

# SERVICE BULLETIN

SERVICE BULLETIN NO: 57-004

REF NO: 194

MODIFICATION NO:

ATA CHAPTER: 57

## WING WING STRUT FITTING - INSPECTION FOR CRACKS

### 1. Planning Information

#### A. Effectivity

PC-6 Series aircraft MSN 101 thru MSN 951 and MSN 2001 thru MSN 2092.

#### B. Concurrent Requirements

None.

#### C. Reason

##### (1) Problem

Cracks have been reported in the wing strut fittings installed on the wing of some PC-6 aircraft.

##### (2) Cause


It is possible that the spherical bearing may be loose in the fitting or may not rotate because of corrosion. If this occurs, the joint may not function as designed.

##### (3) Solution

- (a) Do a non destructive test (Eddy current) of the wing strut fittings installed on the wing for cracks. No cracks are permitted. Replace all wing strut fittings that are cracked.
- (b) Examine the spherical bearing for looseness in the fitting, freedom of movement, correct orientation and corrosion. Replace the spherical bearing if necessary.

**NOTE 1:** If you cannot do Para. 1.C.(3)(a) and/or (b), replacement of the wing strut fittings installed on the wings satisfies the requirement of this Service Bulletin.

**NOTE 2:** Subsequent inspections for cracks will be included in Chapter 5 of the Aircraft Maintenance Manual (AMM).

  
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**D. Description**

This Service Bulletin gives the data and instructions necessary to:

- Do a non destructive test (Eddy current) on the left and right wing strut fittings installed on the wing for cracks
- Examine the spherical bearings for correct installation and operation
- Replace the defective spherical bearing, if necessary
- Replace the defective wing strut fittings, if necessary.

The accomplishment instructions in this Service Bulletin are divided into two parts:

- Section 3. (Accomplishment Instructions - Aircraft - Part 1) gives the procedures necessary to examine the left and right wing strut fittings for cracks and to examine the spherical bearings for correct installation and operation. This includes the procedure to remove and install the spherical bearings.
- Section 4. (Accomplishment Instructions - Aircraft - Part 2) gives the procedures necessary to make access openings in the wing and to replace defective wing strut fittings.

It is possible that some aircraft have access panels installed in the wings as local modifications without the authority of PILATUS. Operators must check with their local Airworthiness Authorities if such modifications affect the embodiment of this Service Bulletin.

**E. Compliance**

Mandatory.

For MSN 2001 thru MSN 2092:

Required within the next 100 flying hours or 3 calendar months, whichever comes first, after the effective date of this Service Bulletin.

For MSN 101 thru MSN 951:

For wing strut fittings, installed on the wing, with **more** than 3500 flying hours or 7 years installed time, this Service Bulletin must be accomplished within the next 100 flying hours or 3 calendar months, whichever comes first, after the effective date of this Service Bulletin.

For wing strut fittings, installed on the wing, with **less** than 3500 flying hours or 7 years installed time, this Service Bulletin must be accomplished within the next 1000 flying hours or 2 years, whichever comes first, after the effective date of this Service Bulletin, but no later than 3600 flying hours or 7 years installed time, whichever comes first.

**NOTE:** If you do not know the life of the wing strut fittings installed on the wing, then you must use the life of the aircraft.

**F. Approval**

The technical content of this Service Bulletin is approved under the authority of DOA No. EASA. 21J. 357.

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.

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**G. Manpower**

	Inspection	Replacement of One Bearing	Replacement of One Fitting
Preparation	1.50	-	-
Inspection	4.00	-	-
Replacement	-	1.00	15.00
Close up	1.50	-	-
<b>TOTAL MAN-HOURS</b>	<b>7.00</b>	<b>1.00</b>	<b>15.00</b>

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

**H. Weight and Balance**

**(1) Weight Change**

Not affected.

**(2) Moment Change**

Not affected.

**I. Electrical Load Data**

Not changed.

**J. Software**

Not changed.

**K. References**

Aircraft Maintenance Manual (AMM). 06-40-00 and 57-00-01.

**L. Publications Affected**

Not applicable.

**M. Interchangeability of Parts**

Not applicable.

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**2. Material Information**

**A. Material Necessary for Each Aircraft**

**(1) Material to be Purchased**

No modification kit is necessary for this Service Bulletin.

**(2) Additional Material to be Procured**

(a) The parts below are necessary for the replacement of one wing strut fitting (left or right). Operators must order the parts from PILATUS as necessary.

NEW PART NO.	DESCRIPTION	OLD PART NO.	QTY	DISP. CODE	FIG	ITEM
111.35.06.057	BOLT	932.53.47.286 932.53.46.436	5	D	3	1
111.35.06.185	LEFT WING STRUT FITTING	6102.0041.00 111.35.06.055 111.35.06.184 111.35.06.185	1	R	1 3	1 4
111.35.06.186	RIGHT WING STRUT FITTING	6102.0041.00 111.35.06.056 111.35.06.184 111.35.06.186	1	R	N/A	N/A
938.07.31.108	NUT	938.07.34.104 938.07.65.105	5	D	3	3
938.71.51.108	WASHER	938.78.11.106 938.78.11.206	5	D	3	2
939.19.86.102	BLIND RIVET	N/A	50	N	2	N/A

DISPOSITION CODES: D - DISCARD / N - NEW / R - RETURN TO PILATUS

(b) The parts below are necessary for the replacement of one bearing in the wing strut fitting (left or right). Operators must order the parts from PILATUS as necessary.

