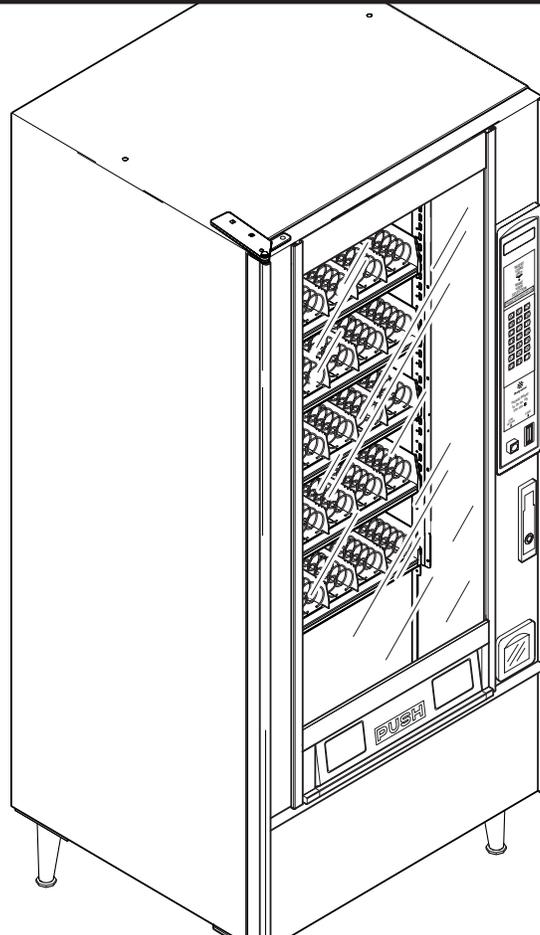


1720007

**Models 159, 160, 172, 173, 452, 453,
467, 490, 491**



Snack Vendor



Set-Up & Operators' Guide

CRANE

MERCHANDISING SYSTEMS™ A Crane Co. Company
GPL

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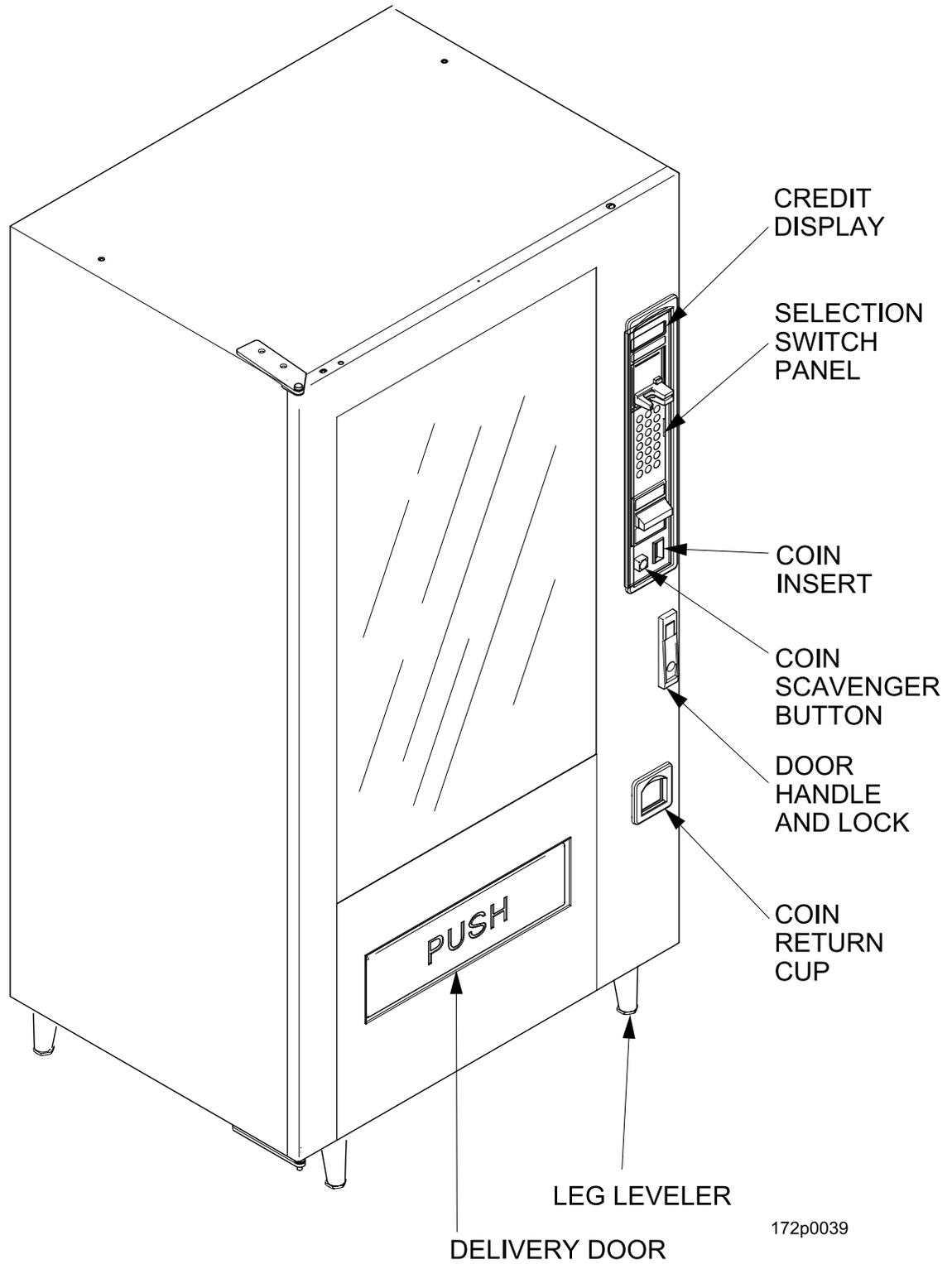
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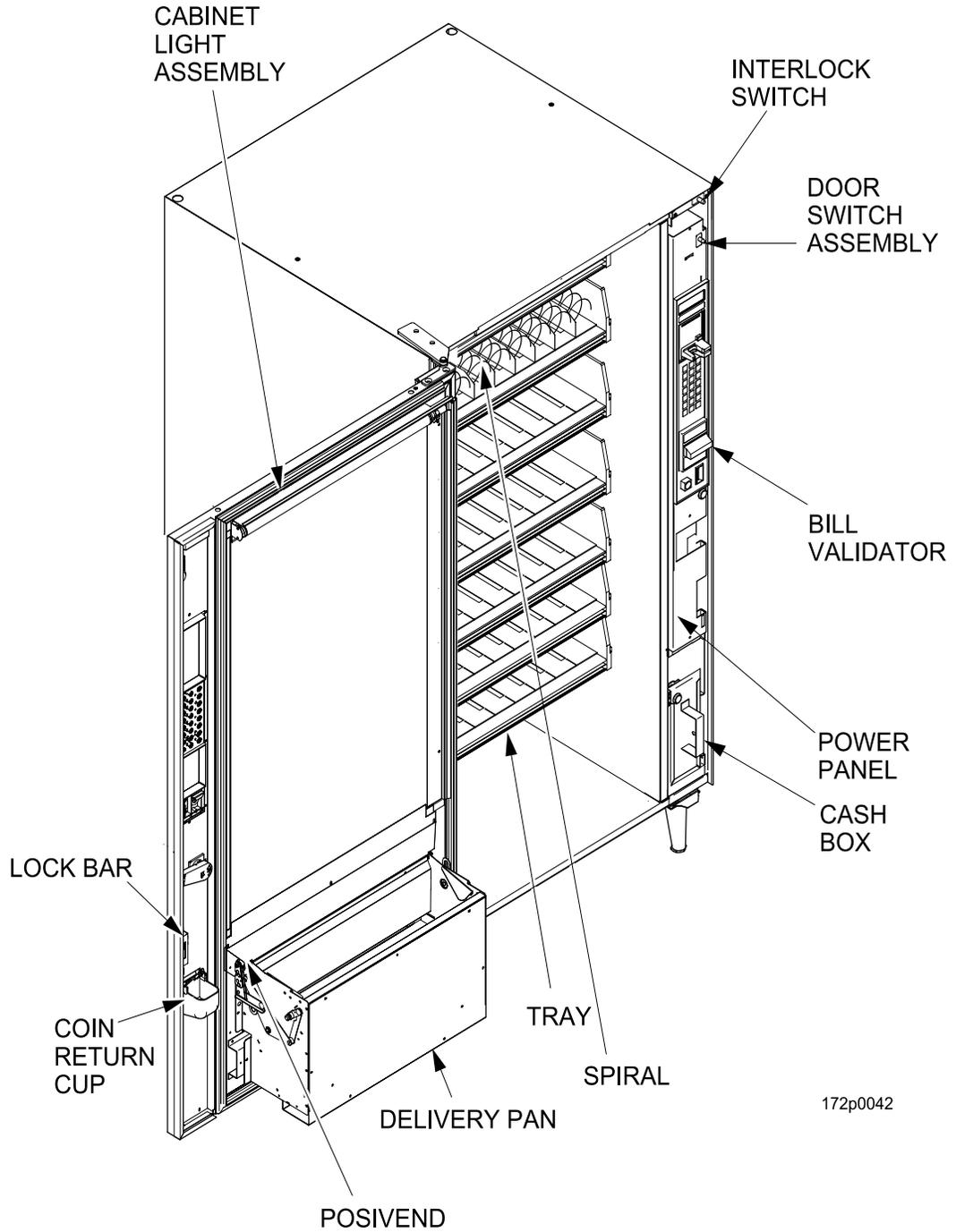
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Section 1: Introduction

Exterior View



Interior View



172p0042

Power Requirements

The merchandiser is supplied with a service cord for the country of use and is terminated with a grounding type plug. The wall receptacle used for this merchandiser must be properly polarized, grounded, and of the correct voltage. Operating the merchandiser from a source of low voltage will **VOID YOUR WARRANTY**. Each merchandiser should have its own electrical circuit and that circuit should be protected with a circuit breaker or fuse conforming to local regulations.

1. **Voltage Check** - Place the leads of a voltmeter across the LINE (LIVE) and NEUTRAL terminals of the wall receptacle. The voltmeter should indicate 110-130 volts AC for 120 volt, 60 Hz locations, or 220- 240 volts AC for 230 volt, 50 Hz locations.
2. **Polarity Check** - Place the leads of a voltmeter across the LINE (LIVE) and GROUND terminals of the wall receptacle. The voltmeter should indicate 110-130 volts AC for 120 volt, 60 Hz locations, or 220- 240 volts AC for 230 volt, 50 Hz locations.
3. **Noise Potential Check** - Place the test leads of a voltmeter across the NEUTRAL and GROUND terminals of the wall receptacle. The meter should indicate 0 volts AC. A measurement greater than 1.5 - 2.0 volts AC could result in problems for the merchandiser's electronic circuitry caused by electrical noise.

Any deviation from these requirements could result in unreliable performance from your merchandiser.

Unpack the Machine

Remove all packing materials from the interior of the machine. Keep all documents; warranty cards, etc. Set aside the base plate kit (if present).

Controls and Indicators

DOOR SWITCH. When the cabinet door is open, this switch turns off the compressor and evaporator fan.

INTERLOCK SWITCH. (230 volt models only) Turns off the glass heater and display lights when the cabinet door is open. Pull the switch out to restore high voltage for maintenance.

LOW VOLTAGE SWITCH. Tells the controller software the main door is open or closed.

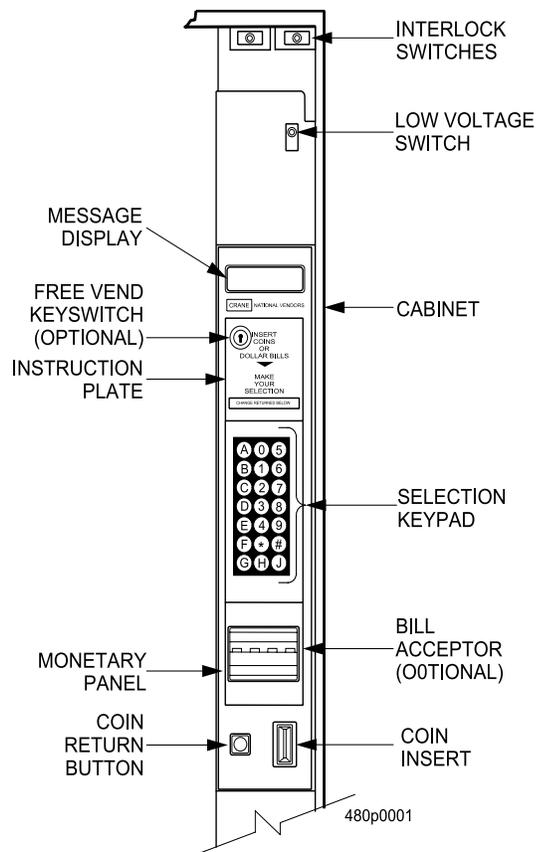
MESSAGE DISPLAY. This is how the merchandiser communicates with the outside world. Customers can see messages about how much money they have put into the merchandiser. The message display also tells customers when a selection is sold out and when vending is free, inhibited, or discounted. The message display shows you what you are doing when you program the merchandiser, and can show you what is wrong if there is a failure.

