RINGERS—B-TYPE MAINTENANCE

1. GENERAL

1.01 This practice covers maintenance, adjustment procedures, and requirements for B-type ringers, including 301-type loud ringing bells.

1.02 Figure 1 shows a typical B-type ringer and its component parts. Figure 2 illustrates a typical 301 subscriber set (loud ringing bell).

Item	Description
1	Mounting Frame
2	Control Wheel (B)
3	Control Wheel (A)
4	Washer
5	Hex. Hd. Lockwasher Screw
6	Gong (A)
7	Gong (B)
8	Resonator
9	Rd. Hd. Lockwasher Screw
10	Eccentric Washer
11	Slide Plate & Lamination Assy.
12	Coil
13	Rind. Hd. Flat Washer Screw
14	Shunt Bar
15	Rd. Hd. Lockwasher Screw
16	Magnet
17	Clamping Plate
18	Rnd. Hd. Lockwasher Screw
19	Armature
20	Weight
21	Clapper Assy.
22	Rnd. Hd. Lockwasher Screw
23	Rubber Foot
24	Mounting Screw
25	Wire Assy.(With Coil 75582 Only)
26	Damper Spring (Type 131 Only)
27	Rubber Tubing (For Tuning Stem)
28	Headless Set Screw (For Weight)

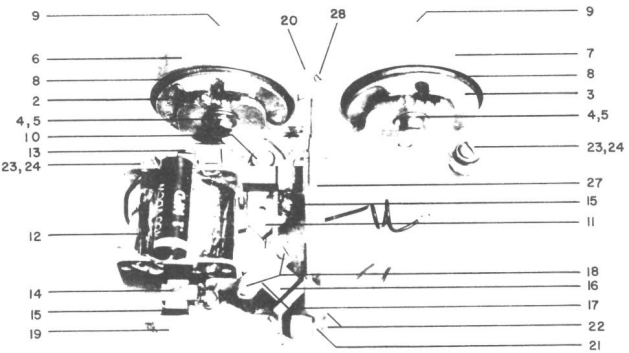

FIGURE 1 TOP VIEW

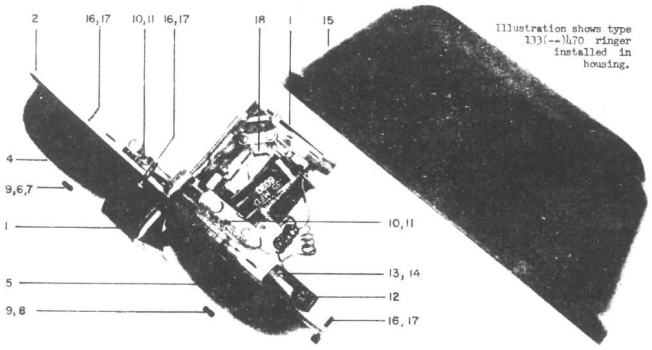

FIGURE 2 FRONT VIEW - COVER REMOVED

Item	Description
1	Bracket
2	Baseplate
3	Hex. Hd. Lockwasher Screw
4	Gong (B)
5	Gong (A)
6	Bushing (Gong B)
7	Washer (Gong B)
8	Washer (Gong A)
9	Hex. Hd. Lockwasher Screw
10	Washer
11	Hex. Hd. Lockwasher Screw
12	Terminal Strip
13	Lockwasher - internal teeth
14	Rd. Hd. Mach. Screw
15	Cover
16	Spring Washer
17	Cabinet Lock Screw
18	Ringer
19	Capacitor
20	Tubing (for item 19 leads)

1.03 The 131 ringer is a single coil, two gong, frequency selective type of unit equipped with a mechanical volume control and assembled on an open, die-cast metal frame. The 133 ringer is identical except that the volume control is omitted. The 141 and 142 ringers are similar units in all respects except that they are provided with split winding coils for party identification on toll ticketing systems. Flexible wire leads are provided for the coil connections of the ringer which is mounted on the telephone base by a locating stud and two screws, each with a shock absorbing rubber bushing.

2. MECHANICAL REQUIREMENTS

2.01 If the armature pin of a B-type ringer does not function properly, replace ringer. Check by feel and visual inspection for binding, excessive wear, or end play.

