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MWS

AP 105B-0738-13

October 91
(Superseding AP 105B-0738-16 and
Superseding Relevant Pages of
AP 4515B Vol 3 Pt 1 Sect 2 Chap 5)

THERMAL RELIEF VALVE DOWTY AEROSPACE GLOUCESTER Part Nos C4603YMKE and C8697YMKA

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

BY COMMAND OF THE DEFENCE COUNCIL

Ministry of Defence

Sponsored for use in the

ROYAL AIR FORCE BY D Air Eng (RAF)

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Publications authority: ATP/MOD(PE)

Service users should send their comments through the channel prescribed for the purpose in:

AP100B-01, Order 0504 (RAF)

CONTENTS

WARNINGS

CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH

MAKE SURE YOU KNOW THE SAFETY PRECAUTIONS AND FIRST AID INSTRUCTIONS BEFORE YOU USE A HAZARDOUS SUBSTANCE

READ THE LABEL ON THE CONTAINER IN WHICH THE SUBSTANCE IS SUPPLIED

READ THE DATA SHEET APPLICABLE TO THE SUBSTANCE

OBEY THE LOCAL ORDERS AND REGULATIONS

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

CONTENTS

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 relieves pressure exceeding a predetermined level caused by thermal expansion in hydraulic systems. A basic unit is described and illustrated and variants are given in the annexes.