FREE VEND KEYSWITCH (OPTIONAL). This allows someone (other than maintenance personnel) to set the merchandiser to free vend without opening the door.

SELECTION KEYPAD. The customer uses this keypad to make selections. Maintenance people may use this keypad during programming.

COIN RETURN BUTTON. Returns any coins paid into the merchandiser prior to a vend.

BILL ACCEPTOR (OPTIONAL). Accepts bills of various denominations, depending upon the type of bill validator, and how the machine is configured.



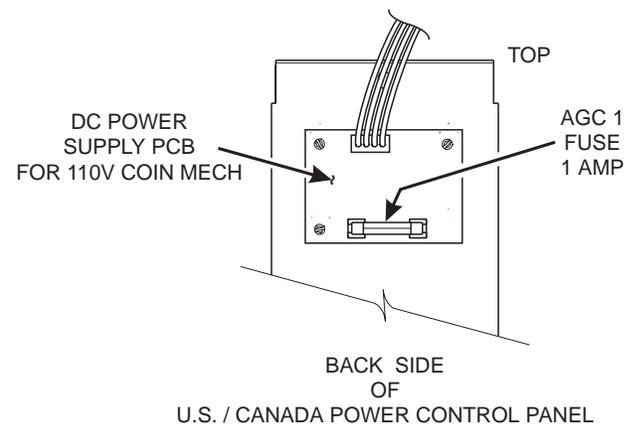
MAIN CONTROLLER PCB DISPLAY. This display consists of two light emitting diodes (LED) mounted on the controller PCB.

POWER ON (LED 1)	When lit, this red LED indicates electrical power is applied to the controller PCB.
HEARTBEAT (LED 2)	When flashing, this red LED indicates that the controller PCB is active, and the software is operating.

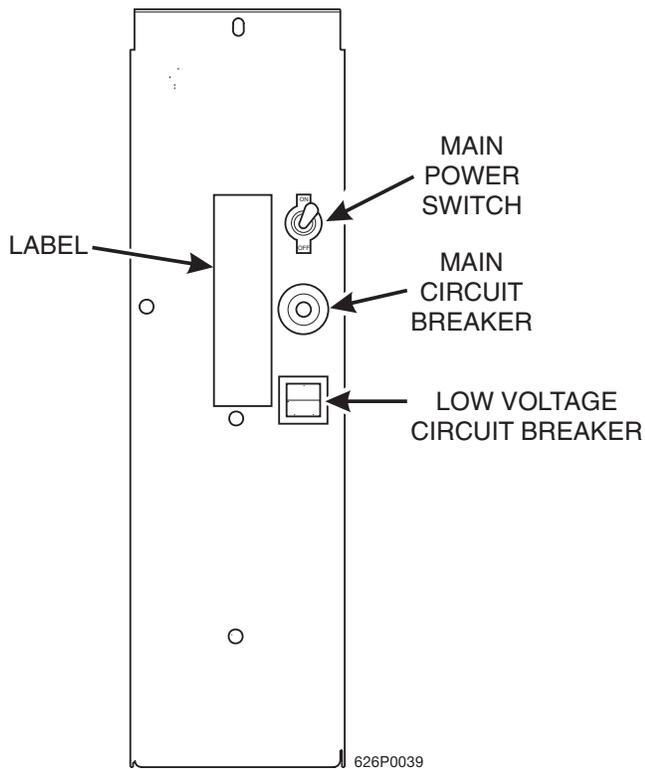
NORMAL CONDITIONS:

When the merchandiser is operating normally, you should see a steady red **POWER ON (LED 1)** indicator and a flashing red **HEARTBEAT (LED 2)** indicator. Contact a service representative if any other condition exists.

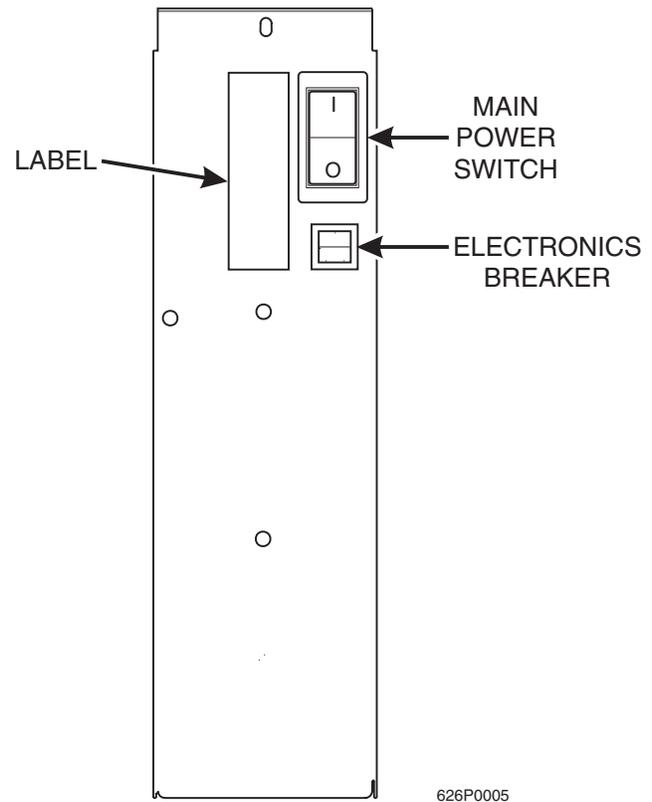
Back Side of U.S./Canada Power Panel. The circuit board mounted on the rear of the power panel is a DC power supply for the coin mechanism. A fuse protects the board circuitry in the event of a coin mechanism solenoid failure. If the coin mechanism is not working, check this fuse. If the fuse is blown, a bad coin mechanism solenoid could be at fault.



Turn the Merchandiser ON and OFF



US / CANADA POWER PANEL



INTERNATIONAL POWER PANEL

- Power to the merchandiser is controlled by the main power switch, located on the power panel.
- The power panel is on the right side of the merchandiser, behind the monetary panel.

WARNING

Lethal voltages are present. Unplug the merchandiser before you perform any of the following tasks:

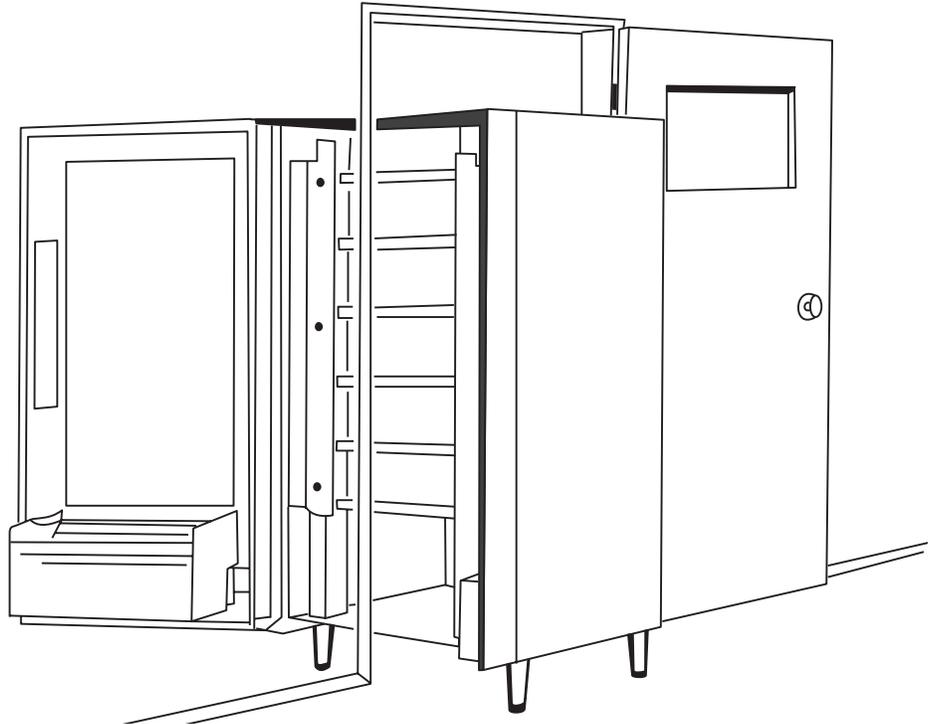
- Change a fuse
- Change the fluorescent lamp
- Change the lamp starter
- Connect or disconnect a harness (except a motor harness when the tray has been removed)

Failure to do so may result in personal injury.

Section 2: Initial Set-Up

Move the Merchandiser through the Opening:

1. Open the cabinet door and place it square with the left side of the cabinet.
2. Carefully walk the merchandiser through the opening.



Position the Merchandiser

Move the merchandiser to its ***approximate position***. There are certain procedures you need to perform before it is in its permanent location. Plug in your merchandiser and turn the power switch to **ON**.

- You can position this merchandiser anywhere in a bank of machines. It can even be placed on an end flush against a side wall.
- The merchandiser should be placed at least four inches away from the back wall (six inches if rear diffuser is not installed). This will provide adequate air circulation for the refrigeration unit.
- The merchandiser will operate more efficiently when placed in a shaded location.
- There should be enough room in front of the merchandiser for the door to move freely.

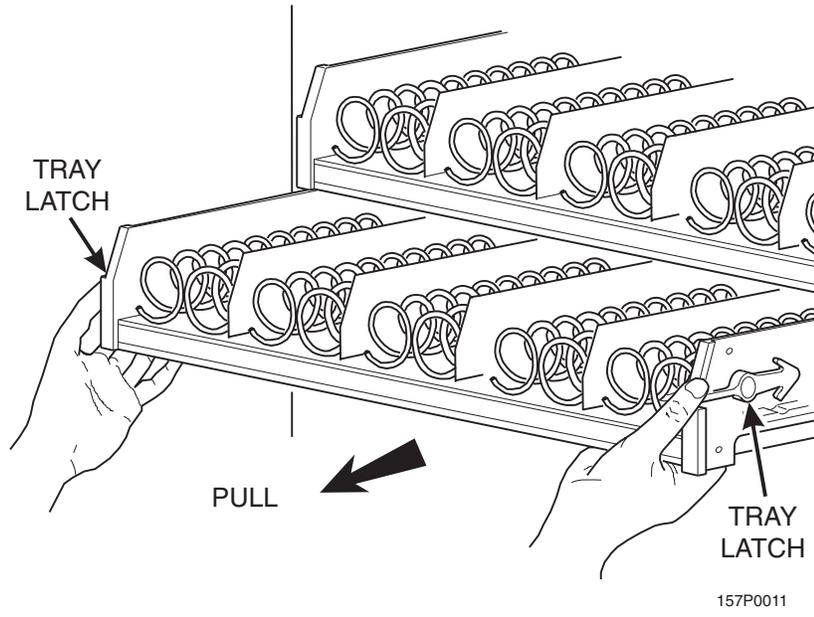
CAUTION

This machine is only UL approved for installation at an indoor location.

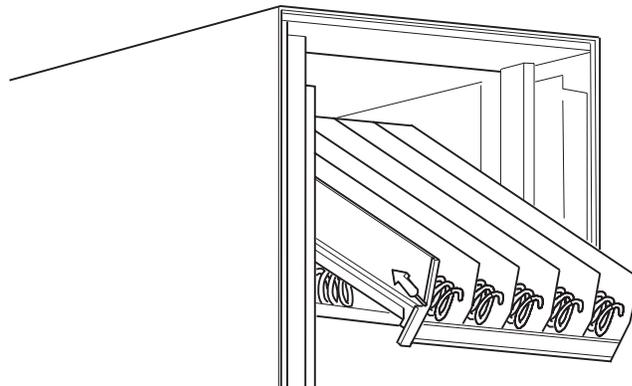
Section 3: Tray Set-Up

Place a Tray in the Loading Position

1. Place both hands on the tray as shown.
2. Push down on the tray latches with your thumbs.
3. **Snack and Candy Trays:** Pull the tray toward you until you hear and feel the rear tray rollers drop into a cut-out in the top of the guide rail.



4. Continue pulling the tray forward for another inch. You will then be able to tilt the tray downward into the loading position as shown. The candy or snack tray is now ready for loading.



SNACK OR CANDY TRAY IN THE LOADING POSITION

NOTE

When the cabinet door is not fully open, the bottom tray will rest on the delivery pan assembly. Handle the tray with care to avoid scratching the delivery pan assembly.

