MAINTENANCE OF SE.50 SELECTORS - MECHANICAL PARTS

(Replaces Issue 3, 1962.)

1. INTRODUCTION.

1.1 The purpose of this E.I. is to list all the mechanical parts of the SE.50 selector in logical groups for quick identification and to furnish brief data on each part as an aid to the communication of information.

1.2 The parts of mechanically-operated spring-sets and interrupters are listed in E.I. TELEPHONE Exchanges MP 4521.

2. CONTENTS OF THIS E.I.

2.1 The parts of the selector, illustrated in Figs. 1 to 9 are grouped functionally and appear on even numbered pages of this E.I. as follows -

2.2 On the odd-numbered pages opposite each illustration is a table which includes a part reference number (for ready identification of the parts on the illustration), the name (and synonymous title) of the parts (to provide a common means for communication purposes), the serial and item numbers of the parts, where applicable (for stores identification), relevant comments pertaining to each part and the quantity fitted to the switch (for information purposes). Where there are two or more variations in a part, the variants are designated with the letters A, B, C, etc. after the part number.

2.3 On the illustration, screws, nuts and washers are shown. These parts are grouped together and listed in the following tables -

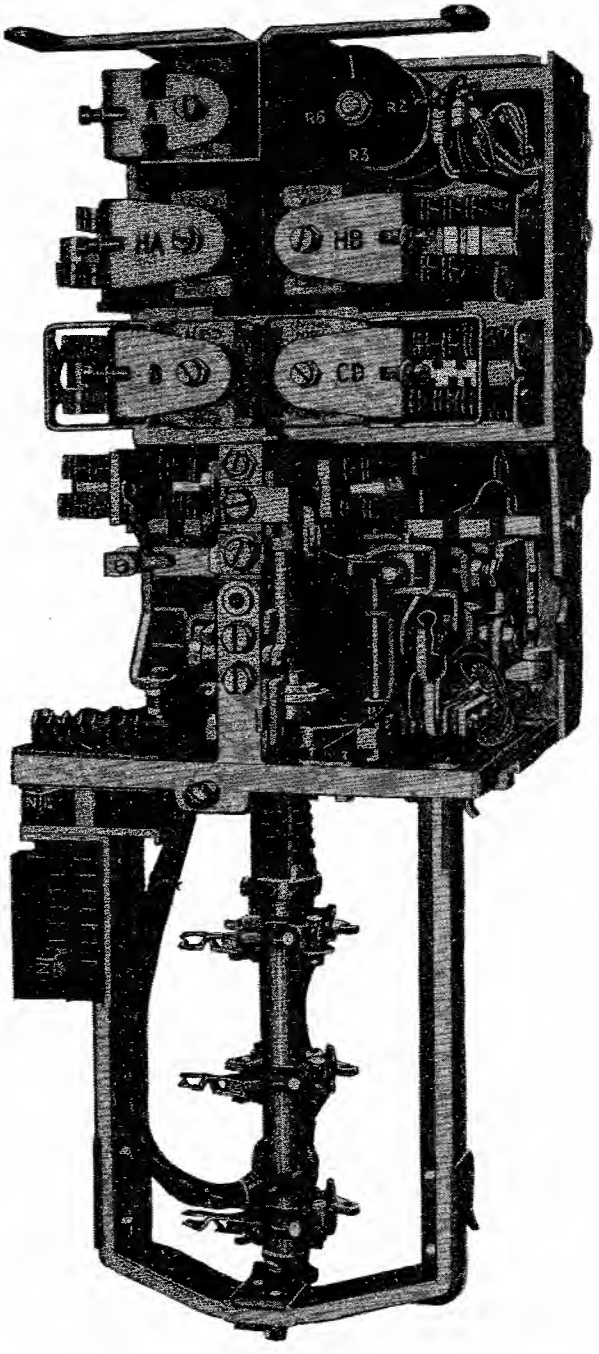

FIG. 1. SE.50 SELECTOR.

3. PART NUMBERS AND STOCK REFERENCES.

3.1 Many of the parts listed in this E.I. do not have a stock reference. At least half of these parts are components of sub-assemblies which have been "jig assembled" in the process of manufacture, and it will not be possible to correctly re-align these parts in the field. These jigs are expensive and cannot be provided at exchanges. When it is found that a jigged sub-assembly is faulty, it will be necessary to replace the complete assembly and to forward the recovered assembly to a repair centre. In the table, the vital parts which cannot be correctly adjusted in the field have the notations JIG ASSEMBLED or MUST NOT BE DISMANTLED or MUST NOT BE REMOVED or NOT TO BE DISTURBED shown in the remarks column.

3.2 It is anticipated that most of the remaining parts, which have not been allotted a stock reference, will not be required for maintenance purposes. Should it be found by field experience that one of these parts is required for maintenance, the matter should be brought to the notice of the Divisional Engineer.

3.3 Beside the tables listing the parts there are three unheaded columns. These columns may be used in exchanges to indicate local information such as:-

(i) Code of bottle, drawer or container in which the part is stored.

(ii) The maximum stock held in the exchange.

(iii) The minimum stock point. (A reminder to order new supplies.)

(iv) Where stock is not held locally, a code to indicate the nearest source of supply.

4. PROVISION OF MAINTENANCE PARTS IN EXCHANGES.

4.1 The number of parts to be held in an exchange for maintenance purposes must be kept to a minimum. The actual quantity of parts to be held should be determined by the Divisional Engineer. In general, only one of each of the mechanical parts need be held for every 1000 switches installed, except for the shaft washers (Part 50 - Quantity 1) and most of the screws, nuts and washers (Quantity 6). A stock of parts in an exchange on this basis should meet all requirements for a three months' period. It should be noted that the parts provided on this basis are an insurance and that many of them will not be used in this period.

5. FAULTY COMPONENTS.

5.1 Where faulty mechanical components are found on selectors, facts relative to the faulty components, such as prevalence of the fault, circumstances under which the fault occurred, possible causes of the fault and other relevant information such as the manufacturer and year of manufacture of the selectors and parts concerned, should be brought to the notice of the Divisional Engineer.

6. AMENDMENTS TO THIS INSTRUCTION.

6.1 There are several manufacturers of the S.E.50 selector and from time to time the manufacturers have introduced minor or major variations (individually or collectively) to component parts of the selector. Changes in design incorporated in the selector as at the date of this issue have been included. From time to time this E.I. will be amended as necessary to include future changes in design.

6.2 If variations in the design of the components listed in this E.I. are noted in exchanges the variations should be brought to the notice of the Divisional Engineer.

6.3 If the Divisional Engineer considers that variations in the listing of the components in this E.I. (or any other information concerning the SE.50 selector brought to his notice) is of general interest, or that amendments should be made to the E.I., arrangements should be made to forward the information to the Engineer-in-Chief.

7. ASSOCIATED INSTRUCTIONS.

7.1 A general reference to all other E.Is. on SE.50 selectors will be included in an E.I. on general maintenance of the selectors when it is issued.

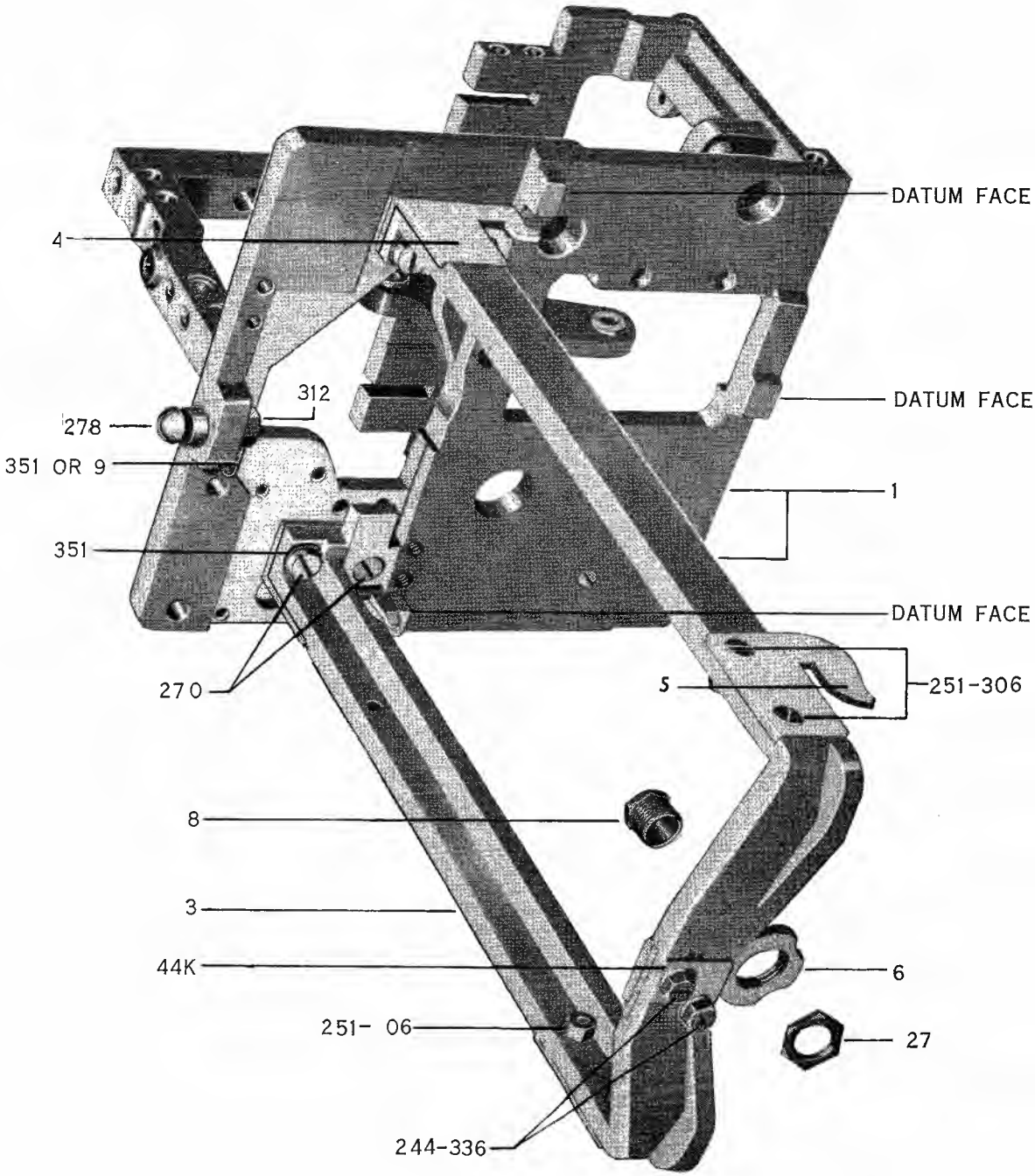

FIG. 2. FRAME ASSEMBLY AND PARTS.

