

Board Update for BC12 – Installation Instructions

These instructions also apply to Rowe changer model BC11, however the Rowe component part numbers will vary.

The following instructions are for the installation of a new board in a Rowe BC12 dollar bill changer. A Rowe BC12 changer is a front opening model with 2 hoppers. The original bill transport, stacker, control board, and power control center are replaced. The two hoppers and Coin Dispenser Assembly 6-50580-02 are reused.

When coins are dispensed, they feed directly from the hoppers to the coin cup. The flaps that were originally used to hold the coins in escrow are removed from the Coin Dispenser Assembly. The new control board is capable of making change if a quarter/dollar coin is inserted into the coin acceptor. The parts for this option are not included with the kit.

The standard configuration of this kit is for the installation of a Mars 120V validator with a compact mask. The bill validator determines the denominations of notes processed by the board. Models AE2411/AE2451 and VN2511 will accept \$1, \$2, and \$5. Model AE2611 accepts \$1-\$20. The bill box capacities currently available for these validators are 200, 300, 500, 700, and 1,000 notes.

The installation information is intended for experienced personnel familiar with the operation of these components. All of the installation procedures should be reviewed and understood prior to installing the kit. The installation instructions are based upon a machine that has not been modified from the original factory configuration. If the machine has been in any way, restore the machine to the original factory configuration prior to beginning the conversion.

There are a few variations of the BC12 model of changer. One option was a dual stacker. Some models did not have a coin acceptor assembly on the front door. This kit will work in all models.

Kit Components

New board assembly in a black metal enclosure with yellow text
Slide plate to mount Mars validator with compact mask -AE2411/AE2451, VN2511, or AE2611
Installation Instructions titled [Board Update for BC12 – Installation Instructions](#)
Four self threading 8-32 ¼" screws

Wiring harnesses:

- Mars validator to new control board part # HM120-36"
- Coin Dispenser assembly harness part #HBC12CDA
- Main power input harness part #HBC12MAINPOWER
- Empty lamp harness part #HRBC12EMPTYLAMP
- A by-pass harness jumper will be placed on Header C3 of the board
- Non-resettable 12vdc meter to register the number of bills inserted
- (Optional) Low coins screw & harness part #HDUALLOWCOINS

Additional Required Items Not Included With Kit

Working Mars validator – Model AE2411/2451, VN2511, or AE2611
The four 11/32" hex nuts used to mount the Mars validator to the metal slide plate are included in the Mars validator shipping box.
Dollar bills to test the validator and verify operation of the kit

Optional Kit Components Not Included With Kit

If you will be using the coin acceptor, you will need to order part number K1TRBC12COINACCEPTOR. The kit includes a harness to attach the board to the coin acceptor assembly and a meter to register the amount of coins inserted. The kit sells for \$25.00.

Tools and Supplies Required

1/4" long handle nut drivers or ratchet wrench

3/8" nut driver or ratchet wrench

5/16" nut driver or ratchet wrench

11/32" nut driver

Regular screwdriver

Phillips screwdriver

Pliers

Electric drill with 7/32" drill bit and safety goggles

Tape - scotch or electrical

Installation Instructions

Removal of the Changer's Original Assemblies

1. Depress the dollar test button and confirm the hoppers and Coin Dispenser Assembly are working properly.
2. Unplug the machine's power cord from the wall outlet.
3. Remove both of the hoppers.
4. Remove the bill transport by unplugging both connectors and sliding the transport forward and out of the tracks
5. Remove the bill box(es).
6. Remove the stacker assembly by unscrewing the two 1/4" hex screws at the top of the transport tracks. It may be necessary to hold the nuts under the assembly with a pair of pliers. If the BC12 being updated has a dual stacker assembly remove the 1/4" hex screws that secure the bottom of the stacker assembly to the base of the changer. Disconnect the harness from the upper right hand side and pull the stacker assembly forward and out of the changer.
7. Unscrew the two 3/8" bolt that secure the Coin Dispenser Assembly, then tilt the unit forward. Slide the assembly to the left and forward so it is no longer resting on the side pivot rods. Reach to the rear of the unit and unplug the wiring harness.
8. The Coin Dispenser Assembly is converted to a direct payout system. The modification of the Assembly involves removing the two-bucket solenoids and permanently positioning the internal coin diverting flaps. The electronics used to count the coins are not changed. The upgrade kit does not hold any coins in escrow, the metal escrow flaps connected to the 2 bucket solenoids are removed.

