

## 0- AND 1-BUTTON TELEPHONE SETS

### COMMON INSTALLATION AND MAINTENANCE INFORMATION

#### 1. GENERAL

**1.01** This section contains information for 500-, 1500-, and 2500-series 0- and 1-button rotary and TOUCH-TONE\* telephone dial equipped sets.

**1.02** The reasons for reissuing this section are listed below. Revision arrows are used to emphasize the more significant changes.

- Include the new snap-in faceplate
- Add the KS-2019L2 buzzer.

**1.03** Refer to the appropriate Service sections for connection information, and Reference sections for ordering and piece-part information located in Division 502.

#### 2. INSTALLATION

##### A. Faceplate and Housing—Removal and Replacement

**2.01** On TOUCH-TONE telephone dial sets, the old type faceplate (Fig. 1) is held in place by a retaining clip and screw at the top of the plate. This faceplate is nonflexible. ♦The new “snap-in” thin section flexible faceplate (Fig. 2) eliminates the need for retaining clip and screw in the telephone housing. ♦

(a) To remove the old type faceplate.

- (1) Place point of KS-21107L1 releaser or equivalent at edge of faceplate latch (Fig. 1).
- (2) Push latch toward rear of set until releaser enters slotted portion of faceplate.
- (3) Turn point of releaser under faceplate and raise.

(b) To replace old type faceplate.

(1) Use the point of the releaser, hold the retaining clip in.

(2) Place faceplate into position.

(3) Release the retaining clip.

(c) ♦To remove “snap-in” faceplate with housing off set.

(1) Turn housing on side and place one hand in front of the faceplate holding the housing securely (Fig. 5).

(2) With the other hand press firmly on the back of the faceplate until the lower tab snaps out of the lower housing slot

(3) Remove the upper tab from the upper housing slot. ♦

(d) To remove the “snap-in” faceplate with housing on set.

(1) Pry up middle right or left faceplate edge and insert a finger under the faceplate.

(2) Bow the faceplate up until the bottom tab is removed from the housing (Fig. 3).

(3) Remove the upper faceplate tab from the housing.

(e) To replace the “snap-in” faceplate with housing on or off set.

(1) Insert lower faceplate tab into the lower housing slot.

(2) Bow the faceplate by pushing upward from the back side while pushing down on the two top corners (Fig. 4).

(3) Tuck the upper tab into the housing slot and release.

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(f) To replace an old-type faceplate with a "snap-in" faceplate.

- (1) Remove the housing retaining clip and screw or turn clip 90 ° and secure.
- (2) Replace "snap-in" faceplate as in paragraph 2.01(e).

(g) To replace "snap-in" faceplate with an old-type faceplate.

- (1) Install a D-180879 Kit of Parts (one 812557205 clip and one 996590899 screw) in the housing. The boss and screw hole in the housing remains the same.
- (2) Use the point of the releaser, hold the retaining clip in.
- (3) Place faceplate in position.
- (4) Release the retaining clip.

**2.02** Desk-type rotary and TOUCH-TONE telephone dial equipped set housings are secured to the base by two captive screws located on bottom of set.

**2.03** Wall-type (rotary dial only) set housings are removed by pushing in tab of snap fastener in slot centrally located in bottom of housing (Fig. 6), and at the same time pushing lower part of housing in releasing snap fastener and then lift lower part of housing outward. To replace housing, slip over handset hook and dial, and engage latch spring assembly (Fig. 7). Press firmly on lower part of housing to engage snap fastener and catch.

**2.04** Wall-type TOUCH-TONE telephone dial equipped set housings are removed by first using a KS-21107L1 type releaser or equivalent to remove number card holder and number card to gain access to two captive housing screws.



*When replacing housings and faceplates on sets equipped with a line and signal key (Fig. 1) and/or exclusion key, exercise caution in alignment. It may be necessary to slightly twist housing to align properly.*

## B. Mounting Wall Sets

**2.05** In early sets, several holes are provided in the baseplate for flexibility in mounting to minimize backboard use.