Set up Trays to Vend Products

These instructions will guide you through setting up your trays for vending. You will be asked to determine if your tray can physically hold the products you intend to vend. If not, you will be directed to other procedures which will help you get them set up. Follow these nine steps for each tray in your machine:

1. Make sure the tray is in the loading position.
2. Is the column wide enough for the intended product? If so, proceed to the next step. Otherwise, set up your tray to vend wider products (see below, this page). When you're done, return to step 3 in this procedure.
3. Will the products fit between the spiral turns? If so, proceed to the next step. Otherwise, change the spiral.
4. Will the product pass under the tray immediately above? If so, proceed to the next step. Otherwise, reposition the tray and guides.
5. Will the product touch products on either side? If not, proceed to the next step. Otherwise, install a product spacer.
6. Load products in the tray.
7. Return the tray to the vending position.
8. Install the price rolls.
9. Install the selection ID numbers.

Set Up A Tray To Vend Wide Products

The following steps will help you configure your tray to vend wide products. When you are done with the entire wide product steps, return to the set-up procedures above.

NOTE:

Does not apply to bottle trays - they cannot be reconfigured.

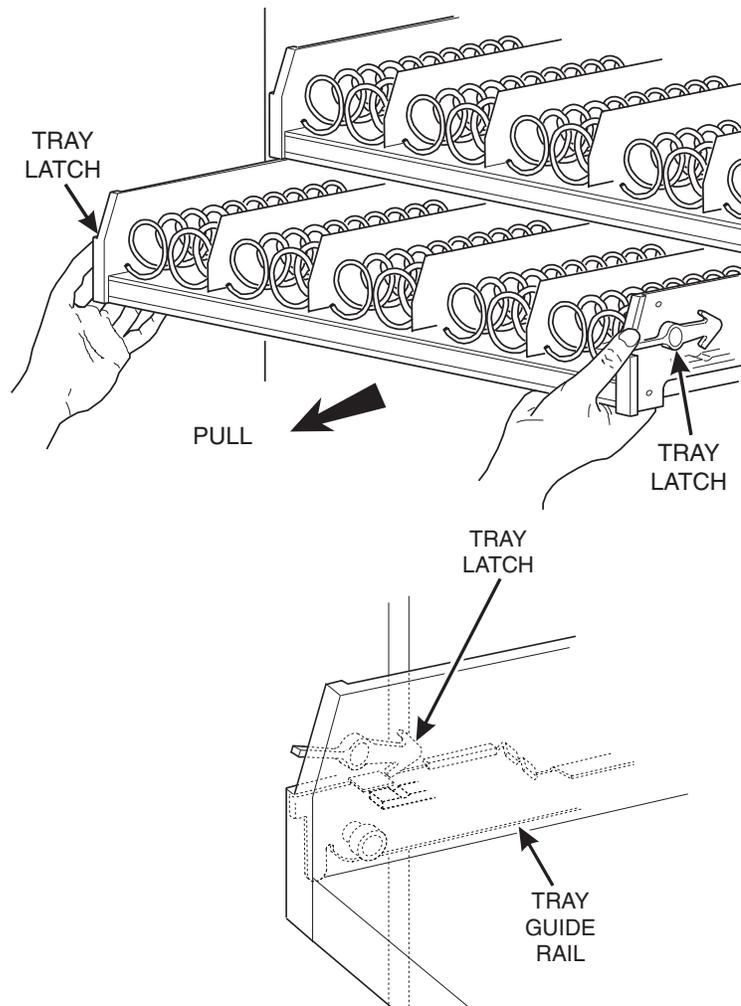
1. Remove the tray from the merchandiser and place it on a flat surface.
2. Based on the size of the product you want to vend, decide how many spiral positions it will occupy. Please remember that the leftmost spiral in the group **must** have an even ID number (0, 2, 4, etc.) For example, if a product is three spirals wide, the left spiral will be ID number 0, and the right spiral will be ID number 2. Be careful how wide you set up for, because some wide products could get hung up in the delivery door.
3. Remove the column dividers inside the group. In the example of three spiral positions, you would be removing the dividers between spiral ID numbers 0 and 1, and 1 and 2.
4. If your group only consists of 2 spirals, replace the rightmost motor with a spiral bearing and gear, and install a gear on the leftmost motor. Skip to step 8.
5. Remove all spirals in the group except the leftmost spiral.

6. Do one of the following:
 - a. If your group has an **ODD** number of spirals (3, 5, etc.) remove the harnesses from all motors in the group except the leftmost one. To the rightmost motor, connect the harness from the motor immediately to its left.
 - b. If your group has an **EVEN** number of spirals (4, 6, etc.) remove the harnesses from all motors **inside** the group (leave the harnesses connected to the leftmost and rightmost motors).
7. Install a spiral at the rightmost position in your group. Make sure it has the same product capacity and is opposite to the one in the leftmost position.
8. Return the tray to the merchandiser.
9. Return to step 3 in the "**Set up Trays to Vend Products**" on page 9.

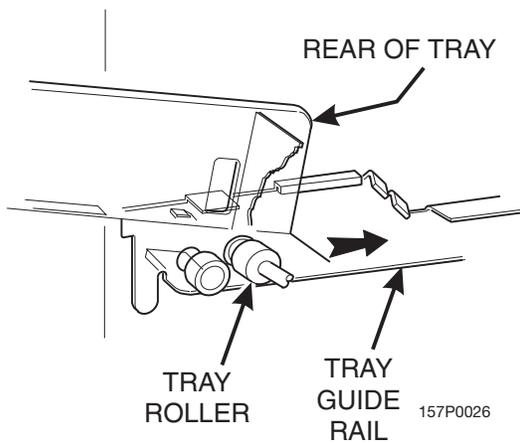
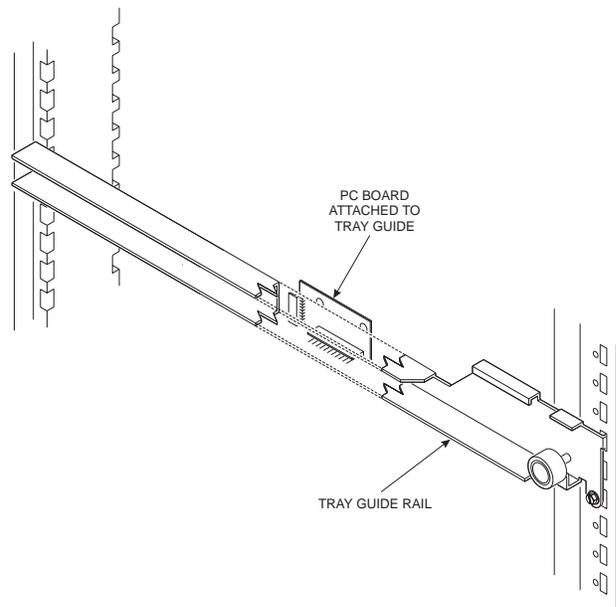
Study this procedure **before** you install a tray for the first time; while you are holding the tray you will not be able to see this area.

Remove a Snack or Candy Tray

1. Remove all product from the tray.
2. Push down on the tray latches with your thumbs.
3. Pull the tray toward you until you hear and feel the rear tray rollers drop into a cut-out in the top of the guide rail.



- Unplug the tray wiring harness from the PC board mounted on the tray guide rail IMMEDIATELY ABOVE the tray you are removing.



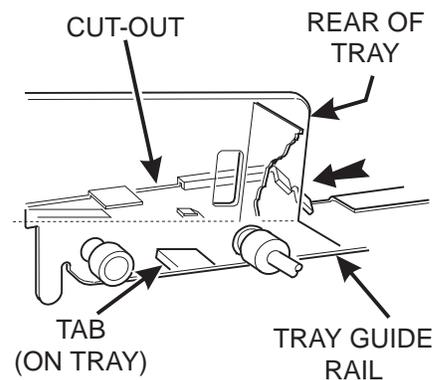
- Lift up on the tray and slide it toward the back. No more than an inch should be needed.

- The tab near the back of the tray should align with the cut-out in the top of the guide rail as shown.

- Lift the tray clear of the guide rail and out of the merchandiser.

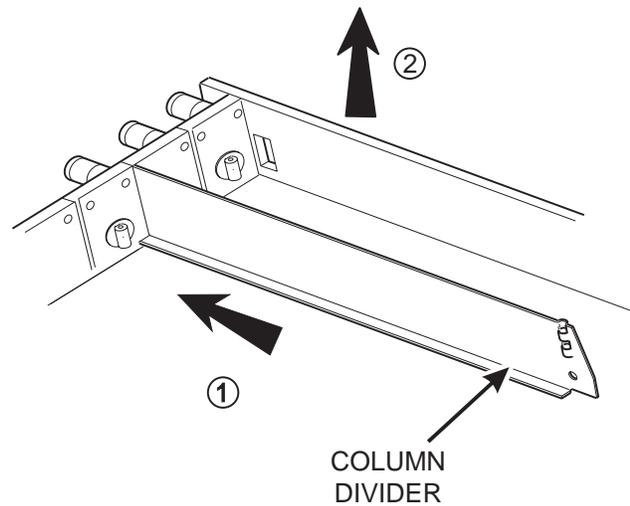
CAUTION

When the cabinet door is not fully open, use extra care in removing the bottom tray. Failure to do so may result in damage to the tray or to the delivery pan assembly.



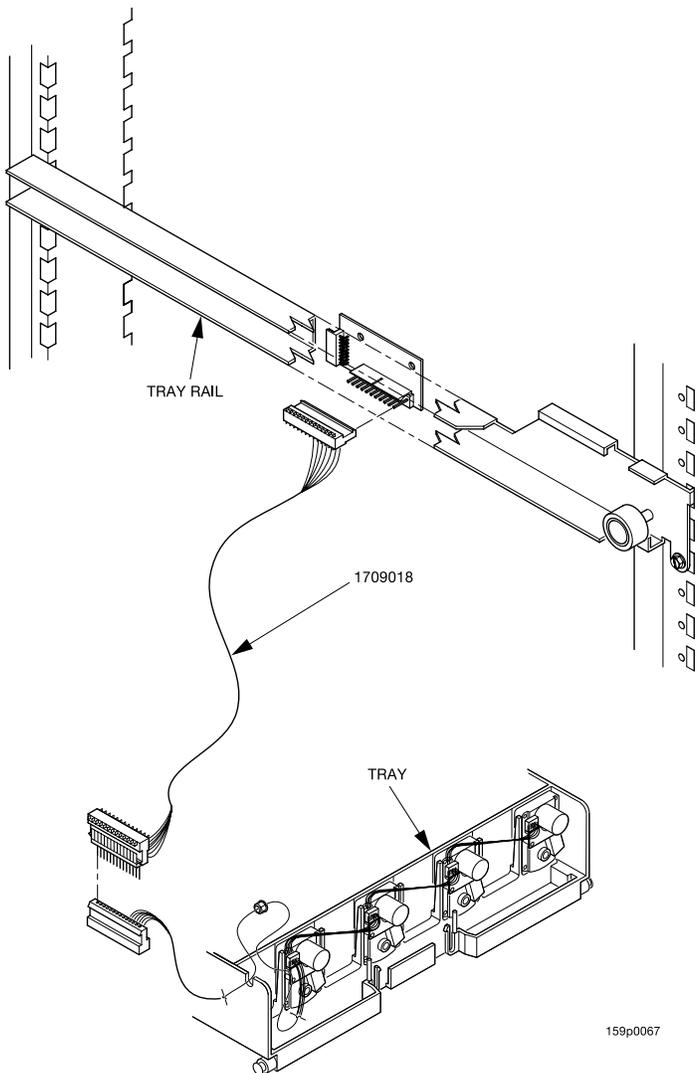
Remove and Install Column Dividers

1. Push the column divider toward the back of the tray - ①.
2. Lift the column divider clear of the tray - ②.
3. Install the column divider in the reverse order of removal.



Operate a Tray Outside of the Machine

Use tray harness extension (P/N 1709018) available from your local distributor. The extension will enable you to remove the tray from the machine and still operate the motors and spirals. Connect it as shown below:

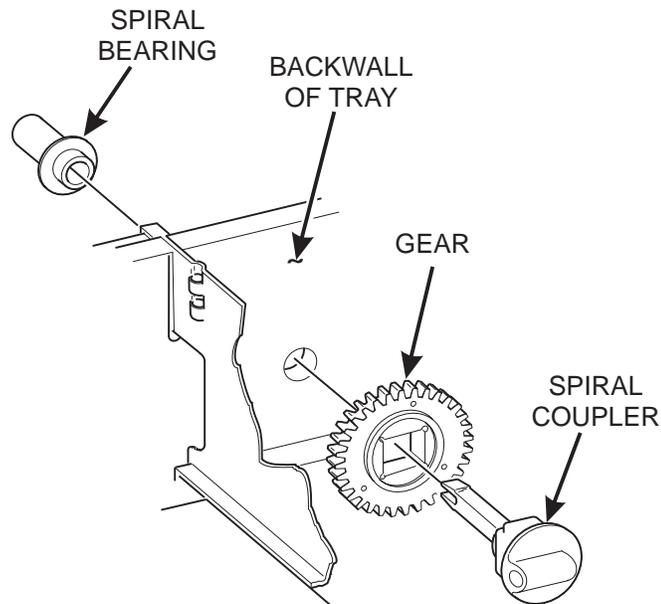


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Replace a Motor with a Spiral Bearing

Remove A Motor:

1. Disconnect the harness from the motor.
(See "**Connect and Disconnect a Motor Harness**" on page 14).
2. Remove the spiral. (See "**Remove and Install Spirals**" on page 15).
3. Remove the spiral coupler. (See "**Remove a Spiral Coupler**" on page 16).
4. Remove the motor. (See "**Remove and Install a Spiral Motor**" on page 17).
5. Install A Spiral Bearing:
 - a. Put the gear into position in this set-up as shown.



