



Airworthiness Directive

AD No.: 2021-0107R2

Issued: 20 May 2022

Note: This Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EU) 2018/1139 on behalf of the European Union, its Member States and of the European third countries that participate in the activities of EASA under Article 129 of that Regulation.

This AD is issued in accordance with Regulation (EU) 748/2012, Part 21.A.3B. In accordance with Regulation (EU) 1321/2014 Annex I Part M.A.301, or Annex Vb Part ML.A.301, as applicable, the continuing airworthiness of an aircraft shall be ensured by accomplishing any applicable ADs. Consequently, no person may operate an aircraft to which an AD applies, except in accordance with the requirements of that AD, unless otherwise specified by the Agency [Regulation (EU) 1321/2014 Annex I Part M.A.303, or Annex Vb Part ML.A.303, as applicable] or agreed with the Authority of the State of Registry [Regulation (EU) 2018/1139, Article 71 exemption].

Design Approval Holder's Name:

PIPER AIRCRAFT, INC.

Type/Model designation(s):

PA-28 and PA-32 aeroplanes

Effective Date: Revision 2: 27 May 2022
Revision 1: 20 May 2021
Original issue: 03 May 2021

TCDS Number(s): EASA.IM.A.234 and USA (FAA TCDS) 2A13 for PA-28; EASA.IM.A.239 and USA (FAA TCDS) A3SO for PA-32

Foreign AD: Federal Aviation Administration (FAA) [AD 2020-26-16](#) dated 15 January 2021.

Replacement: For affected aeroplanes operated under EU regulation, the original issue of this AD replaced FAA State of Design AD 2020-26-16, which was not adopted by EASA.

Revision: This AD revises EASA AD 2021-0107R1 dated 13 May 2021.

ATA 57 – Wings – Lower Main Wing Spar Caps – Inspection

Manufacturer(s):

Piper Aircraft, Inc. (Piper), formerly The New Piper Aircraft, Inc., Piper Aircraft Corporation

Applicability:

This AD applies to the following aeroplanes, identified by model, commercial name(s) and serial numbers (s/n):

Model (commercial name)	s/n
PA-28-151 (Warrior)	All
PA-28-161 (Warrior II)	All
PA-28-161 (Warrior III)	All, except s/n 2842006
PA-28-161 (Cadet)	All
PA-28-181 (Archer II and Archer III)	All



Model (commercial name)	s/n
PA-28-235 (Cherokee Pathfinder)	All
PA-28R-180 (Arrow)	All
PA-28R-200 (Arrow)	All
PA-28R-200 (Arrow II)	All, except s/n 28R-7235151
PA-28R-201 (Arrow III)	All, except s/n 2844029, 2844030, 2844081, 2844125, 2844136, 2844147 to 2844151 inclusive, 28R-7737078, 28R-7737142, 28R-7837108, 28R-7837125 and 28R-7837257
PA-28R-201T (Turbo Arrow III)	All
PA-28RT-201 (Arrow IV)	All
PA-28RT-201T (Turbo Arrow IV)	All
PA-32-260 (Cherokee Six 260)	All
PA-32-300 (Cherokee Six 300)	All
PA-32R-300 (Lance)	All
PA-32RT-300 (Lance II)	All, except s/n 32R-7985004
PA-32RT-300T (Turbo Lance II)	All

Definitions:

For the purpose of this AD, the following definitions apply:

FH: Flight hours (FH) is the accumulated time of the spar (installed on the aeroplane) with the highest number of FH since its first installation on an aeroplane, between the moments when an aeroplane moved under its own power for the purpose of flight and the moments when the aeroplane came to a full stop after landing (total FH of all flights).

EFSH: EASA factored service hours (EFSH) are those calculated in accordance with the formula specified in Figure 1 of this AD.

TIS: With respect to maintenance time records, time-in-service (TIS) means the accumulated time of the spar (installed on the aeroplane) with the highest number of hours since its first installation on an aeroplane, between the moments an aeroplane took off and the moments it touched down (total TIS of all flights). In the case TIS records are unreliable or not available, e.g. because maintenance records have been kept with reference to FH, the use of FH is acceptable for the calculation of the average annual aeroplane usage and EFSH.

AAU: Average annual utilisation (AAU) of an aeroplane is the TIS of that aeroplane, divided by the number of calendar years after the aeroplane's year of manufacture (data plate).

The SB: Piper Service Bulletin (SB) No. 1345.



Reason:

An occurrence was reported of a wing separation on a PA-28R-201 aeroplane. Subsequent investigation results determined that the event was caused by fatigue cracking in a visually inaccessible area of the lower main wing spar cap.

This condition, if not detected and corrected, could lead to similar accidents.

