197- AND 198-TYPE SWITCHES
ASSOCIATED BANKS AND COMMUTATORS
PIECE-PART DATA AND REPLACEMENT PROCEDURES

1. GENERAL

1.01 This section covers the general information necessary for ordering parts to be used in the maintenance of 197- and 198-type switches and associated banks and commutators, and covers specific information for ordering and replacing bank rods, frame mounting screws, and associated parts. It also covers make busy information and procedures for removing and remounting the switches.

1.02 This section is reissued to cover a general revision of the piece part data and replacement procedures.

1.03 Procedures for the replacement of supply bank insulators on banks having silver contacts are covered in Section 030-705-807.

1.04 The piece part data and replacement procedures for the switches and their associated banks, commutators, and wipers are covered in separate sections as follows:

Section No.	Title
030-705-801	Piece Part Data and Replacement Procedures - Switches - 197 and 198 Types - Associated Banks and Commutators - General
030-705-802	Piece Part Data and Replacement Procedures - Switches - 197 and 198 Types - Parts Mounted Above Cover Plate Except Pawls, Pawl Pins, and Contact Spring Assemblies
030-705-803	Piece Part Data and Replacement Procedures - Switches - 197 and 198 Types - Contact Spring and Test Jack Assemblies
030-705-804	Piece Part Data and Replacement Procedures - Switches - 197 and 198 Types - Cords, Cord Guides Commutators, Wiper Springs, and Parts Associated with the Cover Plate
030-705-805	Piece Part Data and Replacement Procedures - Switches - 197 and 198 Types - Pawls and Pawl Pins
030-705-806	Piece Part Data and Replacement Procedures - Switches - 197 and 198 Types - Switch Banks

1.05 Part 2 of each section covers the piece part numbers and the corresponding names of the parts covered in the section which it is practicable to replace in the field in the maintenance of the switches. 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."

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

2. PIECE PART DATA

2.01 The figures included in part 2 of the various sections show the various piece parts in their proper relation to other parts of the switch. 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. Where these names differ from those in general use in the field, the latter names, in some cases, are shown in parentheses.

2.02 From time to time changes are made in the design of apparatus and this sometimes results in noninterchangeability of some of the parts. In order to furnish information for ordering parts of earlier design supplementary figures referred to as Fig. 1A, Fig. 1B, etc., are employed; Fig. 1A showing the earliest design, Fig. 1B the next design, and so on. Unless otherwise specified, the parts shown in the figures are the present type and are interchangeable with all parts of earlier design.

