

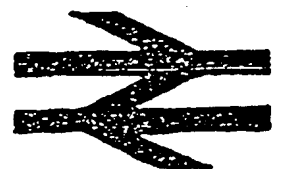
WOSS 528/2

British Railways Board

Mechanical & Electrical Engineering Department

Pressure Switches PGS Types

WORKSHOP OVERHAUL STANDARD SPECIFICATION



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.	Re-issued Page Nos.	Date	Inserted by
1	Rev Rec	Sep 84	
2	Contents	Apr 88	
3	Classes, p22	Nov 93	
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Railpart (UK) Ltd

WOSS 528/2

This Specification applies to equipment fitted to the vehicles indicated 'X' below, but it is only to be implemented when authorised by an appropriate maintenance/overhaul document.

LOCOMOTIVES

03	
08	X
09	X
20	X
26	X
31	X
33	X
37	X
43	X
47	X
50	X
56	X
58	X

73	X
81	X
85	X
86	X
87	X
88	
89	
90	X
91	

DMU'S

101	X
104	X
107	X
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	X
128	X
140	
141	X
142	
143	
144	
150	X
151	X
154	
155	
156	

EMU'S

302	X
303	X
304	X
305	X
307	X
308	X
309	X
310	X
311	X
312	X
313	X
314	X
315	X
317	X
318	
319	X
320	
504	X
507	X
508	X

411	X
412	X
413	X
414	X
415	X
416	X
419	X
421	X
422	X
423	X
432	X
438	
442	X
455	X
485	
486	
487	
488	
489	X

DEMU'S

204	X
205	X
207	X
210	X

COACHING STOCK

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

WORKSHOP OVERHAUL STANDARD SPECIFICATION 528/2

PRESSURE SWITCHES

PGS Types

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TOOLS AND MATERIALS

BR Cat. No.

Rp 1/4 parallel tap	39/64490
Wire insert	35/160350
Grease	27/4612
Shim gauge	Figure 7
Contact gap gauge	Figure 9
Contact gap Setting tool	Figure 10
Contact holder gap Setting tool	Figure 11

SECTION 1 REPAIR PROCEDURE

NOTE:

Where an item is first mentioned in the text it is followed by a number in brackets. The first part of the number, before the full stop, refers to the figure on which the item is identified. The second part of the number, after the full stop, is the number of the item as it appears on the figure. Items lists associated with figures use the full number. If an item is identified on more than one figure then the items list for each figure will give the alternative number.

1 Dismantling

- 1.1 Slacken the screw (1.21) and remove the front cover (1.22).
- 1.2 Remove the locknuts (1.18) and indicator plate (1.17). Unscrew the adjusting screw (1.12) to relieve the spring tension.
- 1.3 Dismantle the diaphragm assembly (1.1). Discard the diaphragm (3.7, 4.16, 5.3).
- 1.4 Detach and remove the toggle spring (1.25) from the rocker assembly (1.40).
- 1.5 Remove the locknut (1.32) and screw (1.5).
- 1.6 Gently spread the sides of the case (1.7) and remove the fixed contact support (1.30) and rocker assembly (1.40).
- 1.7 Gently compress and remove the spring link (1.6).
- 1.8 Remove the case from the end support (1.4).
- 1.9 Remove the locknuts (1.15, 1.24). Remove and discard the bearing pins (1.14, 1.23).
- 1.10 Remove the four screws and lockwashers (1.16), spring stirrup (1.13), adjusting screw (1.12) with adjusting nut (1.10), operating spring (1.8) and plunger assembly (1.11).
- 1.11 Remove the moving contact carriers (1.33, 1.39) from the rocker assembly. Compress the moving contact springs (1.38) and withdraw the moving contacts (1.37) and springs.
- 1.12 Remove and discard any identification plates. Obliterate any painted markings.

2 Cleaning, Examination & Repair

- 2.1 Clean all components in accordance with WOSS 501/1.
- 2.2 Straighten and square up the case and end support if bent. Discard if fractured.
- 2.3 Discard the guide assembly (1.3) if it or the guide pins (1.41) and fractured or distorted.
- 2.4 Discard the plunger assembly (1.11) if worn or damaged, or if any of the four bearing pin holes are visible worn.
- 2.5 Discard the spring link if fractured or distorted.
- 2.6 Discard any moving contact which is burnt or if its contact dome has a flattened area of more than 3 mm ϕ . If any moving contact is discarded, the associated fixed contact (1.29, 1.31) is to be renewed.
- 2.7 Discard any contact holder if the contact is burnt.
- 2.8 Straighten or discard the front cover if it is distorted or fractured. On 'A' suffix switches, renew the insulation (stuck to the inside of the cover) if damaged.
- 2.9 Clean the pipe entry thread on the diaphragm plate (3.2) using an Rp 1/4" tap. If the thread is stripped fit a wire insert.
- 2.10 Fit the rocker assembly into a reforming jig (Figure 6). Place the jig in a vice and tighten the jaws until the plates which carry the contact holders are straight.

3 Reassembly

- 3.1 Renew any spring washers, tab washers, or split pins which have been disturbed. Use new items for those discarded.
- 3.2 Fit the moving contacts and contact springs to the contact holders and fit them to the rocker assembly.
- 3.3 Grease the two bucket pivot (2.7) pins.
- 3.4 Fit the plunger assembly to the end support behind the guide pins (1.41).
- 3.5 Place the operating spring into the bucket. Place the adjusting screw and adjusting nut on the spring and fit the spring stirrup, securing with the four screws and lockwashers. Position the spring stirrup for NO or NC operation (see Figure 2).
- 3.6 Grease and fit the bearing pins and adjust to locate the bucket centrally in the end support hole and give a side play of 0.08-0.15 mm. Fit the locknuts.

- 3.7 Fit the spring link.
- 3.8 Grease the rocker assembly hinge pins.
- 3.9 Fit the case, rocker assembly, contact support, screw (1.5), spring washer and locknut (1.32).
- 3.10 Turn the adjusting screw until the switch can be operated manually via the extended leg of the plunger assembly.
- 3.11 Operate the switch several times and check that:
 - 3.11.1 the operating lever does not foul on the rocker assembly.
 - 3.11.2 the bucket is central in the end support hole.
- 3.12 Operate the contacts by moving the top bar of the rocker assembly and check that:
 - 3.12.1 'A' suffix: each pair of contacts breaks simultaneously.
 - 3.12.2 No suffix : all four contacts break simultaneously.

Move the contact holder if adjustment is required using a 5/16" BSW spanner as shown in Figure 12.
- 3.13 Check that contact open gaps are 4.3-4.9 mm by using a gauge (Figure 9). If incorrect bend the contact carrier at the points shown in Figure 12 using a contact gap setting tool (Figure 10).
- 3.14 With the contacts fully closed, check the gaps between the back faces of the contact tip assemblies and the top inside edges of the contact holders (dimension X on Figure 12).

If this is not 4.3-4.9 mm, adjust by bending the lug on the back of the rocker assembly using a contact holder gap setting tool (Figure 10).
- 3.15 Straighten the manual operating lever of the rocker assembly if it fouls the case.
- 3.16 If two holes are provided adjacent to the operating lever, ensure that a lever cover is fitted.
- 3.17 Place the switch end support (1.4) uppermost and assemble the diaphragm assembly as follows:
 - 3.17.1 Refer to the relevant Figure for fluid (Figure 5), vacuum (Figure 4) or air (Figure 3) operation. Refer to Section 3 Table 1 for the relevant form number.
 - 3.17.2 Place a shim gauge (Figure 7) onto the end support (4) as shown in Figure 8.

