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ACCUMULATOR DOWTY AEROSPACE HYDRAULICS Part No D8691Y and 08692YA05

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

BY COMMAND OF THE DEFENCE COUNCIL

Ministry of Defence

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AP100B-01, Order 0504 (RAF)

AL2 FEB 97

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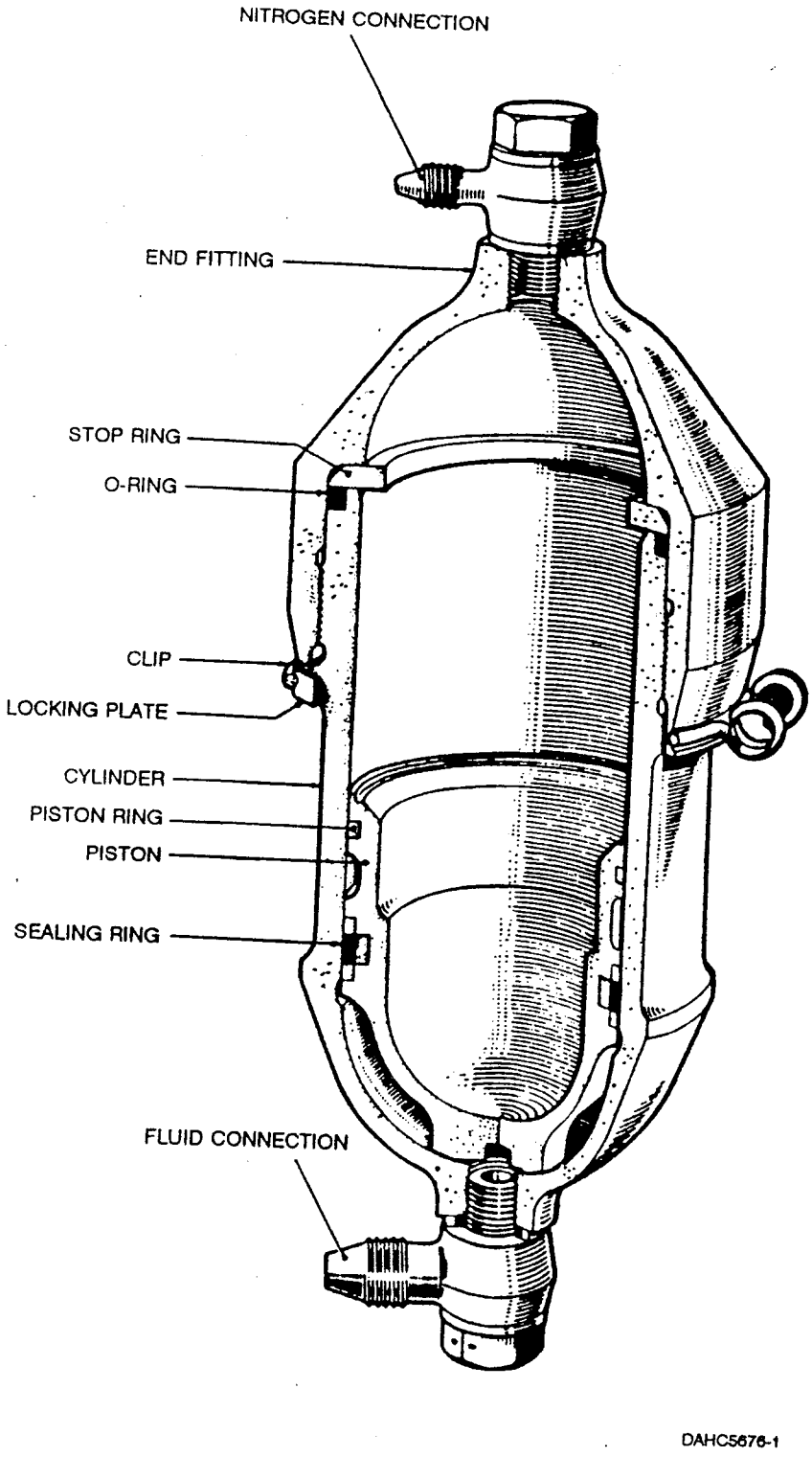

Fig 1 Accumulator

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 The accumulator stores an emergency supply of fluid which is immediately available in the event of pump failure and also compensates the supply pressure, which tends to drop on the selection of a service. The unit consists of a closed cylinder containing a piston with a fluid chamber on one side and a compressed nitrogen chamber on the other.

