

TELEPHONE SETS

500 AND 554 TYPES

IDENTIFICATION, INSTALLATION AND MAINTENANCE

1. GENERAL

1.01 This section is reissued to:

- Up-date information and include addendum.
- Delete reference to Touch Tone Sets covered in a separate section.
- Add Maintenance information from Section 502-510-300 which is hereby cancelled.

1.02 Selection is covered in the following sections: Station Sets, Common Battery, Selection for General Use and Station Sets, Selection for Specific Use.

1.03 Selection of station apparatus for 1A and 1A1 key telephone systems is shown in the section covering connections for the particular telephone set.

1.04 Description of telephone set components, (i.e., handsets, ringers, networks, and equalizers) may be found in sections pertaining to these items.

1.05 Code numbers, such as 500CR/DR, cover both manual and dial versions of each type of telephone set. This permits converting from dial to manual or manual to dial without changing the code marking. The letter R has been added to indicate that the sets are equipped with spring handset cords. (The R marking has been discontinued on sets of later manufacture).

2. IDENTIFICATION

2.01 The 500- and 554- type telephone sets are for use in common battery areas, manual or dial.

2.02 All parts of the set enclosed by the housing, including the network, line switch (switch-hook), dial, ringer, tube, and cords are mounted on the metal base. The plungers are part of the housing assembly. The housing is fastened to the base with two special round head captive machine screws with lockwashers and can be replaced easily. The network and line switch are riveted to the baseplate and are not to be replaced in the field.

2.03 The 425B Network has been replaced by later models which are identical except that they have additional screw terminals. The later type networks provide for equalization.



Fig. 1 — 500DR Set, Exterior

SECTION 502-510-100CA

2.04 The card-operated line switch (switch-hook) uses bifurcated springs which are protected by a plastic cover. Since G-type hand sets are too light to operate the switch directly, the necessary force is furnished by a coil spring which is opposed by the contact springs. The handset weight, through lever arms, is required to overcome the force differential between the coil spring and the contact springs.

2.05 All 500-type telephones are furnished with a 7-type dial. Where required the dial may be replaced, in the field, by an appropriate coloured 95B apparatus blank.

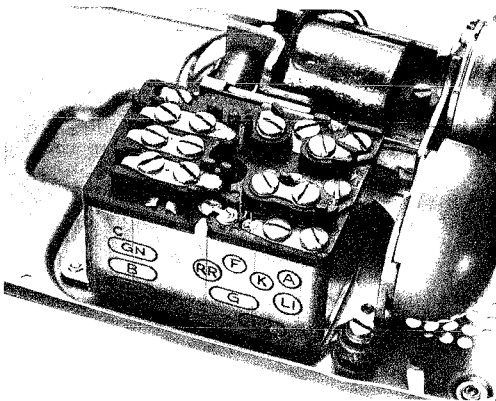


Fig. 2 — 425E Network

2.06 All 500- and 554- type sets are manufactured with C4A ringers. The volume of these ringers may be adjusted to one of four levels. (See Fig. 3). A modification can be made to provide bell cutoff when authorized by a Service Order.

2.07 Provision has been made to mount either a 426A or 425A electron tube to care for conditions of excessive power induction.

2.08 A code and an assembly date are stamped on the base of each set as shown in Fig. 3.

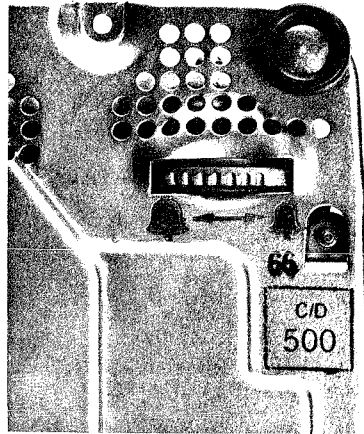


Fig. 3 — Base of 500-Type Set

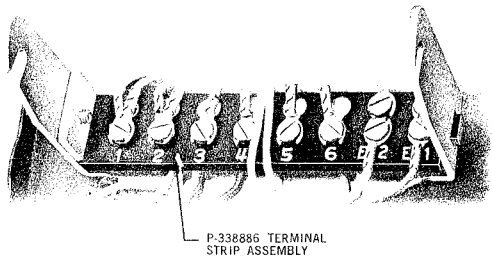


Fig. 4 — Terminal Strip

2.09 Design Features.

- (a) The 500 DR is the basic single line set.
- (b) The 500MR telephone set is equipped with a 4-conductor mounting cord and terminal strip (Fig. 4). It is used when a single line station installation is required with a 1A1 key telephone system. The set may also be used at installations which require the ringing circuit

to be brought separately through the mounting cord. The 500MR telephone set is supplied wired for use with the 1A1 key telephone system. Wiring options provide for the ringing circuit to be brought separately through the mounting cord.

