

RINGERS

NO. 6A, 6J, 6M, 6N, 7A, 8A, 8JA, 37H,
38B, 40A, 40B, 42A, 51A, 51B, 55B,
65B, 68A, 68J, 68JA, 72A, 78A, 78J,
AND B1A, B1AA, B1AB, B1AL, B2A, B2AL,
B3A, AND B3B

REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers the No. 6A, 6J, 6M, 6N, 7A, 8A, 8JA, 37H, 38B, 40A, 40B, 42A, 51A, 51B, 55B, 65B, 68A, 68J, 68JA, 72A, 78A, 78J, and B1A, B1AA, B1AB, B1AL, B2A, B2AL, B3A, and B3B ringers.

1.02 This section is reissued to include the B3B ringer and to add requirements and adjusting procedures covering lubrication for the B1AL ringer. Detailed reasons for reissue will be found at the end of the section.

1.03 References shall be made to Section 020-010-711 covering general requirements and definitions for additional information necessary for the proper application of the requirements listed herein.

1.04 One application of lubricant for the purpose of this section is the amount of lubricant retained on the end of a piece of No. 22 bare tinned copper wire after being dipped into KS-14774, List 1 lubricating grease to a depth of 3/8 inch and slowly removed without touching the container.

1.05 One dip of lubricant for the purpose of this section is the amount of lubricant retained on the KS-14162 brush after being dipped into KS-14774, List 2G lubricating grease to a depth of 3/8 inch and the tip of the brush lightly stroked on the edge of the container to remove any surplus.

2. REQUIREMENTS

2.01 Cleaning: The armature, the core, the armature stop screw, the armature stop spring, and the stop pins shall be cleaned when necessary in accordance with approved procedures.

2.02 Lubrication (B1AL Ringers Only)

Note: B1AL ringers identified by a white stripe are those that have been lubricated and do not require relubrication unless the lubricant is removed during cleaning.

(a) The following parts shall be adequately lubricated with KS-14774, List 1 lubricating grease. When lubrication is necessary, the lubricant shall be applied as follows.

- (1) Fig. 1(A) - One application to the end of the low stop pin.
- (2) Fig. 1(B) - One application to the end of the high stop pin.
- (3) Fig. 4(B) - One application to each of the two strike points of the clapper ball.

(b) The following parts shall be adequately lubricated with KS-14774, List 2G lubricating grease. When lubrication is necessary, the lubricant shall be applied as follows.

- (1) Fig. 1(C) - One dip to the armature pivot between the armature and the yoke tabs (2 points).
- (2) Fig. 1(D) - One dip to the armature pivot at the inner surface of the yoke tabs (2 points).

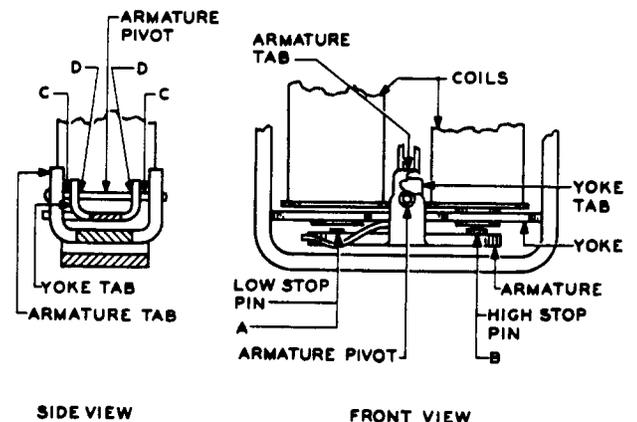


Fig. 1 - Points of Lubrication for Stop Pins and Armature Pivot of B1AL Ringer

2.03 Record of Lubrication: The B1AL ringers lubricated in the field shall be marked.

2.04 Armature Airgap

(a) Ringers With Armature Stop Screws

- (1) Fig. 2(A) - With the stop pin on the stop screw side resting against the core, the airgap between the stop pin and

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the core measured on the biasing spring side shall be

For the No. 6A, 6J, 6M, 6N, 7A, 8A, 8JA, 37H, 68A, 68J, 68JA, 78A, and 78J Ringers

Min 0.030 inch
Max 0.040 inch

Use the No. 126C gauge as shown in (c).

