

COIN COLLECTORS

MAINTENANCE — GENERAL

1.00 INTRODUCTION

1.01 This section covers general maintenance of coin collectors. It includes maintenance of upper housing and of lower housing and backplate assembly. A list of tools, gauges, and materials necessary for cleaning and performing specified maintenance operations also is included.

1.02 Specific items of maintenance and related tests for prepay or postpay coin collectors are covered in the C Section entitled Coin Collectors, Prepay, Maintenance; or Coin Collectors, Postpay, Maintenance.

2.00 GENERAL

2.01 This section does not cover maintenance information for special antifraud attachments which may be installed on coin collector.

2.02 Maintenance of dials, transmitters, receivers, handsets, cords, and ringers is described in the C Sections covering these components.

2.03 Connections for each type of coin collector are given in related C Sections covering connections.

2.04 The 10-cent type coin collector may be used for 5-cent service when a cutover clip is in place.

2.05 When trouble is such that it cannot be cleared by the craftsman, he shall report to test desk and place a KS-7991 out-of-service sign on coin collector. When coin collector is restored to service, sign shall be removed. Sign shall be returned to agent or other person responsible for the public telephone, according to local instructions.

AUXILIARY HANDSET DEVICES

2.06 Transmitter and Receiver Locks: Use and method of mounting transmitter and receiver locking devices are covered under components in the C Section entitled Handsets, Connections and Maintenance. Locks are intended for use at locations where past experience indicates need or where vandalism is likely to occur, such as apartment hallways, air, rail, or bus terminals, filling stations, outdoor booths, etc. Locations where such locks are to be used shall be designated locally.

2.07 Antifrost Transmitter Cover: The 118A cover is intended for use on F- or G-type handsets associated with coin stations located in outdoor booths where subfreezing temperatures are encountered. Cover prevents condensed moisture from freezing in grid holes of transmitter. Use as required.

2.08 Antifraud Transmitter Unit: The T2 transmitter unit is equipped with a special grid to protect unit against certain fraudulent practices. It is used in place of the T1 transmitter unit. Use as designated locally.

2.09 Armored Cords: The H4CG-3 cord, for use with G-type handsets, and the H3AP-3 cord, for use with F-type handsets, are neoprene jacketed armored cords intended for use at locations where vandalism has been encountered. The G1G-3 and F1K-3 handsets equipped with these cords are available. The G1G-3 handset also is equipped with a T2 transmitter unit. Locations for use shall be designated locally.

3.00 TOOLS, GAUGES, AND MATERIAL

The following additional tools, gauges, and materials are required in order to perform maintenance operations in this section.

KS-14164 Brush

KS-13786 Nylon Brush

Pipe cleaners for cleaning

No. 320 Abrasive Cloth for cleaning relay operating fork and housing contacts

KS-2423 Cotton Twill Cloth for cleaning

Paper, Cleaning, Dextilose, 12-pound (9 by 18 inches) for cleaning

Pencil, 2B or softer lead, or equivalent, for lubricating relay operating fork and switchhook pivot pin

KS-7860 Petroleum Spirits

KS-14774, List 1 Lubricating Grease, 1-ounce tube

178A Gauge for checking adjustment of gate operating arm (shaft-type switchhook)

178B Gauge for checking adjustment of gate operating arm (yoke-type switchhook)

139 Tool for leveling coins

265C Tool for burnishing contacts

466A Tool for adjusting housing contacts

528A Tool for removing foreign material from locks

641A Tool (two required) to facilitate mounting of dial

4.00 CLEANING

Cautions

1. *Remove receiver or handset from switchhook before removing or reassembling upper housing from or to backplate of coin collector equipped for 10-cent operation. This reduces possibility of damage to gate operating arm.*
2. *Do not reassemble upper housing on prepay coin collectors without a P-349486, P-16A336, or KS-7994 shield over relay. Shield protects relay from being damaged by upper housing.*

GENERAL

4.01 Cleaning may be done before or during maintenance operations, depending on circumstances. However, operational tests shall follow any cleaning operations which may affect the mechanisms.

