

Service Bulletin No: 57-012

Ref No: 77

Modification No: EC-11-0355

ATA Chapter: 57

**WINGS - OUTER WING
REPLACEMENT OF THE LEFT AND RIGHT AILERON OUTBOARD BEARING-BRACKETS****1. Planning Information****A. Effectivity**

PC-9(M) aircraft MSN 605, MSN 617 thru MSN 670.

B. Concurrent Requirements

None.

C. Reason**(1) Problem**

A Operator has found cracks in the aileron outboard bearing-bracket (bracket), P/N 557.22.09.281 (LH) and P/N 557.22.09.282 (RH) installed on some of his aircraft. If the rivets in the affected location come out, they could cause the aileron to become jammed or lost in flight.

NOTE: The brackets, P/N 557.22.09.281 (LH) or P/N 557.22.09.282 (RH) are part of the (bracket assembly), P/N 557.22.09.279 (LH) or P/N 557.22.09.280 (RH).

(2) Cause

The cause of the cracks is stress corrosion.

It is possible for stress corrosion cracks to occur in the bracket, P/N 557.22.09.281 (LH) and P/N 557.22.09.282 (RH) made of aluminum alloy 2024-T351. These cracks would occur in the areas around the attachment fasteners.

Initially the material specification of the brackets, P/N 557.22.09.281 (LH) and P/N 557.22.09.282 (RH) was aluminum alloy 2024-T351. The material specification was subsequently changed to aluminum alloy 2124-T851 to reduce the risk of damage from stress corrosion. The part number was not changed when the new material specification was introduced.

(3) Solution

Accomplishment of Service Bulletin 57-011 (Wings - Outer - Inspection of the Left and Right Aileron Outboard Bearing-Brackets) identified the type of material that the brackets, P/N 557.22.09.281 (LH) and P/N 557.22.09.282 (RH) were made of and if they were cracked or not.

This Service Bulletin is issued to replace the left and right brackets if they are not made from aluminum alloy 2124-T851.

The Aircraft Maintenance Manual (AMM) will be updated to include a 150 hour eddy-current crack detection of all aluminum alloy 2024-T351 brackets, P/N 557.22.09.281 (LH) and P/N 557.22.09.282 (RH).

Operators that have the bracket assemblies, P/N 557.22.09.279 (LH) and P/N 557.22.09.280 (RH) replaced with new bracket assemblies, P/N 557.22.09.547 (LH) and P/N 557.22.09.548 (RH) or have identified the installed bracket assemblies (P/N 557.22.09.279 (LH) and P/N 557.22.09.280 (RH)) as aluminium alloy 2124-T851, do not need to do the scheduled eddy current test.

D. Description

This Service Bulletin gives the data and instructions necessary to replace the bracket assemblies, P/N 557.22.09.281 (LH) and P/N 557.22.09.282 (RH).

E. Compliance

Highly recommended.

F. Approval

The technical content of this Service Bulletin is approved under the authority of Letter of DOA Acceptance ref. FOCA.21J.002.

Pilatus advises Operators/Owners to check with their local Airworthiness Authorities for any changes, local regulations or sanctions that may affect the embodiment of this Service Bulletin.

G. Copyright Information

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H. Manpower

	Total
Preparation	3.0
Replacement of the left and right aileron outboard bearing-bracket	16.0
Close up	3.0
TOTAL MAN-HOURS	22.0

NOTE: Man-hours figures do not include the time required to cure sealants, paints and adhesives.

I. Weight and Balance**(1) Weight Change**

Negligible.

(2) Moment Change

Negligible.

J. Electrical Load Data

Not changed.

K. Software

Not changed.

L. References

Aircraft Maintenance Manual (AMM), 20-31-00, 25-10-00, 27-00-00, 27-10-01.

M. Publications Affected

Structural Repair Manual (SRM), 57-21-00.

N. Interchangeability of Parts

One way interchangeable. Pre Service Bulletin parts must not be installed on Post Service Bulletin aircraft.

2. Material Information
A. Material - Price and Availability

Operators who require more information should contact:

PILATUS AIRCRAFT LTD,
 CUSTOMER LIAISON MANAGER,
 CH 6371 STANS, Tel: +41 41 619 62 26 (Government)
 SWITZERLAND Fax: +41 41 619 61 70

Kit Number	Price	Availability
500.60.09.148	Contact address above	Contact address above
500.60.09.147	Contact address above	Contact address above

NOTE: Kit No. 500.60.09.148 is the modification kit for the replacement of the left and right brackets. One kit is required for each aircraft.

