



AIRWORTHINESS DIRECTIVE

TYPE AFFECTED: All Pilatus B4 PC 11 series gliders

SUBJECT: Modification/inspection/repair of the airbrake system.

BACKGROUND: Two Pilatus B4 gliders in Austria experienced inflight failures of their airbrake systems following rapid extension of the airbrakes mistakenly extended by the pilots who intended to retract the undercarriage. The airbrake control system in the wing was damaged by the airbrakes moving out of the wing too far, under their own energy, overriding the "out stop" in the cockpit. When the pilot retracted the airbrakes only one retracted, the other jammed fully out, resulting in the glider spiralling into the ground. Pilatus Aircraft Ltd. have issued Service Bulletin No. 1004 (forming part of this AD), classified as mandatory and approved as such by the Swiss Civil Aviation Federal Office.

Damage of a similar nature can be generated if the airbrakes fall out of the wing during assembly and disassembly of the glider.

GFA has investigated this problem, preparing this A.D. after consultation with the manufacturer. This A.D. asks for the modification and inspections to be carried out in a different order to the factory Service Bulletin. This will allow parts to be ordered in bulk effecting some cost saving and providing lead time for parts delivery.

ENCLOSURES:

- (1) Pilatus Service Bulletin No. 1004
- (2) Amended page 15/16 of the B4 Maintenance Manual (dated 17/3/86)

REQUIRED ACTION:

- 1. **WITHIN 10 FLYING HOURS** - Carry out a freeplay check of the airbrake system in both wings, in accordance with Para 2.b of the Service Bulletin.
- 2. **WITHIN 50 FLYING HOURS** - Install one inspection hatch in each wing lower skin in accordance with Para 2.C of the Service Bulletin.

Carry out a full inspection of the airbrake control system inside the wing determining from any damage found what spare parts might be required to carry out repair procedures in accordance with Para 2.d of the Service Bulletin.
- 3. **BEFORE JUNE 30TH, 1987** - Complete (1) and (2) above.

Obtain and install on each airbrake one "out travel" stop in accordance with Para 2.a of the Service Bulletin.

Ensure that the stop in the cockpit is in full contact with the fuselage frame, and by inspection through the lower wing inspection panels ensure that the push rod fork ends and the airbrake control levers are not "bottoming" on each other and in fact have some clearance. These two steps will ensure that the new stops are fully effective in protecting the system.

ISSUED BY:

CHIEF TECHNICAL OFFICER,
AIRWORTHINESS

FOR THE ON BEHALF OF:

GLIDING FEDERATION OF AUSTRALIA

24/9/1986

Sheet 1 of 2

GFA AD 307	Issue 1
24/9/1986	Sheet 2 of 2

IMPLEMENTATION:

The system inspections, stop installation and final, completed system rigging may be carried out by any person holding a DoA 1109 Glider Inspectors Certificate endorsed "C. of A. Inspection". All metal work to be carried out by an 1109 holder endorsed "minor metal repairs". On completion all inspection, modification and repair work is to be recorded in the glider's logbook, certified by the appropriate inspector/s.

COMPLIANCE:

The requirements of this Airworthiness Directive are mandatory. This Directive is issued pursuant to Air Navigation Regulations under the delegated authority of the Secretary of the Department of Aviation.



SERVICE BULLETIN

DATE: July 1985

NO: 1004

TITLE: AIRBRAKE MODIFICATION AND REPAIR TO CONTROL LINKAGE

1. PLANNING INFORMATION

1.1 EFFECTIVITY

A. AIRCRAFT AFFECTED

All PILATUS B4 PC-11 Gliders.

B. SPARES AFFECTED

None.

1.2 REASON

Two incidents have been reported on B4 PC-11 gliders as a result of airbrake mal-operation. This has caused the rivets attaching the airbrake operating lever to the flanged bush, to shear.

1.3 DESCRIPTION

This Service Bulletin provides details for carrying out the following:

- Installation of a travel-stop on LH and RH airbrakes.
- Inspection procedure to find out if damage has occurred to the following: the rivets securing the fork end attachment fittings to the airbrake control rods; the rivets securing the airbrake control lever to the flanged bush.
- Procedure for repairing damage, if found, to the fork end fittings and airbrake lever assembly.

1.4 COMPLIANCE

MANDATORY.

Travel Stops: Travel stops must be installed within 10 flying hours, in accordance with Para. 2.A. of this Service Bulletin.

