

# SERVICE BULLETIN

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REF NO: 96

MODIFICATION NO:

ATA CHAPTER: 57

## WING - MAIN SPAR - REPLACEMENT OF THE MAIN-LANDING-GEAR FRONT ATTACHMENT-BRACKET

### 1. Planning Information

#### A. Effectivity

All PC-7 aircraft which, after inspection in accordance with PC-7 Service Bulletin (SB) 57-004, have a left and/or right main-landing-gear (MLG) front attachment-bracket that must be replaced.

**NOTE:** SB 57-004 was issued to give the necessary inspection instructions and the acceptance/rejection criteria for the MLG front attachment-brackets.

#### B. Concurrent Requirements

None

#### C. Reason

##### (1) Problem

The left and/or right main-landing-gear (MLG) front attachment-bracket has one or more cracks that are not acceptable.

##### (2) Cause

Stress corrosion causes the cracks in the brackets.

##### (3) Solution

The MLG brackets must be replaced if the length and/or location of the cracks are not in the limits given in SB 57-004

#### D. Description

This Service Bulletin gives the data necessary for replacement of the MLG front attachment brackets. The instructions given are for the left MLG front attachment bracket and are applicable to the right MLG front attachment bracket except where shown.

**NOTE:** The Modification (Mod) Kit has the items necessary for replacement of the left and right brackets. If mandatory replacement is applicable to only one of the brackets, Pilatus recommends that the left and right brackets be replaced at the same time. This will prevent continued inspection of the other (serviceable) bracket and possible subsequent replacement.

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**E. Compliance**

Mandatory for aircraft which, in accordance with the criteria given in SB 57-004, have a left and/or right MLG front attachment bracket that must be replaced.

Required immediately after it is found that the bracket(s) must be replaced.

**F. Approval**

The technical aspects of this Service Bulletin have been approved by the Federal Office for Civil Aviation (FOCA) of Switzerland.

**NOTE:** PILATUS advises Operators/Owners to ask their local Airworthiness Authorities for changes, local regulations or sanctions which can have an effect on the embodiment of this Service Bulletin.

**G. Manpower**

	Total
Preparation	20.0
Replacement	120.0
Close up	20.0
<b>TOTAL MAN-HOURS</b>	<b>160.0</b>

**NOTE:** Man-hour figures are per aircraft but do not include the time required to cure sealants and adhesives. The man-hours given in the table are sufficient to replace the left and right MLG brackets.

**H. Weight and Balance**

**(1) Weight Change**

None.

**(2) Moment Change**

None.

**I. Electrical Load Data**

Not changed.

**J. Software**

Not changed.

**K. References**

Service Bulletin 57-004 Wing - Main Spar - Inspection of the MLG Front Attachment-Brackets.

Aircraft Maintenance Manual (AMM), Chapters 06-00-00, 07-00-00, 08-00-00, 12-00-00, 12-11-28, 28-10-00, 28-20-02, 28-20-03, 32-10-01 and 32-10-02.

Structural Repair Manual (SRM), Chapters 51 and 57.

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**L. Publications Affected**

Structural Repair Manual (SRM), Chapter 57-10-01, Page Block 201 (new).

**M. Interchangeability of Parts**

Not affected.

**2. Material Information**

**A. Materials Necessary for Each Aircraft**

**(1) Material to be Purchased**

Modification Kit No. 500.50.07.135, which has these parts:

New Part No.	Description	Old Part No.	Qty	Remarks	Fig	Item
557.10.09.045	Bracket Assembly, MLG Front Attachment, LH	111.34.07.105	1			
557.10.09.046	Bracket Assembly, MLG Front Attachment, RH	111.34.07.106	1			
933.74.21.066	Bolt, 100° Csk Hd NAS1580C4T8X	933.74.20.066 NAS1580C4T8	8	New bolts are 17/64 inch (1st oversize)	8	1
938.07.68.405	Nut, Hex, Self-locking, MS21083-N4		8		8	2
938.77.11.115	Washer, Flat NAS1149F0463P (AN960-416)		8		8	3
939.17.81.255	Rivet, Solid, Univ Hd MS20470AD5-8		110			
939.17.81.257	Rivet, Solid, Univ Hd MS20470AD5-10		50			
939.17.81.258	Rivet, Solid, Univ Hd MS20470AD5-11		12			
939.30.81.255	Rivet, Solid, 100° Csk Hd MS20426AD5-8		22			
939.30.81.257	Rivet, Solid, 100° Csk Hd MS20426AD5-10		10			
940.17.02.249	Pin, Cotter, Steel MS24665-287		2	For assembly of leg and folding strut		
940.17.02.275	Pin, Cotter, Steel MS24665-427		2	For MLG wheels installation		

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New Part No.	Description	Old Part No.	Qty	Remarks	Fig	Item
946.91.27.497	Packing, Preformed MS29513-283		2	For fuel tank access panel installation		
111.36.07.521	Washer, Sealing		4	For fuel tank access panel installation		
115.55.07.008	Gasket		2	For booster pump installation		
946.91.27.206	Packing, Preformed MS29512-06		2	For delivery jet pump installation		
946.91.27.210	Packing, Preformed MS29512-10		4	For booster pump installation		
946.91.27.310	Packing, Preformed MS29513-010		26	For booster pump installation		
946.91.91.020	Packing with Retainer (Bonded Seal) NAS1523AA20R		2	For delivery jet pump installation		
940.01.08.116	Bolt, Hi-Lok, Oversize HL411VAZ-6-16		26	To attach bracket flanges to the wing spar cap	9	1
940.01.08.117	Bolt, Hi-Lok, Oversize HL411VAZ-6-17		12	For the 6 outer holes of the bottom flange	9	2
940.01.04.302	Collar, Hi-Lok, Oversize HL84-6		38		9	3

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**(2) Operator Supplied Materials (Ref. Consumable Materials List, AMM 20-31-00)**

Part No.	Description	Qty	Remarks
910.21.61.015	Methyl-Ethyl-Ketone	A/R	Item P01-010
904.48.83.103	Aluminum Wool	A/R	Item P02-002
904.49.73.004	Cleaning Cloth (lint free)	A/R	Item P02-003
908.40.32.251	Alodine 1200S	A/R	Item P07-001
910.02.05.031	Epoxy Primer, Yellow	A/R	Item P07-007
910.02.05.032	Hardener (for epoxy primer)	A/R	Item P07-007A (not yet in AMM)
917.40.68.001	Adhesive Tape	A/R	Item P09-026
N/A	Petroleum Jelly	A/R	Item P04-007
907.10.11.222	Sealant PR1422-A2	A/R	Item P08-020
907.10.11.232	Sealant PR1422-B2	A/R	Item P08-018
907.10.11.241	Sealant PR1431 Type1	A/R	Item P08-032
907.10.02.001	Sealant PR1005-L (Protective Coating)	A/R	Item P08-024

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**B. Tooling**

**(1) Tools to be Procured**

Tool Kit No. 513.57.09.040 (one per customer), which has these parts:

Part No.	Description	Qty	Remarks
513.57.09.079	Alignment Fixture Assembly, MLG Attachment	1	The fixture assembly includes screws and the related 6 mm inbus key
902.41.28.405	Carbide Burr	2	
513.57.09.078	Reamer, Hand 5.556 mm ZC7	2	
513.57.09.084	Reamer, Hand 6.747 mm H7	2	
513.57.09.066	Drill Guide-Bushing	1	Hole dia. 3.0 mm, bush dia. 4.1 mm
513.57.09.067	Drill Guide-Bushing	1	Hole dia. 5.6 mm, bush dia. 6.35 mm csk
513.57.09.072	Piloted Countersinking Tool	1	Dia. 9.0 mm / 5.0 mm
513.57.09.073	Piloted Countersinking Tool	1	Dia. 12.7 mm / 6.35 mm
513.57.09.068	Stepped Drill	2	Dia. 3.0 mm / 4.1 mm
901.61.04.024	Drill, Special Short	10	Dia. 2.4 mm, titanium-tipped
901.61.04.030	Drill, Special Short	10	Dia. 3.0 mm, titanium-tipped

Tool Kit No. 513.57.09.076 (one per aircraft), which has these parts:

Part No.	Description	Qty	Remarks
513.57.09.069	Drill Template (Blank), LH	1	
513.57.09.070	Drill Template (Blank), RH	1	
513.57.09.071	Piloted Drill	2	Dia. 4.8 mm / 3.0 mm

**(2) Operator Supplied Tools**

Not applicable.

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**3. Accomplishment Instructions - Aircraft**

**A. Preparation**

**WARNING:** OBEY THE SAFETY PRECAUTIONS GIVEN IN THE AMM CHAPTER 28-00-00, PAGE BLOCK 201.

- (1) Defuel the aircraft (Ref. AMM, 12-11-28, Page Block 301).
- (2) Make the aircraft level (Ref. AMM, 08-00-00, Page Block 1).
- (3) Shore the wings at rib stations 21 LH and 21 RH (Ref. AMM 06-00-00, Page Block 1 for rib locations and Ref. AMM 07-00-00, Page Block 1 for shoring data).
- (4) Make sure that the flaps are in the fully retracted position. Use adhesive tape (Material No. P09-026) to hold the flap trailing edge to the wing.
- (5) Remove the left and/or right Folding Strut as applicable (Ref. AMM, 32-10-02, Page Block 401).
- (6) Remove the left and/or right Main Gear Leg as applicable (Ref. AMM, 32-10-01, Page Block 401).
- (7) Remove access panels LB3, LB4 and 4A, LT1, LT5, LT6, LT7 and/or RB3, RB4 and 4A, RT1, RT5, RT6, RT7 as applicable (Ref. AMM 12-00-00, Page Block 1).

