ETPS TSG.

AP 105B-07489-13

2nd Edition March 93
(Superseding AP 105B-07489-1
and Superseding Relevant Pages
of AP 4515B Vol 3 Pt 1 Sect 2 Chap 15)

ONE-WAY RESTRICTOR VALVE DOWTY AEROSPACE HYDRAULICS Part Nos D4140Y and D6102Y

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

BY COMMAND OF THE DEFENCE COUNCIL

Ministry of Defence

Sponsored for use in the

ROYAL AIR FORCE BY DGSM (RAF)

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Dowty Aerospace Hydraulics is a business name of Dowty Aerospace Gloucester Limited

Publications authority: DDATP (RAF)

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CONTENTS

GENERAL

CONTENTS

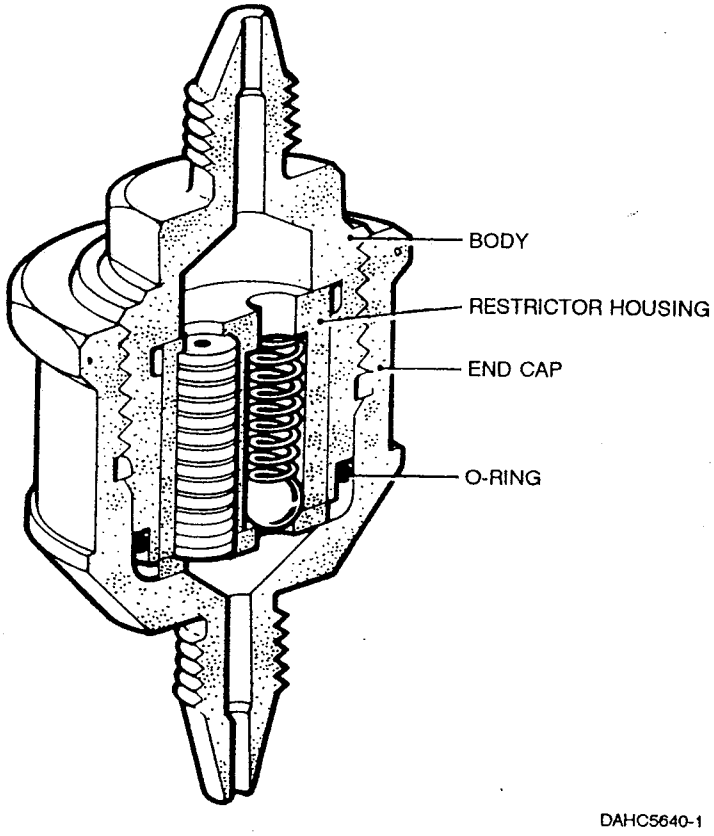

Fig 1 One-way restrictor valve

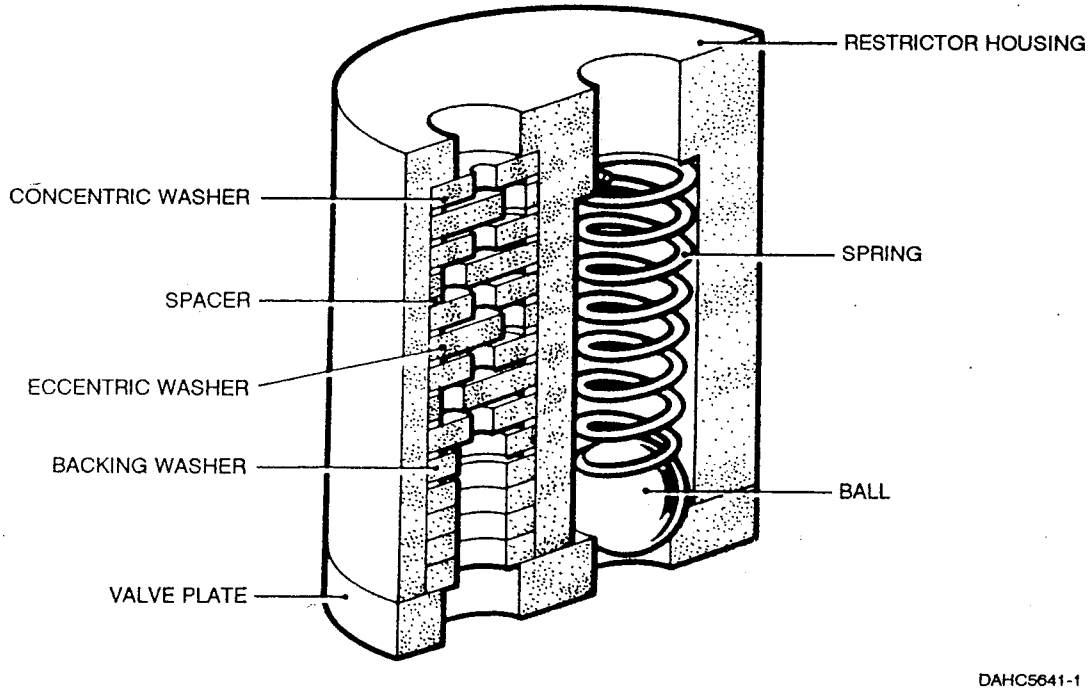

Fig 2 Restrictor and non-return valve assemblies

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

3 This unit permits a restricted flow of fluid in one direction and an unrestricted flow in the opposite direction. A basic type is described and illustrated in the general text and variations are covered in annexes.

Constructional description (Fig 1 and 2)

4 The unit consists of a body and an end cap, formed with pipe connections at the outer ends and screwed together to house a restrictor assembly and a non-return valve assembly. A sealing O-ring is fitted at the joint.

5 The restrictor and non-return valve assemblies are accommodated in parallel bores of a restrictor housing and retained by a valve plate secured by two countersunk screws. The restrictor assembly comprises five concentric and four eccentric washers which are separated by spacers: backing washers and extra spacers are fitted as required. The non-return valve assembly comprises a ball loaded by a spring against a seat in the valve plate.

Functional description (Fig 1 and 2)

6 When fluid enters the unit through the connection of the body, the non-return valve assembly is closed and the passage of the fluid is limited to the restrictor assembly. The rate of flow is thereby reduced. With the reversal of the flow, the non-return valve assembly opens and the flow through the unit is unrestricted.

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

Part No	Description	Application
-	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 and 2)

9

9.1 Remove the locking wire, unscrew the end cap from the body and withdraw the restrictor housing.

9.2 Remove and discard the O-ring from the body.