- b. Install the spiral coupler. (See "**Install a Gear**" on page 18).

Connect and Disconnect a Motor Harness

CAUTION

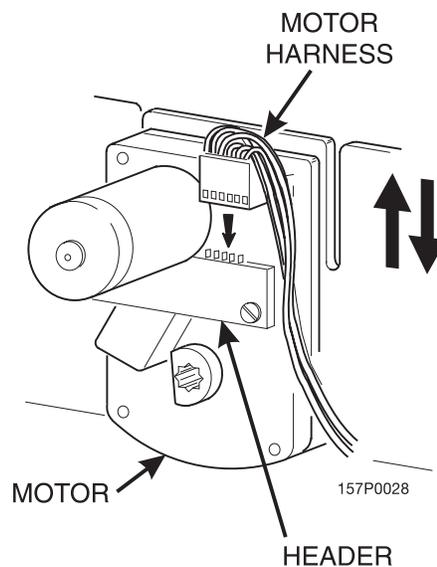
To avoid breaking the motor circuit board, hold the header on the circuit board whenever connecting or disconnecting a motor harness.

Disconnect a Motor Harness:

1. Pull the harness connector away from the circuit board as shown.
2. Tuck the unused part of the harness out of the way in the trough at the back of the tray.

Connect a Motor Harness:

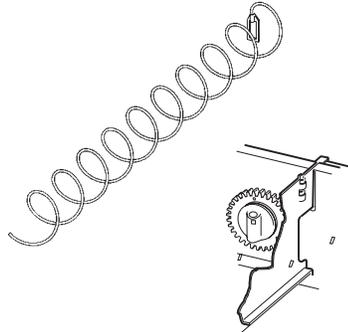
1. Locate the harness connector for the appropriate tray position.
2. Push the harness connector over the header pins on the motor circuit board as shown.



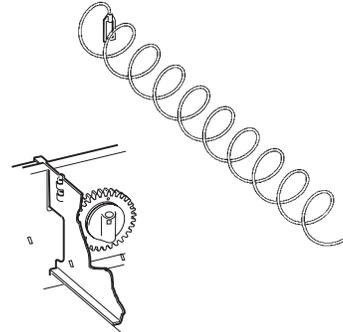
Remove and Install Spirals

- All spirals are the same diameter
- There are two kinds of spirals

Counter Clockwise (left-hand)



Clockwise (right-hand)



SNACK AND CANDY TRAY SPIRAL OPTIONS

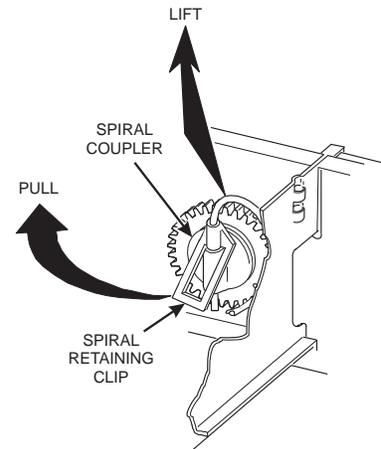
		COUNTER CLOCKWISE (LEFT HAND)		CLOCKWISE (RIGHT HAND)		
SPIRAL COUNT	RETAINER COLOR	ASSEMBLY	SPIRAL	ASSEMBLY	SPIRAL	RETAINER
5	TAN	1707045	1707044	1707047	1707046	4407817
6	PURPLE	1707041	1707040	1707043	1707042	1477107
7	BROWN	1707058	1707057	1707060	1707059	1477106
8	GRAY	1707016	1707017	1707018	1707019	1477155
10	BLUE	1707004	1707005	1707006	1707007	1457061
12	YELLOW	1707008	1707009	1707010	1707011	1457062
14	RED	1707012	1707013	1707014	1707015	1457063
18	WHITE	1707020	1707021	1707022	1707023	1457064

To Remove a Spiral:

1. Pull forward on the retaining clip and remove the end of the spiral from the spiral coupler as shown.
2. Remove the spiral from the tray.

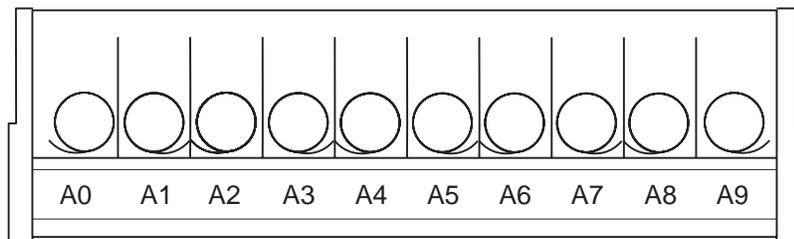
To Install a Spiral:

1. Pull the bottom of the retaining clip toward the front of the spiral.
2. Lower the spiral into the tray column and insert the end of the spiral into the spiral coupler as shown.
3. Release the retaining clip.



Choose a Clockwise or Counterclockwise Spiral

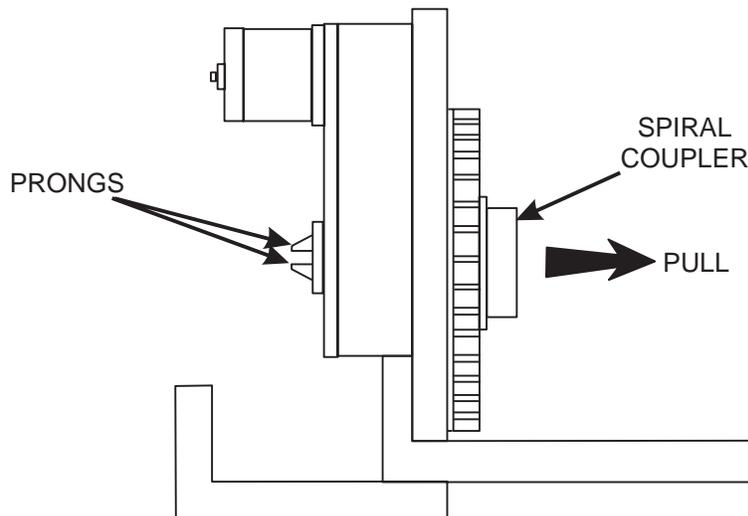
1. The type of spiral used is determined by the column position it will occupy in the tray.
2. Refer to the figure below to find the correct spiral type.



Note: Bottle spirals are all clockwise.

Remove a Spiral Coupler

1. Pinch together the prongs on the end of the spiral coupler as shown.
2. Pull the coupler forward (in the direction of the arrow as shown)



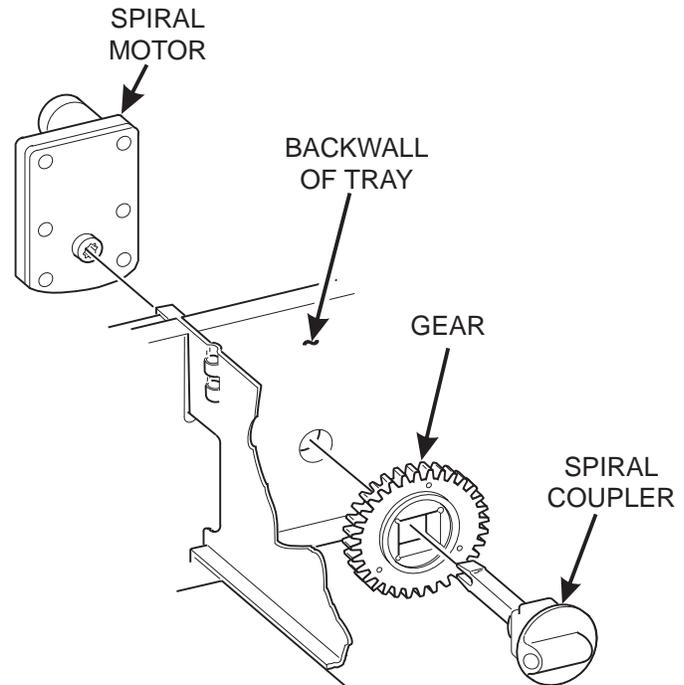
Remove and Install a Spiral Motor

Remove a Spiral Motor:

NOTE

Some steps may already be completed

1. Remove the tray. (See "**Remove a Snack or Candy Tray**" on page 10).
2. Disconnect the motor harness. (See "**Connect and Disconnect a Motor Harness**" on page 14).
3. Remove the spiral. (See "**Remove and Install Spirals**" on page 15).
4. Remove the spiral coupler. (See "**Remove a Spiral Coupler**" on page 16).
5. Lift the motor clear of the tray.
6. Return the tray to the merchandiser. (See "**Install a Tray in the Merchandiser**" on page 21).



Install a Spiral Motor:

1. Remove the tray. (See "**Remove a Snack or Candy Tray**" on page 10).
2. Place the motor in the correct position at the rear of the tray as shown.
3. Place a gear in position if required by this set-up.
4. Install a spiral coupler in the proper orientation. (See "**Install a Gear**" on page 18).
5. Connect the motor harness. (See "**Connect and Disconnect a Motor Harness**" on page 14).

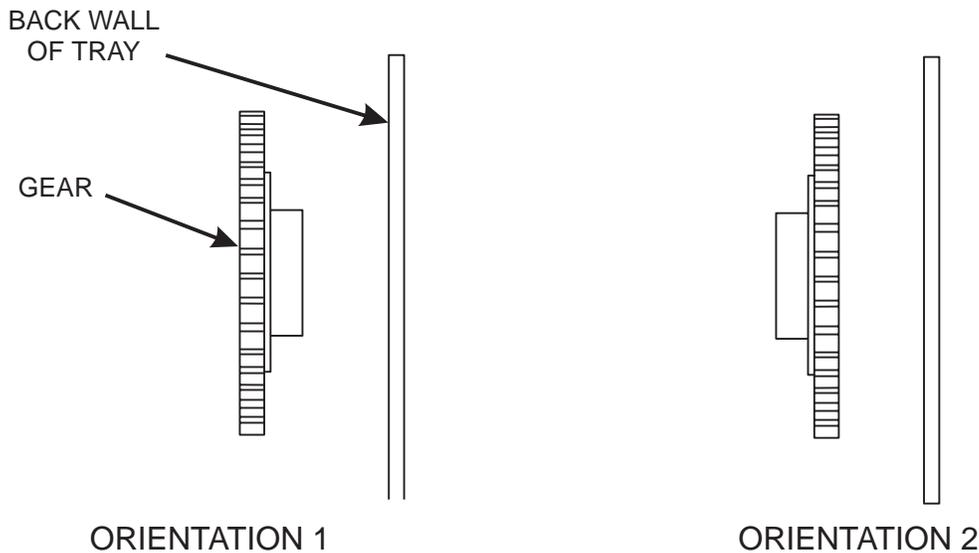
Install a Gear

Use a Gear when:

- Gears are used to mechanically couple the spirals together.
- This happens whenever you have two spirals and only one motor for vending a selection.

Position the Gear

- Place the gear in between the back of the tray and the spiral coupler.
- There are two possible orientations for the gear:



- There are two rules to follow when orienting gears:

RULE 1 The gears for selections next to each other cannot use the same orientation.

RULE 2 All gears for a single selection must use the same orientation.

Install a Spiral Coupler

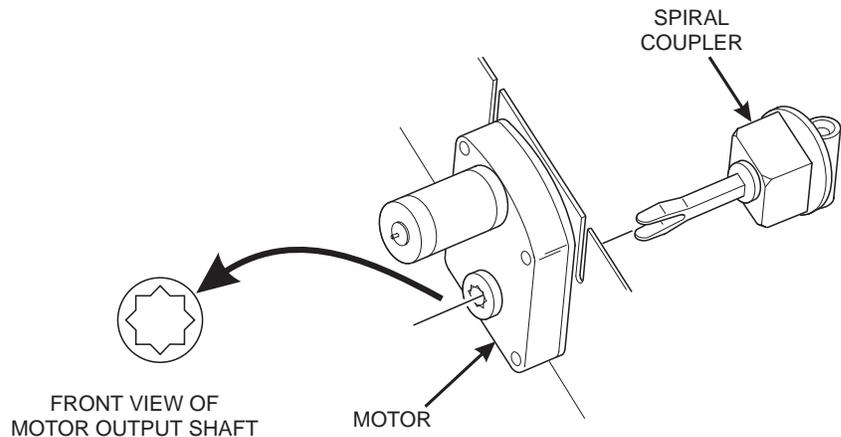
1. Place the gear in position if one is required for this set-up.

