

## TELEPHONE SETS

### 540, 560, 1560, AND 2560 SERIES

### COMMON INSTALLATION AND MAINTENANCE INFORMATION

#### 1. GENERAL

1.01 This section contains common installation and maintenance information on 4- and 6-button key telephone sets.

1.02 This section is reissued to:

- Add information on 51A lamp retainer (D-180557 Kit of Parts) for early 636-type keys
- Add information on KS-20419L1 buzzer now provided from the factory in certain 565- and 2565-type telephone sets
- Add MD information, Table A

1.03 When installing or repairing any telephone set, *all* connections should be checked for tightness in order to prevent trouble reports.

#### 2. INSTALLATION

##### Keys

2.01 The 636-type key (Fig. 1) has a terminal board arrangement to accommodate matching cord terminal wafers, so that any line connected to the set can be interchanged readily to appear on any five line pickup keys. See Fig. 2 and 3 for terminal designations on the 636A and 636B, respectively.

2.02 Lamps associated with the buttons may have common or individual grounds. See sections covering connections of individual telephone sets for lamp connections.

2.03 Certain pickup buttons on 4- and 6-button sets are arranged for conversion to signaling. To convert, remove P-12A892 screw detail (Fig. 1) and make necessary wiring changes. Table A shows key and associated telephone sets with convertible buttons.

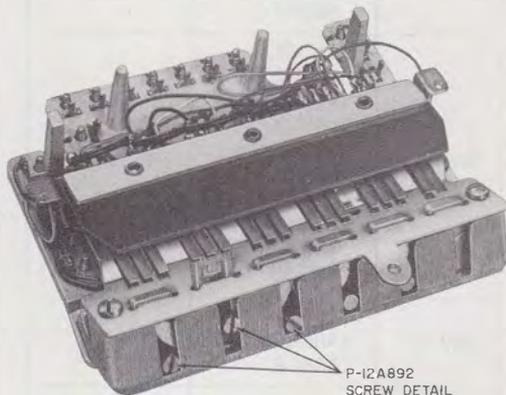


Fig. 1—636A Key, Bottom View

2.04 Unused buttons, either round or square style, may be blocked with a P-12A858 blocking ring. Insert as shown in Fig. 4.

##### ♦Lamp Retainer

2.05 In early telephone sets equipped with a 636A or B key, the 51A lamp contact springs are susceptible to losing their tension. An adjunct 840362347 lamp retainer (Fig. 5) is available and can be installed between the spring contacts of the lamps. The retainer must be ordered separately as D-180557 Kit of Parts.♦

##### Exclusion Switch Assembly

**Note:** When exclusion feature is provided the A25B connector cable must be used.

2.06 The 565- and 1565-type telephone sets manufactured prior to May 1967 provided an exclusion plunger in the housing. Other components of the exclusion assembly were part of a D-179935 Kit of Parts. Current manufactured

◆ TABLE A ◆

## PICKUP BUTTON CONVERSION

KEY	TEL. SETS	CONVERTIBLE BUTTONS
636B	2565GK 1565GK* 565GK	PPPPsPsPs
636A	2565HK 2564HL 2563HB 1565HK* 1564HK* 1564HL* 1563HB* 565HK 564HL 563HB	HPPPsPsPs
589AJ	2565LK 1565LK* 565LK	HPPPPsC
589AN	566MD	HPPPL
589Y*	564HK*	HPPPsPsPs
589L	566MB*	HPPPL
589K*	565LA/LB* 565LD*	HPPPsPsPs
589J*	565GA/GB*	PPPPsPsPs
589H	565HA/HB* 565HD* 564HA/HB* 564HD	HPPPsPsPs
588B	544BA/BB* 545BA/BB*	HPPPs

\* MD.

sets no longer include the plunger in the housing. The plunger is now included in the D-179935 Kit of Parts (ordered separately and field installed).