(c) The 500FR and 500FRN telephone sets are equipped with a plunger switch and are wired to avoid interference with the dialing or talking of another customer on a divided code ringing line. (See Fig. 5). When the handset is lifted to make a call, only a low-loss receiver circuit is bridged across the line. When it is found that the line is not busy or when an incoming call is to be answered, pulling up the left plunger operates the plunger switch and closes through the talking and/or dialing circuits. Replacing the handset restores the telephone set to normal. Instructions are in English on the 500FR telephone set and in French and English on the 500FRN telephone set.

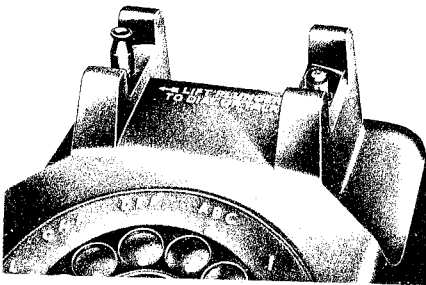


Fig. 5 — 500FR Set

(d) The 500UR sets are equipped with a 584C key and resistor to provide a night light feature with the handset resting in the cradle. When the key is turned to the ON position, the lamp is illuminated at reduced brilliance through the addition of a series resistor in the dial light circuit. When the handset is lifted from the cradle, the switchhook contacts shunt the night light switch and resistor, and full brilliance is obtained from the lamp. With the 584C key in the normal position, illumination is provided only when the handset is removed from the cradle. (See Fig. 6). A 6- to 8-volt ac power

supply must be provided by means of a transformer to light the dial lamp.

(e) The 500WR/YR telephone sets are equipped with a lamp to provide a message-waiting feature (see Fig. 7). They are arranged to receive and hold a visual signal under control of an attendant at a PBX. General application for this feature is in a hotel or motel; however, it can be provided for any station under the control of an attendant. The message-waiting lamp cap is red or amber with a metal insert which provides tongs for engagement with retaining rings in the housing. The lamp is a GE NE 51 which protrudes through the housing into the cap. The lamp cap assembly is LP-11E-100 or #26XP281193 (amber). The words MESSAGE WAITING PHONE are stamped on the bottom of all 500W/YR telephone sets.

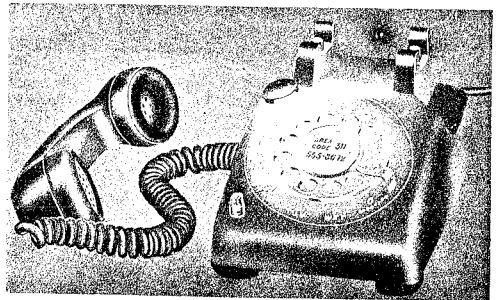


Fig. 6 — 500UR Set

Both 500WR (without dial) and 500YR (with dial) telephone sets, are available on order. However, when advantageous, these sets may be converted to include a dial, and vice versa, in the field.

(f) The 554-type telephone set is designed for wall mounting. With the exception of the switchhook, components are interchangeable with components of 500-type telephone sets. (See Figs. 9 and 10). The housing of the 554-type telephone set is designed as a handset hanger (see Fig. 8).

SECTION 502-510-100CA

The switchhook on coloured 554-type telephone sets is chrome plated (P-12E433) and the dial is a 7C that matches the set. Black 554-type telephone sets of current manufacture have a (P-96B637) black plastic switchhook and a black 7C dial. The black plastic switchhook and

black 7C dial are also provided on certain repaired sets. The (P-96B637) switchhook and black 7C dial have replaced the chrome switchhook and 7D dial that were provided on black 554-type sets.



