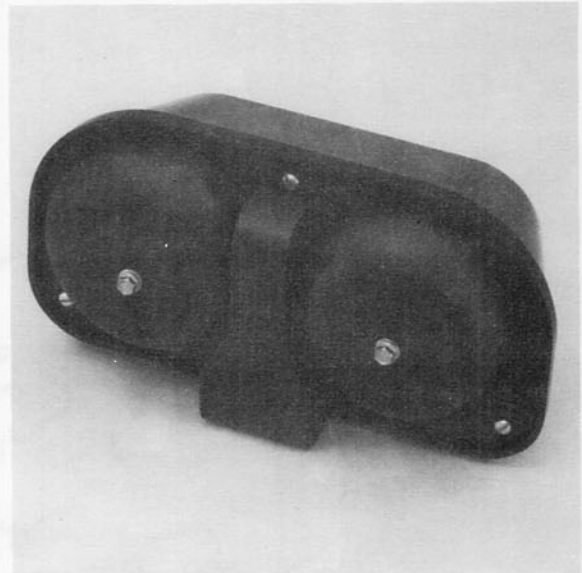


## MODEL 75 LOUD RINGING BELL

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AW 84-812

Figure 1: Model 75 Loud Ringing Bell

### 1. INTRODUCTION

**1.01** This document covers the Model 75 loud ringing bell. (See Figure 1.) A general description as well as information on removal, disassembly, replacement parts, assembly, installation, and adjustments is included.

**1.02** Whenever this section is reissued, reason for reissue will be listed in this paragraph.

**1.03** The Model 75 loud ringing bell is an external ringing device for indoor or outdoor use. It is designed for use in noisy locations or large areas. It is available with either a straight-line or frequency-selective ringer mechanism.

**1.04** For information concerning ringer mechanisms used in the loud ringing bell, refer to the following documents:

(a) Section 55-938-113 for straight-line ringer mechanism, part number 079938-101.

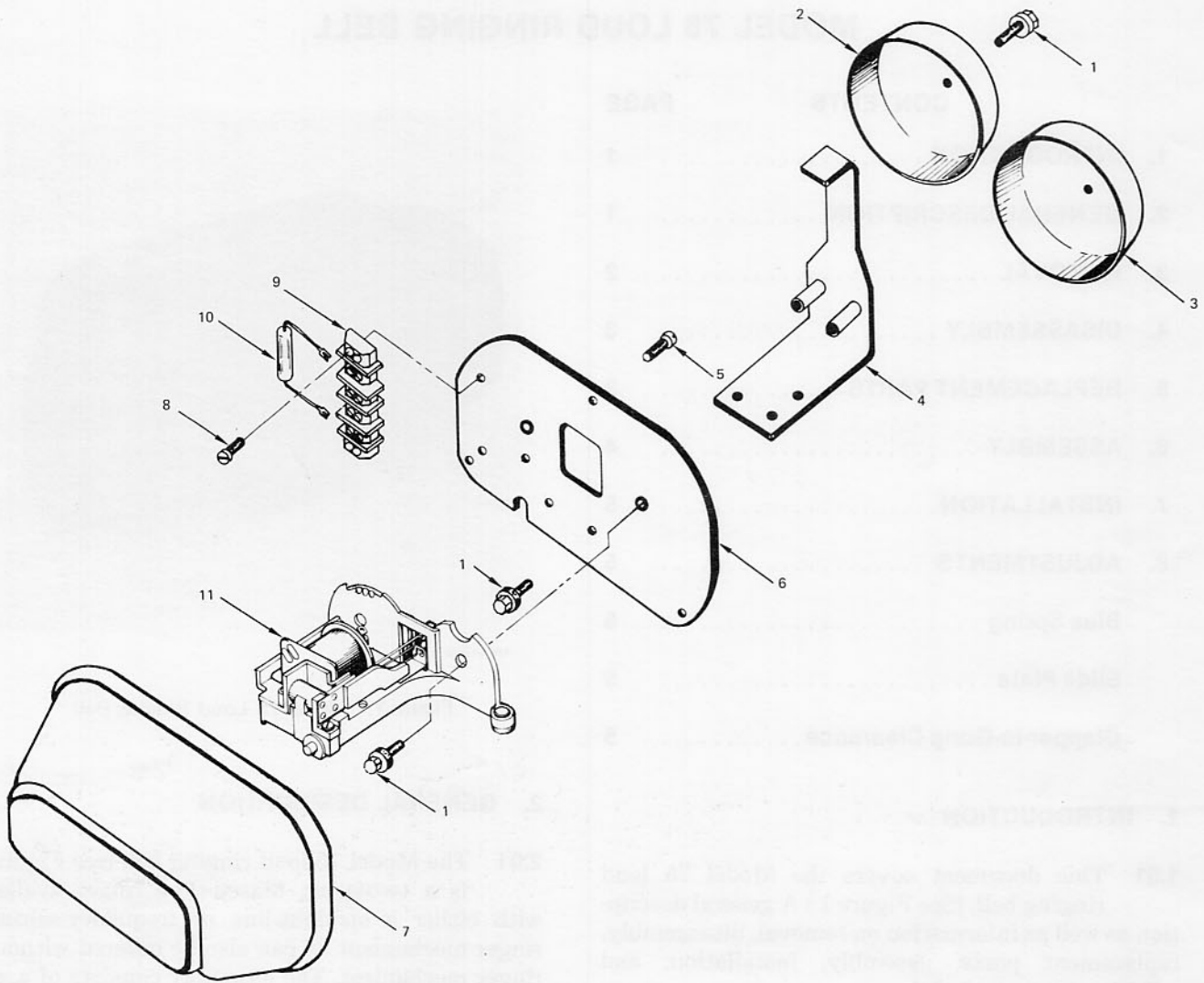
(b) Section 55-939-113 for frequency-selective ringer mechanisms, part numbers 079939-101 through 079939-115.

### 2. GENERAL DESCRIPTION

**2.01** The Model 75 loud ringing bell (see Figure 2) is a two-gong, biased-type ringer available with either a straight-line or frequency-selective ringer mechanism. It can also be ordered without a ringer mechanism. The assembly consists of a wall mounting bracket that supports a horizontal base plate on which two four-inch-diameter gongs and a ringer mechanism are mounted. A water-tight plastic cover, which is mounted to the baseplate, protects the ringer mechanism. The loud ringing bell assembly is mounted using three screws inserted through the wall mounting bracket.

**2.02** The ringer mechanism is mounted on the base plate. The clapper projects through a cutout in the base plate to a position between the two gongs.

**2.03** The armature and clapper assembly is spring-mounted to the ringer mechanism frame. The fluctuating magnetic field produced by the coil causes the armature to vibrate and the clapper to strike the gongs. Increased sensitivity is provided by biasing the armature with a small permanent magnet.



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Figure 2: Model 75 Loud Ringing Bell, Exploded View

**2.04** Frequency-selective ringer mechanisms are tuned to ring at different specific frequencies through the use of various core laminations, clapper weights, and capacitors. They are divided into three classes. HA ringers are classed as harmonic. HB ringers are classed as synchrononic. HC ringers are classed as decimonic.

**2.05** Straight-line ringer mechanisms are designed to ring at 20 or 30 Hz. They are identified as BA ringers.

**2.06** Model 75 loud ringing bells that are not equipped with a ringer mechanism are identified as LR ringers. Refer to Table A for ordering information.

### 3. REMOVAL

**3.01** To remove the Model 75 loud ringing bell from its mounting location, proceed as follows:

- (a) Loosen the three cabinet lock screws located on the bottom of the base plate and lift the cover from the base plate.
- (b) Disconnect the ringer line cord leads from terminals L1 and L2 on the terminal board.
- (c) Loosen and remove the two hex-head screws that attach the base plate to the wall mounting bracket.

TABLE A  
ORDERING INFORMATION

CODE NUMBERS			
RINGER CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS:			
(1) Ringer Model Number (See Part 1)	000075	OBA	
(2) Ringer Style Or Selective Frequency Code (See Part 2)			
PART 1 RINGER MODEL NUMBER			
CODE	DESCRIPTION		
000075	Model 75 Loud Ringing Bell		
PART 2 RINGER STYLE OR SELECTIVE FREQUENCY CODE			
CODE	DESCRIPTION	FREQUENCY Hz	CLASS
OLR OBA	Less Ringer Straight-Line, Biased-Type	20 Or 30	
HA1 HA2 HA3 HA4 HA5	Frequency-Selective Frequency-Selective Frequency-Selective Frequency-Selective Frequency-Selective	33 1/3 50 66 2/3 16 2/3 25	Harmonic
HB1 HB2 HB3 HB4 HB5	Frequency-Selective Frequency-Selective Frequency-Selective Frequency-Selective Frequency-Selective	30 42 54 66 16	Synchromonic
HC1 HC2 HC3 HC4 HC5	Frequency-Selective Frequency-Selective Frequency-Selective Frequency-Selective Frequency-Selective	20 60 30 (Same As HB1) 40 50 (Same As HB2)	Decimonic

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- (d) Lift the loud ringing bell from the wall and slide the ringer line cord from the ringer.

*Note:* The wall mounting bracket is attached using three screws (not provided).

#### 4. DISASSEMBLY

**4.01** To disassemble the Model 75 loud ringing bell perform the following procedure:

- (a) Loosen and remove the two hex-head screws that hold the gongs to the base plate. Remove the gongs.
- (b) Disconnect the four ringer mechanism leads from the terminal board.

- (c) Loosen and remove the two hex-head screws that hold the ringer mechanism to the base plate. Lift the ringer mechanism from the base plate.

- (d) If the ringer mechanism capacitor is located on the terminal board, remove the capacitor from the terminal board.

- (e) Loosen and remove the two screws that hold the terminal board to the base plate. Lift the terminal board from the base plate.

#### 5. REPLACEMENT PARTS

- 5.01** Replacement parts for the Model 75 extension ringer are listed in Table B.

6. ASSEMBLY

6.01 To assemble the Model 75 loud ringing bell, proceed as follows:

- (a) Mount the terminal board to the base plate using two screws.
- (b) Position the ringer mechanism on the base plate; mount it to the base plate using two hex-head screws with spring washers.
- (c) For the straight-line ringer mechanism (79938), connect the coil assembly leads and the 0.47 mfd capacitor leads to the terminal board as shown in Figure 3.

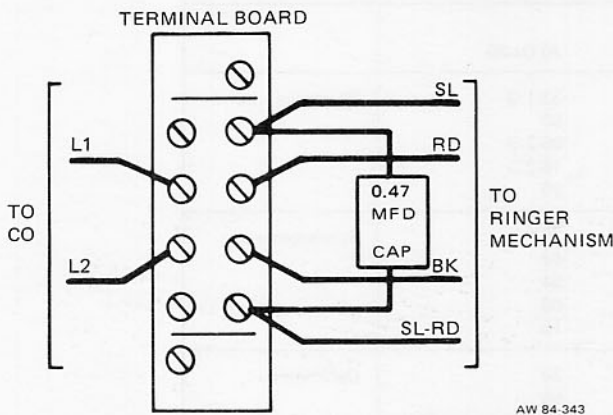


Figure 3: Terminal Board Connecting Diagram for Straight-Line Ringers and Some Frequency-Selective Ringers

(d) For frequency-selective ringer mechanisms classed as HA4, HA5, HB5, or HC1, connect the coil assembly leads and the 0.47 mfd capacitor leads as shown in Figure 3. See Table C.

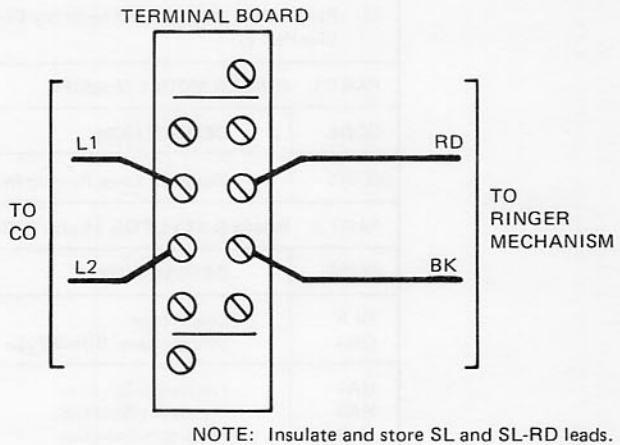
TABLE C

RINGER SERIES CAPACITORS

CAPACITANCE (MFD)	CODE SERIES
0.47	HA4, HA5, HB5, HC1
0.25	HA1, HB1, HC3
0.15	HB2, HC4
0.08	HA2, HA3, HB3, HB4, HC2, HC5

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(e) For frequency-selective ringer mechanisms classed as HA1, HA2, HA3, HB1, HB2, HB3, HB4, HC2, HC3, HC4, or HC5, connect the ringer mechanism leads to the terminal board as shown in Figure 4. These frequency-selective ringer mechanisms have the capacitor factory-wired to the coil. See Table C.



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Figure 4: Terminal Board Connecting Diagram for Frequency-Selective Ringers

- (f) Select the larger gong with the dull interior finish and insert a hex-head screw with a spring washer through the hole in the center of the gong. Mount this gong in the left-hand gong position on the base plate.
- (g) Insert a hex-head screw with a spring washer through the hole in the center of the smaller gong with the bright interior finish. Mount this gong in the right-hand gong position on the base plate.

**Notes:** 1. On older models of the loud ringing bell, a washer must be inserted inside this gong to allow sufficient clearance between the gong and the base plate. The washer should be approximately 1/16-inch thick.  
 2. The gongs may be rotated to center the clapper. Refer to adjustment procedures 8.04.

(h) Place the base plate assembly on the wall mounting bracket with the gongs pointing down and mount with two hex-head screws.

## 7. INSTALLATION

**7.01** To install the Model 75 loud ringing bell, proceed as follows:

- (a) Remove the cover.
- (b) Loosen and remove the two screws that hold the base plate to the wall bracket. Remove the wall bracket.
- (c) Install an extension line cord allowing sufficient length to connect to the terminal board.
- (d) Mount the wall bracket to the wall using three screws (not provided).
- (e) Mount the base plate to the wall bracket using two hex-head mounting screws.
- (f) Connect the line cord leads to the terminal board as follows:

*Note:* The Model 75 loud ringing bell can be used for various special applications but is normally installed with the ringer bridged across the line.

- (1) Connect the Tip side of the line to terminal L1.
  - (2) Connect the Ring side of the line to terminal L2.
- (g) Place the cover over the ringer mechanism and secure it to the base plate using three screws.

## 8. ADJUSTMENTS

### Bias Spring

**8.01** For a straight-line ringer mechanism, the ringer is shipped with the bias spring in the high bias position to ring at 77 VAC, 20 Hz. For

lower voltages and 30 Hz ringing, the bias spring can be moved to the low bias position. (See Figure 5.)

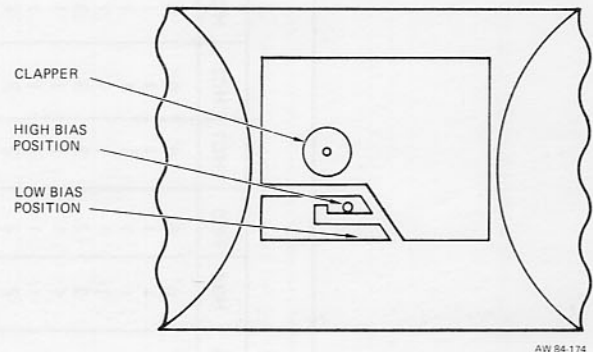


Figure 5: Position of Bias Spring

**8.02** For frequency-selective ringer mechanisms, the bias spring must rest against the clapper arm at all times. Move the clapper arm to rest against the right-hand gong and ensure that the bias spring remains in contact with the clapper arm. The bias spring can be bent slightly, but carefully, if adjustment is required.

### Slide Plate

**8.03** For frequency-selective ringer mechanisms, the slide plate can be adjusted to move the core laminations closer to or farther away from the armature and clapper assembly. Refer to Section 55-939-113.

### Clapper-to-Gong Clearance

**8.04** If the clapper is not centered between the gongs and it causes improper ringing, the bias spring can be bent slightly to provide coarse adjustment. The gongs can be rotated to provide fine adjustment.

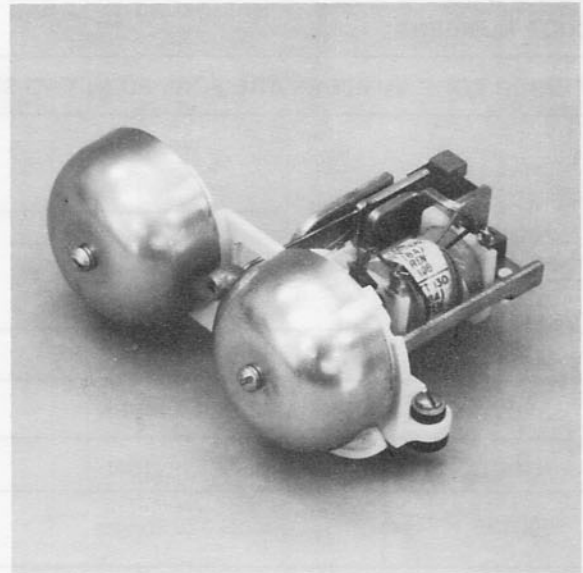
TABLE B  
REPLACEMENT PARTS LIST

INDEX NO	PART NUMBER	DESCRIPTION	QUANTITY USED																
			OLR	OBA	HA1	HA2	HA3	HA4	HA5	HB1	HB2	HB3	HB4	HB5	HC1	HC2	HC3	HC4	HC5
1	180523-101	Model 75 Loud Ringing Bell	6		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
2	079934-101	Screw, Hex-Head	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	079935-101	Gong	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	079929-101	Gong	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	075486-101	Bracket Assembly	3		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
6	079926-101	Screw, Cabinet Lock	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	079923-101	Base Plate Assembly	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	075408-102	Cover Assembly	2		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9	072233-105	Screw, Lockwasher	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	183603-101	Board, Terminal	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		Capacitor, 0.47 MFD	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	079938-101	Ringer Mechanism	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	079939-101	Ringer Mechanism																	
	079939-102	Ringer Mechanism																	
	079939-103	Ringer Mechanism																	
	079939-104	Ringer Mechanism																	
	079939-105	Ringer Mechanism																	
	079939-106	Ringer Mechanism																	
	079939-107	Ringer Mechanism																	
	079939-108	Ringer Mechanism																	
	079939-109	Ringer Mechanism																	
	079939-110	Ringer Mechanism																	
	079939-111	Ringer Mechanism																	
	079939-112	Ringer Mechanism																	
	079939-113	Ringer Mechanism																	
	079939-114	Ringer Mechanism																	
	079939-115	Ringer Mechanism																	

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# MODEL 130 RINGER

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AW 84-814

Figure 1: Model 130 Ringer

## 1. INTRODUCTION

1.01 This document covers the Model 130 ringer. (See Figure 1.) A general description as well as information on removal, disassembly, replacement parts, assembly, installation, and adjustments is included.

1.02 Whenever this section is reissued, reason for reissue will be listed in this paragraph.

1.03 For applications of the Model 130 ringer in telephones, refer to the appropriate section in Volume 1 of the ITT Telephone Apparatus Practices Manual.

