

WOSS 656/9

British Railways Board

Director of Mechanical and Electrical Engineering

Windscreen Wiper Motor (Repair)

Trico Type FPH 375(S)

WORKSHOP OVERHAUL STANDARD SPECIFICATION



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REVISION RECORD

This specification will be updated when necessary by the issue of amended pages accompanied by revision letters. The amended or additional part of re-issued pages will be marked with a vertical black line.

Revision No	Date	Inserted by

Revision	Date	Inserted by

This Specification applies to equipment fitted to the vehicle types indicated 'X' below. The specification shall only be implemented when authorised by the appropriate WOSS or by the Business Engineer in the case of special application.

LOCOMOTIVES

03		73	X
08		81	X
09		85	X
20	X	86	
25	X	87	
26	X	88	
27	X	89	
31	X	90	
33	X	91	
37	X	92	
43			
45	X		
47	X		
50	X		
56			
58			
59			
60			

DMU's

101	X
104	X
107	
108	X
110	X
111	X
114	X
115	X
116	X
117	X
118	X
119	X
120	X
121	X
122	X
127	
128	X
140	
141	
142	
143	
144	
150	
151	
154	
155	
156	
157	
158	
165	

EMU's

302		411	
303	X	412	
304	X	413	
305	X	414	
307	X	415	
308		416	
309		419	
310		421	X
311		422	X
312		423	X
313		432	X
314		438	X
315		442	
317		455	
318		465	
319		466	
320		485	
321		486	
504	X	487	
507		488	
508		489	

COACHING STOCK

Mk 1	
Mk 1 Catering	
Mk 2, 2a - c	
Mk 2d - e	
Mk 2f	
Mk 2 DBSO	
Mk 3a	
Mk 3b	
Mk 3 Catering	
Mk 3 (HST)	
Mk 3 (HST) Catering	
Mk 3 SLE and SLEP	
Mk 4 IC225	
DVT IC225	
DVT 125	
Non Passenger	

DEMU's

201	
202	
203	
204	
205	
207	
210	

WAGONS

PRIVATE OWNER VEHICLES

DEPARTMENTAL VEHICLES

WINDSCREEN WIPER MOTOR
TRICO TYPE FPH 375(S)

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REFERENCE DOCUMENTS

WOSS 100/3 Inspection Procedure.

TOOLS & MATERIALS

Motor Stalling Spanner - Fig 10
 Hypo 90 -27/20411 5 litres
 -27/20412 25 litres
 -27/20413 205 litres
 Shell Alvania EP2 - 27/1978 400 mil cartridge
 - 27/1979 12.5 Kilo keg
 Osmolin Artic - 27/4331 3 Kilo tin
 - 27/4332 25 Kilo keg
 Pantograph Arm Assembly 430 mm long - 14/1652
 Blade 375 mm long - 90/4695
 Pantograph Idler Arm Swivel Assembly - 61/30959
 Plug - 8/12210
 Polythene Bag 305 x 457 - B R 1919/32

INTRODUCTION

The original Trico Ltd wiper motor fitted to BR vehicles was the FPK 375, this was superseded by the hydraulic damped FPH 375. The FPH 375(S) version motor was developed jointly between BR and Trico Ltd for exclusive use on BR.

The FPH 375(S) is now obsolete and new ones will no longer be available from Trico Ltd. On new vehicles, and as a modification on long life vehicles, Trico Ltd B.P.M. motors are being fitted.

FPH 375 and FPH 375(S) motors shall be salvaged from vehicles going for scrap and used to provide a supply of serviceable motors and spare parts. Any FPK 375 motors still available shall also be salvaged as certain parts are interchangeable with FPH 375(S) motors. New spare parts, as listed on Pages 6 & 7 are being purchased from Trico on a once and for all order, after which they will cease to be available. A set of drawings have been supplied by Trico for use as necessary, to manufacture any spares which become unavailable.

All motors repaired to this WOSS shall be assembled according to the FPH 375(S) specification as shown on Table 1. The assembly specification, for reference purposes, of FPH 375 motors is shown on Table 2.

A list of motors at present in use is given on Table 3. Motors on this list will be deleted as classes of vehicles are withdrawn, or FPH 375 motors are replaced by B.P.M. motors.

All discarded serviceable parts from FPH 375 motors shall be retained for possible use if spares unique to 'S' Type motors become no longer available.

SECTION 1 REPAIR PROCEDURE

1. Dismantling. (See Pages 6 & 7, & Fig 1 for illustrated list of parts).

1.1 Unscrew 4 screws, 705454, and remove cover 500017

1.2 To dismantle wiper motor and hydraulic damper assembly remove four screws 709356. This will permit damper to be lifted complete from main cylinder casting. The two items shall be examined separately. All spring washers shall be discarded and new ones fitted during re-assembly.

1.3 Motor Assembly (Fig 1)

1.3.1 Before removing "RUN" and "PARK" end caps, mark caps and housing so that they will be reassembled in the correct position. Remove end cap "RUN", if 511543/511555 store, if 528380/528389 re-use, and "PARK", if 500069 store, if 510231 re-use. Push piston assembly out of housing, see Fig. 2A

1.3.2 Discard piston packing 500020 and piston liner 524392, see Fig 2B.

1.3.3 Dismantle piston and test inlet and exhaust valve seats by applying oil to each ball and testing under vacuum applied at opposite ends of the piston, closing off the ports which require sealing. If oil disappears, a leak is indicated and the complete piston should be replaced, see Fig. 2C

1.3.4 Discard O' rings, 766504, around running tube, see Fig. 2D

1.3.5 Test end cap "PARK" 510231 and plunger assembly. Apply air pressure approximately 5 lbs/in² to inlet. Place a few drops of oil on parking plunger assembly. If oil bubbles appear, plunger is leaking, discard parking end cap assembly 510231, see Fig. 2E

1.3.6 Inspect pinion assembly 503350, if damaged or worn, renew.

1.3.7 When valve tripper spring, 750891 is placed on running end cap, not less than two and half turns must extend beyond the spacer. If spring is short, renew the spring, see Fig. 2F

1.4 Hydraulic Damper Assembly (Fig. 1)

1.4.1 Remove shaft, lever, gear and bushings sub assembly 511123 511126/9 511130. Inspect for wear on bushes and pinion teeth. Renew any worn or damaged items

1.4.2 Remove both end caps, 510783 & 511183, drain oil completely and remove rack piston 511188 or piston body 526942 and piston end pieces 516959. Discard piston seals 766522. If end caps are old type with paper gaskets, discard, see Fig 4

2. Cleaning.

- 2.1 After dismantling, all component parts shall be washed in a cleaning liquid according to BR procedures and dried with a soft lint free cloth.
- 2.2 After cleaning, all component parts shall be examined for wear, damage or scouring (cylinders)

3. Reassembly.

3.1 Hydraulic Damper Assembly

3.1.1 Fit two new piston seals 766522. Refit rack piston 511188 or piston body 526942 and piston ends 516959. Refilling with oil is best accomplished with both end caps removed. With damper in vertical position and plain end cap end uppermost, fill with Hypoy 90 oil. Fit plain end cap 516495, using new 'O' ring, see Fig 4. Reverse damper and push rack to lower end of cylinder. Oil will flow through transfer port to upper cavity of cylinder. Top up to level of cylinder casting with Hypoy 90 oil.

3.1.2 Refit end cap 516494 with needle valve using new 'O' ring, see Fig 4, taking care to ensure that the needle valve locates in the port in the damper body. To achieve this screw needle valve down to just contact port-hole. Slightly tighten the fixing screws then slightly back off the needle valve. Fully tighten home the fixing screws.

