

BELLS, SIGNALS, AND CHIMES
SOLENOID TYPE
PIECE-PART DATA AND REPLACEMENT PROCEDURES

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- 1. GENERAL**
- 1.01** This section covers piece-part data and replacement procedures for maintenance of the KS-5595, KS-6918, KS-6919, KS-6920, KS-7228, KS-7752, and KS-20375 solenoid type bells, KS-5594 and KS-8229 solenoid type signals, and the KS-22001 solenoid type chimes.
- 1.02** This section is reissued for the following reasons:
- To rate the KS-5594, L1, L2, L3, L4, L5, L9, and L10 signals Mfr Disc.
 - To rate the KS-5595, L1, L2, L3, and L4 bells Mfr Disc.
 - To rate the KS-6921 bells Mfr Disc.
 - To rate the KS-8229, L13, L14, L15, and L23 signals Mfr Disc.
 - To add coverage on the KS-20375 bells
 - To add coverage on the KS-22001, L1 through L7 chimes
 - To include changes from Addendum, Issue 1
 - To update the piece-part numbers on all the above bells, signals, and chimes.

Since this is a general revision, no revision arrows have been used to denote significant changes. The Equipment Test List is not affected.

NOTICE
Not for use or disclosure outside the
Bell System except under written agreement

SECTION 028-102-801

1.03 Part 3 of this section covers the piece-part numbers and the corresponding names of the parts that are practicable to replace in the field in the maintenance of the above apparatus. No attempt should be made to replace parts not designated. Part 3 also contains explanatory figures showing the different parts. This information is called Piece-Part Data.

1.04 Part 4 of this section covers the approved procedures for the replacement of the parts covered in Part 3. This information is called Replacement Procedures.

2. APPARATUS

2.01 List of Tools and Gauges:

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
236	9/16-inch Open Single-end Offset Wrench
372	5/16-inch Open Single-end Offset Wrench
417A	1/4- and 3/8-inch Open Double-end Flat Wrench
KS-6320	Orange Stick
KS-8097	5/8- and 7/16-inch 12-point Box Wrench
AT-7860	Long-nose Pliers
AT-7825	3-inch C Screwdriver
AT-7825	4-inch E Screwdriver
GAUGES	
R-8550	6-inch Steel Scale

3. PIECE-PART DATA

3.01 The figures included in this part show the replaceable parts in their proper relation to the other parts of the apparatus.

3.02 When ordering parts for replacement purposes, give the part number, the name of the part, and the KS number. For example, PA-30910 Vibrator Assembly for the KS-5595, L10, bell. Do not refer to the BSP number or to any information shown in parentheses following the piece-part number.

3.03 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 parts names in general use in the field if these names differ from those assigned by the manufacturer.

3.04 Table A gives the KS-number of the old chimes presently in use and the equivalent new chime. Replacement parts are available for the old chimes and should be installed for minor repairs. However, if a major repair is required, it is recommended the chime be replaced by the equivalent new chime.

TABLE A

CHIME REPLACEMENT CHART

NEW CHIME		OLD CHIME
KS-22001, L1	—	KS-5594, L5
KS-22001, L2	—	KS-8229, L23
KS-22001, L3	—	KS-5594, L9
KS-22001, L4	—	KS-5594, L10
KS-22001, L5	—	KS-8229, L13
KS-22001, L6	—	KS-8229, L14
KS-22001, L7	—	KS-8229, L15

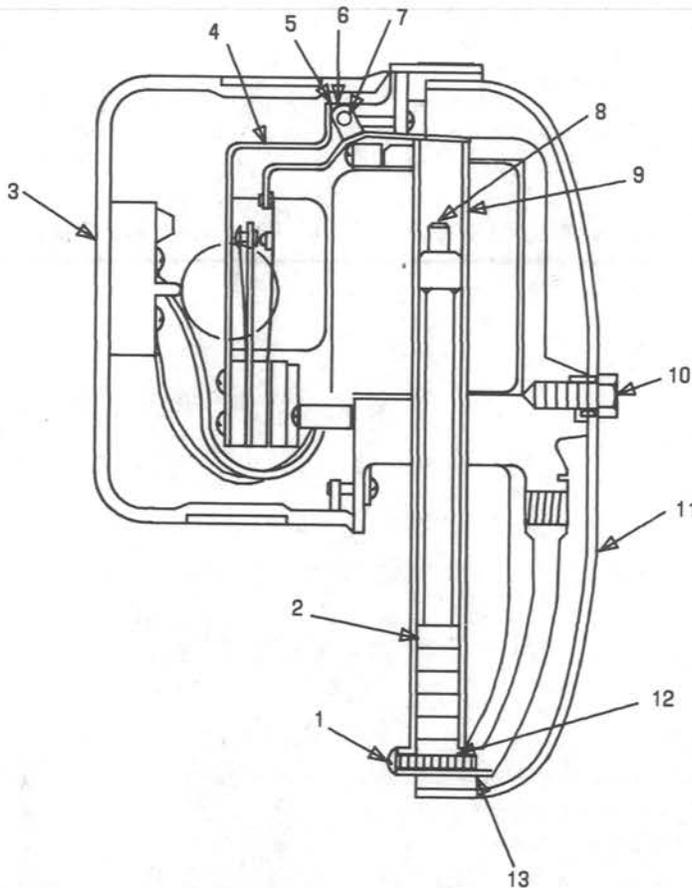


Fig. 1—KS-5595, L5 Through L10, KS-6918, KS-6919, KS-6920, KS-7228 and KS-7752 Bells

