AP 105B-06183-16
(Formerly AP 105B-0002-1, Sect. 8, Chap. 57, App. 3)
Nov. 79

SELECTOR UNIT DOWTY ROTOL TYPES 07408YB06 and 07408YB07

GENERAL AND TECHNICAL INFORMATION REPAIR AND RECONDITIONING INSTRUCTIONS

BY COMMAND OF THE DEFENCE COUNCIL

Frank Cooper.

Ministry of Defence

Sponsored for use in the
ROYAL NAVY by DGA(N)
ROYAL AIR FORCE by D AIR ENG (RAF)

Prepared by: Dowty Rotol Ltd.,
Cheltenham Road, Gloucester.

Publications authority: ATP/MOD(PE)

Service users should send their comments through the channel prescribed for the purpose in:
Naval Aircraft Maintenance Manual (RN)
AP 100B-01, Order 0504 (RAF)

GENERAL AND TECHNICAL INFORMATION

CONTENTS

Introduction

1 The selector is electrically-operated to direct the flow of fluid to a specific service or, alternatively, to permit fluid from the service to pass to return. The unit has no neutral position, and the main flow of fluid is controlled by a slide valve, which is operated by the fluid pressure, diverted as may be required by two pilot valves each actuated by a solenoid.

2 For ground servicing purposes, a manually-operated button assembly is incorporated in the unit to facilitate movement of the slide valve without recourse to power operation. The unit described and illustrated in this publication is a basic type and variations are covered in the annexes.

Description (figs.1 and 2)

3 The body has fluid ducts and houses a slide valve assembly and two solenoid-operated pilot valve assemblies, and receives the supply and return connections. A connection block, fitted with a sealing ring, is secured in the body by four set-bolts and receives the service connection. The connections are reducing adapters fitted with bonded seals. The solenoids A and B are secured to the body by studs and sleeve nuts, and a terminal block, located between the solenoids, is secured by screws. The drillings in the body are blanked at their outer ends by setscrews fitted with bonded seals.

4 The rectangular slide valve has a central slot and is positioned in the centre portion of the main bore. The slide is supported at the ends by two actuating pistons of different diameters which are fitted with sealing rings, and the sealing ring of the small piston is supported by an anti-extrusion ring. The large piston is located in the end of the main bore adjacent to the solenoid A and the small piston which slides in a sealed sleeve, is positioned at the opposite end. An end plug, fitted with a bonded seal, is screwed into the bore to retain the large piston. The button assembly, which is located at the end of the main bore adjacent to the small piston comprises a button flanged at the inner end and sliding in a housing screwed into the bore against a bonded seal. Outward movement of the button is restricted by a stop inserted in the housing, and the button passes out of the housing through a sealing ring supported by an anti-extrusion ring.

5 A secondary bore from the supply connection boss to the connection block intersects the main bore, and oblique drillings W link the return connection to the ends of the slide valve bore. A spring in the secondary bore holds a filter against a shoulder in the bore to prevent the ingress of dirt, and also loads a thimble, fitted with a sealing ring, against the upper face of the slide valve. The connection block, machined with a slot, is faced to mate with the underside of the slide valve, and movement of the slide valve will allow either supply or return fluid to pass through the valve.

6 The pilot valve assemblies are housed in parallel bores, at right-angles to the main bore; each bore having two annular grooves which individually connect to fluid ducts. The valve assemblies each comprise a centrally-drilled valve seat and a retaining plug which are grooved for sealing rings. The inner end of the retaining plug houses a spring-loaded plunger, and both the plunger and the valve seat are countersunk on their opposing ends to provide alternative seatings for a ball located in the gap between. The gap is connected to fluid ducts through one of the annular grooves.

7 The central drilling of the valve seat receives a spindle, the inner end of which is fluted and contacts the ball. The outer end of the spindle for the pilot valve A is flanged, and passes through a sealing washer and a backing washer, to mate with the plunger of the solenoid. The end of the spindle for pilot valve B is sealed and contacts a flanged stop in the bore of the plug. The plug is screwed into the body, against a guide with shims interposed. The stop contacts the plunger of the solenoid.

8 The two solenoids are located adjacent to the pilot valves and each is secured to the body by two studs and sleeve nuts. A terminal block, fitted between the solenoids and attached to the body by screws, is wired to two plunger blocks; each block is backed by an insulating mat and housed in a slot below the pilot valve. The leads of the terminal block pass to each plunger block through an insulating tube housed in the body and sealed at the ends by rubber plugs.

