

SIGNALS  
D-96972 AND D-96829  
AND D-96846 INDICATORS  
REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers apparatus requirements and adjusting procedures for the D-96972 and D-96829 signals and the associated D-96846 indicator. These signals and indicators were designed for use in 550 and 551 type PBX's to permit operation by blind attendants.

This section is reissued to incorporate material from the addendum in its proper location.

1.02 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.

1.03 Requirements are marked with an asterisk (\*) when to check for them would necessitate dismantling or dismantling the apparatus or would affect the adjustment involved or other adjustments. No check need be made for these requirements unless the apparatus or part is made accessible for other reasons or its performance indicates that such a check is advisable.

1.04 Operate A signal and the associated indicator are said to operate if when current is applied to the signal the armature push rod moves upward so as to cause the end of the indicator to project above the face of the indicator shelf sufficiently to provide a satisfactory signal.

1.05 Release A signal and the associated indicator is said to release if, when current is disconnected from the signal, the armature push rod drops down so as to permit the indicator to restore to its normal position approximately flush with the face of the indicator shelf.

2. REQUIREMENTS

2.01 Cleaning The signal and associated indicator shall be cleaned when necessary in accordance with approved procedures.

2.02 Freedom of Indicator Movement - Fig. 1 (A) - The indicator shall move freely in the indicator bushing. Gauge by feel.

2.03 Freedom of Movement of Indicator Actuating Lever - Fig. 1 (B) - The indicator actuating lever shall move freely on its bear-

ings and shall not be sluggish in restoring to normal when the signal is released. Gauge by eye and by feel.

\*2.04 Tightness of Indicator Parts - Fig. 1 (C) - The indicator screw shall be sufficiently tight in the indicator to hold any adjusted position. Gauge by feel.

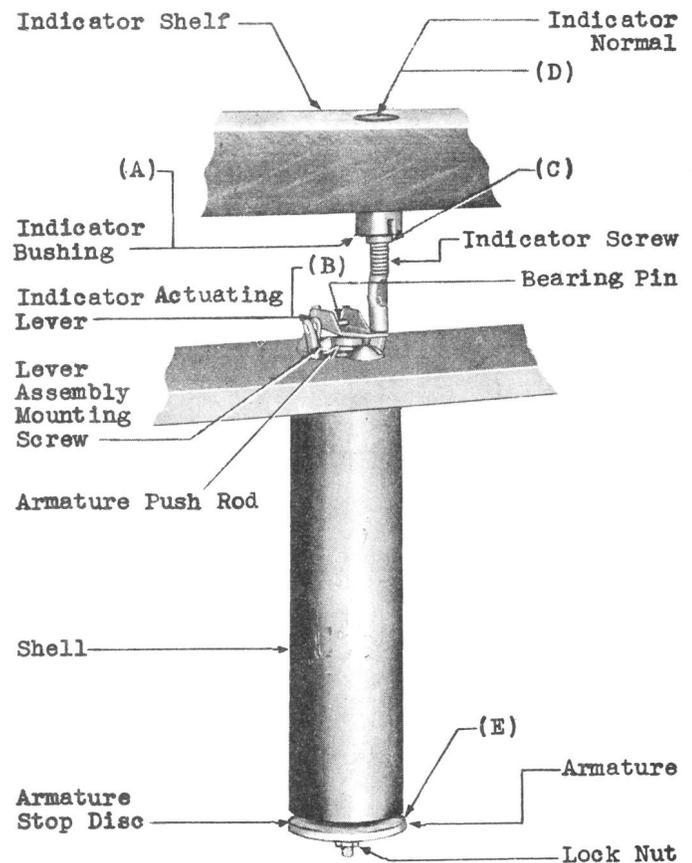


Fig. 1 - General View of Signal and Indicator in Normal Position

2.05 Indicator Position

(a) Fig. 1 (D) With the associated signal in the normal position, and with the indicator shelf screwed tightly in place the top of the indicator shall be approximately ( $\pm .005$ " ) flush with the face of the indicator shelf. Gauge by eye and by feel.

(b) Fig. 2 (A) With the associated signal operated electrically on the specified operating current, the indicator shall project above the face of the indicator shelf Min. 3/32" Gauge by eye.

2.06 Signal Mounting

\*(a) The signal shall be held securely to the mounting plate. Gauge by feel.