**2.06** Early production rotary dial sets have a baseplate which does not provide the proper hole arrangement for fastening directly to conduit outlet boxes, 157A adapter, 63B or KS-20502L2 prewire brackets.

**2.07** Refer to Section 463-121-100 for information on 157A adapter or to Section 461-630-100 for information on 63B and KS-20502L2 brackets.

**2.08** Refer to Section 463-130-100 for information on the 191C backboard or fasteners suitable for mounting wall-type sets directly to wall surface.

## C. Apparatus Blanks (Fig. 8, 9, and 10).

**2.09** The 95A (MD) apparatus blank is intended for use on rotary dial sets equipped with three-point dial mountings only. The 95B (MD) (Fig. 8 and 9) is intended for use with all other rotary dial sets (bracket must be inverted for wall sets). The 95C (early model) fits on dial mounting bracket and (current model) can be used on two or three point dial mountings (Fig. 10).

## D. Ringers

**2.10** Most early 0- and 1-button sets were furnished equipped with multitapped or split ringer coils for tip party identification. When replacement of a split coil ringer i.e., a C4A, the single coil version (C4B) can be used in nonresident or business locations and where tip party identification is not required. Refer to the appropriate Service section for connection information.

## E. 153-Type Adapters

**2.11** When a multibutton station is "down graded" to single or two line service, a 153-type adapter may be used to avoid cutting off connector cable ends. Refer to Section 461-200-102 for ordering information.

## F. Buzzers (Ordered Separately)

**2.12** If required, a KS-8109 type (ac or dc), KS-20419L1 or KS-20419L2 (10 volt ac only)

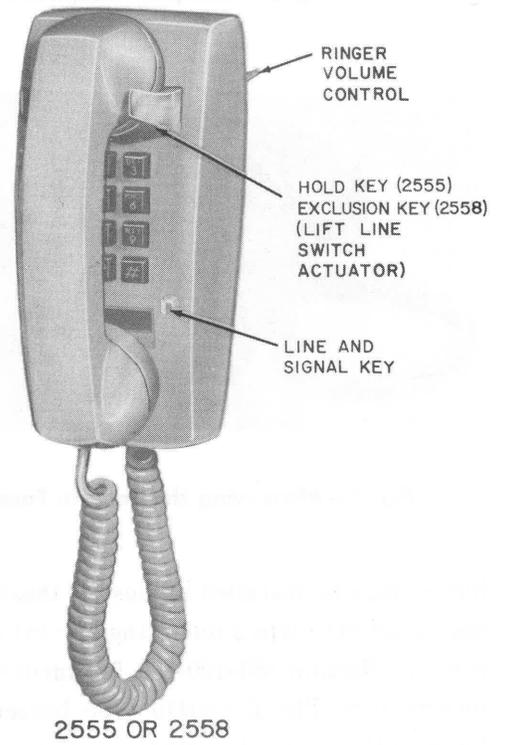
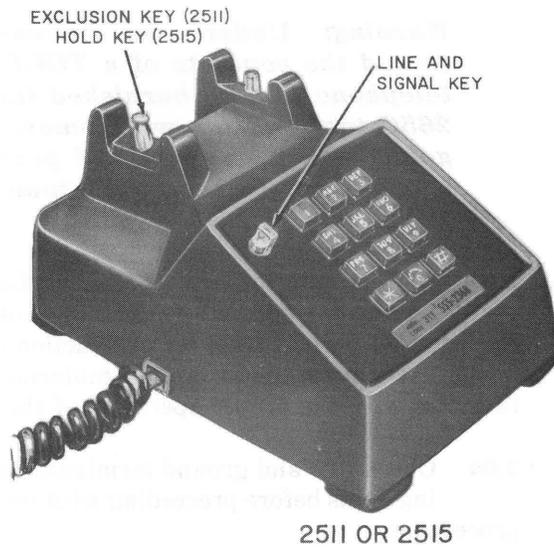
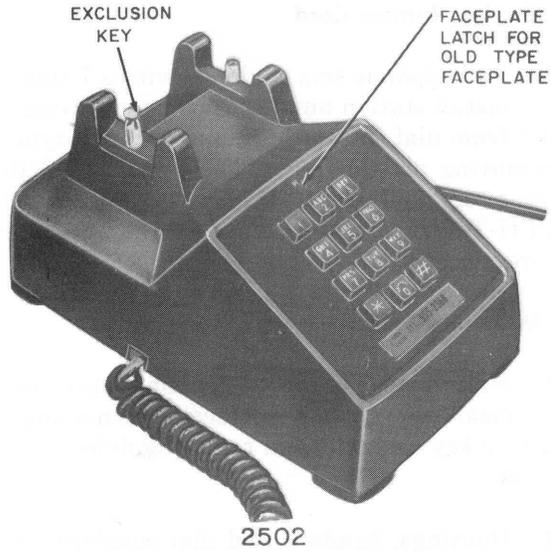