**WARNING:** BE CAREFUL WHEN YOU USE THE CONSUMABLE MATERIALS. OBEY THE MANUFACTURER'S HEALTH AND SAFETY INSTRUCTIONS.

**B. Removal of the MLG Front Attachment Bracket (Ref. Fig. 1 thru Fig. 4)**

**NOTE:** The instructions that follow can be used for the left and/or right MLG front attachment-brackets.

- (1) Remove the LH and/or RH booster pump as applicable (Ref. 28-20-03, Page Block 201).
- (2) Remove the LH and/or RH delivery jet pump as applicable (Ref. 28-20-02, Page Block 201).
- (3) Remove fuel system pipes from the fuel collector tank (Ref. Fig. 1) as follows:
  - (a) Remove the booster pump outlet pipe (2) complete with its bonding strap.
  - (b) Remove the motive flow supply-pipe (1).
  - (c) Remove the fuel tank vent pipe (3).
  - (d) Remove the fuel tank drain pipe (5).
- (4) Remove the delivery jet-pump outlet-pipe (4) which is in the dry area inboard of wing rib 9.
- (5) Install blanking caps on all open pipes and connections.
- (6) Install and assemble the two pieces of the MLG attachment alignment-fixture (Ref. Fig. 2).

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- (7) Do an alignment check of the MLG attachments. Make sure that the pin can be turned in the alignment fixture and the MLG folding strut attachment. This is to make sure that there will be the same alignment when the new front attachment bracket is installed.
- (8) Remove the MLG attachment alignment-fixture.
- (9) Look in the wing log book or equivalent document to see if oversize fasteners were used to attach the MLG front attachment-brackets. If necessary, tell Pilatus of non-conformances found.
- (10) Remove the 23 bolts that attach the MLG front attachment bracket to the wing spar (Ref. Fig. 3) as follows:
  - (a) Remove the 19 nuts and the 19 washers (nine at the top and ten at the bottom) from the bolts at the top and bottom flanges of the MLG front attachment bracket.

**CAUTION:** DO NOT PUNCH DAMAGED, BENT OR VERY TIGHT BOLTS IN THE DIRECTION OF THE WING EXTERNAL SKIN. REMOVAL OF SUCH BOLTS IN THIS DIRECTION CAN CAUSE DAMAGE TO THE SKIN. TO REMOVE SUCH A BOLT, THE BOLT HEAD MUST BE DRILLED OFF. THE BOLT IS THEN PUNCHED OUT OF THE BRACKET FLANGE AWAY FROM THE WING EXTERNAL SKIN.

- (b) Remove the nine bolts from the top flange of the MLG front attachment bracket, and the ten bolts from the bottom flange, as follows:
  - (i) Put a protective cover on the wing external surface, specially in the area around the top and bottom flange bolts and the leading edge.
  - (ii) Use an applicable drift (punch) and carefully punch the bolts until the threaded part of the bolt is flush with the bracket flange. Make sure that the drift has no sharp edges. Use different sizes (lengths) of drift as necessary to prevent damage to the wing skin. Refer to step (c) of this procedure if it is too difficult to move the bolts with a drift.

**CAUTION:** DO NOT INCREASE THE SIZE OF THE HOLES IN THE WING SPAR. FOR STANDARD SIZE BOLTS, DO NOT USE A DRILL THAT IS LARGER THAN 4.8 MM.

- (c) Remove bolts which were not moved in step (b)(ii), as follows:
  - (i) Use the carbide burr supplied and carefully grind away the corners of the screwdriver recess from the bolt head. Make sure the conical recess you make is central.
  - (ii) Carefully drill the heads from the bolts. Start with the 2.4 mm titanium-tipped drill supplied, then the 3.0 mm titanium-tipped drill supplied and complete the task with the piloted 4.8 mm drill supplied. Do not damage the countersink in the wing skin.
  - (iii) Use an applicable drift (punch) and carefully punch the bolts through the wing and the bracket flange.



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**CAUTION:** DO NOT CAUSE DAMAGE TO THE WING STRUCTURE WHEN YOU REMOVE THE SEALANT. SCRATCHES AND OTHER DAMAGE TO THE WING SPAR CAN CAUSE FATIGUE CRACKS AND CORROSION. USE NON-METALLIC OR SOFT ALUMINUM SCRAPERS AND ALUMINUM WOOL.

- (d) In the fuel collector tank (wet side of wing rib 9), remove the sealant from the area of the items that attach the MLG front attachment bracket to the spar web. These are:
- the rivets
  - three nuts and washers (and the ends of the three bolts)
  - a shim.
- (e) Remove the three nuts and washers and the shim, then remove the three bolts. Keep the shim and two of the nuts, washers and bolts, and discard the remaining nut, washer and bolt. The two nuts, washers and bolts will be discarded (replaced) before final installation of the replacement bracket, but can be used temporarily to align the shim during final reaming (oversizing) of the bolt holes.
- (f) At the dry side of wing rib 9, remove the sealant from the area around the nut (and the end of the bolt), washer and shim that attaches the MLG front attachment bracket to the wing spar web.
- (g) Remove the nut and washer and the shim, then remove the bolt. Discard the nut, washer and bolt, but keep the shim.

(11) Remove the 89 rivets that attach the bracket to the wing spar web, as follows:

**CAUTION:** DO NOT CAUSE DAMAGE TO THE WING SPAR WEB OR THE MLG FRONT ATTACHMENT BRACKET WHEN YOU DRILL THE RIVETS. DO NOT DRILL INTO THE MLG BRACKET OR THE SPAR WEB . MAKE SURE THAT ONLY THE HEADS ARE REMOVED. AFTER REMOVAL, THE MLG BRACKET IS USED TO MAKE A TEMPLATE FOR THE NEW BRACKET.

- (a) Carefully drill the heads from the rivets. Do not damage the holes in the MLG front attachment bracket or the wing spar web.
- (b) Use a 4.0 mm drift (punch) and carefully punch the rivets through the bracket and the wing spar web. If it is too difficult to remove a rivet shank, let the rivet shank stay in the spar until after removal of the MLG front attachment bracket. Put a non-metallic support against the wing spar web during the rivet removal procedure.

(12) Remove the MLG front attachment bracket (Ref. Fig. 4) as follows:

- (a) Drill a 6.6 mm hole in the integral support stiffeners of the bracket at four positions (near the top and bottom flanges, inboard and outboard) as shown.
- (b) Put the two impact pullers (slide hammers) in position in the two left holes.

**CAUTION:** DO NOT USE FORCE TO PUT THE WEDGES IN POSITION. THIS WILL CAUSE DAMAGE TO THE WING SPAR.

- (c) Use the impact pullers at the same time and pull the bracket away from the wing spar. Use the two left holes then the two right holes again and again as necessary. During removal, put wedges (of wood or other non-metallic material) between the bracket and the spar so that the bracket does not move back to the spar.

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(13) If there are rivet shanks in the spar, remove them.

**CAUTION:** DO NOT CAUSE DAMAGE TO THE WING STRUCTURE WHEN YOU REMOVE THE SEALANT. DAMAGE TO THE WING SPAR CAN CAUSE FATIGUE CRACKS AND CORROSION. USE NON-METALLIC OR SOFT ALUMINUM ALLOY SCRAPERS AND ALUMINUM WOOL.

(14) In the fuel collector tank, remove the remaining sealant from the area of the items that attach the MLG front attachment bracket to the wing spar web. Remove sealant to a distance of approximately 5 mm from around all edges and fasteners.

(15) In the dry area inboard of wing rib 9, remove the remaining sealant from the area of the items that attach the MLG front attachment bracket to the wing spar web.

(16) Remove all unwanted material from the wing surfaces, the fuel collector tank and the dry area inboard of wing rib 9.

**C. Inspection of the Wing Spar Caps, Angles and Web**

**CAUTION:** DO NOT USE PAINT STRIPPER TO REMOVE THE SURFACE FINISH. PAINT STRIPPER CAN GET INTO THE HOLES AND INTERFACE AREAS OF THE WING STRUCTURE AND CAUSE CORROSION.

(1) Carefully remove the surface finish from the areas of the wing spar caps and web that touch the MLG front attachment bracket. Use mechanical procedures and do not cause damage to the spar.

(2) On the wing spar, at the location for the MLG front attachment bracket, examine these items for corrosion and damage:

- The surface area of the top and bottom spar caps, the spar angles and the web
- The 89 rivet holes in the web
- The four bolt holes in the web
- The nine bolt holes in the top cap
- The ten bolt holes in the bottom cap.

Examine also the areas of the spar between wing ribs 6 and 11 (near the location of the MLG front attachment bracket) for corrosion and damage. If damage and/or corrosion is found, use mechanical procedures and carefully remove the surface finish from the damaged/corroded area. If you let Pilatus know of damage found, an applicable repair will be supplied.

If corrosion is found and stays in a spar cap bolt hole after the holes have been reamed for the 7/32 in. Hi-Lok bolts, it is permitted to ream to the next full size fastener (6.35 mm/ 1/4 in.). The reamer size for this procedure is 6.35 mm ZC7.

**WARNING:** BE CAREFUL WHEN YOU USE THE CONSUMABLE MATERIALS. OBEY THE MANUFACTURER'S HEALTH AND SAFETY INSTRUCTIONS.

(3) Repair the surface finish of the wing spar as follows:

- (a) Clean the repair area with a cleaning cloth (Item No. P02-003) made moist with MEK (Item No. P01-010).

