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PRESSURE REGULATOR DOWTY AEROSPACE HYDRAULICS Part No 102032001

HUNTER.

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

BY COMMAND OF THE DEFENCE COUNCIL

Ministry of Defence

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**Prepared by Dowty Aerospace Hydraulics,
Arle Court, Cheltenham, GL51 0TP, England**

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the channel prescribed for the purpose in:

AP100B-01, Order 0504 (RAF)

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READ THE DATA SHEET APPLICABLE TO THE SUBSTANCE

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WARNINGS

(1) WHITE SPIRIT. THIS PUBLICATION CONTAINS PROCEDURES WHICH USE WHITE SPIRIT. REFER TO AP100B-10, DATA SHEET S2803.

(2) LOTOXANE. THIS PUBLICATION CONTAINS PROCEDURES WHICH USE LOTOXANE. REFER TO AP100B-10, DATA SHEET S2802.

(3) PREVENTATIVE PX1. THIS PUBLICATION CONTAINS PROCEDURES WHICH USE PREVENTATIVE PX1. REFER TO AP100B-10, DATA SHEET S3301.

GENERAL

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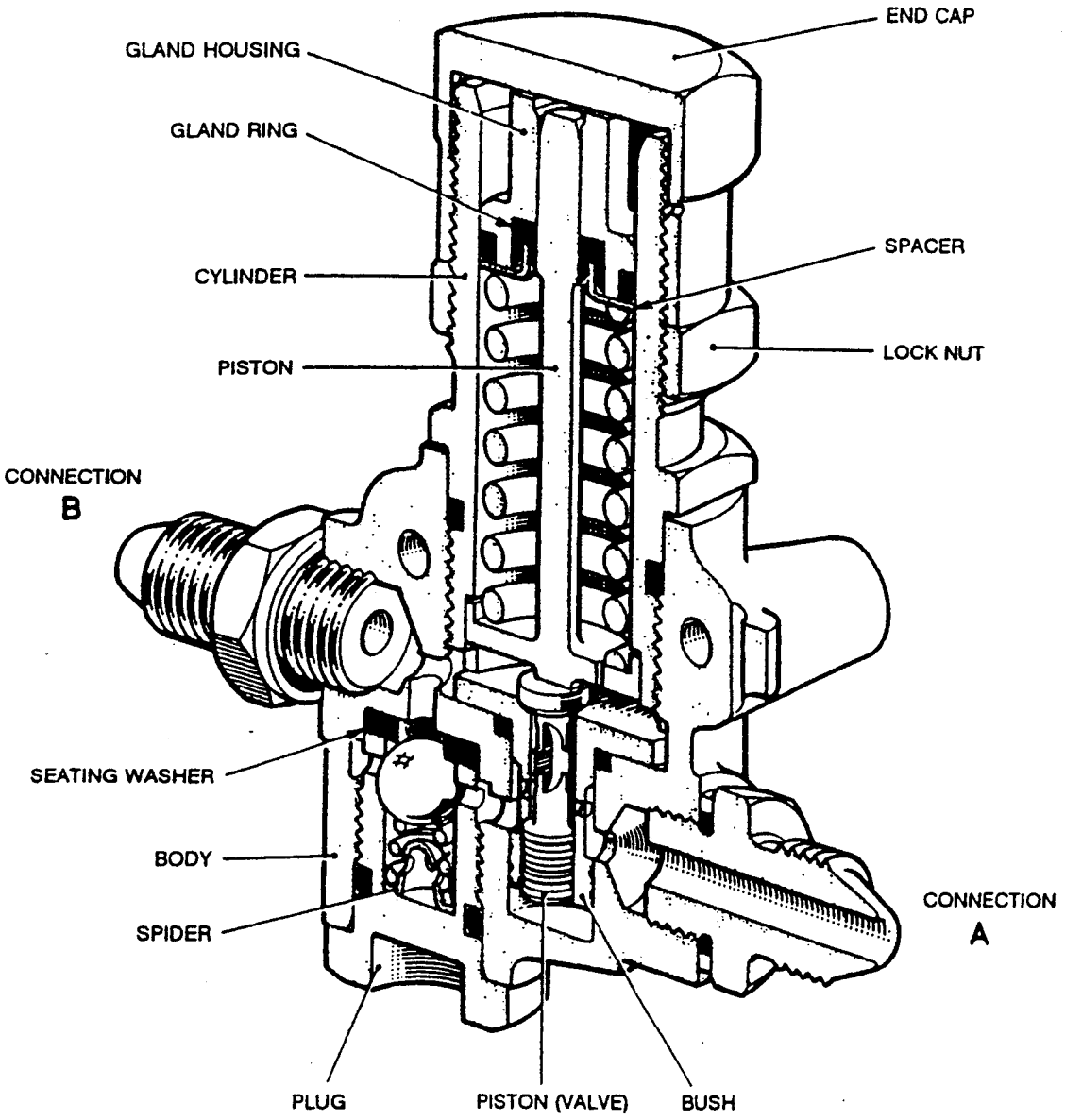