3.2 Motor Assembly

3.2.1 Inspect piston assembly, ensuring that correct parts are fitted, also new seals and packings. The original piston felt (liner) 766751, if still available, shall not be used, see Fig 2B.

3.2.2 At the 'RUN' end of the rack there should be one short push rod, one ball valve, piston head 500006, valve plate (3 holes) 500011 and two shoulder screws.

3.2.3 The 'PARK' end has one long and one short push rod, one ball valve, piston head 500008, valve plate (2 holes) 500012 and two shoulder screws see Fig 1

3.2.4 Grease the marked end of the housing ('PARK' end) with Osmolin Artic grease or equivalent. Insert piston assembly slowly into housing, rotating it as it is pressed in, being careful not to damage the packings. After the piston is in the housing grease both ends, greasing lightly on park end, see Fig 3A. It is important that the 'PARK' end of the piston is at the marked end of the housing, to give the desired hand of motor.

3.2.5 Ensure that correct aluminium spacer, as per Table 1 is fitted to run cap. Refit end caps in proper position, being sure markings are matched. Running tube 500014 must slide freely in 'O' ring 766504.

3.2.6 The centre of the piston is marked with 3 dots, adjust the piston so that it is in the centre of the housing, see Fig 3B.

3.2.7 Grease motor rack with Osmolin Artic grease, fit new gasket, 526924, in motor housing and press correct pinion and lever assembly in place, see Fig. 6 to obtain the correct letter for the Pinion and Lever Assembly, to give the desired arc of wipe. The pinion and lever assembly must be assembled with the lever in the vertical position, see Fig. 3B.

3.3 Motor and Damper Assembly

3.3.1 Fit Damper Assembly, less shaft and lever assembly, to main motor assembly ensuring that the damper rack is centrally positioned, the centre is marked with a dot. Ensure that the roller bearing on the main motor pinion lever, is in good condition.

3.3.2 The protrusion of the shaft (measured from the fixing face of the motor to the end of the shaft) is available in the following lengths to accommodate different thicknesses of cab construction, see Fig 5.

Length 'L' of shaft	Protrusion 'A' (see Fig. 1)	Shaft, Lever and Pinion Assembly (Trico No.)
6"	3"	511123
7"	4"	511126
7.1/2"	4.1/2"	511127
8"	5"	511128
8.1/2"	5.1/2"	511129
9"	6"	511130

3.3.3 Grease rack in damper assembly, with Osmolin Artic grease, and mate pinion on shaft assembly. Grease roller bearing and mating slot in shaft and lever assembly with SHELL ALVANIA EP2 grease. Fit gasket 511185 and shaft and lever assembly to damper assembly, ensuring that the lever is vertical and engages the roller bearing on the pinion lever, without disturbance of the pinion lever position.

3.3. Fit damper cover and secure with four fixing screws. Fit thrust washers and circlips on end of shaft, ensuring that there is 0.003"/015" end float. Attach cover plate with four fixing screws.

3 Spares.

4.1. In the future new spare parts may not be available. The following used parts can be reclaimed by renewing pinions and bushes as necessary:-

- i) Shaft; lever and pinion assemblies Trico Pt. No. 511123, 511126, 511127, 511128, 511129 and 511130 according to Fig. 5.
- ii) Lever and pinion assemblies Trico Pt. No. 503350, 503351, 503352, 503353 and 503354 according to Fig. 6.