Fig. 7 — 500YR Set

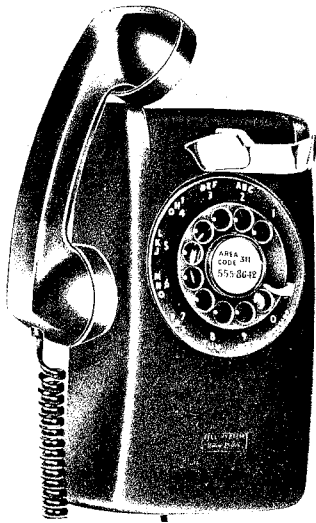


Fig. 8 — 554-Type Set, Housing Handset Rest

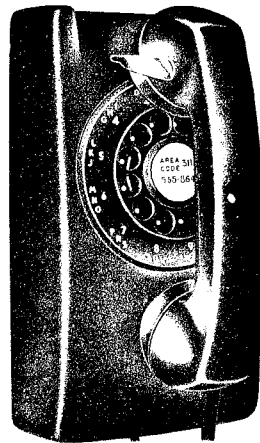
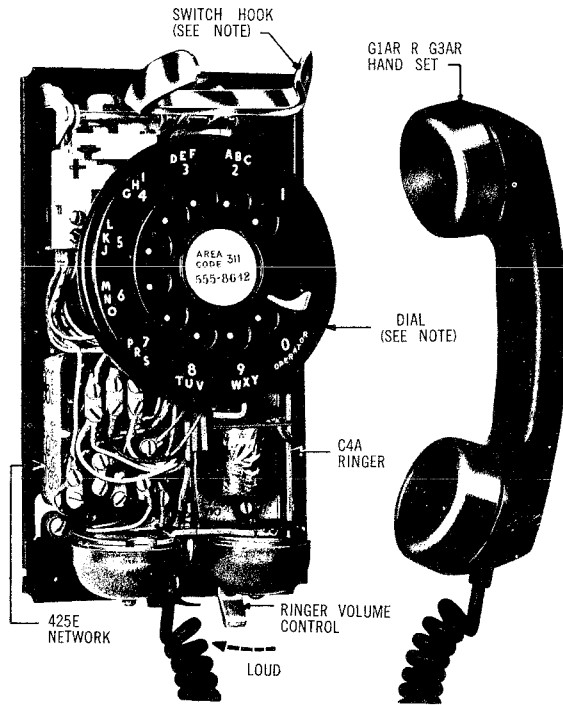


Fig. 9 — 554BR Exterior



NOTE: THE TYPE OF SWITCHHOOK AND DIAL ARE COVERED IN PARA. 2.09 (f).

Fig. 10 — 554BR Set, Interior

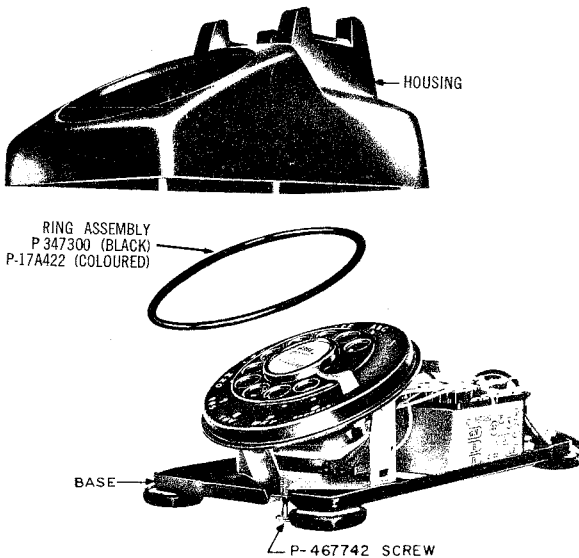


Fig. 11 — 500-Type Set, Housing Assembly

3. INSTALLATION

(a) Housings:

(1) The housing on all 500-type desk sets is secured to the base by two captive mounting screws with lockwashers under the head (see Fig. 11).

(2) To remove housing on wall-type telephone sets, push inward on tab of snap fastener located in the cord slot and, while the tab is depressed, lift the lower part of the housing outward and upward, releasing fastener catch and disengaging latch opening assembly (see Fig. 12 and 13). To replace, slip housing over switchhook and dial, engage the latch spring assembly, then press firmly on lower part of housing to engage snap fastener and catch (see Fig. 14).

(b) Mounting Wall Sets:

(1) Several holes are provided in the baseplate for more flexibility in mounting to minimize backboard use. The telephone set may be mounted directly over a conduit outlet box. (See Fig. 15).

(2) Early production sets have a baseplate which does not provide the proper hole arrangement for fastening directly to conduit outlet boxes as shown in Fig. 15 therefore when required, drill two holes on the baseplate as shown in Fig. 16, using a No. 17 drill point of an Automatic B Push-Drill. An alternate method is to mount the set with wall screw anchors of proper size using the mounting holes at the top and bottom of the baseplate.

(3) Refer to appropriate Section for information on fasteners suitable for mounting wall-type sets directly to wall surfaces.