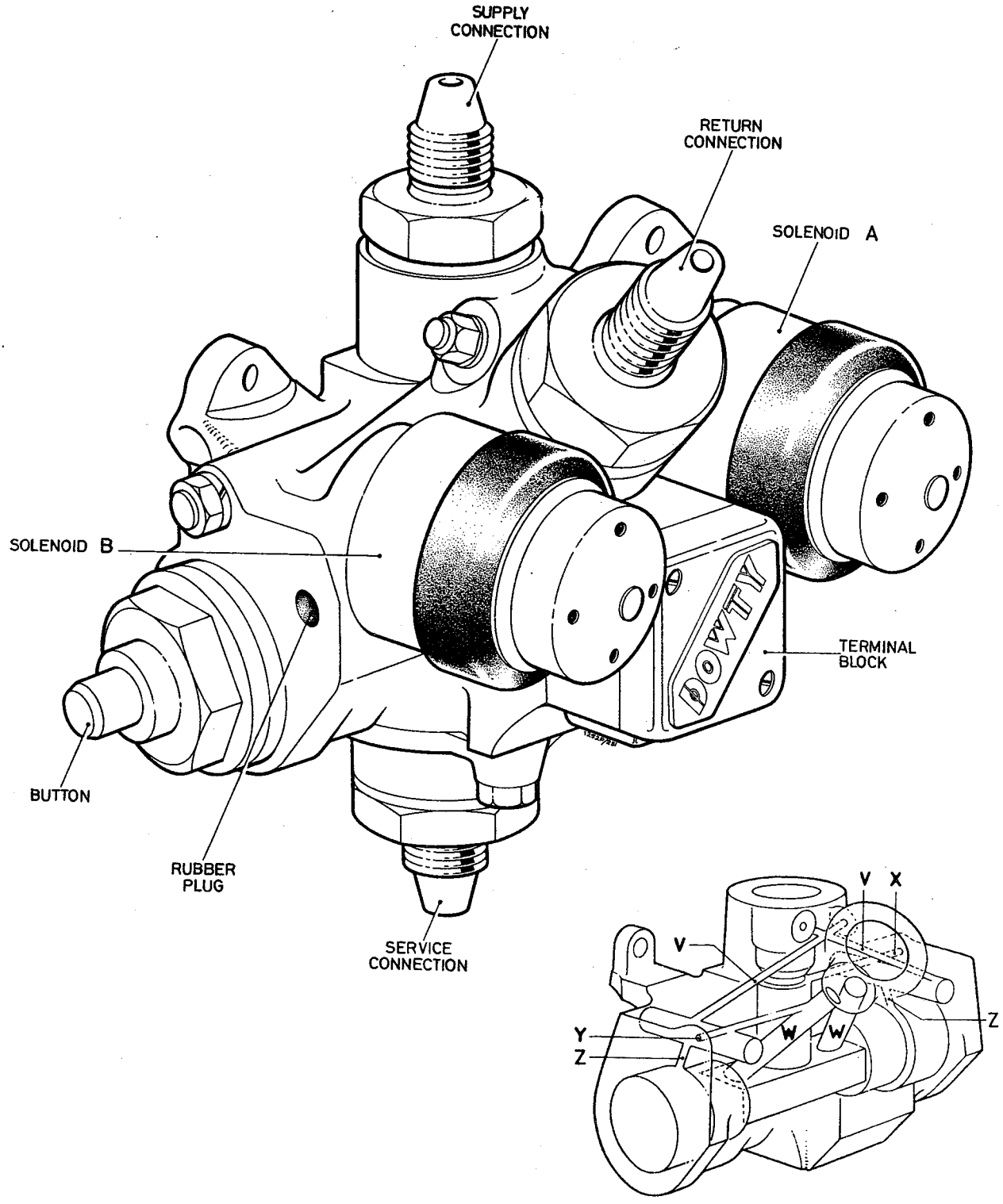


Fig. 1 Selector

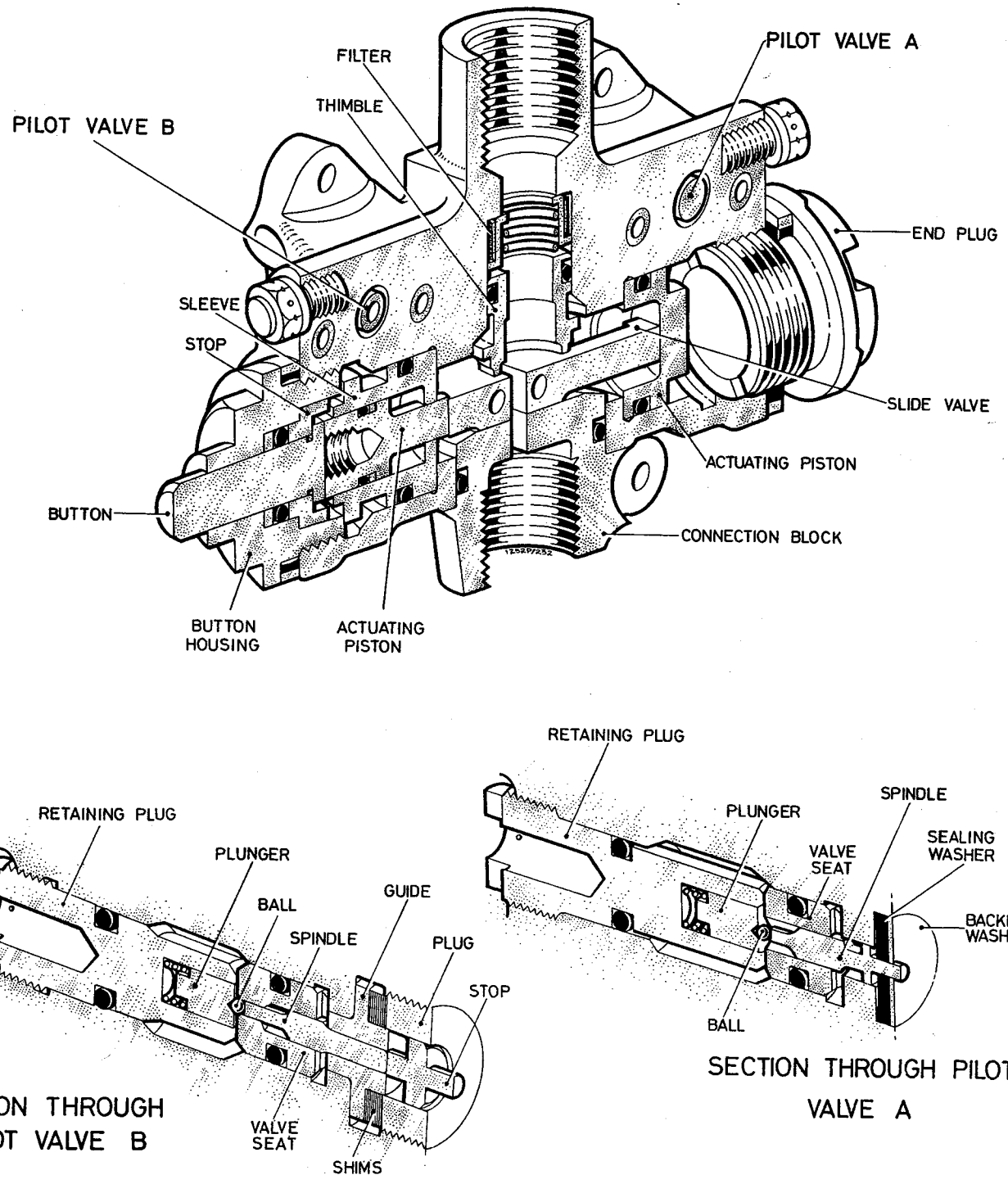


Fig. 2 Selector assembly

9 The plunger block is recessed for a spring through which the relevant lead of the terminal block passes. The spring acts against a ferrule which is attached to the end of the lead to provide a flexible contact and mates with the contact of the solenoid. A protective metal cap is fitted over the rubber shroud of each solenoid to prevent inadvertent manual operation of these units when installed.

Principle of operation (fig.3)

10 When a solenoid is energised, the slide valve will be moved to one end of the main bore and will remain in this position after the solenoid is de-energised and until the other solenoid is energised. Constant pressure is applied to the small actuating piston by supply fluid which passes from the supply connection, through the drilling X, the gap between the valve seat, and the plug and the drilling Z.

11 With the solenoid A energised, its plunger pushes the spindle of the pilot valve to thrust the ball valve from the valve seat against the spring-loaded plunger. This allows fluid at the large actuating piston to flow through the drilling Z, the open valve seat and the drilling Y to the return connection. The pressure applied to the small actuating piston moves the slide valve along the bore to blank off the slot in the valve against the face of the connection block. The flow of supply fluid to the service connection is thus cut off, but return fluid at the service connection passes through the connection block, around the end of the slide valve and through one of the drillings W to the return connection. When the solenoid A is de-energised, the solenoid plunger is withdrawn and the spring-loaded plunger of the pilot valve thrusts the ball valve on to the valve seat. The slide valve is held in the selected position by the pressure on the small actuating piston.