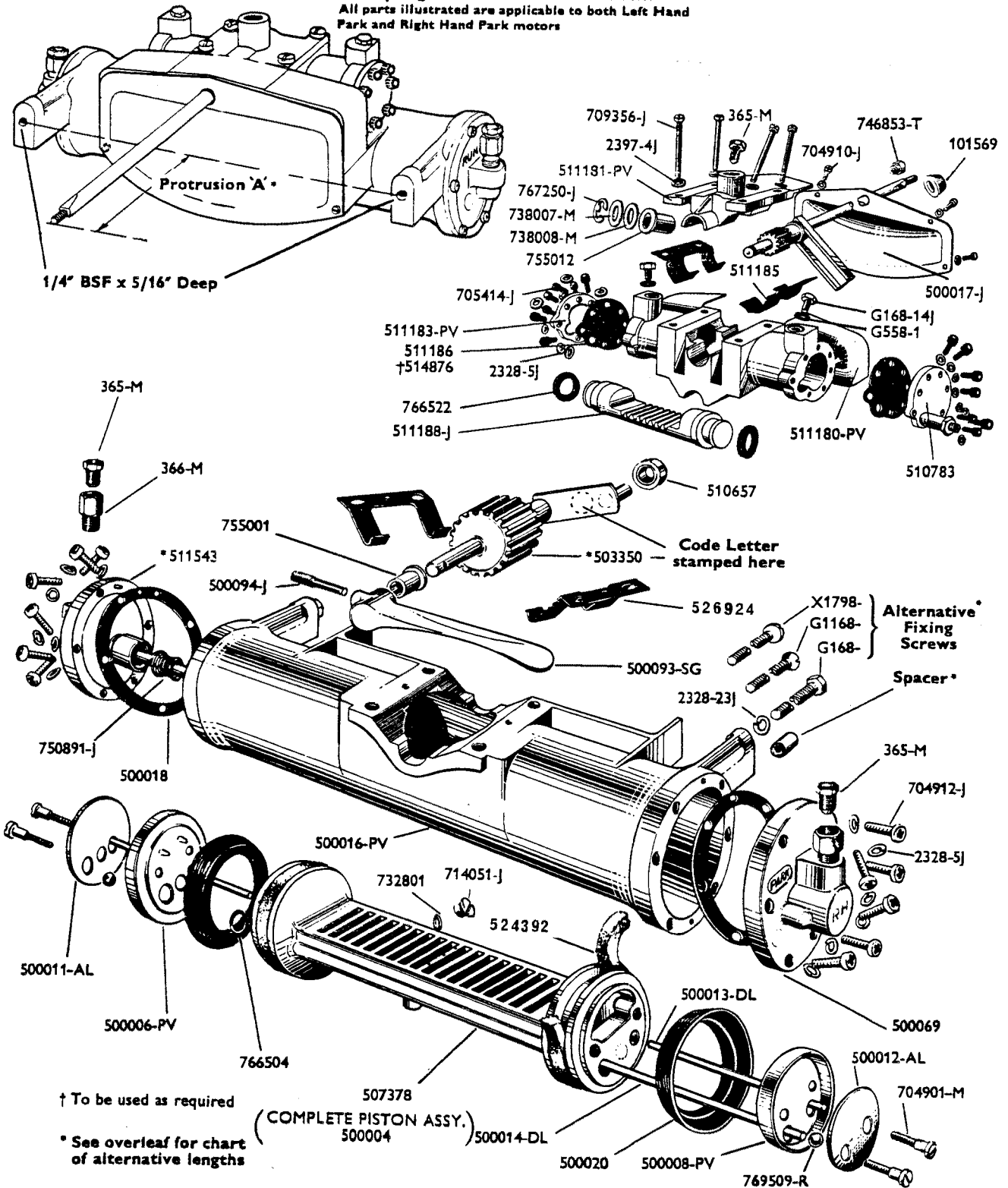
ITEMS LIST FOR FIGURE 1

F.P.H.375(S) MOTOR - SPARE PARTS LIST.				
ITEM NO.	DESCRIPTION	TRICO PT. NO.	BR CAT. NO.	QTY PER MOTOR
1	Shaft Nut	746853	93/53501	1
2	Knurled Driver	101569	14/91420	1
3	End Gasket	500018	14/91590	2
4	Top Gasket (was 500019)	526924	14/91600	1
5	Piston Packing	500020	14/92625	2
6	Gasket	511185	61/40766	2
7	Gasket 'O' Ring	766529	61/36977	2
8	Ring Seal	766504	10/52329	1
9	External Distributor Seal	766522	61/3665	2
10	Piston Liner	524392	61/38600	2
11	Piston Packing	500072	14/92630	1
12	'O' Ring	766556	61/42342	1
13	Gasket Repair kit	562109	61/42343	
14	Items 3 to 12 Inclusive Shaft Lever & Pinion Assy 3" Shaft	511123	51/10783	1
15	Shaft Lever & Pinion Assy 4" Shaft	511126	51/41561	1
16	Shaft Lever & Pinion Assy 4.1/2" Shaft	511127	61/33796	1
17	Shaft Lever & Pinion Assy 5" Shaft	511128	90/10912	1
18	Shaft Lever & Pinion Assy 5.1/2" Shaft	511129	61/37264	1
19	Shaft Lever & Pinion Assy 6" Shaft	511130	61/33797	1
20	365 Compression Nut	768001	17/13145	3
21	366 Compression Body	768256	14/90591	1
22	Drive Piston Assy	500004	14/92968	1
23	Piston Head (Run End)	500006	14/91808	1
24	Piston Head (Park End)	500008	14/91806	1
25	Valve Plate (Left Hand)	500011	14/93038	1
26	Valve Plate (Right Hand)	500012	14/93039	1
27	Push Rod Short	500013	14/93329	2
28	Push Rod Long	500014	14/93327	1
29	Cylinder	500016	14/91390	1
30	Rear Cover	500017	14/91379	1
31	End Cap Assy (Park) (Was 500069)	510231	18/13921	1
32	Handle	500093	14/91800	1
33	Set Screw (For Handle)	500094	14/93420	1
34	Lever & Piston Assy (B) 80°	503351	14/92122	1
35	Lever & Piston Assy (C) 60°	503352	51/7494	1
36	Lever & Piston Assy (D) 55° & 65°	503353	61/865	1
37	Lever & Piston Assy (E) 50° & 70°	503354	61/866	1

ITEMS LIST FOR FIGURE 1 CONTD.

F.P.H.375(S) MOTOR - SPARE PARTS LIST CONT'D				
ITEM NO.	DESCRIPTION	TRICO PT. NO.	BR CAT. NO.	QTY PER MOTOR
38	Drive Piston & Plug Assy	507378	19/92970	1
39	Roller	5106573	61/42350	1
40	End Cap (Hydraulic)	516495	61/36974	1
41	End Cap (Hydraulic Assy Items 7 & 40)	511183	61/42351	1
42	End Cap (Hydraulic)	516494	61/37265	1
43	Valve Screw	510780	61/33795	1
44	Hexagon Nut 2BA	745855	61/37266	1
45	Valve Screw Assy	511182	61/42345	1
46	End Cap & Valve (Hydraulic Assy) (Items 7, 42, 44, 45)	510783	61/36975	1
47	Piston End Peice) Was	516959	18/13928	2
48	Piston Body) 511188	526942	61/42344	1
49	Oil Damper Body	511180	61/41424	1
50	Damper Body Cover	511181	83/1731	1
51	End Cap Assembly (Run) 50°	528382		1
52	End Cap Assembly (Run) 55°	528389		1
53	End Cap Assembly (Run) 60°	528384)		1
54	End Cap Assembly (Run) 65°	528384)	90/4278	1
55	End Cap Assembly (Run) 70°	528384)		1
56	End Cap Assembly (Run) 80°	528388		1
57	End Cap Assembly (Run) 33	528380		1
58	Spring	750891	14/93640	1
59	Retaining Ring	767250	35/40394	1
60	Ball	769509	14/90530	2
61	Bearing (Lever & Pinion Assy)	755042	61/42346	1
62	Drive Shaft Bush	755012	83/1736	1
63	Drive Bearing	755001	14/90539	1
64	Pinion (Shaft, Lever & Pinion Assy)	510781	61/42347	1
65	Pinion (Lever & Pinion Assy)	513229	61/42348	1
<u>SCREWS AND WASHERS</u>				
66	Lockwasher 2328-5	739550	14/94197	30
67	Shakeproof Washer 2397-4	739820	14/94199	4
68	Screw 6.32 (shouldered)	704901	14/93426	4
69	Screw 6.32 Recessed Hd. (Was 704912)	705456	14/93400	12
70	Screw 6.32 Socket Hd. Cap.)	705414	83/1734	14
71	Screw No. 10-32 NF2A POZ	709356	83/1735	4
72	Washer	732801	14/94160	1
73	Washer	738007	14/94162	1
74	Washer	738008	14/94164	1
75	No. 6 x 32 Taptite Rec. Hd.) Screw)	705454 was 704910	61/42349	4

Only Right Hand Park Motor Shown
 All parts illustrated are applicable to both Left Hand
 Park and Right Hand Park motors



Note: Due to modifications the illustration and numbers of some parts may not be correct.

FIG 1 - Wiper Motor - Exploded View

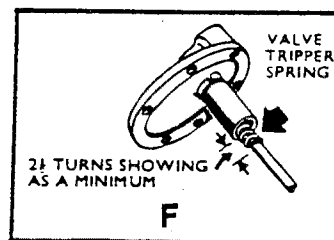
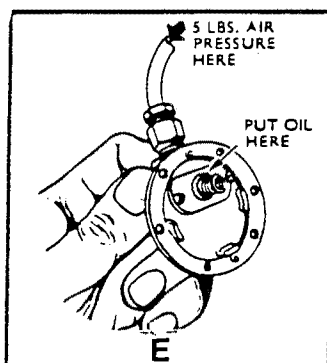
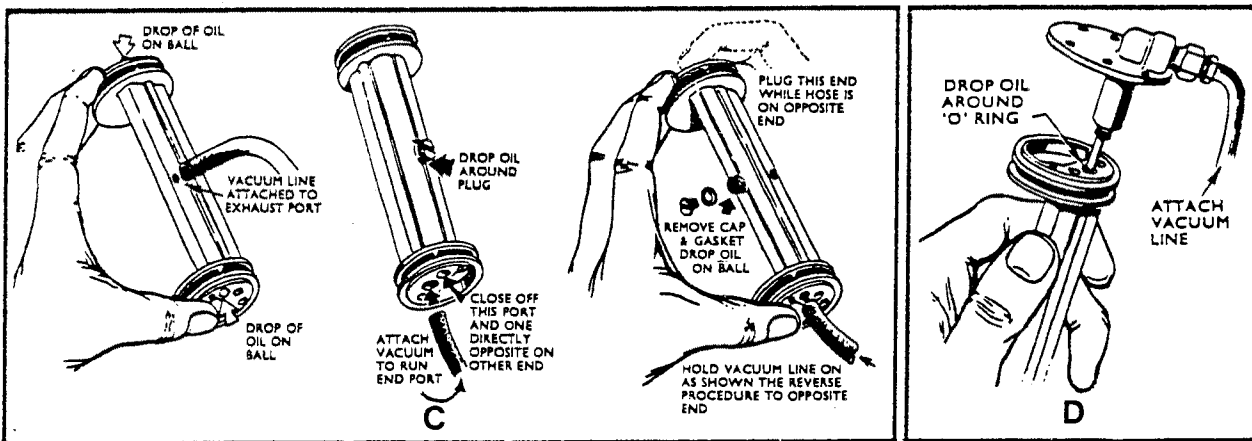
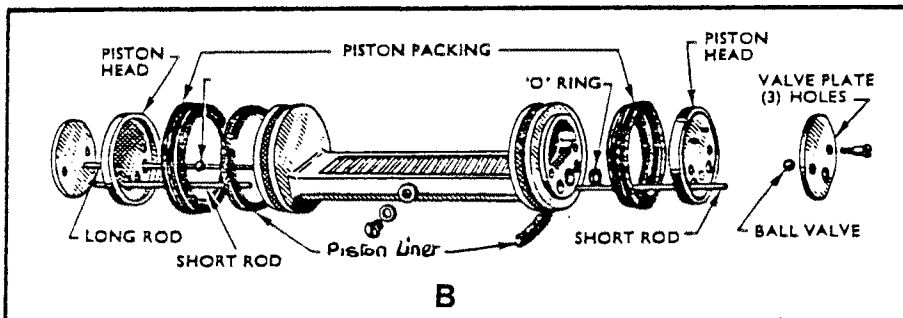
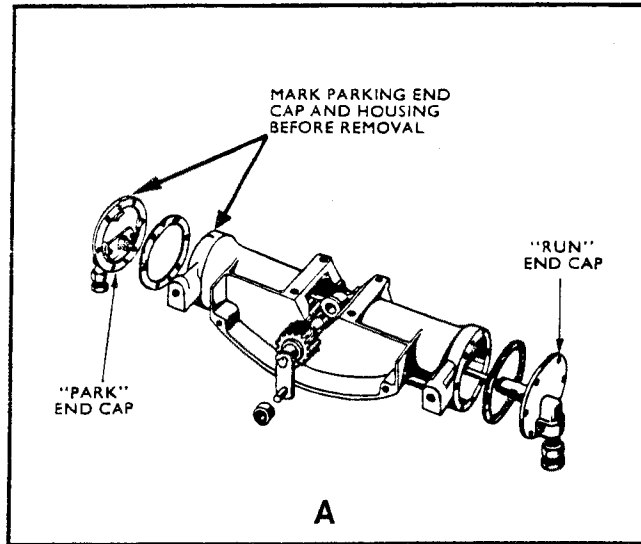


