



CD 7-10 CAN & BEVERAGE MERCHANTISER

MODEL 3089-A



SERVICE MANUAL

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INTRODUCTION

This manual contains service and installation guidelines and instructions for the CD-7/10 Beverage Merchandiser.

The CD-7/10 vendor is a 17 select machine with two types of vending areas. The front five (5) compartments allow for ten (10) adjustable selections. These compartments are capable of vending bottle containers of various sizes and shapes including the 20 ounce containers. The rack located to the back of the vendor allows you to vend seven (7) additional selections for the 12 oz. cans.

Selections can be priced separately at various vend prices ranging from \$.00 to \$99.95 in five (5) cent increments. All programming of the vend functions, pricing and features are done at the controller. Changes in the programming and information can be retrieved without the need of any additional accessories or remote parts.

Electronic failures and service diagnostics are recorded and error code messages display when the controller is placed in the *Service Mode*.

Accounting data, such as the number of vends and the amount of cash received is recorded for the total machine activity and each selection. This can be used by the owner/operator to collect market information on the products in the vendor. Some of the accounting information can be accessed from outside the vendor by entering an access code.

MACHINE SPECIFICATIONS

Electrical

115 VAC, 60 Cycle ($\pm 10\%$), 8.2 amps, (Full Load)
or

230 VAC, 50 Cycle ($\pm 10\%$), 4.1 amps, (Full Load)

Transformer

24 VAC

3 amp @ 50% Duty Cycle

Physical Size

Width:	42 Inches	1.07 Meters
Depth:	35 Inches	.89 Meters
Height:	72 Inches	1.83 Meters
Weight:	1080 LBS.	400 Kg

Capacities

441 Total Cans:

7 Selections, 63 Each

120 Total Column Products:

10 Selections, Minimum 12 Products Each

561 Total Products (Minimum)

Vend Prices

\$0.00 - \$99.95 in \$0.05 increments

Money Handling

Multi Drop Buss (MDB) Coin Mechanism

MDB Bill Validator with 300 bill stacker

Refrigeration

Hermetically Sealed

Super 1/3 HP Compressor

Refrigerant: R-134a

Charge: 7.9 Ounces

UNPACKING

This machine has been thoroughly inspected prior to shipment and has been packed in a manner to prevent damage during transit.

1. Cut and remove the banding straps that secure the packaging material to the vendor.
2. Carefully remove all external packing material from the vendor taking care not to mar or damage the vendor's finish.
3. Remove the protective plastic bag.
4. Remove the "Knock-A-Way" support by placing a 2x4 under the vendor, inserting a large screwdriver or prying tool into the groove of the Knock-A-Way and splitting it in two. Turn the leveling screws in as far as possible. See **Figure 1**.

5. Pull the power cord to its full extension away from the back of the cabinet. The cord will be approximately 6 ft. (1.82 meters) in length.
6. A model number, serial number and inspection number appear on the final inspection form in each vendor. Refer to these numbers on all correspondence and inquiries pertaining to this vendor.
7. Locate the key in the coin return cup and unlock the door. The "T" handle latch requires several full turns counter-clockwise to open the main door.
8. Remove all packing material, shipping brackets and tape from inside the vendor. Adhesive residue can be removed with denatured alcohol or common household vinegar.

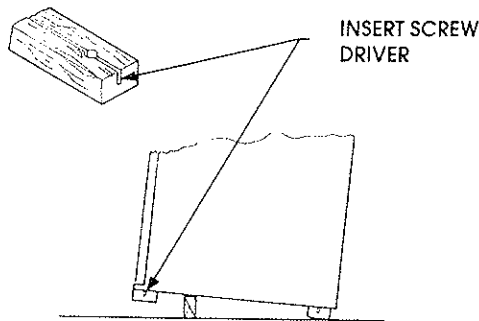


Figure 1

INSTALLATION

Position the vendor in its place of operation no further than 6 feet (1.82 meters) from the power outlet or receptacle and check that the door will open fully without interference. Leave at least 6 inches (15 cm) of space between the back of the machine and any wall or obstruction for proper air circulation and exhaust.

Level the vendor, making sure all leg levelers are touching the floor. The rear leg levelers should be adjusted first, especially when the equipment is being "banked". The vendor must be level to obtain proper operation and proper acceptance of coins through the coin mechanism.

When the vendor is level, the door can be opened to any position and not move by itself. Try the door half closed, straight out and in the wide open position before deciding the vendor is level.

Grounding & Electrical

Prior to connecting the equipment, the integrity of the main electrical supply must be checked for correct polarity, presence of ground and correct voltage. It is recommended that these checks be repeated at 6-month intervals with the routine safety electrical testing of the equipment itself.

To correct negative voltage, amperage, polarity, or ground checks, consult a licensed electrician.

A noise suppresser has been installed in this machine to compensate for any main line signal noise that could interfere with the normal operation of the controller.

230 Volt Vendors

Power source should be 230 VAC ($\pm 10\%$) 50 cycle.

1. Voltage Check: Connect the AC voltmeter probes to the **hot** and **neutral** terminals.
2. Polarity and Ground Check: Connect the AC voltmeter probes to the **hot** and **ground** terminals.
3. Amperage Check: At the fuse box or circuit breaker panel, locate the proper circuit, and ensure that the fuse or breaker protecting that circuit is rated at 13 amps or greater.

NOTE:

The **ground** terminal is perpendicular to the other two slots. In a standard three (3) prong 230 volt wall outlet the **neutral** terminal is located counter-clockwise from the ground terminal and the **hot** terminal is located clockwise from the ground pin. See **Figure 2**.

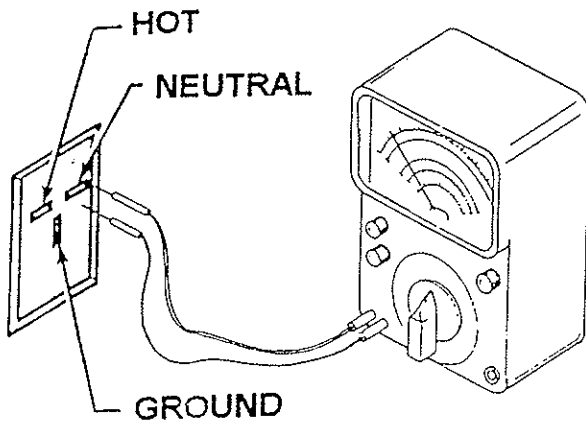


Figure 2

120 Volt Vendors

Power source should be 120 VAC ($\pm 10\%$) 60 cycle.

1. Voltage Check: When the AC voltmeter probes are connected to the **hot** and **neutral** terminals, the voltmeter should indicate 108 - 132 VAC.
2. Polarity and Ground Check: When the AC voltmeter probes are connected to the **hot** and **ground** terminals, the voltmeter should indicate 108 - 132 VAC.
3. Amperage Check: At the fuse box or circuit breaker panel, locate the proper circuit, and ensure that the fuse or breaker protecting that circuit is rated at 20 amps or greater.

NOTE:

The **hot** side of the outlet should always be counter-clockwise from the **ground** terminal. The **neutral** terminal will be clockwise from the **ground** terminal. See **Figure 3**.

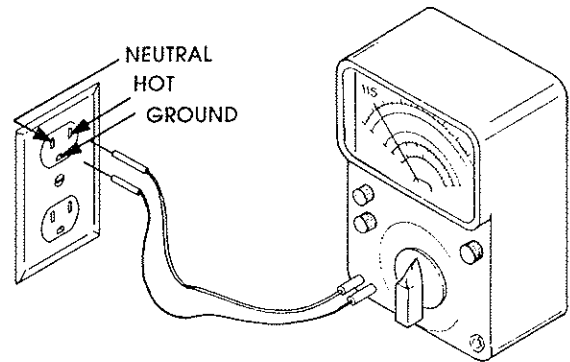


Figure 3

SALES MODE

The *Sales Mode* is the normal operating mode of the vendor. As money is deposited the amount of credit displays.

Vend prices can be verified by pressing the selection letter and number. The vend price will display momentarily.

Vend Count

To display the total number of vends made for a selection since the last reset of the resettable accounting data, press “#” (ENTER) followed by the access code. (Refer to the “Set Access Code” section of this manual.) For security reasons, these key strokes must be entered within 2 seconds of each other.

When the correct access code is entered **Cnt** displays. Press a selection key, and the number of vends since the last reset for that selection displays.

Press “#” (ENTER) to exit this mode.

PROGRAMMING INSTRUCTIONS

To program the functions and operation of the CD 7/10 Beverage Merchandiser, you must be in the *Service Mode*. There are two levels of programming in the *Service Mode*.

The following table indicates the various modes and functions that can be accessed in each of the service mode levels.