5. TABLE OF MECHANICAL PARTS.

5.1 The parts listed in this table are, except for a few minor components such as screws, nuts and washers, illustrated in the figure opposite each page.

	Part Reference	TITLE (and Synonymous Title)	Stock Reference Ser. No.	Stock Reference Item No.	Detail and Remarks	No. Per Switch		
	1	FRAME ASSEMBLY (Frame and Frame Extension)			Frame, frame column and brackets. JIG ASSEMBLED. Must not be dismantled. Components. See parts 2-8.	1		
	A	2 Bank	-	-	Small diameter shaft hole for shafts 12 A-C.			
	B	3 "	-	-	Only on early type selectors is the datum pin bush			
	C	4 "	-	-	short.			
	D	2 Bank	250	77	Large diameter shaft hole for shafts 12 D-J. Datum			
	E	3 "	250	78	pin bush is long.			
	F	4 "	250	79				
	2	FRAME (Base)			The three datum faces underneath the frame and the shaft bearing hole are the basic datum	1		
	A	Small diameter shaft hole	-	-	points for all adjustments. JIG ASSEMBLED to			
	B	Large diameter shaft hole	-	-	frame columns.			
	C	" " " " and mounting holes for both 8 and 10 tag terminal blocks (51).						
	3	FRAME EXTENSION (Frame column)			Supports bottom end of shaft and mounting brackets. JIG ASSEMBLED to frame. MUST NOT BE REMOVED.	1		
	A	2 Bank	-	-				
	B	3 "	-	-				
	C	4 "	-	-				
	4	UPPER CATCH PLATE (Upper bracket)			Retains switch in bank. JIG ASSEMBLED to frame. MUST NOT BE REMOVED.			
	A	Left Hand	-	-		1		
	B	Right Hand	-	-		1		
	5	LOWER CATCH PLATE (Frame column bracket)			Retains switch in bank. JIG ASSEMBLED to frame column. MUST NOT BE REMOVED.			
	A	Left Hand (Short Lugs)	-	-		1		
	C	Left Hand (Long Lugs)	-	-				
	B	Right Hand (Short Lugs)	-	-		1		
	D	Right Hand (Long Lugs)	-	-				
	6	BEARING PLATE			Holds gland for bottom end of shaft. Hole tapped	1		
	A		-	-	40 T.P.I. for screw thread on gland. JIG ASSEMBLED to frame column. MAY ONLY be removed with the aid of a jig. See E.I. TELEPHONE Exchanges Automatic AD 4051.			
	B		-	-	Bearing plates (Part 6B) fitted to selector frames of UK manufacture are narrower and if the screws (Part 244) are loosened the free movement of these plates will be much greater than on Australian made plates (Part 6A).			
	8	SHAFT BEARING (Gland)	250	12	Bottom bearing for shaft. Adjusts vertical ratchet for vertical pawl first vertical step. Threaded 40 T.P.I.	1		
	9	CORD GUIDE CLIP	-	-	Provided on some selectors	1		

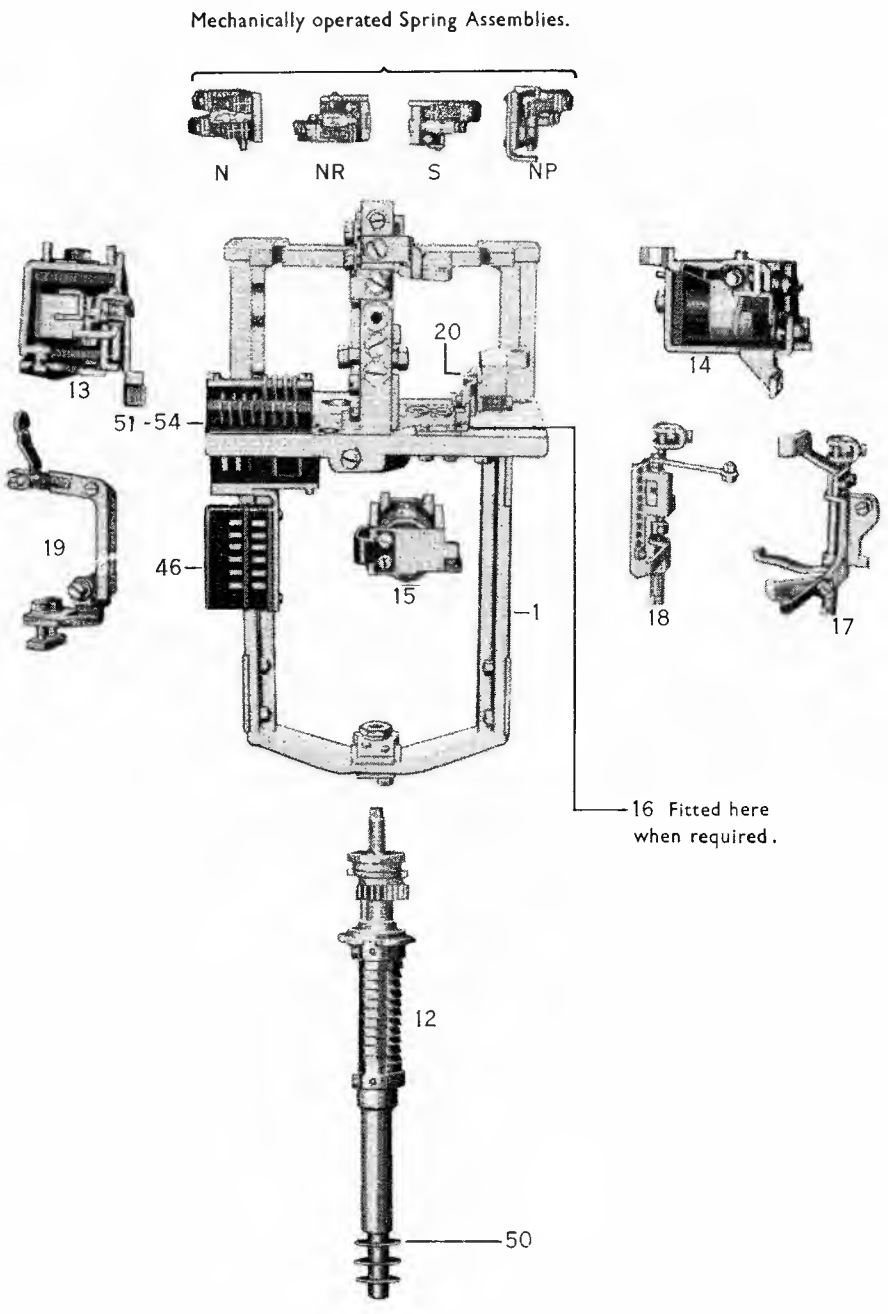

FIG. 3. SUB-ASSEMBLIES OF THE SELECTOR.