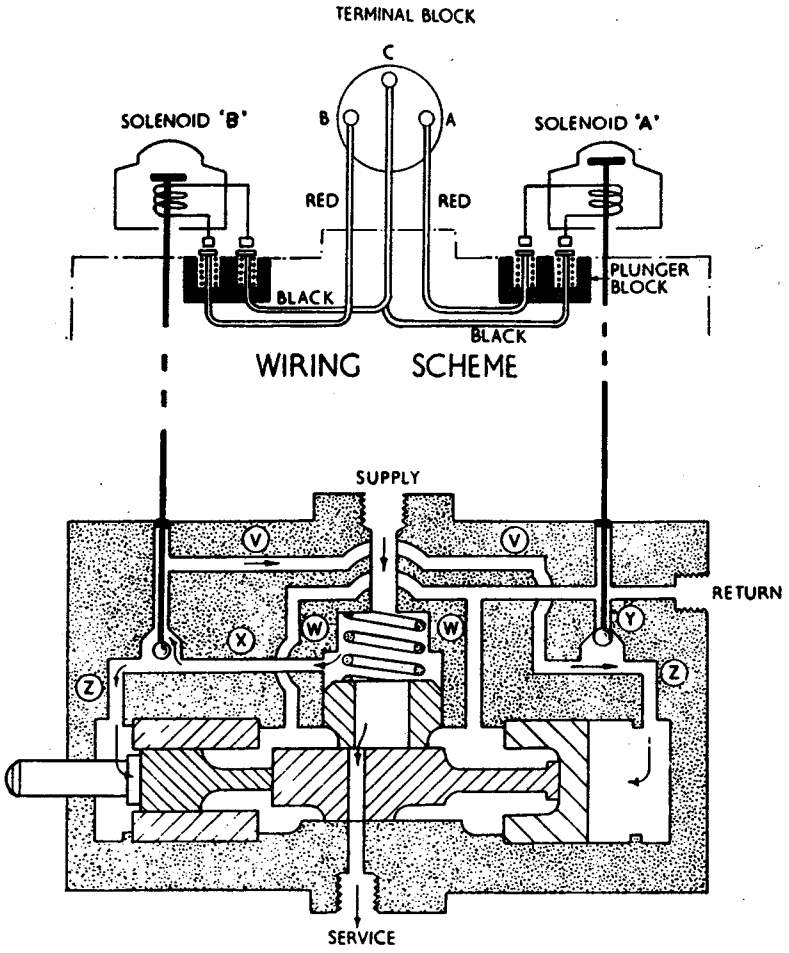
12 When the solenoid B is energised, the movement of the solenoid plunger and the spindle thrusts the ball valve from the valve seat. Pressurised fluid flows from the supply connection through the drilling X to the small actuating piston and also through the open valve seat, and the drilling V, the gap between the valve seat and the retaining plug of the pilot valve A, and the drilling Z to the large actuating piston. The greater effective pressure on the large piston moves the slide valve to align its slot with the slot of the connection block, and supply fluid can now flow through the slide valve and the connection block to the service connection. Meanwhile, fluid displaced by the movement of the small piston will now flow through the drilling Z, along the drilling V and through the open valve seat to the main bore behind the larger piston. When the solenoid B is de-energised, the solenoid plunger is withdrawn and the relevant ball valve is seated by the spring-loaded valve plunger. Fluid is trapped at the large actuating piston, and the slide valve is locked in the selected position until a reverse selection is made, by energising the solenoid A.

13 For ground servicing with the accumulator discharged, the unit may be operated without the necessity of running the aircraft engine, by carrying out the following procedure. Energise the solenoid A and depress the button to impart initial movement to the slide valve, then operate the hand pump of the ground test rig to complete the movement.

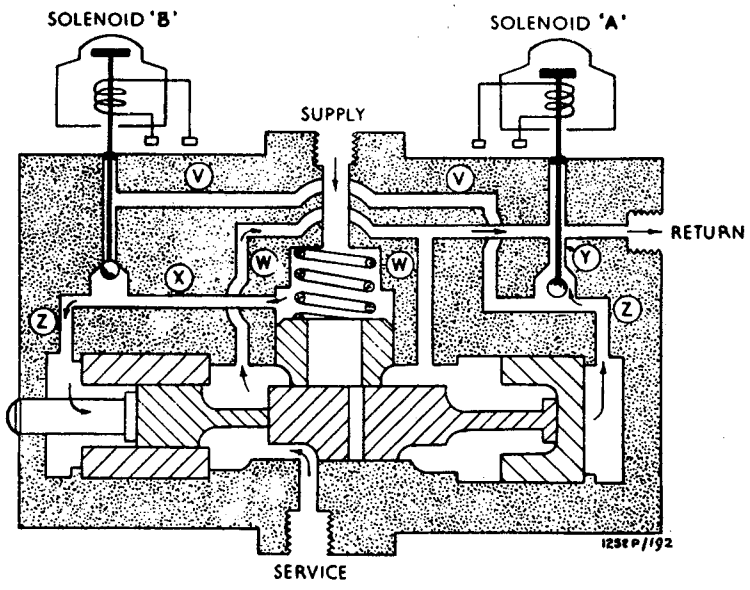
SERVICING

Leakage

14 External seepage may indicate a faulty seal which must be renewed. Internal leakage will result in loss of pressure in the supply line or sluggish action of the valve. The valve must be tested to ascertain the faulty seal which



SOLENOID 'B' ENERGISED



SOLENOID 'A' ENERGISED.

Fig. 3 Principle of operation

must be renewed. Leakage past the slide valve or the pilot valves may be due to scoring or particles of dirt between the mating faces, or a worn or damaged pilot valve plunger spring. The filter should also be examined for damage, and renewed if necessary.

TABLE 1 SPECIAL TOOLS

Ref. No.	Part No.	Description
27Q/13602	ST.1952	Assembly post for seal of pilot valve return seat.
27Q/13603	ST.1964	Assembly post for seal of actuating piston.
27Q/13600	ST.1966	Spring compressor for assembling slide valve.
27Q/13604	ST.2016	Assembly post for seal of pilot valve retaining plug.
27Q/16550	ST.2757	Adapter for use with tension wrench-piston end plug.

Dismantling

15

15.1 Remove the solenoid sleeve nuts and withdraw the solenoids from the body. The solenoids should not be further dismantled.