## 2. GENERAL DESCRIPTION

2.01 The Model 130 ringer (see Figure 2) is a two-gong, straight-line, biased-type ringer equipped with a mechanical volume control and assembled on a plastic frame. A laminated soft-iron core holds the double-wound coil in place. The ringer is designed to ring at 20 or 30 Hz.

2.02 The armature and clapper assembly is spring-mounted to the frame. The fluctuating magnetic field produced by the coil causes the armature to vibrate and the clapper to strike the gongs. Increased sensitivity is provided by biasing the armature with a small permanent magnet.

2.03 The ringer is mounted on shock-absorbing rubber grommets. Two grommets are located on the frame. An alignment pin, molded into the frame, is inserted into an additional grommet located at the base of the telephone hookswitch bracket.

2.04 The ringer is identified by a code number printed on a ringer label attached to the coil assembly. Refer to ordering information in Table A for an explanation of each code number.

## 3. REMOVAL

3.01 To remove the ringer from the telephone, proceed as follows:

- (a) Remove the telephone housing.

TABLE A  
ORDERING INFORMATION

CODE NUMBERS			
RINGER CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS:			
(1) Ringer Model Number (See Part 1)			000130
(2) Ringer Style (See Part 2)			OBA
PART 1 RINGER MODEL NUMBER		PART 2 RINGER STYLE	
CODE	DESCRIPTION	CODE	DESCRIPTION
000130	Model 130 Ringer	OBA	Straight-Line, Biased-Type Ringer

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- (b) Remove any telephone component that may obstruct access to the ringer.
- (c) Disconnect the ringer leads.
- (d) Loosen the two mounting screws and lift the ringer from the telephone base.

#### 4. DISASSEMBLY

4.01 To disassemble the ringer, proceed as follows:

- (a) Loosen and remove the two screws that hold the gongs to the frame.
- (b) Remove the gongs and the resonators.
- (c) Using a permanent marker, place a reference mark on the magnet to ensure that proper polarity is maintained during reassembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.
- (d) Loosen and remove the screw that holds the armature and clapper assembly to the frame.
- (e) Lift the armature and clapper assembly from the frame.

- (f) Remove the magnet.
- (g) Loosen and remove the two screws that hold the core laminations to the support pole piece assembly.
- (h) Lift the coil assembly from the frame and remove the core laminations by sliding them through the coil assembly.
- (j) Lift the support pole piece assembly from the frame.

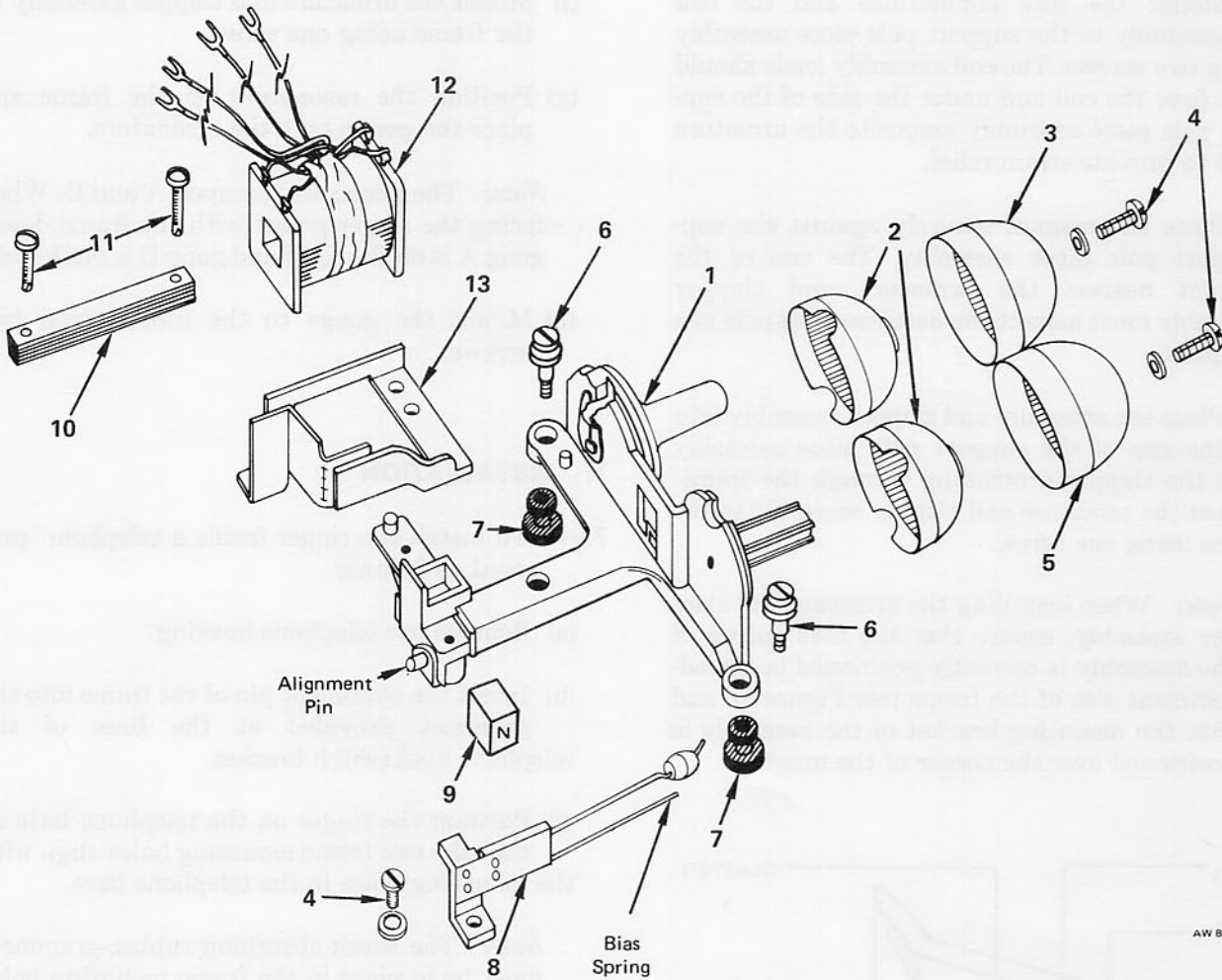
#### 5. REPLACEMENT PARTS

5.01 Replacement parts for the Model 130 ringer are listed in Table B.

#### 6. ASSEMBLY

6.01 To assemble the ringer, proceed as follows:

- (a) Place the support pole piece assembly on the frame, ensuring proper alignment with the pins on the frame.
- (b) Slide the core laminations into the coil assembly. Position the coil assembly with the leads on top of the coil and align the holes in the core laminations with the holes in the support pole piece assembly.



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Figure 2: Model 130 Ringer, Exploded View

TABLE B  
REPLACEMENT PARTS LIST

INDEX NO	PART NUMBER	DESCRIPTION	QUANTITY USED
		Model 130 Ringer	130-0BA
1	185481-101	Frame	1
2	075372-101	Resonator	2
3	075396-101	Gong A	1
4	182845-102	Screw, Mounting W/Lockwasher	3
5	075397-101	Gong B	1
6	075366-101	Screw, Frame Mounting	2
7	075371-101	Grommet, Rubber	2
8	075393-102	Armature and Clapper Assembly	1
9	184973-101	Magnet	1
10	184972-101	Laminations, Core	15
11	075407-110	Screw, Laminations Mounting	2
12	185480-101	Coil Assembly	1
13	184971-101	Support Pole Piece Assembly	1

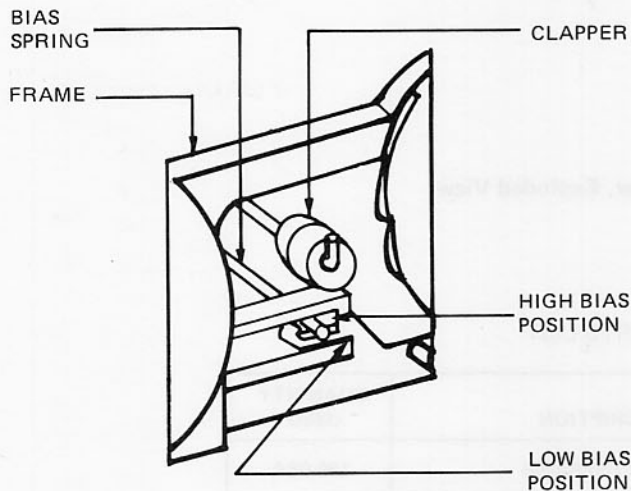
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(c) Mount the core laminations and the coil assembly to the support pole piece assembly using two screws. The coil assembly leads should pass over the coil and under the side of the support pole piece assembly (opposite the armature side) to provide strain relief.

(d) Place the magnet securely against the support pole piece assembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.

(e) Place the armature and clapper assembly into the gap of the support pole piece assembly with the clapper protruding through the frame. Mount the armature and clapper assembly to the frame using one screw.

*Note:* When installing the armature and clapper assembly, ensure that the bias spring of the assembly is correctly positioned in the adjustment slot of the frame (see Figure 3), and that the mounting bracket of the assembly is positioned over the corner of the magnet.



Notes: This ringer is shipped with the bias spring in the high bias position and is adjusted to ring at 77 VAC, 20 Hz. For lower voltages and 30 Hz ringing, the bias spring can be moved to the low bias position.

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Figure 3: Bias Spring Adjustment  
(As viewed when facing the ringer gongs)

(f) Mount the armature and clapper assembly to the frame using one screw.

(g) Position the resonators on the frame and place the gongs over the resonators.

*Note:* The gongs are stamped A and B. When facing the ringer gongs with the frame down, gong A is on the right and gong B is on the left.

(h) Mount the gongs to the frame using two screws.

## 7. INSTALLATION

7.01 To install the ringer inside a telephone, proceed as follows:

(a) Remove the telephone housing.

(b) Insert the alignment pin of the frame into the grommet provided at the base of the telephone hookswitch bracket.

(c) Position the ringer on the telephone base so that the two frame mounting holes align with the mounting holes in the telephone base.

*Note:* The shock-absorbing rubber grommets must be in place in the frame mounting holes and in the telephone hookswitch bracket.

(d) Mount the ringer to the telephone base using two screws.

(e) Connect the ringer coil assembly leads to the telephone network. Refer to the telephone circuit label.

(f) Install the telephone housing.

## 8. ADJUSTMENTS

### Volume Control

8.01 Ringer volume is controlled by turning the thumbwheel on the bottom of the ringer. When facing the ringer gongs with the ringer frame down, turn the thumbwheel to the left to increase the volume. To silence the ringer, remove the telephone housing, disconnect the red or black lead, and tape and store the disconnected lead.

**Bias Spring**

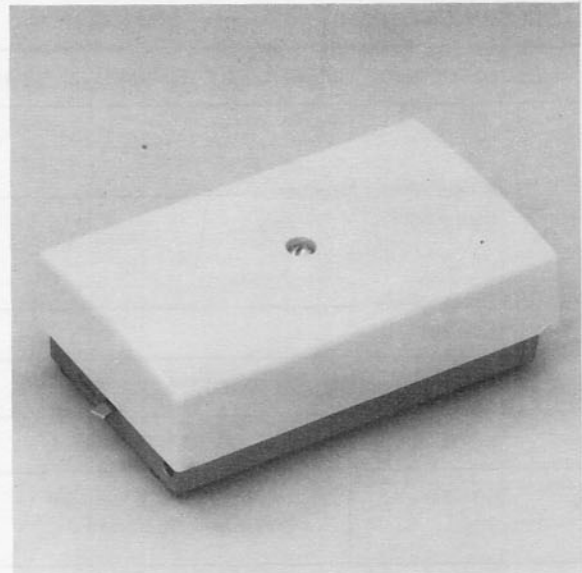
**8.02** The ringer is shipped with the bias spring in the high bias position to ring at 77 VAC, 20 Hz. For lower voltages and 30 Hz ringing, the bias spring can be moved to the low bias position. (See Figure 3.)

**Clapper-to-Gong Clearance**

**8.03** If the clapper is not centered between the gongs (causing improper ringing to occur), the clapper arm may be bent slightly, but carefully, to center the clapper for coarse adjustment. Fine adjustment is made by rotating the gongs.

# MODEL 136 RINGER

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AW 84-815

Figure 1: Model 136 Ringer

## 1. INTRODUCTION

1.01 This document covers the Model 136 ringer. (See Figure 1.) A general description as well as information on removal, disassembly, replacement parts, assembly, installation, and adjustments is included.

1.02 Whenever this section is reissued, reason for reissue will be listed in this paragraph.

## 2. GENERAL DESCRIPTION

2.01 The Model 136 ringer (see Figure 2) is a single-gong, straight-line, biased-type extension ringer equipped with a mechanical volume control and assembled on a die-cast frame with a beige-colored, molded-plastic cover. A laminated soft-iron core holds the double-wound coil in place. The ringer is designed to ring at 20 or 30 Hz.

2.02 The armature and clapper assembly is spring-mounted to the ringer frame. The fluctuating magnetic field produced by the coil causes the

armature to vibrate and the clapper to strike the gong. Increased sensitivity is provided by biasing the armature with a small permanent magnet.

2.03 The Model 136 ringer is compact and can be used either as a main ringer or as an extension ringer. Screw terminals are provided for all lead connections. The ringer can be mounted at four shock-absorbing rubber grommets located on the ringer frame.

2.04 The Model 136 ringer is identified by a code number stamped in ink on the back of the ringer frame. Refer to ordering information in Table A for an explanation of each code number and ringer information.

## 3. REMOVAL

3.01 To remove the ringer from its mounting location, proceed as follows:

- (a) Remove the cover from the ringer frame by loosening the cover mounting screw and lifting the cover.

TABLE A  
ORDERING INFORMATION

CODE NUMBERS			
RINGER CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS:			
(1) Ringer Model Number (See Part 1)		000136	OBA
(2) Ringer Style (See Part 2)			
PART 1 RINGER MODEL NUMBER		PART 2 RINGER STYLE	
CODE	DESCRIPTION	CODE	DESCRIPTION
000136	Model 136 Extension Ringer, Miniature	OBA	Straight-Line, Biased-Type Ringer With Volume Control

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- (b) Disconnect the ringer line cord leads that come into the ringer.
- (c) Loosen and remove the four screws that mount the ringer at the rubber grommets.

#### 4. DISASSEMBLY

4.01 To disassemble the ringer, proceed as follows:

- (a) Disconnect the coil assembly leads from the terminal board.
- (b) Loosen and remove the two screws that hold the terminal board to the ringer frame.
- (c) Lift the terminal board, the stop lever, the spacer, and the lock lever from the ringer frame.
- (d) Using a permanent marker, place a reference mark on the magnet to ensure that proper polarity is maintained during reassembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.
- (e) Loosen and remove the screw that holds the armature and clapper assembly to the ringer frame. Lift the armature and clapper assembly from the ringer frame.

- (f) Remove the magnet.
- (g) Loosen and remove the two screws that hold the laminated core to the ringer frame.
- (h) Lift the coil assembly from the ringer frame and remove the core by sliding the laminations out through the coil.
- (j) Lift the support pole piece assembly from the ringer frame.

#### 5. REPLACEMENT PARTS

5.01 Replacement parts for the Model 136 ringer are listed in Table B.

#### 6. ASSEMBLY

6.01 To assemble the ringer, proceed as follows:

- (a) Place the support pole piece assembly on the ringer frame while ensuring proper alignment with the pins on the ringer frame.
- (b) Slide the core laminations into the coil assembly. Position the coil assembly with the leads on top of the coil; align the holes in the core laminations with the holes in the support pole piece assembly.

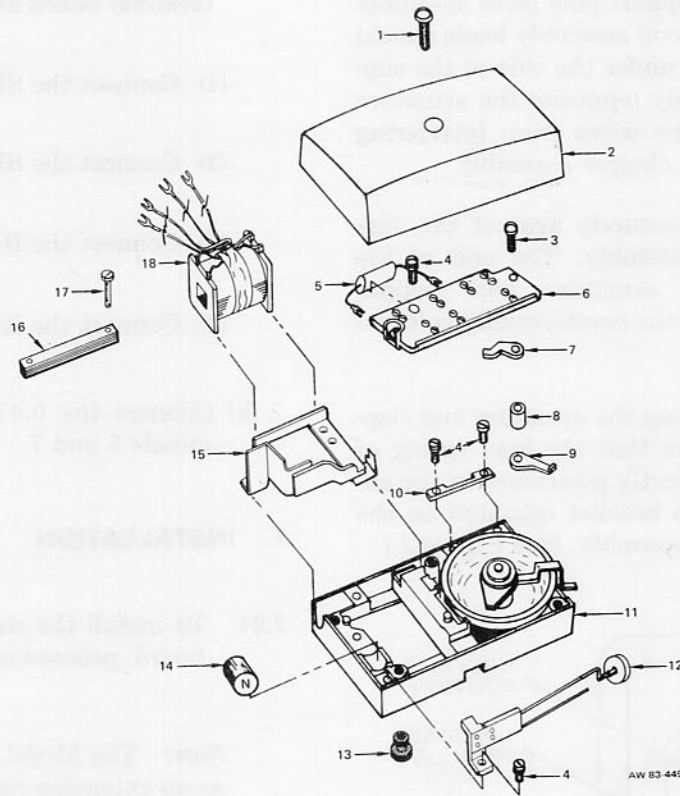


Figure 2: Model 136 Ringer, Exploded View

TABLE B  
REPLACEMENT PARTS LIST

INDEX NO	PART NUMBER	DESCRIPTION	QUANTITY USED
		<b>Model 136 Ringer</b>	<b>136-0BA</b>
1	190178-102	Lock Screw (Cover Mounting)	1
2	190192-101	Cover	1
3	069778-101	Screw	1
4	075408-102	Screw, With Lockwasher	4
5	183603-101	Capacitor, 0.47 MFD, 250 Volt	1
6	190148-101	Terminal Board Assembly	1
7	190143-101	Lever, Stop	1
8	190141-101	Spacer	1
9	190142-101	Lever, Lock	1
10	190144-101	Retainer, Cord	2
11	190146-101	Frame And Gong Assembly	1
12	190066-101	Armature And Clapper Assembly	1
13	075371-101	Foot, Rubber	4
14	184177-101	Magnet	1
15	075398-101	Support Pole Assembly	1
16	075395-101	Core, Laminations	18
17	075409-104	Screw, Lamination Mounting	2
18	185480-102	Coil Assembly	1

AW 84 165

(c) Mount the core laminations and the coil assembly to the support pole piece assembly using two screws. The coil assembly leads should pass over the coil and under the side of the support pole piece assembly (opposite the armature side); this prevents the wires from interfering with the armature and clapper assembly.

(d) Place the magnet securely against the support pole piece assembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.

**Note:** When installing the armature and clapper assembly, ensure that the bias spring of the assembly is correctly positioned in the adjustment slot of the bracket mounted on the support pole piece assembly. (See Figure 3.)