Table 1: Service Mode Definitions

Level 1		
Press	Displays	Mode
"A"	Pri	Set Price
"B"	Coin	Coin Dispense
"C"	Acct	Accounting Data
"D"	rES	Reset Accounting Data
	no OR YES	Not reset Reset
"E"	Frig	Refrigeration Controls
"F"	Vend	Test Vend
"H"	Alin	Align Optical Sensors
"I"	OPt	Options
	1	Force Vend
	2 3	Multi Vend Escrow/Exact Change
"J"	Cnt	Vend Count Since Last Reset
Level 2		
Press	Displays	Mode
"A"	StoS	Space To Sales Configure
"B"	All?	Test Vend All Motors
"C"	- (flashing)	Set Access Code
"D"	P= 1	Set Keypad Layout

To Enter and Exit Service Modes

LEVEL 1: To enter *Service Mode* Level 1, press the Service Mode Button on the lower right corner of the control board. See **Figure 4**. **L1** displays.

LEVEL 2: Press the Service Mode Button two (2) times in rapid succession. **Code** displays.

Press "**C**", then "**B**", then "**A**". These three letters must be pushed within 2 seconds, or the controller will default to Level 1. Once the code is entered correctly, **L2** displays.

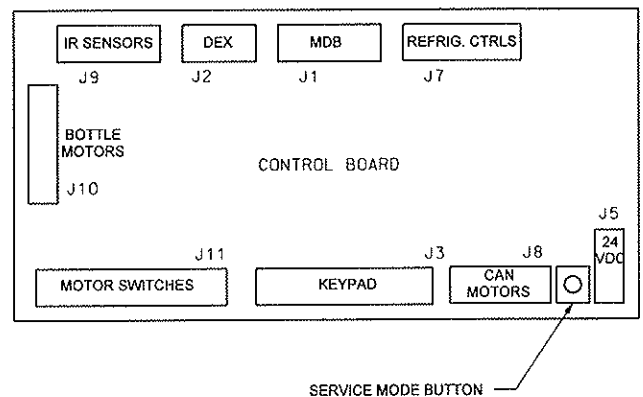


Figure 4

To exit the *Service Mode*, press the Service Mode Button until the *Sales Mode* is entered.

Example: Pressing the Service Mode Button while in Service Level 2 will revert to Level 1. Pressing the Service Mode Button within Service Level 1 will exit the Service Mode and place the controller in the Sales Mode.

The "**#**" (ENTER) key can also be used to back out of the Service Mode. The controller will automatically exit or time-out of the service mode after 20 seconds of no keypad activity.

Special Key Functions

While in a *Service Mode* the following keys will be used to change or alter the program or functions:

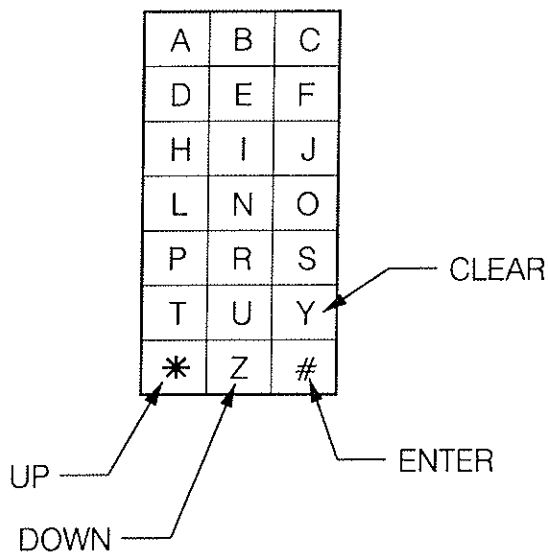


Figure 5

Error Codes

If an error of any electronic functions has occurred, an error code displays when you first enter the *Service Mode*. See **Table 2**.

SERVICE MODE - LEVEL 1

Set Price Mode

Enter *Service Mode* Level 1 by pressing the Service Mode Button.

Press "A" to place the controller in the *Set Price Mode*. **Pri** displays.

Set Price

1. In the *Set Price Mode*, press the key for the selection to be priced. The selection displays, then the current price.
2. Press "*" (UP) or "Z" (DOWN) to increase or decrease the price until the desired price displays.
3. Press "#" (ENTER) to accept the displayed price. **Pri** displays.

Table 2: Error Codes

Code	Problem	To Clear, Correct Or Reset
E2	Defective Motors	Motor must be successfully ran in the test vend mode
E3	Bad Pricing Check	Enter pricing mode and set price correctly
E4	Defective Left Delivery Sensor (Latch Side)	Properly align, adjust or replace sensor
E5	Defective Right Delivery Sensor (Hinge Side)	Properly align or adjust or replace sensor
out of order	Product Jammed In Delivery Area Or Defective Delivery Sensor	Displays during the normal operation mode. Remove jam. Replace delivery sensor if no product jam is evident
E8	Defective Keypad	Adjust or replace.
E9	Defective Control Board	Reset if problem is corrected
E10	Coin Changer Not Responding	Changer errors will reset when status from changer changes
E11	Defective Tube Sensor	Changer errors will reset when status from changer changes
E12	Defective Changer/Acceptor	Changer errors will reset when status from changer changes
E13	Changer Coin Tube Jammed	Changer errors will reset when status from changer changes
E14	Changer Coin Path Jammed	Changer errors will reset when status from changer changes

Clear Price

After identifying a single selection press "Y" (CLEAR). The selection price will revert to **.00**.

Note:

There is no confirmation process. Pressing "Y" (CLEAR) while pricing a selection will always clear the price for that selection immediately. If done in error, the selection must be priced again.

Clear Price Of All Selections

Enter the Set Price Mode. Press “Y” (CLEAR) immediately. **Clr** displays.

- To clear the pricing data from ALL selections, press “#” (ENTER). The prices for all 17 selections will be set to **.00**.
- If you do not wish to clear out the pricing data press “Y” (CLEAR). The command will be aborted.

If you pause for more than five (5) seconds after pressing the CLEAR key, the controller will assume you made an error and abort the clear. **no** displays. No pricing data will be cleared.

Dispense Coins Mode

A typical US coin mechanism might have three coin tubes (Quarter, Dime, and Nickel), giving a coin dispense range of 1 to 3 coins.

Enter *Service Mode* Level 1 by pressing the Service Mode Button.

Press “B” to place the controller in the *Coin Dispense Mode*. **Coin** displays.

Table 3: Coin Dispense Keys

Press	To dispense a coin of:
“A”	the lowest denomination (usually a nickel in a US coin mechanism.)
“B”	the next higher denomination (usually a dime in a US coin mechanism.)
“C”	the next higher denomination (usually a quarter in a US coin mechanism.)

This order continues up to the highest denomination of coins and is limited only by the maximum number of coin tubes on the coin mechanism.

Accounting Data Mode

Two levels of accounting data can be retrieved.

1. Machine Totals (cash & vends), displays access totals for the entire machine.

2. Individual Selection Totals (cash & vends), displays the totals for individual selections.

For each of these levels, four totals are maintained:

1. Total non-resettable cash (coins & bills)
2. Total non-resettable vends
3. Total resettable cash (coins & bills)
4. Total resettable vends

Machine Accounting Totals

1. Press the Service Mode Button once. **L1** displays.
2. Press “C”. **Acct** displays.
3. Press “A” . **tot** displays.
4. Press the key for the desired total. See **Table 4**.
5. Press “#” (ENTER) to revert to previous mode or to advance to another function.

Table 4: Machine Accounting Totals

Press	Description
“A”	Total non-resettable cash (coins & bills)
“B”	Total non-resettable vends
“C”	Total resettable cash (coins & bills)
“D”	Total resettable vends
“F”	Fill Coins (only available in software version 113 and greater)

Fill Coins

This option is only available in software version 113 and greater.

Fill the coin tubes through the coin acceptor part of the coin changer. Do not fill the tubes directly.

To exit, press the Service Mode Button.

Individual Selection Accounting Totals

1. Press the Service Mode Button once. **L1** displays.
2. Press “C”. **Acct** displays.
3. Press “B” . **SEL** displays.
4. Press the key for the desired selection.

5. Press the key for the desired total. See **Table 5**.
6. Press “#” (ENTER) to revert to previous mode or to advance to another function.

Table 5. Individual Selection Accounting Totals

Press	Description
“A”	Non-resettable cash (coins & bills)
“B”	Non-resettable vends
“C”	Resettable cash (coins & bills)
“D”	Resettable vends

Reset Accounting Data Mode

This function is used to zero the accounting data resettable totals. Non-resettable totals are not affected in this mode.

1. Press the Service Mode Button once. **L1** displays.
2. Press “D”. **rES** displays.
3. To reset the totals to zero, press “Y” (CLEAR). **Clr** displays.
4. To confirm your request, press “#” (ENTER). **YES** displays, and the accounting data resettables are zeroed.

To cancel your request, press the Service Mode Button. **no** displays, and the accounting data resettables will not be zeroed.

Refrigeration Control Mode

The setting controls the “cut-in” and “cut-out” points of the refrigeration system. The factory default for the cut-in and cut-out temperatures are 41° F (5° C) and 29° F (-1.7° C) respectively, indicated by **0** in the display.