15.2 Remove the supply, return and service connections together with the bonded seals.

15.3 Remove the set-bolts and the connection block from the body, and remove the sealing ring from the block.

15.4 Remove the piston end plug together with the bonded seal, and withdraw the large actuating piston from the body. Remove the sealing ring from the piston.

15.5 Unscrew the button housing and withdraw the button, the stop, the sealing ring and the anti-extrusion ring from the housing. Remove the bonded seal from the button housing.

15.6 Withdraw the small actuating piston and the sleeve from the body, and remove the sealing rings and the anti-extrusion ring.

15.7 Withdraw the slide valve.

15.8 Withdraw the thimble, the spring and the filter, and remove the sealing ring from the thimble.

15.9 Remove the backing washer, the sealing washer and the flanged spindle of the pilot valve assembly A.

15.10 Remove peening from plug and unscrew and remove plug. Withdraw stop, shims, guide, sealing ring and spindle.

15.11 Remove the retaining plugs together with the springs and plungers, the balls and the valve seats of the pilot valve assemblies. Extract the plungers and the springs from the plugs.

Note ...

Do not disturb the plunger blocks, the terminal block, the rubber plugs and the blanking setscrews unnecessarily.

Cleaning

16

WARNING ...

CLEANING AGENT SHOULD BE USED IN A WELL VENTED AREA, AWAY FROM NAKED FLAMES. CARE SHOULD BE TAKEN NOT TO BREATH THE FUMES OR ALLOW UNDUE CONTACT WITH THE SKIN.

CAUTION ...

Chlorinated solvents can combine with minute amounts of water found in operating hydraulic systems to form hydrochloric acid which will corrode internal metallic surfaces. It is imperative that all internal surfaces are dry and free from any traces of residual solvent prior to assembly and installation. For those applications where it is difficult to remove all traces of solvent, clean unused white spirit is recommended.

To enable all items to be visually inspected for damage and wear, each part must be thoroughly cleaned using the appropriate approved cleaning agents and methods. When cleaning is completed, parts must be dried using compressed air, clean lint-free cloth or tissues and all subsequent handling must be with clean PVC or polythene gloves. If delays occur before assembly, parts must be suitably protected against corrosion.

Assembling

17 All sealing rings are to be lightly coated with grease XG-315 before being assembled in the unit. Leather backing rings are to be smeared with grease XG-285 and fitted with their rough side adjacent to the sealing ring.

17.1 Fit the sealing ring to the valve seat and the retaining plug of pilot valve A and insert the valve seat followed by a ball into the pilot valve bore. Insert the spring and the plunger into the retaining plug and screw in the plug to retain the ball and valve seat.

17.2 Locate the flanged spindle to the pilot valve assembly for the solenoid A and fit the sealing washer and the backing washer over the end of the spindle.

Note ...

Pilot valve B details will be assembled at a later stage.

17.3 Fit the sealing ring to the thimble and insert the filter, the spring and the thimble into the body.

17.4

17.4.1 Hold the thimble in place through the connection block aperture.

17.4.2 Position the special tool ST.1966 through the supply connection tapping and allow the prongs of the centre piece to engage with the shoulders of the thimble.

17.4.3 Push the pin into the centre piece to ensure that the prongs are held in contact with the shoulder.

17.4.4 Turn the nut to draw the thimble against the spring, to allow for the insertion of the slide valve.

17.4.5 Locate the slide valve centrally under the thimble with the stemmed end adjacent to the solenoid A.

17.4.6 Withdraw the pin to its fullest extent and remove the complete tool assembly by giving it a sharp pull.

17.5 Fit the sealing ring to the connection block and secure the block in the body with the four set-bolts.

17.6 Fit the sealing rings to the actuating pistons and the sleeve; an anti-extrusion ring must also be fitted to the small actuating piston. If a new anti-extrusion ring is fitted, the 'feeder' on the side of the ring is to be cut off flush with the surface, and the ring diagonally cut through to facilitate assembly to the piston. The ring is then to be assembled with the flush surface nearest to the centre line of the unit when the piston is assembled.

17.7 Locate the large actuating piston to the stemmed end of the slide valve, fit a bonded seal to the piston end plug and screw the plug into the body to retain the piston.

17.8 Position the small actuating piston in the sleeve and locate the assembly to the other end of the slide valve.

17.9 Assemble the details of the button assembly by inserting the anti-extrusion ring into the button housing, followed by the sealing ring.

17.10 Insert the stop into the button housing and follow with the button, pushing the button through the housing until the flanged end abuts the stop. Locate the assembly to the end of the body adjacent to pilot valve B and screw in the housing fitted with a bonded seal.

17.11 Tighten the piston end plug and button housing, applying a torque load of 50 to 55 lbf.ft.

17.12 Fit bonded seals to the supply, return and service connection adapters and screw them into their respective bosses. Before attaching the solenoids:-

17.12.1 Ensure that the mating faces of the solenoids and the body are clean.

17.12.2 Check for true engagement between the solenoids and the selector body, in order that correct transfer of heat is made from the solenoids to the body.

17.12.3 Refer to fig.5 and coat each solenoid mounting face with grease MS-4.

17.12.4 Check by electrical test that the leads between the plug and the plunger block have been wired correctly.

Note ...

Solenoid A is painted yellow to identify it from solenoid B and it is important that it is assembled to pilot valve A as in fig.1. If a new solenoid A is fitted it is to be completely painted with one coat of yellow glossy synthetic enamel DTD.827 or BSS.381 after attachment to the selector body.

17.13 Position solenoid A so that the contacts will meet those in the plunger block and insert the solenoid studs in the body. Screw in the sleeve nuts from the opposite side to secure the solenoids tightly against the body.