When Used with a Motor:

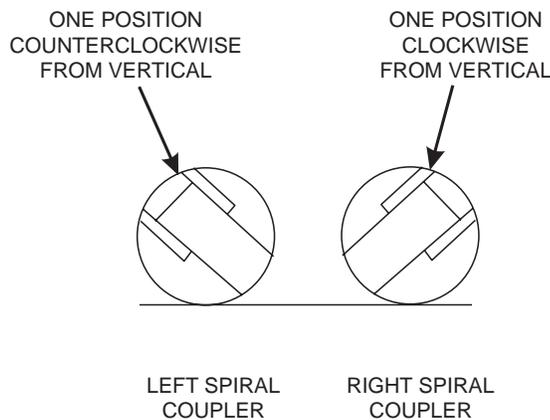
2. Hold the motor in place and push the spiral coupler through the motor gear box until it clicks into position. Be sure the spiral couplers are oriented as shown below.

NOTE

The motor output shaft opening contains eight facets to allow the spiral coupler to be installed in any one of eight positions.



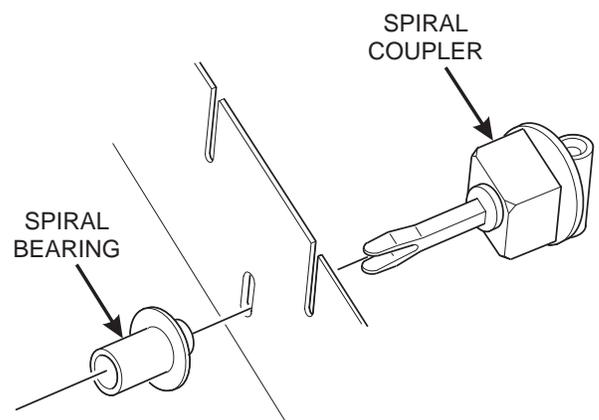
Spiral Coupler Orientation



AS VIEWED FROM FRONT OF TRAY

When Used with a Coupler Bearing:

3. Hold the coupler bearing in place and push the spiral coupler through the bearing until the coupler clicks into position. Be sure the coupler is in the proper orientation as shown.



Move a Tray Up or Down

This merchandiser can be adjusted to vend taller products. Follow the guidelines below:

- Keep in mind that when you increase the product height available to a tray by lowering it, you will be decreasing the product height available to the tray below.
- If a tray is in the lowest position, the tray below it should not be in the highest position.
- If a tray is in the highest position, the tray above should not be in the lowest position.
- You may need to experiment with various tray positions to get the best results for your products.

CAUTION

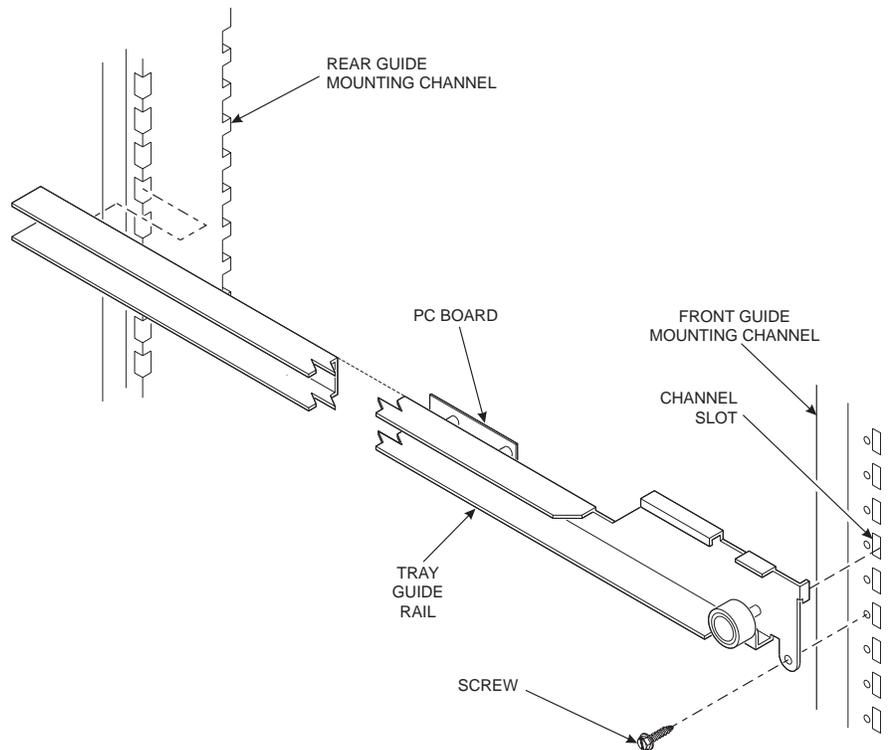
The trays in should not be positioned over an open air discharge vent.

NOTE

Tray movement is limited because the tray harness will limit the amount of travel available to the tray guide rails.

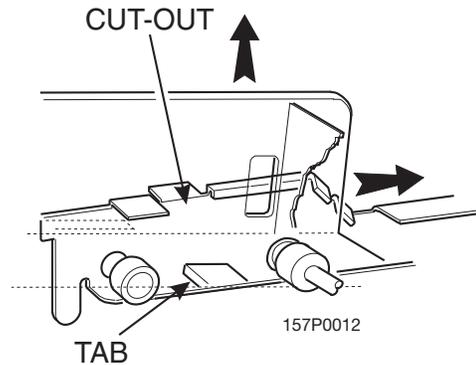
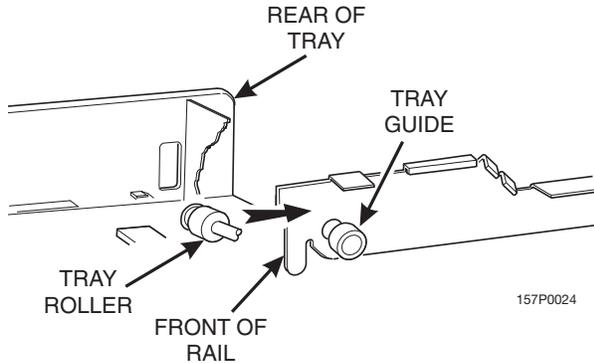
Proceed as follows:

1. Remove the tray from the merchandiser. (See "**Remove a Snack or Candy Tray**" on page 10).
2. Remove the screw that secures the right tray guide rail to the front guide mounting channel as shown.
3. Tap up on the guide rail and unseat the guide rail tabs from the channel slots.
4. Pull the guide rail away from the front and rear guide mounting channels.
5. Move the guide rail to the desired position.
6. Insert the guide rail tabs into the mounting channel slots as shown.
7. Tap down on the guide rail to seat the tabs in the channel slots.
8. Replace the screw that secures the guide rail to the front guide mounting channel.
9. Repeat steps 2 through 8 for the left guide rail.
10. Return the tray to the merchandiser. (See "**Install a Tray in the Merchandiser**" on page 21).
11. Load products into the trays, and perform test vends. Make sure the trays don't interfere with the products you are vending, and that all products vend properly.

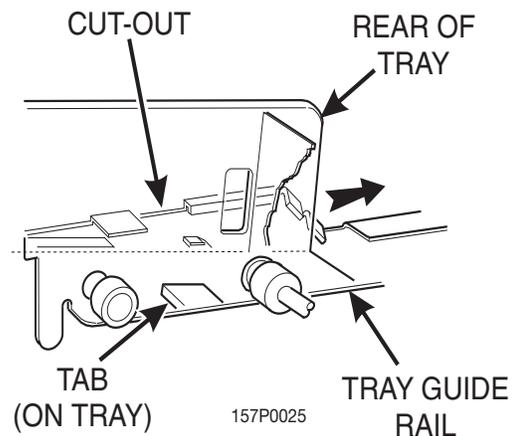
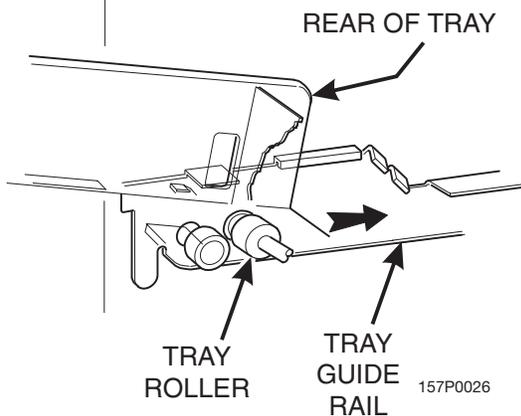


Install a Tray in the Merchandiser

- Study this procedure before you install a tray for the first time; while you are holding the tray you will not be able to see this area. Proceed as follows:
1. Insert the tray so that the tray rollers pass over the tray guide rollers.
 5. Hold the tray up while pushing it toward the rear. Stop when the tab on the tray aligns with the opening in the tray guide.



2. Bring the tray roller to rest on the tray guide.
6. Lower the tray until it rests on the tray guide roller. Push the tray in all the way.
7. The tray latch will fall into the locking position.



3. Tilt the tray upward.
4. Connect the tray wiring harness to the PC board mounted to the guide rail JUST ABOVE the tray you are installing.

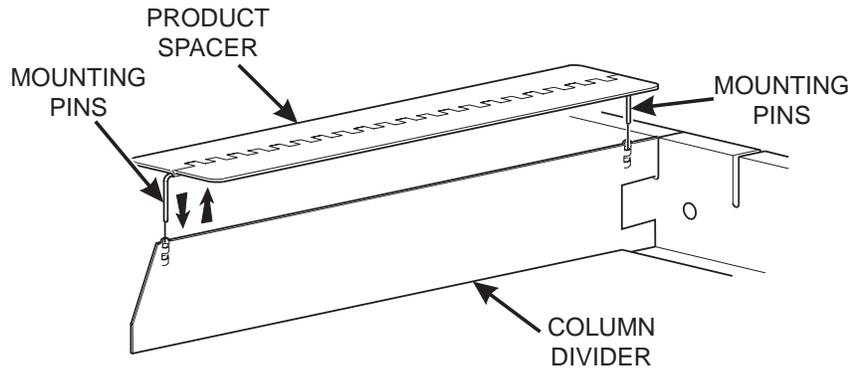
NOTE:
Does not apply to bottle trays.

Install and Remove a Product Spacer

Install a Product Spacer

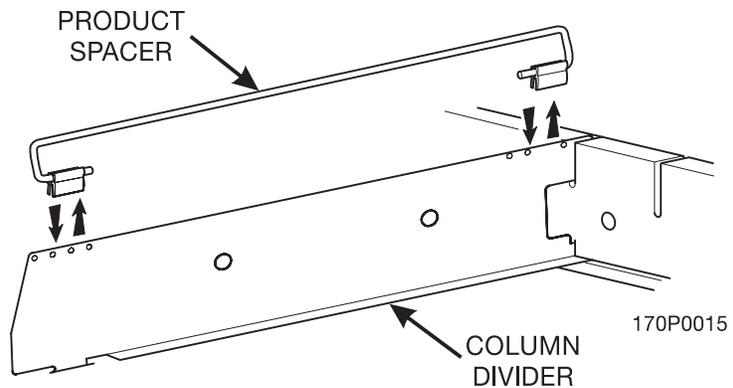
The product spacer will keep a tall, narrow product upright.

Shown at right are spacers and column dividers on both deep and shallow trays. Insert the product spacer onto the column divider as shown.



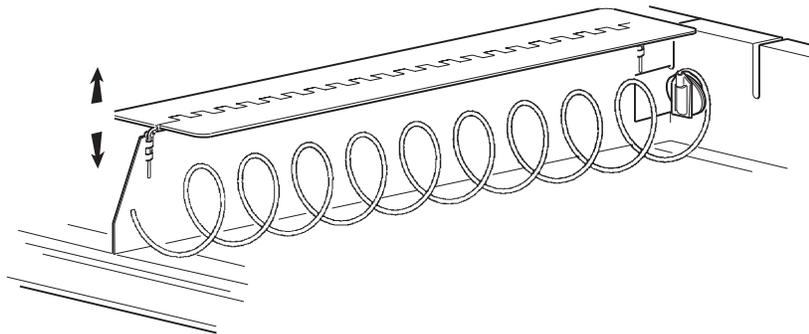
Adjust a Product Spacer

With product loaded in the tray, rotate the product spacer up or down to keep the product upright as shown.



Remove a Product Spacer

Pull the product spacer mounting pins from the column divider.



Section 4: Load the Merchandiser

The color of the spiral coupler (the little plastic tab attached to the rear of the spiral) will tell you how many products will fit in the spiral. (See table below).

NOTE

Another way to determine spiral capacity is to count the spaces in the spiral!