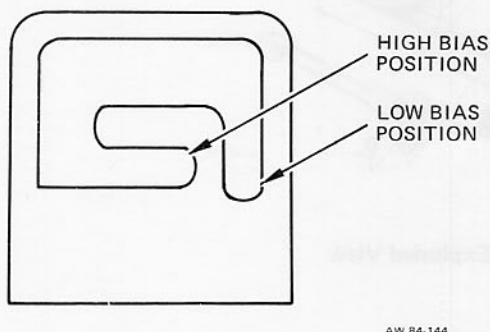


Figure 3: Adjustment Positions of the Bias Spring

(e) Place the armature and clapper assembly into the gap of the support pole piece assembly; the clapper should be resting inside the gong. Ensure that the mounting bracket for the armature and clapper assembly is positioned against the magnet.

(f) Place the terminal board mounting screw through the hole in the top right-hand corner of the terminal board.

(g) Slide the stop lever, spacer, and lock lever in place on the terminal board mounting screw.

(h) Position the terminal board on the ringer frame and mount it to the ringer frame using two screws.

(j) Connect the ringer coil assembly leads to the terminal board as follows:

(1) Connect the SL-RD lead to terminal 1.

(2) Connect the SL lead to terminal 1.

(3) Connect the BK lead to terminal 6.

(4) Connect the RD lead to terminal 7.

(k) Connect the 0.47 mfd capacitor across terminals 5 and 7.

## 7. INSTALLATION

7.01 To install the ringer on a wall or mounting-board, proceed as follows:

**Note:** The Model 136 ringer is normally used as an extension ringer that is connected across the Tip and Ring leads of a line at a connecting block; it is used with the original telephone ringer. The Model 136 ringer can also be used as an extension ringer for a subscriber with Tip Party Identification if the ringer inside the telephone is disconnected and the Model 136 ringer is connected in place of the original ringer. Refer to the telephone circuit label for Tip Party Identification terminal connections.

(a) Install the ringer line cord to the wall, or through a hole in the wall if the line cord is to be hidden.

(b) Mount the ringer to the wall using four screws. Ensure that the ringer line cord passes through either the slot in the back of the ringer frame or through one of the slots on each end of the frame.

**Note:** If the ringer line cord is inserted through one of the slots on the end of the ringer frame, it can be secured in place using one of the cord retainers located on the ringer frame.

(c) For bridged ringing, connect the ringer line cord leads from the telephone or main distribution frame to the ringer terminal board as follows:

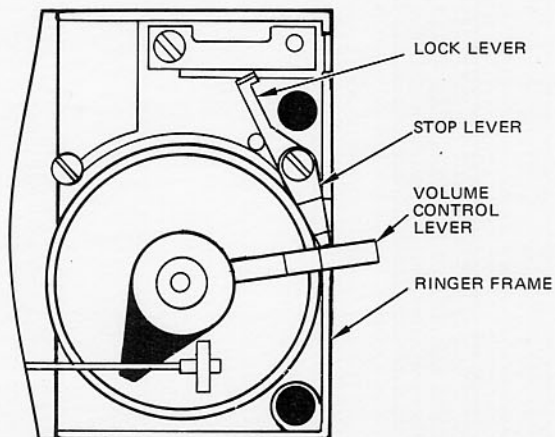
- (1) Connect the Ring lead to terminal 5 of the terminal board.
- (2) Connect the Tip lead to terminal 6 of the terminal board.

(d) Install the cover to the ringer frame using one screw.

## 8. ADJUSTMENTS

### Volume Control

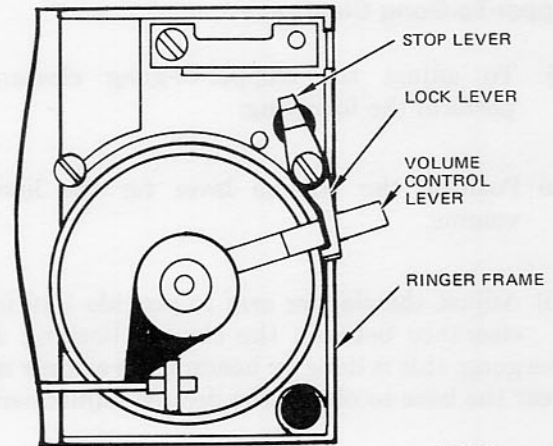
**8.01** Ringer volume is controlled by moving the volume control lever on the side of the ringer frame. (See Figure 4.) An indicating arrow for increasing the loudness of the ringing is stamped in ink on the ringer frame.



AW 83 464

Figure 4: Stop Lever in Silent Ringer Position

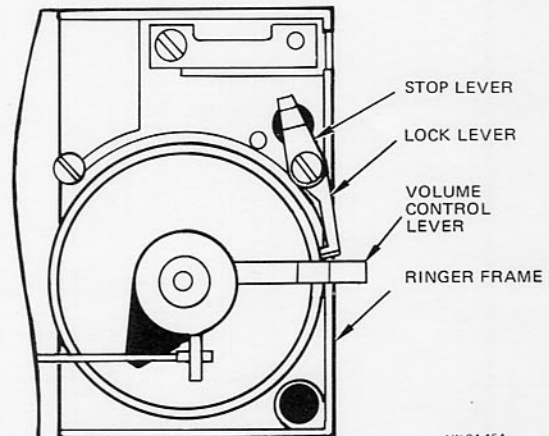
**8.02** The ringer can be silenced by loosening the terminal board mounting screw that holds the stop lever and moving the stop lever to allow the volume control lever to be placed in the ringer silencing position on the ringer frame. The volume control lever can be locked into place by positioning the lock lever over the volume control lever as shown in Figure 5. Tighten the terminal board mounting screw after adjustment is complete.



AW 83-462

Figure 5: Lock Lever in Locked Silent Ringer Position

**8.03** The lock lever can be positioned to prevent the volume control lever from being moved into the low volume position. This is accomplished by positioning the lock lever as shown in Figure 6.



AW 84-154

Figure 6: Lock Lever in Position to Prevent Low Ringing

### Bias Spring

**8.04** The ringer is shipped with the bias spring in the high bias position for ringing at 77 VAC, 20 Hz. For lower voltages and 30 Hz ringing, the bias spring can be moved to the low bias position. (See Figure 3.)

**Clapper-To-Gong Clearance**

**8.05** To adjust the clapper-to-gong clearance, perform the following:

- (a) Position the volume lever for the lowest volume.
- (b) Adjust the clapper arm to provide 1/16 inch clearance between the clapper bushing and the gong; this is done by bending the clapper arm near the base to obtain the desired adjustment.

(c) Adjust the rubber cam to provide 1/16 inch clearance between the clapper bushing and the rubber cam; this is done by rotating the rubber cam.

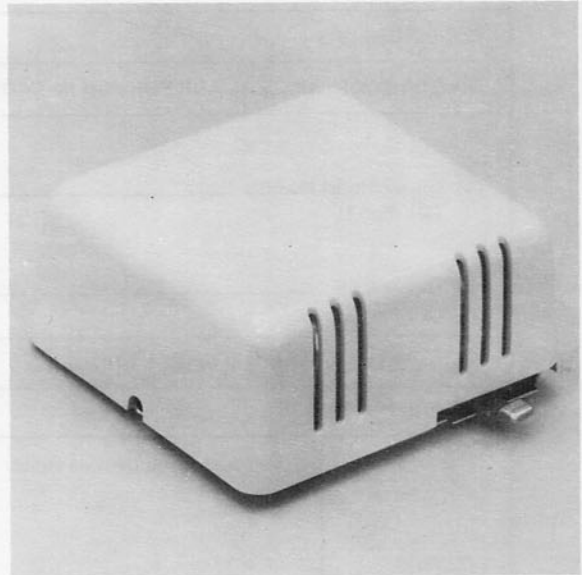
(d) Position the volume lever to silence the ringer; the rubber cam should contact the clapper bushing.

(e) Adjust the clapper arm so the clapper bushing will contact the rubber cam squarely; this is done by bending the clapper arm near the base to obtain the desired adjustment.



## MODEL 139 RINGER

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AW 84-821

Figure 1: Model 139 Ringer

### 1. INTRODUCTION

**1.01** This document covers the Model 139 ringer. (See Figure 1.) A general description as well as information on removal, disassembly, replacement parts, assembly, and installation is included.

**1.02** Whenever this section is reissued, reason for reissue will be listed in this paragraph.

### 2. GENERAL DESCRIPTION

**2.01** The Model 139 ringer (see Figure 2) is designed for use as an external ringer and is equipped with a mechanical volume control. The assembly consists of a Model 130 ringer mounted on a metal base plate; it is protected by a beige-colored, molded plastic cover. External connections are made to a terminal board mounted on the metal base plate.

**2.02** The ringer is mounted on shock-absorbing rubber grommets. Two grommets are located on the sides of the ringer frame for inserting screws to mount the ringer to the base plate. An alignment pin, molded into the ringer frame, is inserted into an additional grommet located on the base plate.

**2.03** The Model 139 ringer is identified by a code number stamped in ink on the back of the base plate. Refer to ordering information in Table A for an explanation of each code number.

### 3. REMOVAL

**3.01** To remove the ringer from its mounting location, proceed as follows:

- (a) Loosen and remove the cover mounting screw located on the top of the cover.
- (b) Lift the cover from the base plate.
- (c) Disconnect the ringer line cord leads that come into the ringer.
- (d) Loosen and remove the three base plate mounting screws.

### 4. DISASSEMBLY

**4.01** To disassemble the Model 139 ringer, proceed as follows:

- (a) Disconnect the coil assembly leads from the terminal board.
- (b) Loosen the two ringer frame mounting screws. Lift the Model 130 ringer from the base plate. Refer to Section 55-130-113 of this manual for procedures to disassemble the Model 130 ringer.

TABLE A  
ORDERING INFORMATION

CODE NUMBERS			
RINGER CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS:			
(1) Ringer Model Number (See Part 1)		000139	OBA
(2) Ringer Style (See Part 2)			
PART 1 RINGER MODEL NUMBER		PART 2 RINGER STYLE	
CODE	DESCRIPTION	CODE	DESCRIPTION
000139	Model 139 Extension Ringer	OBA	Straight-Line, Biased-Type Ringer (Model 130 Ringer)
		OLR	With Volume Control Ringer Box For Two-Gong Ringer (No Ringer Included)

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(c) Disconnect the capacitor leads from the terminal board.

(d) Loosen and remove the two screws that hold the terminal board to the base plate. Lift the terminal board from the base plate.

## 5. REPLACEMENT PARTS

5.01 Replacement parts for the Model 139 ringer are listed in Table B.

## 6. ASSEMBLY

6.01 To assemble the Model 139 ringer, proceed as follows:

(a) Position the terminal board on the base plate and mount using two screws.

(b) Connect a 0.47 mfd capacitor across terminals 5 and 7 on the terminal board.

(c) Insert the alignment pin of the ringer frame into the grommet provided on the base plate. Ensure that the tab on the volume control lever is inserted into the hole in the volume control wheel of the Model 130 ringer.

(d) Position the ringer on the base plate so that the two ringer frame mounting holes align with the mounting holes in the base. The coil assembly leads should pass under the ringer to avoid interference with the clapper mechanism.

*Note:* The shock-absorbing rubber grommets must be in place in the ringer frame mounting holes and in the base plate.

(e) Connect the coil assembly leads to the terminal board as follows:

(1) Connect the SL lead to terminal 1.

(2) Connect the SL-RD lead to terminal 1.

(3) Connect the RD lead to terminal 7.

(4) Connect the BK lead to terminal 6.

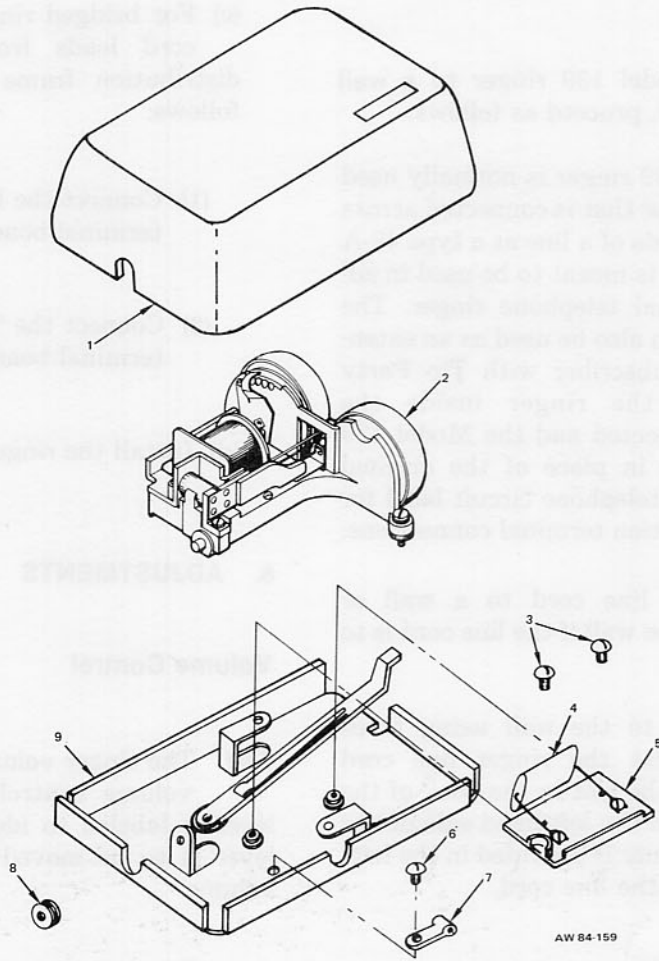


Figure 2: Model 139 Ringer, Exploded View

TABLE B  
REPLACEMENT PARTS LIST

INDEX NO	PART NUMBER	DESCRIPTION	QUANTITY USED	
			OBA	OLR
		<b>Model 139 Ringer</b>		
1	084259-101	Cover Assembly With Screws And Bracket	1	1
2	000130-OBA	Model 130 Ringer	1	—
3	061906-101	Screw, Terminal Board Mounting	2	2
4	183603-101	Capacitor, 0.47 MFD	1	1
5	190148-102	Terminal Board Assembly	1	1
6	182607-101	Screw, Cord Retainer Mounting	1	1
7	078825-102	Retainer, Cord	1	1
8	075303-101	Grommet	1	1
9	084362-101	Base Assembly	1	1

AW 84-206

## 7. INSTALLATION

**7.01** To install the Model 139 ringer to a wall or mounting board, proceed as follows:

*Note:* The Model 139 ringer is normally used as an extension ringer that is connected across the Tip and Ring leads of a line at a type 42-A connecting block. It is meant to be used in addition to the original telephone ringer. The Model 139 ringer can also be used as an extension ringer for a subscriber with Tip Party Identification, if the ringer inside the telephone is disconnected and the Model 139 ringer is connected in place of the original ringer. Refer to the telephone circuit label for Tip Party Identification terminal connections.

- (a) Install the ringer line cord to a wall or through a hole in the wall if the line cord is to be hidden.
- (b) Mount the ringer to the wall using three screws. Ensure that the ringer line cord passes through either the slot in the back of the base plate or the slot in the left-hand side of the base plate. A cord retainer is provided in the left-hand side for securing the line cord.

(c) For bridged ringing, connect the ringer line cord leads from the telephone or main distribution frame to the terminal board as follows:

- (1) Connect the Ring lead to terminal 5 of the terminal board.
- (2) Connect the Tip lead to terminal 6 of the terminal board.

(d) Install the ringer cover using one screw.

## 8. ADJUSTMENTS

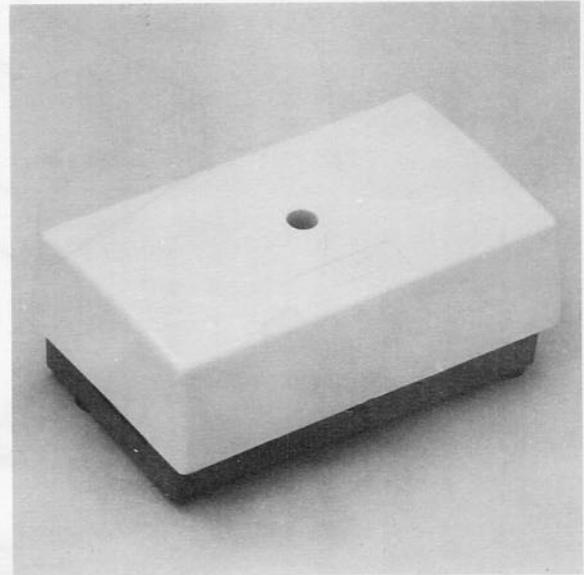
### Volume Control

**8.01** The ringer volume is adjusted by sliding the volume control lever. The volume control lever is labeled to identify the direction that the lever is to be moved to increase or decrease the volume.

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## MODEL 147 RINGER

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AW 84-816

Figure 1: Model 147 Ringer

### 1. INTRODUCTION

**1.01** This document covers the Model 147 ringer. (See Figure 1.) A general description as well as information on removal, disassembly, replacement parts, assembly, installation, and adjustments is included.

**1.02** Whenever this section is reissued, reason for reissue will be listed in this paragraph.

### 2. GENERAL DESCRIPTION

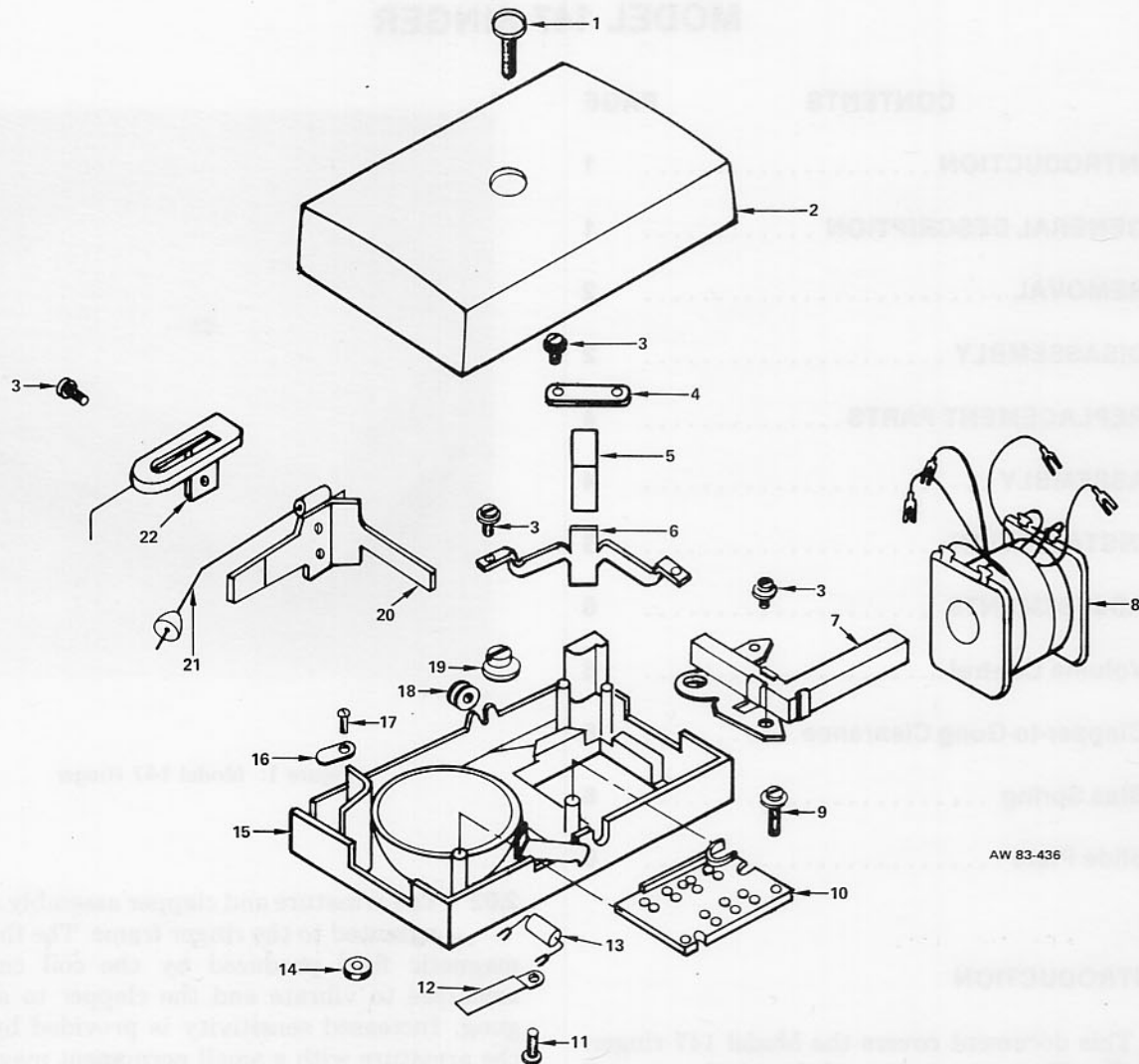
**2.01** The Model 147 ringer (see Figure 2) is a miniature, single-gong, biased-type, frequency-selective, extension ringer equipped with a mechanical volume control and assembled on a die-cast frame with a beige-colored, molded plastic cover. A laminated soft-iron core holds the double-wound coil in place. Through the use of various clapper weights and capacitors, the ringer is tuned to ring at a specific frequency.