17.14 Fit the sealing ring to the valve seat and insert the seat into the bore of pilot valve B, followed by the ball.

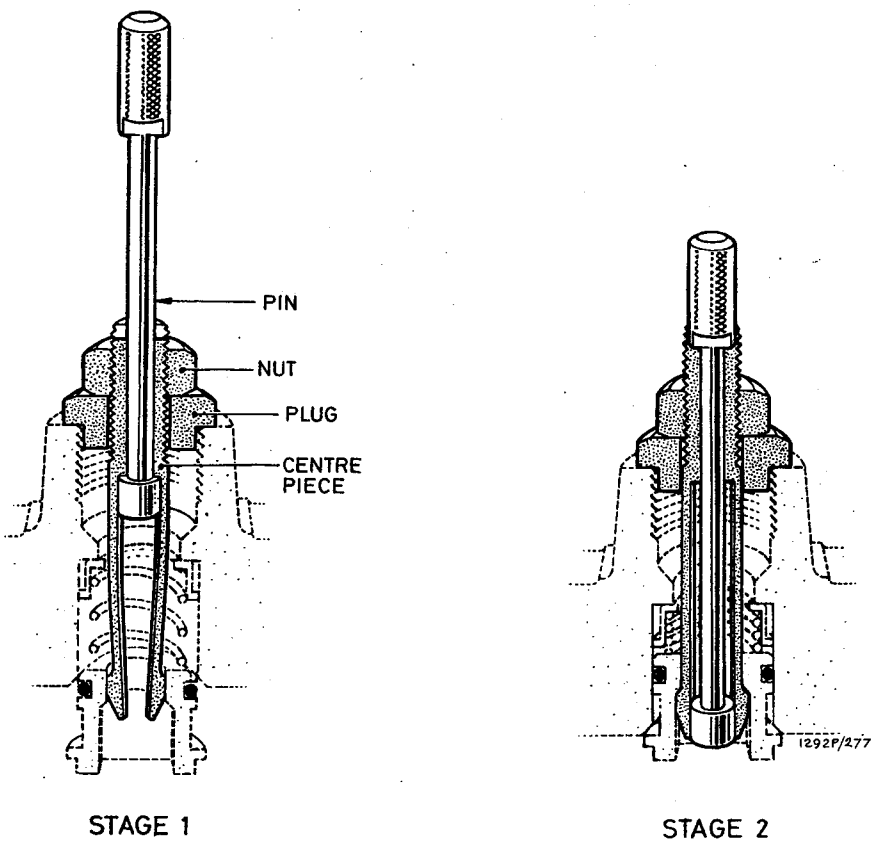


Fig. 4 Use of special tool ST.1966

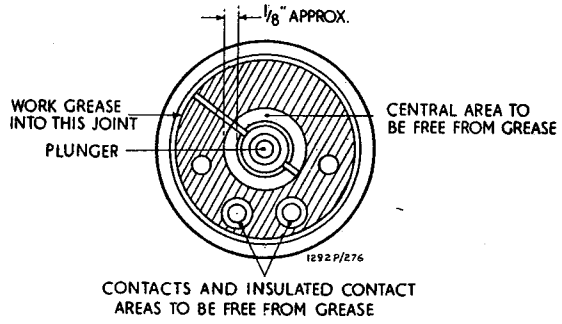


Fig. 5 Solenoid greasing details

17.15 Insert the spring, followed by the plunger, into the retaining plug.

17.16 Fit the sealing ring to the retaining plug and screw the plug into the selector body to retain the ball valve and seat.

17.17 Fit the sealing ring to the spindle and insert the spindle through the valve seat to oppose the ball valve, ensuring that the sealing ring is correctly housed in the body.

17.18 Locate the shims over the larger spigot of the guide. The number of shims initially fitted should be sufficient to permit end float on the stop; but it should not be necessary to fit shims of a total thickness exceeding 0·060 in.

17.19 Insert the guide, smaller spigoted end leading, into the body and over the spindle until the flange abuts the shoulders therein.

17.20 Pack the inside of the plug with grease XG-275. Insert the stop, chamfered face leading, into the plug and screw the plug into the body. Do not lock the plug at this stage.

17.21 At this stage of assembly, connect a hand pump supply line to the supply connection of the selector and blank off the service connection. Connect a 16 volt d.c. electrical supply to the terminal block and energise solenoid A.

17.22 Operate the hand pump, applying a pressure of 4000 lbf/in^2 at the supply connection to hold the ball valve of the pilot valve assembly B on its seat. Maintain this pressure. Connect the supply line of a separate hand pump to the return connection. Maintaining the pressure at the supply connection, apply and maintain a pressure of between 350 and 450 lbf/in^2 at the return connection.

17.23 Measure the protrusion of the stop from the end face of the selector body and note this dimension. Depress the stop and again measure its protrusion from the end face of the body. Record the difference in the two readings and deduct 0·003 in. from the result to obtain the end float, which must be within the limits of 0·003 to 0·007 in.

Note ...

To avoid lifting the ball valve off its seat, it is important that a load of 6 lbf. is not exceeded when depressing the stop.

17.24 Release the pressure, first at the return connection and then at the supply connection. Unscrew the plug and remove shims equal in thickness to the figure obtained in 17.23 less 0·003 in.

17.25 Replace the plug and repeat operations 17.22 and 17.23, checking that the end float is within the required limits, then release the pressures in the sequence stated in sub-para. 17.24.

17.26 Disconnect the supply lines and remove the blanking plug from the service connection. Punch the adjacent metal of the body into the screwdriver slots of the plug in two places to lock.

17.27 Assemble the solenoid B to the selector in accordance with the instructions as detailed in para. 17 sub-para. 17.14 and 17.15 and wirelock the solenoid sleeve nuts.

Testing

18 A static hydraulic test rig, a separate hand pump and an electrical test circuit with a 24 to 28 volt d.c. supply and 16 volt tappings are required. The electrical tests will necessitate a 500 volt d.c. insulation resistance testing set. A blanking adapter is also needed and, to assist testing, should incorporate a bleeder plug to release the pressure as instructed. The separate hand pump should incorporate a pressure gauge and a stop cock in the supply line.

19 For testing Type No. 07408YB07, an additional blanking adapter is required to blank off one pipe adapter of the return connection.

20 In the event of internal leakage occurring during the subsequent tests, the operating condition of the selector is to be noted (i.e. solenoid energised or de-energised) and the calibration test detailed in para.25 carried out under the same operating condition.

Electrical test

21 This test must be carried out before and after the subsequent tests. Connect the 500 volt d.c. insulation resistance testing set across one connection terminal and the selector body. The insulation resistance should not be less than 20 megohms.

Adjustments and pressure tests

22

22.1 Connect the supply line of the static hydraulic test rig to the supply connection, blank off the service connection and close the bleeder plug of the blanking adapter. Remove the rubber shrouds from the solenoids, and connect the test circuit to the terminal block. The power at the solenoids is to be 16 volts d.c. for these tests.

