200-, 206-, 209-, AND 211-TYPE SELECTORS AND 10-, 26-, AND 32-TYPE BANKS PIECE-PART DATA AND REPLACEMENT PROCEDURES

1. GENERAL

1.01 This section covers the information necessary for ordering parts to be used in the maintenance of 200-, 206-, 209-, and 211-type selectors and 10-, 26-, and 32-type banks. It also covers approved procedures for replacing these parts.

1.02 This section is reissued to revise the piece-part data and replacement procedures covering detachable feeder brush units and to add piece-part data covering 206CM, 206CN, and 206CP selectors. Detailed reasons for reissue will be found at the end of the section.

1.03 Part 2 of this section covers the piece part numbers and the corresponding names of the parts which it is practicable to replace in the field in the maintenance of these selectors and banks. No attempt should be made to replace parts not designated. Part 2 also contains explanatory figures showing the different parts. This information is called "Piece-Part Data."

1.04 Part 3 of this section covers the approved procedures for the replacement of the parts covered in part 2. This information is called "Replacement Procedures."

1.05 Before making replacement of any part of the apparatus covered herein, make the associated circuit busy in the approved manner and block relays operated or nonoperated, as necessary, to isolate the selector circuit.

1.06 The 206BE selector is equipped during manufacture with a special detachable feeder brush unit as shown in Fig. 9. Procedures for replacing detachable feeder brush units on 206BE selectors are covered in 3.22. For other selectors, a similar detachable feeder brush unit was provided as a field replacement for worn bank feeder brush springs. However, detachable feeder brush units have been discontinued for all selectors except the 206BE selector which requires a feeder brush unit for transmission purposes.

2. PIECE-PART DATA

2.01 The figures included in this part show the various piece parts in their proper relation to other parts of the apparatus. The piece part numbers of the various parts are given, together with the names of the parts as listed by the Western Electric Company Merchandise Department. When these names differ from

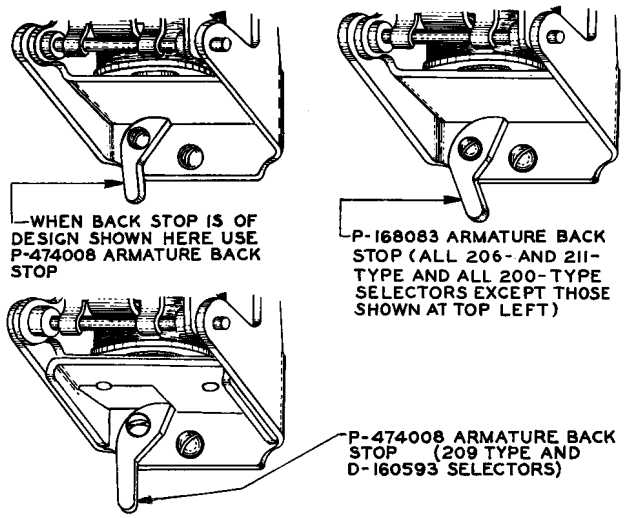


Fig. 1 – Armature Backstop

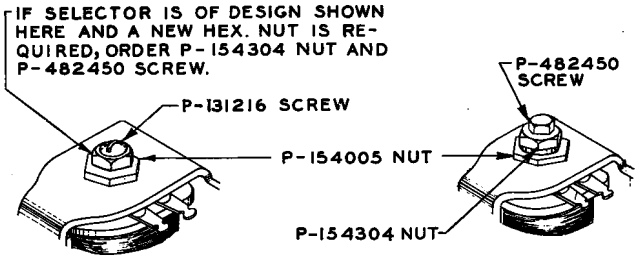


Fig. 2 – Magnet Adjusting Bushing and Associated Parts — 200-, 206-, and 211-Type Selectors

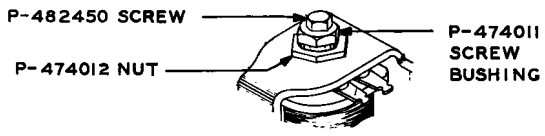
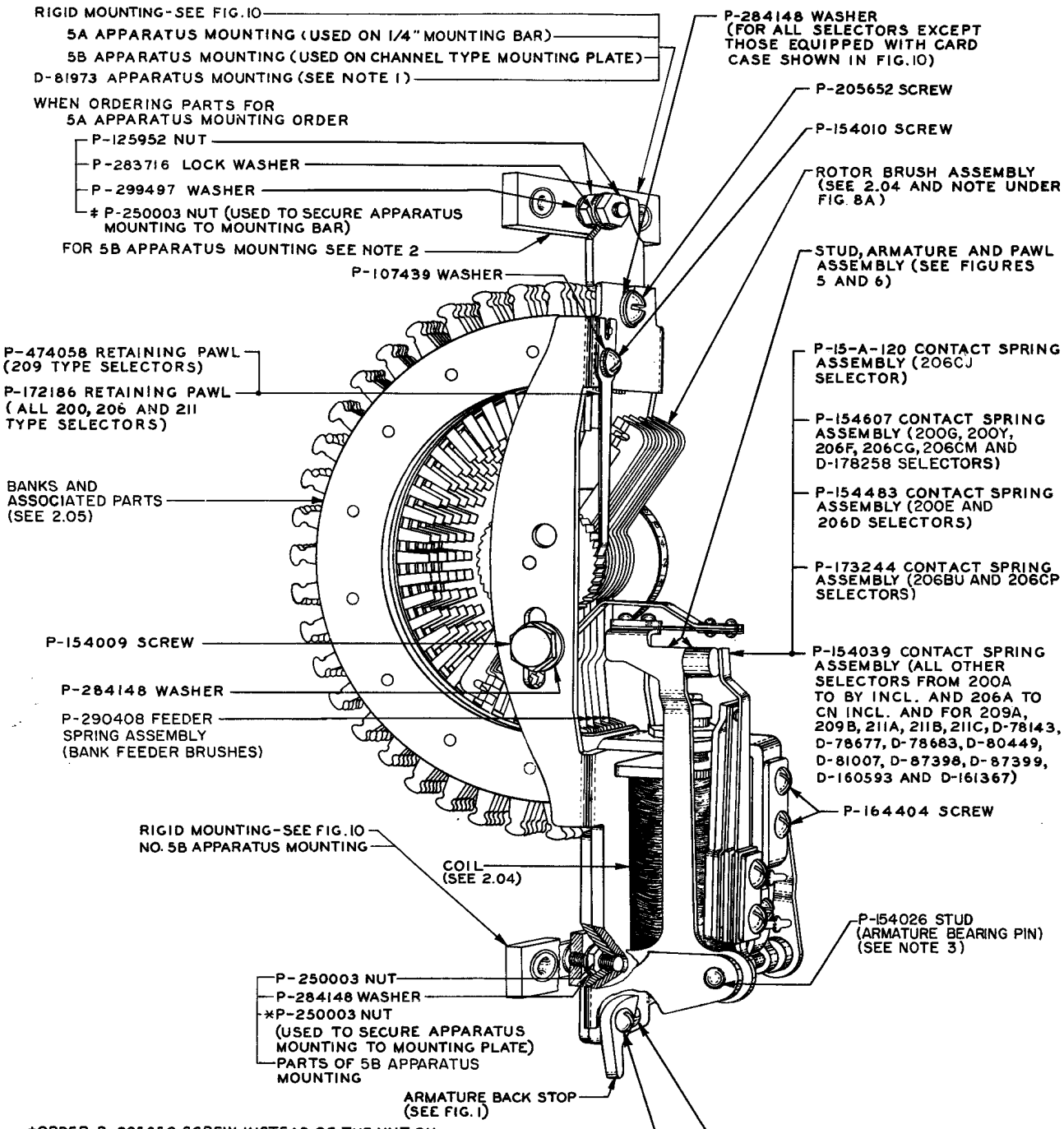


Fig. 3 – Magnet Adjusting Bushing and Associated Parts — 209-Type Selectors



#ORDER P-205652 SCREW INSTEAD OF THE NUT ON APPARATUS MOUNTINGS NOT STUD MOUNTED

* ORDER ONE P-206519 SCREW (OR ONE P-205652 SCREW IF THE HOLE THROUGH THE MOUNTING PLATE IS COUNTERBORED) INSTEAD OF THE NUT ON APPARATUS MOUNTINGS NOT STUD MOUNTED.

