

International

P.O. BOX 3090 ALBANY, GEORGIA 31706-3090 PHONE 229/883-1440 FAX 229/439-9790

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**Service Letter No. SL-AG-23**  
**18 February, 1963**

## **MAIN SPAR AT FUSELAGE SIDE**

**APPLICABILITY:** All S-2A aircraft, S/N 1003 through 1167

There have been reports of cracks originating in the main spar web flange at the fuselage side where the vent flange narrows for clearance of the vertical fuselage tubes. This area on the top and bottom of the spars should be inspected immediately and if cracks are found, Service Kit #23 should be incorporated. If no cracks are found, inspections should be made at 25 hour intervals until the modification is made. This modification is FAA approved.

For "A" models, the modification consists of adding one heavy doubler on the aft face on the main spar under the wing attach on each side. For "B" and "C" models, above mentioned doubler plus a second doubler on the forward face of the spar are added. It is necessary to install Service Kit 18 in conjunction with this modification on all models, since the location of holes in the wing attach angles will be changed. This holds true even if Service Kit 18 has been previously installed. The modification for "A" models is less extensive than for others due to the lower operating gross weights involved and can be accomplished in the field. It is strongly recommended that "B" and "C" models be flown to a repair station in your area for this modification. You may contact the factory to determine which station will be closer to you.

**INSTALLATION INSTRUCTIONS FOR "A" MODELS ONLY ARE AS FOLLOWS:**  
(Service Kit #23-A)

1. If cracks are present in the spar web, stop drill at the end of the crack with a #30 drill.
2. Install shims as required between the lower longeron and the lower spar web flange on each side to hold the wings in place when the wing attach angles are removed. The wing weight should also be supported at the outboard wing jack points.
3. Working room can be increased by removing the main gear shock struts and swinging the gear legs up as far as possible. The fuselage must be supported in some other available manner when this is done.
4. Remove all four wing attach angles.
5. Drill out the rivets on the spar which fail in the area of the 5-2080-2 doubler to be added. See the view looking forward at the right main spar on Dwg. 5-2080. The existing rivets here are 5/32 diameter in the upper rows and 3/16 diameter in the lower rows but all will be replaced with 3/16 diameter rivets.

6. Drill out the 5/32 rivets in the vertical stiffener angle No.2 and remove the stiffener.
7. Clico or bolt the 5-2080-2 doubler in place through several of the lower rivet holes. Note that this doubler is a right and left handed part because of the predrilled holes in it. Enlarge all the upper rivet holes to accept 3/16 diameter rivets by drilling with a #10 drill. Enlarge the wing attach angle pilot holes in the doubler with a #11 drill being careful not to elongate existing holes in webs. All these holes may be drilled from the forward face of the spar.
8. Remove the new doubler and clean all metal shavings from between it and the old parts, then put the doubler back in place.
9. Install AN470-AD6 rivets with manufactured head forward in all the rivet holes in the new doubler except for the two holes (one upper and one lower) directly ahead of the vertical fuselage tube. These two holes will require bolts because of insufficient clearance for rivet bucking. Install one AN3-7A bolt, AN960-10 washer and AN365-1032 nut in each of these holes.
10. Replace the vertical stiffener No.2 by clamping it in place, drilling the holes through it and the spar webs with a #10 drill and installing AN470-AD6 rivets. It may be necessary to file off the edges of the 5-2080-2 doubler to get the angle to fit solidly against the web where it was originally.
11. Repeat step (3) through (10) above on the opposite wing.
12. Install new wing attach angles by following steps (3) through (10) on Page 2 of Service Letter #18.

Installation instructions for "B" and "C" models are given below. Use Service Kit #23-BC. Steps with an asterisk before them are not required on "B" models.

