



Piper Aircraft, Inc.
2926 Piper Drive
Vero Beach, FL, U.S.A. 32960

SERVICE NO. 1346 LETTER

Date: October 31, 2024

(S)

MAINTENANCE ALERT

SUBJECT:

MODELS AFFECTED:

PA-28-140 Cherokee 140
PA-28-150 Cherokee 150
PA-28-151 Warrior
PA-28-160 / PA-28S-160 Cherokee 160
PA-28-161 Warrior II
PA-28-161 Cadet
PA-28-161 Warrior III
PA-28-180 / PA-28S-180 Cherokee 180
PA-28-181 Archer II

PA-28-181 Archer III

PA-28-181 Piper Pilot
PA-28-201T Turbo Dakota
PA-28-235 Cherokee 235

PA-28R-180 Arrow

PA-28R-200 Arrow / Arrow II

PA-28R-201 Arrow III

PA-28R-201T Turbo Arrow III
PA-28RT-201 Arrow IV
PA-28RT-201T Turbo Arrow IV

PA-32-260 Cherokee Six 260

PA-32-300 Cherokee Six 300

PA-32-301FT Piper 6X

SPAR BOX INSPECTION

SERIAL NUMBERS AFFECTED:

28-20001 thru 28-26946, 28-7125001 thru 28-7725290
28-1 thru 28-4377, 28-1760A
28-7415001 thru 28-7715314
28-1 thru 28-4377, 28-1760A
28-7716001 thru 28-8616057, 2816001 thru 2816109
2841001 thru 2841365
2816110 thru 2816119, 2842001 thru 2842420
28-671 thru 28-5859, 28-7105001 thru 28-7505260
28-7690001 thru 28-8690056, 28-690061, 28-690062,
2890001 thru 2890205
2890206 thru 2890231, 2843001 thru 2843949,
2881001 thru 2881040, 2881042 and up
2881041, 28020001 and up
28-7921001 thru 28-7921095
28-03, 28E-11, 28-10001 thru 28-11378,
28-7110001 thru 28-7710089
28R-30000 thru 28R-31270,
28R-7130001 thru 28R-7130013
28R-35001 thru 28R-35820,
28R-7135001 thru 28R-7635545
28R-7737001 thru 28R-7837317,
2837001 thru 2837061, 2844001 thru 2844185
28R-7703001 thru 28R-7803373, 2803001 thru 2803012
28R-7918001 thru 28R-8218026
28R-7931001 thru 28R-8631005,
2831001 thru 2831038
32-1 thru 32-14, 32-16 thru 32-20, 32-22 thru 32-1297,
32-7100001 thru 32-7800008
32-15, 32-21, 32-40000 thru 32-40974,
32-7140001 thru 32-7840202,
32-7940001 thru 32-7940290
3232001 thru 3232074

ATA/JASC: 5711

(OVER)

MODELS AFFECTED (continued):

PA-32-301XTC Piper 6XT
 PA-32-301 Saratoga
 PA-32-301T Turbo Saratoga

PA-32R-300 Lance
 PA-32R-301 Saratoga SP

PA-32R-301 Saratoga II HP
 PA-32R-301T Turbo Saratoga SP
 PA-32R-301T Turbo Saratoga II TC
 PA-32RT-300 Lance II
 PA-32RT-300T Turbo Lance II
 PA-32S-300 Cherokee Six Seaplane

PA-34-200 Seneca
 PA-34-200T Seneca II
 PA-34-220T Seneca III

PA-34-220T Seneca IV
 PA-34-220T Seneca V
 PA-44-180 Seminole

PA-44-180 Turbo Seminole

SERIAL NUMBERS AFFECTED (continued):

3255001 thru 3255051
 32-8006001 thru 32-8606023, 3206001 thru 3206078
 32-8024001 thru 32-8224014,
 32-8324001 thru 32-8424002

