

# BC-20

**bill  
& coin  
changer**

**Field  
Service  
Manual  
&  
Parts  
Catalog**

**ROWE**



**Advanced design...increased profits:  
your return on our investment.**

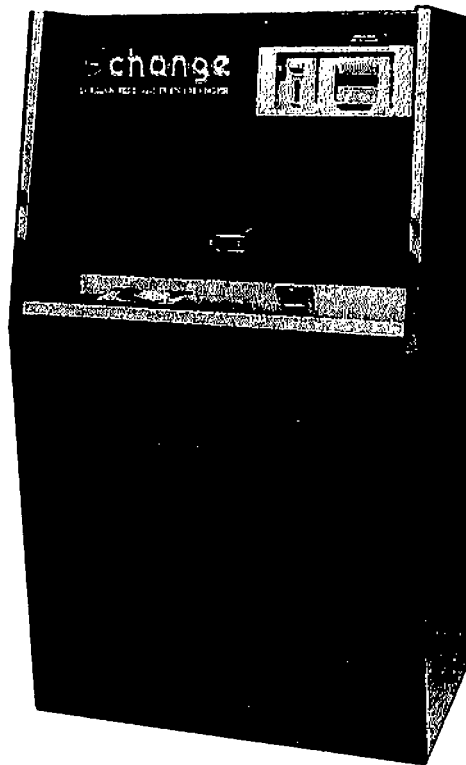
**Customer Services Tech Aid-800-631-8084**

NOTICE: THIS MANUAL MUST BE LEFT  
WITH MACHINE TO INSURE AVAILABILITY  
OF STATUS CODE INFORMATION.

PART NO.2-51672-01

EIGHTH EDITION  
JANUARY 1981

# SPECIFICATIONS



## MODEL BC-20 BILL AND COIN CHANGER

### POWER REQUIREMENTS

120 VAC  
60 Hz.  
400 Watts  
8 Amps

### CIRCUIT BREAKER REQUIREMENTS

5 Amp (2)  
7 Amp  
2 Amp

### HOPPER CAPACITY

Nickel Hopper	2400	\$120.00
Dime Hopper	6000	\$600.00
Quarter Hopper	2100	\$525.00

### DIMENSIONS

Depth	19-1/4"	48.9 cm
Width	27-7/8"	70.8 cm
Height	48-1/4"	122.6 cm
Net Weight	265 lbs.	120.2 kg

**IMPORTANT**

**THIS IS A MODULAR SERVICE MANUAL - PLEASE TAKE THE TIME TO READ THIS PAGE AND REVIEW THE TABLE OF CONTENTS ON THE FRONT OF THE DIVIDER PAGE FOR EACH PART TO GET THE MAXIMUM BENEFIT FROM THIS TEXT.**

This publication is divided into two parts to fully utilize the service features engineered into each Bill and Coin Changer.

**PART 1 - Field Service Manual** provides familiarization with bill changer components and accessories. Included are installation and routine service procedures. The troubleshooting information in this part is intended for personnel with enough skill, experience, general knowledge of the equipment to isolate a problem to a plug-in electronic circuit board or mechanical adjustment. The trouble isolation procedure is based on observing the operation of the equipment and the use of an optional Rowe Diagnostic kit.

**PART 2 - Parts Catalog** contains a complete listing of procurable replacement parts except for electronic components which are listed directly on the schematic diagrams.

**Operational Sequence and Schematics** elaborates on Part 1 to provide information for the repair of circuit boards and the replacement of electronic components. The information and procedures in this part are intended for an advanced level of maintenance where test equipment is available and service personnel have had electronics training.

This is a separate publication available from your distributor. Please order Part No. 3-65355-01.

**WARNING:** *This equipment generates, uses, and can radiate radio frequency energy. Operation of this equipment in a residential area could cause interference to radio communications. If this should happen contact your distributor or Rowe International, Inc. directly. As permitted by regulation it has not been tested for compliance pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference.*

# warranty

Rowe extends to the original operator of this equipment the following warranty:

All parts are guaranteed to be free of defects in material and workmanship for the specific periods which follow. Rowe agrees to repair without charge during such period any part which proves defective upon examination by Rowe. All costs of shipping an allegedly defective part to or from Rowe's offices shall be borne by the original operator.

Electronic Circuit Board Assemblies	2 years
Electrical and Mechanical Moving Parts	1 year
Lamps	90 days

In the case of parts supplied to Rowe as components, Rowe extends the same warranty period as extended by the original manufacturer.

The above warranty applies provided that all parts of the machine have been serviced properly as directed in the service manual, and provided the alleged defective part, upon examination by Rowe, shall prove to be thus defective.

This warranty will not apply to any machine or any part which has been subjected to any accident, abuse, or misuse.

**ROWE INTERNATIONAL, INC. EXTENDS NO WARRANTY, EXPRESSED OR IMPLIED, TO PURCHASERS OR USERS OF ITS PRODUCTS EXCEPT AS HEREIN SET FORTH, WHETHER BY OPERATION OF LAW OR OTHERWISE.**

# PART ONE

# FIELD SERVICE

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# SECTION 1 SYSTEM DESCRIPTION

## INTRODUCTION

The Rowe Model BC-20 Bill and Coin Changer accepts and dispenses change for quarters and half-dollar coins as well as for dollar bills of United States currency. The machine can be easily modified to change the Susan B. Anthony Dollar Coin if desired. A monitor alarm system and high security cabinet provide theft protection. A microcomputer selectively discriminates against and returns, bogus bills and coins and controls the change dispensing functions. Plug in circuits and assemblies are featured for fast field substitution. Coin combination programming is easily changed using switches. The coin hopper feature permits rapid bulk loading of coins. Figure 1, shows major components.

Though greatly simplified in this explanation, the entire validation and payout sequence is controlled by a micro computer to insure the maximum security against bogus currency and jackpotting. Refer to the sequence of operation diagrams for a complete explanation of how the machine works. See manual 3-65355-01.

Inserting a dollar bill in the transport starts a motor which moves the bill along the acceptor track. While in motion, the bill is examined both optically and magnetically to determine whether or not it is valid. If the bill is valid, a vend signal is transmitted to the dispenser and the bill drops into

the bill stacker where it is stacked flat against other valid bills. If the bill is not valid, the bill transport motor reverses, returning the bill to the customer.

The one dollar change bucket opens, and a dollar's worth of change drops into the coin cup. The coin hopper motors then operate, loading the correct number of coins from the nickel, dime, and quarter coin hoppers into the change bucket for the next payout.

Quarter and half-dollar coins pass through a coin acceptor. Solid state coin sensors are used to start the payout cycle for these coins.

When emptying change buckets using the test switches located on power control center, the machine must be turned off and back on between each operation of the test switch. An alternate method is to allow the unit to run to shutdown and then press the reset switch between test switch operations. The reset switch is located on the computer control center.

A functional description of the main components of the Bill Changer follows. This information can be used to gain an overall understanding of the equipment and its operation.

**COIN HOPPERS** - Hold nickels, dimes and quarters. Could hold pennies if desired.

**COIN DISPENSER** - (Behind hoppers) - contains drive motors, coin counting photocells, and escrow buckets for dispensing change.

**BILL STACKER** - Receives and stacks accepted bills, includes removeable bill box.

**POWER CONTROL CENTER** - Contains test vends switches, counters to record dollar, half dollar, and quarter vends, power circuit breakers, on-off switch, EMI Filter, stepdown transformer, power relay, voltage regulator, power transistor, bill acceptor motor capacitor, and power supply circuit board.

**COIN ACCEPTOR** - Accepts valid coins which operate solid state switches to vend change.

**COMPUTER CONTROL CENTER** - Controls validation and change making functions. Contains change programming switches and all electronic adjustments and reset switch.

**MONITOR ALARM** - Makes an incredibly loud noise if an attempt at forced entry is made. Consists of a horn operated by a replaceable Freon Aerosol can. Because the alarm is not electrically operated and not accessible without a key, it cannot be disarmed

**BILL TRANSPORT** - Receives bill inserted by customer. Propels bill along a track where it is examined by sensors. Valid bills are delivered to the bill stacker; bogus bills are returned.

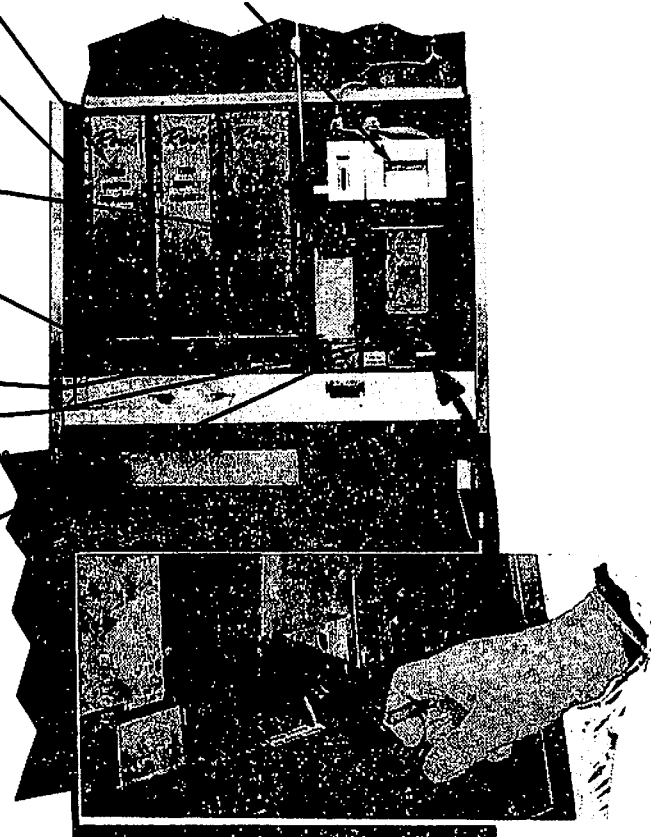


FIGURE 1. MAJOR COMPONENTS LOCATION

BOTTOM DOOR LATCH  
RELEASING BOTTOM DOOR

## BILL TRANSPORT DEVICE (See Figures 2 and 3)

The Bill Transport Device receives bills inserted by the customer. Utilizing a system of rubber rollers located on the upper and lower transport castings, the bill is transported through the bill transport device and delivered to the bill stacker. During this transport operation the bill is subjected to a dynamic examination by optical and magnetic sensors located in the bill transport device. These sensors consist of the P1, P4, and P6 solar cells and their respective light sources (one lamp serves both P4 and P6), and the magnetic head. The magnetic head reads off a magnetic signal from the bill.

The bill pressure solenoid pulls the spring loaded pressure roller away from the magnetic head until the trailing edge of the bill uncovers P1. The pressure roller is then released and maintains pressure on the bill and magnetic head to assure proper signal transfer from the bill. The P6 solar cell is uncovered by the anti-cheat lever as the bill advances through the bill transport device. As the bill drops from the output rollers, the anti-cheat lever swings back to cover the P6 solar cell permitting the dispenser to operate.

If a bill does not pass the required validation tests, the transport is reversed and the bill is returned to the customer. The bill will hang in the bill acceptor inlet by its trailing edge for 30 seconds. During this time, the status display on the computer control will show a code number or letter indicating why the bill was rejected.

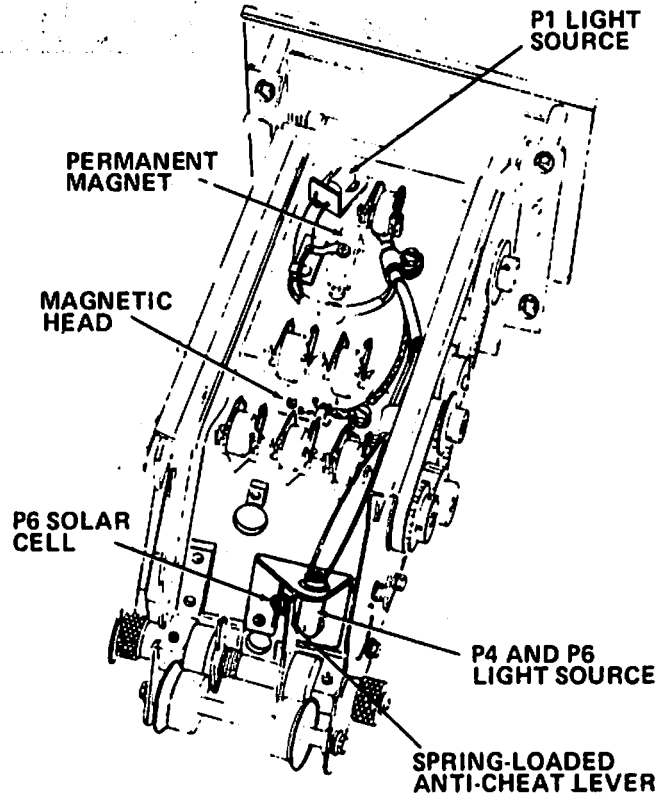


FIGURE 2. BILL TRANSPORT DEVICE

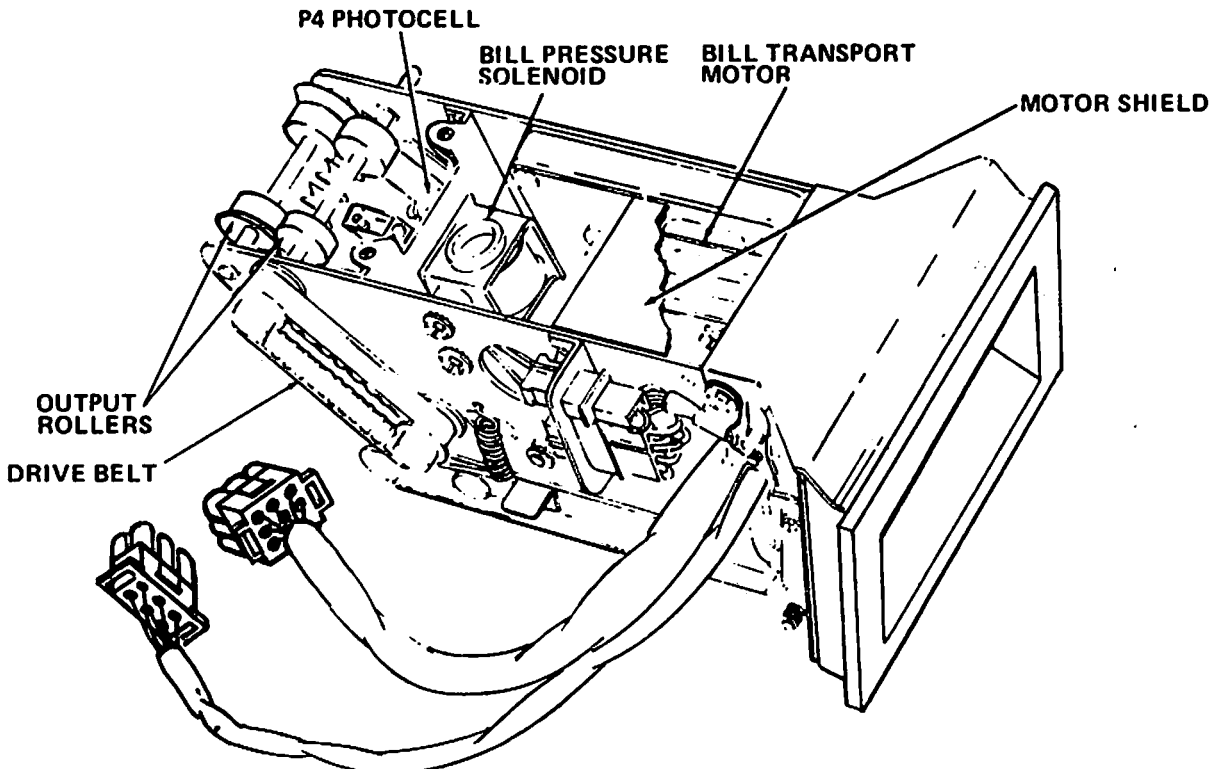


FIGURE 3. BILL TRANSPORT DEVICE - BOTTOM VIEW

## BILL STACKER

The Bill Stacker, Figure 4, accepts the validated bills from the bill transport and stacks them, one at a time, in a removable slide-out box.

After the bill exits the transport and falls into the stacker, a signal from the computer control center energizes the transistorized drive circuit inside the stacker and relay K501 is pulled in, completing a circuit to the 115 VAC bill stacker motor. The signal from the computer control center is not long enough to drive the stacker a full cycle so a set of contacts of K501 is used to hold in the coil. As the stacker leaves home position, cam switch S501 closes followed closely by the switching of cam switch S502. As switch S502 switches, it grounds a line back to the computer control center which prevents the acceptance of bills and coins and disables the machine if the stacker fails to complete its cycle in approximately 1.5 seconds. With the switching of S502, relay K501 drops out and the stacker motor operates through switch S501 only. As the stacker completes a cycle, cam switch S502 switches back and cam switch S501 opens, stopping the stacker motor. The stacker is now ready for another cycle.

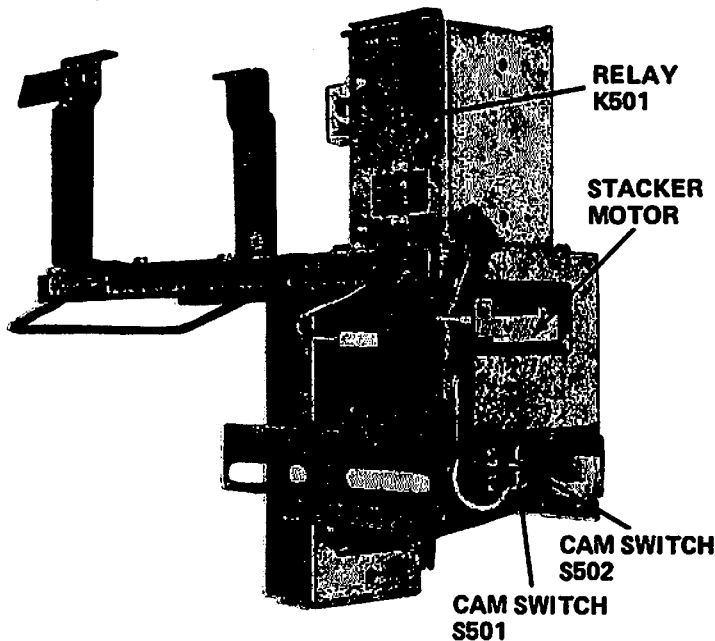


FIGURE 4. BILL STACKER

## COIN ACCEPTOR

The Coin Acceptor checks quarter and half-dollar coins to determine their validity. The S.B.A. Dollar Coin Acceptors are available and can be easily accommodated. Each coin is checked for thickness, diameter, weight and metallic content. If the coin is deformed or invalid it is directed through the coin acceptor to the coin return cup. Genuine coins are directed through the coin acceptor and actuate either of two solid state coin switches located on the rear bottom of the slug rejector mounting frame. Jammed coins or slugs are cleared from the coin acceptor by a wiper arm on the coin acceptor which is actuated by the coin or bill return button. The coin inlet and chute deters cheats and jams. It can be opened for easy clean out by removing the lower thumbscrew and rotating the coin track up.

## SOLID STATE COIN SWITCHES

As a coin passes through a slot in the coin switch assembly it momentarily interrupts an infrared light beam causing a solid state optical detector to send an electrical pulse to the computer control center. The duration of this pulse is then checked by the computer to determine its validity. Valid coins will initiate the dispense cycle. A separate light source (INFRA - red LED) and optical sensor (photo transistor) is provided for each of the two coin denominations accepted.

## DISPENSER

The Dispenser, Figure 5, contains the necessary equipment for the actual handling of the coins. Located on this assembly are the coin bucket and solenoid assembly, the chute from the bucket to the channel mounted on the power control center and the upper chute from the coin detectors to the bucket.

The three coin detectors, each consisting of a lamp and a photo transistor, detect the coins as they exit from their respective hoppers and fall into the upper chute. The upper coin chute directs the change to the change buckets. The drive for the hoppers consist of three AC motors which are also on the dispenser. These motors, as well as the solenoids which open the bottom door of the coin buckets are controlled by signals from the computer control center.

Access to the rear of the dispenser assembly is achieved by removing the two screws in the upper corners, grasping the dispenser at the arrow, and tilting the entire assembly forward on its lower pivots. When replacing the dispenser be sure that the two top screws are tightened down securely. If not, the entire dispenser assembly may tilt forward when hoppers are unloaded or removed.

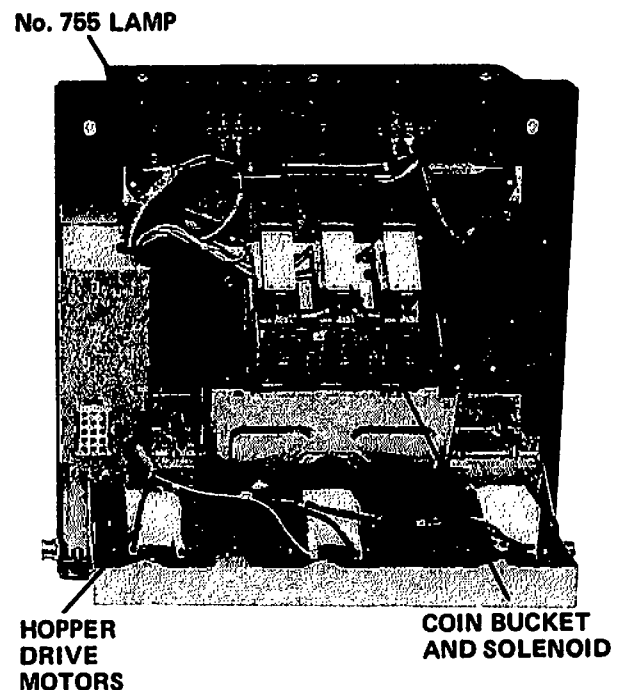


FIGURE 5. COIN DISPENSER

## HOPPERS

The bill changer contains three identical, interchangeable coin hoppers (Figure 6), which mount on the front surface of the dispenser assembly and pivot forward from the bottom for unloading and removal. A special hopper to dispense S.B.A. dollar coins or large tokens is now available.

The hopper transports coins to the detector and coin chutes by means of a chain conveyor driven by a lower sprocket. The chain follows a serpentine path which is designed so that excess coins fall back into the hopper insuring only one coin per pin into the coin counting area.

The chain picks up coins from the bottom of the hopper and carries them up to the top where they fall through the upper chain guide ring and interrupt a light beam to a photo detector, mounted on the dispenser. The coins then fall through a closed chute to the change bucket.

An agitator, mounted on the drive shaft, agitates the coin load to minimize coin jams in the hopper and insure efficient pick up of coins.

It should be noted that there is no empty sensing device in the hopper. Empty hoppers are indicated by a failure to count appropriate number of coins in a specified period of time - approximately 45 seconds. The hoppers in this machine also have teflon coated coin tracks which minimize the need for cleaning.

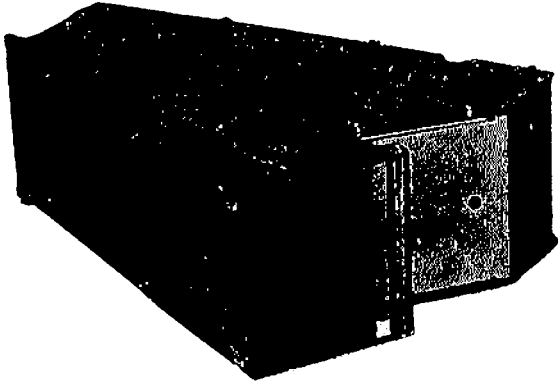



FIGURE 6. COIN HOPPER

## BILL REJECT SWITCH

When the "coin or bill return" button is depressed a switch closes which sends a signal to the computer control center. This pulls in the bill pressure solenoid in the bill acceptor, drops out the coin lockout coil in the coin acceptor and reverses the transport motor. It also causes an  to be displayed on the 7 - segment LED status display on the computer control center.

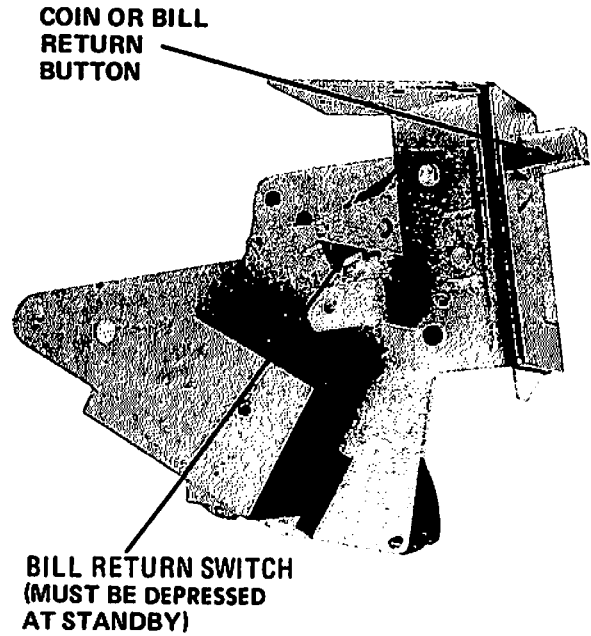


FIGURE 7. BILL REJECT SWITCH

## BURGLAR ALARM

The Burglar Alarm is a mechanically actuated, self-contained, gas operated horn making it immune to power interruptions or tampering. The alarm is armed when the top door is closed and locked. Normal unlocking with a key and opening of the top door by turning the T-handle lock does not disturb the alarm. The alarm is activated if an attempt is made to pry the door open at the shelf. A roll pin attached to the top door center lock bolt lifts a spring-loaded latch lever when an attempt is made to pry the locked door open. This latch lever then releases a spring-loaded slide bar mechanism which actuates the alarm. The alarm system can be re-armed by pulling the slide bar forward until it latches. A new can of freon may be installed by removing the spent can from its retaining clips and replacing it with the new can. Be sure the horn is screwed into the top of the new alarm can and faces to the back of the cabinet when installed.

## WARNING

**LIQUID FREON FROM THE POWER PACK CAN CAUSE SEVERE BURNS TO SKIN AND EYES. USE EXTREME CAUTION IN HANDLING CANS. DO NOT OVERTIGHTEN POWER PACK IN THE FOLLOWING STEP.**

## TEMPORARILY OUT OF SERVICE LAMP

This lamp is located on the top door above the bill and coin inlet area. It comes on whenever the machine is empty of change or shutdown due to some malfunction. The reset button on the computer control center must be pushed to turn the empty light off after the machine has been reloaded or if the malfunction is the kind requiring a manual reset.



## POWER CONTROL CENTER

All power supply and associated circuitry is located in this single subassembly for easy diagnosis and repair. The power control center (Figure 8) is located below the dispenser assembly and contains the vend counters, test switches, EMI filter, power transformer, power supply circuit board, +5 VDC regulator, power control relay, circuit breakers, on-off switch and bill acceptor motor capacitor.

The vend counters register the number of respective vends. These counters are not resettable and advance one count for every vend whether the dispenser is activated by a bill or coin, or by the test switches.

The three test switches are used to manually initiate a change dispense cycle for each of the 3 denominations of money inserted into the machine. The computer will not recognize a test switch closure if the machine is in the process of validating a bill, dispensing change or in shut-down.

The EMI filter removes undesirable noise from the incoming power line. The power transformer supplies 30 VAC and 11.5 VAC from which the rest of the system voltages are derived.

The removable power supply circuit board rectifies and filters the 30 VAC and 11.5 VAC to provide 40 VDC, 30 VDC (current limited) and 14 VDC to the rest of the system. It also contains indicator LED's for each of the above voltages as well as the +5 VDC. The circuit board can be removed by removing (2) screws and pulling the board up and out from the Power Control Center beneath the left hand hopper.

The +5 VDC regulator, is fed from the 14 VDC on the power supply board and supplies +5 VDC to all the lamps and detectors as well as the solid state coin switch assembly.

The computer control center has its own on-board +5 VDC regulated power supply which operates from +14 VDC generated by this power control center.

The power control relay switches the 40 VDC, 30 VDC, 30 VAC and 120 VAC. This relay is controlled by the computer control center and is energized under normal operating conditions. Under certain conditions the computer control center de-energizes the relay to disconnect the above voltages from the rest of the system and shuts down the machine. In this condition, the +40 VDC LED on the power supply board will be out while the other 3 remain lit.

This changer will shutdown for reasons other than an empty changer, specifically, if a fault or malfunction of the machine occurs. When the changer shuts down, a code number or letter will appear on the status display located on the computer board. This unique code will greatly aid the serviceman in quickly determining the malfunction or faulty part.

The BC-20 has no fuses. Instead, a total of 4 manual resettable circuit breakers protect the machine from fire and damaging short circuits.

Access to the power control relay is provided through a removable cover plate at the bottom front of the power control center. Access to this area of the power control center is through the base door.

A 7 amp circuit breaker is in the power line to the bill changer while the power transformer is protected by a 2 amp circuit breaker in the primary circuit and two 5 amp circuit breakers in the secondary circuits.

The on-off switch controls power to the machine.

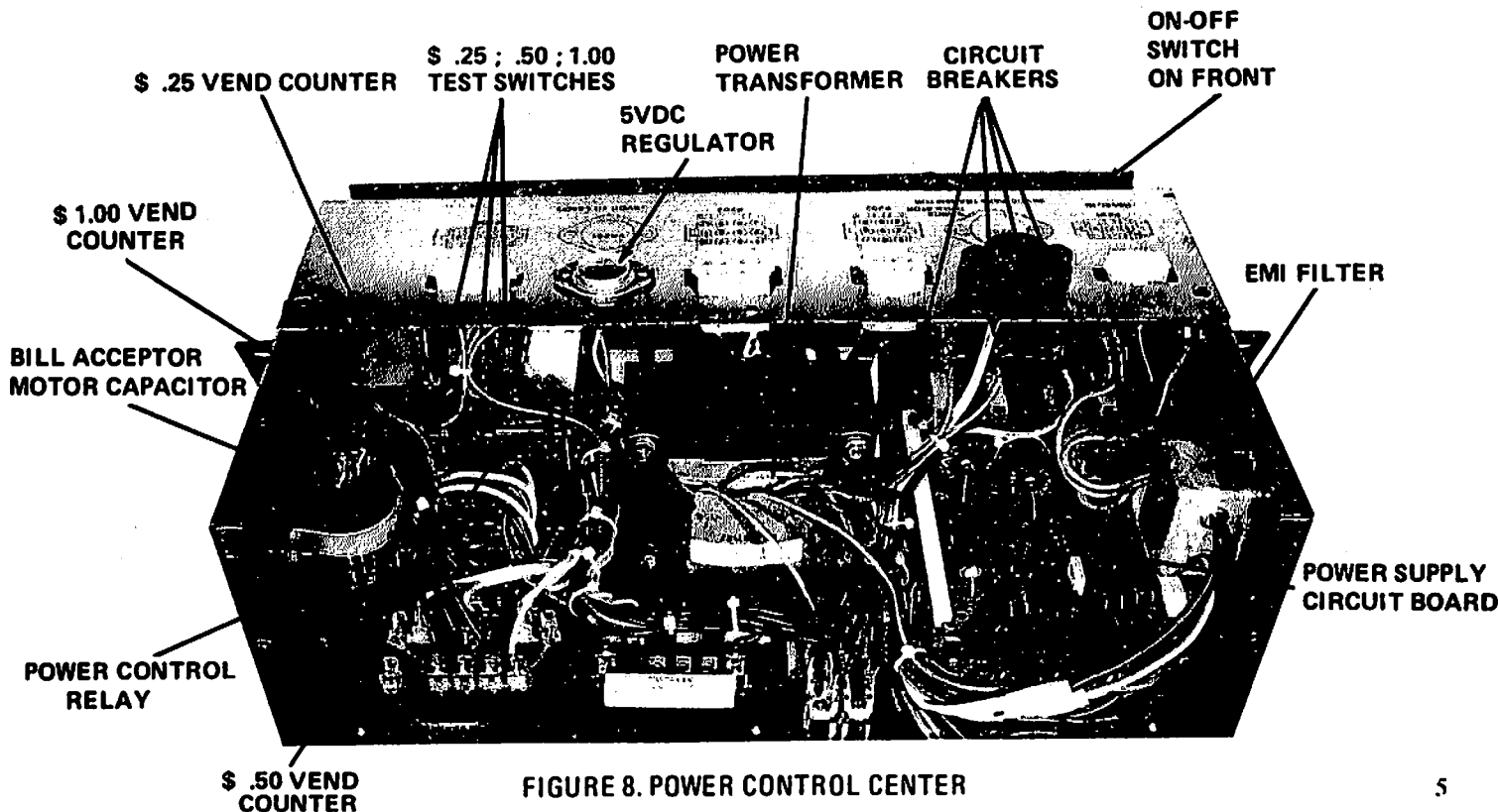


FIGURE 8. POWER CONTROL CENTER

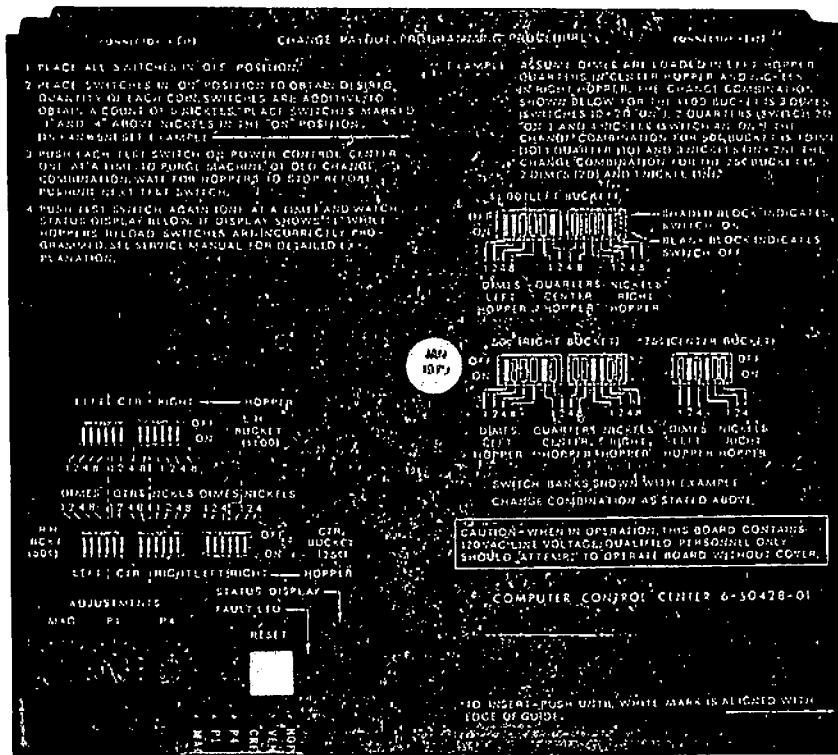


FIGURE 9. COMPUTER CONTROL CENTER

## COMPUTER CONTROL CENTER

The computer control center directs all of the operations of the bill changer including both the validation and change dispensing functions. It contains a microcomputer which is the "brain" of the system as well as the interface and drive circuitry necessary to monitor and control the rest of the machine. It also contains the following control and visual indicators.

**Change Program Switches** - Controls the change combination to be dispensed from each of the 3 change buckets. (See Section 2 for programming instructions).

**MAG Adjustment Pot & LED** - Allows adjustment of the noise threshold of the on-board magnetic amplifier. This amplifier is used in conjunction with the magnetic sensor in the bill transport in order to check for specific magnetic properties of bills. (See Section 2 for adjustment instructions).

**P1 & P4 Adjustment Pots & LED's** - Allow adjustment of the P1 and P4 silicon cells to compensate for light level variations. (See Section 2 for adjustment instructions).

**Reset Push-Button** - The computer control center shuts the machine down under certain abnormal conditions or when it is out of change. The bill changer can be put back into operation only by correcting the problem and then momentarily pressing the reset button. (See Section 2 for details).

**Status Display & Fault LED** - The computer control center contains a self diagnostic feature which is capable of detecting various malfunctions as well as certain normal conditions within the bill changer. The status display can show the numbers 1 through 9 and letters A through F, both with the fault LED either off or flashing. This provides an indication for 30 different conditions which may exist. (See Section 2 for a detailed explanation of these codes).

**Credit LED** - Flashes momentarily to indicate that the bill has been validated and the change dispensing cycle is enabled.

**Vend LED** - Indicates that one of the change buckets is energized, under normal conditions a short flash will be observed whenever change is dispensed.

**Hopper LED** - Indicates that one or more of the hopper motors is on. This occurs during the replenish cycle after change has been dispensed.

The computer control center also contains its own +5 VDC regulated power supply which is fed from the +14 VDC power supply on the power control center. This 5 VDC supplies power to the majority of the on-board circuitry. The exception is the mag amp which is powered by +30 VDC. When the decimal point LED on the status display is lit, it indicates that +5 VDC is present on the computer control center.

# SECTION 2 - INSTALLATION AND PROGRAMMING

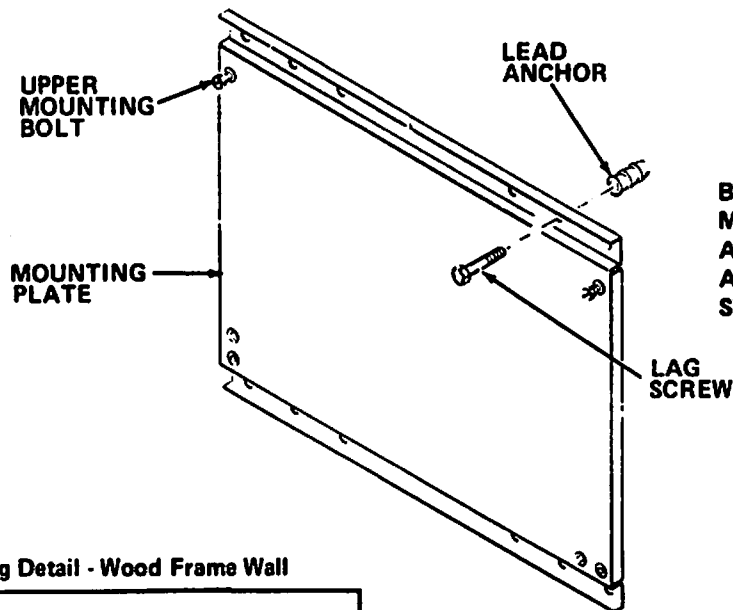
## INSTALLATION

Installation of the BC-20 Bill and Coin Changer requires no special instruction. For all methods of installation, be sure of a convenient power source and also be sure that the changer is mounted level. Questionable security, in some locations, may require that the base be bolted to the floor or wall. Use lag screws and lead anchors to assure adequate security when bolting to the floor.

The following illustrations and procedures should be used for wall mounting. For attachment to concrete or masonry walls use lag screws and lead anchors. For attachment to wood frame walls, use lag screws attached directly to the wall studs. If the wall is not flat, it may be necessary to add spacer washers between the wall and the mounting plate. The universal mounting plate is optional and can be ordered from your Rowe Distributor. Order Rowe part number 4-50194-01.

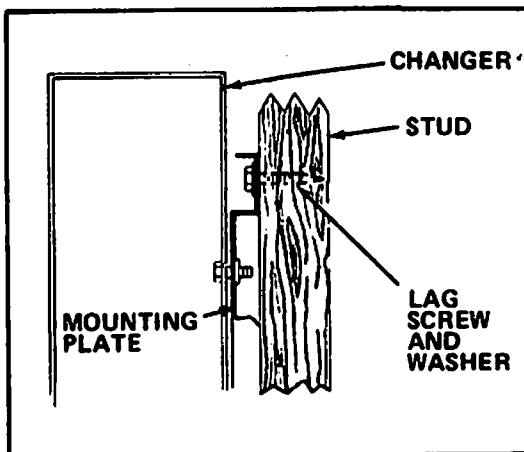
The universal mounting plate is secured to the location wall and the changer is then attached to the mounting plate.

- Install washer-head upper mounting bolts in mounting plate. (See Figure 10).
- Attach mounting plate to wall. Be sure mounting plate is level and flat against the wall. Use spacer washers if necessary. For adequate security use hex head lag screws at least 3/8 inch diameter by 3 inches long for attachment to wood frame walls. Use 3/8 inch hex head lag screws and lead anchors for attachment to concrete or masonry walls.



**NOTE**  
BE SURE LAG SCREWS USED FOR ATTACHMENT ARE AT LEAST 3/8" DIAMETER AND, FOR WOOD FRAME WALLS, ARE ATTACHED DIRECTLY TO THE WALL STUDS.

Mounting Detail - Wood Frame Wall



Mounting Detail - Masonry Wall

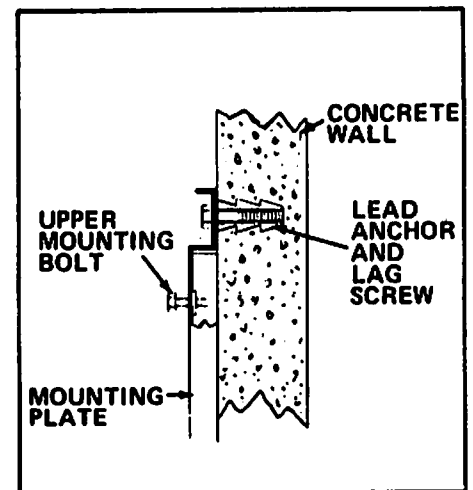


FIGURE 10. INSTALLING WALL MOUNTING PLATE

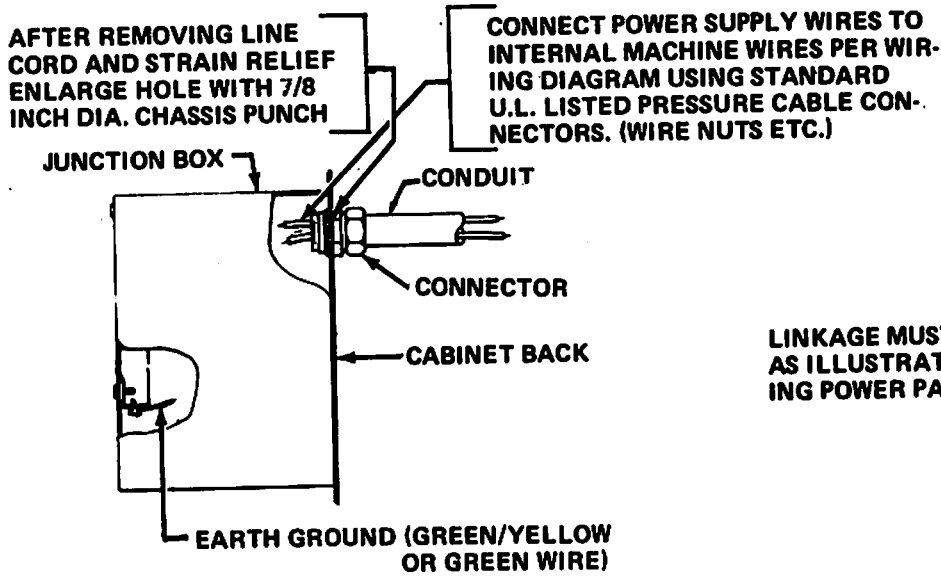


FIGURE 11. INSTALLATION OF 1/2 INCH CONDUIT

- If the changer is rigidly mounted to either wall or floor, it will be necessary to make the power input connection through rigid conduit into the changer to meet U.L. requirements. (See Figure 11).
- The back of the upper cabinet is dimpled in 4 places. Drill a 7/16" - 1/2" hole in each of these locations to accommodate a 3/8" bolt. Be careful when drilling into cabinet not to drill into internal components. (See Figure 12).
- Install upper and lower mounting bolts from inside changer cabinet.

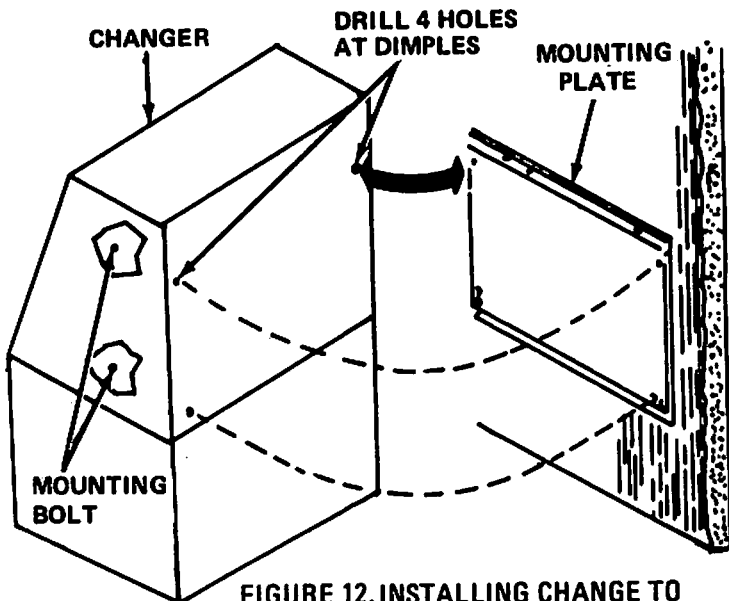


FIGURE 12. INSTALLING CHANGER TO WALL MOUNTING PLATE

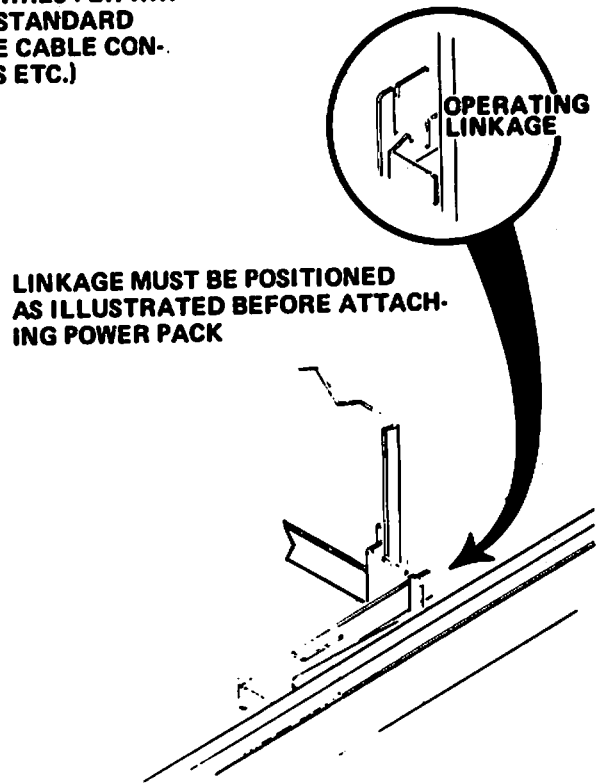


FIGURE 13. ALARM SYSTEM LINKAGE

## MONITOR ALARM SYSTEM

Extra security for your BC-20 Bill and Coin Changer is provided by the Monitor Alarm System. The alarm system is triggered by mechanical linkage whenever forced entry is attempted. The system should be armed only after placing the changer on location.

1. Be sure that alarm latch is set correctly at front of cabinet. (See Figure 13).

### WARNING

**LIQUID FREON FROM THE POWER PACK CAN CAUSE SEVERE BURNS TO SKIN AND EYES. USE EXTREME CAUTION IN HANDLING CANS. DO NOT OVER TIGHTEN POWER PACK IN THE FOLLOWING STEP.**

2. Screw power pack clockwise into horn. Secure firmly but do not overtighten.
3. Press alarm assembly (horn and power pack) into spring clips provided inside cabinet. Make sure that power pack sits firmly on floor of cabinet. Actuating shaft touching bottom of horn with horn facing to back wall of cabinet.
4. Test alarm system periodically by manually releasing linkage. After testing, rearmed alarm latch.

## PROGRAMMING

Machine is factory programmed as follows:

\$1.00	2Q	4D	2N
50¢	1Q	2D	1N
25¢	2D	1N	

If different change combinations are desired, use the following procedure:

Change payout programming is accomplished by three banks of rocker switches on computer control center. (See figure 14). Each switch bank controls change payout from one of three change buckets. Do not use a pencil to set rocker switches. The graphite particles could cause a short or intermittent condition. Any dollar change combinations can be programmed with any half-dollar or quarter change combinations provided that it conforms to hopper loading. Possible combinations are shown in table. Program another change combination as follows:

1. Push all switches off.
2. Push appropriate switches ON to obtain desired quantity of coins from each hopper.

### NOTE

Switches are additive. To obtain a count of 5, push ON switches 1 and 4 (as printed on micro-computer cover) to = 5.

**EXAMPLE** Assume loading in hoppers to be dimes in left hopper, quarters in center hopper and nickels in right hopper. Assume a desired change combination from \$1.00 bucket to be 2 quarters, 3 dimes, and 4 nickels. Push on the following switches on the \$1.00 switch bank. Dimes - push on 1 + 2 = 3 dimes. Quarters - push on 2 = 2 quarters. Nickels - push on 4 = 4 nickels.

Use the same procedure for setting the 50¢ and 25¢ switch bank. The switches shown in Figure 14 below are set for \$1.00 change = 3D + 2Q + 4N. 50¢ change = 1D + 1Q + 3N. 25¢ change = 2D + 1N.

## CAUTION

M.O.S. circuitry used on the computer control board could be damaged by static discharge. Handling of this board is not recommended. Both new and defective boards should be transported in their plastic housing.

Power must be turned off before removing or inserting boards.

3. Push each test switch on power control center one at a time to empty machine of old change combinations.

Push \$1.00 test switch again. Watch display on computer board, if display shows "1" while hoppers are reloading, it means you have not programmed the \$1.00 switch bank to give a dollars worth of change. Change dispensed will not total \$1.00. Repeat steps 2 & 3. If the program does total \$1.00, the display will remain blank.

