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THROTTLING VALVE
DOWTY AEROSPACE HYDRAULICS
Part No D7523Y

GENERAL AND TECHNICAL INFORMATION (-1)
PARTS CATALOGUE AND RELATED INFORMATION (-3)

BY COMMAND OF THE DEFENCE COUNCIL

Ministry of Defence

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GENERAL

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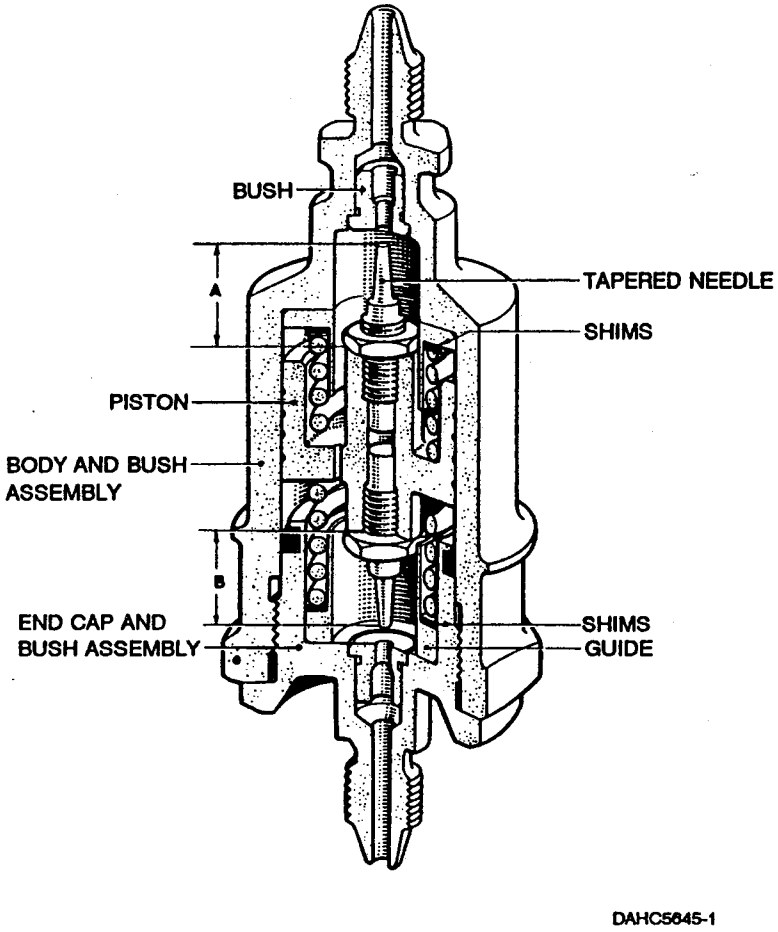

Fig 1 Throttling valve

Leading particulars

1 Leading particulars for the unit are as follows:

1.1	System fluid	Oil OM15 (DTD585)
1.2	Connections	0.25 in BSP

Modification state

2 The information in this publication includes all appropriate modifications up to and including issue 9.

Introduction

3 The throttling valve maintains the flow of fluid to and from a service at a constant rate. The regulation of the flow ensures a smooth movement of the service operated, regardless of sharp increases in the supply and return fluid pressures.

Constructional description (Fig 1)

4 The body and bush assembly and an end cap and bush assembly fitted with an O-ring, each embody a pipe connection and are screwed together to house a piston and tapered needles. There are four fluid ports in the piston which carries the two tapered needles, one on each side. Normally, the assembly is spring-loaded in a central position, away from the orifices of two bushes which are pressed into the body and bush assembly and the end cap and bush assembly.

Functional description (Fig 1)

5 Fluid flows through the piston ports, but an increase in the pressure or an increase in the flow to the throttling valve, which would increase the pressure on one side of the piston, moves the piston in the direction of flow. The leading tapered needle approaches and enters the bush, its travel depending upon the pressure applied to the piston, and restricts the flow out of the valve. The governing factor is the ratio between the piston ports and the varying restriction at the tapered needle and bush.

6 The setting can be varied by screwing the tapered needles in or out of the piston and by fitting or removing shims between the springs and the guides.

MAINTENANCE

Special tools and equipment

7 The following special tools, equipment and materials are required to carry out the maintenance procedures detailed.

Part No	Description	Application
-	Trichloroethane (TS367D)	Cleaning
-	White spirit (BS245)	Cleaning
-	Oil OM15 (DTD585)	Assembling
-	Corrosion preventative PX1	Preservation
-	Locking wire (DTD189A)	Locking parts

Safety and maintenance notes

8 Safety and maintenance notes or other general safety/maintenance requirements appropriate to the equipment, or to the main equipment, must be complied with where relevant throughout the work detailed in this publication.