There are three black rods on the bucket assembly. Remove the e-clip on either side of the assembly from each of the two rods that have e-clips on the outside of the assembly. Push the rods in the direction of the remaining e-clip; the springs and spacers will fall out. The two shafts, springs, and spacers are no longer needed. In order to remove the plunger arms and flap assemblies you need to temporarily remove the lower rear black shaft. Remove one of the e-clips (inside the assembly) and slide the black rod in the direction of the e-clip that was not removed. The flap/plunger arms will fall out. Slide the rod back into place and secure the

- e-clip. The white diverting flaps should be positioned so they are securely locked in position. The position, vertical or sixty degrees, is not important. The modification is complete.
9. The entire cabinet wiring harness assembly is replaced with new harnesses included in the kit. Using a ¼" nut driver remove the bracket directly above the transport slot. This bracket is used to hold the 9 and 6 position connectors. It is held in place with 2 hex nuts.
 10. Unplug the 3 position main power harnesses from the main AC power box located at the forward top right of the cabinet.
 11. Unplug the 4 position wiring harness from the forward connector next to the main AC power box. The wiring to the empty bulb and coin return switch remain on the front door
 12. If the machine has a Coin Acceptor Assembly on the front door unplug the 9 position connector.
 13. Slide the Computer Control Center 6-504903-03 forward. Unplug the 6 wiring harness connectors. Remove the board from the cabinet.
 14. The entire Power Control Center 6-50535-01 is now removed. Using a 5/16" nut driver remove the hex screw at the bottom of the assembly and the hex screw at the top forward left corner of the assembly. Some of the harnessing will need to be released from the cable holders. Once all the harnesses are free remove the Power Control Center from the cabinet.

REASSEMBLY

15. Review the safety procedures supplied by the manufacture of the power drill. Drill the four mounting holes. Mount the new control board to the rear wall in the bottom compartment of the changer. The placement is not critical but should be positioned near the bottom so it is easy to view the meter. Drill the holes and clean the burrs from the interior area.
16. Screw the four self-threading screws into the new holes to "thread" the metal. Remove the screws.
17. Mount the new control board starting with the upper and lower right hand holes. One of the left hand screws is used to secure the coin meter. Insert the screws through one of the holes in the meter base and then through the slot of the enclosure. Tighten the screw. Insert the fourth screw to secure the enclosure.
18. Attach the white connector from the meter to header "Dollar" on the control board.
19. Connect the main power harness to header P1 on the control board. Run the harness up the left hand side of the cabinet and connect it to the power input box. This harness has 2 three position male plugs on each end. Route the harness using the existing harness tie/down and metal clips in the cabinet for a neat job.
20. Connect the new empty bulb harness originating at header "Empty" of the new board to the 4 position connector next to the main power box. This harness has a 4 position plug with two wires. Route the harness using the existing harness tie/down and metal clips in the cabinet for a neat job.
21. Reinstall the modified Coin Dispenser Assembly.
22. Run the new Coin Dispenser Assembly harness (originates at header C1 of the new board) up the rear wall of the changer. Pull the Coin Dispenser Assembly forward and insert the 15 position connector into the plug. Gently set the Assembly back into place.
23. Secure the Coin Dispenser Assembly using both 3/8" bolts.
24. Set the dip switches on the validator per the chart printed on the enclosure.
25. Mount the validator to the metal slide plate using three of the four 11-32 nuts provided with the Mars validator.
26. Slide the validator assembly most of the way down the tracks.
27. Attach the harness originating at C4 of the control board to the validator; be sure to observe the key pins.
28. Reinstall the hoppers. Be sure there are ample coins in inventory.

