

BELLS AND BUZZERS

7 TYPE

REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers the requirements and adjusting procedures for the 7-type bells and buzzers.

1.02 This section is reissued for the following reasons:

- Add 1.04 to provide rerate and replacement information
- Other changes as required.

Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 Reference 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 The 7-type buzzers (Fig. 1), except for 7F, are rated Manufacture Discontinued and are replaced by the buzzers indicated in Table A. The 7F is rated A&M Only. Refer to the appropriate section in Division 501 for additional information on the 7-type buzzers and the KS-type buzzers which replace the 7 type.

2. REQUIREMENTS

2.01 **Cleaning:** The contacts and other parts of the bell or buzzer shall be cleaned when necessary in accordance with the appropriate section in Division 069.

2.02 **Cover Mounting**

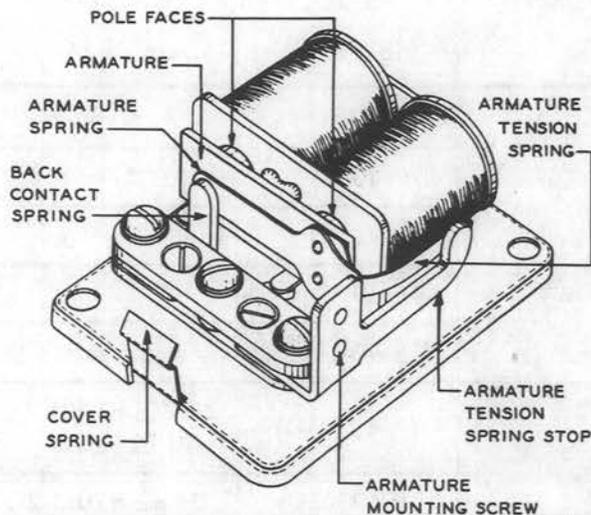


Fig. 1—7-Type Buzzer

(a) **Bells and Buzzers Equipped With Attached Cover Springs:** The cover springs shall hold the cover securely in position.

Gauge by feel.

(b) **Bells and Buzzers Equipped With Formed Cover Springs:** The formed cover springs shall hold the cover securely in position.

Gauge by feel.

2.03 **Clearance Between the Clapper and the Slot in Cover (7-Type Bells Only):** During the normal operation of the bell, there shall be a perceptible (minimum 1/32 inch) clearance between the clapper and the slot in the cover.

Gauge by eye.

NOTICE

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

TABLE A
LOW VOLTAGE AC AND DC SIGNALS

SIGNAL	ORDERING GUIDE		OPERATING FEATURES			
	CODE	REPLACED BY	VOLTAGE RANGE		APPROX DC RES*	APPROX AC CURRENT IN MA
			DC (VOLTS)	50-60 CYCLES AC		
Bell	7A-49	—	14-40	25-50	270	32-75
	7C-49	—	2-5	4-9	2.6	125-200
	7D-49	—	3-10	6-18	15.8	80-175
	7E-49	—	10-20	18-30	105	85-125
	7F-49†	—	24-60	35-60	682	25-50
Buzzer	7A-49 (MD)	**KS-8109L2 or KS-8110L2	14-40	15-21	270	—
	7B-49 (MD)	**KS-8108L2	2-6	4-9	10.5	—
	7C-49 (MD)	**KS-8108L2	2-8	3-8	2.6	—
	7D-49 (MD)	**KS-20419L1	4-15	4-15	15.8	—
	7E-49 (MD)	**KS-8109L2	10-20	10-20	105	—
	7F-49†	—	20-60	20-60	682	—
	7G (MD)	—	14-52	—	—	—
	7H (MD)	**KS-8109L2 or KS-8110L2	14-40	—	270	15-40
	D-99306	—	5-10.6	—	—	—

* Multiply these values by 3 when computing dc current drain, except for 7F buzzer or bell.

** Refer to appropriate section in Division 501 for information on the KS-type buzzers.

† May also be operated with 16- to 20-cycle ringing current. Effective impedance is then 850 ohms and approximately 3500 ohms in series with 2- μ f capacitor.

2.04 Felt Buffer Pressure (7G Buzzer): Fig. 2—With the armature in the normal position, the pressure of the felt buffer against the armature shall be

Min 5 grams

Use the 70F gauge.

2.05 Armature Gap (7G Buzzer): With the armature in the normal position, the gap between the pole face furthest from the fulcrum and the armature shall be

Min 0.002 inch

Use the 92S gauge.

2.06 Armature Pressure (7G Buzzer): With the armature in the normal position, the cork-faced portion of the armature shall press lightly against the pole face nearer the fulcrum.

