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i

WALL BOX *service manual*

MODELS

WQ-120

WQ-200

WQ-200-1

WQ-200-2

WQ-200-3

Sold by:

ROWE - AC SERVICES

Division of Automatic Canteen Co. of America

18 South Michigan Ave.
Chicago 3, Illinois

Manufactured by:

ROWE AC MANUFACTURING

Division of Automatic Canteen Company of America
Grand Rapids Plant
1500 Union Avenue, S. E., Grand Rapids 2, Michigan

INTRODUCTION

This manual is intended as a service guide for the AMI WQ series Wall Boxes. It contains instructions, in text and illustrations, which should be extremely helpful in maintaining proper servicing.

This manual is provided in loose-leaf form to make it possible to insert new or revised information into the related section, anywhere in the manual.

Keep this manual accurate and up-to-date, by inserting supplementary information into its proper section as it is received.

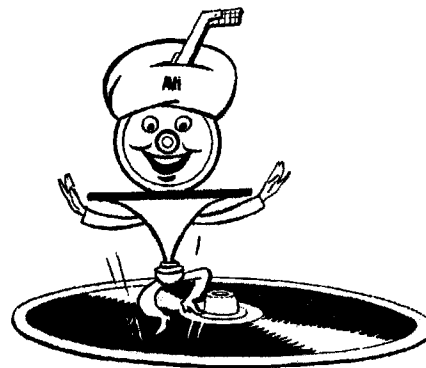


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SECTION I INTRODUCTION

I-1 DESCRIPTION AND OPERATION

The AMI Wall Boxes, Models WQ-120, WQ-200, WQ-200-1, WQ-200-2, and WQ-200-3, are designed to operate as remote control equipment for AMI Phonographs, Models D-80 through the present automatic models. The WQ series Wall Boxes also provide remote operation of AMI Stereophonic and Monaural Selective Hideaways, Models HEB-200 and HAC-200. Although all of the WQ series Wall Boxes are identical in outward appearance, there are differences in the capabilities of each model. These differences are described in the SUMMARY OF MODELS.

Operation:

All of the WQ series Wall Boxes operate in the same general manner; the Wall Box provides complete control of the Record Changer and Selection Systems, of the phonograph or hideaway, from any remote location. Starting with Phonograph Model G-200, an AC Control Switch in the phonograph operates "WAIT" circuits in the phonograph and Wall Boxes. The AC Control Switch prevents any two Wall Boxes, or any Wall Box and phonograph, from being operated simultaneously. Selective hideaway Models HEB-200 and HAC-200 also incorporate the AC Control Switch which prevents any two Wall Boxes from being operated simultaneously. In all Wall Box applications, a four-wire cable provides interference-free operation. A three-wire cable may be used but will make the "WAIT" circuits inactive.

I-2 SUMMARY OF MODELS

Model WQ-120

120 selection Wall Box, for use with any AMI phonograph, as early as Model D-80, equipped with the proper Stepper (or Pulse Converter). It contains a twenty-five cent slug rejector and a single price, non-accumulative credit system.

Model WQ-200

200 selection Wall Box, for use on all AMI 200-E or 200-A phonographs. Otherwise the same as Model WQ-120.

Model WQ-200-1

Same as Model WQ-200 except that it contains a dual price, accumulative credit unit.

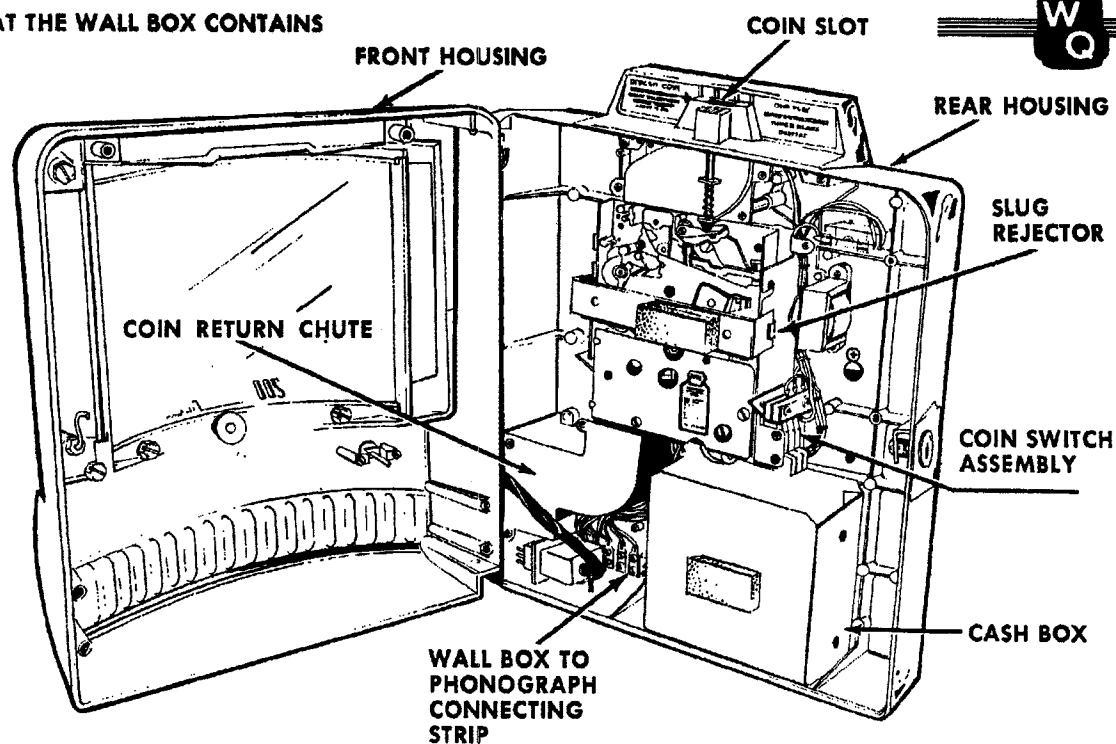
Model WQ-200-2

Same as Model WQ-200-1 except that the accumulative credit system does not provide for dual pricing.

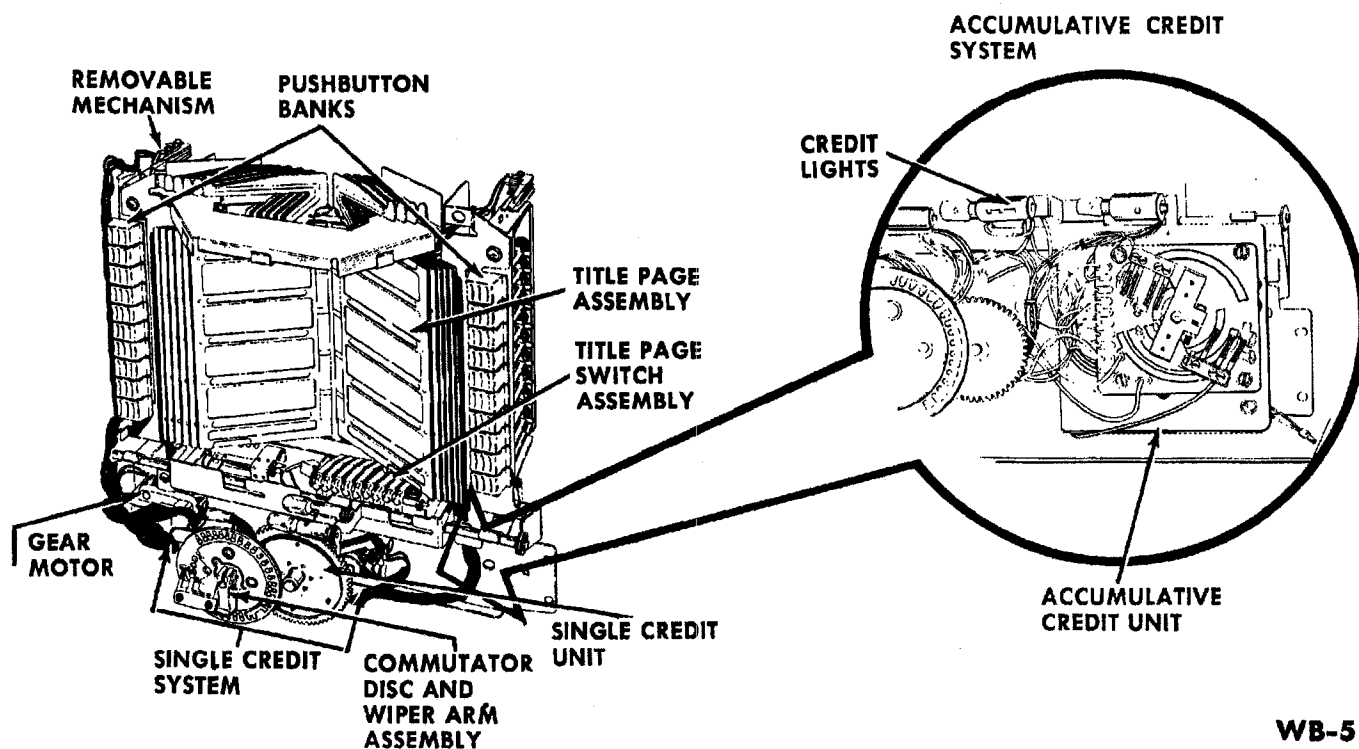
Model WQ-200-3

The same as Model WQ-200-1 except that it contains a fifty cent slug rejector.

1 - 3 WHAT THE WALL BOX CONTAINS



The Wall Box Contains its own Credit and Selection system which are electrically coupled to the phonograph Record Changer Mechanism and Sound System through the Stepper (or Pulse Converter). These are the components which make up the Wall Box.



SECTION II INSTALLATION INSTRUCTIONS

2-1 STEPPER INSTALLATION:

The Stepper, or Pulse Converter, which makes it possible to control phonograph operation from a Wall Box, is considered part of the equipment for the Wall Box, although it is actually in the phonograph.

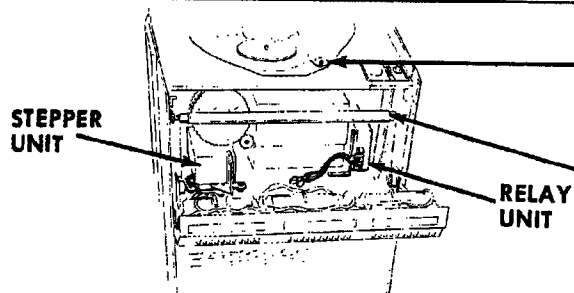
Earlier AMI phonographs, Models D-80 through G-120, (80 and 120 selections), required Stepper Models S-80 and S-120.

AMI phonograph Models G-200 (200 selection) through Models I, J, and K, (120 and 200 selections) contained a built-in Stepper which per-

mitted direct Wall Box hook up.

The present 100 and 200 selection "Automatic" AMI phonographs require installation of a Stepper to provide Wall Box operation. Model CCA Stepper for 200 selections and Model CCB Stepper for 100 selections.

The Stepper may also be used on AMI Model K phonographs by mounting the Stepper and Relay Units on the Record Changer shelf in any appropriate area, that will allow making the necessary plug connections described in the following paragraphs.

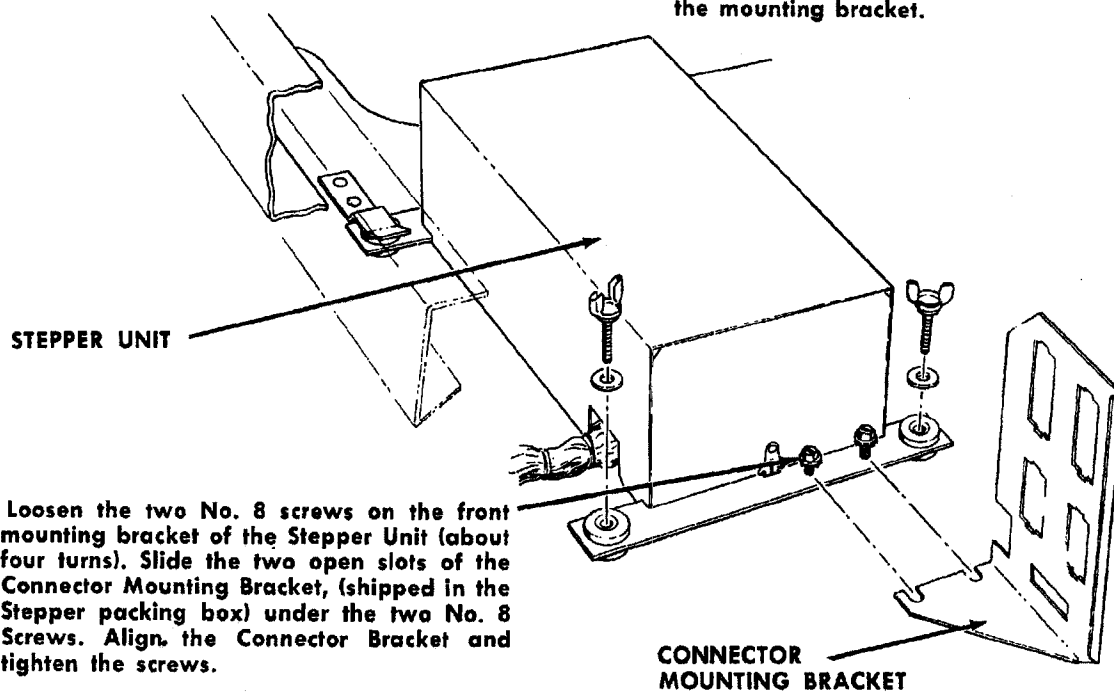


Place the Record Changer Switch, on the top trim of the phonograph, in the "OFF" position.

Remove the long fluorescent lamp at the front of the Record Changer Shelf, in Continental 2 models. The lamp is located on the inside of the access door in Continental 1 and Lyric phonographs, and need not be removed.

Facing the front of the phonograph, place the Stepper on the Record Changer Shelf, the Stepper Unit on the left, and the Relay Unit on the right. Push the two units toward the rear of the phonograph until their mounting brackets engage the retaining clips at the rear of the shelf. Push the units firmly to be sure that the mounting brackets are securely under the retaining clips.

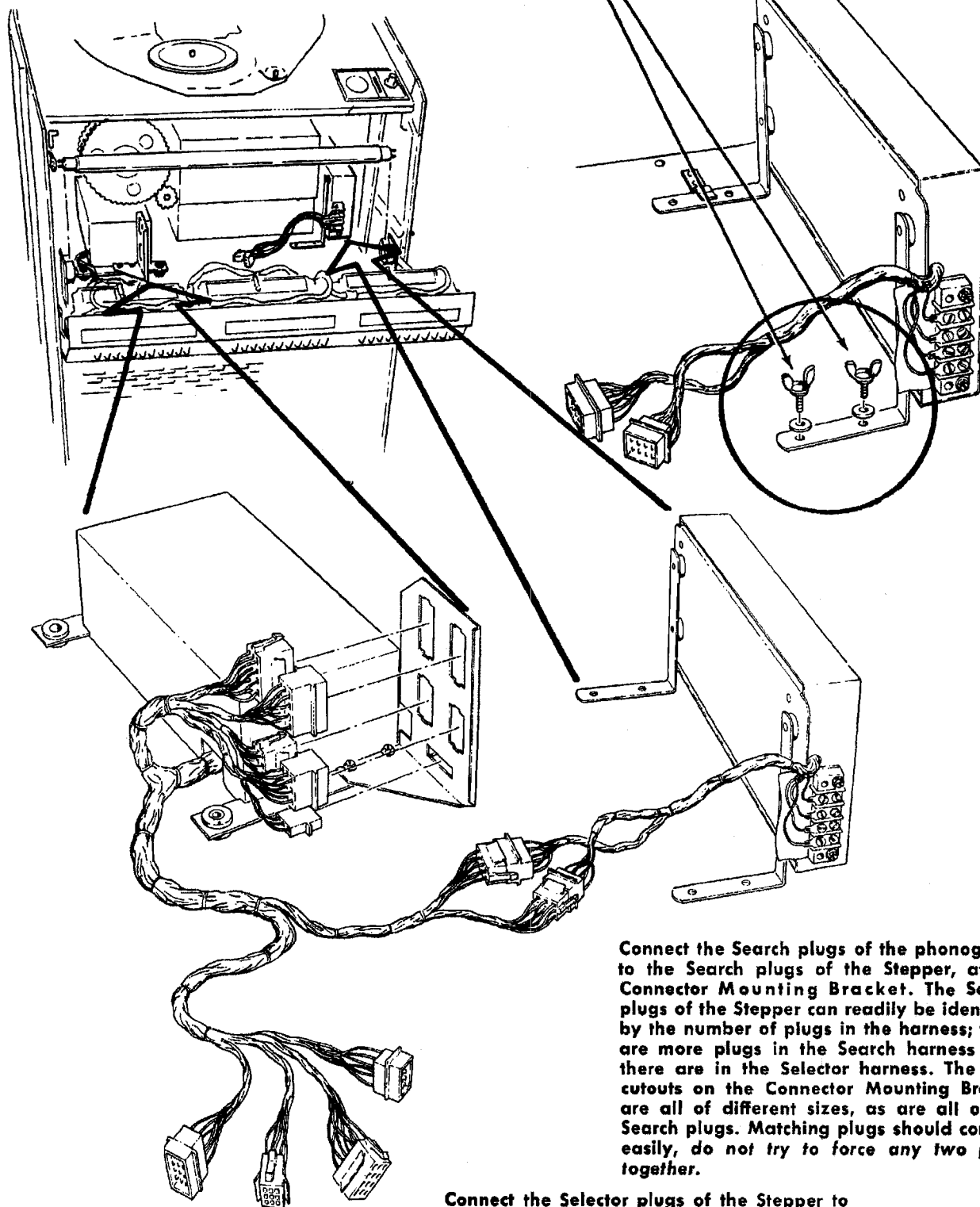
Secure the front mounting bracket of the Stepper Unit with the two $\frac{3}{4}$ inch long Wing Screws provided in the accessories bag. **CAUTION:** If these screws are tightened too much, the frame of the unit will become warped, causing the number stepper inside to fail. Be sure the screws are tightened just enough to hold the unit firmly without compressing the rubber grommets at the ends of the mounting bracket.



Loosen the two No. 8 screws on the front mounting bracket of the Stepper Unit (about four turns). Slide the two open slots of the Connector Mounting Bracket, (shipped in the Stepper packing box) under the two No. 8 Screws. Align the Connector Bracket and tighten the screws.

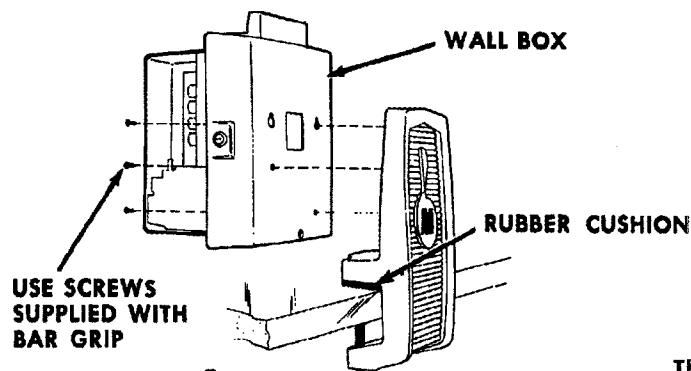
Disconnect the harness plugs between the phonograph Selector System and Search Unit, and move the Selector harness aside. The plugs are located at the front of the Record Changer Shelf, and the Selector harness is the longest of the two sections.

Secure the front leg of the Relay Unit with the two $\frac{3}{8}$ inch long Wing Screws provided in the accessories bag.



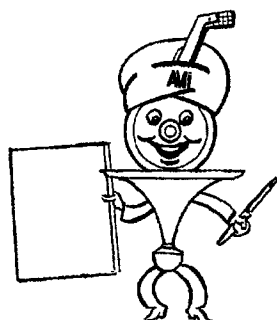
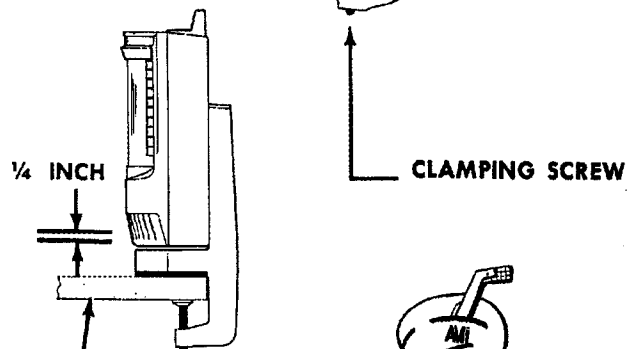
Connect the Search plugs of the phonograph to the Search plugs of the Stepper, at the Connector Mounting Bracket. The Search plugs of the Stepper can readily be identified by the number of plugs in the harness; there are more plugs in the Search harness than there are in the Selector harness. The plug cutouts on the Connector Mounting Bracket are all of different sizes, as are all of the Search plugs. Matching plugs should connect easily, do not try to force any two plugs together.

Connect the Selector plugs of the Stepper to the matching plugs in the phonograph Selector harness.



2-2 WALL BOX INSTALLATION Counter Mounting

The AMI R-167 Bar Grip is recommended for use with AMI Wall Boxes, in bar or counter top installations. The Bar Grip eliminates the need for drilling holes in bar or counter tops.



RECOMMENDED COMBINATIONS

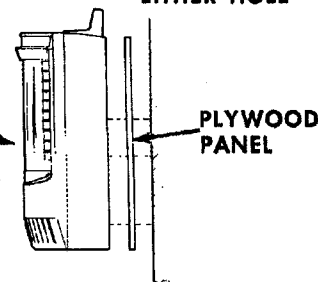
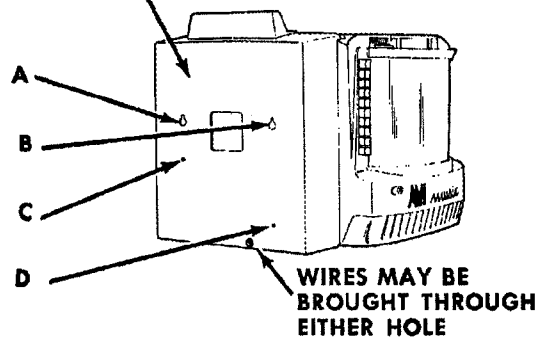
A—B—D
A—B—C
B—C—D

Wall Mounting

The Wall Box should be free of obstructions so that the Front Housing can swing completely open. Allow at least 1/4 inch clearance at the bottom of the Box.

If a Wall Box is to be mounted on a plaster or masonry surface, it may be advisable to first attach a plywood panel to the wall to provide a more stabilized mounting for the Wall Box. The panel should be cut to match the shape of the back of the Wall Box and should be secured by anchor bolts.

USE NOT MORE THAN 3 MOUNTING SCREWS (No. 10 Size) TO AVOID WARPING REAR HOUSING ON UNEVEN SURFACE.

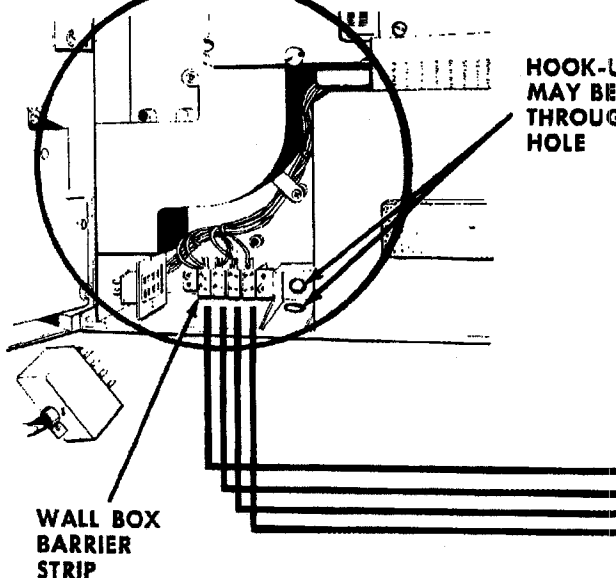
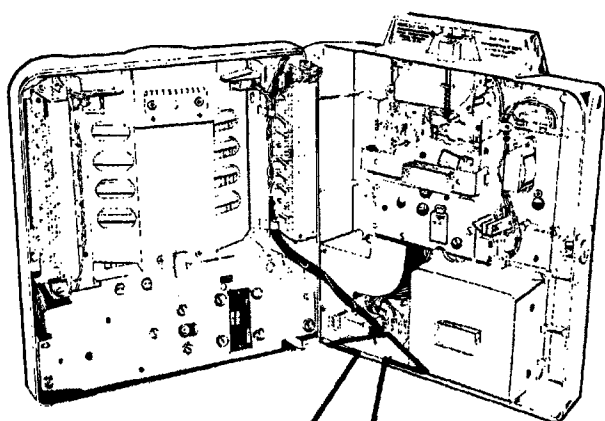


Connecting Wall Boxes

The Wall Boxes are connected to the phonograph or hideaway by means of a four wire cable which connects between the barrier strip in the Wall Box, and the barrier strip in the phonograph or hideaway.