Changing the displayed factor by one increment changes the cabinet temperature by approximately 2°F. The possible range is **-10** (minus ten) to **10** (plus ten).

1. Press the Service Mode Button once. **L1** displays.
2. Press “E”. **Frig** displays.
3. After a short delay, the current temperature factor displays.

4. To increase the cabinet temperature, press “*” (UP) once for increment desired.

To decrease the cabinet temperature, press “Z” (DOWN) once for each increment desired.
5. Press “#” (ENTER) to accept the displayed value.

Example:

If **0** is displayed, press “Z” once to change the factor to **-1**. The cabinet temperature will be maintained at approximately 2°F cooler than the factory setting.

NOTE:

Do not lower the refrigeration factor below the **-2** setting. This could cause the cans to freeze. A lower factor does not accelerate the cooling of the cans. It only maintains a colder cabinet.

Test Vend Mode

Each of the 17 selections can be test vend individually by pressing the corresponding key on the keypad. The motors dispensing the products in the front loading compartments are bi-directional and each motor will control two (2) selections.

Refer to **Figure 6** to identify the motors and compartments.

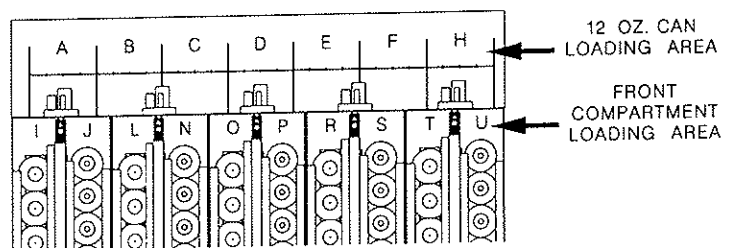


Figure 6

The optical delivery detection is not used when test vending selections. This allows the machine to be test vended without being stocked with product. The test vend mode does not effect the accounting data information.

1. Press the Service Mode Button once. **L1** displays.
2. Press “**F**”. **Vend** displays.
3. Press the key corresponding to the selection.
 - **Vend** displays and controller will beep to signal success, or
 - **FAIL** displays, alternating with the motor number between dashes.

After this, the display will return to the **Vend** display and be ready to test another selection.

Aligning Optical Delivery Sensors Mode

In this mode, the controller checks the alignment of the two optical sensors in the delivery area. When properly aligned, the two (2) LED lamps on the controller and the two (2) LEDs below the numeric display should be on and steady. If one or both of the optical sensors are off axis, one or both of the LEDs will be off.

1. Press the Service Mode Button once. **L1** displays.
2. Press “**H**”. **Alin** displays.
3. To align the sensors, loosen the four (4) screws on the PC Board cover. Adjust the sensor board by loosening the screws and sliding it up or down, or side to side until both LEDs are on and steady. If greater adjustment is required, please call for service.
4. Press “**#**” to return to Level 1.

Set Options Mode

1. Press the Service Mode Button once. **L1** displays.
2. Press “**T**”. **OPt** displays.
3. Press “******” (UP) to scroll through the options. Each option and its current setting displays.
4. To change the setting for the displayed option, press “**Z**” (DOWN).
5. Press “**#**” (ENTER) to save the setting. **OPt** displays.
6. Press the Service Mode Button to exit.

Table 6: Option Settings

Option	Description	Setting
1	Force Vend	0 = Off 1 = On
2	Multi Vend	0 = Off 1 = On
3	Exact Change	0 = Off 1 = On
4	Bill Escrow	0 = Off 1 = On

Force Vend Option

Coin return of credit accumulated with coins only is not affected.

0 (Off): The buying customer can receive change from a dollar bill insertion when the coin return button is pressed. A purchase is not necessary.

When a validator that has an *Escrow* feature is used and the *Force Vend Option* is off, the bill will be returned.

1 (On): The vendor cannot be used to make change for dollar bills. The coin return button will not work and a product selection must be made. If credit is equal to or greater than the lowest vend price programmed into the machine and the first selection made is to an empty column, then the credit is returned in response to the coin return button or automatically after 25 seconds.

Multi Vend Option

1 (On): Multiple items can be vended while credit is established.

If the vend price of the chosen selection is less than the credit, the change will be retained for 25 seconds before a payout is made. The amount of remaining credit displays. The buying customer can use the remaining credit to purchase other items, or push the coin return button to receive the balance.

Multiple vends can be made as long as adequate credit is available.

0 (Off): The controller is set to a single selection vend mode. Change will be returned immediately each time a vend is completed when the credit exceeds the vend price.

Exact Change Option

This option is only available in software version 113 and greater.

1 (On): A vend will not be made if the changer cannot refund change for an over-deposit. If a selection is made that requires a payout that the changer is not capable of making, the full credit will be returned to the customer.

0 (Off): If a vend is selected that requires refunding change on an over-deposit, change will be refunded to the nearest denomination available. However, when the change tube becomes empty the remaining credit will remain in the display.

The customer can deposit additional credit to equal the exact vend price of another item and select that item to receive their full credit. If the customer does not deposit additional credit, the credit will remain in the display for 20 seconds. The controller will then clear all credits and go to the *Sales Mode*, waiting for the next transaction.

Bill Escrow Option

This option is only available in software version 113 and greater and if the validator has an Escrow feature.

1 (On): The last bill inserted is returned to the buying customer when the coin return button is depressed.

0 (Off): The customer can receive change from a dollar bill insertion when the coin return button is pressed. A purchase is not necessary.

NOTE:

If Force Vend is ON, a purchase must be made on a dollar bill insertion. The "Coin Return" feature has been disabled.

Pressing the Service Mode Button will exit the Service Mode and return the controller to the *Sales Mode*. The controller will automatically return to the sales mode after approximately 20 seconds of inactive service mode time.

Vend Count Mode

This mode displays the total number of vends for a selection since the last reset. This information can also be accessed while the machine is in the *Sales Mode*.

See the "Sales Mode: Vend Count" section for instructions.

1. Enter the *Service Mode Level 1*. **L1** displays.
2. Press "J". **Cnt** displays.
3. To display the number of vends for a selection, press the corresponding key.

SERVICE MODE - LEVEL 2

To enter the *Service Mode Level 2*, press the Service Mode Button two (2) times in rapid succession. **CODE** displays.

Press "C", then "B", then "A". These three letters must be pushed within 2 seconds, or the controller will default to Level 1. Once the code is entered correctly, the display will show **L2**.

To exit the *Service Mode Level 2*, press the Service Mode Button to back up a level.

Table 7: Service Level Definitions: Level 2

Press	Displays	Mode
"A"	StoS	Space To Sales
"B"	All?	Test Vend All Motors
"C"	- (flashing)	Set Access Code
"D"	P = 1	Set Keypad Layout

Space To Sales Mode

This mode enables you to vend the same product from two or more compartments. The vendor will alternate which compartment a product will be vended from.

Example:

If selection "S" is programmed for columns S and T, the first vend will be from column S, the next vend from column T, the third vend from column S, and so on.

All accounting data will be recorded under the primary selection.

1. Enter the Service Mode Level 2. **L2** displays.
2. Press "A". **StoS** displays.
3. Press the selection key for the primary selection. The display will alternate between the primary (surrounded by two dashes) and any selections assigned as secondary.

Example:

A displays if selection A was the primary selection, then **__t** displays if selection T is the secondary selection.

Clear All Space To Sales Programming

To clear all secondary selections, press “Y” (CLEAR) immediately after entering the Space to Sales Mode. Pressing any other key after pressing clear will exit you from this function.

NOTE:

Clearing the space to sales programming will set the price for each secondary selection to the price of the previous primary selection.

Add A Secondary Selection

1. Identify the primary selection by entering the *Space To Sales Mode* and pressing the selection key. This selection displays in the readout surrounded by two dashes.
2. Press the selection key for the secondary selection. The display will alternate between the primary and secondary selection. For each secondary selection, press its selection key.
3. When satisfied with the new configuration, press “#” (ENTER). The change is recorded. **StoS** displays.

Remove A Secondary Selection

1. Identify the primary selection by entering the *Space To Sales Mode* and pressing its selection key. This selection displays in the readout surrounded by two dashes.
2. Press the selection key for the secondary selection to be removed.
3. When satisfied with the new configuration, press “#” (ENTER). The change is recorded. **StoS** displays.

Vend All Motors Mode

The delivery sensors will not be checked during this test operation. Pressing any key during the test operation will halt the process. The accounting totals will not be effected by this mode.

CAUTION:

Product will be dispensed from each selection. The operation can be halted at any time by pressing any key.

1. Enter the *Service Mode Level 2*. **L2** displays.
2. Press “B”. **All?** displays.
3. Press “#” (ENTER) to confirm the testing of all motors. The *Vend All Motors* process will begin immediately. When executed, each of the 17 selection motors will be run in sequence.

If an error occurs, the message **FAIL** displays followed by the motor number between dashes (example: **-A-** if motor A failed). After an error is reported, or if no error occurs, the controller will attempt to test the next motor.