Play Check: A check, in accordance with Para.2.B. of this Service Bulletin, of the amount of play in the airbrake control mechanism must be carried out within 10 flying hours.

Inspection: A check in accordance with Para. 2.C. of this Service Bulletin must be carried out depending upon the results of the Play Check.

1.5 APPROVAL

The technical aspects of this Service Bulletin are approved as an AIRWORTHINESS DIRECTIVE (AD) by the Federal Office for Civil Aviation (FOCA) of Switzerland.

1.6 MANPOWER

The following approximate manhours are required to accomplish the following parts of this Service Bulletin:

- A. Installation of RH and LH travel stops: 2 manhours
- B. Play check: 1 manhour
- C. Inspection: 8 manhours
- D. Repair(s) to airbrake control linkage: upon investigations.

1.7 MATERIAL - COST AND AVAILABILITY

A. MATERIAL

Operators should forward orders for modification kits, quoting this Service Bulletin, aircraft serial number and flight hours to:

PILATUS AIRCRAFT LTD.
Product Support Dept.
CH 6370 STANS
SWITZERLAND

B. BASIC COST

SFr. 285.-

NOTE: Material required under Para. 2.D. (repair procedure) to be ordered as required.

1.8 TOOLING

No special tools are required.

1.9 WEIGHT AND BALANCE

Not affected.

1.10 REFERENCE TO OTHER PUBLICATIONS

- Illustrated Parts Catalog (IPC)
- Maintenance and Repair Manual

1.11 PUBLICATIONS AFFECTED

- Illustrated Parts Catalog (IPC)
- Maintenance and Repair Manual

2. ACCOMPLISHMENT INSTRUCTIONS

A. INSTALLATION OF AIRBRAKE TRAVEL-STOP

The following steps detail the procedure required for the installation of a travel-stop on the RH and LH airbrake.

(Refer to Figure 1)

- 1) Operate airbrake hand control and extend RH and LH airbrake. Secure RH and LH airbrake in the extended position.
- 2) Refer to Figure 1 and mark on RH and LH airbrake the position of the two airbrake travel-stop attachment bolt holes.
- 3) Position a cloth so that drill swarf does not enter wing. Drill two holes in RH airbrake as marked in step 2), using a 4,9mm dia. drill. Deburr holes.
- 4) Correctly position airbrake travel-stop (2) LH, (3) RH on airbrake and install spacer (1), lower bolts (5), two washers (6), and two nuts (7).
- 5) Carefully tighten nuts (7) to secure stop in position. Secure rubber buffer (4), in correct position, with contact adhesive (Ref: Para. 3B).

CAUTION: DO NOT OVERTIGHTEN NUTS (7) AS DAMAGE TO AIRBRAKE AND STOP WILL OCCUR.

- 6) Repeat steps 2) thru 5) for LH airbrake.
- 7) On completion of modification check that airbrakes extend and retract correctly.

B. PLAY CHECK

- 1) Disconnect the inboard end of the airbrake control rod and restrain the airbrakes in the retract position.
- 2) Apply a push/pull hand force to the inboard end of the airbrake control rod on each wing.
- 3) If axial play is more than 1.0mm, carry out the inspection in accordance with 2.C. of this Service Bulletin, within 10 flying hours.
- 4) If axial play is less than 1.0mm carry out the inspection, in accordance with 2.C. of this Service Bulletin, within 50 flying hours.

C. INSPECTION

NOTE: This inspection may be carried out with the wings removed but extra care must be taken to prevent contamination of control runs etc. with swarf.

(Refer to Figure 2)

- 1) On LH wing lower surface locate and mark an access hole according to the diameter of the access cover P/N 110.65.11.009 (approx. 130mm dia.) with the hole center 90mm outboard of rib 3A rivet center line and 90 mm aft of center line of airbrake spar rear rivet row.
- 2) Repeat Step 1) on RH wing lower surface.
- 3) Refer to Figure 2 and to PILATUS B4 Maintenance and Repair Manual Doc. N°01482, page 67-69 and using appropriate tools cut an access hole in LH and RH wing at positions marked in Steps 1) and 2).
- 4) Remove all swarf from interior and exterior of wings.
- 5) Restrain LH wing airbrake in retracted position.
- 6) Apply a push/pull force to inboard end of airbrake control rod. Check for loose rivets, excessive wear, elongated bolt holes, etc. at the following locations:
 - rivets securing fork end attachment fitting to airbrake control rod
 - rivets securing airbrake control lever to flanged bush
 - bearing in airbrake operating lever assembly
 - bolt connecting flanged bush in airbrake operating lever assembly to airbrake shaft.
- 7) Repeat Steps 5) and 6) at RH wing.
- 8) If any defects are detected in Steps 6) and 7) the defects must be rectified in accordance with the repairs detailed in Para 2.D. within 10 flying hours.
- 9) If no defects are found refer to Pilatus B4 Maintenance and Repair Manual and install access cover P/N 110.65.11.009.
- 10) Restore external paint finish.
- 11) Install wings.
- 12) Carry out a functional check of airbrake (Ref. MM).