**2.07** Components of the D-179935 Kit of Parts are:

- P-344859 bracket
- P-340560 spring
- P-180922 screw
- P-25E118 exclusion switch
- P-14A613 exclusion plunger

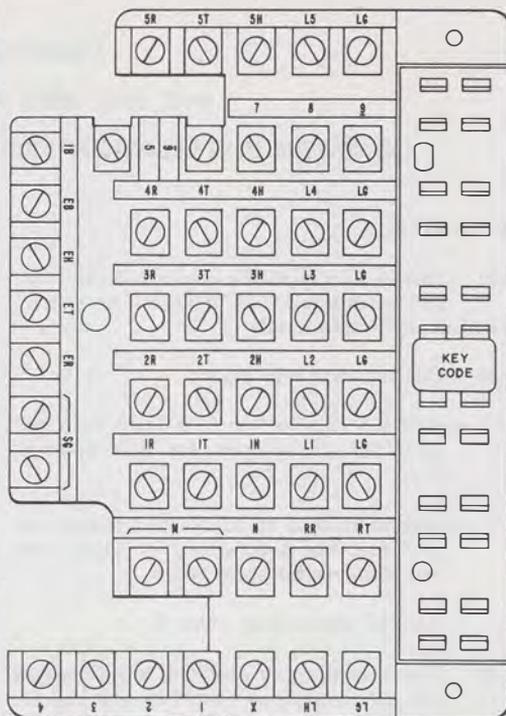


Fig. 2—Terminal Board for the 636A and 589Y Key

**2.08** Install exclusion kit as follows:

- (1) Insert the P-344859 bracket into the two T slots precut in the line switch bracket (Fig. 6).
- (2) Tighten the P-180922 screw which holds the bracket in the T slots.
- (3) Mount the exclusion switch assembly on the bracket (Fig. 6) and fasten in place using the P-340560 spring.
- (4) Remove the P-13E953 plunger from the left side of the telephone set housing and replace it with the P-14A613 exclusion plunger.



*Replace the telephone set housing before making any tests. The housing serves to orient the exclusion switch and tilts the spring pile-up so that it will not short to the bracket.*

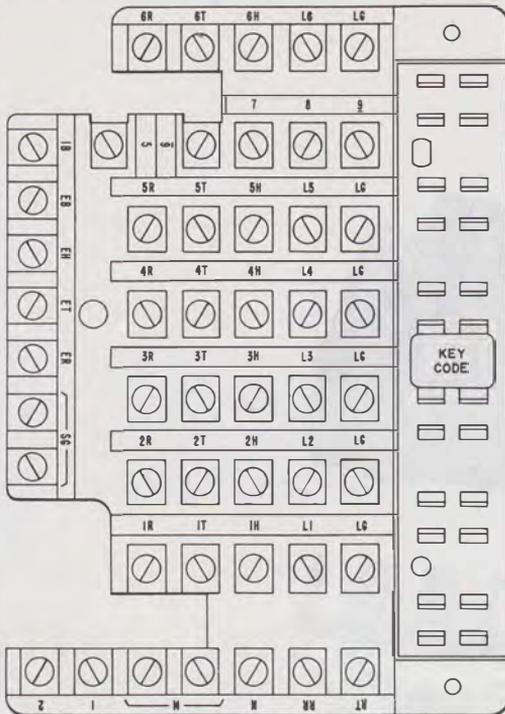


Fig. 3—Terminal Board for the 636B Key

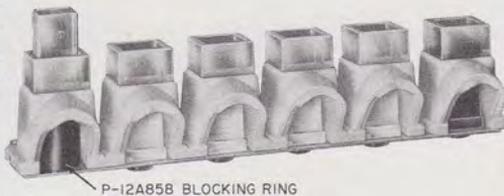


Fig. 4—P-12A85B Blocking Ring, Installed

2.09 The exclusion switch assembly must meet the following requirements:

(a) The exclusion plunger should remain in the oriented position when pulled up to the full extent of its stroke. It should hold in position

when 50 grams of force or less are applied to the center of the plunger.

(b) The plunger should release from its upper (locked) position when the handset is dropped from a distance of 1/4-inch above the plunger.

2.10 The P-25E118 exclusion switch assembly terminates in individual and wafer strip spade-tipped conductors (Fig. 7). This allows adaption of the exclusion feature to any one of the pickup buttons.

2.11 Exclusion switch connections are found in sections covering the appropriate telephone set.

### Buzzers

2.12 A KS-8109L2 or equivalent buzzer may be mounted to the bracket provided with a H1-type ringer of the set (Fig. 8).

2.13 A second buzzer can be installed on a 70-type bracket (ordered separately) mounted on top of the H1-type ringer coil in nonexclusion switch equipped sets.