NOTES:

1. ORDER 5A OR 5B APPARATUS MOUNTING WHEN ANY PART OF THE D-81973 APPARATUS MOUNTING REQUIRES REPLACEMENT.
2. PARTS OF 5B APPARATUS MOUNTING USED AT TOP OF SELECTOR, SAME AS PARTS AT BOTTOM OF SELECTOR AS SHOWN IN FIGURE. IN ADDITION TO THESE PARTS A P-30A936 ADAPTER AND P-205652 SCREW (NOT ILLUSTRATED) ARE USED.
3. WHEN REPLACING A PLATE AND STUD TYPE ARMATURE BEARING PIN ALSO ORDER A NEW P-164401 CLAMP (ARMATURE BEARING PIN CLAMP-FIG.7). IF ONLY SCREW OF PLATE AND STUD TYPE ARMATURE BEARING PIN IS TO BE REPLACED ORDER P-172461 SCREW IF SCREW IS .138-32 THD. OR P-154010 SCREW IF .125-40 THD.

Fig. 4 – Selector Assembly — 200-, 206-, 209-, and 211-Type Selector and Associated Bank

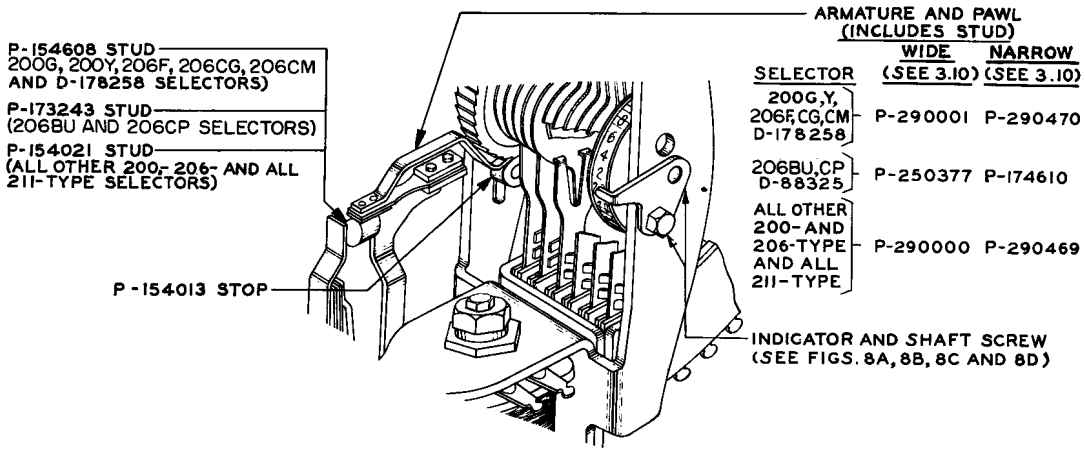


Fig. 5 – 200- and 206-Type Selector — Armature and Associated Parts

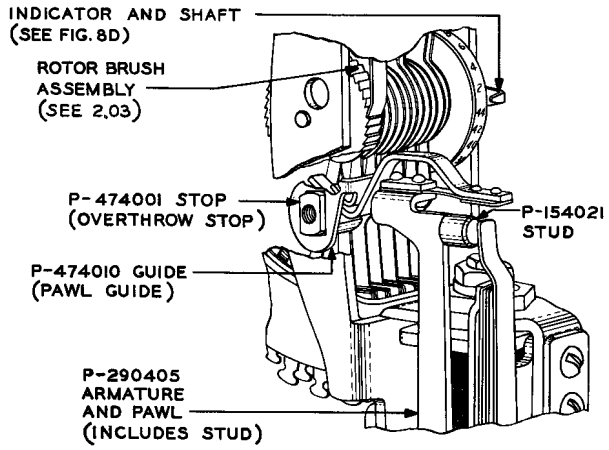


Fig. 6 – 209-Type and D-160593 Selector — Armature and Associated Parts

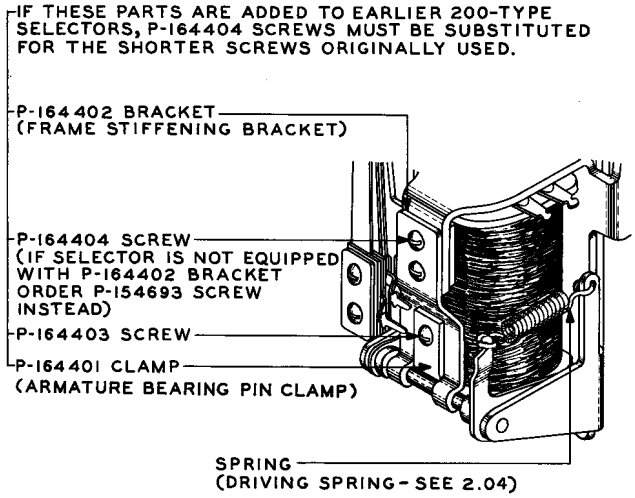


Fig. 7 – 200-, 206-, 209-, and 211-Type Selector — Driving Spring, Armature Bearing Pin Clamp, and Associated Parts

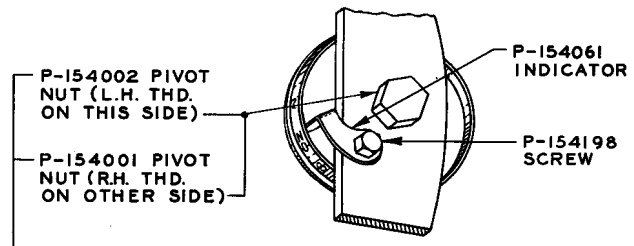


Fig. 8A – Indicator and Copper-Plated Pivot Nut

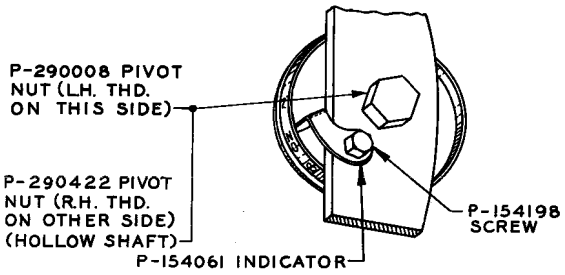


Fig. 8B – Pivot Nuts — Solid and Hollow

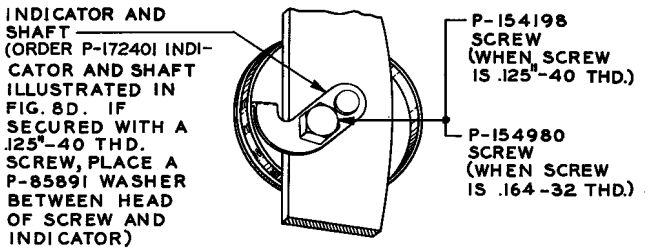


Fig. 8C – Solid-Type Rotor Shaft

those in general use in the field, the latter names, in some cases, are shown in parentheses.