D. REPAIR PROCEDURES

- NOTES: 1. The following procedures are applicable to LH and RH wings and are written assuming that the wings have been removed.
2. The material required for the repair must be ordered, after Para. C, from PILATUS AIRCRAFT LTD.

1) Control Rod Fork End Fittings

(Refer to Figure 5)

- a) Remove nut, washer, and bolt attaching airbrake control rod to airbrake operating lever assembly. Examine bolt (1) for damage or distortion.
- b) Remove airbrake control rod from wing.

CAUTION: ENSURE THAT END OF CONTROL ROD TUBE IS CUT AT RIGHT ANGLES TO CONTROL ROD CENTRE LINE.

(Refer to Figures 3 and 4)

- c) Mark and cut 40mm from end of control rod tube (1). Deburr end of control rod tube.
- d) Insert new fork end fitting (2) (P/N 116.42.11.054) into control rod tube ensuring that fork end fitting is correctly aligned to existing fork end fitting on inboard end of control rod tube.
- e) Mark and drill two holes through control rod tube and fork end fitting using 4.9mm dia. drill.
- f) Insert airbrake control rod (with fork end fitting attachment bolts not installed) through wing.

CAUTION: DO NOT OVERTIGHTEN NUTS WHEN INSTALLING FORK END FITTING SECURING BOLTS.

(Refer to Figure 3)

- g) Install two bolts (3 and 4), two washers (5 and 6) and two nuts (7 and 8) to secure fork end fitting (2) to operating control rod.

(Refer to Figure 5)

- h) Align fork end fitting on bearing in airbrake operating lever and install bolt (1), washer and nut.
- i) Carry out loose article check in wing and ensure that all tools, swarf, etc. have been removed.
- j) Refer to Pilatus B4 Maintenance and Repair Manual and install access cover P/N 110.65.11.009.
- k) Restore external paint finish.
- l) Install wings.
- m) Carry out a functional check of airbrake controls and ensure correct operation of airbrakes (Ref. MM).

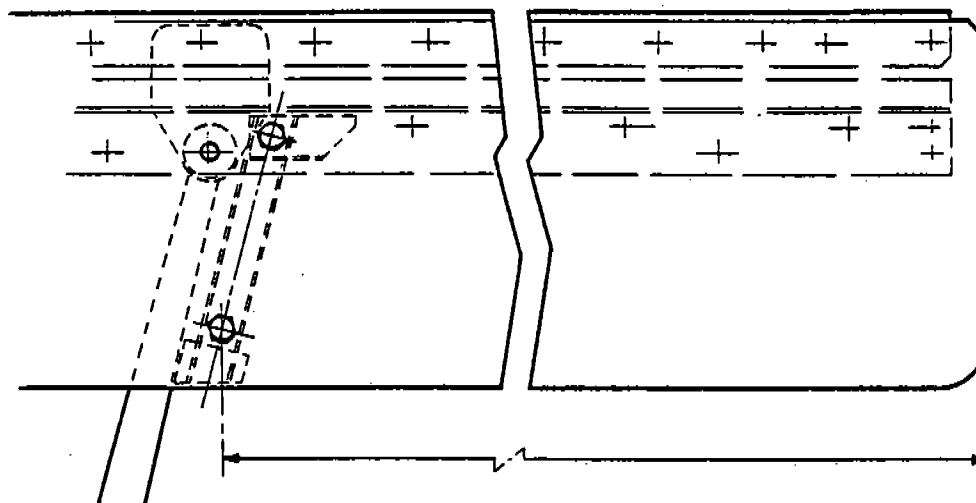
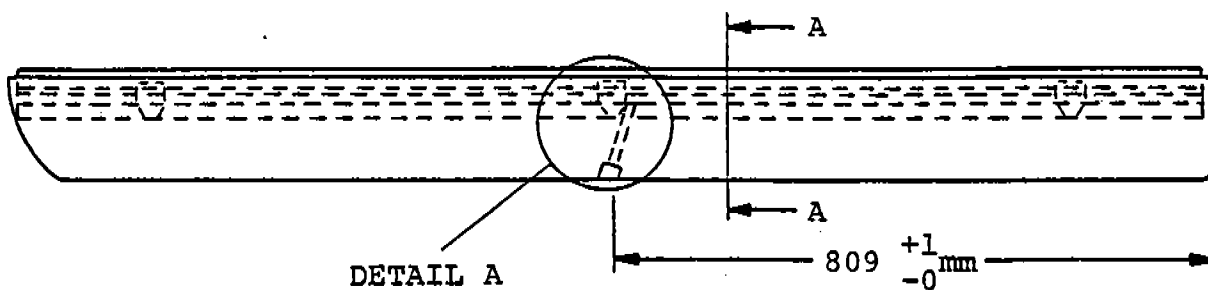
2) Airbrake Operating Lever Assembly

