Formerly AP4601A
Vol 4 Pt 6

AP 105D-1311-5F

Issued July 1974

BAY SERVICING SCHEDULE

POWERED FLYING CONTROLS
ELEVATOR CONTROL UNIT
PART NO. AH 1525
(FAIREY HYDRAULICS)

BY COMMAND OF THE DEFENCE COUNCIL

Michael Carr

(Ministry of Defence)

FOR USE IN THE
ROYAL AIR FORCE

AMENDMENT RECORD CERTIFICATE

1. This certificate is for Ministry of Defence (Air) ALs only.
2. Amendments are to be inserted in numerical sequence except where Non-Availability slips for particular A.L.s are issued.

A.L. No	A.L. MONTH AND YEAR OF ISSUE	AMENDMENT INCORPORATED SIGNATURE	DATE OF INCORPORATION
1	Jan. 85		5-5-85
2			
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P.F.60

POWERED FLYING CONTROLS
ELEVATOR CONTROL UNIT
SUPPLEMENTARY SERVICING

ITEM No	ITEM	OPERATION

REF NO.	EQUIPMENT AND TOOLS	QTY
	Kits Tool Airframe Fitter to Scale A2 AP830 Vol 3 Pt A	1
27KF/683	Seal, Manipulating Tool (Set of 3) Pt No. FHQ100	1
27KF/698	Clamps, Vice Pt No. FHQ161	1
27KF/688	Tool, Manipulating Pt No. FHQ164	1
1A/4390	Balance, Spring 0-10 lb	1
1C/7150	Wrench, Torque 60-360 lbf in.	1
4G/5902	Rig Test, Powered Flying Controls Mk 2	1
1B/910089	Indicator, Dial Test, Universal	

SPARES

Refer to AP4515P Vol 3 Pt 1 Sect 2 Chap 1

	MATERIALS	NATO CODE NO.	
30A/3055	Locking Wire, 22 SWG		As required
34B/2241973	Grease, XG-287	G-354	"

SERVICING NOTES

1. AP105D-0001-5F is to be complied with throughout the work detailed in this schedule.

2. Unless otherwise stated all component parts are to be cleaned using oil, OM-15.

3. Connecting pieces, seals and sealing washers are to be immersed in oil, OM-15 immediately before fitting.

P.F.6.

ITEM No	ITEM	OPERATION
1.	Preparation	
1.1	Servicing Notes.	Read.
2.	Dismantling	
2.1	Servo valve hydraulic connexions.	Fit protection plugs.
2.2	Connecting link attachment bolts. (E and F, Fig 1 refers).	Remove.
2.3	Release unit locking bolt.	Unscrew until clear of ram notch.
2.4	Jack eye and axis pin (B).	(i) Remove. (ii) Remove distance collars.
2.5	Pivot block attachment bolts (A).	Remove.
2.6	Jack and valve assembly.	(i) Remove, complete with release unit, pivot blocks and input levers. (ii) Remove from release unit.
2.7	Output lever. (a) Output lever axis pin (D). (b) Output lever bolt (C).	 (i) Remove. (ii) Remove distance collars. Remove.
2.8	Input lever. (a) Input lever attachment bolts (K). (b) Input levers. (c) Input lever bolts (H and J). (d) Input lever bolt (G).	 Remove. Remove pivot blocks and release unit. (i) Remove. (ii) Remove distance tubes. Remove.
2.9	Pivot block.	(i) Separate. (ii) Remove release unit. (iii) Remove dowels.
2.10	Servo valve eye end.	(i) Remove. (ii) Discard tabwasher.
2.11	External pipe.	Remove.