**2.02** The armature and clapper assembly is spring-mounted to the ringer frame. The fluctuating magnetic field produced by the coil causes the armature to vibrate and the clapper to strike the gong. Increased sensitivity is provided by biasing the armature with a small permanent magnet.

**2.03** The ringer is mounted on three shock-absorbing rubber grommets located on the ringer frame.

**2.04** Frequency-selective ringers are divided into three classes. HA ringers are classed as harmonic. HB ringers are classed as synchrononic. HC ringers are classed as decimonic.

**2.05** The Model 147 ringer is identified by a code number stamped in ink on the back of the ringer frame. Refer to ordering information in Table A for an explanation of each code number and a list of available ringers.



AW 83-436

Figure 2: Model 147 Ringer, Exploded View

### 3. REMOVAL

**3.01** To remove the ringer from its mounting location, proceed as follows:

- (a) Remove the cover from the ringer frame by loosening the cover mounting screw and lifting the cover.
- (b) Disconnect the ringer line cord leads coming into the ringer.
- (c) Loosen and remove the three ringer frame mounting screws.

### 4. DISASSEMBLY

**4.01** To disassemble the ringer, proceed as follows:

- (a) Disconnect the coil assembly leads from the terminal board.
- (b) Disconnect the capacitor leads from the terminal board.
- (c) Loosen and remove the two screws that hold the terminal board to the ringer frame. Lift the terminal board from the ringer frame.

TABLE A  
ORDERING INFORMATION

CODE NUMBERS							
RINGER CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS:							
(1) Ringer Model Number (See Part 1)		000147		HA1			
(2) Selective Frequency (See Part 2)							
PART 1 RINGER MODEL NUMBER				PART 2 SELECTIVE FREQUENCY			
CODE	DESCRIPTION	CODE	FREQUENCY	CODE	FREQUENCY	CODE	FREQUENCY
000147	Model 147 Ringer	HA1	33 1/3 Hz	HB1	30 Hz	HC1	20 Hz
		HA2	50 Hz	HB2	42 Hz	HC2	60 Hz
		HA3	66 2/3 Hz	HB3	54 Hz	HC3	30 Hz
		HA4	16 2/3 Hz	HB4	66 Hz	HC4	40 Hz
		HA5	25 Hz	HB5	16 Hz	HC5	50 Hz
							(Same As HA2)

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(d) Loosen and remove the two screws that hold the bias spring to the ringer frame. Lift the bias spring from the ringer frame.

(e) Lift the armature and clapper assembly from the ringer frame.

(f) Using a permanent marker, place a reference mark on the magnet to ensure that proper polarity is maintained during reassembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.

(g) Loosen and remove the two screws that hold the clamping plate to the ringer frame. Lift the clamping plate from the ringer frame.

(h) Lift the magnet from the ringer frame.

(j) Loosen and remove the two screws that hold the shunt bar to the ringer frame. Lift the shunt bar from the ringer frame.

(k) Loosen and remove the screw that holds the slide plate and core assembly to the ringer frame.

(m) Lift the slide plate and core assembly from the ringer frame. Slide the coil assembly from the core laminations.

(n) Lift the slotted adjusting cam washer from the ringer frame.

(p) Loosen the screw on the back of the ringer frame, slide the retaining clip to one side, and lift the capacitor from the ringer frame.

5. REPLACEMENT PARTS

5.01 Replacement parts for the Model 147 ringer are listed in Table B. (Table B is located at the end of this section.)

6. ASSEMBLY

6.01 To assemble the ringer, proceed as follows (see Figure 3):

(a) Place the capacitor (see Table C) under the retaining clip on the back of the ringer frame and insert the capacitor leads through the slot in the ringer frame. Tighten the retaining clip mounting screw.

TABLE C

RINGER SERIES CAPACITORS

CAPACITANCE (MDF)	CODE SERIES
0.5	HA4, HA5, HB1, HB5, HC1, HC3
0.35	HA1
0.25	HB2, HC4
0.1	HA2, HA3, HB3, HB4, HC2, HC5

AW 84-892

(b) Place the slotted adjusting cam washer in the indentation provided on the ringer frame.

(c) Slide the coil assembly onto the laminated core and slide plate assembly, then position the core and slide plate assembly with the coil assembly onto the ringer frame. Ensure that the slide plate rests flat against the ringer frame in the tracks provided and that the slotted adjusting cam washer is positioned in the correct slide plate hole.

(d) Mount the slide plate to the ringer frame using one screw. Final adjustment of the slide plate is provided in paragraph 8.04.

(e) Position the shunt bar on the ringer frame and mount it to the ringer frame using two screws.

(f) Place the magnet securely against the shunt bar. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.

(g) Position the clamping plate over the magnet and mount it to the ringer frame using two screws.

(h) Place the armature and clapper assembly into the gap between the magnet and the mounting post on the ringer frame. Ensure that the armature return spring of the assembly is outside the mounting post.

(j) Position the bias spring on the mounting post, then align the mounting holes with the holes in the armature return spring and the holes in the mounting post.

(k) Mount the bias spring to the ringer frame using two screws.

*Note:* The bias spring must be positioned to the left of the clapper arm when viewing the ringer from the top.

(m) Position the terminal board on the ringer frame and mount it to the ringer frame using two screws.

(n) Connect the capacitor to the terminal board at terminals 5 and 7. (See Table C.)

(p) Connect the ringer coil assembly leads to the terminal board as follows:

- (1) Connect the SL-RD lead to terminal 1.
- (2) Connect the SL lead to terminal 1.
- (3) Connect the BK lead to terminal 6.
- (4) Connect the RD lead to terminal 7.

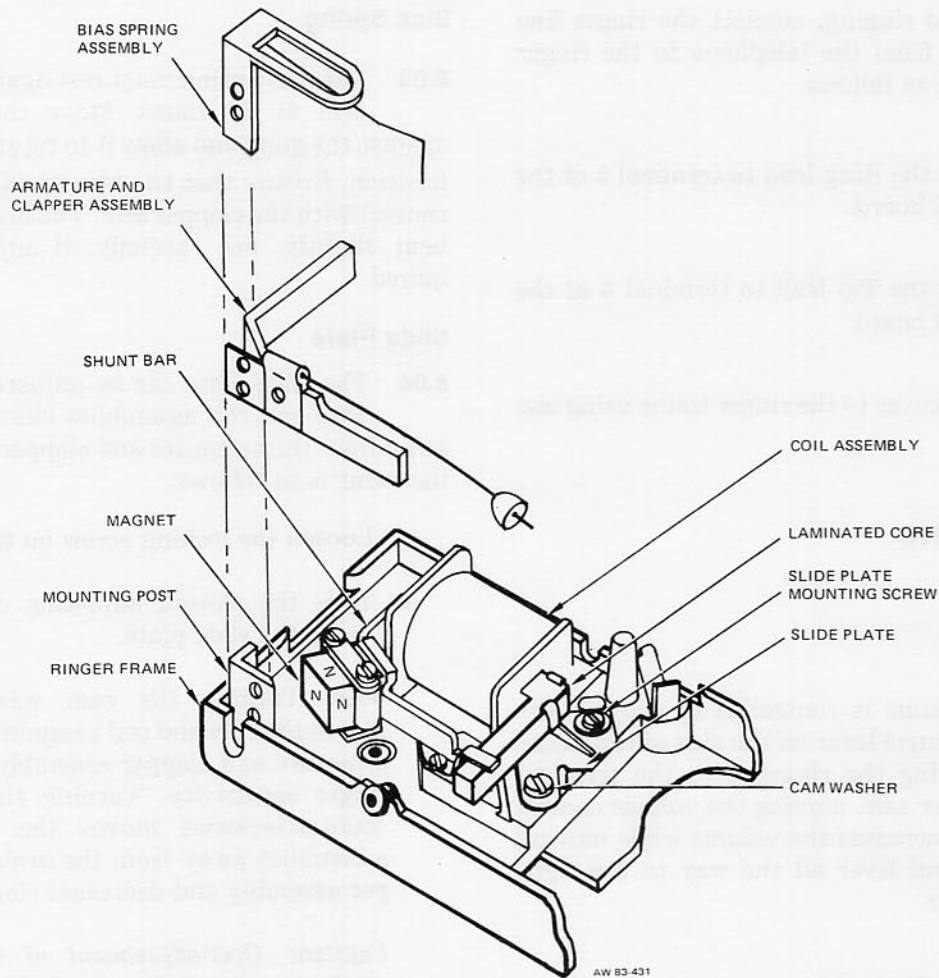


Figure 3: Model 147 Ringer Component Locations

## 7. INSTALLATION

*Note:* The Model 147 ringer is normally used as an extension ringer that connects across the Tip and Ring leads of a line at a connecting block; it is used with the original telephone ringer. The Model 147 ringer can also be used as an extension ringer for a subscriber with Tip Party Identification if the ringer inside the telephone is disconnected and the Model 147 ringer is connected at the telephone in place of the original ringer. Refer to the telephone circuit label for Tip Party Identification terminal connections.

**7.01** To install the ringer on a wall or mounting board, proceed as follows:

- (a) Install the ringer line cord to a wall or through a hole in the wall if the line cord is to be hidden.
- (b) Mount the ringer to the wall using three screws. Ensure that the ringer line cord passes through either the slot in the back of the ringer frame or the slot in the top left-hand corner of the ringer frame. A cord retainer is provided in this corner for securing the line cord.

*Note:* The ringer must be installed with the side of the ringer frame nearest the armature and clapper assembly pointing upward. An indicating arrow is stamped in ink on the back of the ringer frame to aid in installation.

(c) For bridged ringing, connect the ringer line cord leads from the telephone to the ringer terminal board as follows:

- (1) Connect the Ring lead to terminal 5 of the terminal board.
- (2) Connect the Tip lead to terminal 6 of the terminal board.

(d) Install the cover to the ringer frame using one screw.

## 8. ADJUSTMENTS

### Volume Control

**8.01** Ringer volume is controlled by moving the volume control lever on the side of the ringer frame. When facing the ringer with the terminal board on the lower side, moving the volume control lever to the left increases the volume while moving the volume control lever all the way to the right silences the ringer.

### Clapper-to-Gong Clearance

**8.02** Coarse adjustment of the clapper-to-gong clearance for the Model 147 ringer is made by bending the clapper arm slightly.

### Bias Spring

**8.03** The bias spring must rest against the clapper arm at all times. Move the clapper arm against the gong and allow it to return to its normal position. Ensure that the bias spring does not lose contact with the clapper arm. The bias spring can be bent slightly, but carefully, if adjustment is required.

### Slide Plate

**8.04** The slide plate can be adjusted to move the core and coil assemblies closer to or farther away from the armature and clapper assembly. Adjustment is as follows:

- (a) Loosen the locking screw on the slide plate.
- (b) Turn the slotted adjusting cam washer to move the slide plate.

*Note:* Turning the cam washer clockwise moves the core and coil assemblies closer to the armature and clapper assembly and increases ringer sensitivity. Turning the cam washer counterclockwise moves the core and coil assemblies away from the armature and clapper assembly and decreases ringer sensitivity.

*Caution: Over-adjustment of the slide plate produces cross-ringing (undesired ringing at a selective frequency other than the frequency that the ringer is tuned for).*

- (c) When the desired adjustment is made, tighten the locking screw.

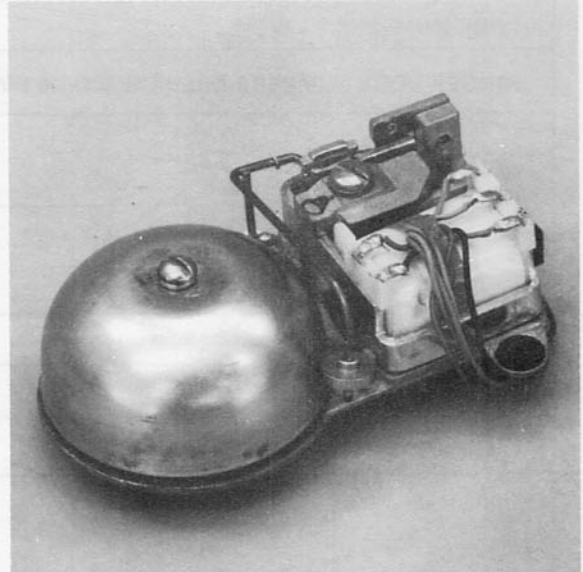
TABLE B  
REPLACEMENT PARTS LIST

INDEX NO	PART NUMBER	DESCRIPTION	QUANTITY USED														
			HA1	HA2	HA3	HA4	HA5	HB1	HB2	HB3	HB4	HB5	HC1	HC2	HC3	HC4	HC5
1	190178-102	Screw, Cover Mounting	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	190192-101	Cover	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	079259-102	Screw, Mounting	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
4	075563-101	Plate, Clamping	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	075562-102	Magnet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	075566-101	Bar, Shunt	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	075578-101	Slide Plate And Lamination Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	185480-108	Coil Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	075408-102	Screw, Terminal Board Mounting	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10	190188-101	Terminal Board Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	063261-103	Screw, Retaining Clip Mounting	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	190472-101	Clip, Retaining	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	190440-103	Capacitor And Terminal Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	190440-105	Capacitor And Terminal Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	190440-104	Capacitor And Terminal Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	190440-102	Capacitor And Terminal Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14	075371-101	Foot, Rubber	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
15	190194-101	Frame And Gong Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	190181-101	Retainer, Cord	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	064127-101	Screw, Cord Retainer Mounting	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	081958-101	Grommet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	075560-101	Washer, Slotted Adjusting Cam	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20	075565-101	Armature	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
21	081056-102	Clapper Stem Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	183923-101	Bias Spring Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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8. ADJUSTMENTS .....	4
Volume Control .....	4
Clapper-to-Gong Clearance .....	4
Bias Spring .....	4



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Figure 1: Model 148 Ringer

### 1. INTRODUCTION

**1.01** This document covers the Model 148 ringer. (See Figure 1.) A general description as well as information on removal, disassembly, replacement parts, assembly, installation, and adjustments is included.

**1.02** Whenever this section is reissued, reason for reissue will be listed in this paragraph.

**1.03** For applications of the Model 148 ringer in telephones, refer to the appropriate section in Volume 1 of the ITT Telephone Apparatus Practices Manual.

### 2. GENERAL DESCRIPTION

**2.01** The Model 148 ringer (see Figure 2) is a miniature, single-gong, straight-line, biased-type ringer equipped with a mechanical volume control and assembled on a die-cast frame. A laminated soft-iron core holds the single-wound coil in place. The ringer is designed to ring at 20 or 30 Hz.

**2.02** The armature and clapper assembly is spring-mounted to the ringer frame. The fluctuating magnetic field produced by the coil causes the armature to vibrate and the clapper to strike the gong. Increased sensitivity is provided by biasing the armature with a small permanent magnet.

**2.03** The ringer is mounted on two shock-absorbing rubber grommets located on the ringer frame.

**2.04** Two variations of the Model 148 ringer are available. The 000148-ABA ringer is a straight-line, biased-type ringer designed to ring at 20 Hz or 30 Hz. The 000148-DBA ringer is identical to the 000148-ABA except the ringer can be silenced by means of the volume control. Refer to Table A for ordering information.

### 3. REMOVAL

**3.01** To remove the ringer from the telephone, proceed as follows:

- (a) Remove the telephone housing.
- (b) Remove any telephone components that may obstruct access to the ringer.

TABLE A  
ORDERING INFORMATION

CODE NUMBERS			
RINGER CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS:			
(1) Ringer Model Number (See Part 1)	000148	ABA	
(2) Ringer Style (See Part 2)			
PART 1 RINGER MODEL NUMBER		PART 2 RINGER STYLE	
CODE	DESCRIPTION	CODE	DESCRIPTION
000148	Model 148 Ringer	ABA	Straight-Line, Biased-Type Ringer With Volume Control
		DBA	Straight-Line, Biased-Type Ringer With Volume Control Silencer

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- (c) Disconnect the ringer leads.
- (d) Loosen the two mounting screws and lift the ringer from the telephone base.

#### 4. DISASSEMBLY

4.01 To disassemble the ringer, proceed as follows:

- (a) Loosen and remove the screw that holds the gong to the ringer frame.
- (b) Remove the gong and the resonator.
- (c) Using a permanent marker, place a reference mark on the magnet to ensure that proper polarity is maintained during reassembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.
- (d) Loosen and remove the two screws that hold the armature and clapper assembly to the ringer frame.
- (e) Lift the armature and clapper assembly from the ringer frame.

- (f) Loosen and remove the screw that holds the retaining plate to the ringer frame. Remove the retaining plate.

- (g) Remove the magnet.

- (h) Lift the pole piece assembly from the ringer frame.

#### 5. REPLACEMENT PARTS

5.01 Replacement parts for the Model 148 ringer are listed in Table B.

#### 6. ASSEMBLY

6.01 To assemble the ringer proceed as follows:

- (a) Place the pole piece assembly on the ringer frame while ensuring proper alignment with the locating pins on the ringer frame.
- (b) Place the magnet securely against the pole piece assembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.