(Refer to Figure 5))

- a) Remove nut, washer and bolt attaching airbrake control rod to airbrake operating lever assembly. Examine bolt (1) for wear, damage, and distortion. Discard bolt if any defect is found.
- b) Remove nut, washer and bolt securing airbrake operating lever assembly to airbrake shaft and remove lever assembly. Examine bolt for wear, damage, and distortion. Discard bolt if any defect is found. Examine holes of flanged bush and airbrake shaft for elongation (more than 0.2mm). If any defect is found replace with oversize bolt (6.0mm max.)
- c) Examine operating lever assembly roller bearing for excessive wear, if any defect is found, replace roller bearing.

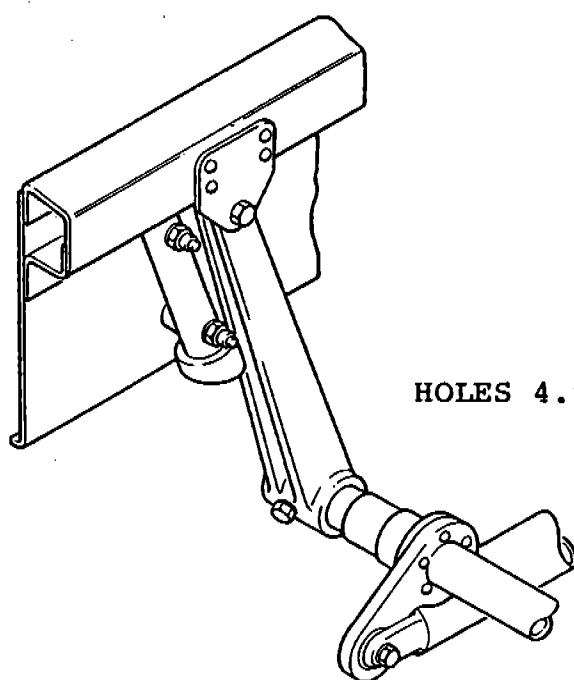
(Refer to Figure 5).

- d) Examine the six rivet heads attaching flanged bush to operating lever for wear. If any defect is found carefully drill off heads of six rivets (A thru F) attaching flanged bush (3) to operating lever (2) and punch out rivet shanks. Install six new rivets P/N 939.17.81.239 (MS 20470 AD-4-8) to attach flanged bush (3) to operating lever (2).
- e) Install airbrake operating lever assembly on airbrake shaft using bolt, washer and nut.
- f) Install airbrake control rod on bearing in airbrake operating lever assembly using bolt, washer, and nut.
- g) Carry out Loose Article Check in wing.
- h) Refer to Pilatus B4 Maintenance and Repair Manual and install access panel P/N 110.65.11.009.
- i) Restore external paint finish.
- j) Install wings.
- k) Carry out a functional check of airbrake controls and ensure correct operation of airbrakes (Ref. MM).