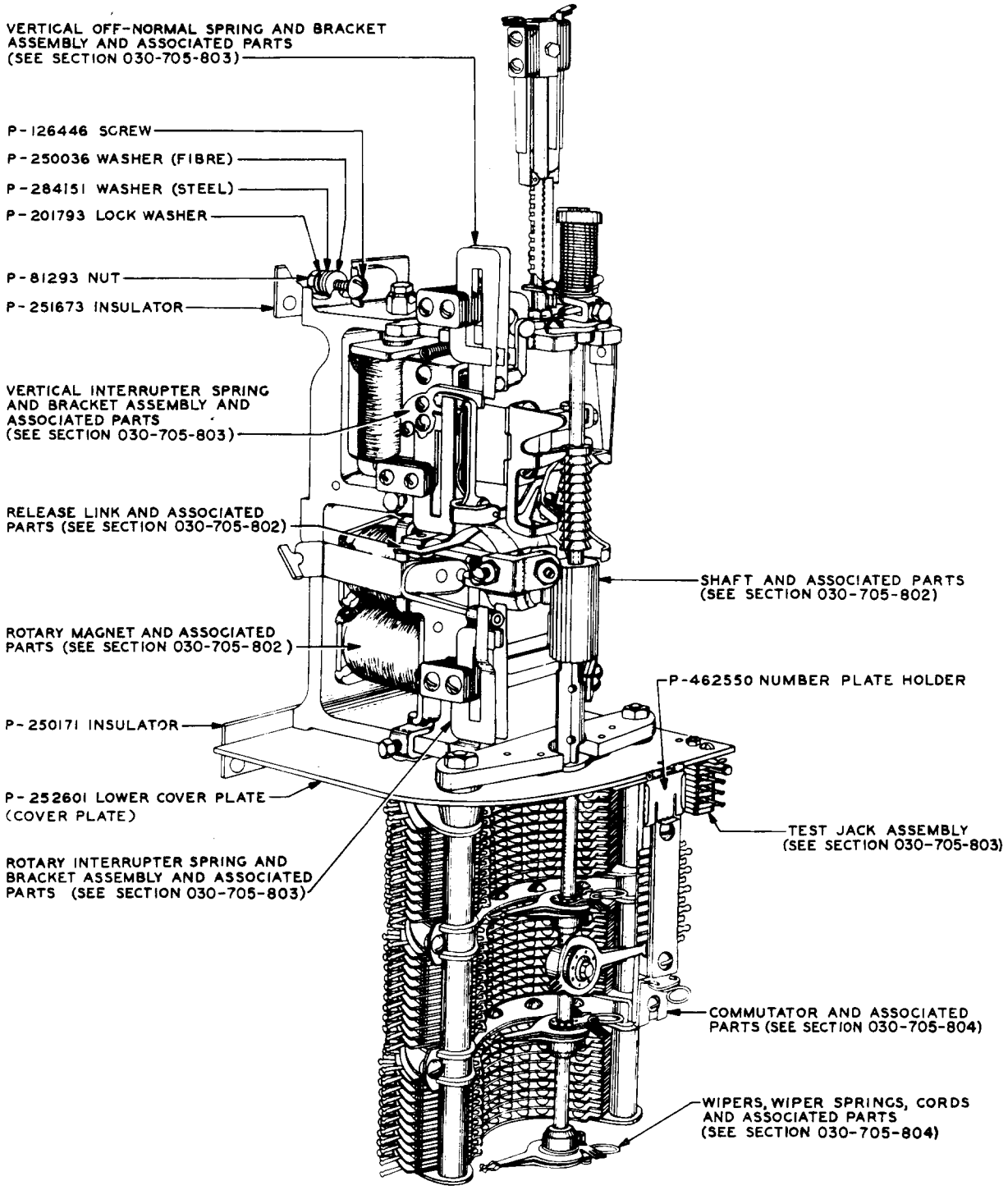
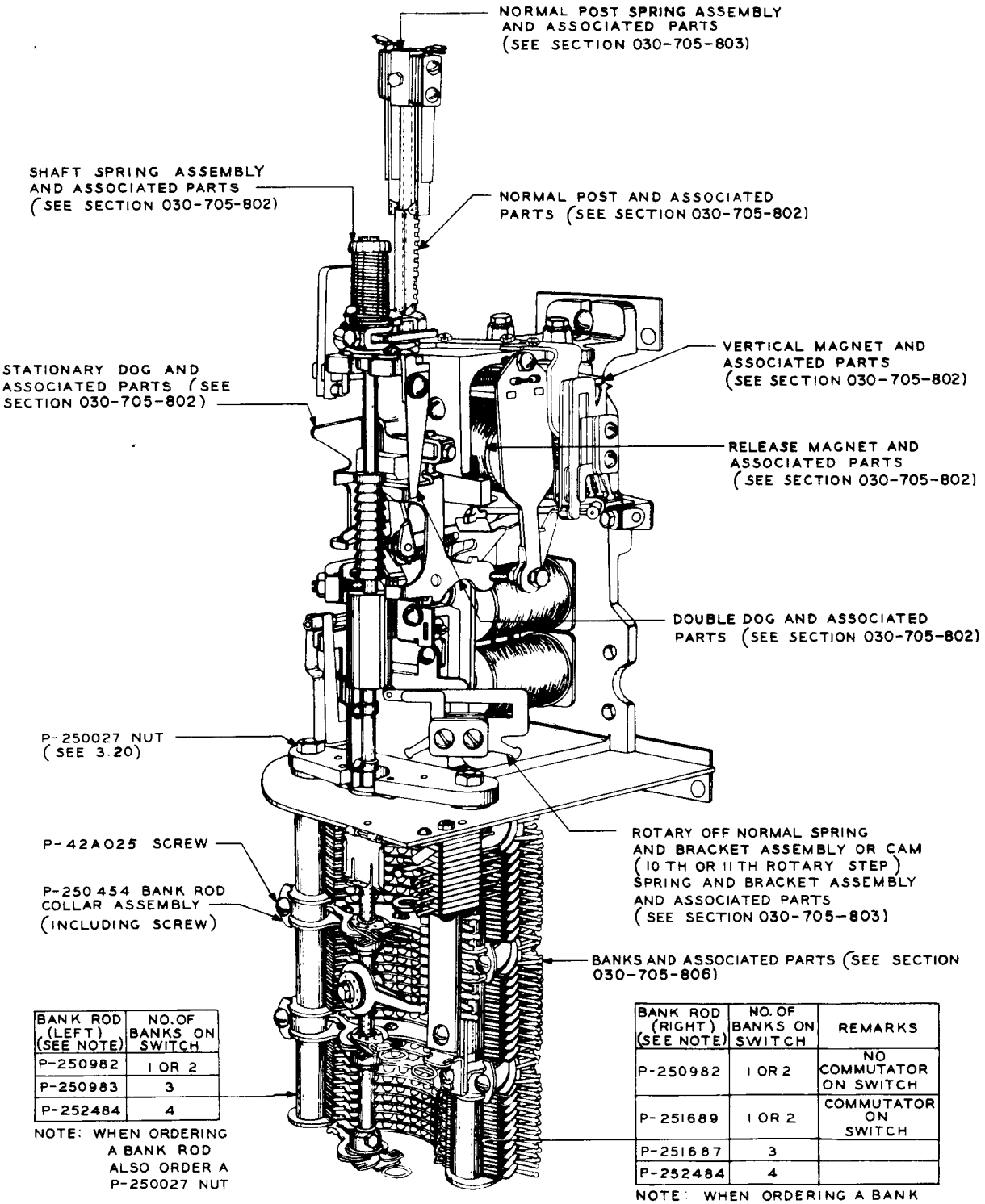