Fig. 1—2500-Series Telephone Sets

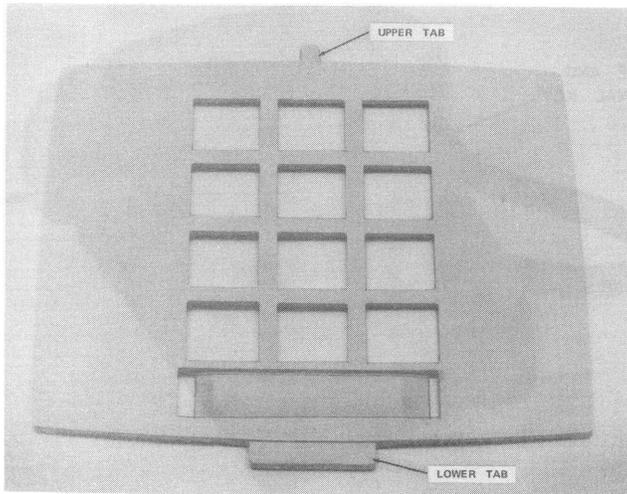


Fig. 2—Snap-In Faceplate



Fig. 3—Removing the Snap-In Faceplate

buzzer may be installed in most of these sets. To install a KS-8109 type a mounting bracket is necessary, refer to Section 501-120-100 for mounting bracket information. The KS-20419 type buzzers are insulated and require only a single screw for installation.

### G. Polarity Guard

2.13 A polarity guard for end-to-end signaling installations may be installed in TOUCH-TONE telephone dial equipped sets when specified by local instructions. Refer to appropriate Reference section for ordering and installation information.

### H. Station Number Card

2.14 On telephone sets equipped with a 7-type dial, install station number card by removing card holder from dial fingerwheel, and with a 9-type dial by removing plastic fingerwheel using KS-21107L1 releaser or equivalent. On desk- and wall-type TOUCH-TONE telephone dial sets use a releaser to remove number card retainer.

## 3. MAINTENANCE

3.01 Maintenance of these telephone sets consist of cleaning exterior surfaces, burnishing and adjusting key contacts, and replacing defective components.

3.02 Housings, handset, and dial pushbuttons can be cleaned with a clean KS-2423 cloth moistened with water. Do not use scouring powders or cleaners. Replace colored components if cleaning procedure does not result in a satisfactory appearance.

**Warning:** *Under no circumstances should the contacts of a TOUCH-TONE telephone dial be burnished (i.e. with a 265C tool) as this will remove the soft gold contact material and permanently affect continued reliable tone generation.*

3.03 Inspect exterior and interior surfaces of the set for obvious defects such as broken, loose, or displaced parts. Check for obstruction of moving parts or the presence of foreign material that may interfere with the proper operation of the set.

3.04 Check line and ground terminations and wiring dress before proceeding with maintenance procedures.

3.05 Maintenance of handsets, dials, and ringers is outlined in sections covering these components. Central office dial test and ringer circuits should be used in testing these components whenever possible according to local instructions.

3.06 Networks and line switch assemblies are riveted to the baseplate and no attempt should be made to replace them in the field. If defective, replace complete telephone set.

3.07 Table A lists common troubles and their probable causes encountered with desk- or wall-



Fig. 4—Replacing the Snap-In Faceplate

type rotary and TOUCH-TONE telephone dial sets. Also listed is recommended corrective action.

