's Determination

We are proposing this AD because we evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

Proposed AD Requirements

This proposed AD would require reviewing the airplane maintenance records to determine the number of 100-hour inspections completed on each installed main wing spar and using the number of 100-hour inspections to calculate the factored service hours for each main wing spar. This proposed AD would also require inspecting the lower main wing spar bolt holes for cracks once a main wing spar exceeds the specified factored service hours and replacing any main wing spar when a crack is indicated. This proposed AD would only apply when an airplane has either accumulated 5,000 or more hours time-in-service (TIS); has had either main wing spar replaced with a serviceable main wing spar (more than zero hours TIS); or has missing and/or incomplete maintenance records.

Interim Action

We consider this proposed AD interim action. The inspection reports will provide us additional data for determining the cause of the cracking. After analyzing the data, we may take further rulemaking action.

Costs of Compliance

We estimate that this proposed AD affects 19,696 airplanes of U.S. registry.

We estimate the following costs to comply with this proposed AD:

Estimated costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Review airplane maintenance records and calculate factored service hours	2 work-hours X \$85 per hour = \$170	Not applicable	\$170	\$3,348,320

We estimate the following costs to do the eddy current inspection. Because some airplanes are only used non-commercially and will not accumulate the specified factored service hours in the life of the airplane, we have no way of determining the number of airplanes that might need this inspection:

On-condition costs

Action	Labor cost	Parts cost	Cost per product
Inspect the lower main wing spar and replace the attach nuts and bolts	1.5 work-hours X \$85 per hour = \$127.50 per wing spar	\$20	\$147.50 per wing spar
Report inspection results to the FAA	1 work-hour X \$85 = \$85	N/A	\$85

We estimate the following costs to do any necessary replacements that would be required based on the results of the proposed inspection. We have no way of determining the number of aircraft that might need this replacement:

On-condition replacement costs

Action	Labor cost	Parts cost	Cost per product
Replace main wing spar	32 work-hours X \$85 per hour = \$2,720 per wing spar	\$5,540	\$8,260 per wing spar

Paperwork Reduction Act

A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number. The OMB Control Number for this information collection is 2120-0056. Public reporting for this collection of information is estimated to be approximately 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, completing and reviewing the collection of information. All responses to this collection of information are mandatory. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Information Collection Clearance Officer, Federal Aviation Administration, 10101 Hillwood Parkway, Fort Worth, TX 76177-1524.

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.

This AD is issued in accordance with authority delegated by the Executive Director, Aircraft Certification Service, as authorized by FAA Order 8000.51C. In accordance with that order, issuance of ADs is normally a function of the Compliance and Airworthiness Division, but during this transition period, the Executive Director has delegated the authority to issue ADs applicable to small airplanes, gliders, balloons, airships, domestic business jet transport airplanes, and associated appliances to the Director of the Policy and Innovation Division.

Regulatory Findings

We determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would 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 this proposed regulation:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Is not a “significant rule” under the 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.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 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 adding the following new airworthiness directive (AD):

Piper Aircraft, Inc.: Docket No. FAA-2018-1046; Product Identifier 2018-CE-049-AD.

(a) Comments Due Date

We must receive comments by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE Federal Register].

(b) Affected ADs

None.

(c) Applicability

This AD applies to Piper Aircraft, Inc. airplanes, certificated in any category, with a model and serial number shown in Table 1 to paragraph (c) of this AD, and that meet at least one of the criteria in paragraphs (c)(1), (2), or (3) of this AD.

(1) Has accumulated 5,000 or more hours time-in-service (TIS); or

(2) Has had either main wing spar replaced with a serviceable main wing spar (more than zero hours TIS); or

(3) Has missing and/or incomplete maintenance records.

Table 1 to paragraph (c) of this AD

Model	Serial Numbers
PA-28-140	All serial numbers
PA-28-150	All serial numbers
PA-28-151	All serial numbers
PA-28-160	All serial numbers
PA-28-161	All serial numbers
PA-28-180	All serial numbers
PA-28-181	All serial numbers
PA-28-235	All serial numbers

PA-28R-180	All serial numbers
PA-28R-200	All serial numbers
PA-28R-201	All serial numbers except 2844029, 2844030, 2844081, 2844125, 2844135, 2844136, 28R-7737078, 28R-7737142, 28R-7837108, 28R-7837125, and 28R-7837257
PA-28R-201T	All serial numbers
PA-28RT-201	All serial numbers
PA-28RT-201T	All serial numbers
PA-32-260	All serial numbers
PA-32-300	Serial numbers 32-40000 through 32-7840202

(d) Subject

Joint Aircraft System Component (JASC)/Air Transport Association (ATA) of America Code 57, Wings.