Test Procedures

1. Plug the machine back into the wall.
2. The red +5v led indicator on the control board should light. If not confirm the ON/OFF switch is in the ON position. The 2 incandescent count sensor bulbs will not be lit.
3. After a 6 second reset period the green arrows on the validator should begin blinking. If not depress the reset button on the control board.
4. Insert bills to test the kit.

Test Procedures

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6. The red +5v led indicator on the control board should light. If not confirm the ON/OFF switch is in the ON position. The 2 incandescent count sensor bulbs will not be lit.
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Installation Instructions for Hopper “Low Coins” Screw

Upon verifying the kit and changer are working properly, a low coins screw can be installed. The low coins screw is installed to prevent shortchanging a customer. If the changer is in an attended location and the hopper will not empty, it is not necessary to install the low coins screws. The bypass jumper is installed on header C3 when the board is shipped.

The screw is used to detect ground through the coins in the hopper. When the coins are not touching the screw and metal wall of the hopper, the changer will no longer accept bills. The reset button on the control board must be depressed after the hopper has been filled to reset the board.

The low coins screw does not need to be installed if the bill validator would fill up with bills prior to the hoppers emptying. In many applications this is the case. If the location is attended you may not need to install the part.

1. Turn off the changer.
2. Remove the hopper from the changer and set it in a work area. If it is filled with coins, remove the coins.
3. Drill an 11/64" hole in the black plastic area at the bottom of the hopper. The hole should be located at the center of the hopper and 7/8" from the very bottom of the plastic. Positioning is important so that a coin does not get wedged between the screw and the hopper body.
4. Insert a screw through the hole. Reach your hand into the hopper and align the nut. Begin tightening the screw while holding the nut. When the nut is almost fully tightened, slip the open spade terminal under the screw head. Finish tightening the screw so the harness is held securely in place. The terminal should be positioned so that it is vertical; 3:00 or 9:00.
5. Place the second fork terminal under one of the ¼" hex screws near the black plastic area.
6. Place the hopper back in the changer.
7. Run the harness over the control board. Unplug the bypass Jumper at C3 and attach the new harness.
8. Secure the harness neatly in the changer using the tie mounts supplied in the parts kit.
9. Refill the hopper with coins so the screw is covered.
10. Turn on the changer. After a 10-second warm-up period, the validator will accept bills.
11. Place the label on hopper that warns service personnel not to remove hopper without disconnecting the empty sensor wire

COINS DISPENSED PROGRAMMING

Two sets of two dip switches are used to programmed the amount of coins dispensed. Each of the hoppers as 2 sets of dip switch banks. The upper bank is used to set the payout for a \$1 bill. When a \$2 bill is inserted the values double. The lower bank is used to program the amount of coins for a \$5 bill. When a \$10 bill is inserted the payout is doubled. When a \$20 bill is insert the payout is quadrupled.

Regular Payout Examples Non Hopper Swapper Feature

Payout for a \$1 bill = 3 quarters from right hopper and 5 nickels from left
upper right bank #1 and #2 ON Upper left bank # 1 and #3 ON
Payout for a \$5 bill = 19 quarters from right hopper and 5 nickels from left
Lower right bank #1,#2, & #5 ON Lower left bank # 1 and #3 ON

Payout for a \$1 bill = 2 quarters from right hopper and 2 quarters from left
upper right bank #2 ON Upper left bank # 2 ON
Payout for a \$5 bill = 10 quarters from right hopper and 10 quarters from left
Lower right bank #2, and #4 ON Lower left bank # 2 and #4 ON

Hopper Swapper Payout

If the same value coin is being dispensed from all of the hoppers, this new feature can be used. The coins are dispensed from the right hopper, then the left hopper. This allows the maximum amount of coins to be dispensed, as well as preventing the changer from shutting down if the right hopper jams.