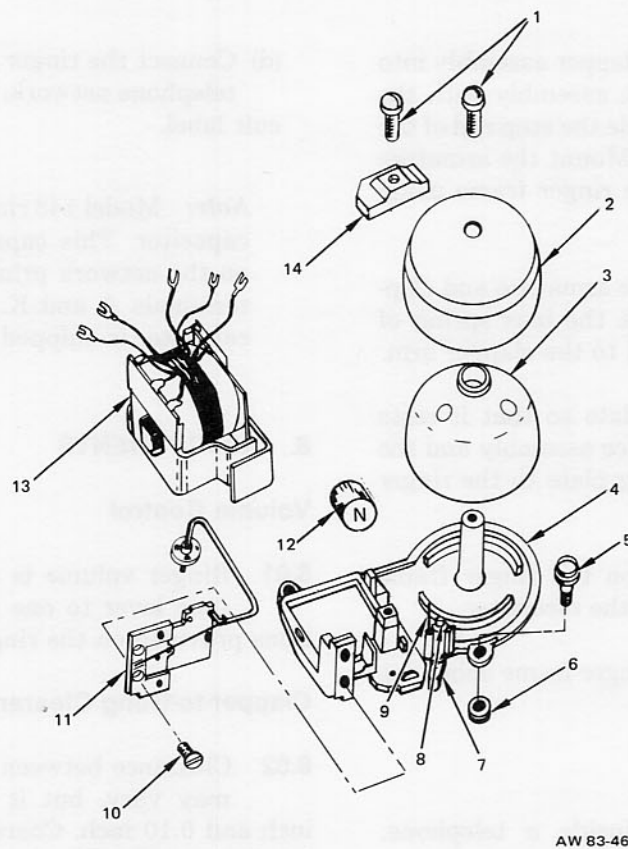


Figure 2: Model 148 Ringer, Exploded View

TABLE B  
REPLACEMENT PARTS LIST

INDEX NO	PART NUMBER	DESCRIPTION	QUANTITY USED	
			148-ABA	148-DBA
<b>Model 148 Ringer</b>				
1	075408-102	Lockwasher Screw (Gong And Retaining Plate Mounting)	2	2
2	075396-101	Gong	1	1
3	075372-101	Resonator	1	1
4	088480-104	Frame, Ringer Mounting	1	1
5	095966-102	Screw (Ringer Mounting)	2	2
6	088209-101	Grommet	2	2
7	180122-101	Lever, Tone	1	1
8	095972-101	Nut, Push	1	1
9	182739-101	Rod, Stop	1	1
10	063975-101	Screw (Armature And Clapper Assembly Mounting)	2	2
11	182734-101	Armature And Clapper Assembly	1	1
12	184176-101	Magnet	1	1
13	088481-107	Pole Piece Assembly	1	—
13	088481-105	Pole Piece Assembly	—	1
14	088483-101	Plate, Retaining	1	1
	095995-103	Capacitor, 0.47 MFD (Not Shown)	1	1

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(c) Place the armature and clapper assembly into the gap of the pole piece assembly with the clapper arm positioned outside the stop rod of the mechanical volume control. Mount the armature and clapper assembly to the ringer frame using two screws.

*Note:* When installing the armature and clapper assembly, ensure that the bias spring of the assembly is connected to the clapper arm.

(d) Position the retaining plate so that it rests against both the pole piece assembly and the magnet. Mount the retaining plate to the ringer frame using one screw.

(e) Position the resonator on the ringer frame and place the gong over the resonator.

(f) Mount the gong to the ringer frame using one screw.

**7. INSTALLATION**

7.01 To install the ringer inside a telephone, proceed as follows:

(a) Remove the telephone housing.

(b) Position the ringer on the telephone base so that the two ringer frame mounting holes align with the mounting holes in the telephone base.

*Note:* The shock-absorbing rubber grommets must be in place in the ringer frame mounting holes.

(c) Mount the ringer to the telephone base using two screws.

(d) Connect the ringer coil assembly leads to the telephone network. Refer to the telephone circuit label.

*Note:* Model 148 ringers use a series matching capacitor. This capacitor is usually provided on the network printed circuit board between terminals A and K. Additionally, a 0.47 mfd capacitor is shipped loose with the ringer.

**8. ADJUSTMENTS**

**Volume Control**

8.01 Ringer volume is controlled by moving the tone lever to one of the three selector positions provided on the ringer frame.

**Clapper-to-Gong Clearance**

8.02 Clearance between the clapper and the gong may vary, but it should be between 0.030 inch and 0.10 inch. Coarse adjustment is made by bending the clapper arm. Fine adjustment is made by rotating the gong.

**Bias Spring**

8.03 The ringer is factory-adjusted to prevent dial tap up to 80 VDC. If ringer dial tap occurs, readjust the bias spring as follows:

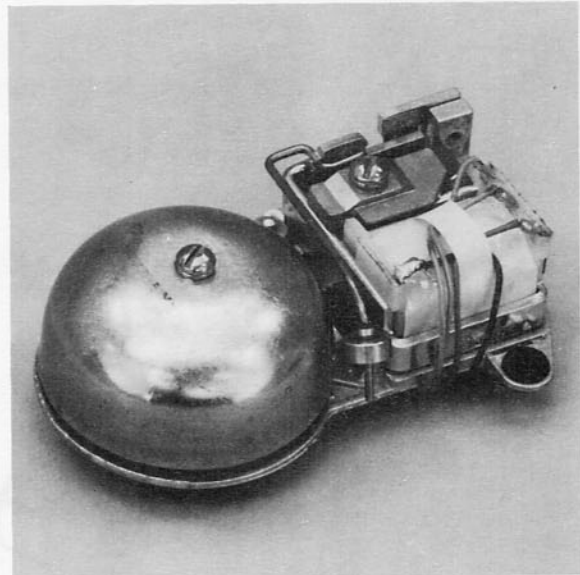
(a) Remove the bias spring from the clapper arm.

(b) Add tension to the bias spring by bending it outward slightly and carefully.

(c) Hook the bias spring onto the clapper arm.

## MODEL 151 RINGER

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8. ADJUSTMENTS .....	4
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Clapper-to-Gong Clearance .....	4



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Figure 1: Model 151 Ringer

### 1. INTRODUCTION

**1.01** This document covers the Model 151 ringer. (See Figure 1.) A general description as well as information on removal, disassembly, replacement parts, assembly, installation, and adjustments is included.

**1.02** Whenever this section is reissued, reason for reissue will be listed in this paragraph.

**1.03** For applications of the Model 151 ringer in telephones, refer to the appropriate section in Volume 1 of the ITT Telephone Apparatus Practices Manual.

### 2. GENERAL DESCRIPTION

**2.01** The Model 151 ringer (see Figure 2) is a miniature, single-gong, biased-type, frequency-selective ringer equipped with a mechanical volume control and assembled on a die-cast frame. A laminated soft-iron core holds the single-wound coil in place. Through the use of various clapper weights and capacitors, the ringer is tuned to ring at different specific frequencies.

**2.02** The armature and clapper assembly is spring-mounted to the ringer frame. The fluctuating magnetic field produced by the coil causes the ar-

mature to vibrate and the clapper to strike the gong. Increased sensitivity is provided by biasing the armature with a small permanent magnet.

**2.03** The ringer is mounted on two shock-absorbing rubber grommets located on the ringer frame.

**2.04** Frequency-selective ringers are divided into three classes. HA ringers are classed as harmonic. HB ringers are classed as synchrononic. HC ringers are classed as decimonic.

**2.05** The Model 151 ringer is identified by a code number printed on a ringer label attached to the gong. Refer to ordering information in Table A for an explanation of each code number and a list of available ringers.

### 3. REMOVAL

**3.01** To remove the ringer from the telephone, proceed as follows:

- (a) Remove the telephone housing.
- (b) Remove any telephone components that may obstruct access to the ringer.

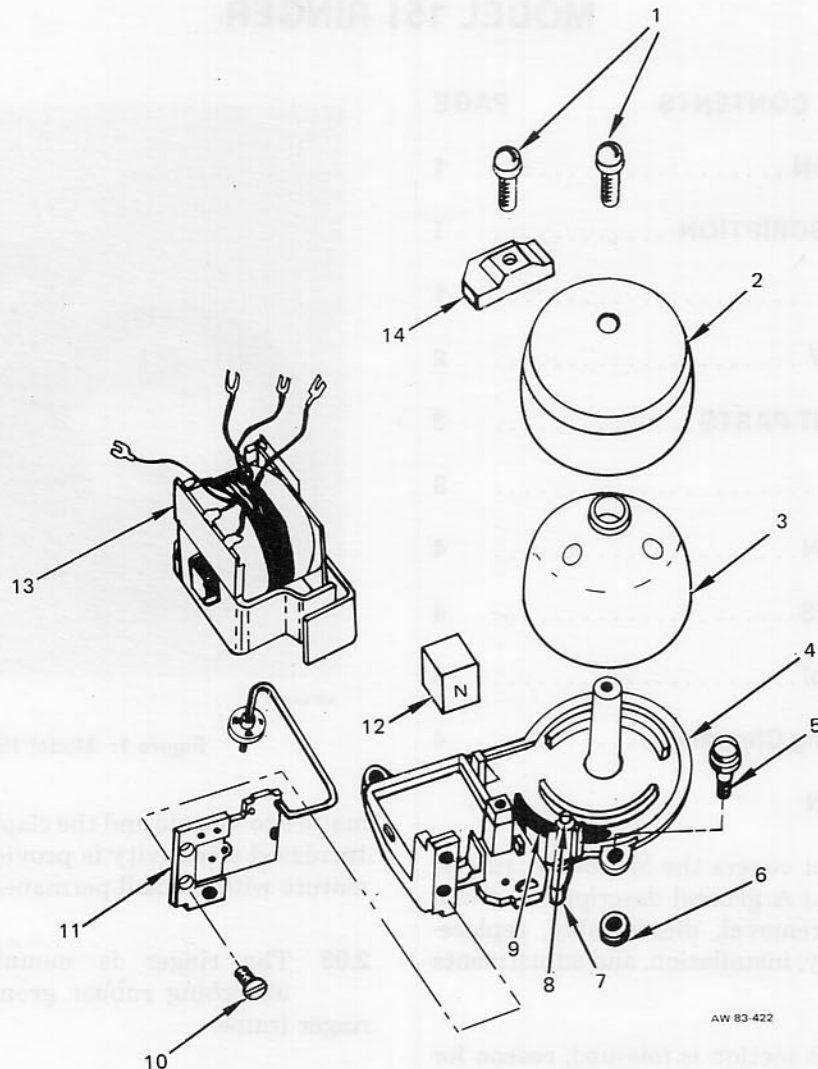


Figure 2: Model 151 Ringer, Exploded View

- (c) Disconnect the ringer leads.
- (d) Loosen the two frame mounting screws and lift the ringer from the telephone base.

#### 4. DISASSEMBLY

4.01 To disassemble the ringer, proceed as follows:

- (a) Loosen and remove the screw that holds the gong to the ringer frame.
- (b) Remove the gong and the resonator.
- (c) Using a permanent marker, place a reference mark on the magnet to ensure that proper polarity is maintained during reassembly. The

end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.

- (d) Loosen and remove the two screws that hold the armature and clapper assembly to the ringer frame.
- (e) Lift the armature and clapper assembly from the ringer frame.
- (f) Loosen and remove the screw that holds the retaining plate to the ringer frame. Remove the retaining plate.
- (g) Remove the magnet.

TABLE A  
ORDERING INFORMATION

CODE NUMBERS							
RINGER CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS:							
(1) Ringer Model Number (See Part 1)		000151		HA1			
(2) Selective Frequency (See Part 2)							
PART 1 RINGER MODEL NUMBER				PART 2 SELECTIVE FREQUENCY			
CODE	DESCRIPTION	CODE	FREQUENCY	CODE	FREQUENCY	CODE	FREQUENCY
000151	Model 151 Ringer	HA1	33 1/3 Hz	HB1	30 Hz (Same As HC3)	HC1	20 Hz
		HA2	50 Hz (Same As HC5)	HB2	42 Hz	HC2	60 Hz
		HA3	66 2/3 Hz	HB3	54 Hz	HC3	30 Hz (Same As HB1)
		HA4	16 2/3 Hz	HB4	66 Hz	HC4	40 Hz
		HA5	25 Hz	HB5	16 Hz	HC5	50 Hz (Same As HA2)

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(h) Lift the pole piece assembly from the ringer frame.

## 5. REPLACEMENT PARTS

5.01 Replacement parts for the Model 151 ringer are listed in Table B. (Table B is located at the end of this section.)

## 6. ASSEMBLY

6.01 To assemble the ringer, proceed as follows:

(a) Place the pole piece assembly on the ringer frame, checking for proper alignment with the locating pins on the ringer frame.

(b) Place the magnet securely against the pole piece assembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.

(c) Place the armature and clapper assembly into the gap of the pole piece assembly. Mount the armature and clapper assembly to the ringer frame using two screws.

(d) Position the retaining plate so that it rests against both the pole piece assembly and the magnet. Mount the retaining plate to the ringer frame using one screw.

- (e) Position the resonator on the ringer frame, and place the gong over the resonator.
- (f) Mount the gong to the ringer frame using one screw.

**7. INSTALLATION**

**7.01** To install the ringer inside a telephone, proceed as follows:

- (a) Position the ringer on the telephone base so that the two mounting holes in the ringer frame align with the mounting holes in the telephone base.

*Note:* The shock-absorbing rubber grommets must be in place in the ringer frame mounting holes.

- (b) Mount the ringer to the telephone base using two screws.

*Note:* The Model 151 ringer uses a series matching capacitor that creates a resonant circuit for a selected ringing frequency. (See Table C.) The capacitor required for the reso-

nant circuit is shipped loose with the ringer, and a 0.47 mfd capacitor is provided between network terminals A and K.

- (c) Connect the series matching capacitor across network terminals A and F if the required capacitor has a value other than 0.47 mfd. Refer to the telephone circuit label.

- (d) Connect the ringer coil assembly leads to the telephone network. Refer to the telephone circuit label.

**8. ADJUSTMENTS**

**Volume Control**

**8.01** Ringer volume is controlled by moving the tone lever to one of the three selector positions provided on the ringer frame.

**Clapper-to-Gong Clearance**

**8.02** Clearance between the clapper and the gong may vary, but it should be between 0.030 inch and 0.10 inch. Coarse adjustment is made by bending the clapper arm. Fine adjustment is made by rotating the gong.

TABLE C

RINGER SERIES CAPACITORS

NETWORK TERMINALS	CAPACITANCE (MFD)	CODE SERIES
A-K	0.47	HA4, HA5, HB5, HC1
A-F	0.25	HA1, HB1, HC3
A-F	0.15	HB2, HC4
A-F	0.08	HA2, HA3, HB3, HB4, HC2, HC5

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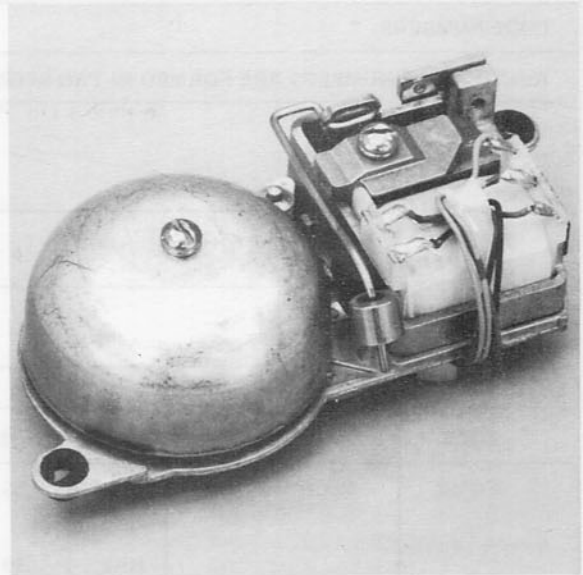
TABLE B  
REPLACEMENT PARTS LIST

INDEX NO	PART NUMBER	DESCRIPTION	QUANTITY USED															
			HA1	HA2	HA3	HA4	HA5	HB1	HB2	HB3	HB4	HB5	HC1	HC2	HC3	HC4	HC5	
		Model 151 Ringer	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1	075408-102	Screw With Lockwasher	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	075396-101	Gong	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	075372-101	Resonator	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	088480-104	Frame	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	095966-102	Screw, Frame Mounting	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6	088209-101	Grommet, Rubber	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7	180122-101	Lever, Tone	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	095972-101	Nut, Push	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	088884-101	Spring, Dampner	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	063975-101	Screw, Armature And Clapper Assembly Mounting	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11	088484-101	Armature And Clapper Assembly	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	088484-102	Armature And Clapper Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	088484-103	Armature And Clapper Assembly	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	088484-105	Armature And Clapper Assembly	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	088484-106	Armature And Clapper Assembly	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	088484-109	Armature And Clapper Assembly	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	184176-101	Magnet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	088481-103	Pole Piece Assembly (Coil And Laminated Core)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	088481-104	Pole Piece Assembly (Coil And Laminated Core)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	088483-101	Plate, Retaining	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	183603-101	Capacitor, 0.47 MFD (Not Shown)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	183603-102	Capacitor, 0.25 MFD (Not Shown)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	183603-103	Capacitor, 0.15 MFD (Not Shown)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	183603-104	Capacitor, 0.08 MFD (Not Shown)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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## MODEL 152 RINGER

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Figure 1: Model 152 Ringer

### 1. INTRODUCTION

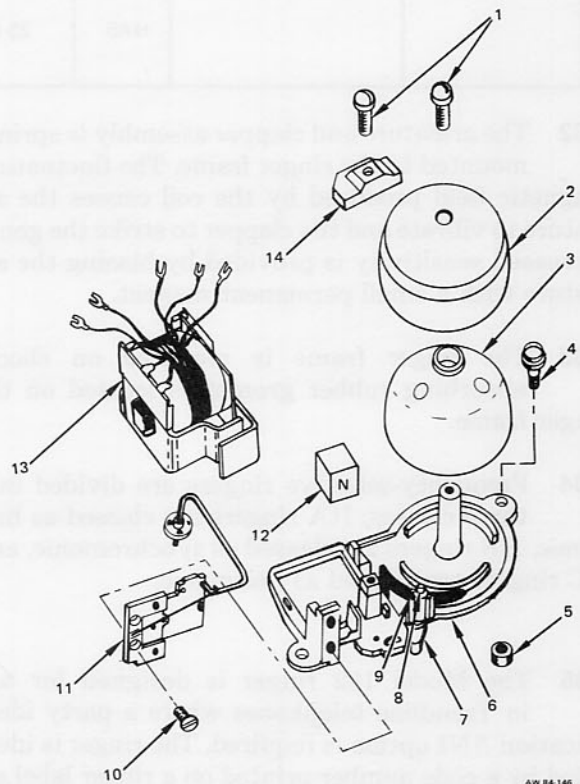
1.01 This document covers the Model 152 ringer. (See Figure 1.) A general description as well as information on removal, disassembly, replacement parts, assembly, installation, and adjustments is included.

1.02 Whenever this section is reissued, reason for reissue will be listed in this paragraph.

1.03 For applications of the Model 152 ringer in telephones, refer to the appropriate section in Volume 1 of the ITT Telephone Apparatus Practices Manual.

### 2. GENERAL DESCRIPTION

2.01 The Model 152 ringer (see Figure 2) is a miniature, single-gong, biased-armature type, frequency-selective ringer equipped with a mechanical volume control. It is assembled on a die-cast frame. Through the use of various clapper weights and capacitors, the ringer is tuned to ring at a specific frequency.