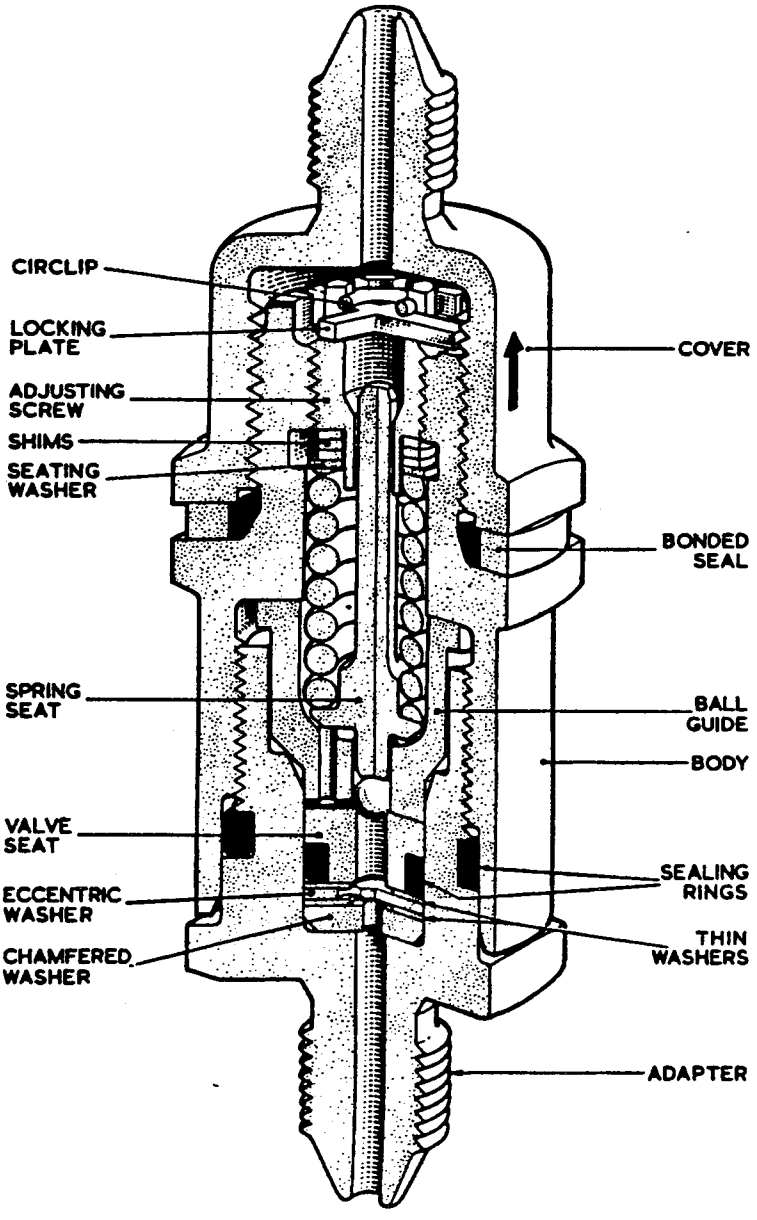

Fig 1 Thermal relief valve

Constructional description

4 A valve assembly consisting of a sealed valve seat, a ball valve, a ball guide and a stemmed spring seat is housed within a body and a sealed union. Washers retainined by the valve seat in the union comprise a chamfered washer and two thin concentric washers, interposed by an eccentric washer to form a restrictor pack. An adjusting screw, which receives the stem of the spring seat, is screwed into the end of the body to compress a spring located between the spring seat and a seating washer. The seating washer is backed by shims and fitted over the spigot of the adjusting screw to facilitate adjustment of the spring pressure. The screw is locked by a plate retained by a circlip. A cover, marked with an arrow to indicate direction of flow, is secured over the body against a bonded seal.

Functional description

5 At a predetermined pressure, the spring resistance is overcome and fluid at A will unseat the ball valve and flow through the valve and out through B. When sufficient fluid has escaped to reduce the pressure within the desired limits, the spring reseats the ball and flow ceases. The restrictor pack assists in obtaining the correct reseating characteristics.

MAINTENANCE

Special tools and equipment

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

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

Safety and servicing notes

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

ROUTINE BAY SERVICING

Dismantling (Fig 1)

WARNINGS

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

8 Discard the O-ring seals and bonded seal on removal from the unit.

8.1 Remove the locking wire, unscrew the union from the body and withdraw the valve assembly together with the sealing ring. Remove the O-ring from the union.

8.2 Dismantle the assembly by removing the shims, seating washer, spring , spring seat, valve guide, ball valve, valve seat and O-ring, the eccentric washer and the two thin washers and the chamfered washer. Remove the O-ring from the valve seat.

8.3 Remove the cover and the bonded seal.

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 PX-1. PREVENTATIVE PX-1 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. ◀

9 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

10 Visually examine all parts for damage and corrosion.

Superficial damage

11 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:

11.1 Not exceeding 0.500 in long.

11.2 Not exceeding 0.010 in deep.

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

NOTE

Burrs are to 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

12 Spring 500Y408

12.1 Number of working coils: 7.

12.2 Wire size: 0.080 in (14 SWG).

12.3 Free length: 0.77 to 0.80 in.

12.4 Check length: 0.68 in.

12.5 Load at check length: 31.5 to 41.5 lbf.

Assembling

13 Lightly lubricate the O-ring seals with clean oil OM15 before assembling into the unit.

13.1 Using assembly post ST1666, fit an O-ring to the union.

13.2 Fit an O-ring to the valve seat.

13.3 Position the chamfered washer with the chamfered face leading, into the union, followed by a thin washer, the eccentric washer, a second thin washer and the valve seat with the O-ring leading.

13.4 Locate the ball and ball guide on the valve seat and insert the spring seat and the spring.

13.5 Screw the adjusting screw into the body and fit the shims and the seating washer over the spigot of the screw which protrudes into the body.

NOTE

The number of shims will be determined during testing.

13.6 Screw the union and the valve assembly into the body, ensuring that the stem of the spring seat is located through the spigot of the adjusting screw. Do not screw the union tightly in the body. Carry out the test procedures as detailed in paragraphs 15 to 15.9.

13.7 Fit the locking plate to the slots of the body and the adjusting screw and secure it with the circlip. The tongues of the locking plate must be an easy fit and not protrude above the slots. The circlip must bottom in the groove and enter without undue force being applied.

13.8 Fit a bonded seal on the body and screw on the cover. Tighten the cover, but do not use excessive force.

13.9 After final assembly and test, wirelock the cover, body and union together.

TESTING

Special tools and test equipment

14 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

Testing the unit (Fig 1)

15 Ensure the unit is hydraulically full and bled free of air. Using the equipment specified in paragraph 14, carry out the following test procedure:

15.1 Connect a hand pump supply with a pressure gauge to connection A.

15.2 Unscrew the body and union by ¼ to ½ turn.

15.3 Gradually apply a pressure of 2000 lbf/in^2 and screw in the adjusting screw until this pressure can be held without leakage.

15.4 Tighten the body and union together, but do not use excessive force. The end of the body and the hexagon of the union must not butt together. Release the pressure.