NEW PART NO.	DESCRIPTION	OLD PART NO.	QTY	DISP. CODE	FIG	ITEM
944.61.00.109	BEARING	944.61.00.109 944.61.00.009	A/R	R	1	

DISPOSITION CODES: D - DISCARD / N - NEW / R - RETURN TO PILATUS

**(3) Operator Supplied Materials**

MATERIAL NO.	DESCRIPTION	QTY	REMARKS
P01-010	SOLVENT	A/R	OR APPROVED ALTERNATIVE
P02-003	CLOTH	A/R	
P02-016	SCOTCH-BRITE	A/R	

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MATERIAL NO.	DESCRIPTION	QTY	REMARKS
P04-012	CORROSION PREVENTATIVE	A/R	
P07-001	ALODINE 1200S	A/R	
P07-007	PRIMER PAINT	A/R	
P08-057	SEALANT	A/R	
P08-059	ADHESIVE	A/R	P08-060 is a suitable alternative for P09-059 for this application.
-	AL SHEET (AA2024-T3 1,0 mm)	A/R	Pilatus P/N 916.16.35.110

**(4) Special Tools**

PART NUMBER	DESCRIPTION	QTY	REMARKS
110.85.07.593	TOOL KIT	1	KIT COMPRISES: <ul style="list-style-type: none"> <li>• REAMER - 8,1 mm (0.318 in.)</li> <li>• REAMER - 8,17 mm (0.321 in.)</li> <li>• REAMER - 8,19 mm (0.322 in.)</li> <li>• REAMER - 8,2 mm (0.323 in.)</li> </ul>

**NOTE:** This tool kit is only necessary if you replace one of the wing strut fittings (left or right). Operators can order the part from PILATUS.

**(5) Operator Supplied Tools**

Part No.	Description	Remarks
-	Eddy Current NDT Equipment	NORTEC 2000 Eddy Current Instrument or equivalent
-	Shielded Probe and Lead Combination	3 mm Diameter, 500 KHz, 90-degree
-	Calibration Standard	7075 Aluminum, 2124 Aluminum or 2024 Aluminum with an EDM slot 0.5 mm deep

**B. Material Necessary for Each Spare**

Not applicable.

**C. Reidentified Parts**

Not applicable.

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**3. Accomplishment Instructions - Aircraft - Part 1**

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

**A. Preparation**

- (1) Remove the left and right wing struts (Ref. AMM. 57-00-01, Page Block 401).

**B. Inspection (Ref. Fig. 1)**

- (1) Remove loose paint if necessary, then, use a cloth (Material No. P02-003) and the solvent (Material No. P01-010) to clean the left and right wing strut fittings (1).
- (2) Visually examine the left and right wing strut fittings (1) for signs of cracks. Do this with a X10 magnifier and a source of bright light. No cracks are permitted. You must replace the fitting if you find a crack (Ref. Para. 4.).
- (3) Examine the bearing (2).

Make sure

- The bearing is free to rotate
- The bearing is not corroded
- The bearing is not loose in the wing strut fitting (1)
- The bearing is aligned (as shown in Detail B).

If necessary, replace the bearing (Ref. Para. 3.C. and 3.D.).

**NOTE:** If you must replace the bearing, do not install the new bearing until you have done the Eddy current inspection (Ref. Para. 3.B.(4)).

- (4) Do the non destructive test (Eddy current).

**CAUTION:** ONLY PERSONNEL THAT ARE TRAINED AND APPROVED (BY THE LOCAL AIRWORTHINESS AUTHORITIES) CAN DO THIS PROCEDURE.

- (a) Calibrate the Eddy Current Instrument as follows:

- Frequency 300 - 500 KHz
- Probe selection Absolute
- Refer to the manufacturer's handbook and calibrate the instrument for an 80% upscale deflection from the 0.5 mm EDM slot of the calibration standard.

- (b) Inspection of the fittings

**NOTE:** Use a non-metallic object to guide the probe as close as possible to all the edges.

- 1 Do the procedure as given in the manufacturer's handbook.
- 2 Put the probe on the lower face of the left fitting.

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- 3 Move the probe across the lower face. Make sure you get as close as possible to the outer edges of the fitting and as close as possible to the edges of the bearing (Ref. Detail B).
  - 4 Put the probe on the upper face of the left fitting.
  - 5 Move the probe across the upper face. Make sure you get as close as possible to the outer edges of the fitting and as close as possible to the edges of the bearing (Ref. Detail B).
  - 6 Put the probe on the face of the edge of the left fitting.
  - 7 Move the probe across the face of the edge. Make sure you get as close as possible to the outer edges (Ref. Detail B).
  - 8 If the bearing is removed:
    - Put the probe on the inner face of the bearing hole of the left fitting
    - Move the probe across the face and around the hole. Make sure you get as close as possible to the outer edges of the hole.
  - 9 Do Para. 3.B.(4)(b)2 thru 8 again for the right fitting.
  - 10 Record the results of the inspection (Ref. Table 1) and send the results to Pilatus. No cracks are permitted. You must replace the fitting if you find a crack (Ref. Para. 4.).
- (5) Apply layers of Alodine 1200S (Material No. P07-001), the primer (Material No. P07-007) and the applicable paint on all bare metal surfaces except the bearing interfaces.

**C. Removal of the Bearing (Ref. Fig. 1)**

**NOTE:** This procedure is applicable if loose, damaged, corroded, incorrectly aligned or worn bearings are found.

- (1) Use a hot air blower (for heat shrink sleeves) and apply heat to loosen the adhesive between the bearing and the fitting.