LEGEND FOR FIG. 1

- | | |
|--|---|
| <p>1—P-11004-7-12 Screw (KS-5595, L5, L6, L7, and L8)</p> <p>P-11339 Screw (KS-7228 and KS-7752)</p> <p>P-11032-4 Roll Pin (KS-5595, L9, L10, KS-6918, KS-6919, and KS-6920)</p> <p>2—P-30433 Felt Washer (KS-5595, L5, L6, L7, and L8)</p> <p>P-42537 Felt Washer (KS-5595, L9, L10, KS-6919, KS-6920, KS-7228, and KS-7752)</p> <p>P-30622 Plunger Cushion (KS-6918)</p> | <p>3—P-30555-1 Back Box (KS-5595, L5, L6, L7, L8, L9, and L10)</p> <p>P-30405 Back Box (KS-6918, KS-6919, KS-6920, KS-7228, and KS-7752)</p> <p>4—PA-30910 Vibrator Assembly (KS-5595, L7, L8, L9, and L10)</p> <p>PA-30911 Vibrator Assembly (KS-7228 and KS-7752)</p> <p>5—P-50518 Clip (KS-5595, L7, L8, L9, L10, KS-7228, and KS-7752)</p> <p>6—P-30414 Trigger Assembly (KS-5595, L7 and L8)</p> <p>P-30673 Trigger Assembly (KS-5595, L9, L10, KS-7228, and KS-7752)</p> <p>7—P-50517 Pin (KS-5595, L7, L8, L9, and L10, KS-7228, and KS-7752)</p> <p>8—PA-30409 Plunger (KS-5595, L5 and L6)</p> <p>PA-30526 Plunger (KS-5595, L7 and L8)</p> <p>PA-30619 Plunger (KS-5595, L9, L10, KS-7228, and KS-7752)</p> <p>PA-30665 Plunger (KS-6918)</p> <p>PA-30694 Plunger (KS-6919 and KS-6920)</p> <p>9—P-30649 Plunger Tube (KS-5595, L9, L10, KS-6918, KS-6919, KS-6920, KS-7228, and KS-7752)</p> <p>P-35021 Plunger Tube (KS-5595, L5, L6, L7 and L8)</p> <p>10—P-30454 Cap Screw (KS-5595, L5, L6, L7, and L8)</p> <p>P-30654 Cap Screw (KS-5595, L9, L10, KS-6918, KS-6919, KS-7228, and KS-7752)</p> <p>P-30854 Cap Screw (KS-6920)</p> |
|--|---|

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11—P-30508 Bell Shell (Gong) (KS-5595, L5, L6, L7, and L8)

P-30634 Bell Shell (Gong) (KS-5595, L9, L10, KS-6918, KS-6919, KS-7228, and KS-7752)

P-30850 Bell Shell (Gong) (KS-6920)

12—P-30545 Plunger Cushion (KS-5595, L7 and L8)

P-30662 Plunger Cushion (KS-5595, L9, L10, KS-7228, and KS-7752)

P-30693 Plunger Cushion (KS-6918, KS-6919, and KS-6920)

13—P-30425-1 Body Casting (Solenoid Casting) (KS-5595, L5, L6, L7 and L8)

P-30645-1 Body Casting (Solenoid Casting) (KS-5595, L9, L10, KS-6918, KS-6919, KS-6920, KS-7228, and KS-7752)