Fig 1 Pressure regulator

Leading particulars

1 Leading particulars of this unit are as follows:

1.1	System fluid	Oil OM15
1.2	Regulatory pressure	1500 to 1550 lbf/in^2
1.3	Connections	0.250 in BSP

Modification state

2 The information in this publication includes all appropriate modifications up to and including issue 11.

Introduction

3 This unit is incorporated in a hydraulic system to maintain the pressure to an essential service during the operation of another service. If the supply of fluid to the more important service is endangered, the valve will restrict the supply to the less important service until conditions improve. The flow between the two connections of the unit is through a spring-loaded piston valve, which is closed when the pressure at the supply connection falls below a predetermined setting.

Constructional description

4 A fluted piston valve, operating in a flanged and sealed bush housed in a body, is held against the seat by a spring-loaded piston located in a cylinder which screws into one end of the body. The spring is compressed between the piston head and a gland housing assembly which consists of a sealed gland housing fitted with a gland ring and spacer. An end cap, screwed over the outer end of the cylinder, is secured by a lock nut.

5 The lower end of the body receives a hollow plug which houses a non-return valve assembly, comprising a ball spring-loaded to a seating washer retained in the body by the plug. The spring is supported by a spider and the plug is grooved for a sealing ring.

6 Fluid ducts in the body which communicate with the piston valve and non-return valve, are linked to two tappings which receive the connections A and B. These consist of standard pipe adapters screwed in against bonded seals.

Functional description

7 The valve is so adjusted that below a specified pressure, which has to be maintained in the line to connection A, the piston valve will not lift until the fluid pressure reaches a predetermined figure. Above this pressure the valve lifts only a slight amount, enabling surplus pressure to escape through connection B and be utilised for another service. Any large increase in pressure above the desired minimum will act independently on the piston, depressing the spring and relieving the spring load on the piston valve. This allows the valve to lift to the full extent, permitting a greater flow of fluid through connection B. Since the valve lift fluctuates according to conditions

in the line to connection A, a small chamber below the piston valve fills with fluid to give a cushioning effect and prevents 'chattering'. Under the above conditions, the ball valve remains seated and fluid can pass only through the piston valve to connection B.

8 When the flow is reversed, fluid enters at connection B and passes through the unit to connection A, by way of the ball valve, an annular groove around the stem of the bush and the interconnecting ducts.

MAINTENANCE

Special tools and equipment

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

Part No	Description	Application
ST172	Assembly post	Assembling
ST1666	Assembly post	Assembling
-	Lotoxane (MIL-T-81533A)	Cleaning
-	White spirit (BS245)	Cleaning
-	Oil OM15 (DTD585)	Assembling
-	Corrosion preventative PX1	Preservation
-	Locking wire (DTD189A)	Locking parts

Safety and maintenance notes

10 Safety and maintenance notes or other general safety/maintenance requirements appropriate to the equipment, or to the main equipment, are to 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 TAKEN WHEN DISMANTLING.