SPIRAL CAPACITY COLOR CODES

SPIRAL CAPACITY	SPIRAL COUPLER COLOR	SPIRAL CAPACITY	SPIRAL COUPLER COLOR
5	Tan	14	Yellow
6	Purple	18	White
7	Brown		
8	Gray		
10	Blue		
12	Red		

General Tray Loading:

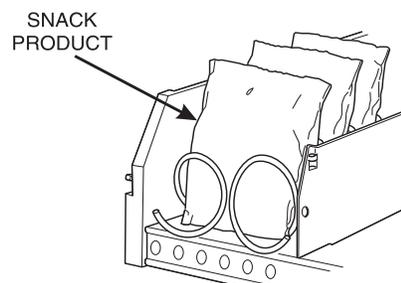
- See "**Spiral Wall Retainer Usage**" on page 24 for spirals with capacity of 20, 25, 30, or 38.
- Begin loading products at the front of the tray and work toward the back. Position the product so the package rests on the tray. **DO NOT** force a product into a spiral.
- If the fit is too tight or too loose, change the spiral size.
(See "**Remove and Install Spirals**" on page 15).
- Be sure there are no empty positions between products in each spiral.

Special Considerations:

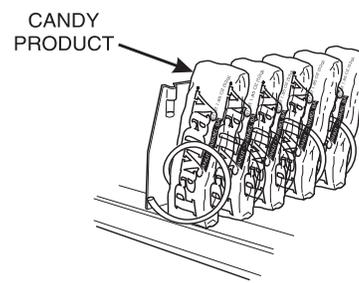
Bagged Products Position package upright, then push the tops slightly toward the rear of the tray.

Thin Packages Position the package upright.
Also, (see "**Spiral Wall Retainer Usage**" on page 24).

KitKat The two right-most columns of the candy tray are designed to accept the KitKat candy bar.



**CORRECT LOADING
OF SNACKS**

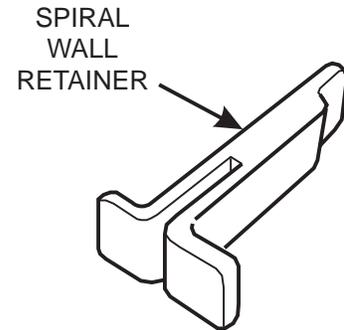


**CORRECT LOADING
OF CANDY** 157P0035

Spiral Wall Retainer Usage

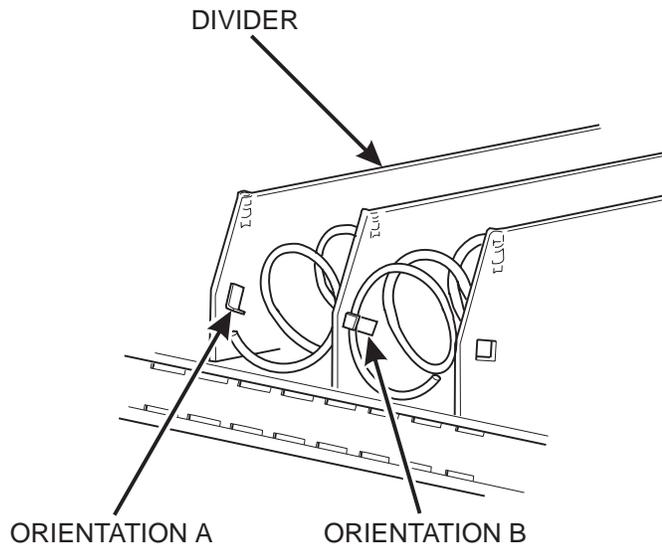
A spiral wall retainer serves to compress the spiral and make it act like a spring to more forcefully eject a product. Do some test vends and use a spiral wall retainer when a product does not readily leave the spiral.

- Use a spiral wall retainer in the following cases:
 - The spiral has a capacity of 20, 25, 30, or 38.
 - The product is thin.
 - The product is on a candy tray.
- The spiral wall retainer can also be used with other spirals and types of products.
- The spiral wall retainer is installed near the front of the column divider.
- There are two ways to install the spiral wall retainer.



	RETAINER ORIENTATION	
	A	B
COLUMN DIVIDER BETWEEN THESE POSITIONS	0 and 1	1 and 2
	2 and 3	3 and 4
	4 and 5	5 and 6
	6 and 7	7 and 8
	8 and 9	

- To install a spiral wall retainer, insert the retainer in the square slot near the front of the column divider.
- The spiral wall retainer must be removed in two cases:
 - A KitKat bar loaded into either of the two right hand positions of a tray will not clear the retainer on the column divider between the two positions.
 - A product pusher will catch on a retainer in *ORIENTATION A*.



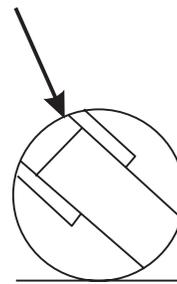
Configure the Merchandiser to vend "Lunch Buckets"

Because of the weight and shape of the package, we recommend that this product be vended only from the bottom tray.

To vend this product, two adjacent positions must be coupled together.

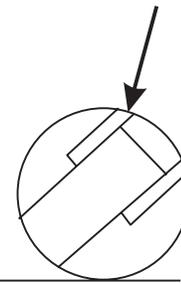
The left spiral coupler should be installed one position counterclockwise from the vertical position.

ONE POSITION
COUNTERCLOCKWISE
FROM VERTICAL



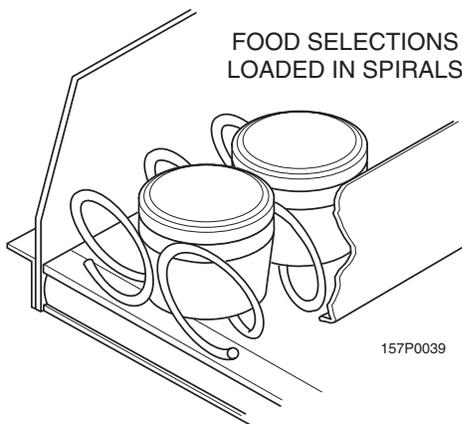
LEFT SPIRAL
COUPLER

ONE POSITION
CLOCKWISE
FROM VERTICAL



RIGHT SPIRAL
COUPLER

AS VIEWED FROM FRONT OF TRAY



The right spiral coupler should be installed one position clockwise from the vertical position.

Replace the current spirals with six-count spirals. These are available from your local distributor. (See "**Remove and Install Spirals**" on page 15). A pad can be installed in the bottom of the delivery pan to quiet and cushion product delivery. This part is available from your local distributor. Load "Lunch Bucket" products as shown at left.

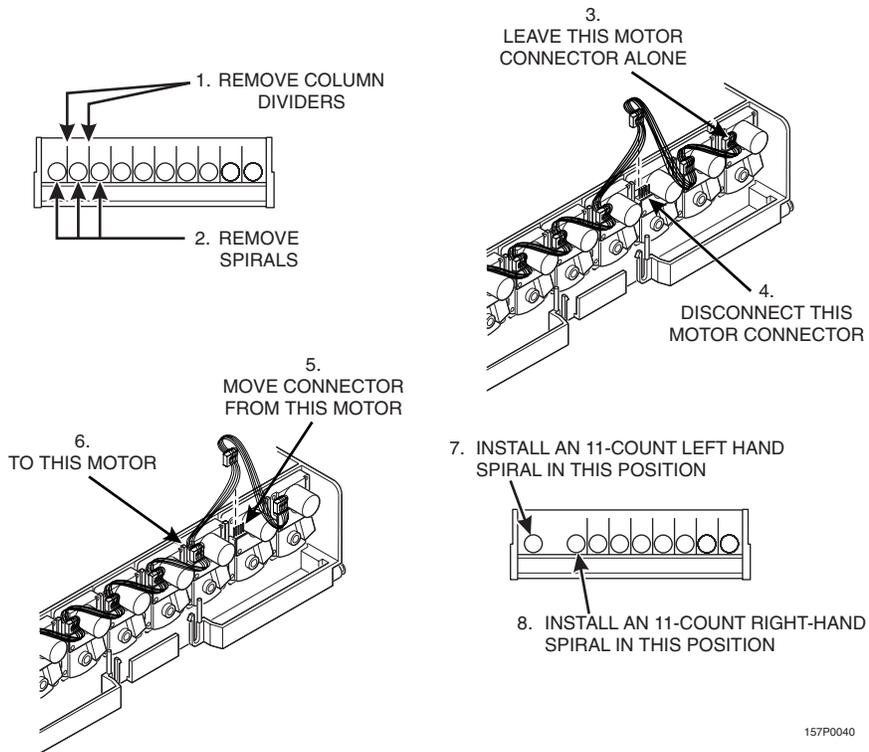
Configure the Merchandiser for Vending "Top Shelf"

we recommend that this product be vended from a candy tray.

1. Move the tray so the package can be loaded standing on its left or right edge. (See "**Move a Tray Up or Down**" on page 20).
2. The following steps must be completed for three adjacent positions on the tray:

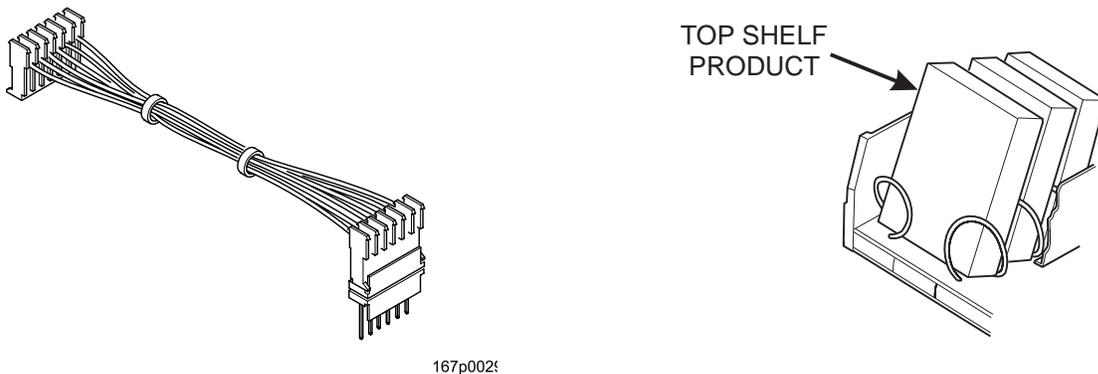
NOTE

The left-most position in the group of three must be an even numbered position.



NOTE

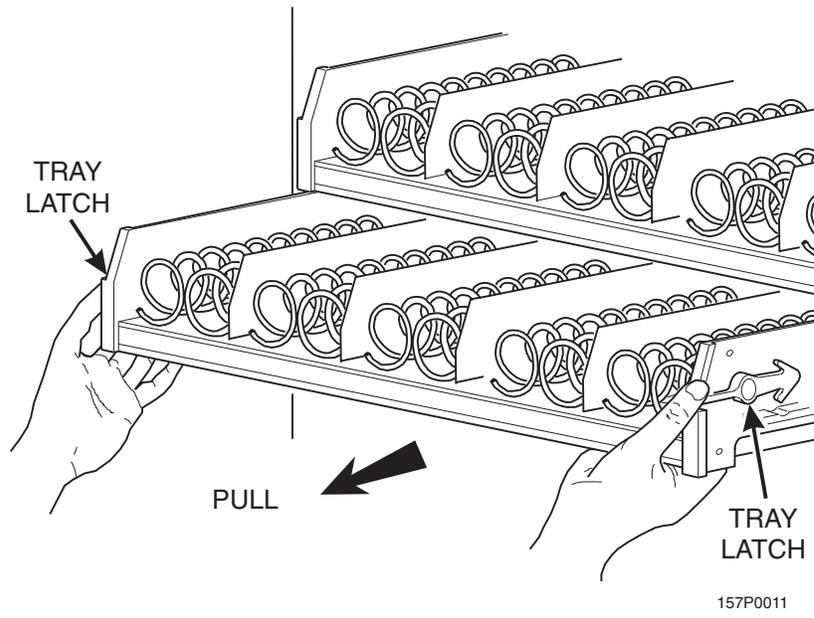
If the motor harness disconnected in step 5 does not reach, use the motor skip harness, (PN 1599024), available at your local distributor.



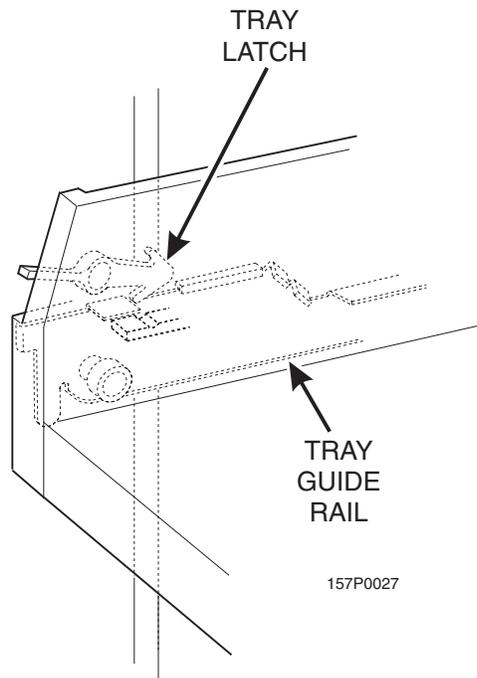
3. Load the "Top Shelf" products as shown.