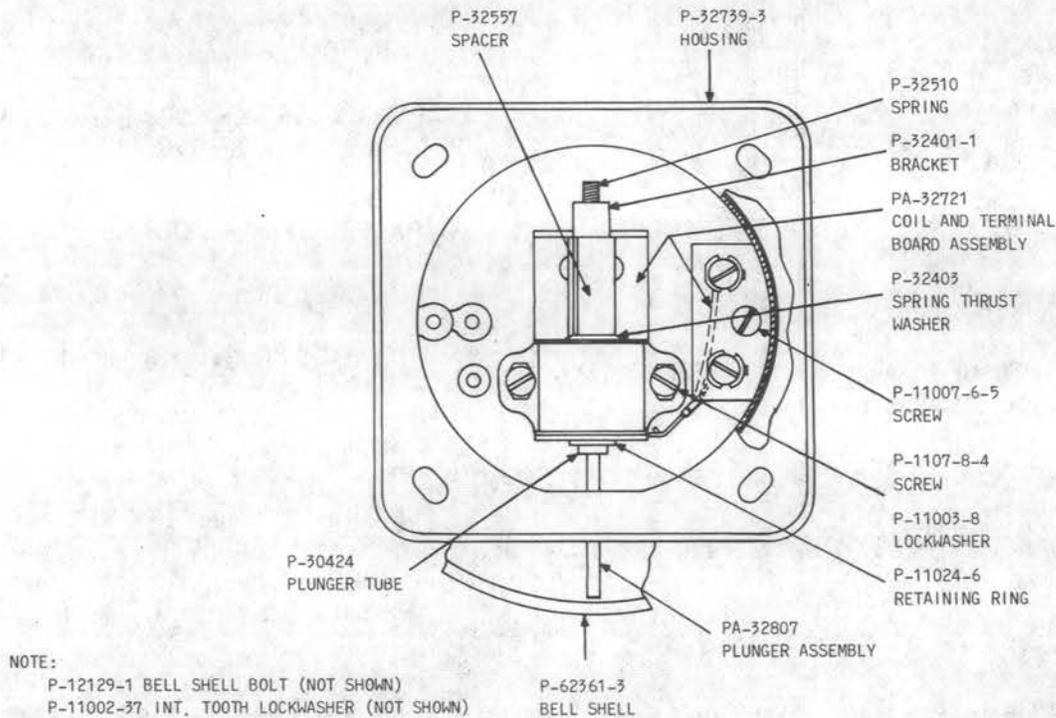


Fig. 2—KS-20375, L1, Bell

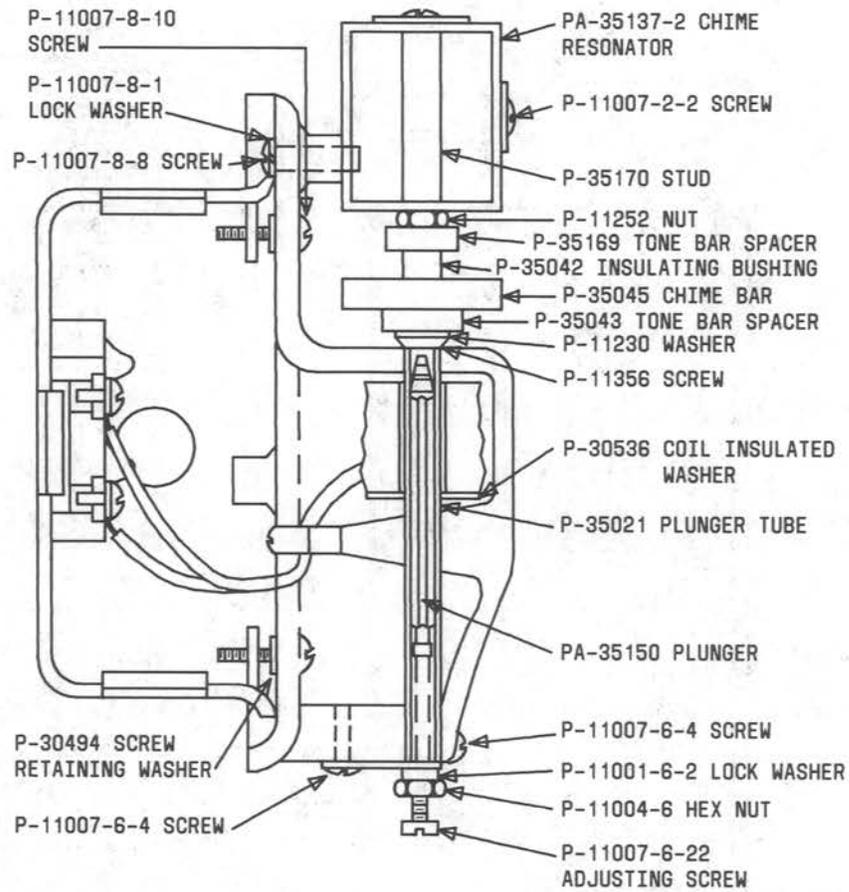


Fig. 3—KS-5594, L5, L9, and L10 Signals (Mfr Disc.)