**CAUTION:** DO NOT USE TOO MUCH FORCE TO REMOVE THE BEARING. YOU CAN DAMAGE THE WING STRUT FITTING IF YOU USE TOO MUCH FORCE.

- (2) Use a press or applicable diameter drift to remove the bearing (2) from the bore in the fitting. Send the bearing (2) to Pilatus. If you cannot remove the bearing (2), replace the fitting (Ref. Para. 4.).

**NOTE:** The bearing (2) is removed and installed from the top (wing side) of the wing strut fitting (1).

- (3) Use the solvent (Material No. P01-010) to remove the unwanted adhesive from the hole in the fitting.
- (4) Use the Scotch-Brite (Material No. P02-016) to polish the hole in the fitting.
- (5) Use the cloth (Material No. P02-003) made moist with the solvent (Material No. P01-010) and clean the hole in the fitting.

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- (6) Apply a layer of alodine (Material No. P07-001) to the surface of the hole and facing. Install the replacement bearing (2) in the alodined hole in less than 72 hours.

**D. Installation of the New Bearing (Ref. Fig. 1)**

- (1) Use the cloth (Material No. P02-003) made moist with the solvent (Material No. P01-010) and clean the bonding face of the new bearing (2).
- (2) Put the bearing (2) in position in the hole. Make sure it can be installed easily. Remove the bearing (2).
- (3) Mix the two parts of the adhesive (Material No. P08-059 or a suitable alternative).
- (4) Apply a layer of the adhesive (Material No. P08-059 or a suitable alternative) to the applicable surfaces of the bearing (2) and the hole. Make sure there is sufficient adhesive to give a full bond when the parts are assembled.
- (5) Put the bearing (2) in position in the hole. Make sure the bearing (2) is correctly aligned (Ref. Detail B) and push the bearing (2) firmly into the hole to make sure it is tightly against the flange face.
- (6) Remove the unwanted adhesive (Material No. P08-059 or a suitable alternative).
- (7) Let the adhesive (Material No. P08-059 or a suitable alternative) cure.


**E. Close up**

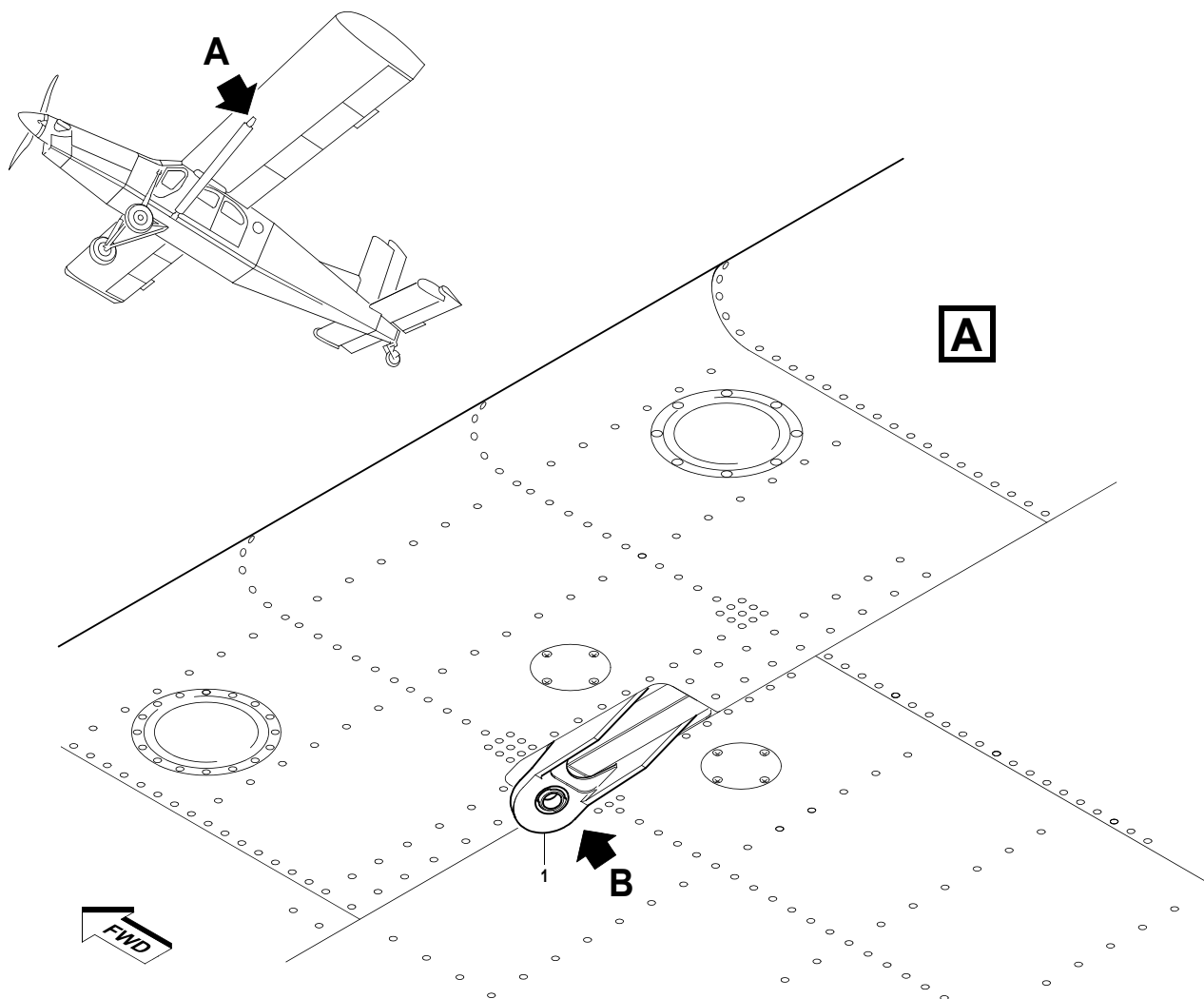
- (1) Remove all tools and materials. Make sure that the work areas are clean.
- (2) Install the wing struts (Ref. AMM. 57-00-01, Page Block 401).