BAY MAINTENANCE

Dismantling (Fig 1)

WARNING

SPECIFIC INTERNAL DETAILS OF THIS UNIT ARE SUBJECT TO SPRING PRESSURE AND CARE MUST BE EXERCISED WHEN DISMANTLING.

9 Unscrew the end cap and bush assembly from the body and bush assembly. Withdraw the piston assembly, the springs, the guides and the shims. Note the number and thickness of the shims fitted to each guide to facilitate correct assembly.

NOTE

Do not disturb the setting of the tapered needles unnecessarily.

Cleaning

WARNING

CLEANING AGENT SHOULD BE USED IN A WELL VENTILATED AREA, AWAY FROM NAKED FLAMES. CARE SHOULD BE TAKEN NOT TO BREATHE 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.

10 To enable all items to be visually examined for damage and wear, each part must be thoroughly cleaned using the appropriate 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 using temporary corrosion preventative PX1.

Examination and checking

11 Visually examine all parts for damage and corrosion. Check parts for permissible wear in accordance with fits and clearances paragraph 14.

Superficial damage

12 Superficial damage in the form of external isolated scores, smooth dents and abrasions free from cracks are to be regarded as negligible provided that internal dimensions are not affected and the damage is within the following limits:

12.1 Not exceeding 0.500 in long.

12.2 Not exceeding 0.010 in deep.

12.3 Not less than 0.250 in from any hole or bearing surface.

NOTE

Burrs must be removed and sharp edges blended out. Minor scores and abrasions in non-sealing bores may be ignored provided that proud portions of the abrasion are removed.

Checking data

13 Spring 500Y449

13.1 Number of working coils: 3.5

13.2 Wire size: 0.104 in (12 SWG)

13.3 Free length: 0.830 to 0.870 in

13.4 Check length:

13.4.1 Compress by 0.0625 in and note load = X

13.4.2 Compress by 0.3125 in and note load = Y

13.5 Load at check length: Load Y-X = 32 to 37 lbf.

Fits and clearances

14 Check that the dimensions are within the specified limits.

FITS, CLEARANCES AND REPAIR TOLERANCES

Ref No on Fig 2	Parts and Description	Dimension New	Permissible Worn Dimension		Permissible Clearance		Remarks
			Interchangeable Assembly	Selective Assembly	New	Worn	
1	PISTON IN BODY						
	Body i/d	1.2510 / 1.2495	1.2512	1.2513	0.0037 / 0.0012	0.0040	
	Piston o/d	1.2483 / 1.2473	1.2472	1.2470			
	NOTE Body bore within 0.0900 in (max) of end face has a "Dimension New" of 1.247 to 1.251 in.						

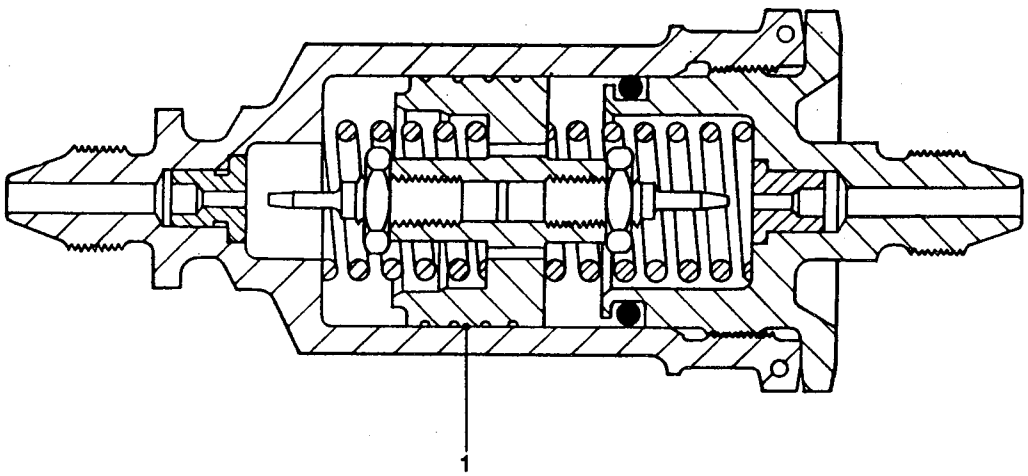

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Fig 2 Fits and clearances

Assembling (Fig 1)

15 Lubricate the parts with clean oil OM15 before assembling the unit.

15.1 If the tapered needles have been removed, fit the nuts and screw the tapered needles into the spigots of the piston until the length of needle A is 0.580 in and needle B is 0.550 in measured from the face of the piston boss. These dimensions may need adjustment to give the required flow during testing. Tighten the nuts against the piston bosses.