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Figure 2: Model 152 Ringer, Exploded View

TABLE A  
ORDERING INFORMATION

CODE NUMBERS							
RINGER CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS:							
(1) Ringer Model Number (See Part 1)		000152		HB1			
(2) Selective Frequency (See Part 2)							
PART 1 RINGER MODEL NUMBER		PART 2 SELECTIVE FREQUENCY					
CODE	DESCRIPTION	CODE	FREQUENCY	CODE	FREQUENCY	CODE	FREQUENCY
000152	Model 152 Ringer	HA1	33 1/3 Hz	HB1	30 Hz (Same As HC3)	HC1	20 Hz
		HA2	50 Hz (Same As HC5)	HB2	42 Hz	HC2	60 Hz
		HA3	66 2/3 Hz	HB3	54 Hz	HC3	30 Hz (Same As HB1)
		HA4	16 2/3 Hz	HB4	66 Hz	HC4	40 Hz
		HA5	25 Hz	HB5	16 Hz	HC5	50 Hz (Same As HA2)

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**2.02** The armature and clapper assembly is spring-mounted to the ringer frame. The fluctuating magnetic field produced by the coil causes the armature to vibrate and the clapper to strike the gong. Increased sensitivity is provided by biasing the armature with a small permanent magnet.

**2.03** The ringer frame is mounted on shock-absorbing rubber grommets located on the ringer frame.

**2.04** Frequency-selective ringers are divided into three classes: HA ringers are classed as harmonic, HB ringers are classed as synchronomic, and HC ringers are classed as decimonic.

**2.05** The Model 152 ringer is designed for use in Trendline telephones where a party identification ANI option is required. The ringer is identified by a code number printed on a ringer label attached to the gong. Refer to ordering information in Table A for an explanation of each code number and a list of available ringers.

### 3. REMOVAL

**3.01** To remove the ringer from the telephone, proceed as follows:

- (a) Remove the telephone housing.
- (b) Remove any telephone components that may obstruct access to the ringer.
- (c) Disconnect the ringer leads.
- (d) Loosen the two ringer mounting screws and lift the ringer from the telephone base.

### 4. DISASSEMBLY

**4.01** To disassemble the ringer, proceed as follows:

- (a) Loosen and remove the screw that holds the gong to the ringer frame.
- (b) Remove the gong and the resonator.

- (c) Using a permanent marker, place a reference mark on the magnet to ensure that proper polarity is maintained during reassembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.
- (d) Loosen and remove the two screws that hold the armature and clapper assembly to the ringer frame.
- (e) Lift the armature and clapper assembly from the ringer frame.
- (f) Loosen and remove the screw that holds the retaining plate to the ringer frame. Remove the retaining plate.
- (g) Remove the magnet.
- (h) Lift the pole piece assembly from the ringer frame.

## 5. REPLACEMENT PARTS

5.01 Replacement parts for the Model 152 ringer are listed in Table B. (Table B is located at the end of this section.)

## 6. ASSEMBLY

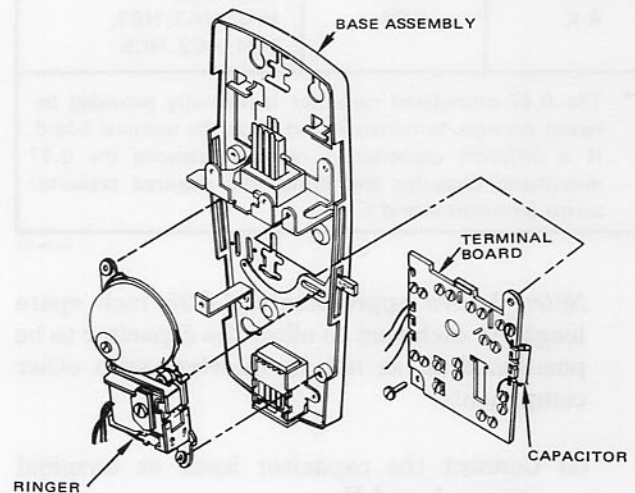
6.01 To assemble the ringer, proceed as follows:

- (a) Place the pole piece assembly on the ringer frame.
- (b) Place the magnet securely against the pole piece assembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.
- (c) Place the armature and clapper assembly into the gap of the pole piece assembly. Mount the armature and clapper assembly to the ringer frame using two screws.
- (d) Position the retaining plate so that it rests against both the pole piece assembly and the magnet. Mount the retaining plate to the ringer frame using one screw.
- (e) Position the resonator on the ringer frame and place the gong over the resonator.

- (f) Mount the gong to the ringer frame using one screw.

## 7. INSTALLATION

7.01 To install the Model 152 ringer, proceed as follows. (See Figure 3.)



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Figure 3: Installation of Model 152 Ringer

- (a) Remove the telephone housing.
- (b) Remove the two screws securing the terminal board to the retaining brackets. (See Figure 3.)
- (c) Carefully rotate the terminal board to the right to expose the telephone base assembly.
- (d) Position the ringer with the gong near the cradle switch, both grommets over the base assembly mounting holes, and the tone lever inserted into the slot in the volume control lever.
- (e) Insert and tighten the two ringer mounting screws.
- (f) Referring to the appropriate circuit label, connect the ringer leads.
- (g) Install the ringer capacitor (see Table C) by placing the capacitor under the terminal board and inserting the leads through slots at terminal screws A and K.

TABLE C

RINGER SERIES CAPACITORS

NETWORK TERMINALS	CAPACITANCE (MFD)*	CODE SERIES
A-K	0.47	HA4, HA5, HB5, HC1
A-K	0.25	HA1, HB1, HC3
A-K	0.15	HB2, HC4
A-K	0.08	HA2, HA3, HB3, HB4, HC2, HC5

\* The 0.47 microfarad capacitor is normally provided between network terminals A and K on the terminal board. If a different capacitor is required, remove the 0.47 microfarad capacitor and bridge the required capacitor across terminals A and K.

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**Note:** Leave approximately 0.25 inch spare length in each lead to allow the capacitor to be positioned so as not to interfere with other components.

- (1) Connect the capacitor leads at terminal screws A and K.

- (2) Clip off excess length of capacitor leads.

- (h) Reinstall the terminal board.

- (j) Reinstall the telephone housing.

**8. ADJUSTMENTS**

**Volume Control**

**8.01** Ringer volume is controlled by moving the tone lever to one of the three selector positions provided on the ringer frame.

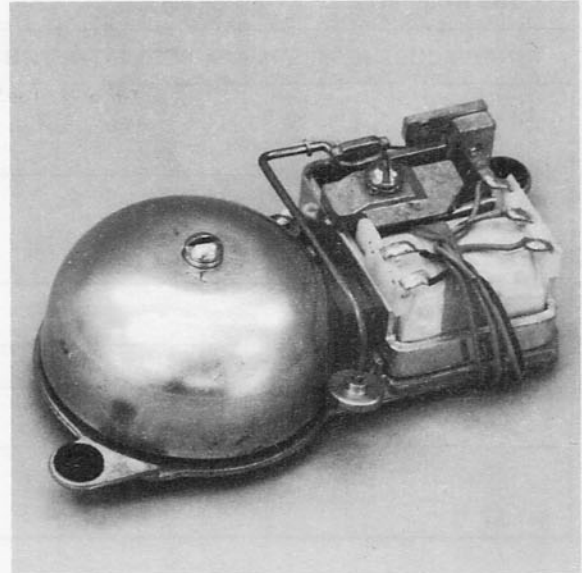
**Clapper-to-Gong Clearance**

**8.02** Clearance between the clapper and the gong may vary, but it should be between 0.030 inch and 0.10 inch. Coarse adjustment is made by bending the clapper arm. Fine adjustment is made by rotating the gong.



# MODEL 153 RINGER

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Figure 1: Model 153 Ringer

## 1. INTRODUCTION

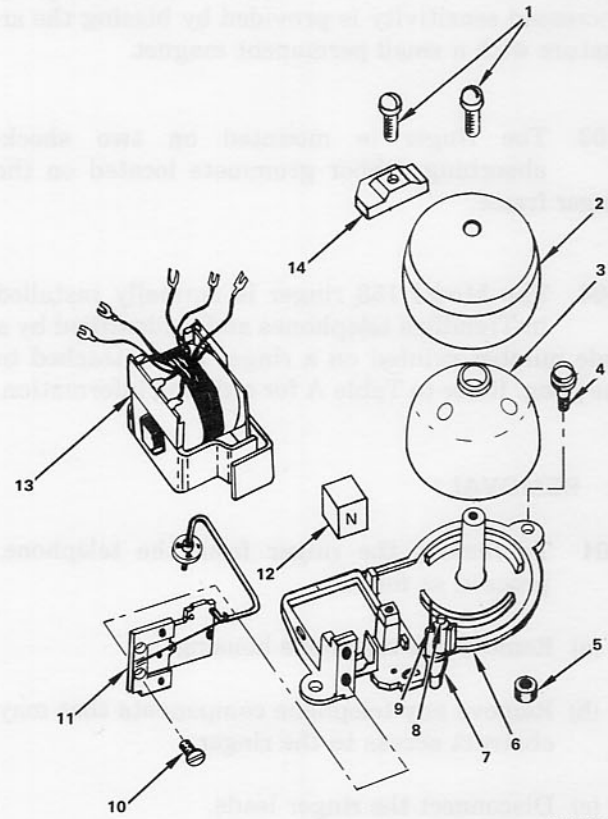
1.01 This document covers the Model 153 ringer. (See Figure 1.) A general description as well as information on removal, disassembly, replacement parts, assembly, installation, and adjustments is included.

1.02 Whenever this section is reissued, reason for reissue will be listed in this paragraph.

1.03 For applications of the Model 153 ringer in telephones, refer to the appropriate section in Volume 1 of the ITT Telephone Apparatus Practices Manual.

## 2. GENERAL DESCRIPTION

2.01 The Model 153 ringer (see Figure 2) is a miniature, single-gong, straight-line, biased-type ringer equipped with a mechanical volume control and assembled on a die-cast frame. A laminated soft-iron core holds the single-wound coil in place. The ringer is designed to ring at 20 or 30 Hz.



AW 84-145

Figure 2: Model 153 Ringer, Exploded View

TABLE A  
ORDERING INFORMATION

CODE NUMBERS			
RINGER CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS:			
(1) Ringer Model Number _____ (See Part 1)		000153	ABA
(2) Ringer Style _____ (See Part 2)			
PART 1 RINGER MODEL NUMBER		PART 2 RINGER STYLE	
CODE	DESCRIPTION	CODE	DESCRIPTION
000153	Model 153 Ringer	ABA	Straight-Line, Biased-Type Ringer With Volume Control

AW 84-175

**2.02** The armature and clapper assembly is spring-mounted to the ringer frame. The fluctuating magnetic field produced by the coil causes the armature to vibrate and the clapper to strike the gong. Increased sensitivity is provided by biasing the armature with a small permanent magnet.

**2.03** The ringer is mounted on two shock-absorbing rubber grommets located on the ringer frame.

**2.04** The Model 153 ringer is normally installed in Trendline telephones and is identified by a code number printed on a ringer label attached to the gong. Refer to Table A for ordering information.

### 3. REMOVAL

**3.01** To remove the ringer from the telephone, proceed as follows:

- (a) Remove the telephone housing.
- (b) Remove any telephone components that may obstruct access to the ringer.
- (c) Disconnect the ringer leads.
- (d) Loosen the two ringer mounting screws and lift the ringer from the telephone base.

### 4. DISASSEMBLY

**4.01** To disassemble the ringer, proceed as follows:

- (a) Loosen and remove the screw that holds the gong to the ringer frame.
- (b) Remove the gong and the resonator.
- (c) Using a permanent marker, place a reference mark on the magnet to ensure that proper polarity is maintained during reassembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.
- (d) Loosen and remove the two screws that hold the armature and clapper assembly to the ringer frame.
- (e) Lift the armature and clapper assembly from the ringer frame.
- (f) Loosen and remove the screw that holds the retaining plate to the ringer frame. Remove the retaining plate.
- (g) Remove the magnet.
- (h) Lift the pole piece assembly from the ringer frame.

TABLE B  
REPLACEMENT PARTS LIST

INDEX NO	PART NUMBER	DESCRIPTION	QUANTITY USED
		Model 153 Ringer	153-ABA
1	075408-102	Screw, Lockwasher (Gong And Retaining Plate Mounting)	2
2	075396-101	Gong	1
3	075372-101	Resonator	1
4	095966-102	Screw (Ringer Mounting)	2
5	088209-101	Grommet	2
6	088480-103	Frame, Ringer Mounting	1
7	180122-101	Lever, Tone	1
8	095972-101	Nut, Push	1
9	182739-101	Rod, Stop	1
10	063975-101	Screw (Armature And Clapper Assembly Mounting)	2
11	182734-101	Armature And Clapper Assembly	1
12	184176-101	Magnet	1
13	088481-106	Pole Piece Assembly	1
14	088483-101	Plate, Retaining	1
	095995-103	Capacitor, 0.47 MFD (Not Shown)	1

AW 84-176

## 5. REPLACEMENT PARTS

5.01 Replacement parts for the Model 153 ringer are listed in Table B.

## 6. ASSEMBLY

6.01 To assemble the ringer, proceed as follows:

- (a) Place the pole piece assembly on the ringer frame.
- (b) Place the magnet securely against the pole piece assembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.
- (c) Place the armature and clapper assembly into the gap of the pole piece assembly, with the clapper arm positioned outside the stop rod of the mechanical volume control. Mount the armature and clapper assembly to the ringer frame using two screws.

**Note:** When installing the armature and clapper assembly, ensure that the bias spring of the assembly is connected to the clapper arm.

(d) Position the retaining plate so that it rests against both the pole piece assembly and the magnet. Mount the retaining plate to the ringer frame using one screw.

(e) Position the resonator on the ringer frame and place the gong over the resonator.

(f) Mount the gong to the ringer frame using one screw.

## 7. INSTALLATION

7.01 To install the ringer inside a telephone, proceed as follows:

- (a) Remove the telephone housing.
- (b) Position the ringer on the base so that the two ringer frame mounting holes align with the mounting holes in the telephone base.
- (c) Mount the ringer to the telephone base using two screws.

- (d) Connect the ringer coil assembly leads to the telephone network. Refer to the telephone circuit label.

*Note:* The Model 153 ringer uses a series matching capacitor. This capacitor (0.47 mfd) is usually provided on the network printed circuit board between terminals A and K. Additionally, a 0.47 mfd capacitor is shipped loose with the ringer.

## 8. ADJUSTMENTS

### Volume Control

- 8.01 Ringer volume is controlled by moving the tone lever to one of the three selector positions provided on the ringer frame.

### Clapper-to-Gong Clearance

- 8.02 Clearance between the clapper and the gong may vary, but it should be between 0.030 inch and 0.10 inch. Coarse adjustment is made by bending the clapper arm. Fine adjustment is made by rotating the gong.

### Bias Spring

- 8.03 The ringer is factory-adjusted to prevent dial tap up to 80 VDC. If ringer dial tap occurs, readjust the bias spring as follows:

- (a) Remove the bias spring from the clapper arm.
- (b) Add tension to the bias spring by bending it slightly but carefully outward.
- (c) Hook the bias spring onto the clapper arm.

**MODEL 156 RINGER**

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**1. INTRODUCTION**

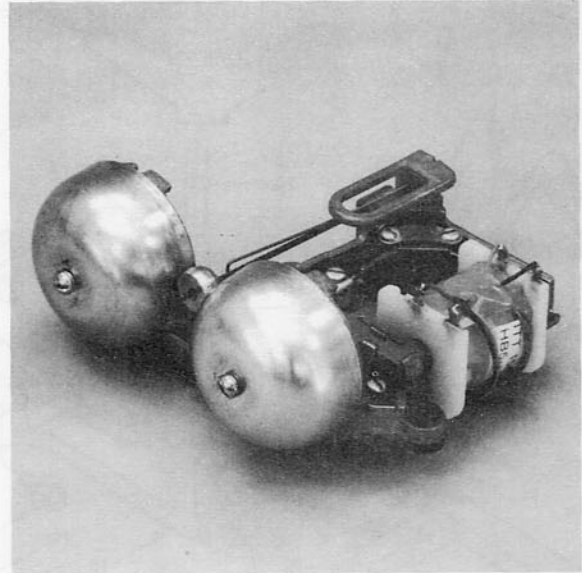
**1.01** This document covers the Model 156 ringer. (See Figure 1.) A general description as well as information on removal, disassembly, replacement parts, assembly, installation, and adjustments is included.

**1.02** Whenever this section is reissued, reason for reissue will be listed in this paragraph.

**1.03** For applications of the Model 156 ringer in telephones, refer to the appropriate section in Volume 1 of the ITT Telephone Apparatus Practices Manual.

**2. GENERAL DESCRIPTION**

**2.01** The Model 156 ringer (see Figure 2) is a two-gong, high-impedance, biased-type, frequency-selective ringer equipped with a mechanical volume control and assembled on a die-



AW 84-813

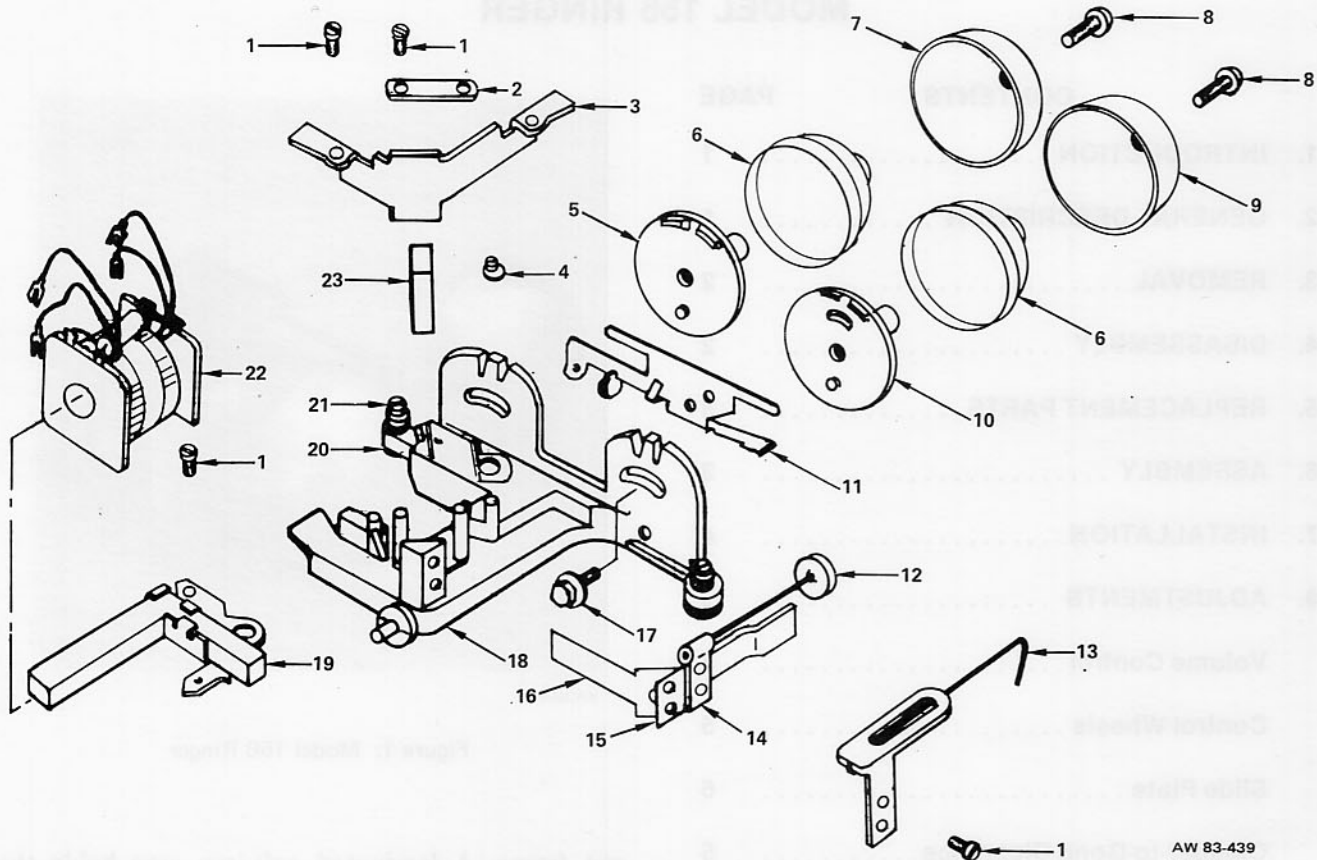
Figure 1: Model 156 Ringer

cast frame. A laminated soft-iron core holds the double-wound coil in place. Ringers are tuned to ring at different specific frequencies by using various core laminations, clapper weights, and capacitors.