**F. Documentation**

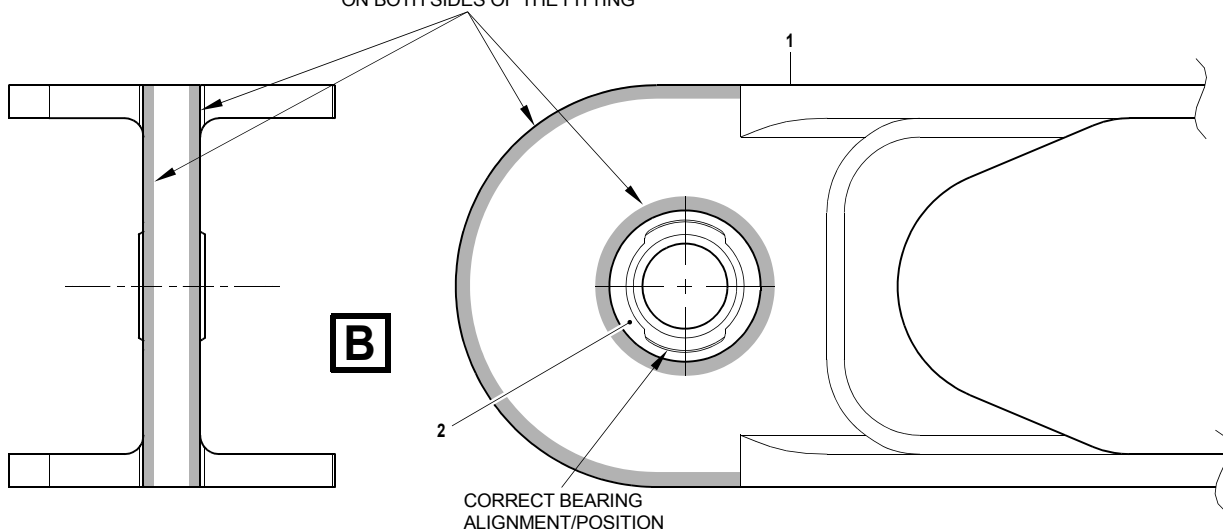
- (1) Make an entry in the Aircraft Logbook that Part 1 of this Service Bulletin has been incorporated.
- (2) Use the Table 1 (at the end of this Service Bulletin) to report your results and the serial number of the aircraft to PILATUS.



  
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MOVE PROBE AS CLOSE AS POSSIBLE TO THE  
 OUTER AND INNER EDGES AS INDICATED  
 ON BOTH SIDES OF THE FITTING



**Wing Strut Fittings - Inspection**  
**Figure 1**

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**4. Accomplishment Instructions - Aircraft - Part 2**

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

**CAUTION:** OBEY THE MANUFACTURERS INSTRUCTIONS WHEN YOU APPLY THE CONSUMABLE MATERIALS.

**A. Fittings - Replacement (Ref. Fig. 2 and 3)**

This procedure is only applicable if you found cracks (Ref. Para. 3.B.(2) or Para. 3.B.(4)(b)) or cannot remove the bearing (Ref. Para 3.C.(2)). The procedure is given for replacement of the left fitting but is also applicable for the right fitting.

**NOTE:** Not all aircraft have the applicable openings for internal access to the fittings.

- (1) Remove the access panels LB10 and/or RB9 (Ref. AMM. 06-40-00, Page Block 1). Keep two of the screws (P/N 935.13.16.018) from the access panel. Discard the unwanted panel and screws.
- (2) Make an access opening in the skin, forward of the fitting (Ref. Fig. 2). This step is only applicable if there is no internal access to the forward flange of the fitting assembly.

**NOTE:** The new opening is at the same location (and is the same width) as the circular (inspection) opening LB10 (left) or RB9 (right). The forward and aft anchor nuts for the access covers LB10 or RB9 will also be used for the cover of the new opening.

- (a) Make marks to show the contours of the opening on the skin. Do this at the location shown and to the given dimensions (192 x 52 mm (7.6 x 2.0 in.) with 26 mm (1.0 in.) radii at each end).
  - (b) Cut the opening in the skin to the contour marks with the applicable cutting tools. Make sure that there are no sharp edges. Do not remove the forward and aft anchor nuts for the access covers LB10 or RB9.
- (3) If necessary make a new access opening in the skin aft of the fitting.
    - (a) Make marks to show an intersection of center lines and the contours of a circular opening 120 mm (4.7 in.) in diameter. Do this on the skin at the location shown.
    - (b) Cut the opening in the skin to the contour marks with the applicable cutting tools. Make sure that there are no sharp edges.
  - (4) Remove the defective fitting(s) (Ref. Fig. 3).
    - (a) Remove the nuts (3), the washers (2) and the bolts (1).
    - (b) Disassemble and remove the fitting (4) from the wing structure. Send the fitting to Pilatus.
  - (5) Make the bolt holes for the new fitting.
    - (a) Put the new fitting (4) in position and hold with the removed bolts (1).