Principle of 4-Wire Hook-Up

The first wire of the 4-wire hook-up cable serves as "COMMON" for the AC and DC lines, the second wire provides the "AC" line connection from the Transformer Fustat Assembly, the third wire carries the "SIGNAL" from the Wall Box, and the fourth provides the connection to the "AC CONTROL" line.



HOOK-UP CABLE
MAY BE ROUTED
THROUGH EITHER
HOLE

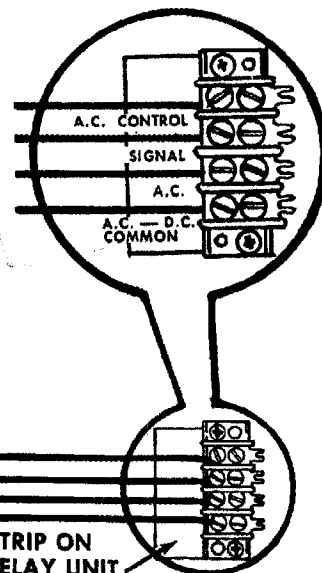
WALL BOX
BARRIER
STRIP

Motor Control Switch, AC Control Line, and AC Control Switch

Each Wall Box has a Motor Control Switch which is connected to the "AC CONTROL" line. A Wall Box cannot be started unless low voltage AC is furnished to the Motor Control Switch through the AC Control Line. The AC Control Line is turned on only when the Letter Stepper in the Pulse Converter, or in the Stepper (Model CCA or CCB), is in the "HOME" position. This switching is accomplished by a pair of contacts, referred to as the "AC CONTROL SWITCH", which are a part of the Homing Switch of the Letter Stepper. Once a Wall Box has been started, its Motor Control Shifts to the "AC" line which is connected to the AC supply at all times.

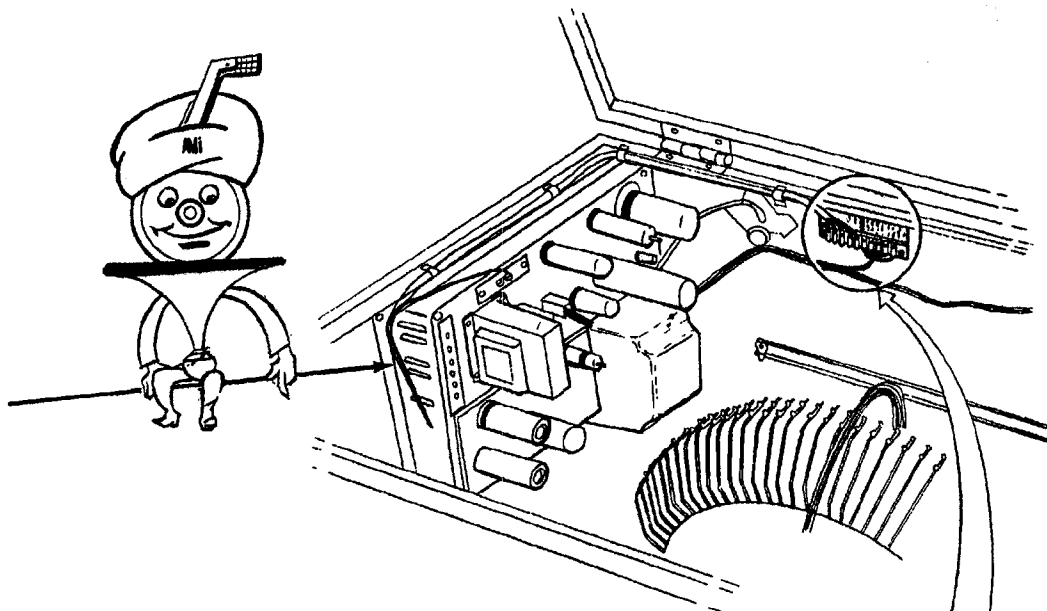
The "WAIT" Circuit

The "WAIT" circuit operates in this manner: If the phonograph Pulse Converter, or Stepper, is cycling as a result of pulses from a Wall Box, the AC Control Switch will be open and the AC Control Line will be dead. If a coin is now deposited in another unit, the Main Credit Switch will close, but the Gear Motor in the second unit will not start, and the "WAIT" light will come on. The Gear Motor in the Wall Box will remain off, and the "WAIT" light will stay on until the Letter Stepping Switch in the Pulse Converter has returned to the "HOME" position, closing its Home Switch contacts. In other words, the AC Control Switch will not allow pulses from another unit to be started until the Pulse Converter, or Stepper in the phonograph has completed its work. "WAIT" circuit operation is identical in the Selective Hideaways, Models HEB-200 and HAC-200.



BARRIER STRIP ON
STEPPER RELAY UNIT
(TAG IS MARKED AS
INDICATED)

HIDEAWAY
UNIT



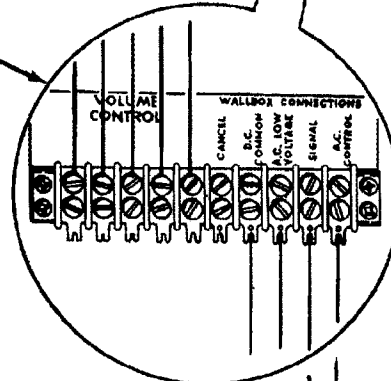
HIDEAWAY BARRIER STRIP

Barrier Strip in the Phonograph

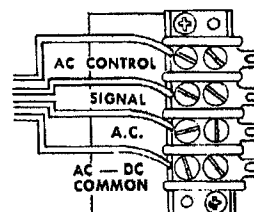
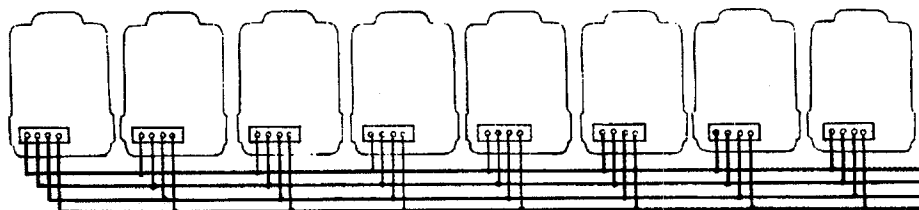
The barrier strip is located on the cover of the Stepper relay unit, in all AMI automatic phonographs. Earlier electrical AMI phonographs have the barrier strips located in several different positions, however, the barrier strips on all of the earlier units are easily identified by a marker as shown. The barrier strip in the hideaway units are located on the back inside wall, near the top, next to the speaker.

1 to 8 Wall Boxes

As many as eight Wall Boxes may be connected to the phonograph or hideaway through the same cable. The distance between the phonograph or hideaway and the farthest Wall Box should not exceed 150 feet, using 18 gauge solid wire in the cable. The distance can be increased by connecting fewer Wall Boxes. In any case, the voltage measured at the "AC" terminal on the barrier strip of the farthest Wall Box should be not less than 20 volts, with the Wall Box cycling.

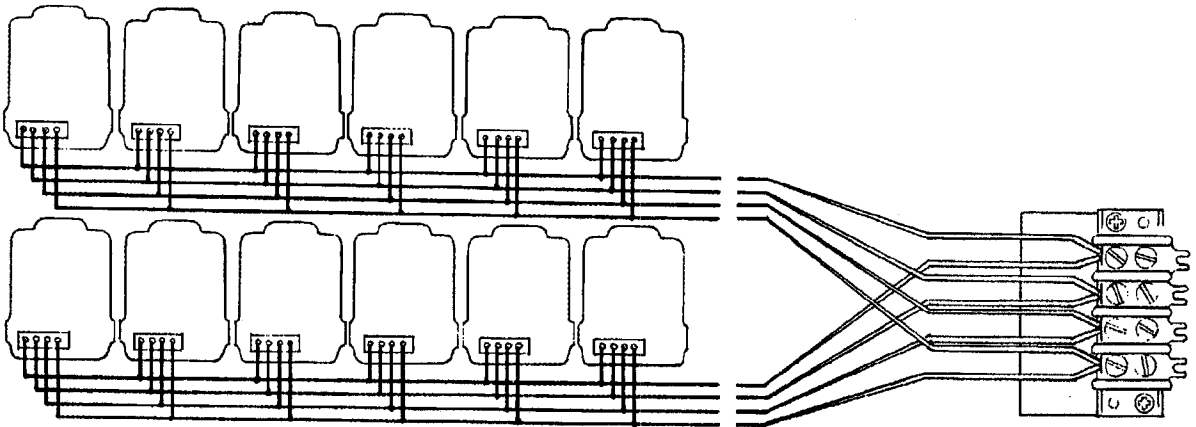


WALL BOX
WIRES

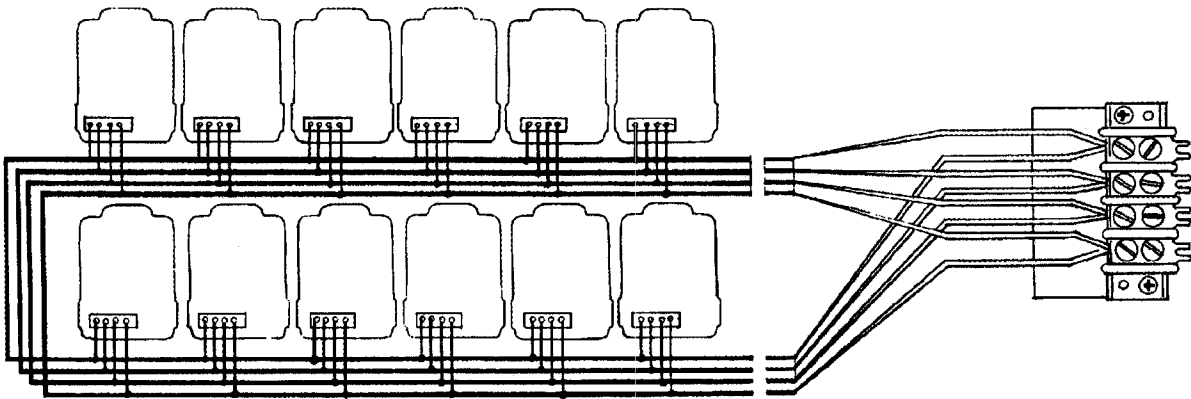


8 to 12 Wall Boxes

In connecting from 8 to 12 Wall Boxes to a phonograph, it is recommended that two four-wire cables be used, in either an open or closed loop. Hideaway installation should be identical.



OPEN LOOP

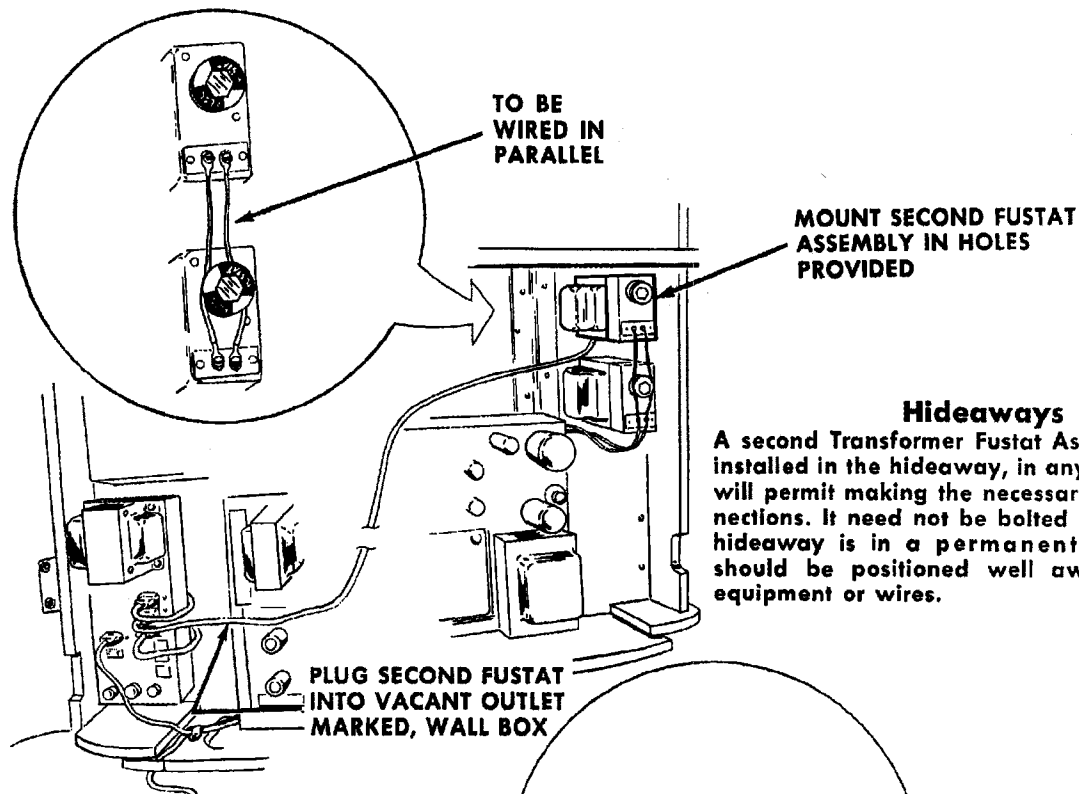


CLOSED LOOP

ADDING A TRANSFORMER-FUSTAT ASSEMBLY

Over 12 Wall Boxes

When more than 12 Wall Boxes are to be connected to the phonograph or hideaway, it will be necessary to add a second Transformer Fustat Assembly to provide sufficient low voltage AC.

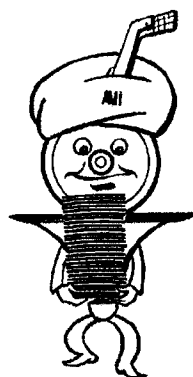


Phonographs

All AMI Phonographs have mounting holes provided, next to the existing Transformer Fustat Assembly, for the purpose of adding a second Transformer Fustat Assembly. These mounting holes are accessible from the rear of the phonograph.

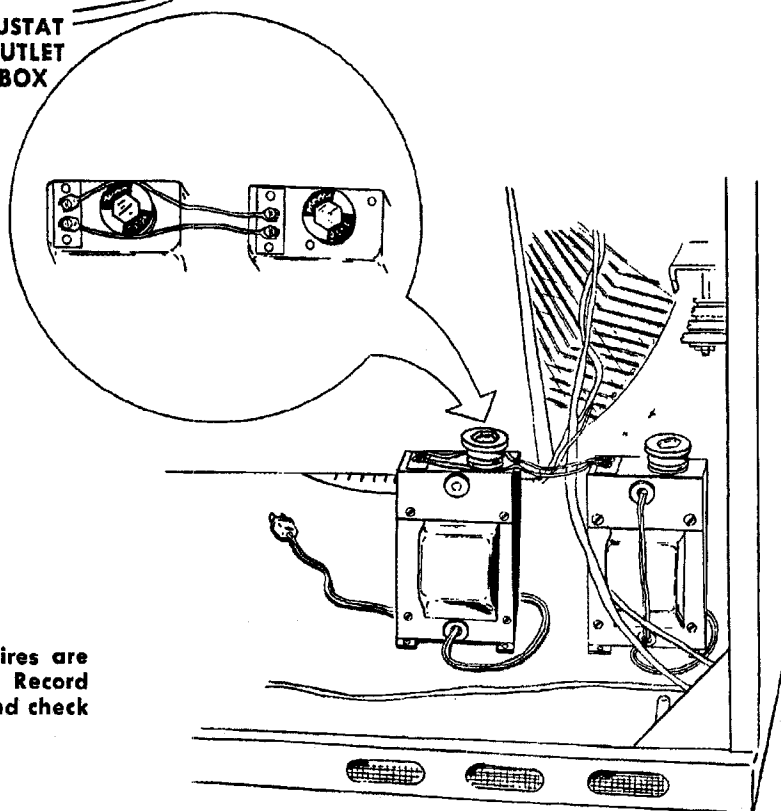
Hideaways

A second Transformer Fustat Assembly may be installed in the hideaway, in any location which will permit making the necessary electrical connections. It need not be bolted down when the hideaway is in a permanent location, but should be positioned well away from other equipment or wires.



Operation:

Check all wiring to be sure that no wires are shorted or left unconnected. Place the Record Changer Switch in the "ON" position and check the Wall Box operation.



2-3 MODIFYING WALL BOX HOOK-UP

The information contained in the following paragraphs is provided so that AMI Wall Boxes, as early as Model W-80, may be adapted for operation with 3 or 4 wire hook-up, depending upon the desired limitations. Existing wiring at any location will determine the type of hook-up that can be used.

3-Wire Partial Control Hook-Up for WQ Series Wall Boxes

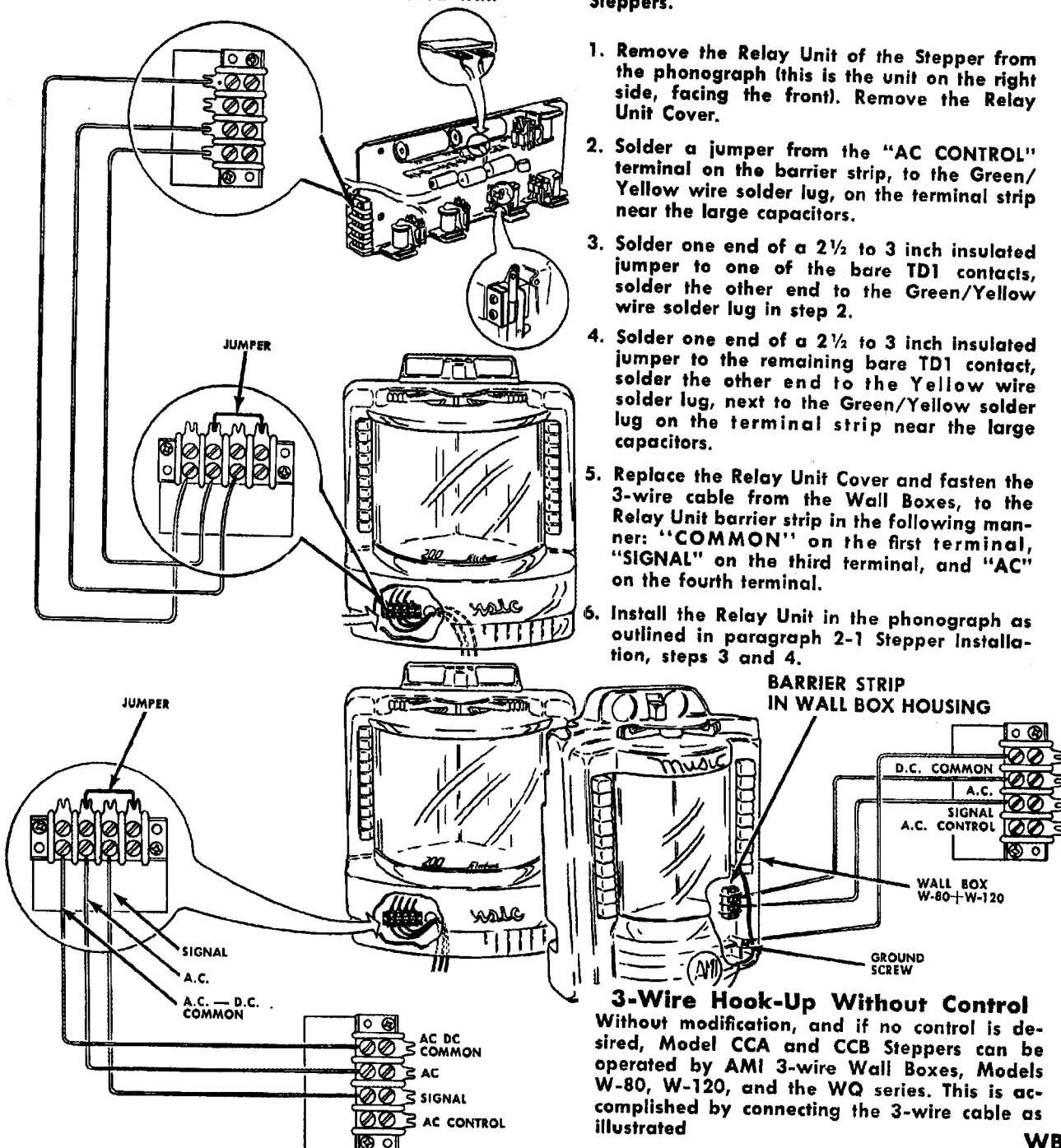
The following information is only pertinent to the WQ Series Wall Boxes that are used with

AMI 100 and 200 Selection Automatic Phonographs in which Stepper Models CCA and CCB are installed.

Partial Control

When the Stepper, or Pulse Converter is cycling as a result of pulses from a Wall Box, Partial Control will turn off all other Wall Boxes, including operating lights and Credit Units. This condition will remain from the time the last pulse is sent, until the selection has been registered. In order to provide 3-wire Partial Control, a few wiring changes will be necessary in the Relay Unit of Model CCA and CCB Steppers.

1. Remove the Relay Unit of the Stepper from the phonograph (this is the unit on the right side, facing the front). Remove the Relay Unit Cover.
2. Solder a jumper from the "AC CONTROL" terminal on the barrier strip, to the Green/Yellow wire solder lug, on the terminal strip near the large capacitors.
3. Solder one end of a 2½ to 3 inch insulated jumper to one of the bare TD1 contacts, solder the other end to the Green/Yellow wire solder lug in step 2.
4. Solder one end of a 2½ to 3 inch insulated jumper to the remaining bare TD1 contact, solder the other end to the Yellow wire solder lug, next to the Green/Yellow solder lug on the terminal strip near the large capacitors.
5. Replace the Relay Unit Cover and fasten the 3-wire cable from the Wall Boxes, to the Relay Unit barrier strip in the following manner: "COMMON" on the first terminal, "SIGNAL" on the third terminal, and "AC" on the fourth terminal.
6. Install the Relay Unit in the phonograph as outlined in paragraph 2-1 Stepper Installation, steps 3 and 4.



3-Wire Hook-Up Without Control

Without modification, and if no control is desired, Model CCA and CCB Steppers can be operated by AMI 3-wire Wall Boxes, Models W-80, W-120, and the WQ series. This is accomplished by connecting the 3-wire cable as illustrated

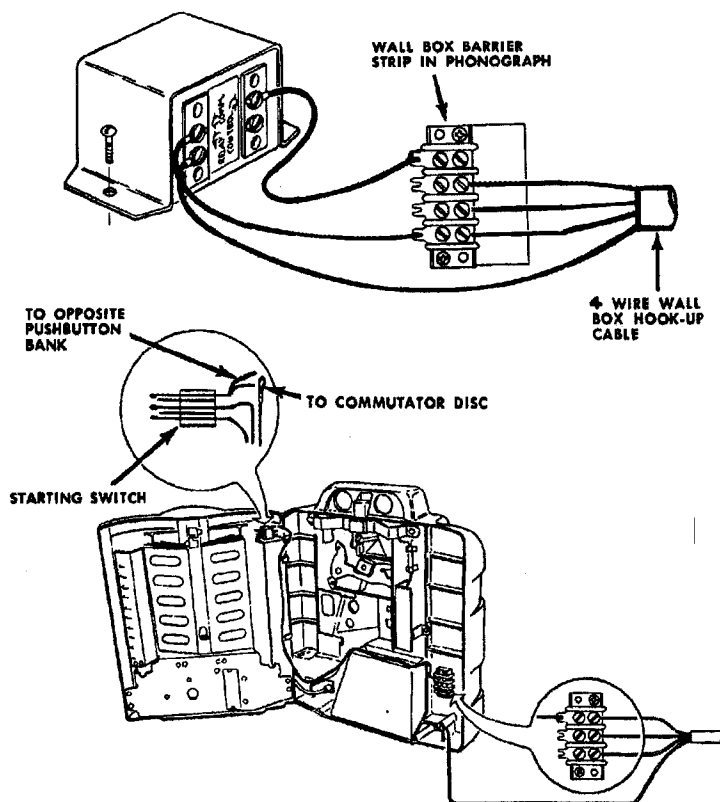
2-4. CONVERTING AMI W-80 AND W-120 WALL BOXES TO 4-WIRE HOOK-UP WITH "WAIT" CONTROL

W-80 and W-120 Wall Boxes may be operated with AMI phonograph Models G-200, H-200, and H-120, but since these Wall Boxes normally operate on a 3-wire hook-up, the "WAIT" circuit is not included. The absence of the "WAIT" circuit will permit any Wall Box to be operated even though the phonograph Pulse Converter may be cycling as a result of pulses from another unit; this can result in improper selections.

F-3912 "WAIT" Control Unit Kit

The AMI F-3912 "WAIT" Control Unit Kit, when installed will provide the "WAIT" circuit when the W-80 and W-120 Wall Boxes are connected to the above phonographs through a 4-wire cable. The Kit consists of a small box containing a relay, and other required parts. In addition to the Kit, an F-3906 3-Terminal Barrier Strip will be required for each Wall Box to be converted.