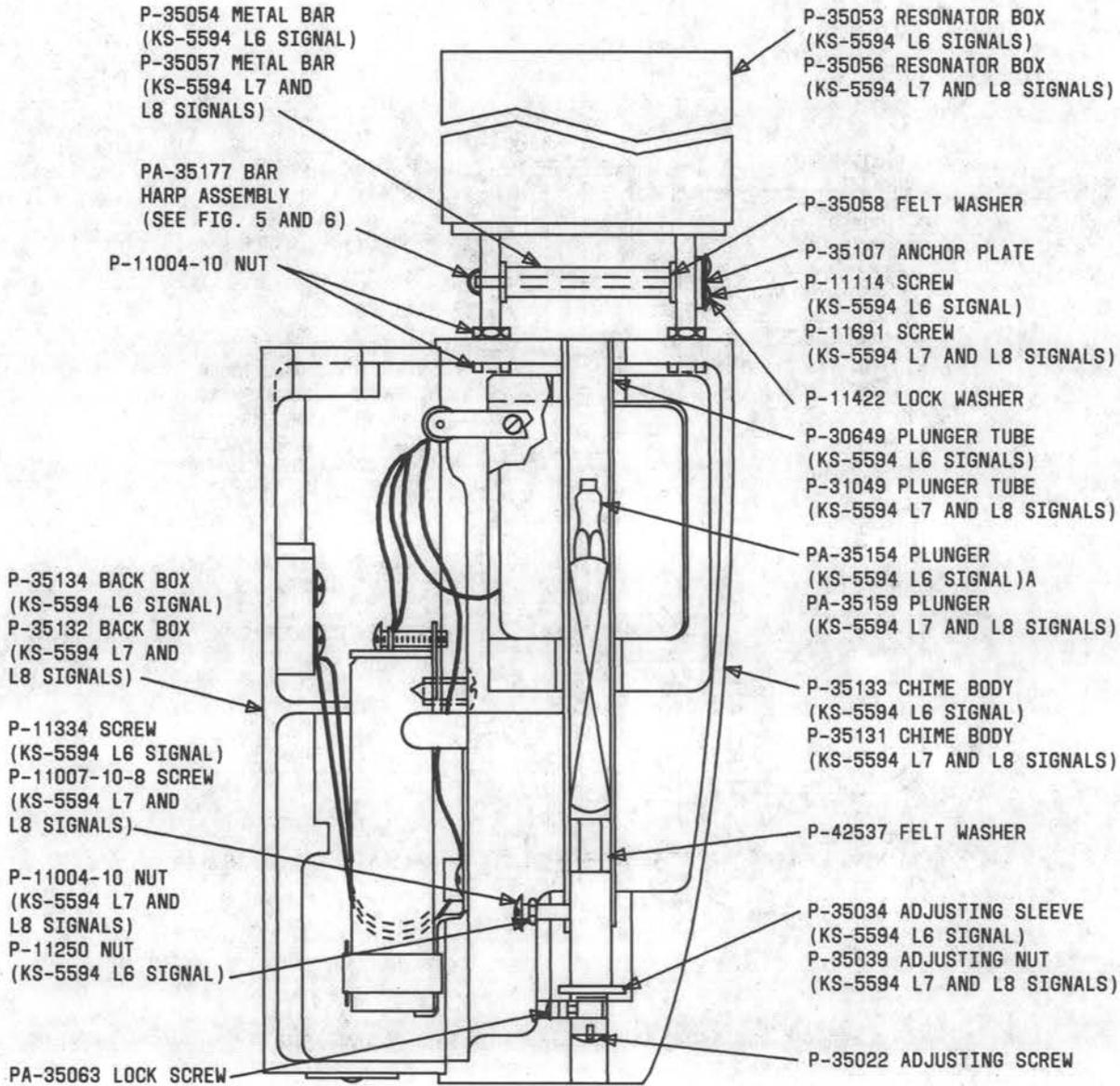


Fig. 4—KS-5594, L6, L7, and L8 Signals

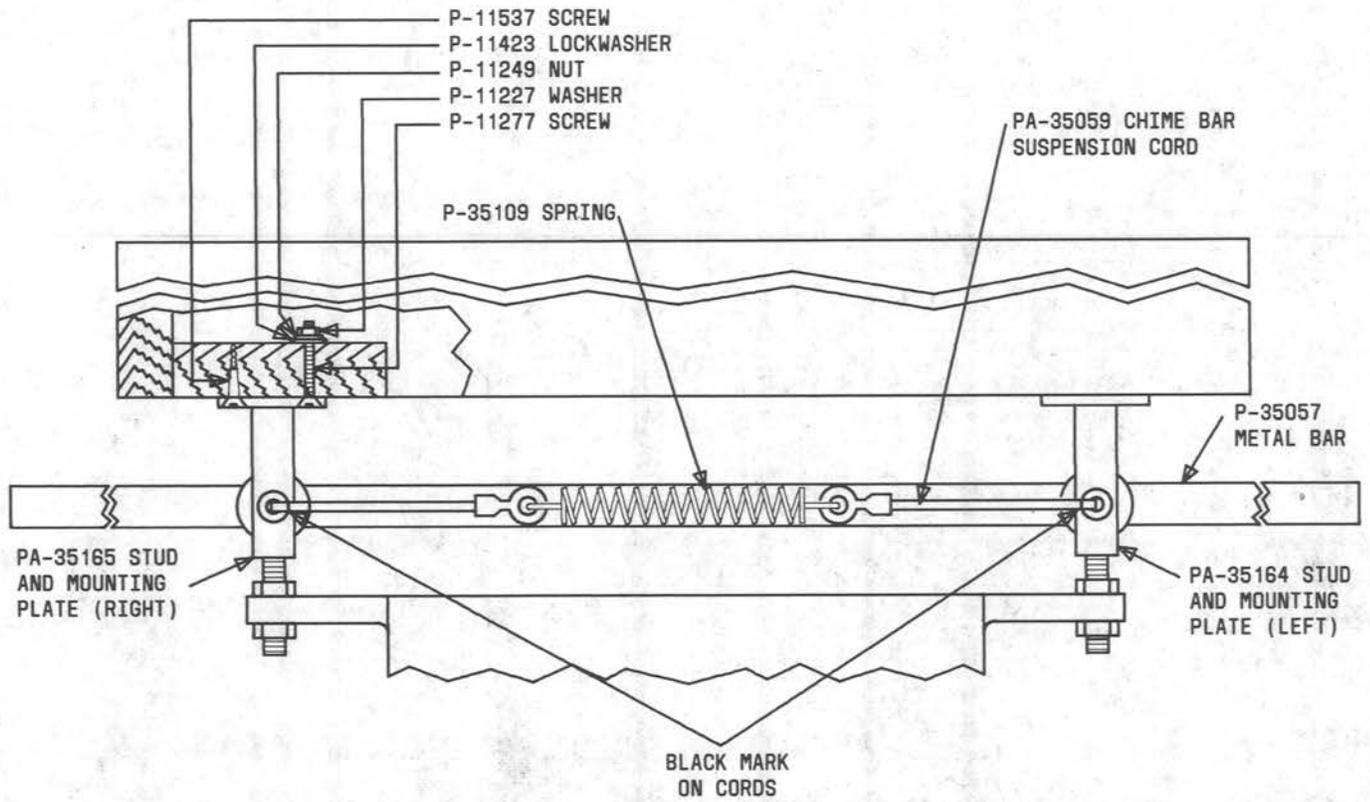


Fig. 5—KS-5594, L7, and L8 Signals-Bar Harp