Set Access Code Mode

This code is used to access the resettable vend count (**Cnt** function) while in the *Sales Mode*.

1. Enter the *Service Mode Level 2*. **L2** displays.
2. Press “C”. The current access code displays in the readout.
3. To set a new access code, press “Y” (CLEAR) followed by the 4-letter code. Only the letters “A” through “L” can be used.
4. Press “#” (ENTER).

Vend Count During Sales Mode

To access this function from outside the vendor, press “#” (ENTER) followed by the access code. For security reasons, these key strokes must be entered within 2 seconds of each other.

When the correct access code is entered **Cnt** displays. Press a selection key, and the number of vends for that selection displays. The number displayed will be the total number of vends made for that selection since the last reset of the resettable accounting data.

Press “#” (ENTER) to exit this mode.

Set Keypad Style

This option is not used in this application, however the proper programming must be maintained for the vendor to function properly.

1. Enter the *Service Mode* Level 2. **L2** displays.
2. Press “**D**”, then “**A**”. The keypad will be set to the standard settings.

LOADING INSTRUCTIONS

Rack Configuration

Figure 7 shows the letter identification of the various compartments. The front compartments are vertical columns used to vend bottled products. The back serpentine columns are used to vend the 12-ounce can drinks. Verify when loading the vendor that the product being loaded in the compartment coincides with what is identified in the live display.

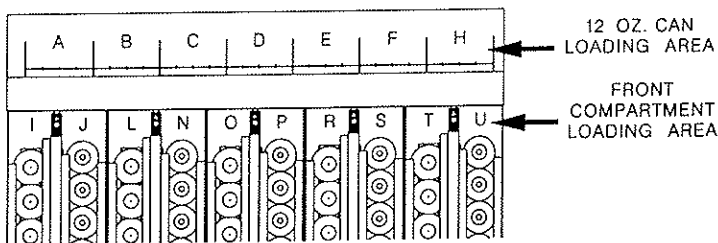


Figure 7

Bottle Rack Area

Theory of Operation

The bottle racks are designed to support a vertical stack of bottles with an Ejector Cam as a shelf. When a product is vended the cam is rotated 110°, removing the shelf from underneath the stack of bottles. At the same time a finger is rotated in to the area between the bottom bottle and the second bottle up. This finger holds the stack and allows only the bottom bottle to fall. See **Figure 8**.

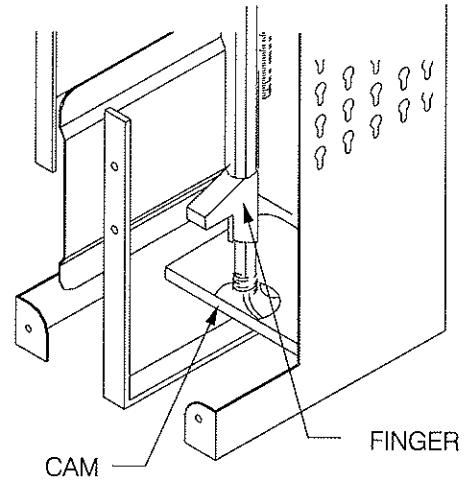


Figure 8

Loading Guidelines

The front compartment area consists of ten (10) upright columns or compartments with adjustable side members, designed to vend containers of different sizes and shapes from 8 to 20 ounces. The containers are loaded with the top of the container facing forward.

The vendor is set up from the factory with the side retainers and product deflectors installed to vend 20-ounce containers.

Retainers and guides are used to confine the product in the column. Deflectors are used as resting places for the mouth of the container in the vend area of the column. Back spacers are used when a mouth of the container being vended does not reach the product deflector. Diameter spacers are used for narrow or non-carbonated containers. See **Figure 9**.

To identify which retainers and spacers you need, refer to **Table 8** and figures **9, 10, 11, 12 and 13** for general installation guidelines. Some changes or adjustments may be necessary.

Additional vend kits are available to vend a variety of plastic, glass, can, or non-carbonated bottled beverages. Refer to the “Special Vend Kit” Addendum included with this manual.

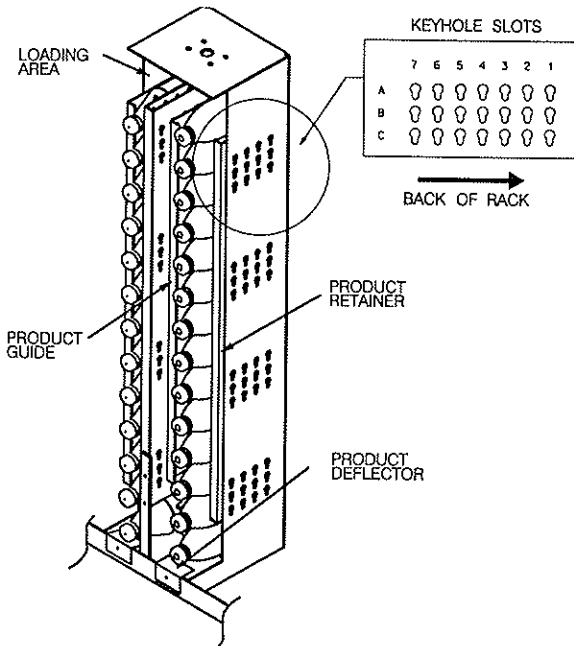


Figure 9

Part Identification

Each retainer and spacer is stamped with a roman numeral, which is next to a punched hole. Read the roman numeral with the hole located to the left.

Table 9. Spacer and Retainer IDs

No.	Part Number	Description
I	4207178-001	Outside Retainer
II	4207226-001	2" Spacer - Right
III	4207226-003	2" Spacer - Left
IV	4208219-001	Tapered Retainer
V	4208222-001	1" Product Spacer - Right
VI	4208222-003	1" Product Spacer - Left
VII	4208223-001	Small Diameter Spacer
VIII	4208310	Angled Deflector
IX	4208316-001	3/8" Spacer - Left
X	4208316-002	3/8" Spacer - Right
XI	4208320	Flat Deflector
XII	4208332-001	Inside Retainer
XIII	4208348	Can Retainer
XIV	4208349-001	1" Can Spacer - Right
XV	4208349-003	1" Can Spacer - Left
XVI	4208381	12 oz. Can Flat Deflector
XVII	4208383	Flexible Diameter Spacer
XVIII	4208936-001	9/16" Spacer - Right
XIX	4208935-001	Small Dia. Spacer
XX	4208934	Wide Flat Deflector
XXI	4208936-003	9/16" Spacer - Left

Table 8. Loading Guidelines

Container	Vol Oz.	Material	Height (in.)	Dia	Product Retainer	Slot	Product Guide	Slot	Product Deflector	Small Dia Spacer	Back Spacer	Adjustment Plate
All Sport	20	Plastic	8 1/2	2.87	I	B-4	XII	B-5	VIII		IX/X	
Coke	20	Plastic	9	2.85	I	B-4	XII	B-5	VIII			
Crystal Clear	16.9	Plastic	8	2.56	I	A-4	XII	B-5	VIII	VII		4208382
Dr. Pepper	20	Plastic	8 7/8	2.89	I	B-4	XII	B-4	VIII			
Evian	16.9	Plastic	8 1/2	2.60	I	A-4	XII	B-5	VIII	VII		4208382
Fruitopia	16	Glass	6 7/8	2.88	I	B-3	XII	B-4	XI			
Generic Sodas	20	Plastic	8	2.91	I	B-4	XII	B-5	VIII		IX/X	
Minute Maid	16	Glass	6 7/8	2.88	I	B-3	XII	B-4	XI			
Mt. Dew	20	Plastic	8 9/16	2.85	I	B-4	XII	B-5	VIII			
Mystic	20	Glass	7 1/2	2.96	I	B-3	XII	B-5	XI			
Nestea	16	Glass	6 7/8	2.88	I	B-3	XII	B-4	XI			
Pepsi	20	Plastic	8 9/16	2.85	I	B-4	XII	B-5	VIII			
Power Ade	20	Plastic	7 1/2	2.93	I	B-4	XII	B-5	VIII			4208382
Snapple	16	Glass	6 7/8	2.88	I	B-3	XII	B-4	XI			
Sprite	20	Plastic	9	2.85	I	B-4	XII	B-5	VIII			

Retainers and Guides

Retainers and Guides confine the product within the compartment. See **Figures 10** and **11**. They are adjustable forward or backwards in one (1) inch spacing.

The product retainer is to the outside of the column and should be positioned as close as possible to the contour of the container. The product retainer should hold the container yet allow movement from front to back. Occasionally, the retainer can not get close enough to the shoulder of the container and the product guide can be adjusted to act as the product retainer.

The product guide is located on the motor shaft, or inside, of the column and should be positioned one space forward of the product retainer. When adjusted properly the container should not bind, and have minimal movement from side to side and front to back.