FIG 2 - Motor Assembly Details

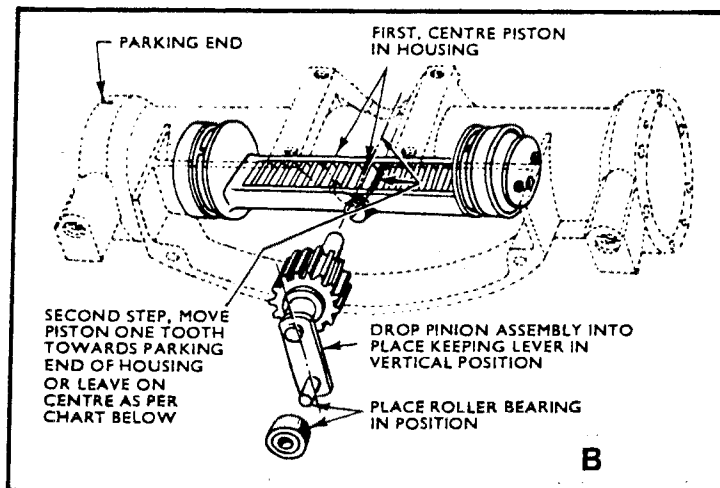
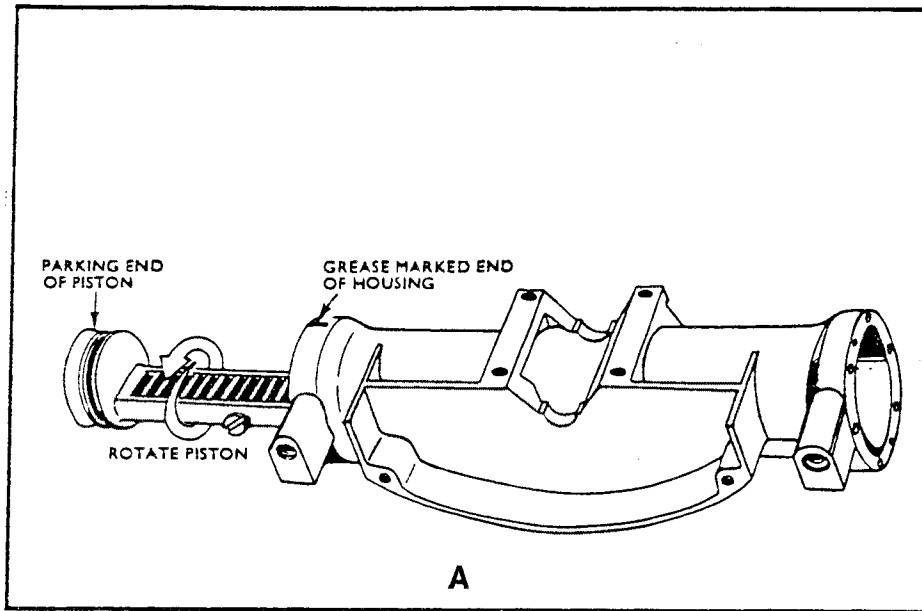
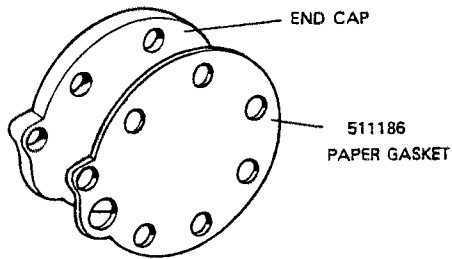


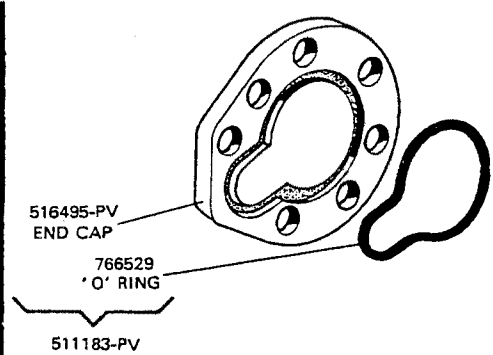
FIG 3 - Motor Assembly Details

WHEN FITTING REPLACEMENT END CAPS, DISCARD PAPER GASKETS AND FIT THE NEW 'O' RINGS AS SHOWN BELOW

REPLACEMENT OF 51183-PV END CAP (Hydraulic)



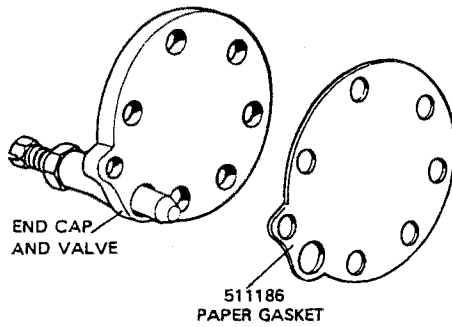
REPLACE OLD END CAP
AND PAPER GASKET



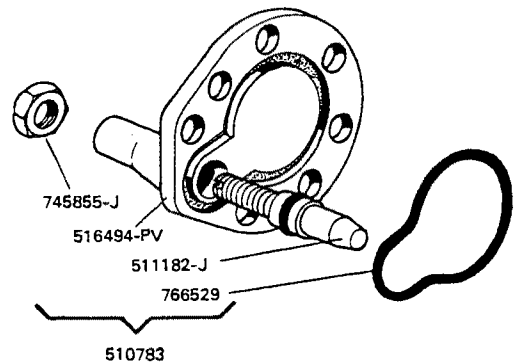
NEW TYPE END CAP
AND 'O' RING

WITH

REPLACEMENT OF 510783 END CAP AND VALVE (Hydraulic)