4. Push 50¢ test switch and watch status display. If the display shows "1" the 50¢ switch bank is not programmed to give 50¢ change. If the program does total 50¢ the display will remain blank.
5. Push 25¢ test switch and watch status display.

### NOTE

If you desire to vend change that does not total \$1.00, 50¢, or 25¢, and want to program the machine to do this, feel free to do so. The machine will vend what you program. Just disregard to code of "1" which will appear every time the buckets reload.

6. The BC-20 is designed to give a maximum count of 15 coins or tokens from each hopper for both \$1.00 and 50¢ vends. The 25¢ vend will give a maximum count of 7 objects from each of the right and left hoppers. The center hopper will not operate for a 25¢ input signal.

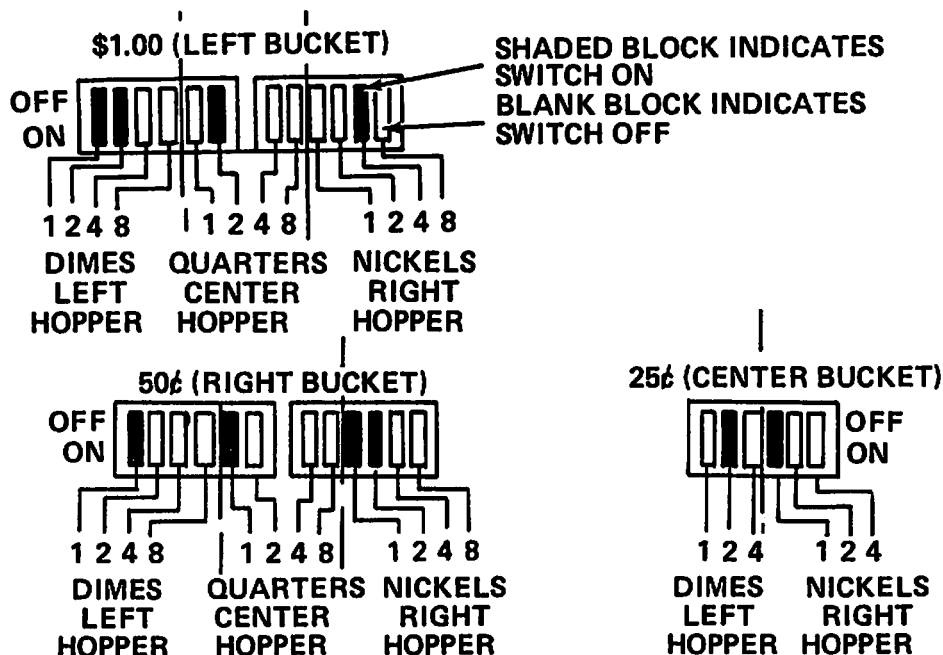


FIGURE 14.



## HOPPER LOADING AND UNLOADING

Hoppers used in the changer can be bulk loaded on location.

Load the hoppers as follows:

1. Hoppers can be loaded either in or out of machine. If hopper is to be loaded out of the changer, it should be suitably supported.
2. Check to see that hopper is loaded with proper value coins. When facing machine, left hopper must contain dimes, center hopper, quarters and right hopper, nickels.
3. Twist top of full coin bag one full twist. Grasp twisted top firmly with one hand and hold bottom of bag with other. Invert bag and insert twisted top into mouth of hopper. (See Figure 15).

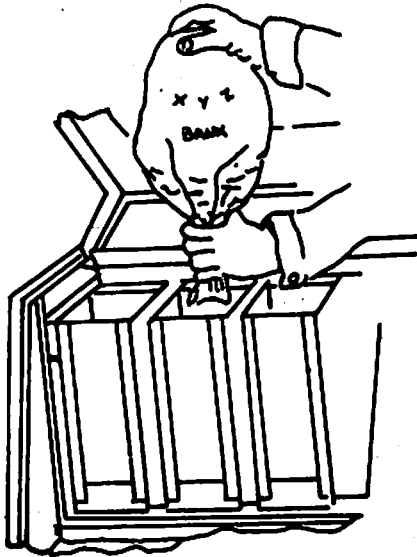


FIGURE 15. LOADING HOPPERS

4. With open end of bag in hopper, slowly release hand holding twist as bag empties. Extreme care must be taken to avoid spilling coins into mechanism of bill changer. Completely empty bag by grasping at bottom and shaking to dislodge coins in folds and twist of bag.
5. Load coin buckets with change by pressing \$1.00, 50¢ and 25¢ test switches, one at a time. Wait for all hopper motors to stop before pressing test switch. Press each switch again, one at a time, and count change.

Unload hoppers as follows:

1. Place opening of bag over mouth of hopper wrapping lip of bag around handle. Grasp bag and handle with one hand and slowly tip hopper forward while holding bag against front of hopper. (See Figure 16)

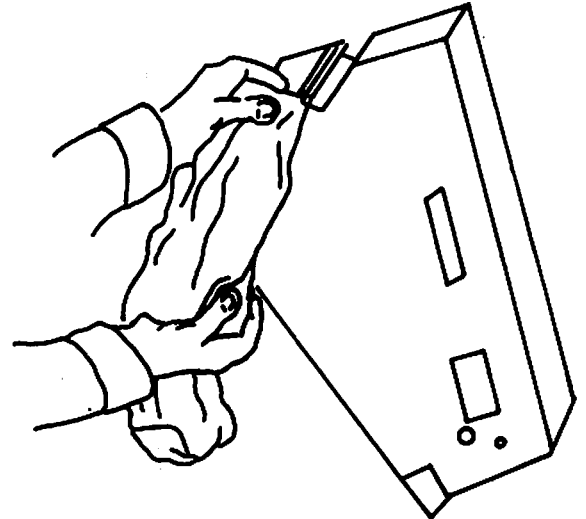


FIGURE 16. UNLOADING HOPPERS

2. Tip hopper forward until rubber bumpers contact front trim. Tap bumpers against trim and return to upright position. Repeat two or three times.
3. Hoppers can also be emptied by lifting up and out to remove pivot pins from brackets. Hopper now may be emptied away from machine by inverting over bag.

### CAUTION

**WHEN REPLACING HOPPER, BE SURE IT IS SECURELY IN PIVOT BRACKETS AND SNUG AGAINST BACK PLATE.**

4. Push test switches one at a time, to empty change from change buckets. Turn the power switch off and then on between each test switch operation.

## LOCK CYLINDER SECURITY

Included in the miscellaneous parts assortment is Kit No. 2-51575-01 (Armor Plate Kit) for use with National Key Set Locks.

The kit contains protective plate with nuts and screws for mounting after the lock cylinder is installed.

## OPERATIONAL INFORMATION

This bill and coin changer uses several visual indicators and controls. The location of these controls and indicators are as follows:

On-Off Switch	Located on front surface of Power Control Center.
Circuit Breakers	(4 total) - Located on front surface of Power Control Center.
Vend Counters	(3 total ) - Also located on front of Power Control Center.
Test Switches	(3 total) - Located under hinged cover on front of Power Control Center.
Voltage LED's	5 total: (+5 VDC, +14 VDC, +30 VDC, & +40 VDC)-Located on edge of Power Supply Board visible from front of Power Control Center;(+5 VDC computer board supply)- decimal point on status code display on Computer Control Center.
Reset Switch	Located on Computer Control Board.
Change Program Switch Banks	(3 groups of 12 switches each ) - Located on Computer Control Board.
Status Display and Fault LED	Located on Computer Control Board.
P1, P4 Mag. Pots. and LED's	Located on Computer Control Board.
Credit, Vend, and Hopper LED's	Located on Computer Control Board.
Bill Return Switch	Located behind bill return button on front of machine.

## POWER TURN ON

Turn on power switch. Briefly, you will see the "Out of Service" lamp and one or more LED's on the computer board flash. The status display will also flash "F" as the switch is turned on. All 4 voltage LED's on the power supply board should now be on and the display should be showing a decimal point. This decimal point indicates that voltage is present at the computer board.

The P1, P4, and/or mag LED's may remain on and the display may show a "3" or a "b". This merely indicates P1, P4, and/or mag is not adjusted properly. These will be adjusted in the following steps. If "b" is showing on display, P4 should always be adjusted first, then P1.

If the P1 and P4 LED's are out at this time, the coin lock-out solenoid will be energized, and so will the power relay inside the Power Control Center.

This power relay controls all power to the machine except the Computer Control Board. It remains energized as long as the machine is in operation. It is controlled by the computer and de-energizes, or drops out, only in the event of a malfunction or fault.

A convenient way to check the state of this relay is to observe the 4 voltage LED's on the power supply board. If the +40 VDC LED is out while the other 3 are lit, most likely the power relay has dropped out. When the power relay drops out, the +40 VDC LED will slowly fade out. It takes approximately 3 to 4 minutes to discharge the capacitor to a point where the LED is out.

## ADJUSTMENTS

### P4 CELL ADJUST

If the P4 LED is not already lit, turn the P4 adjust pot counterclockwise until the P4 LED comes on. Also, the "Out of Service" lamp will light, the fault LED will flash and the status display will show a "b". This is a normal condition in this case. It merely indicates P4 cell is covered when it should not be.

Now, turn the P4 pot 1-2 marks (1/8 turn max.) clockwise beyond where the P4 LED goes out. P4 cell is now adjusted.

### P1 CELL ADJUST

If the P1 LED is not already lit, turn the P1 adjust pot counterclockwise until the P1 LED comes on. The transport motor will start running in the forward direction, the bill pressure solenoid will energize, and the coin lockout solenoid will drop out.

Now, turn the P1 pot clockwise until the P1 LED goes out, then 1-2 marks (1/8 turn max.) beyond. The transport motor will reverse, then stop in about one second with the pressure solenoid dropping out and the coin lockout solenoid energizing. P1 cell is now properly adjusted.

If P1 LED is left on for 5 - 6 seconds, the transport motor will stop and the display will show a "3" (which means that P1 cell was covered too long). To restore machine to service adjust P1 pot as described above.

The P1 cell adjustment on the BC-20 is somewhat more sensitive than it was on earlier Rowe changers. If the P1 pot is turned too far clockwise, bills may be rejected with a code of "4" or "7". It is better to be slightly under 1/8 turn than over on the P1 adjustment pot setting.



## MAGNETIC SIGNAL ADJUST

This adjustment is actually a noise threshold adjustment and, while not nearly as sensitive as earlier "gain" adjustments, provides the means of adjusting out the influence of external electrical noise. This adjustment is dependent on the environment and a final adjustment should be done when the machine is installed on location prior to putting the machine into service.

Push and hold in bill return button. Transport motor will start in reverse. Coin lockout solenoid will drop out, bill pressure solenoid will pull in and status display will show "8". While holding the bill return button in, turn the MAG adjust pot clockwise until the MAG LED begins to flash intermittently.

Now back off the MAG pot (turn counter clockwise) 1 mark. If the MAG LED does not flash or blink with the pot turned fully clockwise, it indicates that the noise level is below the range of the adjustment. In this case the proper pot setting is 1/8 turn (2 marks) counterclockwise from the full on position.

Release the bill return button. The BC-20 is now properly adjusted.

## SELF DIAGNOSTICS

### DIAGNOSTIC CHECK

The self diagnostic features of the BC-20 are centered around a "status" display and an adjacent "fault" LED. This display can show the numbers 1 - 9 as well as the letters A, b, C, d, E, and F, both with the Fault LED off or flashing.

If the status display is showing one of the above characters and the Fault LED is flashing at the same time, there is a fault or malfunction of the machine. In this case, the machine must be repaired before restoring to service. For an explanation of what these codes mean, refer to section 4 entitled Status Codes.

Several things should be explained at this time:

1. **THIS STATUS CODE WILL BE LOST IF POWER TO THE MACHINE IS DISRUPTED OR IF THE RESET BUTTON IS PUSHED.** Always read status code and identify fault before turning power off. However, if the fault still exists the status code will reappear when power is restored.
2. Status codes 2, 3, 4, 5, 7, E, and F with the Fault LED flashing indicate malfunctions that could result in incorrect change loads in one of the change buckets. These faults will always require a service call to correct. Just before going into shutdown, the machine will deliberately cycle the stacker away from its home position.

When one of the above status codes or code "d" is displayed, (with the Fault LED flashing) the only way the machine can be restored to service is by pressing the reset switch after the problem has been corrected. Turning the power back on without pressing the reset switch will result in a status code of "1" with the Fault LED flashing. This indicates that power was disrupted to the machine while it was in shutdown, but because of the possible incorrect change load in one of the buckets, it was not allowed to go back into service.

3. If the code "F" is shown, the Fault LED is flashing, and the hopper LED is on, the reset switch will have no effect. This means that the +14 VDC supply to the computer control center is below approximately 8 VDC and the system is in continuous reset. To restore the machine to operation, correct the cause of low input voltage.
4. Status codes 6, 8, 9, A, b, and C with the Fault LED flashing represent malfunctions that will not result in wrong change in the buckets. If the malfunction or fault somehow self-corrects (a stuck switch frees itself or a lamp comes on again due to a poor connection) the machine will automatically go into operation again.
5. When the Fault LED is flashing, the "Out of Service" lamp will be lit. Under no circumstances should one of these indicators be operating without the other.
6. If the status display ever shows "0", or if the Fault LED is ever flashing with the status display OFF, the computer control center should be replaced.

If the status display is showing a character (1 - 9 and A - F) and the Fault LED is off, there is probably no fault or malfunction of the machine. It is telling the operator why an abnormal condition occurred. In most cases, this is why a bill was rejected.

If a bill is rejected the bill pressure solenoid will energize, the transport motor will reverse and return the bill to the customer. The transport will stop, however, with the tail-end of the bill still hanging in the front of the transport and P1 cell still covered. The status display will now show one of the status codes, but the Fault LED will be off.

The status code will be displayed for as long as the bill is left hanging in the transport. However, if the bill is left in the transport for longer than 30 seconds, the machine will go into a "Self-clear" routine. Once it is removed the status code is lost and the machine is ready to accept bills or coins again.

**THIS STATUS CODE WILL ALSO BE LOST IF THE POWER IS DISRUPTED, OR IF THE RESET SWITCH IS PRESSED.**

For an explanation of what these codes mean, refer to the section 4 entitled "Status Codes".

To check out the status codes, create the fault listed and see if the proper status code is generated on the status display.

## TRANSPORT SELF CLEAR CHECK

If a bill becomes jammed in the transport, the BC-20 automatically tries to clear it out itself before going into shut down. To check out this feature:

Insert bill into transport upside down. Bill will reject and stop hanging out of transport. Status display will show "4" with Fault LED off.

Hold bill in transport. Do not uncover P1 cell. In 30 seconds the transport will start to cycle reverse-forward-reverse-forward-reverse. It will do this 3 times if P1 cell is kept covered. Then motor will stop. Out of Service lamp will turn on and status code will change to "6" with Fault LED flashing. (If P1 cell is uncovered any time during the self clear cycle, the machine will automatically go back into operation). To restore machine to service, push reset switch.

## ACCEPTANCE CHECK

To aid in checking acceptance, set all dollar coin change program switches to "OFF". This will allow checking out the validation portion of the system without having the hopper motors run.

Insert a dollar bill upside down. Bill should reject and display should show a code of "4" with Fault LED off.

Insert the dollar bill correct side up, but backwards. Bill should reject with a code of either "4" or "7" with fault LED off.

Now insert the dollar correctly. It should accept, the stacker should operate, and the dollar bucket should dump. (Since all program switches are set to "OFF" the hoppers should not operate). The dollar vend counter should also advance 1 count.

Also, as the bill moves through the bill acceptor, check to insure that the following visual indicators operate:

1. The P1 and P4 LED's should light in sequence.
2. The Mag LED should flash several times.
3. The CREDIT and VEND LED's should flash in sequence.
4. The status display should show a "1" for about 2 seconds then go out. (See status code chart for explanation of this code. As the display goes out, the coin lockout solenoid should energize and the machine is ready for the next bill.

## MISCELLANEOUS

The BC-20 was designed to be simple and easy to trouble shoot. Please take time to study the operation of the machine and to study the explanations of the various status codes.

The following is a list of incidental characteristics that may be of interest to the operator and service man.

1. The external lockout, described on the status code "A" with flashing Fault LED is not connected on the BC-20. It is used, along with the external credit line, for other applications.
2. Both the coin acceptor and the bill acceptor are locked out during the dispense and replenish cycle. Also, the coin acceptor is locked out during the bill validation cycle as soon as the P1 cell is covered.
3. The +5 VDC voltage from the power supply does not control the computer board. It is used to provide voltage to lamps (dispenser, transport, and display), and the solid state coin switch assembly. The computer board is powered primarily by the +14 VDC voltage from the power supply. It has its own +5 VDC regulator.
4. The bill return switch is disabled during the latter portion of the validation cycle and the entire dispense and replenish cycles.
5. The reset switch is disabled during the entire validation, dispense, and replenish cycle.
6. If power is disrupted during a dispense or replenish cycle, the machine will immediately reset upon power turn on. There will be an incorrect change load in one of the buckets. This is same as the BC-9 series changers.
7. Blocking the coin photo detectors with your fingers, or with foreign objects during replenish cycle may result in wrong counts. If the detectors are blocked too long, the machine will shut down with a code of "7" (Fault LED flashing). If the wrong count is entered the display may show a "5" (see status chart). Either condition will put the machine in a shutdown mode.
8. Always turn power OFF when removing circuit boards. Avoid touching the connectors when handling these assemblies
9. If the power supply board requires removal, wait for the +40 VDC LED to fade out before removing board. This will prevent arcing if the circuit is accidentally grounded to the cabinet or chassis.
10. When the machine is turned on there is 120 VAC voltage on the Computer Control Board. If, for any reason, this board is plugged in without its cover on, BE CAREFUL!
11. + 14 VDC to the Computer Control Board should be present whenever the power switch is on. It is necessary because even though the machine is out of service, or shutdown, the computer is still monitoring and controlling the operation of the changer.

## SECTION 3 - ROUTINE SERVICE

### INTRODUCTION

In order to maintain control over money used for change dispensing, each changer should be charged with a predetermined amount of cash. The inventory should be checked monthly as a precaution against malfunction and theft. Inventory control is most easily accomplished by using the replacement method of servicing. Using this method, all bills and coins are removed by the routeman and the empty hoppers are refilled with a predetermined amount of change. The money removed is returned and all cash is counted against the charged inventory. Any discrepancy is easily detected at this time.

Service frequency on the changer is directly related to the inventory of change maintained and customer usage. Check changer usage daily and schedule service as required.

### REMOVING JAMMED BILL FROM BILL ACCEPTOR

If when servicing the changer a jammed bill is discovered, removal is easily accomplished in the following manner:

1. Unlock and open door.
2. Unplug bill acceptor track harness and pull acceptor out to stop.
3. Pull out retainer rod.
4. Carefully lift up top track.
5. Remove jammed item from tracks.

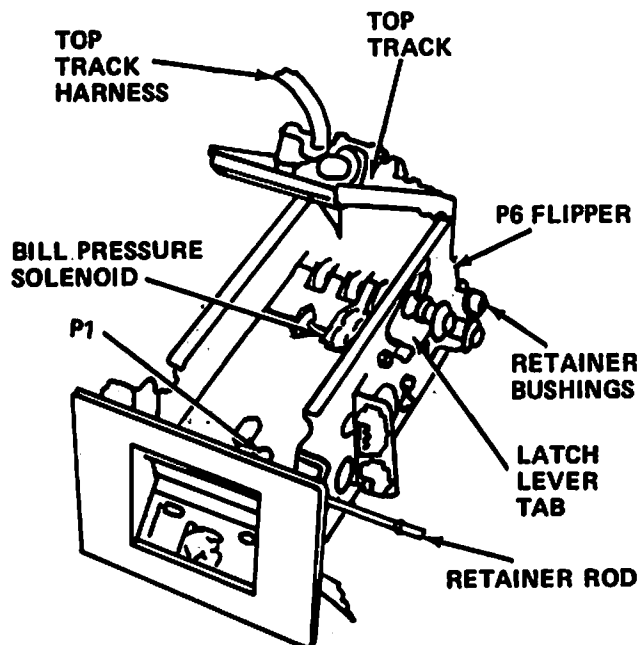


FIGURE 17. REMOVING JAMMED BILL

6. Carefully place track down, and re-insert retainer rod and harnesses.
7. If jam cannot be removed by this procedure, turn off power, unplug and remove bill acceptor by lifting up latch lever tab and pulling out acceptor.
8. Remove retainer rod.
9. Pull out retainer bushings on ends of track, and lift out top track assembly.
10. Reassemble in reverse order, and re-install acceptor in changer.

### BILL JAMMING CHECK LIST

If frequent bill jamming occurs, perform the following checks and corrective procedures. (See Figure 17)

1. Make sure that all drive pulleys on both sides of bill transport are tight on their respective shafts.
2. Both drive belts must not be too loose or too tight.
3. Rubber drive rollers must not be loose or worn.
4. P6 flipper must work freely.
5. All nylon idler rollers in top track assembly must rotate freely and move up and down freely on their respective slots. The retaining springs must also slide without bind in the guide slots and exert adequate force on the idler roller.
6. Pressure solenoid must operate when P1 is covered and when unit goes into reverse.
7. Top track must be properly seated into bill transport with retaining bushings snapped into place and the retaining rod in place.
8. Both top and bottom track bill surfaces must be free of dirt, moisture, burrs, projections, rough spots, etc. which might drag or hang up on the surface of bill.
9. Top and bottom tracks must be parallel to each other with approximately 5/64 spacing between them.
10. Magnetic head must have a bevelled edge on both front and back to keep both bill edges from becoming caught in forward or reverse.

## LOADING AND EMPTYING OF COIN BUCKETS

The dispensing mechanism operates on an escrow principle. Change for a vend must be in coin buckets when the customer inserts a bill. After change is dispensed, the buckets must immediately refill for the next customer. Because of this, there are steps which must be followed when filling or emptying the changer, or when resetting the changer if it has shut down.

### FILLING THE CHANGER

When filling a changer that is empty, the coin buckets must be filled with their proper load of coins before the machine can be put into operation. After hoppers have been loaded and are in place, turn power switch ON and depress DOLLAR TEST SWITCH once. This will start hoppers and load the dollar coin bucket with the proper coins. Wait until hopper motors have all stopped and press DOLLAR TEST SWITCH again. Proper change should be dispensed and hopper motors will start to refill the buckets again.

Repeat the above procedure for the 50¢ TEST SWITCH and 25¢ TEST SWITCH. The machine should now be ready for operation.

#### CAUTION

**ALWAYS WAIT UNTIL ALL HOPPER MOTORS ARE STOPPED BEFORE PRESSING ANY TEST SWITCH. THE SYSTEM WILL IGNORE ANY TEST SWITCH PRESSED WHILE THE CHANGER IS IN VALIDATION OR REPLENISH CYCLE.**

### EMPTYING THE CHANGER

To empty the changer of all coins, first empty all hoppers according to instructions on label on top door. When hoppers are emptied, there are still coins remaining in the change buckets. Press the test switches, one at a time, to empty these remaining coins. Turn the power switch off and then on between each test switch operation.

### COIN INLET CLEANING PROCEDURE

A unique coin inlet design incorporates a built-in cleanout capability as follows:

1. Remove screw from lower front side of inlet as shown in figure 18. Grab tab as shown and rotate clean-out guide up and out of the way.
2. Insert the end of a wire coathanger into the slot and drag out jammed material through front opening. One side of the inlet is clear plastic to permit viewing the interior.
3. After cleanout, rotate guide back down into place and replace screw.



FIGURE 18. CLEANING COIN INLET

## COIN HOPPER CLEANING PROCEDURE

The coin tracks are teflon coated to minimize dirt build-up. It may still be necessary to clean them at regular intervals, as dictated by the number of vends and the environment,, to prevent dirt accumulation in the coin path.

Failure to keep the coin path clean may result in coins sliding out of the track, indicating empty condition even though the hopper contains sufficient coins. Clean the hoppers as follows:

1. Remove hopper from bill changer and place on a working surface.
2. Using nylon hopper cleaning brush, part no. 2-70239-02, remove dirt from the angular sides and flat surfaces of the serpentine coin path as shown in figure 19

### CAUTION

**DO NOT USE DETERGENTS TO CLEAN HOPPER. HOPPER HAS BEEN FACTORY LUBRICATED AND DETERGENT CLEANERS DESTROY THIS LUBRICATION.**

3. Install hopper in bill changer and test vend to check for proper operation.

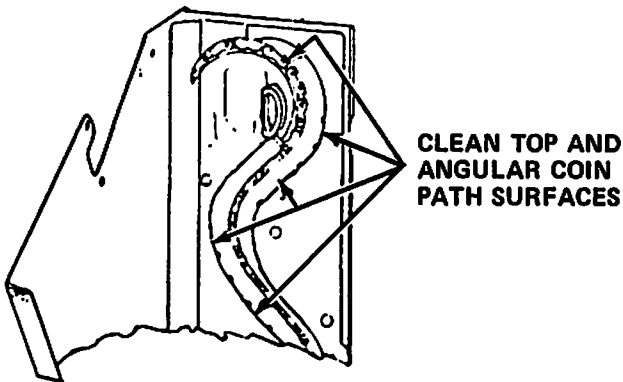
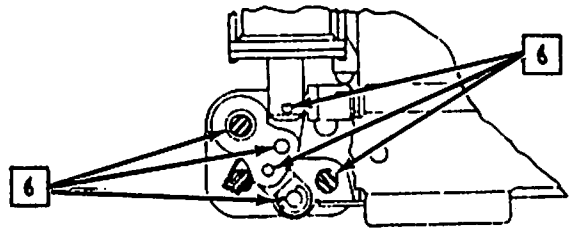


FIGURE 19. CLEANING HOPPER COIN PATH  
CHAIN LUBRICATION IS NOT NORMALLY REQUIRED

## CHANGE BUCKET LUBRICATION

The coin dispenser change bucket door pivots, links, hubs and bell cranks are factory lubricated with light machine oil Rowe Spec. No. 2-01379-00 (3 in 1 Electric Motor Oil can be used). If change bucket is worn beyond repair, order and install Kit No. 2-70258-01 (one kit required for each bucket).

For reliable performance, the lubrication should be renewed annually by applying one drop of oil at the points shown below in figure 20 .



- 6** APPLY ONE DROP OF LIGHT MACHINE OIL PER SPEC. 2-01379-00 OR 2 in 1 ELECTRIC MOTOR OIL TO ALL LINKAGE PINS AND SHAFTS AT BEARING CONTACT POINTS WITH DOORS, LINKS, HUBS, BELLCRANKS ETC. APPROXIMATELY 30 PLACES.

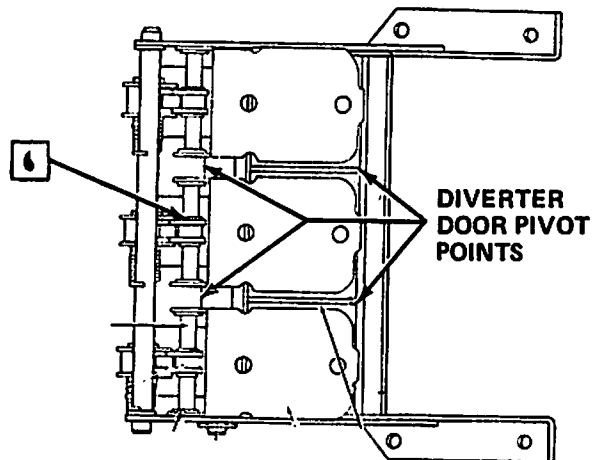


FIGURE 20. CHANGE BUCKET LUBRICATION

## SECTION 4 · TROUBLESHOOTING

### INTRODUCTION

The BC-20 incorporates major assemblies and components as field replaceable plug-in units. There are several on-board diagnostic indicators on these assemblies. The information in this section takes full advantage of this design by isolating possible malfunctions to one or more of these basic plug-in units. This method saves time and requires little training in electronics. Troubleshooting data requiring a higher level of skill is listed in a separate manual part number 3-65355-01.

The most significant troubleshooting aids for BC-11 are the on-board LED's and the status code display LED on the Computer Control Center in particular.

### OPTIONAL MACHINE SERVICE KIT AND DIAGNOSTIC AID

A diagnostic aid is available to make troubleshooting less difficult and time consuming. The aid consists of a circuit board with a series of red LED indicators. This diagnostic aid is plugged into the circuit board edge connectors to check for defects that might damage replacement circuit boards.

If all specified diagnostic tests are O.K., it is O.K. to plug in a replacement board. Refer to the troubleshooting manual supplied with the aids for instructions on what to do.

Table lists diagnostic aids and service kit.

PART NO.	DESCRIPTION	APPLICATION
*6-70013-05 (For BC-20 & BC-11) *6-70013-07 (For BC-25)	Machine Service Kit includes diagnostic aid kit plus spare parts for whole machine in a special fitted case.	Plugs into Computer Control Center and Power Control Center. LED indicators check inputs at connector pins for shorts, open circuits and in some cases voltage and signals.
*6-70013-06	Diagnostic Aid Kit Only.	

\*Used in machine with power on and in test condition - machine is not operable.

# BC-20 & BC-25 STATUS CODES

If "Fault" LED is flashing, out of service lamp will also be lit. This status code represents a malfunction of the machine. This status code will be lost if power to machine is disrupted, or if reset button is pushed.

If fault LED is off. Status codes that normally have fault LED off appear only for a short period of time, either while hopper motors are running or when a bill has been rejected and bill is still in transport.

If changer is setting idle or is inoperative and the status display is showing a code with fault LED OFF, most likely the out of service lamp or fault LED is defective. Read the status code displayed, then test fault LED (See page 22). If fault LED does not flash, refer to the chart of code you observed WITH FAULT LED FLASHING.

Note: Don't forget to repair fault LED circuit also.

If a segment of the display is burned out, an incorrect or misleading character could be displayed. To avoid troubleshooting the wrong problem, always check to see if all segments of the display are working. This is done by pressing the bill return button and watching display. Display should show "8". When bill return button is released, original fault code will again appear.

It should be noted that once a fault has been identified, these charts suggest replacement of a modular subassembly rather than an individual component. This is to minimize on-location down time.

# STATUS CODE INDEX

PAGE

CODE DISPLAY

PAGE

CODE DISPLAY

PAGE

CODE DISPLAY

41 DISPLAY SHOWS "5" (B) FAULT LED OFF

41 DISPLAY SHOWS "6" (B) FAULT LED FLASHING

42 DISPLAY SHOWS "7" (B) FAULT LED OFF

42 DISPLAY SHOWS "8" (B) FAULT LED FLASHING

43 DISPLAY SHOWS "9" (B) FAULT LED OFF

43 DISPLAY SHOWS "0" (B) FAULT LED FLASHING

44 DISPLAY SHOWS "1" (B) FAULT LED OFF

45 DISPLAY SHOWS "2" (B) FAULT LED FLASHING

46 DISPLAY SHOWS "3" (B) FAULT LED OFF

47-48 DISPLAY SHOWS "4" (B) FAULT LED FLASHING

32 DISPLAY SHOWS "5" (A) FAULT LED OFF

33 DISPLAY SHOWS "6" (A) FAULT LED FLASHING

34 DISPLAY SHOWS "7" (A) FAULT LED OFF

35 DISPLAY SHOWS "8" (A) FAULT LED FLASHING

36 DISPLAY SHOWS "9" (A) FAULT LED OFF

37 DISPLAY SHOWS "0" (A) FAULT LED FLASHING

38 DISPLAY SHOWS "1" (A) FAULT LED OFF

38 DISPLAY SHOWS "2" (A) FAULT LED FLASHING

39 DISPLAY SHOWS "3" (A) FAULT LED OFF

39 DISPLAY SHOWS "4" (A) FAULT LED FLASHING

40 DISPLAY SHOWS "5" (A) FAULT LED OFF

40 DISPLAY SHOWS "6" (A) FAULT LED FLASHING

22 TO TEST FAULT LED

22 TO TEST DISPLAY

23 DISPLAY LIT - FAULT LED OFF

23 DISPLAY SHOWS "0" OR FLASHING

24 DISPLAY SHOWS "1" FAULT LED OFF

25 DISPLAY SHOWS "1" FAULT LED FLASHING

26 DISPLAY SHOWS "2" FAULT LED OFF

27 DISPLAY SHOWS "2" FAULT LED FLASHING

28 DISPLAY SHOWS "3" FAULT LED OFF

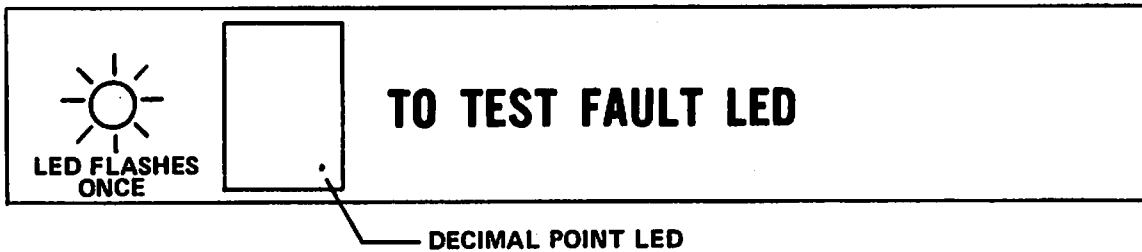
29 DISPLAY SHOWS "3" FAULT LED FLASHING

30 DISPLAY SHOWS "4" FAULT LED OFF

31 DISPLAY SHOWS "4" FAULT LED FLASHING



# STATUS CODE



Turn power switch OFF, then back ON .

"FAULT" LED will flash momentarily.

Display will flash "F".

If this does not happen, check "Out of Service" lamp and wiring to lamp.  
If O.K., look to see if decimal point on display is lit. If it is, replace  
Computer Control Center.

If decimal point is off, check 14 VDC LED on power supply.

If it is lit, check 14V wiring. If wiring O.K., replace Computer Control Center.  
If not lit, check Power Supply.

**NOTE:** Performing this test while machine is displaying a status code will result  
in loss of code.



Push bill return button and hold in.

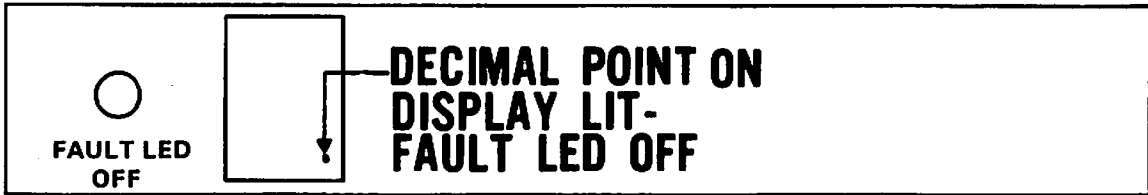
Display should show "8" with decimal point.

If any segment or decimal point not lit, display or display driver is defective.  
Replace Computer Control Center.

If display blank, check + 14 VDC LED on power supply. If not lit, check power  
supply. If lit, check 14V wiring. If wiring O.K., replace Computer Control Center.

# STATUS CODE

BLANK &  
CODE 0



This is the normal operating condition.

Decimal point indicates +5 VDC at computer board.

If decimal point not lit, check +14 VDC LED on power supply. If LED lit, check 14V wiring. If wiring O.K., replace Computer Control Center. If 14 VDC LED not lit, check power supply.



The Number "0" is not allowed.

If display is showing "0" most likely display or display driver has failed. Replace Computer Control Center.

# STATUS CODE



## **HOPPER MOTOR(S) NOT RUNNING - HOPPER LED OFF BILL HAS BEEN REJECTED - END OF BILL IS IN TRANSPORT**

Bill was rejected because P1 cell was not covered long enough.

The bill may have been torn on the right side or torn or folded over at the trailing edge of bill.

If bills are rejected frequently with this code:

P1 adjustment pot may be adjusted too far clockwise, readjust P1 pot.

P1 cell may be giving intermittent signal. Check P1 cell for proper switching. If cell is O.K. check wiring from P1 cell to computer control center for possible short to chassis.

+ 5 VDC supply to lamps may be below 4.5 VDC. Check voltage. If low, replace VR201 regulator on Power Control Center (Part No. 2-00365-01).

If all of above is O.K., replace Computer Control Center.

### **BC-20 ONLY**

## **HOPPER MOTOR(S) RUNNING - HOPPER LED ON**

Program switches on computer board are not set for \$1, 50¢ or 25¢. One or more switch groups is programmed for some other change combination which does not total \$1, 50¢, or 25¢.

To determine which switch groups are set this way, test vend for \$1 and watch display while hoppers replenish. If display shows no code, change loaded into bucket totals \$1. If display shows "1" while hoppers run, change combination set into dollar switch group does not total \$1 and new change load in bucket will be incorrect.

If switches are set correctly, and code "1" still shows, a switch is defective and the computer Control Center should be replaced.

Repeat above sequence for 50¢ and 25¢ test vends in turn to check these programs.

**NOTE:** If you have deliberately chosen to set switches to combinations which do not total to \$1, 50¢, or 25¢ disregard this code. Machine will operate correctly and code will go out when all hoppers have stopped.

### **BC-25 ONLY**

This code flashes briefly during a \$1.00 vend to give the serviceman a visual indication that computer has validated bill as being a legitimate \$1.00 bill.

If bill is left in transport 30 seconds, machines will go into self-clear (5 seconds on BC-25).

# STATUS CODE

 FAULT LED FLASHING		<b>DISPLAY SHOWS "1" FAULT LED FLASHING</b>
------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	-------------------------------------------------

Power to machine was disrupted while the changer was in shutdown and was displaying one of the codes 2, 3, 4, 5, 7, d, E, or F and the Fault LED was flashing. Hopper LED will be lit, but hoppers will not be running.

Most likely there will be an incorrect change load in one of the change buckets.

The actual initial fault cannot be identified due to loss of power.

Reset changer (press reset switch) and see if changer goes back into shutdown. If it does, it will display a new code identifying fault.

If it does not shutdown, refer to troubleshooting chart "Bill Changer Shutdown - Out Of Service lamp lit - status display showing "1". (Fault LED flashing)" for a procedure on how to identify the initial cause of shutdown.

**NOTE:** The bill stacker has been deliberately cycled away from home when the machine is in this status. It will return when machine is reset.

For a more complete troubleshooting sequence, refer to the appropriate troubleshooting chart for this fault.

# STATUS CODE



Bill was rejected because P4 or P6 cell was active too soon after P1 was uncovered.

Computer sees object as being too long to be a legitimate bill.

If bills are frequently rejected with this code:

Check for small piece of paper or other foreign object in track.

If track is clear, check P4 adjustment. P4 pot may be set too far counterclockwise.

P6 flipper may be binding or hanging up on back rollers. Check for flash or burrs on flipper and back rollers.



P4 or P6 cells may be giving intermittent signals. Check cells for proper switching. If cells are O.K. check wiring from P4 and P6 cells to Computer Control Center.

+ 5 VDC supply may be above 5.5V. Check voltage. If high, replace VR201 regulator or check power supply.

If all of above O.K., replace Computer Control Center.

If bill is left in transport for 30 seconds, machine will go into self-clear (5 seconds on BC-25).

# STATUS CODE

 FAULT LED FLASHING		<b>DISPLAY SHOWS "2" FAULT LED FLASHING</b>
------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	-------------------------------------------------

Changer was shutdown because count from right hand (nickel) hopper was not satisfied within 45 seconds.

One change bucket will have incorrect change load from right hand (nickel) hopper.

Check right hand (nickel) hopper. If not empty or low on coins, check for dirt build-up on coin path or jammed hopper.

If hopper looks O.K., check change buckets to see if one is overloaded with nickels (or coins from right hand hopper). If so, check right hand (nickel) coin detector or wiring to detector. If these check O.K. replace Computer Control Center.

If buckets are not overloaded, reset machine and test vend to see if right hand (nickel) hopper runs. If motor does not run, check motor and wiring to motor. If O.K., replace Computer Control Center.

To restore machine to operation, push reset switch after correcting problem.

**NOTE:** The bill stacker has deliberately been cycled away from home position when machine is in this status. It will return when machine is reset.

For a more complete troubleshooting sequence, refer to the appropriate troubleshooting chart for this fault.

**STATUS CODE**

Bill was rejected because P1 cell was covered too long.

Bill was held too long before releasing it, or it may be jammed near front of transport.

This code normally occurs when adjusting P1 cell.

If bills are rejected frequently with this code:

Check operation of bill pressure solenoid, it may not be pulling in. If not, check solenoid for dirt build-up and other reasons that could cause tight operation. Also, check solenoid coil and wiring to solenoid. Solenoid drive on computer board may be defective. Replace Computer Control Center.

**NOTE:** A shorted solenoid or suppression diode across solenoid will cause failure of replacement Computer Board. Always check resistance of coil using meter or diagnostic aid before installing replacement computer control center.

Bill transport rollers may be worn. Check and replace if necessary.

Transport motor may be running slow, or drive belt slipping. Check drive belt adjustment. If O.K., check motor speed (See Manual, Page 78 ). If slow, check motor capacitor, motor itself, or Computer Control Center.

Check track surfaces for burrs, obstructions, foreign substances, or anything that could hinder bill travel. Clean and polish as necessary.

If bill is left in transport for 30 seconds, machine will go into self-clear (5 seconds on BC-25).

# STATUS CODE

 FAULT LED FLASHING		<b>DISPLAY SHOWS "3" FAULT LED FLASHING</b>
------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	-------------------------------------------------

Changer was shutdown because count from left hand (dime) hopper was not satisfied within 45 seconds.

One change bucket will have incorrect change load from left (dime) hopper.

Check left hand (dime) hopper. If not empty or low on coins, check for dirt buildup on coin path or jammed hopper. If hopper looks O.K., check change buckets to see if one is overloaded with dimes (or coins from left hand hopper). If so, check left (dime) coin detector or wiring to detector. If these check O.K., replace Computer Control Center.

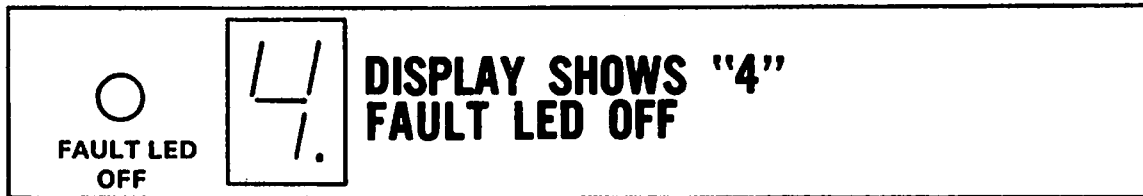
If buckets are not overloaded, reset machine and test vend to see if left hand (dime) hopper runs. If motor does not run, check motor and wiring to motor. If O.K., replace Computer Control Center.

To restore machine to operation, push reset switch after correcting problem.

**NOTE:** The bill stacker has deliberately been cycled away from home position when machine is in this status. It will return when machine is reset.

For a more complete troubleshooting sequence, refer to the appropriate troubleshooting chart for this fault.



**STATUS CODE**

Bill was rejected because it failed to pass first magnetic check.

Bill may have been inserted backwards or upside down.

Front edge of bill may be folded over or torn.

If bills are rejected frequently with this code:

P1 adjustment pot may be adjusted too far clockwise. Readjust P1 pot.

Mag pot may be set too low. Readjust mag pot.

Transport motor may be running slow, or drive belt slipping. Check drive belt adjustment. If O.K., check motor speed (See Manual, page 78 ). If slow, check motor capacitor, motor itself, or computer control center.

Transport rollers may be worn and not grabbing bill properly. Check and replace if necessary.

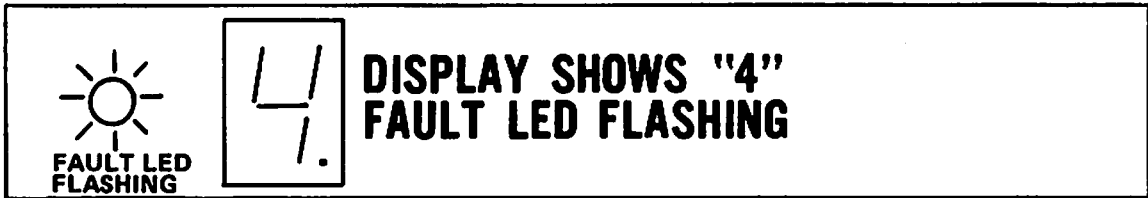
Check Mag LED. It should flash as bill passes through. If it does not, check bill pressure solenoid to see if it is continuously pulled in. If it is, replace computer control center (see note), and check wiring to solenoid (white/green wire) for short to ground. If solenoid O.K., check wiring (shielded cable) from computer control center to magnetic head. If O.K., replace Computer Control Center. If problem still exists, magnetic head is defective or out of alignment - replace transport.

If mag LED does flash in above step, wiring to head is O.K. but head may still be weak. Also, check bill pressure solenoid. Mag LED may flash even though solenoid is continuously pulled in. If both of these O.K., amplifier may be weak. Replace Computer Control Center.

If bill is left in transport for 30 seconds, machines will go into self-clear (5 seconds on BC-25).

**NOTE:** A shorted solenoid or suppression diode across solenoid will cause failure of replacement computer board. Always check resistance of coil using meter or Diagnostic Aid before installing replacement Computer Control Center.

# STATUS CODE



Changer was shutdown because count from center (quarter) hopper was not satisfied within 45 seconds.

One change bucket will have incorrect change load from center (quarter) hopper.

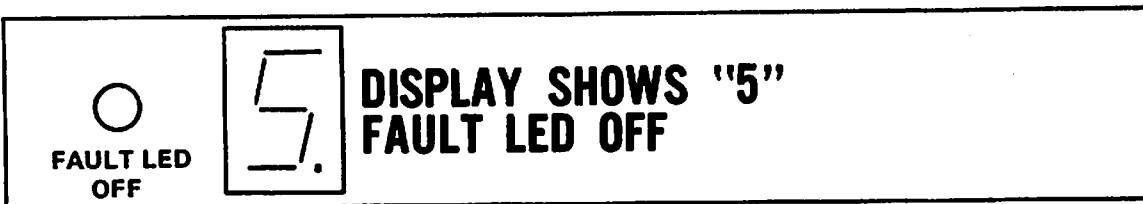
Check center (quarter) hopper. If not empty or low on coins, check for dirt build-up on coin path or jammed hopper. If hopper looks O.K., check change buckets to see if one is overloaded with quarters (or coins from center hopper). If so, check center (quarter) coin detector or wiring to detector. If these check O.K., replace Computer Control Center.

If buckets are not overloaded, reset machine and test vend to see if center (quarter) hopper runs. If motor does not run, check motor and wiring to motor. If O.K., replace Computer Control Center.

To restore machine to operation, push reset switch after correcting problem.

**NOTE:** The bill stacker has deliberately been cycled away from home position when machine is in this status. It will return when machine is reset.

For a more complete troubleshooting sequence, refer to the appropriate troubleshooting chart for this fault.

**STATUS CODE**

Bill was rejected because P6 cell was uncovered too soon.

Computer recognized this as a non-valid validation sequence.

If bills are rejected frequently with this code:

Check for small piece of paper or other foreign object in track.

Check location and alignment of P4/P6 lamp. Side of filament nearest glass shell should be positioned downwards and set at 45° angle to both P4 and P6 cells.

P6 flipper may be binding or hanging-up on back rollers. Check for flash or burrs on flipper and back rollers.

P6 cell may be giving intermittent signal. Check cell for proper switching. If cell is O.K., check wiring from P6 cell to computer control center for possible ground to chassis.

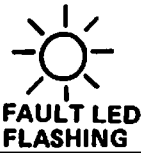

If all of above are O.K., replace Computer Control Center.

If bill is left in transport for 30 seconds, machine will go into self-clear (5 seconds on BC-25)

**BC-25 ONLY**

This code flashes briefly during a \$5.00 vend to give the serviceman a visual indication that the computer has validated bill as being a legitimate \$5.00 bill.

# STATUS CODE

		<b>DISPLAY SHOWS "5" FAULT LED FLASHING</b>
-----------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	-------------------------------------------------

Since last time machine was reset or power turned off, it may have dispensed 2 more coins than it should have. There could be an incorrect change load in one of the buckets.

Most likely the problem is not electrical.

Probable causes are dirt buildup in hoppers, faulty hopper motor brakes, or worn parts in hoppers or hopper motors.

Also, possible causes could be intermittent connections to coin detectors, detector lamps, or wiring.

To restore machine to operation, press reset switch after correcting problem.

**NOTE:** The bill staker has been deliberately cycled away from home position when machine is in this status, it will return when machine is reset.

For a more complete troubleshooting sequence, refer to the appropriate troubleshooting chart for this fault.

# STATUS CODE

 <b>FAULT LED OFF</b>		<b>DISPLAY SHOWS "6" FAULT LED OFF</b>
---------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	--------------------------------------------

**NOTE:** This is Code 6. For Code b see (B)

Bill was rejected because P4 cell did not cover soon enough after P1 uncovered.

Probably, left, leading corner of bill is folded over or torn off.

Also, bill could have hung up or was held back.

If bills are rejected frequently with this code:

Check operation of bill pressure solenoid. It may not be pulling in. If not, check solenoid for dirt build-up and other reasons that could cause tight operation. Also, check solenoid coil and wiring to solenoid. Solenoid drive on computer board may be defective. Replace Computer Control Center.

**NOTE:** A shorted solenoid or suppression diode across solenoid will cause failure of replacement computer board. Always check resistance of coil using meter or Diagnostic Aid before installing replacement Computer Control Center.

Transport motor may be running slow, or drive belt slipping. Check drive belt adjustment. If O.K., check motor speed (see manual, page 78 ). If slow, check motor capacitor, motor itself, or computer control center.

Check track surfaces for burrs, obstructing foreign substances, or anything that could hinder bill travel. Clean and polish as necessary.

Transport rollers may be worn. Check and replace if necessary.