Constructional description (Fig 1 and 2)

4 The domed piston is fitted with a piston ring and a sealing ring with supporting piston rings. The closed end of the cylinder limits the travel of the piston in one direction and the travel in the opposite direction is limited by a stop ring, which together with an O-ring is retained by an end fitting. The end fitting is screwed over the cylinder and locked with a right-angled locking plate secured with a clip and a screw.

5 The nitrogen and fluid connections each consist of a banjo union and bonded seals secured with a banjo bolt to the end fitting and cylinder respectively. The banjo for the fluid connection has an additional threaded boss to accommodate a bleed screw.

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
ST1213	Spanner (Qty 2)	Dismantling/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

7 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)

8 Discard all forms of sealing rings after removal from the unit.

8.1 Remove the banjo bolts, bonded seals, special banjo and the banjo. Remove the bleed screw from the banjo.

8.2 Unscrew the nut and remove the washer, screw and a second washer. Remove the clip and locking plate.

8.3 Using the spanners ST1213, unscrew the end fitting from the cylinder. Remove the stop ring and the O-ring.

8.4 Withdraw the piston and remove the piston rings and sealing ring.

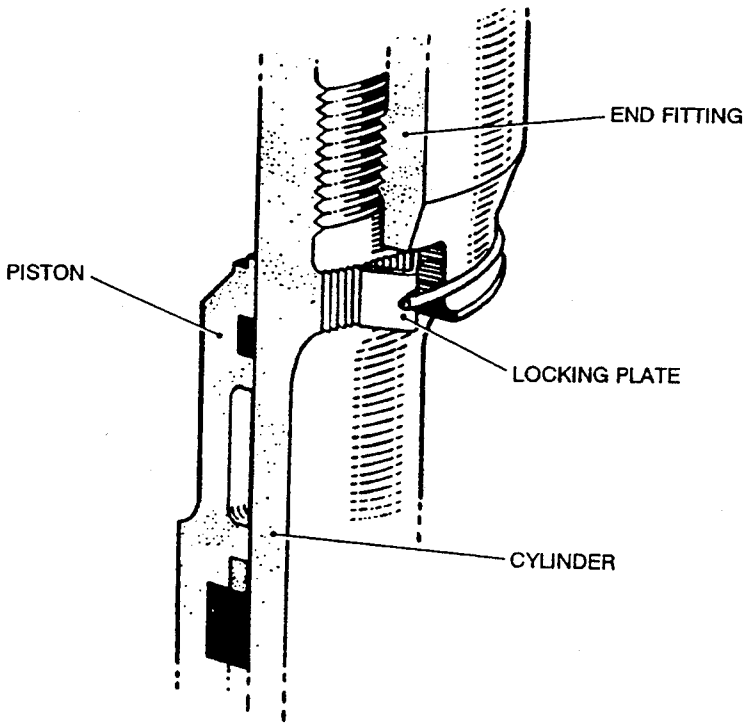

Fig 2 Right-angled locking plate in position

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. Check parts for permissible wear in accordance with fits and clearances, paragraph 12.

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 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.

Fits and clearances

12 Check that the dimensions are within the specified limits.

TABLE 1 FITS, CLEARANCES AND REPAIR TOLERANCES

Ref No on Fig 3	Parts and Description	Dimension New	Permissible Worn Dimension		Permissible Clearance		Remarks
			Interchangeable Assembly	Selective Assembly	New	Worn	
1	SEALING RING ON PISTON IN CYLINDER						
	Cylinder bore i/d	2.505 / 2.500	2.510	2.510	-0.032 / -0.048	-0.027	
	Sealing ring on piston o/d	2.548 / 2.537	-	-			

