AP 105B-0205-13

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HAWK
HARRIER

HIGH-PRESSURE HAND PUMPS TURNER TYPES 700-C-10904, 578-C-10889 AND KB 290K0327-000

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

BY COMMAND OF THE DEFENCE COUNCIL

Ministry of Defence

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CONTENTS

PREFACE

Amendments

Each page of this publication bears the date of issue. Subsequent amendments to the Initial Issue bear the date and number of the Amendment instruction sheet (AIS) with which they were issued. New or amended technical matter will be indicated by the use of triangles positioned outside the type area, thus ▸-------◂ or the words 'completely revised' below the title of each prime element where this has been so changed that amendment indicators will be inappropriate. Triangles will not normally be used where minor non-technical alterations have been made or where text has been moved to allow for inserted material.

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.

WARNING

TRICHLORETHANE. TRICHLORETHANE IS USED IN THE MAINTENANCE OF THIS EQUIPMENT. REFER TO JSP(F)395.

LEADING PARTICULARS

▶	Pump, Type 700-C 10904	Ref No. 27Z/1650-99-4619680
	Pump, Type 578-C-10889	Ref No. 27Z/1650-99-4619679
	Maximum working pressure	... ... 4000 lbf/in.^{2}
	Fluid OM-15, DTD 585	Ref No. 34B/9150-99-9100572 ◀

CHAPTER 1

DESCRIPTION

CONTENTS

DESCRIPTION

1. The high pressure hand pump (Fig 1) is operated by a hand lever. The pump body is integral with the cylinder and has two lugs which are fitted with Oilite bushes to receive the fulcrum pin of the rocker. The handle fits into the rocker and is secured by bolts, spring washers and nuts. Three bosses in the body are drilled to carry the bolts for mounting the pump. A tapped hole adjacent to the lugs forms the outlet connection.

NOTE

Pump 578-C-10889 is issued complete with a handle. Pump 700-C-10904 is issued without a handle. This is the only difference between the two pumps.

2. The inlet connection is in the valve housing. This is fitted with a sealing ring, screwed into the lower end of the pump body and secured by a locking plate and a setscrew. The inlet valve seats on a rubber seat and is spring-loaded to a valve guide fitted into the inlet connection. Radial slots in the valve guide permit the passage of fluid as the valve opens and the spring is retained on the valve stem by a washer and split pin.

3. A gland assembly, comprising a piston bush, gland ring and sealing ring, a guide washer and gland nut, retain the piston assembly in the cylinder. The gland nut is secured by a locking plate and setscrew.

4. The piston head has a deep groove which has holes on both sides for the passage of fluid, as shown in Fig 2. A rubber piston ring, which is an interference fit in the cylinder and a slack fit in the groove, acts as a transfer valve in addition to sealing the space between the piston head and the cylinder wall. A backing washer is fitted to prevent the rubber piston ring from extruding through the holes in the piston head when under high pressure.

5. The spherical end of the piston rod is held in the piston by the piston sleeve, which is screwed in and locked by the circlip. The other end of the piston rod is attached to the swivel pin by a square nut and split pin. The swivel pin is fitted into the Oilite bushes in the forked lugs of the rocker.