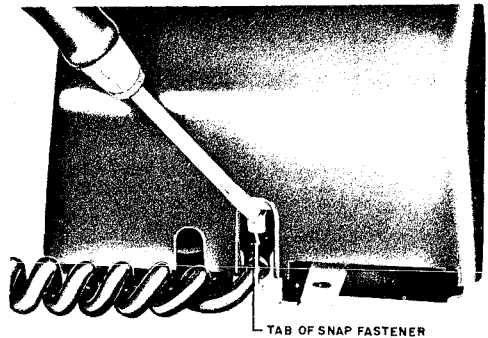


Fig. 12 — Wall-Type Telephone Set, Method of Removing Housing

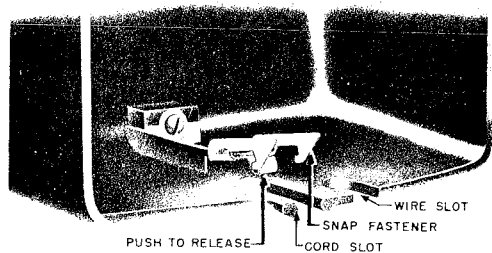


Fig. 13 — 554-Type Set, Cover Interior

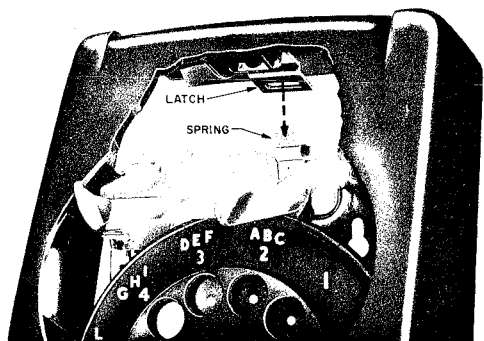


Fig. 14 — Wall-Type Telephone Set, Method of Replacing Housing

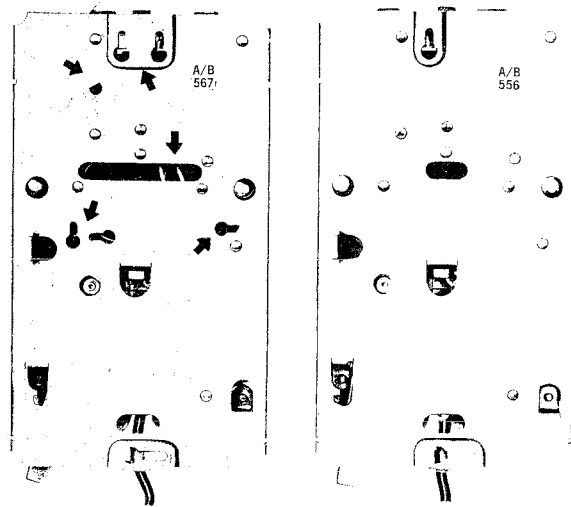


Fig. 15 — Present and Early Production Baseplates

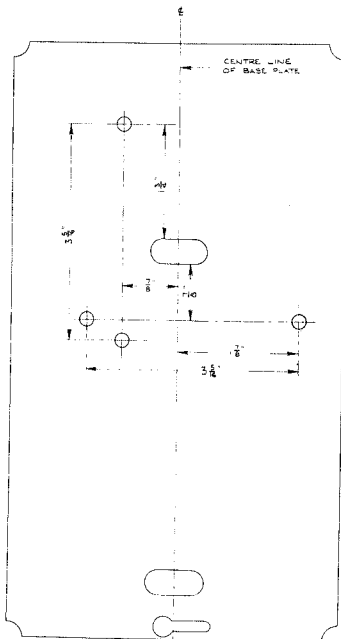


Fig. 16 — Early Production 554 Tel. Set Baseplate Mounting Holes Drilling Location



Fig. 17 — 500-Type Housing with 95B Apparatus Blank Exterior

(c) *Mounting Cords:*

Spade tips or skinned wires should contact only the terminal to which the connection is made. Electrical contact with the metal tab of the network housing may cause the exposed dial finger stop or handset hook on wall sets to become energized with ringing voltage or dc line voltage.

- Dress cord leads to avoid interference with moving parts and ringer gongs.

Three conductor mounting cords may be given a twist (after terminating) before anchoring, to prevent slack from touching ringer gongs.

(d) *Apparatus Blanks:* Figs. 17 and 18 show

front and rear views of the 95B apparatus blank assembly in a 500-type desk set. Figs. 19 and 20, show assembly of the 95B apparatus blank in a 554-type set. Note that bracket position is inverted when used on 554-type sets.