If bill is left in transport for 30 seconds, machine will go into self-clear (5 seconds on BC-25).

# STATUS CODE

		<b>DISPLAY SHOWS "6" FAULT LED FLASHING</b>
-----------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	-------------------------------------------------

**NOTE:** This is Code 6. For Code b see (B)

Bill changer is shutdown because P1 cell circuit is giving computer an incorrect signal.

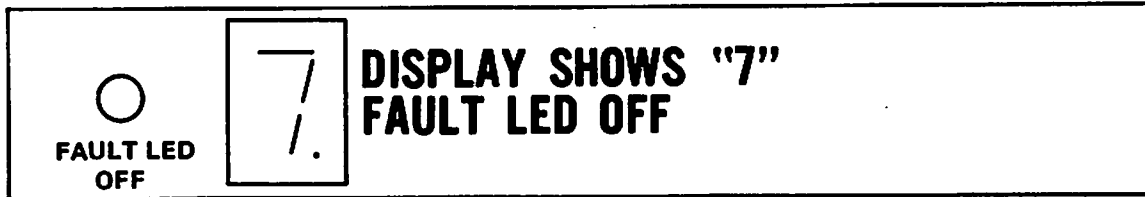
Check P1 LED. If not lit, replace computer control center. If lit, check P1 lamp. If lit, check for small piece of paper or other foreign object in track. If O.K., try to adjust P1 cell. If you can, and code still exists, replace computer control center. If you cannot adjust P1, check P1 cell and wiring to cell. If O.K., replace computer control center.

If P1 lamp not lit, check P4/P6 lamp. If lit, replace P1 lamp. If P4/P6 lamp also out. Check +5 VDC LED. If lit, check blue wires in system for break in +5V supply distribution. If not lit, check +14 VDC LED. If lit, replace VR201 regulator. If not lit, replace power supply board. If problem still exists, replace power control center.

Machine can be restored to service by turning power off and correcting problem.

For a more complete troubleshooting sequence, refer to the appropriate troubleshooting chart for this fault.

# STATUS CODE



Bill was rejected because it failed to pass second magnetic check.

Bill may have been inserted backwards.

If bills are rejected frequently with this code:

P1 adjustment pot may be adjusted too far clockwise. Readjust P1 pot.

Mag pot may be set too low, readjust mag pot.

Transport motor may be running slow, or drive belt slipping. Check drive belt adjustment. If O.K., check motor speed (see manual, page 78). If slow, check motor capacitor, motor itself, or computer control center.


Amplifier may be weak. Replace Computer Control Center.

Magnetic head may be weak or out of alignment. Replace transport.

Transport rollers may be worn. Check and replace if necessary.

If bill is left in transport for 30 seconds, machine will go into self-clear (5 seconds on BC-25).

# STATUS CODE

 <b>FAULT LED FLASHING</b>		<b>DISPLAY SHOWS "7" FAULT LED FLASHING</b>
--------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	-------------------------------------------------

During the last replenish cycle the system detected a coin pulse from the dispenser that was much longer than normal. Most likely there is an incorrect change load in one of the change buckets.

A detector lamp could have burned out during the replenish cycle. If lamps O.K., reset machine and see if it goes back into shutdown. If so, refer to new status code that will appear.

If machine stays in service, check coin load in buckets. One bucket could have wrong change in it. Try to establish whether nickels, dimes, or quarters are wrong, then check that photo detector and wiring is O.K. If O.K., replace computer control center.

If all three bulbs are out, check 5 VDC LED on power supply.  
If OFF, check power supply, If lit check harness.

Also check upper coin chute for anything that would hold coin up.

If everything looks good, replace computer board assembly.

To restore machine to service, press reset switch after correcting problem.

**NOTE:** The bill stacker has been deliberately cycled away from home position when machine is in this status, it will return when machine is reset.

For a more complete troubleshooting sequence, refer to the appropriate troubleshooting chart for this fault.



# STATUS CODE

 FAULT LED OFF		<b>DISPLAY SHOWS "8"</b> <b>FAULT LED OFF</b>
-------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	--------------------------------------------------

Number 8 with LED off indicates that the bill return switch is activated.

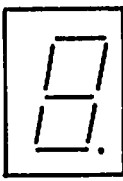
It is used for display testing (see "To Test Display") and to adjust mag signal.

If this code is on continuously, check bill return switch for incorrect adjustment. Also, check for faulty switch and shorted wiring to switch.

If everything checks O.K., replace Computer Control Center.

Machine can be restored to service by turning power off and correcting problem.

NOTE: If this problem corrects itself, machine will automatically resume operation.

 FAULT LED FLASHING		<b>DISPLAY SHOWS "8"</b> <b>FAULT LED FLASHING</b>
--------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------	-------------------------------------------------------

One of the coin switch inputs is showing an incorrect signal.

Leave power on and unplug main harness at coin acceptor bracket. If code goes out, replace coin switch assembly. If code remains, check harness wiring to coin switch plug. If O.K., replace computer control center.


Machine can be restored to service by turning off power and correcting problem.

NOTE: If this problem corrects itself, machine will automatically resume operation.

For a more complete troubleshooting sequence, refer to the appropriate troubleshooting chart for this fault.

# STATUS CODE

CODE 9

 FAULT LED OFF		<b>DISPLAY SHOWS "9" FAULT LED OFF</b>
-------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	--------------------------------------------

Bill was rejected because P6 cell was not uncovered soon enough after P4 was covered.

Bill is possibly torn at leading edge.

Object possibly hung up or jammed in track.

If bills are frequently rejected on this code:

Check for tight, binding, or sticky P6 flipper operation.

Check for intermittent open circuit in wiring to P6 cell.

Check rear portion of transport track for any condition that would cause bill to slow or hang up. (soft drink residue, catsup, burrs in track, etc.)

Rear drive belt of transport broken, or slipping. Check and replace if necessary.

If all of above O.K. replace Computer Control Center.

If bill is left in transport for 30 seconds, machine will go into self-clear (5 seconds on BC-25).

 FAULT LED FLASHING		<b>DISPLAY SHOWS "9" FAULT LED FLASHING</b>
--------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------	-------------------------------------------------

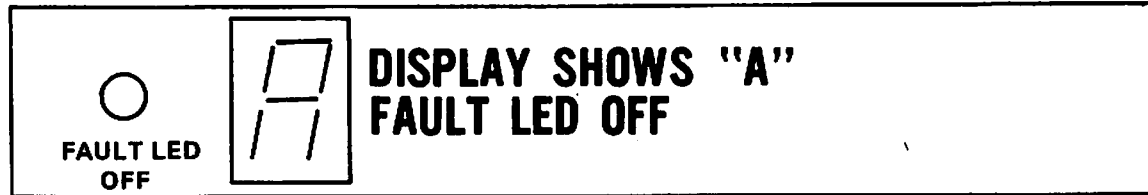
One of the test switch inputs is showing an incorrect signal.

Leave power on, unplug 4-way connector at back of power control center (P204). If code goes out, switch or wiring to switch is bad. Replace power control center. If code remains, check harness wiring to 4-way plug. If O.K., replace Computer Control Center.

machine can be restored to service by turning off power and correcting problem.

**NOTE:** If this problem corrects itself, machine will automatically resume operation.

For a more complete troubleshooting sequence, refer to the appropriate troubleshooting chart for this fault.

**STATUS CODE**

Bill was rejected because P4 cell was uncovered too soon.

Most likely there is a piece torn out of the left hand trailing corner of the bill, or it is folded over at this spot.

If bills are rejected frequently with this code:

P4 adjustment pot may be set too far clockwise. Readjust P4 pot.

P4 cell may be giving intermittent signal. Check P4 cell for proper switching. If cell is O.K., check wiring from P4 cell to computer control center for possible ground to chassis.

+5 VDC supply to lamps may be below 4.5 VDC. Check voltage. If low, replace VR201 regulator on power control center. (Part no. 7-00365-01).

If all of above is O.K., replace Computer Control Center.

If bill is left in the transport for 30 seconds, the machine will go into self-clear (5 seconds on BC-25).



The external lockout line is grounded.

This code should never occur on the BC-20 as this line is not used in the bill changer.

This line is used only if the computer board is used to operate something other than the dispenser.

If this code does appear, replace Computer Control Center. If problem still exists, pin 15 of J1 is grounded (it should be open).

**NOTE:** If this problem corrects itself, machine will automatically resume operation.

For a more complete troubleshooting sequence, refer to the appropriate troubleshooting chart for this fault.

# STATUS CODE

CODE B

 FAULT LED OFF		<b>DISPLAY SHOWS "b" (B) FAULT LED OFF</b>
-------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	------------------------------------------------

Bill was rejected because P1 cell was covered while changer was in process of validating a bill.

Wait until changer completes cycle before inserting next bill.

If bills are rejected frequently with this code:

P1 adjustment pot may be too far counterclockwise. Readjust P1 pot.

P1 cell may be giving intermittent signal. Check P1 cell for proper switching. If cell is O.K. check wiring from P1 cell to computer control center for intermittent open connection.

If both of above O.K., replace Computer Control Center.

If bill is left in transport for 30 seconds, machine will go into self-clear (5 seconds on BC-25).

 FAULT LED FLASHING		<b>DISPLAY SHOWS "b" (B) FAULT LED FLASHING</b>
--------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------	-----------------------------------------------------

P4 or P6 cell in transport is giving an incorrect signal.

Most likely a small object is stuck in rear of transport or P4/P6 lamp is burned out.

If both lamps are out, check +5 VDC LED. If not lit, check power supply. If lit, check +5V power distribution lines in harness (blue wires).

If above O.K., check P4 LED. If lit, try to adjust P4. If you cannot, check P4 cell. If O.K. check wiring from P4 cell to computer control center for open.

If P4 LED is out, check P6 flipper. Make sure it is fully blocking light to P6 and that it works freely without binding or sticking. If O.K., check cell. If cell O.K. check wiring from P6 cell to computer control center for possible short to ground.



If all of above O.K., replace Computer Control Center.

Machine can be restored to service by turning power off and correcting problem.

**NOTE:** If this problem corrects itself, machine will automatically resume operation.

For a more complete troubleshooting sequence, refer to the appropriate troubleshooting chart for this fault.

# STATUS CODE

 <b>FAULT LED OFF</b>		<b>DISPLAY SHOWS "C" FAULT LED OFF</b>
---------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	--------------------------------------------

Bill was rejected because P6 cell was covered too soon after being uncovered.

Computer recognized this as a non-valid validation sequence.

If bills are rejected frequently with this code:



Check for broken or worn parts on P6 flipper or rear of transport that would cause flipper to cover P6 cell prematurely. Replace any bad parts or replace transport.

Check location and alignment of P4/P6 lamp. Lamp filament should be positioned towards low side of lamp and set at 45° angle to both P4 and P6 cells.

P6 cell may be giving intermittent signal. Check P6 cell for proper switching. If cell O.K. check wiring from P6 cell to computer control center for possible intermittent open connection.

If all of above are O.K., replace Computer Control Center.

If bill is left in transport for 30 seconds, machine will go into self-clear (5 seconds on BC-25).

 <b>FAULT LED FLASHING</b>		<b>DISPLAY SHOWS "C" FAULT LED FLASHING</b>
----------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------	-------------------------------------------------

One or more of the coin photodetector inputs is giving an incorrect signal. This happened when the machine was in standby, however, and the change load in the buckets should be correct.

Most likely one of the lamps on the dispenser is burned out. Check lamps and replace if bad. If any lamps still out, check wiring to lamp.

If all lamps are off, check +5 VDC LED on power supply. If not lit, check power supply. If lit, check +5 V power distribution lines in harness (blue wires).

If all lamps are lit, check for dirt on detector lamps. If clean, check coin photodetectors. If they check O.K., check wiring from photodetectors to computer control center for open connections. If O.K., replace Computer Control Center.



Machine can be restored to service by turning power off and correcting problem.

**NOTE:** If this problem corrects itself, machine will automatically resume operation.

For a more complete troubleshooting sequence, refer to the appropriate troubleshooting chart on this fault.

# STATUS CODE

CODE d (D)

 FAULT LED OFF		<b>DISPLAY SHOWS "d" (D) FAULT LED OFF</b>
-------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	------------------------------------------------

Bill was rejected because P4 cell was covered too long.

Bill may have hung up or jammed in the transport.

If bills are rejected frequently with this code:

Check rear portion of transport track for any condition that would cause bill to slow up or hang up (soft drink residue, catsup, burrs on track surfaces, etc.).

Rear drive belt of transport may be loose and slipping. Check and replace if necessary.

Center or back transport rollers may be worn. Check and replace if necessary.

If all of the above are O.K., replace Computer Control Center.

If bill is left in transport for 30 seconds, machine will go into self-clear (5 seconds on BC-25).

 FAULT LED FLASHING		<b>DISPLAY SHOWS "d" (D) FAULT LED FLASHING</b>
--------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------	-----------------------------------------------------

This code flashes briefly when machine is reset following codes 1, 2, 3, 4, 5, 7, E, or F with FAULT LED flashing.

This is normal operation.

If machine is in shutdown and this code is showing, bill stacker monitor input is active.

Leave power on. Disconnect main harness at bill stacker. Press reset switch, if code goes out, replace bill stacker. If code does not go out, replace computer control center. If code still exists, check stacker monitor line (green white wire) from stacker plug to computer control center for short to chassis.

Possible cause is incorrect adjustment of stacker cam switches. Also, stuck stacker relay, defective stacker motor brake or motor itself.

To restore machine to operation, press reset switch after correcting problem.

For a more complete troubleshooting sequence, refer to the appropriate troubleshooting chart for this fault.

# STATUS CODE

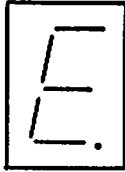
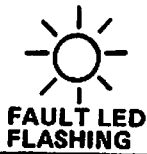
 FAULT LED OFF		<b>DISPLAY SHOWS "E" FAULT LED OFF</b>
-------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	--------------------------------------------

Bill was rejected because P6 cell was uncovered too long.

If this code appears often with good bills, check for tight P6 flipper operation, transport to stacker alignment, or non-operating stacker.

If bill is left in transport for 30 seconds, machine will go into self-clear (5 seconds on BC-25).

# STATUS CODE



**DISPLAY SHOWS "E"  
FAULT LED FLASHING**

Changer has been shutdown because one or more hopper motors were running when they were not supposed to.

There could be too many coins in one of the change buckets. If there is, it will tell you which motor was running.

Most likely the problem is a faulty circuit on the computer board itself. Change computer control center. Also check wiring to motor for shorts. (See Note) \*

To restore machine to service, push reset switch after correcting problem.

**NOTE:** The bill stacker has been deliberately cycled away from home position when machine is in this status. It will return when machine is reset.

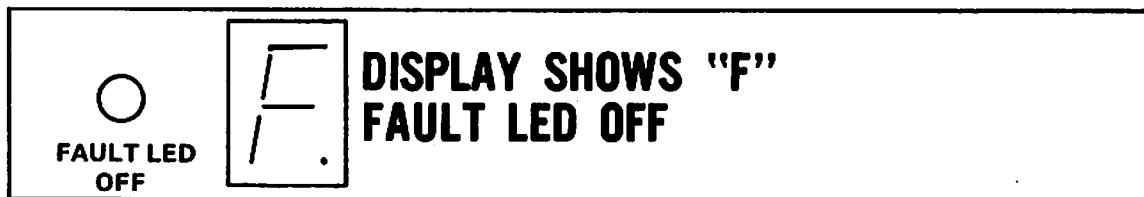
\* This circuit operates on 120 VAC line voltage. **ALWAYS** turn power off when working on this circuitry.

**ALSO** - If there is ANY POSSIBILITY that the wall outlet the changer is connected to may be wired backwards, or - if this changer is connected to a wall outlet via a 2-prong grounding adapter - **PULL CORD FROM OUTLET** before working on this circuit. Serious electrical shock could result otherwise.

For a more complete troubleshooting sequence, refer to appropriate troubleshooting chart for this fault.



# STATUS CODE



Bill was rejected because it failed to pass auxiliary magnetic check.

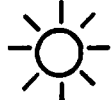
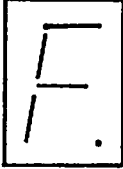
Bill may have been inserted backwards.

If bills are rejected frequently with this code:

- Mag pot may be set too high; readjust mag pot. Turn mag pot down 2 marks (1/8 turn) and try again.
- Also, rubber pressure roller, bill transport tracks, or bill being used may be contaminated with foreign metallic particles. Check and clean or replace if necessary.
- If system is operated without motor shield around transport motor, this code will show frequently. Also, defective transport motor (drawing too much current) could cause this.

If bill is left in transport for 30 seconds, machine will go into self-clear (5 seconds on BC-25).

# STATUS CODE

 <b>FAULT LED FLASHING</b>		<b>DISPLAY SHOWS "F" FAULT LED FLASHING</b>
--------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------	-------------------------------------------------

## HOPPER LED ON - (HOPPERS ARE NOT RUNNING)

Machine is in reset due to low voltage on 14 VDC line to computer board.

Check AC line voltage to machine for low voltage (below approx. 85 volts). If O.K., power supply is probably bad. Check 14 VDC supply, if under 12 VDC, replace power supply board. If still not O.K., replace power control center.

If +14 VDC supply O.K., check wiring to computer board. If O.K., replace computer control center.

**NOTE:** Reset switch will not work in this mode. To restore machine to service, correct cause of low voltage.

## HOPPER LED OFF

Machine has been shutdown because one or more of the bucket solenoids was energized too long, or turned on when it was not supposed to. Most likely there is an incorrect change load in one of the buckets.

Most likely cause is faulty computer control center or short in wiring to buckets. See note \*. Also, a shorted suppression diode on dispenser could cause this. Check diodes (See note \*).

To restore machine to service, press reset switch after correcting problem.

**NOTE:** Bill stacker has been deliberately cycled away from home position. It will return when machine is reset.

\* Installing a replacement computer control center in machine without determining cause of original failure may cause instant destruction of replacement computer control center when power is turned on.

BC-20 Diagnostic Aid or volt-ohm-meter used in accordance with troubleshooting chart for code "F" should be used to establish whether or not it is safe to install replacement board.

For a more complete troubleshooting sequence, refer to the appropriate troubleshooting chart for this fault.

# BC-20 TROUBLESHOOTING CHARTS

## BC-20 TROUBLESHOOTING CHARTS

These charts are for use if written explanation in status code chart is not adequate, or if the serviceman wants more detail. Block diagram, Schematic diagram and Wiring diagram are helpful aids in locating and checking wires, plugs, assemblies etc.

The first charts are arranged according to a particular status code displayed. Following these are charts for faults that may occur in which no status code is displayed.

If a segment of the display is burned out, an incorrect and misleading character could be displayed. To avoid trying to troubleshoot the wrong problem, always check to see if all segments of the display are working. This is done by pressing the bill return button and watching display. Display should show "8". When bill return button is released, the original fault code will again appear.

Logical troubleshooting minimizes effort in removing and replacing the wrong parts. Many failures are caused by minor defects such as loose connections or dirty contacts which can be identified in many instances by the status code display on the Computer Control Center. Check the following before replacing any parts.

1. Check that all plugs are firmly seated.
2. Check that connector pins are not bent, broken, or pushed through the back of the connector when mated.
3. Check that the wires are not bent or broken at connector or pins.
4. Check that coin combination switches on the Computer Control Center are set correctly for the coin combination used.
5. Check that coin hoppers are properly loaded and installed.

Use tables which follow to locate specific malfunctions. Turn to the page referenced and follow the chart step by step for each problem.

# TROUBLESHOOTING INDEX

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Bill Changer Shutdown-Out Of Service Lamp Lit-Status Display Shows	<span style="border: 1px solid black; padding: 2px 5px;">F</span> DISPLAY SHOWS "F" FAULT LED FLASHING	62
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# BILL CHANGER SHUTDOWN -OUT OF SERVICE LAMP LIT STATUS DISPLAY SHOWS "1" (FAULT LED FLASHING)

Power to the machine was disrupted while the changer was in shutdown and was displaying one of the codes 2, 3, 4, 5, 7, d, E, or F and the Fault LED was flashing. Hopper LED will be lit, but hoppers will NOT be running.

Press reset switch and wait for stacker to home (approx. 1 - 1-1/2 sec.)  
Does changer go back into shutdown ?

YES

Read new fault code Consult status codes or troubleshooting charts on new condition.

Computer Control Board may have shorted coin detector input. Replace with new p/n 6-50428-01 Computer Control Center.

OR

Coin Detector may be shorted. Identify denomination of excess coins and replace that photo-detector ass'y Part no. 3-50549-01

NO

Remove hoppers and look into change buckets. Is one bucket overloaded with coins ?

YES

Reload Changer

NO

Changer may have failed to replenish. Are any hoppers empty or low on coins ?

YES

NO

(A)

Leave hoppers out. Test vend for \$1.00. Are all hopper motors running that have been programmed to run ?

YES

NO

Count change from test vend. Was it:

Over?

Under?

Correct?

See status code or troubleshooting chart for status code showing 5 fault LED flashing. (Changer in shutdown)

Determine value of short coin. Check that hopper for poor coin pickup - due to dirt buildup in coin path, or worn part.

See Chart Titled: "1 or more hopper motors fail to run"

Turn power off then back on. Go back to point "A" on chart and repeat with 50¢ test vend. Then with 25¢ test vend

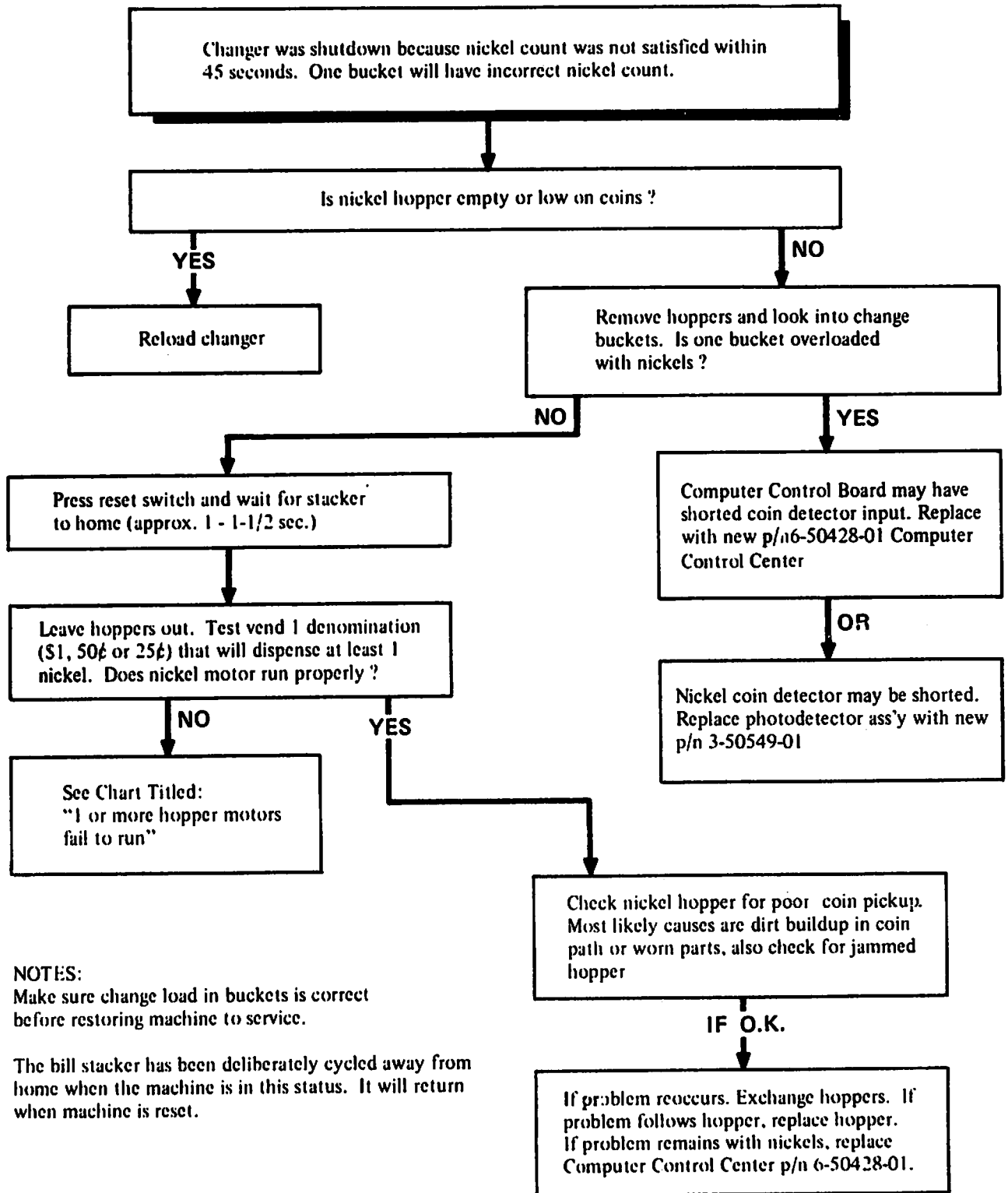
Cause of shutdown unknown. Restore machine to service. If changer again goes into shutdown for unidentified reason consult Rowe Field Service.

**NOTES:**

Make sure change load in buckets is correct before restoring machine to service.

The bill stacker has been deliberately cycled away from home when the machine is in this status. It will return when machine is reset.

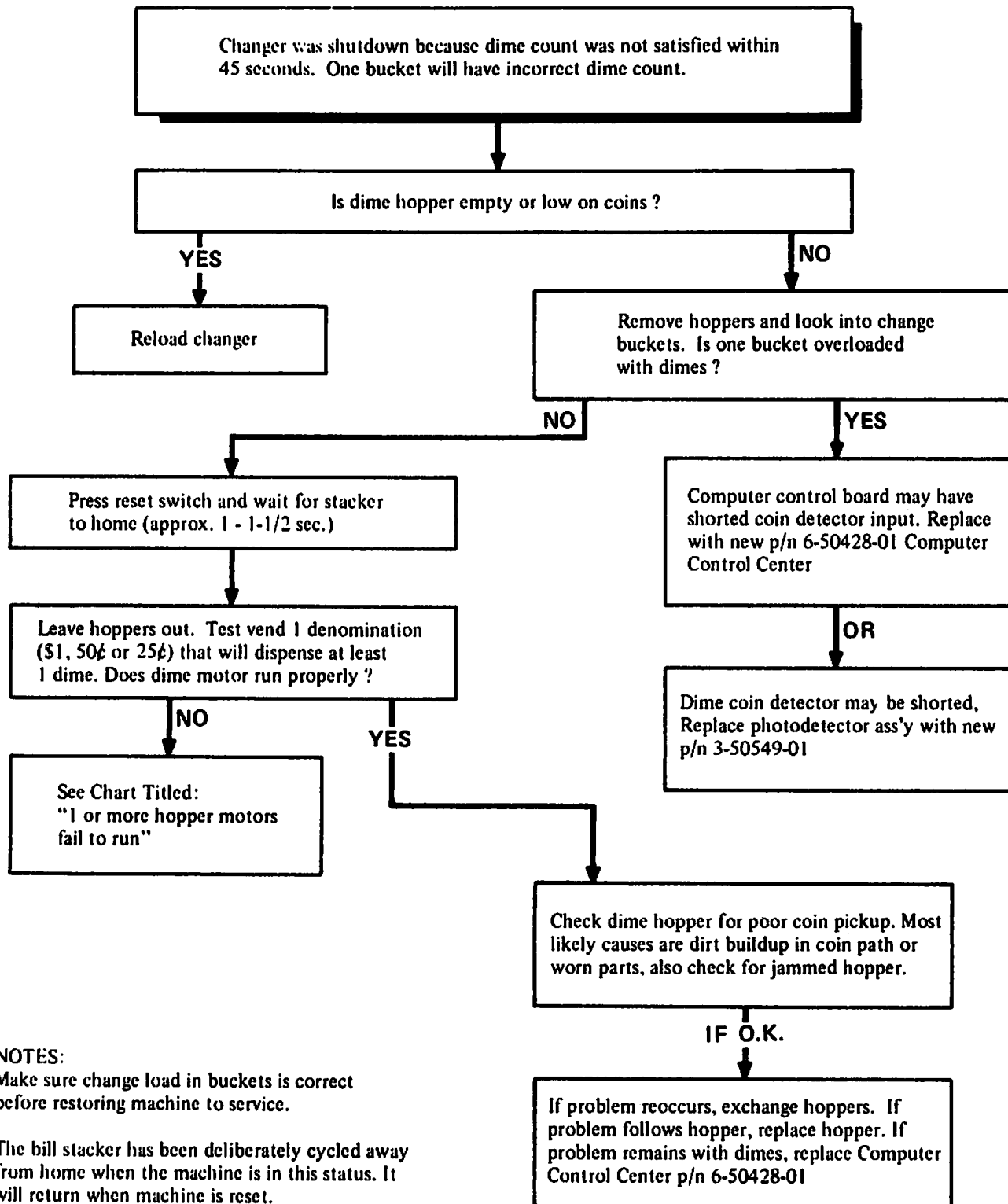
# BILL CHANGER SHUTDOWN -OUT OF SERVICE LAMP LIT STATUS DISPLAY SHOWS "2" (FAULT LED FLASHING)



**NOTES:**  
Make sure change load in buckets is correct before restoring machine to service.

The bill stacker has been deliberately cycled away from home when the machine is in this status. It will return when machine is reset.

# BILL CHANGER SHUTDOWN -OUT OF SERVICE LAMP LIT STATUS DISPLAY SHOWS "3" (FAULT LED FLASHING)

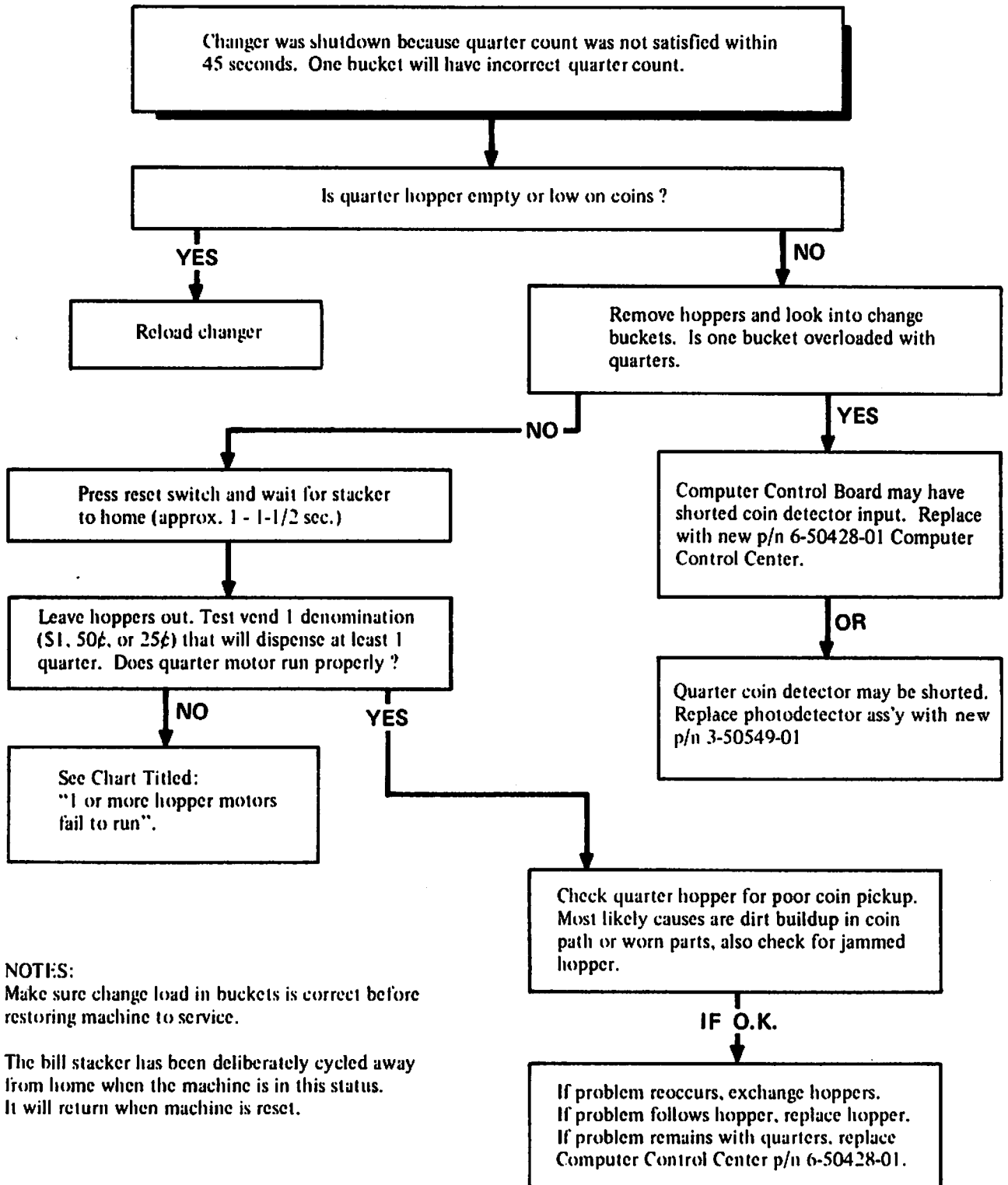


**NOTES:**

Make sure change load in buckets is correct before restoring machine to service.

The bill stacker has been deliberately cycled away from home when the machine is in this status. It will return when machine is reset.

# BILL CHANGER SHUTDOWN -OUT OF SERVICE LAMP LIT STATUS DISPLAY SHOWS "4" (FAULT LED FLASHING)



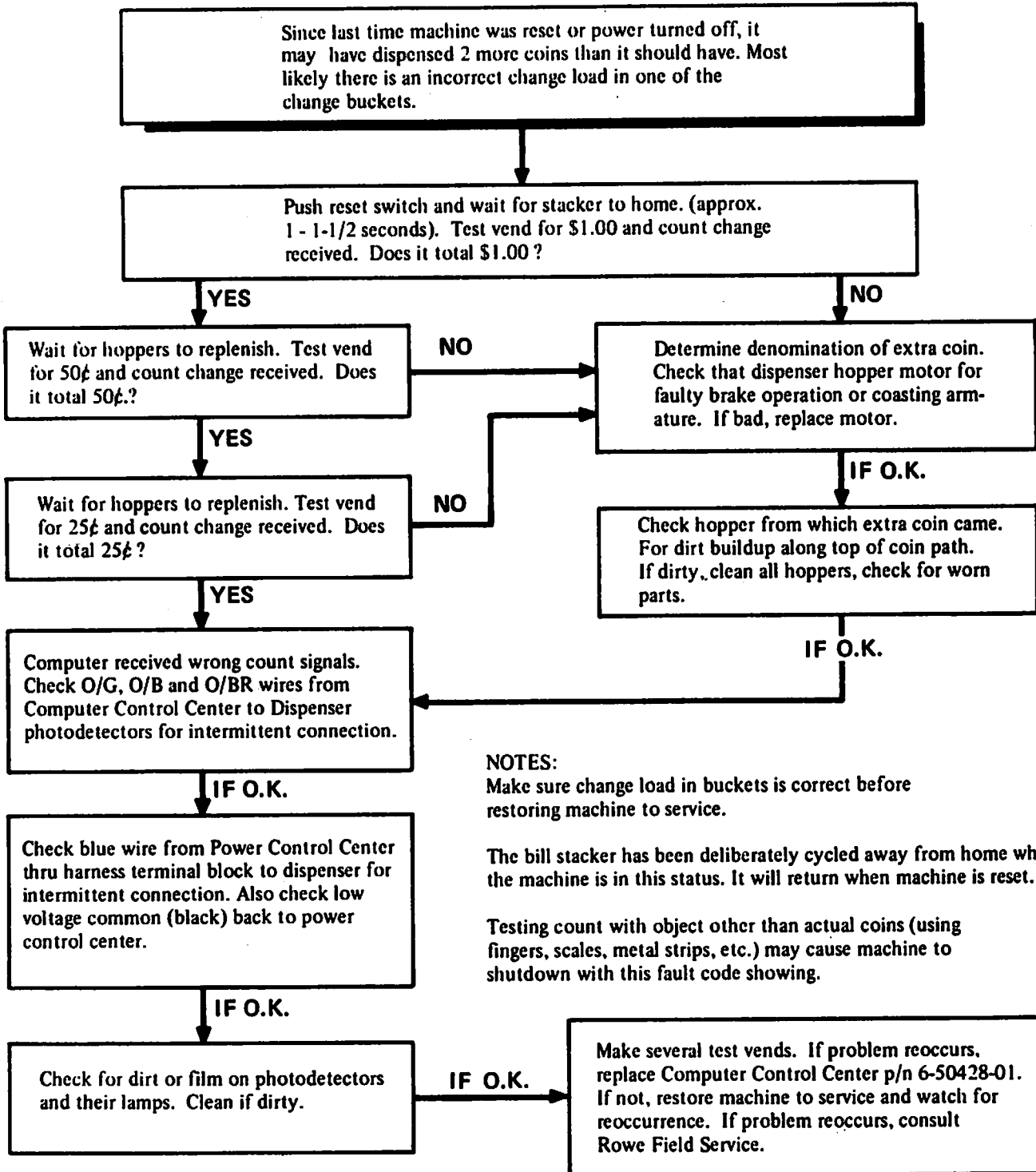
**NOTES:**

Make sure change load in buckets is correct before restoring machine to service.

The bill stacker has been deliberately cycled away from home when the machine is in this status. It will return when machine is reset.



# BILL CHANGER SHUTDOWN -OUT OF SERVICE LAMP LIT STATUS DISPLAY SHOWS "5" (FAULT LED FLASHING)

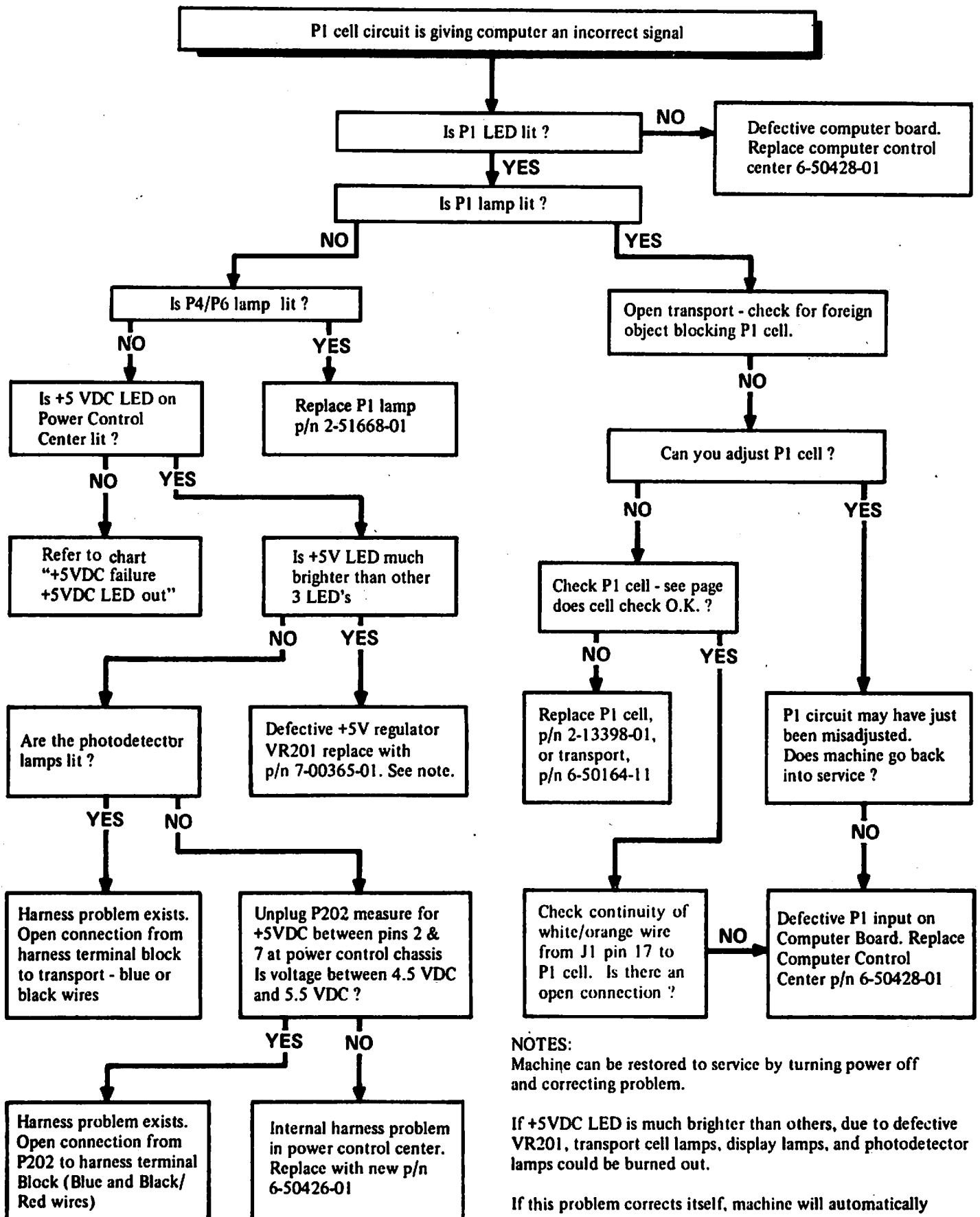


**NOTES:**  
Make sure change load in buckets is correct before restoring machine to service.

The bill stacker has been deliberately cycled away from home when the machine is in this status. It will return when machine is reset.

Testing count with object other than actual coins (using fingers, scales, metal strips, etc.) may cause machine to shutdown with this fault code showing.

# BILL CHANGER SHUTDOWN -OUT OF SERVICE LAMP LIT STATUS DISPLAY SHOWS "6"



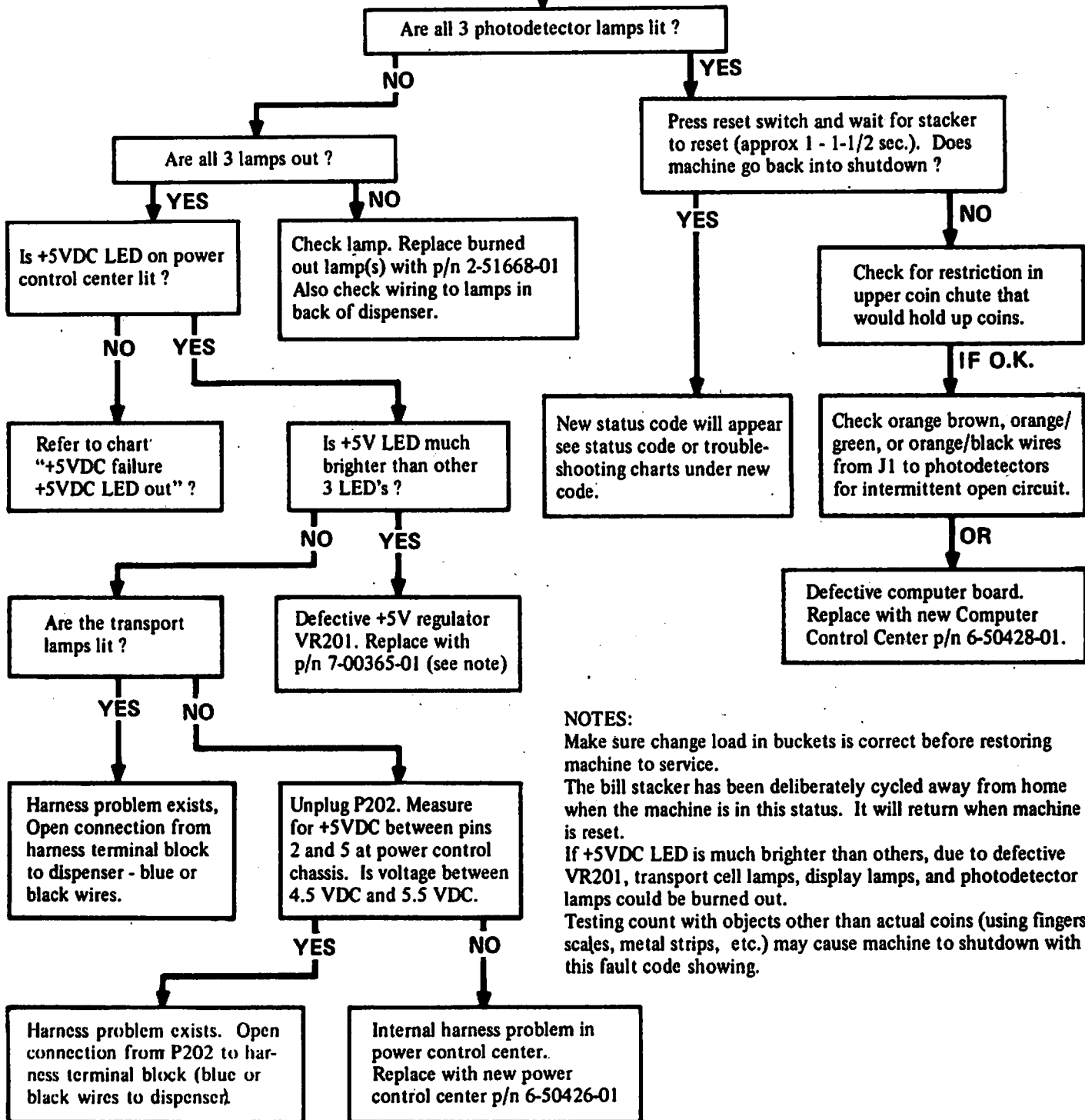
**NOTES:**  
Machine can be restored to service by turning power off and correcting problem.

If +5VDC LED is much brighter than others, due to defective VR201, transport cell lamps, display lamps, and photodetector lamps could be burned out.

If this problem corrects itself, machine will automatically resume operation.

# BILL CHANGER SHUTDOWN -OUT OF SERVICE LAMP LIT STATUS DISPLAY SHOWS "7" (FAULT LED FLASHING)

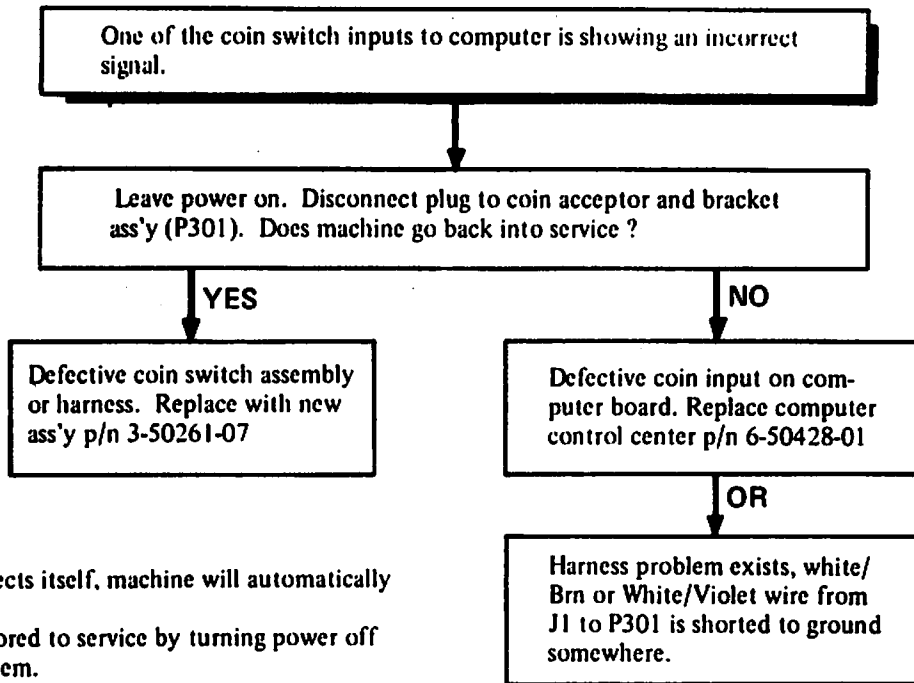
During the last replenish cycle the system detected a coin pulse from the dispenser that was much longer than normal. Most likely there is an incorrect change load in one of the change buckets.



**NOTES:**

Make sure change load in buckets is correct before restoring machine to service.  
 The bill stacker has been deliberately cycled away from home when the machine is in this status. It will return when machine is reset.  
 If +5VDC LED is much brighter than others, due to defective VR201, transport cell lamps, display lamps, and photodetector lamps could be burned out.  
 Testing count with objects other than actual coins (using fingers, scales, metal strips, etc.) may cause machine to shutdown with this fault code showing.