- 3.18.3 Fit one 0.010" and one 0.007" shim (3.4, 4.15, 5.7) on to the spacer peg.
- 3.18.4 Fit the spacer and shims assembly and press down to operate the switch. Adjust the number/thickness of shims so that the switch operates just before the spacer bottoms on the shims gauge.
- 3.18.5 Remove the shim gauge and fit the new diaphragm. Diaphragm types are as follows:

Switch Form No	Diaphragm Marking	BR Cat No
5,12, 18-20, 27-31, 33,34	Y3064671/1	51/ 23001
25,26	Y3064671/2	61/ 14850
2,36	Y3064671/3	51/ 23002

- 3.16.6 Assemble the diaphragm assembly as shown in the relevant Figure. When fitting the diaphragm plate on form Nos. E5, E20, E27-31 note that the short screw (3.3) is fitted to the top hole when the switch is positioned as in Figure 1.
- 3.17 If two or three conduit entry holes exist fit a 3/4" or 20 mm blind rubber grommet to one or two of them respectively.
- 3.18 Test in accordance with Section 2.

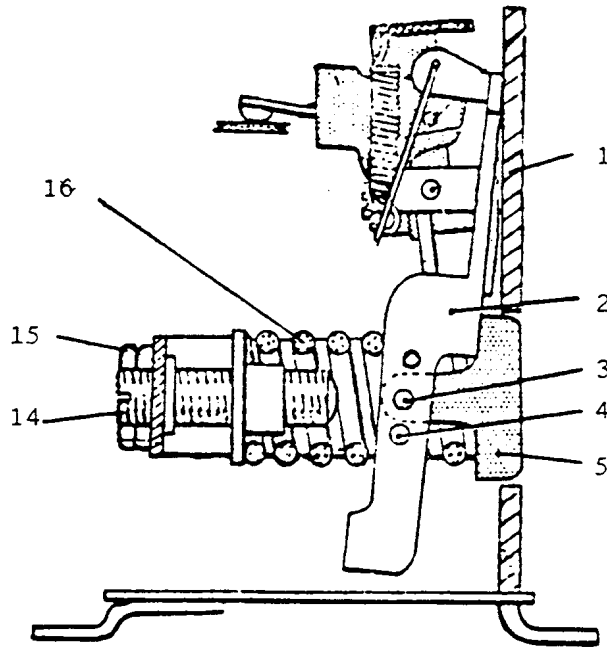
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Items List for Figure 1

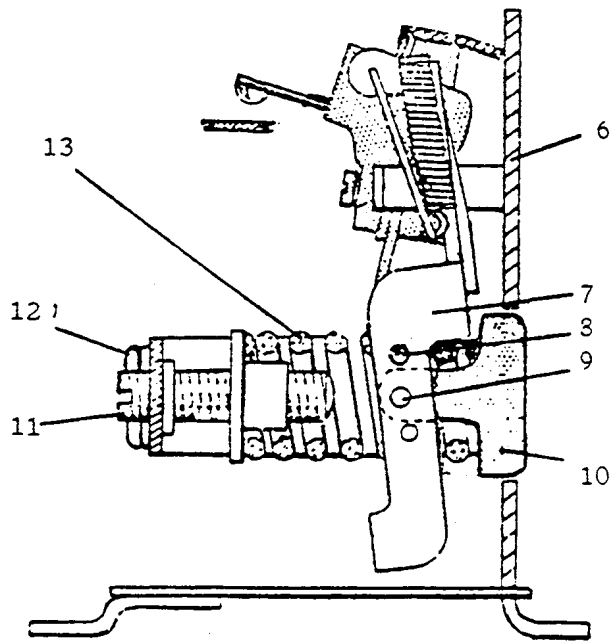
Item	Description	GEC Part No.	BR Cat No.
1.1	Diaphragm assembly	See Figures 3-5	
1.2	Rivet 1/8"φ x 1/4"		
1.3	Guide assembly	AEI C65681	90/ 17550
1.4	End support E19 & 20	AEI 76987	98/ 4907
	End support, bar	AEI 65680	90/ 40890
1.5	Screw 2BA x 3.3/16" csk		
1.6	Spring link	EE94803	17/ 12790
1.7	Case	AEI 65678	90/ 4830
1.8	Operating spring	AEI 65686	
1.9	Rivet 3/32"φ x 3/8 oval hd		
1.10	Adjusting nut	AEI 69124	90/ 25526
1.11	Plunger assembly	AEI 65683	90/ 30330
1.12	Adjusting screw	AEI 69123	90/ 34590
1.13	Spring stirrup	AEI 65682	90/ 38908
1.14	Bearing pin	207896	53/ 3605
1.15	Nut 1BA brass		
1.16	Screw 2BA x 5/16" ch		
1.17	Indicator plate	AEI 95560	98/ 4909
1.18	Locknut (2)	AEI 65725	90/ 26015
1.19	Washer 2BA		
1.20	Shakeproof washer 2BA		
1.21	Screw 2 BA x 3/8" hex slotted		
1.22	Front cover E7, 8, 19, 20	AEI 76991	98/ 4908
	Front cover, bar	AEI 65679	61/ 12066
1.23	Bearing pin	207896	53/ 3605
1.24	Nut 1BA brass		
1.25	Toggle spring yellow	EE95396	17/ 24140
	Toggle spring red	AEI C65694	61/ 14061
	Toggle spring green	AEI C65699	61/ 14062
1.26	Screw (A suffix only) 2BA x 7/8"		
1.27	Screw 2BA x 7/8"		
1.28	Washer & lockwasher 2BA		
1.29	Fixed contact NO	C97824	90/ 632
1.30	Fixed contact support	AEI 74528	51/ 60210
1.31	Fixed contact NC	EE127351	51/ 55700
1.32	Locknut 2BA		
1.33	Contact tip assembly(A suffix only)		
1.34	Screw 3BA x 1/2" ch		
1.35	Shakeproof washer 3BA		
1.36	Washer 3BA		
1.37	Moving contact	EE87256	51/ 55735
1.38	Moving contact spring	EE87257	90/ 1094
1.39	Moving contact carrier	EE94802	51/ 24750
1.40	Rocker assembly	AEI 72256	90/ 34230
1.41	Guide pins		

Items List for Figure 2

Item	Description	GEC Part No.	BR Cat No.
2.1	End support (1.4)		
2.2	Plunger assembly (1.11)		
2.3	Bucket pivot		
2.4	Bearing pin (1.14)		
2.5	Bucket		
2.6	End support (1.4)		
2.7	Plunger assembly (1.11)		
2.8	Bearing pin (1.14)		
2.9	Bucket pivot		
2.10	Bucket		
2.11	Adjusting screw (1.12)		
2.12	Locknuts (1.18)		
2.13	Operating spring (1.8)		
2.14	Adjusting screw (1.12)		
2.15	Locknuts (1.18)		
2.16	Operating spring (1.8)		