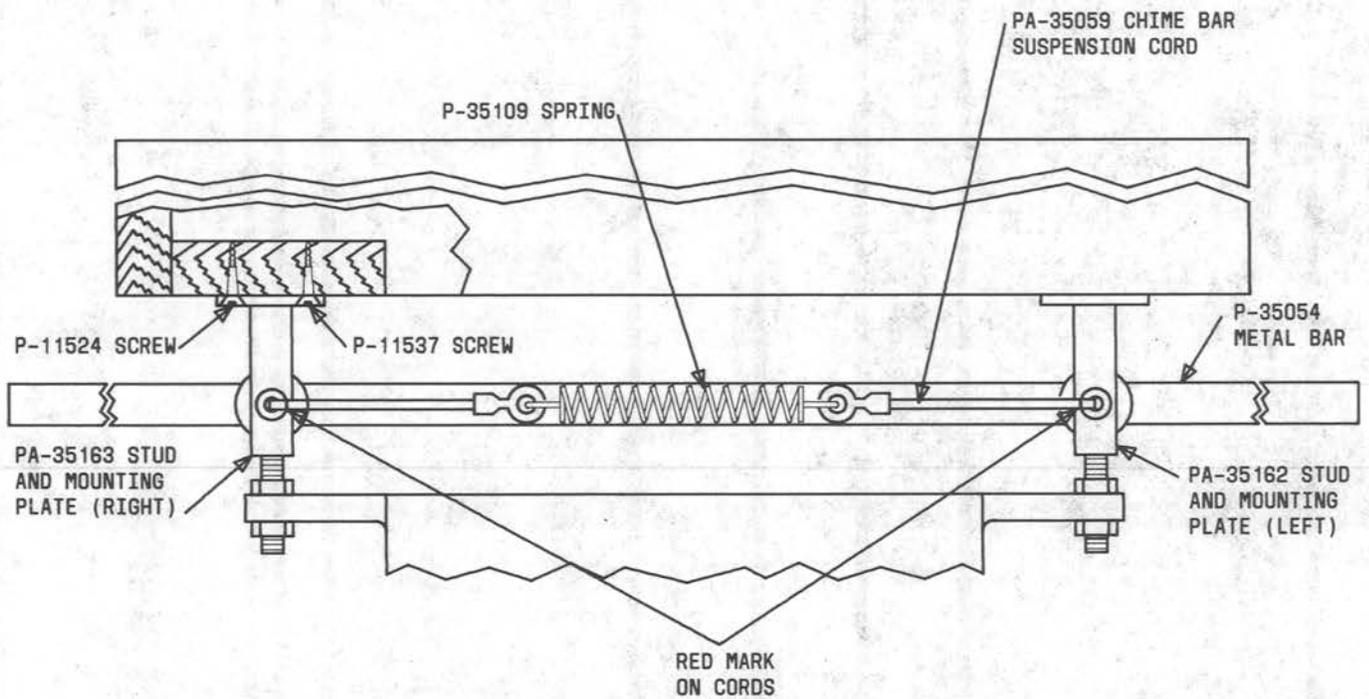


Fig. 6—KS-5594, L6, Signal-Bar Harp

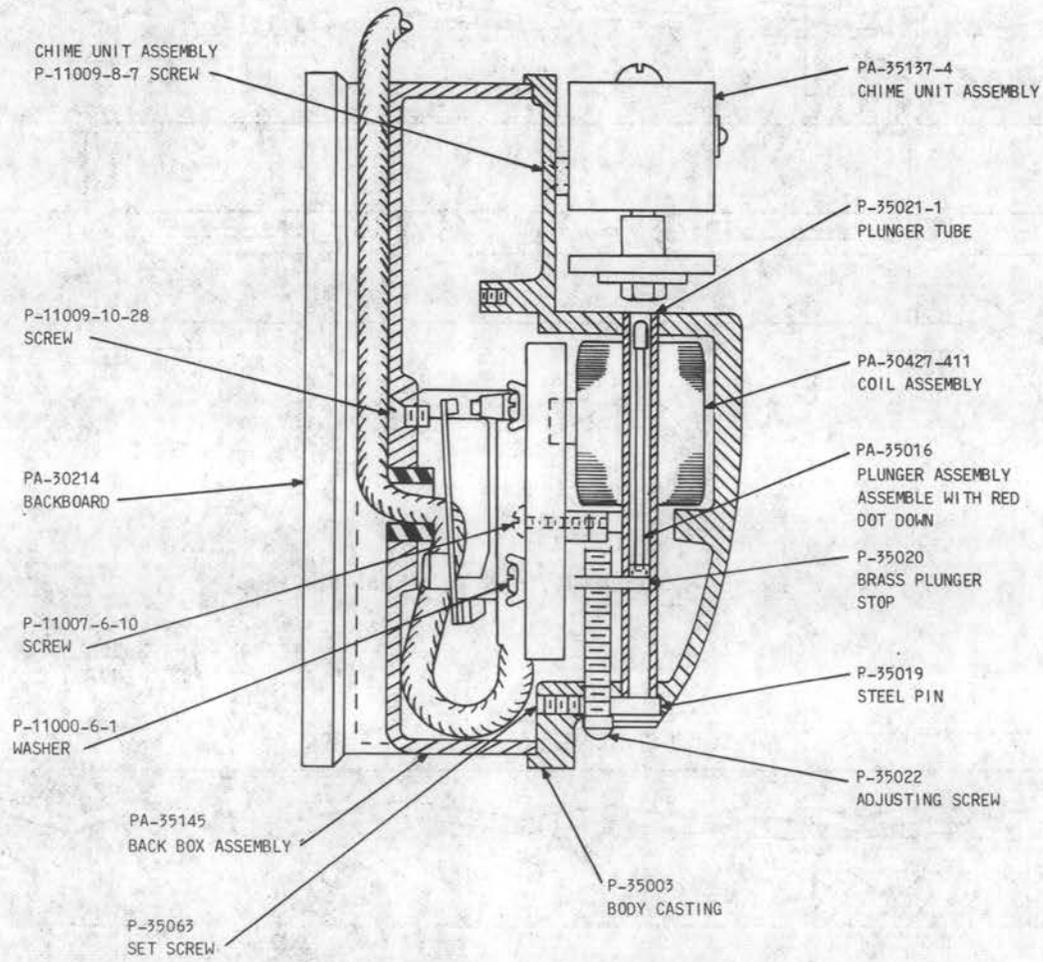
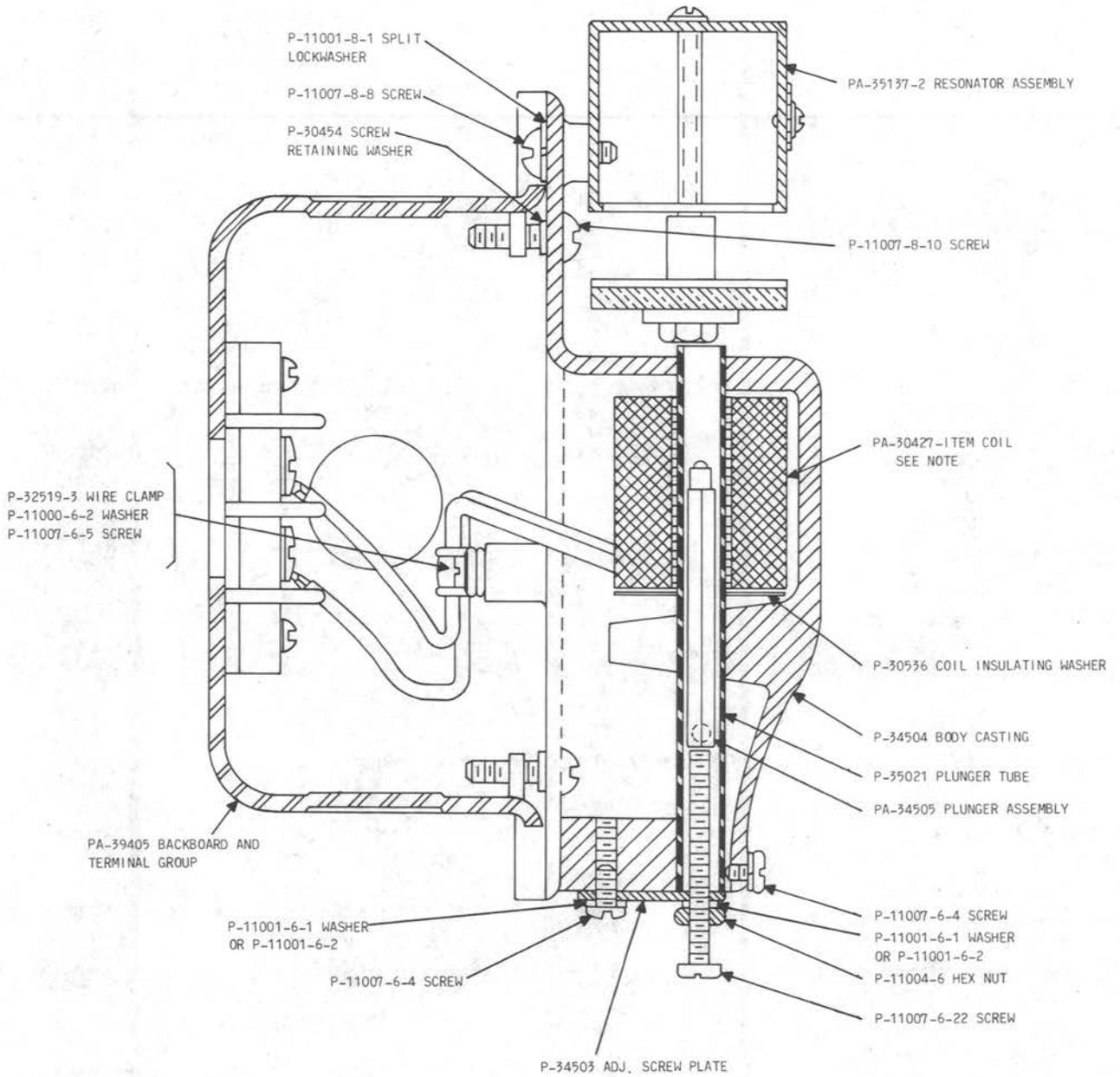