Return the Trays to the Vending Position

1. Lift the tray until it is parallel to the floor as shown.

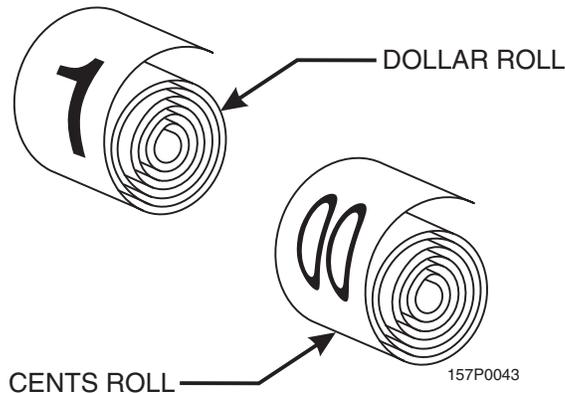


2. Push the tray toward the back of the cabinet. The tray latches on the sides of the tray will lock into position.



Install and Set Price Labels

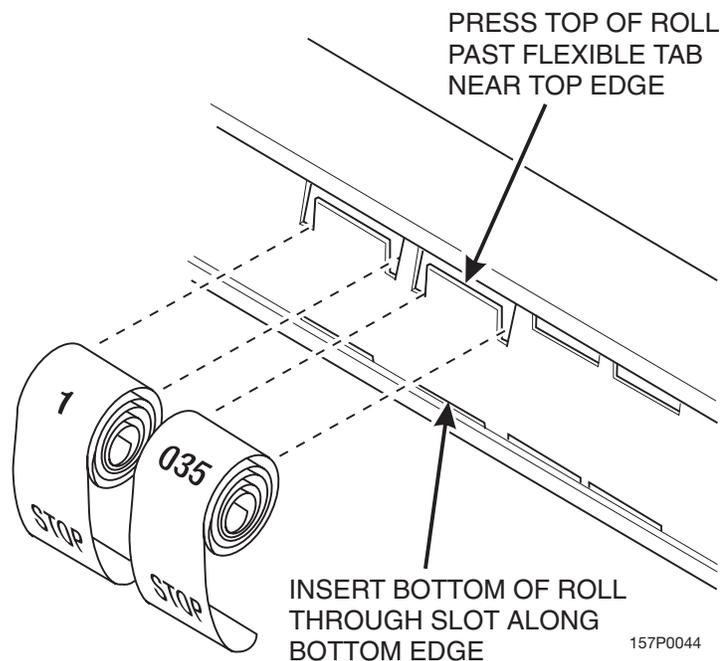
- Price rolls are printed on coiled strips as shown in the illustration below. (The dollar and cents rolls are factory installed.) If you use another type of currency, you will find the appropriate price rolls in the plastic bag that contained this manual.
- There are two types of price rolls:
 - Dollar roll 1 to 12, increments of 1
 - Cents roll 00 to 95, increments of 05
- Remove the price rolls as required, and install the appropriate ones for your currency.



Install Price Labels:

There are three pairs of slots in the front of the can unit for each position. Install per this example:

1. Insert the dollar roll in the left-most pair of slots as shown if the price is \$1.00 or more.
2. Insert the cents roll in the center pair of slots as shown.
3. The low-number end of the roll goes in the top slot and the high-number end of the roll goes in the bottom slot.



Adjust the Price Roll:

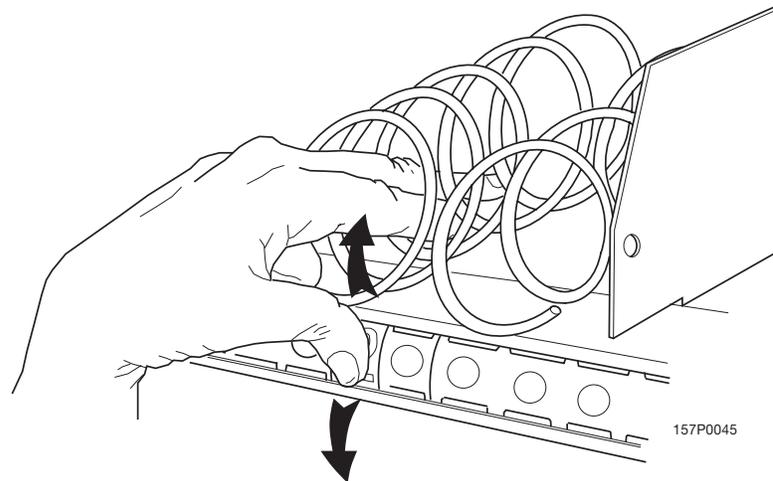
You can set selection prices within the following range:

Minimum price	\$.00
Maximum price	\$99.99
Increment	\$.05

1. Use your thumb as shown to move each price roll up or down as needed to set the desired price.

NOTE

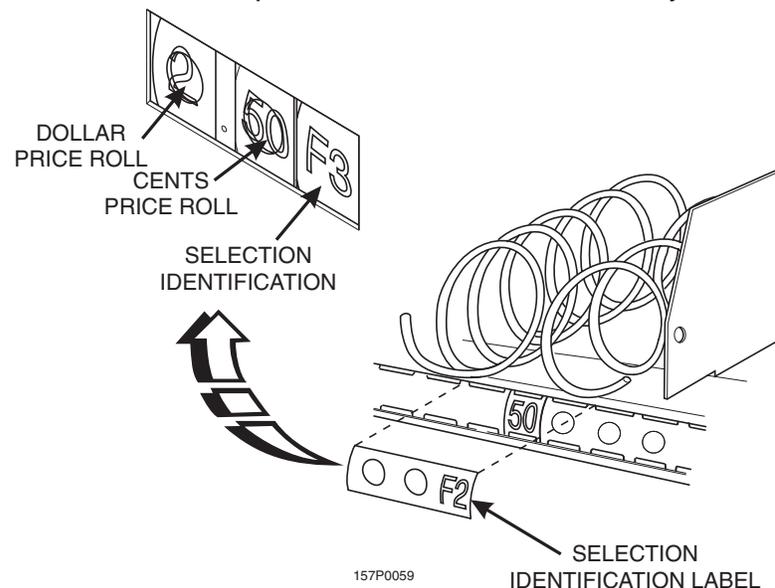
You will see the word **STOP** near either end of the roll.



Selection ID numbers are printed on clear plastic sheets. You will find these in the plastic bag that contained this manual. You will need to separate them along the scored lines between the selections. **BE CAREFUL** when doing this, as it is easy to split the labels.

Install the Selection ID Numbers:

1. Press together the two long edges of the selection ID label.
2. Snap the selection ID label into position on the front of the tray as shown.



See the figures below for snack and candy tray positions.

MOTOR POSITION

TOP TRAY

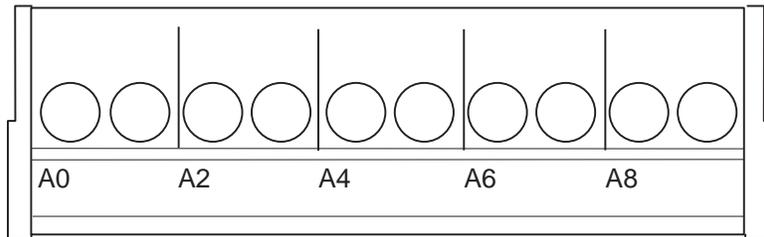
TRAY A	A0	A1	A2	A3	A4	A5	A6	A7	A8	A9
TRAY B	B0	B1	B2	B3	B4	B5	B6	B7	B8	B9
TRAY C	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9

BOTTOM TRAY

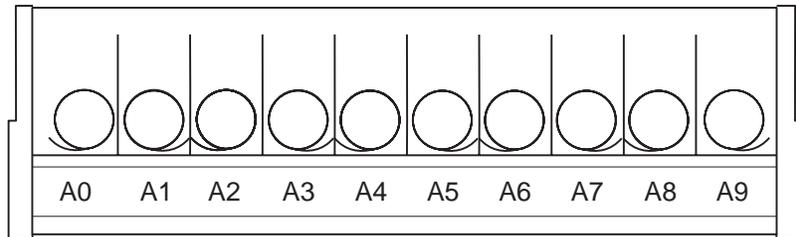
NOTE

This example shows a 3-tray merchandiser.
Some merchandisers can have up to 6 trays.

Example of a Basic
Snack Tray ID Label to Use



Example of a Basic
Candy Tray ID Label to Use



Section 5: Posivend™

The Posivend™ product detection system consists of seven infrared light emitters and seven infrared light detectors that scan the product delivery area with a pattern of crisscrossed light beams. While the machine is idle, the Posivend™ system is constantly calibrating itself for optimum performance in all temperature, humidity, dust, and alignment conditions. The Posivend™ detection system is used by the controller to assure that the selected product is delivered.

- When a customer makes a selection, the controller checks that the Posivend™ detection system is ready and tells it to begin scanning for the product. Different scanning patterns are used depending upon the size and shape of the product.
- The vending machine controller then starts the delivery motor and constantly checks the Posivend™ system for detection of the delivered product.
- If no product delivery is detected, the controller continues to run the delivery motor for up to three revolutions, pausing momentarily at the home position of each revolution of the motor.
- If no product is detected after the third revolution, the selection is marked as empty (SEE FAULTS Page44) and the customer's credit is optionally restored to make another selection or is automatically returned.
- If product delivery is detected before the delivery motor has come to the home position for the first time, the delivery motor continues running to its home position.
- If the delivery motor has already passed the first home position, the motor will stop immediately upon product detection to avoid the possibility of vending a second product.

NOTE:

A fatal malfunction in the Posivend™ detection system during the vend is treated the same as a product delivery. It is assumed that the malfunction is due to tampering or vandalism.

Anti-Jackpot provides protection against unforeseeable cheating of the Posivend™ system. If a certain number of Posivend™ empty conditions occur, Sure-Vend™ will disable itself for a few minutes. A Posivend™ empty condition occurs when product delivery is not detected and the customer's money is restored or returned.

Once Anti-Jackpot is triggered, the Posivend™ system will be turned off for a certain number of minutes so that money can no longer be refunded because of vend failure and thus discourage a thief from remaining. While Posivend™ is disabled, machine will either revert to home switch operation or go out of service.

Once the Anti-jackpot time has elapsed, Posivend™ is re-enabled. The total number of Posivend™ empty selections is displayed.

Section 6: Final Installation

Move the merchandiser to its *final position*:

- Perform "Position the Merchandiser" on page 7 before placing the merchandiser into its final position.
- You can position this merchandiser anywhere in a bank of machines. It can even be placed on an end flush against a side wall.
- The merchandiser should be placed at least four inches away from the back wall (six inches if rear diffuser is not installed). This will provide adequate air circulation for the refrigeration unit.
- The merchandiser will operate more efficiently when placed in a shaded location.
- There should be enough room in front of the merchandiser for the door to move freely.

WARNING

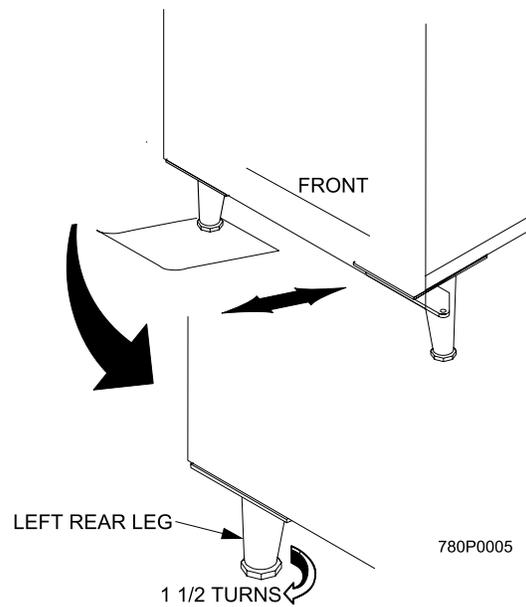
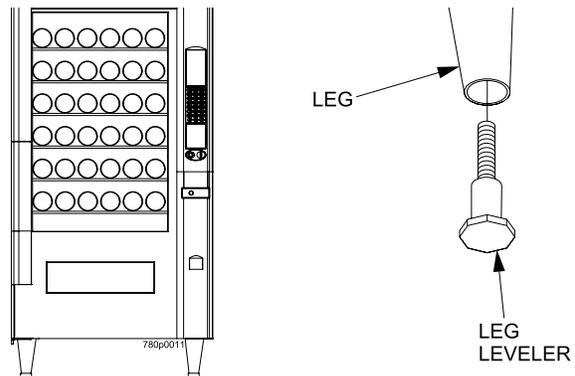
This machine is only UL approved for installation in an indoor location.