32R-7680001 thru 32R-7880068
 32R-8013001 thru 32R-8613005,
 3213001 thru 3213028, 3213030 thru 3213041
 3213029, 3213042 thru 3213103, 3246001 thru 3246244
 32R-8029001 thru 32R-8629006, 3229001 thru 3229003
 3257001 thru 3257493
 32R-7885001 thru 32R-7985105
 32R-7787001, 32R-7887002 thru 32R-7987126
 32S-40001 thru 32S-40974,
 32S-7140001 thru 32S-7240137

34-7250001 thru 34-7450220
 34-7570001 thru 34-8170092
 34-8133001 thru 34-8633014,
 3433001 thru 3433172, 3448001 thru 3448035
 3447001 thru 3447029, 3448038 thru 3448079
 3449001 thru 3449514
 44-7995001 thru 44-8195026, 4495001 thru 4495013,
 4496001 and up
 44-8107001 thru 44-8207020

COMPLIANCE TIME:

Whenever one or more bolts are removed from the lower cap of the main wing spars.

NOTE: Bolts securing the main wing spar to the spar box may be removed for a number of reasons, including but not limited to:

- Service actions mandated by other Piper service publications and/or FAA mandated Airworthiness Directives.
- As part of a repair for some other wing or airframe damage.
- Removal of wings for shipping purposes.

APPROVAL:

The engineering aspects of this service document have been shown to comply with the applicable Federal Aviation Regulations and are FAA approved.

PURPOSE:

If not performed properly, removal of bolts that secure the main wing spar to the spar box can cause damage to bolt holes in the spar box, compromising the structural integrity of the wing attachment to the fuselage.

This service letter provides instructions for inspecting the bolt holes in the lower section of the spar box for damage any time the lower attach bolts of the main wing spars are removed, regardless of the reason.

INSPECTION METHODS:

Follow the instructions for the implementation of the inspection methods described here. This section describes the methodology for visual, eddy current, and fluorescent penetrant inspections.

Visual Inspection Method

Perform a visual inspection for damage and cracks as described in FAA AC 43.13-1B, "Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair" Chapter 5, Section 2.

NOTE: Prior to visual inspection, wipe the surfaces clean using a soft cloth dampened with isopropyl alcohol or mineral spirits.

NOTE: The visual inspection shall be accomplished using a 10X magnifier, a mirror and a suitable light source or other equipment capable of providing equal or better resolution.

Eddy Current Inspection Method

The standard, SAE ARP4402, "Eddy Current Inspection of Open Fastener Holes in Aluminum Aircraft Structure," should be used when performing the applicable inspections under Instructions, below.

NOTE: Prior to inspection, wipe the surfaces clean using a soft cloth dampened with isopropyl alcohol or mineral spirits.

Personnel Qualifications:

Personnel that perform eddy current and/or fluorescent penetrant inspections shall be qualified in accordance with NAS 410 (or equivalent standards that are listed in FAA Advisory Circular (AC) 65-31B) as qualified Level II or Level III nondestructive inspection personnel.

Eddy current bolt hole inspections shall be performed in accordance with SAE ARP4402 or a written procedure specific to the aircraft being inspected and approved by the FAA.

Equipment:

- Equipment used shall provide impedance plane diagrams.
- Probes may be either absolute or differential coil configurations.
- 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.
- Automated scanning systems may be used.
- Bolt hole probes shall 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 (based on the probe manufacturer's recommendation). The fill factor shall be 80 % minimum.
- Holes being inspected shall be no larger than 10 % of the expanded bolt hole diameter.
- A right angle (90-degree) surface probe may be used for further detail indication, if needed.

Reference Standard:

- Any reference standard used shall be of the same conductivity 2024-T3 within ± 15 % IACs. It shall have electrical discharge machining (EDM) notches for simulating defects as calibration references.
- The surface finish shall be 63 RHR or better.
- The reference standard shall 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 lift-off).
- Frequency used shall be between 100 and 500 kHz.
- The calibration shall be checked at the beginning and end and every 30 minutes during inspections.