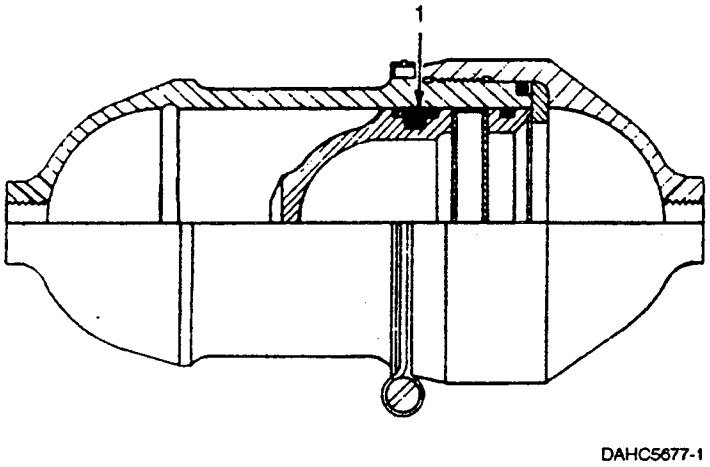

Fig 3 Fits and clearances

Assembling (Fig 1 and 2)

13 Lightly lubricate all bonded seals, O-rings and sealing rings with clean oil OM15 before assembly into the unit.

13.1 Assemble the sealing ring, the supporting piston rings and the single piston ring to the piston.

NOTE

If new piston rings are fitted, they are to be gapped 0.009 to 0.012 in on assembly and the sharp edges at the gap, on the flat faces only, to be removed by a maximum radius of 1/64 in.

13.2 Insert the piston into the cylinder with the domed end leading.

13.3 Assemble the O-ring to the cylinder and locate the stop ring in the end fitting with the chamfered edge leading. Screw the end fitting tightly over the cylinder using the spanners ST1213.

13.4 Engage the locking plate with serrations of the cylinder flange and retain it with the wire clip secured by the screw, two washers and the nut.

13.5 Put a bonded seal on each side of the banjo unions and secure the unions to the end fitting and the cylinder with the banjo bolts. The smaller of the banjo unions is the nitrogen connection and is to be secured to the end fitting.

13.6 After satisfactory testing, wirelock the banjo bolts to the end fitting and the cylinder.

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 (with power pump)	Apply hydraulic pressure
-	Turner inflation kit	
-	Compressed nitrogen supply	

Testing the unit (Fig 1 and 2)

15 Where appropriate, the unit must be hydraulically full and bled free of air before commencing the tests.

15.1 Measure the diameter of the cylinder at two positions at 90 deg to each other on a section approximately midway between the two ends and record the dimensions.

15.2 Connect the supply line and a branched supply line from the static test rig to the nitrogen connection and the fluid connection respectively. Gradually apply a simultaneous pressure up to 4950 lbf/in^2. Leakage must not occur. Release the pressure and disconnect the branched supply line.

15.3 With the fluid connection open, apply a gradually increasing pressure up to 4125 lbf/in^2 to the nitrogen connection. External leakage must not occur. Release the pressure.

15.4 Transfer the test rig supply line to the fluid connection and, with the nitrogen connection open, apply a gradually increasing pressure up to 3700 lbf/in^2. External leakage must not occur. Release the pressure.

15.5 Check the cylinder diameter at the same positions as in paragraph 15.1 and compare the dimensions with those previously recorded. Increase in the diameter dimensions must not occur.

15.6 Connect the nitrogen supply line to the nitrogen connection and, with the fluid end open, gradually apply pressure up to 1650 lbf/in^2. Immerse the unit in fluid with the fluid end uppermost. Leakage of air from the fluid end must not occur. Remove the unit from the fluid.

15.7 Connect the supply line from the static test rig to the fluid connection. With the nitrogen pressure at 1650 lbf/in^2, gradually apply hydraulic pressure to 3300 lbf/in^2 at the fluid connection. Immerse the unit in fluid with the nitrogen connection uppermost. Nitrogen leakage from the nitrogen end must not occur. Remove the unit from the fluid, release the fluid pressure and disconnect the fluid supply line.

15.8 Connect a supply line from the power test rig to the fluid connection and, with the nitrogen pressure set at 1650 lbf/in^2, pressure cycle the accumulator ten times by applying fluid pressure up to 3300 lbf/in^2 and releasing the fluid pressure until the inflation pressure is again reached. Leakage of nitrogen across the piston must not occur.