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- (b) Obey the manufacturer's instructions and apply a thin layer of Alodine 1200S (Item No. P07-001) on the areas of the wing spar from which the surface finish was removed in step (1). Let the material dry.
- (c) Obey the manufacturer's instructions and mix the yellow epoxy primer (Item No. P07-007) with the hardener (Item No. P07-007A).
- (d) Obey the manufacturer's instructions and apply a thin layer of the mixed primer on the applicable areas of the wing spar. Do not apply the primer to the surfaces of the rivet and bolt holes. If the primer layer is too thick it will prevent correct installation of the bracket.

**D. Installation of the MLG Front Attachment Bracket (Ref. Fig. 5 thru Fig. 9)**

- (1) Make a template so that the holes in the new bracket can be drilled in the same positions as the holes in the removed bracket, as follows:
  - (a) On the template blank supplied, put marks on the template as necessary to identify the template with the related aircraft/wing.
  - (b) Install the removed bracket on the flanged surface of the template blank. Attach the bracket to the template with clamps, but not at the four corners.

**CAUTION:** MAKE SURE THAT YOU DRILL THE HOLES AT THE SAME ANGLES AS THE INITIAL HOLES. DO NOT CHANGE THE ANGLES OF HOLES AS THIS WILL CAUSE PROBLEMS DURING INSTALLATION OF THE NEW BRACKET. ALWAYS USE THE DRILLING GUIDE BUSHINGS SUPPLIED.

- (c) Use the 3 mm drill guide-bushing and drill a 3 mm diameter hole in the template at the each of four corners (hole numbers 26, 53, 66 and 89, Ref. Fig. 5 or Fig. 6 as applicable). Drill the template through hole numbers 26, 53, 66 and 89 in the removed bracket (Ref Fig. 7). Install a gripper pin in each hole immediately after you make the hole.
  - (d) Use the 3 mm drill guide-bushing and drill a 3 mm diameter hole in the template at the remaining 85 rivet hole positions. Remove clamps as necessary and drill the template through the holes in the removed bracket (Ref Fig. 7).
  - (e) Use the 5.6 mm drill guide-bushing and drill a 5.6 mm diameter hole in the template at the four bolt hole positions (holes A thru D, Ref. Fig. 5 or Fig. 6 as applicable). Drill the template through the holes in the removed bracket (Ref Fig. 7). Make sure that you keep to the initial hole angles.
  - (f) Remove the bracket from the template and remove unwanted material from the template.
- (2) Prepare the replacement (new) bracket for installation on the template, as follows:
    - (a) Apply a thin layer of petroleum jelly (Item No. P04-007) or an approved general purpose grease to the top and bottom surfaces of the new bracket.
    - (b) Put the new bracket in position at the rear of the wing spar between the top and bottom spar caps and against the spar web. Use a rubber mallet to make sure that the inboard and outboard sides of the bracket touch the spar web. Use clamps to keep the bracket in position.
    - (c) Install and assemble the two pieces of the MLG attachment alignment-fixture (Ref. Fig. 2).

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- (d) Do an alignment check of the MLG attachments. Make sure that the pin can be turned in the alignment fixture and the MLG folding strut attachment. This is to make sure that the alignment of the removed bracket and the new bracket is the same. Use the rubber mallet or a soft-faced hammer to adjust the position of the bracket as necessary to get the correct alignment.
  - (e) Use the 3 mm drill guide-bushing and drill a 3 mm diameter pilot hole in the bracket as close as possible to each of the four corners. Drill the bracket from the front face of the spar through the holes in the spar web. Install a gripper pin in each hole immediately after you make the hole.
  - (f) Do another alignment check of the MLG attachments. Make sure that the pin can be turned in the alignment fixture and the MLG folding strut attachment.
  - (g) Drill the 19 holes in the top and bottom flanges of the new bracket as follows:
    - (i) Use a 4.8 mm drill to make the nine bolt holes in the top flange of the bracket. Drill down into the bracket through the holes in the wing top skin and spar cap. Make sure that you keep to the initial hole angles.
    - (ii) Use a 4.8 mm drill to make the ten bolt holes in the bottom flange of the bracket. Drill up into the bracket through the holes in the wing bottom skin and spar cap. Make sure that you keep to the initial hole angles.
    - (iii) Ream the 19 holes to a diameter of 5.0 mm.
    - (iv) Use the 9.0 mm / 5.0 mm piloted countersinking tool supplied and make sure that the 19 countersinks in the wing skin are smooth and correct for the head size of the new Hi-Lok bolts.
    - (v) Obey the manufacturer's instructions and apply a thin layer of Alodine 1200S (Item No. P07-001) to the surface area of the countersinks. Let the material dry.
  - (h) Do again the alignment check of the MLG attachments. Make sure that the pin can be turned in the alignment fixture and the MLG folding strut attachment.
  - (i) Remove the MLG attachment alignment-fixture.
  - (j) Remove the new bracket from the wing. Use standard toolmaker's clamps (on the bracket stiffeners) to pull the bracket away from the wing spar. Make sure that the stiffeners have protection to prevent damage.
  - (k) On the new bracket, at the 19 bolt holes, make 100° X 7/32 (0.219) in. / 5.556 mm ZC7 countersinks in preparation for final drilling and reaming when the bracket is installed. Do this on the top face of the top flange and the bottom face of the bottom flange only.
- (3) Drill the holes in the replacement (new) bracket in the same positions as the holes in the removed bracket, as follows:
- (a) Install the new bracket on the flanged face of the template. Align the four 3 mm rivet pilot holes in the new bracket with the related four rivet pilot holes in the template. Attach the new bracket to the template with four 3 mm gripper pins.
  - (b) Use the 3.0 mm / 4.1 mm stepped drill supplied to make 85 (of 89) 4.1 mm rivet holes in the new bracket. Drill the bracket through the holes in the template (Ref. Fig. 7). Make sure that you keep to the initial hole angles.

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- (c) Install a 4.1 mm gripper pin in four of the holes drilled in step (b). Install the gripper pins as close as possible to the four corners
  - (d) Remove the four 3 mm gripper pins which were installed in step (a), then use the 3.0 mm / 4.1 mm stepped drill to increase the size of the four holes to 4.1 mm. Drill the bracket through the holes in the template (Ref. Fig. 7). Make sure that you keep to the initial hole angles.
  - (e) Make 100° countersinks at rivet holes 1 thru 12 (Ref. Fig. 5 or Fig.6 as applicable). The finished countersink depth must be 1.4 (+0/-0.1) mm.
  - (f) Drill a 5.6 mm diameter hole in the bracket at the four bolt hole positions (holes A thru D, Ref. Fig. 5 or Fig.6 as applicable). Drill the bracket through the holes in the template (Ref. Fig. 7). Make sure that you keep to the initial hole angles.
  - (g) Increase the size of the four bolt holes made in step (f) to 6.35 mm (1/4 in.). Make sure that you keep to the initial hole angles.
  - (h) Use the 12.7 mm / 6.35 mm piloted countersinking tool supplied to make 100° countersinks at bolt holes A thru D. The depth of the countersink must be sufficient so that the head of the replacement (1st oversize) bolt will be flush with the bracket surface.
  - (i) Remove the bracket from the template. Make sure the holes in the bracket have no sharp edges. Remove burrs as necessary and remove unwanted material from the bracket.
  - (j) Obey the manufacturer's instructions and apply a thin layer of Alodine 1200S (Item No. P07-001) to the surface area of the 12 rivet hole countersinks and the four bolt hole countersinks. Let the material dry.
- (4) Temporarily install and drill/ream the new bracket as follows:
- (a) Apply a thin layer of petroleum jelly (Item No.P04-007) or an approved general purpose grease to the top and bottom surfaces of the new bracket.
  - (b) Put the new bracket in position at the rear of the wing spar between the top and bottom spar caps and against the spar web. Use a rubber mallet to make sure that the inboard and outboard sides of the bracket touch the spar web. Install gripper pins to keep the bracket in position.
  - (c) Install and assemble the two pieces of the MLG attachment alignment-fixture (Ref. Fig. 2). Do an alignment check of the MLG attachments. Make sure that the pin can be turned in the alignment fixture and the MLG folding strut attachment.
  - (d) Run a 4.1 mm drill through the 89 rivet holes. To do the gripper-pinned holes, remove the gripper pins (one at a time) and install them in adjacent holes as necessary.
  - (e) Install the two bolts, nuts and washers and the larger of the two shims (kept from the removal procedure) at bolt holes B and D.
  - (f) Ream through the bracket, spar web, sealing angle and shim at bolt hole C. Start with a 6.6 mm reamer and end the procedure with the 6.747 mm H7 reamer supplied.
  - (g) Remove the bolt, nut and washer from bolt hole B and install them in bolt hole C.