Equipment Guidelines:

The following is a list of equipment capable of performing the inspections described in this service letter. The following optional inspection equipment has been shown to be adequate to conduct this procedure and is provided as an example only. Other equipment meeting the requirements under the heading "Equipment" may be used.

NOTE: Other manufacturers offer equivalents to what is listed here (including GE, Hocking, Rohman, Uniwest, VM, and Zetec).

- NORTEC 500D or 600D Series Portable Eddy Current Flaw Detector – Olympus
- Bolt hole probe, 0.375 in. with 0.062 inch shielded coil – Olympus
- A bolt hole probe must first be used to inspect the bolt holes; an Olympus right angle (90-degree) surface probe with 0.062 inch shielded coil may be used for a more detailed inspection, if needed.
- For the calibration standard (NIST traceable) for bolt holes and surface, use the Air Force General Purpose Eddy Current Standard with the following criteria:
 - Bolt Hole Inspection: 0.030 x 0.030 inch corner notch, 0.030 inch radial notch
 - Surface: 2024-T3: 0.008, 0.020, and 0.040 inch depth EDM notches
 - Frequency 300-500 kHz, EDM notch set at five (5) divisions screen height

Acceptance:

Using the successive evaluation procedure provided under instructions relevant crack or crack-like indications with amplitudes equal to or greater than 50 % of the reference level signal shall be rejected and documented (i.e., such an amplitude reading may mean that the spar box bar does not meet type design requirements and must be reported to Piper Aircraft, Inc. for disposition; fluorescent penetrant inspection is to be accomplished on relevant indications as part of the evaluation).

The pass-fail criteria of this inspection is only applicable to a crack in the spar box. Damage in the other areas mentioned should be reported to Piper Aircraft, Inc. for disposition.

It is possible for non-crack damage, such as elongated holes, fay gaps, thread marks, gouges, or edge chips in the bolt holes of the spar box to return a flaw indication similar to that of a crack. Multiple indications or broad indications may be associated with fay gaps or swarf within these fay gaps and may not be representative of cracks. If an indication is observed, the hole should be carefully inspected for non-crack damage to eliminate the possibility of false crack indications.

To avoid false indications, holes with damage shall be cleaned, per instructions under "Cleaning Surface Imperfections" on page 5, prior to any Eddy Current Inspection.

Fluorescent Penetrant Inspection Method:

If there is paint in the inspection area, remove it from the area specified using only chemical processes. Abrasives or other mechanical methods for paint removal will hide the existence of any cracks, making it impossible to do an accurate inspection. Use isopropyl alcohol to wipe clean the areas to be inspected where paint was removed.

Perform a fluorescent penetrant inspection for cracks as described in FAA AC 43.13-1B, "Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair" Chapter 5, Section 5.

If no cracks are detected during the inspection, wipe the area of inspection clean with isopropyl alcohol. Apply primer to the areas where paint was removed for inspection using MIL-PRF-85582 Type I Class C2 primer. Alternatively, use any primer conforming to MIL-PRF-23377 and apply per the primer manufacturer's instructions.

Any non-crack damage, including elongated holes, should be reported to Piper for disposition. (See "Contact Piper" on page 5.)

Contact Piper: Any indications that is discovered as a result of inspections should be reported to Piper Aircraft Inc., at CustomerService@piper.com or (+1) 772-299-2141. Piper's normal business hours are Monday through Friday, 7:30 a.m. to 4:30 p.m. (Eastern).

INSPECTION AREA CARE:

Care for Bolts and Bolt Holes

To facilitate bolt removal and avoid damage to the bolt holes, follow this guidance.

