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NON-RETURN VALVE
DOWTY AEROSPACE HYDRAULICS
Part No D5212Y

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

BY COMMAND OF THE DEFENCE COUNCIL

Ministry of Defence

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the channel prescribed for the purpose in:**

AP100B-01, Order 0504 (RAF)

CONTENTS

GENERAL

CONTENTS

Leading particulars

1 The leading particulars of this unit are as follows:

1.1	System fluid	Oil OM15 (DTD585)
1.2	Connections	0.125 in BSP

Modification state

2 The information in this publication includes all appropriate modifications up to and including issue 3.

Introduction

3 The non-return valve permits passage of hydraulic fluid in one direction only.

Constructional description (Fig 1)

4 The unit consists of a body and a union, each formed with a pipe connection at the outer end, screwed together to house a ball valve assembly.

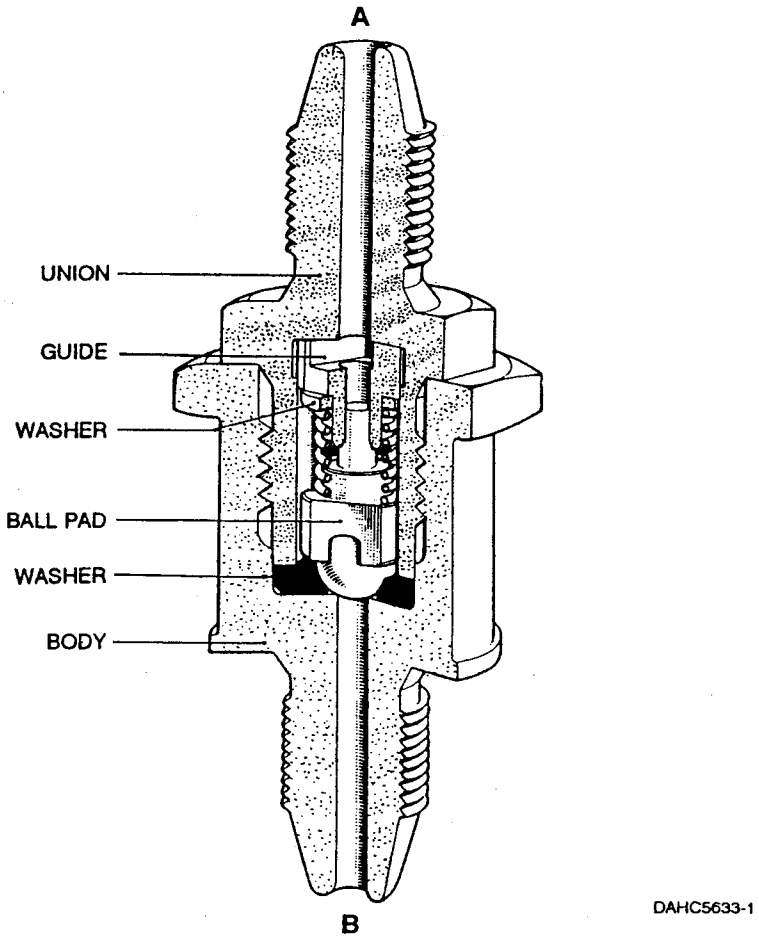


Fig 1 Non-return valve

5 The valve assembly comprises a rubber washer in the bore of the body providing a seat for the ball and also a seal at the joint of the body and union. The ball is backed by a fluted ball pad, the stem of which slides in a guide. A spring, fitted between the ball pad and the guide, loads the ball onto its seat and a washer may be fitted between the spring and the guide to obtain the correct valve lifting pressure.

Functional description (Fig 1)

6 Fluid entering the non-return valve at B lifts the ball off the seat, lifting the ball pad against the spring, and flows past the guide to emerge from the non-return valve at A. Pressure applied at A holds the ball on its seat, preventing any fluid flow through B.

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 Discard the sealing washer on removal from the unit.

9.1 Unscrew the union from the body.

9.2 Withdraw the guide, the washer, the spring, the ball pad and the ball. Remove the sealing washer from the body.

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 500Y372

13.1 Number of working coils: 9

13.2 Wire size: 0.0136 in

13.3 Free length: 0.65 to 0.68 in

13.4 Check length: 0.54 to 0.56 in

13.5 Load at check length: 0.05 to 0.07 lbf

Assembling

14 Lightly lubricate the sealing washer and screw threads with clean oil OM15 before assembling into the unit.

14.1 Insert the sealing washer with the chamfered seat facing outermost.

14.2 Position the washer (if previously fitted) and the spring over the guide and locate the stem of the ball pad in the guide. Insert the assembly into the union with the guide leading.

14.3 Locate the ball in the ball pad, ensuring that the ball is a free fit in the ball pad. Screw the union, with the ball valve assembly, tightly into the body.

14.4 Check that the minimum lift of the ball is 0.06 in. This may be achieved by using a bar of suitable diameter or a depth gauge inserted in the bore of the body connection.

14.5 After satisfactory testing, wirelock the body and the union 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	Testing
-	Compressed nitrogen supply	Testing
-	Blanking cap (0.125 in BSP)	Testing
-	Reservoir of fluid OM15	Testing

Testing the unit (Fig 1)

16 Ensure that 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 test rig supply line to the body connection and gradually apply pressure. Fluid should flow freely from the union connection at a pressure of between 5 to 10 lbf/in^2. If necessary, one washer only is to be fitted between the spring and the guide to obtain the correct ball lifting pressure.