NOTE: Kit No. 500.60.09.147 is the tool kit for the replacement of the left and right brackets. One kit is required for each fleet of aircraft.

B. Material Necessary for Each Aircraft
(1) Material to be Purchased

Modification Kit No. 500.60.09.148 has these parts:

New Part No.	Description	Old Part No.	Qty	Disp. Code	Fig	Item
557.22.09.547	BEARING BRACKET ASSEMBLY (LH)	557.22.09.279	1	D	1	5
557.22.09.548	BEARING BRACKET ASSEMBLY (RH)	557.22.09.280	1	D	1	5
513.57.09.153	DRILLING SHEET (LH)	-	1	-	3	-
513.57.09.154	DRILLING SHEET (RH)	-	1	-	3	-

Disposition Codes: D - Discard / R - Return to Stores

NOTE: Part Numbers given in this Service Bulletin are correct at the time of approval. Pilatus Aircraft Ltd. reserves the right to change the part numbers as necessary. Part numbers of items delivered with the Modification Kit are correct when the kit is dispatched. This could lead to differences between those part numbers quoted in this Service Bulletin and the Modification Kit if parts are superseded. Operators are requested to check the SRM for delivered parts which differ from those listed in the Service Bulletin Materials Kit List.

(2) Operator Supplied Materials (Ref. AMM 20-31-00)

Material No.	Description	Qty	Remarks
P01-010	SOLVENT	A/R	Or equivalent
P02-031	ABSORBENT PAPER	A/R	Or equivalent
P07-004	PRIMER	A/R	Or equivalent
P07-021	ALODINE 1132	A/R	Or equivalent
P07-022	TOP COAT PAINT	A/R	Or equivalent
P08-020	SEALANT	A/R	Or equivalent
-	RIVET NAS1097AD3	11	See Note
-	RIVET NAS1097AD4	1	See Note
-	RIVET CR3224-4	13	See Note
-	RIVET CR3223-4	8	See Note

NOTE: Rivet length to be determined on installation.

C. Material Necessary for Each Spare

Not applicable.

D. Re-identified Parts

Not applicable.

E. Tooling - Cost and Availability

Kit No. 500.60.09.147 has these parts:

PART No.	DESCRIPTION	QTY	REMARKS
513.57.09.151	PLACING DEVICE (LH)	1	
513.57.09.152	PLACING DEVICE (RH)	1	
917.95.05.004	TUBING	1	600 mm
-	BORESCOPE	1	Or similar. Used to see through the tooling hole in wing rear spar to make sure all the unwanted material is removed.

3. Accomplishment Instructions

WARNING: BEFORE YOU GO INTO THE COCKPIT, MAKE SURE THAT BOTH EJECTION SEATS HAVE THE SAFETY PINS INSTALLED IN THE SAFE FOR SERVICING LOCATIONS (REF. AMM, 25-10-00, PAGE BLOCK 201).

WARNING: BE CAREFUL WHEN YOU USE THE CONSUMABLE MATERIALS. OBEY THE MANUFACTURERS HEALTH AND SAFETY INSTRUCTIONS.

NOTE: Obey the manufacturer's instructions when you mix and use the consumable materials.

NOTE: Do this procedure to replace the left and right outer aileron attachment-brackets if not made from aluminum alloy 2124-T851.

A. Preparation

- (1) Put the "DO NOT OPERATE THE FLIGHT CONTROLS" sign near the front and rear cockpits.
- (2) Before you do work on the Flight Control System (FCS), you must do the safety procedures shown in the AMM, 27-00-00, Page Block 201.
- (3) If installed, remove the left and right ailerons (Ref. AMM, 27-10-01, Page Block 401).
- (4) To make access to the bracket easier, remove the membrane from the wing rear spar.

B. Prepare the Outer Aileron Attachment-Brackets (Ref. Fig. 1)

- (1) If installed, make a note of the position of the shim (7) on the applicable bracket (5).
- (2) If installed, use the applicable sized drill and remove the three rivets (8) that attach the shim (7) to the applicable bracket (5).
- (3) Remove and keep the shim (7).
- (4) Remove the five rivets (3) from the top skin, outboard of the bracket (5).

