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PRESSURE REGULATOR DOWTY AEROSPACE HYDRAULICS Part Nos 04862YB07 AND 04862YB08

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

CONTENTS

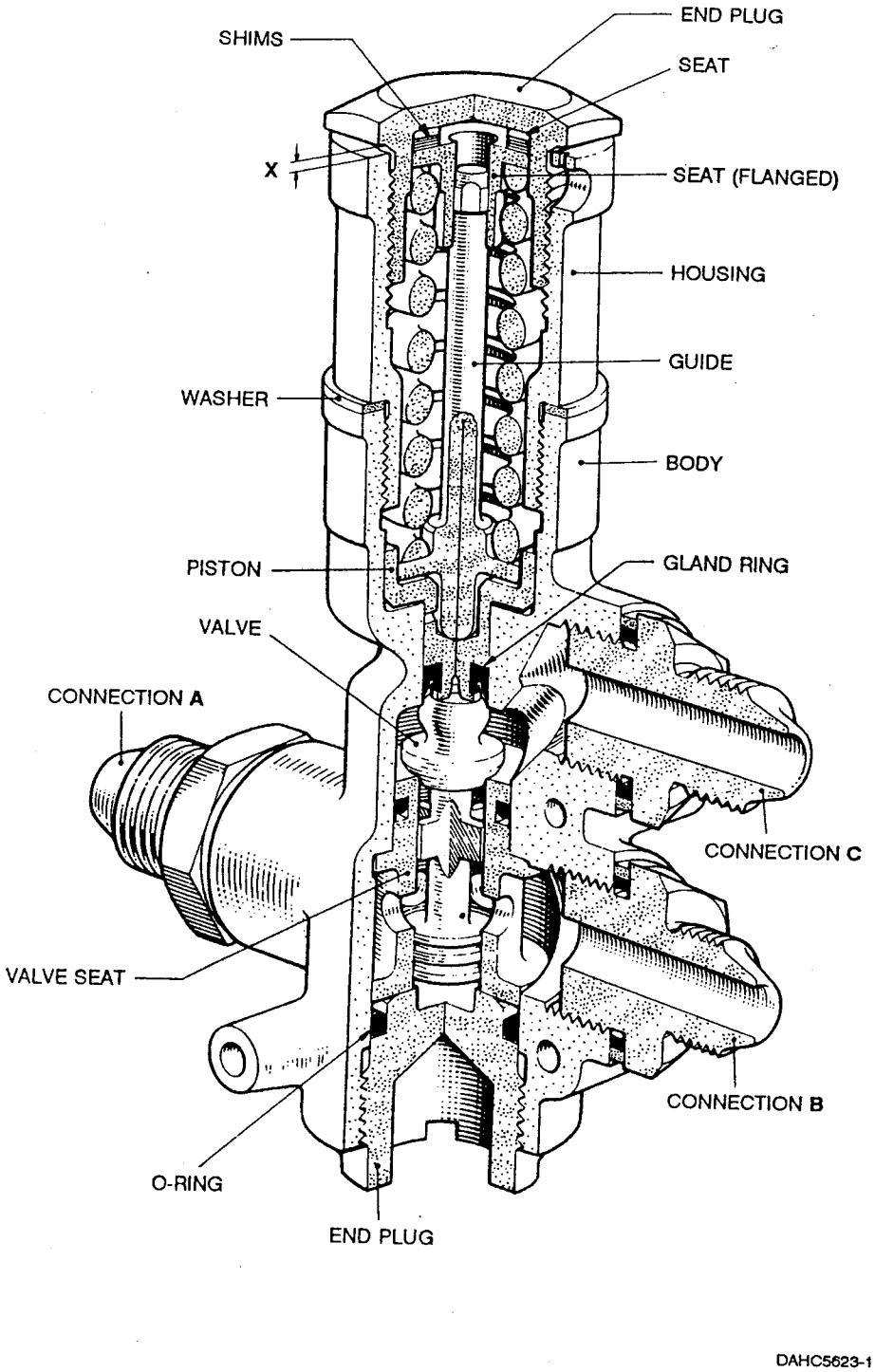

Fig 1 Pressure regulator

Leading particulars

1 Refer to the relevant annex for the leading particulars.

Modification state

2 Refer to the appropriate annex for the relevant modification state.

Introduction (Fig 1)