The coins are initially dispensed from the right hopper. When no coins are sensed for 8 seconds, the payout then shifts to the left hopper. Once the center hopper gets low, and no coins are sensed, the payout shifts to the left hopper.

The control board is programmed for maximum change/hopper swapper payout by turning switch "MC" at the bottom of the upper right bank for \$1. The dip switch banks for each of the hoppers are set to the amount of coins to dispensed for each dollar value received. The most popular setting is to dispense four coins per dollar value.

When using this mode, it is important that the reset button be pressed each time the changer is refilled. If it is not, the payout sequence from right, center, left is not reset and the changer may go empty prematurely. If the coins are at the point of being dispensed from the left hopper and the changer is not reset, they will continue to be dispensed from the left hopper instead of starting at the right hopper.

Hopper Swapper Feature Payout Examples

Payout for a \$1 bill = 4 quarters
upper right bank #3 and #5 ON Upper left bank #3 ON
Payout for a \$5 bill = 20 quarters
Lower right bank #3 and #5 ON Lower left bank #3 and #5 ON

Troubleshooting Tips for Control Board

Status LED

The board's status LED is used to indicate common failures. When the board is operating properly, the status LED will be lit steadily.

+5V LED

The supply of +5 volts direct current is confirmed by the red LED labeled +5v.

+12V LED

The supply of +12 volts direct current is confirmed by the yellow LED labeled +12v.

Reset Button

The reset button must be pressed any time the changer has shut down.

Input Button

The board input button is used to simulate the pulse input from a dollar bill validator. When a test button is depressed, the board will payout according to the dipswitches settings. To simulate the payout for a five-dollar bill, the input button is pressed five times in rapid succession.

Time Out Protection

The board has a built in "Time-out" feature that shuts the board down in the event that a coin count is not sensed for 20 seconds. This feature offers extra protection against jackpotting.

The new control board does not continuously supply power to the two incandescent bulbs used to count the coins. This helps to extend the life of the bulbs. Once a bill has been accepted, the bulbs will illuminate and the hoppers begin to payout coins. If either of the bulbs fails the board will shut down and the status led will flash 4 times. The reset button on the board will need to be depressed after the bulb is replaced.

Error Codes

In the event of malfunction, the error codes help to indicate the problem. The LED display is used to indicate the error codes. The error codes and the corrective measures are as follows:

ER1 - Hopper coin level is low

ER2 - Time out protection feature, a coin was not counted for 20 seconds. The reset button must be pressed

ER3 - Coin(s) overpaid. The reset button must be pressed. Test the hopper for a possible "brake" failure

ER4 - Bulb burned out when used in Rowe changer; trouble input from hopper in Dedicated Cabinet kit

ER5 - E prom Error – This is a permanent shutdown and requires board be sent in for repair

ER6 - Impossible values set on dipswitches, change dipswitches per programming instructions

ER7 - 7 blinks - control board failure – Watch Dog Timer

ER8 - Future Use

ER9 - Future Use

Low Coin Levels

Coins are paid out directly from the hoppers eliminating the need for the escrow buckets. A "low coins screw" that is installed as part of the update monitors the coin levels in the hoppers.

Sales meter

After all the coins have been dispensed a sales meter will pulse one time.