(e) Unsafe Condition

This AD was prompted by a report of a fatigue crack found in a visually inaccessible area of the lower main wing spar cap. We are issuing this AD to detect and correct fatigue cracks in the lower main wing spar cap bolt holes. The unsafe condition, if not addressed, could result in the wing separating from the fuselage in flight.

(f) Compliance

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

(g) Review Airplane Maintenance Records and Calculate Factored Service Hours for Each Main Wing Spar

(1) Within 30 days after the effective date of this AD, review the airplane maintenance records and determine the number of 100-hour inspections completed on the airplane since new and any record of wing spar replacement(s).

(i) If a main wing spar has been replaced with a new (zero hour TIS) main wing spar, count the number of 100-hour inspections from the time of installation of the new main wing spar.

(ii) If either main wing spar has been replaced with a serviceable main wing spar (more than zero hours TIS) or the airplane maintenance records are missing or incomplete, the factored service hours cannot be determined. Perform the eddy current inspection as specified in paragraph (h) of this AD.

(2) Before further flight after completing the action in paragraph (g)(1) of this AD, calculate the factored service hours for each main wing spar using the following formula: $(N \times 100) + [T - (N \times 100)] / 17 = \text{Factored Service Hours}$, where N is the number of 100-hour inspections and T is the total hours TIS of the airplane. Thereafter, after each annual inspection and 100-hour TIS inspection, recalculate the factored service hours for each main wing spar until the main wing spar has accumulated 5,000 or more factored service hours.

(3) An example of determining factored service hours for an airplane with no 100-hour inspections is as follows: The airplane maintenance records show that the airplane has a total of 12,100 hours TIS, and only annual inspections have been done. Both main wing spars are original factory installed. In this case, $N = 0$ and $T = 12,100$. Use those values in the formula as follows: $(0 \times 100) + [12,100 - (0 \times 100)] / 17 = 711$ factored service hours on each main wing spar.

(4) An example of determining factored service hours for an airplane with both 100-hour and annual inspections is as follows: The airplane was originally flown for personal use, then for training for a period of time, then returned to personal use. The airplane maintenance records show that the airplane has a total of 5,600 hours TIS, and nineteen 100-hour inspections have been done. Both main wing spars are original factory installed. In this case, $N = 19$ and $T = 5,600$. Use those values in the formula as follows: $(19 \times 100) + [5,600 - (19 \times 100)] / 17 = (1,900 + 218) = 2,118$ factored service hours on each main wing spar.

(h) Eddy Current Inspect

Within the compliance time specified in paragraph (h)(1) or (2) of this AD, eddy current inspect the inner surface of each bolt hole on the lower main wing spar cap for cracks by using the procedure in appendix 1 of this AD.

(1) Within 100 hours TIS after complying with paragraph (g) of this AD or within 100 hours TIS after a main wing spar accumulates 5,000 factored service hours, whichever occurs later; or

(2) For airplanes with an unknown number of factored service hours on a main wing spar, within the next 100 hours TIS after the effective date of this AD or within 60 days after the effective date of this AD, whichever occurs later.

(i) Replace the Main Wing Spar

If a crack is found during an inspection required in paragraph (h) of this AD, before further flight, replace the main wing spar with a new (zero hours TIS) main wing spar or with a main wing spar that has been inspected as specified in appendix 1 of this AD and no cracks were found.

(j) Report Inspection Results

Within 30 days after completing an inspection required in paragraph (h) of this AD, using Appendix 2, "Inspection Results Form," of this AD, report the inspection results to the FAA at the Atlanta ACO Branch. Submit the report to the FAA using the contact information found in appendix 2 of this AD.

(k) Special Flight Permit

A special flight permit may only be issued to operate the airplane to a location where the inspection requirement of paragraph (h) of this AD can be performed. This AD prohibits a special flight permit if the inspection reveals a crack in a main wing spar.

(l) Paperwork Reduction Act Burden Statement

A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number. The OMB Control Number for this information collection is 2120-0056. Public reporting for this collection of information is estimated to be approximately 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, completing and reviewing the collection of information. All responses to this collection of information are mandatory. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Information Collection Clearance Officer, Federal Aviation Administration, 10101 Hillwood Parkway, Fort Worth, TX 76177-1524.

(m) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Atlanta ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (n) of this AD.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(n) Related Information

For more information about this AD, contact Dan McCully, Aerospace Engineer, Atlanta ACO Branch, FAA, 1701 Columbia Avenue, College Park, Georgia 30337; phone: (404) 474-5548; fax: (404) 474-5605; email: william.mccully@faa.gov.