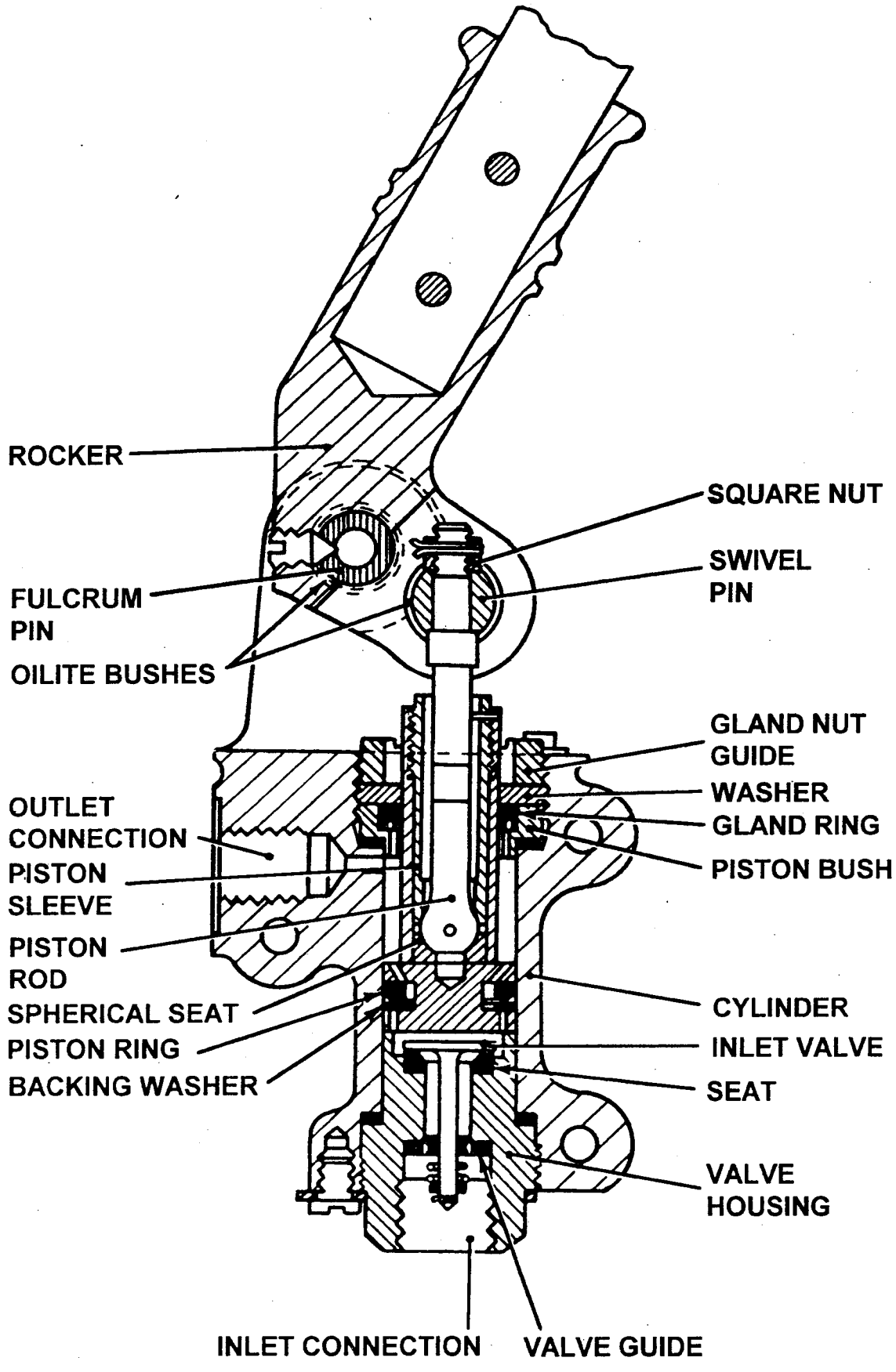

Fig 1 Type 578-C-10889 pump

OPERATING PRINCIPLES

6. The full forward and return movement of the handle equals one stroke of the pump (see Fig 2).

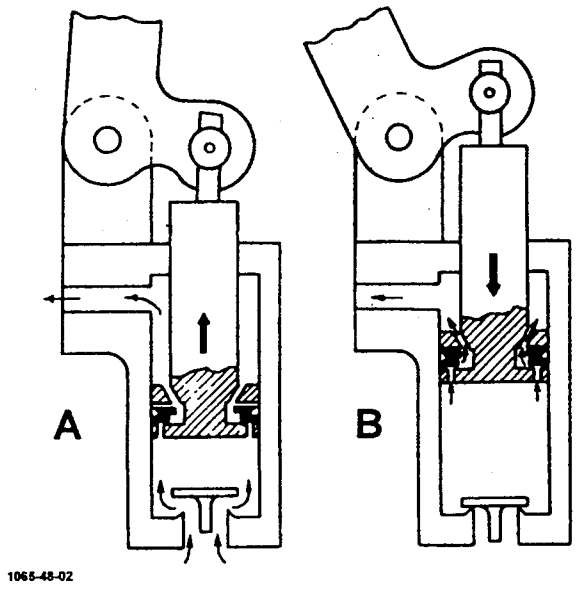

Fig 2 Functional diagram

7. With the forward movement of the handle, as shown at A, the piston is drawn up in the cylinder and the fluid is forced out at the outlet connection. The piston ring and the backing washer move to close the holes on the lower side of the groove, the inlet valve opens and fluid is drawn into the cylinder.