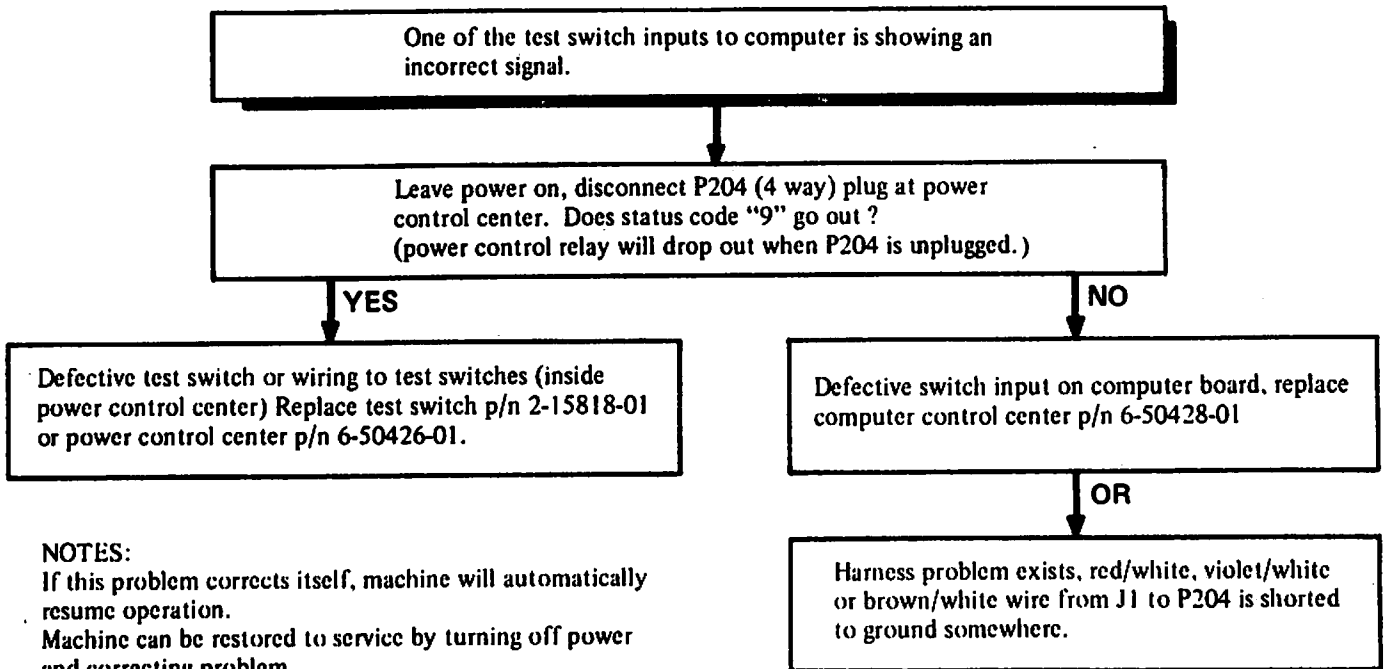
## BILL CHANGER SHUTDOWN -OUT OF SERVICE LAMP LIT STATUS DISPLAY SHOWS "8" (FAULT LED FLASHING)



**NOTES:**

If this problem corrects itself, machine will automatically resume operation.  
Machine can be restored to service by turning power off and correcting problem.

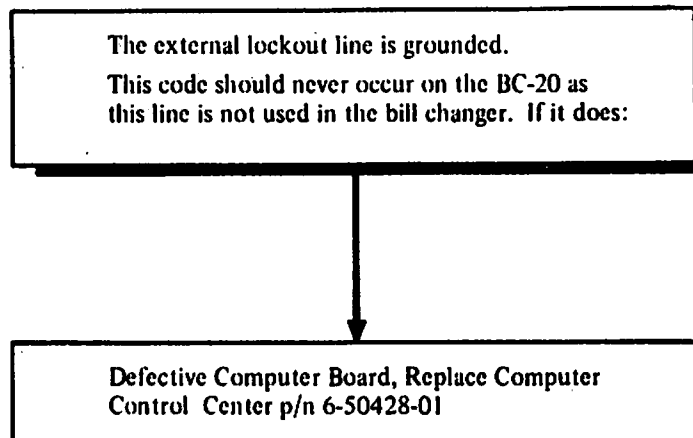
## BILL CHANGER SHUTDOWN -OUT OF SERVICE LAMP LIT STATUS DISPLAY SHOWS "9" (FAULT LED FLASHING)



**NOTES:**

If this problem corrects itself, machine will automatically resume operation.  
Machine can be restored to service by turning off power and correcting problem.

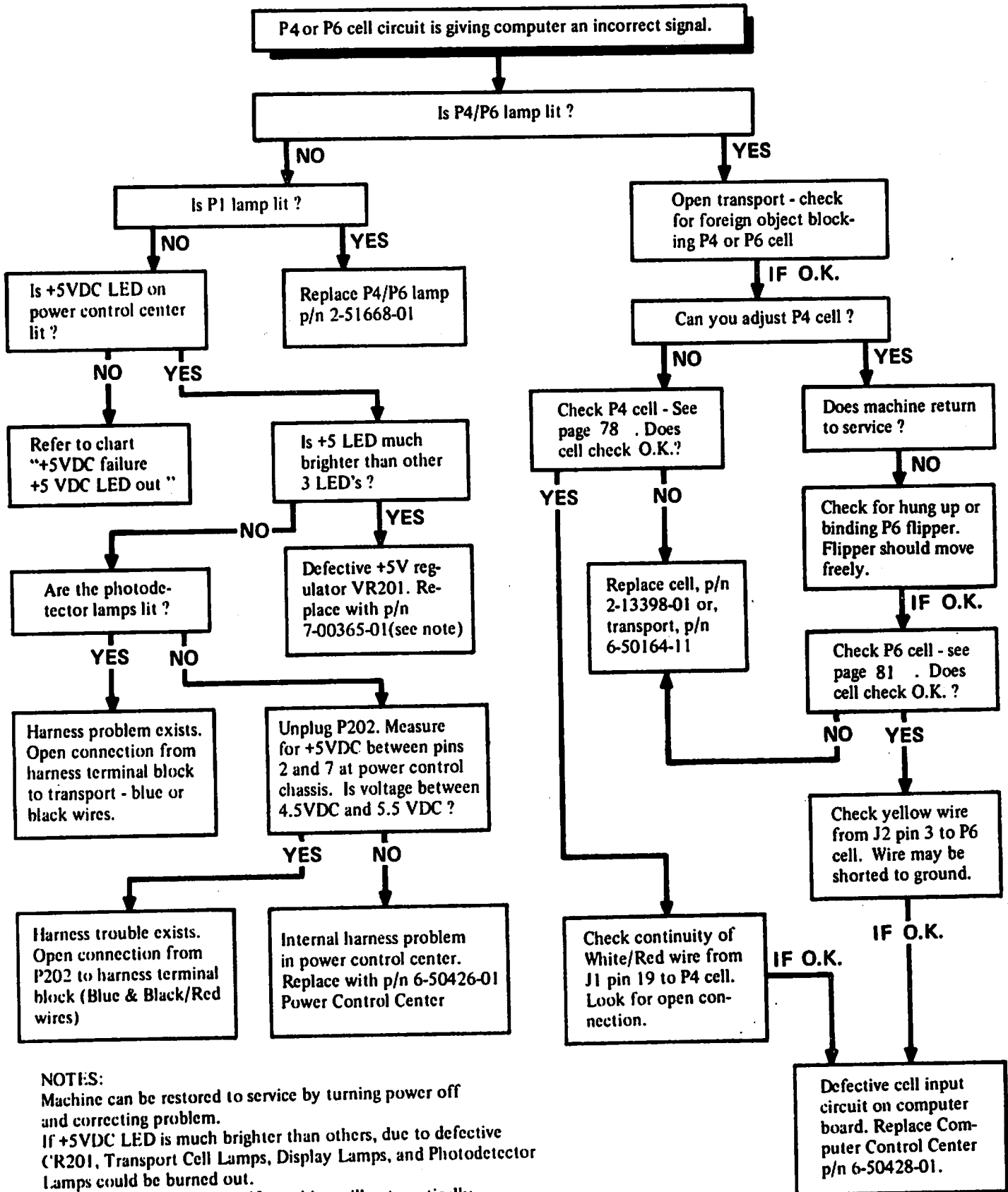
# BILL CHANGER SHUTDOWN -OUT OF SERVICE LAMP LIT STATUS DISPLAY SHOWS "A" (FAULT LED FLASHING)



**NOTE:**

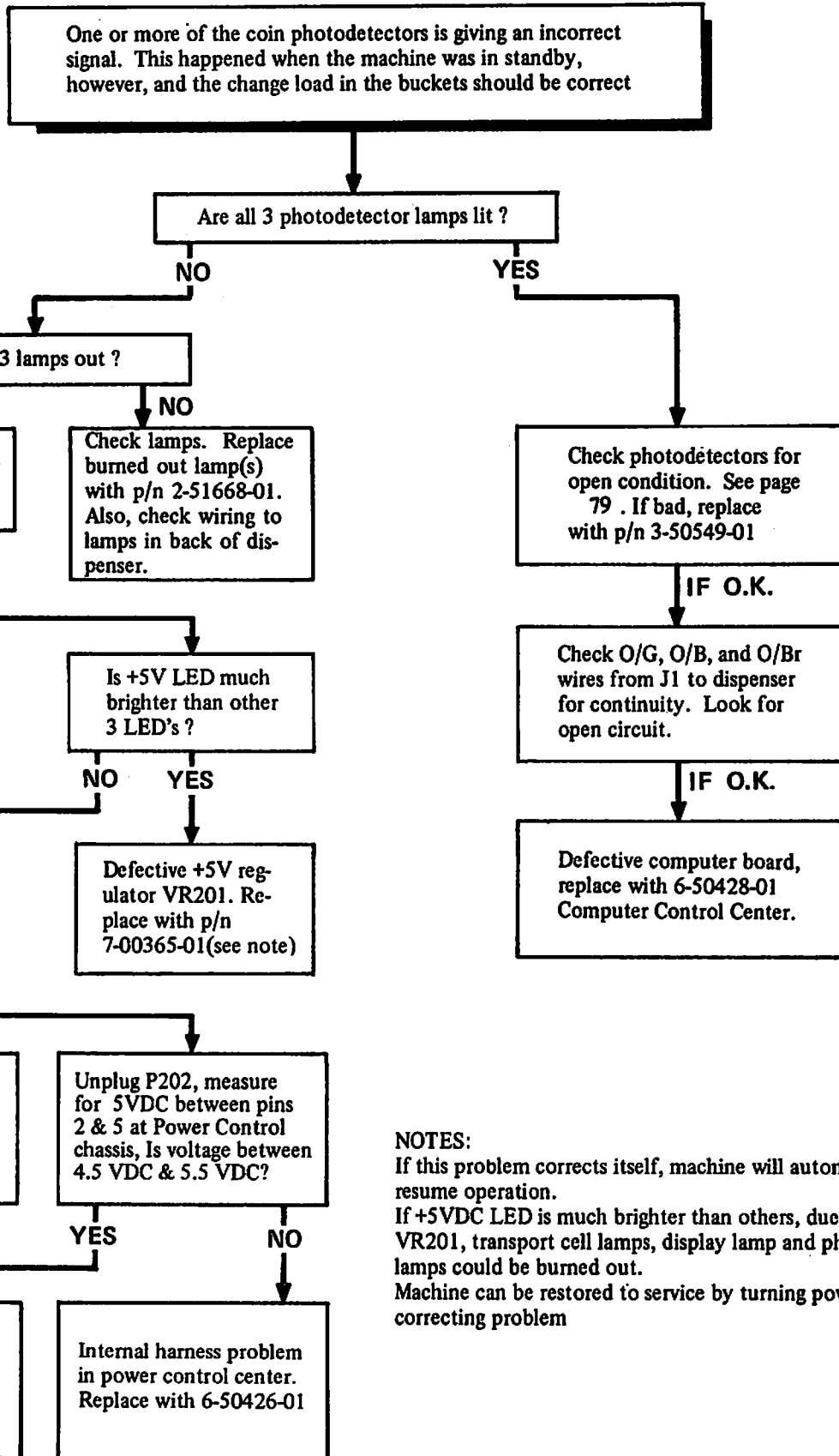
If this problem corrects itself, machine will  
automatically resume operation.

# BILL CHANGER SHUTDOWN -OUT OF SERVICE LAMP LIT STATUS DISPLAY SHOWS "b" (FAULT LED FLASHING)



**NOTES:**  
 Machine can be restored to service by turning power off and correcting problem.  
 If +5VDC LED is much brighter than others, due to defective CR201, Transport Cell Lamps, Display Lamps, and Photodetector Lamps could be burned out.  
 If this problem corrects itself, machine will automatically resume operation.

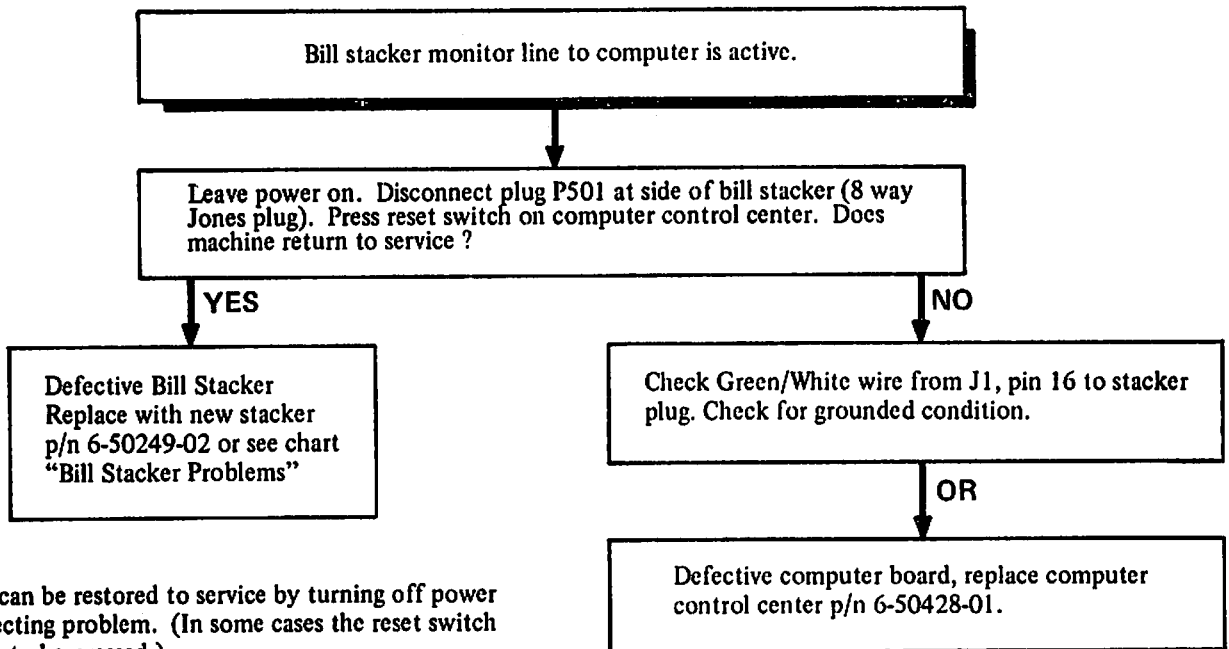
# BILL CHANGER SHUTDOWN -OUT OF SERVICE LAMP LIT STATUS DISPLAY SHOWS "C" (FAULT LED FLASHING)



**NOTES:**

If this problem corrects itself, machine will automatically resume operation.  
 If +5VDC LED is much brighter than others, due to defective VR201, transport cell lamps, display lamp and photodetector lamps could be burned out.  
 Machine can be restored to service by turning power off and correcting problem

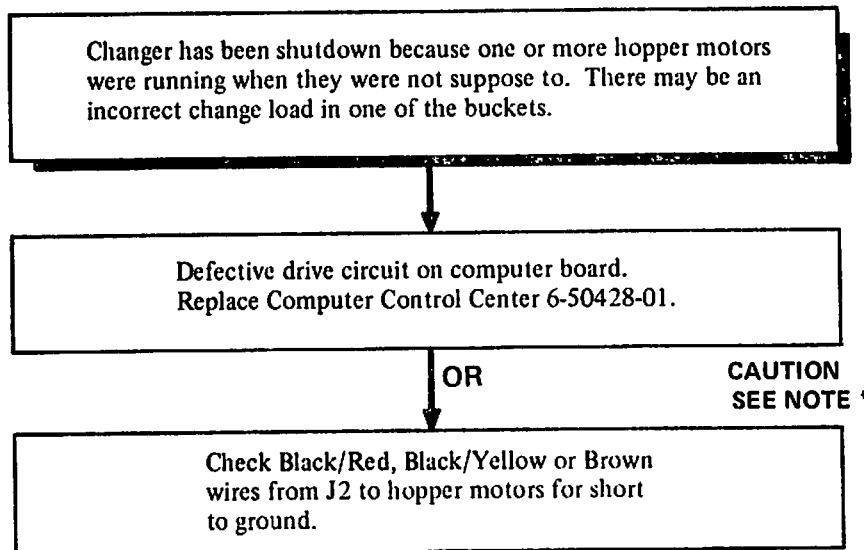
## BILL CHANGER SHUTDOWN -OUT OF SERVICE LAMP LIT STATUS DISPLAY SHOWS "D" (FAULT LED FLASHING)



**NOTES:**

Machine can be restored to service by turning off power and correcting problem. (In some cases the reset switch may have to be pressed.)

## BILL CHANGER SHUTDOWN -OUT OF SERVICE LAMP LIT STATUS DISPLAY SHOWS "E"



**CAUTION  
SEE NOTE \***

**NOTES:**

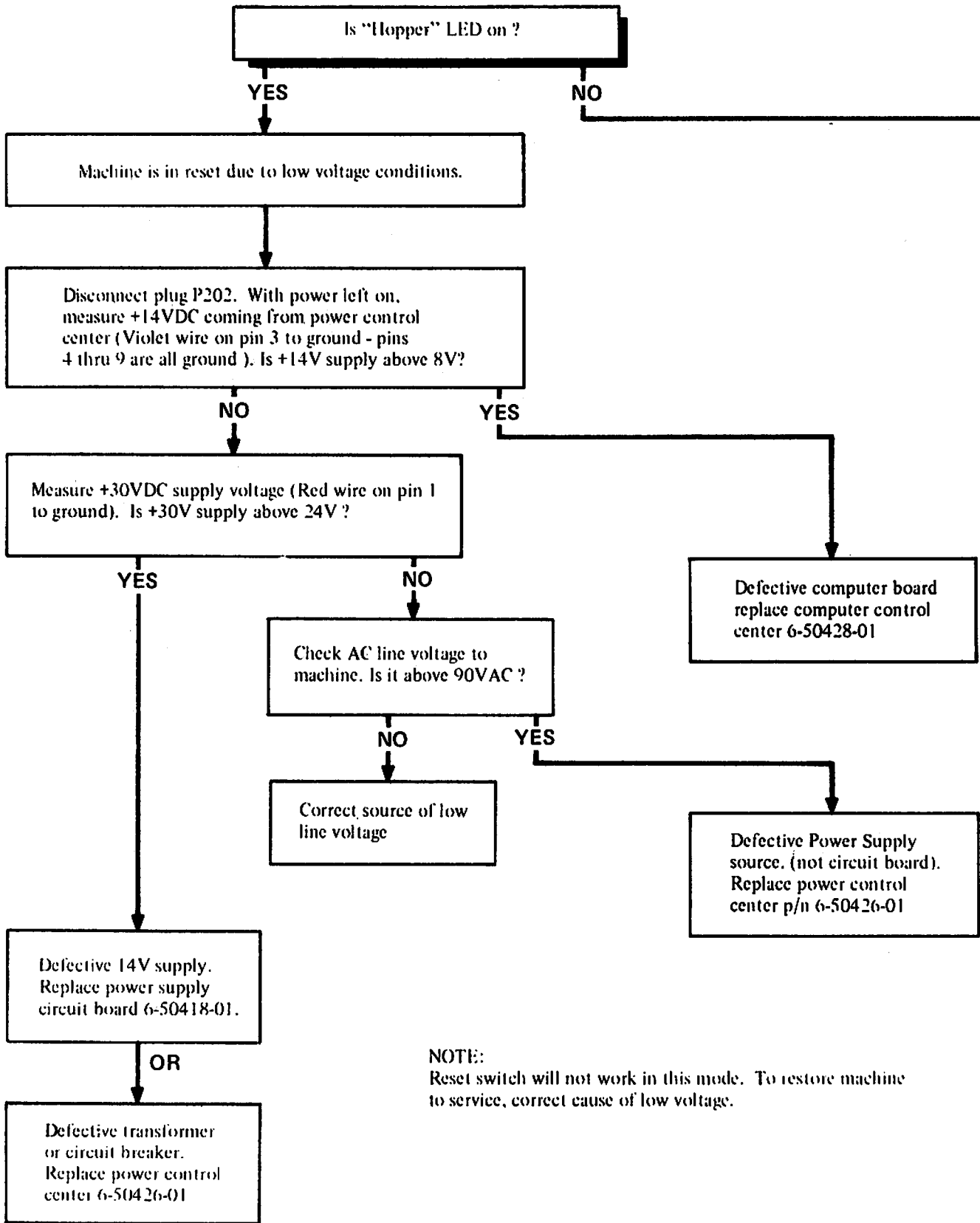
Make sure change load in buckets is correct before restoring machine to service.  
The bill staker has been deliberately cycled away from home when the machine is in this status. It will return when machine is reset.

**WARNING**

\* This circuit operates on 120 VAC LINE VOLTAGE. ALWAYS turn power off when working on this circuitry. ALSO - if there is any possibility that the wall outlet the changer is connected to may be wired backwards, or if the changer is connected to a wall outlet via a 2-prong grounding adaptor - pull cord from outlet before working on this circuit. Serious electrical shock could result otherwise.



# BILL CHANGER SHUTDOWN -OUT OF SERVICE LAMP LIT STATUS DISPLAY SHOWS "F" (FAULT LED FLASHING)



**NOTE:**  
Reset switch will not work in this mode. To restore machine to service, correct cause of low voltage.

**WARNING**

Installing new computer control center in machine without determining cause of failure may result in instant destruction of new board when power is turned on. BC-20 Diagnostic Aid p/n 6-70013-06 or Volt Ohm meter should be used to establish whether or not it is safe to replace new board.

Turn power off. Remove cover to harness junction box. Remove 3 violet/orange wires from 1 group of terminals. Do not let wires touch each other or chassis. Reconnect all modules if you disconnected any.

Turn power back on and press reset switch. Wait for stacker to home (approx 1 - 1-1/2 sec.) Does machine go back into a code "F" shutdown?

NO

YES

A meter or BC-20 Diagnostic Aid is necessary for troubleshooting from this point. Remove computer control center.

Defective computer board. Replace computer control center p/n 6-50428-01

OR

Check for short to ground or cabinet on Red/Black, Yellow/Brown, and Blue/White wire groups at Junction Box. Does short exist?

Short to cabinet on Violet/Orange wire from J2 to harness junction box.

YES

NO

Reconnect 3 Violet/Orange wires removed above. Check for short (less than 7 ohms) from Violet/Orange wires to:  
1.Red/Black wire group (3 wires)  
2.Yellow/Brown wire group (3 wires)  
3.Blue/White wire group (3 wires)  
are any shorts detected?

YES

NO

Defective drive circuit on computer board. Replace computer control center 6-50428-01.

Disconnect dispenser plug P401. Does short disappear?

YES

(See Note)

Replace dispenser 6-50275-04

NO

Disconnect P203 at Power Control Center (12 way). Does short disappear?

YES

(See Note)

Replace power control center 6-50426-01

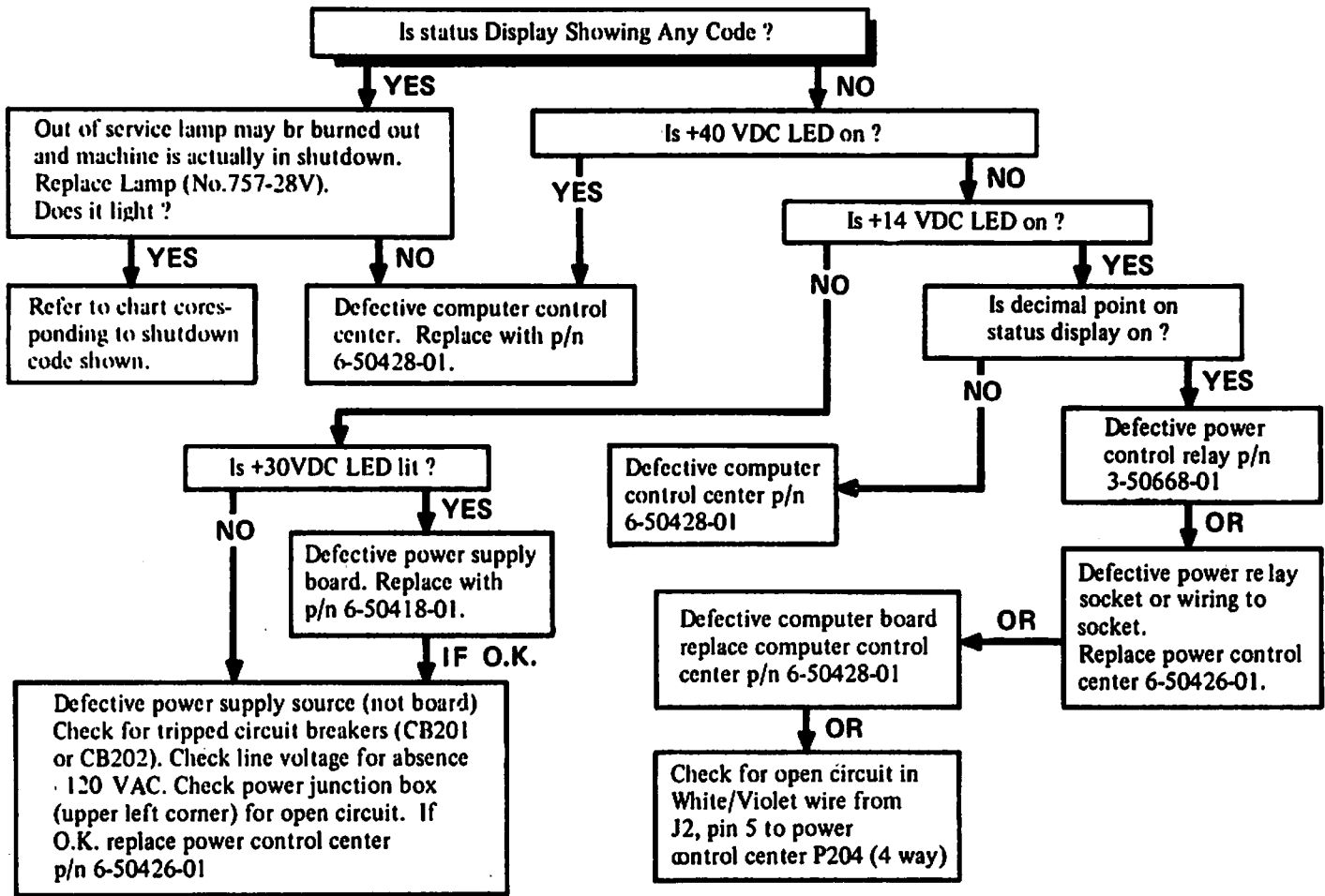
NO

(See Note)

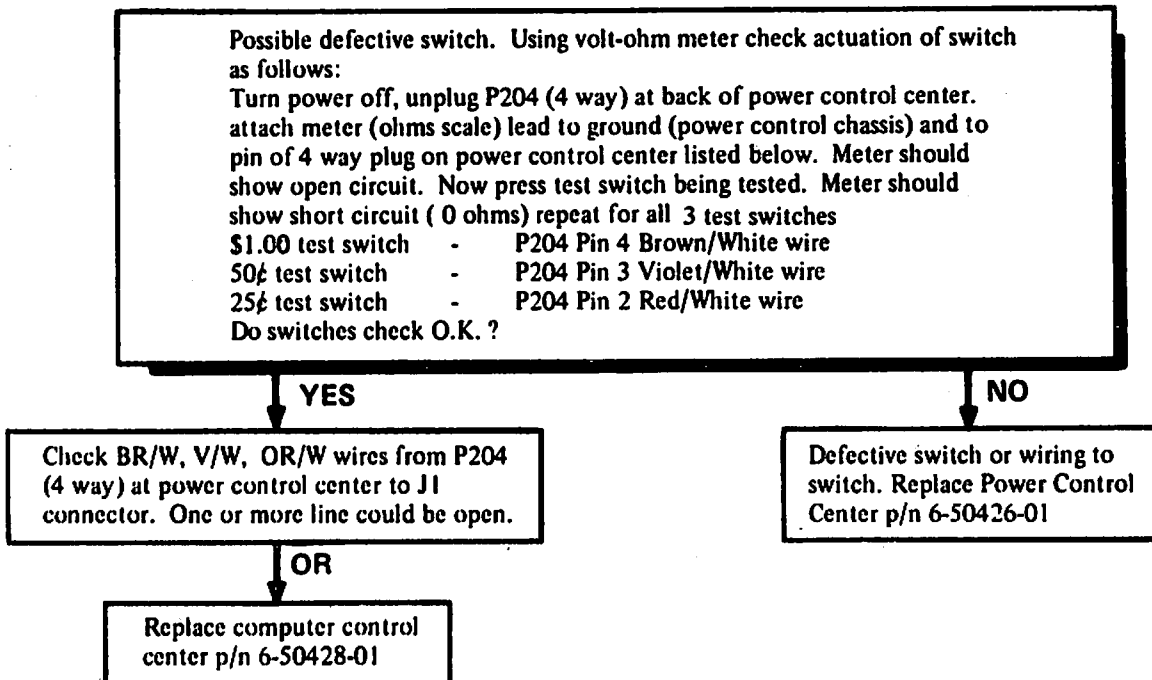
Short in main machine harness, repair or replace with 6-50429-01

NOTE:  
Bucket drive transistor on computer board may be blown. If machine shuts down on code "F" after short is corrected and machine put back together, replace Computer Control Center.

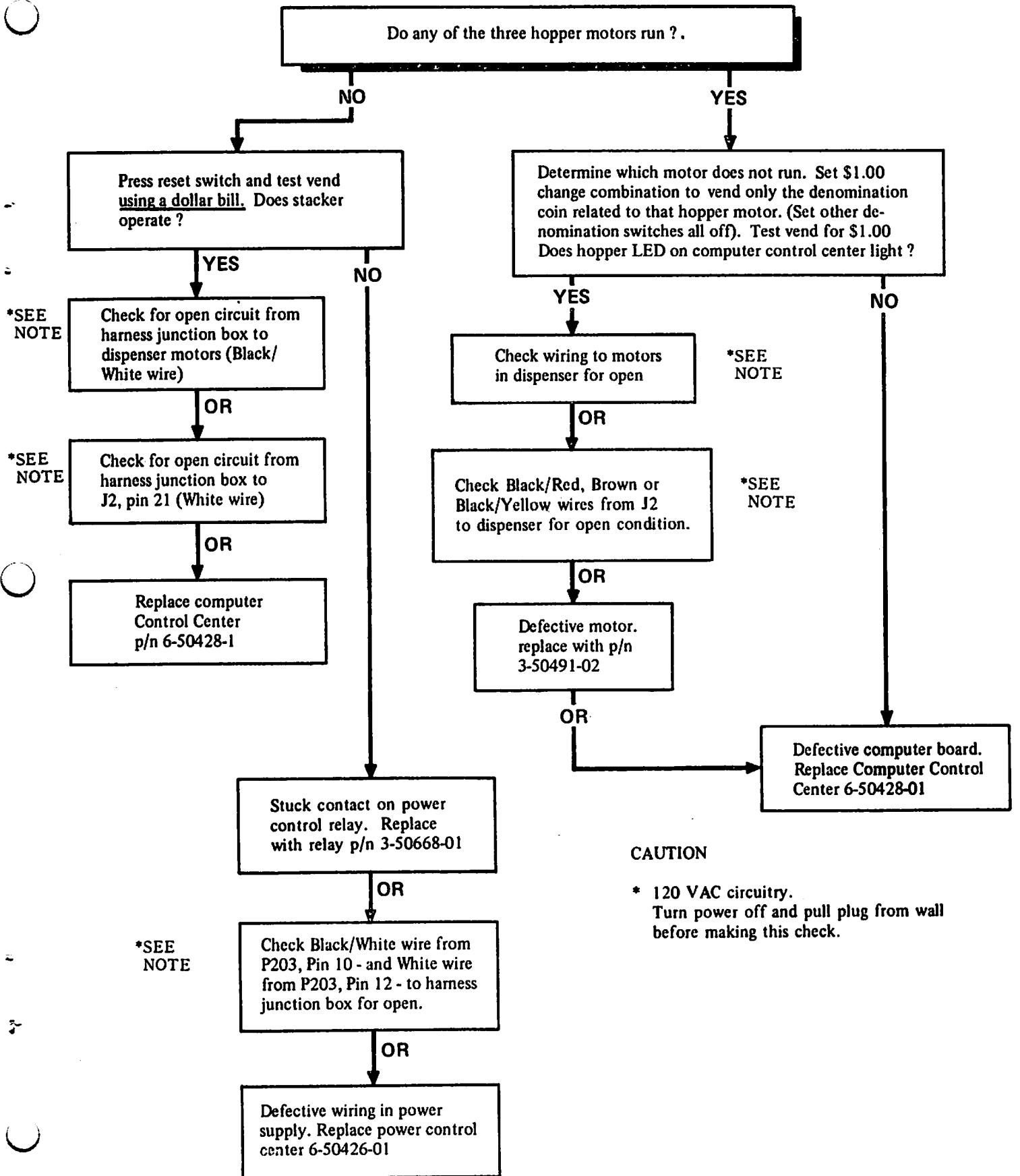
# BILL CHANGER INOPERATIVE -WILL NOT ACCEPT COINS OR BILLS



# TEST SWITCH INOPERATIVE -MACHINE WORKS OK FOR BILLS & COINS NO STATUS CODE



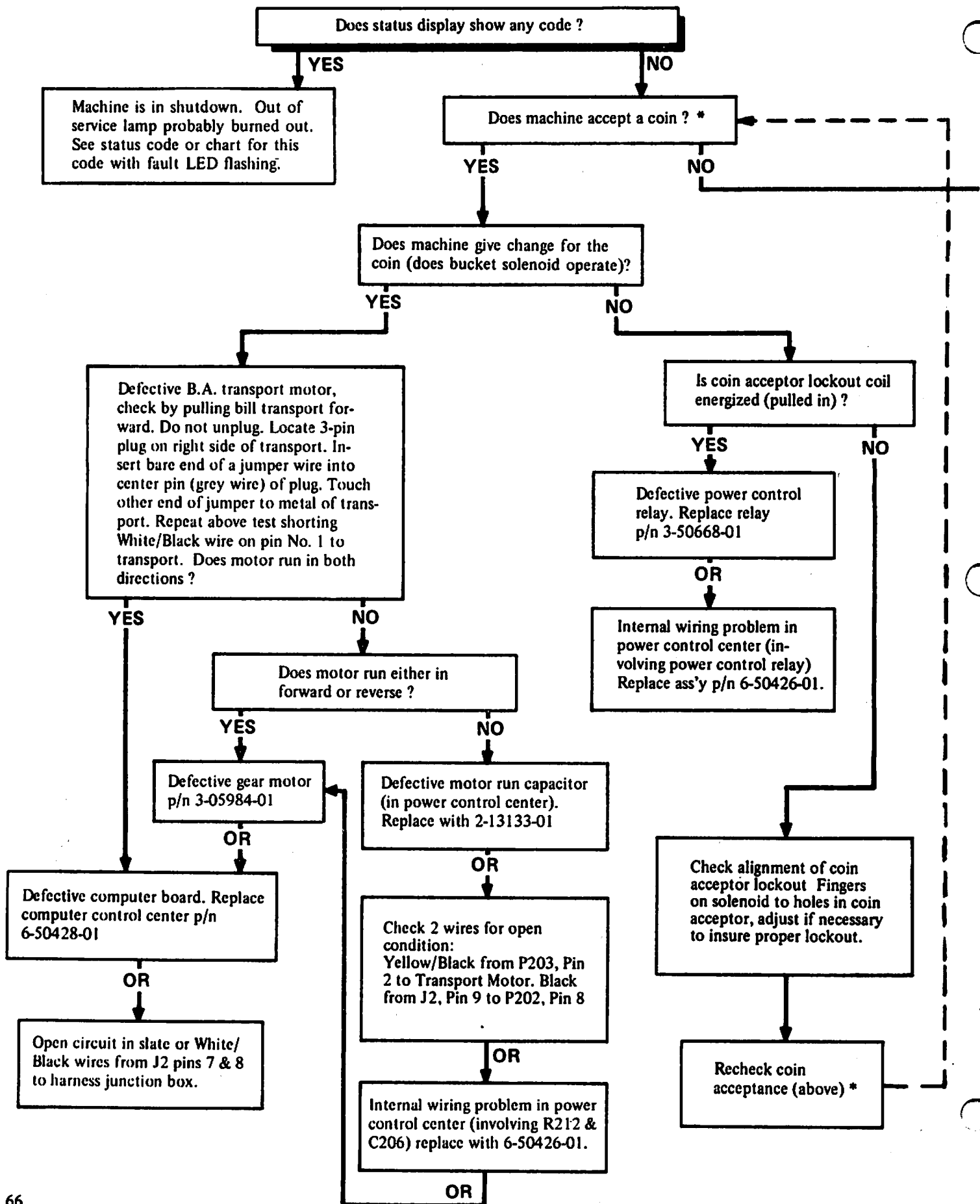
# 1 OR MORE HOPPER MOTORS FAIL TO RUN (REF. PAGES 2-4)

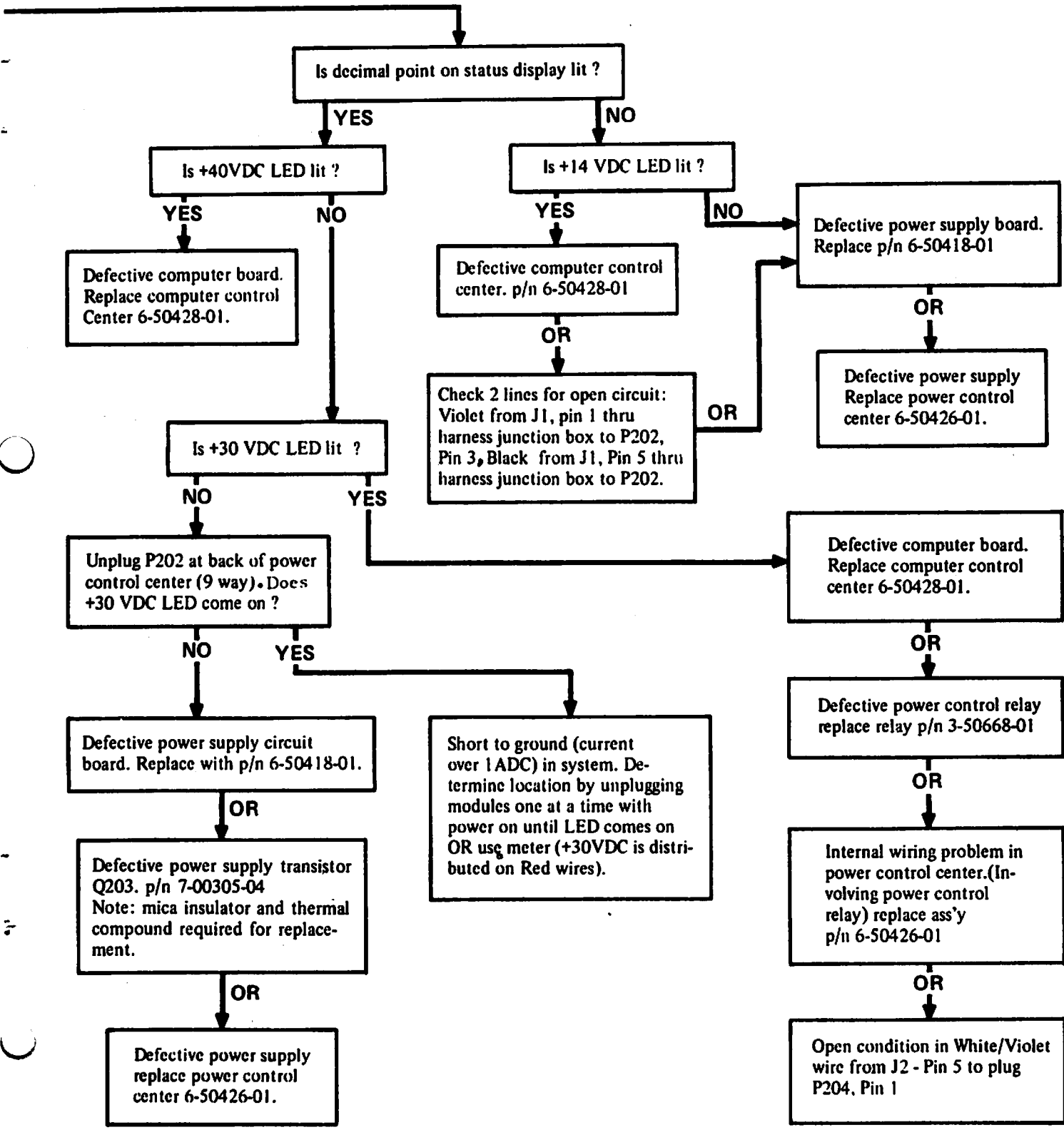


**CAUTION**

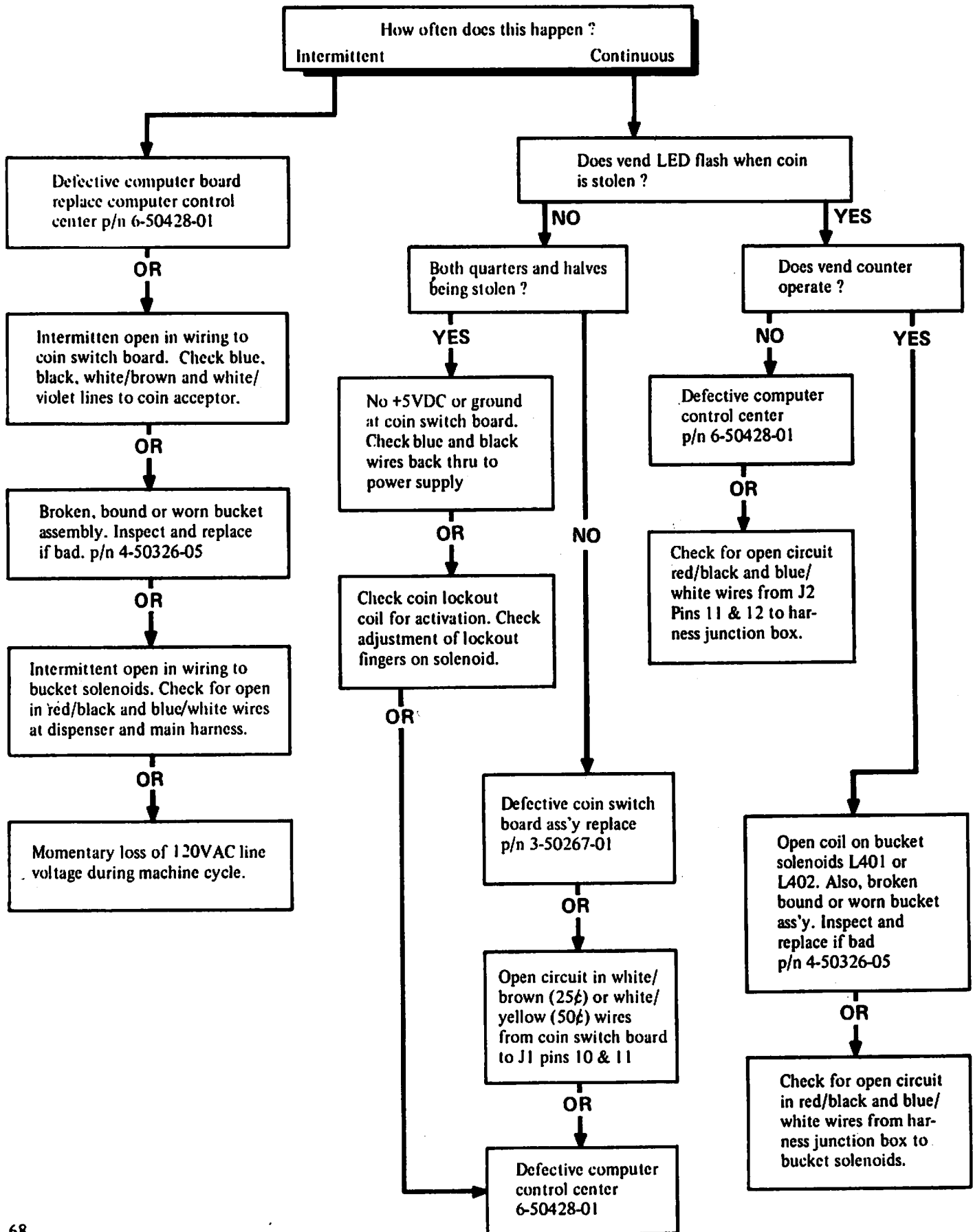
\* 120 VAC circuitry.  
Turn power off and pull plug from wall before making this check.