9.3 Remove the countersunk head screws and the valve plate.

9.4 Withdraw the ball and the spring, the restrictor assembly consisting of the eccentric and concentric washers, the spacers and the backing washers from the restrictor housing.

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.

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 127Y5

13.1 Number of working coils: 13

13.2 Wire size: 0.020 in (25 SWG)

13.3 Free length: 0.550 in

13.4 Check length: 0.300 in

13.5 Load at check length: 0.954 to 1.046 lbf.

Assembling (Fig 1 and 2)

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

14.1 Position the restrictor assembly in the restrictor housing by first inserting a concentric washer, followed by a spacer, an eccentric washer and another spacer. Continue this sequence of assembly until five concentric and four eccentric washers have been assembled.

14.2 Assemble backing washers and spacers as required to complete the restrictor assembly. With all the parts inserted, there should be a slight protrusion above the restrictor housing to ensure a firm fitting of the pack.

14.3 Insert the spring and the ball in the restrictor housing. Locate the valve plate and secure with the two countersunk head screws.

14.4 Position the restrictor and non-return valve assemblies in the body with the valve plate facing outermost. Assemble the O-ring to the body and screw the end cap tightly over the body.

14.5 After satisfactory testing, the body and the end cap must be wirelocked together.

TESTING

Special tools and test equipment

15 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)	Apply hydraulic pressure

Testing the unit (Fig 1 and 2)

16 Ensure the unit is hydraulically full and bled free of air. Using the equipment specified in paragraph 15, carry out the following test procedure:

16.1 Connect the power pump supply line to the body connection.

16.2 Operate the power pump and adjust the by-pass valve to produce a flow through the unit at 2000 lbf/in^2.

16.3 Check the rate of flow from the end cap which should be 0.72 to 0.80 gal/min at this pressure. The rate of flow can be adjusted by varying the number of concentric and eccentric washers. Disconnect the power pump supply line.

16.4 Connect the hand pump supply line of the static test rig to the body connection and blank off the end cap connection. Apply a pressure of 4950 lbf/in^2. Leakage must not occur. Release the pressure and disconnect the supply line.