8. On the return movement of the handle, as shown at B, the inlet valve closes, the piston ring and the backing washer move back in the groove to allow fluid to pass through both sets of holes to the annular space above the piston and out at the outlet connection.

9. As the annular space above the piston is approximately half the volume of the space below the piston, an equal quantity of fluid is ejected at the outlet connection on each movement of the piston.

CHAPTER 2

MAINTENANCE

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Special tools and test equipment

1. The following table gives details of the special tools and test equipment required.

TABLE 1 SPECIAL TOOLS AND EQUIPMENT

Ref No.	Part No.	Description	Remarks
4G/4920-99-4420654	-	Rig, hydraulic test	-
27M/5120-99-4684360	AT18327	Spanner, special, gland nut	Alternative to HP234
27Z/5120-99-4619698	HP257	Clamp	Piston
27Z/5129-99-4619693	HP1119	Depressor, spring	Relief valve
27Z/5120-99-4619704	HP1148	Handle, lapping	Relief valve into housing
27Z/5120-99-4619699	HP234	Spanner, special	Piston gland nut
27Z/5120-99-4619715	HP1221	Spanner, special	Sleeve
27Z/5120-99-4619696	HP1142	Tool, assembly	Piston ring
27Z/5120-99-4619714	HP224	Tool, assembly	Piston gland
27Z/5120-99-4619697	HP225/1	Tool, assembly	Piston gland
27Z/5110-99-4619702	HP253	Tool, assembly	Valve seat

Dismantling

2. (1) Remove the screw and the locking plate and screw out the inlet valve assembly, then remove the sealing ring.

(2) Using spring depressor HP1119, compress the valve spring, withdraw the split pin and remove the washer, spring and valve guide from the valve stem. Remove the valve from the valve housing, then remove the valve seat and ensure that the housing is not damaged.

(3) Remove the screw and the locking plate and, using spanner HP234, unscrew the gland nut.

(4) Remove the two circlips and the grubscrew, drive out the fulcrum pin and, by pulling on the rocker, ease the piston and gland components out of the cylinder.

(5) Position the piston in clamps HP257, held in a vice. Remove the circlip. Using spanner HP1221, screw out the sleeve and pull the piston rod out of the piston. Slide the gland nut, guide washer, piston bush, sealing ring and gland ring off the piston. Remove the spherical seat, the piston ring and the backing washer.

(6) Remove the split pin from the nut, hold the rocker and, using a tommy bar to engage the hole in the spherical end of the rod, screw out the piston rod. Slide the sleeve from the piston rod and remove the swivel pin from the rocker.

Cleaning and examining

WARNING

TRICHLORETHANE. TRICHLORETHANE IS USED IN THE MAINTENANCE OF THIS EQUIPMENT. REFER TO THE TRICHLORETHANE WARNING IN THE PRELIMINARY PAGES OF THIS PUBLICATION.

3. After dismantling, all parts are to be thoroughly cleaned by washing in trichloroethane and examined for serviceability. Defective parts must be repaired or renewed before reassembling the pump. All rubber seals and the backing washer are to be renewed before reassembling. See Table 2 for permissible worn limits.

Repairs

4. (1) External dents or abrasions (Ref 1, Fig 1) 0.020 in. in depth may be neglected provided that the internal dimensions are not affected.

(2) Slight surface defects in the cylinder bore (Ref 2, Fig 1) may be removed by polishing, provided that the diameter of the bore is not increased beyond the permissible worn dimension.

(3) Scores in the pistons which are not deeper than 0.002 in. may be stoned out.