For the No. 42A and 72A Ringers

Min 0.055 inch
Max 0.065 inch

Use the No. 126D gauge as shown in (c).

(2) Fig. 2 (B) - With the armature or the armature stop spring resting against the stop screw, the airgap between the stop pin and the core measured on the stop screw side shall be

Min 0.009 inch
Max 0.015 inch

Use the No. 126A gauge as shown in (c).

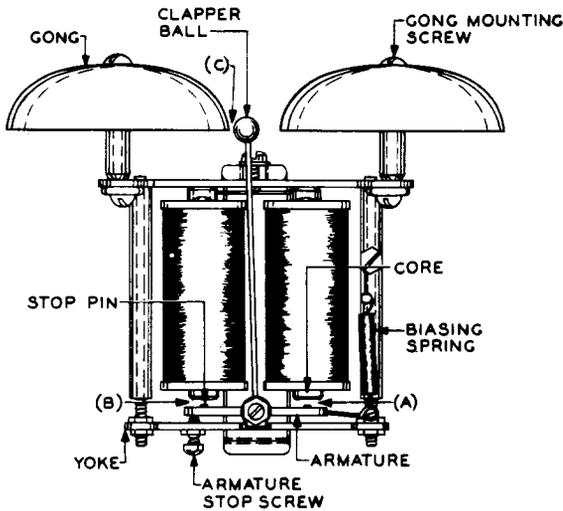


Fig. 2 - Ringers With Armature Stop Screw

(b) Ringers Without Armature Stop Screws

(1) No. 40A, 40B, 55B, and 65B Ringers and the No. 38B, 51A, and 51B Ringers Having Solid Stop Pins: Fig. 3(A) - With the stop pin on either side resting against the core, the airgap between the stop pin and the core measured on the opposite side shall be

For the No. 40A and 40B Ringers

Min 0.020 inch
Max 0.028 inch

Use the No. 126B gauge as shown in (c).

For the No. 38B, 51A, 51B, 55B, and 65B Ringers

Min 0.012 inch
Max 0.020 inch

Use the No. 43 gauge to check the minimum limits and the No. 126B gauge to check the maximum limits as shown in (c).

(2) No. 38B, 51A, and 51B Ringers Having Flexible Armature Stops: Fig. 8(A) -

The smaller of the airgaps between the core and the flexible armature stop, measured at the inner edge of the core and at the location of the embossed points of the flexible armature stops which are in contact with the armature, with the opposite end of the flexible armature stop fully deflected against the core, shall be

Max 0.020 inch

Use the No. 126B gauge as shown in (c).

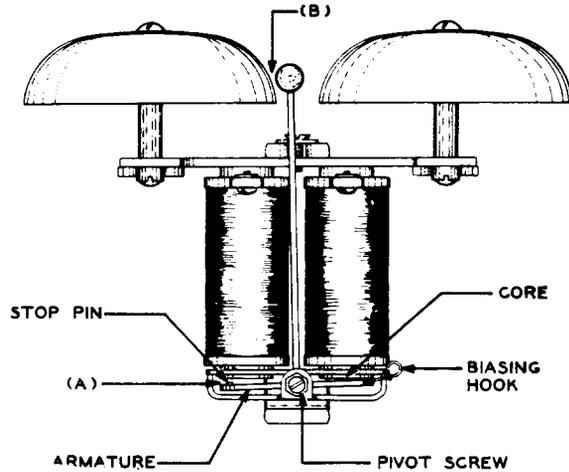


Fig. 3 - Ringers without Armature Stop Screw

(3) B-type Ringers: Fig. 4 and 5 - The airgap, when the high stop pin is in contact with the core, and the play in the bearings is taken up in a direction to reduce the airgap, shall be

For the B1-, B2-type and B3B Ringers

Min 0.022 inch
Max 0.033 inch

For the B3-type Ringers except B3B Ringer

Min 0.022 inch
Max 0.028 inch

Use the KS-6938 gauge to check the maximum limits and the KS-6909 gauge to check the minimum limits as shown in (c).