NOTE: You remove these rivets to install the placing device.

- (5) Remove the four outboard rivets (6) that attach the flange of the bracket (5) to the wing rear spar.

C. Install the Placing Device (Ref. Fig. 2)

NOTE: The P/N of the left placing device is 513.57.09.151. The P/N of the right placing device is 513.57.09.152. In the subsequent steps, they are referred to as "the placing device".

- (1) Make sure there are no pencil marks on all parts of the placing device. If necessary, remove them with the absorbent paper (Material No. P02-031) made moist with the solvent (Material No. P01-010).
- (2) Put part A of the placing device in position on the top skin.
- (3) Hold in position with gripper pins, or equivalent, (10) through the five rivet holes in the top skin.

- (4) Put part C in position against the bearing of the bracket (6). Make sure the mating face of the bracket is smooth. If necessary, remove the paint.
- (5) Install the bolt (2), the washer (3), part D of the placing device, the washer (5) and the nut (4). Do not tighten the nut (4).
- (6) Put part B of the placing device in position against part A and part C of the placing device.
- (7) Install the two screws (7) and the washers (1).
- (8) Install the two screws (8) and the washers (9).
- (9) Make sure the gripper pins, or equivalent, (10), the screws (7 and 8) are tight.
- (10) Make sure that:
 - The bolt (2) and the spherical bearing can move freely
 - Part C of the placing device is in complete contact with the bracket (6).

If necessary adjust part A and part B of the placing device.

- (11) Tighten the nut (4).
- (12) Draw lines around part A of the placing device to show its position on the wing top skin.
- (13) Draw lines around part B of the placing device to show its position against part A.
- (14) Draw lines around part B of the placing device to show its position against part C.

NOTE: Steps 3.C.(12) thru (14) will let you put the placing device in the correct position again if it is accidentally moved.

- (15) Remove the nut (4), the washer (5), part D of the placing device, the washer (3) and the bolt (2).
- (16) Do not loosen the screws (7 and 8).

D. Remove the Bracket Assembly (Ref. Fig. 1)

- (1) Measure and record the height of the tail of the inboard forward rivet (10) that attaches the flange of the bracket (5) to the lower skin.
- (2) Remove the six rivets (9 and 10) that attach the flange of the bracket (5) to the lower skin.
- (3) Remove the eight rivets (2) that attach the flange of the bracket (5) to the upper skin.
- (4) Remove the rivet (1) from the upper skin.

NOTE: This makes the installation of the new bracket (5) easier.

- (5) Remove the lower inboard anchor-nut (4).

NOTE: This makes the installation of the new bracket (5) easier.

- (6) Remove the remaining four inboard rivets (6) that attach the flange of the bracket (5) to the wing rear spar.
- (7) Remove the bracket (5).
- (8) Remove, and keep, the spherical bearing from the bracket (5).

E. Prepare the Drilling Sheet (Ref. Fig. 3)

- (1) Put the drilling sheet (P/N 513.57.09.153, LH or P/N 513.57.09.154, RH) against the old bracket.
- (2) Use a 3.2 mm diameter drill and drill the six holes in the drilling sheet (P/N 513.57.09.153, LH or P/N 513.57.09.154, RH). Do this through the holes in the lower flange of the old bracket.
- (3) Put gripper pins or equivalent through the drilling sheet (P/N 513.57.09.153, LH or P/N 513.57.09.154, RH) and the lower flange of the old bracket.
- (4) Make sure the drilling sheet (P/N 513.57.09.153, LH or P/N 513.57.09.154, RH) is firmly against the wing rear-spar flange of the old bracket.
- (5) Use a 3.2 mm diameter drill and drill the eight holes in the drilling sheet (P/N 513.57.09.153, LH or P/N 513.57.09.154, RH). Do this through the holes in the wing rear-spar flange of the old bracket.
- (6) Make sure the drilling sheet (P/N 513.57.09.153, LH or P/N 513.57.09.154, RH) is firmly against the upper flange of the old bracket.
- (7) Use a 3.2 mm diameter drill and drill two holes in the drilling sheet (P/N 513.57.09.153, LH or P/N 513.57.09.154, RH). Do this through the first two holes (nearest to the wing rear-spar flange) in the upper flange of the old bracket.
- (8) Remove the drilling sheet (P/N 513.57.09.153, LH or P/N 513.57.09.154, RH) from the old bracket.
- (9) Deburr the holes in the drilling sheet.