**NOTE:** The rear flange of the new fitting contains 8,0 mm (0.315 in.) diameter holes. There are no holes in the forward flange.

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- (b) Remove one of the bolts (1) and make a hole in the forward flange of the fitting with an 8,0 mm (0.315 in.) diameter drill.
  - (c) Temporarily install one of the removed bolts (1) and a nut (3) in the drilled hole.
  - (d) Do Steps (b) and (c) again to make the remaining holes in the forward flange of the fitting (4).
  - (e) Remove and discard the nuts (3) and the bolts (1) from the second, third and fourth holes. Do not remove the nuts and bolts from the inboard and outboard holes.
  - (f) Increase the diameters of the empty holes with the reamers. Use the 8,1, 8,17, 8,19 and 8,2 mm (0.318, 0.321, 0.322 and 0.323 in.) reamers in sequence.
  - (g) Temporarily install new larger (oversize) bolts (1) and new nuts (3) in the reamed holes.
  - (h) Remove and discard the nuts (3) and the bolts (1) from the inboard and outboard holes.
  - (i) Do Step (f) again to increase the diameters of the empty holes.
  - (j) Remove the nuts (3), the bolts (1) and the fitting (4).
  - (k) Apply layers of the Alodine 1200S (Material No. P07-001). Do this on the bare metal surfaces of the holes in the wing structure and the fitting (4).
- (6) Install the replacement fitting.
- (a) Apply layers of the sealant (Material No. P08-057) on the faying surfaces of the fitting (4).
  - (b) Apply layers of the corrosion preventative (Material No. P04-012) on the faying surfaces of new bolts (1), the washers (2) and the nuts (3).
  - (c) Put the fitting (4) in position in the wing and align the holes.
  - (d) Install the new bolts (1), the washers (2) and the nuts (3). Make sure that the heads of the bolts point forward.
  - (e) Torque the nuts (3) to between 18 and 24 Nm (159.3 and 212.4 lbf in.).
  - (f) Remove the unwanted sealant (Material No. P08-057) and corrosion preventative (Material No. P04-012) with the solvent (Material No. P01-010).
- (7) Make the cover for the forward access opening (Ref. Fig. 2).
- (a) Make marks to show the center line and contours of the cover on the piece of aluminium alloy sheet (P/N 916.16.35.110). Do this to the given dimensions (224 x 84 mm (8.8 x 3.3 in.) with 42 mm (1.7 in.) radii at each end).
  - (b) Cut the aluminium alloy sheet (P/N 916.16.35.110) at the contour marks with the applicable cutting tools to make the cover (1). Make sure that there are no sharp edges.
  - (c) Make marks to show the locations of the rivet and screw holes around the edges of the cover (2). Do this at the pitch dimensions shown.

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- (d) Make the rivet holes at the applicable marks on the cover (1) with a 3,3 mm (0.13 in.) diameter drill. Deburr the holes.
  - (e) Make the screw holes at the applicable marks on the cover (1) with a 4,0 mm (0.16 in.) diameter drill. Deburr the holes.
  - (f) Apply layers of the Alodine 1200S (Material No. P07-001) and the primer (Material No. P07-007). Do this on the bare metal surfaces of the cover (2) and the edges of the opening in the skin.
- (8) Make the rivet holes for the cover for the forward access opening in the skin.
- (a) Put the cover (1) in position on the skin, align the center lines and hold.
  - (b) Make the rivet and screw holes in the skin with a 3,3 mm (0.13 in.) and 4,0 mm (0.16 in.) diameter drill.
  - (c) Remove the cover and deburr the rivet holes.
  - (d) Apply layers of the Alodine 1200S (Material No. P07-001) and the primer (Material No. P07-007). Do this on the bare metal surfaces of the cover (1) and the edges of the opening in the skin.
- (9) Install the cover for the forward access opening.
- (a) Apply layers of the sealant (Material No. P08-057) on the faying surfaces of the cover (1) and the skin.
  - (b) Put the cover (1) in position on the skin and hold with gripper pins.
  - (c) Install the rivets (P/N 939.19.86.102) (Ref. ROM. Chap. 2). Apply a layer of the sealant (Material No. P08-057) on each rivet before you install it.
  - (d) Remove the unwanted sealant (Material No. P08-057) with the solvent (Material No. P01-010).
  - (e) Install the two screws (P/N 935.13.16.018) that you kept at Para. 4.A.(1).
  - (f) Apply layers of the primer (Material No. P07-007) and the applicable paint on the rivet and screw heads and the exterior surface of the cover (1).
- (10) Make the new cover for the aft access opening.
- (a) Make marks to show an intersection of center lines and the contours of a 155 mm (6.1 in.) diameter circular cover. Do this on a piece of the aluminium alloy sheet (P/N 916.16.35.110).
  - (b) Cut the aluminium alloy sheet (P/N 916.16.35.110) at the contour marks with the applicable cutting tools to make the cover (2). Make sure that there are no sharp edges.
  - (c) Make marks to show the locations of the 16 rivet holes around the edges of the cover (2). Make sure that the holes are of equal pitch, at a diameter of 135 mm (5.32 in.).
  - (d) Make pilot holes in the cover (2). Do this at the marks for the rivet holes with a 2,4 mm (0.1 in.) diameter drill. deburr the holes.

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- (11) Make the rivet holes for the cover for the aft access opening.
  - (a) Put the cover (2) in position on the skin, align the center lines and hold.
  - (b) Make the rivet holes in the cover (2) and the skin. Do this through the pilot holes with a 3,3 mm (0.13 in.) drill.
  - (c) Remove the cover (2) and deburr the rivet holes.
  - (d) Apply layers of the Alodine 1200S (Material No. P07-001) and the primer (Material No. P07-007). Do this on the bare metal surfaces of the cover (2) and the edges of the opening in the skin.
  