Continued overleaf

ITEM No	ITEM	OPERATION
2.12	Servo valve banjo bolt.	(i) Remove. (ii) Discard bonded seal.
2.13	Servo valve banjo union.	Remove.
2.14	Servo valve by-pass connexion.	Fit protection plug.
2.15	By-pass valve banjo union.	Fit protection cap.
2.16	Jack.	Support in vice using vice blocks Pt No. FHQ 762.
2.18	Servo valve attachment bolts.	(i) Remove. (ii) Discard tab washers.
2.19	Servo valve.	Remove, ensuring bottom platen remains in servo valve body.
2.20	Platen retaining washers.	Remove and discard.
2.21	Protection plugs.	Fit to bottom platen.
2.22	Servo valve protection cover.	Fit to base of servo valve.
2.23	Connecting pieces.	(i) Remove from jack platform. (ii) Remove and discard seals. (iii) Place in polythene bag and attach to jack.
2.24	Protection plugs.	Fit to jack platform.
2.25	Platform protection cover.	Fit.
2.26	Release unit.	Bay Service as detailed in AP105D-1314-5F.
2.27	Servo valve.	Bay Service as detailed in AP105D-1302-5F.
2.28	Jack.	(i) Remove from vice and vice blocks. (ii) Bay Service as detailed in AP105D-1307-5F.

ITEM No	ITEM	OPERATION
3.	Examination	
3.1	Eye end.)	
3.2	External pipe.)	
3.3	Banjo bolt.)	
3.4	Banjo union.)	
3.5	Beam.)	
3.6	Pivot blocks.)	
3.7	Input levers.)	
3.8	Output lever.)	(i) Clean.
3.9	Connecting link.)	(ii) Examine.
3.10	Axis pins.)	
3.11	Distance tubes.)	
3.12	Distance collars.)	
3.13	Distance washers.)	
3.14	Bolts.)	
3.15	Nuts.)	
3.16	Washers.)	
3.17	Dowels.)	
4.	Assembling	
4.1	Jack.	Support in vice using vice blocks.
4.2	Platform protection cover.	Remove.
4.3	Protection plugs.	Remove from jack platform.
4.4	Connecting pieces.	(i) Fit new seals. (ii) Fit to jack platform.
4.5	Servo valve protection plate.	Remove.
4.6	Protection plugs.	Remove from bottom platen.
4.7	Platen retaining washers.	Ensure fitted, cones towards valve. ?
4.8	Servo valve.	Fit to jack platform, spindle facing jack ram.
4.9	Servo valve attachment bolts.	Fit and tighten, do not lock tab washers.
4.10	Servo valve hydraulic connexion protection plug.	Remove.

Continued overleaf

ITEM No	ITEM	OPERATION
4.11 4.12 4.13	Servo valve banjo union. Banjo bolt. Bonded seals.	Fit.
4.14	By-pass valve protection plug.	Remove.
4.15 4.16 4.17	By-pass valve banjo union. Banjo bolt. Bonded seals.	Fit.
4.18	External pipe.	Fit, larger radius bend adjacent to servo valve. Note: Ensure clearance exists between pipe and jack body, especially across corner formed by the body flat adjacent to pipe connexion at by-pass housing.
4.19 4.20	Lock nut. Tab washer.	Fit to eye end.
4.21	Eye end.	Fit, do not lock tab washer.
4.22	Jack.	Remove from vice and vice blocks.
4.23	Output lever.	Position in beam.
4.24	Distance collars.	Position each side of output lever bearing.
4.25 4.26 4.27 4.28 4.29	Output lever axis pin (D). Output lever bolt (C). Washers. Nuts. Split pins.	Fit to output lever.
4.30	Pivot blocks.	(i) Fit dowels. (ii) Fit to release unit trunnions so release unit locking bolt is towards jack.
4.31 4.32 4.33 4.34 4.35 4.36 4.37 4.38 4.39	Input lever bolts (H and J). Distance pieces. Washers. Nuts. Split pins. Input lever bolt (G). Washer. Nut. Split pin.	Fit to input levers.