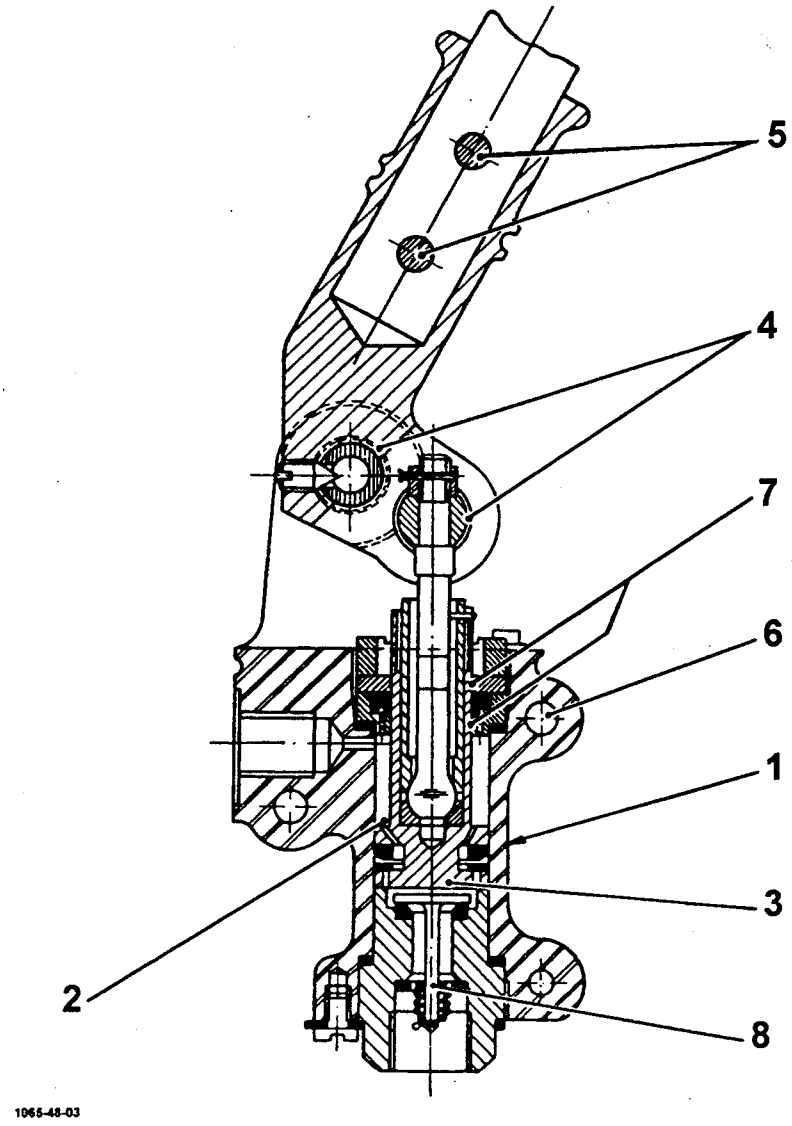

Fig 1 Key diagram for repairs, fits and clearances

(4) If the bushes (Ref 4, Fig 1) are loose in their holes, open out the holes to 0.6882 - 0.6870 in. countersink both sides, 0.030 in. x 45° and press in new oversize bushes 578-E-23502.

(5) Damage to the two 3/16 in. diameter bolt holes in the rocker arm (Ref 5, Fig 1) may be remedied by drilling the two mating parts together 1/4 in. diameter and fitting 1/4 in. diameter bolts.

(6) Any damage to the three fixing holes (Ref 6, Fig 1) can be remedied as follows: Open up the three 17/64 in. diameter holes to 0.3286 - 0.3276 in. diameter, drive in two bushes 76-D-1238, one from each side of the body, until they are flush.

Assembling

5. To assembly the pump:-

(1) Using valve seat assembly tool HP253, press the rubber valve seat into its housing, with the chamfered edge of the seat projecting above the housing.

(2) Position the valve in the housing and fit the guide, spring and washer. Using spring depressor HP1119, compress spring and secure the assembly by fitting a split pin.

(3) Position the sealing ring on to the shoulder of the valve housing and, using a standard spanner, screw the inlet valve assembly into the lower end of the cylinder. Fit the locking plate and the setscrew.

NOTE

The spherical joint must be lapped in if a new spherical seat, piston rod, or sleeve is to be fitted. Position the piston in clamps HP257 held in a vice, then insert the spherical seat into the bore of the piston. Smear the spherical end of the piston rod with fine grinding paste and position it on the seat. Using spanner HP1121, screw in the piston sleeve and use lapping handle HP1148 to lap the end of the piston rod into its housing. Separate the parts, remove the piston from the clamps and extract the spherical seat. Ensure that all traces of the grinding paste have been removed before assembly.

(4) Fit the piston ring into its groove in the piston head, using assembly tool HP1142 (larger diameter of the piston ring towards the piston rod). Fit the backing washer below the piston ring.