- Within the instructions for wing removal found in the applicable Piper AMM, there is the statement, "Arrange and put in place a suitable fuselage cradle and supports for both wings." Proper placement of these supports can neutralize the shear loading of the bolt at the interface of the wing spar and spar box, easing bolt removal.
- Apply penetrating oil around all washers in the inspection area. Capillary action will draw the oil to the bolt shank to facilitate removal. One such oil is Kroil Penetrating Oil Aerosol, from Kano Laboratories (visit www.kroil.com and see "Where To Buy").
- Remove the nut and washers. After removing the nut, apply torque to the bolt head to rotate the bolt approximately one turn, to help draw in the penetrating oil and break the bolt shank free from the hole. Do not wrench the bolt out of its hole, because this can result in thread marking of the hole.
- Before removing a bolt from its hole, thoroughly clean all debris from the exposed threaded end. Use a nylon bristle brush, as necessary, to remove all debris from the threads and solvent clean using acetone.
- Ideally, three people should work simultaneously to remove the bolts. This approach should not demand a lot of effort from the group, as follows:
 - One person adjusts the wing supports or deflects the wing tip up and/or down to neutralize the shear loading.
 - A second person underneath the aircraft pushes the threaded end of the bolt to move it up and out of the hole.
 - A third person, in the aircraft, would receive and remove the pushed bolt.
 - For the person underneath the aircraft: a suitable non-marring tool (such as a 1/4-inch wooden dowel) may be used to push the bolt completely upwards through the hole. If necessary, use a rubber mallet or equivalent to very gently tap the lower end of the tool upwards – do not to make contact with the hole bore.
- Clean the inspection areas using acetone.

Cleaning Surface Imperfections:

Surface imperfections (blemishes, drag marks or scratches) in the hole bore can be cleaned – deburred, smoothed, and polished – using a medium (brown colored) or fine (rust colored) rubberized abrasive, either a point or cylinder, on a 1/16-inch mandrel in a rotary tool. At no point shall the diameter exceed 0.379 inches over the entire shank.

- Cratex Q8M or Q8F – 1 x 9/32 bullet point
- Cratex Q6M or Q6F – 7/8 x 1/4 cylinder

The best results are obtained between 7,500 and 15,000 RPM, using light work pressure. To procure Cratex points, call 800-800-4077 or visit www.cratex.com.

INSTRUCTIONS:

WARNING: FLIGHT WITH KNOWN CRACKS IN THE AIRCRAFT STRUCTURE IS NOT PERMITTED. AN AIRPLANE WITH A CRACK IN THE STRUCTURE DOES NOT MEET ITS TYPE DESIGN AND NO LONGER POSSESSES ITS REQUIRED TYPE DESIGN STRENGTH. ANY CRACK DISCOVERED IN THE AIRCRAFT STRUCTURE MUST BE REPAIR PRIOR TO THE NEXT FLIGHT.

CAUTION: DO NOT DRIVE OUT MAIN WING SPAR BOLTS. TAKE EXTREME CARE NOT TO DAMAGE BOLT HOLES.

CAUTION: DO NOT ROTATE BOLTS WHEN THE THREADS ARE INSIDE THE BOLT HOLE.

NOTE: The instructions contained within this service letter are applicable only to aircraft that conform to type design at the interface of the main wing spar and spar box. Any previously approved repairs or modifications may require alternate methods, instructions, and hardware.

NOTE: Temporary removal of interior components, fairings, and/or access panels may be required in order to accomplish the instructions contained in this service letter.

NOTE: Refer to the applicable Piper Airplane Maintenance Manual (AMM) or Service Manual (SM) for model specific details. Refer to the applicable Piper Parts Catalog (IPC) for the type and size of replacement hardware.

NOTE: These instructions apply to both the left and right wings.