#### A. Line Switch Assembly



***Do not perform any field maintenance other than replacing cover, cleaning contacts, and lubricating bearing points.***

**3.08** Remove switch cover by depressing sides between thumb and index finger and tilting cover away from mounting.

**3.09** The operating bracket assembly of desk-type sets and the line switch operating assembly of wall-mounted sets should function without binding or squeaking.

**3.10** To eliminate any binding or squeaking, clean bosses on operating bracket arms, spring anchor points, operating brackets, shaft bearing points, and pins with a KS-2423 cloth moistened with KS-7860 petroleum spirits. Lubricate bearing surfaces (Fig. 11) with a No. 2 or softer graphite pencil.

#### B. Plungers (Desk-Type Housings)

**3.12** Plungers should move freely throughout entire travel without binding or squeaking. They

are accessible from the underside of the housing when the handhold cover is removed (Fig. 12).

**3.13** Clean plungers with KS-2423 cloth moistened with KS-7860 petroleum spirits and lubricate with a No. 2 or softer graphite pencil. Replace housing if plungers do not move freely after cleaning.



***The KS-7860 petroleum spirits are flammable. Use safety precautions when handling.***

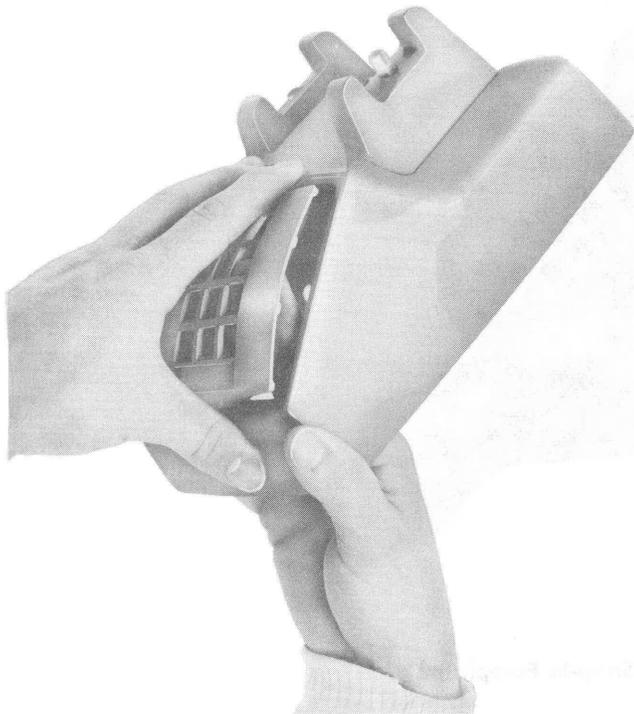
#### C. Exclusion or Hold Key and Plunger Unit



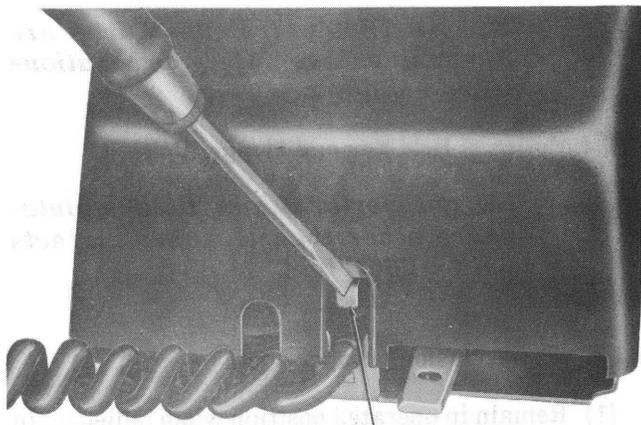
***Do not perform any field maintenance other than cleaning contacts with a 265C tool.***