2.02 The pressure of the clapper stem against the rubber sleeve on the tuning stem must be set within the following ranges:

Ringer Frequency	Pressure
16,16-2/3, 20, 25 cps	0-2 ozs 0-60 grams
30, 33-1/3 cps	1-3 ozs 20-90 grams
40, 42 cps	2-3 ozs 60-90 grams
50, 54 cps	3-4 ozs 90-120 grams
60, 66, 66-2/3 cps	3-5 ozs 90-150 grams

The pressure must be measured at the top of the angled portion of the clapper stem.

2.03 In the high volume control (damper) position both snubbers must be clear of the gongs.

In the middle position the snubber must rest firmly on gong "B".

In the low position both snubbers must rest firmly against their respective gongs.

Bend the spring arms carrying the snubbers to effect the adjustments.

2.04 Sensitivity (using moving coil meter and ERG source). The ringer should function strongly with the maximum voltages, steadily with the minimum voltages and just tinkle with the ultimate voltages applied across the coil only for the 16 through 25 cycle ringers and across the coil and capacitor for the 30 through 66-2/3 cycle ringers.

2.05 If a buzzer tone is desired with the B-type ringer, spread gongs as far apart as possible. Reduce armature stroke as in 3.02, until clapper will not strike gongs. If this adjustment cannot be made, gongs may be removed.

3. SPECIAL ASSEMBLIES

3.01 The 75–301 ringer is only supplied with either the 79938 or 79939 ringer installed or less ringer unit. It is possible to mount the following ringer types in the type 75 housing, however, the desired ringer and housing must be ordered separately:

131–470	141–470
133–470	142–470

These ringers are mounted on the baseplate in the same manner as types 79938 and 79939 after the gongs, resonators and control wheels have been removed.

3.02 It is not possible to mount ringers type 130–470 in the type 75 housing without considerable modification to the ringer frame.

4. BIAS SPRING POSITION

4.01 B-type ringers, sent to the field in instruments or shipped separately, have the bias spring located in the high notch (see Figure 3).

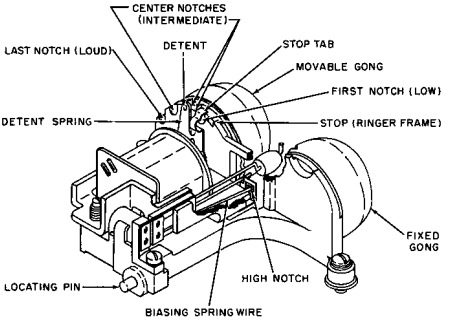

FIGURE 3
Code 130(BA)470 Ringer

4.02 Table A illustrates proper notch for bias spring to prevent bell tap and cross ring, and to provide proper ringing margin. Where the conductor loop resistance is about 1000Ω ring may be unsatisfactory. To correct, place bias spring in next lower notch.

TABLE A

Class of Service	Bias Spring Notch
Bridged Ringing	
Individual Line and PBX Stations*	High
Nonselective Party Lines†	Medium
Grounded Ringing	
2-party Flat and Message Rate	High
4-party Semiselective‡	High
4-party Selective and 8-party Semiselective	Low
Divided Code†	Medium

4.03 Obtain a ring for ringing test in accordance with local instructions. Ringing should be clear and steady. Observe during dialing that bell does not tap.

4.04 If bell tap is encountered with bias spring in medium notch and ringer is poled properly, move bias spring to high notch. Repeat ringer test and, if ringer fails to operate properly, change ringer.

NOTE: *Make certain line and ringer are poled correctly. Correct bias spring tension has been set at the factory. Do not bend bias spring.*

When three or more ringers are bridged across the line and ringer operation is unsatisfactory, placing bias spring in medium notch on all ringers may clear the trouble.

If ringer buzzes on short loop installations, when the party of opposite polarity is being called, place bias spring in high notch. If ringer still buzzes or fails to ring properly, replace ringer.

Where four ringers are connected between one side of line and ground, and ringer operation is unsatisfactory, placing bias spring in medium notch on all ringers on that side of line may clear the trouble.

5. TEST AND ADJUSTMENTS–BELL TAP

5.01 To test for bell tap–manual ring–capacitor-type bridge, operate switchhook rapidly with talking battery on the line. Bell should not ring or tap.

5.02 To test for bell tap–machine ring–dial system–capacitor-type bridge, dial any digit over 5 which is not a special code, such as long distance, operator, etc. Repeat test as many times as required. Dial tone should be heard on the line before each test.