Normally Closed Contacts

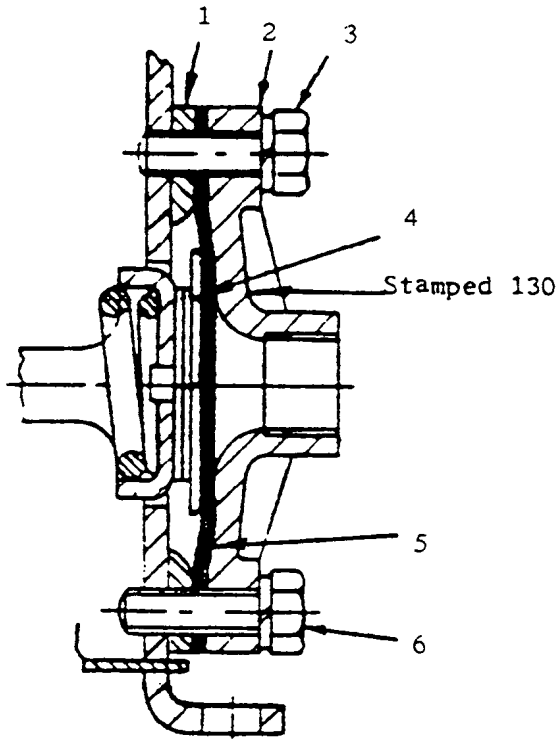


Normally Open Contacts

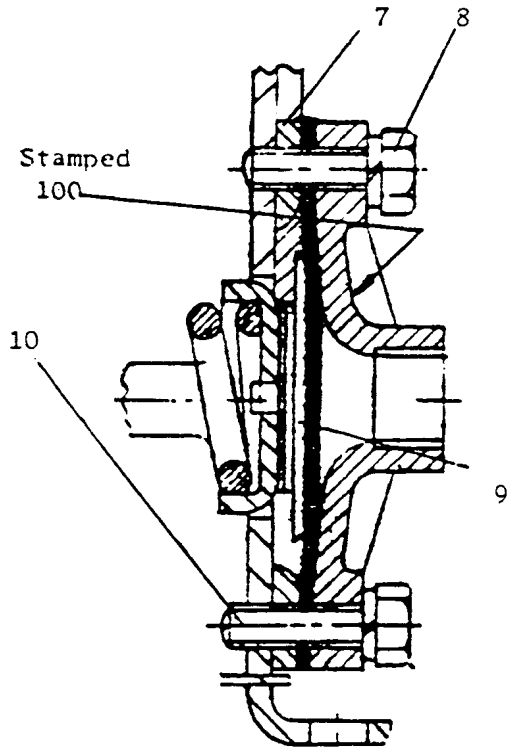
Figure 2 Plunger Assembly

Items List for Figure 3

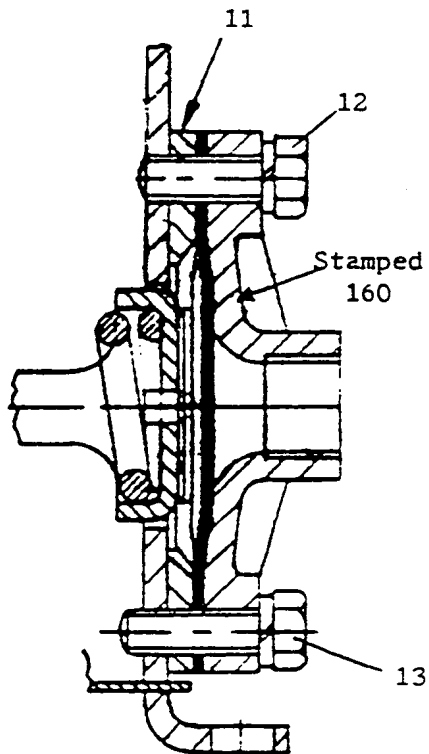
Item	Description	GEC Part No.	BR Cat No.
3.1	Flange E19, 20	AEI C65696	90/ 14557
	Flange E27,28,33,34	AEI C65718	90/ 14551
	Flange E29-32	AEI C69122	90/ 14559
3.2	Diaphragm plate	214744	90/ 29788
3.3	Screw 2BA x 3/8" hex		
	Lockwasher 2BA		
3.4	Shim 0.010" (Brass)	AEI C72252	90/ 34956
	Shim 0.007"(Copper or tinned copper)	AEI C72251	90/ 34955
	Spacer E27, 28, 33, 34	AEI C65717	90/ 37440
	Spacer, bar	AEI C65695	90/ 37455
3.5	Diaphragm (marked Y3064671/1)	AEI C89811	51/ 23001
3.6	Screw 2BA x 1/2" hex		
	Lockwasher 2BA		
3.7	Flange	AEI C65718	90/ 14551
3.8	Screw 1BA x 11/16" hex		
	Lockwasher 1BA		
3.9	Spacer	AEI C65717	90/ 37440
3.10	Screw 1BA x 3/4" hex		
	Lockwasher 1BA		
3.11	Flange	AEI C65696	90/ 14557
3.12	Screw 1BA x 11/16" hex		
	Lockwasher 1BA		
3.13	Screw 1BA x 3/4" hex		
	Lockwasher 1BA		



Forms 29,30 and 31



Forms 5,12,13,27,
28,33 and 34



Forms 19 and 20

Figure 3 Air Operated Diaphragm Assemblies

Items List for Figure 4

Item	Description	GEC Part No.	BR Cat No.
4.1	Flange assembly		90/ 14556
4.2	Screw 2BA x 3/4" E15, 16, 35, 36 Screw 2BA x 5/8", bar		
4.3	Diaphragm (marked Y3064671/3)	AEI C89813	51/ 23002
4.4	Bolt		
4.5	Washer		
4.6	Nut 1BA Nut M5	AEI C74651	3/174126
4.7	Seal	AEI C74649	51/ 29950
4.8	Screw OBA x 5/8" hex Lockwasher OBA		
4.9	Cover plate	AEI C74650	90/ 29760
4.10	Washer (x 2 on E15, 16)	AEI C74646	90/ 45618
4.11	Flange	AEI C74642	90/ 14552
4.12	Foot	AEI C65711	90/ 14536
4.13	Shim 0.032"	AEI C87013	
4.14	Nut	AEI C74644	90/ 25570
4.15	Shim 0.010" (brass) Shim 0.007"(copper or tinned copper)	AEI C72252 AEI C72251	90/ 34956 90/ 34955
	Spacer	AEI C65695	90/ 37455
4.16	Diaphragm	EE87259	51/ 23001
4.17	Flange	AEI C65696	90/ 14557
4.18	Washer, E2	AEI C74648	90/ 45616
4.19	Gasket, E15, 16, 35, 36	AEI C76990	90/ 16430
4.20	Distance piece, E15, 16 Distance piece, E35, 36	AEI C76993 AEI C95562	90/ 27400
4.21	Washer plate, E35, 36	AEI C95561	
4.22	Screw 2BA x 3/4" hex, E1, 2 Screw 2BA x 15/16" hex, E15, 16, 35, 36		