(b) The indicator actuating lever assembly shall be held securely by its associated mounting screw. Gauge by feel.

\*2.07 Freedom of Movement of Armature The armature push rod shall not bind in the hole in the signal core. Gauge by feel.

\*2.08 Armature Travel - Fig. 1 (E) - The armature travel shall be Minimum .038", Maximum .042". Use the No. 66D gauge.

\*2.09 Tightness of Lock Nut The lock nut shall be sufficiently tight to hold the armature in the adjusted position. Gauge by feel.

2.10 Electrical Requirements The signal and the associated indicator shall meet the electrical requirements specified on the circuit requirement table.

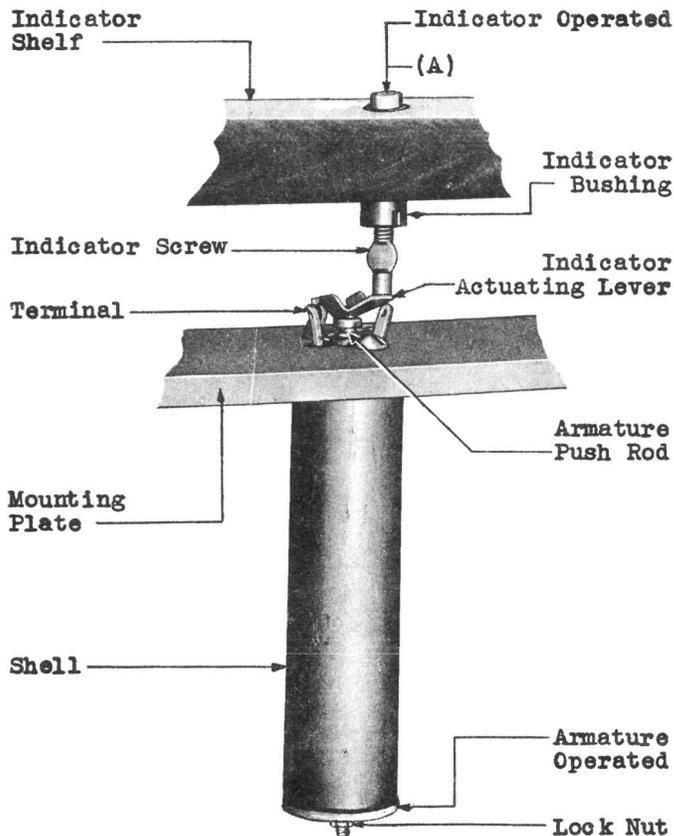


Fig. 2 - General View of Signal and Indicator in Operated Position

3. ADJUSTING PROCEDURES

3.001 List of Tools, Gauges and Materials

<u>Code No.</u>	<u>Description</u>
<u>Tools</u>	
319B	Lamp Cap and Number Plate Extractor
349	Wrench - 3/16"-7/32" Hex., Closed, Double-end, Offset
-	Pliers, Long Nose 6-1/2"
-	Screw-driver - Cabinet 3-1/2"
-	Screw-driver - Regular 4"
-	Stick, Orange per KS-6320
<u>Gauges</u>	
66D	Thickness Gauge Nest
<u>Materials</u>	
-	KS-7860 Petroleum spirits
-	Cloth per KS-2423
-	Bell Seal Bond Paper - Substance No. 20 1/2" x 2-1/2" per KS-7187
-	Paper Clip - Bell System No. 1

3.002 When the indicator shelf is raised for any reason it is advisable to disconnect battery from the signal terminals by operating the PBX battery cutoff key. If this is not feasible great care must be exercised to avoid grounding the signal terminal to the mounting plate or adjacent parts of the signal.

3.003 Due to the design and method of mounting these signals, it will not be practical to perform some of the adjustments specified herein unless the sheet metal plate is removed from the bottom of the signal cabinet. To do this remove the mounting screws using the 4" regular screw-driver.