4.02 Loose dirt or dust may be removed by using dextilose cleaning paper, KS-2423 cloth, a No. 5 sash brush, or equivalent. Care shall be taken that loose dirt and dust do not get into working parts.

4.03 Transmitter mouthpieces, receiver caps, and exterior of coin collectors may be cleaned by using dextilose cleaning paper or KS-2423 cloth moistened with water. Wipe dry with clean cloth or paper.

COIN GAUGE

4.04 If coin gauge openings appear to be dirty or sticky, or if a coin is stuck, clean gauge with dextilose cleaning paper or KS-2423 cloth dampened with KS-7860 petroleum spirits. Also, moisten pipe cleaner, or equivalent, with KS-7860 petroleum spirits and clean coin slots. Wipe dry.

COIN CHUTE

4.05 If coin chute appears to require cleaning or shows definite signs of rusting on electromagnet armature, latch spring, or gate spring, replace chute.

- Do not attempt to clean coin chute.

COIN RETURN

4.06 If coin return is badly rusted, coin collector shall be replaced.

4.07 Dirty coin return or pull bucket shall be cleaned as described below.

- To remove loose dust and dirt, use a dry nylon KS-13786 brush.
- Apply a small quantity of KS-7860 petroleum spirits to a KS-13786 brush or KS-2423 cloth and scrub surfaces to be cleaned.
- Remove dirt or excess petroleum spirits from brush by rubbing on a cleaning cloth.
- Continue removing dirt and cleaner with brush until surface is clean and practically dry. Give particular attention to bottom portion of coin return just back of vertical step. Cleaning cloth or paper shall be used to wipe surfaces that can be readily reached.

HOUSING CONTACTS

4.08 Housing contacts shall be clean. If contact surfaces appear dirty or badly tarnished, clean with No. 320 or finer abrasive cloth. Wipe off with dextilose cleaning paper or KS-2423 cleaning cloth.

LOCKS

4.09 A 528A tool may be used to remove foreign material from cash compartment door lock or from upper housing lock.

WASHER REJECT AND PUSH-BUTTON MECHANISM

4.10 To clean washer reject mechanism, remove upper housing and coin chute. If mechanism is damaged, replace upper housing.

- Do not attempt to reposition or bend star wheels or castings.

4.11 Remove dust from rejector mechanism with dry KS-14164 brush. If wheels do not operate freely, clean with KS-7860 petroleum spirits applied with KS-14164 brush and remove excess spirits and dirt with pipe cleaner, or equivalent. Bearings should be clean and dry. If wheels still do not move freely, replace upper housing. **Do not lubricate.**

4.12 Upper mounting screws and springs of coin chute may be cleaned with KS-2423 cloth moistened with KS-7860 petroleum spirits. Clean bushings in coin chute with pipe cleaner, or equivalent, moistened with petroleum spirits. Dry and apply light coating of KS-14774, List 1 lubricating grease to screws and bushings.

- Do not lubricate lower mounting screw or rubber grommet.

4.13 Push button of washer rejector shall be cleaned with a small amount of KS-7860 petroleum spirits applied with KS-14164 brush. Remove excess spirits and dirt with KS-2423 cloth, wipe dry, and apply light coating of KS-14774, List 1 lubricating grease.

4.14 Reassemble mounting screws and springs and remount chute in upper housing. Do not apply excessive force or tightening torque, as frame may bend.

5.00 UPPER HOUSING**STUCK COINS**

5.01 If coins or slugs are stuck in coin gauge, remove them by using fingers or an orange stick. A screw driver or similar tool shall not be used as damage to coin gauge may result. It may be necessary to loosen or remove coin chute in order to remove stuck coins or slugs. After removal of stuck material, coin gauge shall be cleaned, if necessary. If coin gauge is mutilated, upper housing shall be replaced.