11 Discard all O-rings, sealing ring, seating washer and gland ring after removal from the unit.

11.1 Remove the connections A and B together with the bonded seals.

11.2 Slacken the lock nut and unscrew the end cap and the lock nut from the cylinder.

11.3 Withdraw the gland housing and the spring from the cylinder. Remove the spacer and withdraw the gland ring and the O-ring from the gland housing.

11.4 Unscrew the cylinder from the body and withdraw the piston. Remove the sealing ring from the cylinder.

11.5 Withdraw the piston valve from the bush and withdraw the bush from the body. Remove the O-ring from the bush.

11.6 Unscrew the plug from the body and remove the ball valve, the spring and the spider. Remove the O-ring from the plug.

11.7 Withdraw the seating washer from the body.

Cleaning

▶ WARNINGS

(1) LOTOXANE. LOTOXANE IS USED IN THE MAINTENANCE OF THIS EQUIPMENT. REFER TO THE WARNING IN THE PRELIMINARY PAGES OF THIS PUBLICATION.

(2) PREVENTATIVE PX1. PREVENTATIVE PX1 IS USED IN THE MAINTENANCE OF THIS EQUIPMENT. REFER TO THE WARNING IN THE PRELIMINARY PAGES OF THIS PUBLICATION.

(3) WHITE SPIRIT. WHITE SPIRIT IS USED IN THE MAINTENANCE OF THIS EQUIPMENT. REFER TO THE WARNING IN THE PRELIMINARY PAGES OF THIS PUBLICATION.

12 To enable all items to be visually examined for damage and wear, each part must be thoroughly cleaned using lotoxane or white spirit. 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

13 Visually examine all parts for damage and corrosion.

Superficial damage

14 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:

14.1 Not exceeding 0.500 in long.

14.2 Not exceeding 0.010 in deep.

14.3 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

15 Spring 03651Y023

15.1 Number of working coils: 8.5

15.2 Wire size: 0.144 in

15.3 Free length: 2.07 to 2.13 in

15.4 Check length: 1.58 in

15.5 Load at check length: 84 to 94 lbf

16 Spring 76283

16.1 Number of working coils: 3

16.2 Wire size: 0.036 in

16.3 Free length: 0.390 in

16.4 Check length: 0.140 in

16.5 Load at check length: 3.50 to 4.00 lbf

Assembling (Fig 1)

17 Lightly lubricate all forms of sealing rings and threaded details with clean oil OM15 before assembly into the unit.

17.1 Insert the seating washer into the body, with the outer chamfer innermost and ensure that the seating washer is correctly seated against the inner face.

17.2 Assemble the O-ring to the plug using assembly post ST1666. Insert the spider, followed by the spring and ball, into the plug. Screw the plug tightly into the body.

17.3 Assemble the O-ring to the bush and insert the bush into the body.

17.4 Insert the piston valve into the bush.

17.5 Assemble the sealing ring to the cylinder using assembly post ST172.

17.6 Insert the piston, flanged end leading, into the body. Screw the cylinder tightly into the body.

17.7 Pass the spring over the stemmed-end of the piston and locate it against the piston head.

17.8 Assemble the O-ring to the gland housing and insert the gland ring into the housing, with the lips of the gland ring outermost. Fit the spacer to the gland ring to engage with the lips of the gland ring.

17.9 Slide the gland housing assembly into the cylinder and over the piston stem, until the spacer abuts the spring.

17.10 Screw the lock nut over the cylinder as far as possible and screw on the end cap. Do not tighten the lock nut against the end cap at this stage, as the cap may require adjustment during test.

17.11 Assemble the bonded seals to the adapters for the connections A and B, and screw the adapters tightly into their respective tappings in the body.

17.12 After satisfactory testing, ensure that the lock nut is tightened against the end cap, and double-wirelock the end cap, lock nut and cylinder together. Wirelock the connections A and B to the cylinder and plug respectively.