	Part Reference	TITLE (and Synonymous Title)	Stock Reference Ser. No.	Stock Reference Item No.	Detail and Remarks	No. Per Switch		
					SUB-ASSEMBLIES. (See E.I. TELEPHONE Exchanges Automatic AD 4051 for method of changing ratchet and shaft assemblies.)			
	12	VERTICAL AND ROTARY RATCHET, HUB AND SHAFT ASSEMBLY (Carriage) (Shaft and ratchet assembly)			Components. See parts 73-100.	1		
	A	2 Bank	250	1	Shaft (73A-C) with small dia. top bearing for frames			
	B	3 "	250	2	1 A-C. Vert. ratchet with adjustable spline guides			
	C	4 "	250	3	and splines for wipers (93 A-C) and rotary ratchet (79A). Some deliveries of these assemblies have had vertical ratchets (93 G-J) and rotary ratchet (79B). These shaft and ratchet assemblies are no longer obtainable. When stocks are exhausted ream top bearing hole in frame in accordance with instructions and replace with standard shaft and ratchet assemblies, Serial 250, Items 4, 5 and 6, and also NEVER LOOSEN LEFT HAND SPLINE PLATE SCREWS OR VARNISHED SCREWS ON VERTICAL AND ROTARY CAMS.			
	D	2 "	-	-	Shaft (73 D-F) with normal dia. top bearing for frames			
	E	3 "	-	-	1 D-F. Vert. ratchet with adjustable spline guides			
	F	4 "	-	-	and wiper splines (93 A-C) and with plain tubes (93 D-F) and rotary ratchet (79B).			
	G	2 "	250	4	Shaft (73 D-F) for frames 1 D-F. Vertical ratchet			
	H	3 "	250	5	(93 G-J) and rotary ratchet (79 B).			
	J	4 "	250	6				
	K	2 "	-	-	The shafts on these assemblies have the adjustment			
	L	3 "	-	-	square for the rotary restore spring at the bottom.			
	M	4 "	-	-	(Parts 73 G-J). Vertical and rotary ratchets 93 G-J and 79B used. Fitted only to selectors of UK manufacture. Can only be removed with the aid of jig in E.I. AD 4051.			
	13	VERTICAL MAGNET ASSEMBLY	250	14	NEVER USE ARMATURE BENDERS - REPLACE UNIT. Components. See parts 110-129.	1		
	14	ROTARY MAGNET ASSEMBLY			NEVER USE ARMATURE BENDERS - REPLACE UNIT. Components. See parts 110-128.	1		
	A		-	-	With light return spring - 124A.			
	B		-	-	With heavy return spring - 124B.			
	C		250	15	Improved armature - 117B and spring - 124B.			
	15	RELEASE MAGNET ASSEMBLY			Components. See parts 132-136.	1		
	A		-	-	Release spring in small slot in yoke acts as pivot for armature.			
	B		250	41	Improved design with metal coil cheek and improved armature with increased clearance to yoke.			
	16	INTERCEPTOR MAGNET ASSEMBLY	-	-	Permits only rotary release. Not normally fitted.	1		
	17	DETENT ASSEMBLY	-	-	Components. See parts 137-144.	1		
	18	N.P. OPERATING LEVER BRACKET ASSEMBLY	-	-	Components. See parts 137-149.	1		
	19	VERTICAL OFF-NORMAL LEVER ASSEMBLY	250	46	Components. See parts 65-69.	1		
	20	RELEASE LEVER ASSEMBLY (Manual Release Extension)	250	44	Release operation of detents. Components. See parts 60-63.	1		

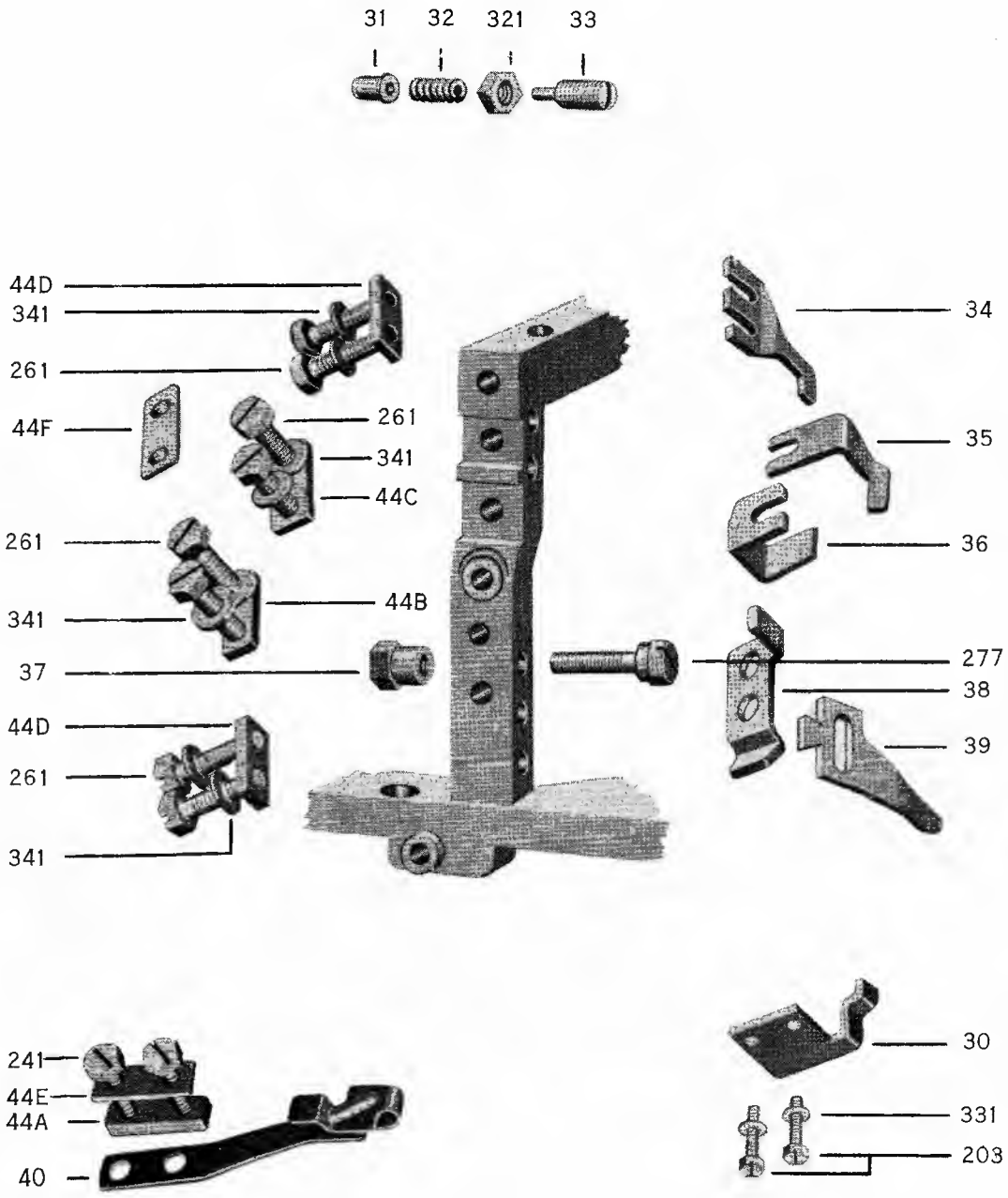

FIG. 4. FRAME ASSEMBLY SMALL PARTS.

	Part Reference	TITLE (and Synonymous Title)	Stock Reference Ser. No.	Stock Reference Item No.	Detail and Remarks	No. Per Switch		
					FRAME ASSEMBLY SMALL PARTS.			
	30	RELEASE GUIDE BRACKET	250	45	Supports front of release lever. In lieu of interceptor magnet.	1		
	31	SHAFT LOCKING PLUNGER	250	64	Holds shaft at required rotary return spring tension.	1		
	32	PLUNGER PRESSURE SPRING (Shaft locking spring)	250	10	Pressure spring for plunger.	1		
	33	PLUNGER ADJUSTING SCREW (Shaft locking screw)	250	62	Adjusts pressure on plunger.	1		
	34	ROTARY STOP			Rotary stop on return of shaft to normal position.	1		
	A		-	-	16 S.W.G. Mild Steel			
	B		250	32	15 " " "			
	35	ROTARY PAWL GUIDE			Guide for rotary pawl.	1		
	A		-	-	16 S.W.G. mild steel. On early model selectors.			
	B		250	75	14 S.W.G. mild steel.			
	36	ROTARY PAWL STOP	250	31	Limit stop for rotary pawl.	1		
	37	VERTICAL PAWL GUIDE (Eccentric Nut)	250	57	Guide for pawl tail.	1		
	38A	VERTICAL PAWL STOP			Limit stop for vertical pawl on early type selectors only. Cannot be used on selectors with the long datum pin bush. Frames 1A-C.	1		
	B		250	30	Limit stop for vertical pawl on all other selectors.			
	39	FIXED DETENT (Ratchet Guide)	250	33	Supports shaft and vertical ratchet assembly during rotary release. Guides carriage during vertical release.	1		
	40	LATCH SPRING (Release Link Spring)	250	40	Operates detents on 1st vertical step.	1		
	44A	CLAMP PLATE NO. S1	250	52	Tapped plate. Secures latch spring to frame.	1		
	44A	CLAMP PLATE NO. S1	250	52	Tapped plate. Secures V.O.N. assembly to frame. (Fig. 6.)	1		
	44B	CLAMP PLATE NO. S2	250	53	Tapped plate. Secures vertical pawl stop to frame.	1		
	44C	CLAMP PLATE NO. S3	250	54	Tapped plate. Secures rotary pawl front stop and guide to frame.	1		
	44D	CLAMP PLATE NO. S4	250	55	Tapped plate. Secures stationary detent to frame (ratchet guide).	1		
	44D	CLAMP PLATE NO. S4	250	55	Tapped plate. Secures rotary stop to frame.	1		
	44E	CLAMP PLATE NO. S5	-	-	Untapped plate. Top plate for latch spring.	1		
	44F	CLAMP PLATE NO. S6	-	-	Untapped plate. In lieu washers for rotary stop and guide (some selectors only). Mounted with convex side outwards.	1		