1. Using two No. 6 x $\frac{3}{8}$ inch, round-head wood screws, mount the H-1978 Box and Relay Assembly at a convenient location inside the phonograph, near the Wall Box connection Barrier Strip.
2. Connect one end of a wire to the terminal on the Relay Box marked "COMMON", connect the other end to the terminal marked "AC DC COMMON" on the phonograph Barrier Strip.



3. Connect a wire from the Relay Box terminal marked "CONTROL", to the terminal on the phonograph Barrier Strip marked "AC CONTROL."
4. Connect the 4-wire Wall Box hook-up cable to the phonograph Barrier Strip as follows:
 - a. Connect the first wire to the "AC DC COMMON" terminal.
 - b. Connect the second wire to the "AC" terminal.
 - c. Connect the third wire to the "SIGNAL" terminal.
 - d. Connect the fourth wire to the Relay Box terminal marked "RELAY."

Open the Wall Box

5. Replace the original two-terminal Barrier Strip with the F-3906 three-terminal Barrier Strip provided in the Kit. This will necessitate drilling and tapping a new hole for a No. 6-32 screw which is also included in the Kit. The new Barrier Strip may be used as a template for locating the hole, or the hole can be located by measuring $\frac{3}{8}$ inch up from the old top hole, on the same center line.

CAUTION

Do not over-tighten the screws when mounting the new F-3906 Barrier Strip, the top hole will not have a "Boss" under it for support and the Barrier Strip could crack with too much pressure.

6. Disconnect the Yellow wire, which leads from the top blade of the Starting Switch of the right hand Pushbutton Bank to the bank of the Commutator Disc. Tape the end of the wire.
7. Connect a new wire, from the top blade of the Starting Switch in step 6, to the top terminal of the new F-3906 Barrier Strip. This wire should be routed down along the front door cable, following the same raceway.
8. Connect the 4-wire hook-up cable from the phonograph to the new F-3906 Barrier Strip as follows:
 - a. The "AC DC COMMON" will be connected to the "Boss" beneath the Barrier Strip as before.
 - b. The wire from the "SIGNAL" terminal in the phonograph will be connected to the bottom terminal of the F-3906 Barrier Strip.
 - c. The wire from the "AC" terminal in the phonograph will be connected to the center terminal of the F-3906 Barrier Strip.
 - d. The wire which is connected to the "RELAY" terminal on the H-1978 Box and Relay Assembly in the phonograph, will be connected to the top terminal of the F-3906 Barrier Strip. This is the same terminal that the new wire from the Starting Switch was connected to in step 7.
9. Make sure all Wall Boxes have been connected properly, and that all wires are properly dressed away from moving parts and possible shorts.
10. Check the operation of all Wall Boxes. The "WAIT" circuit should provide interference-free operation.

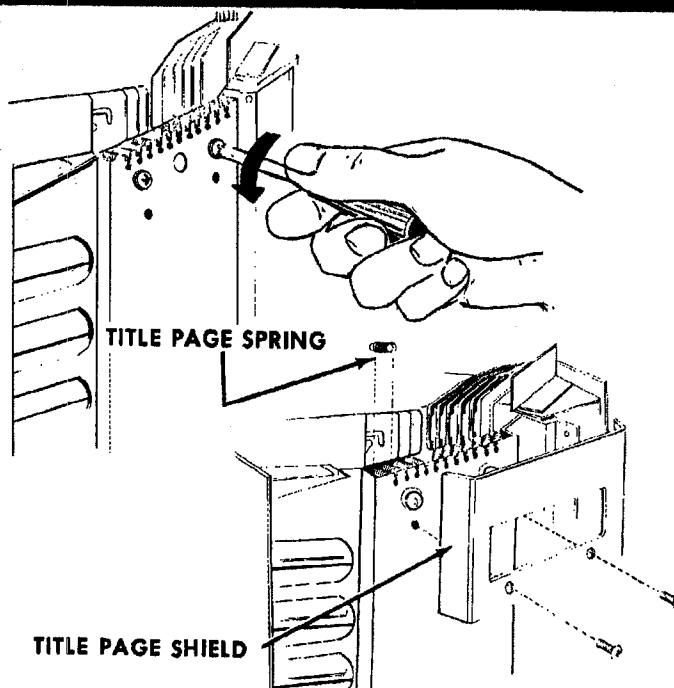
SECTION III MODIFYING TITLE PAGES TO CHANGE NUMBER OF SELECTIONS

WQ series AMI Wall Boxes may be adapted for use with phonographs having a different number of selections by performing the modifications described below.

3-1 CHANGING WQ-200 TO WQ-120

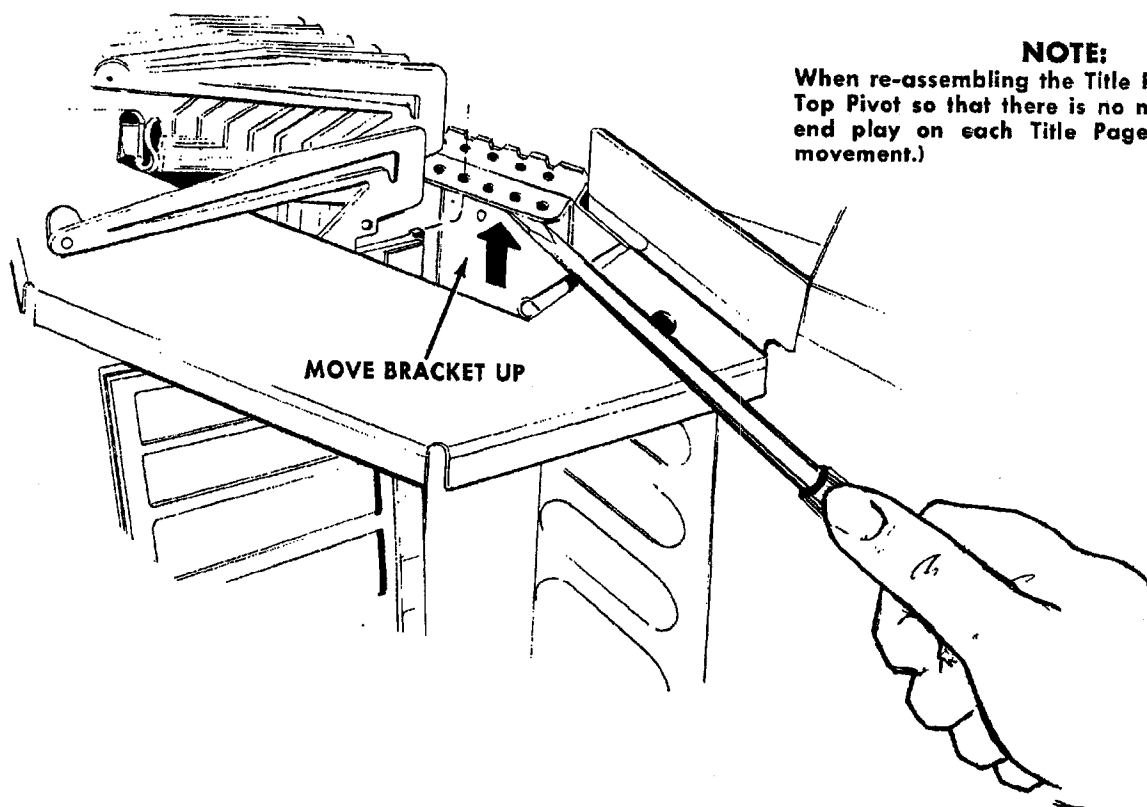
CAUTION: Since the title page switches are operated by tabs on the individual title pages, the vertical position of the pages is important. Do not move the bottom title page pivot.

1. Remove Wall Box mechanism from the Front Housing.
2. Remove the lower pair of screws at the top of the Title Page Back Assembly, remove the Title Page Shield.
3. Disconnect all Title Page Springs from the Title Pages. Do not stretch or bend the springs.
4. Loosen the top Pivot Bracket Mounting Screws, slide the Pivot Bracket up, and remove the last 5 Title Pages (F-11 to K-20).



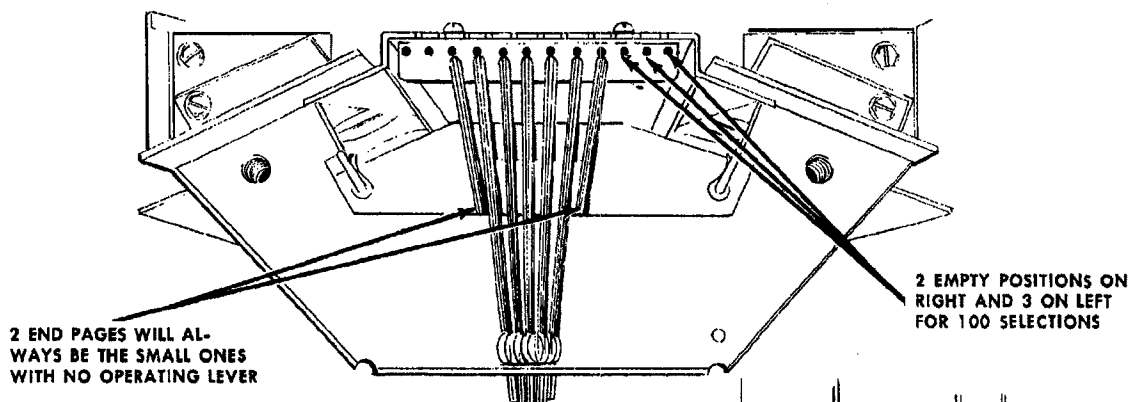
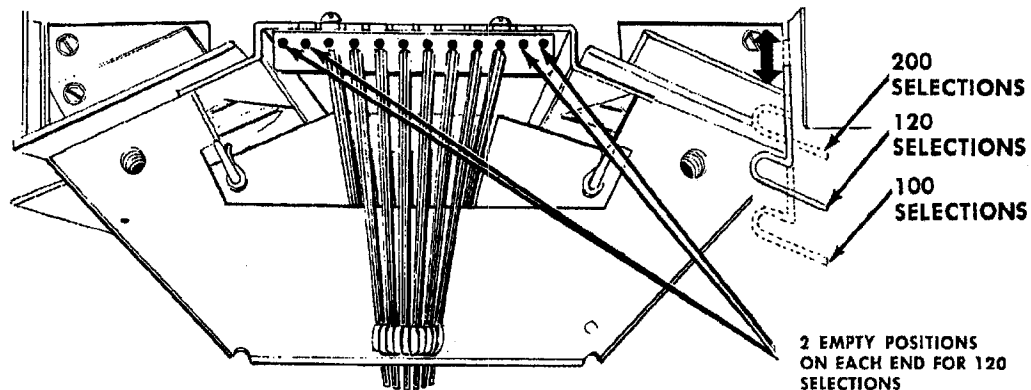
NOTE:

When re-assembling the Title Pages, adjust the Top Pivot so that there is no more than 0.005" end play on each Title Page (up and down movement.)

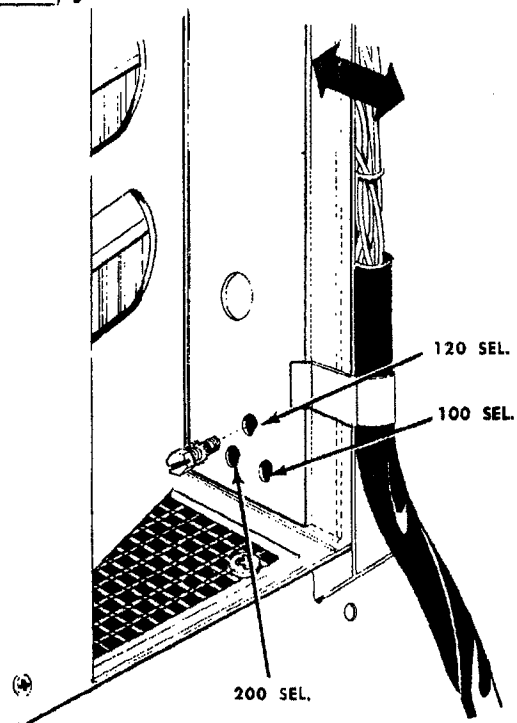


5. Move all remaining Title Pages two places to the right (Selections A-1 to F-10). Remove K-11 to K-20 Number Strip from the small Title Page, having no operating lever, and replace it with the F-11 to F-20 Number Strip.

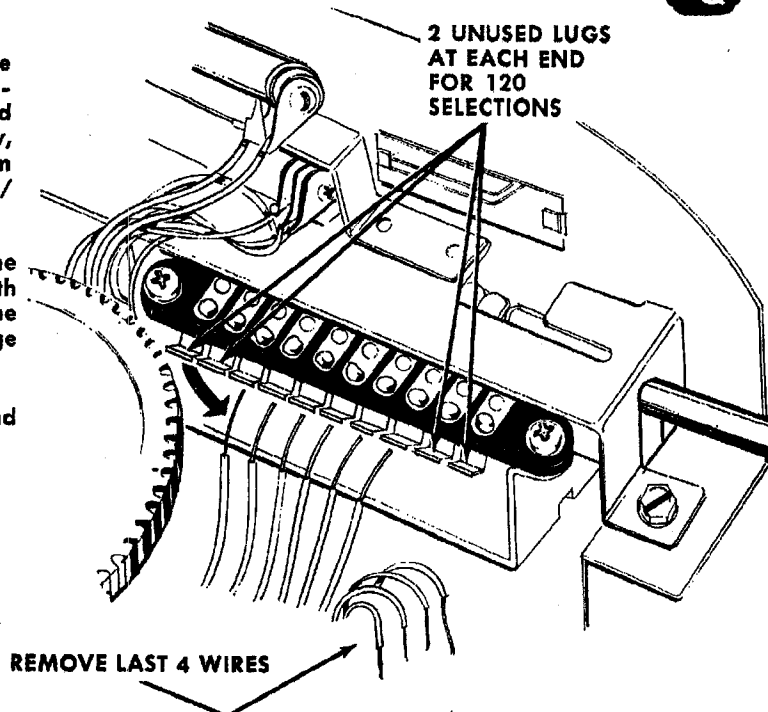
Install this Title Page in the next available (third from right) space in the pivot. There should now be two empty spaces at both ends of the pivots.



6. The Title Page Stops limit the swinging arc of the Title Pages, so that the Tabs can always be brought into correct position to depress the Title Pages Switches. The Title Page Stops are removable brackets, attached to the Main Frame along the sides of the opening through which the Title Page Assembly is removed and installed. Extra screw holes are drilled in the Stops so that the Stops can be fastened in three different positions. On 200 selection boxes, the first hole is used to accommodate all of the Title Pages. The middle hole is used for 120 selection boxes and the last hole for 100 selection boxes.



7. Disconnect the last four wires from the Title Page Switch Assembly. Two color code systems of wiring may be present. In the old system, the last four wires will be: Yellow, Green, Brown, and White. In the new system the colors will be: Orange/White, Green/White, Brown/White, and Slate/White.
8. Move each remaining wire two spaces to the right. This will leave two unused lugs at both ends of the Switch Assembly. Tighten the Top Pivot Bracket, install the Title Page Shield, and attach the Title Page Springs.
9. Install the Unit in the Front Housing and check the Wall Box operation.



3-2 CHANGING WQ-120 TO WQ-200

1. Remove the Title Page Shield, the Title Page Springs, and loosen the Top Pivot Bracket.
2. Remove the last Title Page, (F-11 to F-20) and move all the remaining Pages two places to the left.
3. Install new Title Pages: F-11 to G-10, G-11 to H-10, H-11 to J-10, and J-11 to K-10.

NOTE:

4. Install new K-11 to K-20 Number Strip on the Page without the operating lever, and install this Page in the last space on the Pivots. New Title Pages may have a burr at the top that will drag on the Pivot, while the original Pages seem to have too much play. The burrs on the new Title Pages can be dressed off with a file.
5. Move the Title Page Stop attaching screws to the first hole.
6. Move all of the Title Page Switch wire two places to the left. This will leave four unused lugs on the right.
7. Untape the four spare wires in the harness near the Title Page Switch Assembly and connect them to the four unused lugs in this order: (Old system) Yellow, Green, Brown, and White (New system) Orange/White, Green/White, Brown/White, and Slate/White.

3-3. CHANGING WQ-120 TO 100 SELECTIONS

1. Remove the first Title Page (A-11 to B-10).
2. Move all the remaining Title Pages one place to the left. There will be two vacant positions on the left and three vacant positions on the right.
3. Remove the B-11 to B-20 Number Strip from the first Page and replace it with the B-1 to B-10 Strip.
4. Remove the C-11 to C-20 Strip from the second Page and replace it with the D-1 to D-10 Strip from the opposite side of the same Page. Move the E-1 to E-10 Strip from the second side of the third Page to the second side of the second page.
5. Move the F-1 to F-10 Strip from the second side of the fourth Page to the first side of the third Page.
6. Remove the remaining 11 to 20 Strips and replace them with the following new Strips: G-1 to G-10, H-1 to H-10, J-1 to J-10, and K-1 to K-10.
7. Install the Title Page Stop attaching screws in the last hole.

It is not necessary to reposition the Title Page Switch connections at this time.

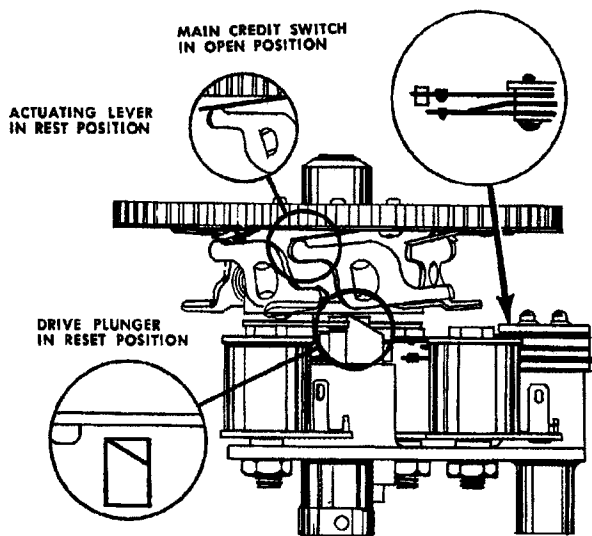
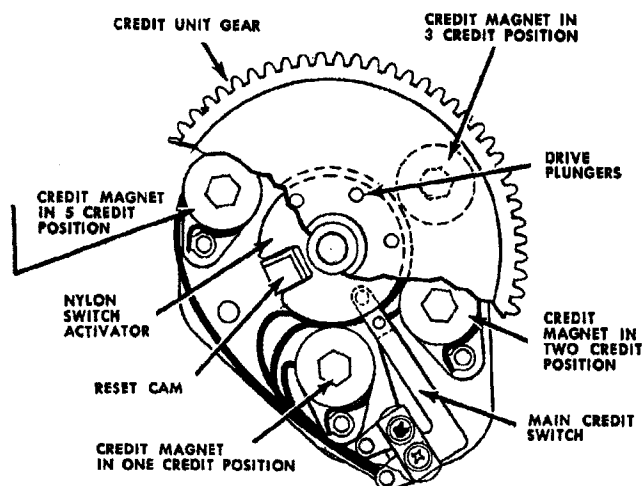
SECTION IV CHANGING PRICE OF PLAY COMBINATIONS

4-1 SINGLE CREDIT UNIT

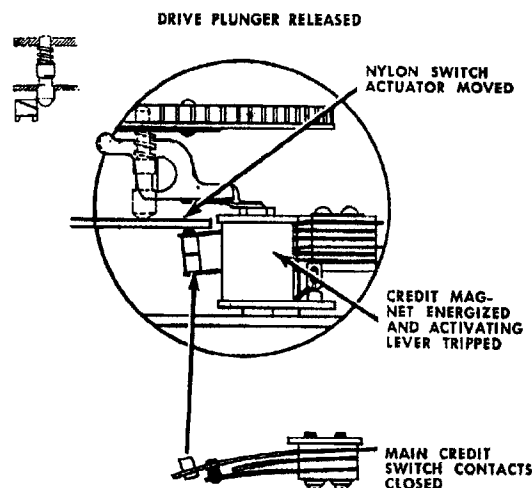
Principle of Operation:

The function of the Credit Unit is to allow the Wall Box to be operated a given number of times corresponding to the value of the coin deposited. In Single Credit Unit operation, credits are not accumulated as a result of depositing several coins, one after another, but rather are limited to the largest number of credits that can be established by depositing a single coin.

Six Drive Plungers and their Actuating Levers are equally spaced in a circle above the hub



of the Credit Unit Gear. The position of each Plunger corresponds to a given number of credits. A reset Cam with a raised shoulder is positioned at a point in the circle, below the hub of the Credit Unit Gear. The Plunger nearest the lower portion of the reset shoulder represents one credit, and will be the first to pass over the Reset Cam as the Credit Unit Gear rotates. This will occur as the Gear turn $1/6$ of a revolution. (This $1/6$ revolution corresponds to one complete revolution of the Wiper Arm on the Commutator Disc.) The sixth Plunger is nearest to the flat side of the Reset Cam, and would be the sixth to pass over the Reset Cam with a complete turn of the Credit Unit Gear.



When a coin is deposited, a Coin Switch is tripped, energizing a Credit Magnet which releases a Drive Plunger by magnetically drawing an Actuating Lever. The moving Plunger in turn moves the molded nylon Switch Actuator which closes the contacts of the Main Credit Switch. The number of credits given for a particular coin depends on the position of the Credit Magnet to which the Coin Switch is connected.

Since the position of the Credit Magnet corresponds to a specific number of credits, a particular Drive Plunger must be released by that particular Credit Magnet. For example, if three plays are to be given for 25 cents, the 25-cent Coin Switch must energize the Credit Magnet in the three credit position, which in turn releases the Drive Plunger in the three credit position.

All of the Drive Plungers pass over the Reset Cam as the Credit Unit rotates. Any released Plunger will be reset at this point, and the contacts of the Main Credit Switch will open as the Switch Actuator moves up.

INSTRUCTIONS:

Remove the Credit Unit from the Wall Box Mechanism. It may be necessary to loosen the set screws on the Pinion Gear in order to facilitate removal of the Credit Unit. However, do not disturb the Commutator Disc Wiper Arm.

Shifting Credit Magnet Positions:

Five mounting holes are provided in the Credit Unit Base, to allow shifting of the Credit Magnet positions to obtain a varied amount of credit for each of the three coin denominations (5 cents, 10 cents, and 25 cents.)

In addition, a fourth Magnet is provided, without wiring connections, in one of the five mounting holes to provide further flexibility of price of play combinations. In some cases it may be desirable to shift the wiring connections

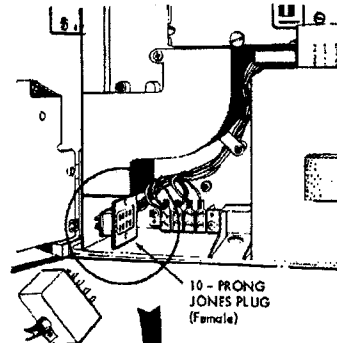
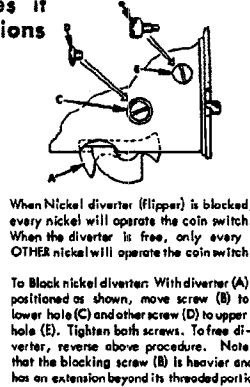
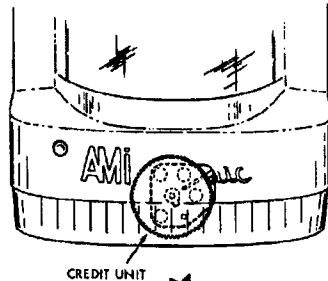
from one Credit Magnet to another, instead of shifting the positions of the Magnets.

NOTE:

Be certain that the particular Magnet which is energized by a given coin passing through the related Coin Switch, is mounted in the proper hole. The wire colors on the Credit Magnet connections should match exactly with those on the Coin Switch.

Mounting:

When mounting the Credit Magnets, do not hold the Magnet coil while tightening the mounting nut. A hex head is provided at the Magnet pole so that a wrench can be used to keep the Magnet from turning.