Prompted by these findings, Piper issued the SB, providing instructions to inspect the main wing spar caps and, if cracks are found, to replace the main wing spar. Consequently, the FAA issued AD 2020-26-16, applicable to aeroplanes that have accumulated 5 000 hours' TIS or more; or have a main wing spar replaced with a used (instead of new) main wing spar; or for which maintenance records are missing or incomplete, and requiring calculation of 'factored service hours', determined by the number of 100-hours inspections or annual inspections that have been accomplished on a main wing spar since new. Based on the outcome of the factored service hours, that AD requires a one-time Eddy-Current (EC) inspection of the inner surface of the two lower outboard bolt holes on the lower main wing spar cap for cracks and, depending on findings, replacement of the main wing spar with a new main wing spar, or a used main wing spar that has passed (no cracks found) an EC inspection in accordance with steps 1 to 3 (inclusive) of the instructions of the SB.

Following EASA review of the FAA AD, it was determined that, since in Europe there is no legal distinction and documentation requirement between the accomplishment of 100-hours inspections and annual inspections, depending on the operation of the aeroplane, the FAA calculation method for FSH is inappropriate for the affected aeroplanes operated under EU regulations. Based on this determination, EASA has decided not to adopt the FAA AD.

For the reasons described above, EASA issued AD 2021-0107 to require repetitive calculations of AAU and EFSH, as defined in this AD and, depending on the results, an EC inspection of the main wing spar caps for cracks and, depending on findings, replacement of the affected main wing spar. That AD also required reporting the inspection results to EASA, the FAA and Piper. Appendix 2 of that AD included a flowchart to assist operators to determine which action is required and when, and also provided some examples of calculation.

After that AD was issued, several reports have come in, indicating that the required EFSH calculation was not done, or incorrectly done, or the inspection was accomplished before accumulating the necessary 5 000 EFSH. Accomplishment of an inspection before reaching this threshold does not meet the intent of EASA AD 2021-0107. This also means that the repetitive calculations must be continued and another inspection accomplished, once that threshold is reached. EASA issued AD 2021-0107R1 for awareness and clarification, introducing a Note.

Since that AD was issued, it became apparent that further clarification is necessary, emphasising the fact that only a one-time inspection is required. This AD is revised to introduce an additional paragraph to confirm that, following inspection (and reporting of results), no further action is required by this AD. The calculation examples in Appendix 2 of this AD have also been updated to represent more realistic scenarios.

This AD is still considered to be an interim action and further AD action may follow.



Required Action(s) and Compliance Time(s):

Required as indicated, unless accomplished previously:

Review of Maintenance Records and Calculation(s):

- (1) Within 30 days after 03 May 2021 [the effective date of the original issue of this AD], and, thereafter, during each 100-hours or annual inspection, as applicable, review the aeroplane maintenance records for completeness and determine whether a wing or wing spar has been replaced with a wing or wing spar that had more than zero hours' TIS at the time of installation.
- (2) If, as result of any review as required by paragraph (1) of this AD, it is determined that a wing spar has accumulated or exceeded 5 000 hours' TIS, within 30 days after 03 May 2021 [the effective date of the original issue of this AD], or after that review, whichever occurs later, calculate the AAU, as defined in this AD.
- (3) If the result of the calculation as required by paragraph (2) of this AD is 100 (TIS/year) or more, before next flight, calculate the EFSH by using the formula specified in Figure 1 of this AD.

Figure 1 – EFSH Calculation

$$\text{EFSH} = (\text{TIS} - 100 \times \text{Years}) + (100 \times \text{Years}) / 15$$

Inspection:

- (4) If, as a result of the calculation as required by paragraph (3) of this AD, the EFSH are determined to be 5 000 or more (see Note 1 of this AD), within 100 hours after accumulating 5 000 EFSH, or within 100 hours after the effective date of this AD, whichever occurs later, accomplish an EC inspection of the inner surface of the two lower outboard bolt holes on the lower main wing spar cap for cracks. If the wing is installed, use steps 1 to 3 (inclusive) of the instructions of the SB or, if the wing is not installed, use step 3 of the instructions of the SB.

Note 1: Results of EC inspections accomplished before reaching the calculated (as required) threshold of 5 000 EFSH are not acceptable to demonstrate compliance with the inspection as required by paragraph (4) of this AD.

- (5) If, as result of the first review as required by paragraph (1) of this AD, maintenance records are found to be incomplete (i.e. unknown whether a wing spar has been installed with more than zero hours' TIS), or spar/aeroplane TIS or FH are unknown, within 100 hours after the effective date of this AD, accomplish an EC inspection of the inner surface of the two lower outboard bolt holes on the lower main wing spar cap for cracks. If the wing is installed, use steps 1 to 3 (inclusive) of the instructions of the SB or, if the wing is not installed, use step 3 of the instructions of the SB.