3 The pressure regulator permits a continuous flow of fluid between two connections, A and B. Flow from connection C is achieved only when the supply pressure is above a predetermined value. This ensures that pressure is available for an essential service by isolating an ancillary service.

Constructional description (Fig 1)

4 The body which has an end plug at one end, receives a housing with an end plug at the other. Bosses are formed on the body for the connections A, B and C, which consist of standard pipe adapters fitted with bonded seals. A washer may be fitted between the body and the housing for adjustment purposes.

5 The assembly consists of a flanged valve seat which houses a fluted valve and is secured in the body by an end plug. The valve seat and the end plug are sealed by O-rings. The valve is held against the valve seat by a spring-loaded piston fitted with a gland ring; the spring being compressed between a stemmed guide and a flanged seat backed by shims. A seat is interposed between the shims and an end plug which screws into the spring housing to secure the assembly.

Functional description (Fig 1)

6 The operation of the unit ensures that a minimum fluid pressure is maintained at connection B, simultaneously with the supply of fluid to connection C. A predetermined pressure lifts the valve against the piston and the spring to permit fluid to pass to connection C. Further increase in the pressure at connection C acts on the piston to lift it against the spring, independently of the valve. The valve moves to the maximum lift position and the rate of flow to connection C is increased.

7 If the pressure at connection C falls below the minimum pressure required at connection B, the spring reacts to seat the valve. The supply to connection C is shut off until the pressure increases sufficiently to lift the valve.

MAINTENANCE

Special tools and equipment

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

Part No	Description	Application
ST1921	C-key spanner	Dismantling/Assembling
ST2036	Checking gauge	Assembling
ST2425	C-peg spanner	Dismantling/Assembling
-	Trichloroethane (TS367D)	Cleaning
-	White spirit (BS245)	Cleaning
-	Oil OM15 (DTD585)	Assembling
-	Grease XG287 (DEF STAN 91-53)	Assembling
-	Corrosion preventative PX1	Preservation
-	Locking wire (DTD189A)	Locking parts

Safety and maintenance notes

9 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 TAKEN WHEN DISMANTLING.

10 Discard the bonded seals, O-rings and gland ring on removal from the unit.

10.1 Remove the connections A, B and C together with the bonded seals.

10.2 Remove the end plug using C-key spanner ST1921 and withdraw the valve seat and the valve. Remove the O-rings from the end plug and the valve seat.

10.3 Unscrew the end plug and withdraw the seat, the shims (noting the shim thickness), the flanged seat, the spring and the guide.

10.4 Unscrew the housing using the C-peg spanner ST2425 and remove the adjusting washer, if fitted. Withdraw the piston and remove the gland ring.

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.

11 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

12 Visually examine all parts for damage and corrosion. Check parts for permissible wear in accordance with fits and clearances paragraph 15.

Superficial damage

13 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:

13.1 Not exceeding 0.500 in long.

13.2 Not exceeding 0.010 in deep.

13.3 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

14 Spring 50000Y037

14.1 Number of working coils: 8

14.2 Wire size: 0.212 in (5 SWG)

14.3 Free length: 2.27 to 2.30 in

14.4 Check length: 2.08 in

14.5 Load at check length: 215 to 240 lbf

Fits and clearances

15 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	0.5005 / 0.4995	0.5010	0.5020	0.0035 / 0.0015	0.0050	
	Piston o/d	0.4980 / 0.4970	0.4960	0.4955			
2	VALVE IN VALVE SEAT						
	Valve seat i/d	0.50050 / 0.49950	0.50100	0.50125	0.00175 / 0.00025	0.00250	
	Valve o/d	0.49925 / 0.49875	0.49850	0.49800			
3	PISTON IN BODY						
	Body i/d	1.09475 / 1.09325	1.09525	1.09575	0.00475 / 0.00225	0.00575	
	Piston o/d	1.09100 / 1.09000	1.08950	1.08900			
4	VALVE SEAT IN BODY						
	Body i/d	0.87575 / 0.87450	0.87675	0.87750	0.00325 / 0.00100	0.00500	
	Valve seat o/d	0.87350 / 0.87250	0.87175	0.87075			

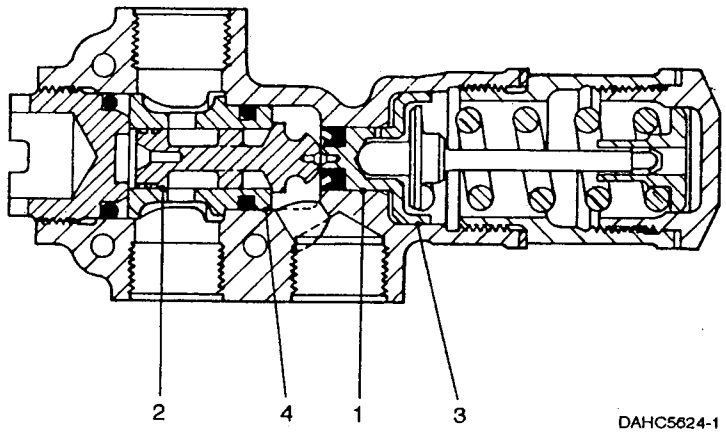

Fig 2 Fits and clearances

Assembling (Fig 1)

16 Lightly lubricate all forms of sealing rings with clean oil OM15 and liberally coat the spring, piston, flanged seat and the guide with grease XG287 before assembly into the unit.

16.1 Assemble the gland ring to the piston and position the piston in the body. Insert the checking gauge ST2036 into the body. If a gap is shown between the gauge and the end of the body, fit an adjusting washer to the housing. Screw in the housing using C-peg spanner ST2425.

16.2 Insert the guide, spherical end leading, into the housing locating it in the piston and follow with the spring and the flanged seat.

16.3 Position shims, to the thickness previously noted, on the seat. Insert the seat into the end plug with the chamfered face innermost, and screw the end plug over the spring and into the housing, until the end plug is within 0.06 in minimum of seating. The gap X (Fig 1) will be finally adjusted during testing.

16.4 Assemble the O-ring to the valve seat.

16.5 Assemble the poppet valve to the valve seat. Insert the assembly into the body followed by the end plug O-ring and screw in the end plug using C-key spanner ST1921.

16.6 Assemble bonded seals to the connections A, B and C and screw them into their respective bosses.

16.7 After satisfactory testing, lock the end plugs, the housing, the body and the connections together with lockwire.

TESTING

Special tools and test equipment

17 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 gal/min at 1150 lbf/in^2)	Apply hydraulic pressure
-	Branched supply line	Testing

Testing the unit (Fig 1)

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

18.1 Connect the supply line of the hand pump to connection A and apply light pressure. Fluid should flow freely from connection B.

18.2 Blank connection B, operate the hand pump and adjust the end plug to give an approximate relief pressure of 1100 lbf/in^2. Release the pressure and disconnect the hand pump supply line.

18.3 Connect the supply line of the power pump to connection A and operate the unit for a minimum of 20 cycles.

NOTE

Operation of the unit to the relief pressure and release of the pressure is one cycle.

18.4 Apply a gradually increasing pressure and adjust the end plug until the valve just cracks open at a pressure of between 1100 and 1150 lbf/in^2. This will be indicated by the flow of fluid from connection C at the rate of a fast drip to a continuous trickle. Repeat this check twice more then release the pressure.