Annex A

ONE-WAY RESTRICTOR VALVE

DOWTY AEROSPACE HYDRAULICS - CHELTENHAM

PART NUMBER D4140Y

Leading particulars

1 Leading particulars of the unit are as follows:

1.1	System fluid	Oil OM15 (DTD585)
1.2	Flow rate	0.72 to 0.80 gal/min at 2000 lbf/in^2
1.3	Connections	0.125 in BSP

Modification state

2 The information in this annex includes all appropriate modifications up to and including issue 6.

Introduction

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

Annex B

ONE-WAY RESTRICTOR VALVE

DOWTY AEROSPACE HYDRAULICS - CHELTENHAM

PART NUMBER D6102Y

Leading particulars

1 Leading particulars of the unit are as follows:

1.1	System fluid	Oil OM15 (DTD585)
1.2	Flow rate	0.32 to 0.35 gal/min at 1700 lbf/in^2
1.3	Connections	0.125 in BSP

Modification state

2 The information in this annex includes all appropriate modifications up to and including issue 7.

Introduction

3 This unit is similar to the type described and illustrated in the general text but differs in that the restrictor pack consists of seven concentric washers and six eccentric washers. The assembly and test requirements are affected as follows.

Assembling

4 Substitute the following for paragraph 14.1 in the general text.

4.1 Position the restrictor assembly in the restrictor housing by first inserting a concentric washer, followed by a spacer, an eccentric washer and another spacer. Continue this sequence of assembly until seven concentric and six eccentric washers have been assembled.

Testing

5 Make the following changes during the test procedure detailed in paragraph 16 of the general text.

5.1 In paragraph 16.2, produce a flow through the unit at 1700 lbf/in^2.

5.2 The flow rate requirement of paragraph 16.3 for this unit should be 0.32 to 0.35 gal/min at the above pressure.

PARTS CATALOGUE AND RELATED INFORMATION

FOR

ONE-WAY RESTRICTOR VALVE

DOWTY AEROSPACE HYDRAULICS - CHELTENHAM

Part Nos D4140Y and D6102Y

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
AC3527	*										

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

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, 7/32 IN DIA			1-9		
AGS596A	28N	5340-99-9128964	1-16	C	
A33B8	28S	5305-99-9995325	1-7	C	
D4140Y	27Q	4820-99-4117599	1	L	
D4140Y1			1-3		
D6102Y	27Q	4820-99-4117611	1	L	
D6102Y1			1-3A		
SP880A	27QA	5330-99-1029282	1-17	C	
SP900-14	27QA	5330-99-9428417	1-6	C	
127Y5	27Q	5360-99-4117607	1-10	C	
133Y3	27Q	5310-99-4117608	1-11	C	
133Y4	27Q	5310-99-4117609	1-14	C	
			1-14A		
133Y6	27Q	4820-99-4117610	1-13	C	
			1-13A		
158Y3	27Q	1650-99-4154051	1-12	C	
2000Y108			1-2		
2000Y15		5340-99-4170071	1-1	C	
3204Y12			1-8		
3204Y6			1-15		
4140Y2			1-5		
4140Y3			1-4		
6102Y2	27Q	5365-99-4117614	1-12A	C	
750060114	27QA	5330-99-9428417	1-6A	C	