5.03 To test for bell tap–ground identification, some specific classes of service require a ground identification from the subscriber set (e.g. tip-party). On this type, connect hand test set across terminals L1 and L2. To test, use dial of test set.

5.04 In an adjustment to stop bell tap, test polarity of ringers and line. If correct, turn biasing stud clockwise 1/16 turn at a time, until bell tap is stopped. When station or ringer cutoff key is provided, test for tapping with key in all positions. Prepay coin collector stations must be tested with coin trigger operated (circuit grounded).

5.05 To test for cross ring–manual ring–party line common battery stations, notify customer of opposite polarity that tests are being made. After tests are complete, notify customer again. Request operator to give a series of rings of the opposite polarity and proceed as follows:

a. With receiver on switchhook, bridge hand test set across terminals L1 and R of subscriber set.

b. During a silent interval, short-circuit terminals L2 and R with a suitable test cord.

c. On next ring (as indicated by audible ringing sound in test set receiver) bell should not ring or tap.

6. TEST AND ADJUSTMENT–CROSS RING

6.01 To test for cross ring–machine ring–manual and dial party line stations, reverse line wire at subscriber set terminals and proceed as follows:

a. Bridge hand test set across terminals L1 and L2 of the subscriber set, and monitor the line.

b. Obtain ring at the station. During a ringing interval, short-circuit terminals L1 and L2 as indicated by the audible signal in receiver of hand test set. If bell rings or taps, proceed as in 5.02. If bell does not ring or tap, restore original line connections.

6.02 An adjustment to stop cross ring, increase biasing spring tension by turning biasing stud not more than 1/16 turn at a time in a clockwise direction, testing for cross ringing each time, until bell is silent (see 6.01).

6.03 Final adjustment and margin test: After completing tests and adjustments to prevent tapping and cross ringing of bell, obtain a ring and increase biasing spring tension 1/2 turn of biasing spring stud. Ringing should start after a silent interval and continue clearly and steadily while the extra tension is being applied. If this test is met satisfactorily, reduce tension 1/4 turn of biasing spring stud. If ringer fails to pass test, replace ringer and repeat all tests and adjustments.

7. GONG ADJUSTMENTS

7.01 Operate armature from side to side (by means of biasing hook, if present) holding it momentarily in extreme positions of its travel. Do not grasp clapper rod to operate armature. See that clapper ball strikes each gong to produce a single clear tone, but does not rest against either gong, except in the case of 301-type loud ringing bells, where it is permissible to have clapper ball just touch the gongs at the end of each stroke. On ringers where the airgaps are changed from 0.035 inch and 0.012 inch to 0.060 inch and 0.012 inch, or vice versa, it may be necessary to bend clapper rod slightly to meet this requirement. If this is the case, a pair of long-nosed pliers should be used to bend rod close to armature. If clapper rod strikes coil or other part of ringer or, the side of the hole through which the rod protrudes, the rod may be straightened or slightly bent, as required.

7.02 Operate armature and see that clapper strikes each gong to produce a single clear tone. On the B-type ringer and 301 loud ringing bell, clapper must not rest against either gong.

7.03 To reduce the loudness of B-type ringers, make these adjustments. Reduce stroke by bending stroke limiting arm against yoke until stop pin on other side strikes pole piece. Then back off arm until proper volume is obtained. Use long-nose pliers for bending. Place pliers about 1/8 inch from the point where it enters the armature. Make final adjustment by bending arm near the middle, and readjust gongs to meet requirements in 6.03.

8. DISTINCTIVE TONES

8.01 For reduced loudness, reduce the stroke (travel) of the armature by reducing the airgap on the stop screw side and readjusting the gongs. Never reduce the airgap below 0.004 inch, the blade may enter with slight looseness or slight friction.

CAUTION: If ringer is to be silenced, do not use the above method. Disconnect ringer and see that connections for remaining ringers are in accordance with the connection paragraphs of individual descriptive practices.

8.02 For increased loudness, adjust ringer for maximum stroke (travel) according to airgap requirements in 8.01 and gong adjustments in 7.01.

8.03 If there is a complaint of low ringer volume, the B-type ringers may be adjusted to have louder volume by setting the gap at 0.060 inch on the biasing spring side and 0.024 inch on the other side. After the airgaps have been set, readjust gongs. If bell taps or cross-rings, see 5.02 and 6.01.