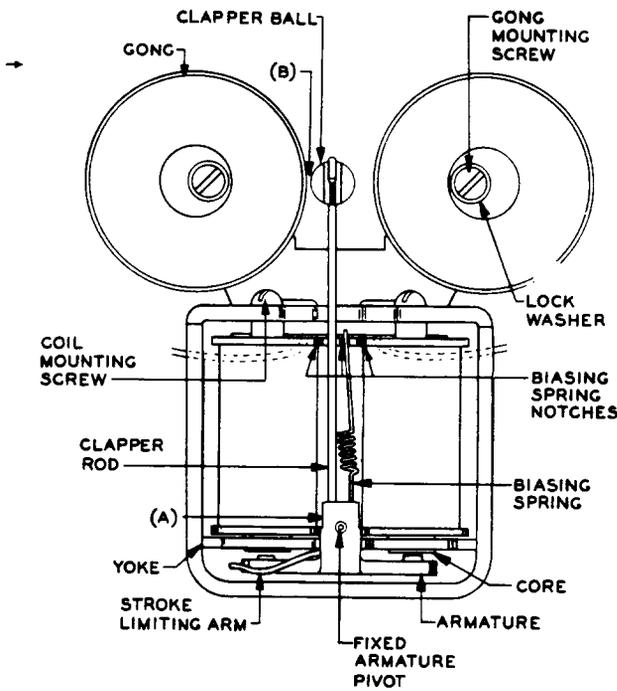


Fig. 4 - Parts of B-type Ringer Except B3B Ringer

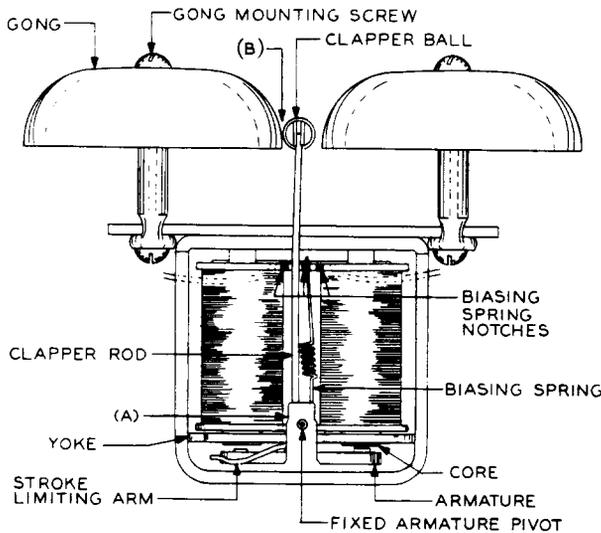


Fig. 5 - Parts of B3B Ringer

(c) To check the requirement, insert the proper gauge blades (as specified in the requirements above) into the airgaps in the manner shown in Fig. 6 through 9, according to the type of ringer, while applying pressure on the biasing spring hook in the manner

indicated, except in the case of B-type ringers where no pressure is applied. The minimum airgap requirements are met if the specified gauge blade enters easily, and the maximum requirements are met if the specified gauge blade does not enter without forcing. See that the blade rests flat on the core.

Note: On the 38- and 51-type ringers with flexible armature stops, the No. 126B gauge maximum should enter the gap with slight friction when the stops are resting against the armature at both ends as shown in Fig. 8.