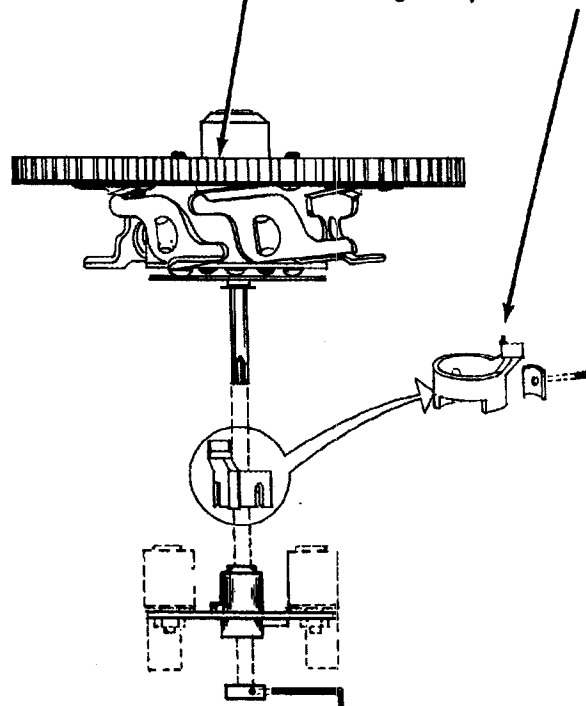
CHOICE OF SELECTIONS	POSITION OF RESET CAM AND CREDIT MAGNETS	NICKEL DIVERTER POSITION	POSITION OF COIN SWITCH WIRES
ONE PLAY Dime or 2 nickels 3 PLAYS Quarter		FREE	
ONE PLAY Dime or 2 nickels 4 PLAYS Quarter		FREE	
ONE PLAY Nickel 2 PLAYS Dime 5 PLAYS Quarter		BLOCKED	
ONE PLAY Nickel 2 PLAYS Dime 6 PLAYS Quarter		BLOCKED	

Shifting Reset Cam and Switch Actuator Positions:

In order to provide four credits for the 25 cent Coin Switch, it will be necessary to change the positions of the Reset Cam and the Switch Actuator. It will also be necessary to shift the Credit Magnets and realign the credit sequence.

INSTRUCTIONS:

1. Rotate the Credit Unit Gear one complete revolution in the clockwise direction (facing gear teeth) to be sure that all of the Drive Plungers have been reset, and that the Switch Actuator is in the raised position.
2. Remove the phillips screw and clamping plate from the mounting slot in the base of the Reset Cam. There are two mounting screw slots in the base of the Cam, which are especially provided for the purpose of shifting the position of the Cam.



3. Turn the Reset Cam and Switch Actuator clockwise (facing the top of the Cam) until the second screw slot appears over the screw hole. A groove in the lower part of the Cam rides over a fixed stop, which is part of the Credit Unit Base. One end of the groove or the other will be against the stop when one or the other of the screw slots are aligned over the screw holes.
4. Mount the clamping plate with the phillips screw. Do not completely tighten the screw until the height of the Cam has been adjusted. (See "Credit Unit Adjustment" — Step 2.)

Credit Unit Adjustment:

1. Loosen the small setscrew which holds the collar on the end of the Credit Unit Gear Shift. Position the collar so that rotation of the shaft is free, but no up and down movement exists (a barely perceptible amount of end play can be allowed.)
2. Adjust the Reset Cam so that its highest point does not touch the brass plate (about 1/64 inch). A reset Drive Plunger must be allowed to drop slightly after it passes the Reset Cam. Check the action of all of the Plungers.
3. With all of the Drive Plungers reset, the contacts of the Main Credit Switch must be in the open position. Check for the following conditions:
 - a. The nylon pusher on the top blade of the Main Credit Switch must be exerting a slight upward pressure against the Switch Actuator.
 - b. The Switch Actuator must be in a completely horizontal position. If there is too much upward pressure, the Drive Plunger cannot drop down when it is released. Also the Switch Actuator can become tilted with too much upward pressure.
 - c. If there is too little pressure upward, the Credit Switch contacts will not be able to open when a Drive Plunger is reset.

Installing the Credit Unit:

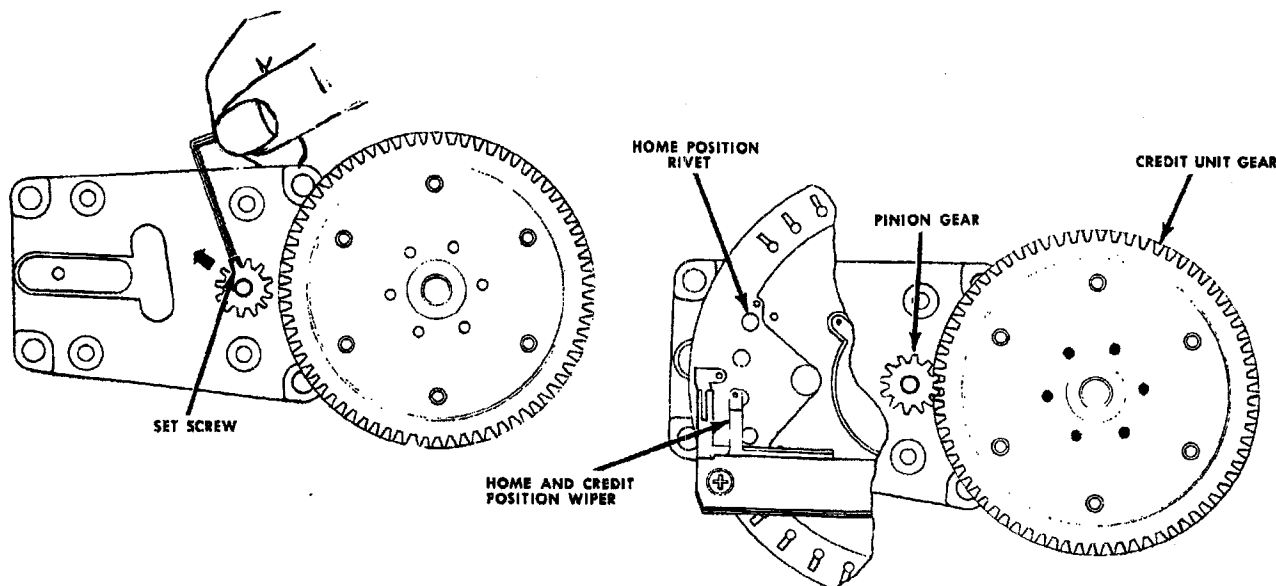
1. Loosen the setscrews on the Pinion Gear and move it slightly to keep it from interfering with the Credit Unit Gear. Fasten the Credit Unit in place.

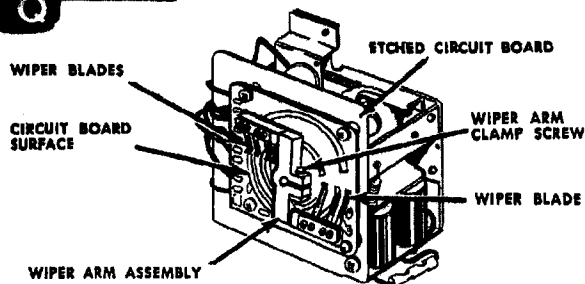
CAUTION: Dress all wires away from moving parts. Be sure that none of the wires lead-

ing to the back of the Commutator Disc are in a position to be caught between the Pinion Gear and Credit Unit Gear.

2. With all of the Drive Plungers reset, position the small notch in the brass plate over the center of the Reset Cam. Facing the top of the Credit Unit Gear, rotate the Gear slowly clockwise until the fourth Actuating Lever is centered over the top of the Reset Cam (count from the Lever just over the small notch). Trip the fourth Actuating Lever so that its Drive Plunger is released, and butts against the flat side of the Reset Cam.
3. Place the Home And Credit Position Wiper on the Commutator Disc in the "Home" position. Mesh the Pinion Gear with the Credit Unit Gear, locking the Pinion Gear in place by tightening the two setscrews. The backlash between the two gears should be sufficient only to prevent binding (1/64 inch maximum). If there is too much backlash, loosen the Pinion Gear setscrews and readjust the gears.
4. Facing the top of the Credit Unit Gear, rotate it clockwise 1/6 of a turn (the distance between Drive Plungers). The Home And Credit Position Wiper will have made one complete turn around the Commutator Disc Signal Segments, and will have returned to the "Home" position. If the Home And Credit Position Wiper fails to "Home" properly, repeat steps 2 through 4.

CAUTION: Never attempt to turn the Credit Unit Gear in the counter-clockwise direction after it has been properly installed. This may cause damage to the Commutator Disc Wipers, which are forced to scan in the clockwise direction, or to the Gear Motor which is designed to turn in only one direction.



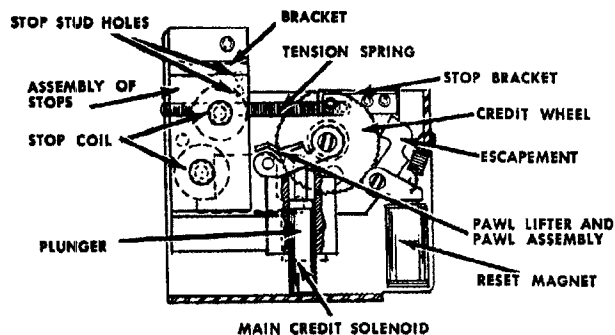


4-2. ACCUMULATIVE CREDIT UNIT

Three types of credit systems using the Accumulative Credit Unit will be covered in this portion of the Service Manual: The Accumulative Credit System with Dual Pricing, (WQ-200-1), the Accumulative Credit System without Dual Pricing (WQ-200-2), and the Accumulative Credit System with Dual Pricing and a 50 cent Slug Rejector. (WQ-200-3)

Principle of Operation

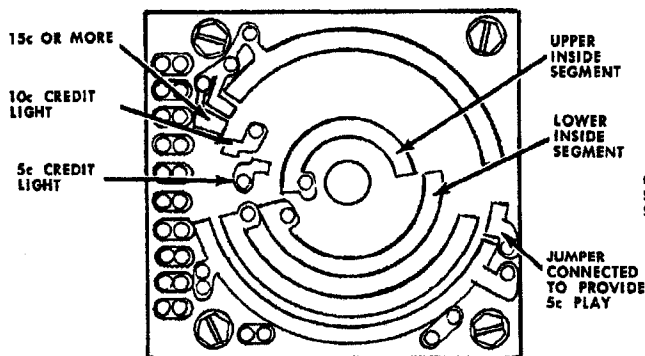
The Accumulative Credit Unit has several jobs to do. It adds up and remembers the value of the coins that are deposited. It allows the customer to make a selection on the phonograph, through the Wall Box, only when the coins deposited equal a certain value. It subtracts the price of one play from the customer's "account" each time a selection is made. As in Single Credit Unit operation, it also serves to turn the Wall Box off when all credits have been used.



Establishing Credit

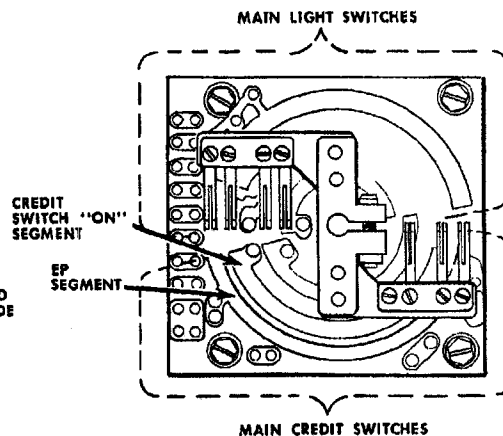
As a coin is deposited in the Wall Box, it travels through the Slug Rejector and trips a Coin Switch Lever as it drops into the Cash Box. The particular Coin Switch that closes completes a DC circuit through the Main Solenoid in the Credit Unit. The magnetic field, which results, causes the Main Solenoid Plunger to push upward against the Pawl which engages a tooth of the Main Credit Wheel, moving upward a distance which is determined by the credit value of the coin deposited.

As the Pawl moves upward it rotates the Main Credit Wheel, which in turn rotates a Wiper Arm and Blade Assembly which are attached to the end of the Main Credit Wheel Shaft over an etched circuit board. The Wiper Arm and Blade Assembly, and etched circuit board comprise the Credit Switch.



The Credit Switch

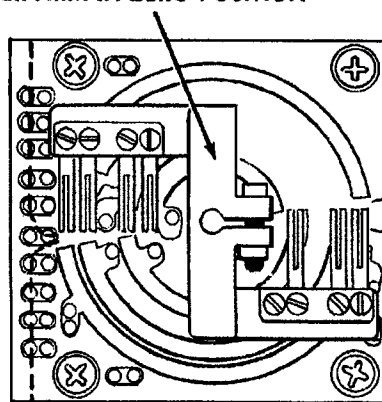
The metal segments on the circuit board represent switch contacts that are closed when the Wiper Arm Blades bridge across the insulating spaces between them. The Wiper Arm is clamped to the shaft of the Credit Wheel and will move with the Wheel as credit teeth are put on or removed. The upper half of the etched circuit board and the blades of the Wiper Arm that move across it serve to turn on the various credit lights ("5 cents", "10 cents", and "15 cents" or more) on the front of the Wall Box. The lights will be on when the corresponding segments are connected through the Wiper Blades to the segment closest to the center of the Board.



MAIN CREDIT SWITCHES

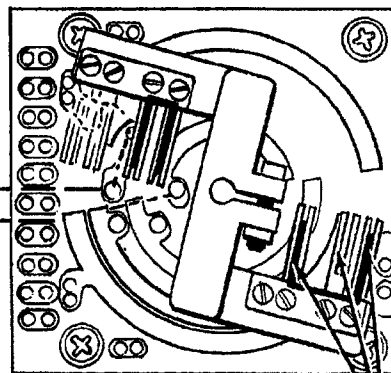
The lower half of the etched circuit board and the Wiper Blades make up the Main Credit Switch, which must be closed before a selection can be made. Note that the outside segment is actually made up of two separate segments; a large one and a small one. The Credit Switch is "ON" when the middle segment is connected through the Wiper Blades, to the segment closest to the center of the board. The outside segment is used as the "EP" or "STEREO" Credit Switch when certain records are programmed at a higher price (15 cents). The small segment is not used.

WIPER ARM IN ZERO POSITION



OPEN POSITION

TO
CREDIT
LIGHTS

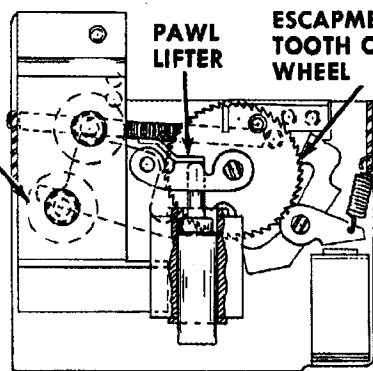


CLOSED POSITION

WIPER BLADES
ADVANCE TWO
STEPS

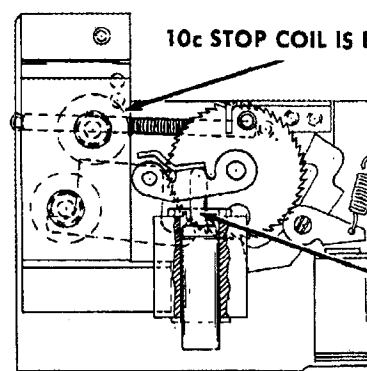
The Wiper Arm is positioned on the Credit Wheel Shaft so that when the Credit Wheel is in the zero credit position, the tips of the outer Wiper Blades do not touch any of the segments. When the Credit Wheel advances, the Wiper Blades move onto the segments, closing the Main Credit Switch and Credit Light Switch. The Wiper Blades must advance two steps to close the Credit Switch.

5c COIL
AND PLUNGER
STOPS PAWL



5c STOP COIL IS ENERGIZED

PAWL LIFTER
ESCAPMENT ENGAGES
TOOTH OF CREDIT
WHEEL



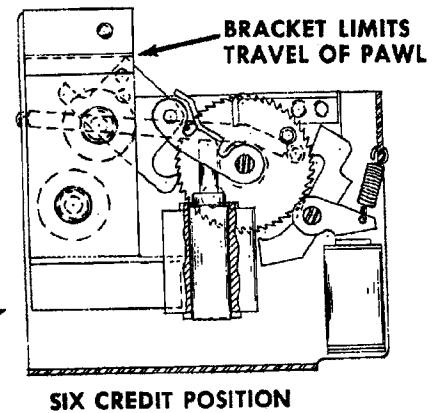
10c STOP COIL IS ENERGIZED

10c COIL AND
PLUNGER STOPS PAWL

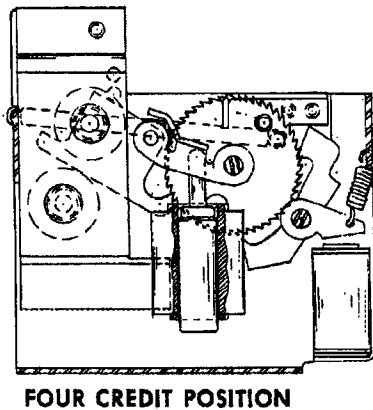
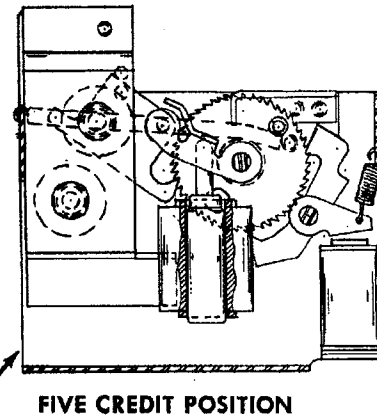
The action of the Assembly of Stops controls the amount of rotation of the Credit Wheel for a given coin. The lower Coil and Plunger represents the 5 cent Stop. This coil is energized when the 5 cent Coin Switch is tripped.

The upper Coil and Plunger represent the 10 cent Stop, and is energized by the 10 cent Switch. Energizing either of these Coils causes their respective Plungers to be thrust into the path of the moving Pawl, limiting its amount of travel and consequently, the amount of credit established.

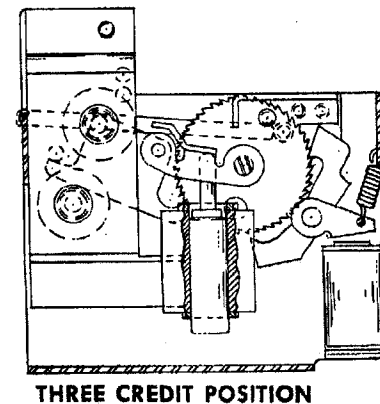
MAIN CREDIT
SOLENOID PLUNGER
MOVES UPWARD



If the 25 cent Switch is closed, the travel of the Pawl is limited only by the Bracket which holds the Assembly of Stops. This amount of travel will cause the Escapement to engage the sixth Credit Tooth on the Credit Wheel. At this time only the Main Credit Solenoid is energized.



If a Price of Play requiring less than six teeth for a quarter is desired, a stud may be placed in one of the three threaded holes in the Mounting Bracket. A stud in the top hole will allow five teeth to be established, a stud in the middle hole will allow four teeth to be established, and a stud in the bottom hole will allow three teeth to be established.



In the WQ Series Wall Boxes when no stud is used in the Assembly of Stops, so that a quarter will establish six credit teeth and a nickel will establish one credit tooth, the Nickel Diverter on the Slug Rejector is set so that every nickel closes the 5 cent Coin Switch. These credit teeth, established at the rate of six for 25 cents, two for 10 cents, and one for 5 cents, are removed at the rate of two teeth per selection. Thus the price of play is 1 for 10 cents and 3 for 25 cents. This will be explained in further detail in "Credit Removal".

WQ-200-1 AND WQ-200-3 WALL BOXES

Extended Play-Premium Price

When it is desired to offer certain selections, such as extended play or stereo records, at an extra price of play, it is accomplished in the following manner:

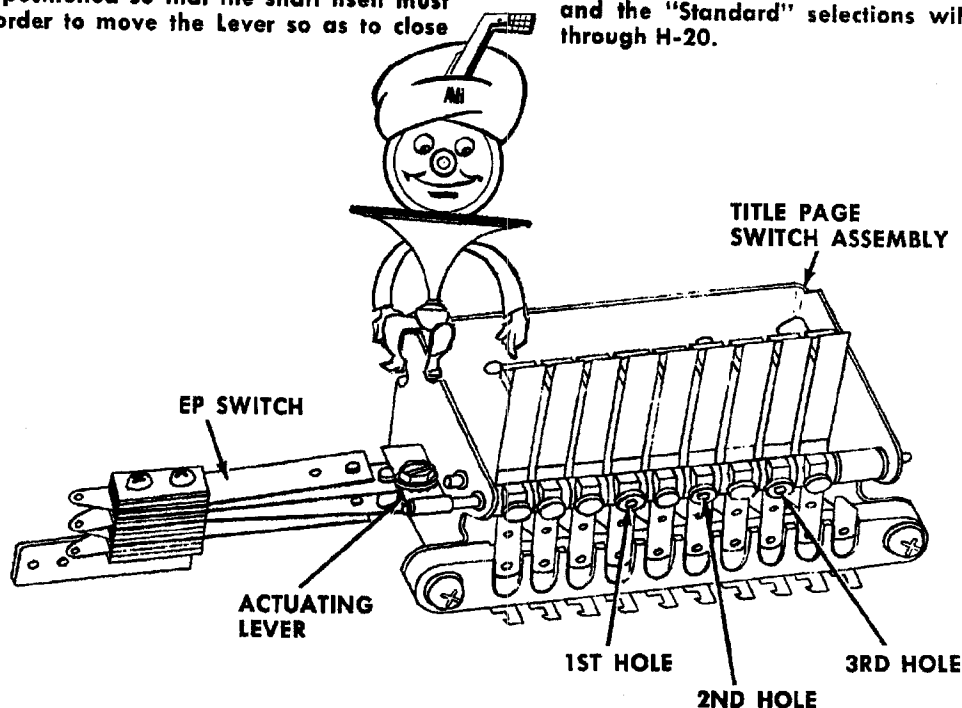
The "EP" Switch is mounted next to the bank of Title Page Switches. This is the switch that determines whether one, or both, of the Credit Take-off switches will be in the circuit when each selection is made on the Wall Box.

The EP Switch is operated by an Actuating Lever that is attached to the end of the shaft on which the Title Page Switch Keys pivot. The Actuating Lever is positioned so that the shaft itself must turn in order to move the Lever so as to close

the lower contacts of the EP Switch. Threaded holes have been provided in three of the Switch Keys so that a set screw can be used to clamp the Keys to the shaft. These are the Switch Keys that are depressed by the tabs of the Title Pages with Strips D-11 through E-10, F-11 through G-10, and H-11 through J-10. Any one of these Title Pages can be used to determine the "EP" or "Stereo" selections by merely inserting the set screw mentioned above. The remaining Title Page Switch Keys are not clamped to the shaft and will therefore not turn the shaft when they are depressed by their respective Title Page Switch Tabs.

The following "EP" and "Standard" selection arrangements may be obtained by inserting the setscrew in the Switch Key holes indicated:

1. When the first hole is used, selections E-1 through K-20 will be the "EP" selections, and the "Standard" selections will be A-1 through D-20.
2. When the second hole is used, selections G-1 through K-20 will be the "EP" selections, and the "Standard" selections will be A-1 through F-20.
3. When the third hole is used, selections J-1 through K-20 will be the "EP" selections, and the "Standard" selections will be A-1 through H-20.

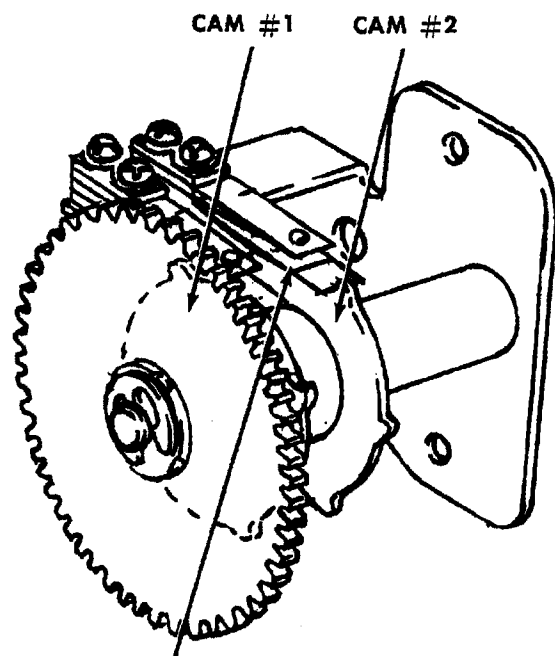


Credit Removal

In order to fully understand the operation of the EP Switch, it will be necessary at this time to go into the subject of credit removal.