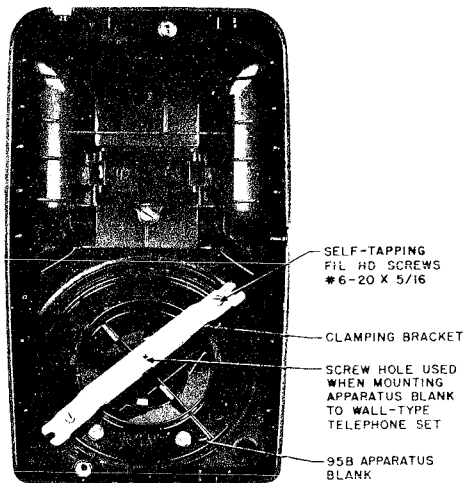


Fig. 18 — 500-Type Housing with 95B Apparatus Blank, Interior

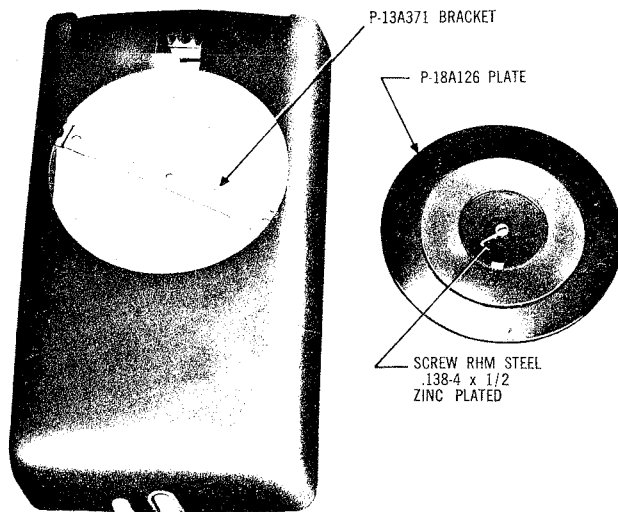


Fig. 19 — 554-Type Housing with 95B Apparatus Blank, Exterior

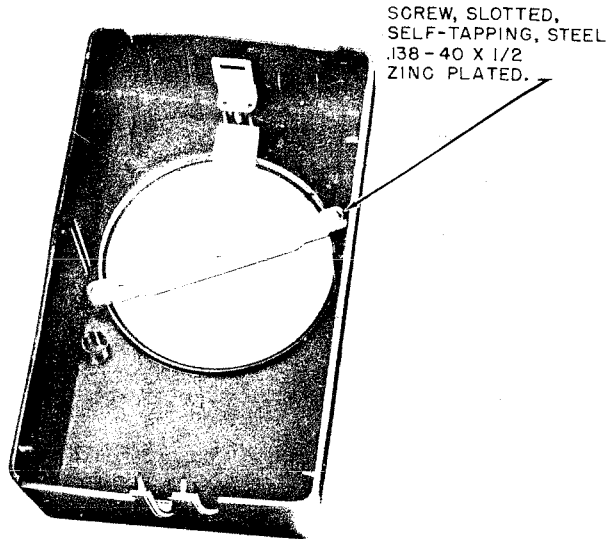


Fig. 20 — 554-Type Housing, Interior

(e) *Ringer:*

(1) Two washer head mounting screws placed through rubber grommets hold the ringer on base of set (see Fig. 21).

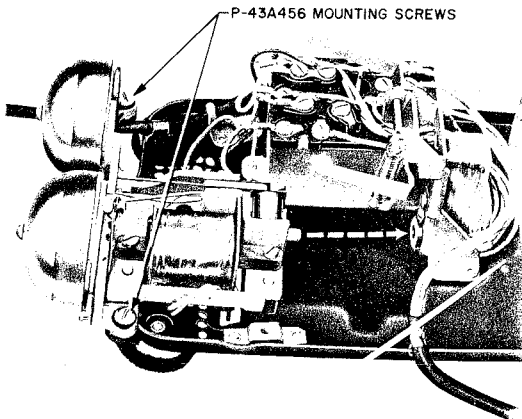


Fig. 21 — 500-Type Set, Ringer Assembly

(2) The ringer volume-control lever in the 554-type telephone sets is riveted at one end to the base of the set (see Fig. 22). In the 500-type telephone set, the ringer volume-control assembly is part of the ringer.

(3) Cord leads should be dressed to avoid interference with moving parts and ringer gongs. On the 500-type set, anchor the mounting cord beneath the stay hook in the right rear corner of the base to prevent interference with the ringer gong.

(f) *Handset:* All 500 and 1500 series telephone sets are equipped with G-type handsets. The handsets may be replaced by a handset containing an amplifier such as the G6AR handset for customers with impaired hearing or the G7AR for customers with impaired speech. A G8Q1A handset can be used in noisy locations.