FIG 1 - PARTS OF 197 TYPE SWITCH AS VIEWED FROM THE LEFT SIDE



BANK ROD (LEFT) (SEE NOTE)	NO. OF BANKS ON SWITCH
P-250982	1 OR 2
P-250983	3
P-252484	4

NOTE: WHEN ORDERING A BANK ROD ALSO ORDER A P-250027 NUT

BANK ROD (RIGHT) (SEE NOTE)	NO. OF BANKS ON SWITCH	REMARKS
P-250982	1 OR 2	NO COMMUTATOR ON SWITCH
P-251689	1 OR 2	COMMUTATOR ON SWITCH
P-251687	3	
P-252484	4	

NOTE: WHEN ORDERING A BANK ROD ALSO ORDER A P-250027 NUT

FIG. 2-PARTS OF 197 TYPE SWITCH AS VIEWED FROM THE RIGHT SIDE

2.03 Wherever a reference to one of these figures is found associated with the name and the number of the parts, examine that figure in order to make sure that the correct part is ordered. In some instances there may be found in figures themselves reference to other figures or other sections. This means that the part in question has been changed more than once. Follow through all such references carefully in order to avoid error.

2.04 In certain cases the manufacture of certain parts of switches has been discontinued and the present parts are not individually interchangeable with the earlier parts. In such cases information is furnished for ordering replacement groups, and suitable illustrations showing the present and earlier type of apparatus are included in the section.