2.02 When ordering piece parts for replacement purposes, give both the number and name of the piece part. For example: "P-482450 Screw." Do not refer to the BSP number or to any information shown in parentheses or in notes following the piece part numbers.

2.03 Information enclosed by parentheses ( ) is not ordering information. This information may be references to notes, parts referred to in other portions of the section and not considered replaceable, or part names in general use in the field if these names differ from those assigned by the manufacturer.

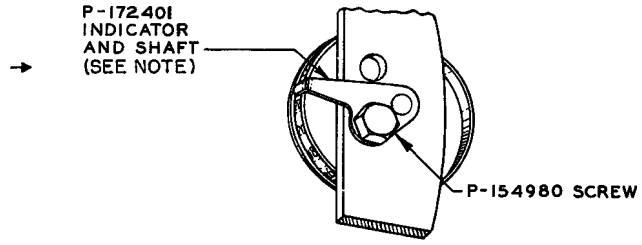


Fig. 8D – Drilled-Type Rotor Shaft

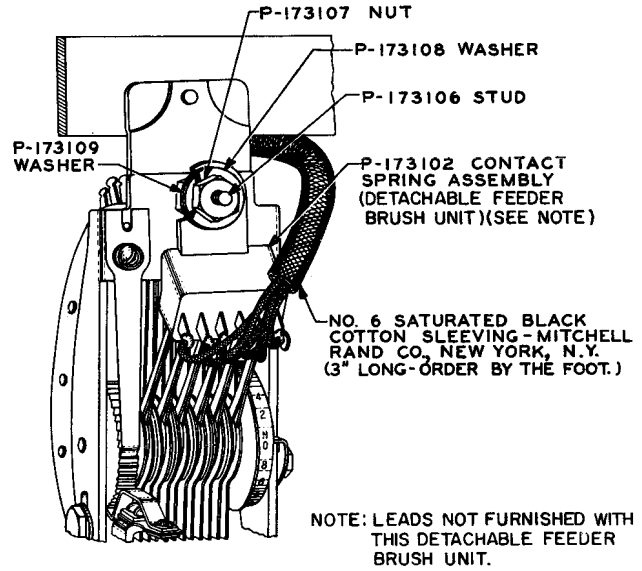


Fig. 9 – Detachable Feeder Brush Unit and Associated Parts for 206BE Selector Only

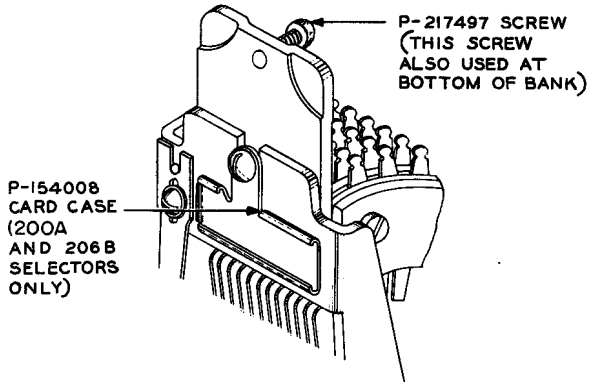


Fig. 10 – Card Case and Bank Mounting Screw for Rigid Mounting

2.04 The following table lists the numbers and corresponding names of piece parts which are not common to all selectors.

200- and 206-Type Selectors

SELECTOR 206 TYPE	SELECTOR 200 TYPE	ROTOR BRUSH ASSEMBLY (See Fig. 4 and 8A)	COIL (See Fig. 4)	SPRING (See Note 1 and Fig. 7)
A	B	P-172830	P-173212	P-474009
B	A	P-172831	P-174035	P-173236
C	D	P-172832	P-174035	P-173237
D	E	P-172859	P-173212	P-173237
E	F	P-172833	P-173211	P-173236
F	G	P-172833	P-173211	P-173236
G	H	P-172830	P-173213	P-474009
H	J	P-172834	P-173213	P-474009
J	K	P-172835	P-174035	P-173237
K	L	P-172836	P-174035	P-173236
L	M	P-172836	P-173212	P-474009
—	N	P-154798	P-173211	P-173237
M	P	P-172848	P-173212	P-474009
N	R	P-172850	P-173212	P-474009
P	S	P-172837	P-173212	P-474009
—	T	P-172841	P-173211	P-173237
R	U	P-172838	P-173212	P-474009
—	W	P-172833	P-173211	P-173236
—	Y	P-172833	P-173211	P-173236
S	AA	P-172839	P-173212	P-474009
T	AB	P-172830	P-457921	P-474009
U	AC	P-172835	P-174035	P-173237
W	AE	P-172835	P-174035	P-173237
Y	AF	P-172835	P-174035	P-173236
AA	AG	P-172840	P-174035	P-173237
AB	AH	P-172841	P-174035	P-173236
AC	AJ	P-172840	P-173211	P-173236
AD	AK	P-172851	P-173212	P-474009
AE	AM	P-172852	P-174035	P-173237
AF	AN	P-172830	P-173212	P-474009
AG	AP	P-172853	P-173215	P-173236
AH	AR	P-172860	P-173215	P-173237
AJ	AS	P-172854	P-174035	P-173237
AK	AU	P-172837	P-173215	P-173237
AL	AW	P-172842	P-173212	P-474009