Figure 10 shows the side retainers and guides in positions when adjusted for different size containers. Place the shoulder rivets in the proper keyhole slot and pull downward to secure.

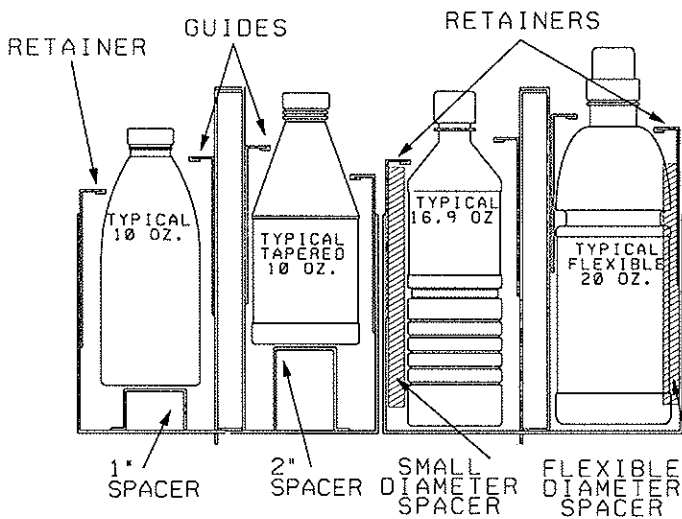


Figure 10

One product retainer must be used for each selection. However, it may be necessary to remove the product guide due to the diameter of the product to obtain proper clearance. See **Figure 11**.

CAUTION:

Do not remove both side members.

Special retainers are used to vend special products such as long tapered bottles and 12 oz. cans (in the front compartments) as shown in **Figure 11**. These components are available in kits when needed. See the "Special Vend Kits" addendum to this manual for more information.

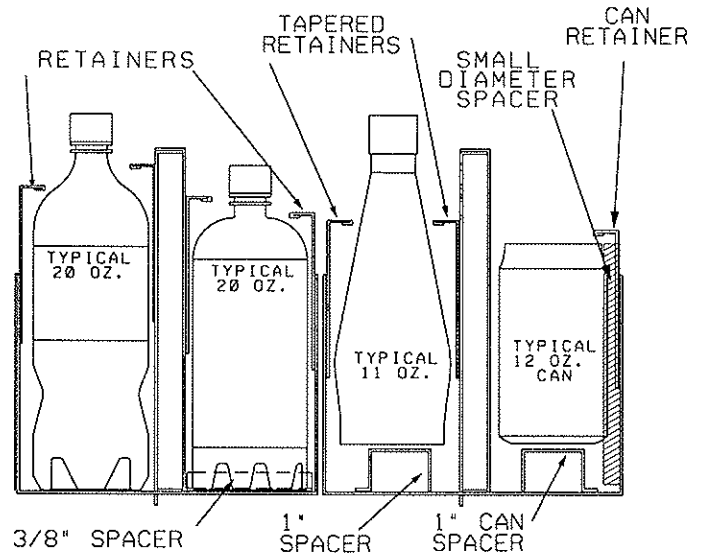


Figure 11

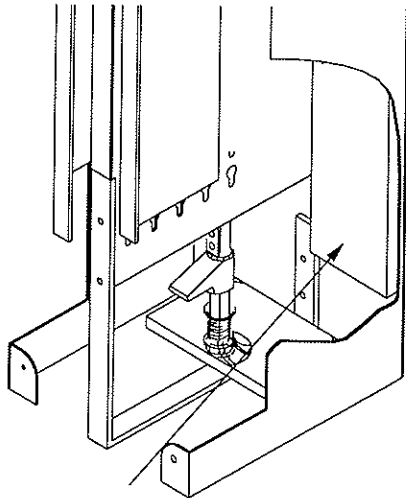
Deflectors

A deflector is mounted at the bottom of each compartment and is used as a resting place for the mouth of the container. The product deflector should hold the neck of the bottle and allow the bottom of the bottle to fall first during a vend.

Generally, if the mouth of the container rests outside the bottle rack an *angled product deflector* is used. If the mouth of the container rests within the compartment a *flat product deflector* is used. See **Figure 9**.

Back Spacers

A back spacer is used when the container being vended is too short to allow the mouth of the container to rest on the product deflector. The back spacers are mounted on the back of the column and keep the product forward in the bottle rack.



BACK SPACER

Figure 12

Diameter Spacers

Narrow or non-carbonated (flexible) containers may require a Small Diameter Spacer or the Flexible Diameter Spacer to push the container towards the motor shaft area of the bottle rack. The spacer is mounted on the outside panel of the bottle rack away from the motor. See Figures 9, 12, & 13.

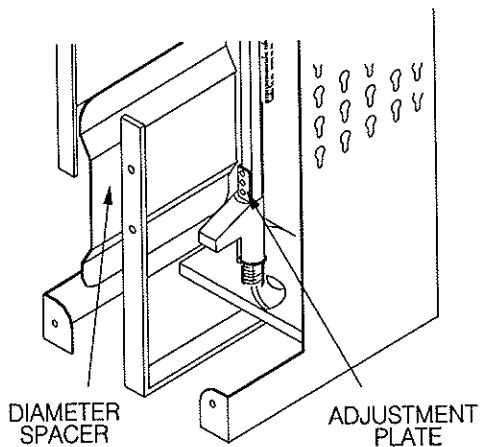


Figure 13

Adjustment Plates

With a Small Diameter Spacer, an Adjustment Plate can be mounted on the motor shaft to enable proper positioning of the finger to prevent puncturing a container.

During the vend, the finger prevents the second item from vending. Adjust the plate so the finger is just above the diameter of the lower container. See Figures 14 and 15.

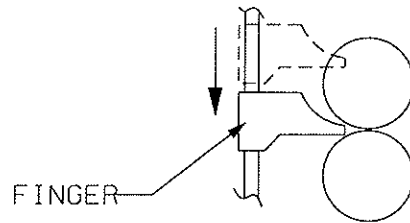


Figure 14

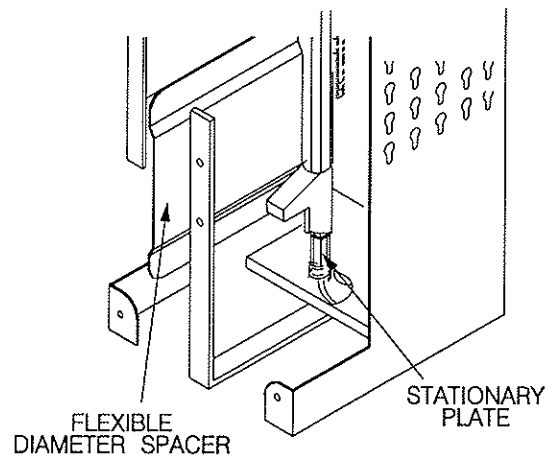


Figure 15

A Stationary Plate is available for flexible non-carbonated containers. This plate is installed (below the finger and underneath the spring) on the motor shaft to prevent movement of the finger. See **Figure 16**.

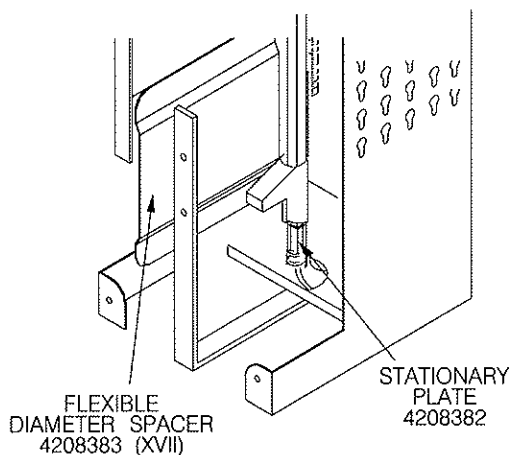


Figure 16

NOTE:

Installation and/or adjustments of the plates on the motor shaft will affect both columns in the bottle rack.

After adjustments are made, test vend the selections to verify proper positioning of the components. Make sure when loading the vendor that the product being loaded coincides with the live display and is properly identified.

Can Area

The can area consists of seven (7) serpentine type columns for dispensing 12 ounce can drinks. **Figure 7** shows the loading area for the 12 oz. cans. Each serpentine column will hold 63 cans.

View holes have been incorporated in the rear of the of the front compartments so that a visual inventory of the 12 oz. cans can be taken for filling purposes. Each hole represents approximately 12 cans.

For a more accurate count of product required for filling, use the outside (*Sales Mode*) access to the resettable vend count.

1. Press “#” (ENTER) followed by the access code. For security reasons, these key strokes must be entered within 2 seconds of each other. When the correct access code is entered **Cnt** displays.
2. Press a selection key. The total number of vends made for that selection since the last reset displays.
3. Press “#” (ENTER) to return to the *Sales Mode*.

When loading the columns, place the cans in the proper opening. Lay the cans on their side and allow them to roll down the serpentine column to the Ejector Mechanism. The columns can be loaded until full to the top of the opening.