2.14 A KS-20419L1 buzzer (10 volt AC only) may be mounted in any convenient location (screw must be provided). In current production 565- and 2565-type sets (except the GK), this buzzer is furnished from the factory and mounted on the left dial mounting bracket screw.

### Mounting Cords

2.15 Mounting cords on 540-type and earlier models of the 560-type telephone sets have spade-tipped leads and terminate at 44A connecting blocks.

2.16 Plug-ended mounting cords terminate at 66E3 or 66E4 connecting blocks or connect to A20B or A25B connector cables. A B20A or B25A connector cable can be used to extend mounting cords where a plug is needed on the equipment end.

2.17 The set ends of mounting cord conductors are furnished with individual spade tips or wafers for terminating on 588-, 589-, or 636-type keys (Fig. 9, 10, and 11).

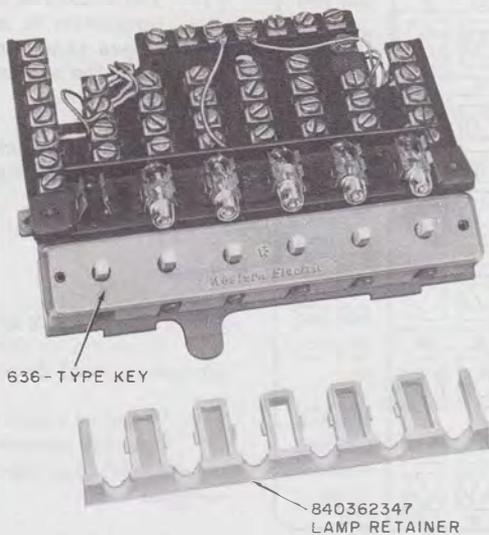
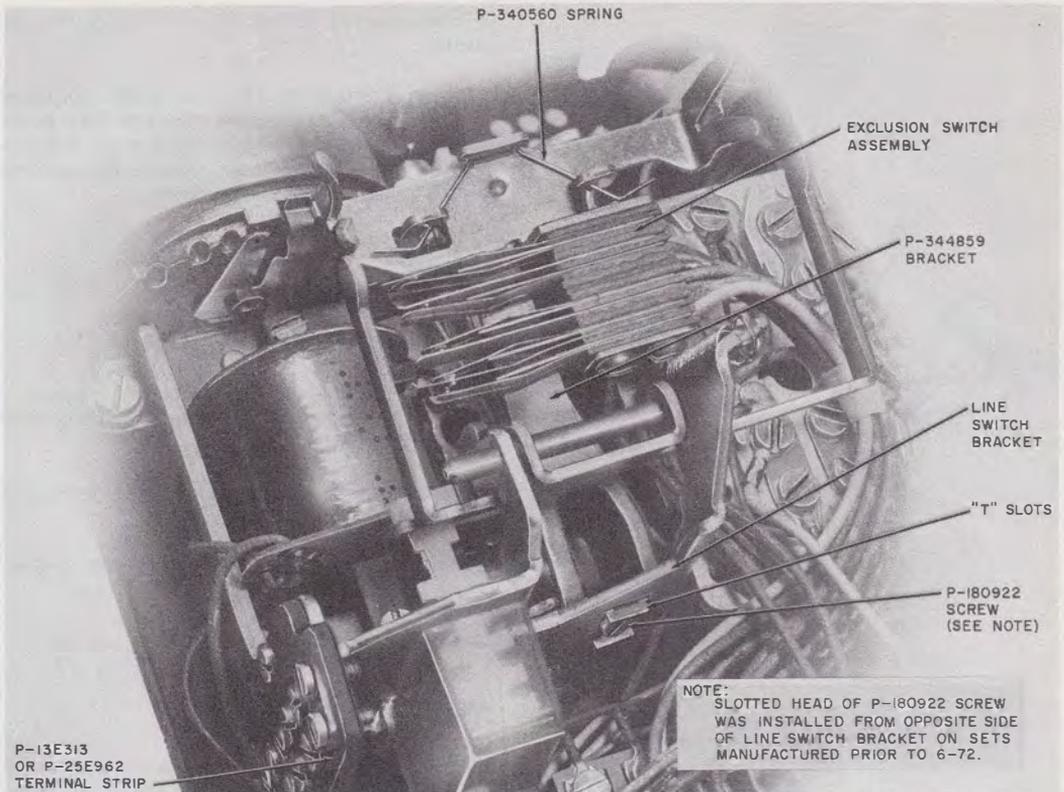