- \*1. Drain both fuel tanks and remove the inspection covers just inboard of the tank filler necks.
2. Remove the wing walk material back to the aft edge of the leading edge skin.
3. Go through steps (1) through (4) of "A" model instructions above.
4. Remove the dust cover from the no. 1 nose rib (see Dwg. 5-2080).
5. Remove the no. 1 and no. 2 nose ribs by drilling out all the rivets which hold them to the leading edge skin and removing the rivets into the spar web by driving a chisel between the rib aft flange and the spar web.
6. Drill out all rivets between vertical stiffener angles no. 1 and no. 4 (see Dwg. 5-2080) except for the two middle rivets in vertical stiffener angle no. 3. Vertical stiffener angle no. 3 should not be removed. This does not include the rivets in vertical stiffener angles no. 1 and no. 4 which remain in place.
7. Clico or bolt the 5-2080-1 and 5-2080-2 doublers to the spar through several of the lower rivet holes. See views of these doublers on Dwg. 5-2080 for location. Note that both doublers are right and left handed parts because of the pre-drilled holes in them. Enlarge all upper rivet

holes to accept 3/16 diameter rivets by drilling with a #10 drill. Enlarge the wing attach angle pilot holes in the doublers with a #11 drill.

8. Remove both doublers and clean out the metal shavings in between them and the spar webs and then put the doublers back in place.
9. Install AN470-AD6 rivets in all rivet holes except those that go through vertical stiffener angle no. 2 and two holes directly ahead of the vertical fuselage tubes. The latter two holes mentioned have to be bolted as explained in step (9) under instructions for "A" models, AN3-10A bolts are used in these two holes on "B" and "C" models. Drive all rivets from the forward face of the spar. All rivets outboard of vertical angle stiffener no. 3 will have to be bucked by reaching inside the fuel tank through the open inspection hole on "C" models.
10. Replace the vertical stiffener angle no. 2 clamping it in place by the bottom two rivets, drilling the remaining holes in it out with a #10 drill through existing holes in spar and installing AN470-AD6 rivets.
11. Drill three #30 holes in each of two 5-2080-3 nose rib angles, using the no. 1 and no. 2 nose rib aft flanges for templates. To do this, place one leg of the angle against the forward face of the aft rib flange, the other leg against the rib web, and center the angle vertically on the aft rib flange. Do this for each angle on each rib. Two of the matching holes in the spar for the inboard angle will have to be drilled from the aft side of the spar through the 5-2080-1 doubler from existing holes in the spar web. Rivet the drilled angles in their respective places on the spar with AN470-AD4 rivets.
12. Rework the no. 1 nose rib by cutting the aft flange off 1/4" forward of the bend line as shown in Section B-B of Drawing 5-2080. Rework the no. 2 nose rib similarly except cut it off 1/8" forward of the bend line.
13. Replace the no. 2 and no. 1 ribs in the wing. Use a #30 drill to drill the 1/8" diameter rivet holes through the rib web and nose rib angle as shown in Section B-B of Drawing 5-2080. Install AN470-AD4 rivets from rib to angle and AN426-AD4 rivets from rib to skin.
14. Trim the aft edge of the nose rib dust cover to conform with the new doubler contour and replace the dust cover.
- \*15. Re-seal the inside of the fuel tank in the area of the rework as follows:
  - a. Brush on one heavy coat of PRC (Products Research Co.) PR-1221A-2 sealer and let dry thoroughly (usually about 12 hours drying time required).
  - b. Brush on two coats of PRC PR-1005-L sealer, allowing the first coat to dry before applying the second coat. (Drying time about 15 minutes).
- \*16. Glue on the new wing walk material with 3M safety walk adhesive (Lot 56J2B) letting the new abrasive material lap over the old at the aft edge of the leading edge skin.
17. Install new wing attach angles by following steps (3) through (10) of Service Letter No. 18
18. Repeat steps (2) through (16) above on the opposite wing.

19. After modification is completed, check fuel tanks for leaks. If any leaks are found, drain tank again and apply another coat of PRC PR-1005-L sealer.