2.05 When ordering parts for replacement purposes give the piece part number as well as the name of the part; for example, "P-252549 Stationary Dog." Do not refer to the BSP number nor to any information shown in parenthesis or in notes following the piece part number.

3. REPLACEMENT PROCEDURES

3.01 List of Tools and Materials

Code or Spec. No.	Description
Tools	
417A	1/4" and 3/8" Hex. Open Double-end Flat Wrench
555A	3/16" Hex. Single-end Socket Wrench
KS-6320	Orange Stick
KS-7782	Parallel Jaw Pliers
-	3" Cabinet Screwdriver
-	4" Regular Screwdriver
-	ED-30712-01 Test Stand (as required)
Materials	
KS-7860	Petroleum Spirits
-	DOOR-EASE (manufactured by American Grease Stick Co., Muskegon, Michigan)
-	Toothpicks, Hardwood, Flat at One End and Pointed at the Other

General

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

3.03 After making any replacement of parts of a 197- or 198-type switch, the part or parts replaced shall meet the readjust requirements involved. Other parts whose adjustments may have been disturbed by the replacing operations shall be checked to the readjust requirements and an over-all operation check shall be made of the switch before restoring the circuit to service.

Make Busy Information

3.04 Before replacing any part, make the switch busy in accordance with approved procedures.

3.05 On certain types of toll connectors, the busy ground is removed when the shaft is moved off-normal. In such cases, open the circuit to the release magnet by blocking the vertical off-normal springs in their unoperated position by means of a toothpick or KS-6320 orange stick as shown in Fig. 3. On 198-type switches, and when necessary on 197-type switches, insulate the contacts of the rotary off-normal springs that close the circuit to the release magnet. Where the adjustments require that the switch cut in on any level, exercise care not to interfere with the normal operation of circuits associated with the bank contacts.

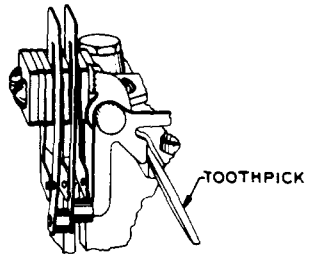


FIG. 3 - METHOD OF BLOCKING VERTICAL OFF-NORMAL SPRINGS IN THEIR UNOPERATED POSITION

3.06 When certain line finders are made busy, raising and rotating the shaft manually may result in a resistance battery being placed on a bank terminal by the wipers. Where this condition may occur, insulate the proper contacts of the vertical off-normal spring assembly to remove this condition from the wipers.

Removal of Switch

3.07 In some cases it may not be possible to gain full access to the parts when the switch is mounted. Where such is the case, remove the switch from the shelf as described in 3.08 to 3.14 inclusive, and mount it on an ED-30712-01 test stand.

3.08 To remove a switch from the shelf, proceed as follows. Remove the switch cover.

3.09 If the switch has a commutator mounted on the banks, remove all cord guides from the commutator. In the case where the cord guide bracket and cord guide are one piece, it will be necessary to loosen the mounting screw holding the cord guide bracket to the commutator, using the 4" regular screwdriver. Where detachable commutator cord guides are used, it is only necessary to detach the commutator cord guides from the cord guide brackets.

3.10 Remove the bank rod nuts with the No. 417A wrench so as to free the switch from the banks.

3.11 Place the left hand under the cover plate of the switch and grasp the switch firmly with the right hand as shown in Fig. 4. The thumb should rest on the release armature bracket on the left of the switch and the first three fingers should rest on the release armature on the right. Then, while pressing the switch inward, lift it upward until the shelf pins are opposite the slot openings. Hold the switch in this position with the right hand, and at the same time, steady the bank with the left hand and exert a slight pressure toward the shelf so as to prevent the wipers from snagging on the bank contacts. When clearance is assured, regrasp the cover plate with the left hand and tilt the lower portion of the switch forward to avoid damage to the wipers. Then draw the switch forward free of the shelf.