NOTE

Should the flow diminish, raise the pressure slightly in order to maintain a continuous flow.

18.5 Measure the gap X (Fig 1). Unscrew the end plug and remove shims equal in thickness to the dimension of the gap. Screw the end plug tightly into the housing.

18.6 Recheck the relief pressure and, if necessary, readjust the shims inside the end plug to suit.

18.7 Operate the power pump to pass a full pump delivery through the unit. The valve should operate without noise. Gradually reduce the pressure until the flow from connection C ceases and leakage is not in excess of 0.37 cm^3/min. The pressure at connection A should not be less than 1000 lbf/in^2.

18.8 Operate the power pump again to pass a full pump delivery through the unit and then reduce the pressure quickly to 1000 lbf/in^2. Leakage from connection C should not exceed a fast drip to a continuous trickle. Check this operation at least three times. Release the pressure and disconnect the power pump supply line.

18.9 Connect the hand pump supply line through the branched supply line to connections A and C. Operate the rig to apply a pressure of 300 lbf/in^2 simultaneously at connections A and C, then increase the pressure gradually to 4500 lbf/in^2. Leakage must not occur. Release the pressure, disconnect the supply lines and remove the blanking cap.

18.10 Repeat the tests in paragraphs 18.4 and 18.7 and readjust the relief and reseating pressures if necessary.

Annex A

PRESSURE REGULATOR

DOWTY AEROSPACE HYDRAULICS - CHELTENHAM

PART NUMBER 04862YB07

Leading particulars

1 Leading particulars of this unit are as follows:

1.1	System fluid	Oil OM15 (DTD585)
1.2	Regulatory pressure	1100 to 1150 lbf/in^2
1.3	Length	5.970 to 6.067 in
1.4	Connections: A and C	0.375 in BSP
	B	0.250 in BSP

Modification state

2 The information in this annex includes all appropriate modifications up to and including issue 12.

Introduction

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

Annex B

PRESSURE REGULATOR

DOWTY AEROSPACE HYDRAULICS - CHELTENHAM

PART NUMBER 04862YB08

Leading particulars

1 Leading particulars of this unit are as follows:

1.1	System fluid	Oil OM15 (DTD585)
1.2	Regulatory pressure	1100 to 1150 lbf/in^2
1.3	Length	5.970 to 6.067 in
1.4	Connections: C	0.375 in BSP
	B	0.250 in BSP

Modification state

2 The information in this annex includes all appropriate modifications up to and including issue 16.

Introduction

3 This unit is similar to that described and illustrated in the general text except that a blanking plug replaces connection A. Dismantling, assembling and testing procedures are affected as follows.

Dismantling

4 Substitute the following for paragraph 10.1 in the general text.

4.1 Remove the blanking plug and connections B and C together with the bonded seals.

Assembling

5 Substitute the following for paragraphs 16.6 and 16.7 in the general text.

5.1 Assemble bonded seals to the blanking plug and connections B and C and screw them into their respective bosses.

5.2 After satisfactory testing, lock the end plugs, the housing, the body, the connections and the blanking plug together with lockwire.

Testing

6 Substitute the following for paragraphs 18.1 and 18.2 of the general text.

6.1 Connect the supply line of the hand pump to connection B and apply pressure until the valve lifts and fluid flows from connection C. Operate the hand pump and adjust the end plug to give an approximate relief pressure of 1100 lbf/in^2. Release the pressure and disconnect the hand pump supply line.

7 Substitute the following for paragraph 18.9 of the general text.

7.1 Connect the hand pump supply line through the branched supply line to connections B and C. Operate the rig to apply a pressure of 300 lbf/in^2 simultaneously at connections B and C, then increase the pressure gradually to 4500 lbf/in^2. Leakage must not occur. Release the pressure and disconnect the supply lines.