15.2 Assemble the thickness shims over the relevant guides as previously noted and insert the appropriate guide in the body. If the unit is being initially assembled, fit two shims (one 0.018/0.022 in, 26 SWG, the other 0.028/0.032 in, 22 SWG) over each guide.

15.3 Locate a spring over the guide in the body and bush assembly.

15.4 Insert the piston assembly in the body and bush assembly with the skirt of the piston and tapered needle A leading.

15.5 Locate a spring over tapered needle B and insert the remaining guide, with any necessary shims fitted, into the spring.

15.6 Assemble the O-ring to the end cap and bush assembly and screw it tightly into the body and bush assembly.

15.7 After final adjustment and satisfactory test, ensure that the tapered needles are locked in the piston and wirelock the body and bush assembly to the end cap and bush assembly.

TESTING

Special tools and test equipment

16 The following special tools and test equipment are required to carry out the test procedures detailed.

Part No	Description	Application
-	Static hydraulic test rig (with power pump capable of delivering 3.45 gal/min)	Apply hydraulic pressure

Testing the unit (Fig 1)

17 Use pipes of 3/8 in outside diameter in the test circuit, with suitable reducing adapters to the unit. The fluid temperature must be between 35 and 43°C.

Flow test

18

18.1 Connect the supply line of the power pump to the body and the end cap connections in turn and operate the pump.

18.2 Ensure that the fluid flow is 1.55 to 1.69 gal/min (7.17 to 7.82 in^3/sec) in each direction throughout the range of 500 to 2750 lbf/in^2 pressure drop across the unit.

18.3 To adjust for the correct flow conditions, the shim pack at each end should be increased or decreased in thickness in conjunction with the adjustment of the length of the tapered needles.

18.4 Disconnect the unit from the power pump.

Pressure test

19

19.1 Connect the supply line of the static hydraulic test rig to the body connection and blank off the end cap connection.

19.2 Gradually apply a pressure of 300 lbf/in^2 and then increase it slowly to 4950 lbf/in^2. Leakage must not occur.

19.3 Release the pressure, disconnect the supply line and remove the blanking cap.

PARTS CATALOGUE AND RELATED INFORMATION

FOR

THROTTLING VALVE

DOWTY AEROSPACE HYDRAULICS - CHELTENHAM

Part No D7523Y

MODIFICATION RECORD

Mod No	AL No	Mod No	AL No	Mod No	AL No	Mod No	AL No	Mod No	AL No	Mod No	AL No

* Incorporated in initial issue of Catalogue
NA Mod not applicable to this Catalogue
C Mod cancelled
AS Amendment Sheet

PARTS CATALOGUE AND RELATED INFORMATION (TOPIC 3)

MEMORANDUM OF INSTRUCTIONS

Demands

1 Requirements for demands are:

1.1 The demand must quote the appropriate Reference Number for each item. Unreferenced parts are not normally provisioned as spares and demands for such items must quote the maker's Part Number and the name and type of the equipment. The location of each part within the equipment should be clearly indicated.

1.2 Demands are to be prepared in accordance with the procedure laid down in AP 830 Volume 1 or BR4.

Local manufacture

2 Parts annotated 'LM' are to be manufactured from local resources. If the manufacture of such items is beyond the capacity of the Unit, the demand is to be endorsed 'Unable to manufacture locally'.

Major repair

3 'MR' indicates that an item is required for major repair purposes only and will not normally be held in store by Units other than those authorised to undertake major repair of the equipment.

Units per assembly

4 The number quoted is the quantity required per next higher assembly in the position shown except 'attaching parts' which quote the quantity required to attach one item. The letters 'AR' in the 'Units per Assy' column indicate that the quantity is 'as required'. Where applicable the quantity normally fitted is shown as a nominal figure, eg (Nom 3). Where an item is listed only for reference purposes the letters 'RF' are quoted.

Classification of equipment

5 The Class of Store is indicated by a single letter as laid down in AP 830 Volume 1 or BR4.

Fitting code (FC)

6 The FC is indicated by one of the following letters and is only quoted against parts which are not directly interchangeable:

V Open up holes on assembly
W Partially assembled
X Ream or machine on assembly
Y Drill or drill and tap on assembly
Z Trim on assembly

Obsolescent stock

7 An asterisk in the 'Part No' column indicates that no further purchases of the item will be made but the part is to be used until stocks are exhausted.

Modifications

8 When items are affected by a modification the 'Mod No' is quoted in the description. Modifications incorporated in the catalogue are listed in the Modification Record.