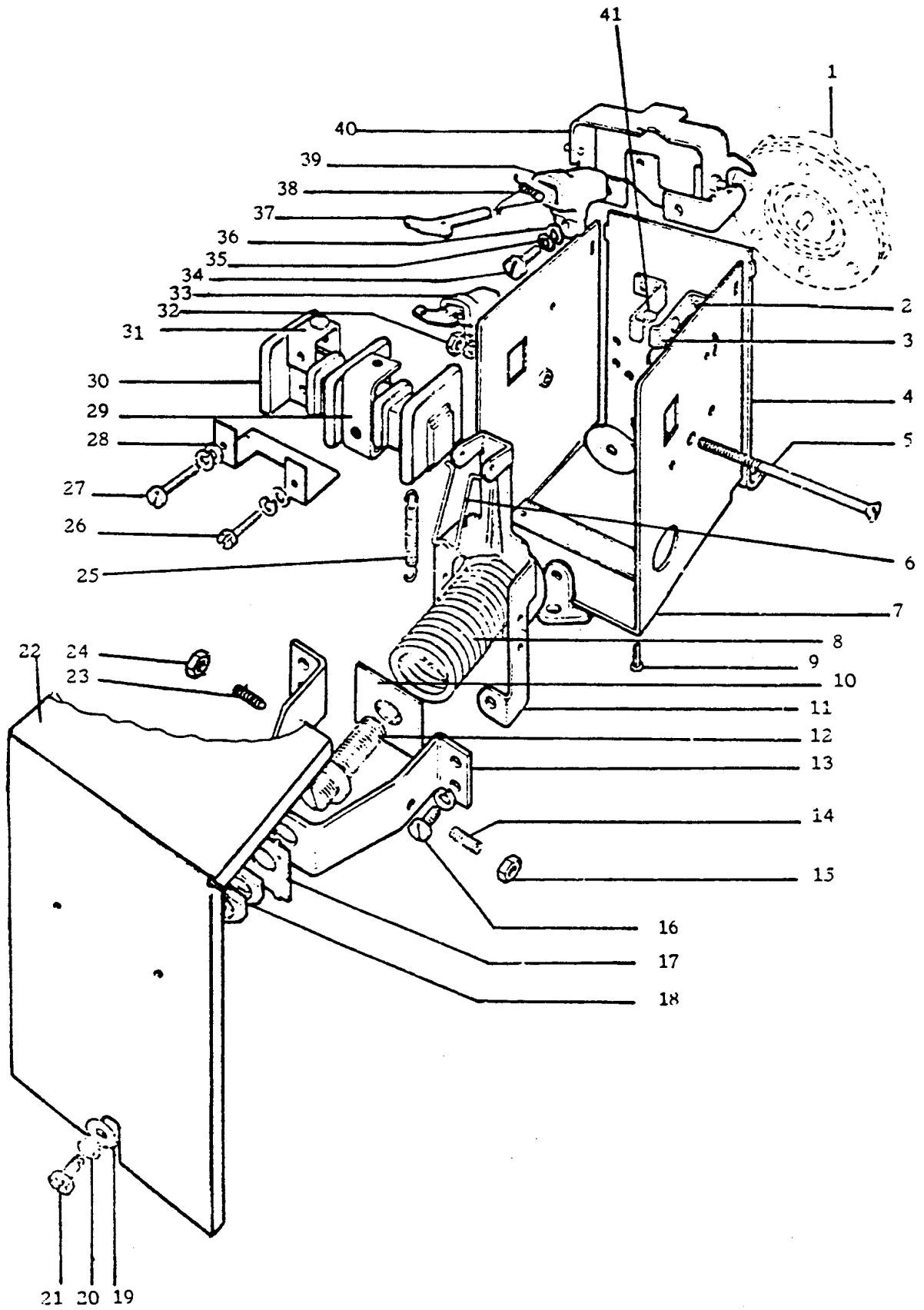
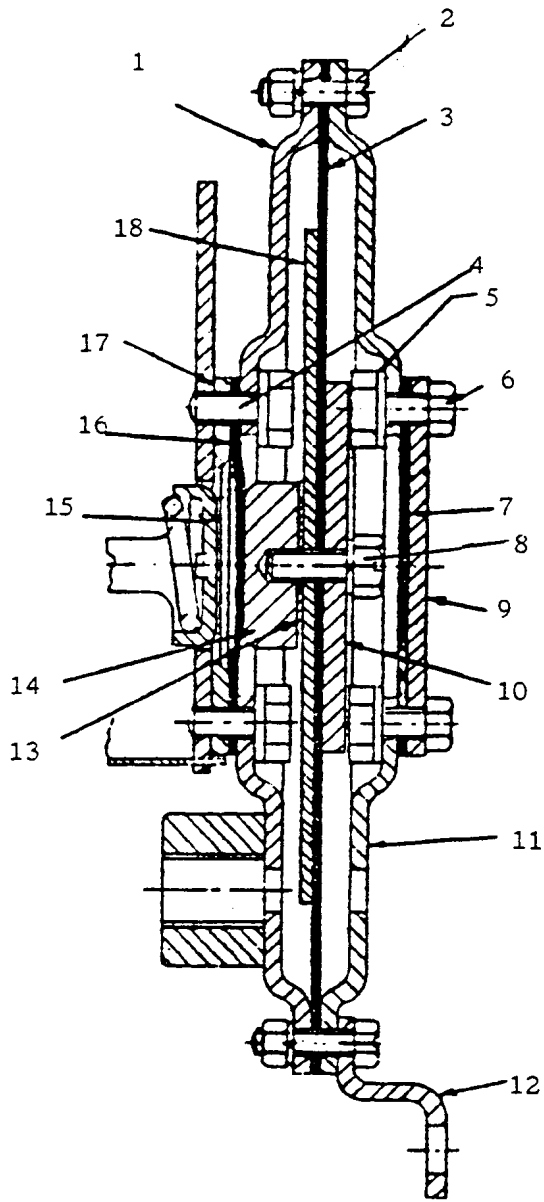
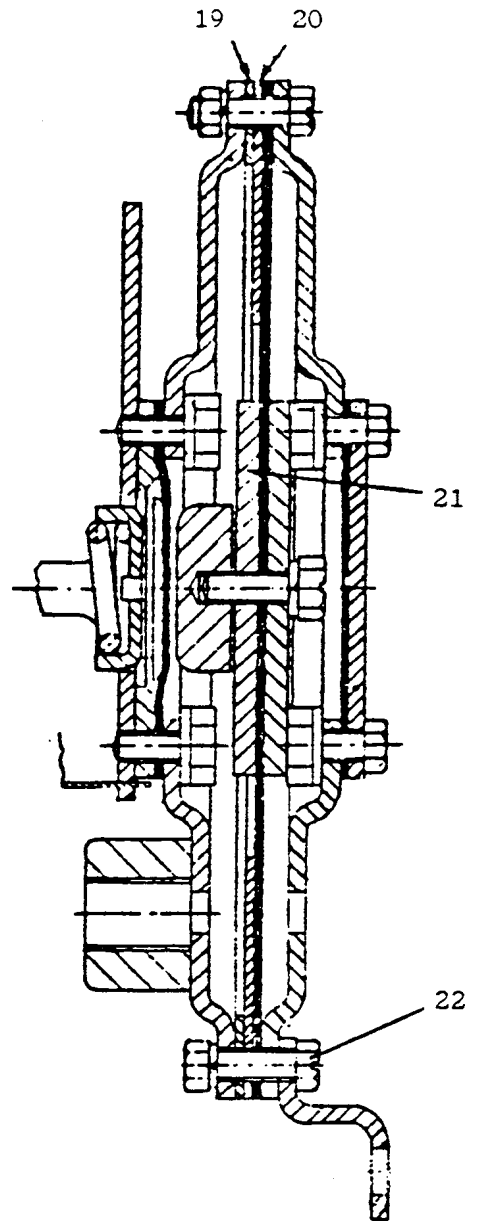


Figure 1 Exploded View



Form 2

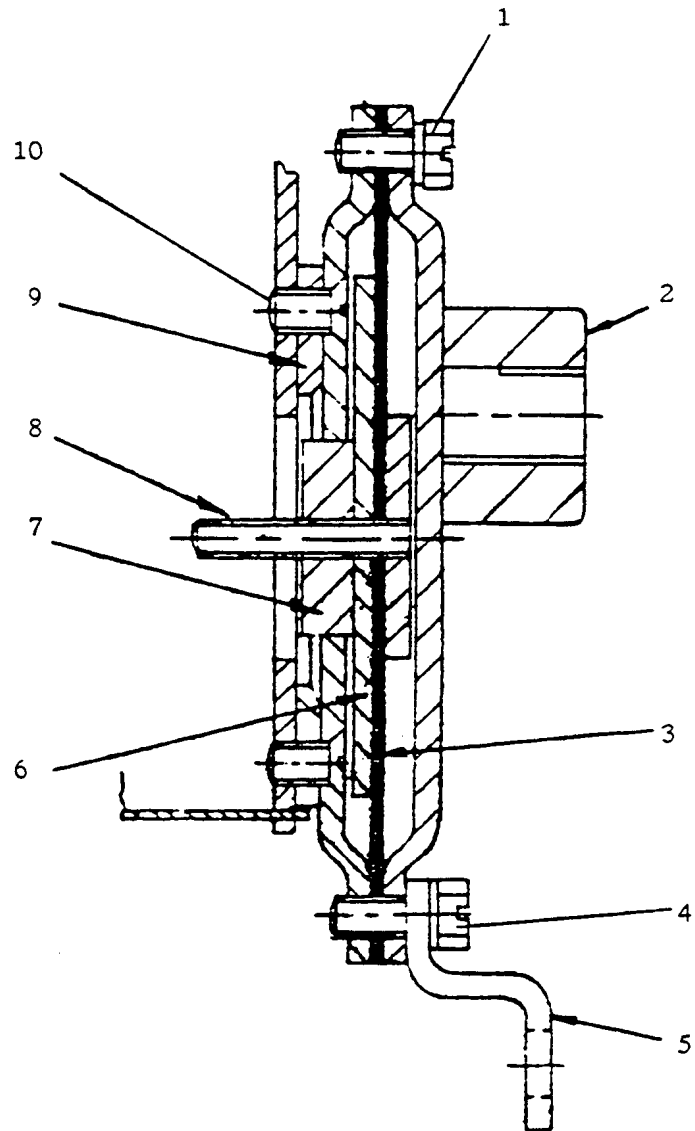


Form 36

Figure 4 Vacuum Operated Diaphragm Assemblies

Items List for Figure 5

Item	Description	GEC Part No.	BR Cat No.
5.1	Screw 2BA x 3/8" hex Lockwasher 2BA		
5.2	Flange assembly	AEI C65707	90/ 14553
5.3	Diaphragm (marked Y3064671/2) Diaphragm	213539 AEI C72251	61/ 14850 90/ 34955
5.4	Screw 2BA x 1/2" hex Lockwasher 2BA		
5.5	Foot	AEI C65711	90/ 14536
5.6	Washer	AEI C65710	90/ 45617
5.7	Spacer	AEI C65705	90/ 37450
	Shim 0.010" (brass)	AEI C72252	90/ 34956
	Shim 0.017"(copper or tinned copper)	AEI C72251	90/ 34955
5.8	Washer and stud assembly	213539	61/ 14850
5.9	Flange	AEI C78849	90/ 14557
5.10	Screw 1 BA x 3/8" csk		



