

BELL SYSTEM PRACTICES
Station Installation and Maintenance

SECTION C64.223
Issue 3, 5-20-40
AT&T Co Provisional

COIN COLLECTORS
MULTI-SLOT TYPES
SERVICE ORDER AND REPAIR WORK
(Reference Section for C42.129)

1. GENERAL

1.01 This section outlines work operations on coin collectors which should be followed on service order and repair visits, and is also the reference section for Section C42.129. The latter section covers detail methods for each test and adjustment specified under Part 4 herein.

1.02 This section is reissued to modify the work operations to be performed on inspection visits, to improve the typographical arrangement and to include other minor changes.

2. WORK OPERATIONS

2.01 Perform work operations in accordance with conditions outlined below. Where certain "columns" are referred to under heading "Work Operations," tests and adjustments of these respective columns of Table I should be performed in addition to any other instructions given at the same point.

Conditions of Visit		Work Operations
Service Order Visit	Collector from Shop or Storeroom	Column A
	Collector Reused or Reconnected	Column B
Periodic Inspection	Heavy Use Station	Column B
	Other Stations	Column E
Trouble Visit	Repeated Coin Collector Trouble Reports	Clear any trouble found. Column B.
	Reports Where Cause of Trouble is Obvious	Clear trouble. Column C, D, or E according to type or trouble.
	Reports Where Cause of Trouble is Not Obvious	Make trouble analysis in Part 3. If trouble not found, perform Column F. See Note.

Note: In cases where cause of trouble is not obvious, any information available such as previous trouble record, information from agent regarding trouble experienced, or condition of station, should be given consideration as an aid in locating source of trouble.

3. TROUBLE ANALYSIS

3.01 Sequence of operations for trouble analysis is as given below. The analysis should be discontinued when probable cause of trouble has been determined and corrected. Where certain "columns" are referred to under heading "Action To Be Taken" tests and adjustments of these respective columns of Table I, should be performed in addition to any other instructions given at the same point.

Sequence of Analysis Operations Action to be Taken

1. Remove upper housing carefully, so as not to disturb trouble condition.
2. Examine coin paths and return chutes:
 - (a) Chute or gauge obstructed.....Column C
 - (b) Return chute obstructed.....Remove obstruction.
Column E
 - (c) D-95365 Contact Device or
D-97495 Latching Device Adjust or Replace
out of Adjustment..... Device. Column E

3. Examine relay and hopper mechanisms:
 - (a) Full coin receptacle.....Level coins, report for collection. Column E
 - (b) Trigger tripped or money on trap.....Column D, including 6.01 to 6.06
 - (c) Trap or relay sticks.....Column D
4. Remount upper housing and have line disconnected from plugging-up circuit, if it has been so connected. Remove receiver from switchhook, deposit coin. If dial tone or operator's answer is not received proceed as follows:
 - (a) Coin fails to pass through gauge or chute.....Column C
 - (b) Ground contacts open.....Column D
 - (c) Relay openReplace relay. Column D
 - (d) Circuit trouble at some other pointClear. Column E
5. In manual areas, have operator refund coin and leave cord up. Request her to check that line has cleared:
 - (a) Coin does not return or line does not clear.....Column D
6. In dial areas, hold switchhook down for several seconds. Then release switchhook, redeposit coin and listen for dial tone:
 - (a) Coin does not return or dial tone not obtained on redepositColumn D
7. In manual areas request operator to leave cord up. In dial areas dial code which will put battery on line. Listen for noise or cut-outs while moving upper housing up and down, from side to side, and forward and backward, and while moving transmitter up and down.
 - (a) Noise or cut-outs in talking circuitClear. Column E
8. No trouble disclosed by operations 1 to 7 incl....Column F

4. TESTS AND ADJUSTMENTS

4.01 Tests and adjustments (marked "yes") to be performed on coin collector in connection with a service order or repair visit are given in Table I. Column to be followed should be selected as indicated in Parts 2 and 3. All operations included in any particular column should be performed in order shown, and in accordance with corresponding requirements and methods given in Section C42.129.