Caution: Take care in all cases not to allow the weight of the switch to be supported by the relays or the cover supports, since this may result in damage to the relays.

3.12 In some cases, the condenser mounting bracket mounted on the rear of the switch may interfere with the removal of the switch. In such cases, make sure that the mounting bracket clears the frame while the switch is being removed and that the switch does not contact the wiring of the shelf above it.

3.13 When the switch mounting plate is equipped with a handle at its upper end, hold the handle with the right hand to assist in raising the switch when removing it from the shelf, at the same time supporting the cover plate with the left hand as described in 3.11.

3.14 Although the methods described in 3.11 and 3.12 are generally applicable, these procedures may be varied as required to prevent damage to switches equipped with vertical interrupter springs or release contact springs.

Remounting of Switch

3.15 Before remounting a switch, examine the shelf jack springs to determine whether they require cleaning. If they do, clean them in accordance with the section covering cleaning and treating 197- and 198-type switches. Remount the switch on the frame as follows.

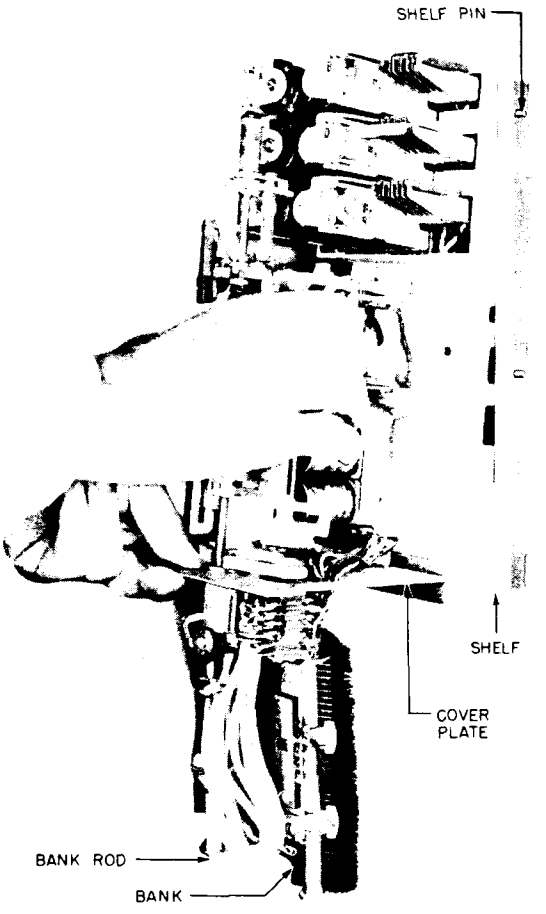


FIG 4 — METHOD OF REMOVING SWITCH FROM FRAME

3.16 Grasp the switch firmly with the right hand so that the thumb rests on the release magnet bracket at the left of the switch and the next three fingers of the right hand rest on the release armature on the right. Hold the switch so that the upper slots in the switch frame are above the upper shelf pins, supporting the switch at the cover plate with the left hand. Tilt the top of the switch toward the shelf. Then move the lower part of the switch against the shelf so that the lower slots in the switch frame are above the lower shelf pins and the full length of the mounting plate rests against the shelf.

3.17 While guiding the switch take care that the bank does not interfere with the wipers. If necessary, exert slight pressure with the right hand against the bank toward the frame to insure clearance. Slowly lower the switch until its downward movement is checked by the shelf pins coming in contact with the upper extremity of the bayonet slots, at the same time guiding the bank rods into the holes in the cover plate. Make sure that

the switch plug properly engages the shelf jack. Where difficulty is experienced in mounting a switch on a shelf due to improper alignment of the switch plug and jack, loosen the jack mounting screws with the 4" regular screwdriver and shift the jack as required to align the parts.