Wing Spar Replacement:

- (6) If, during the EC inspection as required by paragraph (4) or (5) of this AD, as applicable, any crack is detected that exceeds the acceptance criteria of the SB, before next flight, replace the main wing spar with a new (zero TIS) main wing spar, or with a serviceable (more than zero TIS) main wing spar that, before installation, has passed an EC inspection (no cracks detected) in accordance with steps 1 to 3 (inclusive) of the instructions of the SB.



Replacement of a main wing spar can be accomplished in accordance with the instructions of Piper Service Letter (SL) 997.

Bolt Replacement:

- (7) Before next flight after the EC inspection as required by paragraph (4) or (5) of this AD, as applicable, or during the main wing spar replacement as required by paragraph (6) of this AD, as applicable, install new bolts in accordance with step 6 of the instructions of the SB.

Reporting:

- (8) Within 30 days after the EC inspection as required by paragraph (4) or (5) of this AD, as applicable, report the inspection results to EASA, the FAA and to Piper Aircraft.

This can be accomplished by using Appendix 1 (Inspection Results Form) of this AD and the contact information found on that Form.

Terminating Action:

- (9) Inspection of an aeroplane as required by paragraph (4) or (5) of this AD, as applicable, replacing the bolts on that aeroplane as required by paragraph (7) of this AD, and reporting the inspection results of that aeroplane as required by paragraph (8) of this AD, constitutes terminating action for the repetitive reviews as required by paragraph (1) of this AD for that aeroplane. As a consequence, no further calculations (ref. paragraphs (2) and (3) of this AD) are required for that aeroplane.

Ref. Publications:

Piper SB 1345 dated 27 March 2020.

Piper SL 997 dated 14 May 1987.

Remarks:

1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD.
2. The original issue of this AD was posted on 10 March 2021 as PAD 21-041 for consultation until 07 April 2021. The Comment Response Document can be found in the [EASA Safety Publications Tool](#), in the compressed (zipped) file attached to the record for this AD.
3. Enquiries regarding this AD should be referred to the EASA Safety Information Section, Certification Directorate. E-mail: ADs@easa.europa.eu.
4. Information about any failures, malfunctions, defects or other occurrences, which may be similar to the unsafe condition addressed by this AD, and which may occur, or have occurred on a product, part or appliance not affected by this AD, can be reported to the [EU aviation safety reporting system](#). This may include reporting on the same or similar components, other than those covered by the design to which this AD applies, if the same unsafe condition can exist or may develop on an aircraft with those components installed. Such components may be



installed under an FAA Parts Manufacturer Approval (PMA), Supplemental Type Certificate (STC) or other modification.

5. For any question concerning the technical content of the requirements in this AD, please contact: Piper Aircraft, Inc., 2926 Piper Drive, Vero Beach, Florida 32960, United States of America; Telephone: +1 772-299-2141; E-mail: CustomerService@piper.com; Website: <https://www.piper.com/contact-us/> or <https://www.piper.com/technical-publications>.