F. Position the New Bracket (Ref. Fig. 2)

- (1) Put the new bracket (6) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH) in position on the wing.
- (2) Put the washer (3) on the bolt (2).
- (3) Put the bolt (2) through part C of the placing device and new bracket (6) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH).
- (4) Put the spherical bearing (that you kept in Step 3.D.(8)) in the new bracket (6) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH) and on the bolt (2).
- (5) Install part D of the placing device, the washer (5) and the nut (4).
- (6) Make sure that the new bracket (6) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH) is firmly against the wing rear-spar web.

- (7) Use a 3.2 mm diameter drill and drill the six holes that attach the flange of the new bracket (6) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH) to the lower wing skin. Do this through the holes in the lower wing skin.
- (8) Hold it in position with gripper pins or equivalent.
- (9) Use a 3.2 mm diameter drill and drill the eight holes that attach the flange of the new bracket (6) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH) to the upper wing skin. Do this through the holes in the upper wing skin.
- (10) Remove the nut (4), the washer (5), part D of the placing device, the spherical bearing, the washer (3) and the bolt (2).
- (11) Remove the gripper pins or equivalent and the new bracket (6) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH).
- (12) Deburr the holes.

G. Transfer the Holes from the Drilling Sheet (Ref. Fig. 3)

- (1) Put the drilling sheet (P/N 513.57.09.153, LH or P/N 513.57.09.154, RH) (that you prepared in Step 3.E) in position on the new bracket.
- (2) Install gripper pins, or equivalent, in the six holes on the lower flange and in the two holes on the upper flange.
- (3) Use a 3.2 mm diameter drill and drill the eight holes that attach the flange of the new bracket to the rear wing spar. Do this through the holes in the drilling sheet.
- (4) Remove the drilling sheet from the new bracket.

H. Position the Shim (Ref. Fig. 1)

- (1) Put the shim (7) in the same position on the new bracket (5) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH) as noted in Step 3.B.(1).
- (2) Use a 2.4 mm diameter drill and drill the three holes that attach the shim (7) to the new bracket (5) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH). Do this through the holes in the shim (7).
- (3) Countersink the inboard holes in the new bracket (5) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH).
- (4) Remove the shim (7).

I. Install the New Bracket (Ref. Fig. 1 and Fig. 2)

- (1) Deburr all the drilled holes in:
 - The new bracket (Fig. 1, Item 5) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH)
 - The upper skin
 - The lower skin
 - The wing rear spar.

- (2) Apply the Alodine 1132 (Material No, P07-021) to:
 - The new bracket (Fig. 1, Item 5) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH)
 - The upper skin
 - The lower skin
 - The wing rear spar.
- (3) When the Alodine 1132 (Material No, P07-021) is dry, apply a layer of the primer (Material No, P07-007). Let the primer (Material No, P07-007) dry.
- (4) Apply a layer of the sealant (Material No, P08-020) to the new bracket (Fig. 1, Item 5) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH).
- (5) Put the new bracket (Fig. 1, Item 5) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH) in position on the wing.
- (6) Put the washer (Fig. 2, Item 3) on the bolt (Fig. 2, Item 2).
- (7) Put the bolt (Fig. 2, Item 2) through part C (Fig. 2) of the placing device and the new bracket (Fig. 2, Item 6) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH).
- (8) Put the spherical bearing in the new bracket (Fig. 2, Item 6) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH) and on the bolt (Fig. 2, Item 2).
- (9) Install part D (Fig. 2) of the placing device, the washer (Fig. 2, Item 5) and the nut (Fig. 2, Item 4).
- (10) Keep the new bracket (Fig. 2, Item 6) (P/N 557.22.09.547, LH or P/N 557.22.09.548, RH) in position with gripper pins or equivalent (Fig. 2, Item 10).
- (11) Apply a layer of the sealant (Material No, P08-020) to the shank of the rivet (Fig. 1, Item 10) (P/N NAS1097AD4).