**3.14** The exclusion plunger shall:

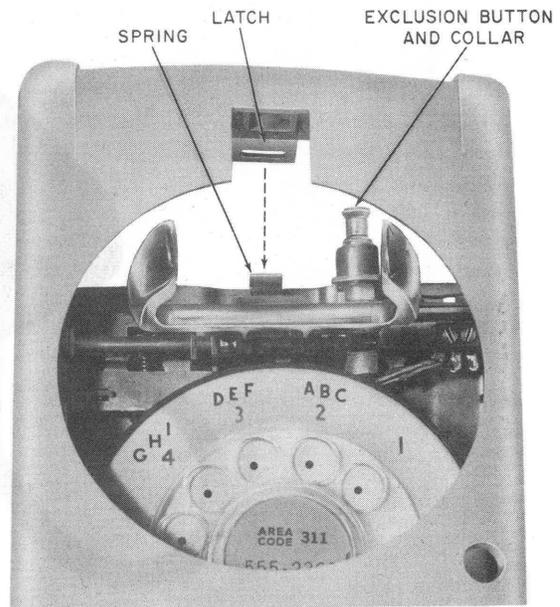
- (1) Remain in operated position when pulled up to the full extent of its stroke.
- (2) Return to fully depressed position when the handset is placed on the cradle of desk-type sets or on the hook of wall-mounted sets.
- (3) Drop by its own weight from the mid position to the fully depressed position when the right plunger is depressed (desk-type sets only).



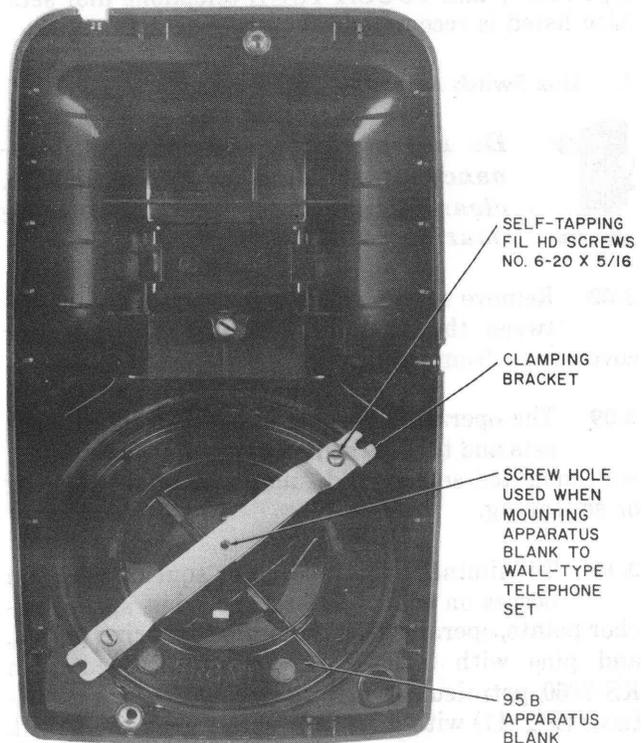
**Fig. 5—Removing the Snap-In Faceplate (Housing Removed)**



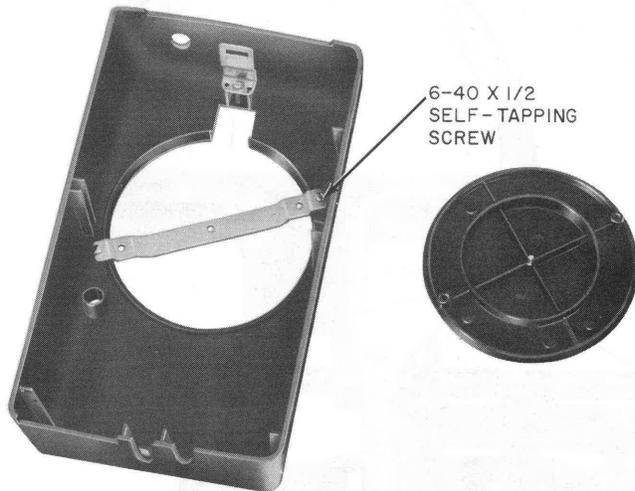
**Fig. 6—Removing Rotary Dial Wall Set Housing**