DETAILED PARTS LIST

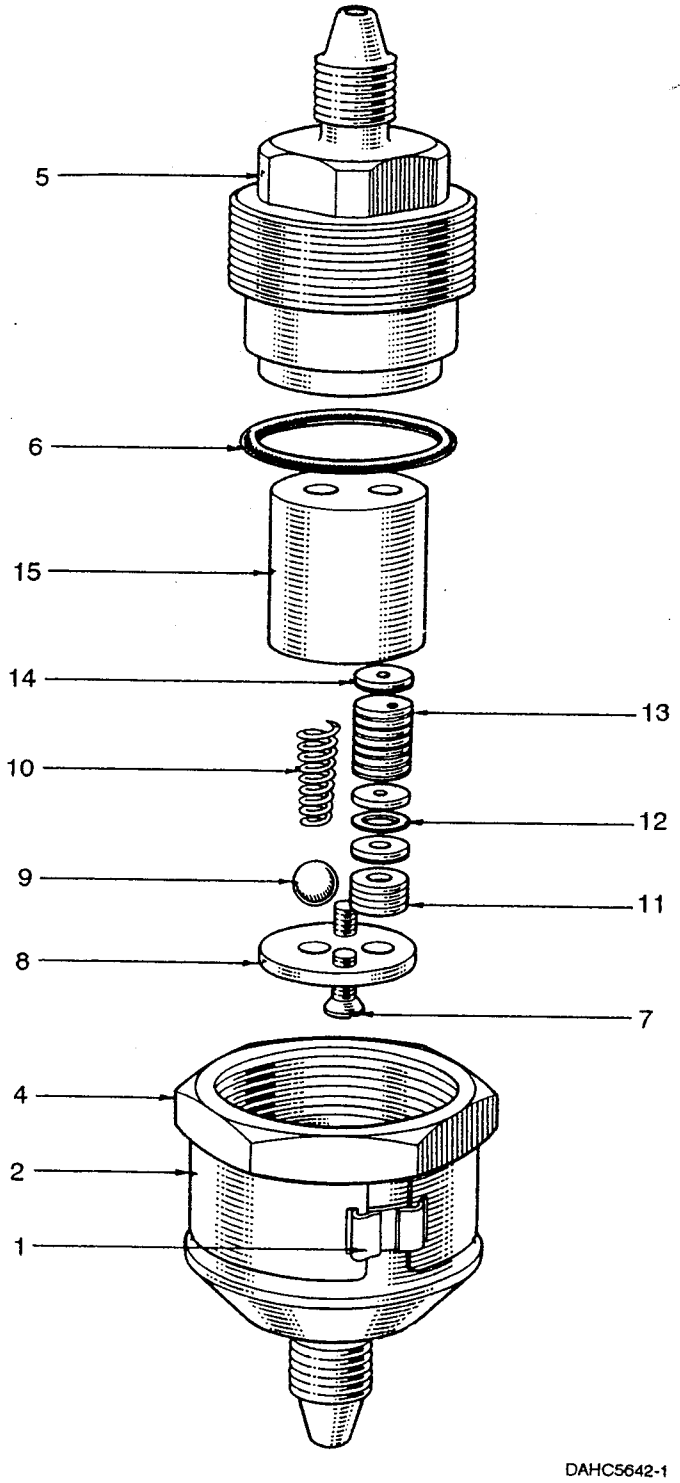

Fig 1 One-way restrictor valve

ONE-WAY RESTRICTOR VALVE

Fig/ Index No	Part No	1 2 3 4 5 6 Nomenclature	Mnfrs NATO Code	Usage Code	Units per Assy
1	D4140Y	Valve, one-way restrictor (Mod AC3527)		A	RF
1+	D6102Y	Valve, one-way restrictor		B	RF
-1	2000Y15	. Strap			1
-2	2000Y108	. Nameplate			1
-3+	D4140Y1	. Valve assembly, one-way restrictor		A	1
-3A+	D6102Y1	. Valve assembly, one-way restrictor		B	1
-4	4140Y3	. . Cap, end			1
-5	4140Y2	. . Body			1
-6	SP900-14 or	. . O-ring (Alternative)			1
-6A+	750060114	. . O-ring			1
-7	A33B8	. . Screw, c'sk head			2
-8	3204Y12	. . Plate, valve			1
-9	ND	. . Ball, 7/32 in dia			1
-10	127Y5	. . Spring			1
-11	133Y3	. . Washer, backing			6 (max)
-12	158Y3	. . Spacer		A	12 (max)
-12A+	6102Y2	. . Spacer		B	A/R
-13	133Y6	. . Washer, eccentric		A	4
-13A+	133Y6	. . Washer, eccentric		B	6
-14	133Y4	. . Washer, concentric		A	5
-14A+	133Y4	. . Washer, concentric		B	7

+ Item not illustrated

ONE-WAY RESTRICTOR VALVE

Fig/ Index No	Part No	1 2 3 4 5 6 Nomenclature	Mnfrs NATO Code	Usage Code	Units per Assy
1-15	3204Y6	. . Housing, restrictor			1
-16+	AGS596A	. Cap, dust (Storage and transit)			2
-17+	SP880A	. Washer, sealing (Storage and transit)		B	2

+ Item not illustrated