Gauge by feel.

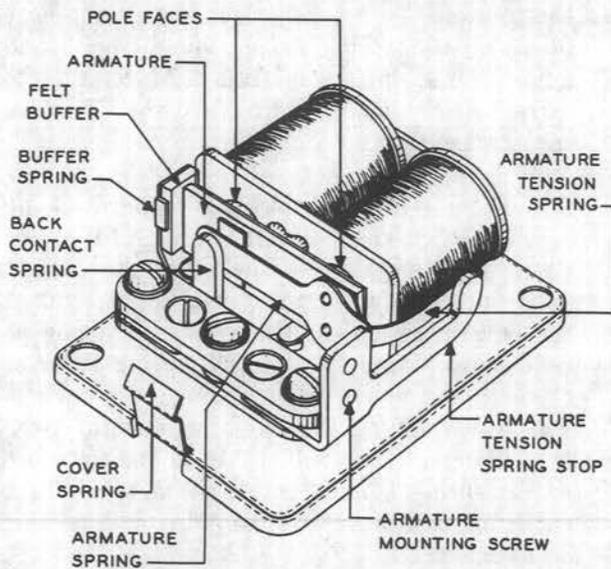


Fig. 2—7G Buzzer

2.07 Operating Voltages: Operating voltages for the bells and buzzers will be as specified in Table A. Use voltmeter to verify input voltages.

2.08 Audible Signals

(a) All buzzers, except the 7G buzzer, will give a satisfactory signal when the circuit in which it is used closes.

(b) The 7G buzzer will vibrate with a minimum of sound.

3. ADJUSTING PROCEDURES

3.001 List of Tools, Gauges, and Test Apparatus

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
363	Spring adjuster
—	6-1/2 inch B long-nose pliers
—	3-inch C screwdriver

GAUGES

70F	10-0-10 gram gauge
92S	0.002-inch thickness gauge

TEST APPARATUS

—	AC-DC voltmeter
---	-----------------

3.01 Cleaning: Clean the contacts and other parts in accordance with the appropriate section in Division 069. After cleaning, check operation of bell or buzzer.

3.02 Cover Mounting

(a) **Bells and Buzzers Equipped With Attached Cover Springs:** If the cover does not fit properly, remove the cover and adjust the cover springs as required with the B long-nose pliers.

(b) **Bells and Buzzers Equipped With Formed Cover Springs:** If the cover does not fit properly, remove the cover and adjust the cover with the fingers.

3.03 Clearance Between the Clapper and the Slot in Cover (7-Type Bells Only): If clearance is not per requirement 2.03, remove cover and adjust the clapper as required using the B long-nose pliers.

3.04 Felt Buffer Pressure (7G Buzzer): If pressure is not per the requirement in 2.04, adjust the spring as required using the 363 spring adjuster applied near the base of the spring.

3.05 Armature Gap (7G Buzzer): If the gap is not per the requirement in 2.05, adjust the back contact spring as required using the B long-nose pliers.

3.06 Armature Pressure (7G Buzzer): If pressure is not per the requirement in 2.06, loosen the armature mounting screws using the 3-inch C screwdriver and move the armature as required. Tighten the mounting screws securely.

3.07 Operating Voltages: If voltages are not per the requirement in 2.07, check for loose connections. If all connections are secure, check the power source for the required output.

3.08 Audible Signals

(a) **General:** The bells and buzzers are designed to operate satisfactorily on the voltages specified in Table A. If failure occurs, it may be due to the voltages being outside these limits and consideration should be given to correcting the voltage before readjusting the apparatus.

(b) **Unsatisfactory Signal**

(1) If a bell or buzzer operates when connected to a source of power but the tone is unsatisfactory, the trouble may be due to any of the following reasons. To correct, remove the cover and proceed as covered in the procedures indicated in parentheses. After making the necessary adjustments, remount the cover and recheck the operation of the bell or buzzer.

Loose connections (2)

Poorly soldered connections (3)

Excessive or insufficient tension of armature tension spring (4)

Excessive or insufficient contact separation (5)

Insufficient separation between armature and pole face nearer fulcrum (all except the 7G buzzer) (6)

Armature not parallel to pole face (7)

Excessive or insufficient pressure of felt buffer against armature (7G buzzer only) (8)

Insufficient armature gap (7G buzzer only) (8)

Distorted clapper (7-type bells only) (9 and 10)

All Bells and Buzzers

(2) Where connections are loose, tighten them using the 3-inch C screwdriver.

(3) Resolder connections where necessary.