Continued

ITEM No	ITEM	OPERATION
4.	Assembling (Contd)	
4.40	Input levers.	Position in pivot blocks (Fig.1 refers).
4.41	Input lever attachment bolts (K).	Fit to input lever.
4.42	Washers.	
4.43	Nuts.	
4.44	Split pins.	
5.	Testing (Internal Leakage Test)	
5.1	Connexion A.	Connect to test rig supply line (Fig 2 refers).
5.2	Connexion B.	Connect to test rig return line.
5.3	PFCU.	Bleed.
5.4	Piston spindle.	Move in.
5.5	Connexion A.	(i) Apply pressure of between 3850 and 4150 lbf/in2. (ii) Maintain for 3 minutes. No external seepage is permissible. (iii) Release pressure.
5.6	Connexion B.	(i) Disconnect from test rig return. (ii) Fit blank.
5.7	Connexion A.	(i) Apply pressure of between 1 and 10 lbf/in2. (ii) Maintain for 2 minutes. No seepage is permissible. (iii) Release pressure.
5.8	Connexion B.	(i) Remove blank. (ii) Connect to test rig return.
5.9	Piston spindle.	(i) Move out. (ii) Repeat Sub-items 5.5 to 5.7 inclusive.
5.10	Connexion B.	Remove blank.

Continued overleaf

ITEM No	ITEM	OPERATION
5.11	Connexion A.	(i) Apply pressure of between 2880 and 3120 lbf/in2. (ii) Maintain pressure with pump on for 4 minutes. During fourth minute check seepage from connexion B does not exceed 100 cm3/min. (iii) Release pressure.
5.12	Piston spindle.	Move in.
5.13	Connexion A.	Repeat Sub-item 5.11.
6.	Establishing Valve Neutral	
6.1	Connexion A.	Apply pressure of between 1920 and 2080 lbf/in2.
6.2	Piston spindle.	Move to extend jack ram.
6.3	Jack ram dial test indicator (DTI).	Fit to jack ram end with plunger at least 0.010 in. from fully bottomed position.
6.4	Balance spindle DTI.	Fit to end of balance spindle, plunger slightly depressed.
6.5	Piston spindle.	Move until jack ram is clear of stops.
6.6	Jack ram DTI.	Set to zero.
6.7	Piston spindle.	Move in until jack ram moves.
6.8	Balance spindle DTI.	Set to zero.
6.9	Piston spindle.	Move out until jack ram moves.
6.10	Balance spindle DTI.	(i) Note indication. (ii) Set to zero at half recorded indication. Note: Zero indication now indicates piston spindle neutral position.
6.11	Connexion A.	Release pressure.
7.	External Leakage Test	
7.1	Piston spindle.	Move to neutral.
7.2	Connexion B.	(i) Connect to test rig pressure line. (ii) Apply pressure of between 960 and 1040 lbf/in2.
7.3	Connexion A.	Apply pressure of between 1920 and 2080 lbf/in2.

Continued

ITEM No	ITEM	OPERATION
7.	External Leakage Test (Contd)	
7.4	Connexions A and B.	Maintain pressure for 2 minutes. No external seepage is permissible.
7.5	Connexion B.	Reduce pressure to between 1 and 10 lbf/in2.
7.6	Connexions A and B.	(i) Maintain pressures for further 2 minutes. No external seepage is permissible. (ii) Release pressure.
8.	Operating Load Tests	
8.1	Connexion B.	Connect to test rig return line.
8.2	Connexion A.	Apply pressure of between 2880 and 3120 lbf/in2.
8.3	Piston spindle.	Move in and out.
8.4	Spring balance.	(i) Connect to piston spindle. (ii) Pull and note indication at which piston spindle starts to move. (iii) Repeat over entire stroke. Maximum load 6 lb. Maximum variation between indications 2.5 lb.
8.5	Piston spindle.	Adjust until jack ram is stationary and clear of stops.
8.6	Spring balance.	Measure load required to cause jack ram to move. This is not to exceed 2.5 lb.
NB	Repeat Sub-items 8.5 and 8.6 for movement of ram in opposite direction.	
8.7	Piston spindle.	Move to neutral.
8.8	Spring balance.	(i) After maintaining pressure for 5 minutes measure load required to move piston spindle. Load is not to exceed 10 lb. (ii) Repeat in opposite direction.
8.9	Connexion A.	Release pressure.
8.10	Connexion B.	Disconnect from test rig.