(5) Fit the sealing ring to the piston bush and slide this assembly on to the piston. Using gland assembly sleeves HP224 and HP225/1, insert the gland ring, feathered edge leading, in the counterbore of the housing. Position the guide washer and the gland nut on the piston.

(6) Position the swivel pin in the bushed holes on the forked lugs of the rocker. Position the sleeve on the piston rod, pass the screwed end of the piston rod through the swivel pin and, using a tommy bar, screw the rod into the square nut. Secure the nut with a split pin.

(7) Hold the piston in clamps HP257 in a vice, fit the spherical seat, insert the piston rod and, using spanner HP222, screw in the piston sleeve. Secure the piston sleeve with the circlip.

(8) Insert the piston assembly into the cylinder, position the rocker assembly between the lugs of the body and fit the fulcrum pin. Secure the pin with the grubscrew and the two circlips, one at each end of the pin. Press the gland component into the cylinder and, using spanner HP234, screw in the gland nut. Lock the gland nut by fitting the locking plate and setscrew.

(9) Fit the handle to the rocker and operate the pump to check for slackness in the spherical joint in the piston. If slackness is observed adjust the clearance by tightening the piston sleeve. This can be done without removing the piston from the body. Remove the circlip from the piston, hold the piston in clamps HP257 and, using spanner HP 1221, tighten the sleeve and refit the circlip.

NOTE

If necessary, drill from the groove of the piston through into the piston sleeve, using a 1.0 mm drill (0.0394 in. diameter) then fit the circlip.

TABLE 2 FITS AND CLEARANCES
(All dimensions are in inches)

Ref No. on Fig 3	Part and description	Dimensions new	Permissible worn dimensions		Clearance new	Permissible worn clearance	Remarks
			Non-selective assembly	Selective assembly			
2	PISTON IN CYLINDER Cylinder bore	0.8755 / 0.8745	0.877	0.8775			The pump may have been fitted with oversize pistons (+0.015 in.)
	Piston diameter (above groove)	0.854 / 0.844			0.0315 / 0.0205	0.0335	Clearances for oversize pistons are the same as those for standard pistons.
3	Piston diameter (below groove)	0.874 / 0.871	0.8705	0.869	0.0045 / 0.0005	0.0065	Part numbers for oversize parts:
7	PISTON SHANK IN PISTON BUSH AND GUIDE WASHER. Bush and washer i/dia	0.625 / 0.6245	0.626	0.6265			Piston: 578-C-23512 Piston ring: 77-E-1236 Backing ring: 551-E-33692
	Piston shank diameter	0.624 / 0.6225	0.622	0.621	0.0025 / 0.0005	0.004	
4	PINS -FULCRUM AND SWIVEL IN BUSH Bush - internal dia	0.501 / 0.4995	0.502	0.5022	0.0018 / 0.0000	0.003	
	Pin dia	0.4995 / 0.4992	0.499	0.498			

TABLE 2 FITS AND CLEARANCES (Continued)
(All dimensions are in inches)

Ref No. on Fig 3	Part and description	Dimensions new	Permissible worn dimensions		Clearance new	Permissible worn clearance	Remarks
			Non-selective assembly	Selective assembly			
8	VALVE IN GUIDE Valve guide	0.130 / 0.125	0.135	0.140			
	Valve shank	0.120 / 0.110	0.105	0.100	0.020 / 0.005	0.030	
4	BUSHES IN ROCKER AND BODY	Fit oversize bushes in oversize holes, if the bushes become loose in the rocker or body.					

CHAPTER 2 ANNEX A

STANDARD SERVICEABILITY TEST

CONTENTS

Standard serviceability test

▶ 1. Using hydraulic test rig 4G/4920-99-4420654 with circuit as shown in Fig 1. ◀

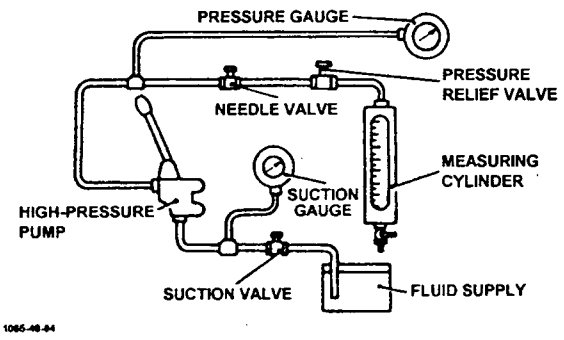

Fig 1 Test rig circuit

High pressure test

2. Connect the pump to the test rig, open both valves, then operate the pump until all the air is expelled from the pump and the pipe lines. Close the needle valve and operate the pump until the delivery pressure stabilises at 5400 lbf/in.^{2}. There must be leakage or loss of pressure. Release the pressure.