# B.A. TRANSPORT MOTOR FAILS TO RUN -FWD OR REV.

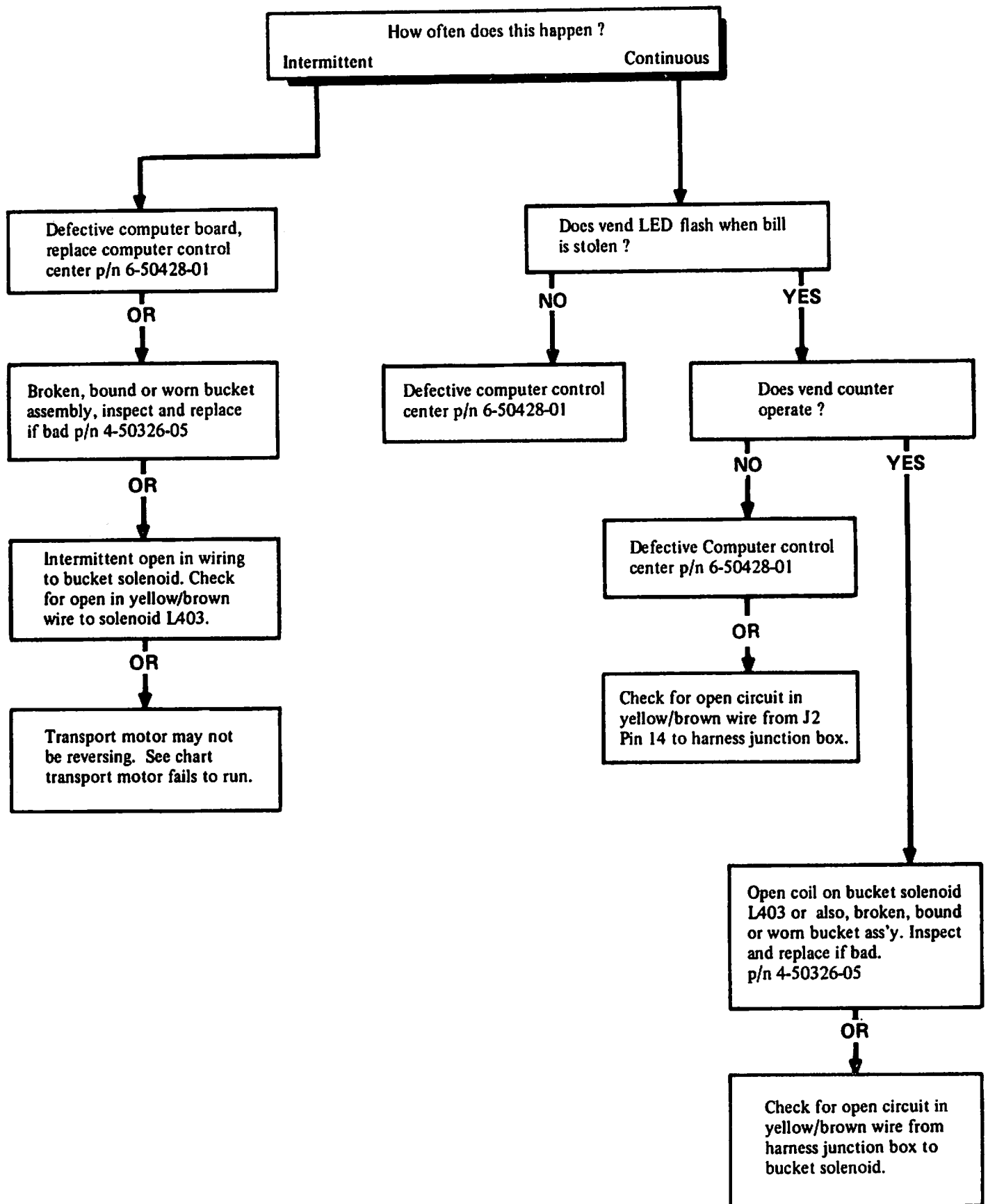




# BILL CHANGER STEALS COINS -WORKS OK WITH BILLS (GIVES NO CHANGE)

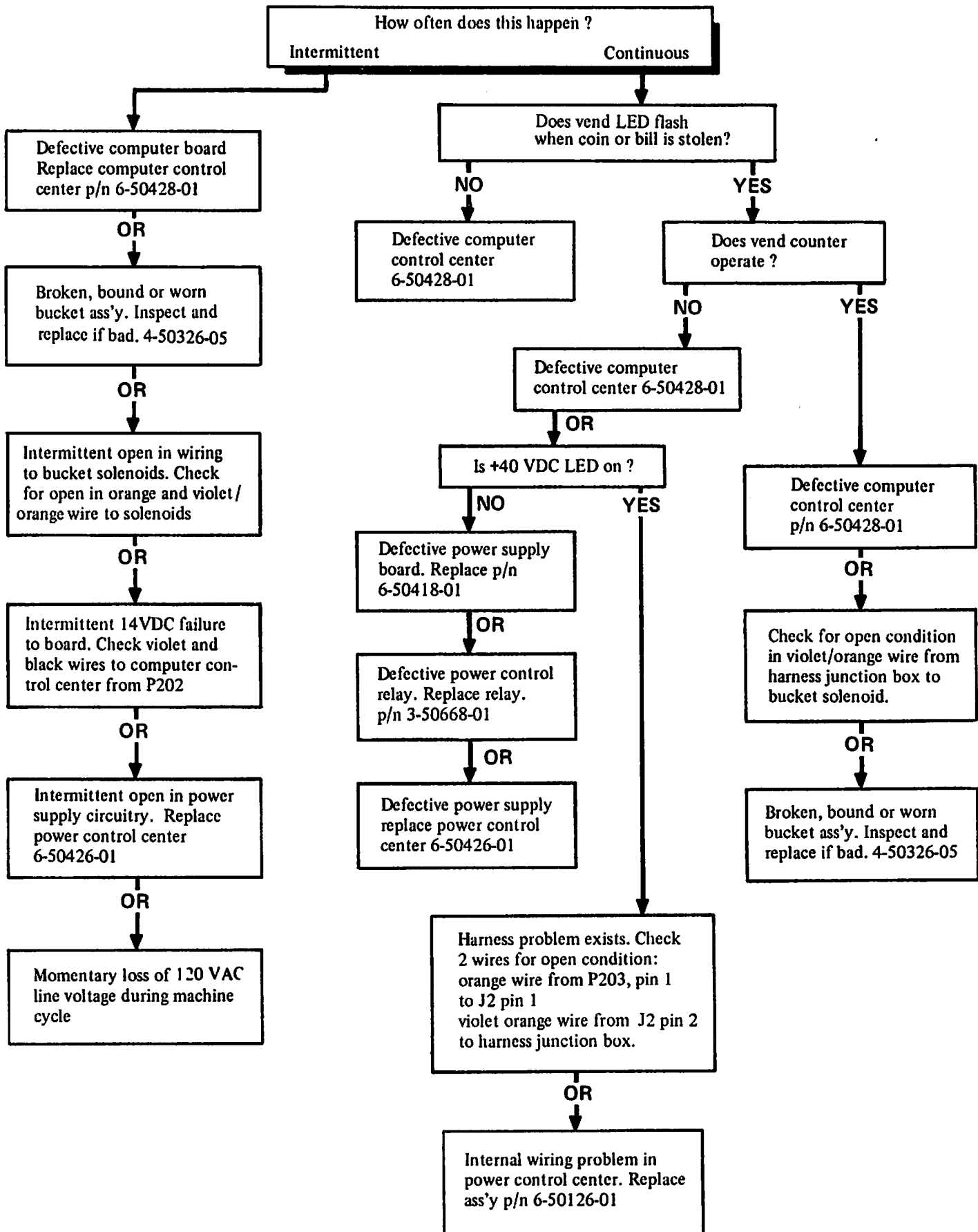


# BILL CHANGER STEALS BILLS -WORKS OK FOR COINS (GIVES NO CHANGE)

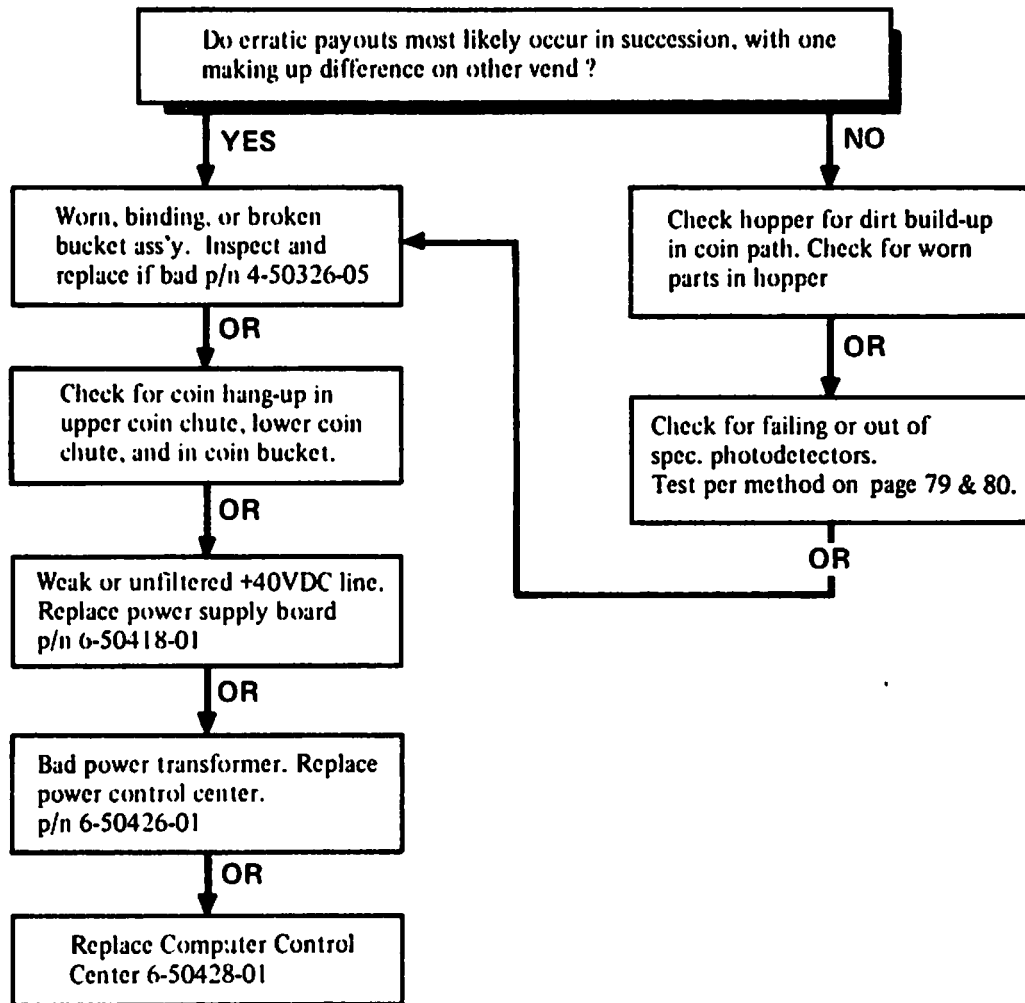




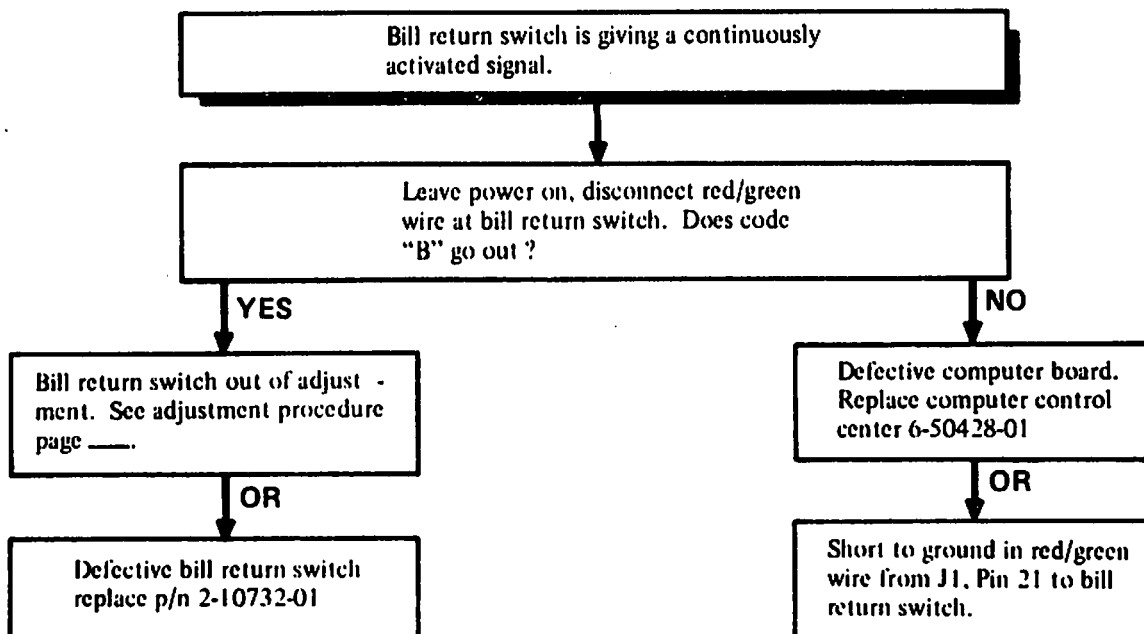
# BILL CHANGER STEALS BILLS AND COINS (GIVES NO CHANGE)



# BILL CHANGER GIVES ERRATIC PAYOUT FOR BILLS & COINS NO STATUS CODES



# TRANSPORT RUNNING IN REVERSE -OUT OF SERVICE LAMP OFF STATUS CODE SHOWING "8"



# BILL STACKER PROBLEMS

Was changer shutdown with a status code "D" (with fault LED flashing) ?

YES

NO

Disconnect plug at stacker (P501). Push reset switch. Does rest of machine operate properly?

NO

YES

Defective computer board. Replace computer control center p/n 6-50428-01

Stacker cam switches out of adjustment. See adjustment procedure page 81

Does stacker motor run at all ?

YES

NO

In addition to steps at left, check following:

Check for short to ground in green/white wire from stacker plug P501 to J1 Pin 16.

Defective driver board in stacker p/n 3-07527-01

Defective stacker motor p/n 3-50396-01

OR

OR

OR

OR

Defective stacker relay K501 p/n 2-12751-01

OR

OR

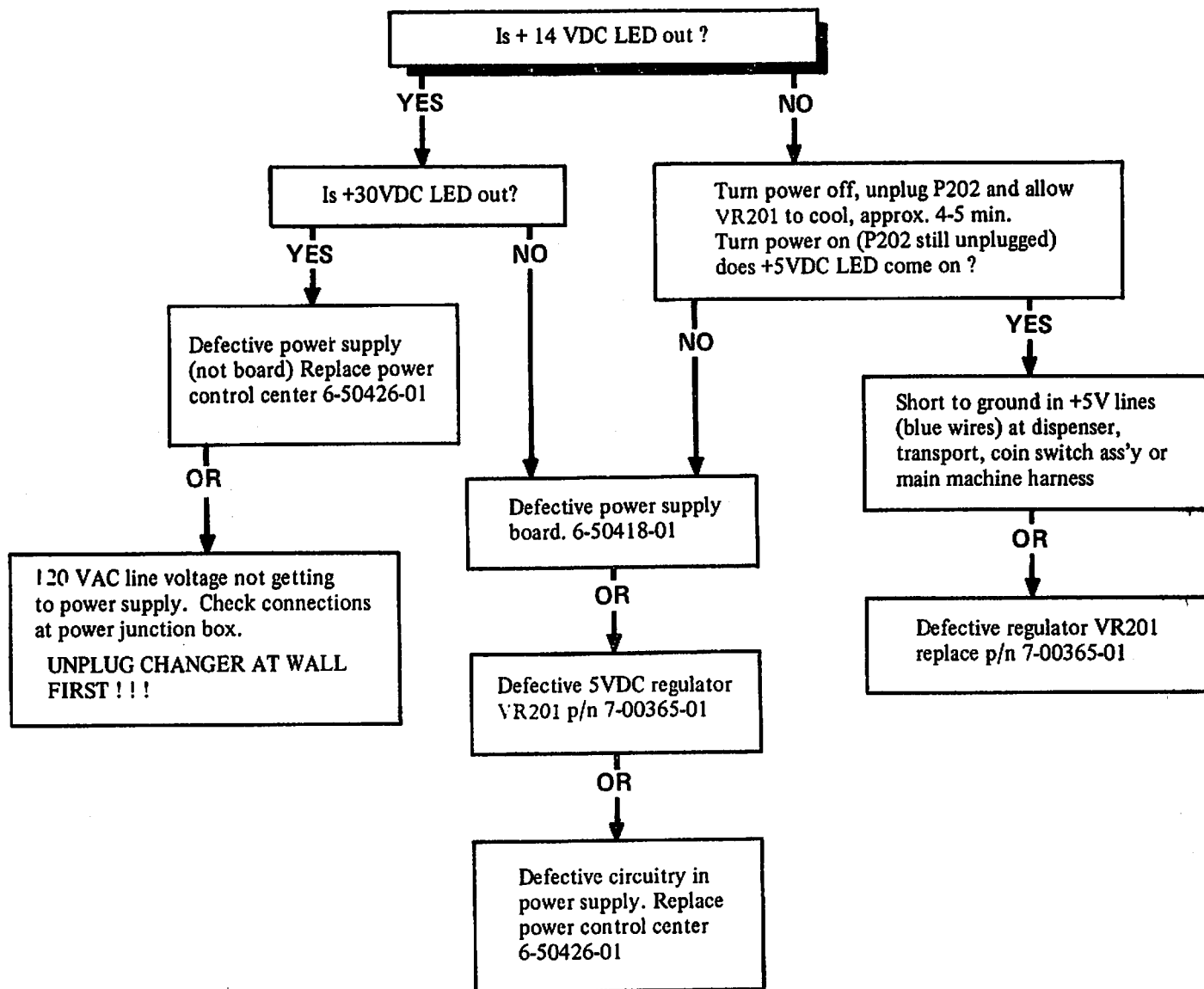
Defective stacker cam switch. Refer to parts manual for correct part no.

OR

Harness problem exists inside stacker. Replace stacker p/n 6-50249-02

Open condition in one or more of the following lines:  
 green/orange from J1 - pin 20 to stacker plug pin 4  
 red from harness junction box to stacker plug pin 1.  
 black from stacker plug pin 3 to P202  
 White and black/white (120 VAC) from stacker plug pins 7 & 8 to harness junction box.

## +5 VDC FAILURE +5 VDC LED OUT



## BILL CHANGER REJECTS ALL OR A LARGE NUMBER OF BILLS

The BC-20 contains self-diagnostic capabilities for identifying primary causes of rejected bills. To use this feature, insert a good, untorn and unfolded bill. Let end of bill remain in front of transport, read and identify code displayed on status display. (Bill will remain in transport for 30 seconds after it has been rejected) After that, machine will go into self-clear routine - see section: Operational Characteristics.

Look up code displayed in status code charts, make sure heading lists proper code and states: "Fault LED off".

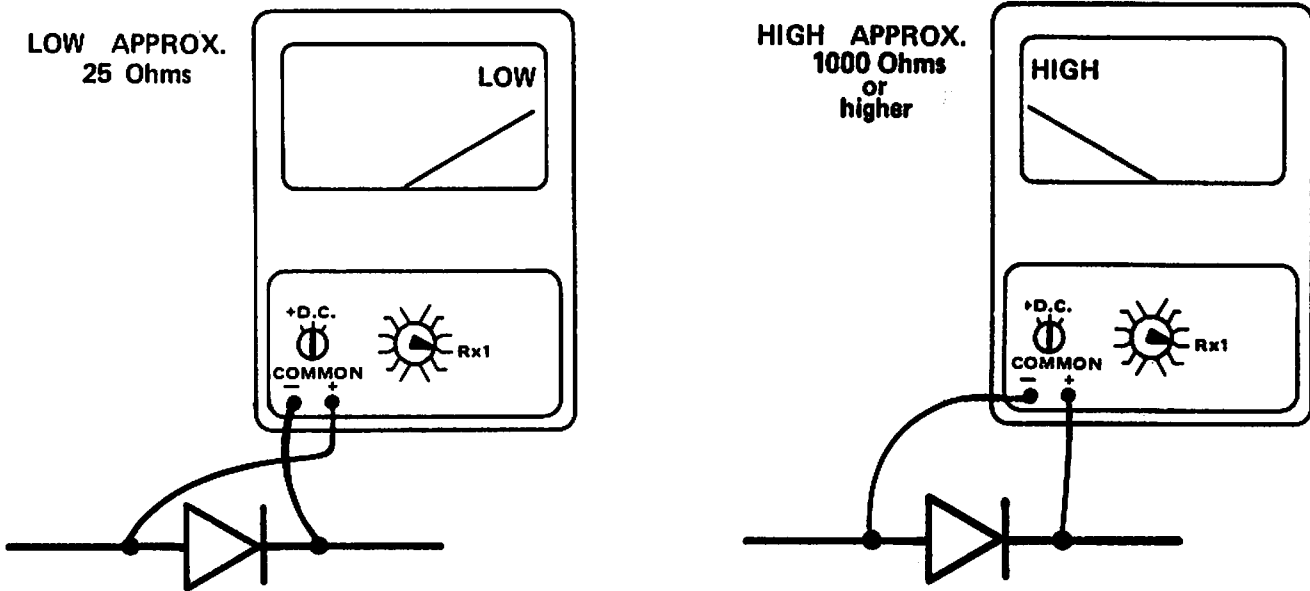
Read cause of rejection from chart. Causes are listed in order of most probable first, next most likely second, then third, etc. Block diagram schematic diagram, and wiring diagrams are helpful aids in checking wires, assemblies, etc.

## TEST PROCEDURES

Immediately following are illustrated procedures describing the various checks called for in the troubleshooting charts. A Simpson Model 260 V.O.M. is illustrated as representative of the typical meter used in service operations.

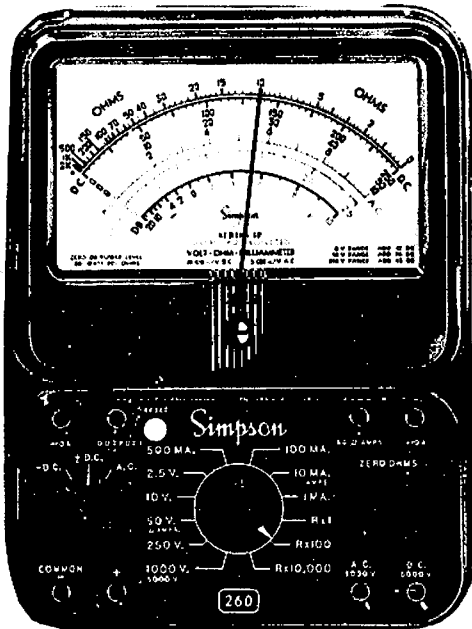
When making the voltage measurements indicated, be sure to only touch the test probes to the exact test point shown in the illustration. Shorting power circuits to ground may result in circuit damage.

### ① CHECKING A DIODE



Diodes conduct in ONE DIRECTION ONLY. They offer infinite resistance in the opposite direction.

### ② CHECKING A RESISTOR



R x 100 scale

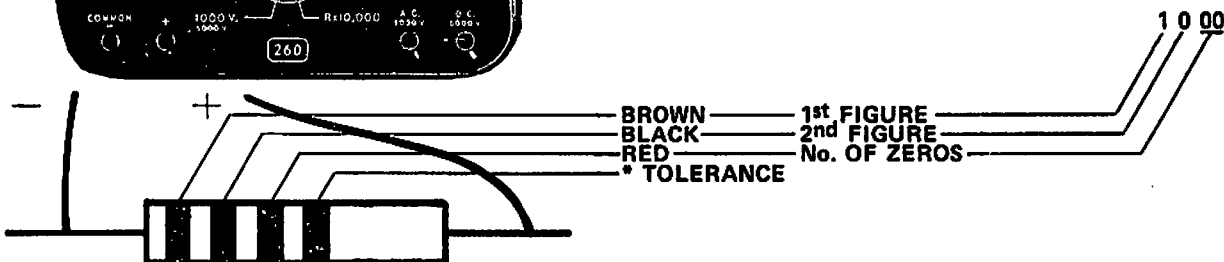
Pointer indicates 10 x scale 100 = 1000 Ohms

#### COLOR CODE

0 = Black	5 = Green
1 = Brown	6 = Blue
2 = Red	7 = Violet
3 = Orange	8 = Grey
4 = Yellow	9 = White

#### \* TOLERANCE

Silver = 10%      Gold = 5%

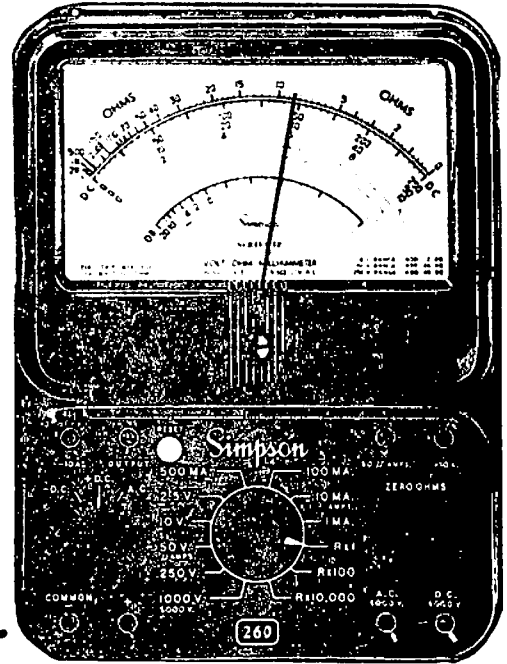


### ③ CHECKING BUCKET SOLENOID WITH OHMMETER

R x 1

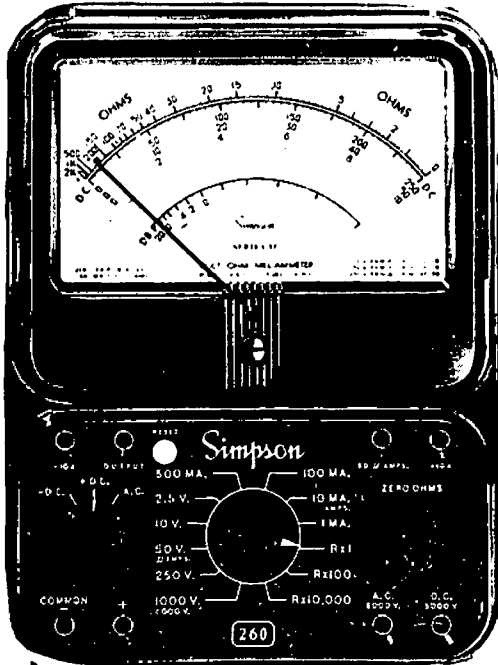
8.5 OHMS

A coil that looks discolored or burned should be checked. Disconnect from circuit before taking measurement.



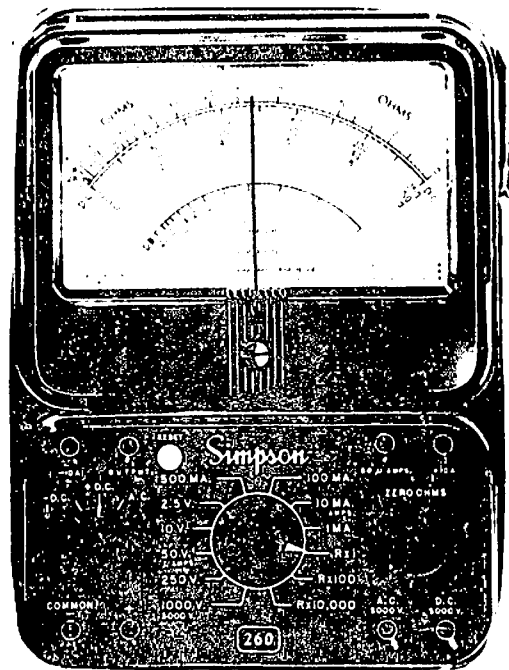
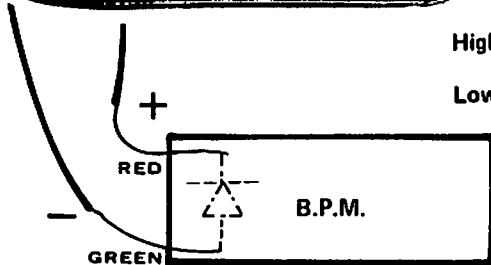
### ④ CHECKING BILL PRESSURE MAGNET WITH OHMMETER

A shorted diode across the Bill Pressure Magnet coil may damage a replacement Computer Control Center when it is plugged in. Always check the Bill Pressure Magnet coil before replacing Computer Control Center or if the transport is jamming bills.

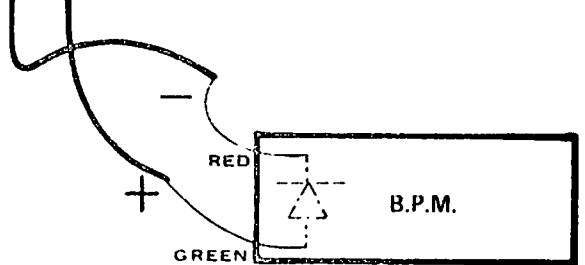


High = 270 Ohms

Low = 13 Ohms



R x 1

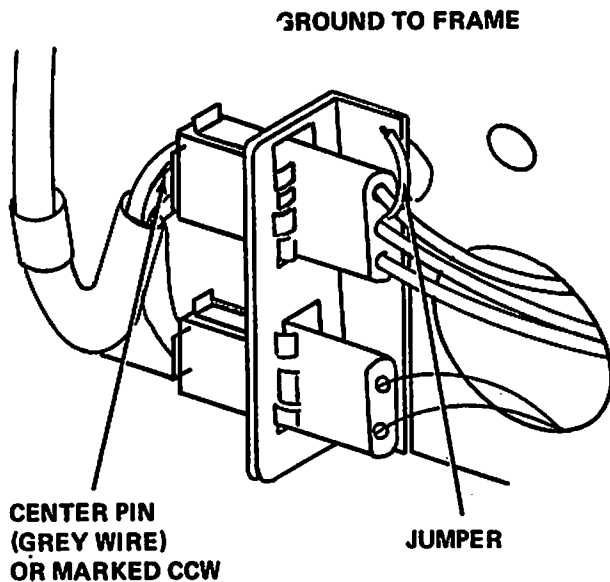


## ⑤ TESTING BILL TRANSPORT MOTOR

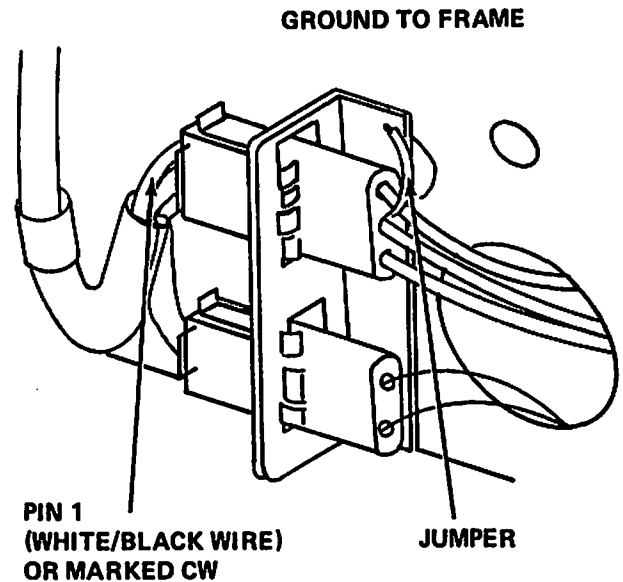
Perform this check if the transport motor will not run.

Pull bill transport assembly forward: do not unplug. Locate 3-pin plug on right side of transport. Insert bare end of jumper wire into center pin (grey wire) of plug. Touch other end of jumper wire to metal surface of transport. Check that motor runs forward. Repeat with pin 1 (white/black wires) and surface of transport. Check that motor runs in reverse. Replace transport motor if it does not run in both directions. If motor tries to run (hums), motor capacitor C206 is defective and should be replaced.

Motor - Part No. 3-05984-03  
Capacitor - Part No. 2-13133-01  
Transport - Part No. 6-50164-11

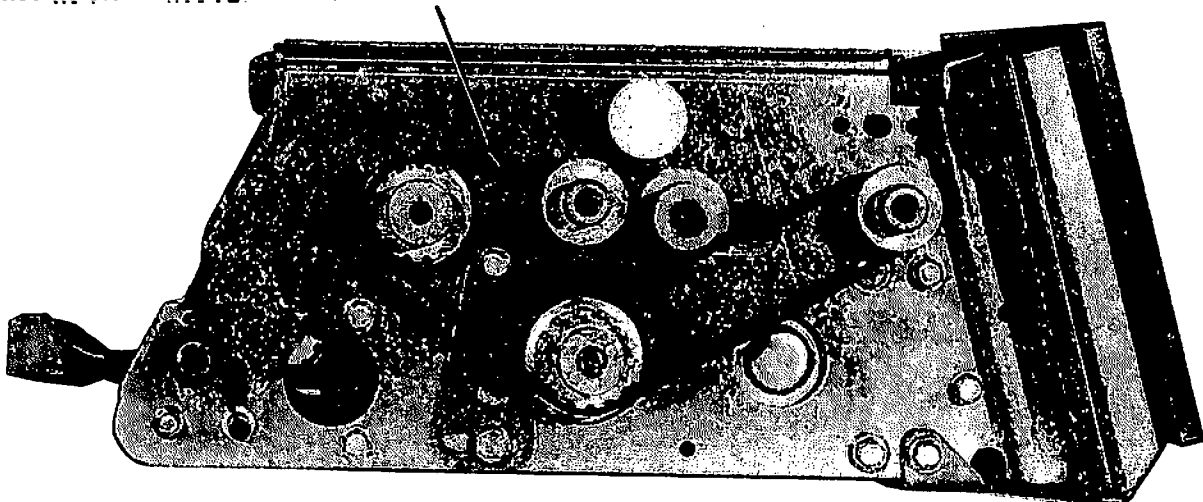


**MOTOR SHOULD RUN FORWARD**



**MOTOR SHOULD RUN IN REVERSE**

**CORRECT SPEED OF BILL ACCEPTOR DRIVE ROLLERS CAN BE CHECKED BY PUTTING A WHITE CHALK MARK ON MAIN TIMING BELT AND COUNTING HOW MANY TIMES THIS MARK PASSES A PARTICULAR POINT IN ONE MINUTE. IT SHOULD BE APPROXIMATELY 47 TIMES PER MINUTE**

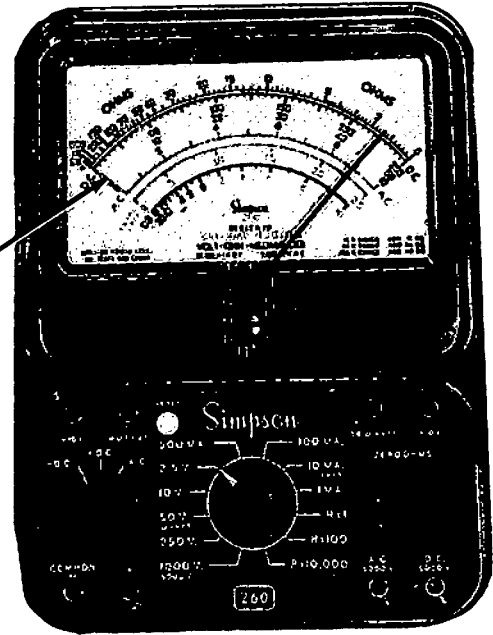


## ⑥ TESTING P1 PHOTOCELL

Perform this check if P4 can be adjusted but not P1

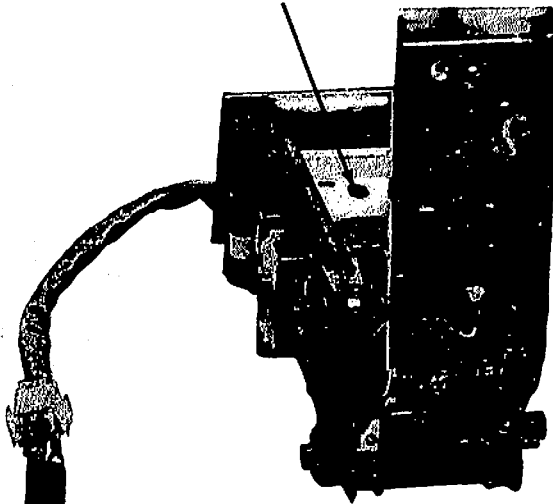
Check with Simpson 260 or equivalent. Set selector switch to 2.5V and the -DC, +DC, AC switch to -DC. Connect the red probe lead to + and the black probe lead to COMMON -. Unplug the bill transport and place the black meter probe on pin 3 (Black wire) of the 9-pin plug and the red probe on pin 5 (White/Orange wire) of the 9-pin plug. Since disconnecting the bill transport removes power to the P1 lamp, the cell must be exposed to an external light source such as a flashlight or available room light. With the cell exposed, check that the meter needle deflects to the right. The cell is defective if no meter movement is noted. Replace P1 cell, p/n 2-13398-01 or bill transport p/n 6-50164-11.

USE  
THIS  
SCALE  
50 = 0.5V  
100 = 1V  
150 = 1.5V  
200 = 2V  
250 = 2.5V



POSITIVE DEFLECTION

EXPOSE P1 CELL  
TO A LIGHT SOURCE



PLACE BLACK  
METER PROBE  
ON PIN 3  
(BLACK WIRE)

PLACE RED METER  
PROBE ON PIN 5  
(WHITE/ORANGE WIRE)

TESTING P1

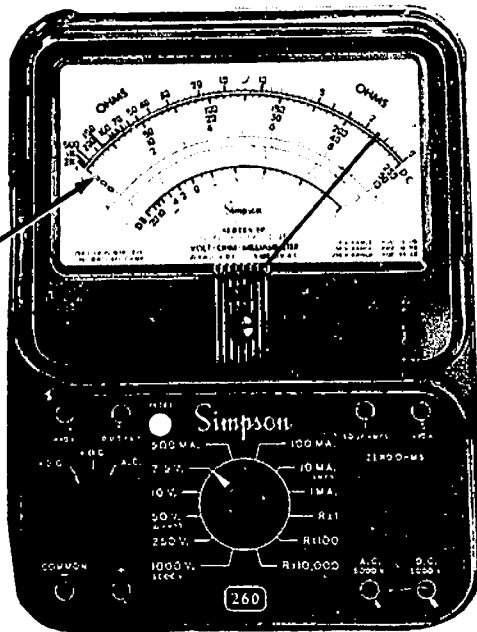


## ⑦ TESTING P4 PHOTOCELL

Perform this check if P1 can be adjusted but not P4.

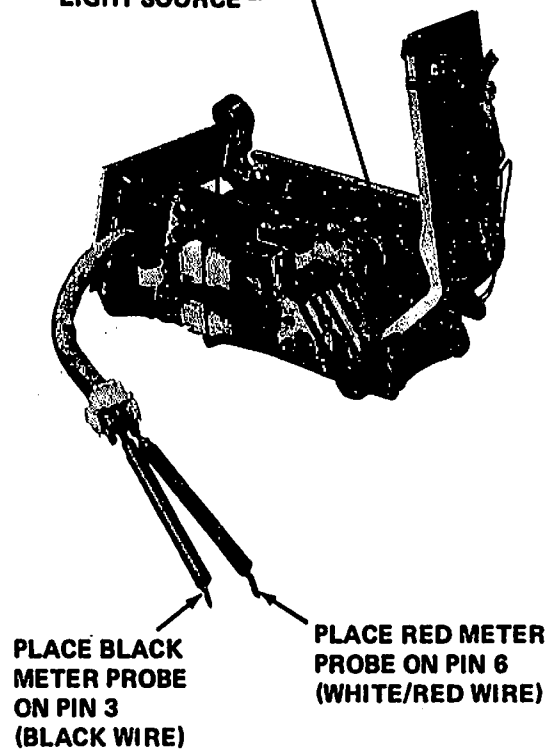
Check with Simpson 260 or equivalent. Set selector switch to 2.5V and the -DC, +DC, AC switch to -DC. Connect the red probe lead to + and the black probe lead to COMMON -. Unplug the bill transport and place the black meter probe on pin 3 (black wire) of the 9-pin plug and the red probe on pin 6 (white/red wire) of the 9-pin plug. Since disconnecting the bill transport removes power to the P4 lamp, the cell must be exposed to an external light source such as a flashlight or available room light. With the cell exposed, check that the meter needle deflects to the right. The cell is defective if no meter movement is noted. Replace with part no. 2-13398-01 if defective or replace entire transport assembly part no. 6-50164-11.

USE  
THIS  
SCALE  
50 = 0.5V  
100 = 1V  
150 = 1.5V  
200 = 2V  
250 = 2.5V



POSITIVE DEFLECTION

EXPOSE P4  
CELL TO A  
LIGHT SOURCE



PLACE BLACK  
METER PROBE  
ON PIN 3  
(BLACK WIRE)

PLACE RED METER  
PROBE ON PIN 6  
(WHITE/RED WIRE)

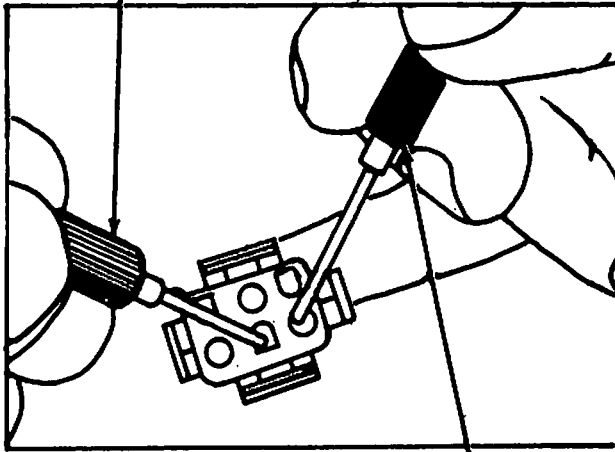
TESTING P4

### ⑧ TESTING P6 PHOTOCELL

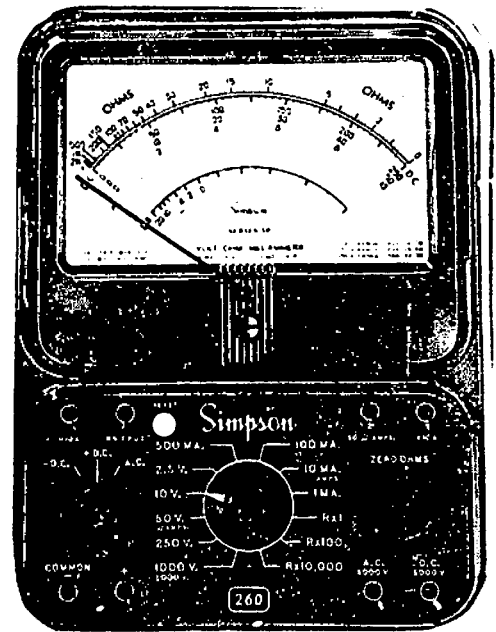
Make this check if bill changer accepts bills but does not give change. This problem may be intermittent.

Set meter selector switch to 10V and the -DC, +DC, AC switch to +DC. Connect the red probe lead to + and the black probe lead to COMMON -. Pull out and disconnect bill transport and place on a working surface.

**CONNECT BLACK PROBE TO PIN 5 (BROWN WIRE)**



**CONNECT RED PROBE TO PIN 6 (YELLOW WIRE)**

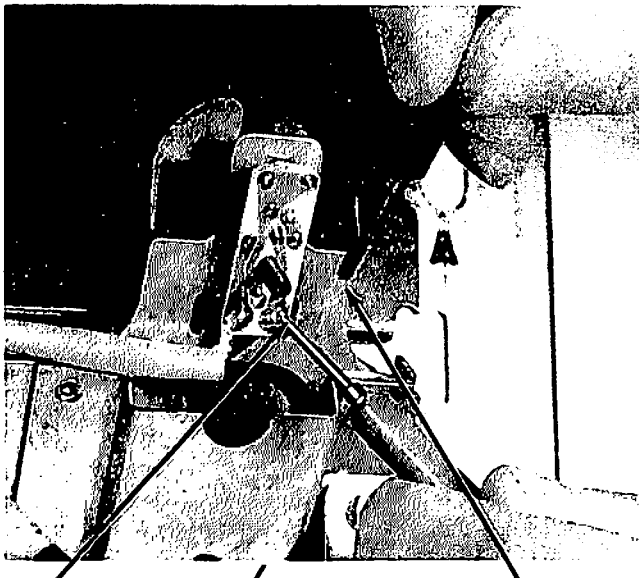


**NEGATIVE OFF SCALE DEFLECTION**

Place black meter probe lead on pin 5 (brown wire) of 6 pin plug and red probe lead on pin 6 (yellow wire). Expose the cell to an external light source. If the meter needle moves off scale to the left with the cell exposed and the needle does not move with the cell covered, the cell is good. If no meter deflection is noted with the cell exposed, replace cell p/n 2-13398-01.

### ⑨ TESTING COIN COUNTING PHOTOTRANSISTOR IN DISPENSER ASSEMBLY

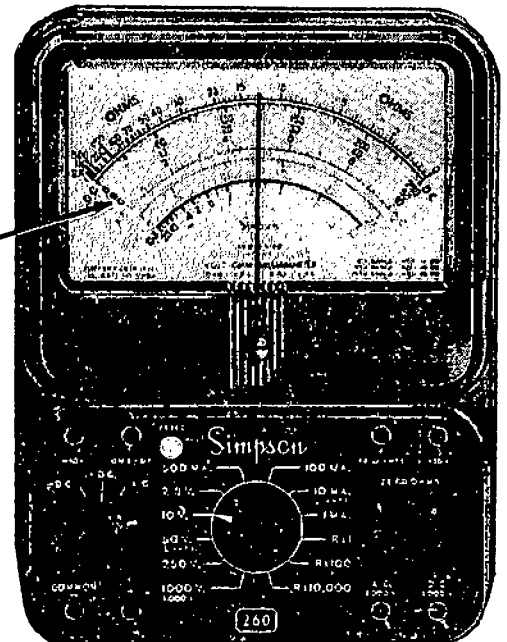
Check using Simpson 260 or equivalent. Set selector switch to 10V and the -DC, +DC, AC switch to the +DC. Connect the red probe lead to + and the black probe lead to COMMON -; turn off power to the bill changer. Remove black case from phototransistor. Connect the black probe lead to the metal dispenser backing plate and the red lead to the phototransistor blue wire. Turn power on to the bill changer; check that the small lamps are lit. If meter reading is not 4.7 to 5.2 volts DC, replace voltage regulator VR201, part no. 7-00365-01 on rear of Power Control Center.



**CONNECT RED METER PROBE TO BLUE PHOTOTRANSISTOR WIRE**

**CONNECT BLACK METER PROBE TO FRAME**

**USE THIS SCALE**

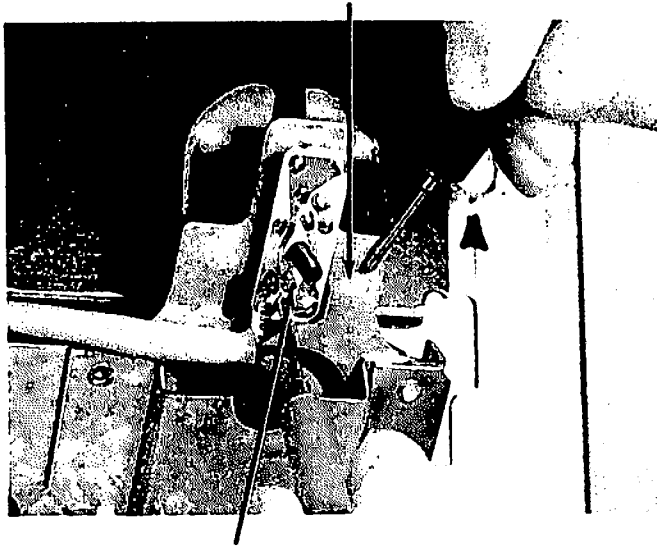


**5.0 VOLTS DC**

**CONNECT BLACK METER PROBE TO FRAME**

Perform this check if accountability problems are evident, usually prevalent with one denomination of coins.

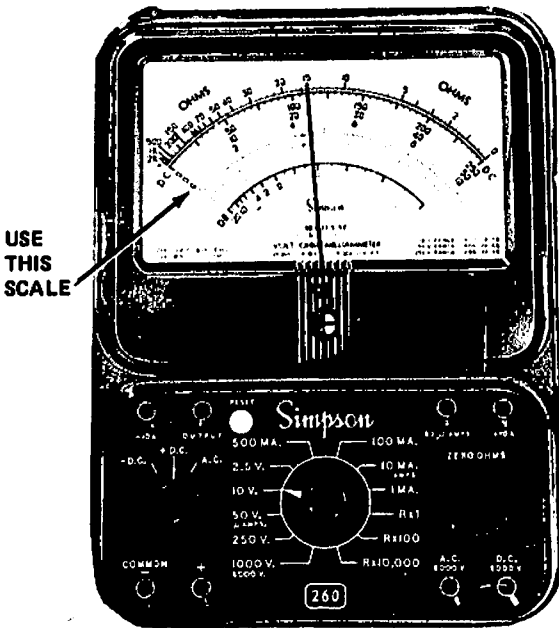
Phototransistor Assembly must have black transistor at bottom; If not, replace phototransistor assembly with part number 2-70222-01



**CONNECT RED METER PROBE TO YEL/BLK, YEL/GRN, OR YEL/VIO PHOTOTRANSISTOR WIRE**

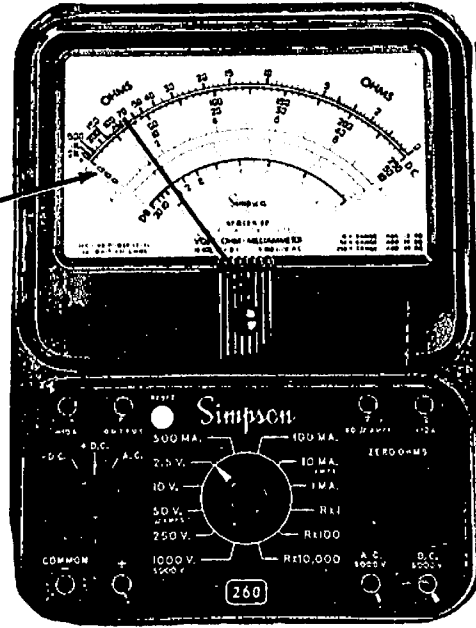
This test assumes that +5 VDC is present at detectors (See first part of test 9 - page 79)

Set meter selector switch to 10V. With black lead still on metal plate, place red lead on yellow/black, yellow/green or yellow/violet wire on phototransistor. With power applied to changer, reading should be 3.5 to 5.0 volts DC. If the voltage is less than 3.5 V., replace the phototransistor.



**PHOTOTRANSISTOR OK + 4.5 VDC**

USE THIS SCALE  
 50 = 0.5V  
 100 = 1V  
 150 = 1.5V  
 200 = 2V  
 250 = 2.5V



**PHOTOTRANSISTOR OK + 0.3 VDC**



Block the light source to the phototransistor. Set meter selector switch to 2.5V. If the reading is higher than 0.6 volt, replace the phototransistor with kit no. 2-70222-01 or replace dispenser assembly part no. 6-50275-04.

## ADJUSTMENTS

### BILL STACKER SWITCH ADJUSTMENT

Adjust the bill stacker switch as follows:

1. Remove bill stacker from changer.
2. Hold motor brake in (disengaged) and manually rotate motor shaft until stacker is 1/2 cycle from home position (Stacker chute is at its outermost extended position). The cam and cam switches should be accessible from below and the narrow lobe of the cam should be pointed at the switches as shown in figure 21.
3. Adjust cam switches by loosening adjustment screw and rotating switch bracket until  $.281''$  (7.14 mm) diameter rod bottoms spring against switch body as shown. (An ordinary wooden lead pencil is approx. this diameter.)
4. Tighten adjustment screw and reinstall stacker in changer.
5. Turn on power and press reset switch.

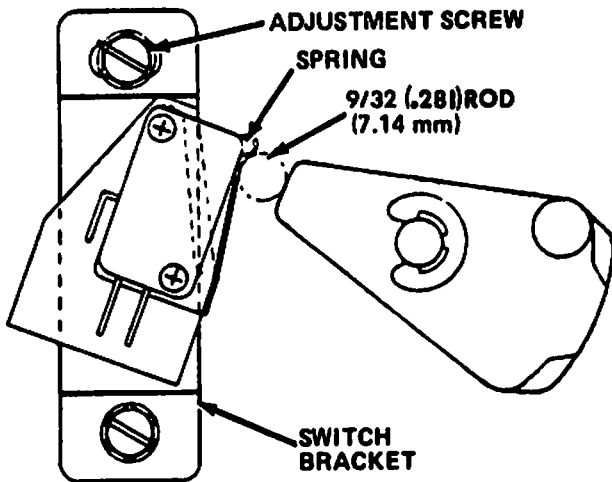


FIGURE 21 ADJUSTING STACKER SWITCH

### BILL RETURN SWITCH ADJUSTMENT

This switch must be in the actuated condition when the machine is on standby with the bill and coin return button out.

The switch should transfer and put the bill acceptor motor in reverse when the bill and coin return button is depressed 1/8 to 1/4 inch.

## HOPPER CHAIN ADJUSTMENT

### NOTE

**MAKE SURE HOPPER IS EMPTY OF ALL COINS BEFORE ADJUSTING CHAIN TENSION.**

1. Loosen (3) screws at top back of hopper which will allow black plastic upper chain guide ring to move diagonally upwards.
2. Pull upper chain guide ring up as shown in figure 22, while rotating drive pin clockwise until slack is removed from chain but no bind is evident.

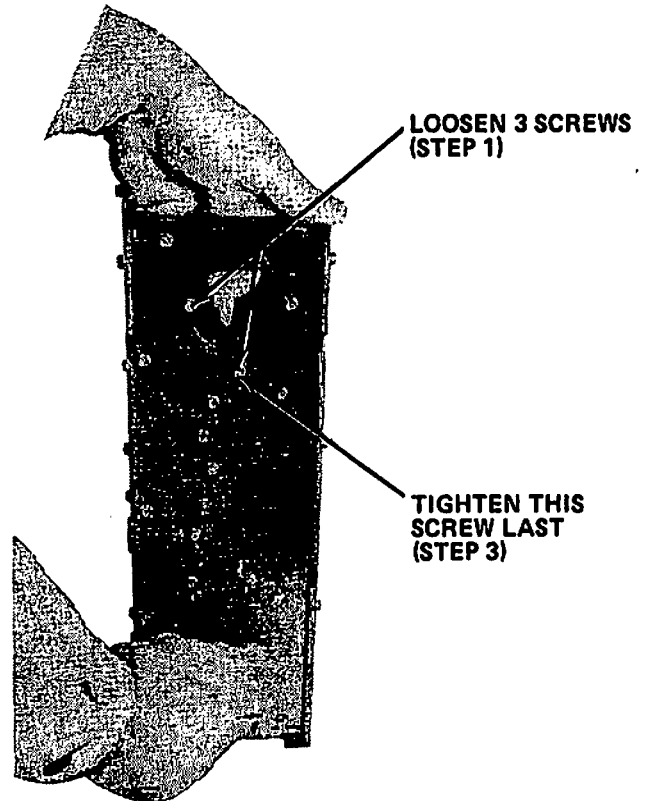


FIGURE 22 ADJUSTING HOPPER CHAIN

3. Tighten the 3 screws making sure the lower screw is tightened last. If a torque wrench is available, the chain should be adjusted so that the torque input at the drive pin should be 1-4 inch pounds.