Technical Assistance for kit part number KITRBC10-MAEVN is available from 9:00am – 4:00pm EST at (800) 814-7756

Mars validator Dip Switch Settings

AE2400 \$1-\$5

1. ON
2. ON
3. OFF
4. ON
5. ON
6. ON
7. OFF
8. ON

AE2600 \$1-\$20

1. ON
2. ON
3. ON
4. ON
5. ON
6. OFF
7. OFF
8. ON

VN2500 \$1-\$5

1. ON
2. ON
3. OFF
4. ON
5. ON
6. ON
7. ON
8. OFF

BC11/BC12 Board Kit

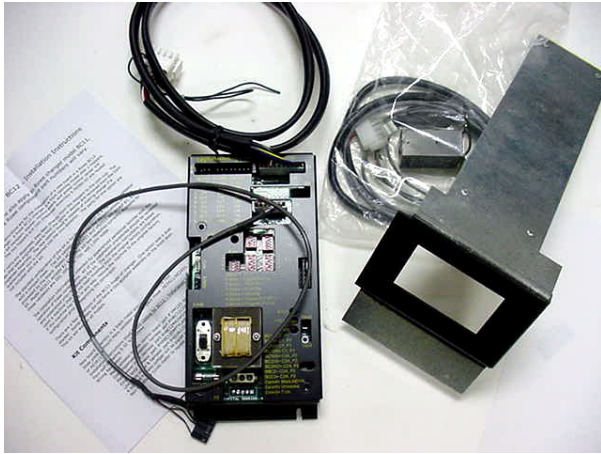


Figure 1



Figure 2

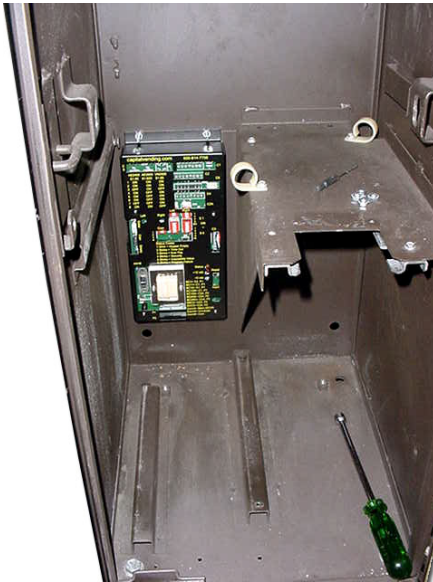


Figure 3



Figure 4



Figure 5

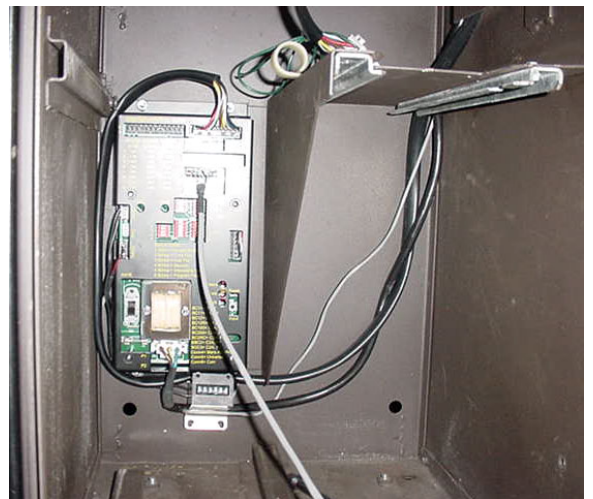


Figure 6

Rowe Board Kit – 2 hoppers

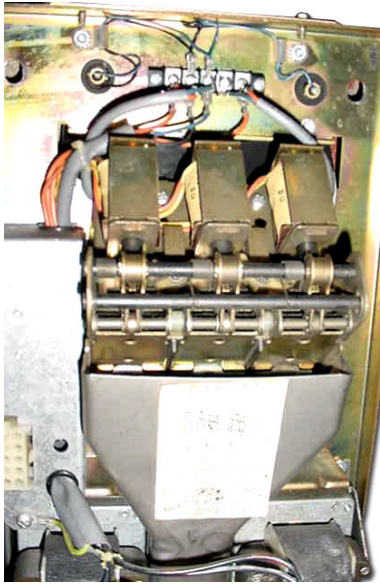


Figure 7

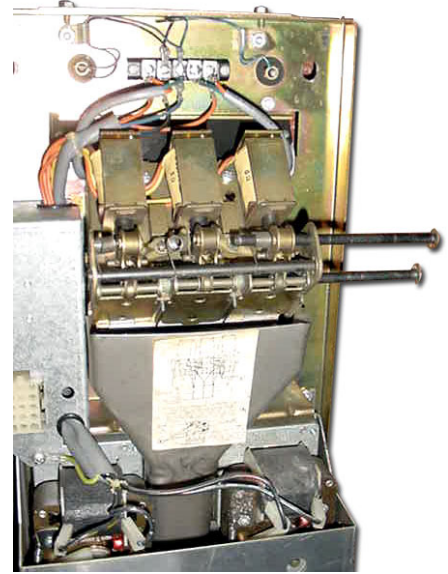


Figure 8

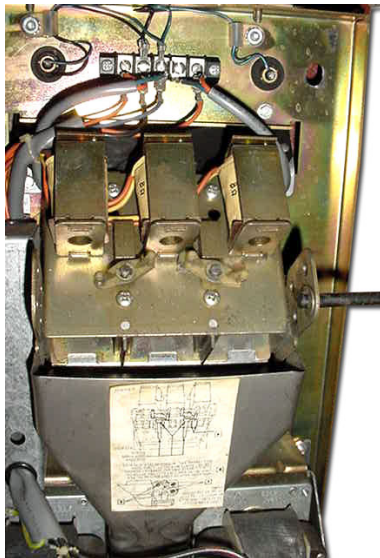