Flow test

3. With the needle valve open and the pressure relief valve set to 1500 lbf/in.^{2}, make 20 complete strokes of the handle (one to-and-fro motion of the handle equals one stroke). The amount of fluid pumped must not be less than 125 cm^3 for pumps with standard pistons and 115 cm^3 for those with oversize pistons.

Suction test

4. Close the suction valve and open the needle valve and the pressure relief valve. Operate the pump and check the suction gauge. It must be possible to obtain a negative pressure of 25 in. Hg in not more than 25 complete strokes. No fall in the reading must occur in 30 seconds.

Locking

5. Wirelock all parts drilled for that purpose and lightly peen metal into the grubscrew of the fulcrum pin.

INTRODUCTION

PREFACE

DEMANDS

1. Parts are to be demanded under Vocabulary Section 27Z except where the list shows that the part is held under a different Vocabulary Section.

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.

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.

INDEX OF REFERENCE NUMBERS (SEVEN-DIGIT)

8. Reference numbers consisting of seven digits are identical with the seven-digit National Item Identification Number (NIIN) contained in the NATO Stock Number. This index has therefore been compiled in numerical order of the seven-digit NIIN/Ref No. irrespective of the Vocabulary Section or NATO Class or Country of Origin Codes. By this method both the Reference Number and the NATO Stock Number can be referred to simultaneously.

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.

AMENDMENTS

10 Amendments to the catalogue will be published as and when necessary. They will be numbered consecutively and the Amendment Record Sheet is to be completed for each amendment embodied. A summary of amendments distributed is published in 'The CSE Newsletter'.

CATALOGUE INSTRUCTIONS

INDEX OF PART NUMBERS

1 This index provides a complete list of all items given in the Detailed Parts Lists, and correlates each part number with its corresponding NSN. All items are listed by part number in alpha-numeric order, those with no part number being listed by description in alphabetical order at the beginning of the index.

2 Items having no part number are normally identified by a 'type' number taken from the manufacturer' s parts catalogue/list, or by a British Standards 'BS' number.

DETAILED PARTS LIST

3 The Detailed Parts Lists break down the fully assembled equipments into main assemblies, these in turn being broken down to component level. Where appropriate, cross-references are made to the parts lists for the assembly concerned.

4 All items are listed in a logical order of association or breakdown and are indented to the right to show the relationship between an assembly and its component parts. Item figure/index numbers are listed in numerical sequence, and thus bear a direct relationship to the order of association or breakdown of the assembly.

5 Illustrations accompanying the parts lists show the location of components.

INDEX OF PART NUMBERS

INDEX OF PART NUMBERS

Part Number	Vocab Sect	NATO Stock No. or Ref No.	C of S	Fig/Index No.
A25-9C	28D	5305-99-9140644	C	-7
A27/CT	28M	5310-99-1006473	C	1-8
A31-B8	28S	5305-99-9435712	C	-10
AGS162/6				-9
AGS2031-2	28N	5340-99-1007951	C	-4
KB290K0327-000	27PL	4320-99-6154986	L	1B
SP13-A	28W	5310-99-9419464	C	-32
SP90-A3	28P	5315-99-1202556	C	-33
SP90-C3	28P	5315-99-1021104	C	-18
UMC 504	27W	2530-99-4006197	C	-34
UMC 506	27W	5330-99-8000748	C	-16
UMC 507	27W	2530-99-8000749	C	-28
UMC 508	27W	2530-99-8000751	C	-30
UMC 511	27W	4320-99-8000754	C	-24
UMC 512	27W	2530-99-8000757	C	-22
UMC 514	27W	2530-99-8000760	C	-20
UMC 515	27W	5340-99-9489397	C	-21
UMC 516	27W	2530-99-8000763	C	-15
UMC 519	27W	2530-99-8000765	C	-13
UMC 519	27W	2530-99-8000767	C	-12
UMC 520	27W	2530-99-8000769	C	-11
UMC 523	27W	2530-99-8000773	C	-17
UMC 526	27W	5430-99-8000778	C	-31
UMC 527	27W	5305-99-1331473	C	-5
76-D-1235	27Z	5330-99-9489849	C	-14
76-D-1243				-34
76-D-1245				-16
76-D-1246				-28
76-D-1247				-30
76-D-1251				-24
76-D-1252				-22
76-D-1254				-20
76-D-1255	27W	5340-99-9489397	C	-21
76-D-1256				-15
76-D-1258				-13
76-D-1259				-12
76-D-1260				-11
76-D-1263				-17
76-D-1266				-31
76-D-1267	27W	5305-99-1331473	C	-5
87-D-1268				-36
87-D-1269	10AR	5340-99-9710726	C	-35
551-E-33677	27Z	5310-99-2224325	C	-25
578-C-10889	27Z	1650-99-4619679	P	1A
578-C-23438	27Z	1650-99-1491718	L	-26
578-C-23439	27Z	1650-99-1491719	C	-6
578-C-23442	27Z	1650-99-4619708	C	1-23
578-D-23440	27Z	1650-99-1491720	C	-29
578-D-23473	27Z	4320-99-2224759	C	-19
578-E-23441	27Z	1650-99-4619713	C	-27
578-E-23443	27Z	1650-99-4619709	C	-1