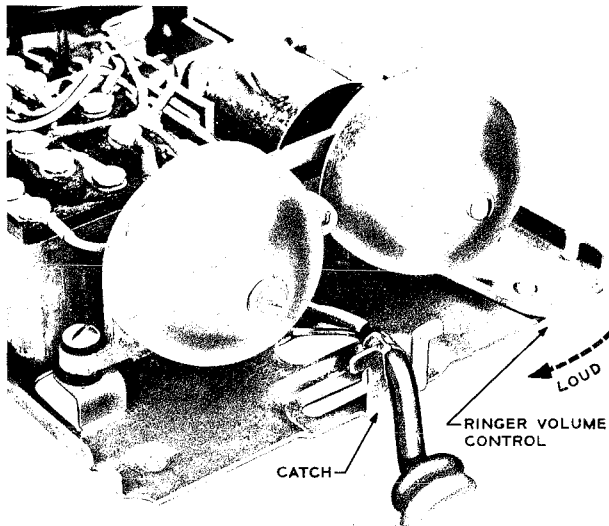


Fig. 22 — 554-Type Set, Ringer Volume-Control Lever

4. MAINTENANCE

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

4.02 A KS-8035 Friction Pad is available for use on telephone sets equipped with leather feet. The pad has adhesive on one side which is covered by a removable fabric.

4.03 If it is necessary to instruct a customer in a method of cleaning his telephone set, suggest wiping with a cloth slightly dampened in a common household detergent. The set should then be immediately dried by wiping with a clean cloth. The customer should be warned not to allow excessive moisture to penetrate the dial, receiver, transmitter and switch-hook areas. Under no circumstances should any other type of cleaning agent be used to clean a telephone set. Many wax and cleaning agents contain silicone oil which will damage plastic housing and set components.

4.04 Check line and ground terminations before determining trouble causes from Table A.

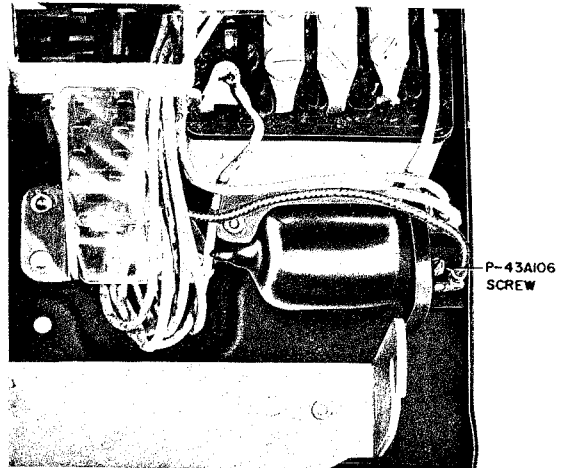


Fig. 23 — 500-Type Set Showing Tube Mounting

TABLE A
TROUBLES, PROBABLE CAUSES, AND CORRECTIVE MEASURES

Trouble	Probable Cause	Corrective Measure
Bell Does Not Ring	Ringer disconnected or incorrectly wired in set.	Connect correctly.
	Volume control wheel in cut-off position.	Move control wheel to ring 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.
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 Switch	Incorrect wiring.	Check mounting cord and ringer connections.
	Loose gong.	Tighten screw as required.
Bell Rings When Other Party Is Called : Cross Ring or False Ring	Incorrect wiring.	Check mounting cord 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 or dial pulse contacts.	Replace handset cord or dial.
	Defective network or open set wiring.	Replace set.
	Line contacts on switch do not close.	Check switch cover and ears. Ears should fit into notches.
No Dial Tone or Set Dead	Open mounting cord or handset cord.	Replace cord.
	Defective receiver unit or varistor shorted.	Replace receiver unit.
	Dial pulse contacts open or off-normal shunt contacts closed.	Replace dial.

(Continued on
Page 12)

TABLE A (Cont)
TROUBLES, PROBABLE CAUSES, AND CORRECTIVE MEASURES

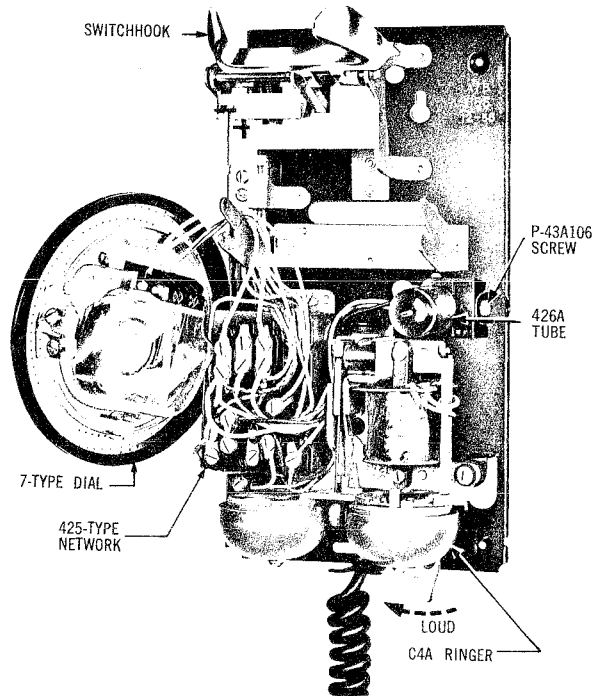
Trouble	Probable Cause	Corrective Measure
No Dial Tone or Set Dead	Open induction coil.	Replace telephone set.
	Switch contacts do not operate.	Check switch cover for proper installation.
Cannot Break Dial Tone	Dial pulse contacts do not open.	Replace dial.
	Dial filter capacitor shorted.	Replace telephone set.
Loud Clicks While Dialing	Dial off-normal shunt contacts do not close.	Replace dial.
Cannot Hear	Open or shorted receiver unit or handset cord.	Replace receiver unit or handset cord.
	Dial off-normal shunt contacts closed.	Replace dial.
	Open induction coil or network.	Replace telephone set.
	Switch receiver contacts do not open.	Check switch cover for interference.
Cannot Be Heard	Defective transmitter or open handset cord.	Replace transmitter or handset cord.
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.