PARTS CATALOGUE AND RELATED INFORMATION

FOR

PRESSURE REGULATOR

DOWTY AEROSPACE HYDRAULICS - CHELTENHAM

Part Nos 04862YB07 AND 04862YB08

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
AC4524	*										

* 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
AGS1186D	28F	5330-99-2077439	1-4	C	
AGS566D	28D	5365-99-7146648	1-3	C	
AGS596B	28N	5340-99-9128965	1-26	C	
AGS596C	28N	5340-99-9143884	1-25	C	
C4862Y2			1-24		
C4862Y9			1-24A		
SP758D	27Q	4730-99-4117814	1-1	C	
SP880B			1-28		
SP880C			1-27		
SP900-13	27QA	5330-99-1013063	1-11	C	
SP900-16	27QA	5330-99-9431639	1-9	C	
04862YB07	27QM	6685-99-4117503	1	P	
04862YB08	27QM	6685-99-4117532	1	P	
04862Y011			1-20		
04862Y012			1-13		
04862Y027			1-7		
11020Y469	27Q	4820-99-4117517	1-17	C	
11020Y471	27Q	4820-99-4117507	1-19	C	
2000Y15		5340-99-4170071	1-5	C	
2000Y46			1-6		
3300Y206	27Q	5365-99-4702667	1-23	C	
4651Y4A	27Q	4820-99-4117524	1-12	C	
4651Y5	27Q	4820-99-4117518	1-10	C	
4651Y6	27Q	5365-99-4117511	1-8	C	
4862Y6			1-16		
4862Y8			1-21		
50000Y037	27Q	5360-99-4117522	1-18	C	
5400534			1-23A		
5750Y3	27Q	5310-99-4117519	1-14	C	
750060113			1-11A		
750060116			1-9A		
7504Y6			1-22		
8413Y4	27Q	1650-99-4117521	1-15	C	
99521	27Q	4730-99-4140018	1-2	C	