INDEX OF PART NUMBERS (continued)

Part Number	Vocab Sect	NATO Stock No. or Ref No.	C of S No.	Fig/Index
578-E-23444	27Z	3120-99-2224326	C	-2
578-E-23445	27Z	5315-99-4619710	C	-3
700-C-10904	27Z	1650-99-4619680	P	1
UMC 504	27W	2530-99-4006197	C	-34

DETAILED PARTS LIST

CONTENTS

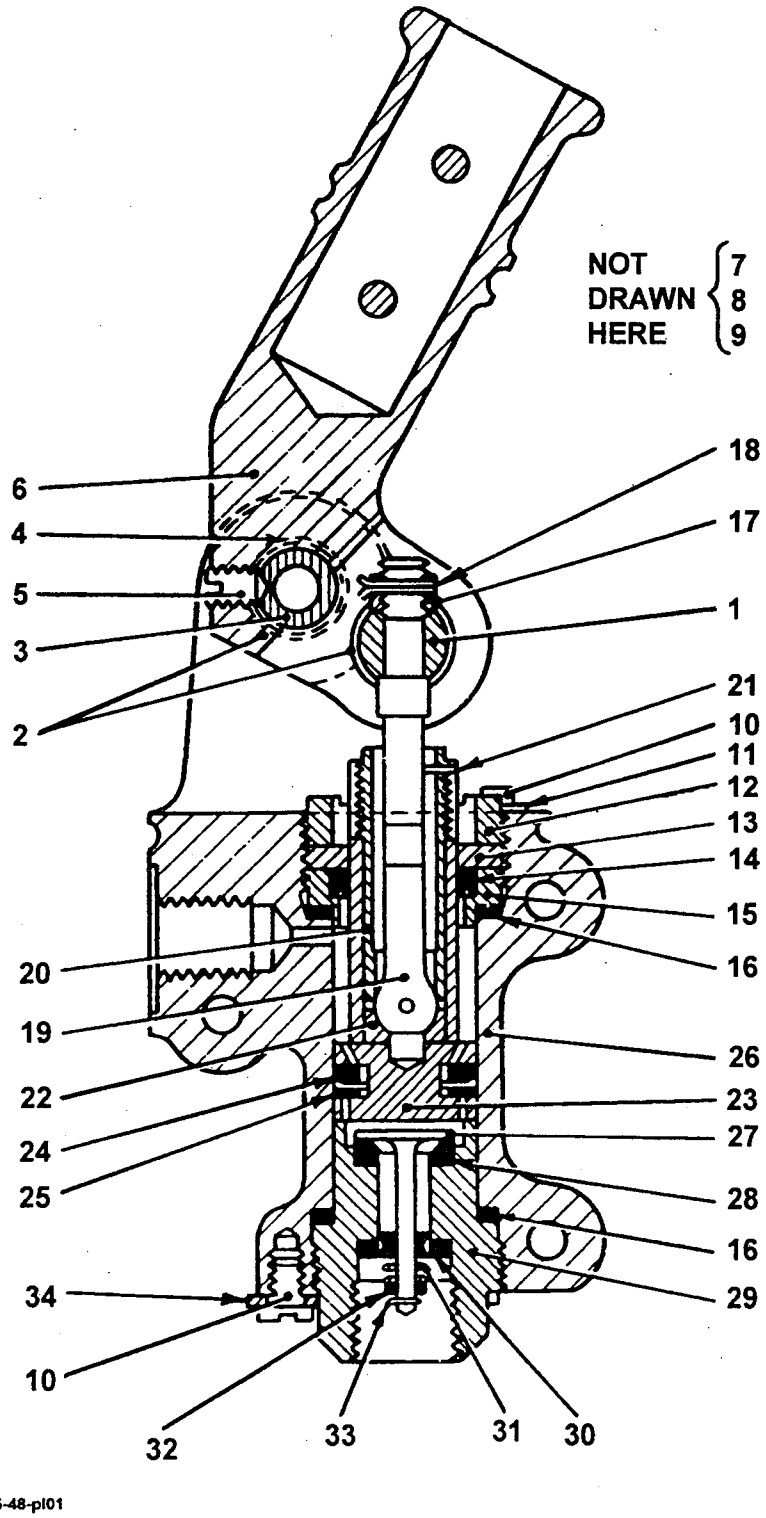

Fig 1 Turner 700-C-10904

DETAILED PARTS LIST

Fig and Index	Part Number	Nomenclature 1 2 3 4 5 6 7	Usage Code	Units per Assy
1-	700-C-10904	PUMP, HAND, HIGH PRESSURE (without handle)		1
-1	578-E-23443	. PIN, Swivel		1
-2	578-E-23444	. BUSH		4
-3	578-E-23445	. PIN, Fulcrum		1
-4	AGS2031-2	. CIRCLIP, Pin, fulcrum		2
-5	76-D-1267	. SCREW, Locking		1
	or			
-5	UMC 527			1
-6	578-C-23439	. SOCKET, Handle		1
-7	A25-9C	. BOLT		2
-8	A27-CT	. NUT, Thin 2BA		2
-9	AGS162/C	. WASHER, Spring		2
-10	A31-B8	. SCREW, Set		2
-11	76-D-1260	. PLATE, Locking		1
	or			
-11	UMC 520			1
-12	76-D-1259	. NUT, Gland		1
	or			
-12	UMC 519			1
-13	76-D-1258	. WASHER, Guide		1
	or			
-13	UMC 518			1
-14	76-D-1235	. RING, Sealing		1
-15	76-D-1256	. RING, Gland, piston		1
	or			
-15	UMC 516			1