Fig. 5—Installing D-180557 Kit of Parts



**Fig. 6—D-179935 Exclusion Kit, Installed**

**2.18** Terminating methods are shown in sections covering connecting blocks.

### **Ringer**

**2.19** The ringers may be connected as individual line ringer or common audible signals. Refer to the Service section for the appropriate telephone set connections.

**2.20** Current production models are manufactured equipped with a C4B or H1B (one-coil) ringers. These ringers can also be used as maintenance replacements for the C4A and H1A ringers. When wiring changes are necessary refer to the Service section for the appropriate telephone set.

**2.21** Volume control cams project through the base of the telephone set when equipped with C4A, B, or H1-type ringers, and through the lower left side of the housing on telephone sets equipped with N1A ringers.

**2.22** Volume is adjustable to loud, soft, and off by either type volume control ringer.

**2.23** For ringer cutoff on sets with volume control cams, remove housing and move the detent spring from its slot and rotate the cam to the off position.

**2.24** For ringer cutoff on sets with volume control arms, it is not necessary to remove the housing. Rotate and exert pressure on the arm

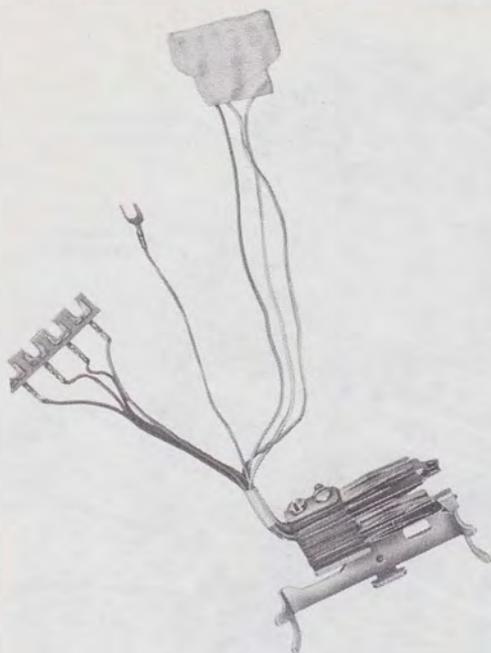


Fig. 7—P-25E118 Exclusion Switch

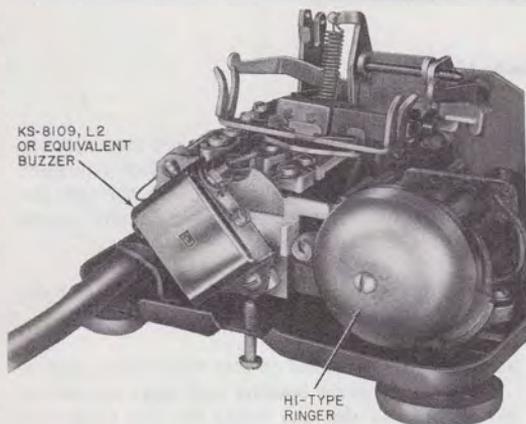


Fig. 8—Location of KS-8109 Buzzer

to overcome the detent action to reach the off position.



*Volume control lever detent action of current N-type ringers has been improved by making it more difficult to inadvertently operate the control lever to the off position.*

### Terminal Strips

2.25 The 589Y and 636A use the P-43A983 terminal strip (Fig. 2). The 636B uses the P-44E400 terminal strip (Fig. 3).

2.26 Additional terminal for connecting auxiliary equipment in 6-button sets must be ordered separately as follows:

- 589-type keys require a P-13E313 terminal strip.
- 636-type keys require a P-25E962 terminal strip.

2.27 These auxiliary terminal strips are attached to the line switch bracket as shown in Fig. 6.

### TOUCH-TONE® Dial

2.28 The 1560 and 2560 series telephone sets have 25-type 10-button and 35-type 12-button TOUCH-TONE dials, respectively.