**2.02** The armature and clapper assembly is spring-mounted to the ringer frame. The fluctuating magnetic field produced by the coil causes the armature to vibrate and the clapper to strike the gongs. Increased sensitivity is provided by biasing the armature with a small permanent magnet. Adjustment for sensitivity is facilitated by a slotted adjusting cam washer and locked by a separate locking screw. An adjustment for centering the gongs on the ringer frame is also provided.

**2.03** The ringer is mounted on shock-absorbing rubber grommets. Two grommets are located on the ringer frame. An alignment pin, molded into the ringer frame, is inserted into a grommet located at the base of the telephone hookswitch bracket.

**2.04** Frequency-selective ringers are divided into three classes. HA ringers are classed as harmonic. HB ringers are classed as synchronomic. HC ringers are classed as decimonic.



AW 83-439

Figure 2: Model 156 Ringer, Exploded View

**2.05** The Model 156 ringer is identified by a code number printed on a ringer label attached to the gong. Refer to ordering information in Table A for an explanation of each code number and a list of available ringers.

### 3. REMOVAL

**3.01** To remove the ringer from the telephone, proceed as follows:

- (a) Remove the telephone housing.
- (b) Remove any telephone components that may obstruct access to the ringer.
- (c) Disconnect the ringer leads.
- (d) Loosen the two frame mounting screws and lift the ringer from the telephone base.

### 4. DISASSEMBLY

**4.01** To disassemble the ringer, proceed as follows:

- (a) Loosen and remove the two screws that hold the gongs to the ringer frame.
- (b) Remove the gongs and the resonators.
- (c) Loosen and remove the two screws that hold the bias spring to the ringer frame. Remove the bias spring.
- (d) Lift the armature and clapper assembly from the ringer frame.
- (e) Using a permanent marker, place a reference mark on the magnet to ensure that proper polarity is maintained during reassembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.

TABLE A  
ORDERING INFORMATION

CODE NUMBERS							
RINGER CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS:							
(1) Ringer Model Number (See Part 1)		000156		HB1			
(2) Selective Frequency (See Part 2)							
PART 1 RINGER MODEL NUMBER				PART 2 SELECTIVE FREQUENCY			
CODE	DESCRIPTION	CODE	FREQUENCY	CODE	FREQUENCY	CODE	FREQUENCY
000156	Model 156 Ringer	HA1	33 1/3 Hz	HB1	30 Hz (Same As HC3)	HC1	20 Hz
		HA2	50 Hz (Same As HC5)	HB2	42 Hz	HC2	60 Hz
		HA3	66 2/3 Hz	HB3	54 Hz	HC3	30 Hz (Same As HB1)
		HA4	16 2/3 Hz	HB4	66 Hz	HC4	40 Hz
		HA5	25 Hz	HB5	16 Hz	HC5	50 Hz (Same As HA2)

AW 84 150

- (f) Loosen and remove the two screws that hold the clamping plate to the ringer frame. Remove the clamping plate.
- (g) Remove the magnet.
- (h) Loosen and remove the two screws that hold the shunt bar to the ringer frame. Remove the shunt bar.
- (j) Loosen and remove the screw that holds the slide plate and lamination assembly to the ringer frame.
- (k) Lift the slide plate and lamination assembly from the ringer frame. Slide the coil assembly from the core laminations.
- (m) Lift the slotted adjusting cam washer from the ringer frame.

- (n) Loosen and remove the two screws that hold the control wheels to the ringer frame. Remove the control wheels.
- (p) Slide the damper spring from the ringer frame.

**5. REPLACEMENT PARTS**

5.01 Replacement parts for the Model 156 ringer are listed in Table B. (Table B is located at the end of this section.)

**6. ASSEMBLY**

6.01 To assemble the ringer, proceed as follows:

- (a) Slide the damper spring into the ringer frame tracks located on the side where the gongs are to be mounted. Ensure that the hook on the damper spring is positioned behind the ringer

frame, and ensure that the damper spring is placed under the ringer frame tab. The damper spring should rest flat on the ringer frame. (See Figure 3.)

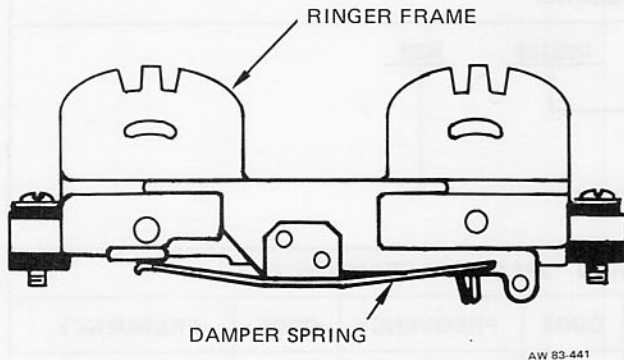


Figure 3: Damper Spring Mounted on Ringer Frame

- (b) Position the control wheels on the ringer frame while ensuring that the alignment pins on the control wheels are in the holes provided on the ringer frame. As viewed from the gong side of the ringer, the control wheel with the slot cut in it should be on the left-hand side.
- (c) Mount the control wheels to the ringer frame using two hex-head screws. The control wheels will adjust from side to side. Position the control wheels to center the gongs, and lightly tighten the hex-head screws. Final adjustment of the control wheels is provided in paragraph 8.02.
- (d) Place the slotted adjusting cam washer in the indentation provided on the ringer frame.
- (e) Slide the coil assembly onto the core laminations, and position the slide plate and lamination assembly (with the coil assembly) onto the ringer frame. Ensure that the slide plate rests flat against the ringer frame in the tracks provided, and that the slotted adjusting cam washer is positioned in the hole of the slide plate. (See Figure 2.)
- (f) Mount the slide plate to the ringer frame using one screw. Final adjustment of the slide plate is provided in paragraph 8.03.
- (g) Position the shunt bar on the ringer frame and mount it to the ringer frame using two screws. (See Figure 2.)

(h) Place the magnet securely against the shunt bar. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.

(j) Position the clamping plate over the magnet and mount it to the ringer frame using two screws. (See Figure 2.)

(k) Place the armature and clapper assembly into the gap between the magnet and the ringer frame mounting post. Ensure that the armature return spring of the assembly is outside the ringer frame mounting post. (See Figure 2.)

(m) Position the bias spring on the ringer frame mounting post, and align the mounting holes with the holes in the armature return spring and the holes in the ringer frame mounting post.

(n) Mount the bias spring to the ringer frame mounting post using two screws. (See Figure 2.)

*Note:* The bias spring must be positioned to the right of the clapper arm, when viewing the ringer from the top with the gongs pointing away from the assembler.

(p) Position the resonators on the ringer frame and place the gongs over the resonators.

*Note:* The gongs are stamped A and B. With the ringer frame down, gong A is on the right and gong B is on the left as viewed with the ringer gongs pointing toward the assembler.

(q) Mount the gongs to the ringer frame using two screws.

## 7. INSTALLATION

7.01 To install the ringer inside a telephone, proceed as follows:

(a) Remove the telephone housing.

(b) Insert the ringer frame alignment pin into the grommet provided at the base of the telephone hookswitch bracket.

- (c) Position the ringer on the telephone base so that the two mounting holes in the ringer frame align with the mounting holes in the telephone base.

*Note:* The rubber grommets must be in place in the ringer frame mounting holes and in the telephone hookswitch bracket.

- (d) Mount the ringer to the telephone base using two screws.
- (e) Connect the ringer coil assembly leads to the telephone network. Refer to the telephone circuit label.

## 8. ADJUSTMENTS

### Volume Control

**8.01** Ringer volume is controlled by sliding the damper spring. Sliding the damper spring toward gong A decreases the volume. Sliding the damper spring toward gong B as far as possible silences the ringer.

### Control Wheels

**8.02** The control wheels can be moved from side to side to center the clapper between the gongs. Adjustment is made by loosening the hex-head screws, positioning the gongs, and tightening the hex-head screws.

### Slide Plate

**8.03** The slide plate can be adjusted to move the core laminations closer to or farther away from the armature and clapper assembly. Adjustment is as follows:

- (a) Loosen the locking screw of the slide plate.

*Note:* Turning the cam washer clockwise moves the core laminations closer to the armature and clapper assembly and increases ringer sensitivity. Turning the cam washer counterclockwise moves the core laminations away from the armature and clapper assembly and decreases ringer sensitivity.

*Caution:* Over-adjustment of the slide plate can introduce cross ringing (undesired ringing at a frequency other than the ringer's tuned frequency).

- (b) Turn the slotted adjusting cam washer to move the slide plate.
- (c) When clear ringing is obtained, tighten the locking screw.

### Clapper-to-Gong Clearance

**8.04** If the clapper is not centered between the gongs (causing improper ringing to occur) and the problem cannot be corrected by adjusting the control wheels, the clapper arm may be bent slightly to center the clapper.

### Bias Spring

**8.05** The bias spring must rest against the clapper arm at all times. Move the clapper arm to rest against gong A, and ensure that the bias spring remains in contact with the clapper arm. The bias spring can be bent slightly if adjustment is required.

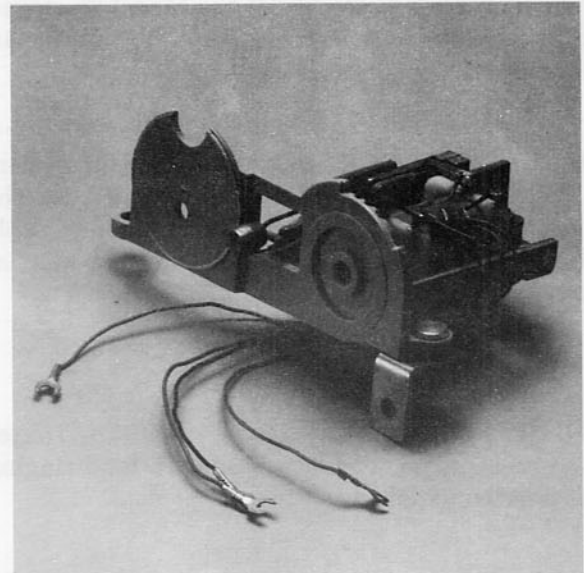
TABLE B  
REPLACEMENT PARTS LIST

INDEX NO	PART NUMBER	DESCRIPTION	QUANTITY USED														
			HA1	HA2	HA3	HA4	HA5	HB1	HB2	HB3	HB4	HB5	HC1	HC2	HC3	HC4	HC5
1	180221-101	Screw	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
2	075563-101	Plate, Clamping	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	088492-101	Bar, Shunt	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	075560-101	Washer, Adjustment Cam	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	075570-102	Wheel, Control	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	075372-101	Resonator	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7	075396-101	Gong, A	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	075408-102	Screw, Gong Mounting With Washer	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9	075397-101	Gong, B	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	075570-101	Wheel, Control	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	181682-101	Damper Spring Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	183134-101	Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	183134-106	Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	183134-108	Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	183134-109	Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	184347-116	Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	184347-117	Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	184347-118	Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	183923-101	Damper Spring And Holder Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14	081056-103	Clapper Stem Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14	081056-101	Clapper Stem Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	075587-101	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	075587-103	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	075587-104	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	075587-105	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	075587-106	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	075587-107	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	075587-108	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	075587-109	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	075565-101	Armature	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	180523-101	Screw, Hex-Head With Washer	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
18	088501-101	Frame, Mounting	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	075578-101	Slide Plate And Lamination Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20	075371-101	Grommet, Rubber	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
21	075366-101	Screw, Frame Mounting	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
22	185480-104	Coil Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	185480-105	Coil Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	185480-106	Coil Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	185480-107	Coil Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	185480-108	Coil Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
23	075562-103	Magnet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
23	075562-102	Magnet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

AW 04 101

# MODEL 79938 RINGER MECHANISM

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Figure 1: Model 79938 Ringer Mechanism

## 1. INTRODUCTION

1.01 This document covers the Model 79938 Ringer Mechanism. (See Figure 1.) A general description as well as information on removal, disassembly, replacement parts, assembly, installation, and adjustments is included.

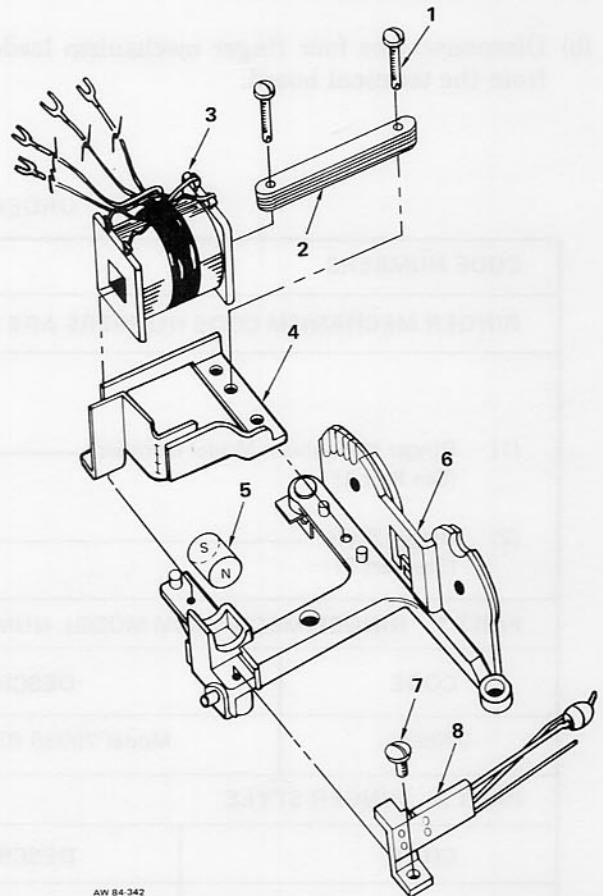
1.02 Whenever this section is reissued, reason for reissue will be listed in this paragraph.

1.03 This ringer mechanism is used in the Model 75 loud ringing bell. Refer to Section 55-075-113 for information concerning the loud ringing bell.

## 2. GENERAL DESCRIPTION

2.01 The Model 79938 ringer mechanism (see Figure 2) is a straight-line, biased-type ringer mechanism that is used in the Model 75 loud ringing bell. The mechanism consists of a coil and core assembly, armature and clapper assembly, frame, pole piece assembly, and magnet.

2.02 A laminated soft-iron core holds a double-wound coil on the pole piece assembly. The armature and clapper assembly is spring-mounted



AW 84-342

Figure 2: Model 79938 Ringer Mechanism, Exploded View

to the ringer frame. The fluctuating magnetic field produced by the coil causes the armature to vibrate and the clapper to strike the gongs that are mounted on the base plate assembly of the Model 75 ringer. Increased sensitivity is provided by biasing the armature with a small permanent magnet.

**2.03** The Model 79938 ringer mechanism is identified by a code number stamped on the ringer frame. Refer to ordering information in Table A for an explanation of each code number and a list of available ringers.

**3. REMOVAL**

**3.01** To remove the Model 79938 ringer mechanism from the Model 75 loud ringing bell, proceed as follows:

- (a) Remove the cover of the loud ringing bell by removing the three screws on the base plate assembly and lifting the cover.
- (b) Disconnect the four ringer mechanism leads from the terminal board.

- (c) Loosen and remove the two hex-head screws that hold the ringer mechanism to the base plate. Lift the ringer mechanism from the base plate.

**4. DISASSEMBLY**

**4.01** To disassemble the Model 79938 ringer mechanism, perform the following procedure:

- (a) Loosen and remove the screw that holds the armature and clapper assembly to the frame. Lift the assembly from the frame.
- (b) Using a permanent marker, place a reference mark on the magnet to ensure that proper polarity is maintained during reassembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.
- (c) Remove the magnet.
- (d) Loosen and remove the two screws that hold the coil and core assembly and the support piece assembly to the frame. Lift the coil and core assembly from the pole piece assembly.

TABLE A

ORDERING INFORMATION

<b>CODE NUMBERS</b>		
RINGER MECHANISM CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS:		
(1) Ringer Mechanism Model Number (See Part 1)	<u>079938</u>	<u>OBA</u>
(2) Ringer Style (See Part 2)		
<b>PART 1 RINGER MECHANISM MODEL NUMBER</b>		
<b>CODE</b>	<b>DESCRIPTION</b>	<b>RINGER STYLE</b>
079938	Model 79938 Ringer Mechanism	OBA
<b>PART 2 RINGER STYLE</b>		
<b>CODE</b>	<b>DESCRIPTION</b>	
OBA	Straight-Line, Biased-Type	

AW 84-921

- (e) Remove the core laminations from the coil.
- (f) Lift the pole piece assembly from the frame.

## 5. REPLACEMENT PARTS

**5.01** Replacement parts for the Model 79938 ringer mechanism are listed in Table B.

## 6. ASSEMBLY

**6.01** To assemble the Model 79938 ringer mechanism, perform the following procedure:

- (a) Place the pole piece assembly on the ringer frame.
- (b) Insert the laminated core into the coil assembly.
- (c) Mount the coil and core assembly to the frame using two screws.
- (d) Place the magnet securely against the pole piece assembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.
- (e) Place the armature and clapper assembly into the gap of the pole piece assembly. The bias spring must be inserted into the proper position. (See Figure 3.)
- (f) Mount the armature and clapper assembly to the ringer frame using one screw.
- (g) Adjust the ringer biasing as desired. (Refer to paragraph 8.01.)