200- and 206-Type Selectors

SELECTOR 206 TYPE	SELECTOR 200 TYPE	ROTOR BRUSH ASSEMBLY (See Fig. 4 and 8A)	COIL (See Fig. 4)	SPRING (See Note 1 and Fig. 7)
AM	AY	P-172843	P-173212	P-173236
AN	BA	P-172855	P-173215	P-173236
AP	BB	P-172859	P-173212	P-474009
AR	BC	P-172856	P-173215	P-173236
AS	BD	P-172849	P-173215	P-173236
AT	BE	P-172837	P-173215	P-173236
AU	—	P-172843	P-173212	P-474009
AW	—	P-172855	P-173212	P-173236
AY	—	P-172835	P-174035	P-173237
BA	—	P-172917	P-173215	P-173236
BB	—	P-172843	P-173215	P-173236
BC	—	P-172844	P-457921	P-474009
BD	—	P-172855	P-457921	P-474009
BE	—	P-172843	P-173215	P-173236
BF	—	P-173133	P-173215	P-173236
BG	—	P-173134	P-173215	P-173236
BH	—	P-173135	P-173215	P-173236
BJ	—	P-172861	P-173219	P-173237
BK	—	P-172862	P-173217	P-173237
BL	—	P-172847	P-457921	P-474009
BM	D-81007	P-172833	P-173215	P-173236
BN	—	P-173173	P-173215	P-173236
BP	—	P-172917	P-173212	P-474009
BR	—	P-172843	P-457921	P-474009
BS	—	P-172857	P-174035	P-173237
BT	—	P-172855	P-173215	P-173236
BU	—	P-172917	P-173215	P-173236
BW	—	P-172858	P-457921	P-474009
BY	—	P-172853	P-457921	P-474009
CA	—	P-172842	#P-173213	P-173236
CB	—	P-173606	P-174035	P-173237
CC	—	P-172842	P-173213	P-474009
CE	—	P-283583	P-173215	P-173236
CF	—	P-172833	P-174035	P-173236
CG	—	P-172833	P-174035	P-173236
CH	—	P-172840	P-174035	P-173236
CJ	—	P-42A032	P-457921	P-474009
CK	—	P-11B573	P-173212	P-474009
CL	—	P-172850	P-174035	P-173236
CM	—	P-172830	P-173212	P-474009
CN	—	P-13B118	P-173212	P-474009
CP	—	P-172917	P-173212	P-474009
D-78143	—	P-172852	P-173211	P-173237
D-78677	—	P-172835	P-173211	P-173237
—	D-80449	§	§	P-173236
D-87398	D-78683	P-172855	P-174035	P-173237
D-87399	—	§	P-173229	P-173236
D-88325	—	P-172917	P-173215	P-173236
D-161367	—	P-172847	P-173212	P-474009
D-178258	—	P-172844	P-457921	P-474009
209 TYPE				
209A		P-371562	P-457921	P-474009
209B		P-172834	P-457921	P-474009
D-160593		P-172834	P-457921	P-474009
211 TYPE				
211A		P-174025	P-173212	P-474009
211B		P-174030	P-457921	P-474009
211C		P-373701	P-457921	P-474009

If the coil of the 206CA selector is replaced, the code marking on the selector should be changed to 206CC.

§ Order by name of part and number of selector on which the part is to be used.

Note 1: If the P-474009 spring will not fit in the eye, use the P-173236 spring.

2.05 Obtain replacement parts for defective banks as follows.

(a) Order replacement feeder spring as specified in Fig. 4 and replacement bank clamping screws as covered in 2.06.

(b) For all other parts, disassemble a spare bank of the same type having similar parts, except that parts for a 10-type bank shall be obtained from a corresponding 26-type bank.

Retain unused parts of a disassembled bank for future use.

2.06 The following table lists the piece part numbers of the clamping screws used with 10-, 26-, and 32-type banks.

BANK	CLAMPING SCREW
10A, B, C, E	P-154172
10D	P-154490
10F, J	P-154725
26A, B, D, H, J, K	P-154172
26C	P-250450
26G	P-250457
26E	P-43B177
26F	P-173642
32A, C, D	P-154172
32B	P-43B177

3. REPLACEMENT PROCEDURES

3.01 *List of Tools, Gauges, and Materials*

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
209	5/16-Inch Hex. Open-End Offset Wrench
243	3/16- and 5/8-Inch Hex. Closed Double-End Flat Wrench
245	3/8- and 7/16-Inch Open Double-End Flat Wrench
344	Offset Screwdriver
395A	Feeder Brush Spacer

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
395A (2 reqd special)	Feeder Brush Spacers Modified Locally (see 3.04)
417A	1/4- and 3/8-Inch Hex. Open Double-End Flat Wrench
541A	1/4-Inch, 12-Point Double-End Box Wrench
563A	90-Degree Offset Screwdriver
564A	45-Degree Offset Screwdriver
573A	3/4-Inch Single-End Box Wrench
575A	Feeder Brush Aligner
676A	Feeder Brush Spacer
KS-6320	Orange Stick
KS-8097	7/16- and 5/8-Inch, 12-Point Offset Box Wrench
—	Soldering Copper
—	Piece of No. 31 Drill Rod Approximately 2 Inches Long
—	Hacksaw
—	4-Ounce Riveting Hammer
—	5-Inch Diagonal Pliers
→— →	P-Long-Nose Pliers (or the replaced long-nose pliers)
—	No. 565 3/32-Inch Pin Punch (or equivalent) L.S. Starrett Co
—	3-Inch C Screwdriver
—	4-Inch E Screwdriver
GAUGE	
74D	Gauge
MATERIALS	
P-173109	Washer
—	6-Ply Twine
—	6-32 Nut

3.02 After making any replacement of parts of a selector, the part or parts replaced shall meet the readjust requirements involved as specified in Section 026-706-701. Other parts whose adjustments may have been directly disturbed by the replacing operations shall be checked to the readjust requirements and an over-all operation check shall be made of the selector before restoring the circuit to service.

3.03 No replacement procedures are specified for screws and other parts where the procedure consists of a simple operation.

3.04 ***Modification of 395A Feeder Brush Spacer for Selector Equipped With Nonbalanced-Type Feeder Brushes:*** Since the standard 395A feeder brush spacer cannot be used satisfactorily on selectors associated with banks having two or four feeder brushes, it will be necessary to modify one of these tools for use with each of these types of selectors. Do this by sawing off the sides of the tools with a hacksaw as indicated in Fig. 11.

3.05 ***Removing Selector From Bank:*** In replacing some parts of the selector, it may be necessary to remove the selector from the bank in order to obtain access to the parts. To remove the selector from the bank, rotate the selector until the rotor brushes are in the horizontal position. Then on a selector equipped with nonbalanced-type feeder brushes, place a 395A feeder brush spacer over the feeder brushes in the position shown in Fig. 12. If the selector is associated with a bank having two or four feeder brushes, use a feeder brush spacer which has been modified as covered in 3.04. On a selector equipped with either 2-piece or single-piece feeder brushes of the balanced type, place a 676A feeder brush spacer over the feeder brushes in the same way as shown for the feeder brush in Fig. 12, except be sure that the spacer is placed

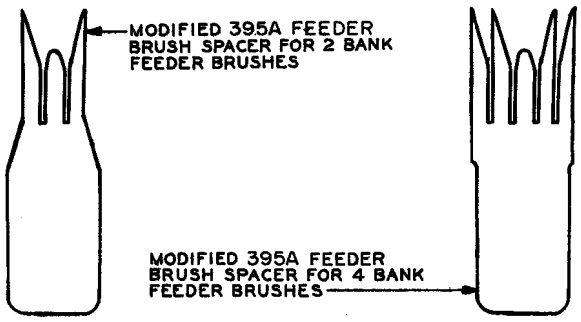


Fig. 11 – Illustrating Modified 395A Feeder Brush Spacers for Use With Selectors Equipped with 2- and 4-Bank Feeders