NOTE: Rivet length to be determined on installation.

- (12) Install the rivet (Fig. 1, Item 10) (P/N NAS1097AD4) in the forward inboard hole in the location shown.
- (13) Make sure the tail of the rivet (Fig. 1, Item 10) (P/N NAS1097AD4) is the same dimension as recorded at Step 3.D.(1). The minimum height is 0.5 mm. If necessary, remove material from the tail.
- (14) Install the remaining rivets (Fig. 1, Item 9) (P/N CR3224-4) in the other five positions.

NOTE: Rivet length to be determined on installation.

- (15) Install the rivets (Fig. 1, Item 6) (P/N CR3223-4) in all locations that are accessible

NOTE: Rivet length to be determined on installation.

- (16) Install the rivets (Fig. 1, Item 2) (P/N CR3224-4).

NOTE: Rivet length to be determined on installation.

- (17) Remove the nut (Fig. 2, Item 4), the washer (Fig. 2, Item 5), part D (Fig. 2) of the placing device, the spherical bearing, the washer (Fig. 2, Item 3) and the bolt (Fig. 2, Item 2).
- (18) Remove the placing device.
- (19) Install the remaining rivets (Fig. 1, Item 6) (P/N CR3223-4).

NOTE: Rivet length to be determined on installation.

- (20) Remove the dirt and grease from the shim (Fig. 1, Item 7) with the absorbent paper (Material No. P02-031) made moist with the solvent (Material No. P01-010).
- (21) Apply a layer of the sealant (Material No, P08-020) to the shim (Fig. 1, Item 7).
- (22) Put the shim (Fig. 1, Item 7) in position.
- (23) Install the three rivets (Fig. 1, Item 8) (P/N NAS1097AD3) with a countersunk on both sides of the joint.

NOTE: Rivet length to be determined on installation.

- (24) Apply a layer of the sealant (Material No, P08-020) to the five rivets (Fig. 1, Item 3) (P/N NAS1097AD3) and install them in the position that were used for the installation of the placing device (Ref. Step 3.B.(4)).

NOTE: Rivet length to be determined on installation.

- (25) Apply a layer of the sealant (Material No, P08-020) to the rivet (Fig. 1, Item 1) (P/N NAS1097AD3) and install it in the position shown.

NOTE: Rivet length to be determined on installation.

- (26) Install the lower inboard anchor-nut (Fig. 1, Item 4) with the rivets (P/N NAS1097AD3).
- (27) Make the tooling hole in wing rear spar (Ref Fig. 1) larger with a 7.0 mm diameter drill.
- (28) Deburr the hole.

- (29) Remove the unwanted material from forward of the wing rear spar with the tube (P/N 917.95.05.004) attached to a vacuum device. Make sure you remove eight rivet tails.

NOTE: Use a borescope, or similar, through the tooling hole in wing rear spar (Ref. Fig. 1) to make sure all the unwanted material is removed.