4.02 When any defect is encountered, defect should be cleared before proceeding with next operation.

TABLE 1

Section C42.129 Paragraph No.	Tests and Adjustments	Service Order Visit		Repair Visit				
		Collectors from Shop or Store- room	Collectors Reused or Recon- nected	Periodic Inspection of Heavy Use Stations	Repeated Coin Collector Trouble Reports	Coin Gauge or Coin Chute Trouble	Coin Relay, Trap or Vane Trouble	Trouble Corrected in Trouble Analysis or Trouble Not in Coin Collector Other Periodic Inspections
		A	B	C	D	E	F	
2.01	Brushing off.		Yes	Yes	Yes	Yes	Yes	Yes
3.01	Upper housing cords.		Yes			Yes		
3.02	Coin gauge openings and slots.		Yes	Yes	Yes	Yes	Yes	Yes
3.03	Coin gauge wear.		Yes	Yes				
3.05	Spreading of chute.		Yes	Yes				Yes
3.06	Chute clearance.		Yes	Yes		Yes		
4.01	Coin shield, devices.		Yes		Yes			Yes
4.02	Receiver cord and wiring.		Yes			Yes		
*5.01	Position of relay.		Yes		Yes†			
*5.02	Relay release margin.		Yes		Yes			Yes
*5.03	Trap & vane release margin.		Yes		Yes			Yes
*6.01 to 6.05 Incl.	Trigger type and operation.		Yes		Yes†			
*6.06	Trigger restoral and non-restoral.		Yes		Yes†			
*6.07	Separation of ground contacts.		Yes					
6.08	Ground spring contact pressure.		Yes		Yes			
6.09								
6.10	Ground contact continuity.		Yes		Yes§			
6.11	Bias margin.		Yes		Yes	Yes	Yes	Yes
7.01	Switchhook operation.		Yes			Yes		
7.02	Switchhook spring assembly.		Yes					
8.01	Collect operation.			Yes				
8.02	Housing crossed with wiring.	Yes	Yes					
8.03	Coin signal test.	Yes	Yes	Yes				
8.04	Final station tests.	Yes	Yes	Yes	Yes	Yes	Yes	
**8.05	Noise or cutouts.		Yes	Yes	Yes	Yes	Yes	
8.06	Refund of coins.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9.01	Out-of-Service Notices.		Yes	Yes	Yes			Yes
9.02	Removal of Notices.	Yes	Yes					

*Ground wire disconnected in manual areas.

**When not made as part of 8.04.

†If relay has been moved, remounted or replaced.

‡If trigger trouble is indicated in Trouble Analysis.

§Only if contact pressure has been readjusted.

4.03 For the convenience of repairman or installer, tests and adjustments marked "yes" in various columns of Table I are itemized below.

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Tests and Adjustments

Column A—Collectors from Shop or Storeroom

- 8.02 Housing crossed with wiring.
- 8.03 Coin signal test.
- 8.04 Final station tests.
- 8.06 Refund of coins.
- 9.02 Removal of Out-of-Service notices.

Column B—Complete Routine

- 2.01 Brushing off.
- 3.01 Upper housing cords arrangement.
- 3.02 Clean coin gauge openings and slots.
- 3.03 Coin gauge wear.
- 3.05 Spreading of chute.
- 3.06 Chute clearance.
- 4.01 Coin shield, devices.
- 4.02 Receiver cord and wiring arrangement.
- *5.01 Position of relay.
- *5.02 Relay release margin.
- *5.03 Trap and vane release margin.
- *6.01 to } Trigger type and operation.
- 6.05 Incl. }
- *6.06 Trigger restoral and non-restoral.
- *6.07 Separation of ground contacts.
- 6.08 } Ground spring contact pressure.
- 6.09 }
- 6.10 Ground contact continuity.
- 6.11 Bias margin.
- 7.01 Switchhook operation.
- 7.02 Switchhook spring assembly.
- 8.02 Housing crossed with wiring.
- 8.03 Coin signal test.
- 8.04 Final station tests.
- 8.05 Noise or cut-outs (when not made as part of 8.04).
- 8.06 Refund of coins.
- 9.01 Out-of-Service notices.
- 9.02 Removal of Out-of-Service notices.