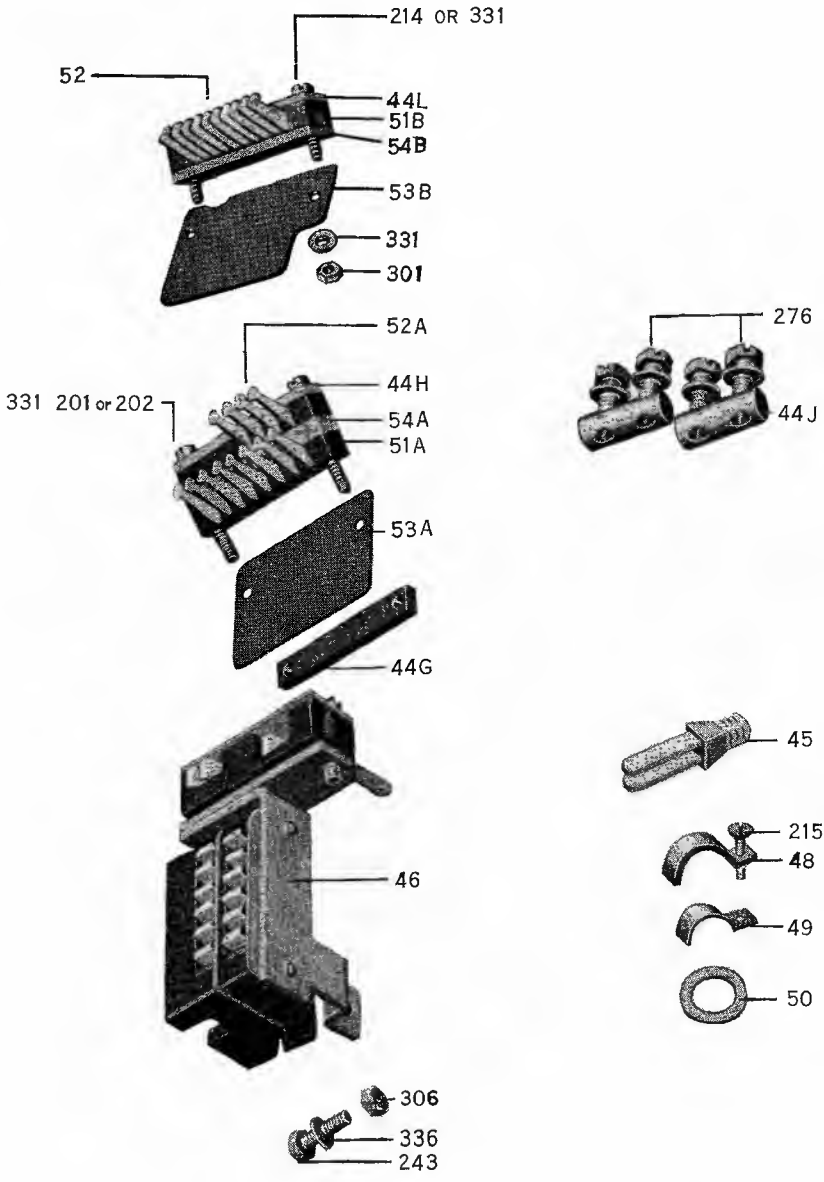

FIG. 5. MINOR SUB-ASSEMBLIES AND SMALL PARTS.

	Part Reference	TITLE (and Synonymous Title)	Stock Reference Ser. No.	Stock Reference Item No.	Detail and Remarks	No. Per Switch		
	44G	CLAMP PLATE NO. S7	250	56	Tapped plate. Secures terminal block to frame.	1		
	44H	CLAMP PLATE NO. S8	-	-	Untapped plate. Top plate for terminal block.	1		
	44J	CLAMP ROD NO. S9 (Lognut)	250	76	Tapped log. Secures NR and S spring-sets.	2		
	44K	CLAMP PLATE NO. S10	-	-	Untapped plate for shaft plate.	1		
	44L	CLAMP PLATE NO. S12	289	109	10 tag terminal block (see note).	1		
	45A	"U" LINK, RED	9	45	Test link.	1		
	45B	"U" LINK, GREEN	9	46	Test link.	1		
	46	TEST AND LAMP JACK ASS.	-	-	14 point, vertical.	1		
	48	CLIP	-	-	Wiring clip near vertical magnet.	1		
	49	PROTECTOR	-	-	Wiring clip insulating protector.	1		
	50	FIBRE WASHER	250	11	Shaft. 5 fitted on earlier selectors, 3 on later types.	3		
	51	TERMINAL BLOCK						
	A	Block for 8 tags	250	58	Termination of wiper cords.	1 or 2		
	B	" " 10 "	289	110	" " " " See Note.	1		
	52	TERMINAL						
	A		250	59	Termination of wiper cords.	as re-		
	B		289	108	" " " " See Note.	quired.		
	53	INSULATING PLATE			Insulates terminals from frame.			
	A		250	60	See Note.	1		
	B		289	111		1		
	54	INSULATING SPACER						
	A		-	-	Separates terminal blocks when two used.	1		
	B		-	-	Raises tags above frame. See Note.	as re-quired.		

NOTE:- On a few imported selectors a 10 tag wiper cord terminal block is fitted.

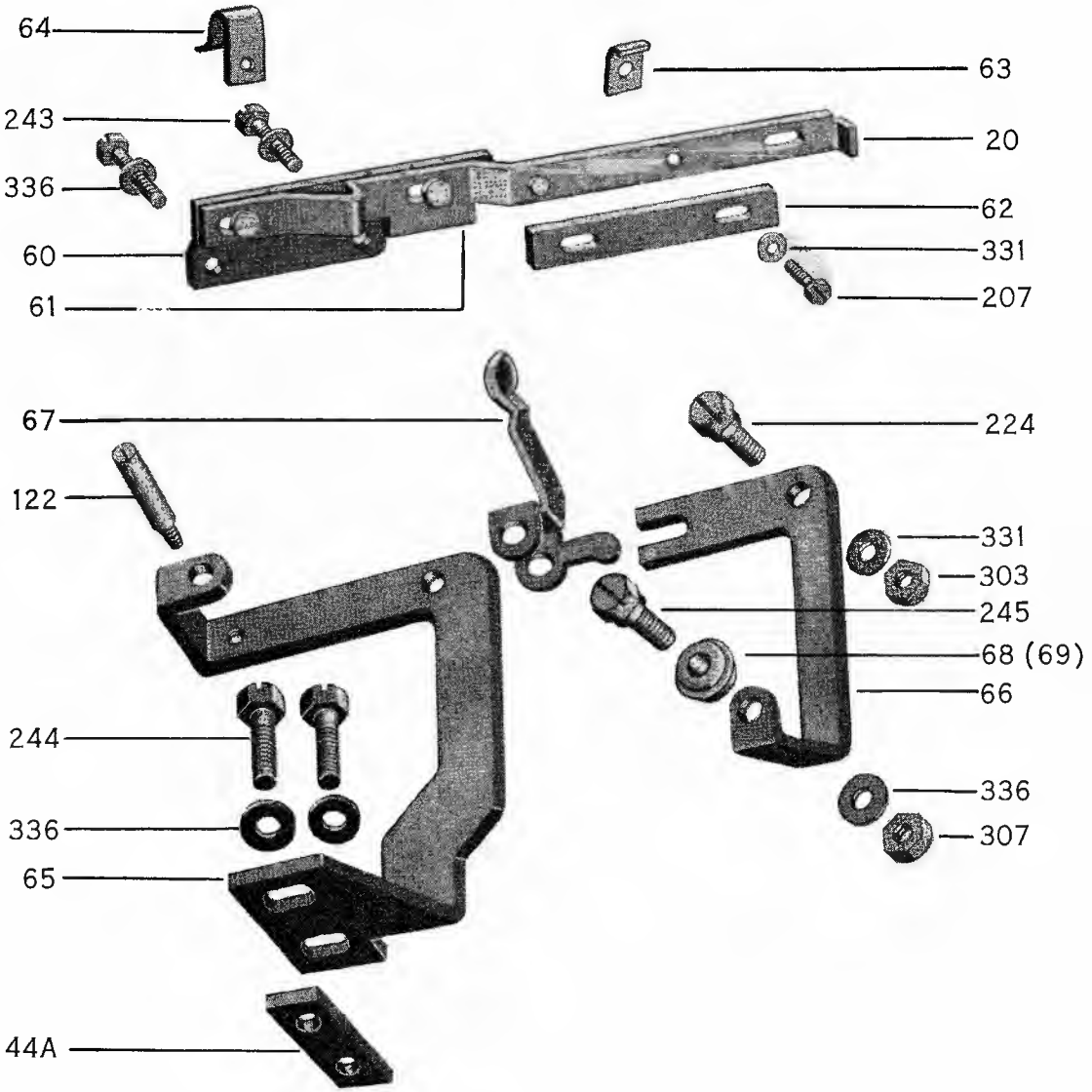

FIG. 6. RELEASE LEVER AND VERTICAL OFF-NORMAL ASSEMBLIES.

	Part Reference	TITLE (and Synonymous Title)	Stock Reference Ser. No.	Stock Reference Item No.	Detail and Remarks	No. Per Switch		
		COMPONENTS OF SUB-ASSEMBLIES.						
		RELEASE LEVER ASSEMBLY (Part 20)						
	60	MOUNTING BRACKET			Rivetted to release lever 61.	1		
	A		-	-	18 S.W.G. M.S. with offset bend.			
	B		-	-	16 S.W.G. M.S. flat.			
	61	MANUAL RELEASE LEVER	-	-	Extension for manual release. Includes rivetted rear mounting bracket 60.	1		
	62	RELEASE LEVER ADJUSTING PLATE	-	-	Transmits release function to detents.	1		
	63	CLAMP PLATE NO. S11	250	63	Clamps release plate to lever. 8BA nut used on early models.	1		
	64	WIRING CLIP	-	-	In lieu of washer 336 on later selectors.	1		
		VERTICAL OFF-NORMAL LEVER ASSEMBLY (Part 19)						
	65	BRACKET	-	-	Supports operating lever.	1		
	66	CAM OPERATED LEVER	-	-	Transfers movement from roller to toggle arm.	1		
	67	ARMATURE OPERATING LEVER (Toggle arm)	-	-	Operates V.O.N. spring-set.	1		
	68	CAM FOLLOWER (Roller)	-	-	Operated by shaft assembly cam.	1		
	69	ROLLER ASSEMBLY	250	47	Consists of parts 68, 245, 307 and 336.	1		