5.02 When coins or slugs are stuck in coin chute, remove chute before removing stuck coins, etc. Removal of chute will facilitate removal of stuck material without causing damage. Check for cause of sticking, such as dirt, damage to reject openings or coin channels. If sticking of coins was caused by obviously mutilated coins or slugs, and chute does not appear to be damaged or dirty, it may be reassembled in upper housing. If chute appears to be damaged or dirty, or latches, gate, or electromagnet arm do not work freely, replace coin chute.

5.03 Slugs, foreign coins, or washers of a size close to a standard coin may be found stuck in coin reject openings. Such material shall be removed and reject opening checked with a standard coin before chute is reassembled or replaced.

CORD INTERFERENCE

5.04 If dial, handset, or receiver cord causes interference with passage of coins through coin chute, cords shall be properly dressed and clamped. Tie cord may be cut off when clamp is provided.

COMMON COIN TROUBLES

5.05 A list of common coin troubles with their probable causes and corrective measures is shown in Table A.

COIN RELEASE MECHANISM

5.06 To test push-button mechanism, remove upper housing. With push button in its normal out position, there shall be no contact between gate operating bracket and any part of gate lever. Coin chute shall rest against both stop surfaces of frame assembly, not against push-button mechanism. Judge by feel.

5.07 When push button is fully operated, it shall cause top of coin chute to move approximately 1/4 inch. Judge visually.

5.08 Gradual release of push button shall allow coin chute to move freely to its normal position against stop on frame assembly.

Note: If adjacent cardholder mounting screw interferes with electromagnet cover, clip off end of screw.

5.09 Deposit a nickel in 5-cent slot; coin shall stop at first latch. Operate push button slowly; nickel shall be released by gate with approximately 1/8-inch push-button travel remaining.

Note: If station is equipped with cutover clip for 5-cent service, clip shall be removed for this test.

5.10 Push button shall not bind in its fully out or in position, or at any point over its length of travel.

5.11 If push-button mechanism fails to meet above requirements, clean and lubricate as outlined in 4.10 to 4.14. If trouble is still experienced after cleaning, upper housing shall be replaced.

COIN CHUTE REPLACEMENT

5.12 To replace coin chute, disconnect external leads.

- If gong signal assembly is mounted on chute, disconnect signal transmitter lead from housing terminal.

TABLE A
COMMON COIN TROUBLES

Place	Probable Cause	Correction
Coin Chute—10¢ on Top of Gong*	Adjustment of gong	Check spacing between gong and coin chute. Change location of washer or replace upper housing
Coin Chute—25¢ at Gong*	Quarter overrides gong	Replace gong with one having chamfer or bevel on mounting hub
Nickel edgewise at coin shield†	Coin shield distorted or wrong type	Replace coin shield with offset type
Dime at coin shield†	Shield pin bent or shield distorted causing shield to bind	Replace shield and pin
Coins fall out or stick at rejector mechanism*	Loose star wheel shaft, loose or defective rejector frame	Replace upper housing

*Careful removal of upper housing will facilitate finding these troubles.

†May be found after removing upper housing.

- If filter is present on coin chute, unfasten filter by removing mounting screw. Leave filter hanging loose until replacement chute is installed.
- If capacitor is mounted on coin chute and replacement coin chute is not so equipped, remove capacitor for re-use on coin chute to be installed. The capacitor shall be mounted with lead-wire end upward. If there are signs of leakage of compound, capacitor shall be replaced.
- Capacitor mounting bracket shall be equipped with gate operating arm guide. End of guide shall clear gate lever by maximum $\frac{3}{64}$ inch as shown in Fig. 1. Guide reduces possibility of distorting gate operating arm when removing or reassembling upper housing.
- If gong signal assembly is mounted on coin chute and replacement coin chute is not so equipped, remove gong signal assembly for re-use on coin chute to be installed.
- Turn down mounting screws until they seat securely. Do not apply excessive force or tightening torque as frame may bend.
- On 191- and similar-type coin collectors, cord tips on BK housing terminal shall be dressed so as to clear coin chute.