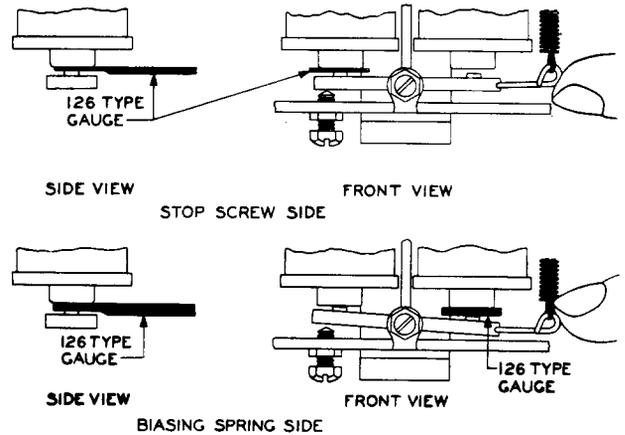


Fig. 6 - Method of Checking Airgaps on Ringers With Stop Screws

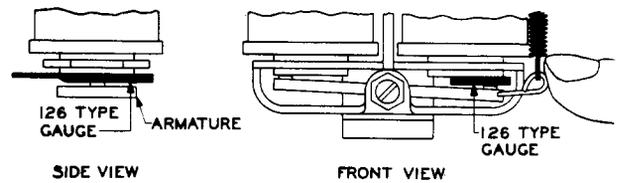


Fig. 7 - Method of Checking Airgaps on Ringers Without Stop Screws Having Solid Stop Pins

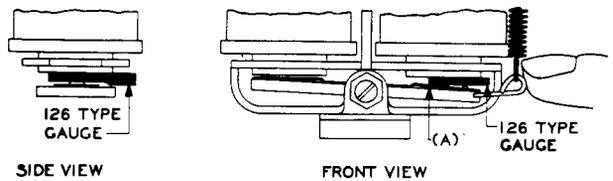


Fig. 8 - Method of Checking Airgaps on Ringers Without Stop Screws Having Flexible Stop Pins

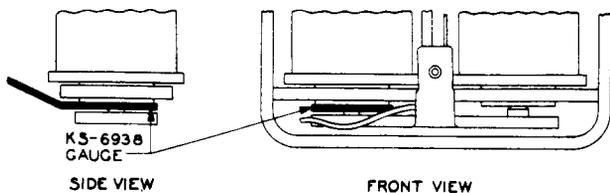


Fig. 9 - Method of Checking Airgaps on B-type Ringers

To check the requirement attempt to insert the No. 92H gauge between the armature and the yoke at the pivot pin. It should not enter.

2.07 Tightness of Adjusting Screws and Lock-nuts: The adjusting screws and the lock-nuts shall be sufficiently tight to maintain their adjusted positions.

2.08 Electrical Requirements: The ringer shall give a good, clear ring when it is connected to the current supply as specified and in the circuit in which it is to be used.

2.05 Clearance Between Clapper Ball and Gong

→ (a) Fig. 2(C), 3(B), and 4(B) - With the armature pushed over gently against the core or the stop screw, the clearance between the clapper ball and the nearest gong shall be

- 0.010 inch (all except B type ringers)
- 0.016 inch (for B type, except the B3B ringers)

at both extreme positions of the armature. Gauge by eye.

To check the clearance between the clapper ball and the gong, operate the armature to one side by pushing it toward the core. Grasp the armature, not the clapper rod. The clapper ball should strike the gong when the armature is operated in this manner, but when the armature is held against the core there should be the specified clearance between the clapper ball and either gong. Operate the armature to the other side and make a similar check.

↖ (b) B3B Ringer: Fig. 5 - The clapper shall be midway between the gongs when the armature is moved approximately half of the armature travel.

When viewed from the side of the ringer, the striking position of the clapper ball shall be in approximate alignment with the gong mounting posts.

L Gauge by eye.

2.06 Freedom of Movement of Armature

(a) The armature shall have perceptible end play in its bearings.

Gauge by eye and by feel.

To check the requirement grasp the armature between the thumb and forefinger and move it on the pivot screws or pivot, observing whether or not there is sufficient play between the armature and the pivot screw (or the armature and the yoke on B-type ringers) to prevent bind.

→ (b) Fig. 4(A) and 5(A) (B-type ringers only) - The end play of the armature shall be

Max 0.025 inch

Use the No. 92H gauge.