REPLACE OLD END CAP ASSY.
AND PAPER GASKET



NEW TYPE END CAP & VALVE
(assembled as above) & 'O' RING

WITH

FIG 4 - Hydraulic Damper End Cap

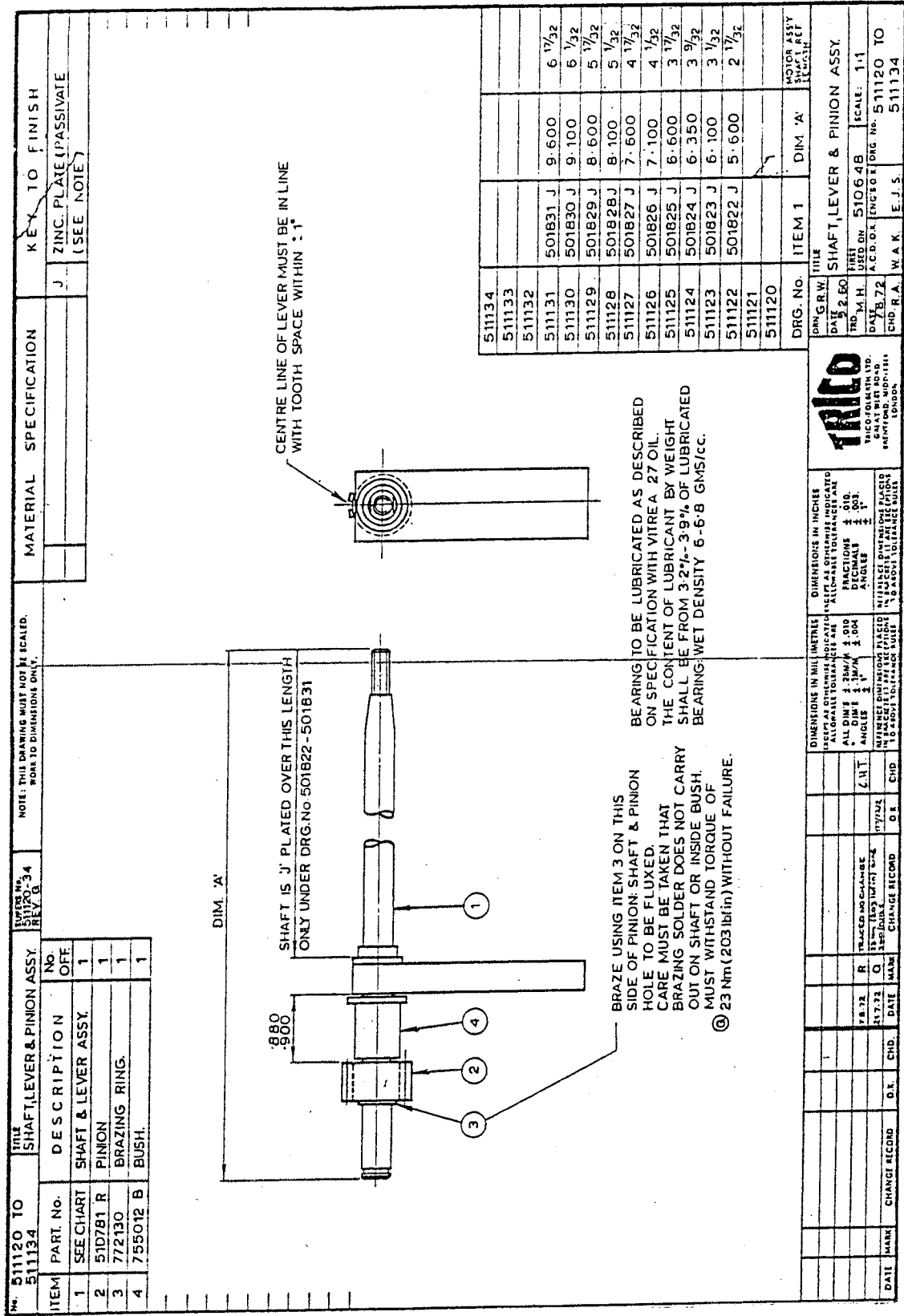


FIG 5 - Shaft Lever and Pinion Assembly

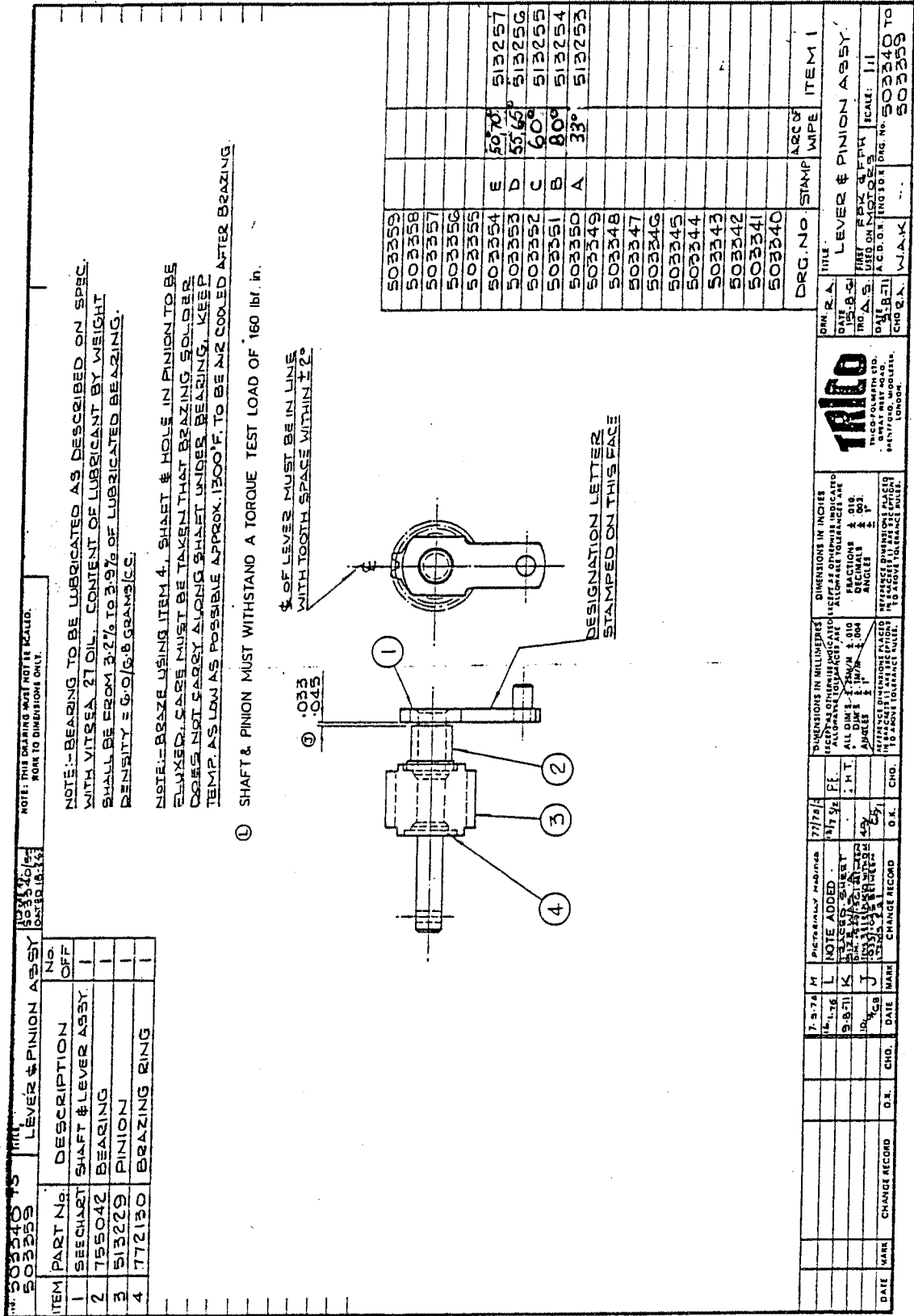


FIG 6 - Lever and Pinion Assembly

SECTION 2 TEST SPECIFICATION

1. Test Equipment

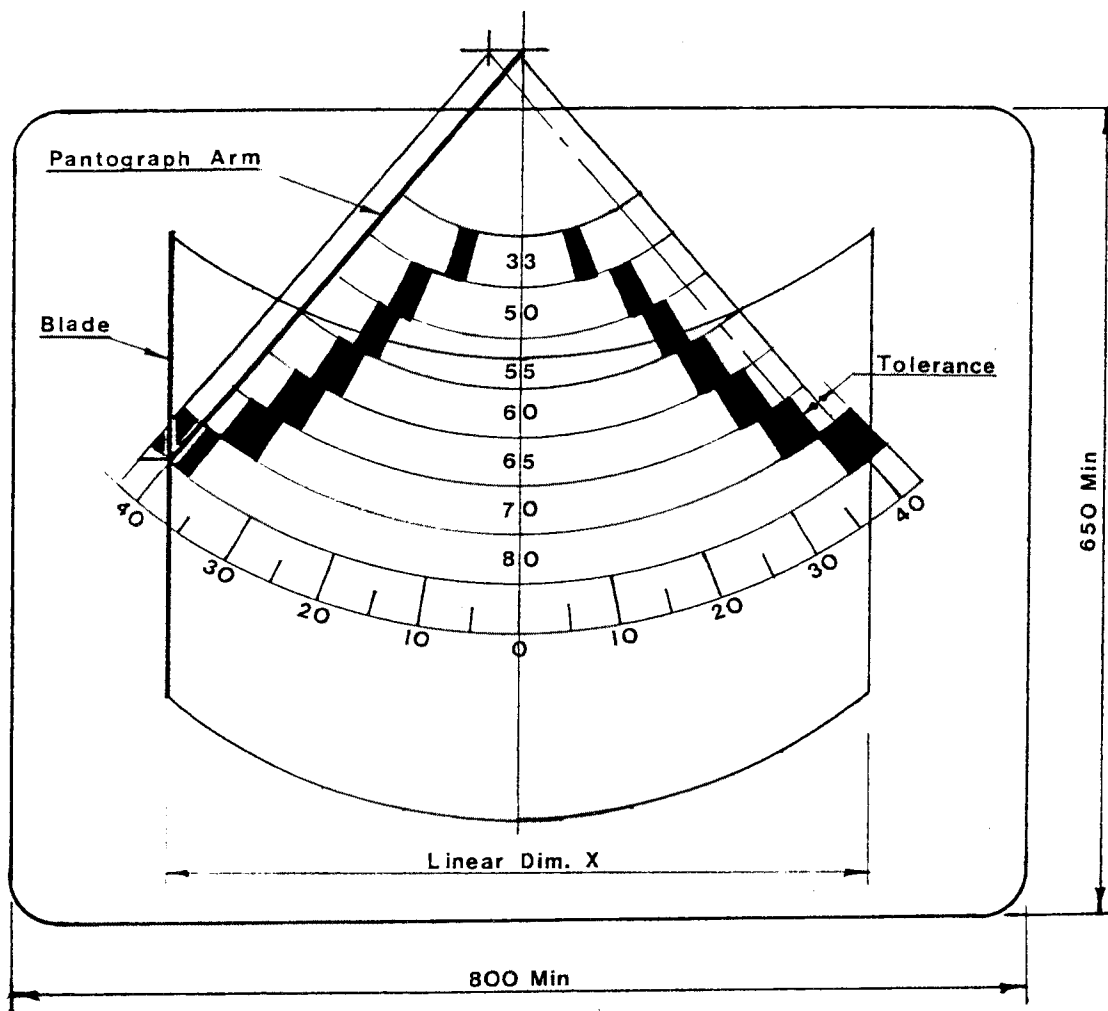
- 1.1 In order to test the motor a test rig shall be provided containing a F.1430-1 controller, glass screen and facilities to continuously wet the screen, see Figs. 7 and 8. The screen shall be suitably marked in degrees to test the arc of wipe of the motor see Fig. 7. Facilities shall be provided to top mount the motor, also fit a pantograph idler arm swivel assembly. A pantograph test arm assembly, 430 mm long, shall be provided, fitted with a blade 375 mm long. An air pressure of 150 p.s.i. (10.0 bar) shall be provided.
- 1.2 The screen shall be kept in a clean and grease free condition. The arm and blade shall be checked periodically for wear and loss of arm load, they shall be changed as necessary.

2. Testing of Motor

- 2.1 With front cover removed from motor, connect up air lines as shown on Fig. 8. Run motor then park and check that there is a mechanical lock between output shaft and drive pinion. Fit front cover.
- 2.2 Top mount the motor to test rig and adjust pressure reducing valve to give 40 p.s.i. on supply to control valve. Fix special tool, as shown on Fig. 9, to motor, holding in place with washer and nut.
- 2.3 Hold special tool to stall motor, check pressure in run line to motor, if significantly less than supply pressure of 40 p.s.i. suspect piston leaks, re-check motor.
- 2.4 Re-set pressure reducing valve to give an inlet pressure of 140 p.s.i. Turn dash control knob to run position, allow motor to complete two cycles and then turn dash control knob to park position to ensure motor parks.