COIN CHUTE ALIGNMENT

5.13 Proper coin chute alignment, with upper housing in vertical position (but not on back-plate), shall be checked as follows. Coins used for testing shall not be worn (i.e., rim shall be distinct).

- Deposit nickel in 5-cent slot of coin gauge. Coin shall pass freely from gauge into coin chute. Coin should stop at first latch. Release locking latch by depositing second nickel to permit coins to continue through channel.

Note: On dial postpay chutes, position electromagnet arm out of 5-cent channel for this test.

- Deposit a dime in 10-cent slot of coin gauge. Coin shall pass freely from gauge into chute and exit from chute.
- Deposit a quarter in 25-cent slot of coin gauge. Coin shall pass freely from gauge into chute and exit from chute. When a nickel is deposited in 25-cent slot of coin gauge, it shall pass freely from gauge into chute and drop into coin return of upper housing.

- If coins do not enter chute freely, check that chute is properly positioned on mounting lugs and that screws are tight. Do not use washers to obtain coin chute alignment. Do not attempt to bend or straighten distorted chutes.

5.14 In case of failure in any of the above alignment checks, try another chute. If any test coin still fails to enter chute freely, upper housing shall be replaced.

5.15 Quarter gong shall have revised contour which reduces possibility of coins sticking or overriding gong. This type of gong is identified by a chamfer or straight bevel on outer edge of bushing (or mounting hub). Replace old-type gongs.

COIN SIGNALS

5.16 At same time coin chute alignment tests are made, signal gongs shall be checked for signal output as follows:

- When either a nickel or quarter is deposited in its respective opening in coin gauge and passes through coin chute, associated gong shall emit a clear signal.
- Solid gong shall emit two clear signals when dime is deposited.

5.17 If poor signal is obtained, check for interference caused by improperly dressed conductors; also check that gongs are fastened securely. Round gongs may be rotated to any position or washer may be located on either inside or outside of gong. Oval gongs shall be located so that prick punch mark is within $\frac{1}{8}$ inch of a plane which passes through center of

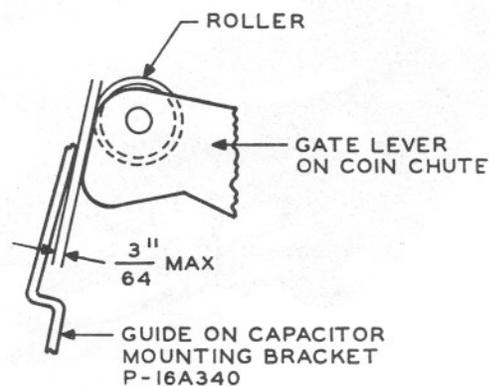


FIG. 1—CLEARANCE BETWEEN GUIDE AND GATE OPERATING ARM

gong and is at right angles to face of gong mounting bracket. Judge visually. Handset-type coin collectors shall be equipped with oval-type gongs. Final judgment of signal tones should be determined by coin signal tests with the operator as called for in the C Section covering prepay or postpay maintenance. If satisfactory signals are not obtained, upper housing shall be replaced.

DIAL REPLACEMENT

5.18 If dial replacement is required, a 6-type dial shall be replaced with a 6-type dial and a 4- or 5-type dial shall be replaced with a 5-type dial. When necessary to replace a 4- or 5-type dial with a 6-type dial, upper housing shall be replaced.

- Replacement of a 4- or 5-type dial with a 6-type dial involves added replacement of dial adapter, number plate, dial cord, and, possibly, modification of upper housing.

5.19 In assembly of 6-type dials, mounting studs shall be assembled to dial before mounting dial on upper housing.

5.20 Assembly of 5-type dial can be facilitated by use of two 641A tools which are screwed into upper mounting holes to act as guide pins while mounting dial on upper housing.