Fig. 7—KS-8229, L13, L14, and L15 Signals (Mfr Disc.)



NOTE:
 IF THE COIL REQUIRED IS #411, THEN (2) P-30558-1
 TERMINALS MUST BE SUPPLIED AND ASSEMBLED ON THIS
 ASSEMBLY.

Fig. 8—KS-8229, L23, Signal (Mfr Disc.)

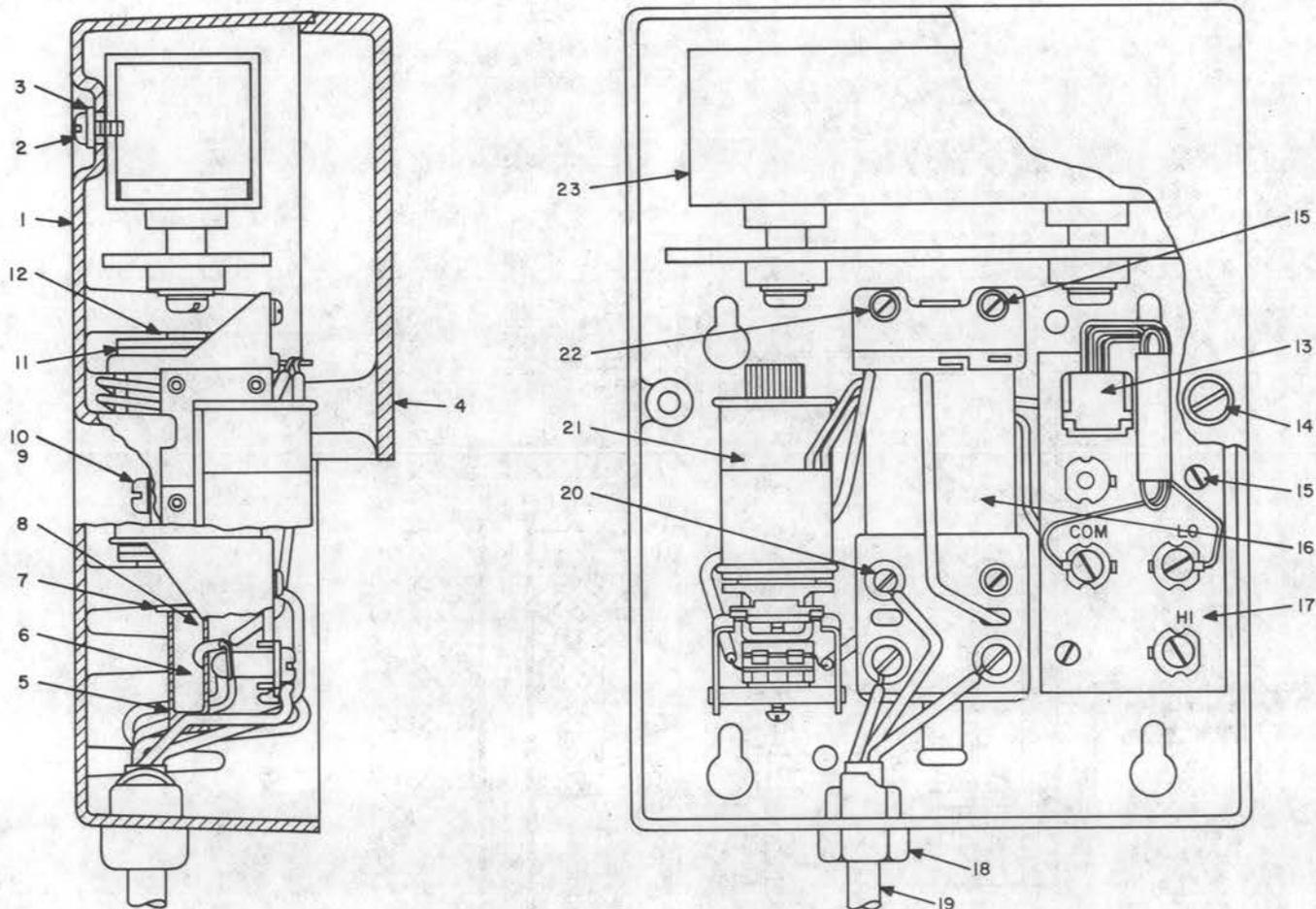


Fig. 9—KS-22001, L1 Through L7 Signals

LEGEND FOR FIG. 9

1—P-30380-2 Chime Housing (KS-22001, L1, L2, L3, L4, L5, L6, and L7)