Figure 9

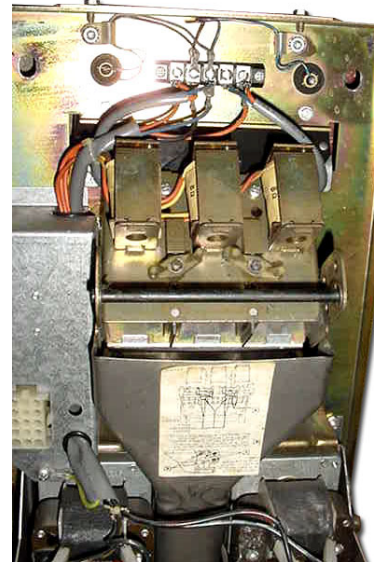


Figure 10

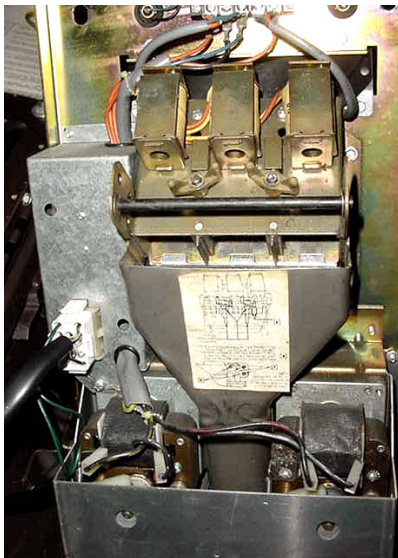


Figure 11

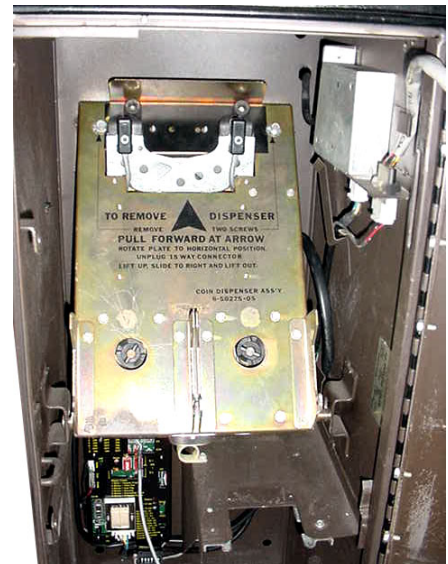


Figure 12

BC11/BC12 Board Kit



Figure 13

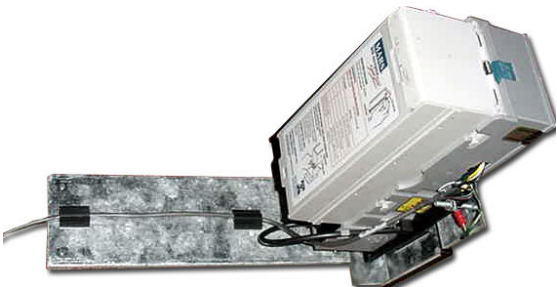


Figure 14



Figure 15



Figure 16

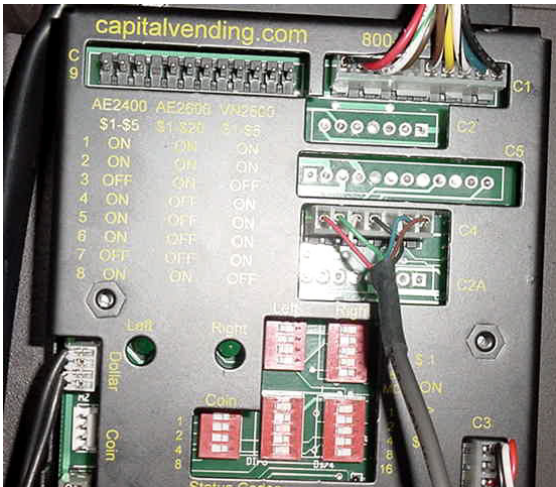


Figure 17



Figure 18

BC11/BC12 Board Kit



Figure 19

Bullet Bulb for Rowe Changers

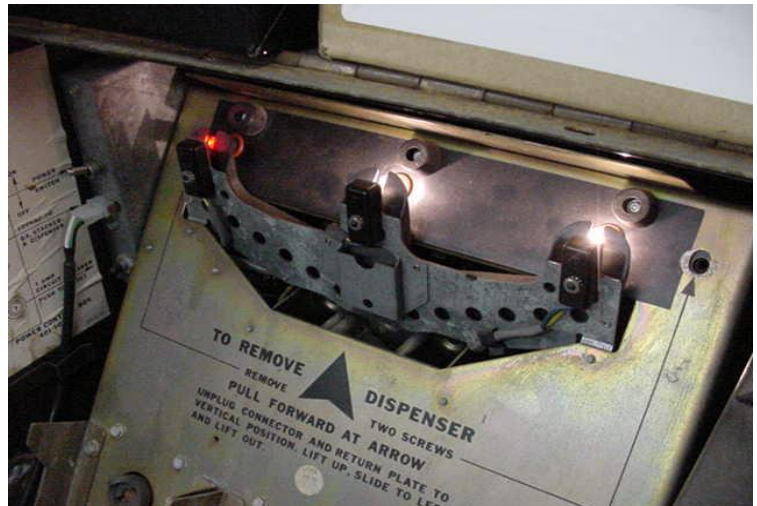
This custom part replaces the 755 incandescent count emitter bulb in Rowe dollar bill changers. This part is installed in the coin dispenser assembly that is located behind the hoppers. This new part offers the advantage of a considerably longer life and will not fail due to vibrations. This is very important as Rowe changers shut down when the count emitter bulb fails. This item easily pays for it self by eliminating service calls and unnecessary downtime.

The "Bullet Bulb" can be installed in a bill changer that originally used an incandescent lamp *BC2RC, SCC3, BC9, C10, BC11, BC115, BC12, BC12R, BC20, BC25, BC25MC, and BC35.*
Part# NRBULLETBULB

For Rowe changer models *BC100, BC150, BC200, BC1200, BC1400, BC2800, and BC3500.*
Part # NRBULBxx00

Installation: On location installation time of 5 minutes or less.

Tools Required: Regular screwdriver, 3/8" socket or pliers to remove the 2 bolts securing the coin dispenser assembly.



New Bullet Bulb shown on left hand side

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