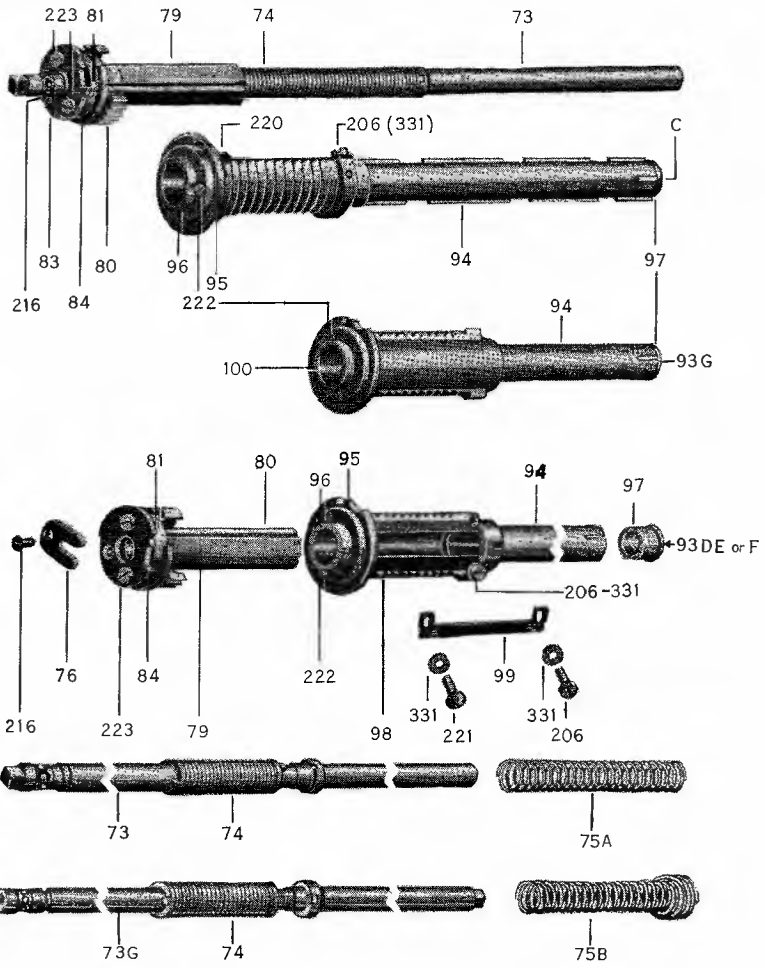

FIG. 7. VERTICAL AND ROTARY RATCHET AND SHAFT ASSEMBLIES.

	Part Reference	TITLE (and Synonymous Title)	Stock Reference Ser. No.	Stock Reference Item No.	Detail and Remarks	No. Per Switch		
	VERTICAL AND ROTARY RATCHET ASSEMBLIES AND SHAFT (Part 12)							
	73	SHAFT			If worn or damaged replace complete assembly, Part 12.	1		
	A	2 Bank	-	-	For Part 12A)			
	B	3 "	-	-	For Part 12B) Has small diameter			
	C	4 "	-	-	For Part 12C) top bearing.			
	D	2 "	-	-	For Part 12D, G)			
	E	3 "	-	-	For Part 12E, H) Has large diameter			
	F	4 "	-	-	For Part 12F, J) top bearing.			
	G	2 "	-	-	)			
	H	3 "	-	-	) For Parts 12 K.L.K.M. Has rotary tension			
	J	4 "	-	-	) adjusting square at the bottom.			
	74	ROTARY RETURN SPRING ASSEMBLY				1		
	A	2 Bank	250	8				
	B	3 and 4 Bank	250	9				
	75	VERTICAL RETURN SPRING			Not supplied shaft at ratchet assemblies (Part 12)	14		
	A		-	-	Plain spring on early type selectors. Bottom loop is			
	B		250	7	larger. To be fitted with large loop at the bottom.			

	Part Reference	TITLE (and Synonymous Title)	Stock Reference Ser. No.	Stock Reference Item No.	Detail and Remarks	No. Per Switch		
	76	SHAFT RETAINING PLATE	250	61	Locates rotary ratchet on shaft.	1		
	79	ROTARY RATCHET ASSEMBLY			MUST NOT BE DISMANTLED. Dowel screw (223) sealed-in during assembly, then MR and S cam ground concentric to shaft centre. If screws loosen, replace complete assembly Part 12. Components. See parts 80 - 84.	1		
	A		-	-	With rotary ratchet 80A. Assembled with vertical ratchet 93A-F in complete assembly 12A-F.			
	B		-	-	With rotary ratchet 80B. Assembled with vertical ratchet 93G-J in complete assembly 12G-J. May be in some assemblies 12A-F.			
	80	ROTARY RATCHET			Part of Rotary Ratchet Assembly, 79.	1		
	A		-	-	With wide tolerances on dimensions. Has reduced outside diameter at the bottom.			
	B		-	-	With very close tolerances on critical dimensions of splines. Has reduced outside diameter at the bottom.			
	81	SPACER	-	-	Part of Rotary Ratchet Assembly, 79.	1		
	83	ROTARY CAM	-	-	Part of Rotary Ratchet Assembly, 79.	1		
	84	ROTARY CAM PLATE	-	-	Part of Rotary Ratchet Assembly, 79.	1		
	93	VERTICAL RATCHET ASSEMBLY			MUST NOT BE DISMANTLED. Left-hand spline plate and datum slot aligned in a jig and are related to third tooth on rotary ratchet. If spline plate screws (206 and 220) or cam screws (222) loosen, replace complete assembly 12. Components. See parts 94 - 100.	1		
	A	2 Bank	-	-	Adjustable spline guides and splined tube for wipers. For complete assemblies 12A-F.			
	B	3 "	-	-				
	C	4 "	-	-				
	D	2 Bank	-	-	Adjustable spline guides and splineless tube for wipers. For complete assemblies 12D-F.			
	E	3 "	-	-				
	F	4 "	-	-				
	G	2 Bank	-	-	Internal spline guides and splineless tube for wipers. For complete assemblies 12G-J. Used only with rotary ratchet assembly 79B. See Remarks 97B.			
	H	3 "	-	-				
	J	4 "	-	-				
	94	VERTICAL RATCHET AND TUBE				1		
	A	2 Bank	-	-	For adjustable spline guides. Splined tube for wipers on assemblies 93A-C.			
	B	3 "	-	-				
	C	4 "	-	-				
	D	2 Bank	-	-	For adjustable spline guides. Round tube for wipers on assemblies 93D-F.			
	E	3 "	-	-				
	F	4 "	-	-				
	G	2 Bank	-	-	For internal broached spline guides. Round tube for wipers on assemblies 93G-J.			
	H	3 "	-	-				
	J	4 "	-	-				
	95	CAM	-	-	On vertical ratchet assemblies 93A-F only. Operates V.O.N. assembly and MP bracket (when fitted).	1		
	96	BEARING	-	-	On vertical ratchet assemblies 93A-F only. Top bearing for vertical ratchet assembly.	1		
	97	TUBE BEARING BUSH			Bottom bearing bush for carriage tube on vertical ratchet assembly. Plain bush for vertical ratchet and tube 94A-F.	1		
	A		-	-				
	B		-	-	Groove in bush for vertical ratchet and tube 94G-J. Some tubes (94D-F) were supplied fitted with this bush.			
	98	SPLINE GUIDE, LEFT HAND	-	-	Left-hand spline guide is secured to be parallel to spline on rotary ratchet accurately related rotarily to the 3rd rotary ratchet tooth. This is secured when IN A JIG and cannot be replaced manually in its correct position. Fitted to assemblies 93A-F only.	1		
	99	SPLINE GUIDE, RIGHT HAND	-	-	Adjustable spline guide. Fitted to assemblies 93A-F only.	1		
	100	CAM AND BEARING	-	-	Replaces parts 95 and 96 on 93G, H and J.	1		

NOTE: Parts of vertical and rotary ratchet assemblies should not be interchanged. Although parts from the same production can be interchanged they cannot be identified as such and there is a definite risk of introducing false adjustments if parts from different productions are interchanged.