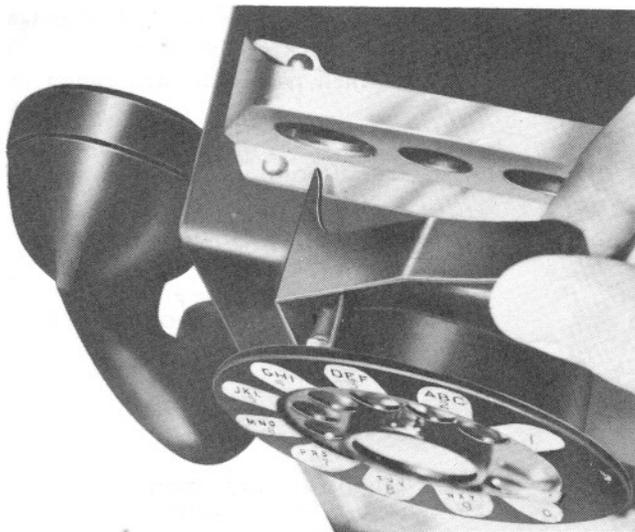


FIG. 2—METHOD OF INSTALLING P-14A544 COIN DEFLECTOR

COIN DEFLECTORS

5.21 The 63A dial adapter used with the 6-type dial incorporates a coin deflector to prevent dropped coins from lodging behind dial. The P-14A544 coin deflector is designed for use with the 5-type dial and 56A dial adapter.

5.22 The P-14A544 coin deflector replaces earlier D-158436 coin deflector. It consists of a black metal band so formed that it is easily snapped over top of 56A dial adapter. Fig. 2 shows deflector being installed; Fig. 3 shows it in place.

VERTICAL PLAY

5.23 Vertical play of upper housing on assembled coin collector shall not exceed 1/32 inch, judged by feel. Vertical play shall not be confused with normal gap between upper and lower housing.

5.24 If vertical play is in excess of 1/32 inch, one or two P-12A745 spacer plates shall be added as required. The number and position of spacer plates to be used depends on width of gap between top of upper housing and backplate flange. The P-12A745 spacer plate is 0.032-inch thick. It has a turned-over edge which, if positioned up, provides 0.055-inch effective thickness. To control amount of vertical play,



FIG. 3—P-14A544 COIN DEFLECTOR IN PLACE

assemble spacer plate with turned-over portion either up or down according to thickness required. If additional thickness is required, use two plates, one with turned-over portion down, the other on top of first plate with turned-over portion up. Spacer plates added shall reduce vertical play to less than 1/32 inch but shall not cause binding between upper and lower housing.

5.25 Spacer plates are mounted on top of upper housing and secured by the two rear 8B cardholder slotless head mounting screws. Cardholder, if present, is positioned on top of spacer plates. Two screws (longer) are furnished with each spacer plate for use if required.

6.00 LOWER HOUSING AND BACKPLATE ASSEMBLY

6.01 Check for interference between induction coil and coin chute. The 196-, 197-, and 198-type coin collectors manufactured prior to the third quarter of 1954 have very little clearance between induction coil and coin chute electromagnet. If there is interference when coin release button is pressed, change to 101B induction coil modified as shown in C Section entitled Coin Collectors, Conversion of 191-type to 196-type and 195-type to 197-type.

FULL COIN RECEPTACLE

6.02 If coin paths are blocked because coin receptacle is full, trouble may be cleared temporarily by inserting a 139 tool through hole in right side of mechanism base and leveling coins in receptacle. Report condition to test desk.

DEFECTIVE CAPACITOR

6.03 If 195C capacitor indicates leakage of filling compound or collapse of container, capacitor shall be replaced.

37A VARISTOR

6.04 Check that 37A varistor, where required, is present and connected properly as shown in the C Sections covering connections. Add varistor as necessary. Insulating finish on lead-out terminal (not wire) shall not be badly cracked or chipped. If it is, varistor shall be replaced.

SWITCHHOOK OPERATION

6.05 Switchhook shall move freely without binding, squeaking, or interfering with upper housing throughout its entire travel and shall come to a positive stop in its up and down positions. Proceed as follows:

1. Slowly lift handset or receiver from switchhook. Switchhook shall move upward and come to a positive stop against coin collector backplate.