2—P-11007-6-5 Screw (KS-22001, L1, L2, L3, L4, L5, L6, and L7)

3—P-11003-6 Lockwasher (KS-22001, L1, L2, L3, L4, L5, L6, and L7)

4—P-30381-3 Chime Cover (KS-22001, L1, L2, L3, L4, L5, L6, and L7)

5—P-32029-5 Rubber Cord (1/2 inch) (KS-22001, L3, and L4)

P-32029-4 Rubber Cord (1/4 inch) (KS-22001, L1, L2, L5, L6, and L7)

6—P-30388-1 Plunger Assembly (KS-22001, L3 and L4)

P-30388-2 Plunger Assembly (KS-22001, L1, L2, L5, L6, and L7)

7—P-11024-6 Retaining Ring (KS-22001, L1, L2, L3, L4, L5, L6, and L7)

8—P-32404-2 Plunger Tube (KS-22001, L1, L2, L3, L4, L5, L6, and L7)

9—P-11001-4-1 Split Lock Washer (KS-22001, L5, L6, and L7)

10—P-11007-4-5 Screw (KS-22001, L5, L6, and L7)

11—P-30378 Flux Washer (KS-22001, L1, L2, L3, L4, L5, L6, and L7)

- 12—P-32303 Spring Thrust Washer (KS-22001, L1, L2, L3, L4, L5, L6, and L7)
- 13—P-30453-1 Telephone Jack (KS-22001, L7)
- 14—P-11007-8-14 Screw (KS-22001, L1, L2, L3, L4, L5, L6, and L7)
- 15—P-11007-4-5 Screw (KS-22001, L1, L2, L3, L4, L5, L6, and L7)
- 16—PA-30376-4 Coil and Terminal Assembly (KS-22001, L1)
- PA-30376-5 Coil and Terminal Assembly (KS-22001, L3)
- PA-30376-6 Coil and Terminal Assembly (KS-22001, L2, L5, L6, and L7)
- PA-30376-7 Coil and Terminal Assembly (KS-22001, L4)
- 17—PA-30385-5 Terminal Board Assembly (KS-22001, L7)
- PA-30385-2 Terminal Board Assembly (KS-22001, L5, and L6)
- 18—P-37066-5 Strain Relief Bushing (KS-22001, L5, L6, and L7)
- 19—P-32692 Cord and Plug (KS-22001, L5, L6, and L7)
- 20—P-11000-4-2 Flat Washer (KS-22001, L5, L6, and L7)
- 21—P-30408-3 Chime Relay (KS-22001, L5)
- P-30408-2 Chime Relay (KS-22001, L6)
- P-30408-1 Chime Relay (KS-22001, L7)
- 22—P-11001-4-1 Split Lockwasher (KS-22001, L1, L2, L3, L4, L5, L6, and L7)
- 23—PA-30374 Chime Bar and Resonator (KS-22001, L1, L2, L3, L4, L5, L6, and L7)

4. REPLACEMENT PROCEDURES

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

4.02 Any parts replaced shall meet the readjustment requirements given in Section 028-102-701. Other parts whose adjustment 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 bell or signal before restoring the circuit to service.

KS-5595, L5 Through L10, KS-6918, KS-6919, KS-6920, KS-7228, KS-7752, and KS-20375 Bells (Fig. 1 and 2)

4.03 Gong: To replace a gong, remove the gong mounting screw using the No. 417A, No. 236, or KS-8097 wrench. Remove the gong. Substitute a new gong and securely mount it in place.

4.04 Plunger, Plunger Tube, and Plunger Cushions: To replace any of these parts, remove the gong as covered in paragraph 4.03. Remove the solenoid casting mounting screws, using the 4-inch E screwdriver, and remove the casting. While holding the casting, loosen the electrical connecting clamping screws at the terminal block using the 4-inch E screwdriver. Remove the wires. Remove the plunger tube mounting screw using the 4-inch E screwdriver. While holding the casting in an upright position, remove the plunger tube from the casting. Remove the plunger and plunger cushions from the tube. Make the necessary replacement of parts. Reassemble the parts in the plunger tube. Insert the plunger tube through the holes in the casting and through the magnet coil and insulating washer, taking care that the washer has not shifted out of position when inserting the tube in the upper hole in the casting. Align the holes in the tube with the holes in the bottom portion of the casting and insert and securely tighten the mounting screw. Reassemble the parts that were removed in the reverse order of removal.

4.05 Trigger Assembly and Vibrator Assembly: To replace the trigger assembly or vibrator assembly, remove the solenoid casting as covered in paragraph 4.04. Remove the bearing pin clips and bearing pin, using the long-nose pliers. Remove the trigger assembly. If it requires replacement, replace it. If it does not, proceed as follows to replace the vibrator assembly. Remove the capacitor bracket mounting screws, using the 3-inch C screwdriver, and remove the bracket. Unsolder and tag the wires connected to the spring terminals. Remove the vibrator assembly

by removing the mounting screws using the 3-inch C screwdriver, taking care not to lose the lockwashers under the screws. Substitute a new vibrator, insert the lockwashers, and securely tighten the mounting screws. Connect the wires to the proper terminals. Remount the other parts that were removed in the reverse order of removal.

Signals with External Tone Control - KS-5594, L5, L9, L10 (Mfr Disc.), and KS-8229, L23 (Mfr Disc.) Signals (Fig. 3 and 8)

4.06 Adjusting Screw and Plunger: To replace either of these parts, remove the adjusting plate mounting screw, using the 3-inch C screwdriver. Remove the adjusting screw. Remove the plunger. Make the necessary substitution of parts and insert the plunger in the tube with the plunger cushion uppermost. Remount the adjusting screw securely in position.