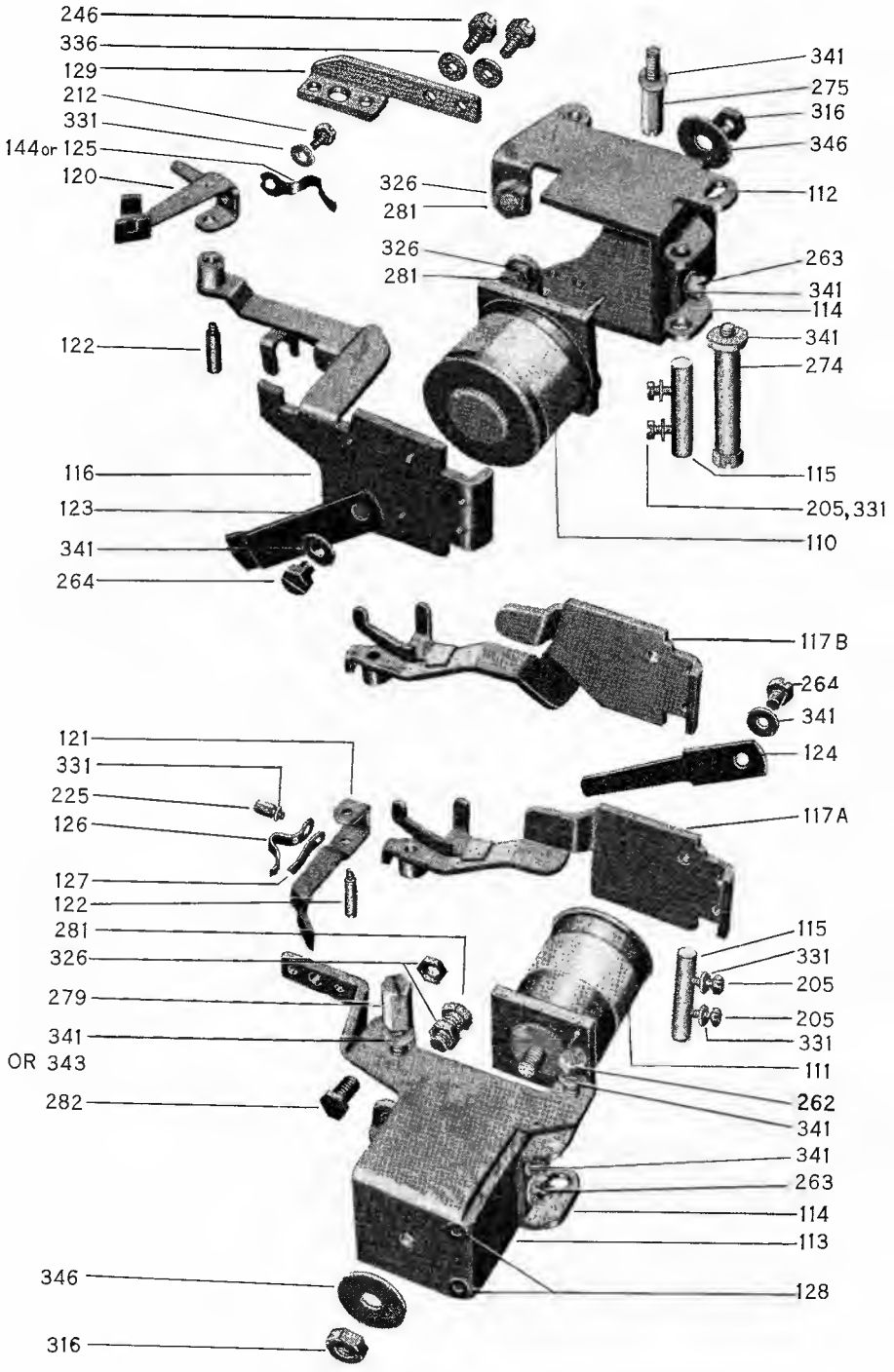

FIG. 8. VERTICAL AND ROTARY MAGNET ASSEMBLIES.

	Part Reference	TITLE (and Synonymous Title)	Stock Reference Ser. No.	Stock Reference Item No.	Detail and Remarks	No. Per Switch		
	PARTS OF VERTICAL AND ROTARY MAGNET ASSEMBLIES (Parts 13 and 14)							
	110	VERTICAL MAGNET COIL	250	26	50 ohms. Purchases suspended because of difficulties in interchanging coils.	1		
	111	ROTARY MAGNET COIL	250	27	50 ohms. Purchases suspended because of difficulties in interchanging coils.	1		
	112	VERTICAL MAGNET YOKE	-	-	Not to be provided as maintenance item.	1		
	113	ROTARY MAGNET YOKE	-	-	Not to be provided as maintenance item.	1		
	114	ARMATURE BEARING BRACKET	-	-	Fixed in position on magnet yoke with the aid of a jig. MUST NOT BE REMOVED. For both vertical and rotary magnets.	2		
	115	MAGNET ARMATURE BEARING PIN	-	-	For both vertical and rotary magnets.	2		
	116	VERTICAL MAGNET ARMATURE	-	-		1		
	117	ROTARY MAGNET ARMATURE				1		
	A		-	-				
	B		-	-	Improved design to prevent cracking of armature near rotary armature stop screw.			
	118	VERTICAL MAGNET ARMATURE ASSEMBLY	-	-	Consists of parts 114, 115, 116, 120, 122, 123, 125 or 144. 205(2), 212(1), 263(2), 264(1), 331(3), 341(3).	1		
	119	ROTARY MAGNET ARMATURE ASSEMBLY			Consists of parts 114, 115, 117, 121, 122, 124, 126, 127, 205(2), 225(1), 263(2), 264(1), 331(3), 341(3).	1		
	A		-	-	With parts 117A and 124A or 124B			
	B		-	-	With parts 117B and 124B.			
	120	VERTICAL PAWL	250	21		1		
	121	ROTARY PAWL	250	22		1		
	122	BEARING PIN	250	23	Bearing pin for pawl on vertical and rotary magnet assemblies and for V.O.N. toggle arm.	3		
	123	VERTICAL ARMATURE RESTORE SPRING	250	24		1		
	124A	ROTARY ARMATURE RESTORE SPRING	-	-	0.32" thick. Provided on some early model selectors.	1		
	B		250	25	0.36" thick. Has a notch at fixing end on some selectors.			
	125	VERTICAL PAWL SPRING	289	11	Notch in end of spring. Rotary detent spring (part 144) used as alternative on some selectors.	1		
	126	ROTARY PAWL SPRING	289	12		1		
	127	AUXILIARY ROTARY PAWL STOP	250	29		1		
	128	INSULATING BUSH	-	-	Magnet coil tag insulating bush on both vertical and rotary magnets.	4		
	129	VERTICAL INTERRUPTER BRACKET	-	-	Attached to vertical magnet yoke to hold interrupter.	As required		

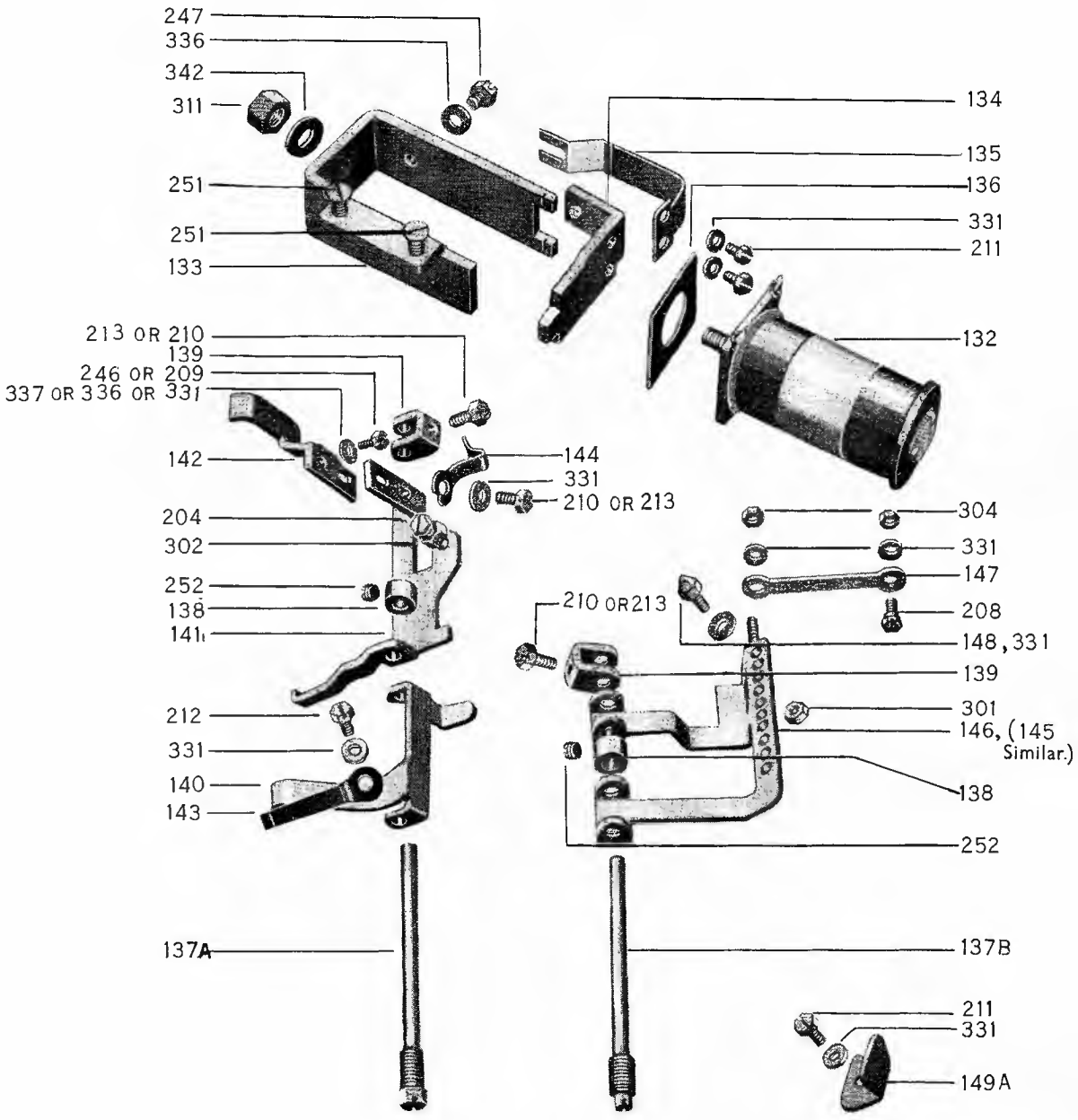

FIG. 9. RELEASE MAGNET ASSEMBLY, DETENT AND NP ASSEMBLIES.