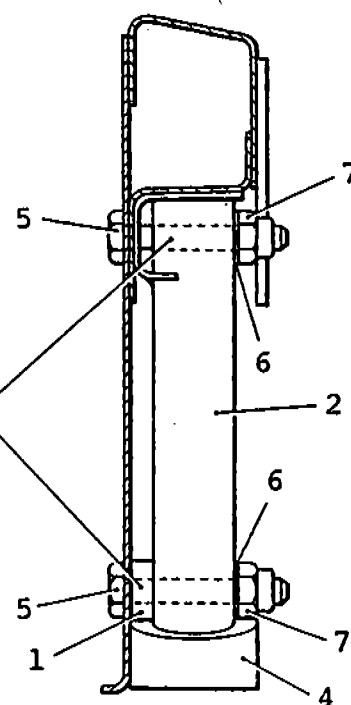


DETAIL A

SECTION A-A

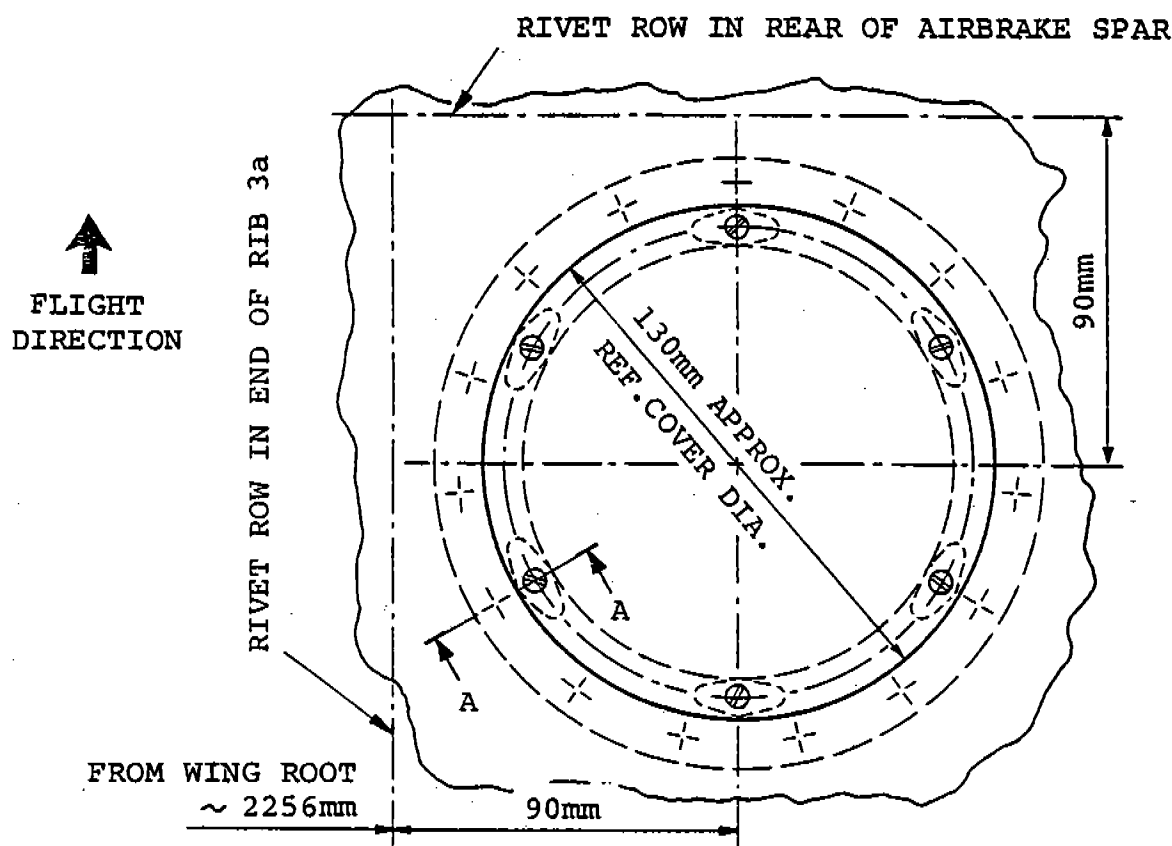


HOLES 4.9mm DIA.