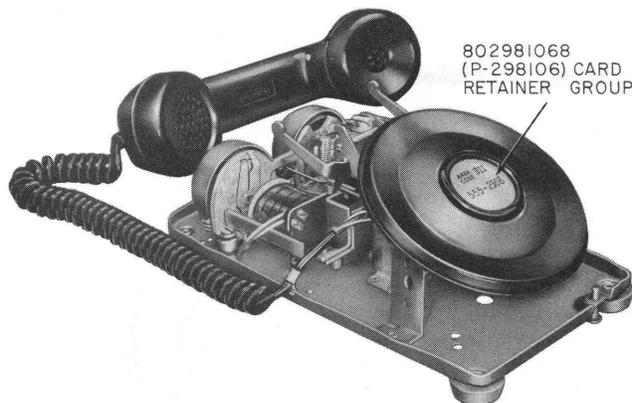
**Fig. 7—Replacing Wall Set Housing**



**Fig. 8—500-Type Telephone Set With 95B (MD) Apparatus Blank**



**Fig. 9—95B (MD) Apparatus Blank Mounted in Wall-Type Telephone Set**



**Fig. 10—95C Apparatus Blank on Dial Mounting Bracket in 500-Series Telephone Set**

**3.15** With set housing removed.

- (1) Normally closed contacts of exclusion switch shall have perceptible follow when the switch is operated manually.

- (2) Normally open contacts shall have a minimum separation of 0.015 inch.

**D. Turnbutton/Pushbutton Key**



*Adjust this key only if replacement of the complete telephone set is impracticable.*

- 3.16 Use a 363 tool to adjust key. Be sure there is adequate light. Pay particular attention to turnbutton contact operating sequence. If any adjustment is made on the contact springs, recheck all requirements applicable to the key. If springs cannot be adjusted, replace the telephone set.

**3.17** Requirements of the key include:

- (1) The pushbutton shall operate freely in either turnbutton position and return to normal after being depressed to the limit of its stroke.
- (2) When plunger is fully depressed, there shall be perceptible clearance between bottom pushbutton contacts and set baseplate.
- (3) Contacts for turnbutton operation shall not be made or broken by operation of the plunger as a pushbutton.
- (4) The pushbutton contacts shall have a minimum separation of 0.030 inch.
- (5) It shall not be possible to make or break the contacts by any side thrust against the plunger in either the operated or unoperated position.
- (6) All springs, including those which make when the key is unoperated, shall have perceptible follow (approximately 0.010 inch).
- (7) All normally closed contacts shall break before any normally open contact makes.
- (8) Normally closed turnbutton contacts shall have a break of at least 0.015 inch. Normally open contacts shall have a break of at least 0.025 inch.