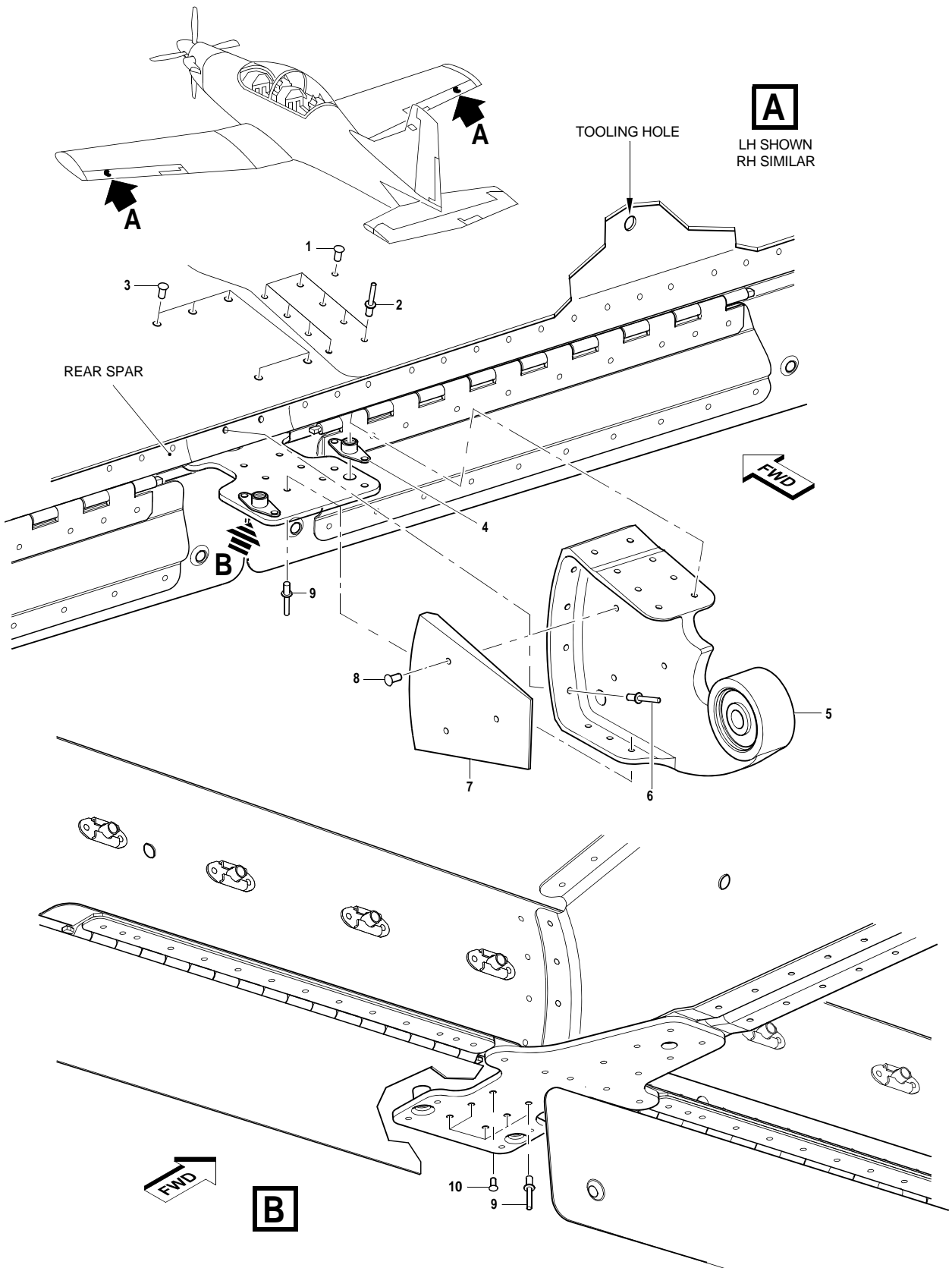
- (30) Apply Alodine 1132 (Material No, P07-021) to the tooling hole in wing rear spar (Ref. Fig. 1).
- (31) When the Alodine 1132 (Material No, P07-021) is dry, apply a layer of the primer (Material No, P07-007). Let the primer (Material No, P07-007) dry.
- (32) Repair the aircraft external finish with the topcoat paint (Material P07-022).
- (33) Do Steps 3.B thru 3.I again for the other outer aileron attachment-bracket.

J. Close-Up

- (1) Make sure that the work areas are clean and clear of tools and other equipment.
- (2) Install the ailerons (Ref. AMM, 27-10-01, Page Block 401).
- (3) Make sure the aileron does not touch the tails of the newly installed rivets.