(4) To change the pitch of the sound, increase or decrease the tension of the armature tension spring. Decrease the pitch by decreasing the tension, and increase the pitch by increasing the tension. To do this, place the B long-nose pliers on the spring as shown in Fig. 3 and adjust the spring away from the armature to increase the tension and toward the armature to decrease the tension.

(5) If, with the bell or buzzer operating on direct current, the tension or follow of the armature spring is such that the contact does not open when the armature is against the pole faces, adjust the armature spring as required, by applying the 363 spring adjuster close to the base of the spring as shown in Fig. 4 and giving the adjuster a slight twist in a direction that will decrease the pressure of the spring against the back contact. Take care not to kink the spring in making this adjustment.

All Bells and Buzzers Except the 7G Buzzer

(6) Insufficient separation between the pole face nearer the fulcrum and armature will result in the armature striking this pole face before the armature strikes the other pole face. A check of the conditions will be facilitated if a piece of white paper is inserted beneath the spools and the armature and the

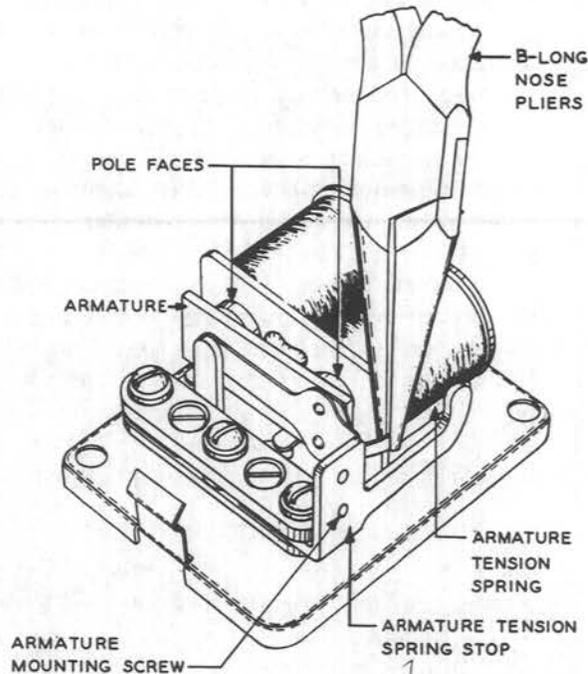


Fig. 3—Method of Tensioning Armature Tension Spring

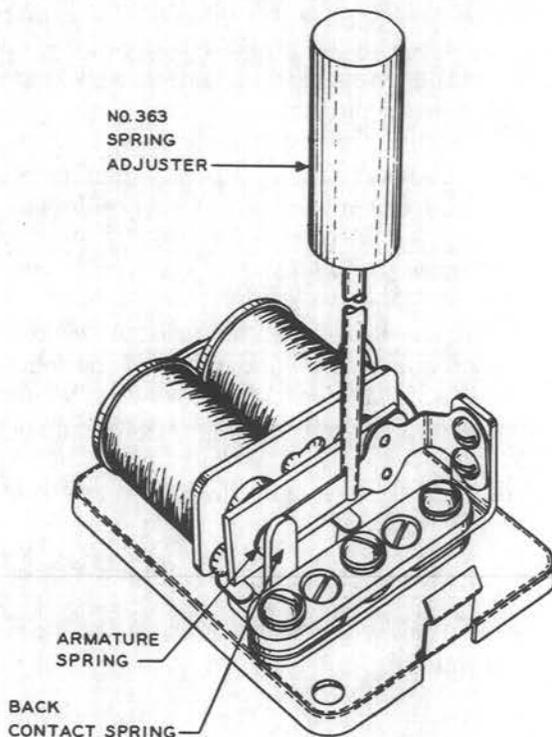


Fig. 4—Method of Adjusting Armature Spring for Follow

armature operated manually. To correct, loosen the armature mounting screws using the 3-inch C screwdriver. Slightly shift the armature away from the pole faces. If the armature cannot be moved far enough to obtain a satisfactory separation, move it as far away as possible and tighten the screws securely. Adjust the armature spring at a point near the mounting screws with the B long-nose pliers so as to move the armature away from the pole faces. After making this adjustment, check the tension of the armature spring and the amount of armature travel, adjusting if necessary.

(7) If the armature is not parallel to the pole faces, loosen the armature mounting screws with the 3-inch C screwdriver and rotate the armature slightly until it is parallel. Tighten the mounting screws securely.

7G Buzzers

(8) If the sound is too loud, it may be due to the insufficient pressure of the felt buffer against the armature or to insufficient pressure of the armature against the pole face nearer the fulcrum. To correct the pressure of the buffer, adjust the spring as shown in 3.04. If the armature does not rest lightly against the pole face, nearer the fulcrum, adjust per 3.06.