*Ground wire disconnected in manual areas.

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Column C—Coin Gauge or Coin Chute Trouble

2.01	Brushing off.	
3.02	Clean coin gauge openings and slots.	←
3.03	Coin gauge wear.	
3.05	Spreading of chute.	
3.06	Chute clearance.	
8.01	Collect operation.	
8.03	Coin signal test.	
8.04	Final station tests.	
8.05	Noise or cut-outs (when not made as part of 8.04).	
8.06	Refund of coins.	
9.01	Out-of-Service notices.	

Column D—Coin Relay, Trap or Vane Trouble

2.01	Brushing off.	
3.02	Clean coin gauge openings and slots.	←
4.01	Coin shield, devices.	
*5.01	Position of relay (if relay has been moved, remounted or replaced).	
*5.02	Relay release margin.	
*5.03	Trap and vane release margin.	
*6.01 to } 6.05 Incl.)	Trigger type and operation (if trigger trouble is indicated in trouble analysis).	
*6.06	Trigger restoral and non-restoral (if trigger trouble is indicated in trouble analysis).	
6.08 } 6.09 }	Ground spring contact pressure.	
6.10	Ground contact continuity (only if contact pressure has been readjusted).	
6.11	Bias margin.	
8.04	Final station tests.	
8.05	Noise or cut-outs (when not made as part of 8.04).	
8.06	Refund of coins.	
9.01	Out-of-Service notices.	

*Ground wire disconnected in manual areas.

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Tests and Adjustments

**Column E—Trouble Corrected in Trouble Analysis or Trouble
Not in Coin Collector, and Other Periodic Inspections**

2.01	Brushing off.	
3.01	Upper housing cords arrangement.	
3.02	Clean coin gauge openings and slots.	
3.06	Chute clearance.	
4.02	Receiver cord and wiring arrangement.	
6.11	Bias margin.	
7.01	Switchhook operation.	
8.04	Final station tests.	
8.05	Noise or cut-outs (when not made as part of 8.04).	
8.06	Refund of coins.	

**Column F—Cause of Trouble not Detected in Trouble
Analysis**

2.01	Brushing off.	
3.02	Clean coin gauge openings and slots.	
3.05	Spreading of chute.	
4.01	Coin shield, devices.	
*5.02	Relay release margin.	
*5.03	Trap and vane release margin.	
6.11	Bias margin.	
8.06	Refund of coins.	
9.01	Out-of-Service notices.	

**5. SEQUENCES OF TESTS AND ADJUSTMENTS FOR
REFERENCE PURPOSES**

To indicate sequences of adjustments, replacements and other procedures required to correct defects found by tests, and as reference information for Section C42.129, a complete list of tests and adjustments specified in Table I is given below. Columns of Table I under which various tests are specified are also indicated at left of each test. Paragraph numbers correspond to those of Section C42.129. Subparagraphs cover corrective measures.

*Ground wire disconnected in manual areas.

BRUSHING OFF

B C D E F 2.01 With the upper housing removed, **brush off coin collector** if dirty. ↗

UPPER HOUSING

B E 3.01 Check cords for arrangement (Section C42.105). Dress and secure cords.

B C D E F 3.02 Clean coin gauge openings and slots.

B C 3.03 If slugs are found stuck in coin chute runways, check corresponding coin gauge slots for wear with 122A gauge.

If discs fall freely through, replace upper housing.
Resume at 4.01.

B C F 3.05 Check spreading of chute at "A" (Max. .015") and for presence and fit of clip on 3-gram chute.

If gauge enters at "A", replace chute.

If gauge does not enter, but clip missing or poorly fitting, remove chute and check for spreading at "B" (Max. .015").

If gauge enters at "B", replace chute.

If gauge does not enter, apply clamps, except on chutes having steel back plates. Apply only lower member on chutes having nickel size washer reject feature. Before remounting chute, check clearance as in 3.06.