Verify that the product being loaded coincides with the live display and is properly identified.

LIVE DISPLAY

The Live Display provides a full view of the products being dispensed along with the price and selection number of each item.

Access the live display by removing the thumb screw and opening the door to the live display. Place the display item where the product label is in full view of the buying customer and secure with clip. Selections A, B, C, D, E, F, and H are for the serpentine columns (cans) and all other selections are for the front compartments. Set each price scroll to agree with the price programmed into the controller.

COINAGE OPERATION

Load the coin changer coin tubes with nickels, dimes and quarters. (See **Figure 17.**) If DEX/UCS information is to be downloaded, see the “Machine Data Accounting: Fill Coins” section of this manual.

The coin mechanism pays out nickels, dimes and quarters from self-loading, high capacity change tubes in the least number of coins available.

CAUTION:

Do not plug or unplug coin changer with the power on.

Table 11: Coin Tube Capacity

	Number of Coins			
	5¢	10¢	25¢ Option	
			Hi 25¢	Low 25¢
Full Level	68-69	98-99	66-67	8-9
Low Level	7-8	10-11	8-9	8-9

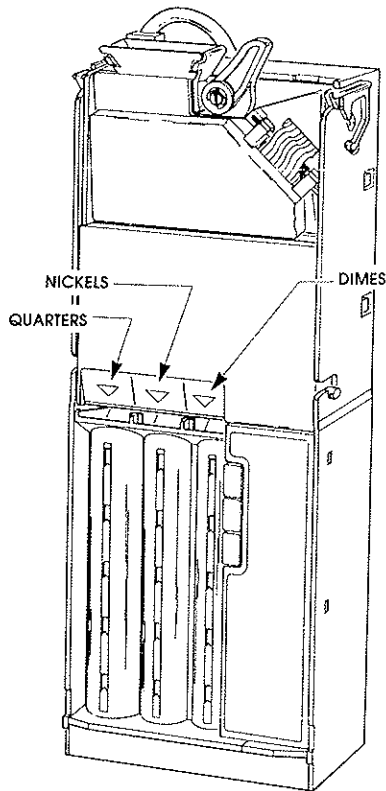


Figure 17

Option Switch Setting

The coin changer has three (3) option switches which enable you to select the type of coins to be accepted along with the number of quarters that will be stored in the 25¢ coin tube.

These switches have been factory set in the OFF positions. See **Table 12.**

Should a different setting be desired, or a new changer installed:

1. Open the outer door and turn the main power switch to the “OFF” position.
2. Open the coin acceptor part of the coin changer. (See **Figure 18.**)
3. Locate the coin changer option switches and select from the following optional settings:

Table 12: Coin Changer Option Switches

Switch	Setting	Description
USA/CAN	ON	U.S. and Canadian coins are accepted
	OFF	Canadian coins are rejected
LO 25¢	ON	Quarters are diverted to cash box once the change tube has inventoried approximately 8 quarters
	OFF	Quarters are diverted into the change tube until the change tube is full. (Used with Bill Validator.)
\$ACPT	ON	Dollar coins are accepted
	OFF	Dollar coins are rejected

NOTE:

The bill validator operation of this vendor requires the “LO 25¢” option switch to be in the “OFF” position

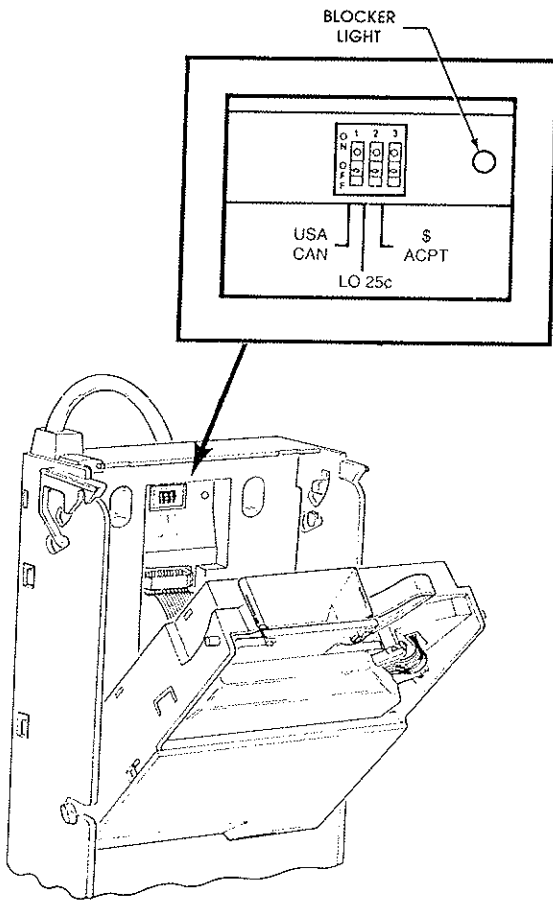


Figure 18

The controller will monitor the condition of the coin changer at all times. Any activity (coins inserted) will be recorded in the Accounting Data Mode and included in the DEX/UCS report.

If the DEX/UCS information is to be used, the FILL COINS procedure should be used when filling the coin tubes. See the "Machine Accounting Data - Fill Coins" section of this manual for additional information.

BILL VALIDATOR

The BA32 Series bill validator contains an option switch module allowing to you customize to the requirements of an individual account. **Table 13** shows the functions of the option switches:

Table 13: Validator Switch Settings

Switch	On	Off
1	High Security	Standard Acceptance
2	Accepts bills in one direction only (face up, green seal first)	Accepts bills in both directions (face up)
3	Serial or Parallel Interface	Pulse interface
4	\$20 Accept	\$20 Reject
5	\$10 Accept	\$10 Reject
6	\$5 Accept	\$5 Reject
7	\$2 Accept	\$2 Reject
8	\$1 Accept	\$1 Reject

Factory settings are not shaded.

To change the settings:

1. Remove power from the validator by turning the main power switch to the "OFF" position.
2. Remove the retaining screw that secures the logic board and strain relief. (See **Figure 19**.)
3. Slide the logic board downward to expose the option switch module.
4. Set the option switches to the desired setting.
5. Reassemble the bill validator in reverse order of disassembly.
6. Reapply power. The stacker motor should cycle.
7. Test for proper operation.

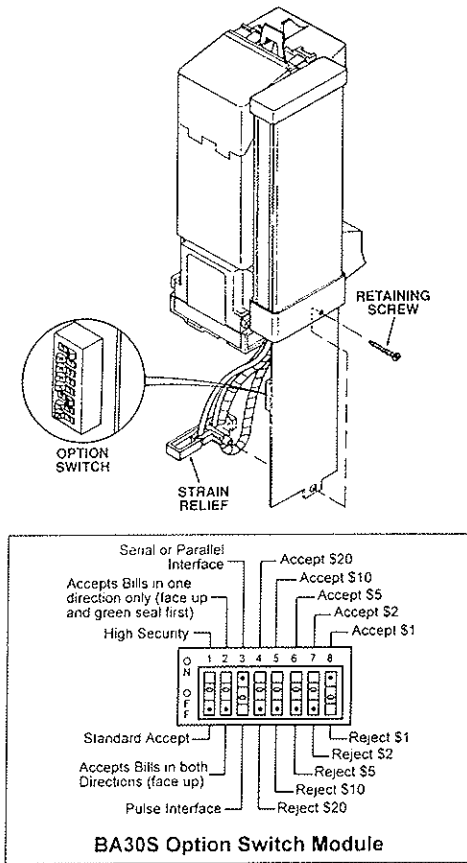


Figure 19

Removing Accepted Bills

Accepted bills may be removed by opening the stacker lid or by removing the stacker from the validator. (See Figure 20.)

NOTE:

If the stacker is removed, make sure it is fully latched in place when returned to the validator.

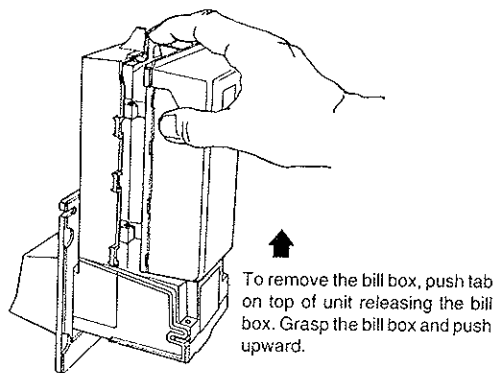


Figure 20

Troubleshooting

Troubleshooting can be achieved by reading flashes or blinks of light from the (red) LED located on the side of the logic board cover. These flashes can be seen through the gray smoked cover. (See Figure 21.) During normal operation the LED will be a steady or constant red.