### Service Kit #23-A Parts List

<u>Description</u>	<u>Part No.</u>	<u>No. Reqd.</u>
Doubler – Spar Aft	5-2080-2	1 R, 1 L
AN3-11 A Bolt	-----	16
AN3-10 A Bolt	-----	16
AN960-10 Washer	-----	36
AN365-1032 Nut	-----	36
AN4-30 Bolt	-----	8
AN365-428 Nuts	-----	8
.063 x 2 x 1, 2024-T3 Shim	-----	2
½” Spot Facer ground to .496” dia. With ¼” pilot (DoAll #D-376)	-----	1
Wing Attach Angle	112-B	4
Shoulder Bushing	112-10	16
18” long ¼” dia. Drill bit	-----	1
AN470 AD6-14 Rivets	-----	34
AN470 AD6-12 Rivets	-----	34
AN470 AD6-10 Rivets	-----	40
Blueprint 5-2080	-----	1
AN3-7 A Bolt	-----	4

### Service Kit #23-A Parts List

\* Parts Marked With Asterisk Before Them Are Not Used For “B” Models

<u>Description</u>	<u>Part No.</u>	<u>No. Reqd.</u>
Doubler Spar Fwd.	5-2080-1	1R, 1 L
Doubler Spar Aft	5-2080-2	1R, 1L
Angle-Nose Rib	5-2080-3	4
AN 3-12A Bolt	-----	16
AN 3-11A Bolt	-----	16
AN 3-10A Bolt	-----	4
AN 960-10 Washer	-----	36
AN 365-1032 Nut	-----	36
AN 4-30A Bolt	-----	8
AN 365-428 Nut	-----	8
.063 x 2 x 1, 2024-T3 Shim	-----	4
½” spot facer ground to .496” dia. With ¼” pilot (DoAll #D-376)	-----	1
18” long ¼” dia. Drill bit	-----	1
Wing Attach Angles	112-B	4
Shoulder Bushing	112-10	16
AN 470-AD6-16 Rivets	-----	34
AN 470-AD6-14 Rivets	-----	34
AN 470-AD6-12 Rivets	-----	120
AN 470-AD4-8 Rivets	-----	12
AN 470-AD4-5 Rivets	-----	12

<u>Description</u>	<u>Part No.</u>	<u>No. Reqd</u>
AN 426-AD4-5 Rivets	-----	60
*PRC PR-1221A-2 Sealer	-----	½ pint
*PRC PR-1005-L Sealer	-----	½ pint
* Wing Walk Material (12"x24")	-----	2
*3M Safety Walk Adhesive (Lot 56J2B)	-----	½ pint
Blueprint 5-2080	-----	1

## Memo on Service Letter #23

Subject: Main Spar at Fuselage Side

Applicability: All S-2 Aircraft, Serial Numbers 1003 through 1167

There have been reports of cracks originating in the main spar web flange at the fuselage side where the bent over flange narrows for clearance of the vertical fuselage tubes. This area on the top and bottom of the spars should be inspected immediately and if cracks are found, Snow Service Kit 23 should be incorporated. If no cracks are found, inspection should be made at 25 hour intervals until the modification as described in Service Letter #23 is made.

Service Letter #23 prescribes a different fix for "A" models than for "B" models, so be sure and specify which model the service kit is desired for when ordering. The modification for "A" models is less extreme than for the others and can be accomplished in the field. It is strongly recommended that "B" and "C" models be flown to a repair station in your area for modifications. You may contact the factory to determine which repair station will be closest to you.

Correction for Snow Service Letter #23 Installation Instructions. Read the following paragraph before installing Service Kit #23.

All drilled holes which will receive AN 3 bolts should be drilled with a #13 drill bit rather than a #11 drill bit as stated in steps (7) on installation instructions of Service Letter #23. This also includes the two holes just forward of the vertical fuselage tube as mentioned in steps (9) of instructions for Kits 23-A and Kits 23-BC.