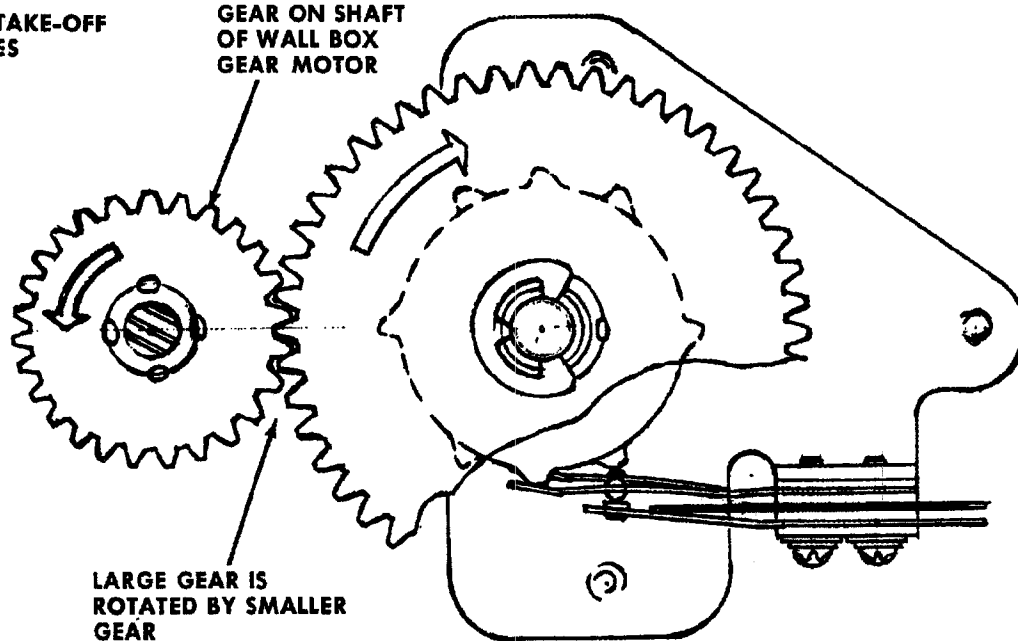
The Commutator Disc and Wiper Arm Assembly signals the Credit Unit to remove Credit Teeth when a selection is made. This is accomplished by closing one of two Credit Removal Switches during the operation of the Wall Box. The number of times these switches close for each revolution of the Wiper Arm may be controlled and thus also control the price of play.

The coupling ratio between the Cam Assembly Gear, and the Pinion Gear of the Gear Motor Shaft is such that the Cam Assembly will make $\frac{1}{2}$ revolution for each revolution of the Commutator Disc Wiper Arm. Thus the number of times that the Credit Take-Off Switches close for each revolution of the Wiper Arm, depends on the number of lobes on the Cams which actuate the switches. Therefore, if the Cam has four lobes and since it makes $\frac{1}{2}$ revolution for each revolution of the Wiper Arm, the Credit Take-off Switch will close twice.



CREDIT TAKE-OFF SWITCHES

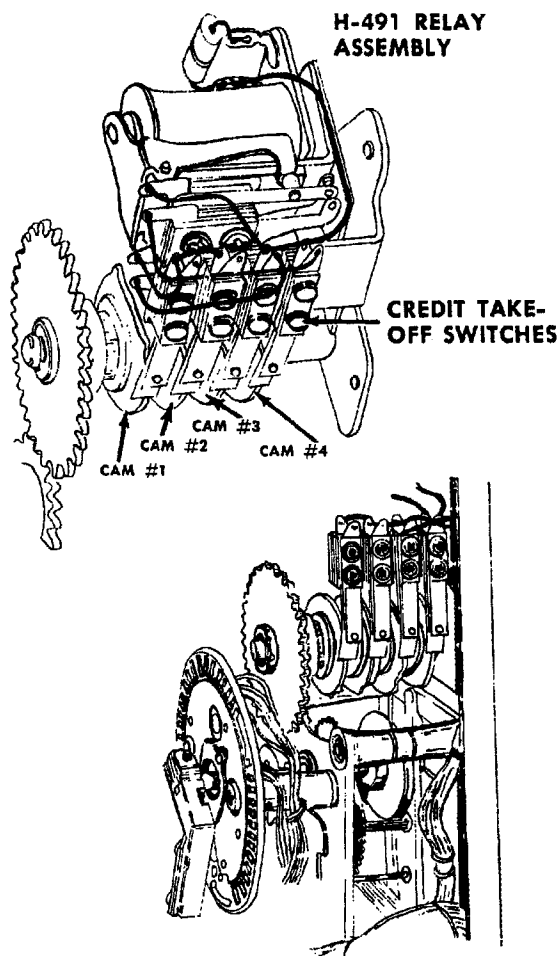
GEAR ON SHAFT OF WALL BOX GEAR MOTOR



LARGE GEAR IS ROTATED BY SMALLER GEAR

When the Credit Take-off Switch is closed twice, a Reset Coil in the Credit Unit will actuate the Reset Armature twice, causing the Credit Wheel to move two teeth toward its home position. Since there are two Credit Take-off Switches that are actuated by different Cams, it can be seen that by having a different number of lobes on the two Cams, a different number of Credit Teeth can be removed for one revolution of the Wiper Arm. This depends upon which of the Credit Take-off Switches is connected in the circuit for any particular revolution.

When the Wall Box is operated on the basis of one price of play for all selections (no EP's at a premium price of play), the second Cam from the gear will normally be used to take off credits. Therefore, if this Cam has four lobes, two Credit Teeth would be removed for each selection. If those Credit Teeth were put on at a rate of one for a nickel, two for a dime, and six for a quarter as mentioned earlier, then, the resulting price of play would be one for ten cents and three for a quarter.



When EP's or Stereo selections are offered, depressing the EP Title Page Switch Key will cause the EP Switch contacts to be transferred and the circuit to be set up so as to make use of both of the Credit Take-off Switches as the lobes on the two Cams close them. Thus, with the first cam having two lobes and the second cam having four, and with the EP Switch actuated, the Credit Wheel will be rotated three teeth toward its home position. When any of the Title Page Switch Keys representing "Standard" selections are depressed, the EP Switch will not be actuated and its contacts will remain in the rest position. When a standard selection is played, the electrical circuit is set up so that only the Credit Take-off Switch operated by the four-lobe Cam can be actuated. Thus, for each revolution of the Commutator Disc Wiper Arm, while the EP Switch is in the rest position, the Credit Wheel will only rotate two teeth toward its home position. It can readily be seen how selections on the Wall Box may be offered at two different prices.

Fifty Cent Operation WQ-200-3 Wall Boxes

Having covered the manner in which the desired number of credits are obtained for the 5 cent, 10 cent, and 25 cent coins, it becomes obvious that a special method must be used to establish the proper number of credits for a 50 cent coin. This is accomplished in the following manner: The WQ-200-3 Wall Box is provided with a fifty cent slug rejector which has a fifty cent Coin Switch. In addition, it contains a Gear and Cam Assembly that has a special H-491 Relay and four phenolic cams.

Closing the 50 cent Coin Switch energizes the H-491 Relay which closes two pairs of normally open contacts and opens two pairs of normally closed contacts. Through one pair of the normally open contacts, a series circuit is provided to energize the Main Credit Solenoid and rotate the Credit Wheel to a position six teeth from its home position. The Main Credit Solenoid is energized from the time of the Relay pickup to the time the 50 cent Coin Switch opens. The circuits from the Credit Take-off Switches to the Reset Magnet in the Credit Unit pass through one pair of the normally closed contacts of the H-491 Relay. These last contacts must be closed in order for credits to be removed. When the Relay is energized, no credits may be removed from the Credit Wheel even though the Wall Box is cycling.

When a 50 cent coin is deposited, the Home and Credit Position Wiper on the Commutator Disc, moves from the "HOME" position to the "CREDIT" position and a selection may then be made. As the Wall Box cycles the Gear and Cam Assembly makes $\frac{1}{2}$ revolution. During this $\frac{1}{2}$ revolution, one of the two lobes, on the cam furthest from the gear, closes the contacts of its switch. When these contacts close, a circuit is completed through a pair of normally

open contacts on the H-491 Relay, to the Main Credit Solenoid. These normally open Relay contacts are now closed due to the Relay having been energized.

Energizing the Main Credit Solenoid causes its Plunger to make another stroke, advancing the Credit Wheel by six more teeth. Therefore, when a 50 cent coin is deposited, a total of twelve Credit Teeth will be established and an extra selection made without removing credit from the Credit Wheel. Using the credit removal rate for standard selections (1 for 10 cents), seven selections will then be provided for the half dollar.

As the Home and Credit Position Wiper completes its revolution, the recessed area on the third Cam from the gear allows a pair of normally closed contacts to open. This action serves to de-energize the relay. It cannot be re-energized until the 50 cent Coin Switch has been closed again by another coin.

NOTE: The H-491 Relay is in operation only when a fifty cent coin is deposited. It does not exist in the Credit Unit circuit when nickels, dimes, or quarters are deposited in the Wall Box. The same amount of credit will not be received for two quarters that is given for a half dollar.

4-3. Adjusting The Accumulative Credit Unit

Credit Units seldom become out of adjustment by themselves. However, if the need should arise, the Credit Unit may be checked and adjusted as outlined in the following instructions: **NOTE:** It is essential that all parts of the Credit Unit be kept clean and free of dust, dirt, and corrosion. This is particularly necessary at the Stop Coil Plungers and the Main Credit, Solenoid Plunger. These Plungers should never be oiled.

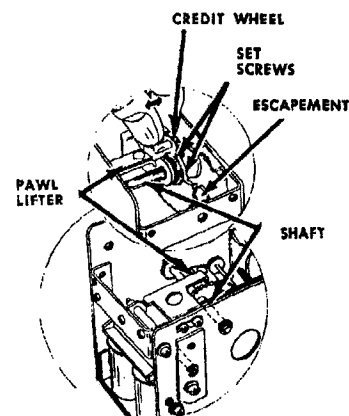
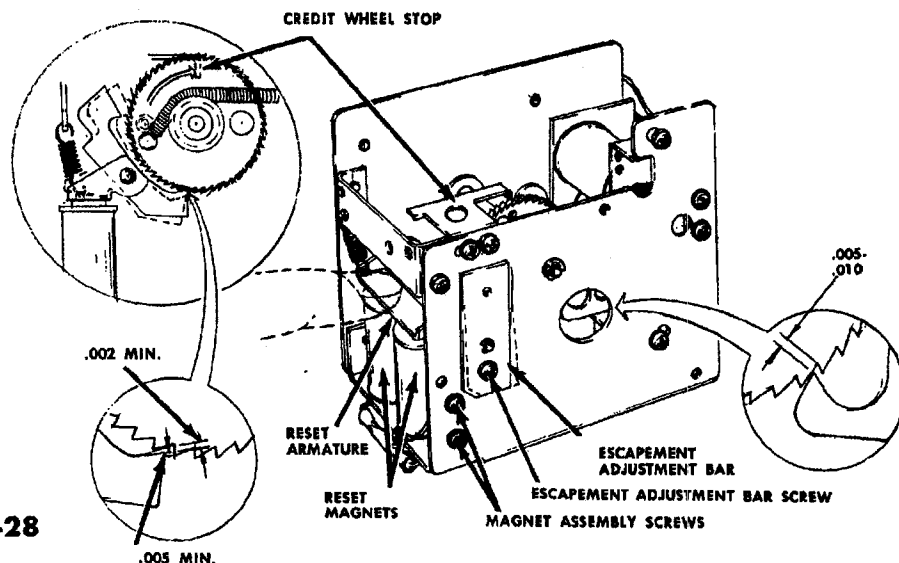
Credit Wheel

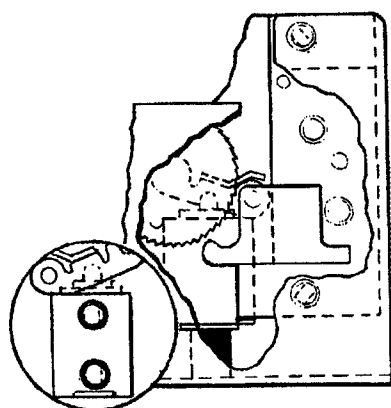
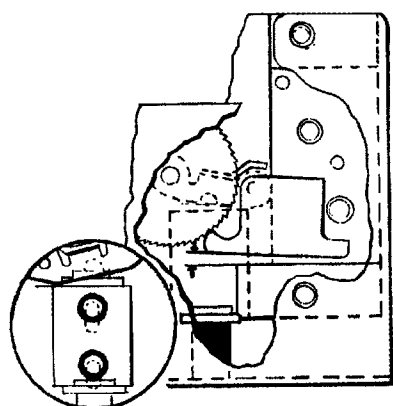
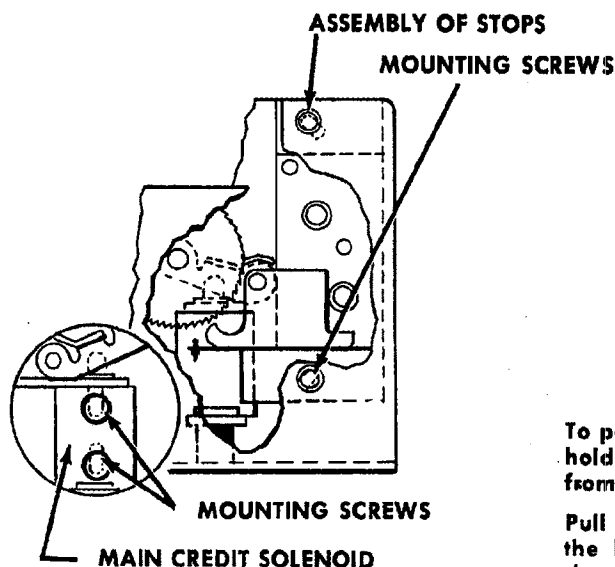
The Credit Wheel is fastened to its shaft with two set screws. The wheel should be so positioned along the length of its shaft that it is free to rotate without binding on the pawl lifter or the back plate of the frame. The pawl lifter must be free to rotate around the shaft and the Credit Wheel and shaft must be free to move slightly in both directions along the length of the shaft.

Escapement

If the escapement is too close to the credit wheel, the wheel will jam and credits cannot be put on or removed. If the escapement is too far away from the wheel, all the credits will be removed at one time.

The escapement should allow the credit wheel to return toward home position, one tooth at a time, with no tendency to bind. An elongated hole is beneath the screw which holds the escapement adjustment bar. To permit correct positioning of the escapement, move the escapement toward the credit wheel by moving the escapement adjustment about its pivot until the wheel will not escape properly. Then, back the adjustment bar away just enough to permit proper operation at all positions of the wheel from full credit to no credit positions. As either tooth of the escapement releases the credit wheel, and before the credit wheel moves, there must be a .002 inch minimum clearance between the other escapement tooth and the credit wheel. When either tooth of the escapement has just released the credit wheel, the other tooth of the escapement must catch a credit wheel tooth with a .005 inch minimum interference. When the adjustment is completed, make sure the holding screw is tight. Check the adjustment by rotating the credit wheel to full credit position several times and operating the reset armature slowly with your finger.





Reset Magnets

To position the reset magnets, loosen the screws holding the magnet assembly and move it away from the escapement.

Pull back the escapement and check to see that the lower escapement tooth is fully seated in the tooth space on the credit wheel. Maintaining this escapement position, move the reset magnets upward until both pole faces touch squarely against the tape on the reset armature. Tighten the screws holding the reset magnet assembly.

Assembly of Stops

Loosen the screws holding the main credit solenoid and allow it to drop as far as it will go. The wiper arm and commutator plate should be removed for easy access to the solenoid's mounting screws.

Turn the credit wheel to a position representing several credits. Push the main credit solenoid's plunger up slowly with a tool inserted through the hole in the bottom of the credit unit frame. Observe the pawl, through the hole in the back frame, to see where the point of the pawl engages the credit wheel. The point of the pawl should first touch on the non-radial (longest) face of the tooth at a point .005-.010 from the root of the tooth. If it does not engage properly, position the Assembly of Stops in various attitudes, until the pawl point engages any credit wheel tooth as described, except when the credit wheel is in the zero credit position.

Main Credit Solenoid

To adjust the position of the main credit solenoid, slowly move it upward until it just touches the lower edge of the pawl lever. It should not lift the pawl lever since this will cause the pawl to rise from the stop bracket. It should allow the pawl to be seated squarely against the stop bracket along its entire length. The final position of the solenoid must be such that there is no tendency for the escapement to jam and remain jammed if the credit solenoid is energized after the credit wheel has been advanced to the full credit position. To check for this, advance the credit wheel until its stop pin strikes the frame of the main credit solenoid, and then try to force one more credit wheel tooth to slip past the top tooth on the escapement. If this occurs, move the solenoid sideways or tilt it slightly until jamming cannot occur.

Credit Wheel Stop

To adjust the credit wheel stop, loosen the screws which hold the stop in position and move it as far as it will go toward the center of the credit unit.

Advance the credit wheel to its maximum credit position. Operate the escapement by hand to allow the credit wheel to return 20 steps. Slide the credit wheel stop to a position where it just touches the stop pin on the credit wheel and tighten the screws. Check to see that the upper escapement moves in and out of the tooth on the credit wheel without binding or dragging. If the escapement does not clear the credit wheel tooth, move the credit wheel stop outward a very slight amount until the escapement tooth just barely misses the credit wheel tooth when the escapement is operated.

Credit Unit Switch

The proper pressure between the credit unit wiper blades and their respective commutator segments may be established as follows:

- (a) Place the wiper arm on the shaft so that the inside surface of the wiper arm hub is $\frac{1}{4}$ inch from the phenolic circuit board surface.
- (b) Adjust each blade by bending each blade at the wiper arm end so that its contact surface is just touching the board surface.
- (c) Reset the wiper arm to a position where its inside surface is $\frac{1}{4}$ inch from the surface of the circuit board.

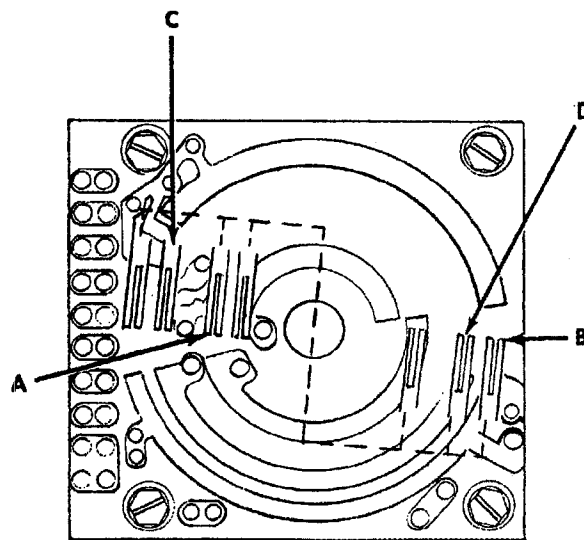
Indexing the Wiper Arm Assembly

Set the ratchet wheel in the position of one credit tooth. Adjust the wiper arm clamp screw slightly so that the wiper arm will slip on the shaft. Position the arm so that the wiper blade which contacts segment "A" is approximately centered on the segment. Check to see that the wiper is touching its corresponding segment, "B". Also check to see that the wipers, corresponding to segments "C & D" are not in contact with their segments.

Remove the credit by actuating the escapement. The wipers must move off the segments.

The two inside wipers must be in contact with their segments at all times.

Set the ratchet wheel in a position of two credits. A wiper must not be in contact with segment "A", however, wipers must be in contact with segments "B", "C", and "D". Tighten the clamping screw in this position. Check to see that when the escapement is operated slowly by hand, credits are removed without any tendency to bind.



Fifty Cent Bonus Play Adjustment One Bonus Play for 50 Cents

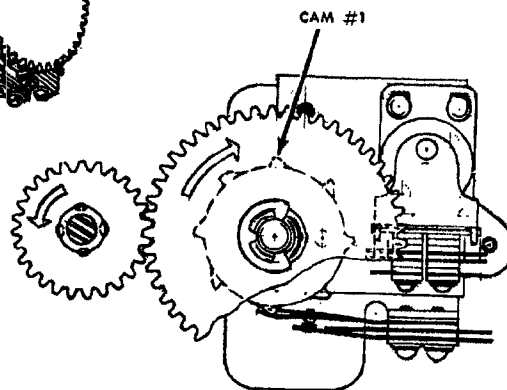
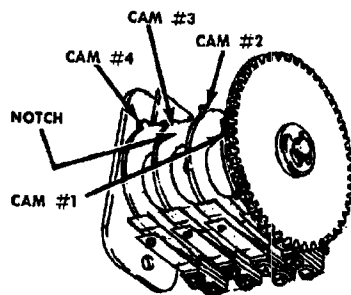
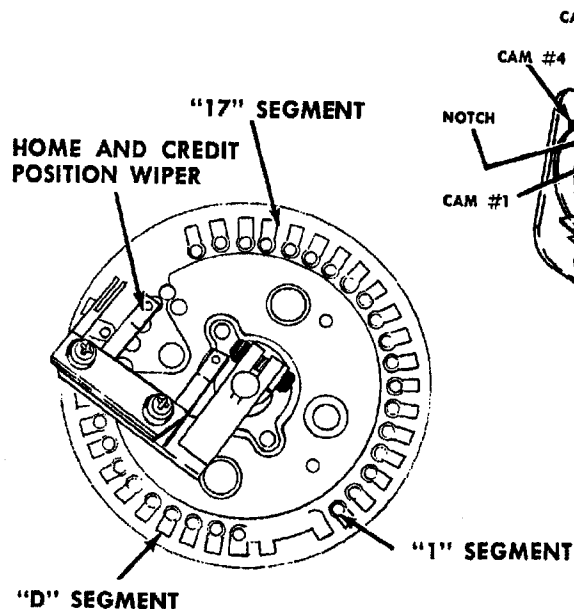
- A. Turn the large gear until the wiper arm is in contact with the commutator segment corresponding to selection Number 17.
- B. Loosen the set screws in the hub of the large gear and turn the cams to the point where the actuating switch blade drops into either notch on cam No. 3.
- C. Tighten the set screws in this position.
- D. Turn the gear until the wiper arm is in contact with the commutator segment corresponding to selection letter "D".
- E. Loosen the set screws between cam No. 1 and cam No. 2 and rotate these two (independently of No. 3 and No. 4) to a point where the lobe on cam No. 1, in line with one of the two set screws, has just passed the actuating switch blade.
- F. Tighten the set screws in this position.

No Bonus Play for 50 Cents

- A. Turn the large gear moving the wiper arm

to the position where it is in contact with commutator segment corresponding to selection letter "D".

- B. Loosen the two set screws in the hub of the large gear and rotate the cams to a point where the switch blade drops into the notch (either notch) of the No. 3 cam.
- C. Tighten the set screws in this position.
- D. Turn the gear moving the wiper arm to a position where it is in contact with the commutator segment corresponding to selection Number 1.
- E. Loosen the set screws between the first and second cams and rotate these two (independently of cams No. 3 and No. 4) to a point where the lobe of the first cam, which is in line with one of the two set screws, has just passed the actuating switch blade (i.e. the switch contacts have just opened as the result of the switch blade having dropped off the steep edge of the cam lobe.)
- F. Tighten the set screws holding cams No. 1 and No. 2 in this position.



memo . . .

INSTRUCTIONS FOR CHANGING PRICE OF PLAY COMBINATIONS

The combinations listed below are the various prices of play which can be obtained on AMI Wall Box, Models WQ-200-1, WQ-200-2, and WQ-200-3. To use the chart properly, merely find the number of the combination at the top and read down to see the adjustments which must be made to obtain each one.

1	2	3
1 play 5¢	1 play 5¢	1 play 10¢
2 plays 10¢	2 plays 10¢	3 plays 25¢
6 plays 25¢	5 plays 25¢	
4	5	6
1 play 10¢	1 play 10¢	1 play 10¢
4 plays 25¢	3 plays 25¢	4 plays 25¢
	1 play 15¢ (EP or	1 play 20¢ (EP or
	2 plays 25¢ Stereo)	2 plays 25¢ Stereo)
7	8	9
1 play 5¢	1 play 10¢	1 play 10¢
2 plays 10¢	3 plays 25¢	4 plays 25¢
6 plays 25¢	7 plays 50¢	9 plays 50¢
1 play 10¢ (EP or		
3 plays 25¢ Stereo)		
10	11	12
1 play 10¢	1 play 5¢	1 play 10¢
5 plays 25¢	2 plays 10¢	3 plays 25¢
11 plays 50¢	6 plays 25¢	7 plays 50¢
	13 plays 50¢	1 play 15¢ (EP or
		2 plays 25¢ Stereo)
		5 plays 50¢
	13	
	1 play 5¢	
	2 plays 10¢	
	6 plays 25¢	
	13 plays 50¢	
	1 play 10¢ (EP or	
	3 plays 25¢ Stereo)	
	7 plays 50¢	

	Pertin Price
	Orange
	Brown
COIN SWITCH CONNECTIONS AT RECEPTACLE VIEW A	Brown/ view A
	Blue w
SLUG REJECTOR ADJUSTMENTS VIEW B	Set nict switch (
	Set nict coin sw
CREDIT SWITCH ADJUSTMENTS VIEW C	Add a
	Place I to 5-to
CREDIT UNIT ADJUSTMENTS VIEW D	Place I credit
	Place F wheel I
	F-1179
	Orange
	Slate v
EP SWITCH CONNECTIONS VIEW E	Orange
	Slate v
	Place I
	E.P. swi
GEAR AND CAM ASSEMBLY ADJUSTMENTS VIEW F	Cam # (view F
	Cam # directly necessa
EP SWITCH CONNECTIONS VIEW E	Remov
	Solder (view E
CREDIT TAKE-OFF SWITCH CONNECTIONS VIEW F	The Bl blade
	The Bl blade

Pertinent to AMI Wall Box Models . . .
Price Combination . . .