# SECTION 5 - ADDITIONAL INFORMATION

## HARNESS COLOR CODING

Harness wiring in the BC-20 is color coded according to function. To check wiring in the machine, find the function you want in the chart below and note the wire color associated with this function. Then, check this color wiring to find the source of problem. The wiring diagram will tell you where the wires are routed.

<u>FUNCTIONS</u>	<u>WIRE COLOR</u>
<b><u>SUPPLY VOLTAGES</u> (See Note 1)</b>	
120 VAC Hot	Black/White
120 AC Common	White
30 VAC	Yellow/Black
+40 VDC	Orange
+40 VDC Sensed	Violet/Orange
+30 VDC	Red
+30 VDC to out of service lamp	Yellow/Violet
+14 VDC	Violet
+ 5 VDC	Blue
<b><u>GROUNDS</u></b>	
Earth (Fault) Ground	Green/Yellow
High Current Ground	Black
Low Voltage Common	Black (See note 2)
<b><u>SIGNAL LINES</u></b>	
Transport:	
Magnetic Head	Shielded Cable (See note 3)
P1 Cell	White/Orange
P4 Cell	White/Red
P6 Cell	Yellow
Bill Pressure Solenoid	White/Green
Transport Motor Forward	Slate
Transport Motor Reverse	White/Black
Bill Stacker:	
Stacker Drive Signal	Green/Orange
Stacker Monitor	Green/White
Coin Switch Assembly:	
Coin Lockout Coil	White/Blue
25¢ Coin Switch	White/Brown
50¢/\$1.00 Coin Switch	White/Yellow

**FUNCTIONS**

**WIRE COLOR**

**Dispenser:**

10¢ (Left) Coin Detector	Orange/Green
25¢ (Center) Coin Detector	Orange/Brown
5¢ (Right) Coin Detector	Orange/Black
10¢ (Left) Hopper Motor	Black/Red
25¢ (Center) Hopper Motor	Brown
5¢ (Right) Hopper Motor	Black/Yellow
\$1.00 (Left) Vend Solenoid	Yellow/Brown
25¢ (Center) Vend Solenoid	Red/Black
50¢ (Right) Vend Solenoid	Blue/White

**Power Control Center:**

Power Relay Control	White/Violet
\$1.00 Test Switch	Brown/White
50¢ Test Switch	Violet/White
25¢ Test Switch	Red/White
\$1.00 Vend Counter	Yellow/Brown
50¢ Vend Counter	Blue/White
25¢ Vend Counter	Red/Black

**Bill Return Switch:**

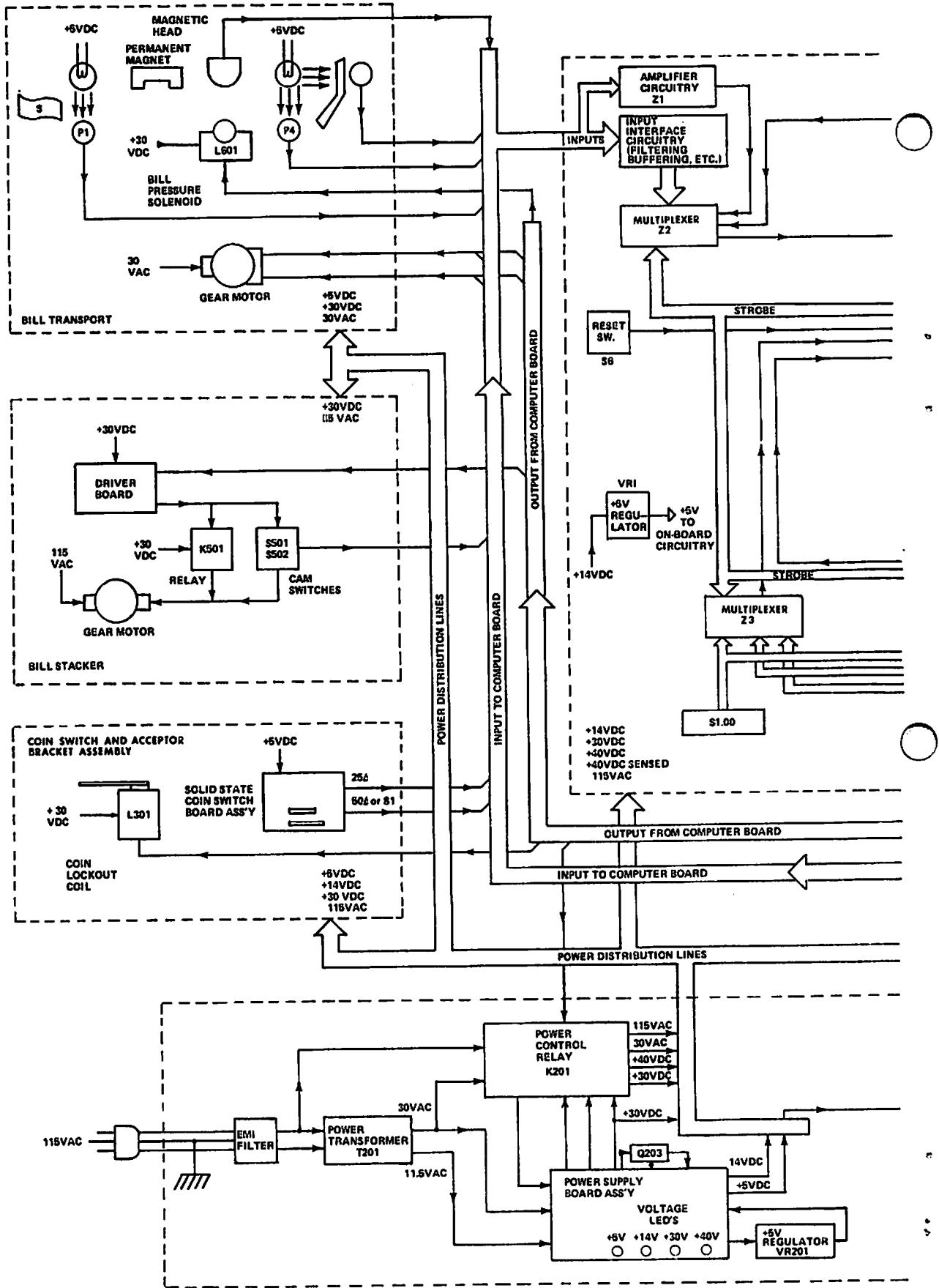
Red/Green

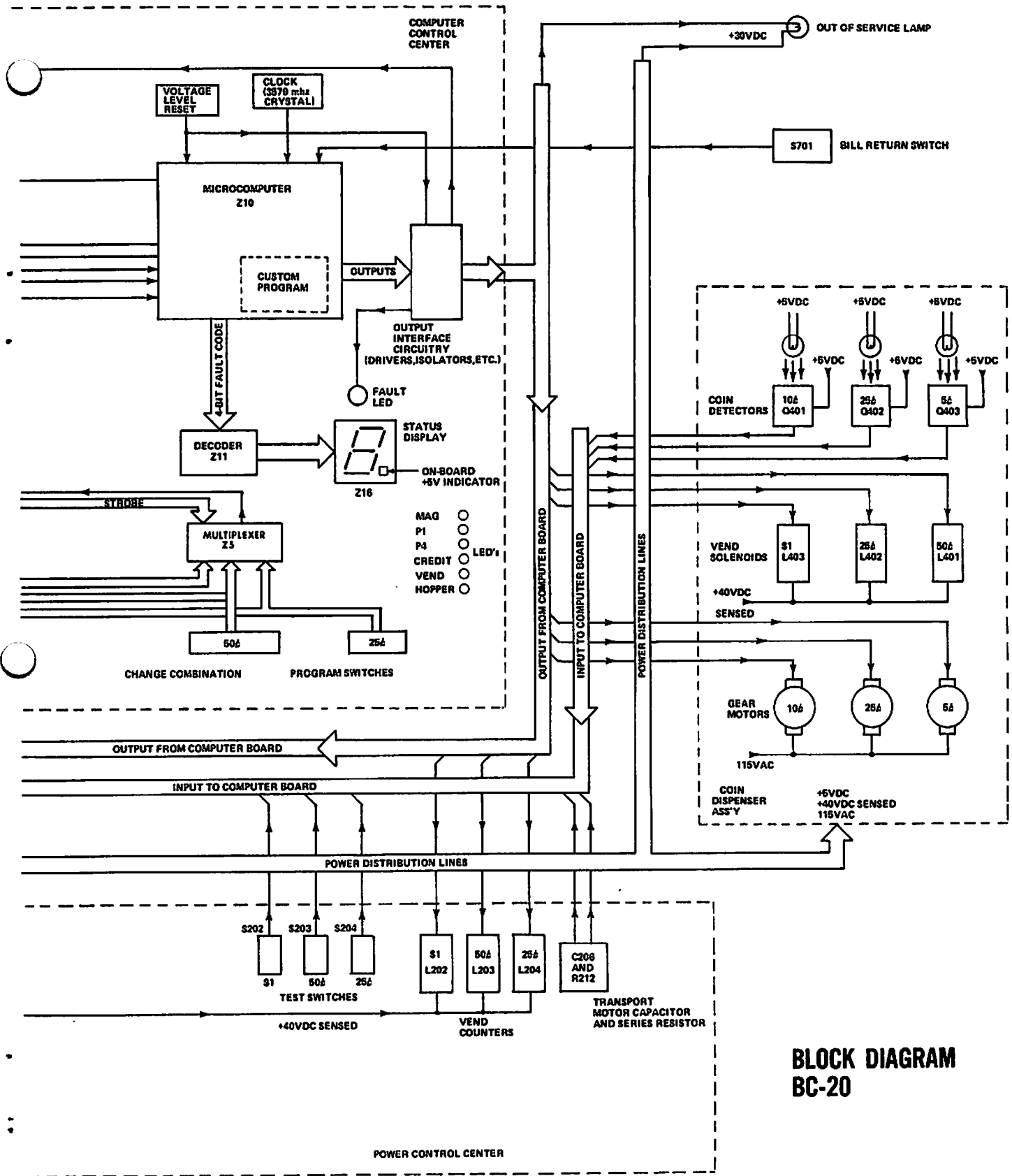
**Out Of Service Lamp**

Brown/Yellow

**NOTES:**

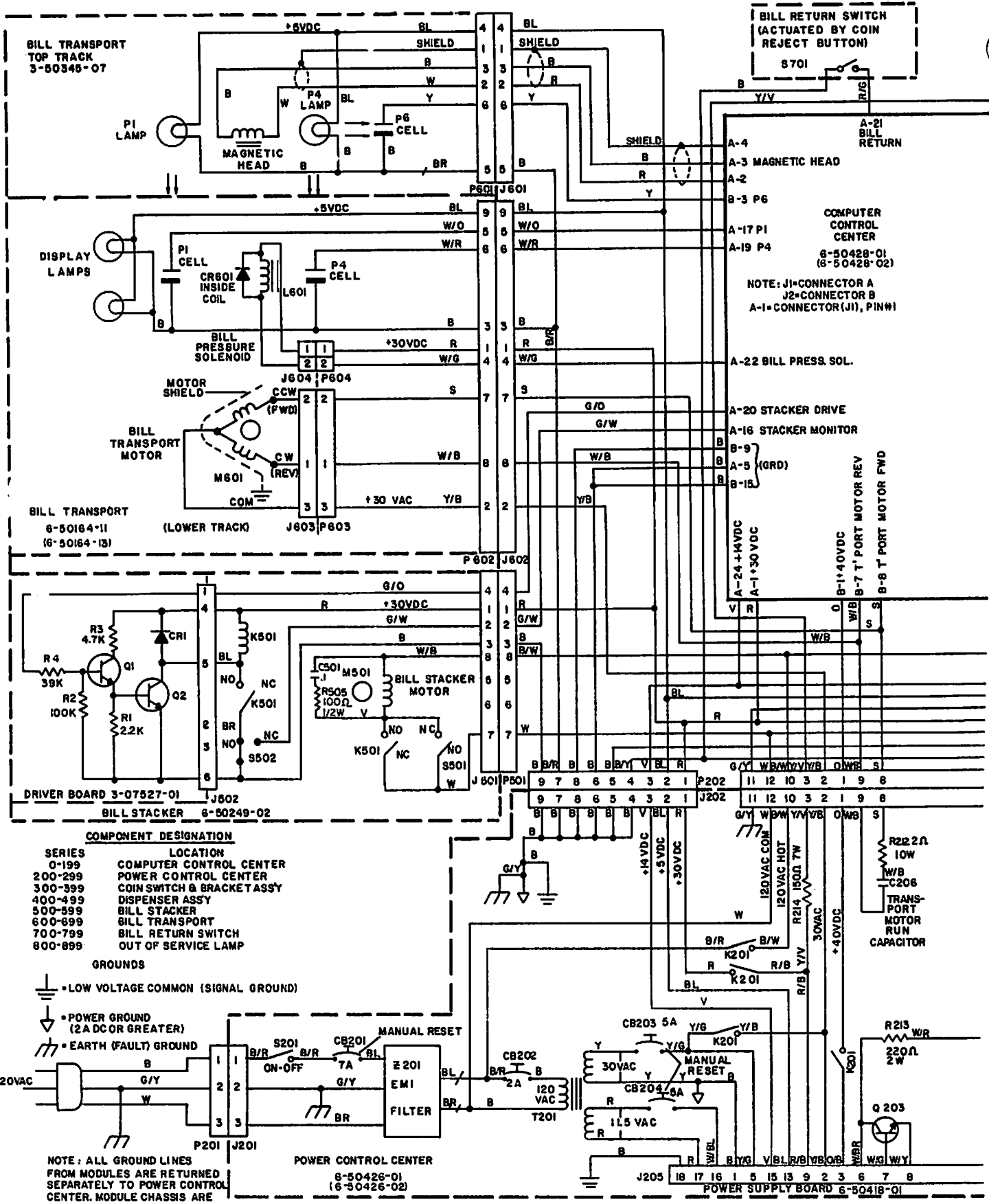
1. Inside Power Control Center, as voltage lines pass through switches, circuit breakers, relay contacts, etc. wire colors change for clarity. Consult Power Supply schematic for these wire colors.
2. At harness plug J203 to Power Control Center, two low voltage common wires are not black. These are black/red, on Pin No. 7 and black/yellow on Pin No. 4. Both wires go to main junction box where they connect to black wires.
3. On transport top track harness, the shielded cable has black and white leads. In main harness, inside leads of shielded cable are black and red. (White changes to red at P601).





**BLOCK DIAGRAM BC-20**





BILL RETURN SWITCH  
(ACTUATED BY COIN  
REJECT BUTTON)  
S701

BILL TRANSPORT  
TOP TRACK  
3-50345-07

DISPLAY  
LAMPS

BILL TRANSPORT  
6-50164-11  
(6-50164-13)

DRIVER BOARD 3-07527-01

BILL STACKER 6-50249-02

COMPUTER  
CONTROL  
CENTER  
6-50428-01  
(6-50428-02)

NOTE: J1=CONNECTOR A  
J2=CONNECTOR B  
A-1=CONNECTOR (J1), PIN#1

**COMPONENT DESIGNATION**

SERIES	LOCATION
0-199	COMPUTER CONTROL CENTER
200-299	POWER CONTROL CENTER
300-399	COIN SWITCH & BRACKET ASSY
400-499	DISPENSER ASSY
500-599	BILL STACKER
600-699	BILL TRANSPORT
700-799	BILL RETURN SWITCH
800-899	OUT OF SERVICE LAMP

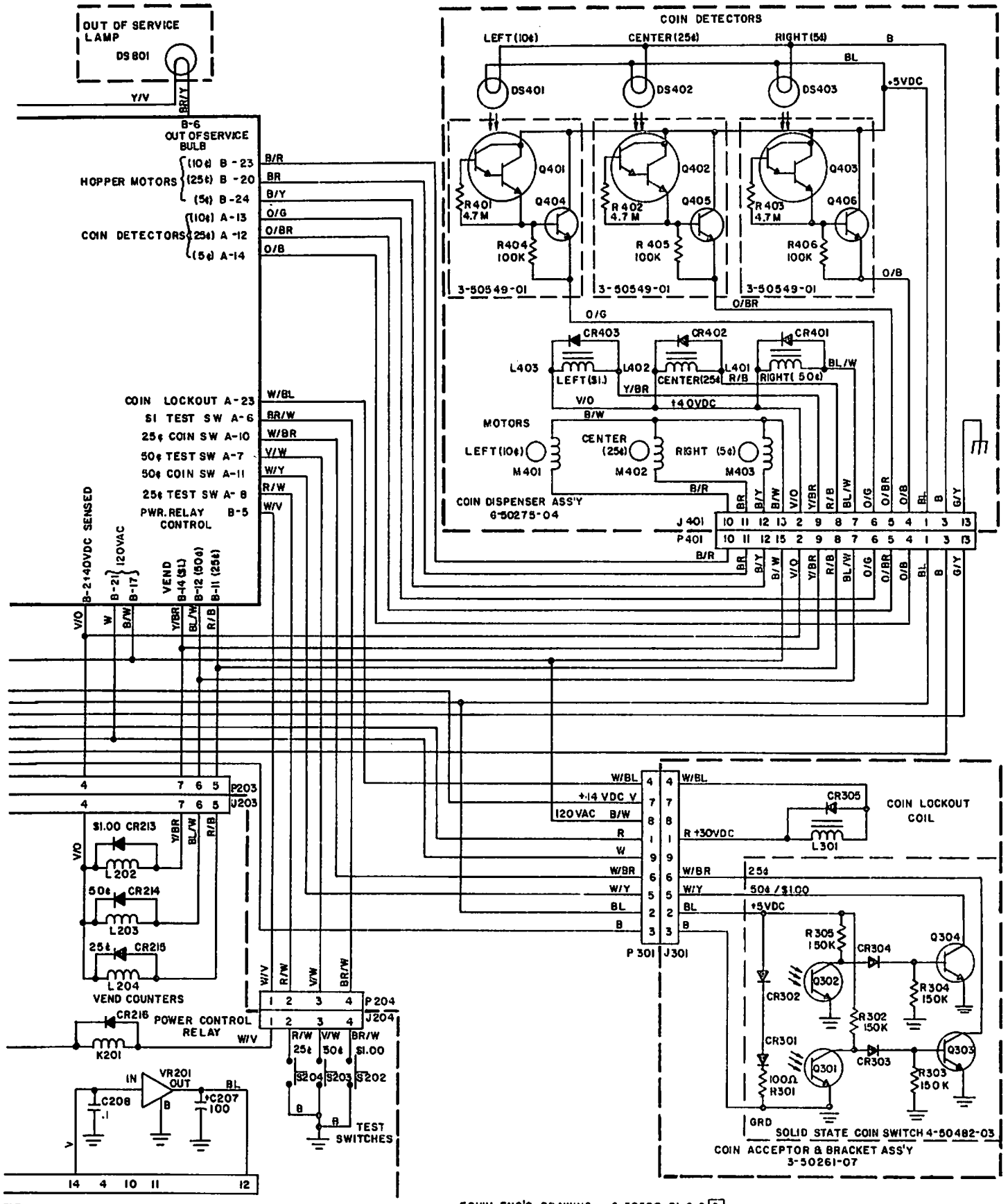
**GROUNDS**

- ⏏ = LOW VOLTAGE COMMON (SIGNAL GROUND)
- ⏏ = POWER GROUND (2A DC OR GREATER)
- ⏏ = EARTH (FAULT) GROUND

NOTE: ALL GROUND LINES  
FROM MODULES ARE RETURNED  
SEPARATELY TO POWER  
CONTROL CENTER. MODULE CHASSIS ARE  
NOT GROUNDED TO LOW VOLTAGE  
COMMON EXCEPT AT POWER CONTROL.

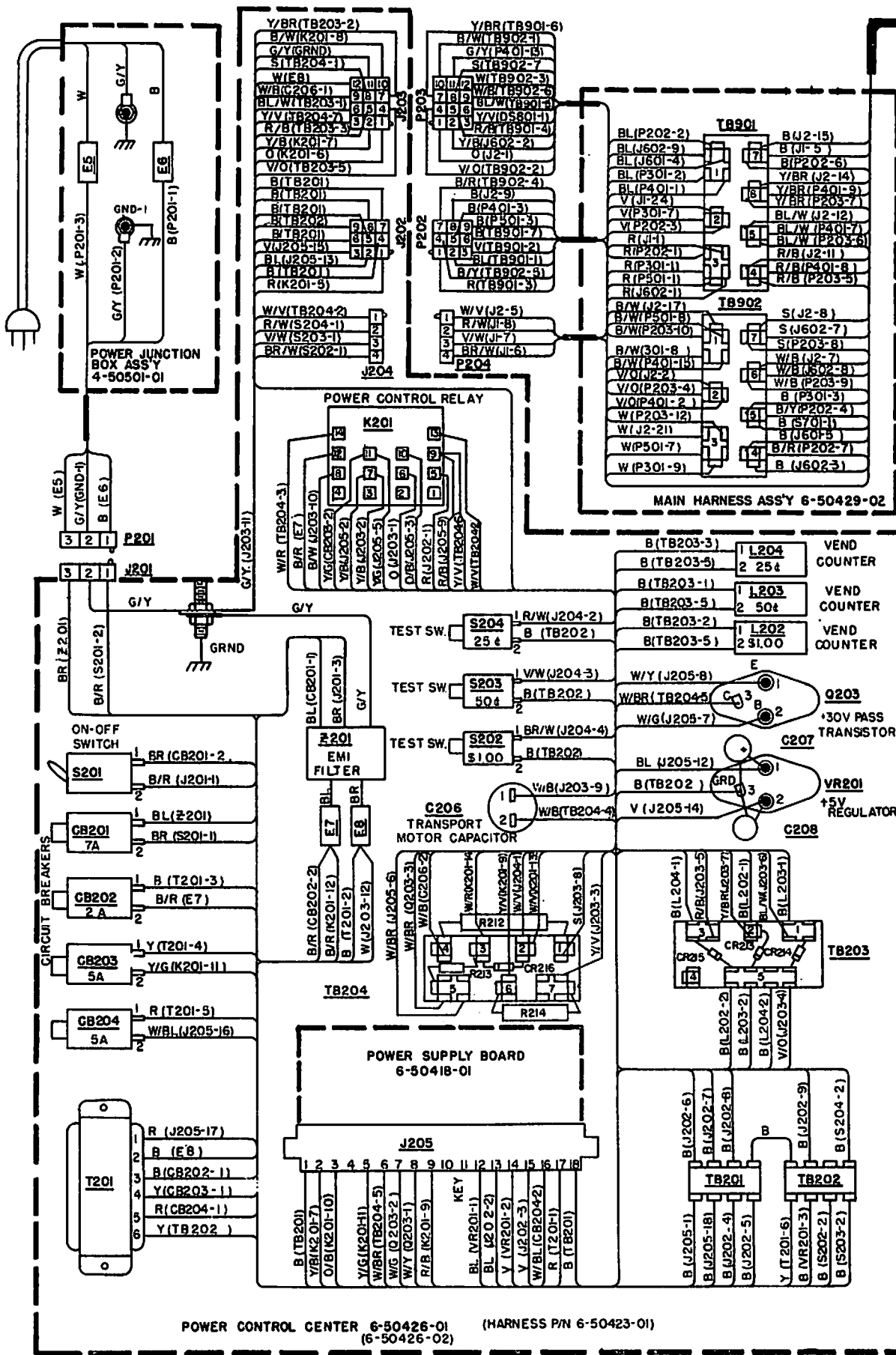
POWER CONTROL CENTER  
6-50426-01  
(6-50426-02)

NOTE: MODULE PART NUMBERS SHOWN IN PARENTHESIS ARE FOR BC-25



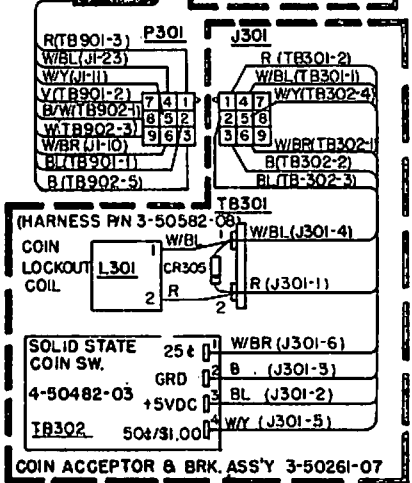
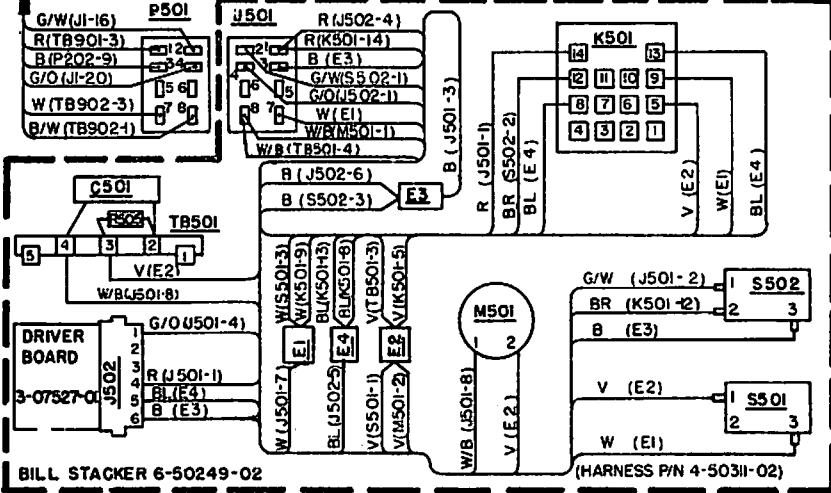
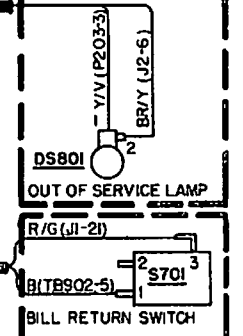
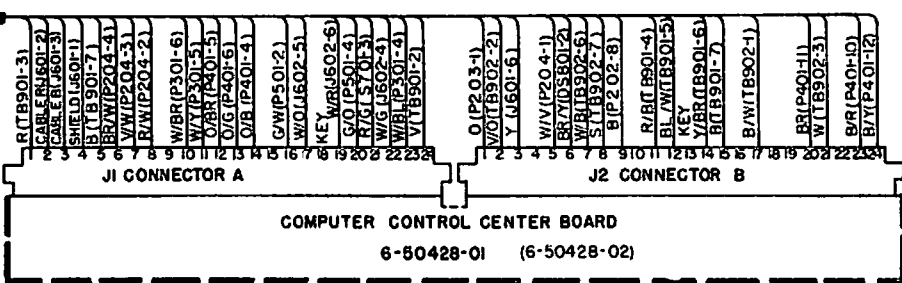
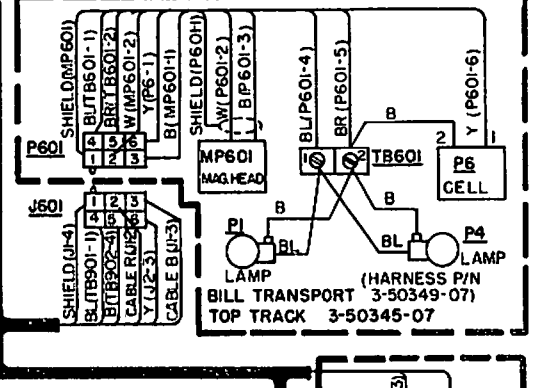
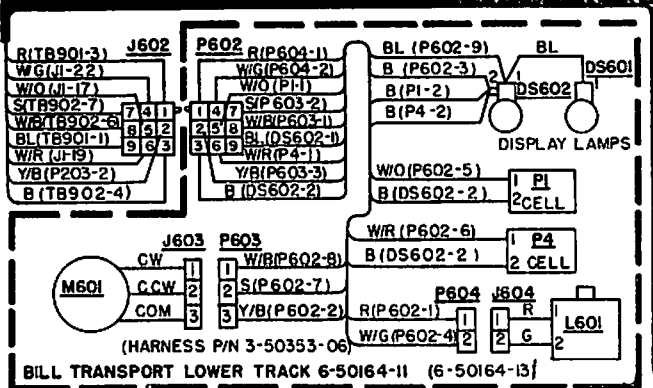
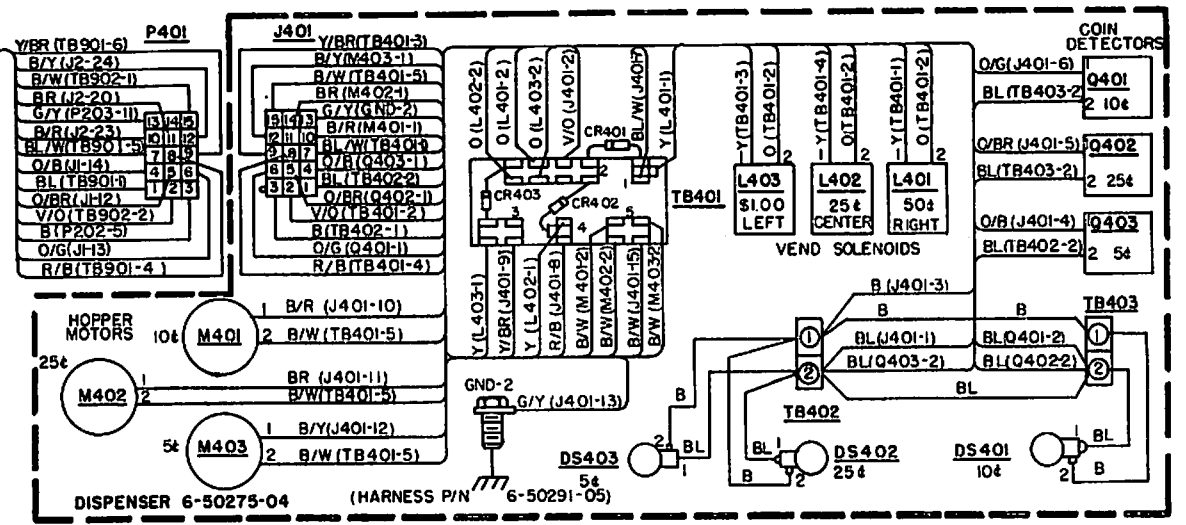
EQUIV. ENG'G. DRAWING 6-50520-01-0-2 [G]

SCHEMATIC DIAGRAM BC-20, BC-25



POWER CONTROL CENTER 6-50426-01 (HARNESS P/N 6-50423-01)  
 (6-50426-02)

NOTE: MODULE PART NUMBERS SHOWN IN PARENTHESIS ARE FOR BC-25

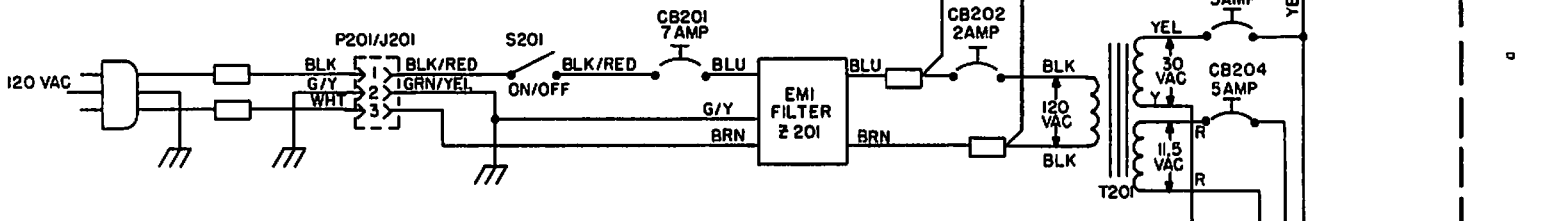


EQUIV. ENGG. DRAWING 6-50520-01-Q-1

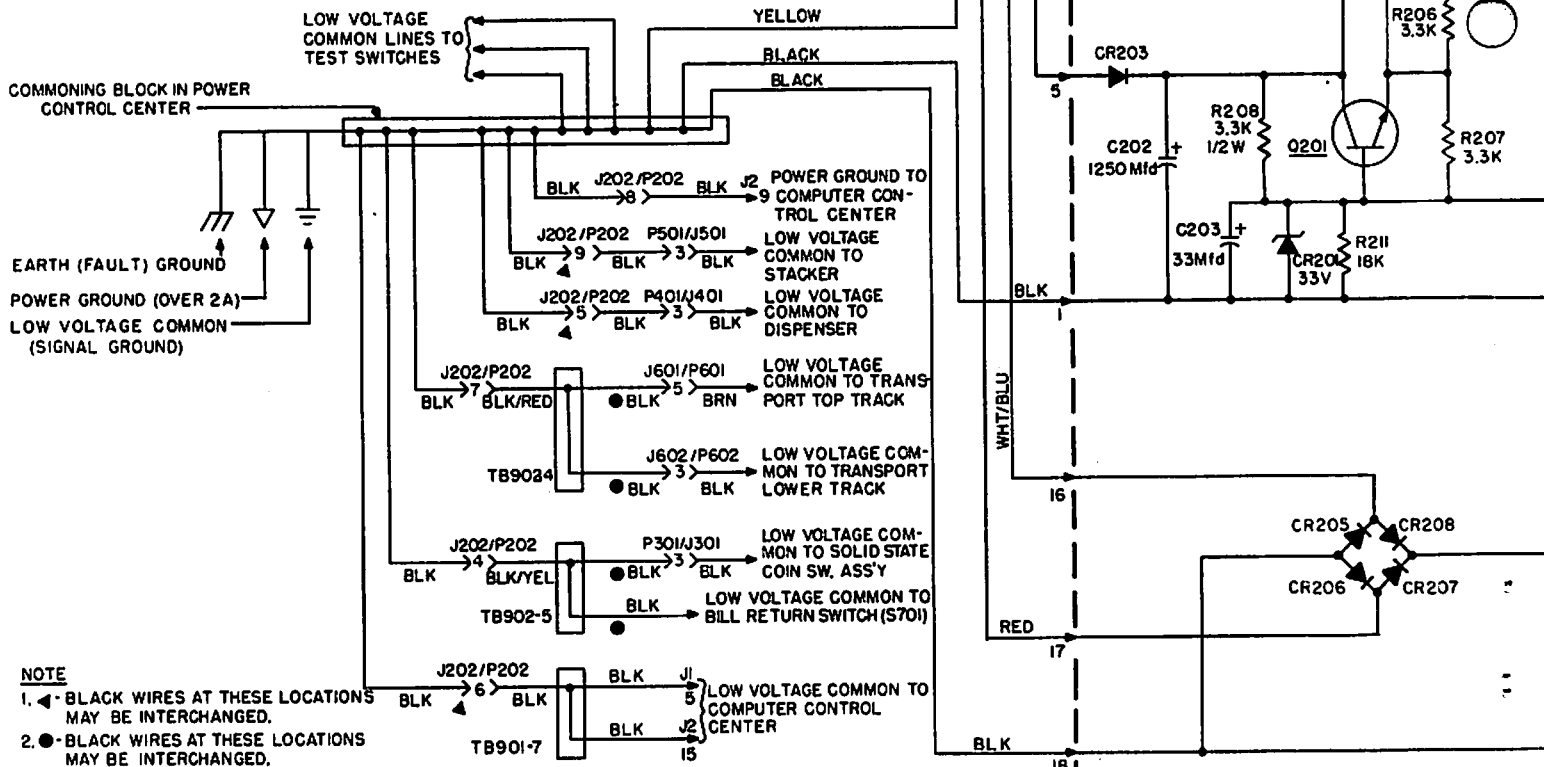
WIRING DIAGRAM BC-20, BC-25

**COMPONENT & CONNECTOR DESIGNATION**

SERIES	LOCATION
0-199	COMPUTER CONTROL CENTER
200-299	POWER CONTROL CENTER
300-399	COIN SWITCH & BRACKET ASS'Y
400-499	DISPENSER ASS'Y
500-599	BILL STACKER
600-699	BILL TRANSPORT
700-799	BILL RETURN SWITCH
800-899	OUT OF SERVICE LAMP
900-999	MAIN HARNESS JUNCTION BOX

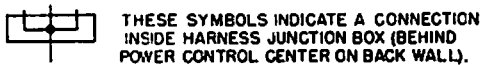


ALL GROUND LINES FROM MODULES ARE RETURNED DIRECT TO POWER CONTROL CENTER. INDIVIDUAL MODULE CHASSIS ARE NOT GROUNDED TO LOW VOLTAGE COMMON EXCEPT AT POWER CONTROL CENTER.

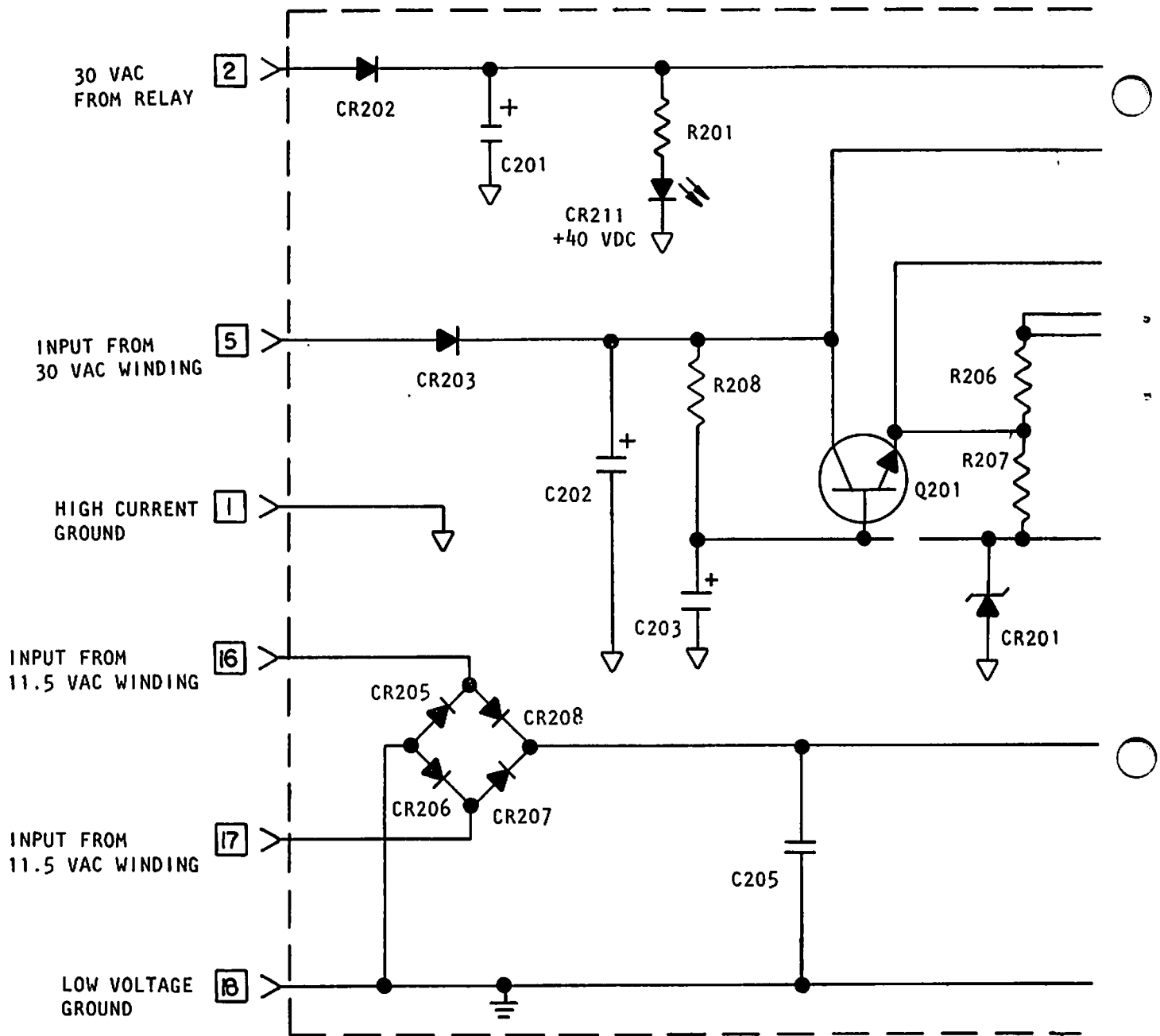


**NOTE**

- BLACK WIRES AT THESE LOCATIONS MAY BE INTERCHANGED.
- BLACK WIRES AT THESE LOCATIONS MAY BE INTERCHANGED.
- BLACK WIRES AT LOCATIONS MARKED MAY NOT BE INTERCHANGED WITH BLACK WIRES AT LOCATIONS MARKED





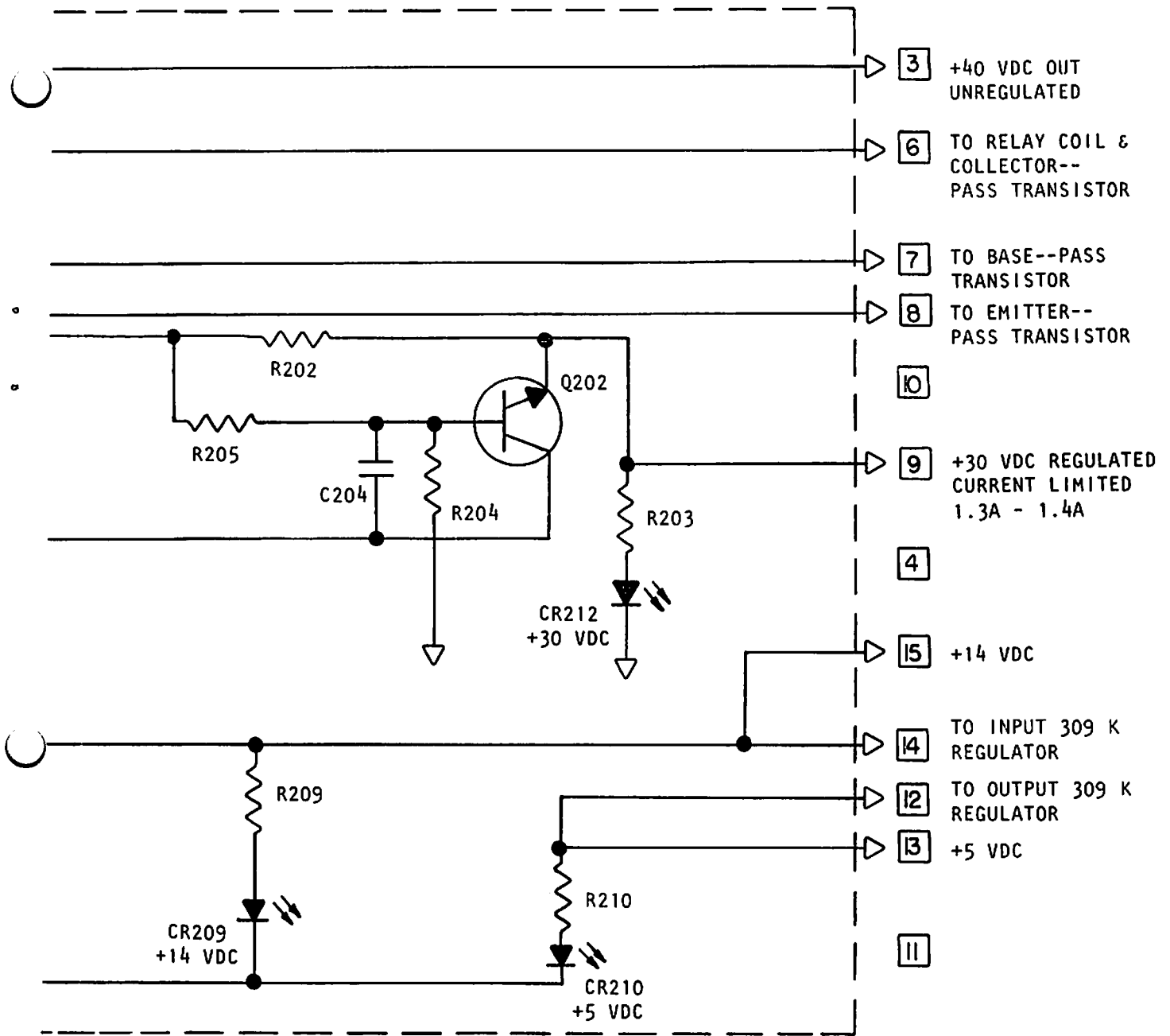


COMPONENT REF  
DESIGNATION

DESCRIPTION

ROWE  
PART NO.

C201	CAPACITOR - ELECTROLYTIC	2200/2500 Mfd 50 V	7-00235-05
C202	CAPACITOR - ELECTROLYTIC	1250 Mfd 50 V	7-00233-10
C203	CAPACITOR - TANTALUM	33 Mfd 35 V	7-00251-14
C204	CAPACITOR - MYLAR	.1 Mfd 100 V	7-00240-02
C205	CAPACITOR - ELECTROLYTIC	4700 Mfd 25 V	7-00235-12
CR201	DIODE - ZENER	33 VOLT 1 W	7-00355-23
CR202	DIODE - SILICON		7-00350-10
CR203	DIODE - SILICON		7-00350-04
CR204	NOT USED		
CR205-CR208	DIODE - SILICON		7-00350-04
CR209-CR212	DIODE - LIGHT EMITTING		7-00353-03



COMPONENT REF  
DESIGNATION

DESCRIPTION

ROWE  
PART NO.

Q201-Q-202	TRANSISTOR - NPN SILICON		7-00300-08
R201	RESISTOR - CARBON	3.9 K 1 W	7-00108-05
R202	RESISTOR - WIRE WOUND	1.5 Ω 2 W	7-00126-07
R203	RESISTOR - CARBON	4.7 K 1/4 W	7-9901-472
R204	RESISTOR - CARBON	4.7 K 2% 1/4 W	7-9902-472
R205	RESISTOR - CARBON	270 Ω 2% 1/4 W	7-9902-271
R206-R207	RESISTOR - CARBON	3.3 K 1/4 W	7-9901-332
R208	RESISTOR - CARBON	3.3 K 1/2 W	7-00107-20
R209	RESISTOR - CARBON	560 Ω 1/4 W	7-9901-561
R210	RESISTOR - CARBON	390 Ω 1/4 W	7-9901-391



# PART TWO

# PARTS CATALOG

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ORDERING REPLACEMENT PARTS	95
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## INTRODUCTION

This parts catalog lists procurable replacement parts for the BC-20 Bill and Coin Changer.

The purpose of this parts catalog is to locate and identify replaceable components and to supply ordering information.

## DESCRIPTION

The parts catalog is divided into 13 major assemblies called "FIGURES" corresponding to the illustrations used. In some instances major assemblies require more than one illustration to identify the procurable parts.

Parts of riveted or welded units are not listed since repair of these parts is normally impractical in the field, however these parts are available as assemblies.

To be sure that this parts catalog contained the latest information, last minute revisions were made. In these instances the additions were added in sequence with a letter added to the identification numbers both in the parts list and corresponding illustrations i.e., 1A, 1B, 1C.

The Parts List contains four columns:

Fig and Index No. - The first entry in this column lists the figure number of the corresponding illustration. An index number when listed corresponds to the index number appearing on the illustration. Index numbers are not used when:

- Items are listed for reference purposes only.
- The item listed is an alternate part.

Rowe Part No. - This column lists the part number of the item which should be specified for ordering purposes.

Description - This column contains a brief word description of the assembly or part. Each item is indented to show its proper relationship to the unit of which it is a part or to its next higher assembly.

Qty. Per Assy. - This column contains the quantity of the part used in the assembly. When a figure covers more than one model of an assembly, the "Qty. Per Assy." column is divided to show each model.

## ORDERING REPLACEMENT PARTS

All replacement parts can be ordered directly from an authorized ROWE Distributor.

Once the replacement item is determined, complete a standard parts order form available from your ROWE distributor at no charge. Very often parts orders are delayed, because of inadequate or incomplete information. To insure prompt parts delivery, always specify the following information:

- Part Number and Description. State color if applicable.
- Quantity required.
- Model and Serial Number of machine for which the repair part is needed.
- Complete shipping address including ZIP code.
- Shipping Instructions must be specified. If the shipping method selected is Parcel Post, Air Parcel Post, United Parcel Service or Air UPS, indicate an alternate shipping method if there is a possibility the packages may exceed the size and weight limits established by these services. If you would like ROWE to select the best way to ship your parts order, specify "BEST WAY". If fastest delivery is the requirement, specify "FASTEST WAY". ROWE will select the carrier for those orders which justify shipment by truck.