- 2.5 Fix a 430 mm long test pantograph arm assembly with 375 mm long blade to the motor shaft so that it wipes in the centre of the test screen, the blade pressure measured at the centre of the blade shall be approximately 750 grams.
- 2.6 All speeds must be set and arcs of wipe checked, on a wet screen.
- 2.7 Fully open the damper valve screw on the motor, see Fig. 10. Turn the dash control knob to run position and set needle valve, on the controller, to give
 - a) 120-125 cycles/min on 33° Arc of Wipe Motors.
 - b) 80-90 cycles/min on all other motors.
- 2.8 With the dash control needle valve set (2.7), screw the motor damper valve screw in a clockwise direction until the speed drops to:-
 - a) 85-90 cycles/min on 33° Arc of Wipe Motors.
 - b) 65-75 cycles/min on all other motors.

tighten the lock nut on the motor damper valve screw.

- 2.9 With the motor running, turn off air supply, using the self-exhausting switch, physically move the arm to the extreme of the motor arc and measure the mechanical degree of arc. The arc requirement on the run cap must be achieved within the linear tolerances shown on Fig 7.
- 2.10 All arcs of wipe shall have a 0-5° park allowance measured from end of run stroke to park lock out position. All 'RUN' arcs of wipe shall have a $\pm 5^\circ$ tolerance in the 'RUN' mode, see Fig. 7, but must achieve the mechanical arc as per clause 2.9.
- 2.11 After successful completion of all tests, a motor repair label, as shown on Fig. 11, shall be filled in and fixed to the motor, at the position shown on Fig. 10.
- 2.12 The two inlet and one outlet motor ports shall be fitted with plugs Cat No 8/12210 to prevent ingress of dirt and the completed motor sealed in a polythene bag 305 x 457 B R 1919/32.