3. ADJUSTING PROCEDURES

3.001 List of Tools, Gauges, and Materials

Code or Spec No.	Description
<u>Tools</u>	
129B	1/4-inch Open Double-end Offset Wrench
311	3/8-inch and 7/16-inch Hex. Double-end Socket Wrench
→ KS-14162	Brush
→ (2 required)	
R-1021	1/2-inch Flat Brush
-	or
-	Brush, Sash, Devoe and Reynolds Co., No. 4
-	6-1/2-inch P-long-nose Pliers
-	3-inch Cabinet Screwdriver
-	4-inch Regular Screwdriver
<u>Gauges</u>	
43	Thickness Gauge Nest
92H	0.025-inch Thickness Gauge
126A	0.009- to 0.015-inch Thickness Gauge
126B	0.020- to 0.028-inch Thickness Gauge
126C	0.030- to 0.040-inch Thickness Gauge
126D	0.055- to 0.065-inch Thickness Gauge
127A	0.004-inch Thickness Gauge
KS-6909	Thickness Gauge Nest
KS-6938	Thickness Gauge Nest
P-464203	Ring (for No. 126 Gauges)
<u>Materials</u>	
KS-7188	Bell Seal Bond Paper
↖ KS-7433	White Multiple Marking Paint
KS-14774,L1	Lubricating Grease
L KS-14774,L2G	Lubricating Grease
→ -	No. 22 Bare Tinned Copper Wire
- -	Hardwood Toothpicks, flat at one end, pointed at the other

3.002 Before making any of the adjustments specified herein for ringers forming part of 43- and 127-type subscriber sets, remove the ringer and the cover from the subscriber set. To do this, remove the three roundhead screws in the cover with the 3-inch cabinet screwdriver. In lifting the cover and the ringer exercise care not to damage the wiring.

3.003 Do not remove the permanent magnet from the ringer when making any of the adjustments specified herein as this has a tendency to alter its magnetic characteristics.

3.004 Armature Stop Spring

(a) To minimize sticking between the armature and the stop screw, armature stop springs are provided for use on ringers other than the No. 38, 40, 51, 55, 65, and B type. Where ringers are equipped with chromium-plated armatures or are unbiased, it is not necessary to use armature stop springs. To mount the springs, proceed as follows.

(b) Slide the proper type of stop spring (square end or round end type) onto the armature from the stop screw side as shown in Fig. 10. If the airgap adjustment of the ringer, as found, does not give adequate working space to place the spring, back off the stop screw approximately 1/4 turn with a No. 129B wrench. Press the spring into place with the blade of a screwdriver. Be sure that clips on the stop spring engage the armature properly so that the spring lies substantially flat against the armature face.

(c) Readjust the stop screw to obtain the proper armature airgap as described in 3.04.

3.01 Cleaning (Rq 2.01)

(1) Clean the ringer assembly by brushing it off with a No. 5 sash brush or the R-1021 flat brush.

(2) Clean the point of contact between the stop screw and the armature, or armature stop spring if so equipped, by inserting a piece of KS-7188 Bell Seal bond or other approved cleaning paper between the screw and armature and withdrawing the paper while pressing the armature against the stop screw. Repeat until a clean paper shows no sign of dirt.

(3) Clean the points of contact between the armature stop pin and pole faces, using a method similar to that described in (2).

(4) (Blal ringer only) Relubricate as covered in 3.02 if the lubricant is removed while cleaning the ringer. ↴ ↵