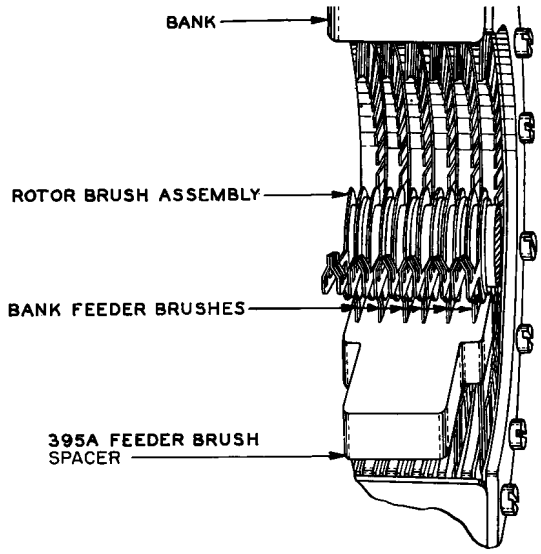


Fig. 12 – Method of Using 395A Feeder Brush Spacer

with the short tooth of the spacer on the index wheel side. Slide the spacer upward to a position such that the top surface of the spacer is about 1/8 inch from the feeder brush tips. Remove the selector mounting screws with the 4-inch E screwdriver. Pull the selector frame forward (away from the bank) until the rotor brush assembly is clear of the feeder brushes. To reassemble the selector and bank, lower the selector into place. Take care in doing this that the rotor brushes engage the bank terminals properly, that the feeder brushes engage the proper rotor brush hubs, and that the dowel on the bank frame is in the hole in the selector frame. A slight sidewise movement of the feeder brush spacer will help proper engagement of the feeder brushes and rotor brush hubs. Then insert and tighten the selector mounting screws and remove the feeder brush spacer.

Contact Spring Assembly

3.06 To replace a contact spring assembly, unsolder the wires which are connected to its terminal lugs and tag them to indicate the terminal to which they should be reconnected. Then remove the screws which mount the frame stiffening bracket and contact spring assembly with the 3-inch C screwdriver. Remove the old contact spring assembly and place the new one in position, holding the assembly so that the interrupter spring is aligned centrally with the driving arm stud. Reassemble and tighten the screws which mount the frame stiffening bracket and contact spring assembly and resolder the wires, taking care that they are connected to the proper terminals.

Driving Spring

3.07 Remove the driving spring from the driving spring arm with the P-long-nose pliers and disengage the other end of the spring from the driving spring lug. Engage one end of the new driving spring in the eye of the driving spring lug and attach the other end of the spring to the eye or the notch in the driving spring arm.

Frame Stiffening Bracket and Armature Bearing Pin Clamp

3.08 Remove the screws which mount the frame stiffening bracket and contact spring assembly with the 3-inch C screwdriver and allow the contact spring assembly to hang by the wires, taking care that the wires do not get broken off. Remove the armature bearing-pin clamp mounting screw with the 3-inch C screwdriver. Substitute the required parts. If these parts are added to a 200-type selector not previously equipped with them, it may be necessary to bend the contact spring assembly terminals toward the front of the selector to avoid the possibility of short circuiting on the bracket.

Armature Bearing Pin

3.09 Initially, the armature bearing pin consisted of a stud to which was riveted a clamping plate. Later, this clamping plate was eliminated and a plain stud adopted which is held in place by a slightly modified armature bearing pin clamp (P-164401 clamp). When replacing a bearing pin with riveted clamping plate, make sure that a new P-164401 clamp is also used. To replace a bearing pin, proceed as follows.

(1) Remove the driving spring as covered in 3.07. If space does not permit removal of a bearing pin without removing the selector from the bank, remove the selector as covered in 3.05.

(2) If a bearing pin with riveted clamping plate is being replaced, remove the clamping plate mounting screw and pin clamp mounting screw using the 3-inch C screwdriver and discard the pin and pin clamp. If

a plain bearing pin (P-154026 stud) is being replaced, loosen the pin clamp mounting screw using the 3-inch C screwdriver and remove the pin.

(3) Mount the new pin, and if necessary mount the new pin clamp. Centrally locate the pin in its bearings and securely tighten the pin clamp mounting screw.

Armature and Pawl Assembly

3.10 Remove the frame stiffening bracket and the armature bearing pin as covered in 3.08 and 3.09. This will permit the armature and pawl assembly to be removed. Two widths of armature and pawl assemblies are available for 200-, 206-, and 211-type selectors. To determine which armature should be used, proceed as follows. Place the proper wide armature and pawl assembly in position and insert the bearing pin. Operate the armature manually. Then attempt to insert the 0.007-inch blade of the 74D gauge in the gap between the frame and the rear edge of the armature. If the gauge enters, the wide armature is satisfactory. If the gauge will not enter, remove the assembly and substitute the proper narrow armature (marked X). On 209-type selectors only one width of armature is furnished.

Overthrow Stop and Pawl Guide (209-Type Selectors Only)

3.11 Remove the selector from the bank as described in 3.05. Remove the screw and associated washer from the overthrow stop with the 417A wrench. Place the rotor brushes at an angle of approximately 45 degrees above horizontal at the front. Press down on the driving pawl and remove the pawl guide and overthrow stop. Mount the new pawl guide and overthrow stop on the selector frame, placing the parts in position in the reverse order of removal. Remount the selector on the bank as described in 3.05.

