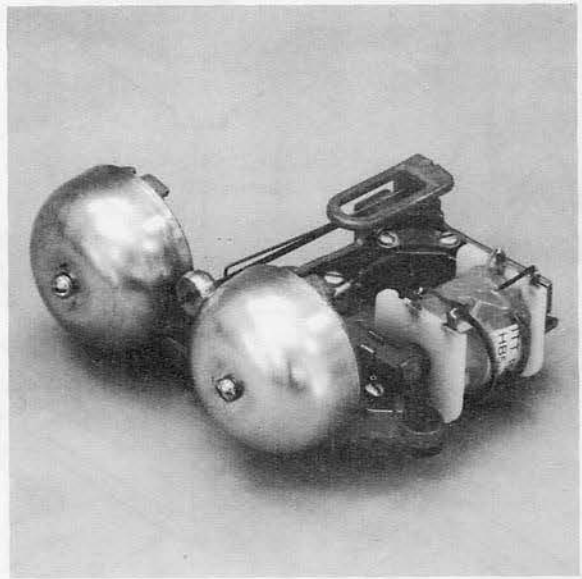
MODEL 156 RINGER

CONTENTS PAGE



AW 84-813

Figure 1: Model 156 Ringer

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-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 synchromonic. HC ringers are classed as decimonic.