WQ-200-1
WQ-200-2
WQ-200-3

WQ-200-1
WQ-200-3

WQ-200-3

1 2 3 4 5 6 7 8 9 10 11 12 13

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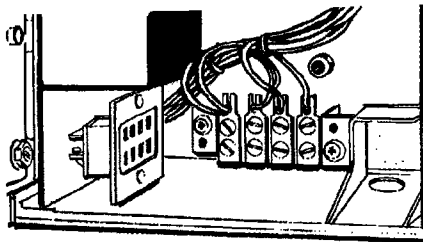
ND
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CH
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E-OFF
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:

Orange wire (5¢) connected to terminal . . . view A	8	8	8	8	8	8	8	8	8	8	8	8	8
Brown wire (10¢) connected to terminal . . . view A	9	9	8	8	8	8	9	8	8	8	9	8	9
Brown/White wire (25¢) connected to terminal . . . view A	10	10	10	10	10	10	10	10	10	10	10	10	10
Blue wire (50¢) connected to terminal . . . view A	Tape End to Eliminate 50c Play							3	3	3	3	3	3
Set nickel diverter so that every nickel closes 5¢ coin switch (view B)	✓	✓	✓		✓		✓	✓			✓	✓	✓
Set nickel diverter so that every other nickel closes 5¢ coin switch (view B)				✓		✓			✓	✓			
Add a jumper between segments "A" and "B" view C	✓	✓					✓				✓		✓
Place F-1179 Stud in top hole limiting credit wheel to 5-tooth space of travel (view D)		✓								✓			
Place F-1179 Stud in second hole from top limiting credit wheel to 4-tooth space of travel (view D)				✓		✓			✓				
Place F-1179 Stud in third hole which limits the credit wheel to three teeth of travel each time (view D)													
F-1179 Stud not required	✓		✓		✓		✓	✓			✓	✓	✓
Orange wire must be connected to terminal "C" (view E)	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
Slate wire must be connected to terminal "D" (view E)	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
Orange wire must be connected to terminal "D" (view E)							✓						✓
Slate wire must be connected to terminal "C" (view E)							✓						✓
Place jumper between terminals "C" & "D" (view E)	✓	✓	✓	✓				✓	✓	✓	✓		
E.P. switch actuator assembly required.					✓	✓	✓					✓	✓
Cam #2 gear & cam assembly must have 4 lobes. (view F)			✓		✓			✓	*	*		✓	
Cam #2 gear & cam assembly must have only 2 lobes directly opposite each other. (Clip off two lobes if necessary). (view F)	✓	✓		✓		✓	✓				✓		✓
Remove green lead from terminal "A" (view E)	✓	✓	✓	✓				✓	✓	✓	✓		
Solder green lead taped in harness to terminal "A" (view E)					✓	✓	✓					✓	✓
The Blue/White wire must be connected to the top blade of credit take-off switch #2. (view F)			✓		✓	✓	✓	✓				✓	
The Blue/White wire must be connected to the top blade of credit take-off switch #1. (view F)	✓	✓		✓					✓	✓	✓		✓

*CAM #2 IS NOT USED IN THIS PRICE COMBINATION



9	7	5	3	1
10	8	6	4	2

VIEW A

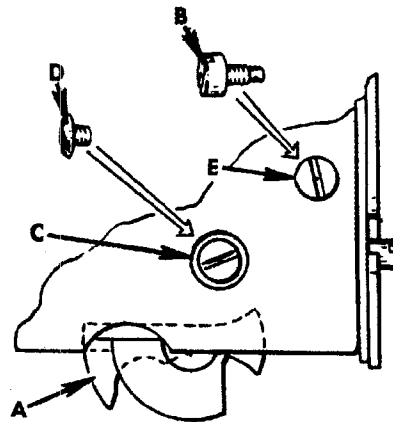


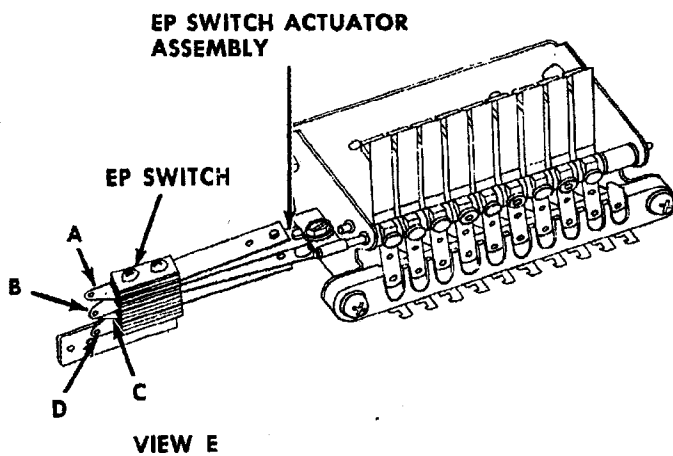
Fig. 1. (Lower, right hand corner of slug rejector)

When nickel diverter (flipper) is blocked, every nickel will operate the coin switch. When the diverter is free, only every OTHER nickel will operate the coin switch.

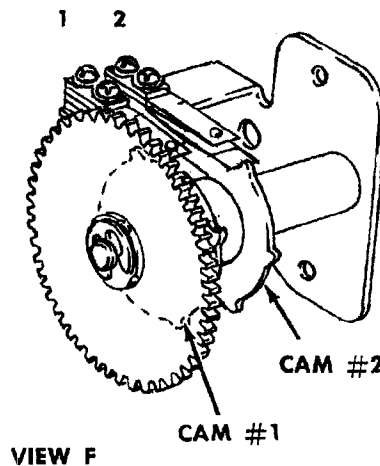
To Block nickel diverter: With diverter (A) positioned as shown, move screw (B) to lower hole (C) and other screw (D) to upper hole (E). Tighten both screws. To free diverter, reverse above procedure. Note that the blocking screw (B) is heavier and has an extension beyond its threaded portion.

VIEW B

GEAR AND CAM ASSEMBLY 2-CAM UNIT (WQ-200-1 & WQ-200-2) CREDIT TAKE OFF SWITCHES



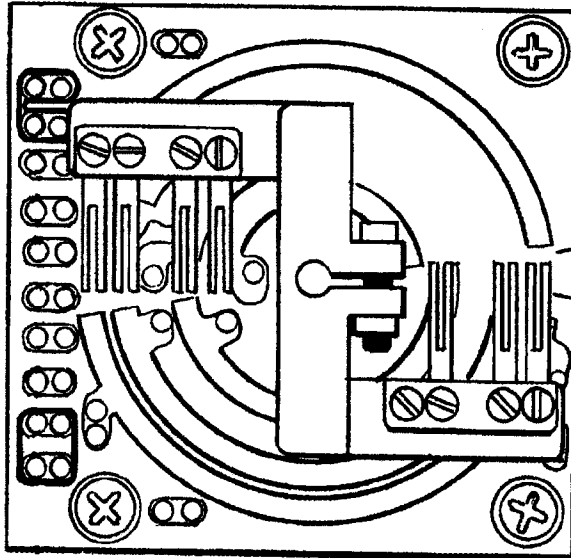
VIEW E



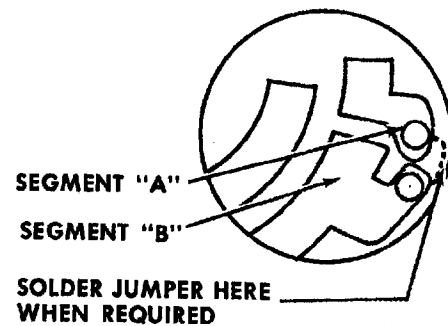
VIEW F

VIEW

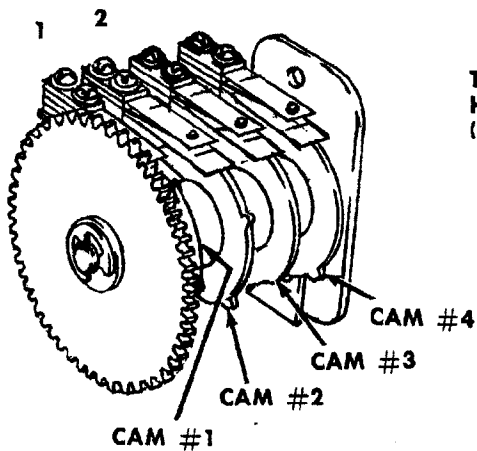
CREDIT UNIT SWITCH



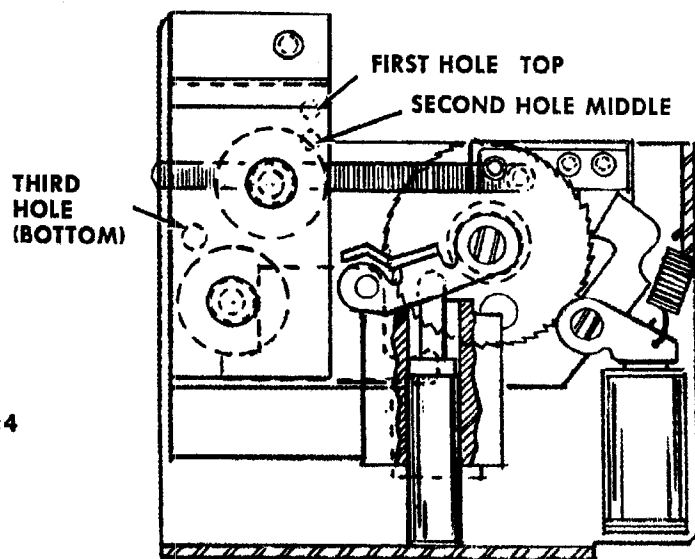
VIEW C



GEAR AND CAM ASSEMBLY 4-CAM UNIT (WQ-200-3 ONLY) CREDIT TAKE-OFF SWITCHES



VIEW F



VIEW D

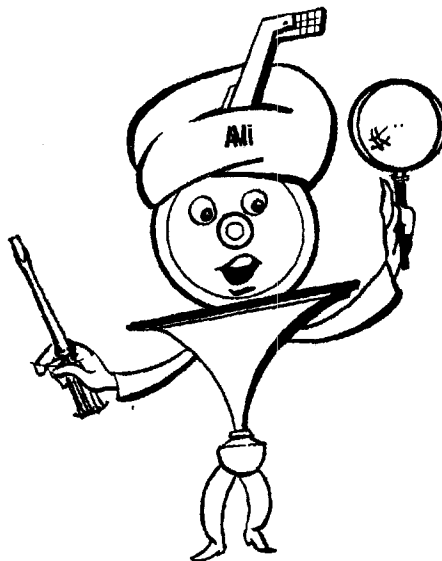
SECTION V TROUBLESHOOTING

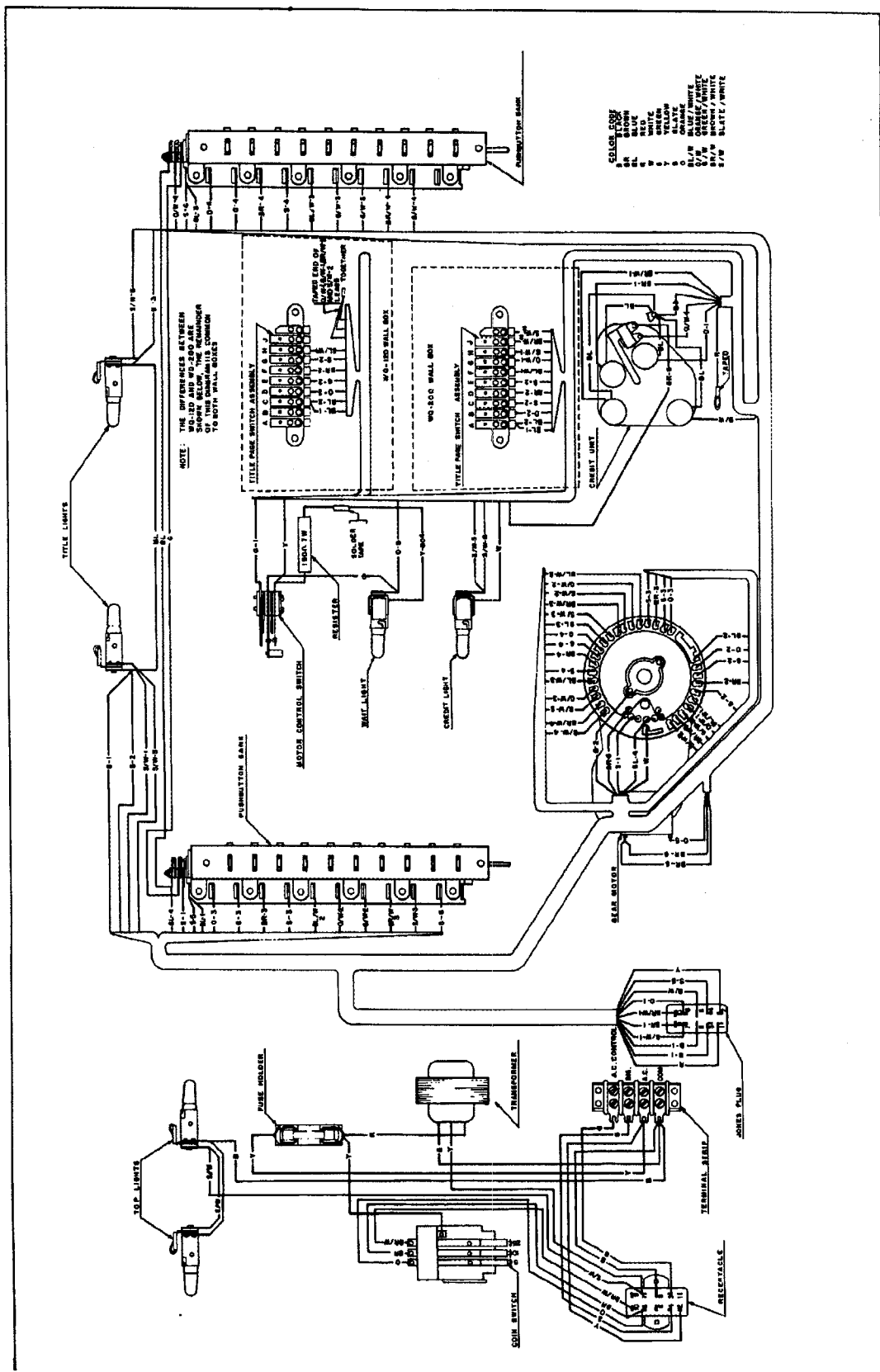
The information in this section has been set up to constitute a systematic process of locating the cause or causes of trouble so that corrective repairs can be made to restore the Wall Box to its proper operating condition.

Wall Box operation is such, that a particular phase must take place in its proper sequence before another phase can begin. The informa-

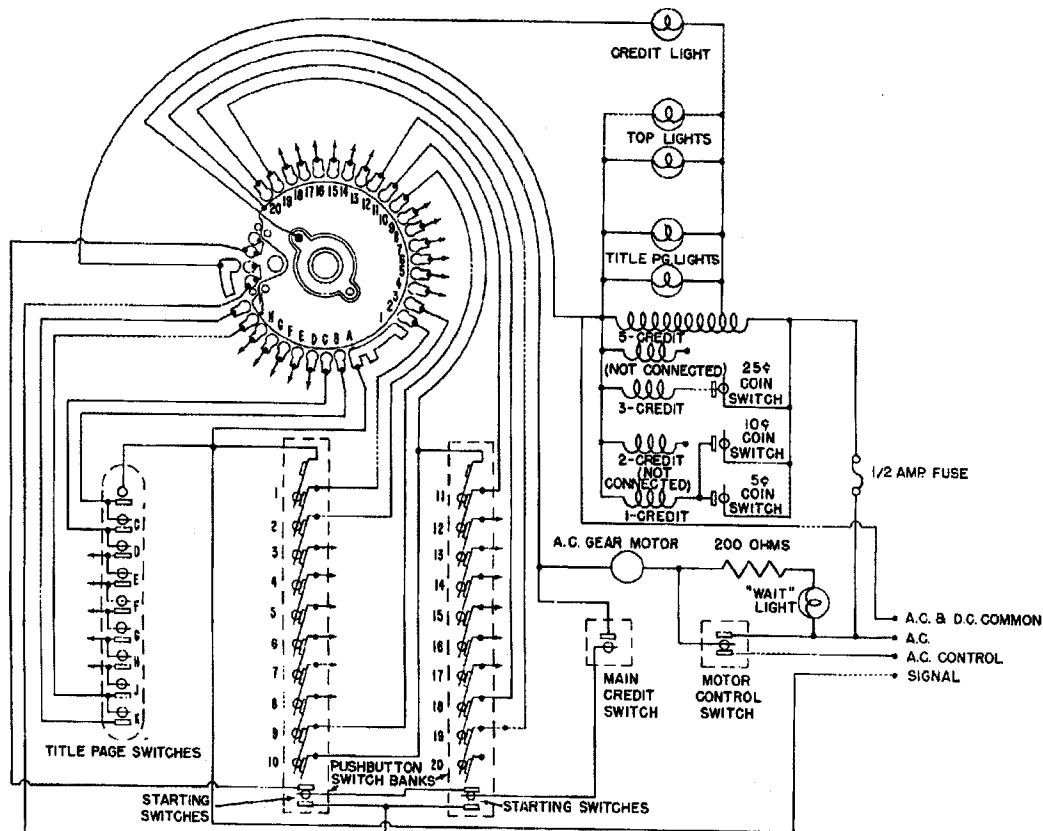
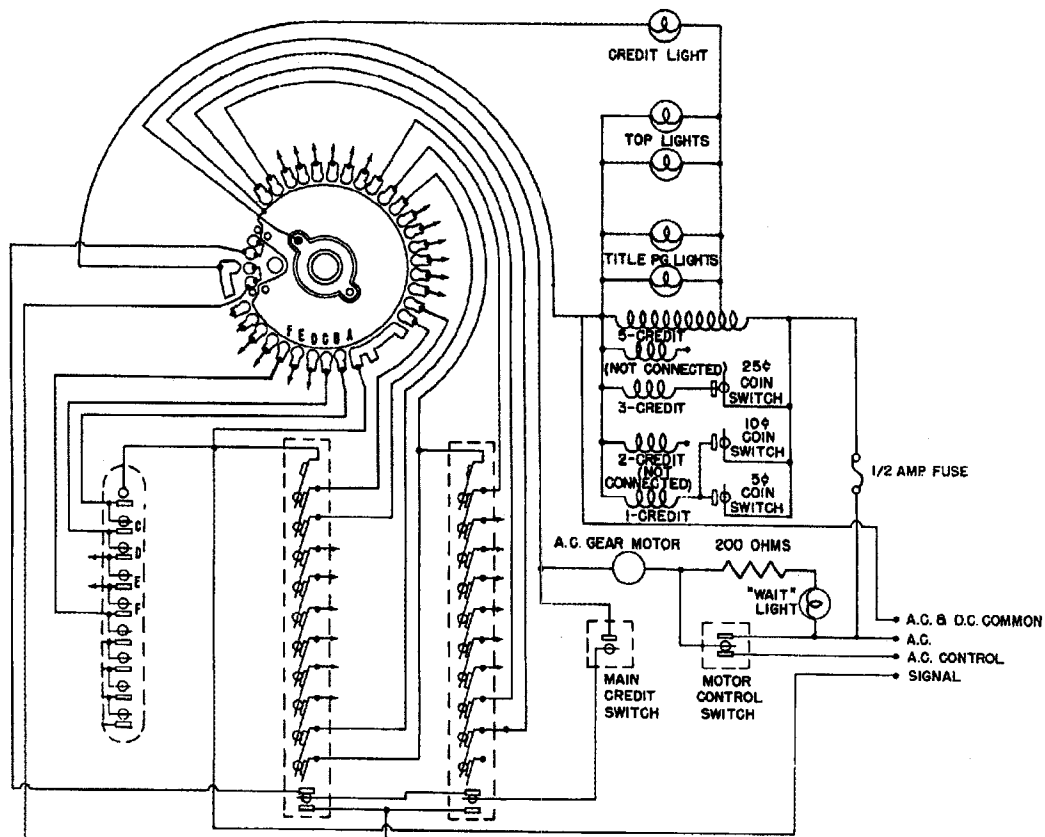
tion on the following pages has been found to be a most effective method of locating and correcting troubles.

The questions and possible answers that are in chart form must be followed from beginning to end in the sequence outlined, in order to effectively pinpoint the area of trouble.

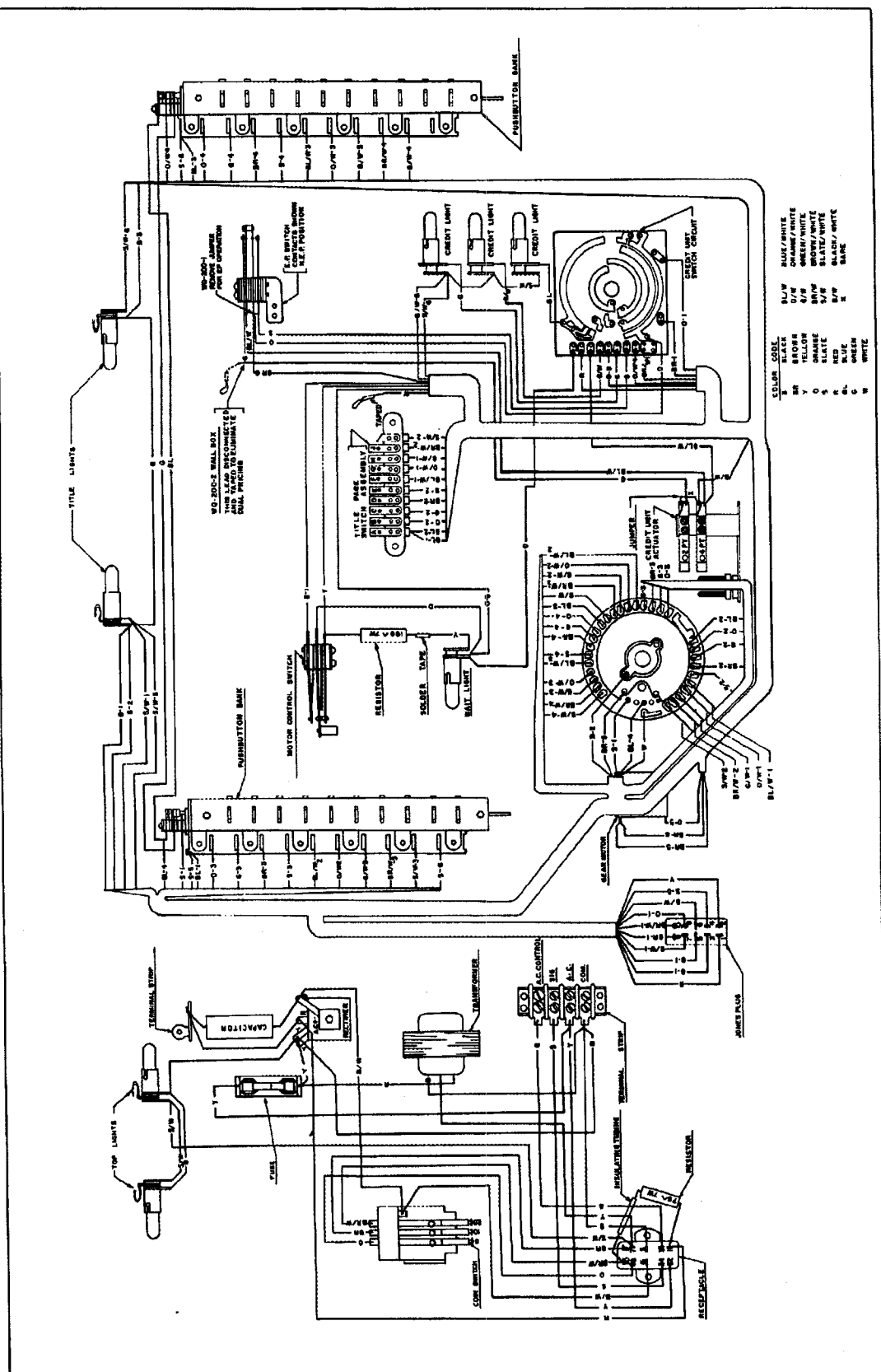




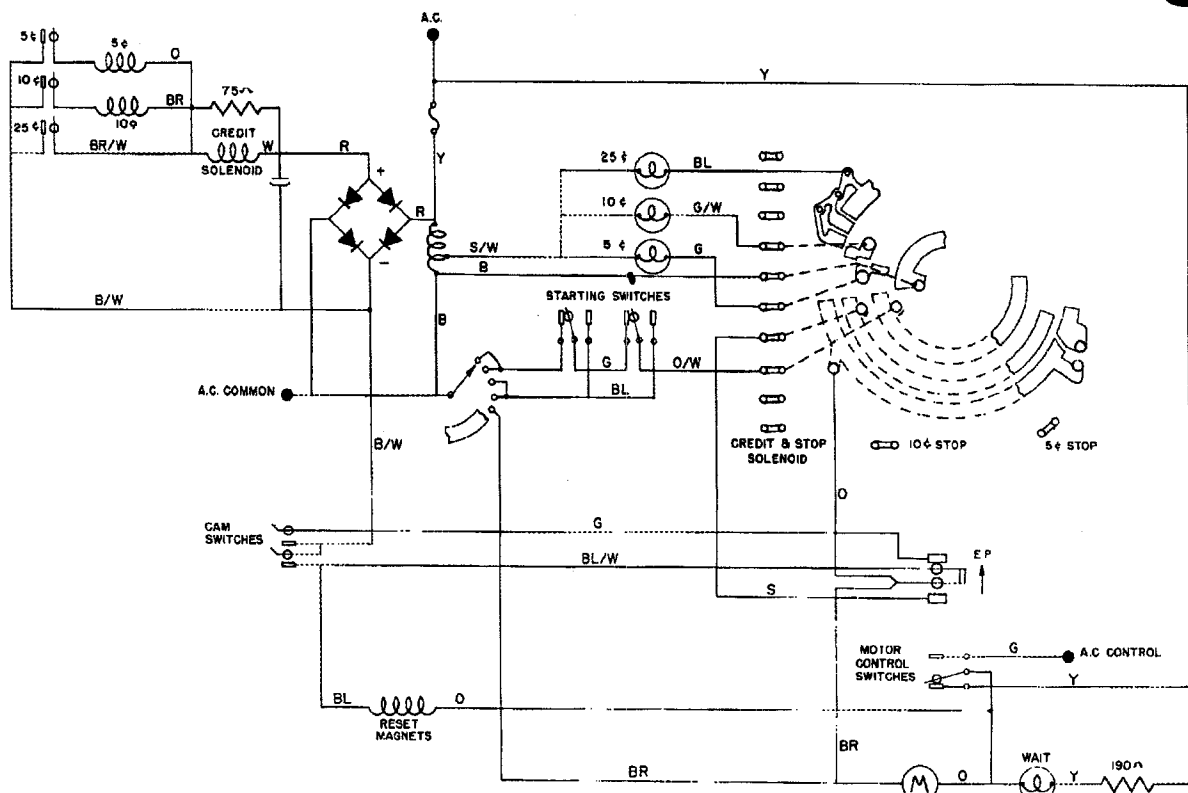
**Wiring Diagram for AMI Wall Box
Models WQ-120 and WQ-200.**