2.29 These dials must be connected so the green dial lead is positive (+) and the orange-black lead is negative (-).

2.30 After completing installation, check the dial operation on each line using the central offices dial test circuits. Refer to the appropriate dial section in Division 501.

### Handsets

2.31 When special conditions exist the G1AR, G3AR, or G3A4 may be replaced by the following:

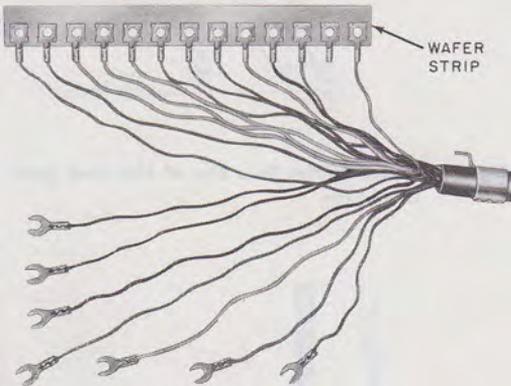
- G6AR (MD) or G6B handset for impaired hearing
- G7AR handset for weak speech

- G8A or G8B handset for noisy locations

### **Polarity Guard**

**2.32** Polarity guards should be installed in TOUCH-TONE sets only when specified by local instruction for end-to-end signaling when battery and ground reversals are encountered.

**2.33** Mount the P-90D052 guard assembly to the right dial mounting bracket as shown in Fig. 12.



**Fig. 9—Non-slotted Wafer Strip End of Mounting Cord, Early Type**

**2.34** A polarity guard can not be mounted in a 1563 or 2563 series telephone set.

### **1P2 Lamps**

**2.35** The 1P2 key telephone system requires the use of a dual envelope lamp (KS-20673) on PICTUREPHONE® lines to indicate whether an audio or video call is being processed.

**2.36** The same pair of wires is used to control the KS-20673 lamp as is used for the 51A lamp. The voltages are under the control of the PICTUREPHONE line circuit. The lamp is inserted so that the white lamp is illuminated on audio calls (−10 volt DC from the line circuit) and the red lamp on video calls (+10 volt DC from the line circuit). This test should be made by the installer before fully inserting the lamp.

### **Speakerphone**

**Note:** When speakerphone feature is provided the A25B connector cable should be used.

**2.37** In nonspeakerphone installations, it is necessary for the installer to disconnect the speakerphone leads (violet-green, green-violet, violet-brown, brown-violet, violet-slate, and slate-violet) whenever these sets are multiplied with other sets supplying speakerphone.

## **3. MAINTENANCE**

### **Components**

**3.01** Maintenance of handsets, dials, and ringers is outlined in sections covering these components.

### **Removing and Replacing Housing**

**3.02** Sets without exclusion:

- To remove housing, loosen captive screws in base of set. Lift housing up and toward front of set.
- To replace housing, guide lower front of housing over pushbuttons, align housing with base of set, and gently press housing into place. Tighten captive screws in base of set.

**3.03** Sets with exclusion:

- To remove housing, pull up exclusion plunger to its operated position, loosen captive screws in base of set, and lift housing up and toward the front of set.
- To replace housing, guide lower front portion of housing over pushbuttons, align housing with base of set, and gently press housing in place.
- Depress exclusion plunger. With slight pressure it should snap into its unoperated position.
- Operate exclusion plunger several times to insure proper operation. Tighten captive screws in base of set.

**Exclusion Switch**

**3.04** Perform no field maintenance on exclusion switch and plunger other than cleaning contacts with a 265C tool.

**3.05** Replace set or exclusion switch assembly if any of the following exclusion switch requirements cannot be met:

- Exclusion plunger should remain in the operated position when pulled up to the full extent of its stroke.
- The plunger should return to the fully depressed position when handset is replaced.
- With housing removed, normally closed contacts of the exclusion switch should have perceptible follow when operated manually.
- With housing removed, open contacts of the exclusion switch should have minimum separation of 1/64-inch; gauge by eye.