3.18 Bring the bank into position against the cover plate. Take care in doing this that no wires are pinched between the shoulders of the bank rods and the bottom of the cover plate as the switch seats itself. Remount and securely tighten the bank rod nuts, using the No. 417A wrench. Remount the cord guide (or guides) and cord guide bracket if these were removed.

3.19 Remount the switch cover. Where difficulty is experienced in mounting or removing covers, examine the cover for bent lugs. If these are bent, straighten them with the KS-7782 pliers. If, with the lugs properly straightened, the cover is still difficult to mount, apply DOOR-EASE to both sides of each lug. On switches equipped with 204-type selectors, the bank terminals of the selector may have to be bent out of the way to permit the cover to be mounted without interference.

Bank Rods and Associated Parts

3.20 To replace bank rods, remove the switch from the frame as described in 3.08 to 3.14 inclusive. Loosen the bank rod collar clamping screws with the 3" cabinet screwdriver or the No. 555A wrench. Remove the bank rod from the banks. Substitute the new bank rod, remounting the bank rod collars as the bank rod is lowered into position. Take care that the collars properly link the adjacent banks together. Locate the top bank so that it is firmly against the lower edge of the bank rod shoulder and tighten the bank rod collar clamping screws securely. Remount the switch on the frame as described in 3.15 to 3.18.

Note: Bank rod nuts formerly supplied may not fit bank rods of latest manufacture. However, bank rod nuts now supplied will fit both old and new bank rods.

Cover Plate

3.21 To replace the cover plate, loosen the setscrews in the upper hubs with the 3" cabinet screwdriver or the No. 555A wrench. Remove the wiper assemblies from the shaft.

3.22 Unsolder and tag the wires from the test jack assembly and commutator (if equipped).

3.23 Remove the test jack assembly, number plate holder, and terminal assembly from the cover plate.

3.24 Remove the two bank clamping nuts, using the No. 417A wrench, and lower the banks. Remove the screws which hold the cover plate to the frame with the 3" cabinet screwdriver. If the switch is equipped with a P-251147 commutator, this will be released at this time. Lower the cover plate below the shaft.

3.25 Place the new cover plate in position from below the shaft, reposition the commutator if it was removed, and attach the cover plate to the frame. Raise the banks into position and remount the bank clamping nuts. Remount any assemblies removed from the cover plate being replaced. Resolder the wires to the test jack assembly and commutator. Remount the wiper assemblies on the shaft.

REASONS FOR REISSUE

1. To add a paragraph referring to Section 030-705-807 for replacement of supply bank insulators (1.03).
2. To add a paragraph covering an index to other sections covering the switch (1.04).
3. To add figures referring to other sections for detailed information (Figs. 1 and 2).
4. To revise the piece part information for the mounting washer and lock nut (Fig. 1). (Information for WECo covered by CO-165608.)
5. To add piece part information for the insulators between the switch mounting plate and the switch frame (Fig. 1). (Information for WECo covered by CO-165735.)
6. To add piece part information for the cover plate (Fig. 1).
7. To revise the piece part number of the number plate holder (Fig. 1). (Information for WECo covered by CO-139496.)
8. To revise the piece part number for the bank rod collar screw (Fig. 2). (Information for WECo covered by CO-135448.)
9. To revise the figures to bring them up to date (Figs. 1 and 2).
10. To amplify and revise the list of tools and materials (3.01).
11. To revise and amplify the procedure for making the switch busy (3.02 to 3.04 inclusive).
12. To revise and amplify the procedure for removing the switch (3.08 to 3.14 inclusive).
13. To revise the procedure for mounting the switch (3.15 to 3.19 inclusive).
14. To add a procedure covering the replacement of bank rods and associated parts (3.20).
15. To add procedures for the replacement of the cover plate (3.21 to 3.25).