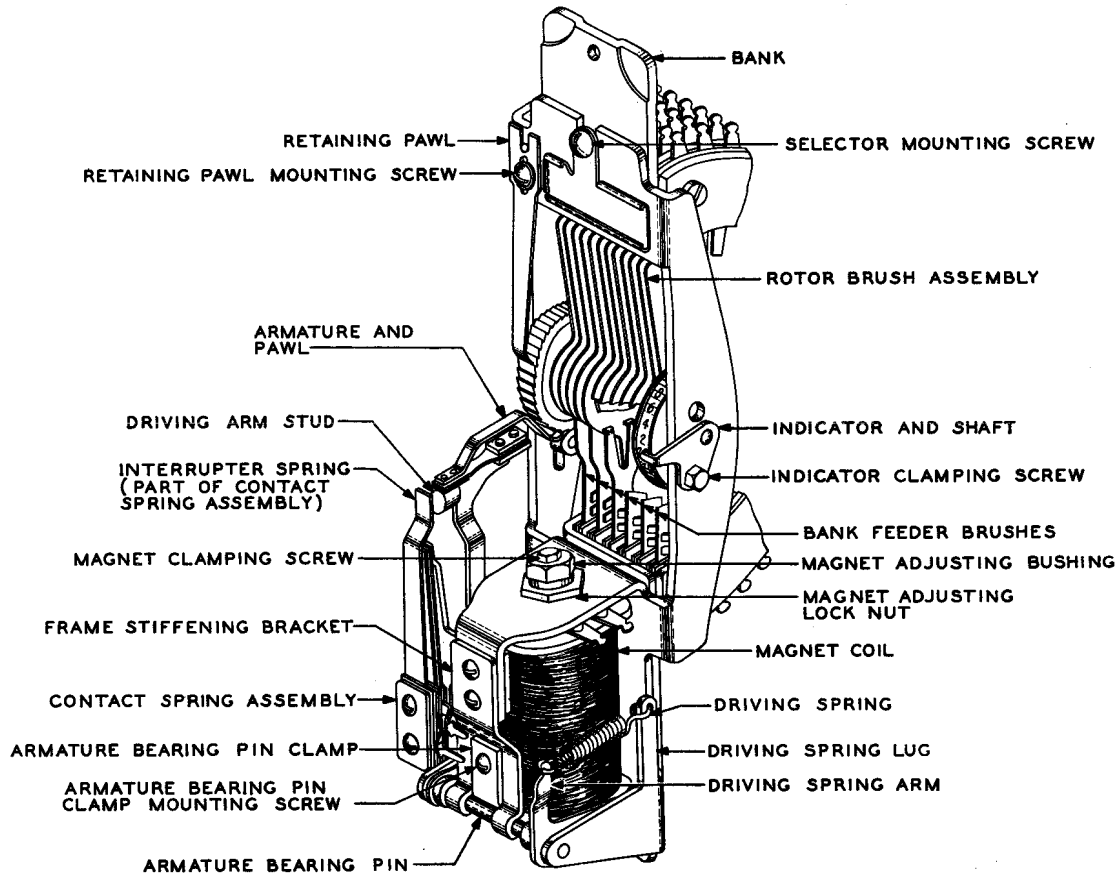


Fig. 13 – Designation of Parts

Indicator and Shaft

3.12 If necessary, remove the selector from the bank as covered in 3.05. Remove the indicator clamping screw with the 417A wrench or the 243 wrench, depending on whether a 1/4-inch or 3/16-inch hexagonal head screw is used. If the shaft can be removed without removing the selector from the bank, use a piece of No. 31 drill rod to push the shaft out. As the shaft is pushed out, the piece of drill rod will assume the position previously occupied by the shaft and will hold the rotor brush assembly in place until the new shaft can be inserted. If the shaft cannot be removed with the fingers, use the 3/32-inch pin punch and 4-ounce riveting hammer to loosen the shaft. When replacing the shaft, it may be necessary to tap the shaft in the hole because of a tight fit. To do this, place the frame on its side with the indicator wheel up and with the hole in the rotor assembly in line with the associated holes in the frame. Place the end of the shaft over the associated hole in the frame with the hole in the indicator lined up with the threaded hole in the frame. Then place a piece of fiber or wood over the indicator and tap lightly with the 4-ounce hammer until the shaft is forced into position. If the shaft will not go into the hole when tapped lightly, select a shaft of a size that will go into the hole when tapped lightly. Reassemble the selector on the bank.

Rotor Brush Assembly

3.13 ***Selectors Equipped With Indicator and Shaft:*** Fig. 14 — On selectors equipped with the types of indicators and shafts shown in Fig. 14, if space permits the removal of the indicator and shaft without removing the selector from its bank, first remove the retaining pawl mounting screw with the 3-inch C screwdriver and remove the retaining pawl. If the shaft cannot be removed without removing the selector from the bank, it will not be necessary to remove the retaining pawl, but in this case the rotor brush assembly must be removed from the rear of the selector frame. Remove the indicator and shaft as covered in 3.12, after which the rotor brush assembly can be removed. Replace the defective rotor brush assembly and reassemble the parts as covered in 3.16.

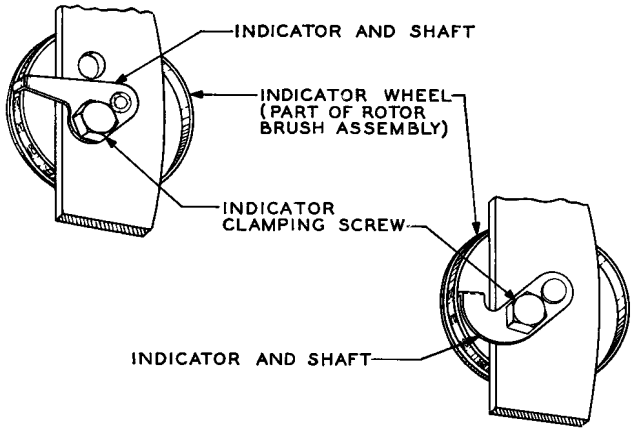


Fig. 14 – Indicators and Shafts

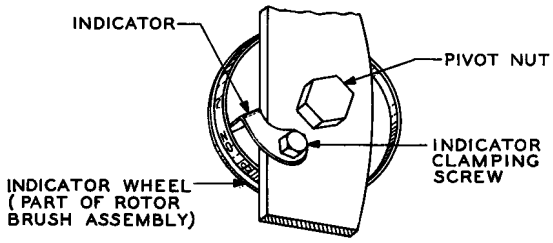


Fig. 15 – Indicator and Pivot Nut

3.14 ***Selectors Equipped With Pivot Nuts:*** Fig. 15 — Remove the retaining pawl mounting screw with the 3-inch C screwdriver and remove the retaining pawl. If the shaft cannot be removed without removing the selector from the bank, it will not be necessary to remove the retaining pawl, but in this case the rotor brush assembly must be removed from the rear of the selector frame. Remove the pivot nuts on both sides of the selector frame with the 417A wrench and the indicator clamping screw with the 243 wrench. Then remove the rotor brush assembly. Replace the defective rotor brush assembly as covered in 3.16.

3.15 When replacing a rotor brush assembly with which copper-plated pivot screws were used, replace these screws with screws as covered in Fig. 8B.

3.16 ***Reassembling Rotor Brush Assembly in Selector:*** On selectors where the shaft and indicator are an assembly, hold the rotor brush assembly in place in the frame and then insert the shaft as described in 3.12. On selectors where the short bearing pin type pivot nut is

used, hold the rotor brush assembly in place in the frame, insert the pivot nuts into the frame, and tighten them securely. On selectors where the hollow shaft type pivot nut is used, hold the rotor brush assembly in place in the frame, insert the pivot nuts into the frame, and tighten them securely. Then check for binding of the rotor brush assembly as follows. Remove the selector from the bank, if this has not been done. Hold the driving pawl and the retaining pawl (if the latter has not been removed) away from the ratchet wheel and spin the rotor brush assembly by hand. If the rotor brush assembly does not spin freely, the trouble is due to misalignment of the shaft and the rotor brush assembly. To correct, slightly bend the hollow shaft. Do this by removing the pivot nut on the index wheel side and applying pressure on the rotor assembly until the hole in the rotor assembly is concentric with the hole in the frame from which the pivot nut was removed. Reinsert the pivot nut and recheck for binding. If the rotor still does not spin freely, it will be necessary to bend the shaft a little further. Do this by again removing the pivot nut and applying pressure on the rotor. Reinsert the pivot nut and again check for binding. Repeat these operations, if necessary, until the rotor does not bind. Reassemble the selector on the bank as covered in 3.05 and mount the retaining pawl, if it was removed.

Magnet Coil

3.17 Unsolder the wires from the terminals and remove the magnet clamping screw with the 344 screwdriver or 541A wrench, as required. Remove the armature and pawl assembly as covered in 3.10 and remove the coil. Substitute the new coil and tighten the clamping screw. Reassemble the parts of the selector.

Magnet Adjusting Locknut and Bushing

3.18 To replace either of these parts, remove the magnet clamping screw with the 344 screwdriver or 541A wrench, as required. Loosen the magnet adjusting locknut with the 243 or 573A wrench, as required, and remove the magnet adjusting bushing with the KS-8097 wrench. Reassemble the parts, making the necessary replacements.

Driving Arm Stud

3.19 To replace a driving arm stud, remove the contact spring assembly as covered in 3.06 and allow the assembly to hang by the wires, taking care that the wires do not break off. Remove the driving arm stud by cutting it with the 5-inch diagonal pliers.

3.20 Before placing a new stud on the projecting lug of the driving arm, heat the stud until it becomes pliant by placing it near a hot soldering copper. Then place it on the projecting lug of the driving arm and press against it until it assumes its correct position against the shoulder on the driving arm.