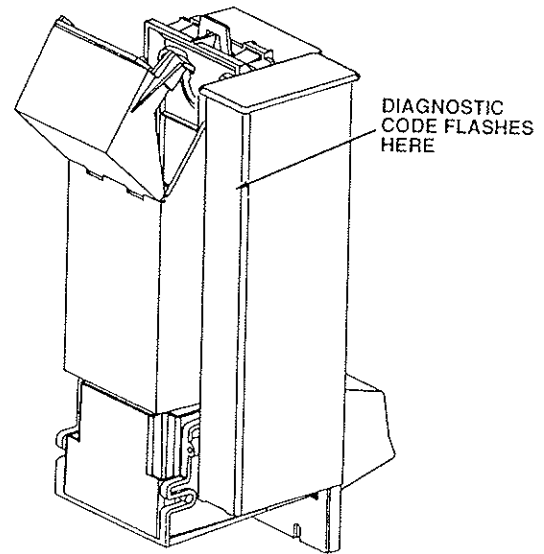


Figure 21

Table 14: Validator Diagnostic Codes

No. Of Flashes	Description of Diagnostic Codes
None	Check Power and Harnessing to Validator
1	Bill Box Full
2	Bill Box Lid is open or not latched in place.
3	Check Bill Path
4	All Bill Accept Switches are Off
5	Bill Jam or Sensor Error
6 or more	Reset (Remove and Apply Power) or service required.

Clearing Jams & Cleaning

Trapped bills, debris or dirt can result in poor bill acceptance or bill rejection. Remove the lower housing to clear trapped bills or debris. See **Figure 22**. Clean the bill path plastic parts or belts with a cloth moistened with a mild soap and water solution. Clean the magnetic head and optic sensors using a swab and isopropyl alcohol. **Do not use any petroleum based cleaning solvents, scouring pads or stiff brushes for cleaning.**

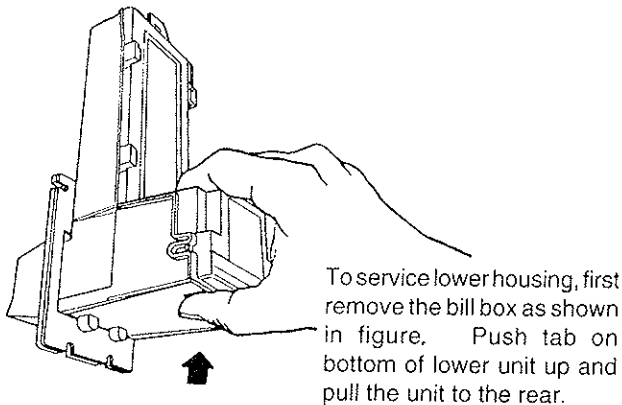


Figure 22

SERPENTINE EJECTOR REMOVAL

To access the serpentine can rack, first remove the front bottle compartment in the following manner:

NOTE:

Before removing the front compartment, the product must be removed from the columns.

1. Remove the seven can extensions from the top of the bottle racks.
2. Remove the screw from the center of the motor cover located at the top of the bottle racks.
3. Lift up to remove the motor cover.
4. Unplug the motor harness.
5. Remove the spacers from the bottle rack.
6. Remove the three screw across the support on the bottom of the bottle rack.
7. Remove the two screws located behind the motor.
8. Lift up to remove the bottle rack.

NOTE:

Before removing the ejector mechanisms, the product must be removed or held back in the serpentine column.

To remove the ejector mechanism from the serpentine column, complete the following:

CAUTION:

The motor can be rotated **clockwise** slowly by hand. Damage to the motor could result if rotated too fast or in the wrong direction.

1. Insert the upper can stop (P/N 1211018) available from your local distributor or VendNet™, by hooking it over the rod and clamping it down around the can. See **Figure 23**.
2. Loosen the latch screw until the latch drops out of the way. It is not necessary to completely remove the latch. See **Figure 24**.

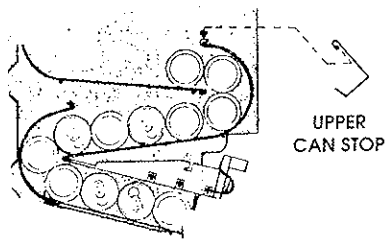


Figure 23

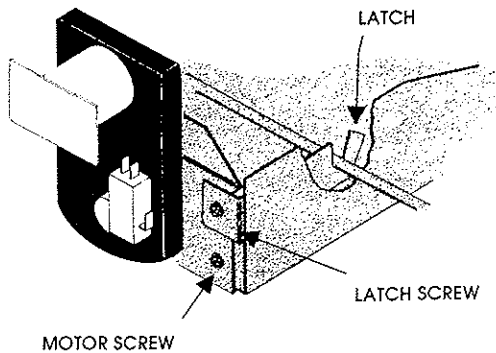


Figure 24

3. To remove the complete ejector mechanism without removing the motor, rotate the cam clockwise slowly by hand to remove the cans (approximately 10 cans).
4. Unplug the ejector mechanism wiring harness from the main motor harness.
5. Push the ejector mechanism backward until it clears the rod and drops down and out.
6. To remove the vend motor remove the two motor screws. Remove the wire harness connections from the motor switch and circuit board tabs, noting which wire connects to which tab. Cut the plastic cable tie that straps the main harness to the motor cylinder.

NOTE:

After the motor screws have been removed, pressure will be needed to pull the motor off the cam drive shaft.

CARE & CLEANING

WARNING:

Always disconnect the power source before cleaning.

Cabinet Interior

Wash with a mild detergent and water, rinse and dry thoroughly. Odors may be eliminated by including baking soda or ammonia in the cleaning solution. Plastic parts may be cleaned with a quality plastic cleaner. Do not get the cleaning solution on electrical components.

Cabinet Exterior

Wash with a mild detergent and water, rinse and dry thoroughly. Clean occasionally with a quality car wax. Remove and clean Condensate Drain Hose to eliminate any deposits that may restrict condensate water flow.

Refrigeration System

Clean dust from condenser and screen in the front door with a soft bristle brush or a vacuum cleaner. Remove any dirt or debris from the refrigeration system compartment. Clean the condensation pan.

CAUTION:

If the condenser coil is not kept clean, the compressor will overheat or fail, voiding the sealed system warranty.

REFRIGERATION CONTROL

If for any reason the refrigeration unit is turned off or the power interrupted, the refrigeration unit will not start for at least three (3) minutes regardless of the temperature.

When the temperature is above the "cut-in" temperature programmed, the unit will be turned on. When the refrigeration unit reaches the "cut-out" temperature it will be turned off.

Refrigeration Troubleshooting

Know and understand how to service the unit and how it operates. Units may vary, but the operation is basically the same. Never guess at the problem; find the symptom before attempting any repair.

Note:

90% of all refrigeration problems are electrical.

The sealed hermetic system was not meant to be worked on outside the Factory Service Center. The three things that can go wrong with a sealed system and should be repaired at the Factory Service Center are:

1. Low Charge - usually caused by leaks; look for oil around seals and welds. Unit will not seal properly.
2. Restriction in Systems (unit frost, then melts) - not cooling properly, low side in vacuum
3. Bad valves - unit does not cool properly; noisy compressor

Compressor will not start

Compressor has no power

1. Tripped breaker or blown fuse
2. Wall outlet faulty
3. Short or tear in power cord
4. Thermistor circuit is open.

At room temperature the thermistor should measure approximately 13k ohms.

5. Improper wiring
6. Defective refrigeration relay.

Unplug power to the machine; remove the relay plate. Use an insulated jumper wire to short the wires on the output side of the relay; then restore power to the machine. The compressor should start indicating a problem in the control circuit.

Compressor trips on Overload

1. Improper voltage: 5-10% above, 5% below. Test with Multi-Meter.
2. Overload defective: Test with Multi-Meter.
3. Relay defective: Test with Multi-Meter.
4. Compressor defective: Test with Multi-Meter.
5. Short in other component: Isolate and eliminate each electrical component until short is found.
6. Compressor is too hot
 - Dirty condenser
 - Faulty condenser motor or blade
 - Restricted air flow

CAUTION:

Condenser must be kept clean of dirt and debris to allow for proper air circulation.

Noisy or vibrating unit

1. Components rubbing or touching each other
 - Check fan blades and motor
 - Loose shrouds and harness
 - Copper tubing
 - Loose or unsecured parts
2. Worn or aged grommets
3. Compressor
 - Bad Valves
 - Slugging
 - Bad windings (See **Schematic 1.**)
4. Relay frozen in start position (See **Schematic 1.**)
5. Low voltage

Unit short cycles

1. Thermistor defective or not mounted on the evaporator cover.
2. Defective control board.

Unit operates long or continuously

1. Thermistor defective or not mounted on the evaporator cover.
2. Refrigeration relay shorted.
3. Air flow restricted
 - Faulty evaporator motor or blades causing coils to ice over
 - Air flow blocked by product in front of evaporator
4. Gasket leak
5. Excessive load: After loading, unit will run longer to pull out excessive heat from product.
6. Shortage of refrigerant or restriction
7. Bad controller

Refrigerated space too warm

1. Restricted evaporator space
 - Evaporator motor or blades faulty, causing the coils to ice over the evaporator
 - Condenser air flow restricted
 - Plugged or dirty condenser
 - Condenser motor or blades bad
 - Blade stuck
 - Condensing space restricted
 - Unit placed too close to a wall
 - Compressor - bad valves
 - Cap tube will start frosting 8 to 10 inches past evaporator connection tube
 - Check for oil around brazed connections
2. Thermistor defective.
3. Refrigeration control not set correctly. See "Refrigeration Control Mode" Section of this manual.
4. Refrigeration Relay Bad
5. Faulty Control Board

Troubleshooting circuits with Multi-Meter

1. Using voltage section of the Multi-Meter, check the power source.
2. Check overload.

NOTE:

Power must be off and fan circuit open.