TESTING

Special tools and test equipment

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

Part No	Description	Application
-	Static hydraulic test rig	Apply hydraulic pressure

Testing the unit (Fig 1)

19 The unit under test and the test circuit must be hydraulically full and bled free of air before commencing the tests.

19.1 Connect the supply line of the static hydraulic test rig to connection A and apply pressure. Adjust the end cap by screwing it in or out until the piston valve lifts at a pressure of between 1500 and 1550 lbf/in^2 (103.5 and 106.8 bar), indicated by a flow of fluid from connection B.

19.2 Recheck the lifting pressure several times and then gradually decrease the pressure and note the pressure at which fluid ceases to flow from connection B. This pressure should not be less than 900 to 930 lbf/in^2 (62.1 to 64.1 bar). Release the pressure and tighten the lock nut against the end cap.

19.3 Operate the test rig, applying pressure at connection A up to within 5% of the lifting pressure. Leakage from connection B should not exceed 0.37 cm^3/min.

19.4 Increase the pressure and fluid should flow from connection B when the piston valve lifts. Release the pressure.

19.5 Blank off connection B with a pressure gauge. Operate the test rig and apply a pressure of between 1500 and 1550 lbf/in^2 (103.5 to 106.8 bar). Pressures at both connections should then be equal.

19.6 Gradually increase the pressure to 4050 lbf/in^2 (279.3 bar). Leakage must not occur. Release the pressure at connection A and the pressure registered on the gauge at connection B should fall rapidly to 20 lbf/in^2 (1.38 bar) maximum.

19.7 Remove the gauge from connection B and repeat the test at para 19.3.

19.8 Connect the test rig supply line to connection B and operate the rig. Fluid should flow freely from connection A at a pressure not exceeding 20 lbf/in^2 (1.38 bar). Release the pressure and disconnect the supply line.

PARTS CATALOGUE AND RELATED INFORMATION

FOR

PRESSURE REGULATOR

DOWTY AEROSPACE HYDRAULICS - CHELTENHAM

Part No 102032001

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
AC4211	*										

* 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
BALL, 3/8 in dia	2A	3110-99-9500573	1-19	C	
SCREW, PK 1/8 in dia			1-25		
AGS1104B			1-1		
AGS1186B	28F	5330-99-9428453	1-2	C	
AGS596B	28N	5340-99-9128965	1-27	C	
C3651Y3			1-24		
SP597-43	27QA	5330-99-4117496	1-12	C	
SP900-10	27QA	5330-99-5802282	1-16	C	
SP900-11	27QA	5330-99-1007954	1-18	C	
SP900-14	27QA	5330-99-9428417	1-8	C	
03651Y023	27Q	5340-99-4117500	1-10	C	
102032001	27QM	6685-99-4117477	1	P	
102032101			1-3		
2000Y30			1-26		
3651Y10			1-5		
3651Y13	27Q	5365-99-4117497	1-9	C	
3651Y15	27Q	4820-99-4117486	1-6	C	
3651Y18			1-17		
3651Y19			1-4		
3651Y2			1-23		
3651Y20			1-14A		
3651Y21			1-13A		
3651Y4	27Q	4820-99-4117483	1-15	C	
3651Y5	27Q	4820-99-4117488	1-14	C	
3651Y6	27Q	4730-99-4117485	1-11	C	
3651Y7	27Q	4820-99-4117490	1-13	C	
3651Y9	27Q	5310-99-4117502	1-22	C	
5400381			1-7		
750060110			1-16A		
750060111			1-18A		
750060114	27QA	5330-99-9428417	1-8A	C	
76283			1-20		
84065	27Q	4820-99-4117498	1-21	C	