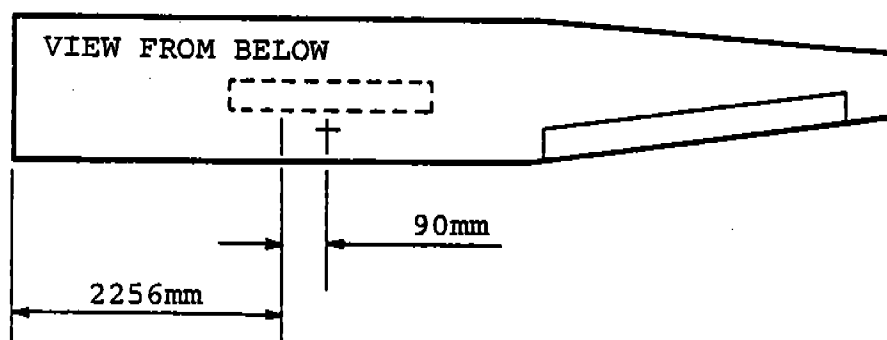
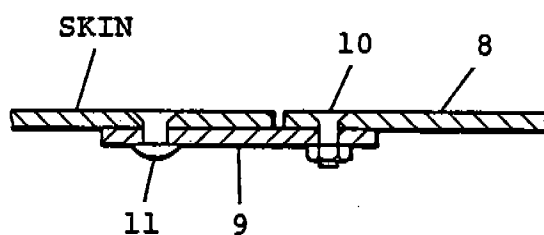