	Part Reference	TITLE (and Synonymous Title)	Stock Reference Ser. No.	Stock Reference Item No.	Detail and Remarks	No. Per Switch		
	PARTS OF RELEASE MAGNET ASSEMBLY (Part 15)				NOTE: For parts 133, 134 and 135 the variants A and B are for release magnet assemblies, parts 15A and 15B respectively.			
	131A	COIL AND YOKE ASSEMBLY	-	-	Parts 132A, 133A, 134A, 135A, 136A, 251, 311 and 342.	1		
	B		250	-	Parts 132B, 133B, 134B, 135B, 136B, 251, 311 and 342.			
	132A	RELEASE MAGNET COIL			125 ohms + 500 ohms N.I. on early type selectors only.	1		
	B		250	42	140 ohms + 460 ohms N.I. with metal coil cheek. Purchase suspended because of difficulties in interchanging coils.			
	133A	RELEASE MAGNET YOKE	-	-	With slots for restore spring.	1		
	B		-	-	No slots for restore spring.			
	134A	RELEASE MAGNET ARMATURE	-	-	Has flat residual stud.	1		
	B		-	-	Has domed residual stud.			
	135A	RELEASE MAGNET ARMATURE RESTORE SPRING	-	-	Wide extension for slot in Yoke 133A.	1		
	B		250	43	Reduced extension for Yoke 133B.			
	136A	INSULATING PLATE	-	-	Insulates coil from yoke.	1		
	B							
	PARTS OF DETENT AND NORMAL POST ASSEMBLIES (Parts 17 and 18)							
	137A	BEARING SPINDLE (Bearing Shaft)	-	-	Parts common to detents and N.P. bracket. (Illustrated on detent assembly. Fitted on early (type selectors.	1 or 2		
	B		250	37	(Illustrated on N.P. bracket assembly. (Fitted on later type selectors.			
	138A	SPACING COLLAR	250	36		1 or 2		
	B	SPACING COLLAR WITH GRUB SCREW	250	72				
	139A	"U" CLAMP (Clamping Bracket)	250	66		1 or 2		
	B	"U" CLAMP WITH SCREW	250	73				
	140	VERTICAL DETENT	250	34		1		
	141A	DETENT BRACKET	-	-		1		
	B		250	71	Parts of vertical and rotary detent assembly. See Note.			
	142A	ROTARY DETENT	250	35		1		
	B		250	74				
	143	VERTICAL DETENT SPRING	250	38		1		
	144	ROTARY DETENT SPRING	250	39	This spring is also used as vertical pawl spring on some selectors.	1		
	145	INNER LEVER BRACKET (N.P.B. Bracket)	250	67		1		
	146	OUTER LEVER BRACKET (NP or NPA Bracket)	250	68	Normal post parts.	1		
	147	NORMAL POST LINK	250	69		1 or 2 as required		
	148	NORMAL POST CAM 1 LEVEL	250	127		As required		
	149A	NORMAL POST CAM 2 LEVEL	250	65				
	B	3 LEVEL	-	-				
	C	4 LEVEL	-	-				
	D	5 LEVEL	-	-				
	E	6 LEVEL	-	-	Normal post cams. Fit as required.			
	F	7 LEVEL	-	-				
	G	8 LEVEL	-	-				
	H	9 LEVEL	-	-				
	J	10 LEVEL	-	-				

NOTE: Rotary Detent (Part 142A) is secured to the detent bracket (Part 141A) with an 8BA screw (Part 209). When the rotary detent is replaced with part 142B the bracket (part 141B) must also be fitted to the selector and 6BA screw (Part 246) used. The rotary detent spring (Part 144) will interfere with the washer under the 6BA screw (Part 246) unless (a) the washer used is Part 337, or (b) the spring has a cut out at the point near the adjoining washer.

6. SCREWS.

6.1 In the following table all the screws used in the mechanical portion of the switch including magnet assemblies) are listed. The screws are listed in the following way -

Vertically - they are placed according to size, type and length.

Horizontally - the quantity, length of thread, the material and the length tapped (where the full length is not tapped)* of each particular type of screw is listed together with the serial reference (if it is a stock item) and relevant remarks.

* For the purpose of this E.I. a screw is considered as being tapped for the full length when the untapped portion of the screw is less than 1/16".

6.2 In this table, the following abbreviations have been used -

Spec.	Special.
Hex. Hd.	Hexagon Head.
Inst. Hd.	Instrument Head.
Rd. Hd.	Round Head.
R.	Rotary
B.A.	British Association.
T.P.I.	Threads per Inch.
MS	Mild Steel.
SS	Stainless Steel.
Ph. Br.	Phosphor Bronze.
V.	Vertical.
V.O.N.	Vertical Off Normal.
N.	Normal)
NR	Rotary Normal) Mechanically operated
S.	11th Step) spring-sets.
NP	Normal Post)
S.C.I.	Standard Commercial Item.

6.3 Although some parts in the following tables have the abbreviation S.C.I. (Standard Commercial Item) indicated in the remarks column, it should be noted that these parts may not be readily available through local commercial channels, and that they may not have the finish specified for the Serial Item.

	Part Reference	Screws			Stock Reference Ser. No.	Stock Reference Item No.	Use and Remarks		
		8BA Quantity and Size	Material	Threaded					
		Hexagon Head							
	201	2 @ 25/32"	MS	5/8"	-	-	Wiper cord block to frame for double block on 4 bank selectors with vertical marking bank only.		
	202	2 @ 17/32"	MS	7/16"	-	-	Wiper cord block to frame for single block.		
	203	2 @ 3/8"	MS	1/4"	250	124	Release lever front bracket or 'Z' springset to frame.		
	204	1 @ 5/16"	SS		250	121	V. and R. detent coupling adjustment. Used with nut 302.		
	205	4 @ 1/4"	MS		250	118	Vertical and Rotary magnet armature hinges.		
	206	2 @ 7/32"	SS		-	-	Left hand and right hand spline plates (bottom screws).		
	207	1 @ 0.206"	SS or MS		250	123	Release lever.		
	208	1 @ 0.181"	MS	0.101"	250	126	Normal post links. Has eccentric shoulder 0.056" long. 2 per link on early type selectors. Normally 1 per MP link.		
	209	1 @ 11/64"	MS		250	120	Rotary detent. Replaced by part 246 on some selectors.		
	210	1 @ 0.165"	MS		-	-	Rotary detent spring. Screws 213 to be used instead except on selectors manufactured before 1938. On these selectors screw 210 should be used as a 3/16" long screw may interfere with the detent bearing spindle.		
	210	1 @ 0.165"	MS		-	-	V. and R. detent bearing.) Screws 213 provided on some		
							'U' clamp screw.) selectors. Note: These screws are		
	210	1 @ 0.165"	MS		-	-	'NP' bearing 'U' clamp screw.) supplied for maintenance purposes fitted to the 'U' clamp, part 139B.		
	211	1 @ 1/8"	MS		250	122	NP consecutive level cam (1 per cam).		
	211	2 @ 1/8"	MS		250	122	Release magnet armature spring.		
	212	1 @ 3/32"	MS		250	116	Vertical detent spring.		
	212	1 @ 3/32"	MS		250	116	Vertical pawl spring.		
	213	3 @ 3/16"	MS		250	138	In lieu of 210 on some selectors.		
	214	2 @ 5/8"	MS	7/16"	-	-	In lieu of 201 or 202 when 10 tag block is fitted.		

	Part Reference	Screws			Stock Reference Ser. No.	Stock Reference Item No.	Use and Remarks		
		8BA (Contd.)							
		Quantity and Size	Material	Threaded					
		Countersunk Head							
	215	1 @ 5/16"	MS				Wiring clip to frame. S.C.I.		
	216A	1 @ 3/16"	MS		289	159	Shaft retaining plate screw. S.C.I. on early type selectors.		
	216B	1 @ 0.221"	MS Spec. Hd.	0.149"	250	128	Shaft retaining plate screw.		
		Special							
	220	1 @ 7/32"	SS Inst. Hd.		-	-	Left-hand spline plate dowel screw.		
	221	1 @ 7/32"	SS Spec. Hd.		-	-	Right-hand spline plate - to eliminate fouling on V.O.N. assembly.		
	222A	2 @ 1/4"	MS Inst. Hd.		-	-	Vertical ratchet assembly (Parts 93A - F). SEALED. NOT TO BE DISTURBED.		
	222B	2 @ 1/4"	MS or SS Inst. Hd.	0.109"	-	-	Dowel screw, vertical ratchet assembly (Parts 93G-J). SEALED. NOT TO BE DISTURBED.		
	223A	2 @ 0.515"	SS	0.144"	-	-	) Dowel screw, rotary ratchet assembly. SEALED.		
	223B	2 @ 0.498"	SS	0.127"	-	-	) NOT TO BE DISTURBED. "223A" on early type selectors.		
	224*	1 @ 1/4"	MS Hex. Hd.	0.155"	-	-	V.O.N. lever arm - use 6BA spanner. Has shoulder 0.070" long.		
	225	1 @ 11/64"	MS Hex. Hd.		250	117	Rotary pawl spring - long head.		
		6BA							
		Hexagon Head							
	241	2 @ 7/16"	MS	1/4"	250	109	Latch spring - long shank.		
	241	2 @ 7/8"	MS	1/4"	250	109	Provided on some selectors in lieu of 243.		
	243	1 @ 13/32"	MS	1/4"	250	111	Test jack to frame column - long shank.		
	243	2 @ 13/32"	MS	1/4"	250	111	Release lever to frame - long shank.		
	244A	2 @ 11/32"	MS	1/4"	-	-	) Shaft plate to frame column. NOT TO BE DISTURBED.		
	244B	2 @ 23/64"	MS		250	112	) "244A" on early type selectors.		
	244B	2 @ 23/64"	MS		-	-	V.O.N. assembly to frame.		
	245	1 @ 5/16"	MS	0.150"	-	-	V.O.N. roller. Has 0.131" shoulder. (See part 69).		
	246	2 @ 3/16"	MS		250	136	Vertical interrupter bracket.		
	246	1 @ 3/16"	MS		250	136	Rotary Detent. In lieu part 209 on some selectors.		
	247	1 @ 1/8"	MS		250	110	Release magnet restore spring.		
		Countersunk Head							
	251	2 @ 11/32"	MS		250	114	Release magnet to frame. S.C.I.		
	251	4 @ 11/32"	MS		250	114	Frame column bracket to frame column. NOT TO BE DISTURBED.		
		Special							
	242	2 or 4 @ 27/64"	MS with 7BA Hex. Hd.		250	113	M and MP spring assemblies to frame. 7BA cheese head screws provided on some selectors.		
	252	2 @ 5/64"	SS		250	115	Grub screw and MP bearing pin locating bush. Provided as part of spacing collar, part 138B.		