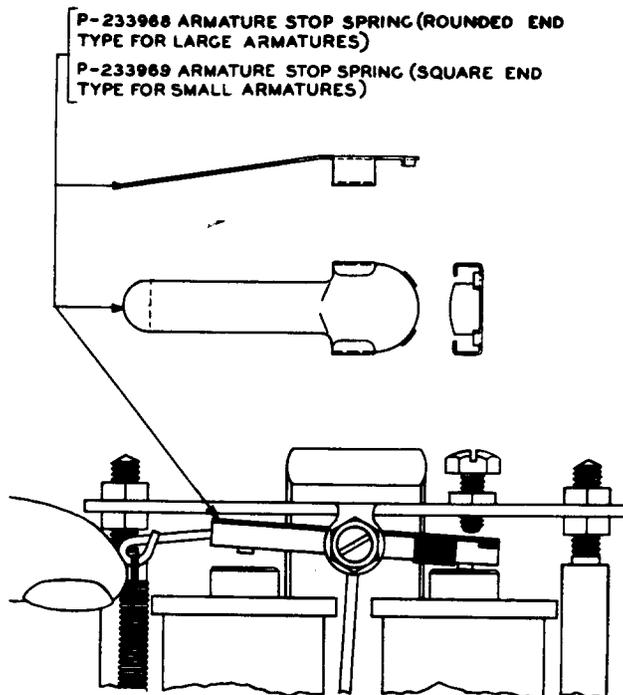


Fig. 10 - Method of Mounting Armature Stop Spring

3.02 Lubrication (Rq 2.02)

(1) General: Before lubricating remove the ringer mounting screws with the 3-inch cabinet screwdriver and remove the ringer from its mounting. In removing the ringer exercise care not to damage the wiring. If necessary, loosen the terminal screws with the 4-inch regular screwdriver and remove the leads. When lubricating, hold the ringer in a vertical position with the gong uppermost.

(2) Low and High Stop Pins: Remove any foreign matter between the low and high stop pins and the core with the flat end of a toothpick, then make one application of KS-14774, List 1 lubricating grease with the end of the No. 22 wire to the end of each pin. During each procedure operate the armature in the direction away from the part to be cleaned or lubricated.

(3) Strike Points on Clapper Ball (2 Points): Make one application of KS-14774, List 1 lubricating grease applied with the No. 22 wire to the 5/16-inch diameter portion of the clapper ball at each of the two points where the ball strikes the gong.

(4) Armature Pivot Between Armature and Yoke Tabs (2 Points): Hold the ringer in the palm of the hand with the clapper rod between the ringer and the hand. On the side of the clapper, apply one dip of KS-14774, List 2G lubricating grease with the ↴ ↵

↖ KS-14162 brush between the yoke tab and armature tab at a point above the armature pivot so that the lubricant will creep down to the armature pivot. Turn the ringer over, holding it so that the gongs are still uppermost and repeat the procedure on the opposite side as outlined above.

(5) Armature Pivot at Inner Surface of Yoke Tabs (2 Points): Hold the ringer as described in (4). On the side of the clapper, apply one dip of KS-14774, List 2G lubricating grease with the KS-14162 brush to the armature pivot where it enters the inner surface of the yoke tab. Turn the ringer over, holding it so that the gongs are still uppermost and repeat the procedure on the opposite side as outlined above.

3.03 Record of Lubrication (Rq 2.03)

(1) Apply a white stripe approximately 1/16-inch wide by 1/4-inch long to the surface of the coil cover. Use the KS-7433 white multiple marking paint applied with a KS-14162 brush.

3.04 Armature Airgap (Rq 2.04)

Ringers With Armature Stop Screws

(1) When it is necessary to readjust the airgaps on these ringers, loosen the locknut on the stop screw with the No. 129B wrench. Turn the stop screw with the 3-inch cabinet screwdriver and adjust the gaps so that the specified thickness gauge fits between the core and the stop pin on the armature with slight friction. In case the ringer is equipped with an armature stop spring adjust the gaps with the armature stop spring in place. If it is impossible to adjust the gaps in this manner, proceed as in (2) and (3).

(2) Loosen the locknut on the stop screw with the No. 129B wrench and turn it out (counterclockwise) with the 3-inch cabinet screwdriver until the tip of the stop screw is flush with the yoke. Then loosen the yoke nuts with the No. 129B wrench and raise or lower the yoke until the gauge specified for the biasing spring side of the armature fits with slight friction between the stop pin and core with the opposite stop pin and core in contact.

(3) Tighten the yoke nuts, making sure that the adjustment has not been destroyed in the tightening operation. Adjust the stop screw as covered in (1).

Ringers Without Armature Stop Screws

(4) When it is necessary to readjust the airgaps on these ringers, decrease or increase the airgap by turning the yoke adjustment screw (Fig. 12) in (clockwise) or

out (counterclockwise), respectively, with the 3-inch cabinet screwdriver until the specified thickness gauge fits with slight friction between either stop pin and core with the opposite stop pin and core in contact.

