

Airworthiness Directive

AD No.: 2021-0107

Issued: 19 April 2021

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, 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 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: 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, this AD replaces FAA State of Design AD 2020-26-16, which is not adopted by EASA.

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
PA-28-235 (Cherokee Pathfinder)	All
PA-28R-180 (Arrow)	All
PA-28R-200 (Arrow)	All

Model (commercial name)	s/n
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, this AD requires 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. This AD also requires reporting the inspection results to EASA, the FAA and Piper. Appendix 2 of this AD includes a flowchart to assist operators to determine which action is required and when, and also provides some examples of calculation.

This AD is 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 the effective date 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 the effective date 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, 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.
- (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.

Ref. Publications:

Piper SB 1345 dated 27 March 2020.

Piper SL 997 dated 14 May 1987.

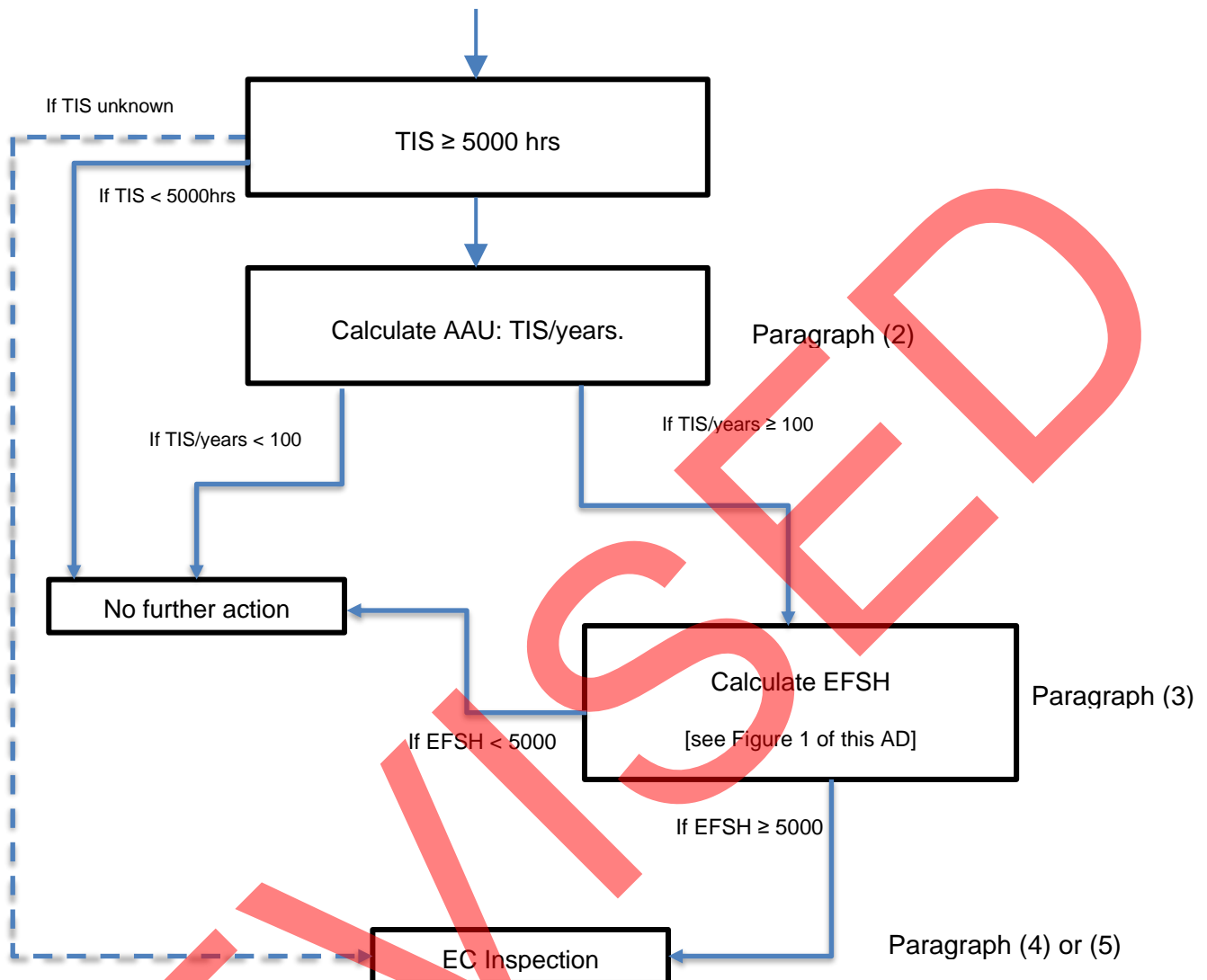


Remarks:

1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD.
2. 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 2 – Flowchart / Examples of Calculation

**Example 1:**

For a spar with 8 calendar years and 700 hours TIS (TIS=700), the results would be:

1. Paragraph (2): $TIS/years = 700/8 = 87,5 < 100 \rightarrow$ no action required.

Example 2:

For a spar with 8 calendar years and 3 000 hours TIS Hours (TIS=3 000), the results would be:

1. Paragraph (2): $TIS/years = 3\,000/8 = 375 > 100 \rightarrow$ go to paragraph (3);
2. Paragraph (3): $EFSH = (3\,000 - 100 \times 8) + (100 \times 8)/15 = 2\,253 < 5\,000 \rightarrow$ no further action

Example 3:

For a spar with 8 calendar years and 6 000 hours TIS (TIS = 6 000), the results would be:

1. Paragraph (2): $TIS/years = 6\,000/8 = 750 > 100 \rightarrow$ go to paragraph (3);
2. Paragraph (3): $EFSH = (6\,000 - 100 \times 8) + (100 \times 8)/15 = 5\,253 \rightarrow$ 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 (at this time, in 2021) the number would be 31.