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- (h) Ream through the bracket, spar web, sealing angle and shim at bolt hole B. Start with a 6.6 mm reamer and end the procedure with the 6.747 mm H7 reamer supplied.
  - (i) Remove the bolt, nut and washer from bolt hole D and install them in bolt hole B.
  - (j) Ream through the bracket, spar web, sealing angle and shim at bolt hole D. Start with a 6.6 mm reamer and end the procedure with the 6.747 mm H7 reamer supplied.
  - (k) Remove and discard the two bolts, nuts and washers at bolt holes B and C. Keep the shim for final installation.
  - (l) Ream through the bracket, spar web and sealing angle at bolt hole A. Start with a 6.6 mm reamer and end the procedure with the 6.747 mm H7 reamer supplied.
  - (m) Remove the gripper pins, then remove the new bracket from the aircraft. Remove burrs from the holes and remove all unwanted material from the bracket.
  - (n) At a workbench, ream the smaller of the two shims (kept from the bracket removal procedure). Start with a 6.6 mm reamer and end the procedure with the 6.747 mm H7 reamer supplied.
- (5) Install the new bracket as follows:

**WARNING:** BE CAREFUL WHEN YOU USE THE CONSUMABLE MATERIALS. OBEY THE MANUFACTURER'S HEALTH AND SAFETY INSTRUCTIONS.

- (a) Make sure that the mating surfaces of the bracket and the wing spar are clean and free from damage. Use Methyl-Ethyl-Ketone (MEK) (Item No. P01-010) to remove all grease and/or petroleum compounds.
- (b) Obey the manufacturer's instructions and mix approximately 48 grams of sealant PR1431 (Item No. P08-032). Mixing ratio is 15 grams of base to 1 gram of catalyst.
- (c) Obey the manufacturer's instructions and apply sealant PR1431 (Item No. P08-032) as follows:
  - (i) Apply a thin layer of the sealant to the flat surfaces of the bracket ( the front face, the top of the top flange and the bottom of the bottom flange).
  - (ii) Apply a 3 mm fillet of the sealant to the internal radius of the top and bottom spar angle extrusions. Do this along the length of the area where the MLG front attachment bracket touches the spar.
  - (iii) Apply a 4 mm fillet of the sealant to the bottom edge of the top spar angle extrusion and to the top edge of the bottom spar angle extrusion. Do this along the length of the area where the MLG front attachment bracket touches the spar.
- (d) Put the bracket in position at the rear of the wing spar between the top and bottom spar caps and against the spar web. Use a rubber mallet to make sure that the inboard and outboard sides of the bracket touch the spar web. Use the rubber mallet or a soft-faced hammer to adjust the position of the bracket as necessary to align the rivet holes in the bracket and the spar web.

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- (e) Install a 4.1 mm gripper pin in the hole at each of the four corners (hole numbers 26, 53, 66 and 89, Ref. Fig. 6 or Fig.7 as applicable).
- (f) Install and assemble the two pieces of the MLG attachment alignment-fixture (Ref. Fig. 2). If the fixture was adjusted during the bracket removal procedure (Ref. NOTE which follows step (7) of Para. B.), install the same shims for this procedure.
- (g) Do an alignment check of the MLG attachments. Make sure that the pin can be turned in the alignment fixture and the MLG folding strut attachment. Use a rubber mallet or a soft-faced hammer to adjust the position of the bracket as necessary to get the correct alignment.
- (h) Remove the MLG attachment alignment-fixture.
- (i) Remove unwanted sealant from the area around the bracket.
- (j) Install the four replacement bolts at the center of the bracket (Ref. Fig. 8), as follows:
  - (i) Obey the manufacturer's instructions and apply a thin layer of the sealant PR1431 (Item No. P08-032) to the mating surfaces of the sealing angle (in the fuel collector tank between the spar web and wing rib 9) and the larger of the two shims (which was reamed during the temporary installation of the bracket).
  - (ii) Use the wet installation procedure and install the replacement (1st oversize) bolt (1), washer (2) and nut (3) and the large shim at holes B, C and D (Ref. Fig. 8).
  - (iii) Obey the manufacturer's instructions and apply a thin layer of the sealant PR1431 (Item No. P08-032) to the mating surfaces of the rib angle (at bolt hole A) and the small shim.
  - (iv) Use the wet installation procedure and install the small shim with the replacement (1st oversize) bolt (1), washer (2) and nut (3) at hole A (Ref. Fig. 8).
  - (v) At hole positions A thru D, torque tighten the nuts to between 5.7 and 7.9 Nm (50 and 70 lbf in.).
  - (vi) Remove unwanted sealant from the area of the shims.
- (k) Use the wet riveting procedure and rivet the bracket to the spar web in the numerical sequence shown (Ref. Fig. 5 or Fig. 6 as applicable) as follows:
  - (i) Obey the manufacturer's instructions when you use the sealant PR1431 (Item No. P08-032).
  - (ii) Use the type (countersunk or universal head) and length of rivet applicable to each of the 89 rivet positions (Ref. Table 1). If necessary, refer to Chapter 51 of the Structural Repair Manual for the data related to solid rivets and riveting practices.
  - (iii) When approximately half of the rivets are installed, remove the four gripper pins and complete the rivet installation sequence. At the end of the riveting procedure remove unwanted sealant.

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Part No.	Description	Specification.	Hole No.(Ref. Fig. 5 and 6)
939.30.81.257	Rivet, Solid, 100° Csk Hd	MS20426AD5-10	1, 2, 3
939.30.81.255	Rivet, Solid, 100° Csk Hd	MS20426AD5-8	4, 5, 6, 7, 8, 9, 10, 11, 12
939.17.81.255	Rivet, Solid, Univ Hd	MS20470AD5-8	13, 14, 15, 16, 17, 18, 27, 28, 29, 30, 31, 32, 33, 34, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 54, 57, 58, 59, 60, 61, 62, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83
939.17.81.257	Rivet, Solid, Univ Hd	MS20470AD5-10	19, 21, 22, 23, 24, 25, 26, 35, 37, 38, 51, 52, 53, 55, 56, 64, 65, 66, 85, 86, 87, 88, 89
939.17.81.258	Rivet, Solid, Univ Hd	MS20470AD5-11	20, 36, 63, 84

Table 1: Rivet and Hole Data

- (l) Install the 19 Hi-Lock bolts in the top and bottom flanges of the MLG front attachment bracket (Ref.Fig. 10). The procedure that follows is for installation of the 7/32 in. (oversize) Hi-Lock bolts supplied. If it is necessary to ream the hole(s) more than the 7/32 in. (5.556 mm) given (to remove corrosion or damage), then ream as applicable for installation of 1/4 in. Hi-Lock bolts (Ref. Table 2).
- (i) At each of the nine bolt holes in the top flange, ream down through the wing skin, the spar cap and the flange. Start with a 5.2 mm reamer, then a 5.4 mm. reamer and end the procedure with the 5.556 mm ZC7 reamer supplied.
  - (ii) At each of the ten bolt holes in the bottom flange, ream up through the wing skin, the spar cap and the flange. Start with a 5.2 mm reamer, then a 5.4 mm reamer and end the procedure with the 5.556 mm ZC7 reamer supplied.
  - (iii) At the 19 reamed holes, make sure that the 100° countersinks in the wing skin are clean and free of burrs.
  - (iv) Obey the manufacturer's instructions when you use the sealant PR1431 (Item No. P08-032) during the wet installation procedure .
  - (v) Use the wet installation procedure and install the nine Hi-Lock bolts (1) and collars (3) in the top flange (Ref. Fig. 9).
  - (vi) Use the wet installation procedure and install the four Hi-Lock bolts (1) and collars (3) in the four inner holes of the bottom flange (Ref. Fig. 9).
  - (vii) Use the wet installation procedure and install the six (longer) Hi-Lock bolts (2) and collars (3) in the six outer holes of the bottom flange (Ref. Fig. 9). At the end of the procedure remove unwanted sealant.



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HOLE DIAMETER		ISO LIMITS and FITS (μm)	
7/32 (0.219) in.	5.556 mm	ZC7	-0.076 -0.088
1/4 (0.250) in.	6.35 mm	ZC7	-0.091 -0.106

Table 2: Limits and Fits for Spar Cap Interference-Fit Fasteners

- (6) Repair the surface finish (clean, then apply primer and top coat) as necessary at these locations (Ref. SRM, 51-10-02):
- inside the fuel collector tank (primer only)
  - at the heads of the 19 Hi-Lok bolts (nine on the top wing surface and ten on the bottom wing surface)
  - on the MLG front attachment bracket (Hi-Lok collars included).
- (7) Repair the sealant in the areas of the items that attach the MLG front attachment bracket to the spar web (Ref. AMM, 28-10-00, Page Block 801, Para. C. Major Repair). The applicable areas are:
- The rivets, the three nuts and washers (and the ends of the three bolts) and the shim in the fuel collector tank.
  - The area around the nut (and the end of the bolt), washer and shim at the dry side of wing rib 9.
- (8) Make sure that the sealant has had sufficient time to cure and that the fuel collector tank (and the area around the nut, washer and shim at the dry side of wing rib 9) is clean and free of all unwanted material.
- (9) Remove the blanking caps from fuel pipes and connections as applicable.
- (10) Install the delivery jet-pump outlet-pipe (4) which is in the dry area inboard of wing rib 9 (Ref. Fig. 1).
- (11) Install fuel system pipes in the fuel collector tank (Ref. Fig. 1) as follows:
- (a) Install the fuel tank drain pipe (5).
  - (b) Install the fuel tank vent pipe (3).
  - (c) Install the motive flow supply-pipe (1).
  - (d) Install the booster pump outlet pipe (2) complete with its bonding strap.
- CAUTION:** DO NOT REFUEL THE AIRCRAFT FOR FUEL LEAK AND/OR OPERATIONAL TESTS UNTIL AFTER THE AIRCRAFT IS LOWERED TO THE GROUND.
- (12) Install the LH and/or RH delivery jet pump as applicable (Ref. 28-20-02, Page Block 201).
- (13) Install the LH and/or RH booster pump as applicable (Ref. 28-20-03, Page Block 201), but do not refuel the aircraft or do the booster pump operational test at this time. The instructions to refuel the aircraft and do the test is included in the close up procedure.

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**E. Close up**

- (1) Install access panels LB3, LB4 and 4A, LT1, LT5, LT6, LT7 and/or RB3, RB4 and 4A, RT1, RT5, RT6, RT7 as applicable (Ref. AMM 12-00-00, Page Block 1).
- (2) Install the left and/or right Folding Strut as applicable (Ref. AMM, 32-10-02, Page Block 401).
- (3) Install the left and/or right Main Gear Leg as applicable (Ref. AMM, 32-10-01, Page Block 401).
- (4) Remove the shoring material and lower the aircraft to the ground (Ref. AMM, 07-00-00, Page Block 1).
- (5) Remove the adhesive tape that holds the flap trailing edge to the wing.
- (6) Refuel the aircraft (Ref. AMM, 12-11-28, Page Block 301) and examine for fuel leaks.
- (7) Do an operational test of the LH and/or RH booster pump as applicable (Ref. 28-20-03, Page Block 201).
- (8) Let the aircraft stand for 24 hours, then examine again for fuel leaks.
- (9) Remove all tools and materials and make sure the work area is clean.