Continued overleaf

ITEM No	ITEM	OPERATION
8.11	Piston spindle.	Move in 0.030 in. from neutral position.
8.12	Connexion A.	(i) Gradually raise pressure until flow starts at connexion B. (ii) Note pressure at which flow falls to normal seepage rate. This pressure is not to exceed 500 lbf/in2. (iii) Increase pressure to between 2880 and 3120 lbf/in2, then gradually decrease and note pressure at which flow recommences at connexion B. This is not to be less than 200 lbf/in2.
8.13	Piston spindle.	Move out 0.030 in. from neutral position.
8.14	Connexion A.	(i) Repeat Sub-item 8.12. (ii) Release pressure. (iii) Disconnect from pressure line.
8.15	PFCU.	(i) Fully retract ram. (ii) Ensure unit is left full of fluid. (iii) Fit storage blanks to hydraulic connexions.
9.	Completion	
9.1	Servo valve attachment bolts.	Lock tab washers.
9.2	Servo valve bleed screws.	Lock with wire.
9.3	External pipe unions.	
9.4	Banjo bolts.	
9.5	Jack ram.	Fit to release unit.
9.6	Release unit locking bolt.	Screw in and ensure pawl engages cleanly in ram notch.
9.7	Jack ram.	Coat with grease, XG-287.
9.8	Release unit pawl.	
9.9	Jack and pivot block assembly.	Position in beam.
9.10	Pivot block attachment bolt (A).	
9.11	Washers.	Fit.
9.12	Nuts.	
9.13	Split pins.	
9.14	Jack extension end.	(i) Position distance collars each side of extension end. (ii) Position in output levers.

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ITEM No	ITEM	OPERATION
9.	Completion (Contd)	
9.15	Output lever axis pin (B).	Fit.
9.16	Washer.	
9.17	Nut.	
9.18	Split pin.	
9.19	Connecting link.	Position between servo valve and input levers.
9.20	Connecting link attachment bolts (E and F).	Fit.
9.21	Washers.	
9.22	Nuts.	
9.23	Split pins.	
9.24	Release unit locking bolt.	Unscrew until clear of ram notch.
9.25	Jack.	Ensure ram strokes freely through release unit.
9.26	Release unit locking bolt.	(i) Torque load to 60 lbf in. ensuring pawl engages cleanly in ram notch. (ii) Lock with wire.
9.27	External pipe.	(i) Stroke jack in both directions and check pipe is clear of beam by at least 0.06 in.
9.28	Servicing forms.	Sign.