2. If failure occurs in up position on coin collectors with an induction coil on backplate, check that gate operating arm is not touching induction coil or any wiring of induction coil, and that arm is not caught under cover of induction coil. (See 6.11.)

3. Slowly lower handset or receiver into place on switchhook. Switchhook shall move downward and come to a positive stop against coin collector backplate.

4. If failure occurs in down position, check that gate on coin chute operates smoothly (without binding or sticking). Check gate operating arm adjustments as covered in 6.08.

5. Check for binding between switchhook and upper housing by taking up all upper housing play sidewise and up and down while operating switchhook. If switchhook binds on upper housing, upper housing or coin collector shall be replaced.

6.06 If switchhook binds with upper housing removed on coin collectors having terminals on wooden block, proceed as follows:

1. Loosen set screw and remove pivot pin. If necessary to use longnose pliers during removal, care shall be taken not to burr bearing surface of pin. Replace pin if bent or rusted.

2. Clean pin with cloth or paper moistened with petroleum spirits and dry. Lubricate bearing surfaces of pin with lead of a 2B or softer lead pencil, rubbing lead on pin so as to deposit as continuous a coating as practicable. Also clean and lubricate bearing surfaces of switchhook and lugs on backplate.

3. Clean hard rubber stud on switchhook and adjacent spring. Lubricate with lead pencil.
4. Reassemble switchhook. Pin shall be within $1/64$ to $1/32$ inch of end of hole in switchhook. Judge by feel. Tighten set screw. If above operations do not clear trouble, coin collector shall be replaced.

SWITCHHOOK CONTACT SPRINGS

6.07 Switchhook contact springs shall meet the following conditions:

- **Make, Break, Sequence:** Contacts shall make and break and shall have such sequence as shown in applicable figures of connection diagrams. Contacts that touch but do not make shall be burnished with a 265C tool.

- **Follow and Separation:** When handset or receiver is removed from switchhook, there shall be some travel before first switchhook contact closes and some travel after last switchhook contact closes. If adjustment is required, follow and separations shall be as follows:

1. All contacts shall have perceptible follow (approximately $1/64$ inch) and contact pairs of twin contacts shall make at approximately same time.

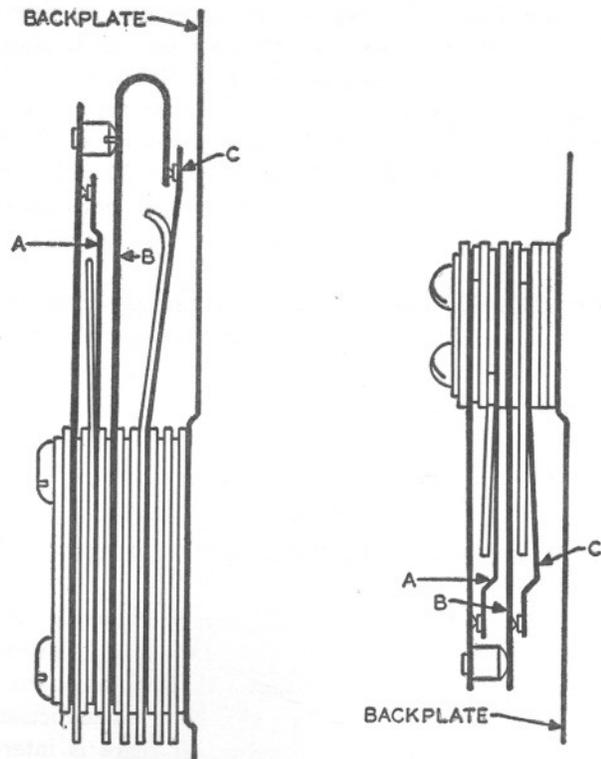
2. When open, separation between mating contacts shall be minimum 0.025 inch for point-disc type and minimum 0.016 inch for bar type. Judge visually.