B C E 3.06 Check chute for cleanliness and clearance with 122A gauge. (If chute was removed under 3.05 and is to be reused, check before remounting.)

If discs stick, remove and clean chute.

If chute has caked substance, battered material, fins, etc., replace chute.

Remount chute in housing and check clearance as above. If discs still stick, check interference with return chute, and if interferes try another chute. If second chute interferes or discs stick in second chute, replace upper housing.

LOWER HOUSING—GENERAL CONDITION

B D F 4.01 Check that coin shield does not bind on pin and that it swings freely.

Replace coin shield or pin. ↙

Check contact, latching or alarm devices, if present, in accordance with local instructions.

Adjust or replace device.

Check loop of coin shield pin for interference with device.

Adjust position of coin shield pin.

B E 4.02 Check receiver cord and coin collector and local wiring for anchorage and arrangement (Section C42.105).

Dress receiver cord and wiring.

RELAY AND HOPPER RELEASE

Note: When performing operations 5.01 to 6.10 below:

If it becomes necessary to remove relay, check bias margin (6.11), before removing relay.

If relay fails, replace relay.

If relay does not fail, make adjustments prescribed.

While relay is removed:

Check smoothness of bearing surfaces of fork.

Lubricate fork and coin vane pin, if of brass (5.02).

Check for binding of trap on vane or catching of trap on vane roller by operating trap manually by means of counterweight to its extreme position, and manually operating vane pin slowly from its extreme position on one side to mid-position, at same time restraining upward motion of trap. Perform this operation first with vane pin pushed toward rear of hopper, then toward front of hopper. Repeat with vane operated to other side. If trap binds or catches, correct as in 5.03.

Whenever relay is moved, remounted or replaced:

Place relay as close to hopper as possible before tightening mounting screws.

Check that operating arm does not touch front of hopper or back of relay at any point in its operation.

If operating arm touches hopper or relay, bend arm, remount and check 5.01.

Check that vane pin does not touch relay at any point in its operation.

If vane pin touches relay, replace relay.

If relay is replaced for any reason:

Check 5.01, 5.02 and 5.03.

B D† *5.01 Check that full thickness of vane is visible ↗
through center hole of trap.

Move relay to center vane and place relay as near to
hopper as possible. Check operating arm and vane
pin for binding as in Note above.

If vane cannot be centered, remove relay and check
fork alignment.

If fork alignment is correct, replace relay.

If incorrect, adjust for alignment and recheck cen-
tering and binding. If vane cannot then be cen-
tered, replace relay.

B D F *5.02 Relay Release Margin. Check that with "70"
slot of 147A gauge applied to operating arm and relay
fully operated by pressing on armature **relay will return**
to normal when pressure is removed. Make test 3 times,
then repeat applying pressure to gauge instead of to arma-
ture. Repeat on opposite side.

Check for and clear binding between operating arm
and hopper, operating arm and relay, vane pin and
relay.

Check for and remove magnetic particles.

Check 5.01 and if relay then does not release, disengage
fork from vane pin and repeat 2nd part of test
(pressure on gauge).

If relay does not release, replace relay.

If relay does release, remove relay and smooth,
clean and lubricate fork and vane pin (if of brass).

If fork is too rough, replace relay.

Check for and clear vane binding on hopper or in
bearings.

Mount relay and check 5.01.

B D F *5.03 Trap and Vane Release Margin. Check that
with "50" slot of 147A gauge applied to operating arm,
relay fully operated by pressing on armature **and trap**
pushed downward and forward as far as possible by means
of a tongue depressor, **relay will return to normal** when
pressure on armature is released and depressor is very
slowly withdrawn. Make test 3 times, then repeat on
opposite side.

Check for and clear binding of operating arm on hop-
per or relay or interference of vane pin.

*Ground wire disconnected in manual areas.

†If relay has been moved, remounted or replaced.

With relay removed, smooth, clean and lubricate fork and vane pin (if of brass) if not already done.

Check that trap when in normal position clears vane.

Check trap for binding on vane or catching on roller.

Check vane for binding on hopper or in bearings.