Appendix 1 to this AD

Eddy Current Inspection Procedure

A. Equipment

1. Equipment Requirements

- (i) Equipment used must provide impedance plane diagrams.
- (ii) Probes may be either absolute or differential coil configurations.
- (iii) For manual bolt hole probing: use probe collars at an increment of every 1/64 inch to ensure the uniform depth of rotation and to aid in reducing lift-off effects.
- (iv) Automated scanning systems may be used.
- (v) Bolt hole probes must match as closely as possible, but not exceed, the bolt hole diameter. Split core probes may be expanded to a maximum of 0.050 inch beyond the probe's nominal diameter (in accordance with on the probe manufacturer's instructions). The fill factor must be 80 percent minimum.
- (vi) A right angle (90 degree) surface probe may be used for further detail indication, if needed.

2. Equipment Examples

The following optional inspection equipment has been shown to be adequate to conduct this procedure and is provided as examples only. Other equipment meeting the requirements in A.1. may be used.

- (i) Nortec 500D Series Portable Eddy Current Flaw Detector – Olympus
- (ii) Bolt hole probe, 0.375 inch with 0.062 inch shielded coil – Olympus
- (iii) Right angle (90 degree) surface probe with 0.062 inch shielded coil – Olympus
- (iv) Calibration standard (NIST traceable) for bolt holes and surface: Air Force General Purpose Eddy Current Standard
 - (a) Bolt hole: 0.030 x 0.030 inch corner notch, 0.030 inch radial notch
 - (b) Surface: 2024-T3: 0.008, 0.020, and 0.040 inch depth EDM notches
 - (c) Frequency 300 KHz, EDM notch set at five (5) divisions screen height

B. Reference Standard

- (1) Use a reference standard of the same conductivity 2024 T-3 within +/-15% IACs. It must have electrical discharge machining (EDM) notches for simulating defects as calibration references.
- (2) The surface finish must be 63 RHR or better.
- (3) The reference standard must have a corner notch size of 0.030 x 0.030 inch (screen set at minimum of three divisions vertical with a phase signal of between 45 and 120 degrees separation from the horizontal liftoff).
- (4) Use a frequency between 100 and 500 kHz.

(5) The calibration must be checked in the beginning and end and every 30 minutes of

inspections.

C. Personnel Qualifications

Personnel doing the eddy current inspection must have NAS 410 Level II or Level III certification.

D. Material Required

NOTE: Hardware part numbers and torque values are contained in the Aircraft Maintenance Manual and Illustrated Parts Catalogue for the specific airplane model.

For each wing inspected:

- (1) Two (2) wing to spar attach bolts
- (2) Two (2) wing to spar attach nuts
- (3) Two (2) wing to spar attach washers
- (4) Cleaning cloth
- (5) Isopropyl alcohol or mineral spirits

E. Conduct Inspection

For each wing to be inspected:

(1) Locate the two (2) lower outboard main spar attach bolts, as shown in Figure 1 of Appendix 1, installed on the lower cap of the main spar, on the forward and aft sides of the spar web.

CAUTION: The interior surface of the bolts holes can be easily damaged during bolt removal and installation. Do not drive out spar to fuselage attach bolts.

(2) Clean the inspection surfaces using a cloth dampened with isopropyl alcohol or mineral spirits.

(3) Use eddy current surface and bolt hole examinations to detect surface and shallow subsurface cracking and discontinuities on the left and right lower outboard spar bolt holes. Use SAE ARP4402, "Eddy Current Inspection of Open Fastener Holes in Aluminum Aircraft Structure," or another FAA-approved eddy current inspection method to do these inspections.

F. Accept/Reject Criteria

A crack or crack-like indication with an amplitude equal to or greater than 50 percent of the reference level signal must be rejected and documented. Such an amplitude reading indicates that the spar does not meet type design.