3. Clearance between springs not intended to make contact, and between spring and backplate, shall be as shown in Fig. 4.

- **Contact Alignment, Pile-up Tightness:** Spring pile-up shall be tight, as judged by feel, and contacts shall line up so that a contact point falls wholly within circumference of opposing contact disc, or a contact bar falls wholly within length of opposing contact bar.

1. If switchhook spring pile-up is loose on coin collectors having terminals on wooden block, tighten; or if contacts do not line up, loosen and realign contacts and retighten.

2. If spring pile-up is loose, or contacts do not line up on coin collectors having terminals in spring pile-up, coin collector shall be re-



MIN. $1/32$ " CLEARANCE BETWEEN SPRINGS A AND B, AND BETWEEN SPRING C AND BACKPLATE. JUDGE VISUALLY.

FIG. 4—SPRING CLEARANCE

placed. On these coin collectors, screws are power-tightened while pile-up is under heavy pressure. Do not loosen or attempt to tighten these screws.

GATE OPERATING ARM

6.08 Check gate operating arm as follows: With upper housing locked in place and switchhook in up position, deposit a single nickel. Nickel shall be stopped by holding latch. Lower switchhook slowly to release nickel. There shall be some travel before nickel is released from holding latch and some travel after nickel is released. With switchhook down, deposit a quarter. Quarter shall be stopped by open gate. Raise switchhook, quarter shall be released and strike gong.

6.09 If above requirements are not met, adjust operating arm, using a 178A or 178B gauge as shown in Fig. 5, to meet the following requirements:

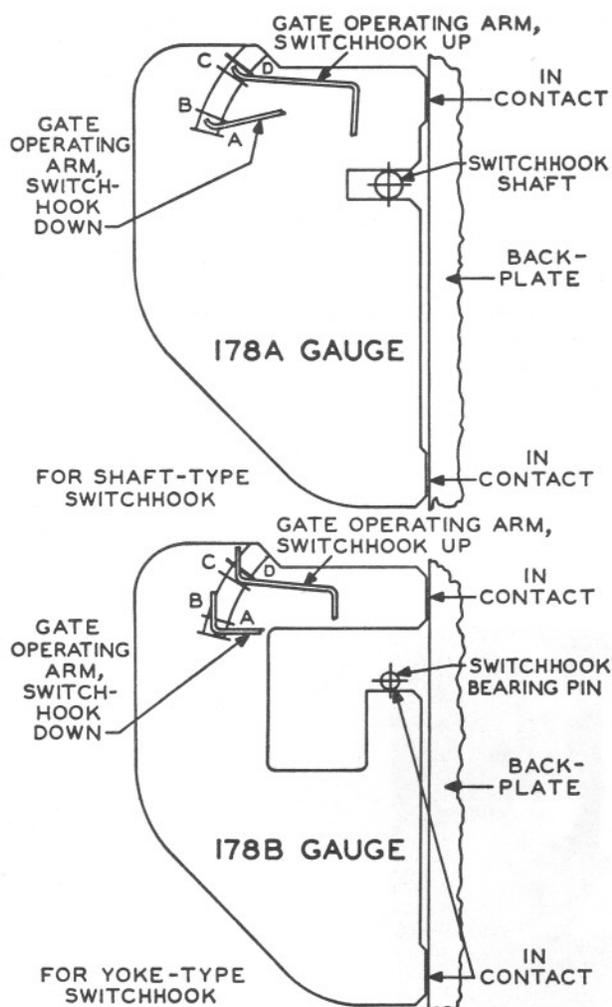


FIG. 5—GATE OPERATING ARM ASSEMBLY

- In down position, bottom surface of curved end of arm shall be between the two arcs and lines A and B.
- In up position, bottom surface of curved end of arm shall be between the two arcs and lines C and D.
- If travel of curved end of arm is greater than distance between A and D, curved end of arm may be permitted to go above D provided arm clears induction coil (with cover), if present. In cases where arm touches induction coil, curved end may be permitted to go below A, not to exceed distance between A and B.