Check for and remove magnetic particles, if not already done.

If relay does not then release, replace relay, and if second relay fails, replace coin vane if hopper is of replaceable vane type, otherwise replace coin collector.

Check 5.01 and 5.02.

GROUND CONTACT ASSEMBLY AND BIAS MARGIN

Note: See Note under Part 5, Relay and Hopper Release. If relay has been replaced under Part 5, only 6.11 need be performed under this part.

B D† *6.01 Check that trigger is chromium plated.

Replace with chromium plated trigger.

B D† *6.02 Check that coin engaging surface of trigger arm is horizontal when pressure of coin trigger lever is removed.

Bend spring.

B D† *6.03 In case of relays having flat trigger spring, clean contacting surfaces of trigger and armature pivot frame.

B D† *6.04 In case of relays having coiled wire type trigger spring, check for engagement of trigger with end of spring, and for "A" end of spring standing out from pivot frame.

Bend spring.

B D† *6.05 Check that trigger lever arm is centered over trigger pin.

Bend trigger lever arm.

B D† *6.06 Check that coin trigger restores without trigger lever touching cam surface of trigger when operating arm stop lug is given its full travel manually. Make test three times.

*Ground wire disconnected in manual areas.

†If trigger trouble is indicated in "Trouble Analysis."

Check that trigger does not restore when stop lug is moved \nearrow down rapidly by hand to within .040" of full down travel. Make test 3 times.

If relay has insulating roller, operate relay rapidly several times between each test.

Repeat both tests on opposite side.

If trigger fails to restore with full travel of stop lugs, observe that trigger clears sides of hopper slots with play taken up in each direction. If trigger touches, and play is more than .005", reduce to about .005" by bending trigger. If necessary, eliminate touching by bending trigger bracket or end of trigger. Observe that trigger turns freely on its pivot pin, and if not bend trigger or replace pin.

If relay has flat type trigger spring, operate relay to collect position, operate trigger over entire travel and observe that spring does not touch armature restoring arm. If necessary, bend spring.

If trigger still fails to restore with full travel of stop lugs, or if it restores with .040", bend coin trigger lever. If it still fails, replace relay and check 5.01, 5.02 and 5.03.

B *6.07 Check separation of ground spring contacts.
(Approx. .015").

Adjust outer contact spring and stop spring.

B D 6.08, 6.09 Check that with 3-gram slot of 147A gauge applied to coin trigger lever, and trigger tripped, ground contacts are closed.

In case of 3-gram chute, also check that with 5-gram slot applied as above, contacts preferably are not closed.

3-GRAM CHUTE: With 3-gram slot on coin trigger lever, if contacts touch but circuit is open, burnish contacts.

Check for opens in other parts of circuit and clear if present.

If circuit is open with ground spring contacts short-circuited, replace relay and check 5.01, 5.02, 5.03.

If ground contacts do not touch, adjust pressure to min. 3 grams, preferably not more than 5 grams. Check that outer ground contact spring bears against stop spring and make dime dropping test.

***Ground wire disconnected in manual areas.** \searrow

If trigger does not trip, replace chute with 5-gram⁷ chute, check clearance as in 3.06 and proceed as below for 5-gram chute.

If trigger does trip, check contact separation (6.07) and pressure (6.09) and adjust springs if necessary.

With 5-gram slot on coin trigger lever, if contacts close, make dime dropping test.

If trigger does not trip, replace chute with 5-gram chute, check clearance (3.06) and proceed as for 5-gram chute.

5-GRAM CHUTE: If contacts touch but circuit is open, clear open as above.

If contacts do not touch, adjust pressure to min. 5 grams, preferably not more than 7 grams. Check that outer ground contact spring bears against stop spring. Check contact separation (6.07) and pressure (6.09) and adjust springs if necessary.

B D§ 6.10 Check that when coin trigger is tripped, contacts are made and held without break while armature is moved from its normal to its fully operated position. Make this test 3 times in each direction. It is immaterial at what point during release contacts open.

If relay has insulating roller, relay shall be operated rapidly several times between each test.