DETAILED PARTS LIST

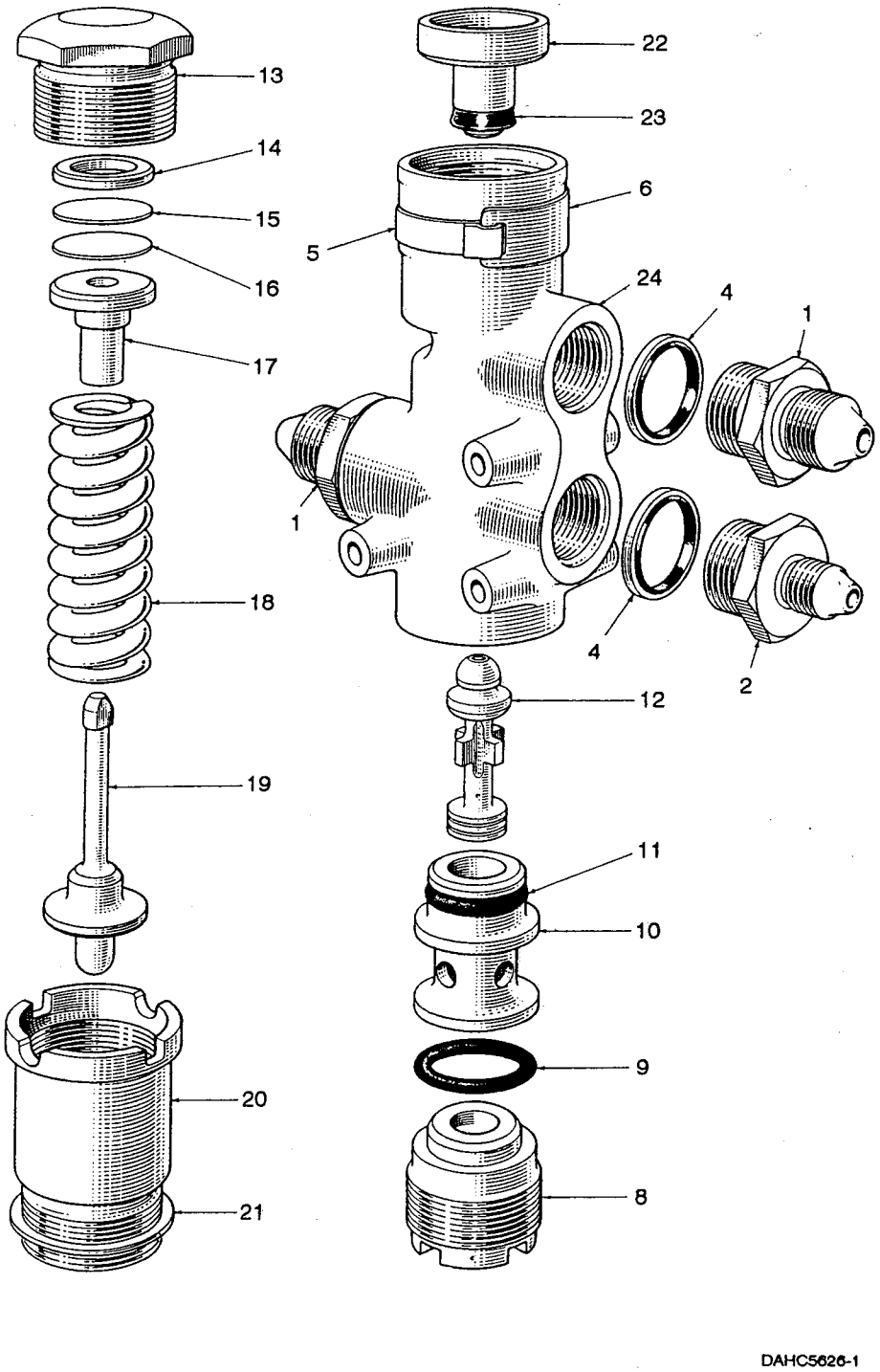

Fig 1 Pressure regulator

PRESSURE REGULATOR

Fig/ Index No	Part No	1 2 3 4 5 6 Nomenclature	Mnfrs NATO Code	Usage Code	Units per Assy
1	04862YB07	Regulator, pressure (Mod AC4524)		A	RF
1+	04862YB08	Regulator, pressure (Mod AC4524)		B	RF
-1	SP758D	. Union, reducing			2
-2	99521	. Adapter		A	1
-3+	AGS566D	. Plug, blanking		B	1
-4	AGS1186D	. Seal, bonded			3
-5	2000Y15	. Strap			1
-6	2000Y46	. Nameplate			1
-7+	04862Y027	. Regulator assembly, pressure			1
-8	4651Y6	. . Plug, end			1
-9	SP900-16 or	. . O-ring (Alternative)			1
-9A+	750060116	. . O-ring			1
-10	4651Y5	. . Seat, valve			1
-11	SP900-13 or	. . O-ring (Alternative)			1
-11A+	750060113	. . O-ring			1
-12	4651Y4A	. . Valve			1
-13	04862Y012	. . Plug, end			1
-14	5750Y3	. . Seat			1
-15	8413Y4	. . Shim			6 (max)
-16	4862Y6	. . Shim			8
-17	11020Y469	. . Seat			1
-18	50000Y037	. . Spring			1
-19	11020Y471	. . Guide			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
1-20	04862Y011	. . Housing			1
-21	4862Y8	. . Washer			1
-22	7504Y6	. . Piston			1
-23	3300Y206	. . Ring, gland			1
	or	(Alternative)			
-23A+	5400534	. . Ring, gland			1
-24	C4862Y2	. . Body			1
	or	(Alternative)			
-24A+	C4862Y9	. . Body			1
-25+	AGS596C	. Cap, dust (Storage and transit)			2
-26+	AGS596B	. Cap, dust (Storage and transit)		A	1
-27+	SP880C	. Washer, sealing (Storage and transit)			2
-28+	SP880B	. Washer, sealing (Storage and transit)		A	1

+ Item not illustrated