Forms 25 & 26

Figure 5 Fluid Operated Diaphragm Assemblies

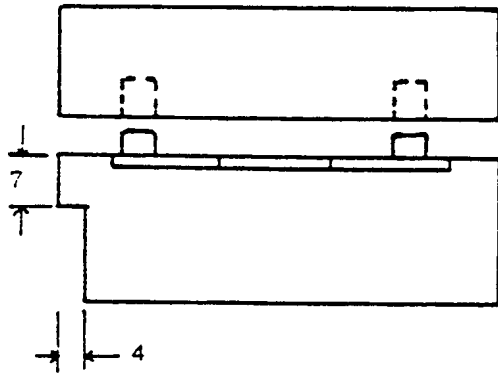
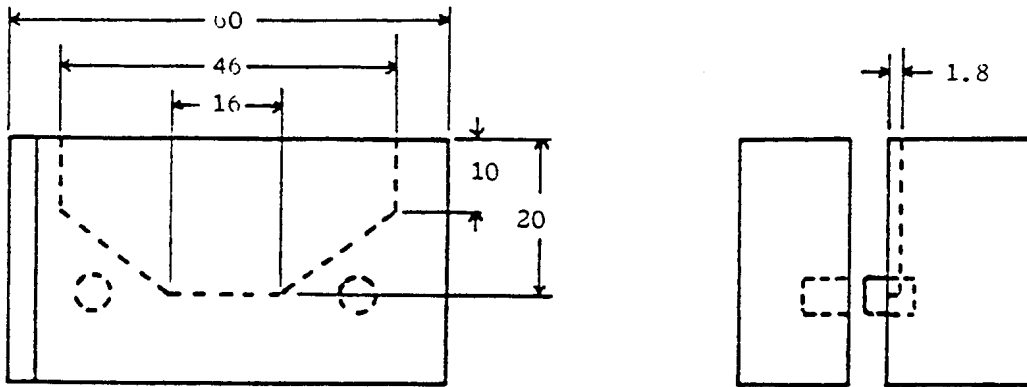
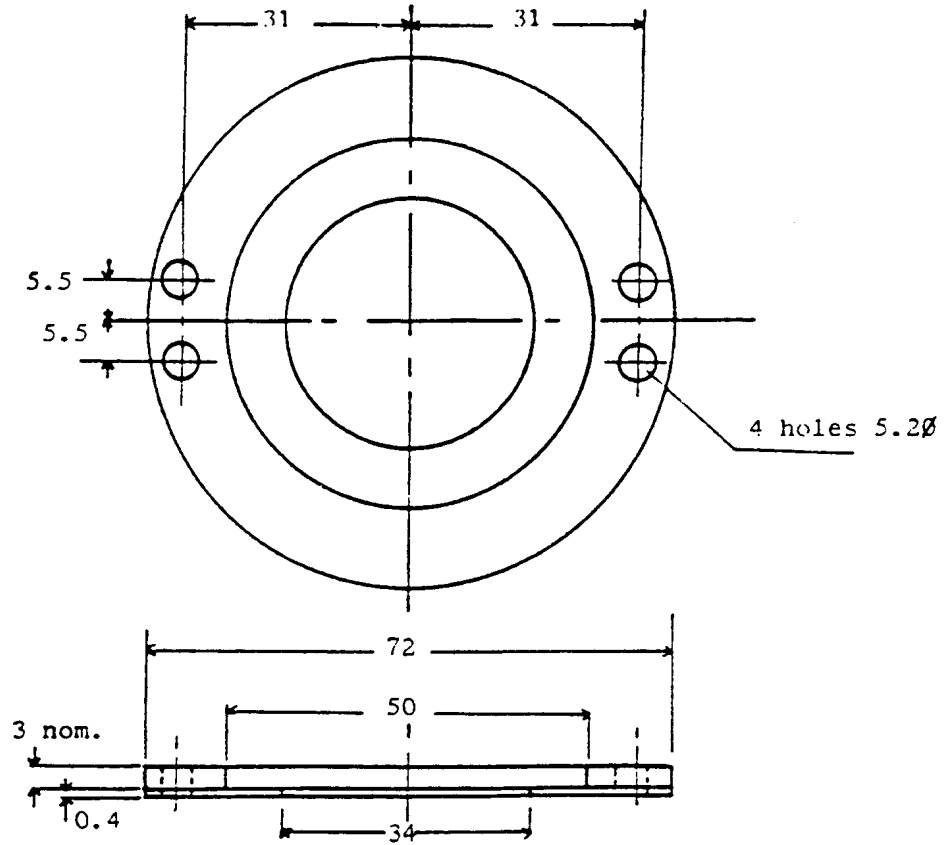