**Mounting Cords**

**3.06** Replace mounting cords of early manufacture (Fig. 9) as follows:

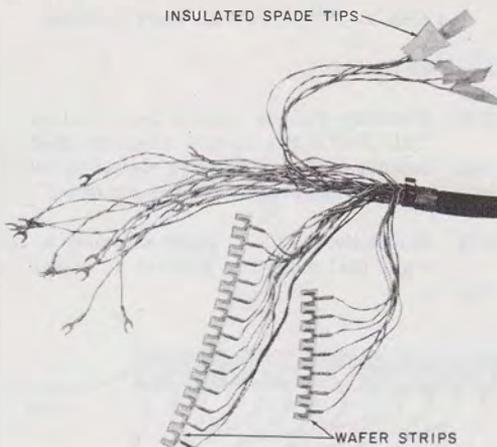
- (1) Remove dial from its mounting bracket.
- (2) Remove terminal screws.
- (3) Disconnect spade-tipped conductors and wafer sections.
- (4) Disengage cord stay hook from right leg of dial mounting bracket.

**3.07** Mounting cords of late manufacture feature a slotted wafer strip (Fig. 10) to facilitate replacement.

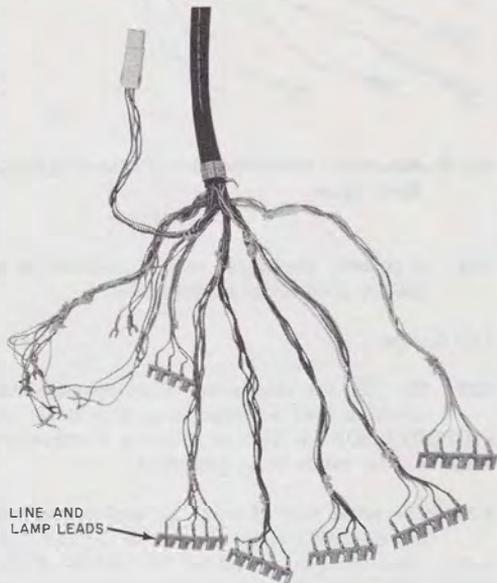
**3.08** Still later manufactured cords, designed for use with 636-type key assemblies, feature slotted wafer sections for each line appearance (Fig. 11). This allows easy arrangement of lines to pickup buttons.



**No field maintenance should be performed on the plug end of plug-ended mounting cords.**



**Fig. 10—Slotted Wafer Strip End of Mounting Cord, Later Type**



**Fig. 11—Mounting Cord Used With 636A Key**

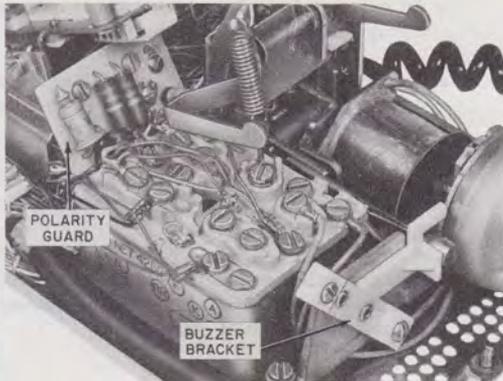


Fig. 12—P-90D052 Guard Assembly, Installed

### Lamps and Pushbuttons

#### 3.09 Replace cracked pushbuttons or collars.

Remove accumulated dirt or film from lamps, collars, and pushbuttons with a water dampened cloth. **DO NOT USE SOLVENTS OF ANY KIND.** If cleaning does not correct binding of pushbuttons, replace button and collar assembly.

#### 3.10 To replace defective lamp:

- (1) Remove dial from mounting bracket.
- (2) Carefully lift lamp from socket with KS-6320 orange stick.
- (3) Align lamp contact surfaces when placing new lamp in socket.
- (4) Remount dial.

3.11 The button and collar assembly should be carefully aligned to avoid interference with removal or replacement of housing.

### Loose Number Card Retainers

3.12 Current production TOUCH-TONE sets are equipped with P-25E803 and P-269561 card retainers, which cannot be adjusted.