MOTOR ARC	LINEAR DIMENSION 'X'	
	MIN	MAX
33°	247 mm	332 mm
40°	307 mm	389 mm
50°	389 mm	470 mm
55°	431 mm	510 mm
60°	470 mm	548 mm
65°	510 mm	586 mm
70°	548 mm	620 mm
80°	620 mm	689 mm
90°	689 mm	752 mm

FIG 7 - Test Windscreen

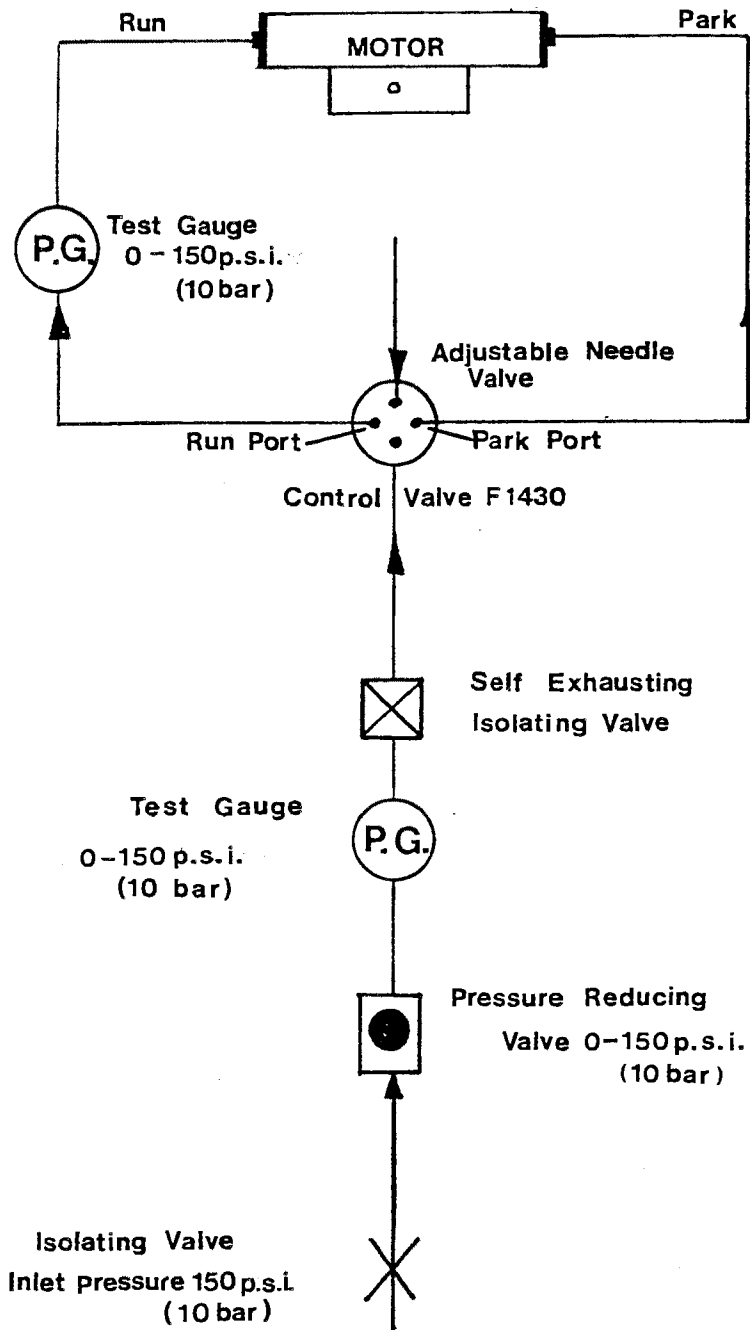


FIG 8 - Test Rig - Equipment and Piping Arrangement

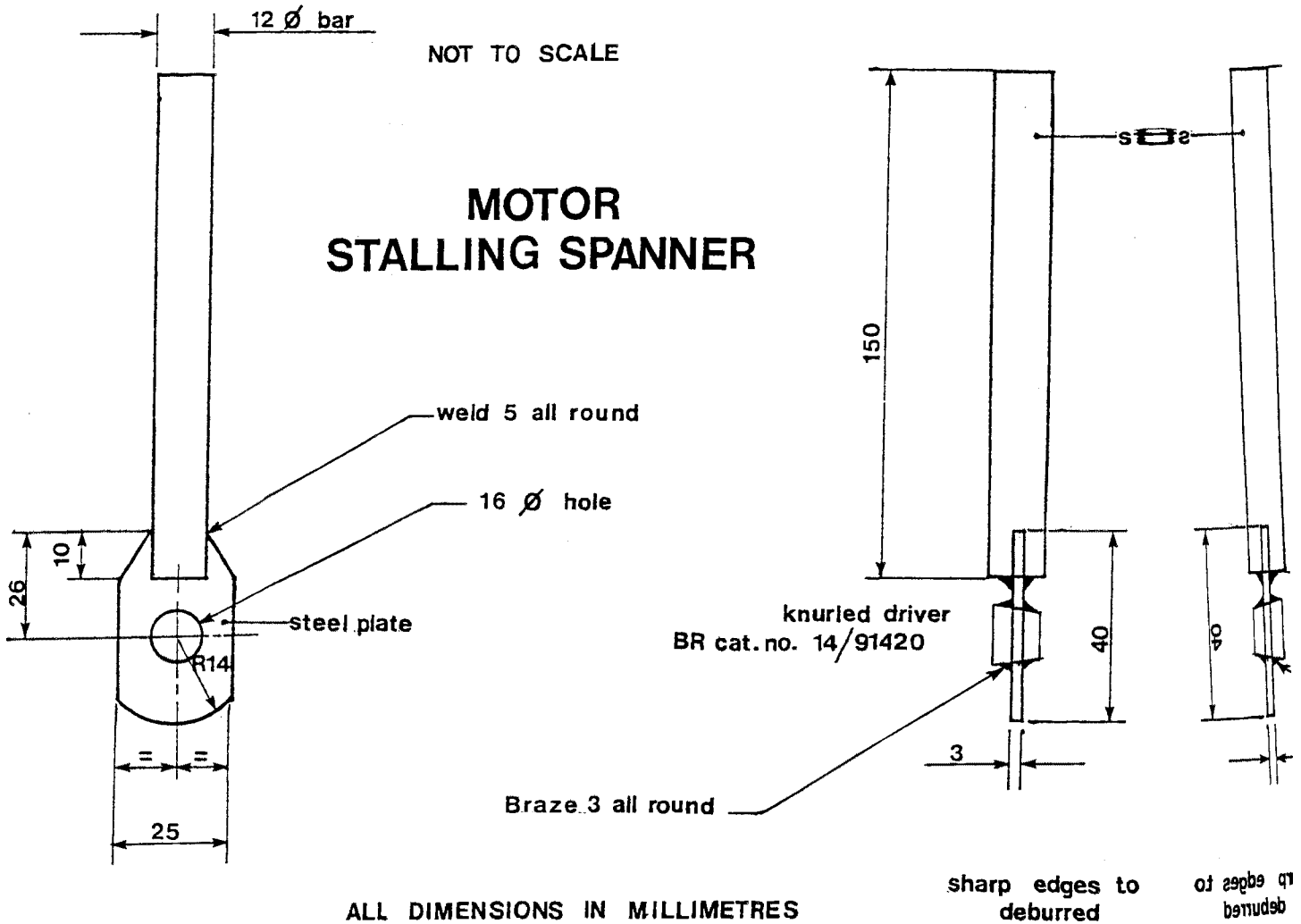


FIG 9 - Motor Stalling Spanner

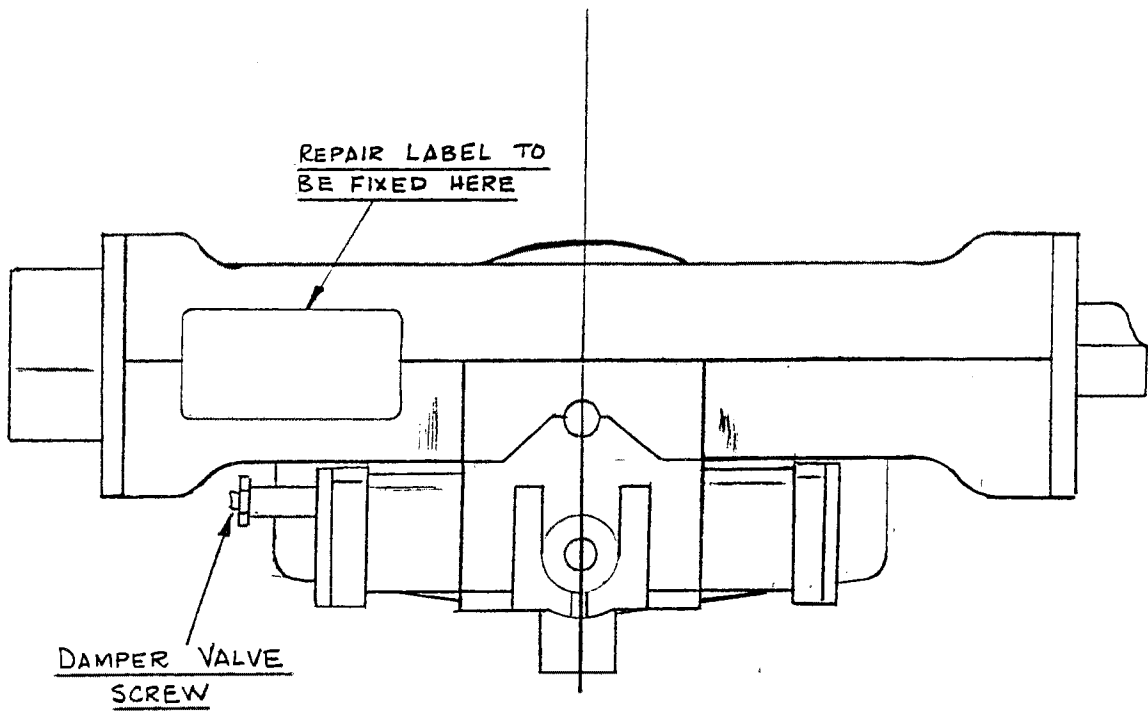
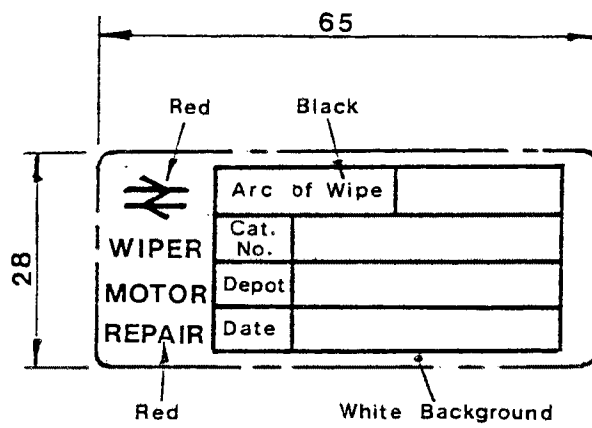


FIG 10 - Motor - Label Postion



Drg. No. A1-A2-9029626

B.R. Cat. No. 56/133061

FIG 11 - Repair Label

BRITISH RAIL							
F.P.H.'S. TYPE ASSEMBLIES (L.H. & R.H.)							
MOTOR ARC	RUN CAP	IDENTIFICATION (ALLUM SPACER BLOCK)	PARK CAP	PINION & LEVER ASSY.	P. & L. ASSY. LETTER	RACK TO PINION POSITION	
110°	528388	NO ALLUM SPACER BLOCK	SEE ECN 40/77	503354	'E'	CENTRE	
100°	"	" " "	510231	503354	'E'	"	
90°	"	" ; "	510231 (LONG SPRING)	503352	'C'	"	
80°	"	" " "	" "	503351	'B'	"	
70°	528384	4 GROOVES ON S.B.	" "	503354	'E'	"	
65°	"	" " "	" "	503353	'D'	"	
60°	"	" " "	" "	503352	'C'	"	
55°	528389	6 " " "	" "	503353	'D'	"	
50°	528382	—	" "	503354	'E'	"	
40°	528381	—	" "	503352	'C'	"	
33°	528380	8 GROOVES ON S.B.	" "	503350	'A'	"	

SK 014407

STANDARD							
F P H TYPE ASSEMBLIES (L.H. & R.H.)							
MOTOR ARC	RUN CAP	IDENTIFICATION (ALLUM SPACER BLOCK)	PARK CAP	PINION & LEVER ASSY	P & L ASSY. LETTER	RACK TO PINION POSITION	
33°	511543	33° STAMPED ON E.C.	500069	503353	'D'	22½°	
40°	511543	40° " " "	"	503354	'E'	"	
50°	511547	50° " " "	500069 (SHORT SPRING)	503354	'E'	"	