Figure 6 Rocker Assembly Reforming Jig



Material mild steel

Figure 7 Shim Gauge

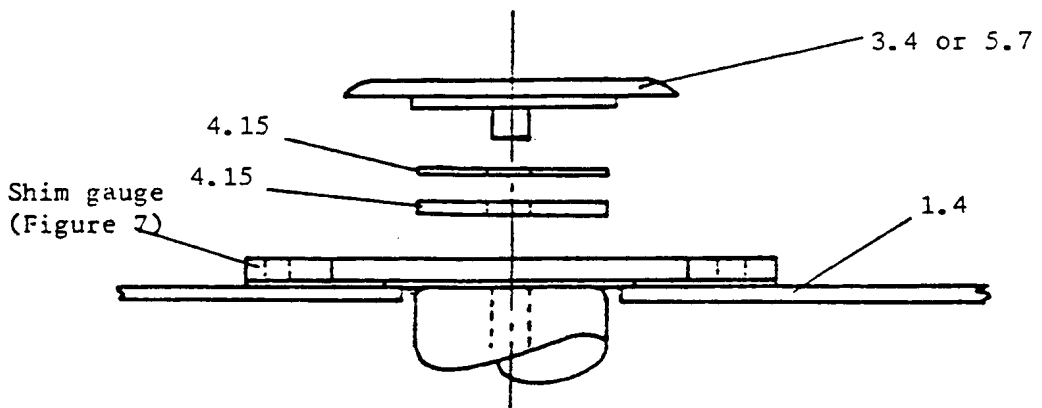


Figure 8 Location of Shim Gauge on End Support

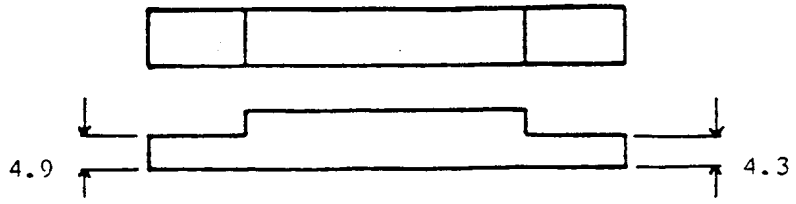


Figure 9 Contact Gap Gauge

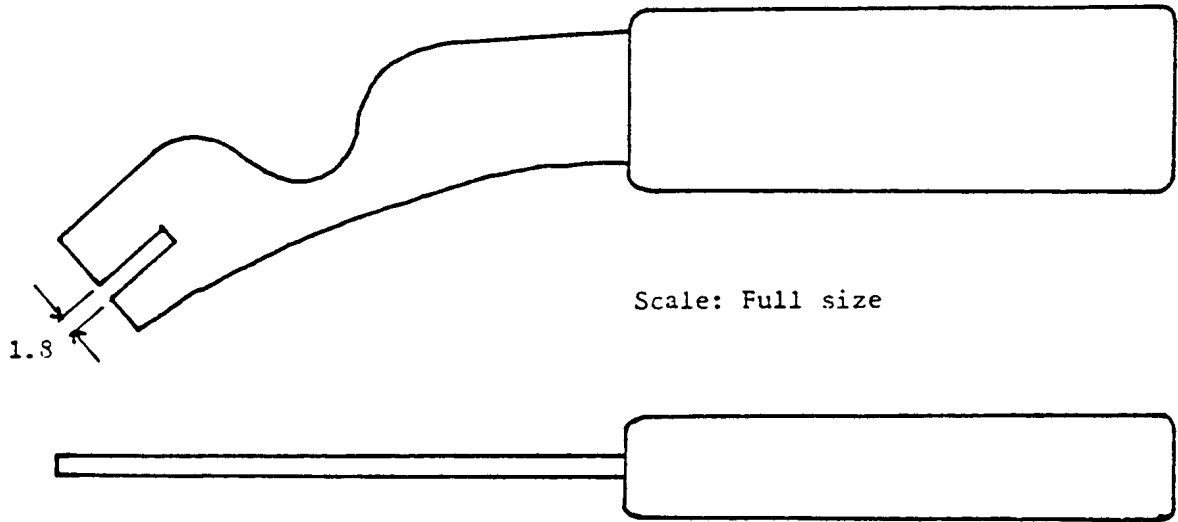


Figure 10 Contact Gap Setting Tool

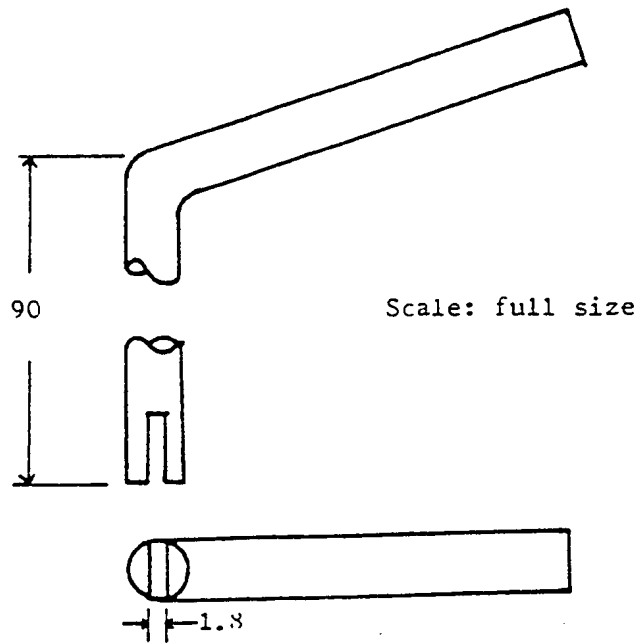


Figure 11 Contact Holder Gap Setting Tool

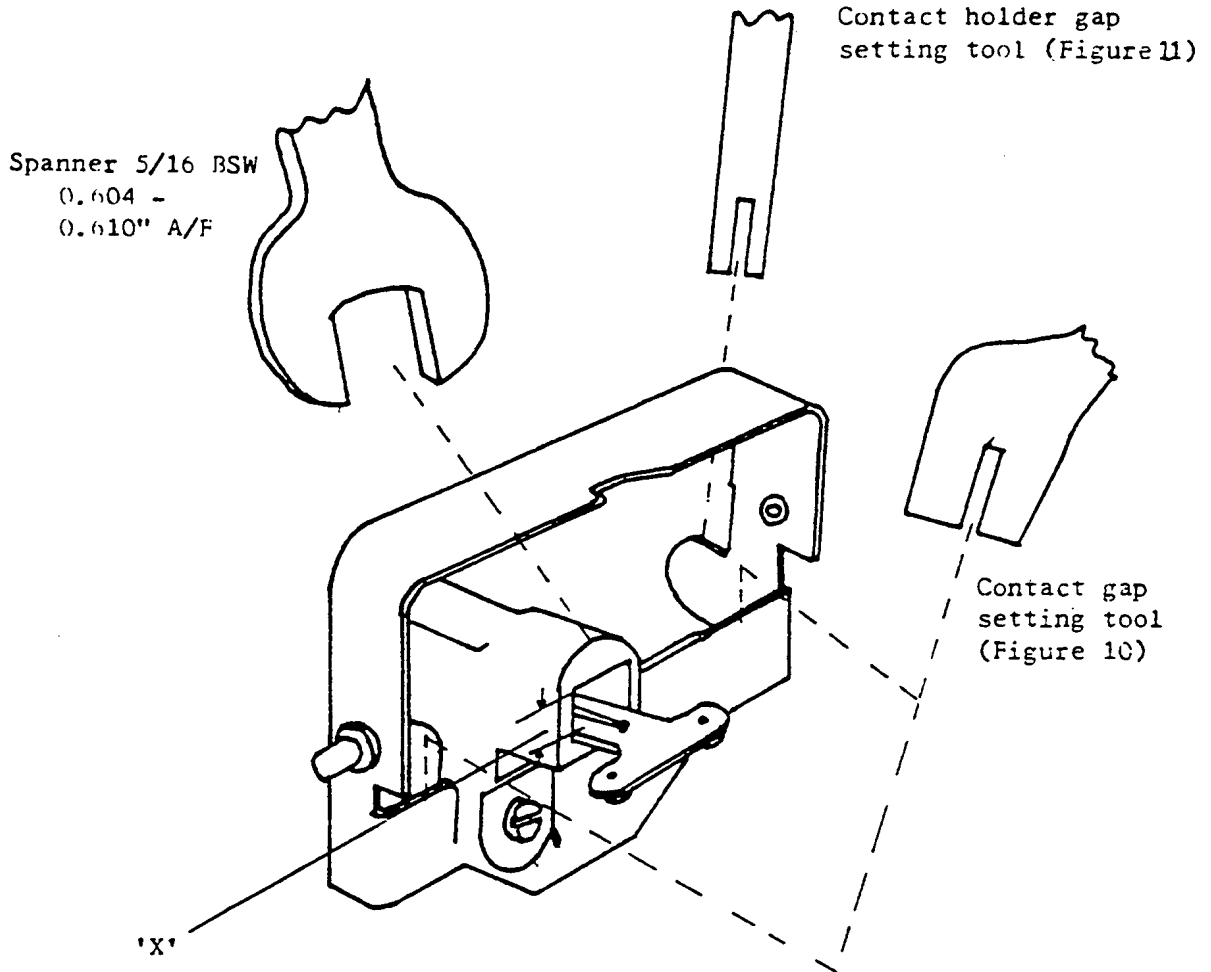


Figure 12 Setting Points on Rocker Assembly

SECTION 2 TEST SPECIFICATION

Equipment

Regulated air or vacuum supply and gauge. (Fluid operated switches may be tested with air).

Continuity tester.

If any of the following tests do not give the indicated result, investigate and rectify the defect and repeat the test.