3.01 Cleaning (Rq.2.01)

(1) To clean the indicator raise the top of the cabinet using the 4" regular screw-driver to remove the screws and lift the indicator so that the flat portion of the indicator screw engages the slotted portion of the indicator bushing. Then turn the top portion of the indicator with the fingers in a counter-clockwise direction until the indicator is separated from the associated screw. If the indicator cannot be turned with the fingers the No. 319B lamp cap and number plate extractor may be used. Before using the No. 319B tool place a piece of KS-2423 cloth over the indicator to guard against marring the surface. Remove the indicator and wipe off the surface

with a KS-2423 cloth which has been slightly moistened in petroleum spirits. Clean the inside surfaces of the indicator bushing with a KS-2423 cloth wrapped around the end of the KS-6320 orange stick. Then reassemble the indicator, close the indicator shelf and adjust for indicator position as covered in 3.02-3.04.

(2) To clean the armature, core and shell, insert a strip of KS-7187 paper between the armature stop disc and the shell and while holding the signal operated manually, withdraw the paper. Repeat this operation until all parts of the armature, core and shell have been cleaned and the paper when withdrawn shows no evidence of dirt.

- 3.02 Freedom of Indicator Movement (Rq.2.02)  
3.03 Freedom of Movement of Indicator Actuating Lever (Rq.2.03)  
 3.04 Tightness of Indicator Parts (Rq.2.04)  
 3.05 Indicator Position (Rq.2.05)

(1) If the indicator binds in its bushing, clean it as covered in 3.01. If this does not correct the condition, replace the indicator and associated screw. To do this remove the indicator as covered in 3.01, substitute the new parts close the indicator shelf and readjust for indicator position.

(2) If the indicator actuating lever binds, adjust the sides of the actuating lever and mounting as required with the long nose pliers applied just above the bearing pin.

(3) If the indicator screw is loose in the indicator remove the indicator as covered in 3.01. Turn the screw into the indicator approximately three threads and press the sides of the slot in the lower end of the indicator together tightly using the long-nose pliers. Reassemble the indicator, close the indicator shelf and adjust for indicator position.

(4) If the indicator is not flush with the surface of the face plate when the signal is in the normal position, insert the end of a paper clip in the hole in the center of the top of the indicator and lift the indicator as high as possible so that the flat portion engages the slot in the indicator bushing. Then turn the indicator to the right or left as required so that when it is restored to its normal position, the top of the indicator is approximately flush with the surface of the indicator shelf.

(5) If after making the adjustment covered in (3) the indicator does not extend beyond the indicator shelf as required

when the signal is operated, increase the armature travel toward the maximum as covered in 3.07-3.09.

### 3.06 Signal Mounting (Rq.2.06)

(1) To tighten a signal which is loose on the mounting plate, remove the lever assembly mounting screw and remove the indicator actuating lever assembly. Tighten the signal mounting screw securely, using the 3-1/2" cabinet screw-driver, remount the indicator actuating lever assembly and tighten the mounting screw securely. If the indicator actuating lever assembly only is loose tighten the lever assembly mounting screw securely with the 3-1/2" cabinet screw-driver.

- 3.07 Freedom of Movement of Armature (Rq.2.07)  
3.08 Armature Travel (Rq.2.08)  
3.09 Tightness of Lock Nut (Rq.2.09)

(1) If the armature does not move freely, it may be due to a bent armature push rod or to dirt or a gummy substance collected on the armature push rod. To correct this condition, unsolder the leads and remove the signal from the mounting using the 3-1/2" cabinet screw-driver to remove the signal mounting screws. Remove the lock nut from the armature push rod with the No. 349 wrench and remove the armature by turning it off the push rod. Draw the armature push rod from the armature core and if it is bent straighten it or substitute a new one. If the armature push rod is dirty wipe it off with a KS-2423 cloth which has been slightly moistened with petroleum spirits. Then assemble the parts and adjust for armature travel as covered in (2).

(2) To adjust for armature travel remove the signal from the mounting plate as covered in (1). Turn the outer shell of the signal so that the core face projects beyond the end surface of the shell and loosen the lock nut on the armature with the No. 349 wrench. Insert the .040" blade of the No. 66D gauge in the gap between the armature and the core. Turn the armature up against the gauge and tighten the lock nut securely. With the gauge still in position turn the outer shell so that it is brought down against the gauge, thereby aligning the face of the shell with the face of the core. Then withdraw the gauge and remount the signal. Reconnect the leads and recheck for indicator position.

### 3.10 Electrical Requirements (Rq.2.10)

(1) If the signal fails to meet the electrical requirements, recheck the armature, indicator and indicator actuating lever assembly for bind and make adjustments as required. Recheck and, if necessary, readjust the armature travel.