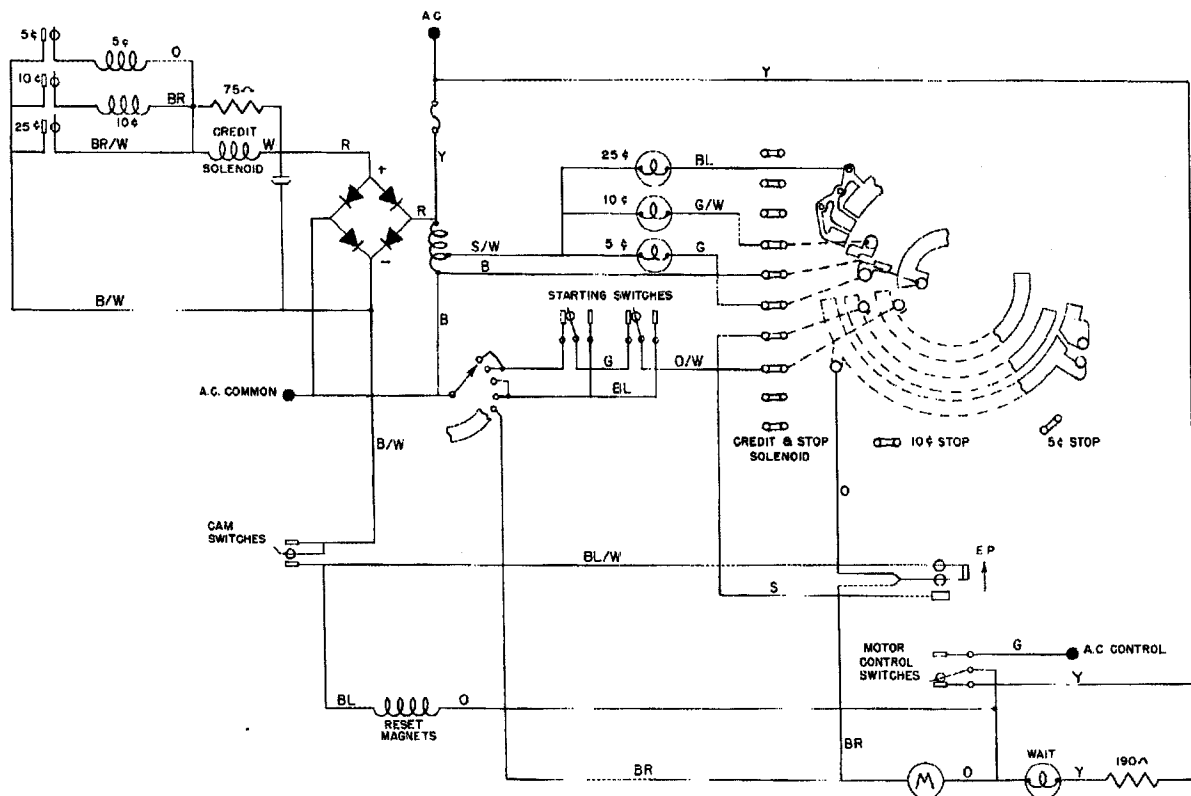
**Schematic for WQ-120 and WQ-200
Wall Boxes.**



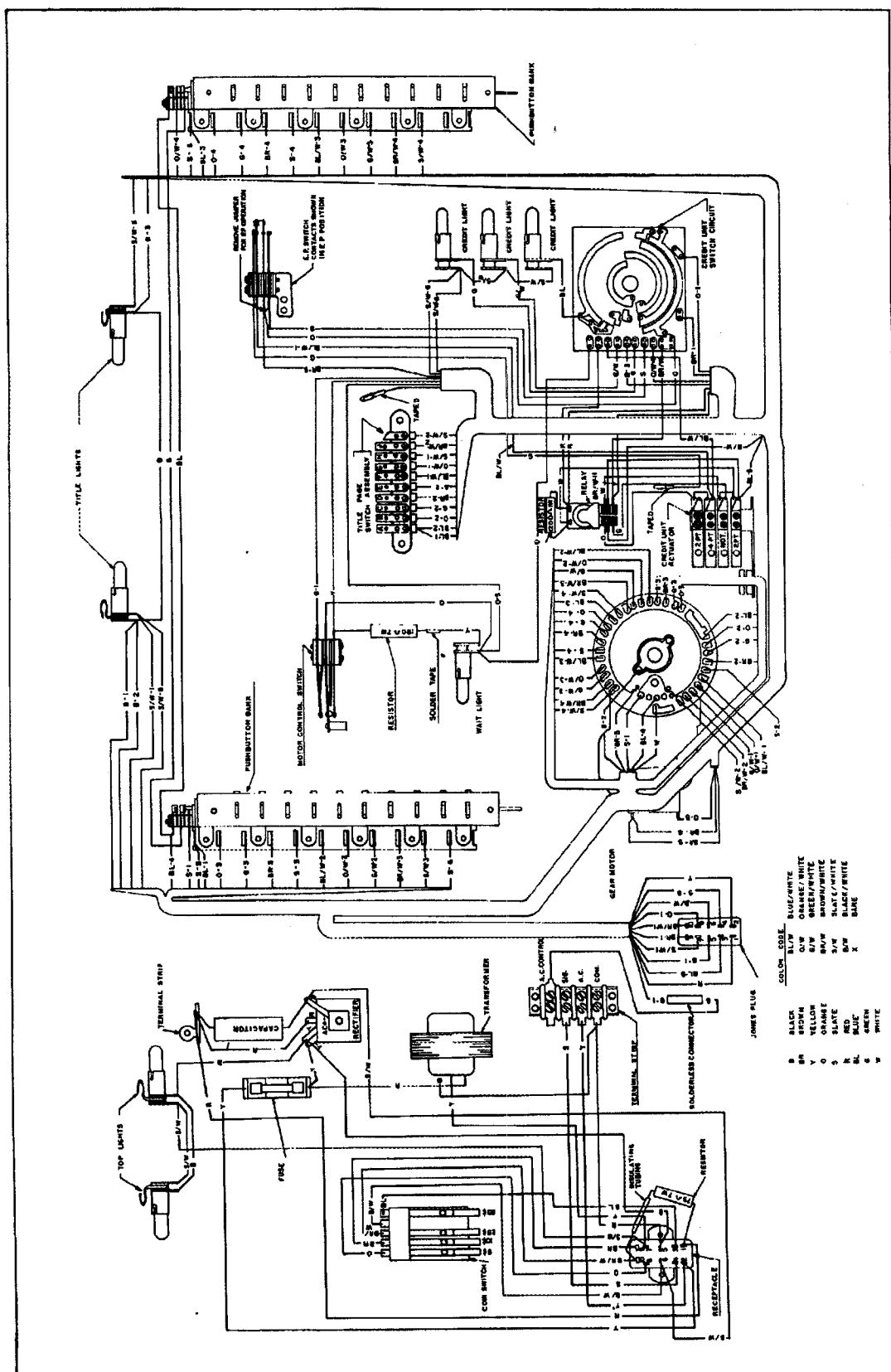
Wiring Diagram for AMI Wall Box, Models WQ-200-1 and WQ-200-2.



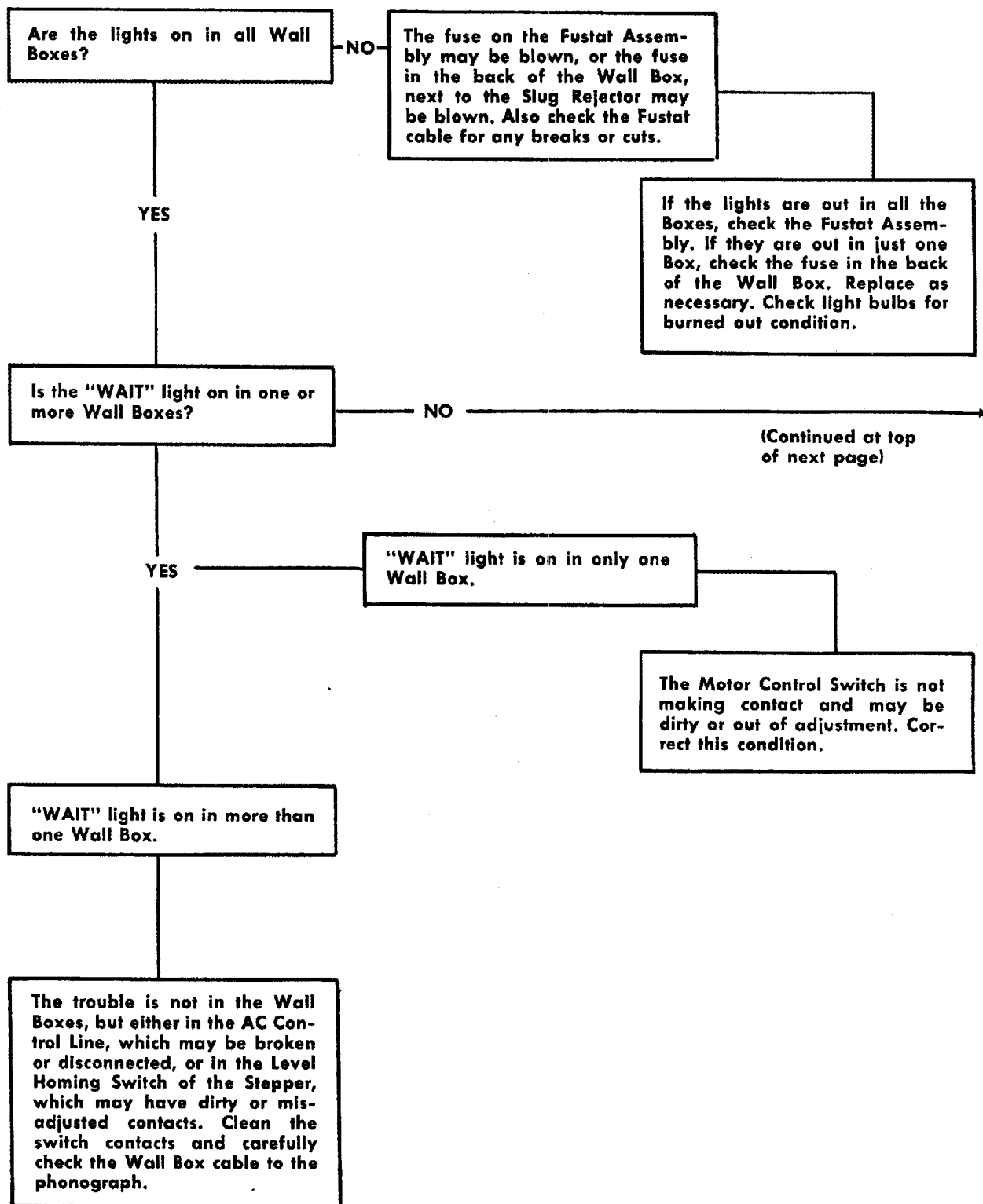
**Schematic for WQ-200-1
Credit System.**

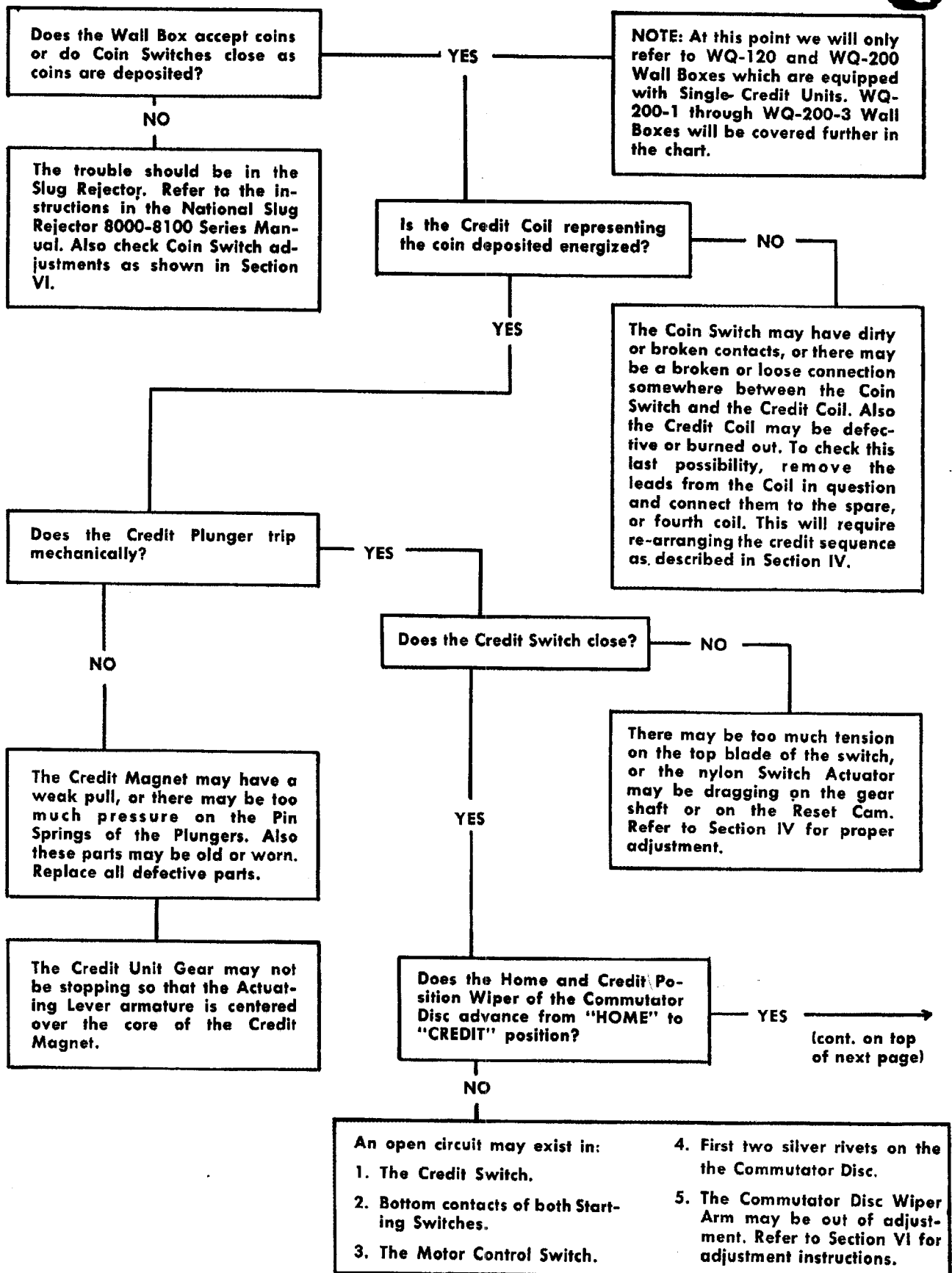


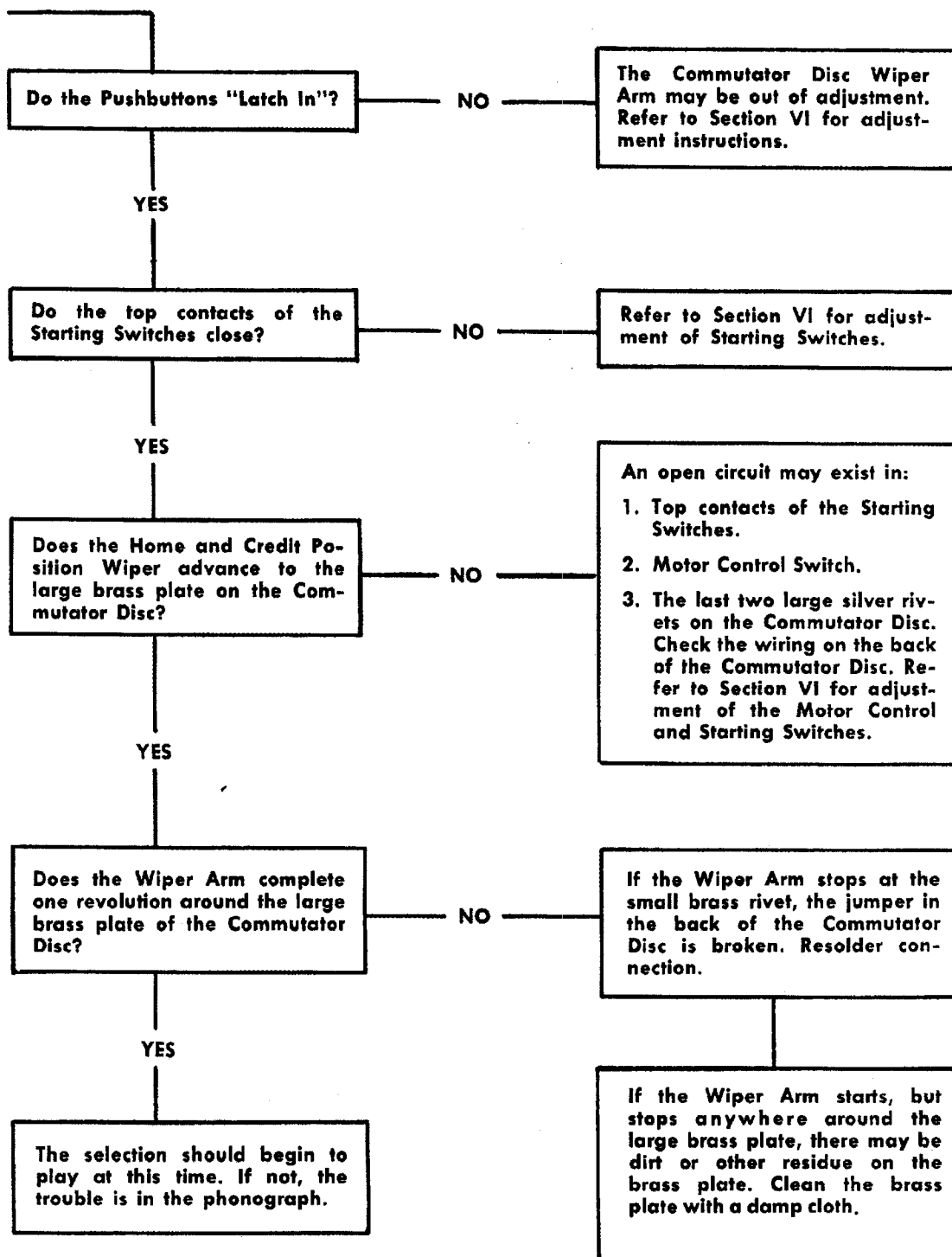
**Schematic for WQ-200-2
Credit System.**











SEE THE FOLLOWING PAGE FOR WQ-200-1 THROUGH WQ-200-3 WALL BOXES

NOTE: Since all WQ Series Wall Boxes are identical to the point where the first note appears early in the first chart, we will proceed on from that point in this chart . . .

When a coin is deposited, does the plunger of the Main Credit Solenoid move up against the Pawl?

NO

1. The Coin Switch may have dirty or broken contacts.
2. There may be a broken or loose connection somewhere in the circuit between the Coin Switch and the Solenoid.
3. The Solenoid Plunger may be binding because of dirt, or the coil may be defective.

Check the wiring in the harness and at the solder points. Push the Plunger up manually from the hole at the bottom of the Credit Unit to check for binding. Check the coil for a burned out condition. Replace if necessary.

YES

Does the Credit Wheel advance the exact number of teeth which represent the coin deposited?

NO

If the Credit Wheel advances too many teeth, the appropriate Stop Coil may not energize due to:

1. A broken or loose connection between the Coin Switch and the Stop Coil.
2. The Stop Coil may be defective, or burned out. Check the Stop Coil and associated wiring.

YES

Does the Home and Credit Position Wiper on the Commutator Disc, move from "HOME" to "CREDIT" position and stop?

NO

If a Stop Stud is used, the Stud may have been mounted in the wrong hole. Check the position of the Stud.

YES

The Wiper Arm and/or Wiper Blade may be out of adjustment. The Motor Control Switch Blades may not be opening properly. Check all adjustments as described in Section VI.

Do the Pushbuttons "Latch In"?

NO

An open connection may exist in the Gear Motor circuit. Check Gear Motor action.