# Bill And Coin Changer Assembly Sheet 1

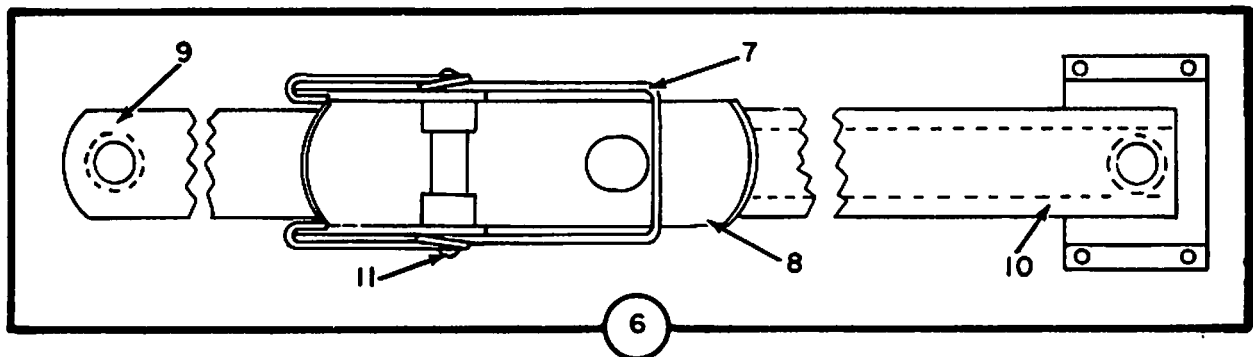
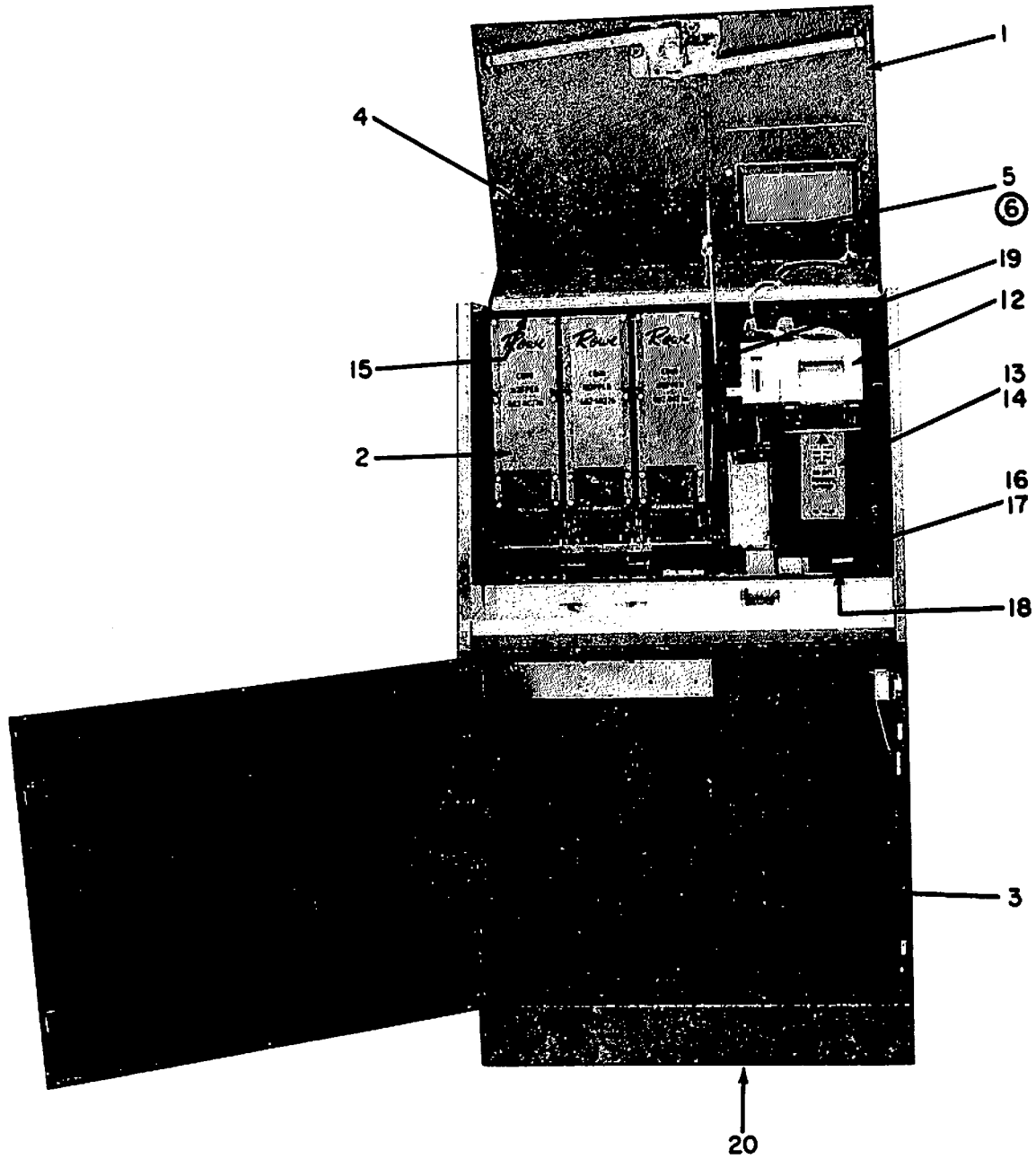


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
1-	6-50520-01	BC-20 Bill and Coin Changer Assembly	
1	6-50151-11	. Front Door Assembly (See Figure 3)	1
2	6-50276-02	. Hopper Assembly (See Figure 10)	3
3	6-50167-07*	. Base Assembly (See Figure 2) Wheatstone	1
4	2-51168-01	. Leaf Spring	3
5	7-01430-02	. External Retaining Ring	2
6	3-50344-04	. Door Support Assembly	1
7	2-50677-02	. . Torsion Spring	1
8	2-50679-02	. . Lever Latch	1
9	3-50329-03	. . Slide Bar Assembly	1
10	3-50328-03	. . Pivot Bar Assembly	1
11	2-51632-01	. Pivot Pin	1
12	6-50164-11	. Bill Acceptor Transport Assembly (See Figure 4)	1
13	6-50249-02	. Bill Stacker Assembly (See Figure 12)	1
14	7-01200-19	. Flat Washer	2
15	3-50644-01	. Hinge Strap	1
16	3-50651-02	. Crank Assembly	1
17	2-50644-01	. Tension Spring	1
18	2-51618-01	. Door Crank Label	1
19	2-50678-01	. Pivot Plate	1
20	2-51623-01	. Adjustable Foot	4

\*6-50167-08 . Base Assembly - Roweswood

# Bill And Coin Changer Assembly Sheet 2

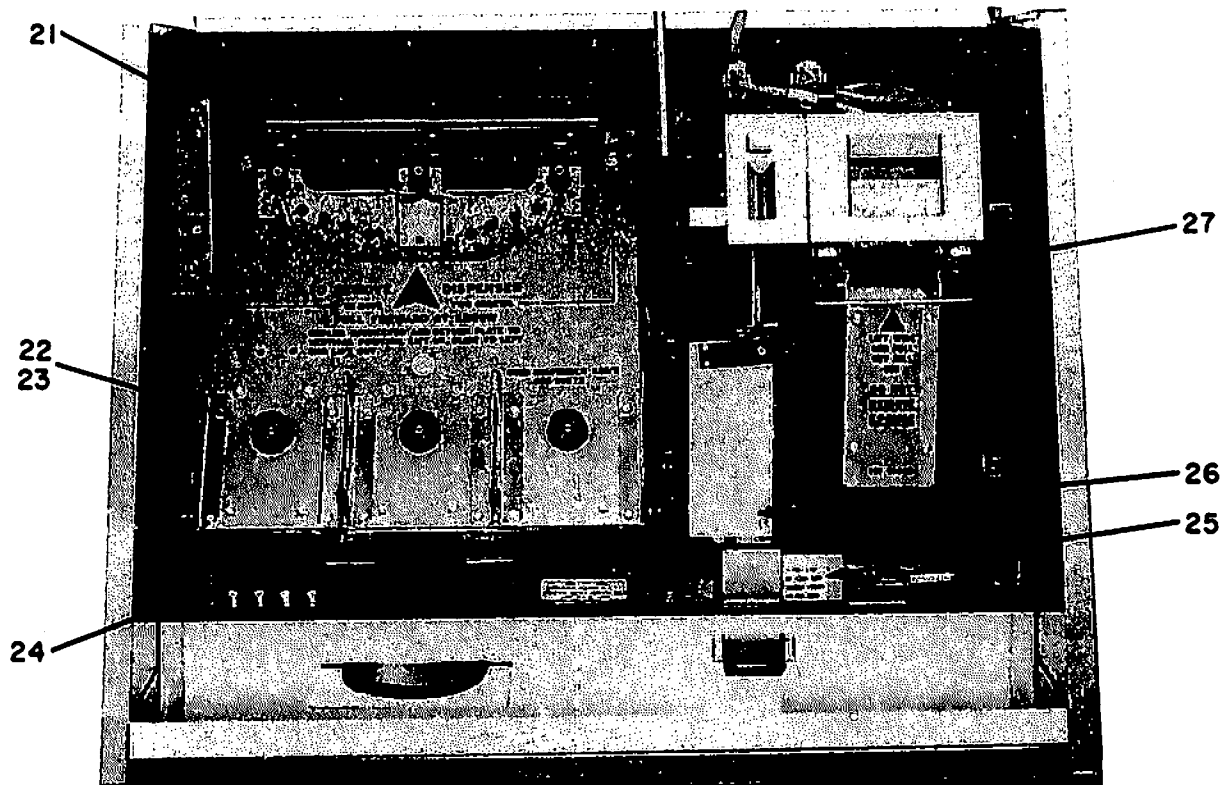


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
1-	6-50520-01	BC-20 Bill and Coin Changer Assembly (Continued)	
	2-50784-01	. Cord and Plug Assembly (Not Shown)	1
21	4-50501-01	. Power Junction Box Assembly	1
	3-50447-03	. . Power Junction Box	1
	7-02322-04	. . Strain Relief	1
	7-00915-11	. . Terminal Ring	1
	3-07491-02	. . Plug Housing (3 Ckt.) P201	1
	7-00975-04	. . Contact	3
	7-00931-03	. Cable Clamp (Not Shown - Hidden by Power Control Box)	1
22	6-50275-04	. Coin Dispenser Assembly (See Figure 8)	1
23	7-01341-07	. 1/4-20 Special Screw	2
24	6-50426-01	. Power Control Center Assy. (See Figure 6)	1
25	4-50153-04	. Coin Box Assembly	1
26	4-50157-01	. Coin Acceptor Assembly	1
	2-50545-01	. Coin Switch Guard (Not Shown)	1
	7-00921-08	. Solderless Connector (Not Shown)	2
	7-02323-01	. Right Angle Strain Relief (Not Shown)	1
27	6-50428-01	. Control Computer Assembly	1

# Bill And Coin Changer Assembly Sheet 3

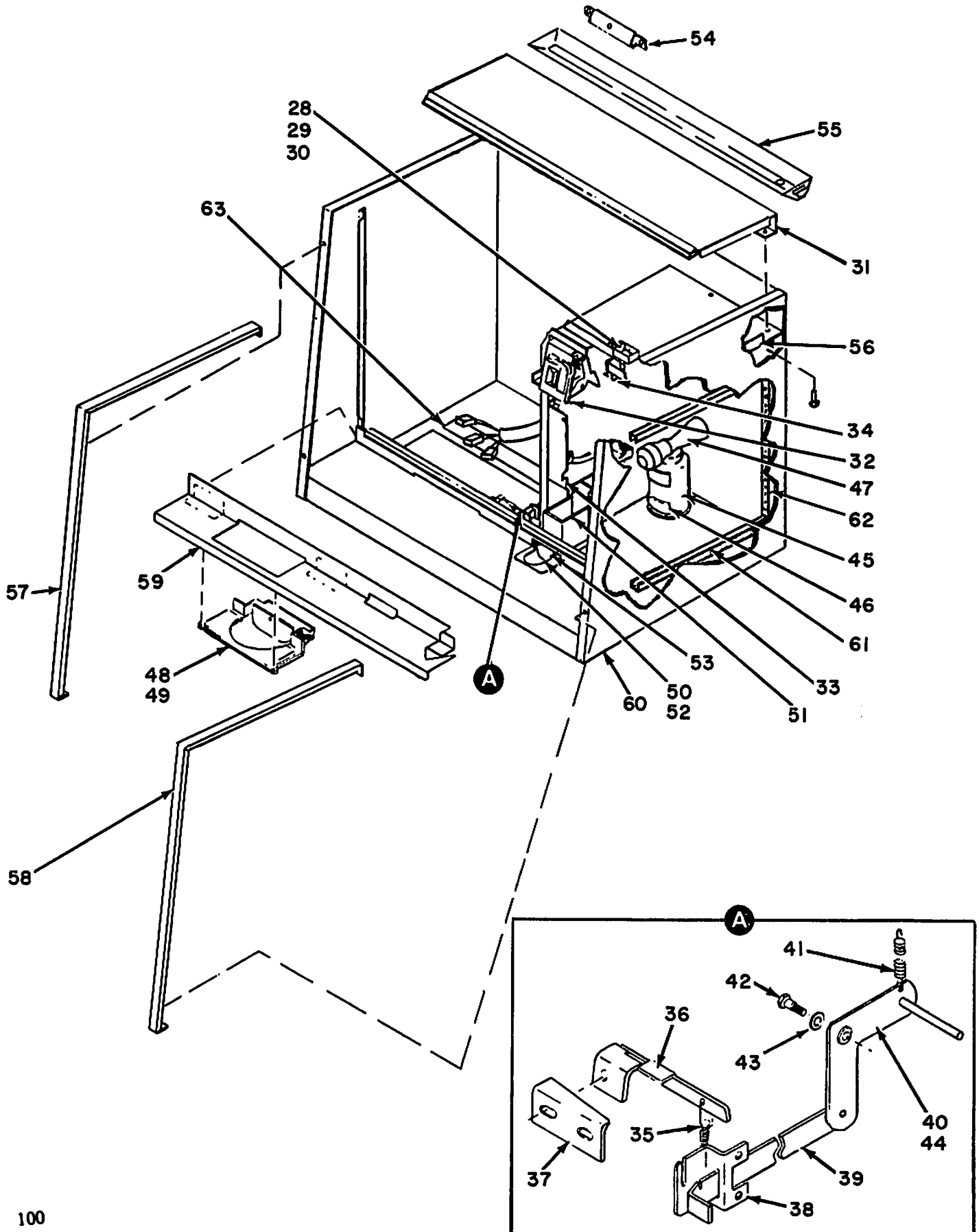


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
1-	6-50520-01	BC-20 Bill and Coin Changer Assembly (Continued)	
28	7-00950-02	. Tube Clamp	1
29	2-51253-01	. Drain Tube	1
30	2-51254-01	. Funnel	1
31	4-50137-08	. Top Panel Assembly (Bronze)	1
32	4-50167-07	. Coin Inlet and Chute Assembly (See Figure 13)	1
33	3-50261-07	. Coin Acceptor Bracket and Harness Assembly (See Figure 11)	1
34	3-50233-01	. Bill Acceptor Mounting Bracket	2
35	2-14024-01	. Handle Return Spring	1
36	2-50533-01	. Latch Assembly	1
37	2-50502-01	. Locking Wedge	1
38	2-50519-01	. Slide Support Bracket	1
39	2-50524-02	. Latch Slide	1
40	2-51584-01	. Horn Actuator Assembly	1
41	2-50845-01	. Extension Spring	1
42	2-13900-01	. Lever Pin	1
43	7-01214-08	. Washer	1
44	7-01430-04	. Retaining Ring	1
45	2-17228-01	. Alarm Power Pack	1
46	2-51481-01	. Spring Clip	2
47	3-07284-01	. Horn	1
48	2-51442-01	. Cover Plate (Coin Cup)	1
49	3-50285-01	. Coin Cup Assembly	1
	6-50171-00	. . Coin Cup	1
	2-50557-00	. . Hinge Wire	1
	3-50268-00	. . Change Door	1
50	2-51442-02	. Cover Plate (Slug Cup)	1
51	3-50322-03	. Slug Chute Assembly	1
52	4-50190-01	. Slug Cup	1
53	2-50643-01	. Slug Cup Door	1
54	3-50527-02	. Trough Mounting Bracket	2
55	4-50376-01	. Drip Trough	1
56	2-50597-01	. Stop Bracket	1
57	6-50156-01	. L.H. Cap Trim	1
58	6-50157-01	. R.H. Cap Trim	1
59	4-50185-01	. Front Trim Assembly	1
60	6-50427-01	. Cabinet Weld Assembly	1
	6-70003-07	. Service Parts Cabinet and Door Assembly	1
61	3-50672-01	. Side Guide	2
62	3-50672-02	. Back Guide	1
	7-01200-19	. Flat Washer (Not Shown)	2
63	3-50676-01	. Label - Power Control	1



**FIGURE  
1**

# Bill And Coin Changer Assembly Sheet 4

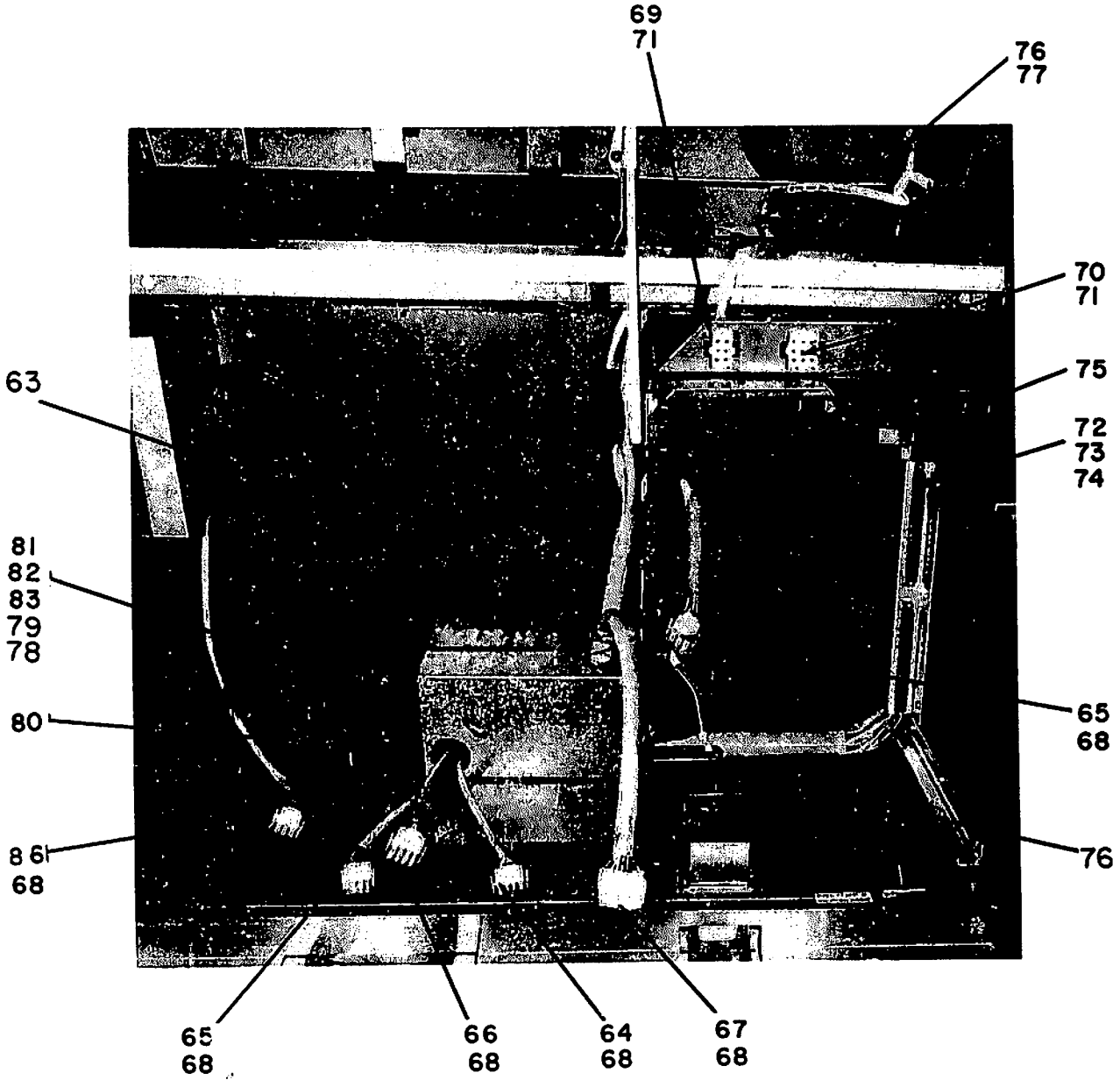


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
1-	6-50520-01	BC-20 Bill And Coin Changer Assembly (Continued)	
63	6-50429-02	. Main Harness Assembly	1
64	3-07491-03	. . Plug Housing (4 Ckt.) (P204)	1
65	3-07491-05	. . Plug Housing (9 Ckt.) (P202, P301)	2
66	3-07491-06	. . Plug Housing (12 Ckt.) (P203)	1
67	3-07491-07	. . Plug Housing (15 Ckt.) (P401)	1
68	7-00975-04	. . Contact (Universal Connector)	48
69	3-07490-04	. . Cap Housing (6 Ckt.) (J601)	1
70	3-07490-05	. . Cap Housing (9 Ckt.) (J602)	1
71	7-00975-03	. . Contact (Universal Connector)	15
72	2-50572-08	. . Edge Connector (Mod. Fork) (J1, J2)	2
73	7-00929-04	. . Terminal (Mod Fork)	40
74	2-50586-01	. . Keying Plug	2
75	2-51130-02	. . Socket (8 Contact - Jones) (P501)	1
76	7-00913-02	. . Terminal Lug	4
77	2-14086-01	. . Straight Receptacle	2
78	7-00913-08	. . Terminal Lug	49
79	2-51669-02	. . Terminal Block (TB901, TB902)	2
80	7-02332-08	. . Snap Bushing	3
81	4-50502-02	. . Harness Junction Box	1
82	3-50678-02	. Junction Box Cover	1
	7-08001-01	. . Wire Ties	15
83	2-51690-01	. . Label	1
84	7-00913-08	. Terminal	49
85	2-51669-02	. Terminal Block	2
86	3-07491-02	. . Plug Housing (3 CKT.) (P-201)	1

# Base Assembly

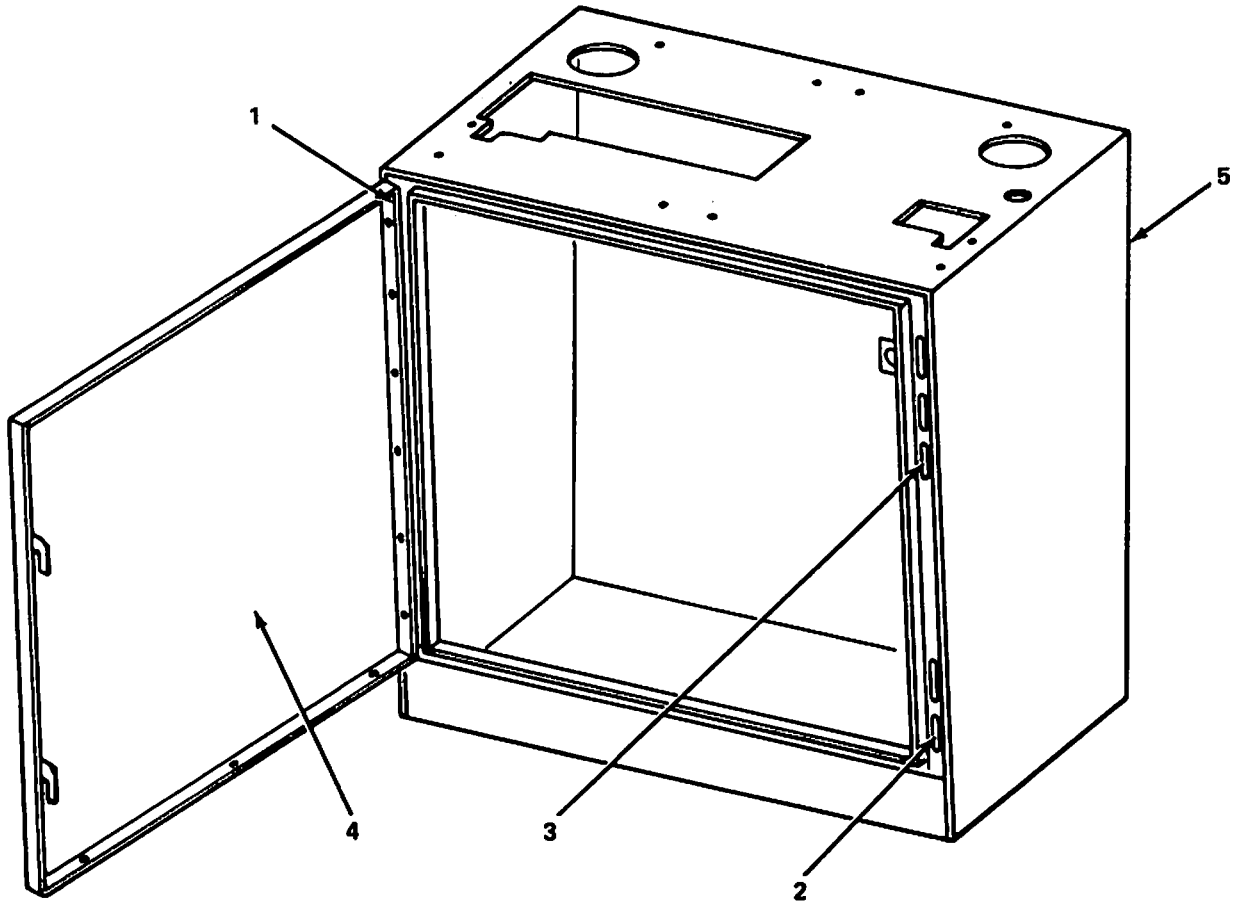


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
--------------------	---------------	-------------	---------------

2-	6-50167-07*	Base Assembly Wheatstone (See also Figure 1, Item 3)	REF
1	3-50263-00	. L.H. Side Trim	1
2	2-09225-02	. Spacer	2
3	3-50649-01	. Latch Bar and Pin Assembly	1
4	6-50183-12**	. Base Door Assembly, Wheatstone	1
	2-50655-01	. . Adhesive Strip	5
	2-50556-00	. . Top Trim	2
	2-50264-00	. . R.H. Side Trim	1
	7-01503-04	. . Self Clinching Stud	8
	4-50165-08	. . Door Weld Assembly (With Spec. 7071 Wheatstone Vinyl)	1
5	6-50188-11	. Base Weld Assembly	1

\* 6-50167-08 . Base Assembly - Roweswood

\*\* 6-50183-10 . Base Door Assembly - Roweswood

# Front Door Assembly

**FIGURE 3**

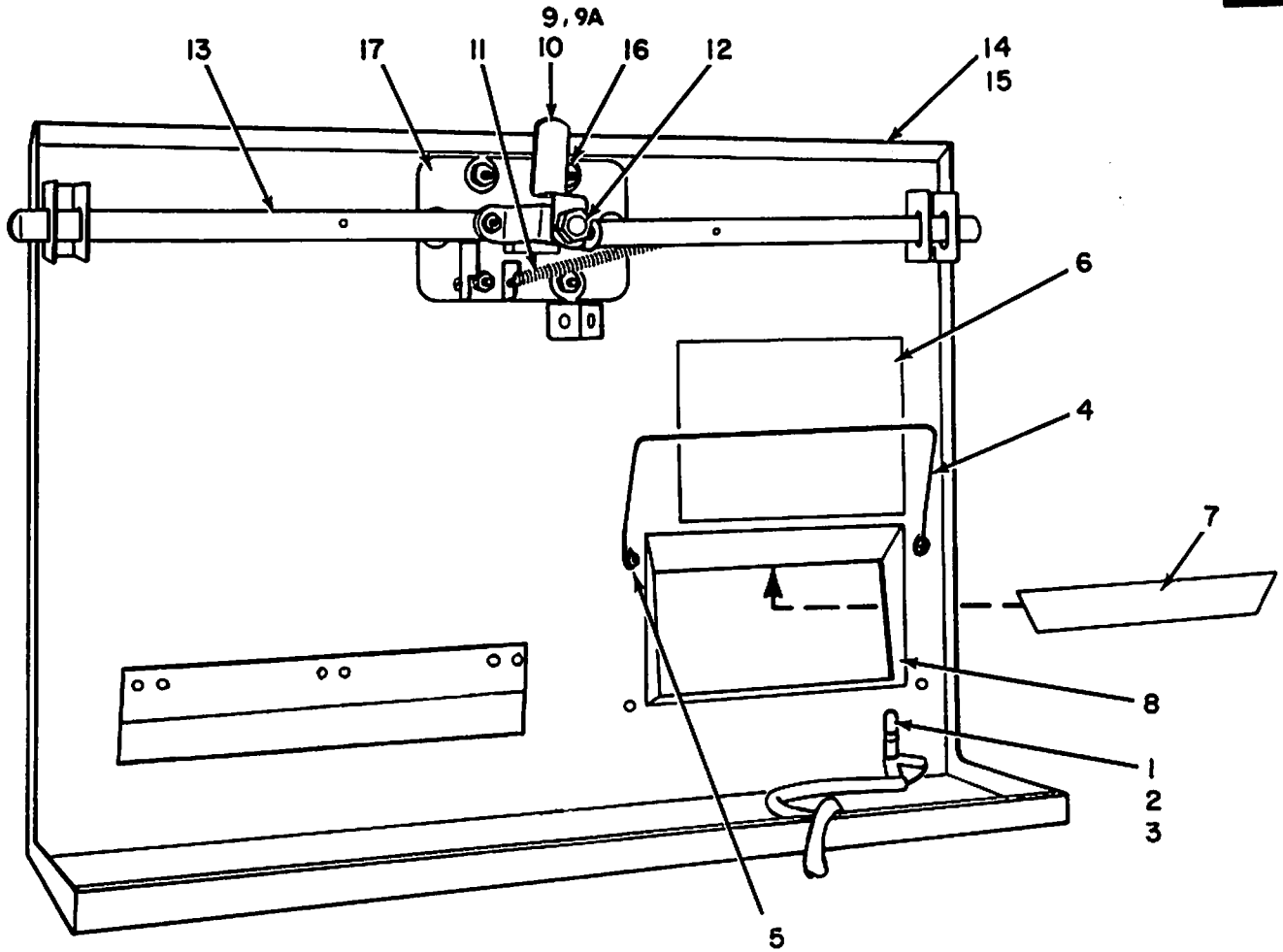


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
3-	6-50151-11	Front Door Assembly, Bronze (Figure 1 Item 1)	REF
1	2-50763-01	. Lamp (No.755)	1
2	7-01220-08	. Internal Tooth Lockwasher	1
3	2-50900-01	. Empty Light Socket	1
4	2-51112-01	. Cash Box Push Bar	1
5	7-01204-04	. 3/16" I.D. Flat Washer	2
6	2-50709-00	. Bill Jam Label	1
7	3-50323-00	. Instruction Panel	1
8	6-50153-02	. Bill Acceptor Trim	1
9	3-50278-03	. T-Handle Assembly	1
10	2-50683-01	. Door Lock Guard Assembly	1
11	2-50644-00	. Tension Spring	1
12	2-50664-00	. 1/2-13 Hex Locknut	1
13	3-50277-02	. Locking Bar Assembly	1
14	2-50717-00	. Warning Label	1
15	6-50143-09	. Front Door Weld Assembly (Bronze)	1
16	7-01341-03	. Carriage Bolt	2
17	3-50675-01	. Lock Plate Assembly	1
	2-51575-01	. Armored Plate Kit (For T Handle) Not Shown	1
9A	2-70230-01	. "National Keyset Lock Cylinder & 2 Keys".	1

**FIGURE  
4**

# Bill Acceptor Transport Assembly Sheet 1

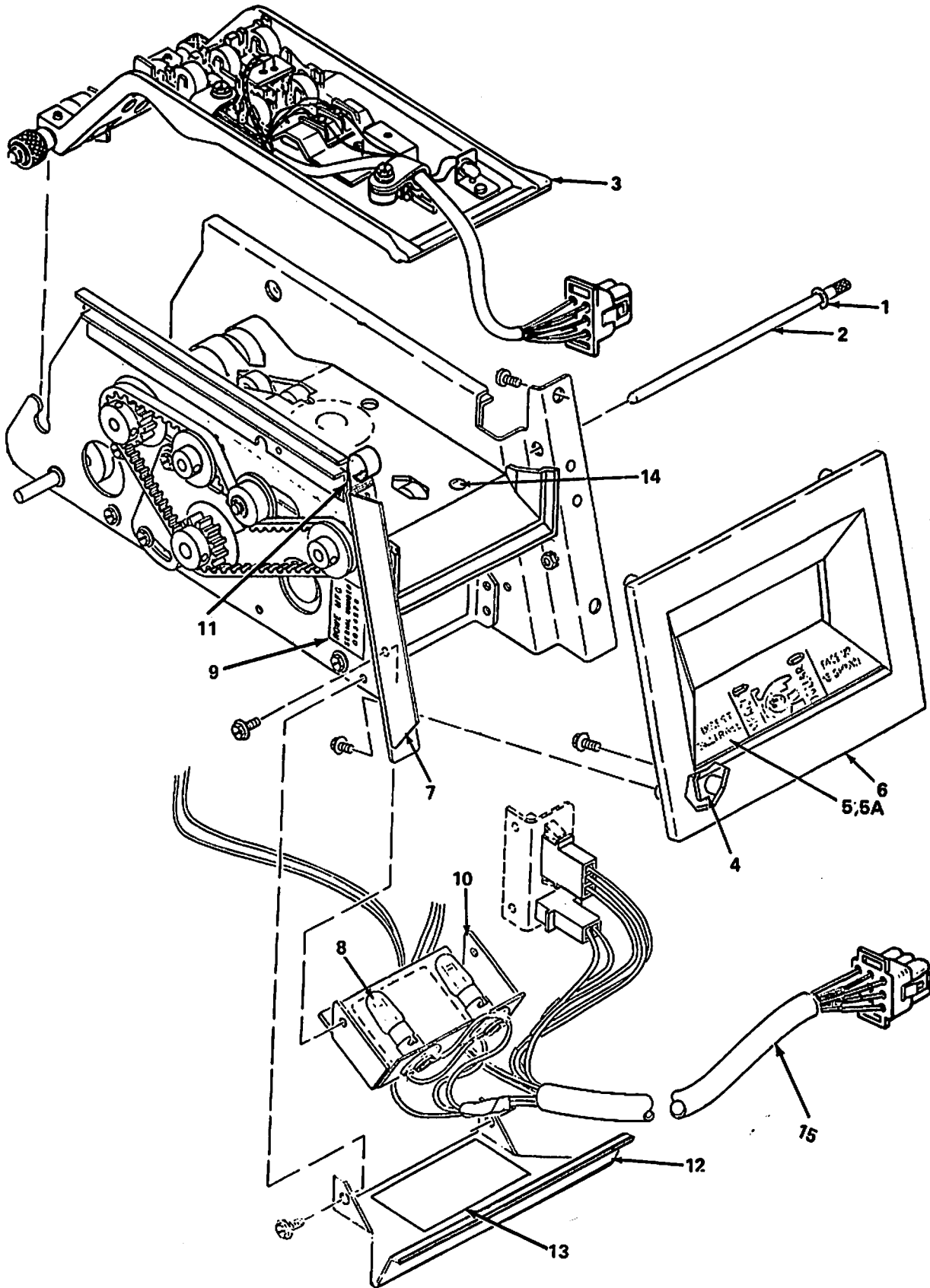
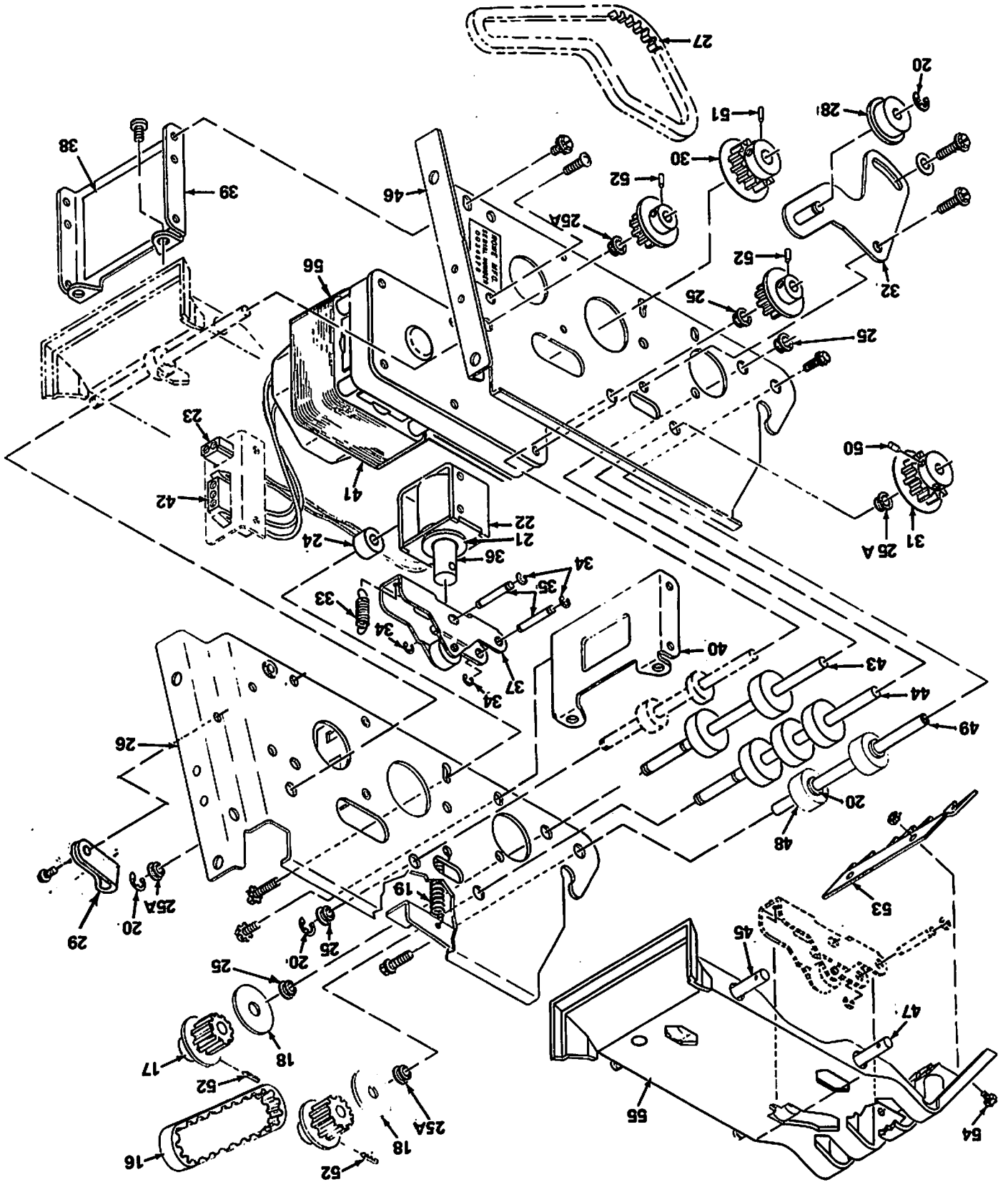


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
4-	6-50164-11	Bill Acceptor Transport Assembly (See Figure 1, Item 12)	REF
1	7-01430-03	. Retaining Ring	1
2	2-50793-00	. Latch Shaft	1
3	3-50345-07	. Upper Track Assembly (See Figure 5)	1
4	2-13847-00	. Window Retainer	1
5	3-06221-02	. Legend Window	1
5A	3-06323-00	. Window Insert	1
6	6-50224-00	. Front Trim	1
7	2-50601-00	. Slide Shield Bracket	2
8	2-50763-00	. Incandescent Lamp (No. 757)	2
9	7-03032-24	. Serial No. Label	1
10	2-50774-00	. Mounting Bracket	1
11	7-00934-02	. Cable Clamp	1
12	3-50351-00	. Shield Bracket	1
13	2-50662-00	. Insulator	1
14	2-13398-01	. Light Sensor Assembly (P1, P4)	2
15	3-50353-06	. Lower Track Harness Assembly	1
	2-50590-02	. . Light Socket	2
	3-07491-05	. . Plug Housing(9 Ckt.) (P602)	1
	3-07491-02	. . Plug Housing (3 Ckt.) (P603)	1
	3-07491-01	. . Plug Housing (2 Ckt.) (P604)	1
	7-00975-04	. . Contact	14



Bill Acceptor Transport Assembly  
Sheet 2

FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
4-	6-50164-11	Bill Acceptor Transport Assembly (Continued)	
16	2-50738-00	. Timing Belt (36 Tooth)	1
17	2-13122-02	. Timing Pulley (10 Tooth)	4
18	7-01206-03	. Washer	2
19	2-13985-00	. Tension Spring	1
20	7-01430-03	. Retaining Ring	5
21	7-01207-23	. Rubber Washer	1
22	2-13846-03	. Solenoid Assembly (L601)	1
23	3-07490-01	. Cap Housing (2 Ckt.) (J604)	1
	7-00975-01	. . Contact	2
24	7-01216-12	. Spacer	2
25	7-01460-03	. Bearing (Short)	4
25A	7-01460-10	. Bearing (Long)	4
26	3-50352-05	. R.H. Side Plate Assembly	1
27	2-13128-00	. Timing Belt	1
28	2-13124-00	. Idler Roller	1
29	7-00934-01	. Cable Clamp	1
30	2-13123-03	. Timing Pulley (15 Tooth)	1
31	2-13123-04	. Timing Pulley (15 Tooth)	1
32	2-13144-01	. Bracket and Pin Assembly (Idler)	1
33	2-13290-00	. Tension Spring	1
34	7-01430-01	. Retaining Ring	4
35	2-11160-00	. Linkage Pin	2
36	2-13284-00	. Solenoid Plunger	1
37	2-13286-01	. Roller Arm Assembly	1
38	2-13968-00	. Reflector	1
39	2-50765-01	. Support Bracket	1
40	2-50765-02	. Support Bracket	1
41	2-13845-06	. Motor and Contact Assembly	1
	3-05984-03	. . Gear Motor (M601)	1
42	3-07490-02	. Cap Housing (3 Ckt.) (J603)	1
	7-00975-03	. . Contact	3
43	2-50766-02	. Roller and Shaft Assembly (Drive)	1
44	2-50766-01	. Roller and Shaft Assembly (Drive)	1
45	2-50768-01	. Roller and Shaft Assembly (Input)	1
46	3-50360-01	. L.H. Side Plate Assy.	1
47	2-50762-01	. Double Roller and Shaft Assembly	1
48	2-50962-01	. Output Idler Roller	2
49	2-50963-01	. Output Shaft	1
50	7-01131-14	. Roll Pin	1
51	7-01130-06	. Roll Pin	1
52	7-01130-05	. Roll Pin	4
53	3-50354-00	. Fork Guard	1
54	2-50788-00	. Screw	2
55	6-50226-00	. Lower Track	1
56	3-50582-02	. Motor Shield	1





FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
5-	3-50345-07	Upper Track Assembly	REF
1	7-00931-03	. Cable Clamp	1
2	7-00931-02	. Cable Clamp	1
3	3-50349-07	. Harness Assembly	1
	3-07491-04	. . Plug Housing(6 Ckt.) (P601)	1
	7-00975-04	. . Contact	6
	7-00927-10	. Pin Receptacle	2
4	2-51683-01	. Terminal Block (TB601)	1
4A	2-51684-01	. Bracket Clamp	1
5	2-50760-02	. Magnetic Head Assembly	1
6	2-10724-00	. Magnet	1
7	2-13398-01	. Light Sensor Assembly (P6)	1
8	2-50756-00	. Light Sensor Bracket	1
9	2-50754-01	. Light Guide	1
10	2-50754-02	. Light Guide	1
11	2-13427-00	. Roller Retaining Spring	6
12	2-13125-00	. Idler Roller	6
13	7-01430-03	. Retaining Ring	2
14	2-13161-00	. Compression Spring	2
15	2-13308-00	. Pivot Retainer	2
16	2-50769-00	. Pivot Shaft	1
17	2-13156-00	. Idler Roller (Output)	2
18	2-50685-00	. Anti-Cheat Lever (Long)	1
19	2-50785-00	. Anti-Cheat Lever (Center)	1
20	2-13158-00	. Torsion Spring	1
21	2-50684-00	. Anti-Cheat Lever (short)	1
22	2-50798-00	. Lug	1
	2-11583-00	. Lug	ALT
23	2-51668-01	. Lamp & Terminal Assy (No. 755 lamp)	2
24	2-50757-00	. Lampholder Bracket	1
25	2-50786-00	. Grommet	2
26	7-01210-10	. Spacer	1
27	6-50225-01	. Upper Track Casting	1
28	2-50239-02	. Wire Tie	1

FIGURE  
6

# Power Control Center Assembly

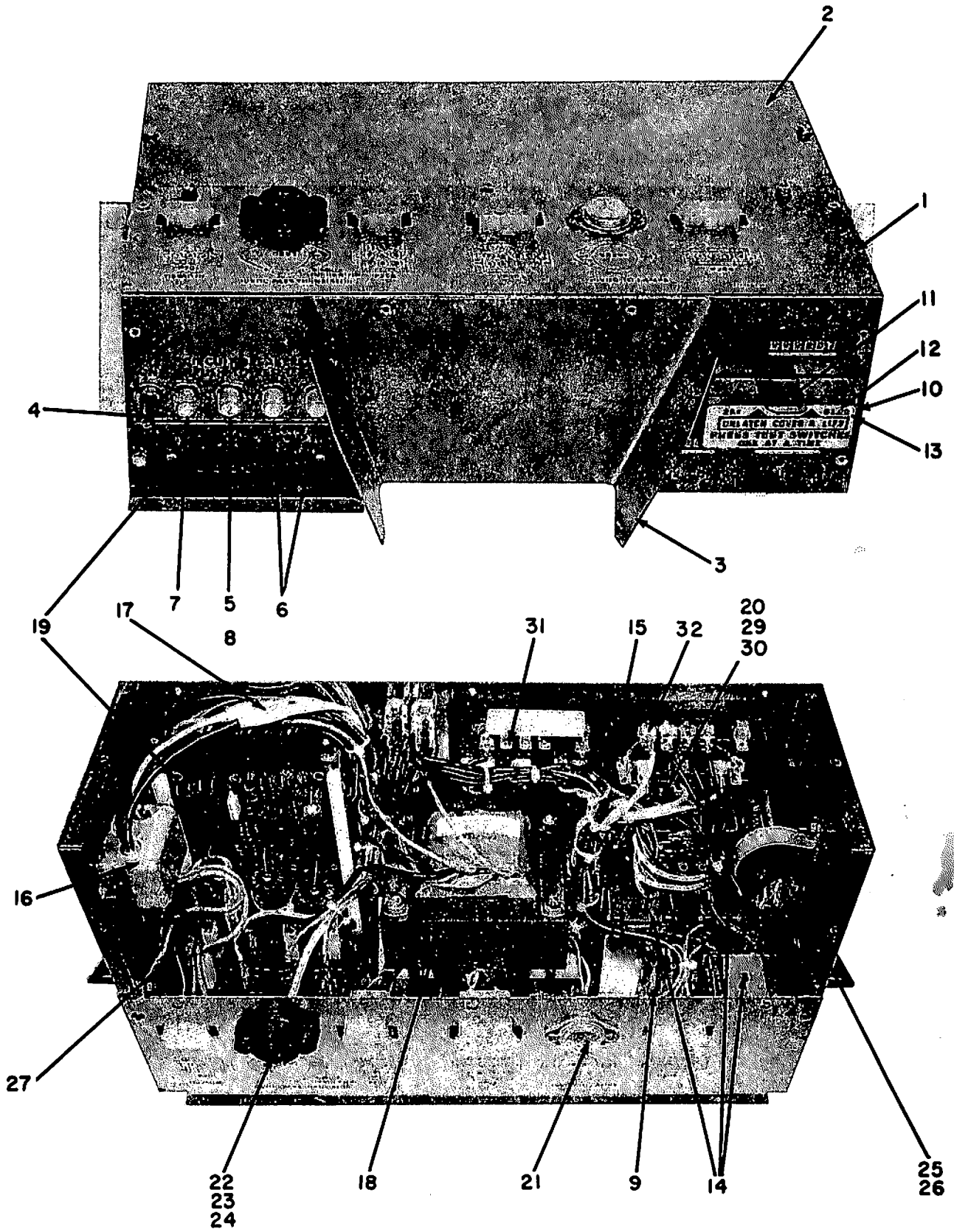


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
6-	6-50426-01	Power Control Center Assembly (See Figure 1, Item 2 <sup>1</sup> )	REF
1	6-50424-01	. Power Control Chassis Assembly	1
2	4-50499-01	. Power Control Box Cover	1
3	3-50494-01	. Chute and Stud Assembly	1
4	2-50772-00	. Toggle Switch (Spst) (S201)	1
5	7-00734-15	. Circuit Breaker 2 amp (CB202)	1
6	7-00734-21	. Circuit Breaker 5 amp (CB203, CB204)	2
7	7-00734-23	. Circuit Breaker 7 amp (CB201)	1
8	2-00490-00	. Internal Tooth Lockwasher	4
9	2-15818-01	. Pushbutton Switch (N.O.) (S202, S203, S204)	3
10	3-50507-01	. Switch Guard	1
11	2-51461-01	. Latch Spring	1
12	2-51204-01	. Switch Guard Cover	1
13	2-51205-01	. Test Switch Label	1
14	2-50657-03	. Counter Ass'y	3
15	6-50423-01	. Power Control Harness Assembly	1
	3-07490-02	. . Cap Housing, 3 Ckt. (J201)	1
	3-07490-03	. . Cap Housing, 4 Ckt. (J204)	1
	3-07490-05	. . Cap Housing, 9 Ckt. (J202)	1
	3-07490-06	. . Cap Housing, 12 Ckt. (J203)	1
	7-00975-03	. . Contact	28
	2-50572-06	. . Mod. Fork Edge Connector (J205)	1
	7-00929-04	. . Mod. Fork Fork Terminal	16
	2-50586-01	. . Keying Plug	1
	2-51670-01	. . Relay Socket	1
	2-51675-01	. . Relay Bracket	1
	2-51586-01	. . Transistor Socket	2
	7-00251-11	. . Capacitor (Tantalum 100 Mfd/10V) (C207)	1
	7-00223-14	. . Capacitor (Ceramic Disc. 1 Mfd/25V) (C208)	1
	7-00915-11	. . Ring Terminal Lug	2
	7-00913-08	. . Terminal Lug (.250)	33
16	2-51527-03	. Filter and Lug Assembly	1
17	7-00921-03	. Solderless Connector	2
18	4-50495-01	. Power Transformer	1
19	6-50418-01	. Power Supply Board (See Schematic in Part III for Component PL)	1
20	3-50668-01	. Power Relay	1
21	7-00365-01	. Voltage Regulator (VR201)	1
22	7-00305-04	. Power Transistor (NPN Silicon) (Q203)	1
23	2-13189-01	. Mica Insulator	1
24	2-15370-01	. Insulating Cover (TO-3)	1
25	2-13133-00	. Motor Capacitor (C206)	1
26	7-00931-12	. Cable Clamp	1
27	2-14086-02	. Straight Receptacle	3
28	2-51686-01	. Relay Access Cover	1
29	2-51687-01	. Label - Power Relay	1
30	2-51685-01	. Terminal Block Ass'y (TB204)	1
	2-51669-02	. . Terminal Block	1
	7-00113-22	. . Resistor (220 ohms, 2W) (R213)	1
	7-00125-05	. . Resistor (2 ohms, 10W) (R212)	1
	7-00115-16	. . Resistor (150 Ohm 7W) (R214)	1
	7-00350-02	. . Silicon Diode (CR216)	1
31	2-51685-02	. Terminal Block Ass'y (TB203)	1
	2-51669-01	. . Terminal Block	1
	7-00350-02	. . Silicon Diode (CR213, CR214, CR215)	3
32	2-18140-09	. Hex Lock Nut (Nylon) - Transistor Socket	2