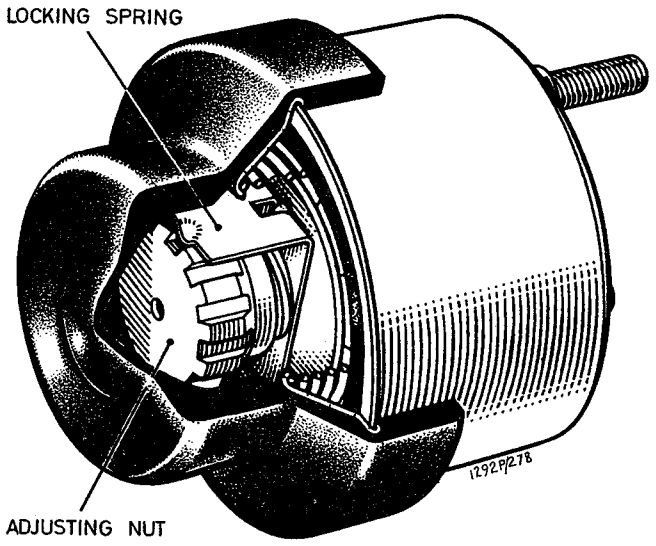


Fig. 6 Location of solenoid adjusting nut

22.2 Energise both solenoids and slacken the pilot valve adjusting nuts (ref. fig.6). Apply a pressure of between 1000 and 2000 lbf/in^2. and screw down the adjusting nut of solenoid B until the ball valve of the pilot valve assembly is lifted from its seat; indicated by a drop in pressure. Raise the pressure again to between 1000 and 2000 lbf/in^2 and screw down the adjusting nut of solenoid A until the ball valve of the pilot valve assembly is lifted from its seat. This will be indicated by a release of pressure from the return connection.

Note ...

Indication of pilot valve opening will be facilitated by keeping the volume of fluid under pressure to a minimum, by the use of a short length of small diameter pipe for the test rig supply line. Also, screwing down the adjusting nut a further two 'clicks' of the locking spring beyond the pilot valve 'cracking' point, will ensure that the ball has fully left the seat.

22.3 With both solenoids energised, unscrew the solenoid A adjusting nut sufficiently to permit a pressure of 2000 lbf/in^2 to be applied at the supply connection. Screw down the adjusting nut of solenoid A until the ball valve of the pilot valve is lifted from its seat. This will be indicated by the release of pressure from the return connection. Ensure that the locking spring is engaged in a serration of the adjusting nut and then screw the nut down a further ten 'clicks' of the spring.

Note ...

For operations 22.3 and 22.4, it is important that the respective solenoid adjusting nuts are screwed down just sufficiently to cause a drop in pressure before screwing them down the requisite number of 'clicks' of the locking spring.

22.4 With both solenoids energised, unscrew the solenoid B adjusting nut sufficiently to permit a pressure of 2000 lbf/in^2 to be applied at the supply connection. Screw down the adjusting nut of solenoid B until the ball valve of the pilot valve is lifted from its seat. This will be indicated by a release of pressure from the return connection. Ensure that the locking spring is engaged in a serration of the adjusting nut, and then screw the nut down a further seven 'clicks' of the spring.

Note ...

The tests in 22.5 and 22.6 are to be carried out at a voltage of between 21 and 23 volts d.c.

22.5 Apply a pressure of 3500 lbf/in^2 and energise solenoid A. Then energise solenoid B, when the slide valve should operate to select supply to service; indicated by a drop in pressure and a flow of fluid from the return connection. De-energise solenoid A. Apply and maintain a pressure of 3500 lbf/in^2 at the supply connection.

22.6 De-energise solenoid B and then re-energise immediately. The pilot valve must operate. Check this operation by ascertaining that the air gap between the core and armature of solenoid B when energised, is zero. To make this check, rotate the solenoid adjusting nut by hand when frictional resistance will be felt, thus indicating a zero air gap. De-energise solenoid B and release the pressure.

22.7 Reduce the voltage to 16 volts d.c. Apply a pressure of 5200 lbf/in^2 and energise solenoid A. Energise solenoid B and the pressure should be released through the return connection. De-energise solenoid A and apply a pressure of 5200 lbf/in^2. Energise solenoid A and the pressure should be released through the return connection. De-energise the solenoid B and apply a pressure of 500 lbf/in^2 to ensure that the slide is in the fully 'off' position. Release the pressure.

22.8 With the solenoid A energised, open the bleeder plug at the service connection. Slowly apply a pressure of 300 lbf/in^2 and then gradually increase it to 4500 lbf/in^2. Leakage is not permissible. Release the pressure and de-energise solenoid A.

22.9 Close the bleeder plug at the service connection, energise the solenoid B and apply a pressure of 200 lbf/in^2. Open the bleeder plug and the pressure should be released from the service connection. Close the bleeder plug and slowly apply a pressure of 300 lbf/in^2, gradually increasing it to 5200 lbf/in^2. Leakage from the return connection is not permissible. De-energise solenoid B and ensure that the pressure is maintained. Leakage from the return connection is not permissible. Release the pressure.

Note ...

For test 22.9, it is important that the pressure does not exceed 5200 lbf/in^2 with solenoid B energised.

22.10 Energise solenoid A and apply a pressure of 200 lbf/in^2. Open the bleeder plug and there should be no flow of fluid from the service connection. Increase the pressure to between 1850 and 2000 lbf/in^2 and maintain this pressure. Connect the supply line of the separate hand pump to the return connection. Operate the pump and fluid should flow freely from the service connection. Close the bleeder plug at the service connection and slowly raise the pressure at the return connection to 100 lbf/in^2, then increase it gradually to 750 lbf/in^2. Leakage is not permissible. Release the pressure, first at the return connection and then at the supply connection. De-energise solenoid A, disconnect the supply lines and remove the blanking adapter from the service connection.

Power rig test

23 The power rig should incorporate a pump with a minimum delivery of two gal/min. at a pressure of 3700 lbf/in^2. The peak pressure of the pump should be within the range of 4000 to 4300 lbf/in^2 and the fluid temperature must not exceed 45 deg. C. The electrical supply to the solenoids is to be 24 to 28 volts d.c., and for this test, electro-magnetic counters will be required.

23.1 Connect the selector to the power rig with the service connection connected to the anchored end of any convenient slave jack. Connect the supply line of the power rig to the piston rod end of the jack.

23.2 Operate the selector for 500 jack cycles. One jack cycle is the extending and closing of the jack with the pump building up to the peak pressure at the end of each stroke.

Note ...

The jack cycles and solenoid operations are to be recorded on the separate electro-magnetic counters and the recordings compared on completion of the test in 23.2 to ascertain whether any malfunctioning of the pilot valves has occurred.

23.3 On conclusion of the 500 jack cycles, and whilst the pump is still running, apply the following check for satisfactory functioning of the pilot valves.

23.4 Energise solenoid B to extend the jack, allow the pump to build up to peak pressure and then de-energise solenoid B. Permit the pump to run for a minimum period of three minutes, during which time there must be no reversal of selection. Disconnect the line from the return connection. Leakage is not permissible. Reconnect the line to the return connection.