Using the resistance section of the Multi-Meter, check terminals 1 and 3 for continuity. If no continuity is measured (infinity), overload may be tripped. Wait 10 minutes and try again. If still no continuity, overload is defective.

3. Checking Relay (See **Schematic 1**)
 - A. Unscrew lead terminals and remove relay from compressor. (NOTE: keep relay upright)
 - B. Check terminals 1 and S, or L and S. Replace relay if there is continuity.
4. Checking compressor (See **Schematic 1**)

Check winding resistance with the Multi-Meter. If readings are not within 2 Ohms, the compressor is faulty.

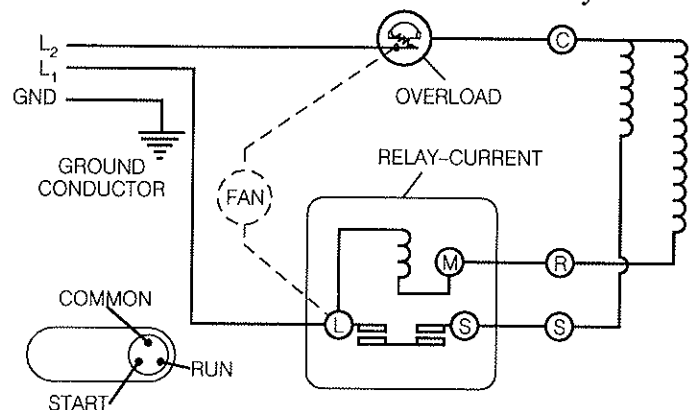
WARNING:

Wiring diagrams must be followed as shown. Any mis-wiring can cause serious electrical hazard and potential damage or rupture component electrical parts

Winding Resistance

Approximate resistance reading across terminals - use RXI scale:

COMMON to START: 12 Ohms
COMMON to RUN: 2 Ohms
RUN to START: 14 Ohms
COMMON to SHELL: No Continuity



Schematic 1

PARTS ORDERING PROCEDURE

When ordering parts, include the following:

1. Shipping address.
2. Address where the invoice should be sent.
3. The number of parts required.
4. The model number and serial number of the machines.
5. Any special shipping instructions.
6. Carrier desired: air or air special, truck, parcel post, or rail.
7. Signature and date.
8. If a purchase order number is used, be sure that it is legible and visible.
9. Correct part number and description from the pertinent part and/or parts manual.

NOTE:

When "Right" and "Left" are used with a part name, it is taken to mean that the person is facing the machine with the door closed.

10. Mail your order to **VendNet™**
P. O. Box 488
165 North 10th Street
Waukee, IA 50263-0488

All orders are carefully packed and inspected prior to shipment. Damage incurred during shipment should be reported at once and a claim filed with the terminating carrier.

If you do not have the right parts manual, contact the above address. They will provide a copy for you, if available.

Do not wait to order until you receive the parts manual; instead use the most accurate description you can. Include the model number and serial number of the machine, the name of the assembly in which the part is used, and if practical, a sample part. Furnish any information to enable our Parts Department to pinpoint the exact part needed.

BEFORE CALLING FOR SERVICE

Check the following:

1. Does your machine have at least 6" of clear air space behind it?
2. If the power is turned off at the fuse box is the machine the only thing that doesn't work?
3. Is the machine plugged directly into the wall outlet?

CAUTION:

Extension cords invite trouble! Do not use them.

4. Is the evaporator coil free of ice?
5. Is the condenser coil free of dust and dirt?
6. Is the compressor free of dust? (A blanket of dust can prevent the compressor from cooling off between workouts.)
7. Has the circuit breaker been reset?
8. Are the evaporator fans running?

EVAPORATOR FAN TEST

Fold a sheet of 8 ½" x 11" paper in half from top to bottom so it is not 5 ½" by 8 ½". Place the paper in front of the evaporator coil and see if the evaporator fans blow the paper away from the coil. If it does, the answer to question 10, is yes.

9. Is the condenser fan running?

CONDENSER FAN TEST

Fold a sheet of 8 ½" x 11" paper in half. Place the paper in front of the condenser coils, and see if it draws the paper to the coils. If it does the answer to question 11, is yes.

10. Is the shelf in front of the evaporator coil clear? (Free of cans, tools or other air restricting items)

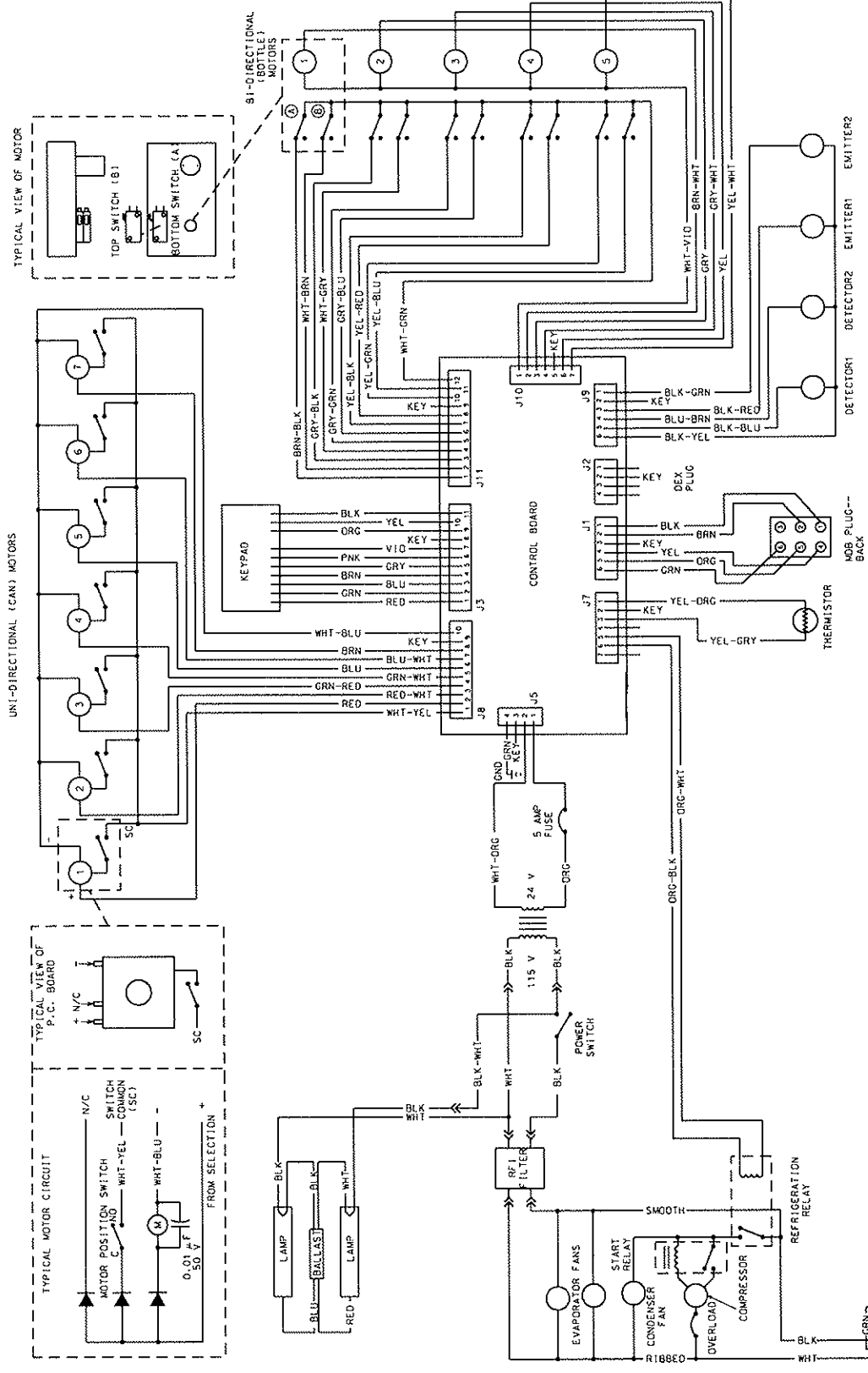
For additional information phone: 1-800-833-4411

Or E-Mail: VendNet@Ecity.net

Include model number and serial number

CD7/10 WIRING SCHEMATIC
P/N 4207760

SCHEMATIC



115/230 VOLTS
GND