-16	76-D-1245	. RUBBER, Sealing		2
	or			
-16	UMC 506			2
-17	76-D-1263	. NUT, Rod, piston		1
	or			
-17	UMC 523			1
-18	SP90-C3	. PIN, Split		1
-19	578-D-23473	. ROD, Piston		1
-20	76-D-1254	. SLEEVE, Piston		1
	or			
-20	UMC 514			1
-21	76-D-1255	. WIRE, Locking		1
	or			
-21	UMC 515			1
-22	76-D-1252	. SEAT, Spherical		1
	or			
-22	UMC 512			1
-23	578-C-23442	. PISTON		1
-24	76-D-1251	. RING, Piston		1
	or			
-24	UMC 511			1
-25	551-E-33677	. WASHER		1

DETAILED PARTS LIST (Continued)

Fig and Index	Part Number	Nomenclature 1 2 3 4 5 6 7	Usage Code	Units per Assy
-26	578-E-23438	. BODY		1
-27	578-E-23441	. STEM, Valve		1
-28	76-D-1246	. SEAT, Valve		1
	or			
-28	UMC 507			1
-29	578-D-23440	. SEATING, Valve, inlet		1
-30	76-D-1247	. GUIDE, Valve		1
	or			
-30	UMC 508			1
-31	76-D-1266	. SPRING, Valve		1
	or			
-31	UMC 526			1
-32	SP13-A	. WASHER		1
-33	SP90-A3	. PIN, Split		1
-34	76-D-1243	. WASHER, Tab		1
	or			
-34	UMC 504			1
1A-*	578-C-10889	PUMP, HAND, HIGH-PRESSURE as Fig 1 above, except for		1
▶ *35	87-D-1269	. GRIP		1
*36	87-D-1268	. HANDLE		1 ◀

* Not illustrated