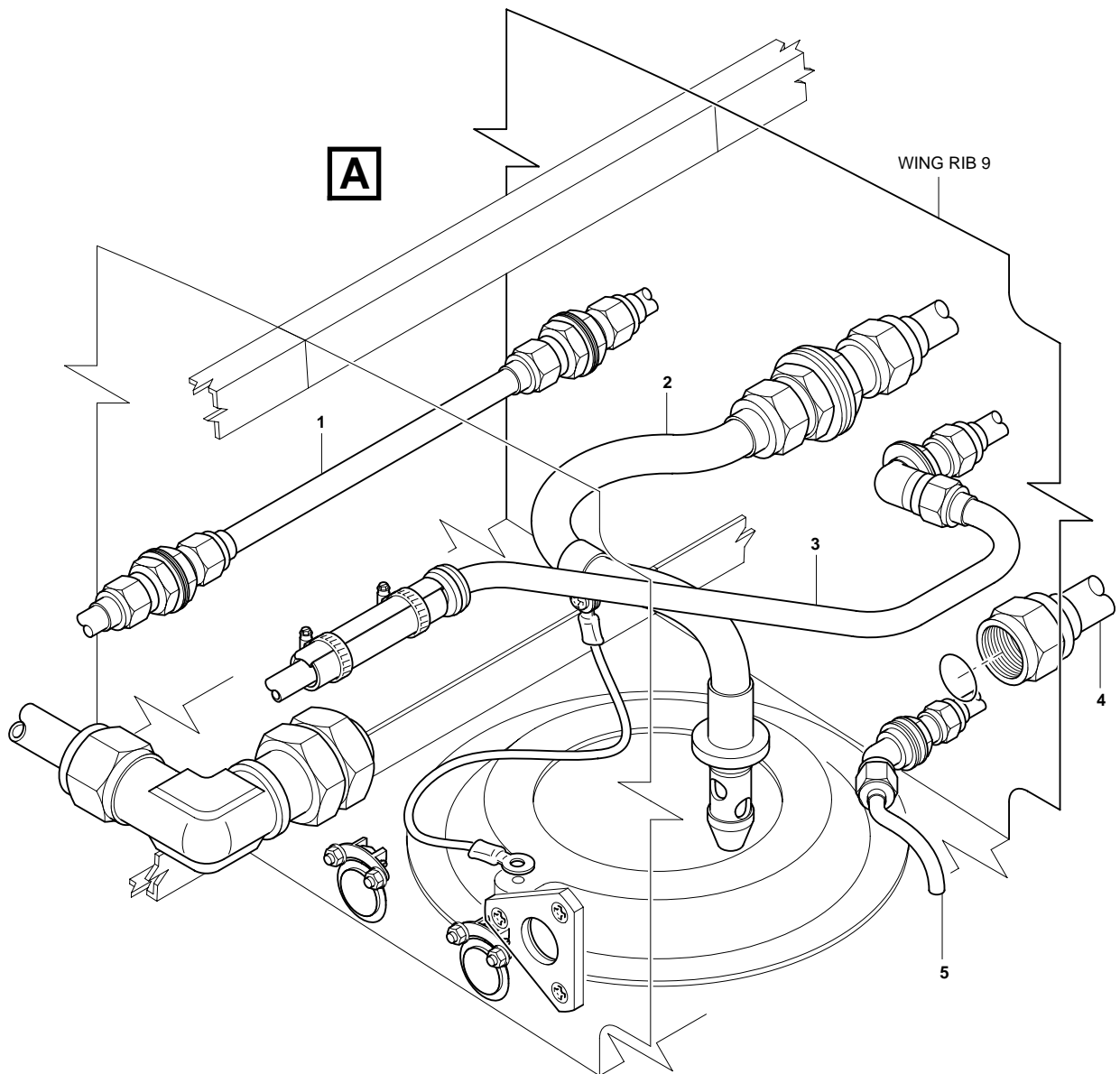
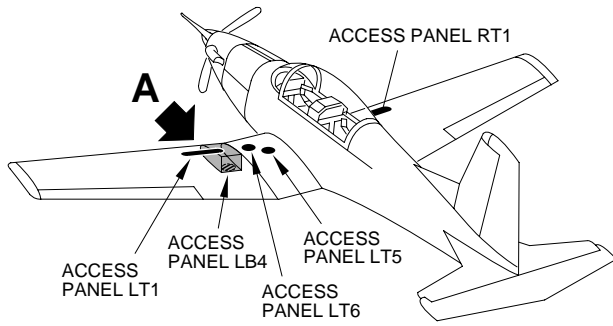
**F. Documentation**

- (1) Make an entry in the Aircraft Logbook that this Service Bulletin has been incorporated.

**4. Accomplishment Instructions - Spares**

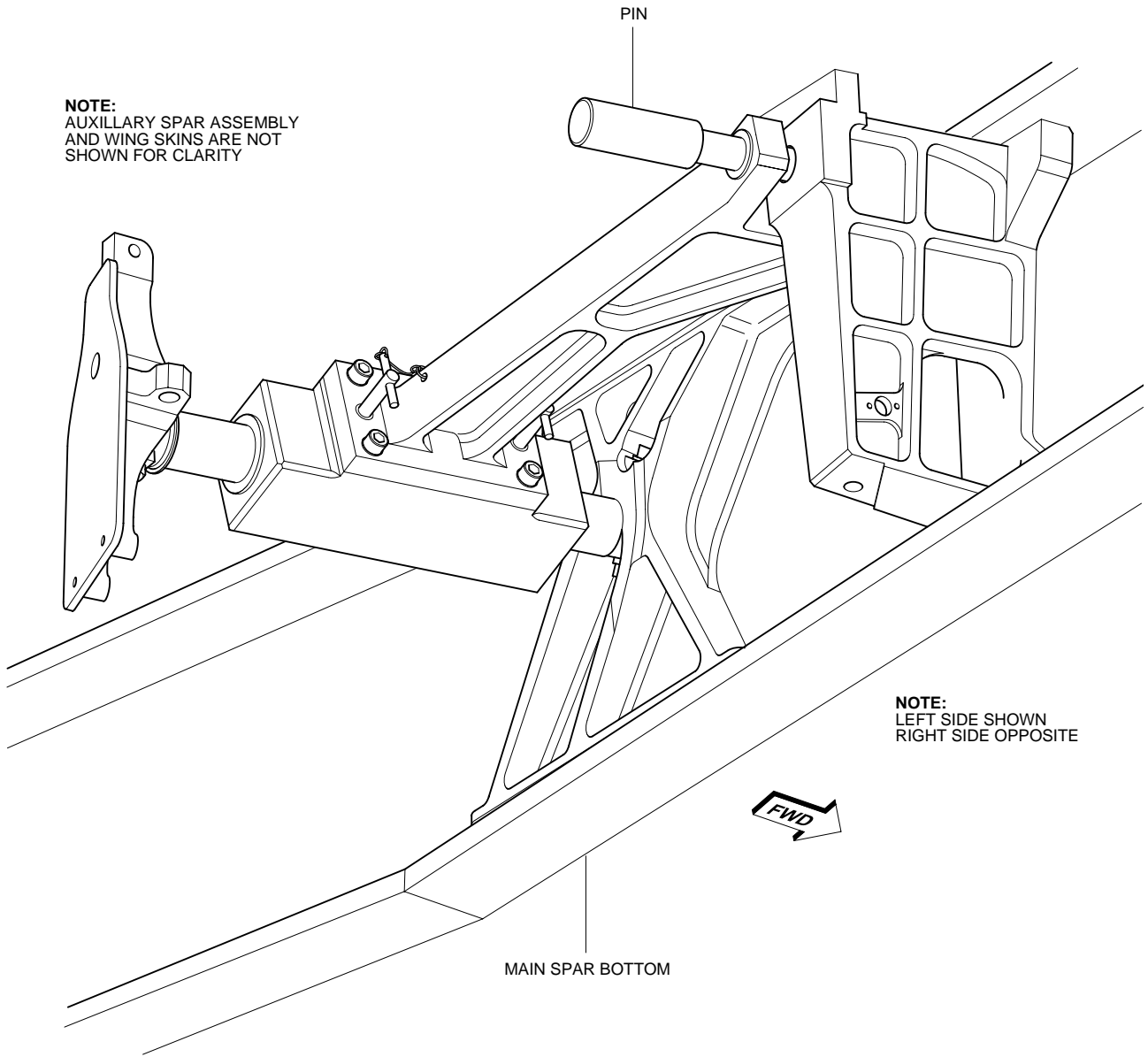
Not applicable.