4.05 Electrical Maintenance**(a) Tube Assembly**

- 425A, 4-element tube may be substituted for 426A, to care for cases of excessive power induction. See section on inductive noise.
- Tube assembly is held to base of set with single screw (Fig. 23).
- Wall type telephone mounting is shown in Fig. 24.

4.06 Mechanical Maintenance:**(a) Plungers**

- Should move freely throughout entire travel without binding or squeaking.
- Accessible when handhold cover is removed (Fig. 25).
- Clean with KS-2423 cloth moistened with KS-7860 petroleum spirits and lubricate with a No. 2 or softer graphite pencil.



**Fig. 24 — Wall Type Telephone
Showing Tube Mounting**

- Replace housing if plungers do not move freely after cleaning and lubricating.

with a No. 2 or softer graphite pencil (Fig. 26 and 27).

(b) Plunger Switch Assembly

- If left-hand plunger fails to lock when pulled upward to extreme position, replace set.
- No field maintenance shall be performed other than cleaning.

(c) Operating Bracket Switch Assembly

- Should function throughout entire travel without binding or squeaking.
- Clean bosses on operating bracket arms, spring anchor points, operating bracket, and shaft bearing points with KS-2423 cloth moistened in KS-7860 petroleum spirits and lubricate bearing surfaces

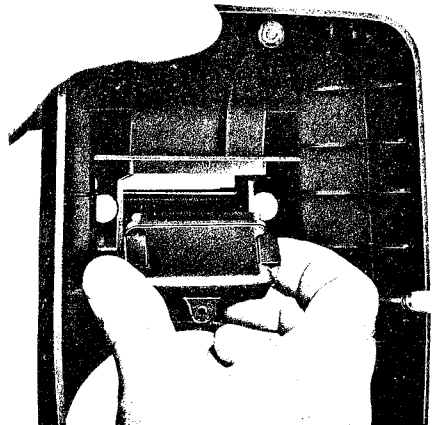


Fig. 25 — Handhole Cover

(d) *Switch Contacts*

- (1) Line Switch: Remove line switch cover by depressing slides between thumb and index finger and tilting cover up and away from mounting. Clean contacts with 265C tool.
- (2) 584C Key (500U and 501U telephone sets only) — clean contacts of key with 265C tool.

(e) *Switchhook Assembly*

- (1) Do not perform any field maintenance other than replacing cover and cleaning contacts, except as noted in 4 to 6 below.
- (2) Remove switchhook cover by depressing sides between thumb and index finger and tilting cover up and away from mounting (Fig. 31).
- (3) Replace set if any other trouble is encountered in switchhook assembly, except as noted in 4 to 6 below.

Hookswitch Operating Card

- (4) Some trouble has been experienced with breakage of the operating card on wall mounted telephones and to a lesser extent on desk telephones. A new card P-339685 has been developed to reduce this trouble. The new card, which is easily identified because of its white colour, is now used on all 500-type telephones of new manufacture.
- (5) When breakage occurs on wall mounted telephones or desk telephones with multi-conductor cords it will generally be found more economical to change the broken operating card than to replace the telephone. No attempt shall be made to replace stationary cards in the field.
- (6) A visual inspection, before removal of the broken card, will reveal the placement of the springs in the card fingers. Exercise care when removing broken card and placing new card. Do not bend or deform the contact springs. Examine the

assembly for correct contact sequence before replacing switch cover. If contact springs are damaged or stationary card is broken replace telephone.

- (f) *Dial Light*: to remove, turn lamp cap and lamp counterclockwise (Fig. 28) and lift out.