4.07 Plunger Tube: To replace the plunger tube, remove the adjusting screw as covered in paragraph 4.06 and remove the plunger. Remove the plunger tube mounting screw, using the 3-inch C screwdriver, and remove the plunger tube. In some cases, it may be necessary to pry the tube out of the casting. To do this, insert the end of the KS-6320 orange stick into the mounting hole on the inside of the tube and apply a downward pressure. This should move the tube far enough to permit the tube to be withdrawn with the fingers. Substitute a new plunger tube being careful to line up the holes in the tube with the one in the casting. Insert and securely tighten the mounting screw and remount the parts that were removed in the reverse order of removal. In removing and replacing the plunger tube, the signal should be held in an upright position in order to facilitate removing and inserting the tube through the magnet coil.

Signals With Internal Tone Control—KS-5594, L6, L7, and L8 Signals (Fig. 4)

4.08 Plunger: To replace the plunger, remove the back box mounting screws using the 4-inch E screwdriver and remove the back box. While holding the back box, loosen the electrical connection clamping screws at the terminal block using the 4-inch E screwdriver. Remove the wires. Remove the nuts from the underside of the chime body using the No. 417A wrench and remove the resonator box. Remove the plunger by turning

the chime body upside down. Substitute a new plunger. Reassemble the parts that were removed in the reverse order of removal.

4.09 Plunger Tube and Spacers: To replace any of these parts, remove the parts as covered in paragraph 4.08. Remove the screw and locknut on the inside of the chime body using the 4-inch E screwdriver. While holding the signal in an upright position, push the tube up through the top. Make the necessary replacement of parts. Reassemble the plunger in the tube. Insert the plunger tube through the hole in the chime body and the magnet coil. Align the hole in the tube with the hole in the bottom of the chime body. Insert and securely tighten the screw and locknut. Reassemble the parts that were removed in the reverse order of removal.

4.10 Adjusting Screw and Adjusting Nut: To replace any of these parts, remove the parts as covered in paragraphs 4.08 and 4.09. Remove the locking screw using the 3-inch C screwdriver. Remove the adjusting screw using the 3-inch C screwdriver. Make the necessary substitution of parts. Insert the lockscrew so that the end of the screw enters the groove in the adjusting screw. Reassemble the parts that were removed in the reverse order of removal.

4.11 Bar Harp (Fig. 5 and 6)

(a) **Extension Spring and Suspension Cord:** To replace an extension spring and suspension cord, remove the screws holding the anchor plates using the 3-inch C screwdriver. Untie the knot in the cords and remove the cords and spring. Hook the loop of a new spring to the terminals on the new cords. Insert the ends of the cords through the holes in the rear studs, washers, and bar. Pull the cord so that the spots on the cord of the appropriate color, as indicated in Fig. 5 or 6, are at the entrance of the holes in the studs. Tie the cords with a double knot against the front studs. Reassemble the anchor plates and lockwashers and securely tighten the screws.

(b) **Felt Washers:** To replace the felt washers, remove the spring and cords as covered in (a). Insert the new washers between the studs and bar. Remount the cords and spring as covered in (a).

(c) **Stud and Mounting Plate and Metal**

Bar: Remove the nuts from the underside of the chime body using the No. 417A wrench and remove the bar harp. Remove the nuts from the studs. Remove the spring and cords as covered in (a). Remove the mounting plate screws from the resonator box of the KS-5594, L6, signal with the 4-inch E screwdriver or remove the mounting plate screws, nuts, and washers from the resonator box of the KS-5594, L7, or L8 signal with the 4-inch E screwdriver and the No. 372 wrench, as applicable. Make the necessary substitution of parts. Reassemble the parts that were removed in the reverse order and proceed as follows. With the current through the coil, the clearance between the tip of the plunger and the bottom surface of the metal bar shall be 1/16 inch minimum and 1/8 inch maximum. Use the R-8550 scale and adjust the bar harp mounting screws with the No. 417A wrench as required.

KS-8229, L13, L14, and L15 Signals (Mfr Disc.) Fig. 7

4.12 Plunger: To replace the plunger, remove the backbox and then the resonator assembly box, using the 3-inch C screwdriver. Turn the chime body over and slide out the plunger. Insert the new plunger and reassemble in reverse order of removal.

4.13 Plunger Tube: To replace the plunger tube, remove the parts covered in paragraph 4.12. Remove the adjusting screw using the 3-inch C screwdriver. Remove the two screws holding the coil relay assembly and raise it out of the way. Remove the brass plunger stop. Using long-nose pliers, remove the steel pin holding the plunger tube and slide out the plunger tube. Reassemble in reverse order and check adjustments.

4.14 Plunger Coil: To replace the plunger coil, remove the parts covered in paragraphs 4.12 and 4.13. Tag and disconnect the two wires from the terminal plate and remove the coil. Install

the new coil and reconnect the wires in the proper position. Reassemble in reverse order of disassembly and check adjustments.

KS-22001, L1 Thru L7 Chimes (Fig. 9)

4.15 Plunger: To replace the plunger, remove the front cover, using the 3-inch C screwdriver. Remove the four mounting screws holding down the plunger coil. Turn the chime over and angle the coil so the plunger will slide out. Insert new plunger and reassemble in reverse order.

4.16 Plunger Tube: To replace the plunger tube, remove the parts covered in paragraph 4.15. Disconnect the two power wires from the terminals on the base of the plunger coil (for KS-22001, L5, L6, and L7 chimes; also remove the screw on the back of the chime holding the coil relay assembly). Swing the plunger coil clear of the mounting bracket and remove the plunger tube. Install the new plunger tube, making sure it contains a plunger cushion and the washers are correctly positioned. Reassemble in reverse order of disassembly and check all adjustments prescribed in Section 084-102-701.

4.17 Coil and Terminal Assembly, Chime Relay: To replace the coil and terminal assembly or the chime relay (KS-22001, L5, L6, and L7 only), remove the parts covered in paragraphs 4.15 and 4.16. Tag all wire connections to ensure proper placement upon reassembly. Remove the wire connections from the piece being replaced and install the new one. Reconnect the new piece being careful that all wires are attached to the proper points and all solder joints are firmly connected.

Caution: *Be sure that all solder connections make good contact and there is no bridging across terminals.*

Reassemble in reverse order of disassembly and check adjustments in accordance with Section 084-102-701.