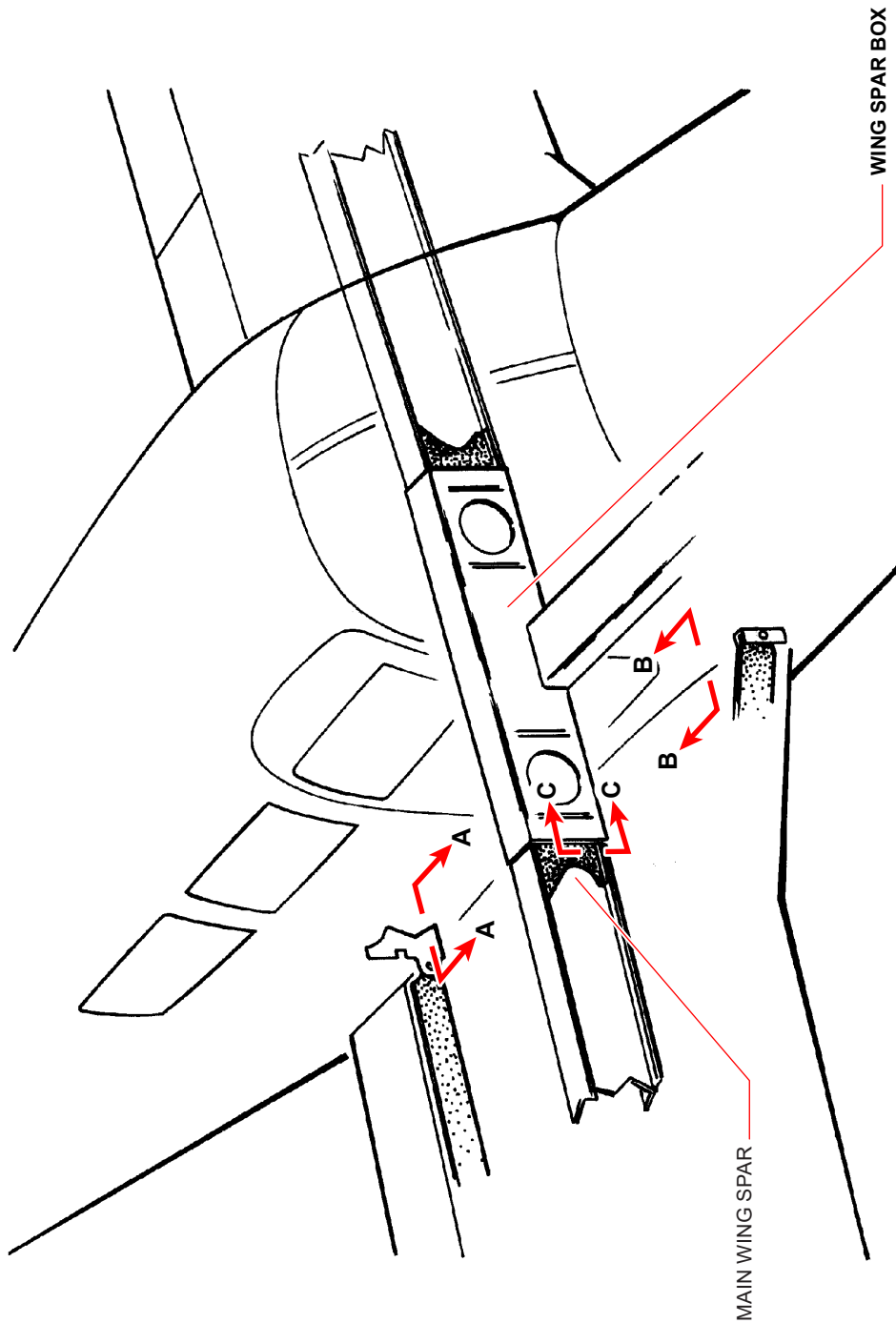
1. For each bolt removed from the lower wing cap that secures the main wing spar to the spar box, perform the Visual Inspection method, as described page 3, on the inner surface of each spar box bolt hole for damage (scratches, gouges, thread marks, etc.). See Figure 1 for a view of the spar box and main wing spar that identifies the bolt holes and inspection areas.
 - If no damage is discovered in any bolt hole, proceed to step 6.
 - If damage is discovered in one or more bolt holes, proceed to step 2.
2. Clean the subject spar box bolt holes with damage as described under Cleaning Surface Imperfections on page 5. Then perform the Visual Inspection method again on the inner surface of each subject spar box bolt hole.
 - If no damage is discovered in any bolt hole, proceed to step 6.
 - If damage is still discovered in one or more bolt holes, proceed to step 3.
3. For each spar box bolt hole with damage, perform the Eddy Current Inspection (ECI) method following the guidance under Inspection Methods on page 3.
 - If no ECI indications are present, then proceed to step 6.
 - If an ECI indication is present, proceed to step 4.