16.2 Blank off the union, gradually apply a pressure of 300 lbf/in^2 and then increase it to 6600 lbf/in^2. Leakage must not occur.

16.3 Slacken the blanking adapter to release the pressure and then remove the adapter.

16.4 Operate the rig to pass a full flow of fluid through the valve and then cut off the supply fluid to allow the ball to reseat.

16.5 Repeat sub-paragraph 16.4 at least 10 times.

16.6 Disconnect the supply line from the body and connect it to the union.

16.7 Gradually apply a pressure of 10 lbf/in^2 and check for leakage.

16.8 Slowly raise the pressure of 300 lbf/in^2 and then increase it to 6600 lbf/in^2. Leakage must not occur.

16.9 Release the pressure, disconnect the supply line and drain the fluid from the valve.

16.10 Connect the nitrogen supply line to the union, gradually apply a pressure of 300 lbf/in^2 and then increase it to 2000 lbf/in^2. Leakage from the body is only permissible at pressure below 25 lbf/in^2.

16.11 Release the pressure and disconnect the nitrogen supply line.

16.12 With the reservoir of fluid vented to atmosphere, connect it to the union by means of a suitable pipe to allow a head of fluid 18 to 24 in above the centre line of the valve in the horizontal position.

16.13 Lift the ball valve from its seat with a suitable rod inserted through the bore of the body connection. Fluid should flow from the body, expelling all air from the unit. Allow the ball valve to reseat by quickly withdrawing the rod. Leakage from the body must not occur.

16.14 Repeat sub-paragraph 16.13 at least 3 times.

16.15 Disconnect the reservoir from the unit.

PARTS CATALOGUE AND RELATED INFORMATION

FOR

NON-RETURN VALVE

DOWTY AEROSPACE HYDRAULICS - CHELTENHAM

Part No D5212Y

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
AC3359	*										

* 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

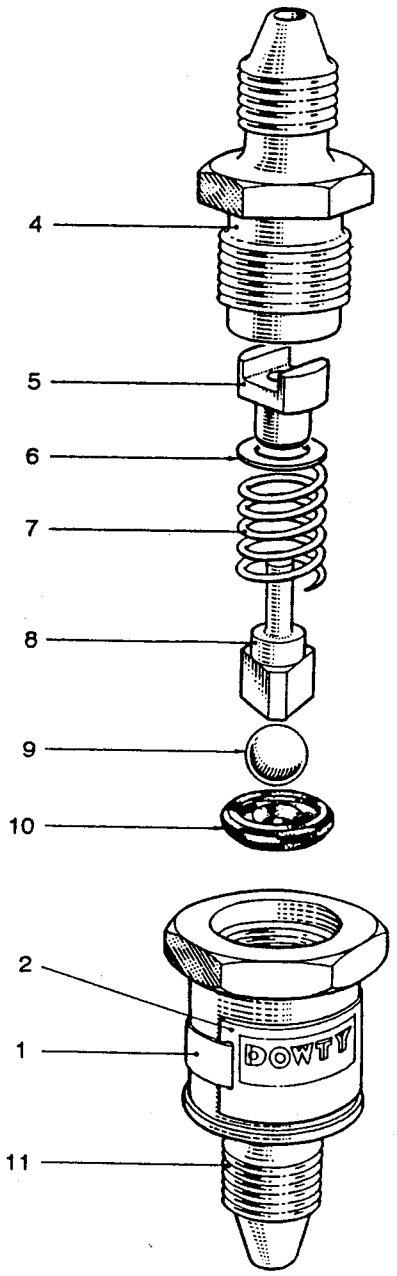
Usage code

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, 7/32 IN DIA			1-9		
AGS596A	28N	5340-99-9128964	1-12	C	
D5210Y10	27Q	4730-99-4117434	1-4	C	
D5210Y9	27Q	4820-99-4117435	1-11	C	
D5212Y	27QM	4820-99-4117441	1	P	
D5212Y2			1-8		
D5212Y3			1-5		
D5212Y4			1-6		
SP880A	27QA	5330-99-1029282	1-13	C	
2000Y107			1-2		
2000Y15		5340-99-4170071	1-1	C	
500Y372	27Q	5360-99-4117437	1-7	C	
5210Y6	27Q	5310-99-4704632	1-10	C	
5212Y1			1-3		

DETAILED PARTS LIST



DAHC5634-1

Fig 1 Non-return valve

NON-RETURN VALVE

Fig/ Index No	Part No	1 2 3 4 5 6 Nomenclature	Mnfrs NATO Code	Usage Code	Units per Assy
1	D5212Y	Valve, non-return (Mod AC3359)			RF
-1	2000Y15	. Strap			1
-2	2000Y107	. Nameplate			1
-3+	5212Y1	. Non-return valve sub-assembly			1
-4	D5210Y10	. . Union			1
-5	D5212Y3	. . Guide			1
-6	D5212Y4	. . Washer			1
-7	500Y372	. . Spring			1
-8	D5212Y2	. . Pad, ball			1
-9	ND	. . Ball, 7/32 in dia			1
-10	5210Y6	. . Washer			1
-11	D5210Y9	. . Body			1
-12+	AGS596A	. Cap, dust (Storage and transit)			2
-13+	SP880A	. Washer, sealing (Storage and transit)			2

+ Item not illustrated