55°	511548	55° " " "	"	503352	'C'	"	
60°	511549	60° " " "	"	503350	'A'	"	
65°	511550	65° " " "	"	503353	'A'	"	
70°	511551	70° " " "	"	503351	'B'	"	
80°	511552	80° " " "	"	503352	'C'	"	
90°	511553	90° " " "	"	503353	'D'	"	
100°	511554	100° " " "	"	503354	'E'	CENTRE	
110°	511555	110° " " "	"	503354	'E'	"	

SECTION 3 TECHNICAL DATA TABLE 3

LIST OF F P H 375(S) WINDSCREEN WIPER MOTORS				
DESCRIPTION	TRICO PT. NO.	BR CAT. NO.	CLASS OF VEHICLE	REGION
33°-5.1/2"-RHP 33°-5.1/2"-LHP	528409 528209	14/974) 14/1384)	128	LMR
50°-5.1/2"-RHP Non 'S' Type	508514	83/2003	303	LMR
50°-4.1/2"-RHP 50°-4.1/2"-LHP	528452 528252	18/11163 18/11164	421,422,423, 432,438	SR
55°-5.1/2"-RHP 55°-5.1/2"-LHP	528454 528254	83/463 83/464	73	SR
55°-6"-RHP 55°-6"-LHP	528455 528255	61/38276 61/38277	26,27 33	Scot R SR
60°-4.1/2"-RHP	528467	93/046	307	ER
65°-4.1.2"-RHP 65°-4.1/2"-LHP	528482 528282	14/966 14/967	108,115,116, 122,304,504 114,117,118, 119,121,305	LMR ER
65°-5"-RHP 65°-5"-LHP	528483 528283	90/2008 90/2009	85	LMR
65°-5.1/2"-RHP 65°-5.1/2"-LHP	528484 528284	14/971 14/972	104,110	LMR
65°-6"-RHP 65°-6"-LHP	528485 528285	90/2006 90/2007	81	LMR
70°-4"-RHP 70°-4"-LHP	528496 528296	51/40302 51/40303	31	ER LMR, WR
70°-4.1/2"-RHP 70°-4.1/2"-LHP	528497 528297	14/970 14/1387	101,111,20	ER, LM Scot R
70°-5"-RHP 70°-5"-LHP	528498 528298	61/38272 61/38273	25	LMR
80°-3"-RHP 80°-3"-LHP	528508 528308	61/39271 61/39270	37(Unmod.) 45	LMR ER, WR, Scot R
80°-5.1/2"-RHP 80°-5.1/2"-LHP	528514 528314	14/973 14/1388	120	LMR
80°-6"-RHP 80°-6"-LHP	528515 528315	61/38280 61/38281	47,50(Un- modified)	ER,LMR WR,Scot