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Removal and Installation of Fuel Pipes  
Figure 1

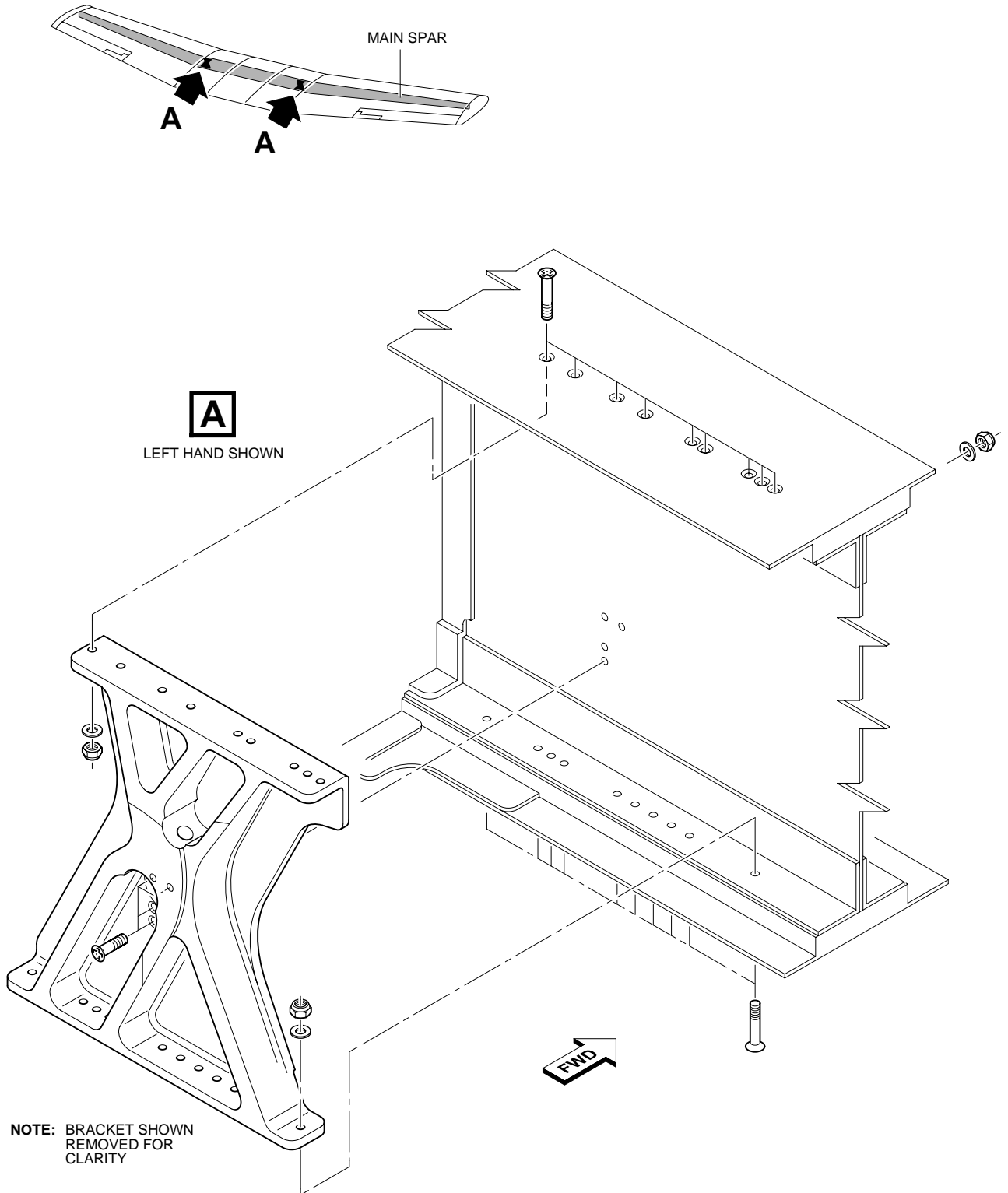
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Assembly and Installation of the MLG Attachment Alignment-Fixture  
Figure 2

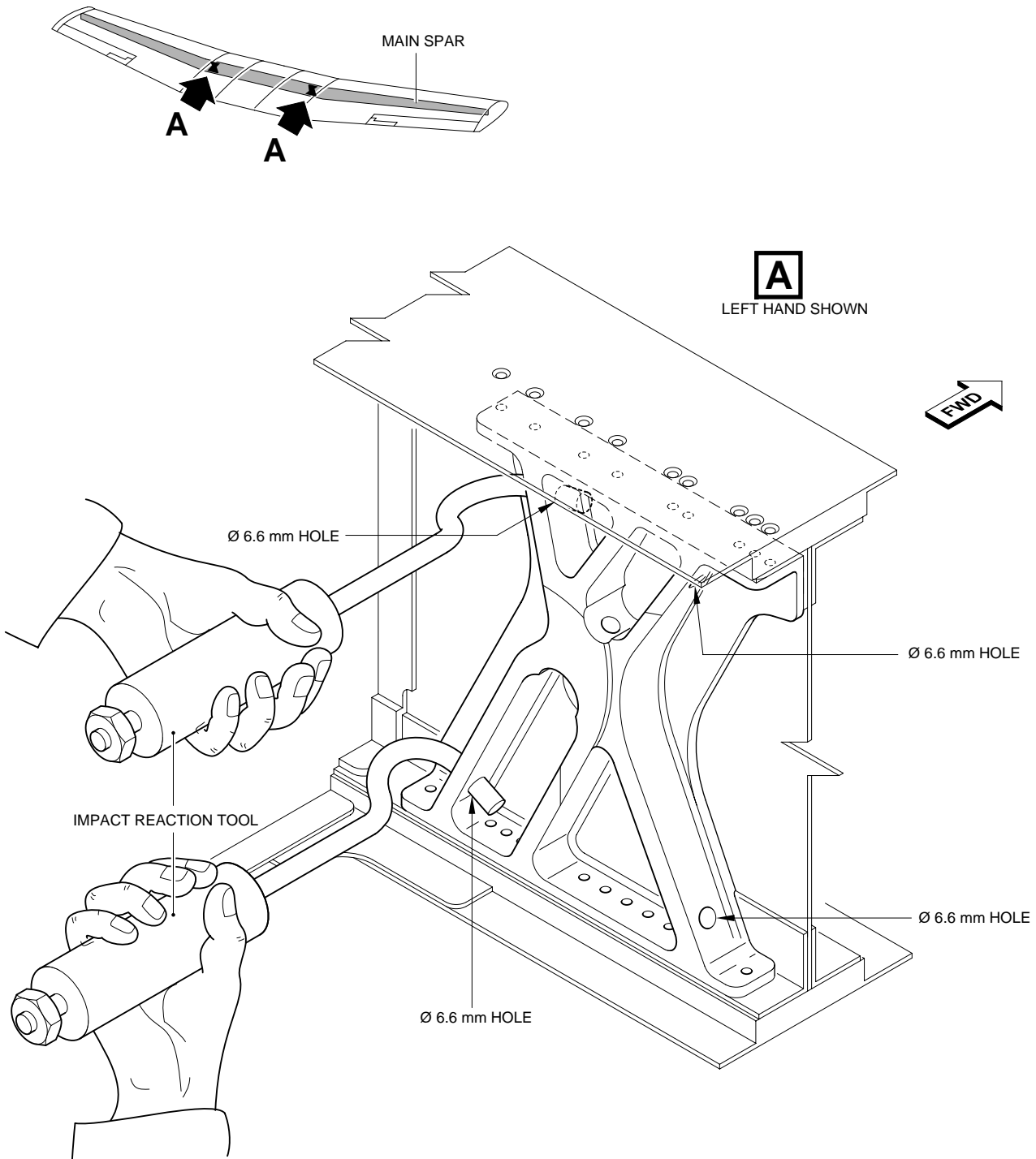
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Removal of the MLG Front Attachment-Bracket Bolts  
Figure 3

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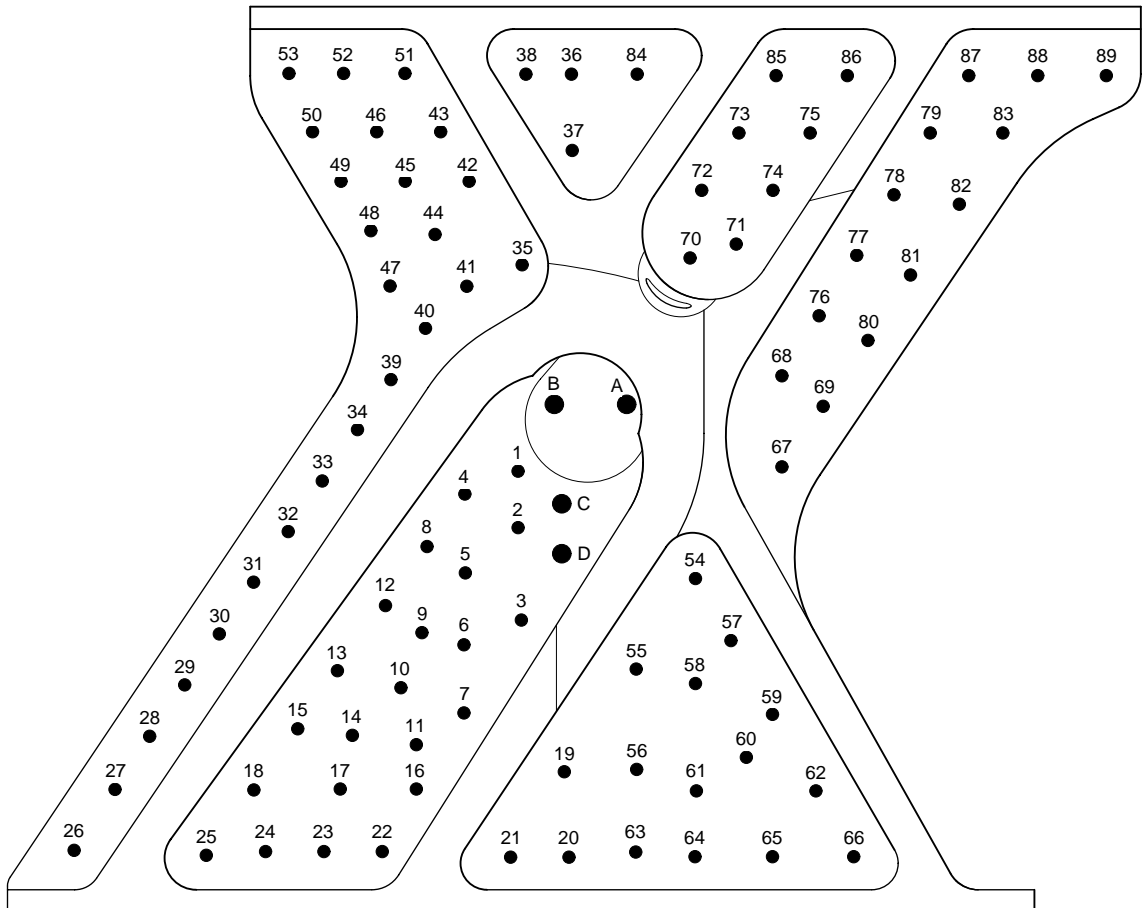
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Removal of the MLG Front Attachment Bracket  
Figure 4