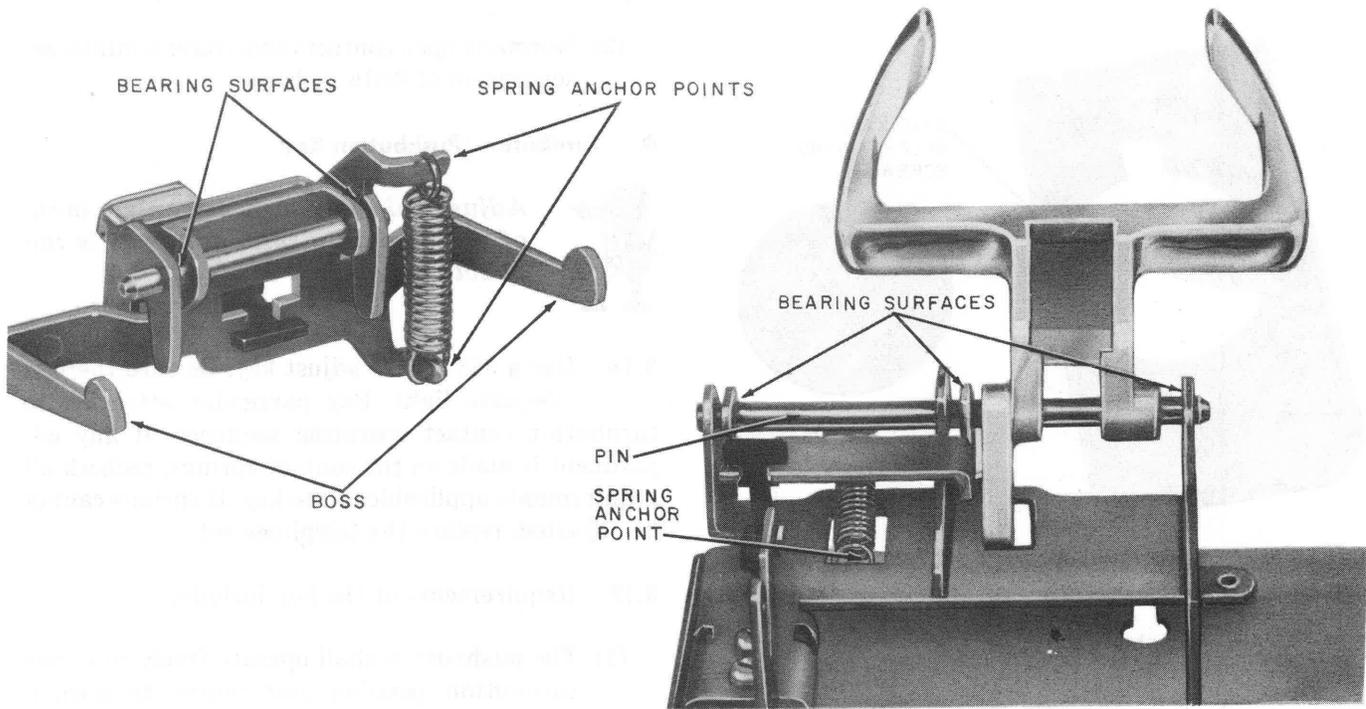
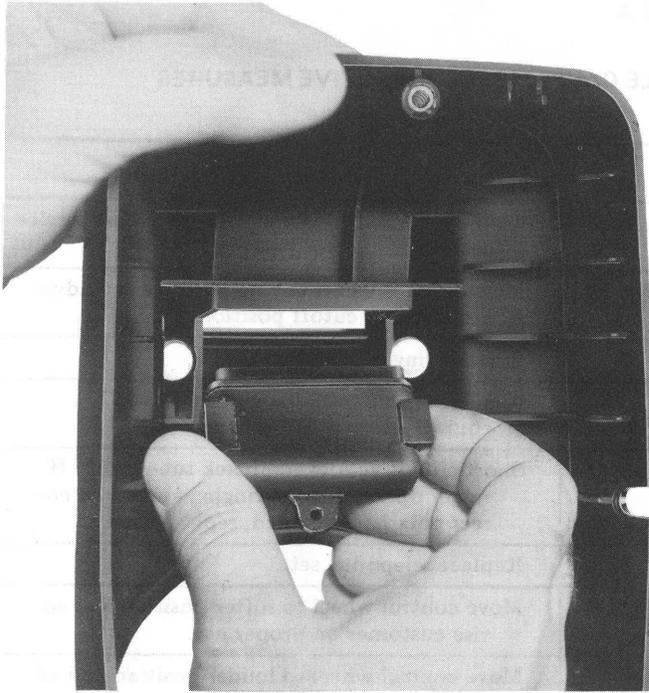