23.5 Energise solenoid A to close the jack, allow the pump to build up to peak pressure and then de-energise solenoid A. Permit the pump to run for a minimum period of three minutes during which time there must be no reversal of selection. Energise solenoid A and disconnect the line from the return connection. Leakage is not permissible. De-energise solenoid A.

23.6 Before removing the selector from the power rig, reduce the voltage to 16 volts d.c. and check for satisfactory operation.

Static rig checks

24

24.1 Connect the supply line of the static test rig to the supply connection and re-check the setting and adjustment of the pilot valves as detailed in para.22.3 and 22.4. Readjust if necessary.

24.2 Repeat the tests as detailed in para. 22.5 to 22.10.

24.3 Energise solenoid A, apply a pressure of 20 lbf/in^2 and depress the button at the end of the selector body. The button should be depressed as far as possible.

24.4 With solenoid A energised, open the bleeder plug at the service connection and slowly apply a pressure of 300 lbf/in^2, increasing it gradually to 4500 lbf/in^2. Leakage is not permissible. Release the pressure and de-energise the solenoid.

24.5 After final tests, re-tighten the piston end plug and button housing, applying a torque load of 50 to 55 lbf.ft.

Internal leakage calibration

25

25.1 With the test rig supply line connected to the supply connection and the service connection blanked off, connect a short length of pipe to the return connection.

25.2 Apply and maintain a pressure of 300 to 500 lbf/in^2 and operate the unit to place the slide in the position at which leakage has occurred. When leakage from the return connection has ceased or fallen below a rate of 0·55 c.c. per minute, increase the pressure to 1000 lbf/in^2 and measure the rate of leakage from the return connection at this pressure. This must not exceed 1·30 c.c. per minute. Increase the pressure to 4000 lbf/in^2 and then to 4500 lbf/in^2. Measure the rate of leakage at each pressure stage, the same leakage rate will apply.

25.3 Release the pressure and remove the pipe from the return connection.

25.4 After final assembly and test, the connections, the blanking setscrews, the piston end plug, the button housing, the sleeve nuts and the connection block set-bolts must be wirelocked.

Annex A

Selector Type 07408YB06

Description

1 This unit is identical to the type described and illustrated in the general text.

Annex B

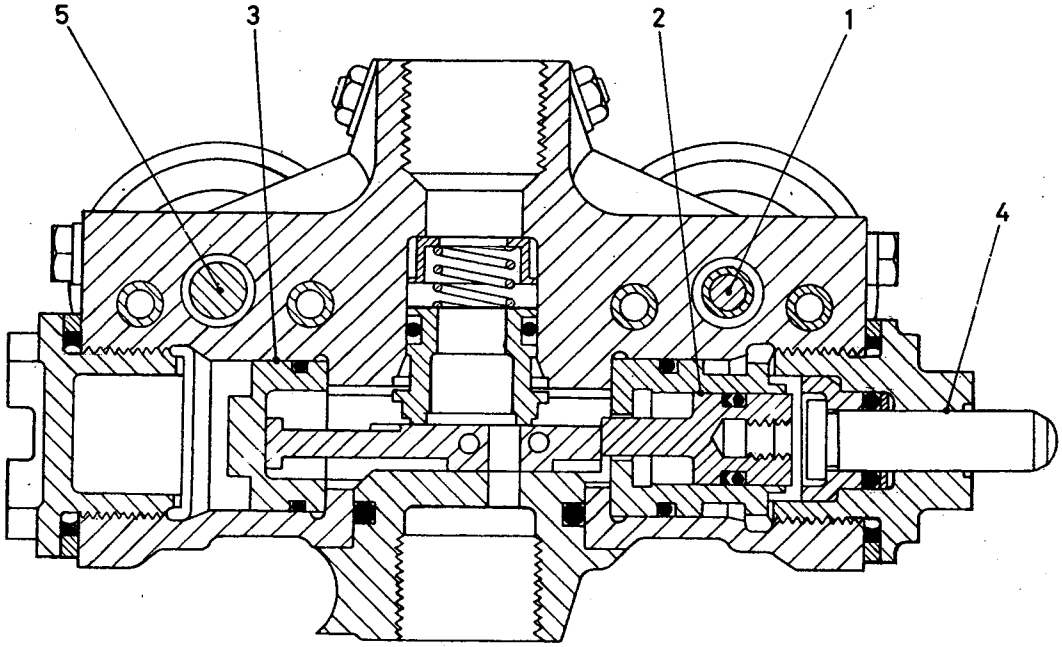
Selector Type 07408YB07

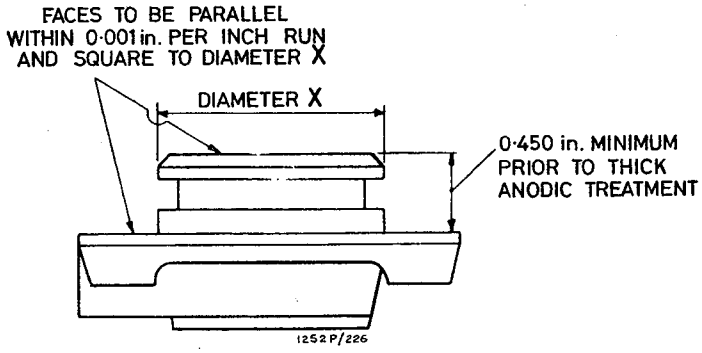
Description

1 This unit is similar to the type described and illustrated in the general text but differs in that the return connection consists of a banjo union secured between bonded seals by a banjo adapter bolt screwed into an adapter in the body.