15.5 Slowly apply a pressure of 300 lbf/in^2 and gradually increase it to 4500 lbf/in^2. Screw in the adjusting screw to counteract the rising pressure. Leakage must not occur. Release the pressure.

NOTE

The number of shims may be adjusted to a maximum of 2 to give the correct operating pressure.

15.6 Vary the adjusting screw setting to give an operating pressure of between 3350 and 3550 lbf/in^2. Operate the hand pump rapidly 20 times and finally set the adjusting screw to give an operating pressure of between 3350 and 3550 lbf/in^2.

15.7 Check that the locking plate can be correctly fitted and that the protrusion of the adjusting screw does not exceed 0.090 in. During final adjustment it is necessary to only just move the ball from the seat.

15.8 Operate the unit and check that the reseating pressure is not less than 3100 lbf/in^2.

15.9 Release the pressure and remove the unit from the test rig. Complete the assembling procedure detailed in paragraphs 13.7 and 13.8.

15.10 Connect a hand pump supply with a gauge to connection B with a branch line to connection A.

15.11 Raise the pressure to both connections to 200 lbf/in^2 then gradually increase to 750 lbf/in^2. Leakage must not occur. Release the pressure and remove the unit from the test rig.

15.12 Alternatively, connect a hand pump supply and gauge to each connection. Apply a pressure of 750 lbf/in^2 to connection A and slowly raise the pressure at connection B to 200 lbf/in^2. Gradually increase the pressure at connection B to 750 lbf/in^2. Leakage must not occur. Release the pressure at connection B then connection A. Remove the unit from the test rig.

Annex A

THERMAL RELIEF VALVE

DOWTY AEROSPACE GLOUCESTER

Part No C4603YMKE

Leading particulars

1 Leading particulars of this unit are as follows:

1.1	System fluid	Oil OM15
1.2	Operating pressure	3350 to 3550 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 9.

Introduction

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

Annex B

THERMAL RELIEF VALVE

DOWTY AEROSPACE GLOUCESTER

Part No C8697YMKA

Leading particulars

1 Leading particulars of this unit are as follows:

1.1	System fluid	Oil OM15
1.2	Operating pressure	3350 to 3550 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 9.

Introduction

3 This unit is similar to that described and illustrated in the general text with the exception of the test procedures.

Testing the unit

4 Test the unit in accordance with Para 15.1 to 15.9 of the general text, then substitute the following:

4.1 Connect a hand pump supply with a gauge to connection B and slowly apply a pressure of 200 lbf/in^2. Gradually increase the pressure to 4500 lbf/in^2. Leakage must not occur.

4.2 Release the pressure and disconnect the supply from connection B.

4.3 Operate the unit and check that the operating pressure and reseating pressure are within limits. If the pressures are not within limits, repeat Para 15.6 to 15.8 of the general text.

4.4 Release the pressure and remove the unit from the test rig.

PARTS CATALOGUES AND RELATED INFORMATION

FOR

THERMAL RELIEF VALVE

DOWTY AEROSPACE GLOUCESTER

Part Nos C4603YMKE and C8697YMKA

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 CATALOGUES AND RELATED INFORMATION (TOPIC 3)

PREFACE

Demands

1 Requirements for demands are:

1.1 The demand must quote the appropriate Vocabulary Section and Reference/Stock Number for each item. Unreferenced parts are not normally provisioned as spares and demands for such items must quote the Vocabulary Section, 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 to 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, e.g. (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 AP830 Volume 1 or BR4.

Condition of supply (Interchangeability Code)

6 Condition of Supply 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 Nomenclature. Modifications incorporated in the catalogue are listed in the Modification Record.