15.9 Release the pressures, disconnect the supply lines and drain the fluid from both ends of the accumulator.

Annex A

ACCUMULATOR

DOWTY AEROSPACE HYDRAULICS - CHELTENHAM

Part No D8691Y

Leading particulars

1 The leading particulars for this unit are as follows:

1.1	System fluid	Oil OM15
1.2	Connections:	
	Fluid	0.250 in BSP
	Nitrogen	0.125 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 identical to that described and illustrated in the general text.

Annex B

ACCUMULATOR

DOWTY AEROSPACE HYDRAULICS - CHELTENHAM

Part No 08692YA05

Leading particulars

1 The leading particulars for this unit are as follows:

1.1	System fluid	Oil OM15
1.2	Connections:	
	Fluid	0.250 in BSP
	Nitrogen	0.125 in BSP

Modification state

2 The information in this annex includes all appropriate modifications up to and including issue 17.

Introduction

3 This unit is similar to that described and illustrated in the general text. The cylinder, end fitting and piston have been subjected to an improved heat treatment application.

PARTS CATALOGUE AND RELATED INFORMATION

FOR

ACCUMULATOR

DOWTY AEROSPACE HYDRAULICS - CHELTENHAM

Part No D8691Y and 08692YA05

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
AC3960	*										
AC4246	*										

* 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
AGS1174	28F	4730-99-9128952	1-4	C	
AGS1186B	28F	5330-99-9428453	1-2	C	
AGS1213B	28F	4730-99-9143383	1-1	C	
AGS2001C1			1-9		
AGS245			1-11		
AGS596A	28N	5340-99-9128964	1-21	C	
AGS596B	28N	5340-99-9128965	1-23	C	
AS470C			1-10		
C3300Y1970			1-17		
C8307Y3			1-20		
D4133Y5			1-15		
D7524Y5B			1-5B		
D7524Y6B			1-5A		
D8307Y4			1-14		
D8691Y			1		
D8691Y1			1-8		
SP832-26	27Q	1650-99-4117982	1-19	C	
SP836-6	27Q	1650-99-4117980	1-18	C	
SP880A	27QA	5330-99-1029282	1-22	C	
SP880B	27QA	5310-99-9452626	1-24	C	
SP901-10	27QA	5330-99-4117981	1-16	C	
08692YA05	27QM	1650-99-4117993	1	P	
08692Y002			1-8A		
08692Y003	27Q	1650-99-4117976	1-20A	L	
08692Y004			1-14A		
08692Y005	27Q	1650-99-4117978	1-17A	C	
100029616			1-20B		
1644Y1	27Q	4730-99-4140192	1-3	C	
2000Y126	27Q	4820-99-4117984	1-7	C	
2000Y136	27Q	4820-99-4117985	1-6	C	
2791Y13	27Q	1650-99-4140199	1-13	C	
3653Y10	27Q	5340-99-4117975	1-12	C	
5825Y11MKB			1-5		
750060310			1-16A		