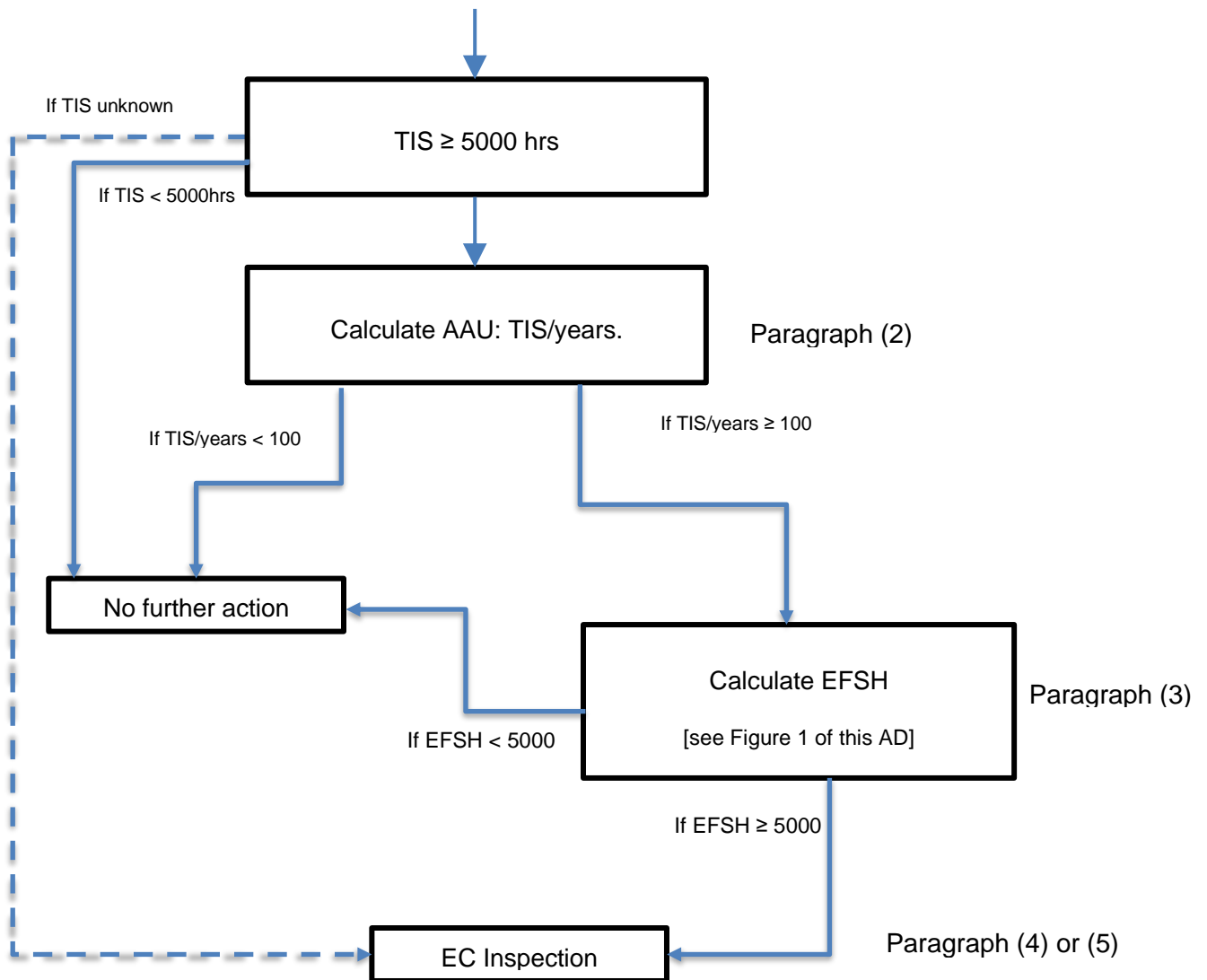


Appendix 1

Inspection Results Form	
E-mail completed from to: 9-ASO-ATLCOS-Reporting@faa.gov and customer.service@piper.com and ads@easa.europa.eu	Or mail to: Federal Aviation Administration Atlanta ACO Brach, AIR-7A1 1701 Columbia Avenue College Park, GA 30337 and Piper Certification Office 2926 Piper Drive Vero Beach, FL 32960
SUBJECT LINE: Docket No. FAA-2018-1046	
<i>Include Photos, if applicable</i>	
Aircraft Model: PA-	Serial Number:
Aircraft Total TIS: or FH:	Registration:
EASA FSH – LH Wing:	RH Wing:
(if both wings are factory installed original, these numbers should be the same)	
Inspection Results	
LH Wings Spar FWD: Accepted <input type="checkbox"/> Rejected <input type="checkbox"/>	RH Wings 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 (observed damage, condition of hole, etc.)	
Inspector Information:	
Name (print):	Signature:
Certificate No.:	Date:



Appendix 2 – Flowchart / Examples of Calculation



Example 1:

For a spar with 55 calendar years and 5 400 hours TIS Hours (TIS=5 100), the results would be:

1. Paragraph (2): $TIS/years = 5\,400 / 55 = 92.7 < 100 \rightarrow$ no further action, except to continue the annual calculations \rightarrow go to paragraph (1).

Example 2:

For a spar with 55 calendar years and 8 000 hours TIS Hours (TIS=8 000), the results would be:

1. Paragraph (2): $TIS/years = 8\,000 / 55 = 145 > 100 \rightarrow$ go to paragraph (3);
2. Paragraph (3): $EFSH = 8\,000 - 100 \times 55 + (100 \times 55) / 15 = 2\,867 < 5\,000 \rightarrow$ no further action, except to continue the annual calculations \rightarrow go to paragraph (1).

Example 3:

For a spar with 55 calendar years and 11 000 hours TIS (TIS = 11 000), the results would be:

1. Paragraph (2): $TIS/years = 11\,000 / 55 = 200 > 100 \rightarrow$ go to paragraph (3);
2. Paragraph (3): $EFSH = (11\,000 - 100 \times 55) + (100 \times 55) / 15 = 5\,867 \rightarrow$ go to paragraph (4).

Example of calendar years: For an aeroplane (or spar, if a replacement spar was installed) that was manufactured in 1989, 1990 is the first calendar year to be counted, and the full year before calculation would be the last, so (if calculated in 2021) the number would be 31.