# Control Computer Assembly

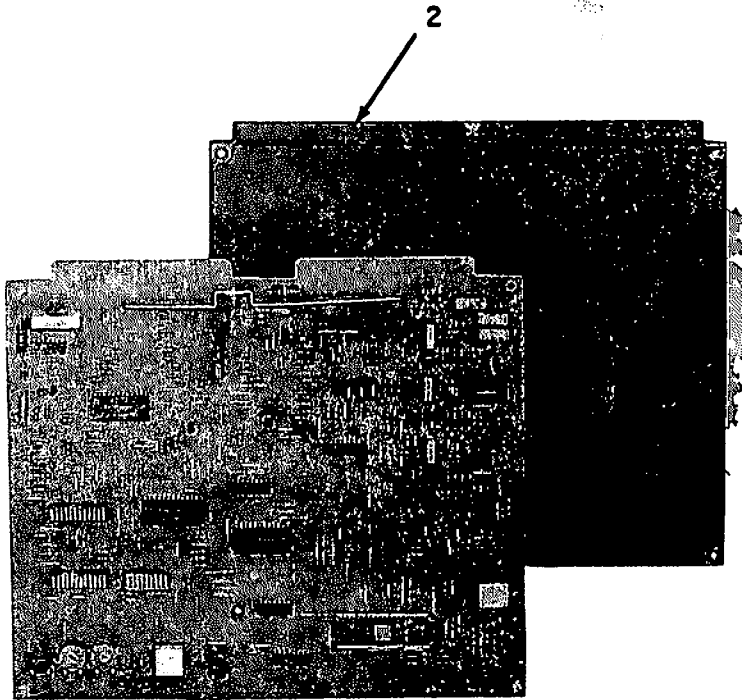
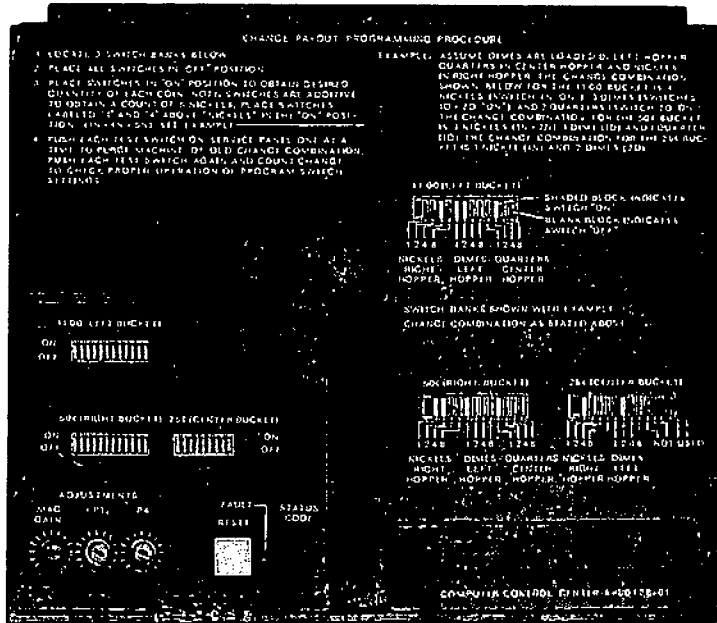


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
7-	6-50428-01	Control Computer Assembly (See Figure 1, Item 27)	REF
1	6-50420-01	. Control Computer Board Assembly (See Schematic in Part III for Component PL)	1
2	6-50430-01	. Bottom Cover	1
3	4-50496-01	. Top Cover Assembly	1

FIGURE  
8

# Coin Dispenser Assembly

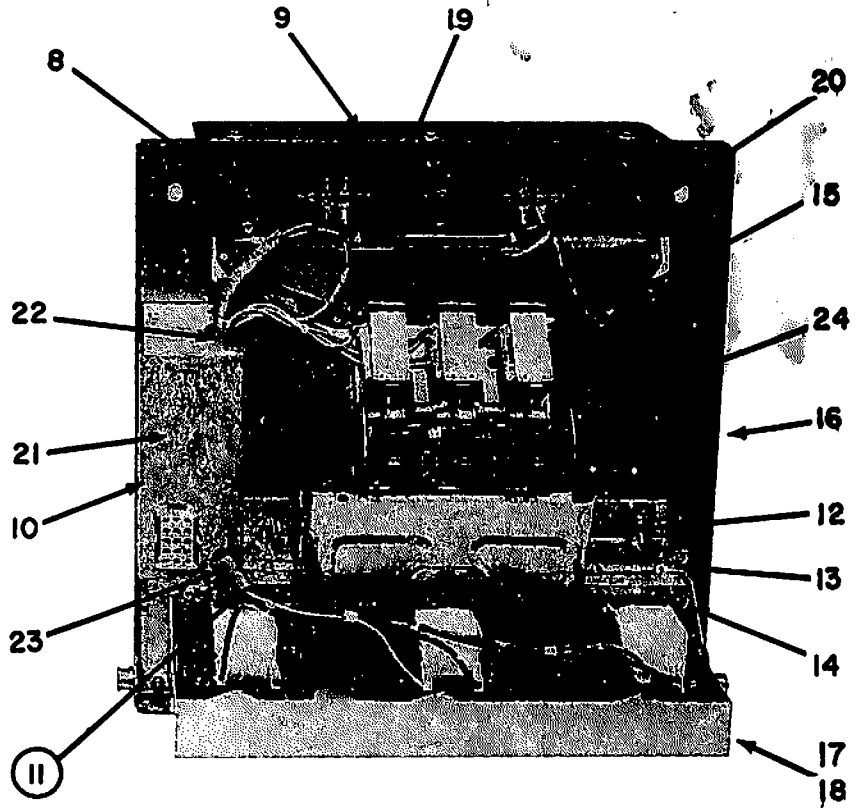
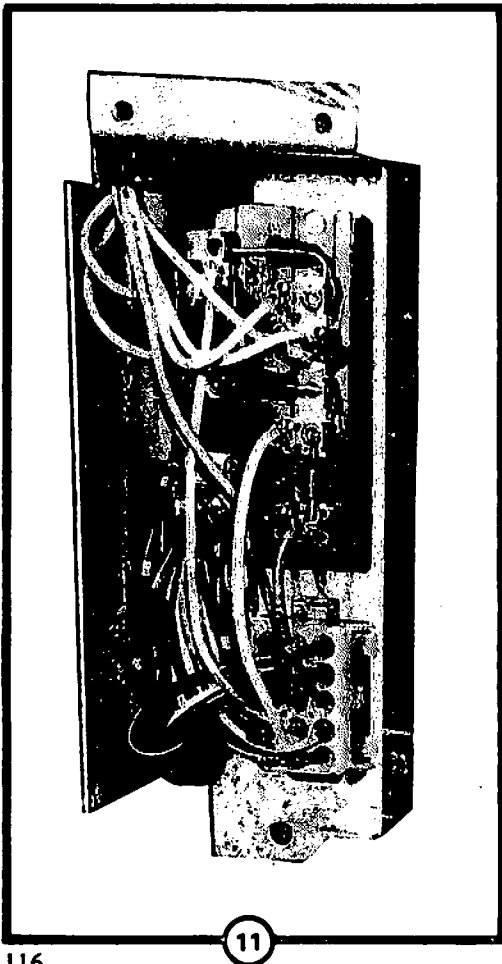
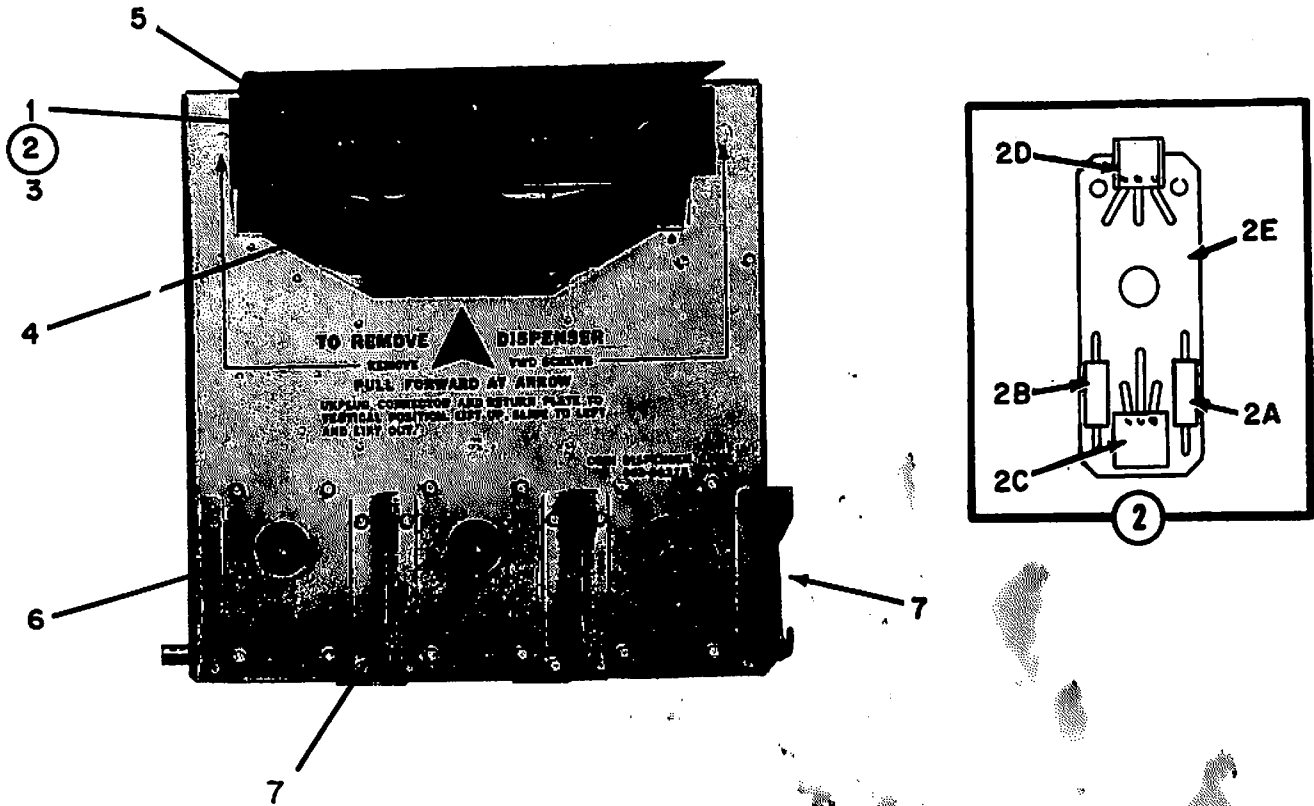


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
8-	6-50275-04	Coin Dispenser Assembly (See Figure 1, Item 22)	REF
1	3-50482-02	. Terminal Board Cover	3
2	3-50549-01	. Terminal Board Assembly (Photo Transistor)	3
A	7-9901-475	. . . 1/4W Carbon Resistor, 4.7 Meg $\pm$ 5% (R401, R402, R403)	1
B	7-9901-104	. . . 1/4W Carbon Resistor, 100K $\pm$ 5% (R404, R405, R406)	1
C	7-00332-02	. . . NPN Photo Transistor (Q401, Q402, Q403)	1
D	7-00300-07	. . . NPN Silicon Transistor (Q404, Q405, Q406)	1
E	3-50440-02	. . . Terminal Board (Cell)	1
3	7-01216-26	. Spacer	3
4	4-50350-01	. Hopper Coin Chute Assembly	1
5	2-51127-01	. Rubber Bumper	3
6	3-50447-01	. L.H. Hopper Mounting Bracket	3
7	3-50448-01	. R.H. Hopper Mounting Bracket	3
8	2-51135-01	. Grommet	3
9	3-50492-01	. Hold Down Plate	1
10	2-51691-01	. Dispenser Wiring Label	1
11	6-50291-05	. Dispenser Harness Assembly	1
	7-00913-02	. . . Terminal Lug	6
	2-14086-01	. . . Straight Receptacle	6
	7-00913-08	. . . Terminal Lug	8
	2-51685-03	. . . Terminal Block Assembly (TB401)	1
	2-51669-01	. . . . Terminal Block	1
	7-00350-06	. . . . Silicon Diode (CR401, CR402, CR403)	3
	3-07490-07	. . . Cap Housing (15 Ckt.) (J401)	1
	7-00975-03	. . . Contact	14
	2-51683-01	. . . Terminal Block (TB402, TB403)	2
12	3-50476-01	. Dispenser Chute Assembly	1
13	3-50464-01	. Motor Mounting Bracket	3
14	3-50491-01	. Hopper Drive Motor Assembly	3
	7-01101-26	. . . Drive Pin	1
	4-50340-01	. . . Ratchet Coupling	1
	2-50977-01	. . . Compression Spring	1
	7-01209-04	. . . Thrust Washer	1
	4-50341-01	. . . Hopper Drive Motor (M401, M402, M403)	1
15	4-50326-05	. Change Bucket Assembly (See Figure 9)	1
16	4-50353-05	. Frame and Pivot Assembly	1
17	7-01301-11	. 10-32 Hex Nut	4
18	4-50426-01	. Dispenser Motor Guard	1
19	2-50239-02	. Wire Tie	5
20	2-51668-01	. Lamp & Terminal Assembly (No. 755 Lamp)	3
21	3-50677-01	. Mounting Bracket	1
22	7-02332-04	. Snap Bushing	1
23	7-02332-07	. Snap Bushing	1
24	2-51639-01	. Dispenser Lube Label	1



# Change Bucket Assembly

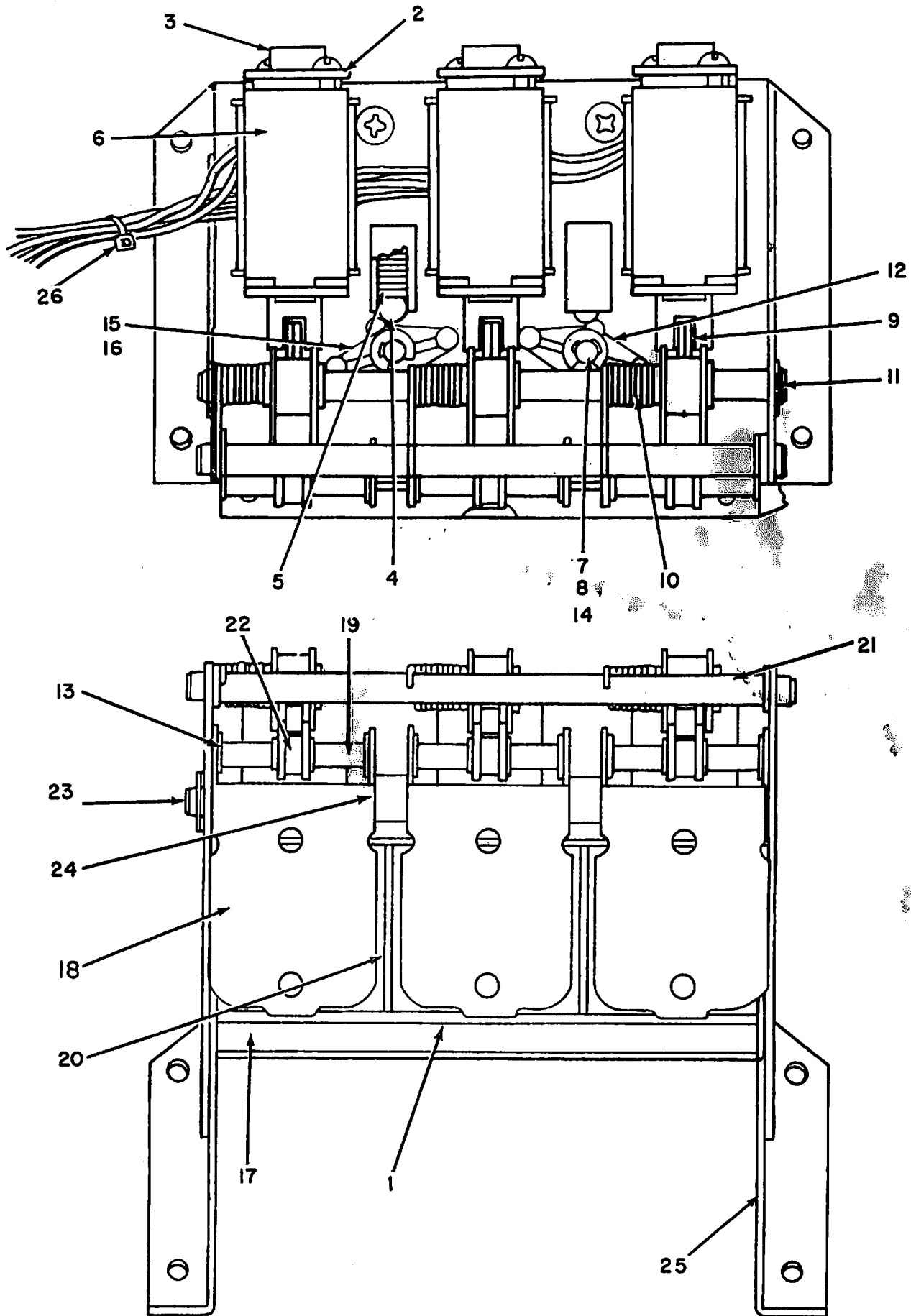


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
9-	4-50326-05	Change Bucket Assembly (See Figure 8, Item 15)	REF
1	3-50470-01	. Bucket Front Plate	1
2	2-50984-03	. Solenoid Stop Plate	3
3	2-51580-01	. Stop Assembly	3
4	2-07465-01	. Ball Bearing	2
5	2-50997-01	. Compression Spring	2
6	2-50994-03	. Solenoid Assembly (L401, L402, L403)	3
7	3-50451-01	. Diverter Door Assembly (L.H.)	1
8	7-01130-05	. Roll Pin	2
9	2-50995-03	. Solenoid Plunger Assembly	3
10	2-51120-01	. Torsion Spring	3
11	7-01430-04	. External Retaining Ring	16
12	2-51100-01	. Door Toggle (L.H.)	1
13	7-01430-03	. External Retaining Ring	14
14	2-51129-01	. Support Post	2
15	2-51101-01	. Door Toggle (R.H.)	1
16	3-50452-01	. Diverter Door Assembly (R.H.)	1
17	2-51124-01	. Dispenser Coin Chute Mounting Bracket	1
18	3-50453-01	. Bucket Door	3
19	2-50991-01	. Link Pivot Pin	3
20	2-50987-01	. Spacer Support	2
21	2-50990-01	. Pivot Shaft (Door)	1
22	7-01212-11	. Spacer	3
23	2-50990-03	. Pivot Shaft (Door)	2
24	2-50983-01	. Sleeve Spacer	2
25	3-50450-01	. Bucket Frame Assembly	1
26	2-50239-02	. Wire Tie	1

**FIGURE  
10**

# Hopper Assembly Sheet 1

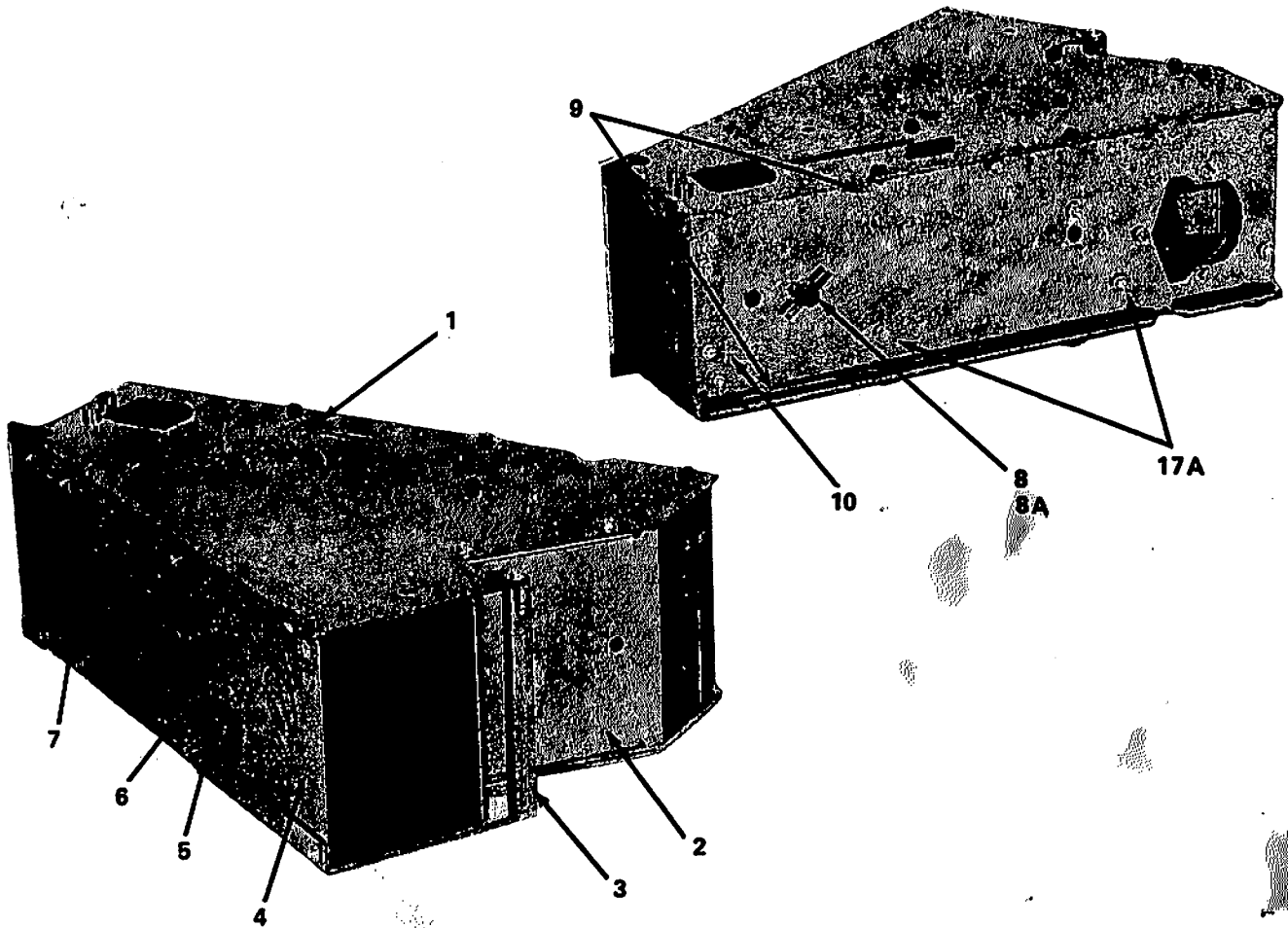


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
10-	6-50276-02	Hopper Assembly (See Figure 1, Item	REF
1	4-50324-01	. L.H. Side Assembly	1
2	4-50315-01	. Top Coin Hopper	1
3	2-50981-01	. Coin Handle	1
4	3-50446-02	. Front Plate	1
5	2-51147-01	. Bumper	2
6	4-50325-01	. R.H. Side Assembly	1
7	6-50279-01	. Fixed Funnel	1
8	2-51137-01	. Drive Shaft and Pin Assembly	1
8A	7-01209-03	. Washer	1
9	7-01216-04	. Spacer	2
10	3-50488-01	. Tie Bracket	1
11	3-50471-01	. Agitator Cam	1
12	4-50321-01	. Coin Baffle	1
13	7-01460-06	. Nylon Bearing	2
14	3-50485-01	. Chain Guide	2
15	3-50605-01	. Plate and Post Assembly	1
16	7-01460-21	. Nylon Bearing	1
17	3-50437-03	. Extended Pin Chain	1
17A	7-01341-09	. Special Screw (Black)	2

# Hopper Assembly Sheet 2

FIGURE  
10

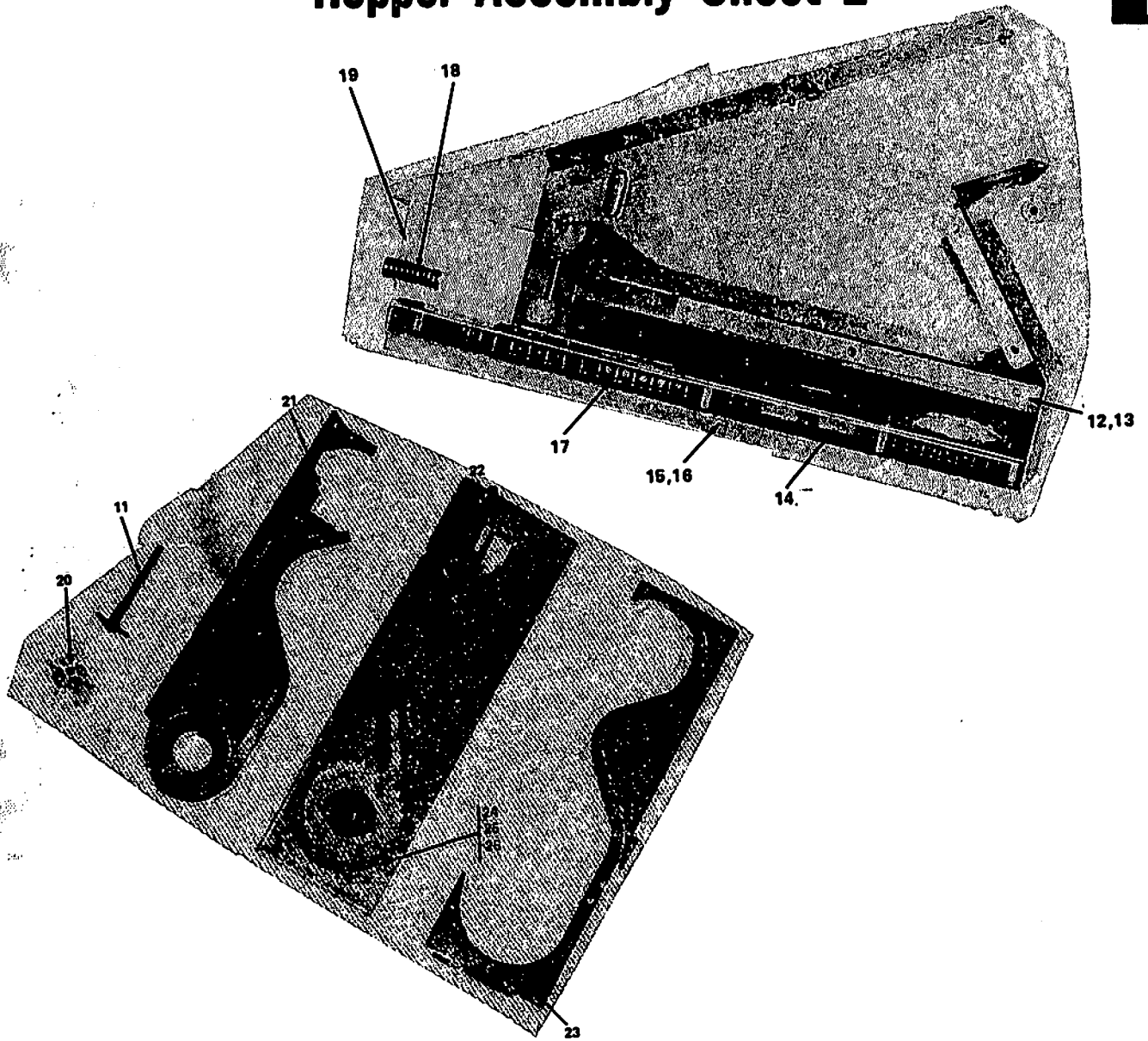


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
10-	6-50276-02	Hopper Assembly (See Figure 1, Item 2)	REF
18	2-51134-01	. Compression Spring	2
19	6-50282-02	. Sliding Funnel	1
20	4-50342-02	. Agitator	1
21	3-50445-02	. Inner Coin Guide Assembly	1
22	6-50288-02	. Chain Guide Ring	1
23	4-50319-02	. Outer Coin Slide Assembly	1
24	4-50356-01	. Sprocket	1
25	3-50471-01	. Drive Spacer	1
26	7-01209-03	. Thrust Washer	1

FIGURE  
11

# Coin Acceptor Bracket And Harness Assembly

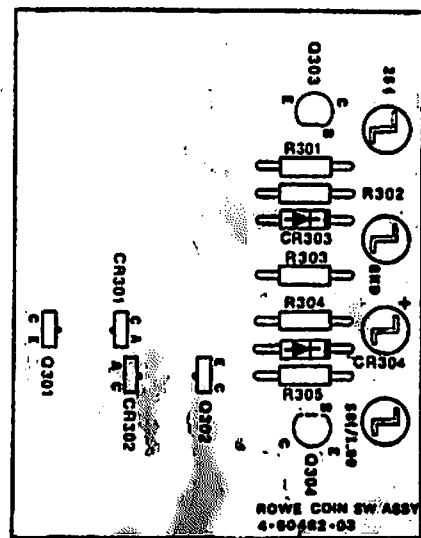
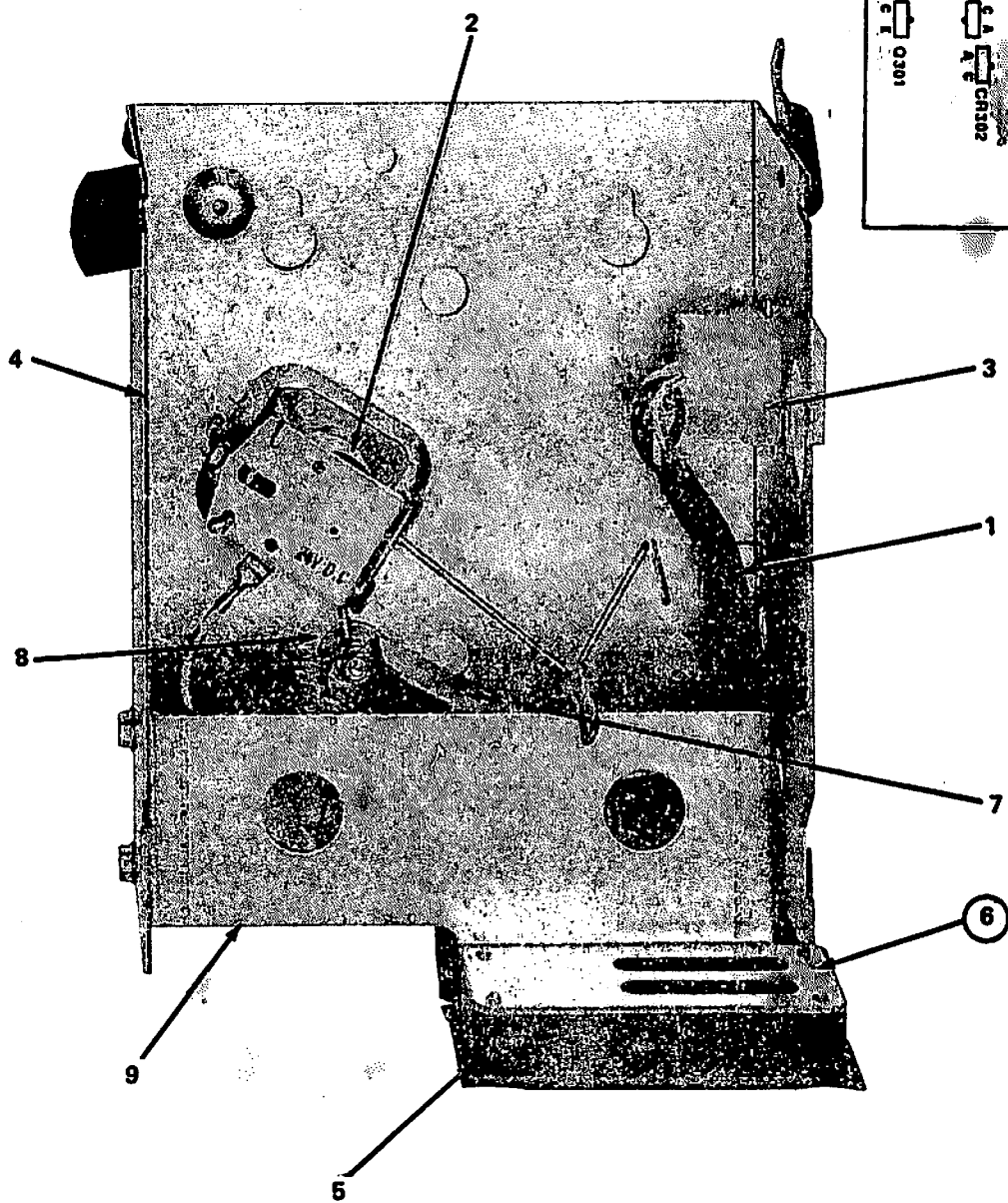


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
11-	3-50261-07	Coin Acceptor Bracket and Harness Assembly (See Figure 1, Item 33)	REF
1	7-00931-04	. Cable Clamp	1
2	3-50317-01	. Lockout Magnet	1
3	3-50282-08	. Coin Acceptor Harness and Plug Assembly	1
	3-07490-05	. . Cap Housing (9 Ckt.) (J301)	1
	7-00975-03	. . Contact (Universal)	6
	7-00924-01	. . Terminal	4
	7-00913-21	. . Terminal Lug	2
	3-04225-17	. . Terminal Strip (TB301)	1
	7-00350-02	. . Silicon Diode (CR305)	1
4	3-50318-01	. Coin Acceptor Bracket and Lock Assembly	1
5	2-51711-01	S.S. Coin Switch Cover	1
6	4-50482-03	Solid State Coin Switch Assembly	1
	7-9901-101	. Resistor (100 Ohm 1/4 W) (R301)	1
	7-9901-154	. Resistor (150 K 1/4 W) (R302, R303, R304, R305)	4
	4-50479-01	Solid State Coin Switch Housing	1
	7-00300-08	. . Transistor (Silicon NPN) (Q303, Q304)	2
	7-00350-07	. . Silicon Diode (CR303, CR304)	2
	7-00918-01	. . Terminal Tab	4
	7-00335-01	. . Sensor/LED Pair (CR301 and Q301, CR302 and Q302)	2
	4-50478-03	. . Solid State Coin Switch Printed Wiring Board	1
7	2-51631-01	. Shield Bracket	1
8	7-01200-19	. Washer	1
9	3-50630-01	. Bracket Mounting	1

**FIGURE  
12**

# Bill Stacker Assembly

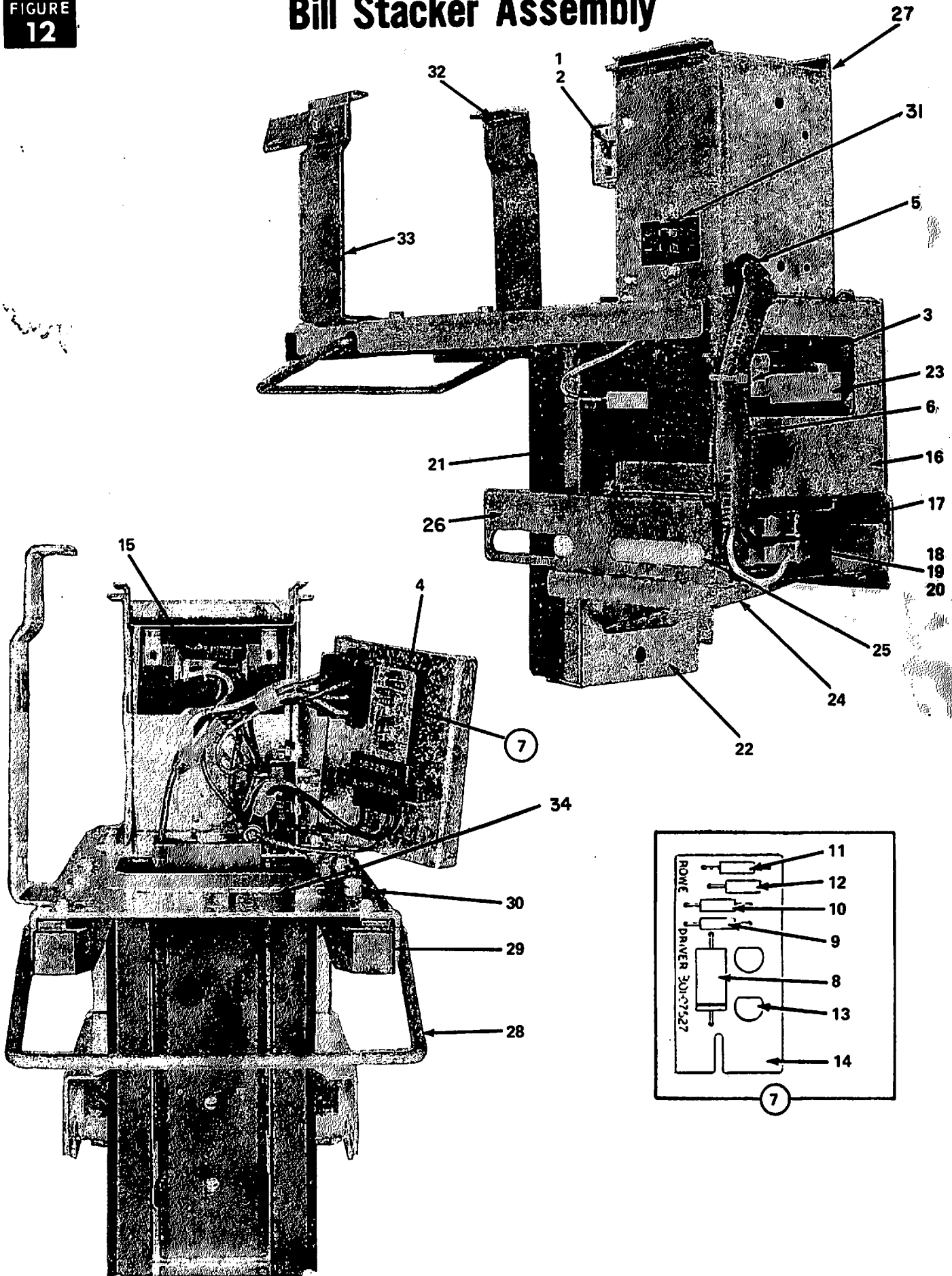


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
12-	6-50249-02	Bill Stacker Assembly (Figure 1, Item 13)	REF
1	2-12869-00	. Relay Retaining Spring	1
2	2-12751-00	. Relay	1
3	7-08002-02	. Cable Clamp	1
4	2-51115-02	. Box Cover	1
5	7-02332-06	. Split Snap Bushing	1
6	4-50311-02	. Bill Stacker Harness Assembly	1
	2-51106-01	. . Triple Receptacle	2
	2-14086-01	. . Straight Receptacle	2
	2-50964-01	. . 8 Pin Plug (J501)	1
	2-13782-04	. . Relay Socket	1
	2-50572-01	. . 6 Circuit Edge Connector (J502)	1
	2-50586-00	. . Keying Plug	1
	7-00929-04	. . Mod. Fork Terminal	4
	7-00913-02	. . Slip On Terminal Lug	7
	7-00990-03	. . Insulated Parallel Splice	4
	7-00924-02	. Terminal (SKT)	6
	2-51392-02	. Edge Connector Mounting Bracket	1
	7-00102-22	. . Carbon Resistor, 100 Ohms, 1/2 W (R505)	1
	7-00213-01	. . Mylar Capacitor, 0.1 MFD, 400 V (C501)	1
	3-04225-07	. . Terminal Strip (TB501)	1
7	3-07527-01	. Driver Circuit Board Assembly	1
8	7-00350-02	. . Silicon Diode (1N4002) (CR1)	1
9	7-9901-393	. . 1/4 W Carbon Resistor, 39 K $\pm$ 5% (R4)	1
10	7-9901-472	. . 1/4 W Carbon Resistor, 4.7K $\pm$ 5% (R3)	1
11	7-9901-222	. . 1/4 W Carbon Resistor, 2.2K $\pm$ 5% (R1)	1
12	7-9901-104	. . 1/4 W Carbon Resistor, 100K $\pm$ 5% (R2)	1
13	7-00300-04	. . NPN Silicon Transistor (Q1, Q2)	2
14	3-07526-01	. . Driver Circuit Board	1
15	2-17728-02	. Capacitor Insulator	1
16	4-50305-01	. Motor Bracket Assembly	1
17	2-10731-00	. . Switch (S502) (Next to Motor Case)	1
18	2-10732-00	. . Switch (S501)	1
19	2-50548-00	. . Switch Insulator	1
20	2-50956-01	. . Switch Bracket	1
	2-10829-00	. . Switch Actuator (Not Shown - Under Switches)	2
	7-01430-18	. . Retaining Ring (Not Shown - Holds Crank)	1
	4-50338-01	. . Crank (Not Shown - On Motor Shaft)	1
21	3-50393-01	. . Chute Edge	2
22	3-50386-01	. . Chute	1
23	3-50396-01	. . Motor and Pin Assembly	1
24	4-50302-01	. . Carriage Assembly	1
25	3-50239-01	. . Actuator Guide	2
26	4-50307-01	. . Motor Bracket	1
27	3-50480-03	. Electrical Box Assembly	1
28	2-50958-01	. Cash Box Catch	1
	4-50346-01	. Cash Box (Not Shown)	1
	2-50961-01	. . Foam Block	1
29	4-50339-01	. Cash Box Guide	2
30	4-50309-01	. Frame	1
31	7-01125-08	. Pop Rivet	2
32	3-50388-03	. Front Hanger	1
33	3-50660-02	. Strap and Stop Assembly (R.H.)	1
34	2-51501-01	. Identification Label	1



FIGURE  
13

# Reject Button Assembly Coin Inlet And Chute Assembly

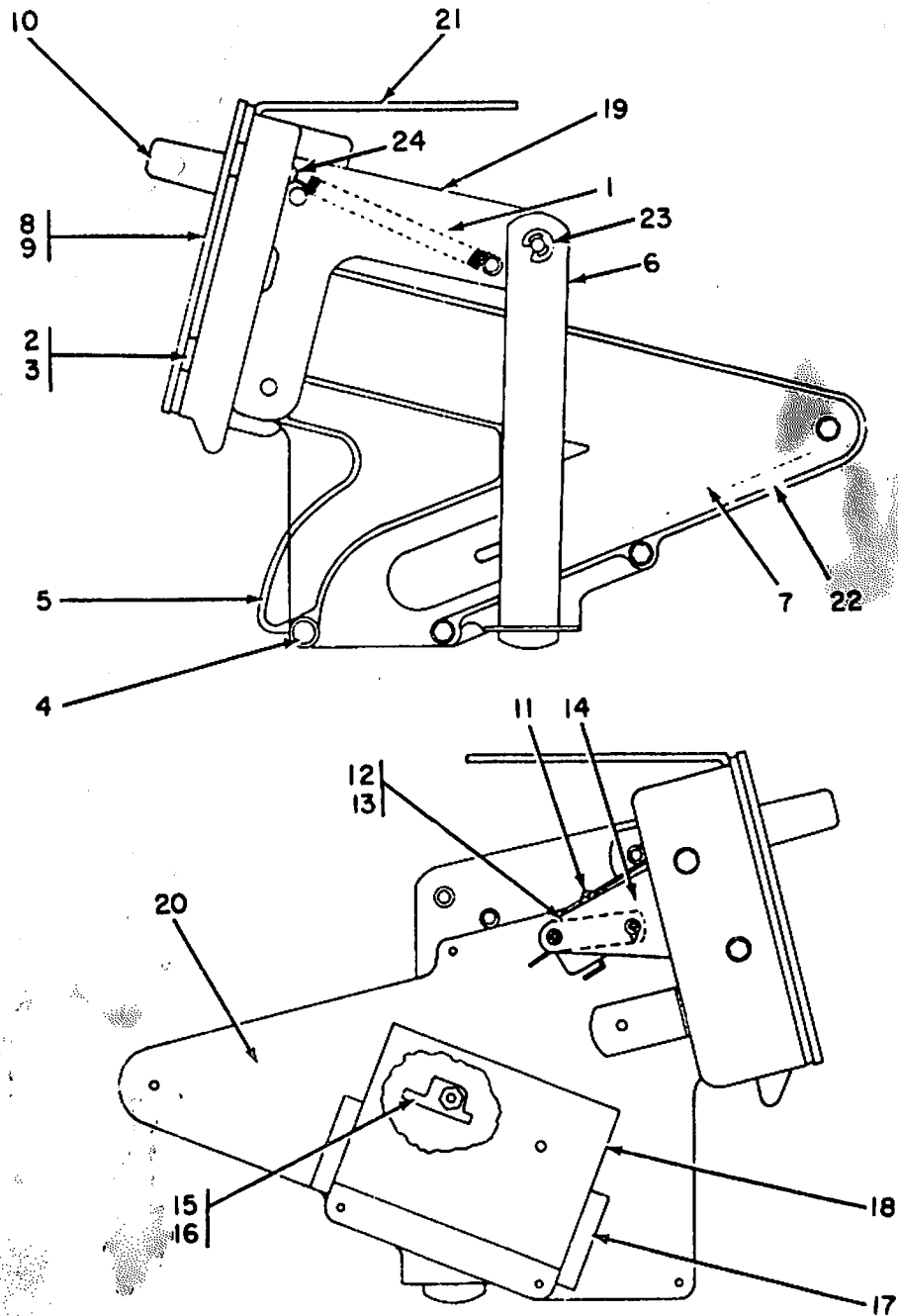


FIG. AND INDEX NO.	ROWE PART NO.	DESCRIPTION	QTY. PER ASSY
13-	4-50167-07	Coin Inlet and Chute Assembly (See Figure 1, Item 32)	REF
1	2-13251-00	. Tension Spring	1
2	2-13018-20	. Cup Washer	2
3	2-50571-02	. Coin Chute Bracket (Upper)	1
4	7-01345-01	. Thumbscrew	1
5	2-51614-01	. Coin Chute Clean-Out	1
6	2-51605-01	. Scavenge Link	1
7	3-50312-02	. Coin Chute	1
8	2-50616-00	. "Coin or Bill Return" Instruction Panel	1
9	4-50134-00	. Coin Inlet Trim	1
10	2-50565-03	. Reject Button and Blade Assembly	1
11	2-50613-01	. Switch Actuator	1
12	2-10732-00	. Switch (S701)	1
13	2-10830-00	. Twin Nut	1
14	2-50529-02	. Reject Switch Bracket	1
15	2-51479-01	. Blade Holder	1
16	2-51480-01	. Blade	1
17	2-51621-01	. Hole Cover	1
18	2-50633-02	. Coin Chute Support Bracket	1
19	2-51616-01	. Rejector Actuator Assembly	1
20	3-50313-02	. Coin Chute Back	1
21	3-50260-01	. Coin Acceptor Bracket Assembly	1
22	7-02124-03	. Cork Composition Strip	1
23	7-01430-04	. External Retaining Ring	3
24	7-00917-02	. Solder Lug	1

KITS

2-66973-02 S.B.A. Dollar Coin Kit (Mechanical Coin Acceptor)  
2-70237-01 Coin Inlet Kit for Undersize Coins  
2-70239-02 Nylon Hopper Brush  
2-70258-01 Bucket Solenoid Plunger Kit  
2-70286-01 Bill Acceptor Front Trim Shield Kit (Deters Insertion of Junk)  
2-70291-01 Program Switch Guard Kit (Computer)  
3-70036-01 Bill Acceptor Adapter Harness (BA-3 into BC-20)  
3-70036-02 Bill Acceptor Adapter Harness (BA-3 into BC-9 or BC-8)  
4-70019-01 Extender Cable - Computer Control Center  
6-50276-06 S.B.A. Dollar Coin Hopper (or Large Tokens)  
6-70013-05 Machine Service Kit (Diagnostic Aid with Spare Parts)