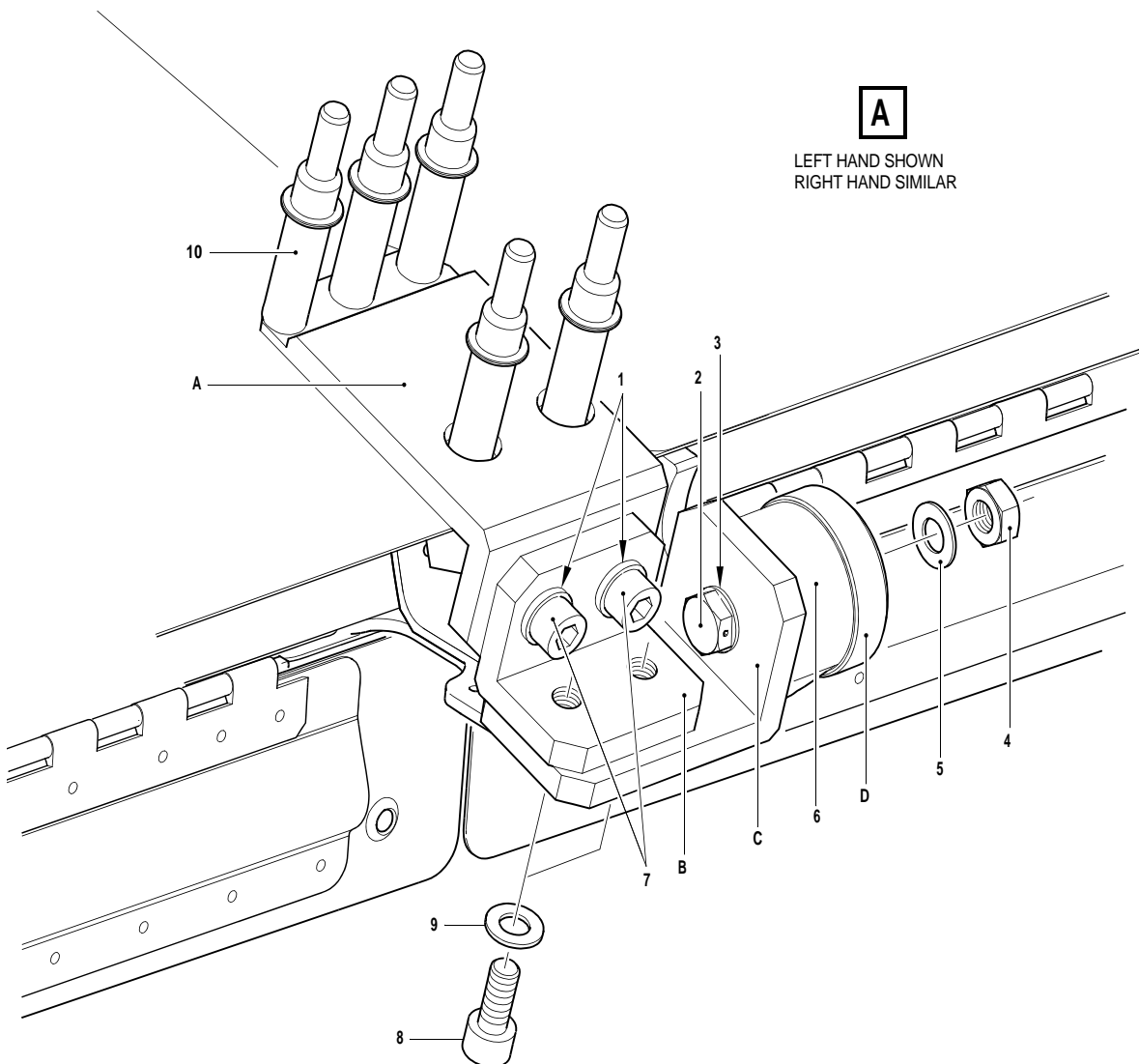
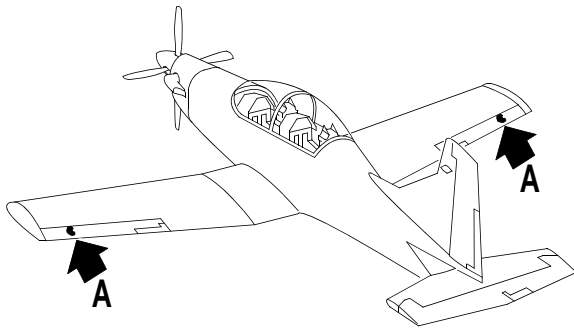
K. Documentation

- (1) Make an entry in the Aircraft Logbook that this Service Bulletin has been incorporated.
- (2) Use the Service Bulletin Evaluation Sheet and report your results and the serial number(s) of the aircraft to Pilatus.