(5) If necessary reset the gongs as covered in 3.05.

(6) If the airgap of B-type ringers does not meet the requirement, replace the ringer.

3.05 Clearance Between Clapper Ball and Gong (Rq 2.05)

(1) If the gong mounting is of the style shown in Fig. 11, adjust the clearance between the clapper ball and gong by loosening the gong adjusting screws with the 3-inch cabinet screwdriver and shifting the gong as required.

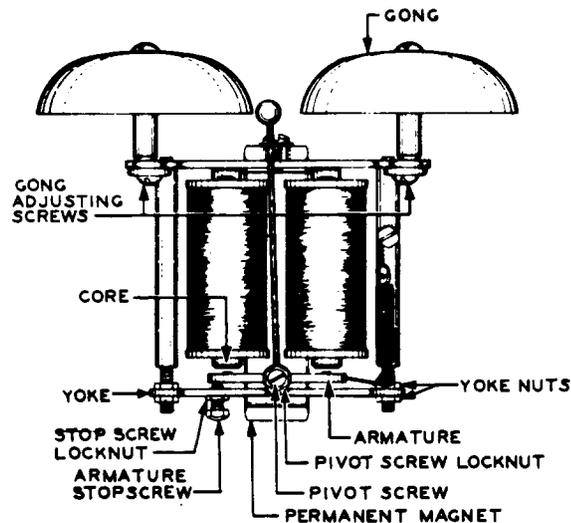


Fig. 11 - Adjusting Screws for 6-, 7-, 8-, and 42-type Ringers

(2) If the gong mounting is of the eccentric style shown in Fig. 12, adjust the clearance between the clapper ball and gong by loosening the eccentric setscrew with the 4-inch regular screwdriver and turning the eccentric gong as required.

(3) If the ringer is equipped with gongs of the eccentric type as shown in Fig. 13, loosen the gong setscrew with the 4-inch regular screwdriver or the No. 311 wrench and rotate the gong as required, by hand.

↖ (4) If the gong mounting is of the style shown in Fig. 14, loosen the gong adjusting screws with the 4-inch regular screwdriver and shift the gong mounting post as required.