REPAIR AND RECONDITIONING INSTRUCTIONS

CONTENTS



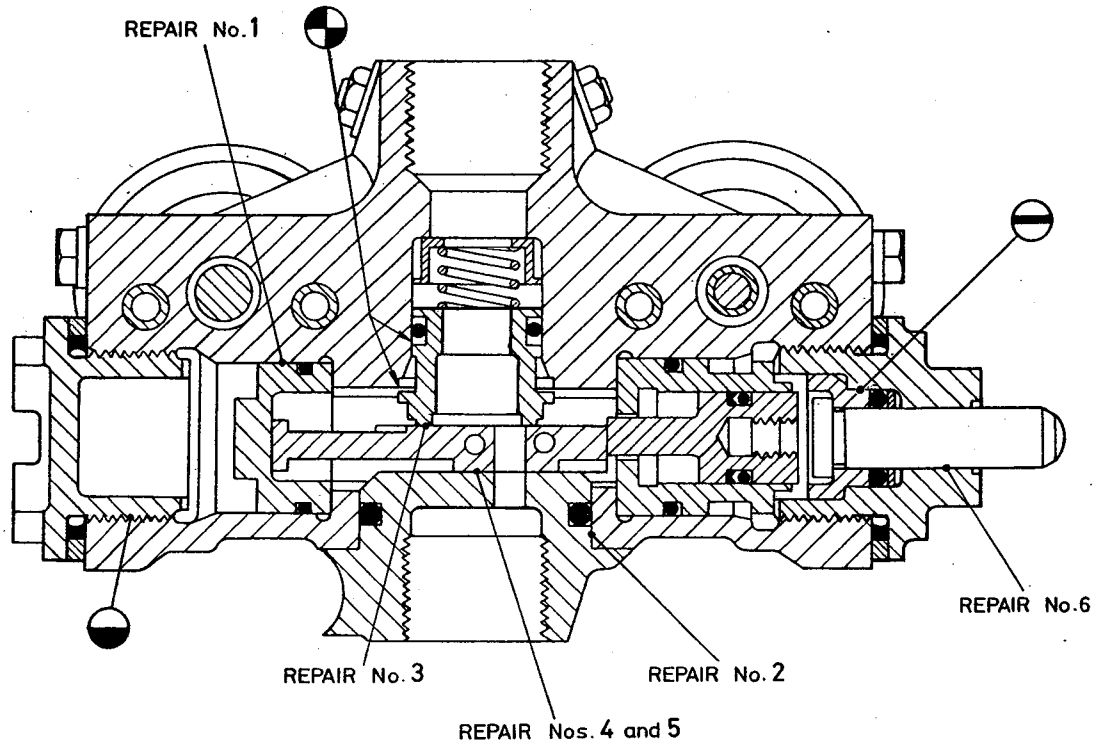


CONNECTION BLOCK

Fig. 1 Fits and clearances - locations

FITS, CLEARANCES AND REPAIR TOLERANCES

Ref. No. on Fig. 1	Parts and Description		Dimension New	Permissible Worn Dimension		Permissible Clearance	
				Interchangeable Assembly	Selective Assembly	New	Worn
1	Pilot valve seat	i/d	0·09425 / 0·09325	0·09500	0·09575	0·00225 / 0·00525	0·00700
	Pilot valve spindle	o/d	0·09100 / 0·08900	0·08800	0·08725		
2	Sleeve	i/d	0·50050 / 0·49950	0·50100	0·50150	0·00050 / 0·00250	0·00350
	Piston	o/d	0·49900 / 0·49800	0·49750	0·49700		
3	Valve body	i/d	0·87575 / 0·87450	0·87630	0·87670	0·00075 / 0·00350	0·00450
	Centralising piston	o/d	0·87375 / 0·87225	0·87180	0·87130		
4	Button housing	i/d	0·37550 / 0·37450	0·37650	0·37650	0·00050 / 0·00250	0·00350
	Button	o/d	0·37400 / 0·37300	-	-		
5	Pilot valve seat	i/d	0·09425 / 0·09325	0·09500	0·09575	0·00050 / 0·00250	0·00400
	Pilot valve spindle	o/d	0·09275 / 0·09175	0·09100	0·09025		



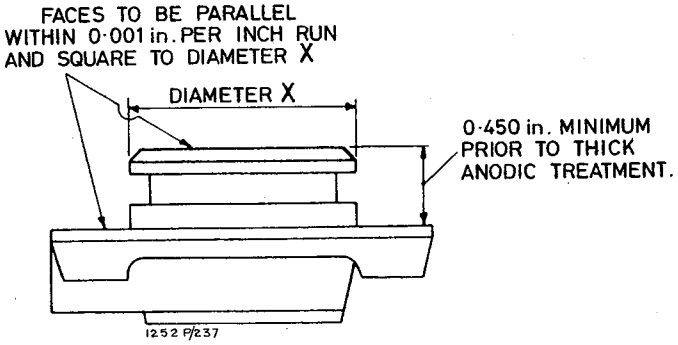


Fig. 2 Repair - locations

REPAIR

General

When carrying out repairs, certain references are made to PS (eg. PS405-3). In these cases, reference must be made to Dowty Rotol Specification Manual, Publication 872.

REPAIR No.1

Repair to valve body (fig.2)

Repair procedure

Scores in the bore are to be polished out providing the permissible worn dimension is not exceeded, and a smooth finish free from tool marks is achieved. Concentricity of this diameter with thread marked ◒ to be 0·002 in. T.I.R. Mark repair number R340 diagram 5A adjacent existing part no. to PS405-3.

REPAIR No.2

Repair to valve body (fig.2)

Repair procedure

Minor scores or abrasions in the bore, not deeper than 0·004 in. are to be polished out locally to blend with existing bore provided that the total area affected does not exceed 2 in. of the circumference. A smooth finish free from tool marks must be achieved. Concentricity of this diameter with diameters marked ◒ to be 0·001 in. T.I.R. Mark repair number R340 diagram 5A1 adjacent existing part no. to PS405-3.

REPAIR No.3

Repair to slide and thimble (fig.2)

Repair procedure

Superficial scores on mating surfaces are to be remedied by lightly lapping. Mark repair number R340 diagram 5B adjacent existing part no. to PS405-3.

REPAIR No.4

Repair to connection block (fig.2)

Repair procedure

Superficial scores on the bearing surface are to be remedied by lightly lapping out ensuring the thick anodic surface is not penetrated. Mark repair no. R340 diagram 5B1(a) adjacent existing part no. to PS405-3.

REPAIR No.5

Repair to connection block (fig.2)

Repair procedure

1 Scores which have penetrated the thick anodic surface are to be remedied as follows:-

(1) Grind back metal, removing 0·004 in. within the dimension quoted on fig. 2.

(2) A flat surface with a finish of 4 micro inches C.L.A. max. must be achieved.

(3) Hard anodise and finally lap in accordance with PS104, achieving a final surface finish of 4 micro inches C.L.A. max.

2 Mark repair number R340 diagram 5B1(b) adjacent existing part no. to PS405-3.

REPAIR No.6

Repair to button housing (fig.2)

Repair procedure

Scores in the bore are to be remedied by polishing out providing that the permissible worn dimension is not exceeded and that a final surface finish of 8 micro-inches C.L.A. max. is achieved. Concentricity of this diameter with diameter marked ⊖ to be within 0·002 in. T.I.R. Mark repair number R340 diagram 5C adjacent existing part no. to PS405-3.

Annex A

Selector Type 07408YB06

Description

1 The Repair and Reconditioning Instructions for this unit are identical to those covered in the general text.

Annex B

Selector Type 07408YB07

Description

1 The Repair and Reconditioning Instructions for this unit are identical to those covered in the general text.