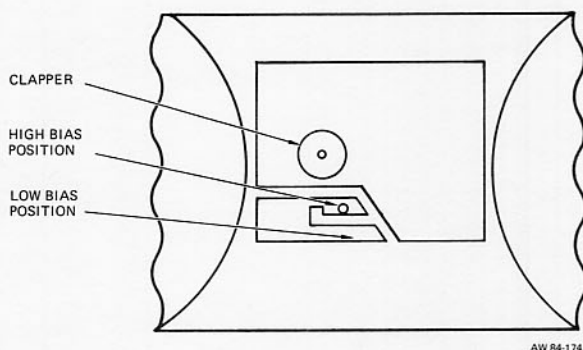


Figure 3: Positions of the Bias Spring

## 7. INSTALLATION

**7.01** To install the Model 79938 ringer mechanism into the Model 75 loud ringing bell, perform the following procedure:

- (a) Remove the cover from the loud ringing bell.
- (b) Position the ringer mechanism on the base plate and mount it to the base plate assembly using two hex-head screws with spring washers.
- (c) Connect the ringer mechanism leads to the terminal board as illustrated in Figure 4.
- (d) Place the cover on the base plate assembly and mount it using three screws.

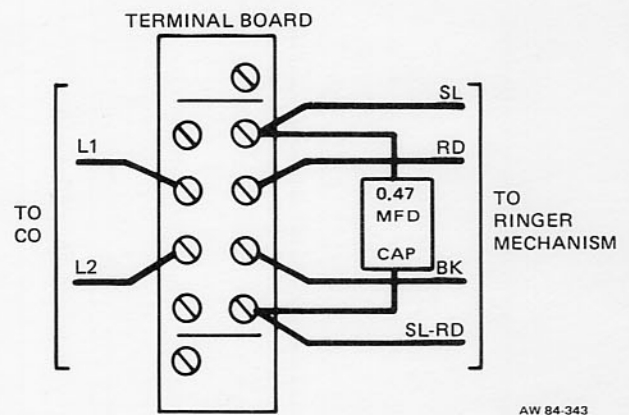


Figure 4: Terminal Board Connecting Diagram

## 8. ADJUSTMENTS

### Bias Spring

**8.01** The Model 79938 ringer mechanism is shipped with the bias spring in the high bias position to ring at 77 VAC, 20 Hz. For lower voltages and 30 Hz ringing, the bias spring can be moved to the low bias position. (See Figure 3.)

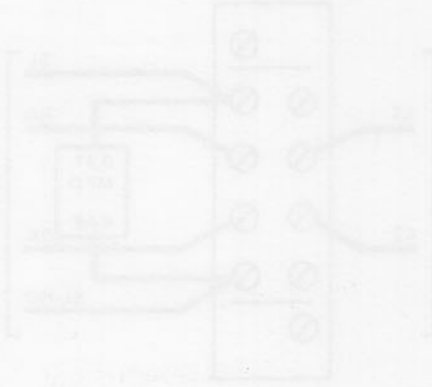
### Clapper-to-Gong Clearance

**8.02** If the clapper is not centered between the gongs and it causes improper ringing, the gongs can be rotated to provide proper clearance. To make the adjustments, loosen the gong mounting screws, rotate the gongs to the desired position, and tighten the gong mounting screws. The clapper arm may also be bent slightly, but carefully, to center the clapper between the gongs.

TABLE B  
REPLACEMENT PARTS LIST

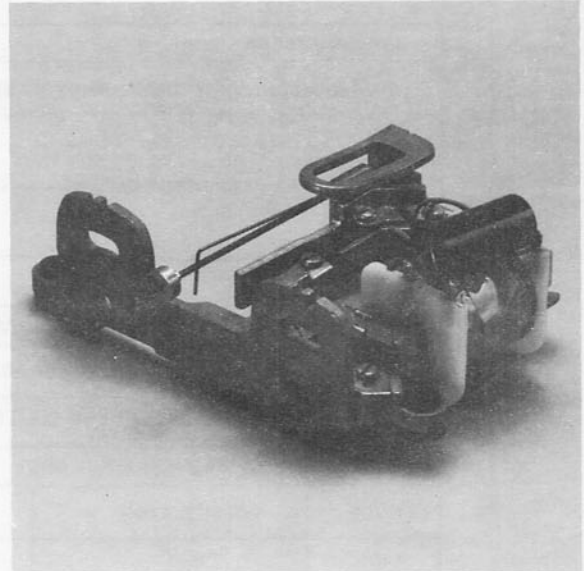
INDEX NO	PART NUMBER	DESCRIPTION	QUANTITY USED
		<b>Model 79938 Ringer Mechanism</b>	<b>0BA</b>
1	075407-110	Screw, Lamination Mounting	2
2	184972-101	Lamination, Core	15
3	185480-101	Coil Assembly	1
4	184971-101	Piece, Support Pole	1
5	184973-101	Magnet	1
6	185651-101	Mounting Frame Assembly	1
7	182845-102	Screw, Armature Mounting	1
8	075393-102	Clapper Assembly	1

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## MODEL 79939 RINGER MECHANISM

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Figure 1: Model 79939 Ringer Mechanism

### 1. INTRODUCTION

1.01 This document covers the Model 79939 Ringer Mechanism. (See Figure 1.) A general description as well as information on removal, disassembly, replacement parts, assembly, installation, and adjustments is included.

1.02 Whenever this section is reissued, reason for reissue will be listed in this paragraph.

1.03 This ringer mechanism is used in the Model 75 loud ringing bell. Refer to Section 55-075-113 for information concerning the loud ringing bell.

### 2. GENERAL DESCRIPTION

2.01 The Model 79939 ringer mechanism (see Figure 2) is a frequency-selective, biased-type ringer mechanism that is used in the Model 75 loud ringing bell. The mechanism consists of a coil and core assembly, armature and clapper assembly, frame, and magnet. The ringer mechanisms are tuned to ring at different specific frequencies by using various core laminations, clapper weights, and capacitors.

2.02 A laminated soft-iron core holds a double-wound coil in place. The armature and clapper assembly is spring-mounted to the ringer frame. The fluctuating magnetic field produced by the coil causes the armature to vibrate and the clapper to strike the gongs that are mounted on the base plate assembly of the Model 75 ringer. Increased sensitivity is provided by biasing the armature with a small permanent magnet. Adjustment for sensitivity is facilitated by a slotted adjusting cam washer and locked by a separate locking screw.

2.03 Frequency-selective ringers are divided into three classes: HA ringers are classed as harmonic, HB ringers are classed as synchrononic, and HC ringers are classed as decimonic.

2.04 The Model 79939 ringer mechanism is identified by code number stamped on the ringer frame. Refer to ordering information in Table A for an explanation of each code number and a list of available ringers.

### 3. REMOVAL

3.01 To remove the ringer mechanism from the Model 75 loud ringing bell, proceed as follows:

TABLE A  
ORDERING INFORMATION

CODE NUMBERS			
RINGER MECHANISM CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS:			
(1) Ringer Mechanism Model Number (See Part 1)		079939	101
(2) Selective Frequency Code (See Part 2)			
PART 1 RINGER MECHANISM MODEL NUMBER			
CODE	DESCRIPTION	SELECTIVE FREQUENCY CODE	
079939	Model 79939 Ringer Mechanism	101 Through 115	
PART 2 SELECTIVE FREQUENCY CODE			
CODE	DESIGNATOR	FREQUENCY	CLASS
101	HA1	33 1/3 Hz	Harmonic
102	HA2	50 Hz	
103	HA3	66 2/3 Hz	
104	HA4	16 2/3 Hz	
105	HA5	25 Hz	
106	HB1	30 Hz	Synchronomic
107	HB2	42 Hz	
108	HB3	54 Hz	
109	HB4	66 Hz	
110	HB5	16 Hz	
111	HC1	20 Hz	Decimonic
112	HC2	60 Hz	
113	HC3	30 Hz (Same As HB1)	
114	HC4	40 Hz	
115	HC5	50 Hz (Same As HA2)	

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- (a) Remove the cover of the loud ringing bell by removing the three screws on the base plate assembly and lifting the cover.
- (b) Disconnect the ringer mechanism leads from the terminal board.
- (c) Loosen and remove the two hex-head screws that hold the ringer mechanism to the base plate. Lift the ringer mechanism from the base plate.
- 4. DISASSEMBLY**
- 4.01** To disassemble the ringer mechanism, proceed as follows:
- (a) Loosen and remove the two screws that hold the bias spring to the ringer frame. Remove the bias spring.
- (b) Lift the armature and clapper assembly from the ringer frame.
- (c) Using a permanent marker, place a reference mark on the magnet to ensure that proper polarity is maintained during reassembly. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.
- (d) Loosen and remove the two screws that hold the clamping plate to the ringer frame. Remove the clamping plate.
- (e) Remove the magnet.
- (f) Loosen and remove the two screws that hold the shunt bar to the ringer frame. Remove the shunt bar.

- (g) Loosen and remove the screw that holds the slide plate and lamination assembly to the ringer frame.
- (h) Lift the slide plate and lamination assembly from the ringer frame. Slide the coil assembly from the core laminations.
- (j) Lift the slotted adjusting cam washer from the ringer frame.

## 5. REPLACEMENT PARTS

5.01 Replacement parts for the Model 79939 ringer mechanism are listed in Table B.

## 6. ASSEMBLY

6.01 To assemble the ringer mechanism, perform the following procedure:

- (a) Place the slotted adjusting cam washer in the indentation provided on the ringer frame.

(b) Slide the coil assembly onto the core laminations, and position the slide plate and lamination assembly (with the coil assembly) onto the ringer frame. Ensure that the slide plate rests flat against the ringer frame in the tracks provided, and that the slotted adjusting cam washer is positioned in the hole of the slide plate. (See Figure 2.)

(c) Mount the slide plate to the ringer frame using one screw. Final adjustment of the slide plate is provided in paragraph 8.01.

(d) Position the shunt bar on the ringer frame and mount it to the ringer frame using two screws. (See Figure 2.)

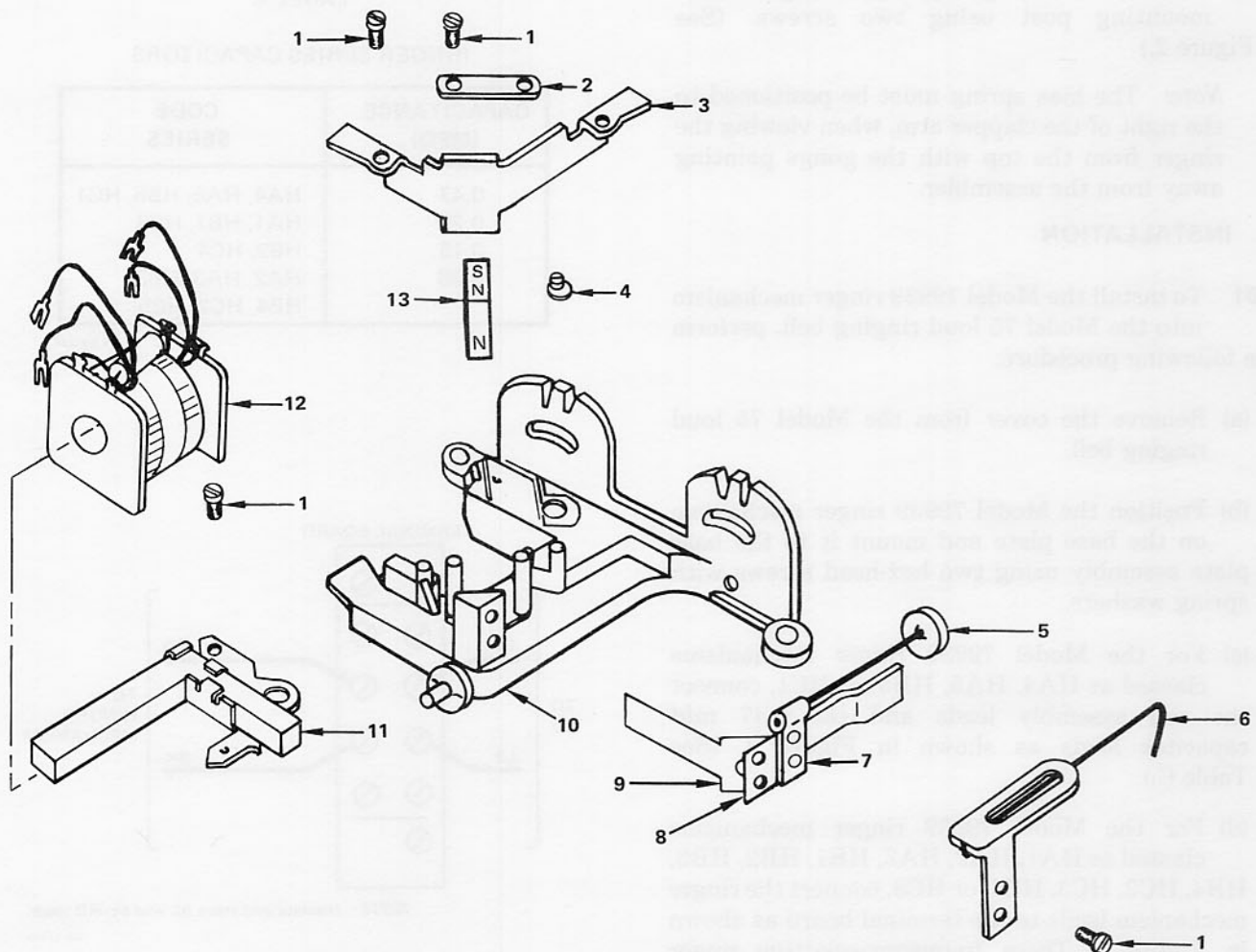


Figure 2: Model 79939 Ringer Mechanism, Exploded View

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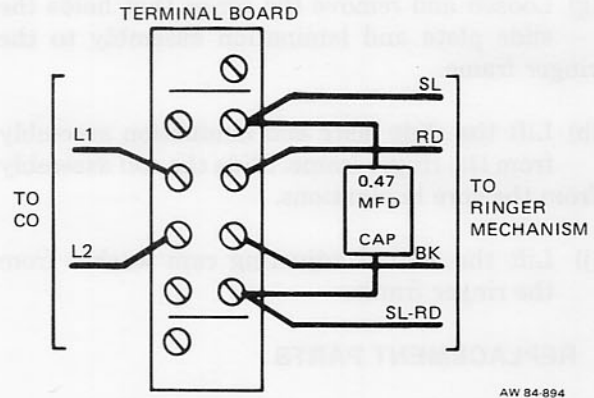
- (e) Place the magnet securely against the shunt bar. The end of the magnet nearest the armature and clapper assembly must attract the north-seeking pole of a compass.
- (f) Position the clamping plate over the magnet and mount it to the ringer frame using two screws. (See Figure 2.)
- (g) Place the armature and clapper assembly into the gap between the magnet and the ringer frame mounting post. Ensure that the armature return spring of the assembly is outside the ringer frame mounting post. (See Figure 2.)
- (h) Position the bias spring on the ringer frame mounting post, and align the mounting holes with the holes in the armature return spring and the holes in the ringer frame mounting post.
- (j) Mount the bias spring to the ringer frame mounting post using two screws. (See Figure 2.)

**Note:** The bias spring must be positioned to the right of the clapper arm, when viewing the ringer from the top with the gongs pointing away from the assembler.

**7. INSTALLATION**

**7.01** To install the Model 79939 ringer mechanism into the Model 75 loud ringing bell, perform the following procedure:

- (a) Remove the cover from the Model 75 loud ringing bell.
- (b) Position the Model 79939 ringer mechanism on the base plate and mount it to the base plate assembly using two hex-head screws with spring washers.
- (c) For the Model 79939 ringer mechanisms classed as HA4, HA5, HB5, or HC1, connect the coil assembly leads and the 0.47 mfd capacitor leads as shown in Figure 3. (See Table C.)
- (d) For the Model 79939 ringer mechanisms classed as HA1, HA2, HA3, HB1, HB2, HB3, HB4, HC2, HC3, HC4, or HC5, connect the ringer mechanism leads to the terminal board as shown in Figure 4. These frequency-selective ringer mechanisms have the capacitor factory-wired to the coil. (See Table C.)



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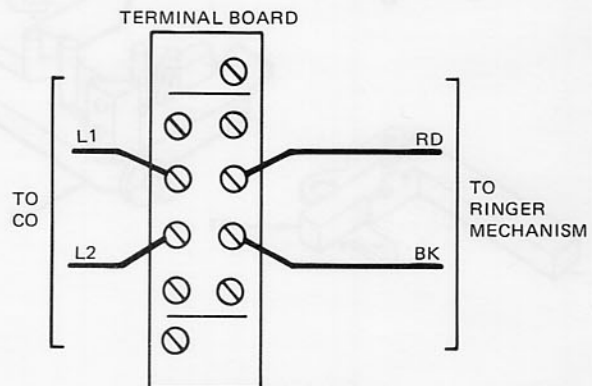
Figure 3: Terminal Board Connecting Diagram

TABLE C

RINGER SERIES CAPACITORS

CAPACITANCE (MFD)	CODE SERIES
0.47	HA4, HA5, HB5, HC1
0.25	HA1, HB1, HC3
0.15	HB2, HC4
0.08	HA2, HA3, HB3, HB4, HC2, HC5

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NOTE: Insulate and store SL and SL-RD leads.

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Figure 4: Terminal Board Connecting Diagram

## 8. ADJUSTMENTS

### Slide Plate

**8.01** The slide plate can be adjusted to move the core laminations closer to or farther away from the armature and clapper assembly. Adjustment is as follows:

- (a) Loosen the locking screw of the slide plate.

*Note:* Turning the cam washer clockwise moves the core laminations closer to the armature and clapper assembly and increases ringer sensitivity. Turning the cam washer counterclockwise moves the core laminations away from the armature and clapper assembly and decreases ringer sensitivity.

*Caution:* Over-adjustment of the slide plate can introduce cross ringing (undesired ringing at a frequency other than the ringer's tuned frequency).

- (b) Turn the slotted adjusting cam washer to move the slide plate.

- (c) When clear ringing is obtained, tighten the locking screw.

### Clapper-to-Gong Clearance

**8.02** If the clapper is not centered between the gongs and it causes improper ringing, the bias spring can be bent slightly to provide coarse adjustment. The gongs can be rotated to provide fine adjustment.

### Bias Spring

**8.03** For frequency-selective ringer mechanisms, the bias spring must rest against the clapper arm at all times. Move the clapper arm to rest against the right-hand gong and ensure that the bias spring remains in contact with the clapper arm. The bias spring can be bent slightly, but carefully, if adjustment is required.

TABLE B  
REPLACEMENT PARTS LIST

INDEX NO	PART NUMBER	DESCRIPTION	QUANTITY USED															
			HA1	HA2	HA3	HA4	HA5	HB1	HB2	HB3	HB4	HB5	HC1	HC2	HC3	HC4	HC5	
		Model 79939 Ringer Mechanism	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
1	180221-101	Screw	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	075563-101	Plate, Clamping	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	088492-101	Bar, Shunt	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	075560-101	Washer, Eccentric	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	183134-101	Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	183134-102	Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	183134-103	Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	183134-104	Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	183134-105	Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	183923-101	Damper Spring And Holder Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	081056-103	Clapper Stem Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	081056-101	Clapper Stem Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	075587-101	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	075587-103	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	075587-104	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	075587-105	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	075587-106	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	075587-107	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	075587-108	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	075587-109	Reed	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	075565-101	Armature	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	088501-101	Frame, Mounting	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	075578-101	Slide Plate And Lamination Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	185480-104	Coil Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	185480-105	Coil Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	185480-106	Coil Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	185480-107	Coil Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	185480-108	Coil Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	075562-102	Magnet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	075562-103	Magnet	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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