DETAILED PARTS LIST

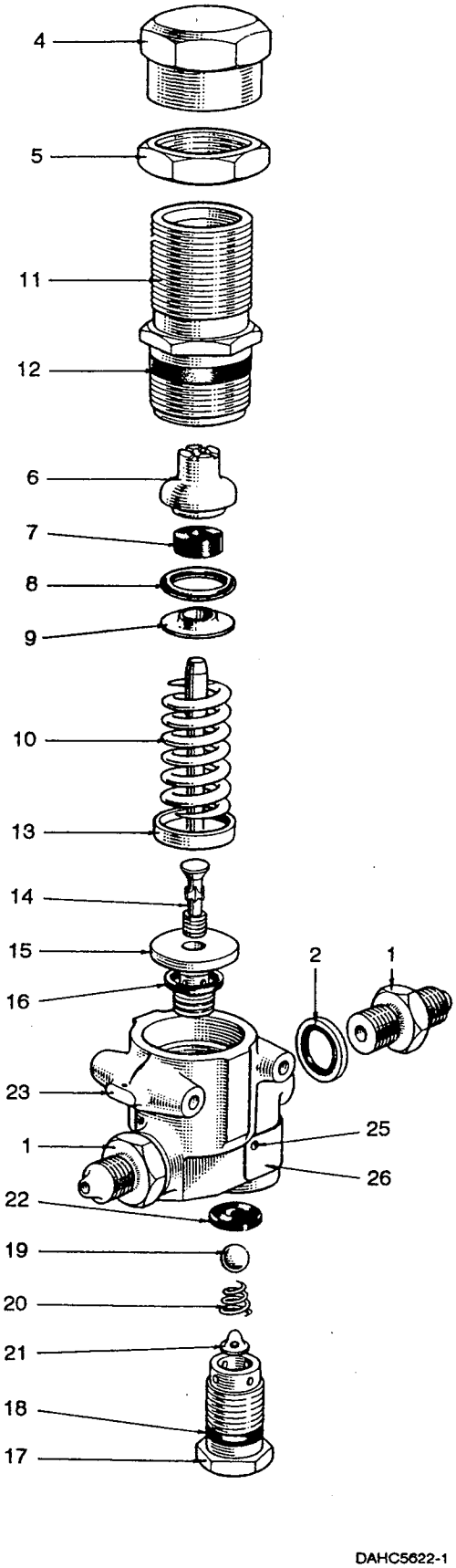

Fig 1 Pressure regulator

PRESSURE REGULATOR

Fig/ Index No	Part No	1 2 3 4 5 6 Nomenclature	Mnfrs NATO Code	Usage Code	Units per Assy
1	102032001	Regulator, pressure (Mod AC4211)			RF
-1	AGS1104B	. Adapter			2
-2	AGS1186B	. Seal, bonded			2
-3+	102032101	. Regulator sub-assembly, pressure			1
-4	3651Y19	. . Cap, end			1
-5	3651Y10	. . Nut, lock			1
-6	3651Y15	. . Housing, gland			1
-7	5400381	. . Ring, gland			1
-8	SP900-14	. . O-ring			1
	or	(Alternative)			
-8A+	750060114	. . O-ring			1
-9	3651Y13	. . Spacer			1
-10	03651Y023	. . Spring (Mod AC4211)			1
-11	3651Y6	. . Cylinder			1
-12	SP597-43	. . Ring, sealing			1
-13	3651Y7	. . Piston			1
	or				
-13A+	3651Y21	. . Piston			1
-14	3651Y5	. . Piston			1
	or				
-14A+	3651Y20	. . Piston			1
-15	3651Y4	. . Bush			1
-16	SP900-10	. . O-ring			1
	or	(Alternative)			
-16A+	750060110	. . O-ring			1
-17	3651Y18	. . Plug			1

+ Item not illustrated

PRESSURE REGULATOR

Fig/ Index No	Part No	1 2 3 4 5 6 Nomenclature	Mnfrs NATO Code	Usage Code	Units per Assy
1-18	SP900-11	. . O-ring (Alternative)			1
-18A+	750060111	. . O-ring			1
-19	ND	. . Ball, 3/8 in dia			1
-20	76283	. . Spring			1
-21	84065	. . Spider			1
-22	3651Y9	. . Washer, seating			1
-23	3651Y2	. . Body sub-assembly			1
-24+	C3651Y3	. . . Body, valve			1
-25	ND	. . . Screw, PK 1/8 in dia			4
-26	2000Y30	. . . Nameplate			1
-27+	AGS596B	. Cap, dust (Storage and transit)			2

+ Item not illustrated