- 1 Mount the switch in its operating position (see Section 3 Table 3).
- 2 Connect the air or vacuum supply to the switch via a flexible hose.
- 3 Connect the continuity tester across one pair of contacts.
- 4 Raise the air/vacuum pressure to the cut-in or cut-out value (whichever is the higher) given in Section 3 Table 4. Adjust the operating spring tension until the switch operates. Reduce the air/vacuum pressure to zero.
- 5 Raise the air/vacuum pressure slowly and check that the switch operates at the correct value. Do not take longer than 1 minute to raise the pressure over the final 5 p.s.i. on air-operated switches. Check the pressure at which the switch operates. Readjust the switch and repeat this test until the setting is correct.
- 6 Reduce the air/vacuum pressure slowly and check that the switch operates at the value given in Section 3 Table 4. If the correct differential is not achieved, adjustments may be made by changing the toggle spring (1.25) for one of a different colour code. Yellow = average strength; red = strong (increases differential); green = weak (reduces differential).
- 7 Transfer the continuity tester leads to the opposite pair of contacts and check that they conduct when the switch operates.
- 8 Disconnect the continuity tester and lock the adjustment screw with the locknuts (1.18).
- 9 Fit the cover and tighten the screw (1.21).
- 10 Repeat tests 5 and 6 and check that the settings are correct.
- 11 Switch off and disconnect the air/vacuum hose.
- 12 Seal the diaphragm chamber with masking tape.

SECTION 3 TECHNICAL DATA

Table 1 Vehicle Classes, Switch Types and Functions

Class	Function	BR Cat. No.
08V	CCG	17/ 1211
08A	ABPG LMRG	90/ 9309 61/ 14117
08X 09	APBG VCG	90/ 9309 51/ 32140
20	APBG AP ATG CCG VCG	90/ 9309 61/ 14903 51/ 16775 51/ 16775 51/ 32140
26	ABPG CG(001-7) CG(008+) LMRG OPS VCG WPS	90/ 9309 90/ 52233 72/ 8044 61/ 14117 17/ 52920 51/ 32140 61/ 14905
31	ABPG CCG CG EXSS1-2 VCG	90/ 9309 90/ 9309 61/ 14904 90/ 11790 51/ 32140
33	EG CCG OPS WPS VCG	61/ 14908 61/ 14909 17/ 52920 61/ 14905 51/ 32140
37	CG CCG BPAG XSS1-2 VCG	90/ 9307 90/ 9309 90/ 9309 90/ 11790 51/ 32140
43	APBG CG MRG PBPS1 PBPS2	90/ 11789 72/ 8044 72/ 8046 72/ 800 72/ 795

Class	Function	BR Cat. No.
47	ABPG	90/ 9309
	CG	90/ 52233
	EG	72/ 800
	EXSS	61/ 14910
	LMRG	61/ 14903
	PCG	61/ 25609
	ROPS	61/ 29488
	SOPS	90/ 9311
50	VCG	51/ 32140
	WPS	61/ 14907
	ABPG	90/ 9309
	CCG	90/ 9309
	CG	90/ 52233
56	EXSS1	90/ 11790
	EXSS2	90/ 11790
	VCG	51/ 32140
	ABPG	90/ 9309
	CG	72/ 8044
58	EG	90/ 9309
	MRG	61/ 14117
	PBPS1	72/ 8046
	PBPS2	72/ 8045
73/0	BPG	98/ 2624
	EG	72/ 5294
73/1	MRG	72/ 5294
	ABPG	90/ 9309
81	CCG	90/ 11789
	EG	90/ 11789
85	CG	53/ 17162
	ABPG	90/ 9309
	ABG	90/ 11792
	ACG	90/ 11791
	CG	90/ 52233
86	VCG	51/ 32140
	XG	90/ 11788
	XSG	90/ 11790
87	ABG	90/ 9309
	ABPG	93/ 49653
	ACG	90/ 11791
	CG	90/ 52233

Table 1 (Contd.)

Class	Function	BR Cat. No.
90	-	98/8633
97/7	CCG	53/17162
	CG	90/9307
101-128	APS	15/65232
141		
150	BPG	15/2271
151	MRG	15/2272
201-207	CCG	90/11789
302	ABG	93/49653
	ACG	93/49654
	CCG	90/11789
	CG	90/9307
305	ABG	93/49655
	ACG	93/49654
	CCG	90/11789
	CG	90/9307
	FG	90/11789
307	ABG	93/49653
	ACG	93/49654
308	CCG	90/11789
	CG	90/9307
309	ABG	93/49653
	ACG	93/49654
	CCG	90/11789
	CG	90/9307
303-4	ABG	93/49655
	ACG	93/49654
310-12	CCG	90/11789
	CG	90/9307
313	ACG	98/9203
	BAG	98/3071
	BRG	98/2469
	CG	98/9204
	EG	90/9309
	MRG, LPG	51/13958
	PL	98/9201
	TGG	98/9206
VBG	98/9209	

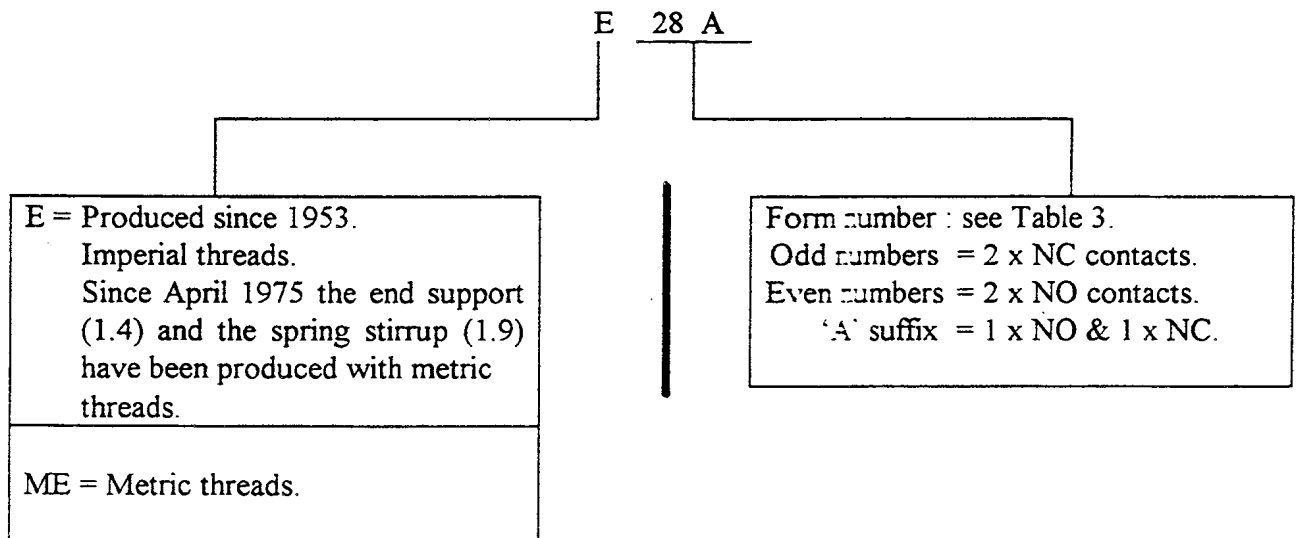
Class	Function	BR Cat. No.
314 315	ACG	98/9203
	BAG	98/3071
	BRG	98/2469
	CG	98/9204
	EG	90/9309
317	MRG	51/13958
	VBG	98/9209
318	ACG	98/9205
	CG	98/4263
	EG	98/2624
	MRG	98/2623
319	VBG	98/9209
	-	98/8633
410-419	CCG	90/11789
420/1	CCG	90/11789
	EG(1)	61/14909
420/2	EG(2)	53/17163
	CCG	
421/1	EG	90/11789
	421/2	CCG
423	EG (1)	61/14909
	EG (2)	53/17163
411	CCG	90/11789
	419	EG (1)
491	EG (2)	53/17163
	420	CCG
421	EG	98/2624
	423	CCG
432	EG	98/9204
	PHCC	90/41376
	PLCG	90/11789
442	EG	98/8842
455	CG	98/2621
	EG	98/9210
	MRG	98/9207

Table 1 (Contd.)