7-Type Bells

(9) If, after the bell has been adjusted, the tone is still unsatisfactory with the cover mounted in place, it may be due to the clapper striking the edge of the cover. If this occurs, adjust per 3.03.

(10) If the armature vibrates satisfactorily, but the clapper does not strike the gong, adjust the clapper as required with the B long-nose pliers as shown in Fig. 5.

(c) Failure to Operate

(1) If the armature of a bell or buzzer fails to move toward the pole faces when connected to a source of power, the trouble may be due to any of the following reasons. To correct, remove the cover and proceed as covered in the procedures indicated in

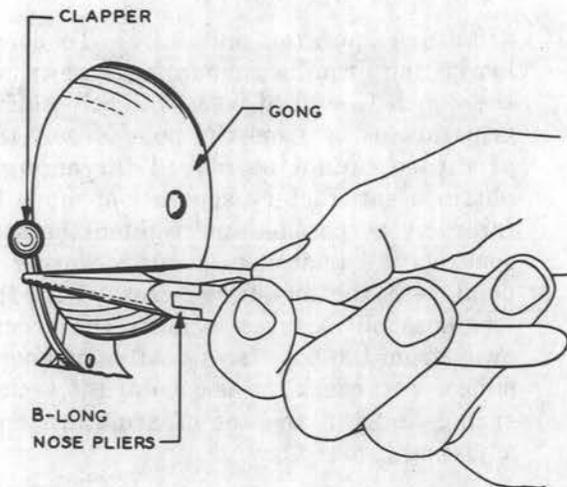


Fig. 5—Method of Adjusting for Clapper Movement

parentheses. After making the necessary adjustments, remount the cover and recheck the operation of the bell or buzzer.

Open winding (2)

Insufficient separation between the armature and the pole face nearer the fulcrum (all except the 7G buzzer) (3)

Excessive armature travel (all except the 7G buzzer) (4)

Excessive tension of the armature tension spring (5)

Insufficient armature gap (7G buzzer) (6)

All Bells and Buzzers

- (2) If the windings are open, replace the bell or buzzer.
- (3) If the separation between the armature and the pole face nearer the fulcrum appears insufficient, proceed as covered in (b)(6).
- (4) To check for excessive armature travel, place the 363 spring adjuster lightly against

the armature so as to move the armature nearer the pole faces. If this improves the tone, reduce the armature travel by adjusting the back contact spring slightly in toward the armature with the B long-nose pliers. It may be necessary to remove the bell or buzzer from its mounting in order to make this adjustment. Repeat this adjustment until the travel is such that the armature operates satisfactorily when the circuit is closed. If the bell or buzzer under test is operating on direct current, note at this time that when the armature is moved manually against the pole faces, there is approximately 0.005-inch separation between the armature spring and the back contact. In making any adjustment, make an effort to maintain this separation.

- (5) If the armature travel is satisfactory, the failure may be due to excessive tension of the armature tension spring. To correct, apply the B long-nose pliers to the spring as shown in Fig. 3 and adjust the spring in a direction toward the armature. After making this adjustment, check that the armature tension spring rests against the armature tension spring stop when the bell or buzzer is in the unoperated position and that the cover clears the stop.

- (6) **7G Buzzer:** If the armature gap is insufficient, proceed as covered in (4).

(d) *Failure to Release*

- (1) If the bell or buzzer fails to release, the trouble may be due to any of the following reasons. To correct, remove the cover and proceed as covered in the procedures indicated in parentheses. After making the necessary adjustments, remount the cover and recheck the operation of the bell or buzzer.

Insufficient armature travel (2)

Insufficient tension of the armature tension spring (3)

Excessive follow of the armature spring (4)

Excessive pressure of the felt buffer (7G buzzer only) (5)

- (2) If the armature travel is insufficient, adjust the back contact spring slightly with the B long-nose pliers.

- (3) To correct the tension of the armature tension spring, apply the B long-nose pliers near the bend in the spring and adjust the spring away from the armature as shown in Fig. 3. Do not adjust the armature tension spring stop when making this adjustment as it may adversely affect the operation of the bell or buzzer.
- (4) If the follow of the armature spring is excessive, adjust the spring as required by applying the 363 spring adjuster close to

the base of the spring as shown in Fig. 4. Give the adjuster a slight twist in a direction which will decrease the pressure of the spring against the back contact spring. Take care not to kink the spring in making this adjustment.

- (5) **7G Buzzer:** If the felt buffer rests against the armature with excessive pressure, reduce the pressure of the buffer spring using the 363 spring adjuster applied near the base of the spring.