6.10 Adjust the position of the spring arm by bending the arm support bracket by means of a suitable tool placed on adjusting lugs provided on each

side of support bracket. Spring arm shall be tensioned against its stop. If adjustment is required, use a 466A tool and bend spring just above its mounting rivets. Adjust earlier-type operating arm, when required, with a 466A tool. If requirements cannot be met by adjustment, replace operating arm or switchhook assembly. If switchhook is replaced, recheck switchhook operation and contact spring requirements.

INDUCTION COIL COVER

6.11 A neoprene cover, P-16A833, for 101-type induction coil shall be used on all coin collectors that are equipped with this type coil.

- When a neoprene coil cover is installed, avoid placing cover over gate operating arm which is directly below coil. This may be avoided by hanging handset on hook before placing cover. Remove handset before reassembling or replacing upper housing.

7.00 PULL BUCKET

Pull bucket shall operate without binding. It shall restore freely to fully-closed position when released slowly from fully-opened position. It shall not be broken or have sharp burrs or nicks that could cause personal injury. If these conditions are not met, pull bucket shall be replaced as covered in the C Section entitled Coin Collectors, Pull Buckets, Maintenance.

8.00 GROUNDING COIN COLLECTOR HOUSINGS

Check that coin collector backplate assembly is grounded and that clip, Tinnerman C-23405-012-3B, is in place on upper housing assembly. All coin collector backplate assemblies, both prepay and postpay, shall be grounded as covered in the C Section entitled Coin Collectors, Installation.

Note 1: Existing prepay installations located in indoor booths which are not equipped with the No. 14 insulated ground wire assembly to coin collector shall be grounded in same manner as in open-type installations.

Note 2: Existing postpay installations, except those located in all-metal outdoor booths, may require rearrangement of inside wiring to provide ground to backplate assembly.

9.00 NOISE OR CUTOUT

9.01 With upper housing locked in place and talking battery on line, there shall be no noise or cutouts in talking circuit resulting from the following:

- Move upper housing up and down, from side to side, and forward and backward.
- Check that force between housing and equalizing springs and between housing and contact springs is approximately equal. Gauge by feel.
- Move transmitter up and down on transmitter-receiver type sets; shake handset or receiver cords to check for noisy cords. Observe by listening for noisy transmitter units.

9.02 If talking circuit is noisy or cutouts occur, trouble may be corrected as follows:

- Clean and adjust housing contact springs and equalizing spring to have approximately 1/4-inch follow so that housing comes into contact with housing contact springs and equalizing spring at about same time. A 466A tool is used for adjusting springs, as shown in Fig. 6.
- If noise is introduced by manipulating transmitter or shaking cords, check for loose contacts. Replace noisy cords and defective transmitter units.

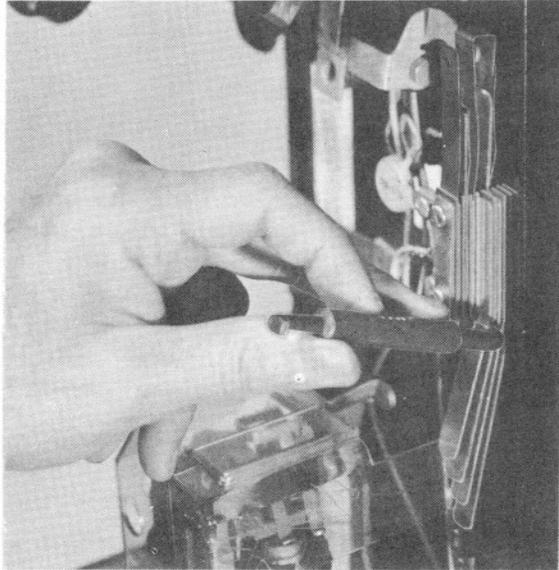


FIG. 6—ADJUSTMENT OF HOUSING CONTACT SPRINGS