Usage code

9 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	Vocab Sect	NATO Stock No Ref No or LM	Fig/ Index No
BALL			1-10
		₮103505	
AGS1186C	28F	5330-99-1358971	1-17A
AGS596A	28N	5340-99-9128964	1-22
C4603Y1MKE			1-2
C4603YMKE	27QM	1650-99-4143197	1-
C8697Y1MKA			1-2A
C8697YMKA	27QM	4820-99-4674311	1-
SP815-6			1-17
2000Y46			1-1
3194Y25	27Q	5365-99-4140188	1-18
4603Y10	27Q	4820-99-4117740	1-8
4603Y11	27Q	5310-99-4117745	1-6
4603Y12	27Q	5310-99-4117746	1-5
4603Y13	27Q	4820-99-4117738	1-20
4603Y14	27Q	4820-99-4117735	1-19
4603Y15	27Q	4730-99-4117733	1-16
4603Y3	27Q	4730-99-4117729	1-3
4603Y4	27Q	5310-99-4117742	1-15
4603Y5	27Q	5365-99-4679195	1-13
4603Y6	27Q	4820-99-4117744	1-14
4603Y7	27Q	4820-99-4117739	1-11
4603Y8	27Q	4820-99-4117734	1-9
4603Y9	27Q	4820-99-4117731	1-21
500Y408	27Q	5360-99-4117741	1-7
750060105 SP900-5 or 100-010-1911 - 27QA 9439762. } DON'T HUNTER			1-12
750060112 SP900-12 or 100-114-1911 - 27QA 9439736. } PAGE 47.			1-4
		PLATE 21.	
8697Y2			1-21A
8697Y4			1-16A

DETAILED PARTS LIST

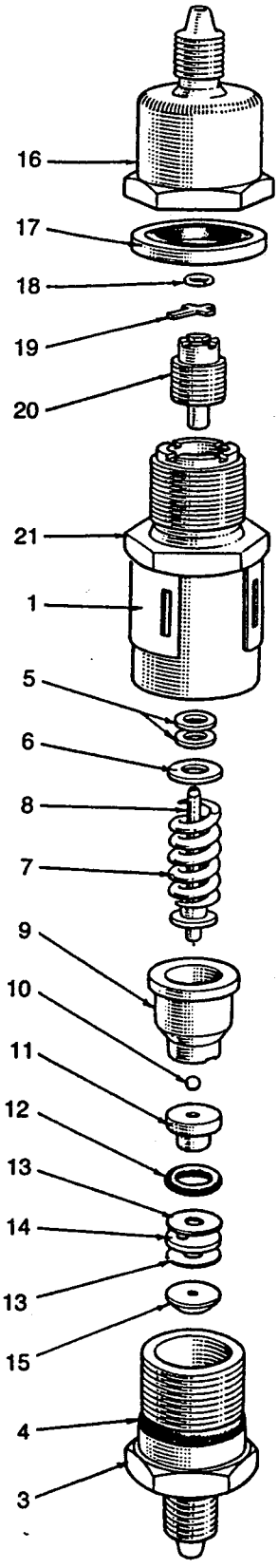

Fig 1 Thermal relief valve

THERMAL RELIEF VALVE

Fig/ Index No	Part No	1 2 3 4 5 6 Nomenclature	Usage Code	Units per Assy
1	C4603YMKE	Valve, relief, thermal	A	RF
1+	C8697YMKA	Valve, relief, thermal	B	RF
-1	2000Y46	. Nameplate		1
-2+	C4603Y1MKE	. Valve assembly, relief, thermal	A	1
-2A+	C8697Y1MKA	. Valve assembly, relief, thermal	B	1
-3	4603Y3	. . Union		1
-4	750060112	. . Seal, O-ring		1
-5	4603Y12	. . Washer, shim		AR (2 max)
-6	4603Y11	. . Washer, seating		1
-7	500Y408	. . Spring		1
-8	4603Y10	. . Seat, spring		1
-9	4603Y8	. . Guide, ball		1
-10	ND	. . Ball, 1/8 in dia		1
-11	4603Y7	. . Seat, valve		1
-12	750060105	. . Seal, O-ring		1
-13	4603Y5	. . Washer, packing		2
-14	4603Y6	. . Washer, eccentric		1
-15	4603Y4	. . Washer, seating		1
-16	4603Y15	. . Cover	A	1
-16A+	8697Y4	. . Cover	B	1
-17	SP815-6	. . Seal, bonded	A	1
-17A+	AGS1186C	. . Seal, bonded	B	1
-18	3194Y25	. . Circlip		1

+ Item not illustrated

THERMAL RELIEF VALVE

Fig/ Index No	Part No	1 2 3 4 5 6 Nomenclature	Usage Code	Units per Assy
1-19	4603Y14	. . Plate, locking		1
-20	4603Y13	. . Screw, adjusting		1
-21	4603Y9	. . Body, valve	A	1
-21A+	8697Y2	. . Body, valve	B	1
-22+	AGS596A	. Cap, dust (Storage and transit)		2

+ Item not illustrated

BDC 26838 8350571 NOV 91 2630