If contacts open, replace relay and check 5.01, 5.02, 5.03.

B D E F 6.11 Bias Margin. If not already done, **check that relay operates in correct direction** with ordinary collect and refund current when opposed by 146A gauge on armature. Test shall be made 3 times in each direction.

If relay does not operate, replace relay and check 5.01, 5.02, 5.03.

SWITCHHOOK

B E 7.01 Check that switchhook moves freely and comes to positive upward and downward stops.

50, 150, 161A, 161B, 162A, 162B TYPES: If switchhook binds, clean hard rubber stud and adjacent parts of spring.

Remove pin and replace or clean and lubricate.

Check alignment of bearing holes.

If bearing holes are out of alignment or switchhook still binds, replace switchhook.

§ If contact pressure has been readjusted.

If hook does not come to a positive stop, check for and clear binding as above, otherwise adjust long contact spring with switchhook removed.

If spring cannot be adjusted to give positive stops, replace switchhook spring assembly.

161C, 161D, 162C, 162D TYPES: If switchhook interferes with upper housing, check switchhook slot width on housing and replace housing if slot is 1/2" wide.

If hook still binds, replace switchhook.

If hook does not come to a positive stop, adjust long contact spring with switchhook removed.

B 7.02 Check make and break and sequence of contacts
(Sections C64.231, C64.233 and C64.234).

If contacts touch but do not make, burnish contacts.

If contacts fail to make or break or if sequence is incorrect, check spring pile-up for tightness.

If pile-up is loose, shift springs if necessary and re-tighten.

If pile-up is tight, check for alignment.

If tight but contacts do not line up, proceed as follows:

50, 150, 161A, 161B, 162A, 162B TYPES:
Loosen spring pile-up, shift springs, re-tighten.

161C, 161D, 162C, 162D TYPES: Replace coin collector.

If pile-up is tight and contacts line up, adjust short contact springs for make, break and sequence. Check following and if necessary adjust short contact springs:

Contact Follow, Approx. 1/64". Check that pairs of twin contacts make at approximately same time.

Contact Separation; Point and Disc Contacts, Min. .025"; Bar Contacts, Min. .016".

Spring Clearance, 1/32" (150, 161, 162 Types Only).

If short contact springs are adjusted, check that contact spring (or each finger thereof) is tensioned against its stop spring.

FINAL TESTS

C 8.01 Check for collection operation, 3 times.

Perform operations of Column D, Table I.

A B 8.02 Check for housing crossed with wiring.

Clear trouble. If cross cannot be cleared, replace coin collector.

A B C 8.03 If transmitter, upper housing or coin collector has been replaced, **check coin signals** with operator. Manipulate housing.

Check gongs for looseness. Turn solid gong to a different position if better signal is thus obtained. Replace transmitter or upper housing if necessary.

A B C D E 8.04 Make station tests with test desk.

Make current flow test only if following Column B.

Omit .035 amp. non-operate part of test.

If relay fails on current flow test, replace relay and check 5.01, 5.02, 5.03, 6.11.

Check for noise or cut-outs by manipulation of upper housing and transmitter.

If noise is caused by manipulating upper housing, clean and adjust housing contact springs and adjust equalizing spring.

If noise is caused by manipulating transmitter, tighten transmitter terminal or rim screws or replace transmitter cords.

Clear any other trouble as instructed by test deskman.

C D E 8.05 In areas where facilities for making station tests with test desk are not provided, call operator or dial ring back code and **check for noise or cut-outs** by manipulation of upper housing and transmitter.

Clear as under 8.04.

A B C D E F 8.06 Check for refund of coins.

Remove upper housing. Locate coin and perform operations 2 to 6 inclusive of Part 3. If trouble cannot be found, replace coin collector.

OUT-OF-SERVICE NOTICES

B C D F 9.01 If trouble cannot be cleared (as in case new coin collector is required) advise test desk and place 126A number plate or "Temporarily Out-of-Service" card on coin collector.

A B 9.02 When collector is restored to service, remove 126A number plate. Return "Temporarily Out-of-Service" card to subscriber or agent.

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