Class	Function	BR Cat. No
489	CCG	90/11789
	HCG	90/41376
	HG	90/9309
501	CCG	53/17162
504	CG	90/9307

Class	Function	BR Cat. No.
507	CG	98/9204
	BAG	98/9208
508	EG	90/9309
	MRG	51/13958
	TGG	98/9206

Table 2 Form Details



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Table 3 Switch Variations

Form	BR Cat.	Mount	Medium	Max. Setting		Differential	
				Rising	Falling	Max.	Min.
E2	51/32140	Back	Vacuum	26.5"Hg	1"Hg	3"Hg	2"Hg
E12A	72/800	Base	Air	6.89 bar 100 psi	0.34 bar 5 psi	1.03 bar 15 psi	0.83 bar 12 psi
E18	90/9309	Back					
E27	90/41376	Base					
E28	90/9310	Base					
ME28	98/2624	Base					
ME28	98/8633	Base					
E19	90/52233	Base	Air	11.03 bar 160 psi	0.83 bar 12 psi	1.79 bar 26 psi	1.24 bar 18 psi
ME19	98/4263	Base					
E19A	61/25609	Base					
E20	61/14117	Base					
ME20	72/5294	Base					
E20A	98/3071	Base					
ME20A	98/3433	Base					
E25	90/9311	Back	Fluid	2.75 bar 40 psi	0.07 bar 1 psi	0.38 bar 5.5 psi	0.24 bar 3.5 psi
E26	17/52920	Back					
E26A	61/29488	Back					
E29	90/9307	Base	Air	8.96 bar 130 psi	0.69 bar 10 psi	1.24 bar 18 psi	0.96 bar 14 psi
ME29	98/2621	Base					
E30	51/13958	Base					
ME30	98/2623	Base					
E30A	98/2469	Base					
ME30A	98/2622	Base					

Notes

1. Obsolescent forms 5 and 33 are identical to 27.
2. Obsolescent forms 12 and 34 are identical to 28.
3. Obsolescent form 36 is identical to 2.

Table 4 Switch Settings

BR Cat.No.	Type PGS-	Rise bar	Rise ps	Fall bar	Fall psi
15/ 2271	ME28	3.83 - 3.97	55 - 58	2.58 - 3.10	37 - 45
15/ 2272	ME30	5.30 - 5.70	77 - 83	4.30 - 4.50	62 - 64
15/ 65232	E12	4.07 - 4.21	59 - 61	3.10 - 3.31	45 - 48
17/ 1211	E18	3.03 - 3.24	44 - 47	2.14 - 2.27	31 - 33
17/ 52920	E26	1.03 - 1.17	15 - 17	0.76 - 0.90	11 - 13
51/ 13958	E30	6.06 - 6.34	88 - 92	5.03 - 5.17	73 - 75
51/ 32140	E 2	14.5-15.5" Hg		12.25-12.75" Hg	
53/ 17162	E18	3.58 - 3.79	52 - 55	2.69 - 2.83	39 - 41
53/ 17163	E28	4.90 - 5.03	71 - 73	3.93 - 4.14	57 - 60
61/ 14117	E20	5.80 - 6.20	85 - 90	4.40 - 4.60	64 - 66
61/ 14903	E18	5.80 - 6.20	85 - 90	4.40 - 4.55	64 - 66
61/ 14904	E19	7.93 - 8.34	115 - 121	9.59 - 9.72	138 - 141
61/ 14905	E26	0.48 - 0.62	7 - 9	0.21 - 0.34	3 - 5
61/ 14906	E26A	0.52 - 0.65	8 - 10	0.21 - 0.34	3 - 5

Table 4 (Contd)

BR Cat.No.	Type PGS-	Rise bar	Rise psi	Fall bar	Fall psi
61/ 14907	E28		7 - 9		3 - 5
61/ 14908	E28	3.93 - 4.14	57 - 60	3.03 - 3.17	44 - 46
61/ 14909	E28	4.21 - 4.34	61 - 63	3.24 - 3.45	47 - 50
61/ 14910	E28	4.59 - 4.72	66 - 69	3.62 - 3.83	52 - 55
61/ 25609	ME19A	3.86 - 4.41	56 - 64	2.55 - 2.69	37 - 39
61/ 29488	E26A	1.07 - 1.21	15 - 18	0.76 - 0.90	11 - 13
72/ 795	E33	1.23 - 1.43	18 - 21	0.34 - 0.48	5 - 7
72/ 800	E12A	4.41 - 4.55	64 - 66	3.47 - 3.67	50 - 53
72/ 5294	ME20	5.70 - 6.20	84 - 90	4.43 - 4.57	64 - 66
72/ 8044	E19	9.93 - 10.10	144 - 146	8.21 - 8.76	119 - 127
72/ 8045	E20	4.95 - 5.05	72 - 74	3.30 - 3.70	48 - 54
72/ 8046	E20	5.44 - 5.99	79 - 87	4.14 - 4.26	60 - 62
90/ 9307	E29	6.83 - 6.96	99 - 101	5.65 - 5.93	82 - 86
90/ 9309	E18	4.20 - 4.45	61 - 65	3.30 - 3.45	48 - 50
90/ 9311	E25	1.31 - 1.45	19 - 21	1.00 - 1.14	14 - 17

Table 4 (Contd)

BR Cat.No.	Type PGS-	Rise bar	Rise psi	Fall bar	Fall psi
90/ 11788	E19	6.62 - 7.17	56 - 64	5.31 - 5.45	77 - 79
90/ 11789	E28	3.79 - 3.93	55 - 57	2.83 - 3.03	41 - 44
90/ 11790	E28	4.55 - 4.70	66 - 69	3.60 - 3.85	52 - 56
90/ 11791	E29	5.86 - 6.00	83 - 87	4.69 - 4.83	68 - 70
90/ 11792	E30	5.03 - 5.17	73 - 75	3.86 - 4.14	56 - 60
90/ 41376	E27	4.96 - 5.17	72 - 75	4.07 - 4.21	59 - 61
90/ 52233	E19	9.59 - 9.72	139 - 141	7.93 - 8.34	115 - 121
93/ 49653	E28	5.03 - 5.17	73 - 75	4.07 - 4.27	59 - 62
93/ 49654	E29	6.20 - 6.48	90 - 94	5.17 - 5.31	75 - 77
93/ 49655	E30	5.10 - 5.24	74 - 76	3.93 - 4.21	57 - 61
98/ 2469	E30A	6.14 - 6.27	89 - 91	4.96 - 5.24	72 - 76
98/ 2621	ME29	7.50 - 7.70	109 - 112	6.43 - 6.57	93 - 95
98/ 2623	ME30	6.10 - 6.30	88 - 91	5.03 - 5.17	73 - 75
98/ 2624	ME28	4.20 - 4.45	61 - 64	3.30 - 3.45	48 - 50
98/ 3071	E20A	2.14 - 2.69	31 - 39	0.83 - 0.97	12 - 14

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Table 4 (Contd.)

BR Cat. No.	Type PGS-	Rise bar	Rise psi	Fall bar	Fall psi
98/4263	ME19	9.90 - 10.10	144 - 147	8.41 - 8.55	122 - 124
98/8633	ME28	4.41 - 4.55	64 - 66	3.45 - 3.60	50 - 52
98/9201	E20A	2.83 - 2.96	41 - 43	1.11 - 1.66	16 - 24
98/9202	ME28	4.41 - 4.55	64 - 66	3.45 - 3.60	50 - 52
98/9203	E29	6.06 - 6.34	88 - 92	5.03 - 5.17	73 - 75
98/9204	E29	7.52 - 7.65	109 - 111	6.36 - 6.44	92 - 96
98/9205	ME29	6.14 - 6.27	89 - 91	5.00 - 5.20	73 - 75
98/9206	E30	5.45 - 5.58	79 - 81	4.26 - 4.55	62 - 66
98/9207	ME30	6.40 - 6.60	93 - 96	5.33 - 5.47	77 - 79
98/9208	E30A	1.86 - 2.14	27 - 31	0.83 - 0.97	12 - 14
98/9209	E28	4.41 - 4.45	64 - 66	3.47 - 3.67	50 - 53
98/9210	ME28	5.10 - 5.40		4.13 - 4.27	