DETAILED PARTS LIST

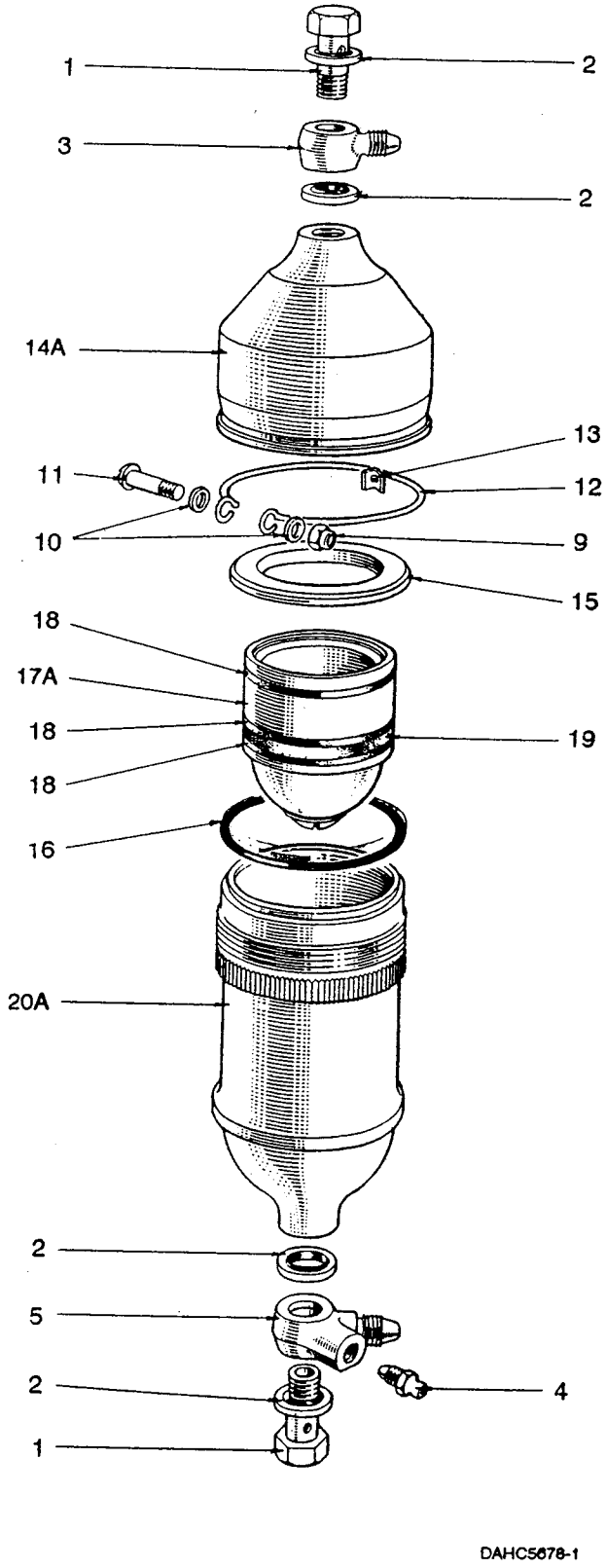

Fig 1 Accumulator

ACCUMULATOR

Fig/ Index No	Part No	1 2 3 4 5 6 Nomenclature	Mnfrs NATO Code	Usage Code	Units per Assy
1+	D8691Y	Accumulator (Pre Mod AC3960) (Mod AC4246)		A	RF
1	08692YA05	Accumulator (Mod AC3960)		B	RF
-1	AGS1213B	. Bolt, banjo			2
-2	AGS1186B	. Seal, bonded			4
-3	1644Y1	. Banjo, special			1
-4	AGS1174	. Screw, bleed			1
-5	5825Y11MKB	. Banjo			1
	or	(Alternative)			
-5A+	D7524Y6B	. Banjo, special			1
	or	(Alternative)			
-5B+	D7524Y5B	. Banjo			1
-6+	2000Y136	. Transfer			1
-7+	2000Y126	. Transfer			1
-8+	D8691Y1	. Accumulator assembly		A	1
-8A+	08692Y002	. Accumulator assembly		B	1
-9	AGS2001C1	. . Nut			1
-10	AS470C	. . Washer			2
-11	AGS245	. . Screw (2BA x 1.75 in)			1
-12	3653Y10	. . Clip			1
-13	2791Y13	. . Plate, locking			1
-14+	D8307Y4	. . Fitting, end		A	1
-14A	08692Y004	. . Fitting, end		B	1
-15	D4133Y5	. . Ring, stop			1
-16	SP901-10	. . O-ring			1
	or	(Alternative)			
-16A+	750060310	. . O-ring			1

+ Item not illustrated

ACCUMULATOR

Fig/ Index No	Part No	1 2 3 4 5 6 Nomenclature	Mnfrs NATO Code	Usage Code	Units per Assy
1-17+	C3300Y1970	. . Piston		A	1
17A	08692Y005	. . Piston		B	1
-18	SP836-6	. . Ring, piston			3
-19	SP832-26	. . Ring, sealing			1
-20+	C8307Y3 or	. . Cylinder (Alternative)		A	1
-20A	08692Y003	. . Cylinder		B	1
-20B+	100029616	. . Cylinder		B	1
-21+	AGS596A	. . Cap, dust (Storage and transit)			1
-22+	SP880A	. . Washer, sealing (Storage and transit)			1
-23+	AGS596B	. . Cap, dust (Storage and transit)			1
-24+	SP880B	. . Washer, sealing (Storage and transit)			1

+ Item not illustrated