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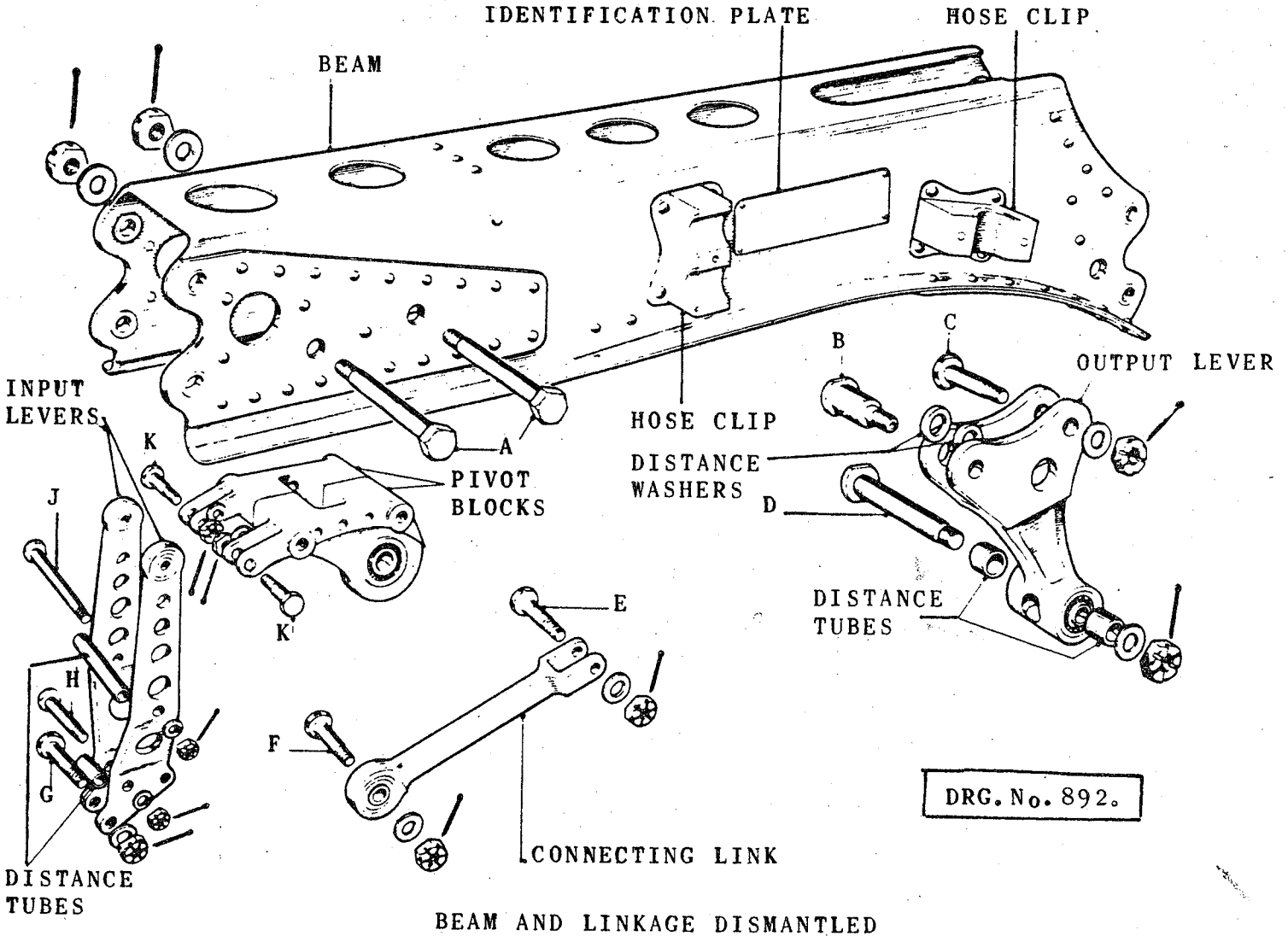

DRG. No. 892.

FIG 1

BEAM AND LINKAGE DISMANTLED

Continued

E0409 (9A)