3.21 Remount the contact spring assembly as covered in 3.06.

Detachable Feeder Brush Unit – 206BE Selector Only (see 1.06)

3.22 To replace the detachable feeder brush unit, proceed as follows.

(1) Remove the fuse which supplies current to the circuit associated with the selector magnet. Cover the apparatus below the bank being worked on to protect it against falling solder or screws.

(2) Unsolder the wires connected to the terminals of the detachable feeder brush unit. Tag the wires to indicate the terminals on the new feeder brush unit to which the wires are to be connected. Remove the mounting nut holding the old feeder brush unit with the 417A wrench and remove the unit. Mount the replacement unit as follows.

(3) Place the 395A tool on the springs of the detachable feeder brush unit to hold the paired spring tips together. Rotate the rotor brush assembly of the selector so that the front brushes are approximately 45 degrees below the horizontal. Mount the feeder brush unit on the mounting stud and at the same time guide the tips of each pair of springs between the hubs of the associated pairs of rotor brushes. After this operation, assemble the clamping washer and clamping nut and securely tighten the nut with the 417A wrench, at the same time holding the feeder brush unit to prevent it from turning.

(4) Solder the wires to the proper terminals. Check the requirements as covered in 3.23.

3.23 Check the requirements as covered in Section 026-706-701 and adjust as required. If it is found that there is insufficient clearance

between the ends of the feeder brushes and the spacing washers or that the entire contacting surfaces of the prongs do not contact with the rotor, loosen the mounting nut and attempt to correct this condition by shifting the feeder brush unit on the stud making use of the play in the mounting hole in the unit. If this does not correct the trouble, remove the feeder brush unit from the mounting stud and place a P-173109 washer in back of the feeder brush unit. Replace the nut and securely tighten it, making sure that the interdependent requirements are met. If one P-173109 washer does not bring about the desired results, add another washer, following the procedure described above.

Bank Feeder Brush Replacement

3.24 To replace worn bank feeder brushes, proceed as covered in 3.25, 3.26, or 3.27.

3.25 ***Selector Not Equipped With Detachable Feeder Brushes:*** To replace bank feeder brushes on a selector not equipped with detachable feeder brushes, proceed as follows.

(1) Remove the fuse which supplies current to the circuit associated with the selector magnet. Cover the apparatus below the bank being worked upon to protect it against falling solder or screws.

(2) Remove the selector from the bank as covered in 3.05. If necessary, tie the selector to the framework by means of a piece of twine to avoid damaging the wiring to the selector. Remove the feeder brush spacer mentioned in 3.05.

(3) Remove the bank mounting screws with the 4-inch E screwdriver and draw the bank to the front or rear of the frame, depending upon which is more convenient, taking care not to damage the bank wiring.

(4) With the 4-inch E screwdriver or the 563A and 564A offset screwdriver, loosen the bank clamping screws sufficiently to remove the bank frame to make the bank feeder brushes accessible. The topmost bank clamping screw and a 6-32 nut may be used to keep the remainder of the bank assembly together. Exercise care that the bank frame is not bent or damaged.

(5) Where a feeder brush is to be replaced on a bank equipped with the earlier-type 2-piece feeder brushes or single-piece unidirectional-type feeder brushes, it will be necessary to replace all of the feeder brushes on the bank as covered in (7), as only single-piece feeder brushes of the balanced type are furnished as replacement parts.

(6) Starting with a feeder brush to be replaced, or if all brushes are to be replaced starting with the No. 1 feeder-brush, loosen the adhesive holding the feeder brush in position by means of the heat from a soldering copper held against the soldering terminal of the feeder brush. Take care not to touch the adjacent bank terminals with the soldering copper. While applying the soldering copper, gently push the feeder brush toward the front of the bank by applying pressure with the KS-6320 orange stick near the prongs of the feeder brush. When the feeder brush is loose and while still hot, grasp the feeder brush near its base at the bank insulator with the P-long-nose pliers and gently pull forward and out toward the front of the frame. Make sure that the brush is loose before pulling to avoid damaging the varnished muslin insulators between which the feeder brush is set. If any metallic particles have accumulated near the base of the bank terminal adjacent to the feeder brush, remove them to avoid a possible short circuit between the terminal and the feeder brush. Then unsolder the wires connected to the feeder brush and tag the wires for identification if necessary.

(7) Insert the soldering terminal end of the new feeder brush into the bank from the inside in the space between the varnished muslin insulators left vacant by the removed feeder brush. Take care that the semicircular notch in the edge of each new feeder brush is toward the bank terminals and that the brush is being inserted between the varnished muslin insulators. Press the feeder brush through the bank until the soldering terminal protrudes slightly. At the same time guide the brush so that it will slide between the varnished muslin insulators in the groove previously occupied by the brush that was removed. Take care to avoid damaging the varnished muslin insulators.

(8) Reassemble the bank. Before tightening the clamping screws, press the prong ends of the feeder brushes outward (towards the front) without forcing. With all brushes moved upward as far as the tinned part of the soldering terminal, place the 575A feeder brush aligner on the bank so that the wedge-shaped block of the tool enters between the prongs on the feeder brushes. Move the tool toward the bank, taking care that the frame of the bank goes between the lugs on the side of the tool. Force the tool down slowly until the locating pin on the bank enters the slot in the frame of the tool. Press the tool flat against the bank. With a bank mounting screw, securely fasten the 575A tool to the bank frame, using the lower clearance hole in the tool as illustrated in Fig. 16.

(9) Make sure that each individual feeder brush bears tightly against the wedge-shaped block of the tool and rests against the round block of the tool. These conditions will generally be met automatically, though in some cases it may be necessary to shift individual brushes slightly by pushing them up from underneath the bank.

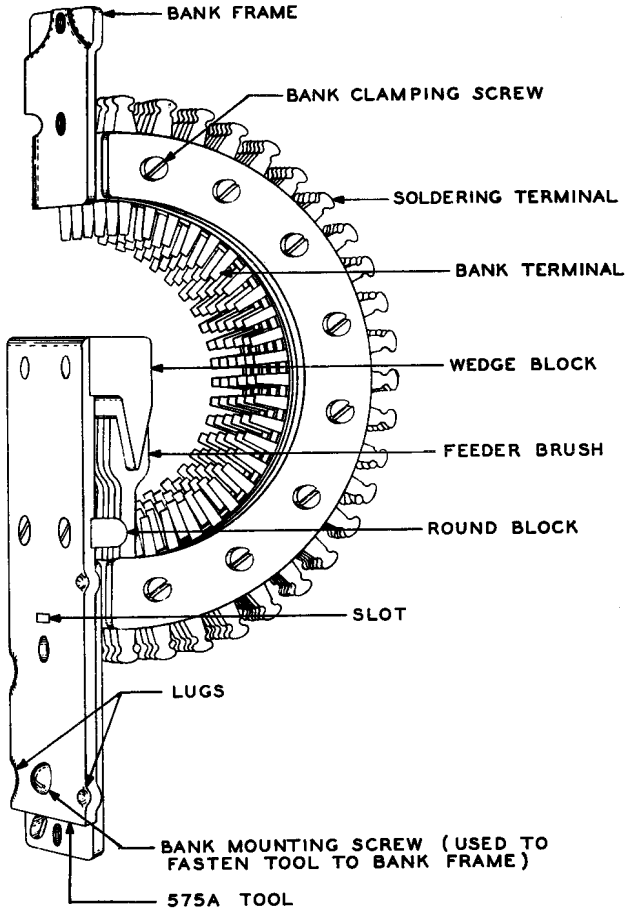


Fig. 16 – Feeder Brushes Aligned with 575A Tool

(10) When the feeder brushes are properly positioned and with the feeder brush aligner still held on the bank frame, start all the bank clamping screws a few turns into their respective tapped holes. Then securely tighten them, starting at the bottom screw and then working back from top to bottom. Make sure that each feeder brush remains in position as covered in (9). Remove the 575A tool and note that the feeder brushes and bank contacts are properly aligned and have not shifted during the tightening of the bank clamping screws. If parts are not properly aligned, loosen the bank clamping screws and reposition the bank parts to meet the conditions covered in (9).