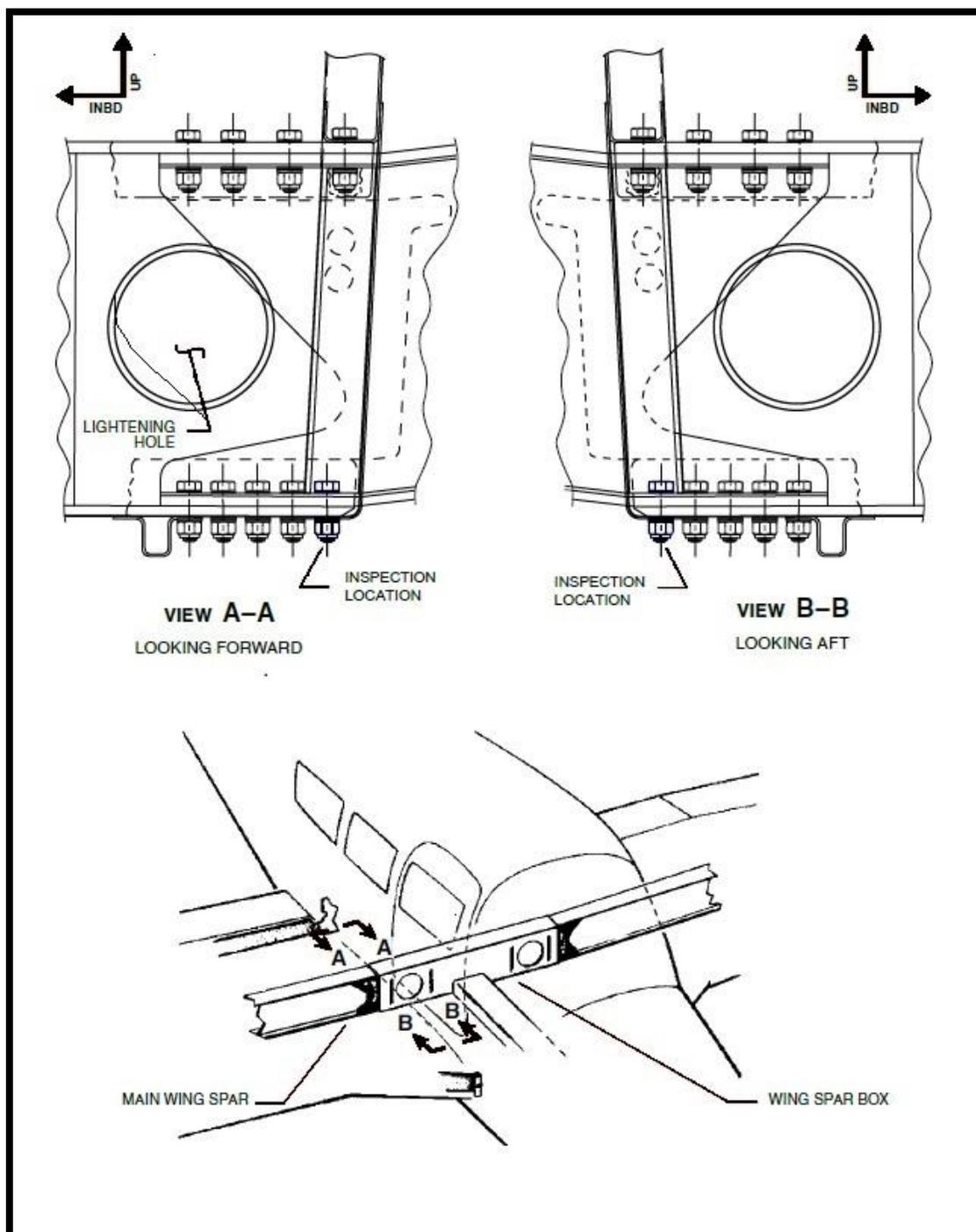


Figure 1. Main Spar Attach Bolt Locations (RH Side Shown)

Appendix 2 to this AD
Inspection Results Form

Email completed form to: **9-ASO-ATLCOS-Reporting@faa.gov** Or mail to: Federal Aviation Administration
 SUBJECT line : Docket No. FAA-2018-1046 Atlanta ACO Branch, AIR-7A1
 1701 Columbia Avenue
 College Park, GA 30337

Include photos if applicable

Aircraft Model No.: PA-	Serial Number:
Aircraft Total Hours Time-In-Service (TIS):	Registration Number:
Factored Flight Hours Left-Hand (LH) Wing:	Right-Hand (RH) Wing:
(If both wings are factory installed original, these number should be the same)	
Inspection Results	
LH Wing Spar Fwd Accepted <input type="checkbox"/> Rejected <input type="checkbox"/>	RH Wing Spar Fwd Accepted <input type="checkbox"/> Rejected <input type="checkbox"/>
LH Wing Spar Aft Accepted <input type="checkbox"/> Rejected <input type="checkbox"/>	RH Wing Spar Aft Accepted <input type="checkbox"/> Rejected <input type="checkbox"/>
Inspector Comments	

Inspector Information

Name (print): _____ Signature: _____

Certificate No.: _____ Date: _____

Issued in Kansas City, Missouri, on December 7, 2018.

Melvin J. Johnson
Aircraft Certification Service
Deputy Director, Policy and Innovation Division, AIR-601

[FR Doc. 2018-27577 Filed: 12/20/2018 8:45 am; Publication Date: 12/21/2018]