NOTE: If there is any uncertainty when performing an eddy current inspection (ECI), uncertainty in the results of an ECI, or when performing an ECI it is believed that a noisy condition exists, Piper Aircraft, Inc. recommends consulting with a NAS 410 (or equivalent standard per FAA AC 65-31B) Level III technician.

4. Perform the fluorescent penetrant inspection (FPI) method on the subject spar box bolt holes and the surrounding area local to each subject bolt hole. FPI improves situational awareness of the inspection area and potential contributors to false positives (e.g., fay gaps, swarf, etc.); it can further identify potential false positives and corroborate eddy current findings (additional ECIs are appropriate, as necessary). Follow the guidance under Inspection Methods on page 3.

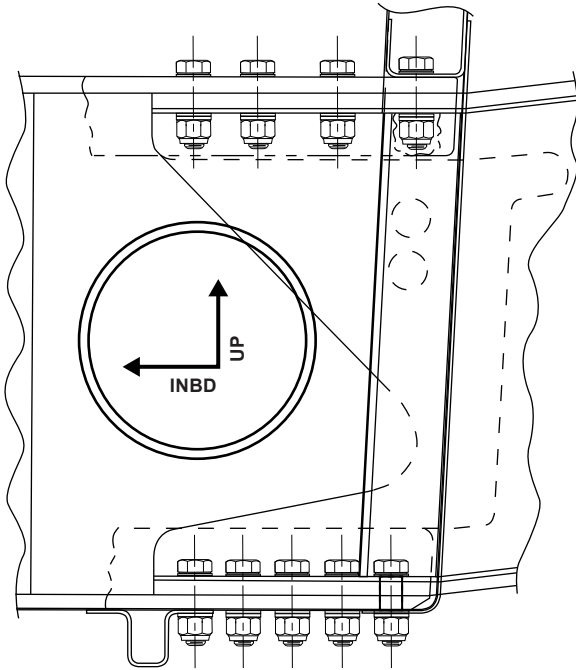
NOTE: If the technician accomplishing FPI is not the ECI technician, then the ECI technician shall observe the FPI to gain situational awareness of the inspection area for the benefit of the ECI in step 1.

5. Consult with a NAS 410 (or equivalent standard per FAA AC 65-31B) Level III technician to interpret the NDT results and provide final determination of indications.
 - If ECI indications are determined not to be damage, then proceed to step 6.
 - If ECI indications are determined to be damage, proceed to "Contact Piper" on page 5 for further action.
6. Make a logbook entry documenting compliance with this service bulletin.

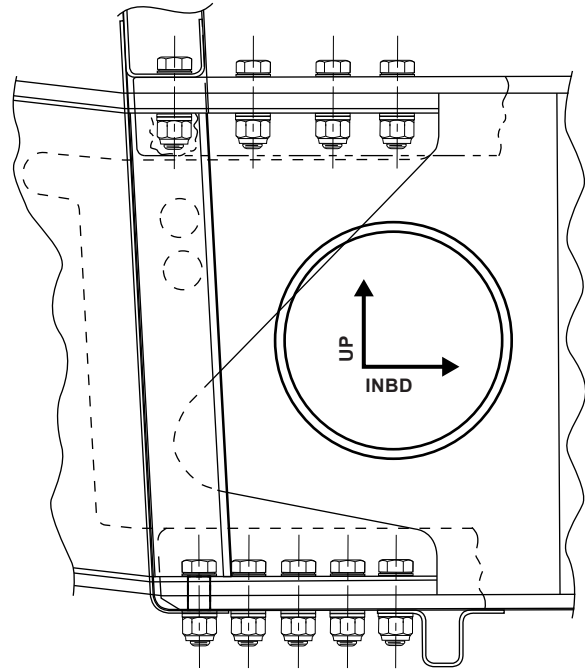


MAIN WING SPAR INSTALLATION
PERSPECTIVE VIEW
(PA-28-181 SHOWN, OTHERS SIMILAR)