(11) When properly aligned, solder the wires to the soldering terminals. Remount the bank on the frame and reassemble the selector on the bank. Then make sure that the selector meets the requirements specified in Section 026-706-701.

3.26 ***Selector Equipped With Detachable Feeder Brushes Except 206BE Selectors:*** To replace bank feeder brushes on a selector equipped with detachable feeder brushes other than a 206BE selector, proceed as follows.

(1) Remove the fuse as covered in 3.25(1). Then remove the detachable feeder brushes, as covered in (1) and (2) below, before removing the selector from the bank.

(2) Remove the detachable feeder brush mounting nut with the 245 wrench and remove the detachable feeder brushes. Remove the spacing washers and unscrew the stud on which the detachable feeder brushes were mounted, using the 245 wrench.

(3) Open the local cable form of the detachable feeder brush unit. Separate and tag the wires for identification if necessary. Cut the cable skinners so that the leads will be of sufficient length to reach the bank feeder brush terminals. Discard the detachable feeder brushes and associated parts.

(4) Proceed as in 3.25(2) through (11). In case the remaining portion of the feeder brush is too short, it may be necessary to grasp the feeder brush at the soldering terminal instead of near the base as covered in 3.25(6). In reassembling the selector on the bank a top selector mounting screw must be provided, since the detachable feeder brush mounting stud should not be used.

3.27 ***Selector Equipped With Detachable Feeder Brushes — 206BE Selector:*** To replace bank feeder brushes on a 206BE selector, proceed as follows.

(1) Remove the fuse as covered in 3.25(1). Then remove the detachable feeder brush unit by removing the mounting nuts with the 417A wrench.

(2) Proceed as covered in 3.25(2) through (10). When the parts are properly aligned, solder the wires to the feeder brush soldering terminals. Remount the bank on the frame and reassemble the selector on the bank. Then, proceed as covered in 3.22(3) and 3.23.

Individual Bank Terminal

3.28 Where it is desired to replace worn bank terminals, proceed as in 3.25(1) through (4). Then unsolder any wires or strapping connected to the bank terminal and tag them for identification if necessary.

3.29 Loosen the adhesive holding the terminal in position by means of the heat from a soldering copper held against the soldering terminal of the bank terminal to be removed. Take care not to touch adjacent terminals with the soldering copper. When the terminal is loose and while it is still hot, grasp the soldering lug of the terminal with the P-long-nose pliers and gently pull the terminal out to the rear of the bank.

3.30 Insert the contacting end of the new bank terminal into the rear (wiring side) of the bank in the space between the varnished muslin insulators left vacant by the removed bank terminal. Take care that the semicircular notch in the edge of the new terminal is toward the bank clamping screw if the terminal is located adjacent to a clamping screw. Press the terminal end of the new bank terminal into the bank, taking care not to damage the varnished muslin. Position the new terminal in the bank by eye.

3.31 Reassemble the bank and tighten the bank clamping screws as covered in 3.25(10). Then proceed as covered in 3.25(11).

Row of Bank Terminals

3.32 When several terminals in a row are defective, it may be advisable to replace the entire row as a unit. The row of terminals may be obtained by dismantling a spare unwired bank. Proceed as covered in 3.25(1) through (3). Then unsolder the wires connected to the row of terminals to be replaced, and if necessary tag the wires for identification.

3.33 With a 4-inch E screwdriver or a 563A or 564A screwdriver, loosen the bank clamping screws sufficiently to remove the bank frame. Then carefully dismantle the bank as required to remove the defective row of terminals. Care should be taken not to drop the metal separators or the clamping screws.

3.34 Strap terminals of the new row as required. Then reassemble the bank parts, inserting the new row of terminals in the proper place. Then proceed as covered in 3.25(10) and (11).

Nonrigid Mounting

3.35 To replace the nonrigid mounting, remove the mounting screws which hold the mountings on the mounting plate apparatus with the 3-inch C screwdriver and pull the selector and associated bank forward, away from the frame, sufficiently to remove the mountings from the bank. Take care not to damage the wiring and soldered connections. Then remove the upper or lower nonrigid mounting from the bank as required, using the 209 wrench to loosen the nut on the 5A apparatus mounting or by turning the 5B apparatus mounting.

3.36 Mount the 5A apparatus mounting by inserting the screw on the mounting through the hole in the bank frame and securing it with the nut and washer. Mount the 5B apparatus mounting by inserting the screw on the mounting into the tapped hole in the bank frame (or the P-30A936 adapter, where

used) and turning the mounting until the screw is tight and then continue turning until the mounting is horizontal. Mount the bank and associated apparatus mountings on the frame. Where the apparatus mounting is secured to the frame by a screw, insert the screw through the mounting bar and into the apparatus mounting from the rear. Where the apparatus mounting is provided with a stud, insert the stud through the mounting bar from the front, and secure it with the nut.

Frame

3.37 Remove the fuse which supplies current to the circuit associated with the selector magnet. Cover the apparatus below the selector being worked on to protect it against falling screws, etc.

3.38 Remove the retaining pawl. Loosen the armature bearing pin clamp mounting screw. Remove the screws which mount the frame stiffening bracket and the contact spring assembly. Allow the contact spring assembly to hang by the wires, taking care that they do not get broken off.

3.39 Remove the armature backstop. Remove the driving spring as described in 3.07. Remove the selector from the bank as described in 3.05. Remove the armature bearing pin as described in 3.09. Remove the armature and pawl assembly. Remove the rotor brush assembly as described in 3.13 and 3.14. Remove the magnet clamping screw with the 344 screwdriver or 541A wrench, as required. Remove the coil, taking care not to break off the wires. Loosen the magnet adjusting locknut with the 243 or 573A wrench, as required, and then remove the locknut and bushing. Remove the overthrow stop with the 417A wrench.

3.40 Assemble parts on the new frame in the reverse order of removal and mount the selector on the bank. Stencil the code number of the selector on the frame.

REASONS FOR REISSUE

1. To add information covering detachable feeder brush units (1.06).
2. To revise titles and piece-part data of Fig. 4 and 5.
3. To revise titles of Fig. 6 and 7.
4. To add a note for Fig. 8D.
5. To omit piece-part data and replacement procedures covering D-78824 detachable feeder brush units (Fig. 9 and 3.22 through 3.28, of previous issue).
6. To add piece-part data covering 206CM, 206CN, and 206CP selectors (2.04).
7. To revise the List of Tools and Materials (3.01).