Fig. 11—Operating Bracket Switch Assemblies



**Fig. 12—Removing Hand Hold Cover**

TABLE A

## TELEPHONE SETS – TROUBLES, PROBABLE CAUSE, AND CORRECTIVE MEASURES

TROUBLE	PROBABLE CAUSE	CORRECTIVE MEASURE
Bell Does Not Ring	Ringer disconnected or incorrectly wired in set.	Connect correctly. Refer to appropriate service section.
	Volume control wheel in cutoff position.	Move control wheel to ring position and advise customer of cutoff position.
	Open winding.	Replace ringer.
	Metal particles in armature gap.	Remove with Scotch tape or approved equivalent.
	Open tube.	Short-circuit yellow and black tube leads. If ringer operates when ringing voltage of correct polarity is applied, replace tube.
	Faulty ringing capacitor.	Replace telephone set.
Bell Too Loud	Volume control wheel in wrong position.	Move control wheel to softer position and advise customer on proper use.
Bell Too Soft	Volume control wheel in wrong position.	Move control wheel to louder position and advise customer on proper use.
	Set on sound-absorbent material.	Place set on hard surface.
	Cord touching gong.	Dress cord properly.
Bell Taps While Dialing or Operating Line Switch	Incorrect wiring.	Check mounting cord, mounting cord jack or plug, and ringer connections.
	Loose gong.	Tighten screw as required.
Bell Rings or Taps When Other Party is Called: Cross Ring or False Ring	Incorrect wiring.	Check mounting cord, mounting cord jack or plug, and ringer connections.
	Biasing tension too low.	Place bias spring in high tension notch. If ringer still cross-rings, replace ringer.
Bell Keeps Ringing When Handset Is Removed	Open handset cord, handset jack or dial pulse contacts.	Replace handset cord, handset jack, or dial.
	Defective network or open set wiring.	Replace set.
	Contacts on line switch do not close.	Check switch cover and ears. Ears should fit into notches.
No Dial Tone or Set Dead	Open mounting or handset cord or jack.	Replace cord or jack.
	Defective receiver unit or varistor shorted.	Replace receiver unit.
	Dial pulse contacts open or off-normal shunt contacts closed.	Replace dial.
	Open network.	Replace telephone set.
	Switch contacts do not operate.	Check switch cover for proper installation..

TABLE A (Contd)

## TELEPHONE SETS – TROUBLES, PROBABLE CAUSE, AND CORRECTIVE MEASURES

TROUBLE	PROBABLE CAUSE	CORRECTIVE MEASURE
Cannot Break Dial Tone	Dial pulse contacts do not open.	Replace dial.
	Dial filter capacitor shorted.	Replace telephone set.
	TOUCH-TONE dial inoperative.	Replace dial.
	TOUCH-TONE dial leads reversed.	Check dial lead polarity.
	Depressing more than one button.	Instruct customer on correct dialing procedures.
Loud Clicks While Dialing	Dial off-normal shunt contacts do not close.	Replace dial.
Cannot Hear	Open or shorted receiver unit, handset cord, or handset jack.	Replace receiver unit, handset cord, or handset jack.
	Dial off-normal shunt contacts closed.	Replace dial.
	Open induction coil or network.	Replace telephone set.
	Line switch receiver contacts do not open.	Check switch cover for interference.
Cannot Be Heard	Defective transmitter, open handset cord, or handset jack.	Replace transmitter, handset cord, or handset jack.
High Sidetone	Defective sidetone balancing network.	Replace telephone set.
Dial Lamp Does Not Light	Lamp burned out.	Replace lamp.
	Transformer plug is out of receptacle.	Replace plug.
	Defective transformer.	Replace transformer.
	No power at ac receptacle.	Check with customer for possible blown fuse or for a power-control switch.
Cannot transfer between lines using 2-line pick-up key	Turnbutton/pushbutton key contacts do not close.	Check key contacts. Replace set if key contacts cannot be cleared or adjusted.
Pushbutton key will not operate signaling circuit.	Incorrect wiring.	Check wiring and connections.
	Pushbutton key contacts do not close.	Check key contacts.
	Defective signal device.	Replace bell or buzzer.
Cannot exclude extension station or cutoff external ringer	Exclusive switch contacts do not close.	Check exclusion switch. Replace set if switch contacts cannot be cleared or adjusted.
Noisy set.	Potentiometer arm not making contact at times.	Replace potentiometer or set.
Volume of entire set low (below normal set)	Open or short in amplifier.	Replace set.

TABLE A (Contd)

TELEPHONE SETS – TROUBLES, PROBABLE CAUSE, AND CORRECTIVE MEASURES

TROUBLE	PROBABLE CAUSES	CORRECTIVE MEASURE
Does not amplify.	Open potentiometer. Open or short in amplifier.	Replace potentiometer or set. Replace set.
Entire set dead.	Open semiconductor diode.	Replace semiconductor diode or set.
Maximum volume cannot be turned down.	Shorted potentiometer.	Replace potentiometer or set.