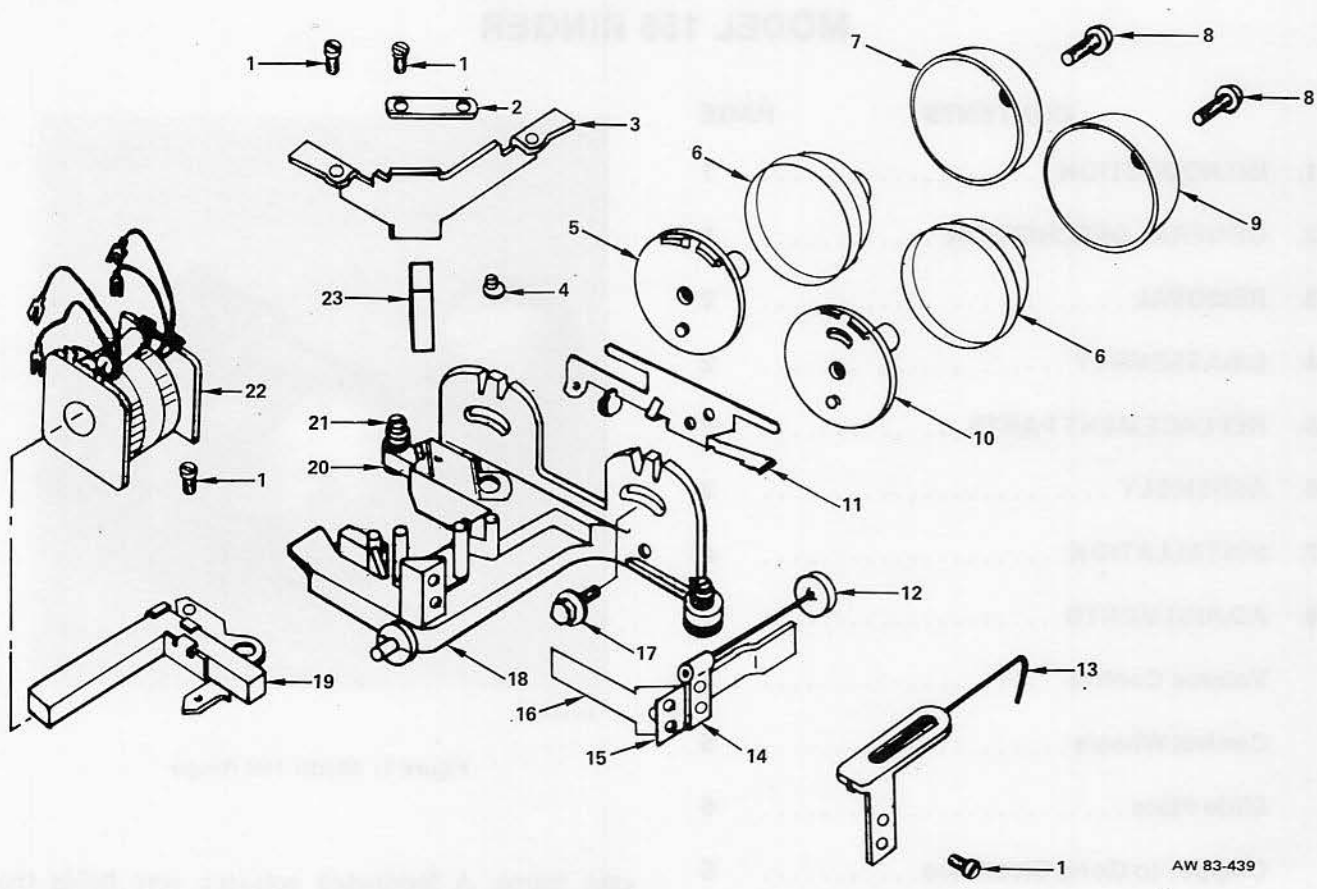


Figure 2: Model 156 Ringer, Exploded View

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:

000156 HB1

(1) Ringer Model Number (See Part 1)

(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 84 160

(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.)

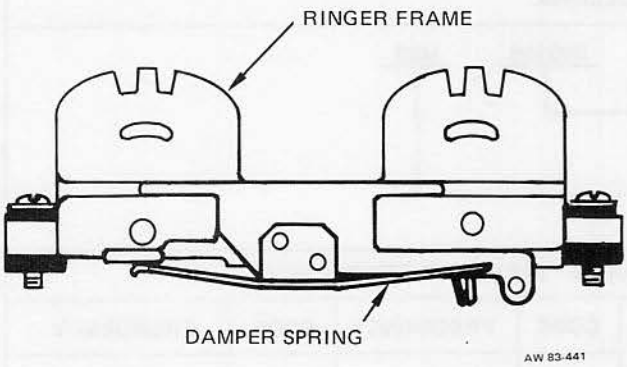


Figure 3: Damper Spring Mounted on Ringer Frame

(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 A 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														
		Model 156 Ringer	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	–	–	–	–	–	–	–	–	–	–	–	–	–	–
12	183134-106	Weight	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–
12	183134-108	Weight	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–
12	183134-109	Weight	–	–	–	–	–	1	–	–	–	–	–	–	1	–	–
12	184347-116	Weight	–	1	–	–	–	–	–	1	–	–	–	–	–	–	1
12	184347-117	Weight	–	–	1	–	–	–	1	–	1	–	–	–	–	–	–
12	184347-118	Weight	–	–	–	–	–	–	–	–	–	–	–	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
14	081056-101	Clapper Stem Assembly	1	–	1	1	1	1	–	–	1	1	1	1	1	1	1
15	075587-101	Reed	1	–	–	–	–	1	–	–	–	–	–	–	1	–	–
15	075587-103	Reed	–	–	1	–	–	–	–	–	1	–	–	1	–	–	–
15	075587-104	Reed	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–
15	075587-105	Reed	–	–	–	–	–	–	1	–	–	–	–	–	–	1	–
15	075587-106	Reed	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
15	075587-107	Reed	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
15	075587-108	Reed	–	1	–	–	–	–	–	–	–	–	–	–	–	–	1
15	075587-109	Reed	–	–	–	–	–	–	–	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	–	–
22	185480-105	Coil Assembly	–	–	–	–	–	–	1	–	–	–	–	–	–	1	–
22	185480-106	Coil Assembly	–	1	–	–	–	–	–	1	–	–	–	1	–	–	1
22	185480-107	Coil Assembly	–	–	1	–	–	–	–	–	1	–	–	–	–	–	–
22	185480-108	Coil Assembly	–	–	–	1	1	–	–	–	–	1	1	–	–	–	–
23	075562-103	Magnet	1	–	–	1	1	1	–	–	–	1	1	–	1	–	–
23	075562-102	Magnet	–	1	1	–	–	–	1	1	1	–	–	1	–	1	1

AW 84 161