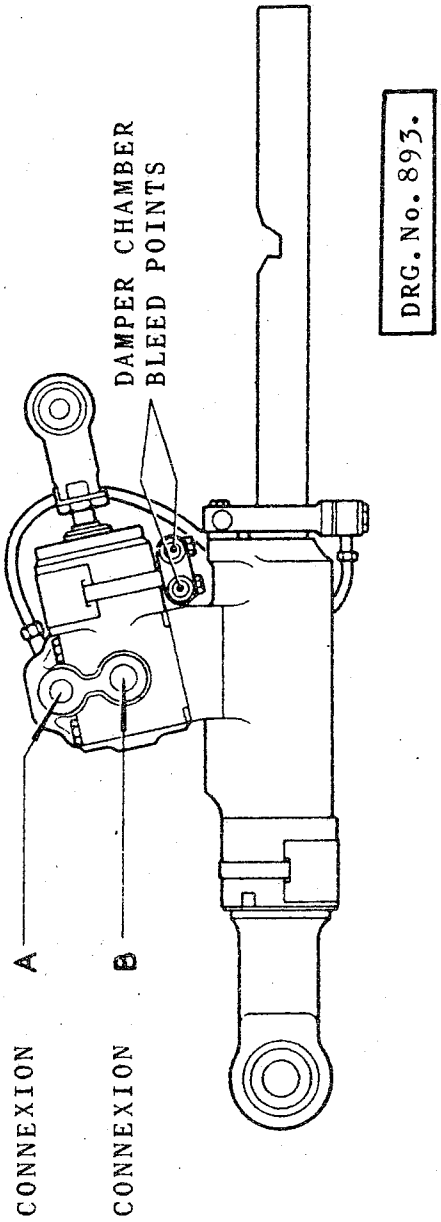

FIG 2 Test Connexions

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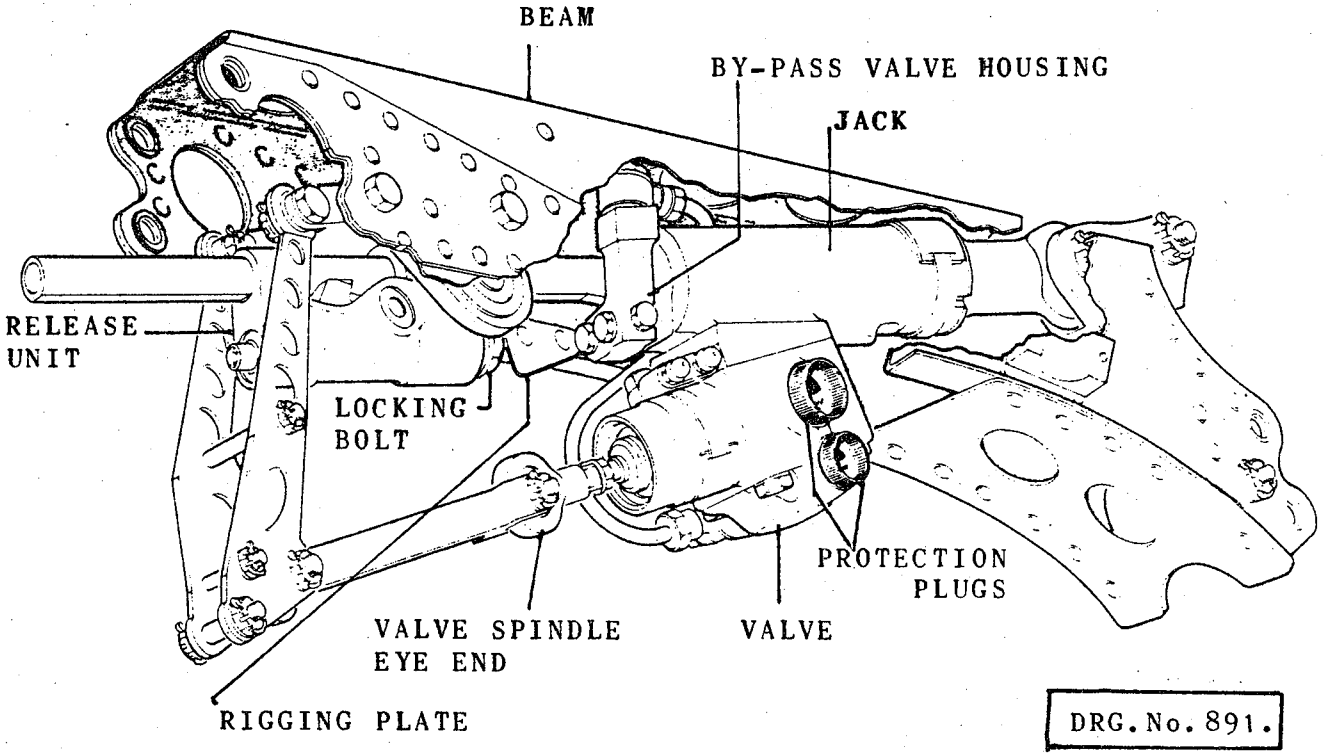

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FIG 3