500NN/PN

- When operator rings, with the special cord, lamp lights.

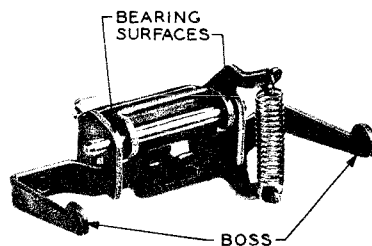


Fig. 26 — Operating Bracket Switch Assembly
500 Type Telephone Sets

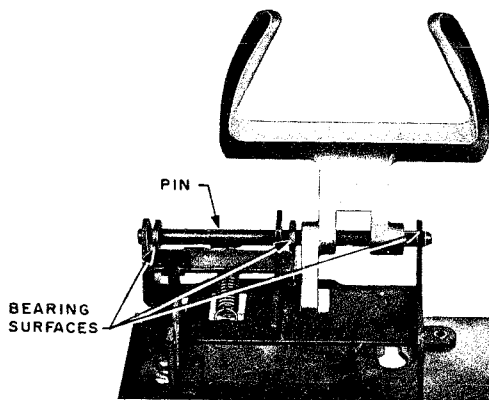


Fig. 27 — Handset Hook Assembly
554 Type Telephone Sets

- These telephones require an 1820A Lamp and a 26-XP28-1196 Lamp Cap Assembly.

500U

- When handset is lifted the dial lamp should light. With the 584C key (see Fig. 29) turned lamp should light. If not see Table A and check line switch or key contacts.

Lamp Assembly Shown in Fig. 28.

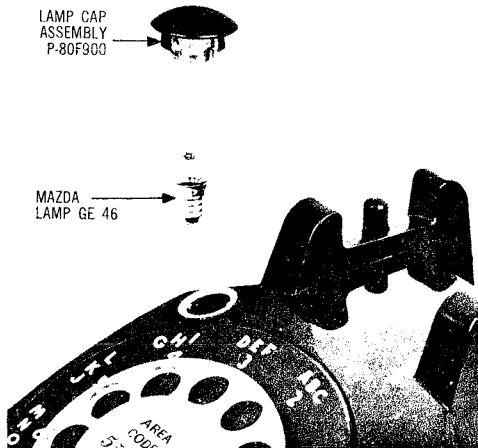


Fig. 28 — Lamp Assembly, 500UR Set

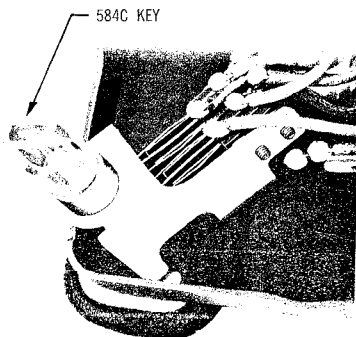


Fig. 29 — 584C Key

- (g) **Dial Assembly** (Fig. 30): The dial is attached to the dial mounting bracket with two or three screws. The current-type dial bracket assembly does not have a front mounting attachment.

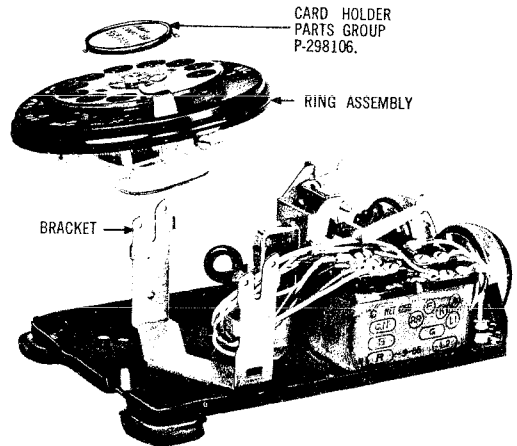


Fig. 30 — Dial Assembly

- (h) **Other Components:** For maintenance of handsets, dials, and ringers refer to the sections covering these components.

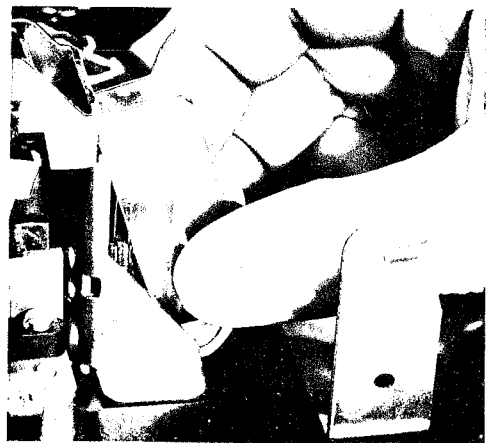


Fig. 31 — Removing Switch-Cover Assembly