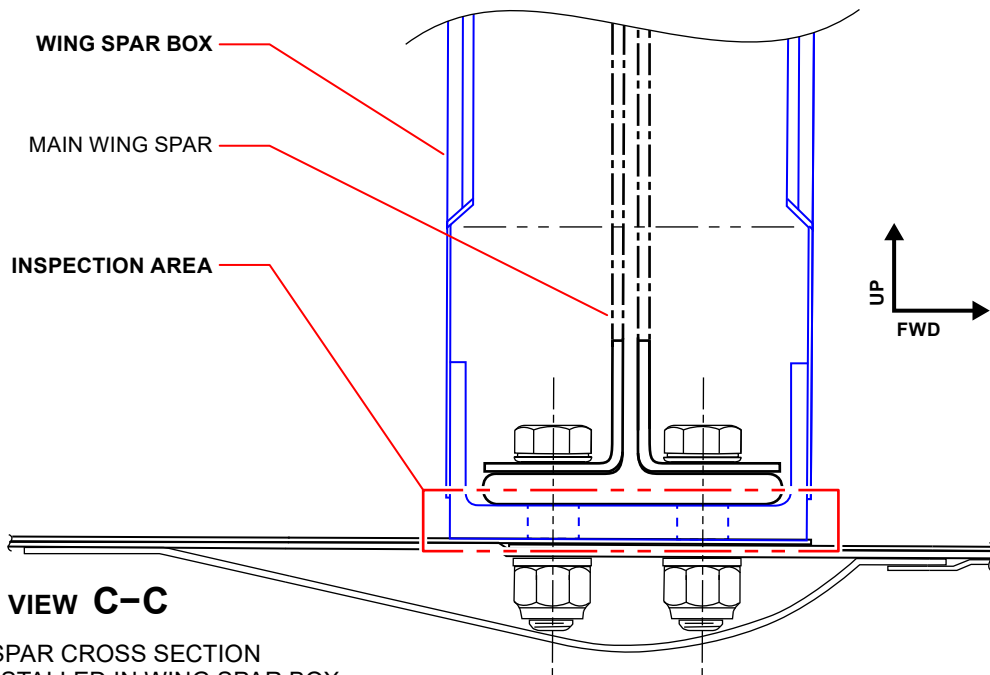
Figure 1 (Sheet 1 of 2)
Spar Box Inspection



VIEW A-A
LOOKING FWD
(LH SHOWN, RH OPPOSITE)



VIEW B-B
LOOKING AFT
(LH SHOWN, RH OPPOSITE)



VIEW C-C
WING SPAR CROSS SECTION
SHOWN AS INSTALLED IN WING SPAR BOX
(LH SHOWN, RH OPPOSITE)

Figure 1 (Sheet 2 of 2)
Spar Box Inspection

MATERIAL REQUIRED: N/A

EFFECTIVITY DATE: This service letter is effective on November 12, 2024.

SUMMARY: Please contact your Piper Approved Service Center to make arrangements for compliance with this service letter in accordance with the compliance time indicated.

NOTE: Please notify the factory of any address/ownership corrections. Changes should include aircraft model, serial number, and current owner's name and address.

Corrections and/or changes should be directed to:

PIPER AIRCRAFT, INC.
Attn: Customer Service
2926 Piper Drive
Vero Beach, FL 32960

or:

CustomerService@piper.com
Please include in subject line: "Aircraft ownership update"