- (12) Install the cover for the aft access opening cover.
  - (a) Apply layers of the sealant (Material No. P08-057) on the faying surfaces of the cover (2) and the skin.
  - (b) Put the cover (2) in position the skin and hold with gripper pins.
  - (c) Install the rivets (P/N 939.19.86.102) (Ref. ROM. Chap. 2). Apply a layer of the sealant (Material No. P08-057) on each rivet before you install it.
  - (d) Remove the unwanted sealant (Material No. P08-057) with the solvent (Material No. P01-010).
  - (e) Apply layers of the primer (Material No. P07-007) and the applicable paint on the rivet heads and the exterior surface of the cover (1).
  
- (13) If necessary do Steps (1) thru (12) again to make the access openings and replace the fitting (4) in the remaining wing.

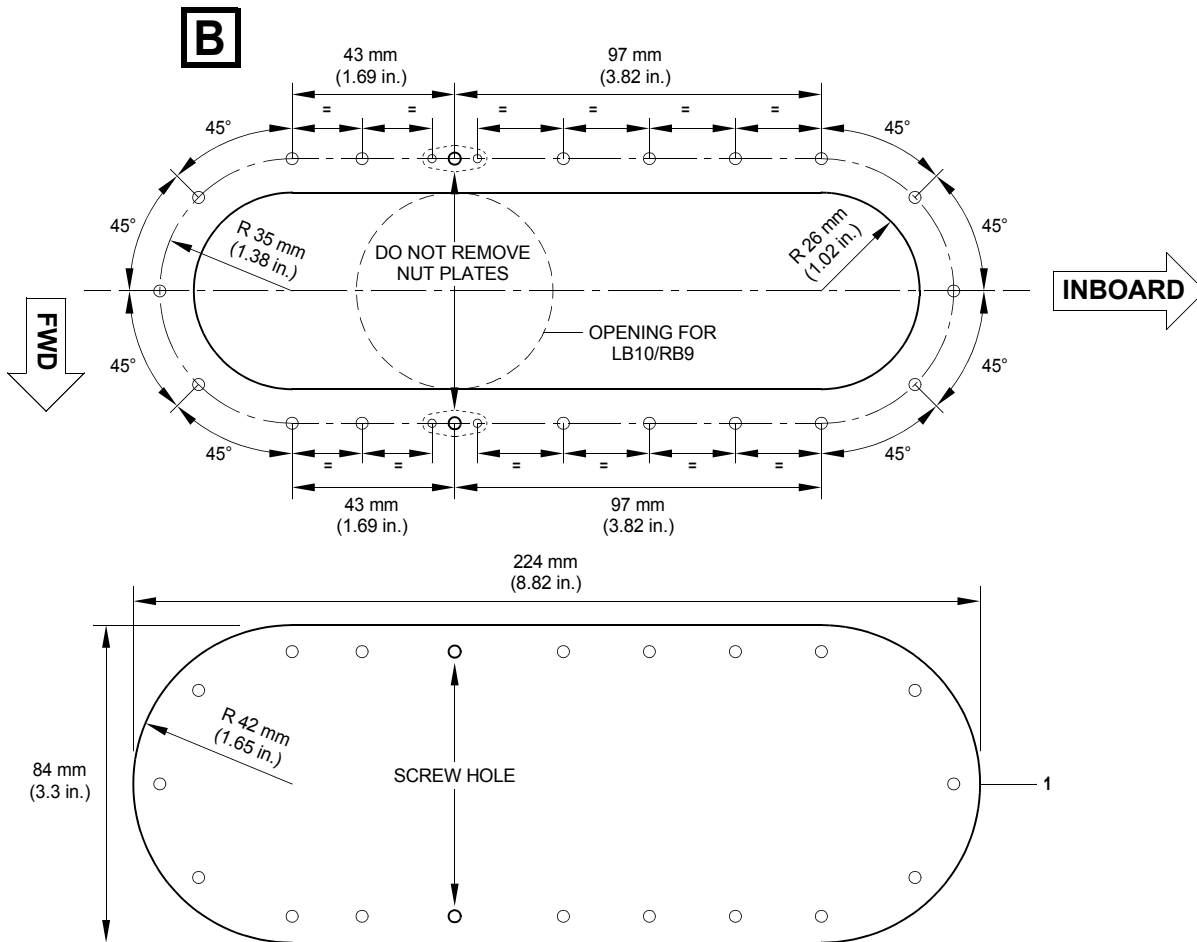
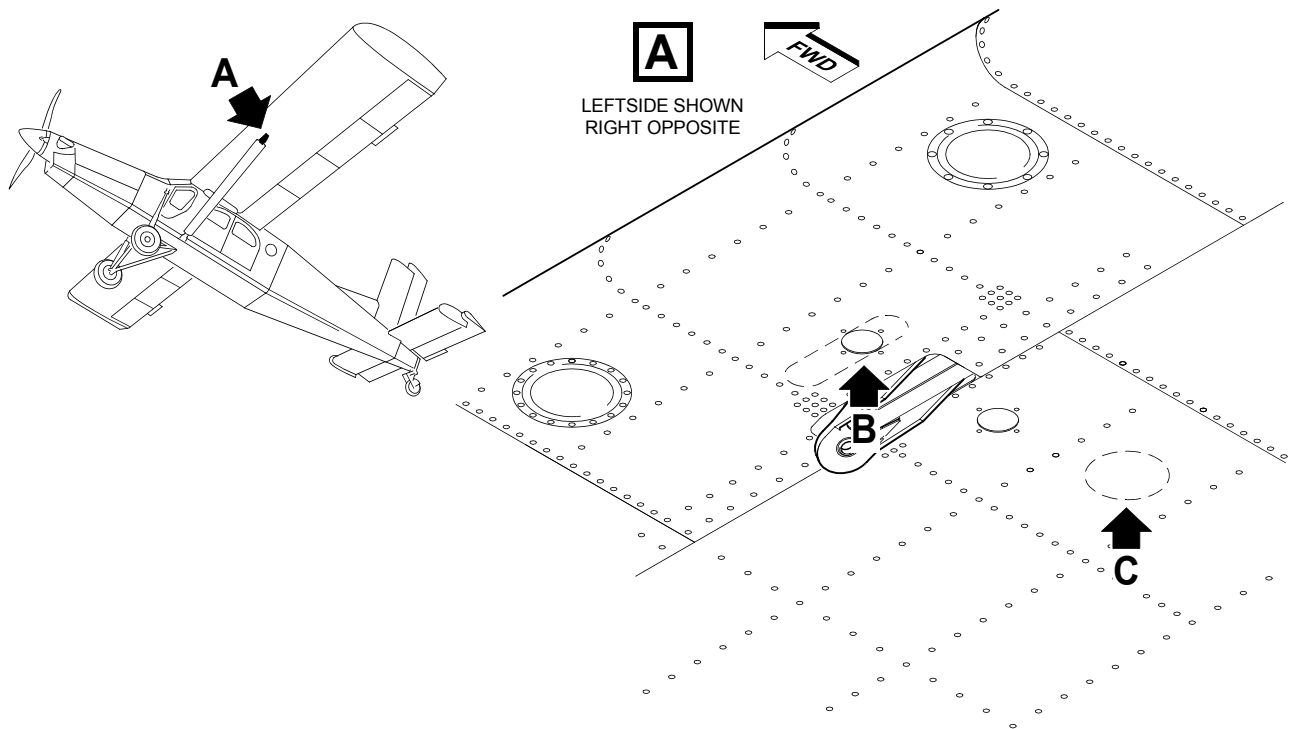
**B. Close up**