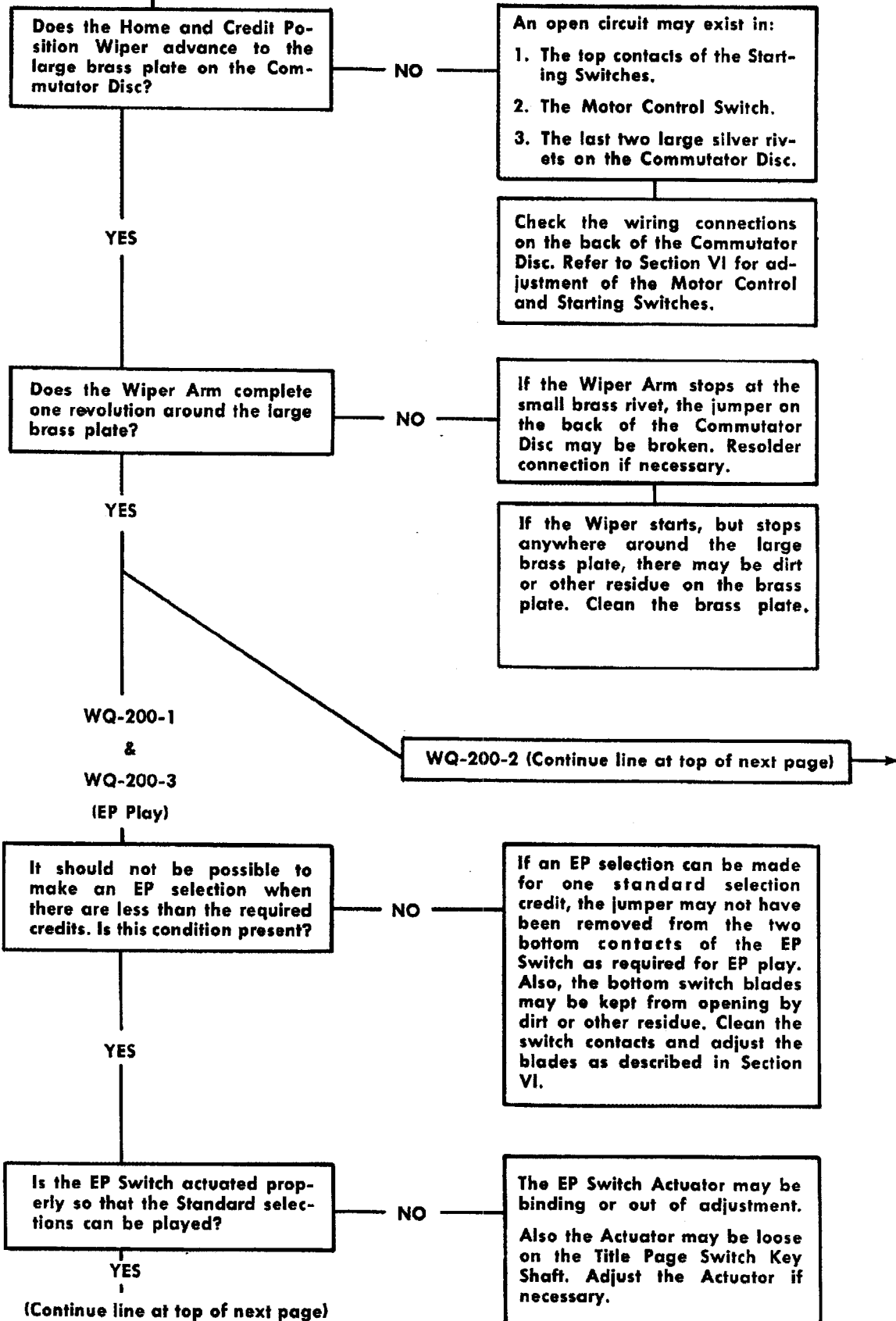
YES

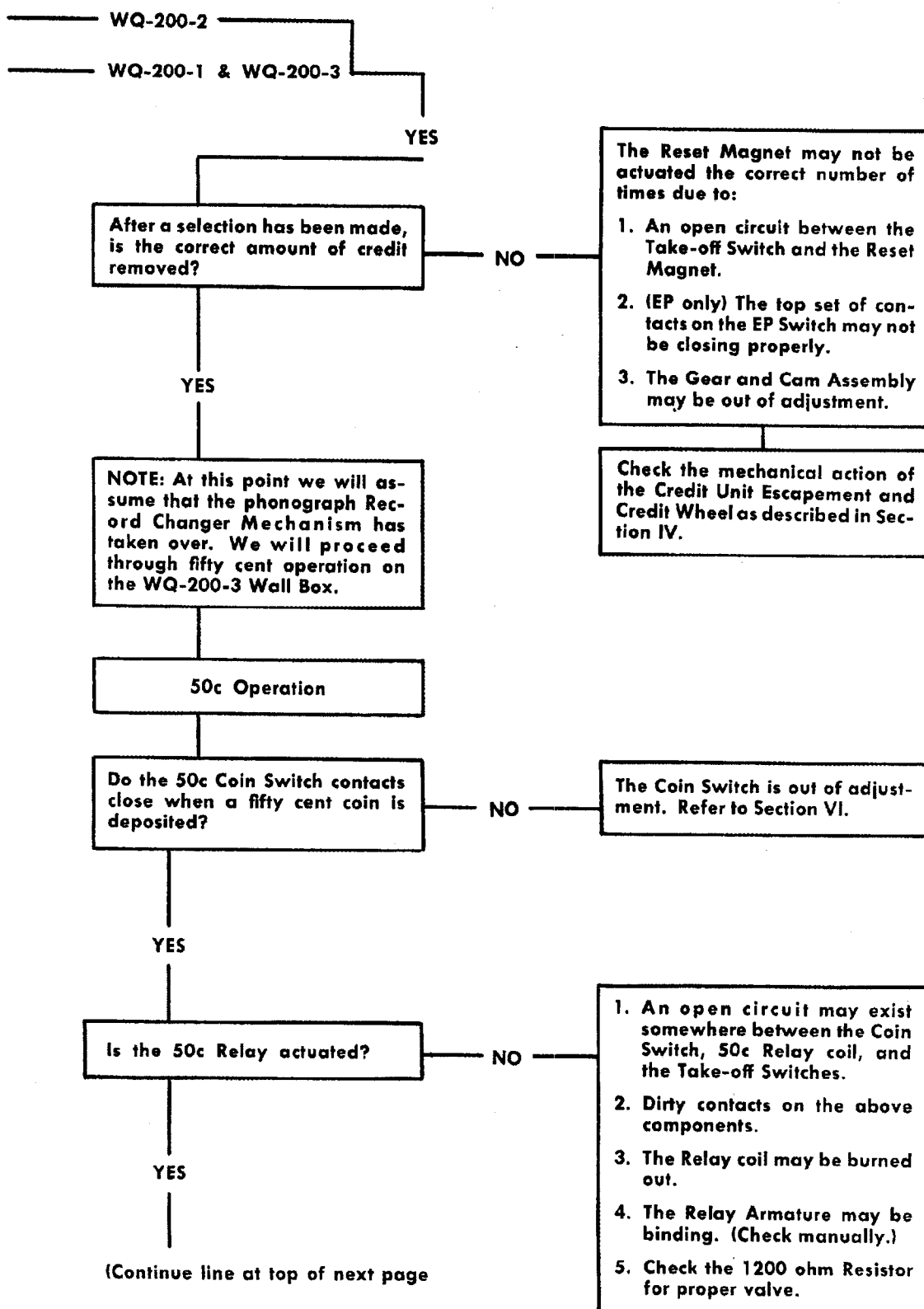
Do the top contacts of the Starting Switches close?

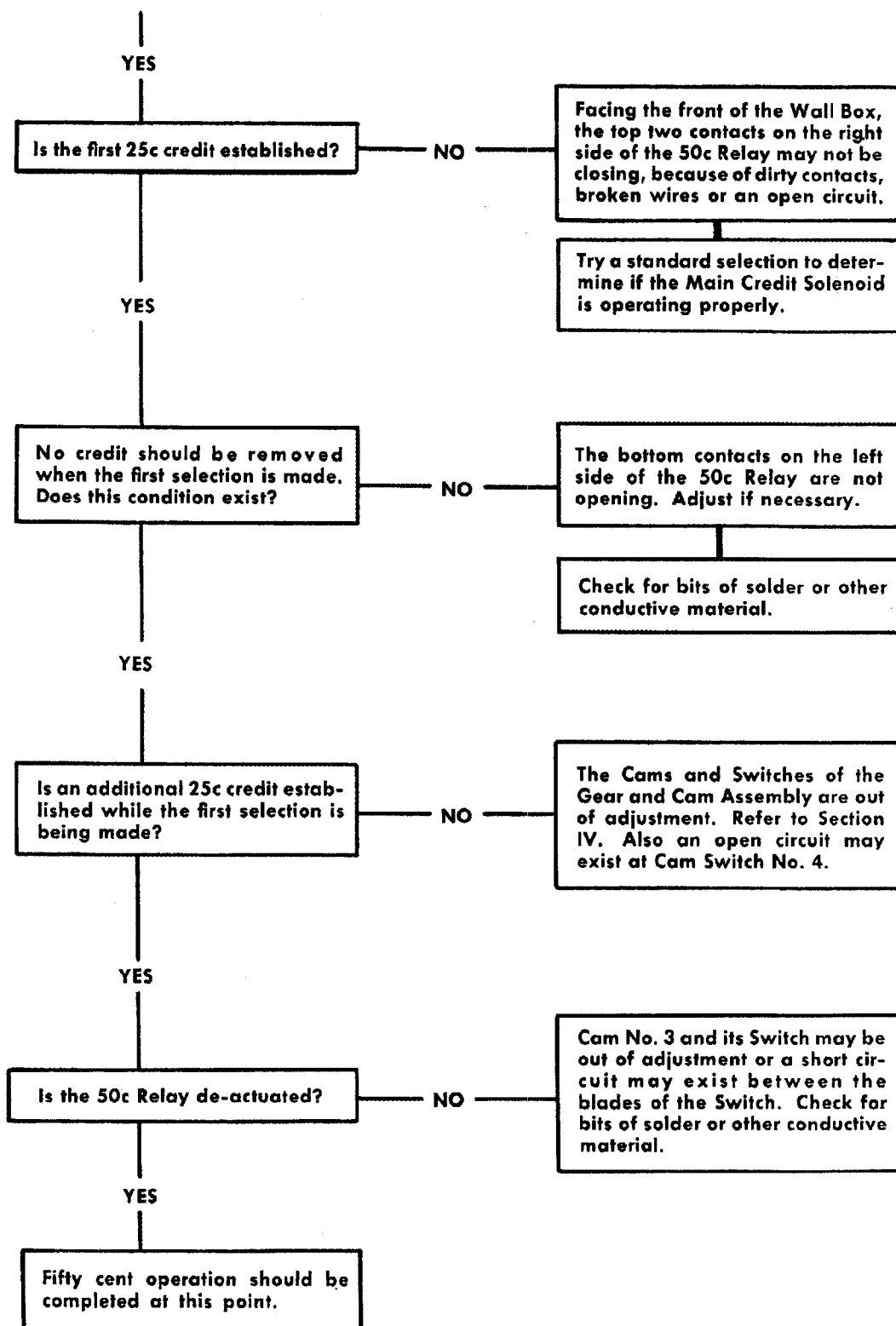
NO

Refer to Section VI for adjustment of Starting Switches.

(Start at top left of following page)



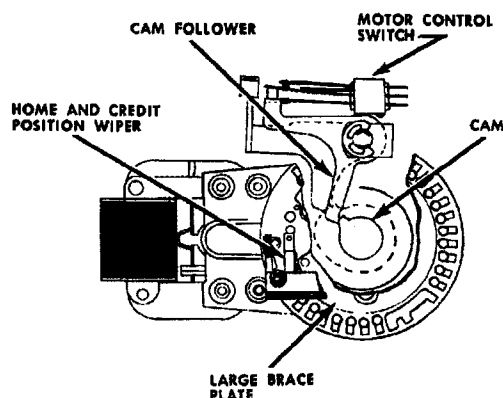




SECTION VI OVERALL ADJUSTMENTS

Motor Control Switch

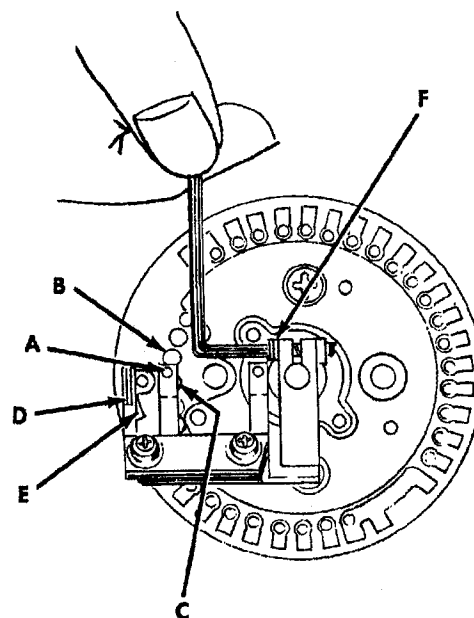
With the Wiper Arm in such a position that the contact on the middle Wiper Blade is making contact with the large brass disc on the Commutator Plate, the Motor Control Switch should be adjusted as follows: The fiber pusher on the moving blade must touch or be within .005 inch of the tab on the cam lever which actuates it. At this point, the gap between the pair of open contacts must be a minimum of .015 inch. The force between the closed contacts (as measured at the contacts) must be 20 grams minimum.



To check the operation of the Motor Control Switch, turn the Wiper Arm Assembly by hand until the pushbutton Cam Follower Arm passes the highest point on the cam and drops into the first notch. (NOTE: When turning the Wiper Arm by hand, it should be done by moving the last gear in the gear train. Never turn this Wiper Arm by applying force against the Wiper Arm itself. Back the gear, at this point, to take out all play. In this position, the Motor Control Switch contacts must have been transferred. The gap between the open contacts at this point must be .015 minimum and the force between the closed contacts must be 20 grams minimum. The Motor Control Switch is adjusted by shifting its position after loosening two screws which hold its mounting bracket. As the switch transfers, the contacts must close before the other two open.

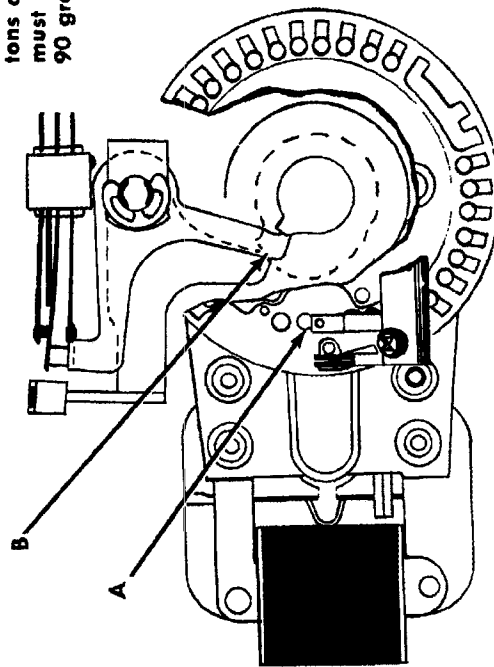
Wiper Arm Positioning

The position of the Wiper Arm with respect to the position of its Drive Shaft is important. To position the Wiper Arm, turn the Gear Motor so that the pushbutton Cam Follower Arm passes the highest surface and drops into the notch following this surface. Back the Gear Motor to take out all play. Then set the Wiper Arm so that the contact on the middle Wiping Blade (A) is approximately centered between the second large home position rivet (B) and the first large credit position rivet (C). The arm should be further positioned so that the Wiper Blade has just broken contact with home position rivet (B). The outside blade (D) must be making contact with the credit position segment (E), (large segment) on the Commutator Plate when in this described position. Tighten the Wiper Arm on the shaft (F). The arm must be adjusted so that the contacts on the inside blades exert pressures of 55 to 75 grams on the Commutator Plate. The force of each half of the bifurcated blade against the Commutator Plate must be 10 to 20 grams.



Pushbutton Banks

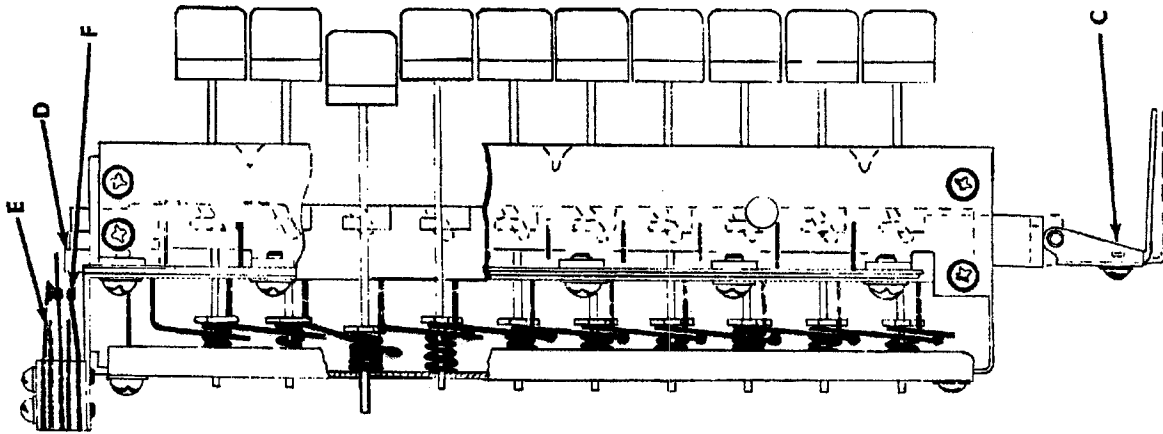
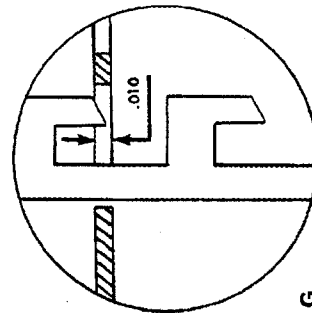
With the Wall Box Wiper Arm in credit position (A) the pushbutton Cam Follower Arm in the first notch of the cam (B), each pusher (C) on the Shaft and Lever Assembly must support its Latch Bar at such a height that a minimum of .010 inch interference is obtained between the latch bar and the pushbutton shaft (G) when a pushbutton is latched in. The pushers must be set low enough to accomplish this, but high enough to unlatch any pushbutton as the Wall Box operates. With a pushbutton latched in, the Interlocking Bar (D) must be raised high enough to prevent any other button from being depressed.



Pushbutton Contacts and Starting Switch Adjustments

Two Starting Switches are located at the top of the two Pushbutton Banks (E & F). They are individually actuated by Latch Bars in their respective pushbutton banks. With no pushbutton latched in, the normally open pair of contacts (E) on the starting switch must have a minimum gap of .020 inch. The contact pressure on the normally closed bottom contacts (F) must be 10 grams minimum. With any pushbutton latched in, the top contacts must be closed and the contact pressure must be 10 grams minimum. The bottom contacts must be opened with a minimum gap of .010 inch.

Individual contacts on each pushbutton must be opened by .020 inch minimum with their corresponding button latched in. With no pushbutton depressed, all individual selection contacts must be closed with contact pressures of 40 to 90 grams.



The Slug Rejector

The Slug Rejector used in AMI WQ series Wall Boxes is a standard unit made by National Rejectors, Inc. Complete information on operation, adjustment, and maintenance is obtained in National's 8000-8100 Series Rejector Manual.

The EP Switch and Actuator

There is no particular adjustment to be made on the EP Actuator except to make sure that it operates without binding, and that it is operated by the designated Title Page Tab and Switch Key. It must be understood that the "EP Action" in the Wall Box is directly opposite to that of the phonograph, that the EP Switch Actuator comes in contact with the EP Switch only when "Standard" play is desired.

The EP Switch must meet the following conditions:

When the Switch Is Not Actuated:

The contact pressure of the normally closed

contacts (A & B) should be 25-45 grams.

Blade "A" should be held at least .010" from its stiffener by the action of the second blade (B).

The gap between the normally open contacts (C & D) should be .030" to .040".

Blade "D" should push against its stiffener with a force of 30 to 40 grams.

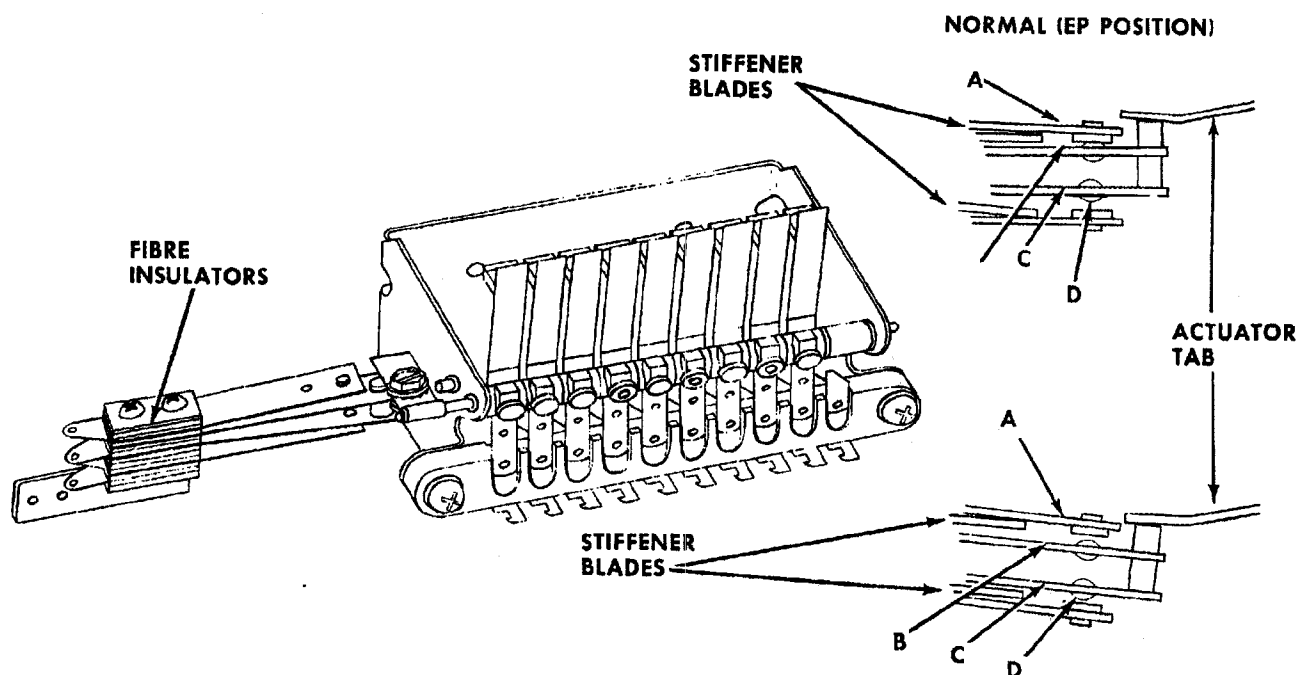
When the Switch Is Actuated:

Blade D should be moved at least .010" from its stiffener by the action of the moving contact (C).

Blade "A" should push against its stiffener with a force of 30 to 40 grams.

Contacts (A & B) should be open.

The operating point of the "E.P." switch is adjusted by bending the tab on the switch actuator as necessary.



COIN SWITCHES

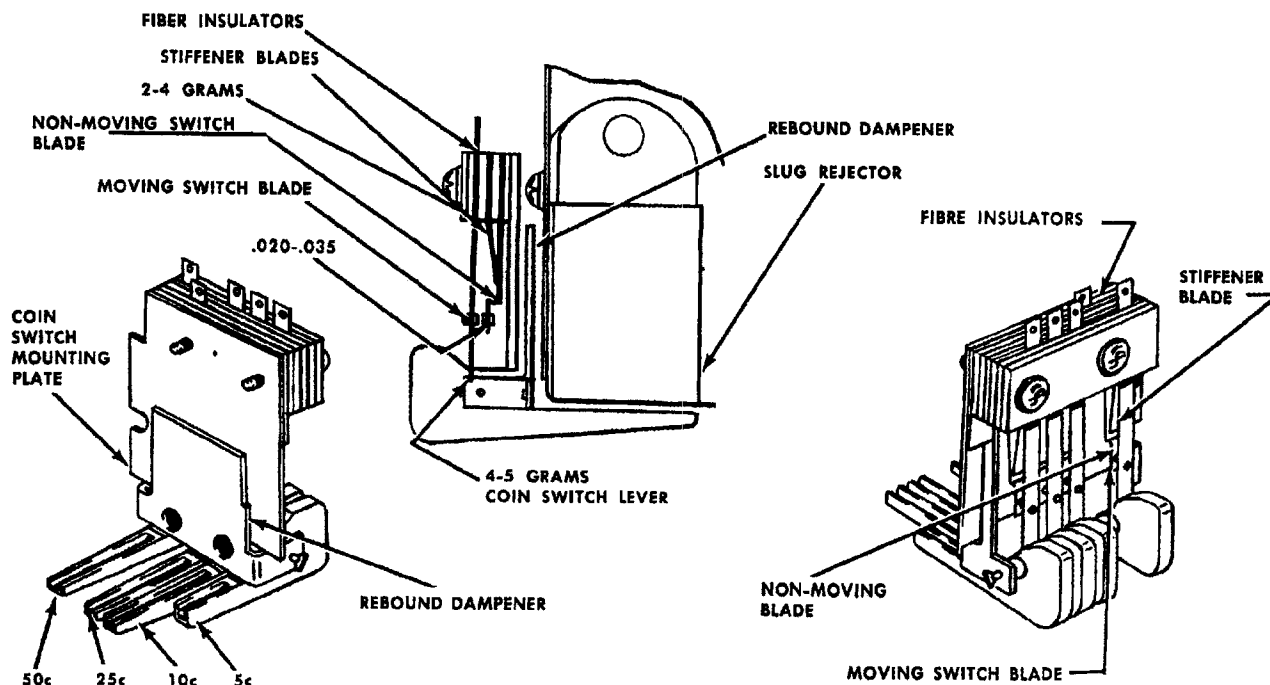
The coin switch is located on the slug rejector mounting frame in combination with the slug rejector. It will normally require no attention unless in some way it is damaged. Note that the coin switch levers do not touch the slug rejector but rather they are stopped in their "at rest" position by the rebound dampener. Also note that the rebound dampener is limited in travel by the long vertical part of the arm which bears against the coin switch mounting plate.

The rebound dampener must fall freely against the coin switch levers. When measurements of

the contact pressures and gaps are made, care must be used to see that the rebound dampener is in its normal position and that the levers bear against it.

Operational Check

Hold the plastic coin switch lever in its normal position and drop a coin through the slug rejector. When the coin comes to rest on the lever, release the lever slowly. The weight of the coin alone must operate the lever enough to close the coin switch and allow the coin to fall free.



Contact Pressure and Gap

Each moving switch blade must push against its lever with just enough force (4-5 grams) to hold the lever against the rebound weight. Each non-moving blade must push slightly (2-4 grams) against its stiffener blade. The gap between the contacts of each switch should be .020 to .035 (about $\frac{1}{32}$).

NOTE: Contact pressure is adjusted by bending the contact blade near the fiber insulators. The gap between contacts is adjusted by bending the stiffener blade.

NOTE: The remaining adjustments are covered in the preceding portions of this manual. For specific reference to any other item, such as adjustment of the Title Pages, see the Table of Contents at the beginning of the manual.

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