Manufacturers NATO code

9 The NATO supply code for manufacturers is an alpha-numeric code for non-US based approved manufacturers and a numeric code for US based approved manufacturers. Manufacturers details related to a specific code are contained in the following publications available from DCA, Kentigern House, 65 Brown Street, Glasgow G2 8EX.

99-H4-1 Name to Code
99-H4-2 Code to Name

Usage code

10 The usage code column is normally left blank indicating full applicability of all items. Where a code letter is shown, it indicates that all items with that letter form part of the same assembly or sub-assembly.

INDEX OF PART NUMBERS

Part Number	DMC	Reference Number	Fig/Index	C of S or LM	FC
AGS596B	28N	5340-99-9128965	1-19	C	
C5759Y12			1-18		
D5759Y18			1-4		
D7523Y	27QM	4820-99-4117748	1	P	
D7523Y1			1-3		
SP900-19	27Q	5330-99-1006106	1-7	C	
2000Y15		5340-99-4170071	1-1	C	
2000Y53	27Q	9905-99-4117757	1-2	C	
4972Y6			1-5		
			1-17		
500Y449			1-10		
5759Y11	27Q	5310-99-4117755	1-13	C	
5759Y13			1-6		
5759Y14			1-15		
5759Y15			1-8		
5759Y17			1-16		
5759Y21	27Q	5365-99-4117759	1-9	C	
5759Y22			1-14		
750060119	27Q	5330-99-1006106	1-7A	C	
7523Y2			1-11		
7523Y4			1-12		

DETAILED PARTS LIST

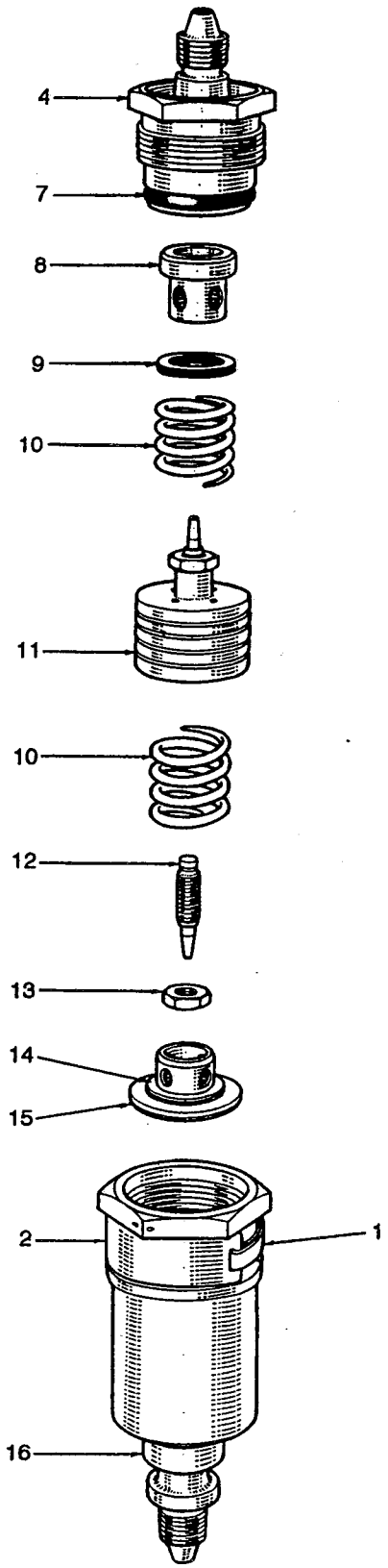

Fig 1 Throttling valve

THROTTLING VALVE

Fig/ Index No	Part No	1 2 3 4 5 6 Nomenclature	Mnfrs NATO Code	Usage Code	Units per Assy
1	D7523Y	Valve, throttling			RF
-1	2000Y15	. Strap			1
-2	2000Y53	. Nameplate			1
-3+	D7523Y1	. Valve assembly, throttling			1
-4	D5759Y18	. . End cap and bush assembly			1
-5+	4972Y6	. . . Bush			1
-6+	5759Y13	. . . Cap, end			1
-7	SP900-19	. . O-ring			1
	or	(Alternative)			
-7A+	750060119	. . O-ring			1
-8	5759Y15	. . Guide			1
-9	5759Y21	. . Shim			2 (max)
-10	500Y449	. . Spring			2
-11	7523Y2	. . Piston			1
-12	7523Y4	. . Needle, tapered			2
-13	5759Y11	. . Nut			2
-14	5759Y22	. . Shim			2 (max)
-15	5759Y14	. . Guide			1
-16	5759Y17	. . Body and bush assembly			1
-17+	4972Y6	. . . Bush			1
-18+	C5759Y12	. . . Body			1
-19+	AGS596B	. Cap, dust (Storage and transit)			2

+ Item not illustrated