INSTALLATION OF AIRBRAKE TRAVEL-STOP
Figure 1

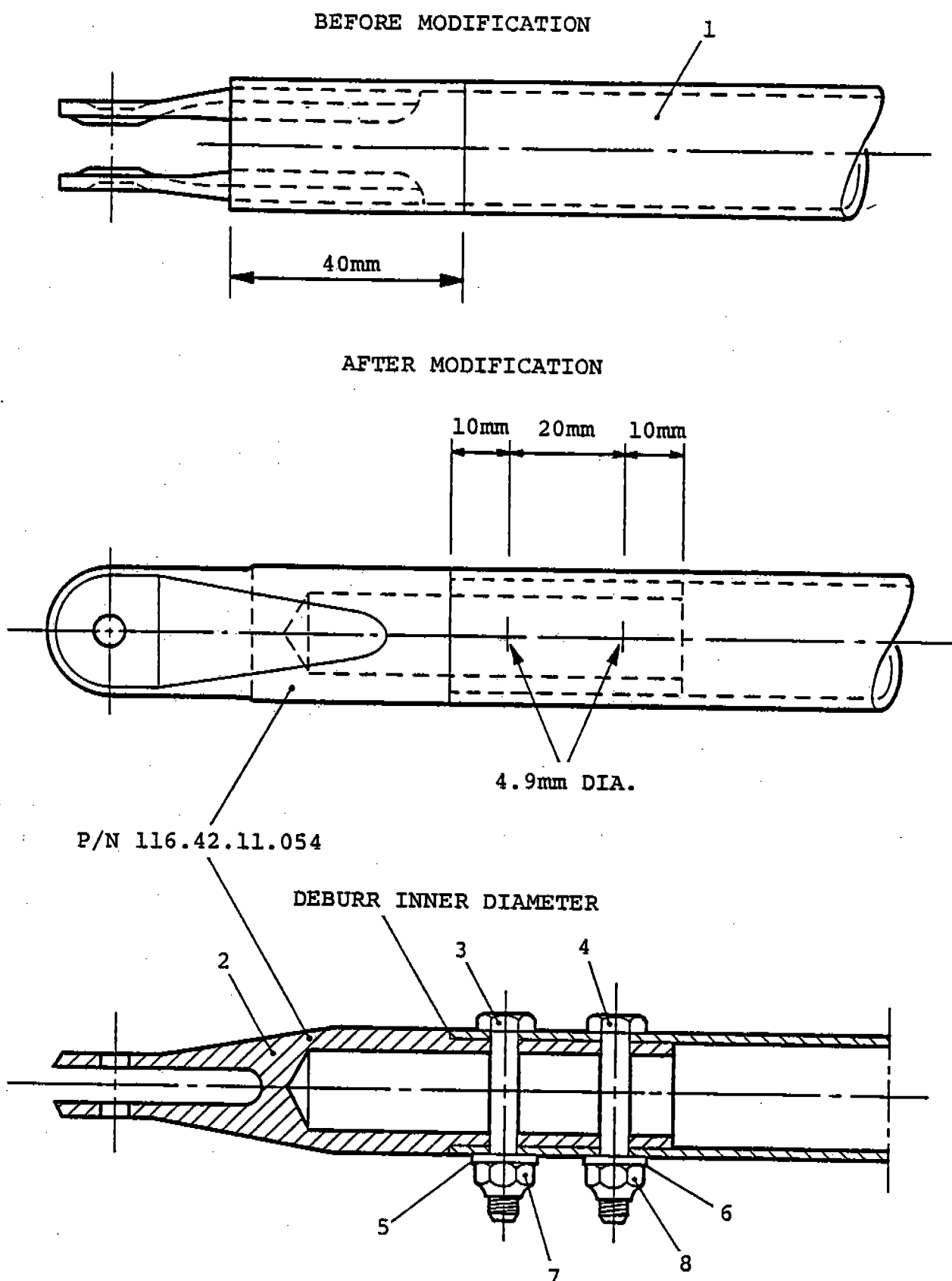
NOTE: LH WING VIEWED FROM BELOW, RH WING MIRROR IMAGE



SECTION A-A

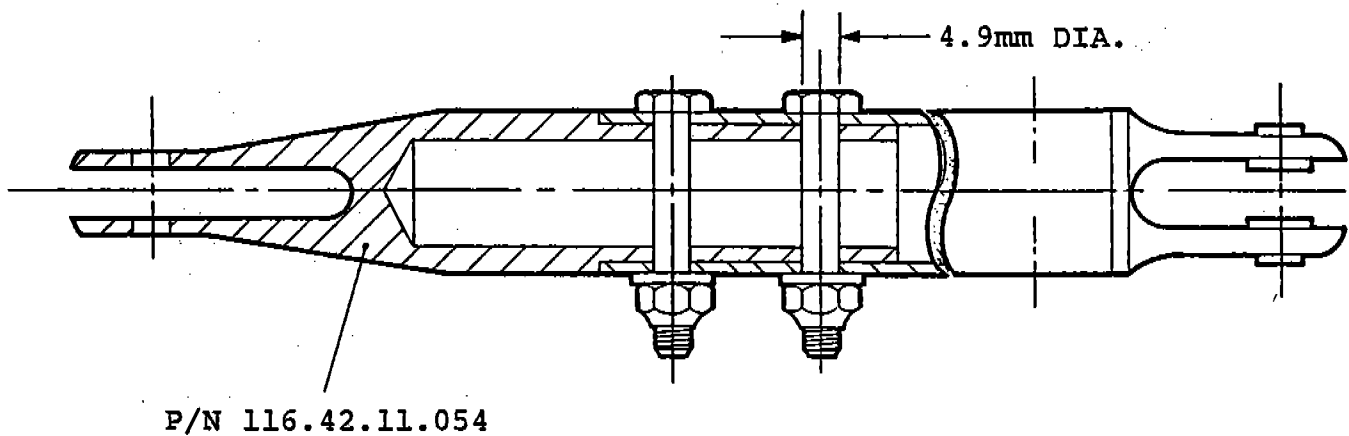


ACCESS PANEL DETAILS
Figure 2

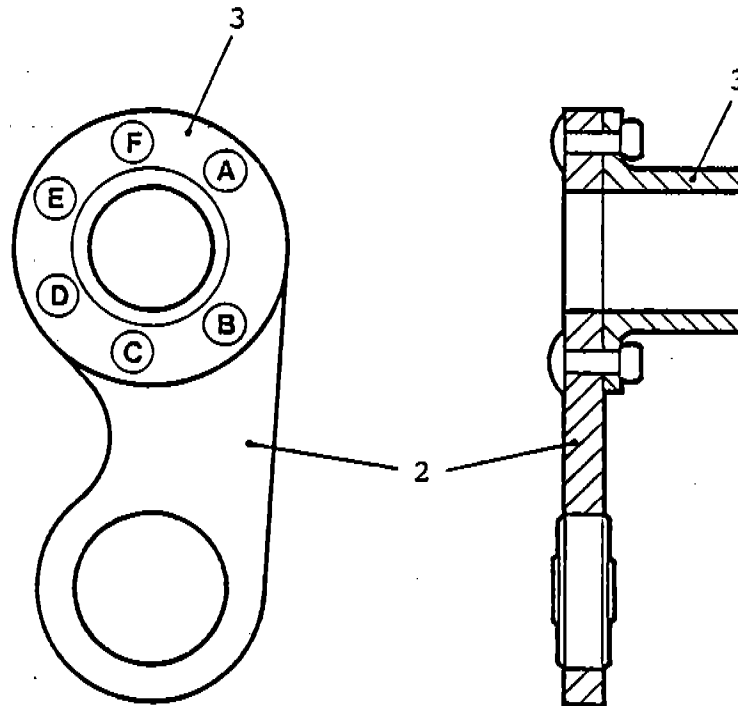


REPAIR TO AIRBRAKE CONTROL ROD
Figure 3

ENSURE INBOARD AND OUTBOARD
FORK END FITTINGS ALIGN

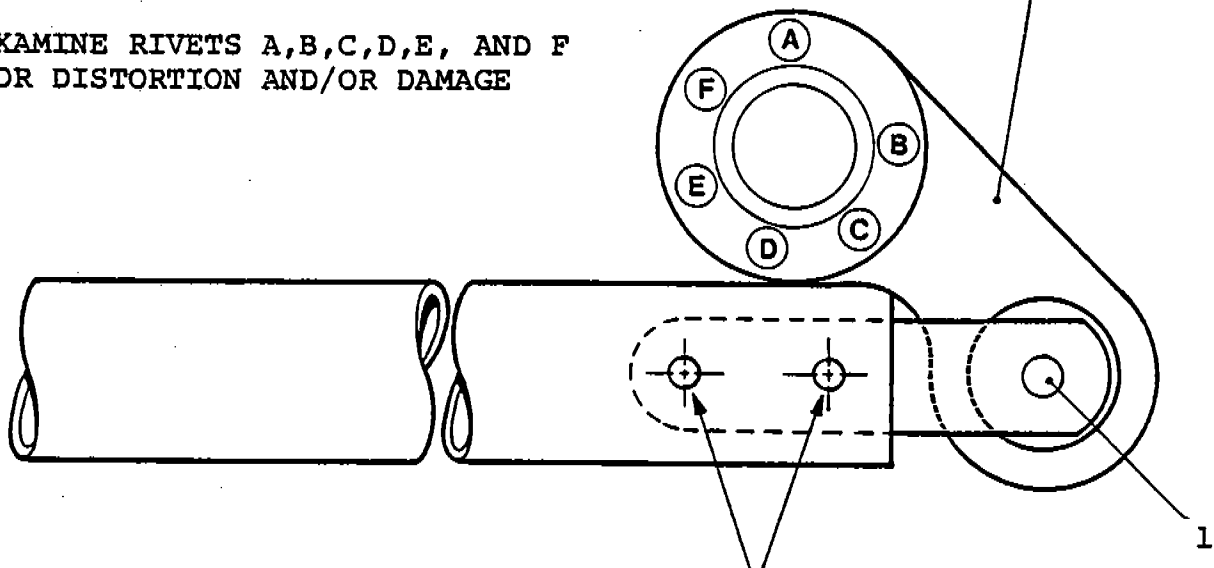


CORRECT ALIGNMENT OF AIRBRAKE CONTROL ROD
Figure 4



EXAMINE RIVETS A,B,C,D,E, AND F
FOR DISTORTION AND/OR DAMAGE

AIRBRAKE OPERATING
LEVER



EXAMINE THESE RIVETS ON BOTH
SIDES FOR LOOSENESS

REPAIR TO AIRBRAKE LEVER ASSEMBLY
Figure 5

3. MATERIAL INFORMATION

A. Basis for the following material data is per aircraft.
Refer to Figs. 1 and 2.

Item N°	Part Number	Qty	Designation
1	111.55.11.032	2	SPACER
2	111.55.11.033	1	AIRBRAKE TRAVEL STOP L/H
3	111.55.11.034	1	AIRBRAKE TRAVEL STOP R/H
4	111.55.11.035	2	RUBBER BUFFER
5	932.19.60.819	4	BOLT AN 173C12A
6	938.77.61.013	4	WASHER AN 960-C10
7	938.07.17.604	4	NUT MS 21044N3
8	110.65.11.009	2	ACCESS COVER
9	111.35.11.195	2	SUPPORT RING
10	933.45.16.121	12	COUNTERSUNK SCREW MS 24693-528
11	939.35.80.903	30	RIVET Avdel-4022-0407
	or		
	939.32.81.253	30	RIVET 2.6x6 VSM 13128/741.4

B. List of Operator Supplied Materials:

- Contact adhesive 3M FASTBOND 10 or equivalent
- Araldite adhesive
- External paint finish.