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1 THRU 89 RIVET HOLES  
 A THRU D BOLT HOLES

LEFT BRACKET



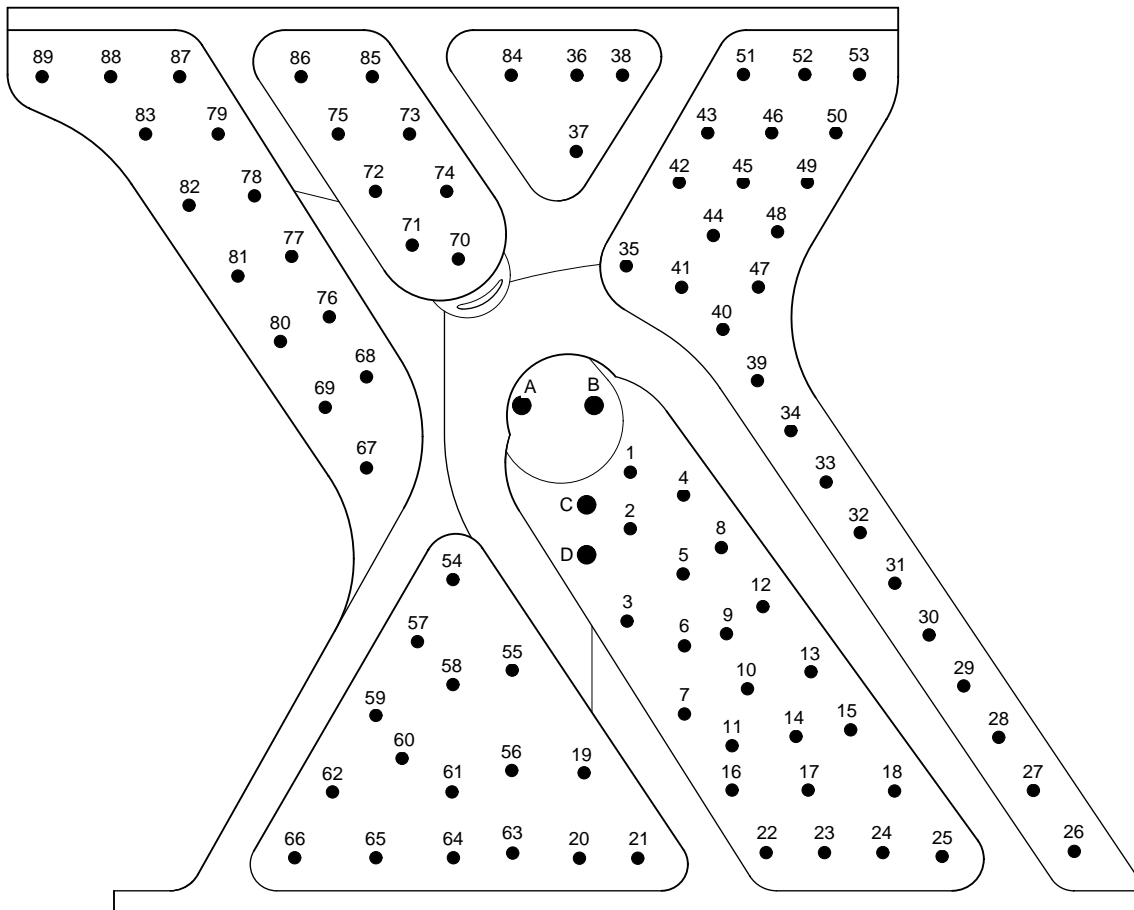
Left MLG Front Attachment Bracket - Rivet and Bolt Hole Data  
 Figure 5

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1 THRU 89 RIVET HOLES  
A THRU D BOLT HOLES

RIGHT BRACKET

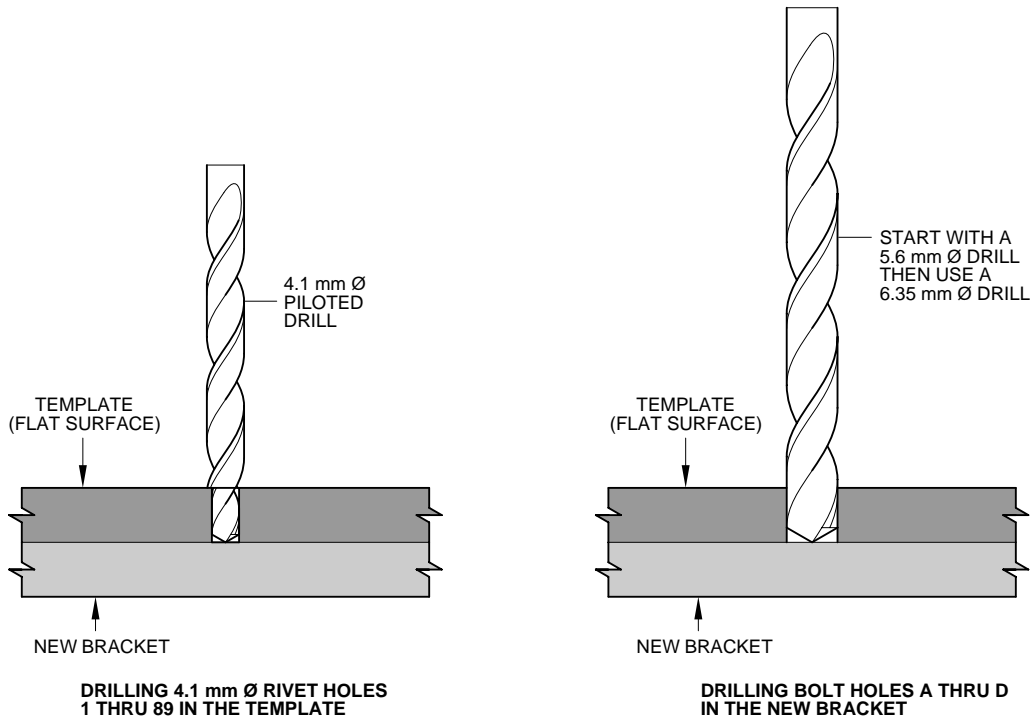
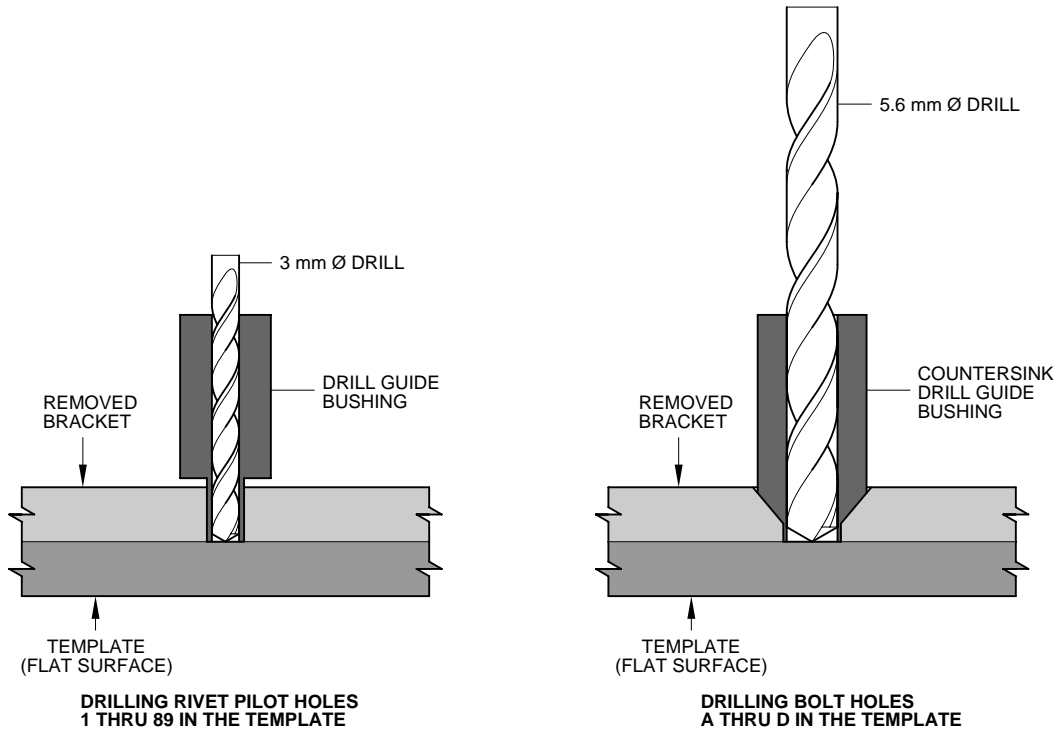