- (1) Remove all tools and materials. Make sure that the work areas are clean.
- (2) Install the access panels LB10 and RB9 as applicable (Ref. AMM. 06-40-00, Page Block 1).
- (3) Install the wing struts (Ref. AMM. 57-00-01, Page Block 401).

**C. Documentation**

Make an entry in the Aircraft Logbook that Parts 1 and 2 of this Service Bulletin have been incorporated.

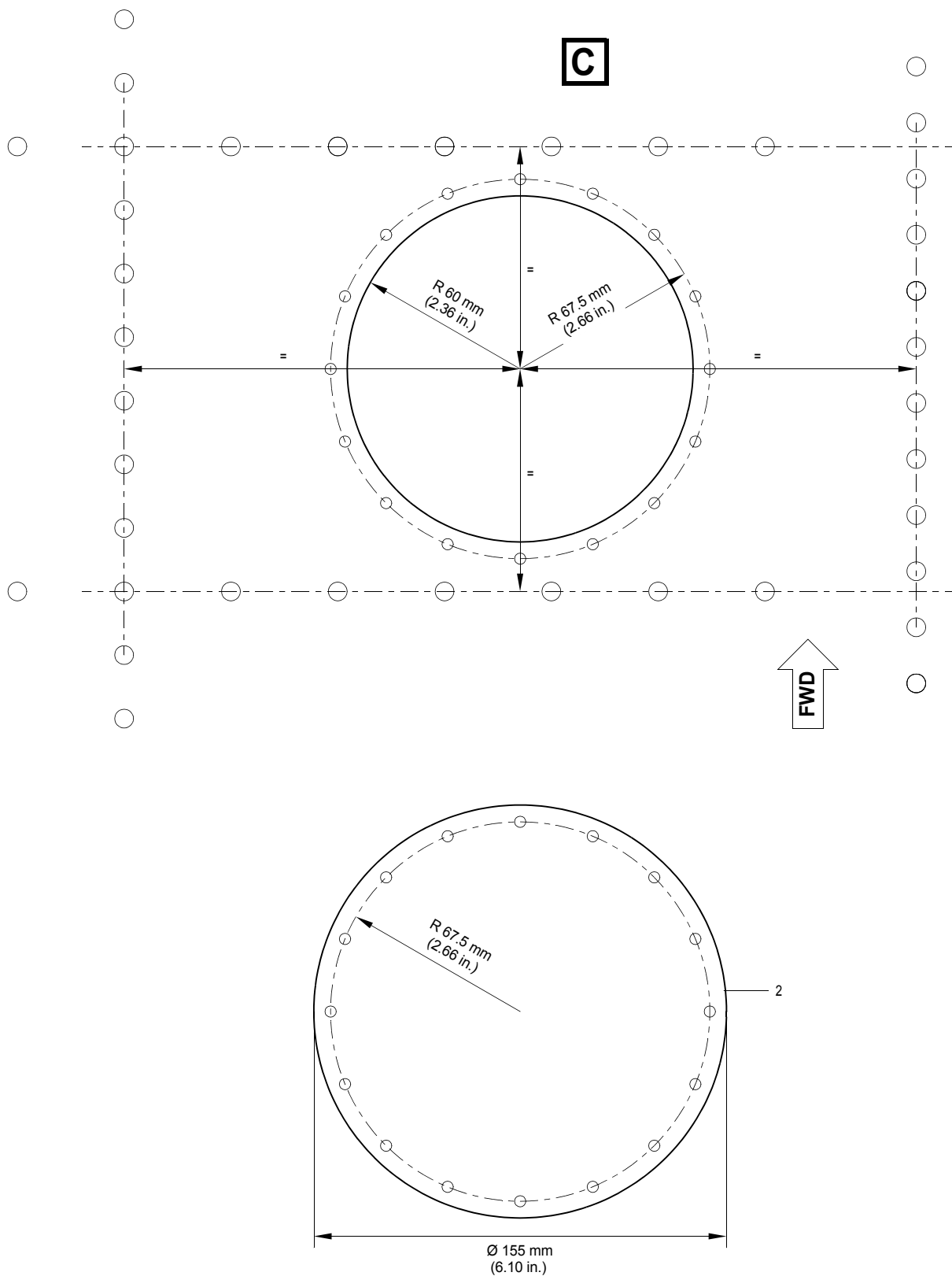
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Access Openings and Covers - Installation (Left Shown, Right Similar)  
Figure 2 (Sheet 1 of 2)