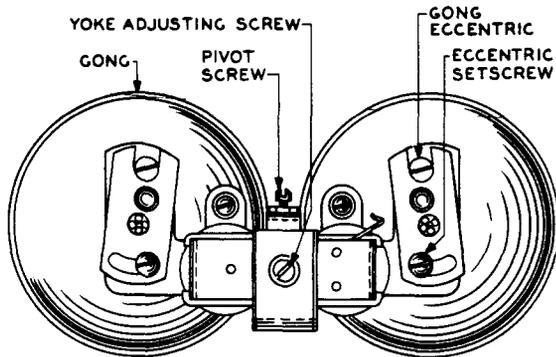


Fig. 12 - Adjusting Screws for Eccentric-type Gong Mountings

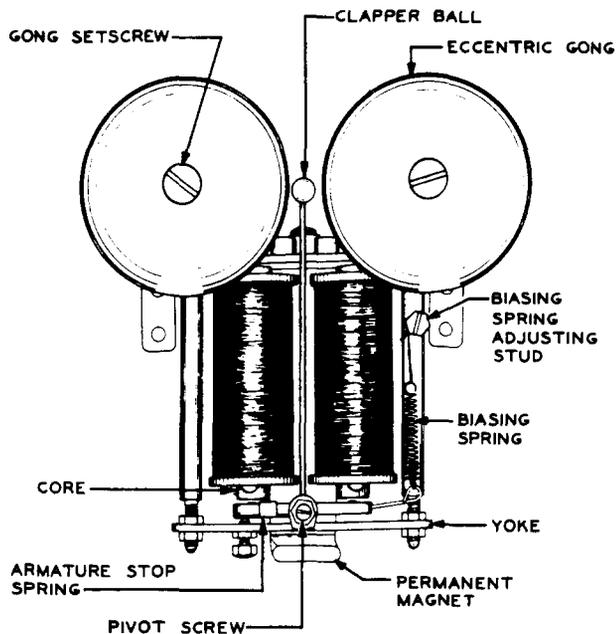


Fig. 13 - Adjusting Screws for 78-type Ringers

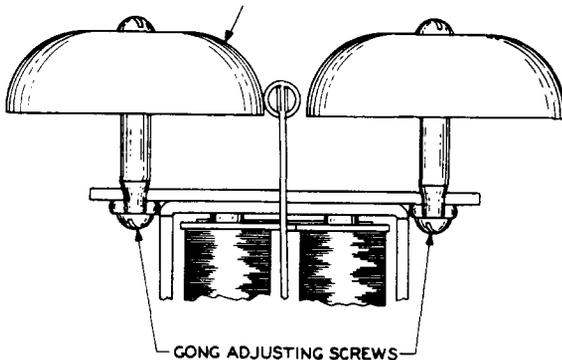


Fig. 14 - Adjusting Screws for B3B Ringers

(5) When the required setting of the gongs has been obtained, securely tighten the screws.

(6) In the case of 51-type ringers take care in resetting the gongs so that the armature airgap is not disturbed to such an extent that requirement 2.04 is not met.

3.06 Freedom of Movement of Armature (Rq 2.06)

(1) If the armature binds or has excessive sideplay loosen the locknut on the pivot screw with the No. 129B wrench and adjust the pivot screw as required with the 3-inch cabinet screwdriver and then tighten the locknut. The B-type ringers have a fixed pivot. If the armature on this ringer binds, replace the ringer.

3.07 Tightness of Adjusting Screws and Locknuts (Rq 2.07)

(1) If it is found that the adjusting screws or locknuts are loose, tighten the adjusting screws with the 3-inch cabinet screwdriver and the locknuts with the No. 129B wrench. Recheck for all other requirements.

3.08 Electrical Requirements (Rq 2.08)

Ringers Equipped With Biasing Springs

(1) All Except B-type Ringers

(a) First ascertain whether the biasing spring is a brown cord biasing spring. If not, it is recommended that a brown cord biasing spring be installed.

(b) To readjust ringers having a biasing spring change the armature tension by turning the biasing spring adjusting stud as required with the 3-inch cabinet screwdriver or the No. 129B wrench until a good clear ring is obtained.

(c) Obtain this by loosening the ringer biasing spring so that the cord is slack and then tightening the spring so that the biasing spring adjusting stud is 1/8 turn beyond the position where the cord is just taut. However, in case the ringer operates on superimposed ringing current, more than 1/8 turn will probably be required.

(d) To reduce the loudness it may be necessary to reduce the stroke of the armature by reducing the airgap on the stop screw side, readjusting as necessary the gongs in accordance with 3.05. Do not reduce the loudness more than is necessary, and do not in any case reduce the airgap below 0.004 inch (use No. 127A gauge). (The regular airgap limits may, however, be waived where necessary.)

(2) B-type Ringers: To readjust these ringers move the biasing spring from one notch to another until the electrical requirements and the proper loudness are obtained. To reduce the loudness it may be necessary on these ringers to reduce the stroke of the armature by bending the stroke limiting arm. Bend the stroke limiting arm using the P-long-nose pliers until it strikes the yoke before the armature stop pin strikes the core, readjusting the gongs in accordance with 3.05 as necessary. Do not reduce the loudness more than is necessary, and do not in any case reduce the airgap (measured on the side opposite the stroke limiting arm) below 0.004 inch (use the No. 127A gauge).

Ringers Not Equipped With Biasing Springs

(3) To readjust ringers not equipped with a biasing spring, increase or decrease the airgap between the armature and the core,

keeping the gaps, however, within the specified limits.

REASONS FOR REISSUE

1. To add the B3B ringer.
2. To add requirements and procedures for lubrication for the BlAL ringer.
3. To add a figure showing the points of lubrication for the BlAL ringer (Fig. 1).
4. To revise Fig. 2, 3, and 4 to show the clearance between clapper ball and gong.
5. To remove Fig. 8.
6. To revise the List of Tools and Materials (3.001).