Part Reference	Screws			Stock Reference Ser. No.	Stock Reference Item No.	Use and Remarks
	4BA					
	Quantity and Size	Material	Threaded			
	Hexagon Head					
261	1 @ 19/32"	MS	1/2"	250	106	Rotary pawl guide*) Have captive
261	1 @ 19/32"	MS	1/2"	250	106	Rotary pawl stop*) washers on some selectors.
261	2 @ 19/32"	MS	1/2"	250	106	Rotary stop to column) *Part 44F
261	2 @ 19/32"	MS	1/2"	250	106	Vertical pawl stop) provided in lieu
261	2 @ 19/32"	MS	1/2"	250	106	Stationary detent) of washers on some selectors.
262	1 @ 0.365"	MS		250	104	Rotary magnet to frame.
263	2 @ 7/32"	MS		-	-	Rotary magnet bearing brackets)NOT TO
263	2 @ 7/32"	MS		-	-	Vertical magnet bearing brackets) BE)REMOVED.
264	1 @ 11/64"	MS		250	101	Rotary magnet restore spring.
264	1 @ 11/64"	MS		250	101	Vertical magnet restore spring.
	Cheese Head					
270A 270B	4 @ 13/32" 4 @ 3/8"	MS MS		-	-	Frame column to frame. NOT TO BE REMOVED. Screws $\frac{3}{8}$" long provided on some selectors.
	Special					
274	1 @ 1.781"	MS Hex. Hd.	5/16"	250	102	Vertical magnet to frame. Has shoulder 1.406" long.
275	1 @ 7/16"	MS Hex. Hd.	3/8"	250	103	Vertical magnet to frame. Has long head.
276A	4 @ 17/32"	MS Hex. Hd.	3/8"	-	-	NR and S spring-sets to frame with washer 341.
276B	4 @ 31/64"	MS Hex. Hd.	21/64"	250	108	NR and S spring-sets to frame. Has captive washer.
277	1 @ 25/32"	MS Hex. Hd.	1/2"	250	107	Vertical pawl guide. Has shoulder 0.093" long.
278	1 @ 0.430"	MS Rd. Hd.	1/4"	250	135	Switch cover latching screw. Latch screw on 2000 type selector is not interchangeable.
279	1 @ 37/64"	MS Hex. Hd.	1/4"	250	105	Rotary magnet to frame. Has long head.
	Special Threads					
281	3 @ 3/8"	Ph. Br. Hex. Hd.	43 TPI	-	-	V and R magnet assemblies, armature restore spring adjusting screw and vertical magnet armature backstop.
282	1 @ 5/16"	Ph. Br. Hex. Hd.	43 TPI	-	-	Rotary magnet armature backstop. Slotted opposite end to head. Screw 281 provided on some selectors.

7. NUTS.

7.1 In the following table all the nuts used in the mechanical portion of the selector have been listed in the following order –

Vertically – In order of size.

Horizontally – The quantity, material, thickness, serial reference and relevant remarks.

7.2 The abbreviations used are as listed in paragraph 6.2 for screws.

	Part Reference	Nuts			Stock Reference		Use and Remarks		
					Ser. No.	Item No.			
		Quantity and Size	Material	Thickness					
		8BA							
	301	1 (per cam)	MS	0.089"	250	131	NP single level cam. S.C.I.		
	301	2	MS	0.089"	250	131	10 tag terminal block (when fitted). May also be used instead of part 44G.		
	302	1	MS	0.080"	250	129	V and R detent coupling and release lever. Use 6BA tube spanner. Used with screw 204.		
	303	1	MS	0.054"	-	-	V.O.N. lever arm pivot screw 224. If nut works loose change the complete assembly (part 19). DO NOT USE a lockwasher.		
	304	2 (per link)	Brass or MS	0.054"	250	132	NP links.		
		6BA							
	306	1	MS	0.112"	-	-	Test jacks to frame column. S.C.I.		
	306	4	MS	0.112"	-	-	Frame column brackets to frame column. S.C.I. NOT TO BE DISTURBED.		
	307	1	MS	0.068"	-	-	V.O.N. roller locknut (see part 69)		
		4BA							
	311	1	MS	0.144"	-	-	Release magnet coil nut. S.C.I.		
	312	1	Hard Brass or MS	0.144"	250	134	Switch cover latch screw. S.C.I.		
		2BA							
	316	2	MS	0.185"	250	28	V and R magnet coil nuts.		
		1BA							
	321	1	MS	0.094"	250	130	Shaft locking plunger locknut - use 3BA spanner.		
		Special Thread							
	326	4	MS	0.094"	-	-	V and R magnet assembly restore spring adjustment and backstops. 43 T.P.I.		
	327	1	Hard Brass	0.062"	250	13	Gland screw locknut. 40 T.P.I.		

7.3 In the parts listed above, the following are in accordance with the requirements of the British Standards Institution:

Part 301	8BA thick
Part 303 and 304	8BA thick
Part 306	6BA thick
Part 307	6BA thick
Part 311 and 312	4BA thick

8. WASHERS.

8.1 All the washers in the mechanical part of the selector are listed in the following table. Under each type of washer, there is a brief description of the part against which it is located, the screw it is used with, the quantity provided and relevant remarks.

8.2 The abbreviations used are listed in paragraph 6.2 for screws.

8.3 Figures in brackets in column 1 are the nominal washer sizes - outside diameter/inside diameter/ thickness in thousandths of an inch.

8.4 No lockwashers should be used under any screw on the selector except where referred to below.

Washer Part and Number For Use with	Used with Screw (or Nut).	Quantity	Remarks
8BA Brass. Part No. 331 (183/91/18)			Serial 56, Item 58. S.C.I.
Spline plates	206,221	3	To be changed if screw loosened. Right-hand plate only.
V and R armature to bearing pin	205	4	
V and R pawl spring	212,225	2	
Release magnet armature	211	2	
V and R detent springs	210,212	2	
Rotary detent	209	1	On some selectors. Washers 336 or 337 provided on other selectors.
MP consecutive level cam	211	1	Per cam. Washer not provided on all selectors.
MP link	208,145	2	Per link.
Release lever front bracket	203	2	
Wiper cord terminal block (8 tag)	201 or 202	2	
" " " " (10 tag)	214 or 301	4	Only on some selectors.
V.O.N. lever arm	224	1	
Release lever	207	1	
MP single level cam	148	1	Per cam. Washer not provided on all selectors.
6BA Brass. On MS Part No.336 (231/116/22)			Serial 250 Item 137. S.C.I.
Release magnet restore spring	247	1	
Shaft plate to frame column	244	2	Screws NOT TO BE DISTURBED.
V.O.N. bracket to frame	244	2	
Test jack to frame column	243	1	
Release lever to frame	243	1 or 2	Wiring clip, part 64 provided on some selectors.
V.O.N. bracket roller assembly	245	1	See part 69.
Vertical interrupter bracket	246	2	When fitted.
Rotary Detent	246	1	When screw 246 is provided in lieu of screw 209. (See also washer part 337.)
6BA Brass. Part No. 337 (198/116/22)			Serial - Item -.
Rotary Detent	246	1	Provided in lieu of part 336 on some selectors.
4BA Brass. Part No. 341 (298/149/35)			Serial - Item -. (Part 342) used on some selectors.
V & R magnet assembly bearing brackets	263	4	
V & R magnet assembly restore springs	264	2	
V & R magnet assembly to frame	(262,274, (275,279	3 or 4	Note washer 343 for screw 279 used on some selectors.
Rotary pawl guide	261	1	)Replaced by clamp plate 44F or with captive
Rotary pawl stop	261	1	)washers on the screws on some selectors.
Vertical pawl stop	261	2	}
Stationary detent	261	2	}Captive washer on the screws on some
Rotary stop	261	2	}selectors.
NR and S spring-set mounting	276A	4	On some selectors. Captive washers generally provided on screw.
4BA Mild Steel. Part No. 342 (298/149/24)			Serial - Item - S.C.I.
Release magnet coil cut	311	1	
4BA Brass. Part No. 343 (250/149/43)			Serial - Item -.
Rotary magnet assembly to frame	279	1	Washer 341 used on some selectors.
4BA Shockproof Lock Washer, Part No.351			Serial - Item - S.C.I. (Code SLW 1206 or SLW1906). These washers are not provided on all selectors. In some cases washer SLW 1106 is fitted.
Frame column to frame	270B	2	Provided on some selectors, screws are NOT TO BE DISTURBED.
Cover latch screw	27B	1	Provided on some selectors.
2BA Mild Steel. Part No.346 (625/195/48)			Serial - Item -.
V & R magnet coil nut	316	2	

8.5 In the parts listed above the following are in accordance with the requirements of the British Standard Institution: Part 331 8BA small, Part 336 6BA small, Part 342 4BA small.

END.