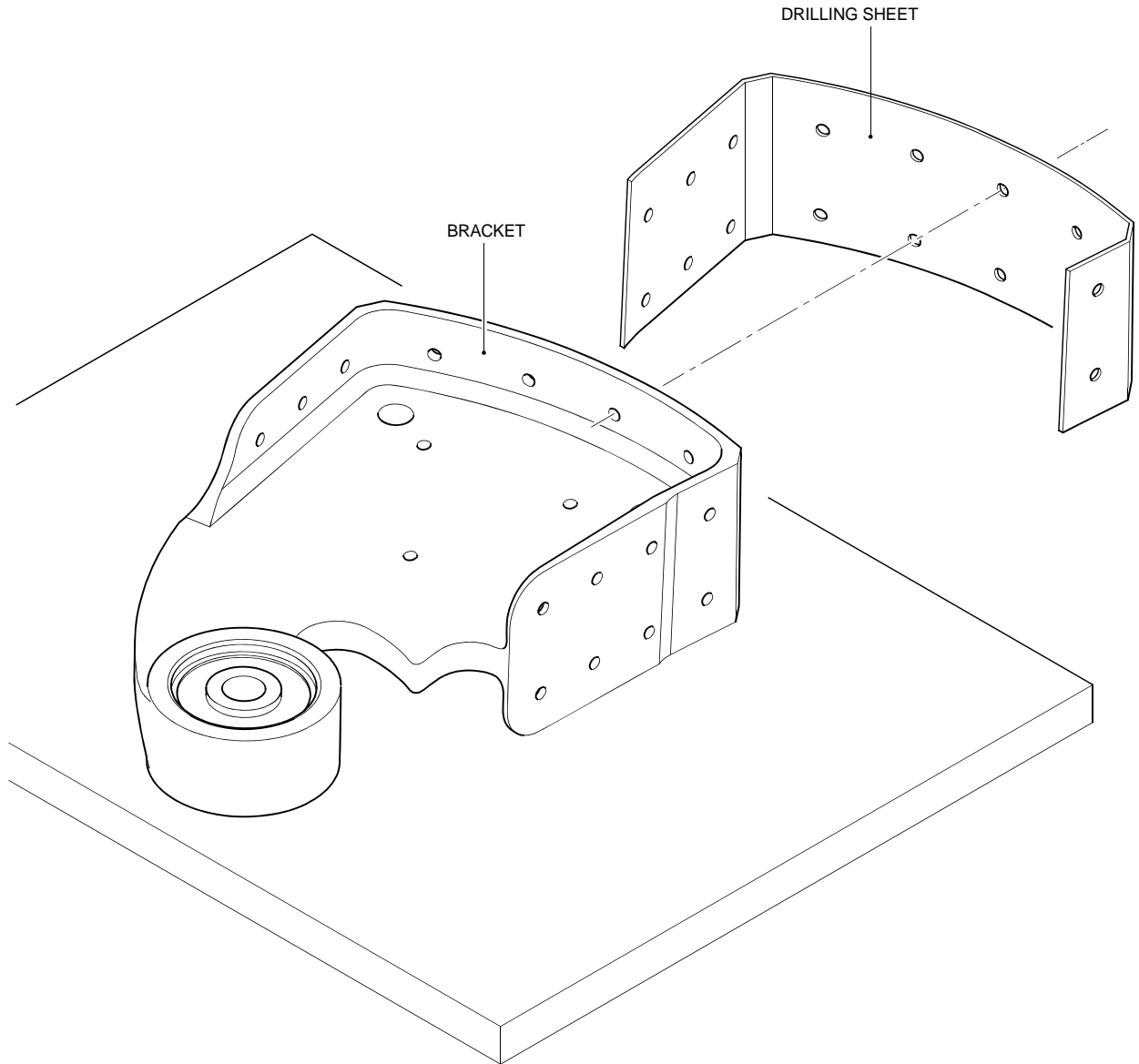
SB 2103

Removal / Installation of the Shim and Bracket
Figure 1



Installation of the Placing Device
Figure 2

SB2101



Replacement of the Bracket Assembly
Figure 3

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SERVICE BULLETIN EVALUATION SHEET FOR SB No. 57-012			
Title	Wings - Outer Wing Replacement of the Left and Right Aileron Outboard Bearing- Brackets		
Customer			
Service Center			
EMBODIMENT REPORTING			
This SB has been embodied:		<input type="checkbox"/>	On the entire fleet
		<input type="checkbox"/>	Only partially
Provide embodiment details per aircraft (use additional copies of this table, if necessary)			
MSN	Flying Hours	MSN	Flying Hours
Additional embodiment comments/findings			
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