3.13 If the P-25E785 (MD) number card retainer becomes so loose on the faceplate that the

number card or key designation strip slips, it can be tightened as follows:

- (1) Remove faceplate from set.
- (2) Remove card retainer from faceplate.
- (3) Bend the four arms of the retainer so that more pressure will be applied to the number card and designation strip. The bends should be made approximately 1/2-inch in from the tabs on the ends of the arms and in the opposite direction from the factory bent tabs.
- (4) Install the card retainer on the faceplate and insert the number card and key designation strip.
- (5) Install faceplate on telephone set.

**Note:** If adjusting the arms of the retainer does not result in sufficient holding power, replace the number card retainer.

### 589- and 636-Type Keys

3.14 Field maintenance of the 589- and 636-type keys (Fig. 1, 13, and 14) consist of:

- Adjusting contacts with a 363 tool.
- Cleaning contacts with a 265C tool.
- Replacing loose or missing damper studs with P-18A859 vibration damper sleeves (Fig. 14). Later 589-type keys do not require this vibration damper.

3.15 Contact follow and separation is obtained by using a 363 tool at a point adjacent to contact spring pile-up (Fig. 14). When adjusting springs:

- There should be a minimum spring clearance of 1/64-inch between contact springs and those parts of the key which do not make contact with springs (Fig. 14).
- Normally open contacts should make with perceptible follow on locking keys before key plunger assumes locked position.

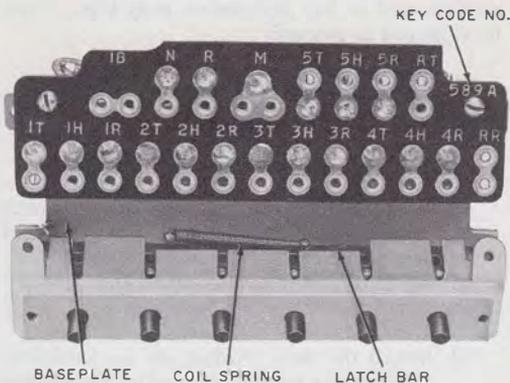


Fig. 13—589-Type Key, Top View

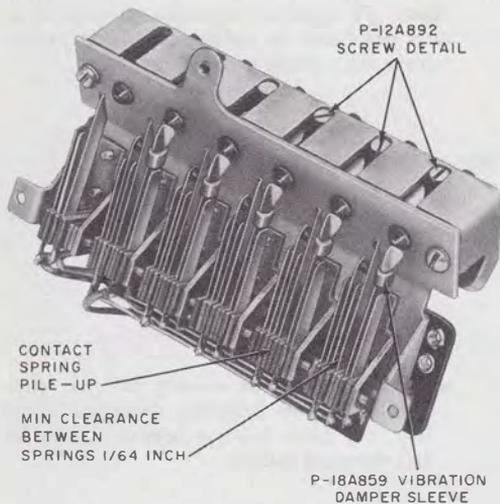


Fig. 14—589-Type Key, Bottom View

**3.16** Replace set if the following requirements cannot be met:

- When depressed, locking plunger should release any previously locked plunger on its downstroke.
- When any pushbutton plunger is released from its operated position, it should return with a snap to its nonoperated position.

- An operated key plunger should not release during downstroke of hold button.
- An operated key plunger should release from its operated position on the upstroke of the hold button.
- A turnbutton operated plunger, when rotated 90 degrees clockwise, should maintain its operated position.
- When rotated counterclockwise from its operated position, it should be self-restoring the last 30 degrees of rotation.

### 241-Type Amplifier

**3.17** Used in telephone sets with headset jacks to amplify the output of the headset transmitter. **NO FIELD MAINTENANCE SHOULD BE ATTEMPTED ON 241-TYPE AMPLIFIERS.**

**3.18** The 241A "Series II" or 241B amplifier must be used on all 563HB, 1563HB, and 2563HB sets to eliminate mechanical interference with the exclusion plunger.

**3.19** Replace a 241-type amplifier if it is suspected of being defective (as evidenced by poor or no transmission).

### TOUCH-TONE Dial

**3.20** Check line polarity if no tones are heard in the receiver when a button is depressed.



*The 25- and 35-type dial will function only when the green dial lead is positive (+) and when the orange-black lead is negative (-).*

**3.21** A hand test set connected to line terminations can be used to test for defective dials.



*Do not attempt repair of TOUCH-TONE dials in the field. Replace defective dials.*