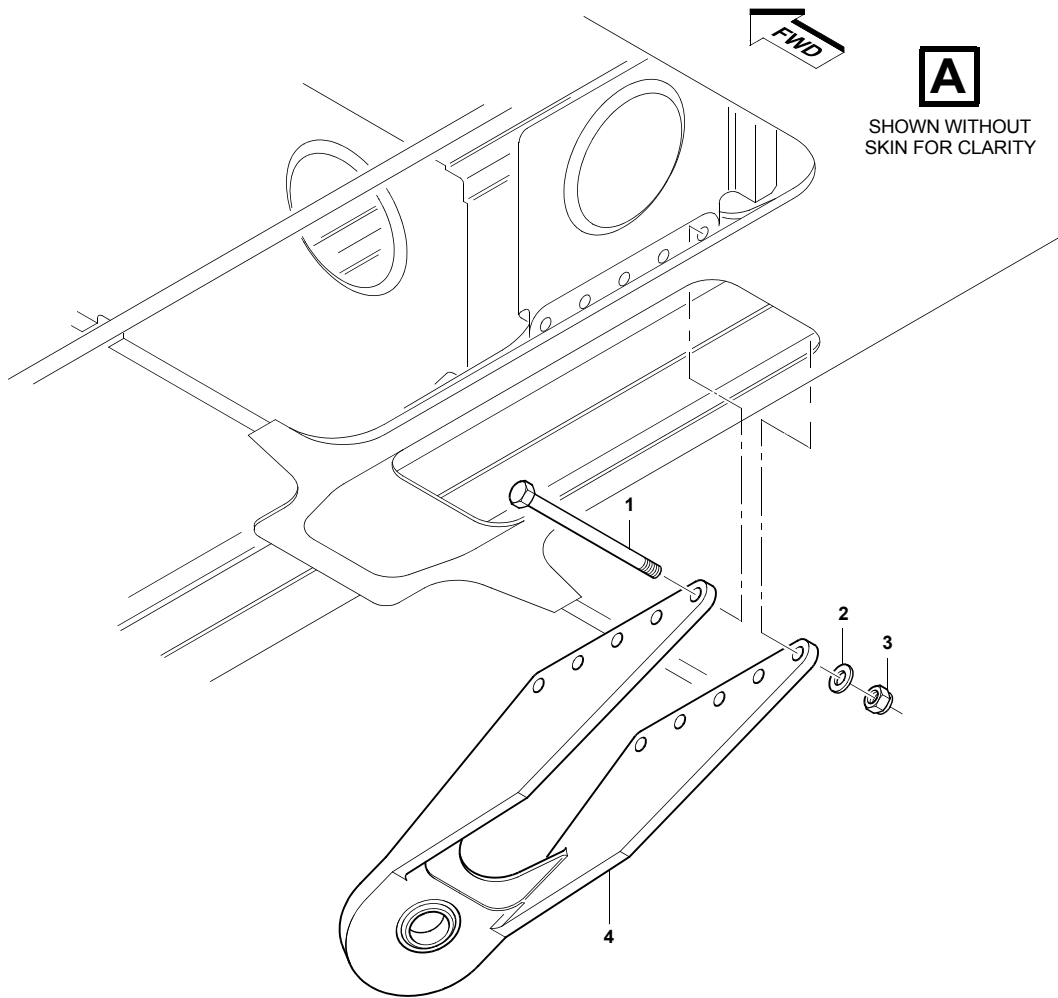
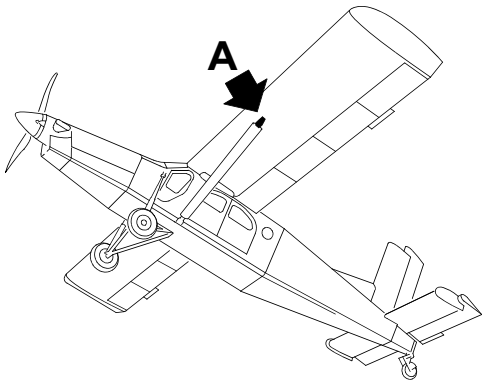
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Access Openings and Covers - Installation (Left Shown, Right Similar)  
Figure 2 (Sheet 2 of 2)

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Fitting - Replacement (Left Shown, Right Similar)  
Figure 3

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