Right MLG Front Attachment Bracket - Rivet and Bolt Hole Data  
Figure 6

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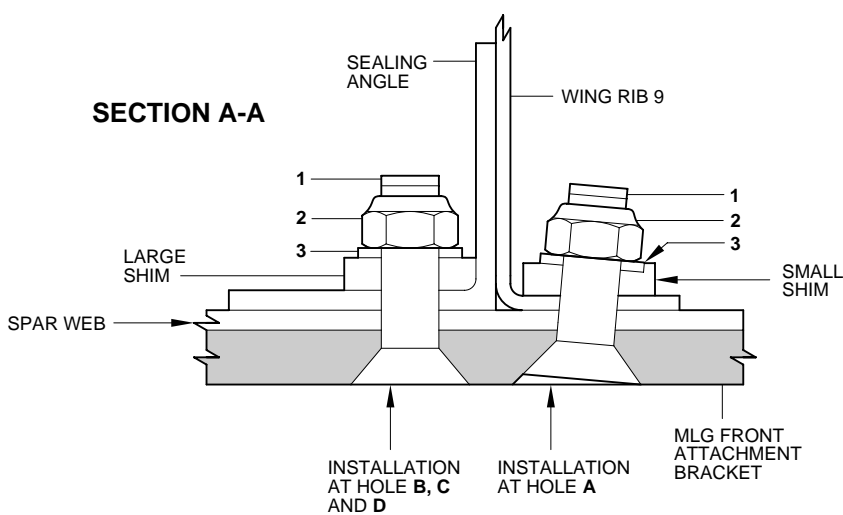
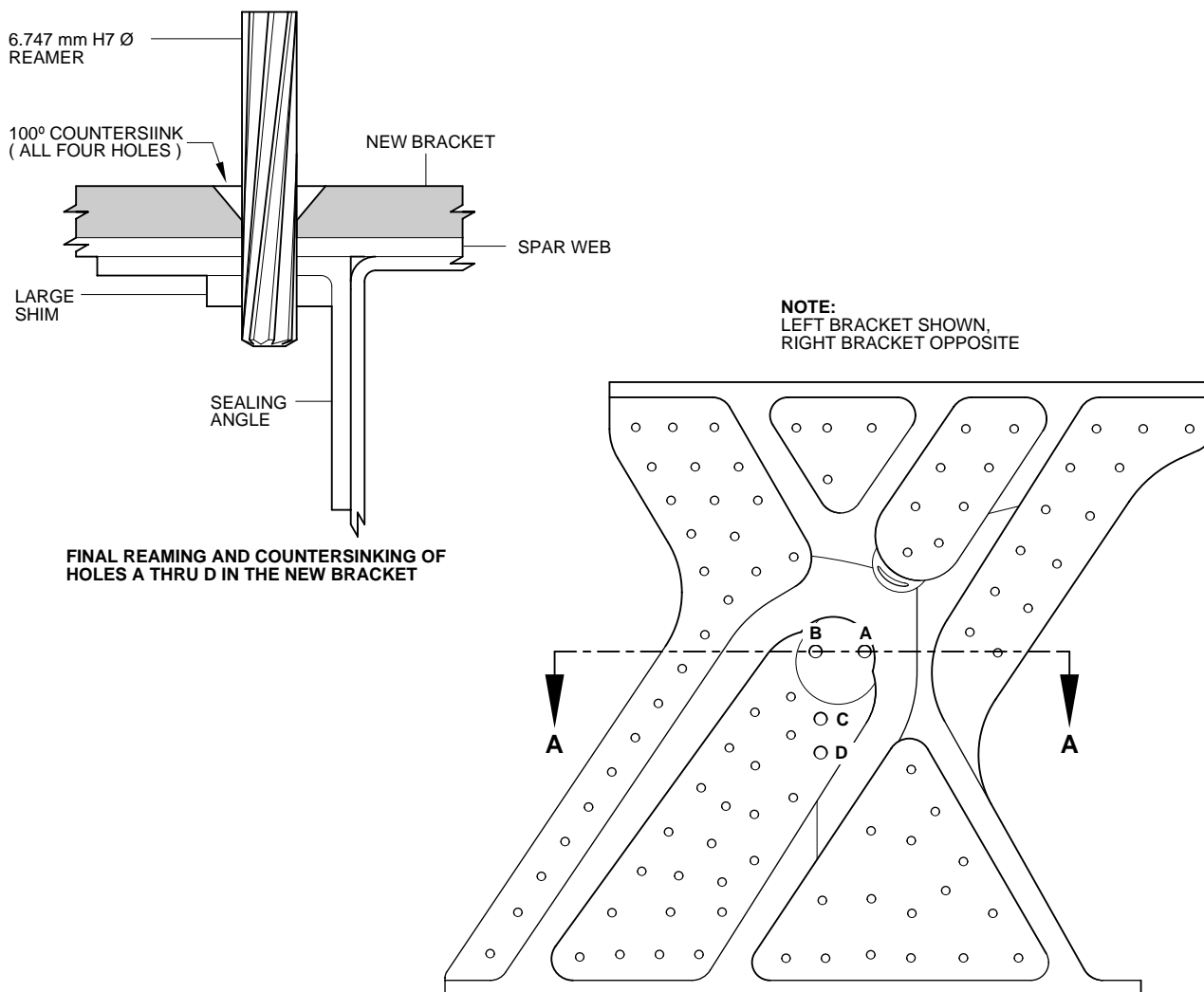



  
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MLG Front Attachment Bracket and Template - Rivet and Bolt Hole Drilling Data  
Figure 7

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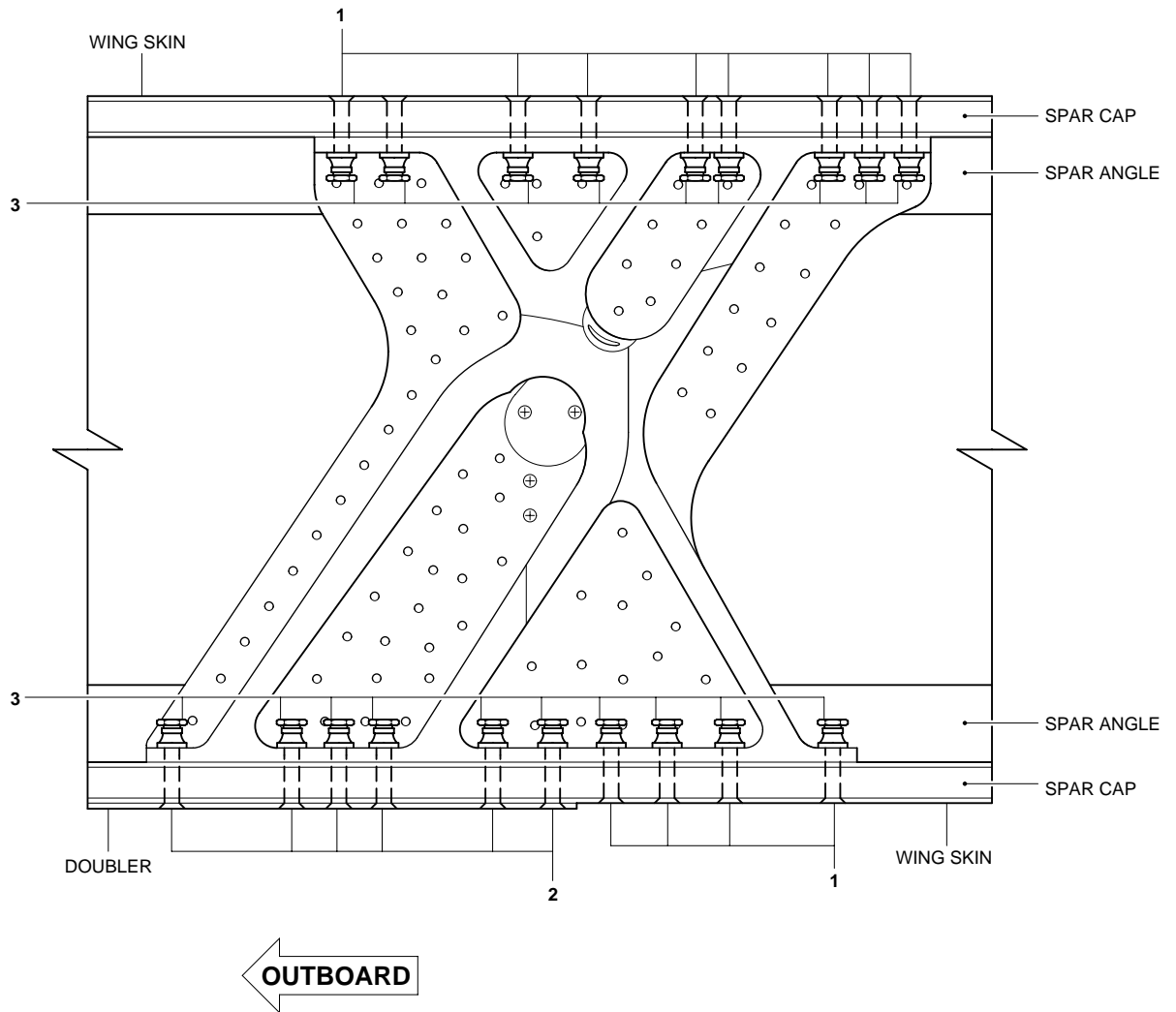


MLG Front Attachment Bracket and Template - Installation of Bolts at Holes A thru D  
Figure 8

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**NOTE:**  
 LEFT BRACKET SHOWN,  
 RIGHT BRACKET OPPOSITE



MLG Front Attachment Bracket - Installation of Hi-Lok Bolts at Top and Bottom Flanges  
 Figure 9