Level the Merchandiser

1. Use a spirit level to adjust the legs until the cabinet is level from side to side and front to back.

NOTE

A slight slope from front to back will improve the draining of condensate from merchandisers with refrigerating units. When the merchandiser is part of a bank of machines, level it in reference to the other machines. After leveling is complete, check that the door operates easily.



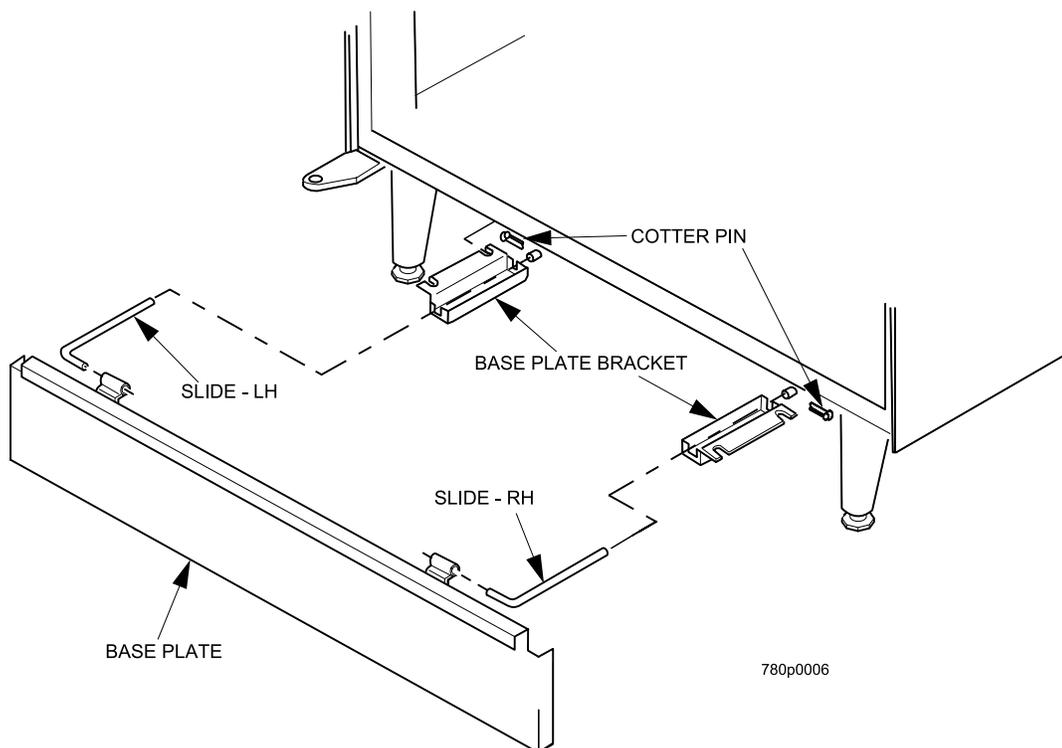
Install the Base Plate

Refer to the figure below while completing the following procedures:

WARNING

Do not move the cabinet while the hex head screws and/or carriage bolts are loosened. The cabinet would be unstable and could tip and cause injury.

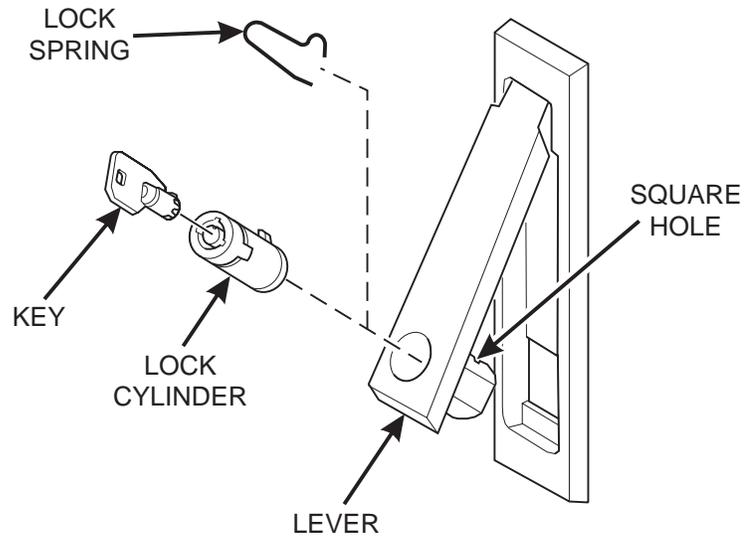
1. Loosen the left leg assembly hex screws to allow mounting a base plate bracket.
2. Secure one of the base plate brackets to the leg assembly and tighten the hex screws.
3. Loosen the right leg assembly hex screws to allow mounting the other base plate bracket.
4. Secure the other base plate bracket to the right leg assembly using the two hex head screws. Tighten the hex head screws.
5. Insert the short arms of the slides into the hinged tabs of the base plate. Position the slide so the notch near the short arm is on the bottom side.
6. Insert the long arms of the slides into the base plate brackets.
7. Insert and secure a cotter pin through the hole in the back of each of the slides.
8. Push the base plate toward the merchandiser cabinet. The front tabs of the base plate brackets should seat in the notches in the long arms of the slides.



Install the Lock Cylinder

Install an optional lock cylinder in the merchandiser as follows:

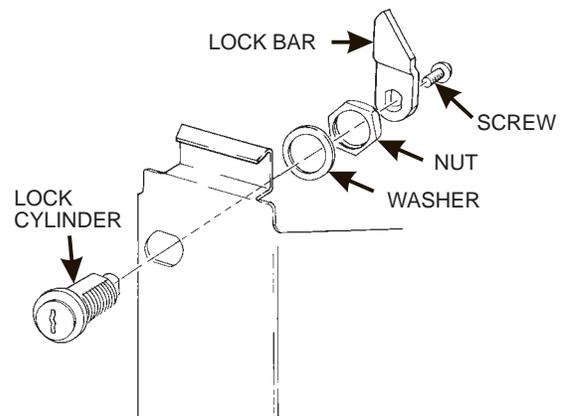
1. Position the lift handle lock lever as shown.
2. Depress the lock spring at the square hole of the lock cylinder receptacle and pull the lock springs out through the front.
3. Position the lock cylinder as shown. Depress the spring loaded lock pin.
4. Push the cylinder into the cylinder receptacle in the lever. The pin should snap into the square hole.
5. If the cylinder pin does not seat in the square hole, press against both ends of the lock cylinder. Rotate the cylinder until the pin snaps into place.
6. **Leave the door open** and test the lock mechanism with a key. Do not close the door until you are certain the key will unlock the lock.



Install the Optional Cash Box Lock

Remove the cash box from the merchandiser.

1. Assemble the lock as shown in the illustration to the right.
2. Return the cash box to the merchandiser.

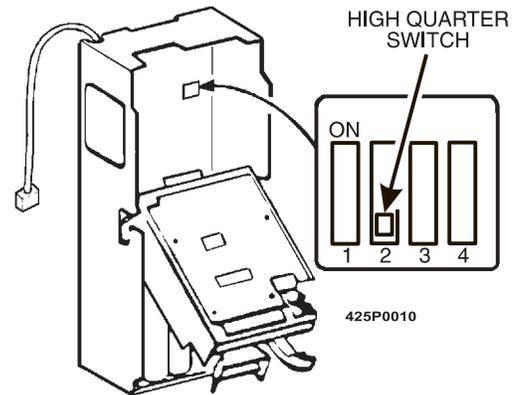


Set Up the Coin Mechanism

If the changer is not a MARS TRC 6000, proceed to **LOADING THE COIN MECHANISM**
 If the Changer is a MARS TRC 6000, you must set the high quarter switch.

Set the Quarter Switch:

QUARTER SWITCH POSITION	ACTION
LOW	The coin mechanism will only store 6 quarters. The rest are sent to the coin box. Fewer quarters are available for change.
HIGH	The coin mechanism will store 69 quarters. More quarters are available for change.



Load the Coin Mechanism

Once you arrive at the steps that tell you how to setup your coin mechanism, please perform the following steps:

1. Plug the power cord into the electric outlet and turn ON the main power switch.
2. Open the cabinet door.
3. Open the monetary door.
4. Insert coins one at a time until each one of the coin tubes has been filled.
5. Inspect the tubes for shingled coins and correct if necessary.

Operational Readiness Check

1. Perform test vends on all selections.
2. Do any of the snack or candy products catch on the tray and fail to vend? If not, skip to step 3. If so, perform the following procedures on the affected areas until all products vend properly:
 - a. Install and/or adjust a product spacer (See "**Install a Product Spacer**" on page 22).
 - b. Install and/or remove spiral wall retainers (See "**Spiral Wall Retainer Usage**" on page 24).
 - c. Perform the appropriate spiral anti-hang-up procedure(s).
3. Test the operation of the coin mechanism.
4. Test the operation of the bill validator.
5. Return all test vended products to the trays.

Spiral Indexing Procedure (One Spiral, One Motor)

The spiral indexing procedures involve rotating spirals one position at a time until the product vends properly.

1. Home all the motors.
2. Remove the effected spiral.
3. Is the coupler in the proper position?
NO - Move the coupler to the position as shown in "**Install a Gear**" on page 18. Go to step 4.
YES - Move the coupler to the next clockwise position (if it's on a right-hand motor), or the next counterclockwise position (if it's on a left-hand motor). Go to step 4.
4. Replace the spiral.
5. Perform a test vend (see the previous page).
6. Did the product hang up?
NO - You're finished. Continue to test vend the remaining selections until everything works right.
YES - Go to step 7.
7. Did you previously move the coupler to the next clockwise or counterclockwise position?
NO - Move the coupler to the next clockwise position (if it's on a right-hand motor), or the next counterclockwise position (if it's on a left-hand motor). Return to step 6.
YES - Return to step 2 in the operational readiness check and try another procedure. Do not move the coupler again.

Spiral Indexing Procedure (Two Spirals, One Or Two Motors)

The spiral indexing procedures involve rotating spirals one position at a time until the product vends properly.

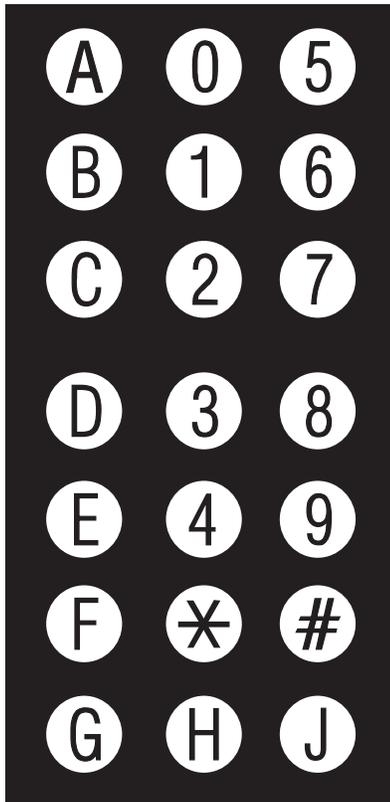
1. Home all the motors.
2. Remove the left hand spiral of the affected pair.
3. Is the coupler in the proper position?
 - NO** - Move the coupler to the position as shown in "**Install a Gear**" on page 18. Go to step 4.
 - YES** - Move the left coupler to the next counterclockwise position. Go to step 4.
4. Replace the left hand spiral.
5. Remove the right hand spiral, spiral coupler, and gear (if used) of the affected pair as a unit.
6. Rotate this unit until the right hand spiral mirrors the position of the left hand spiral.
7. Replace the right hand spiral, spiral coupler, and gear (if used).
8. Perform a test vend (see the previous page).
9. Did the product hang up?
 - NO** - You're finished. Continue to test vend the remaining selections until everything works right.
 - YES** - Go to step 10.
10. Did you previously move the left hand coupler to the next counterclockwise position?
 - NO** - Remove the left hand spiral of the affected pair. Turn the left spiral coupler to the next counterclockwise position. Return to step 4.
 - YES** - Return to step 2 in the operational readiness check and try another procedure. Do not move the coupler again.

Test the Bill Validator

1. Insert a \$1 bill into the validator.
2. Push the coin return button.
 - THE BILL VALIDATOR IS IN THE ESCROW MODE** - No money is returned - you must make a selection in order to receive any change. Go to step 3.
 - THE BILL VALIDATOR IS NOT IN THE ESCROW MODE** - You should receive four quarters in change. Go to step 3.
3. Make a selection. The correct selection should be vended and correct change should be returned.

Section 7: Programming Intro

Some setup, test, and maintenance operations are computer controlled. The control panel switches and the selection panel switches regulate these operations.



The Keypad

During vending, customers use the keypad to make selections. When you pull the door switch to the ON position, the keypad becomes your programming input device.

Special Programming Keys

Press this key to move from one function to another.

From within a function, press once to return to the beginning of the function; press and hold to return to the standby message.

* Press this key to move from one function to another.

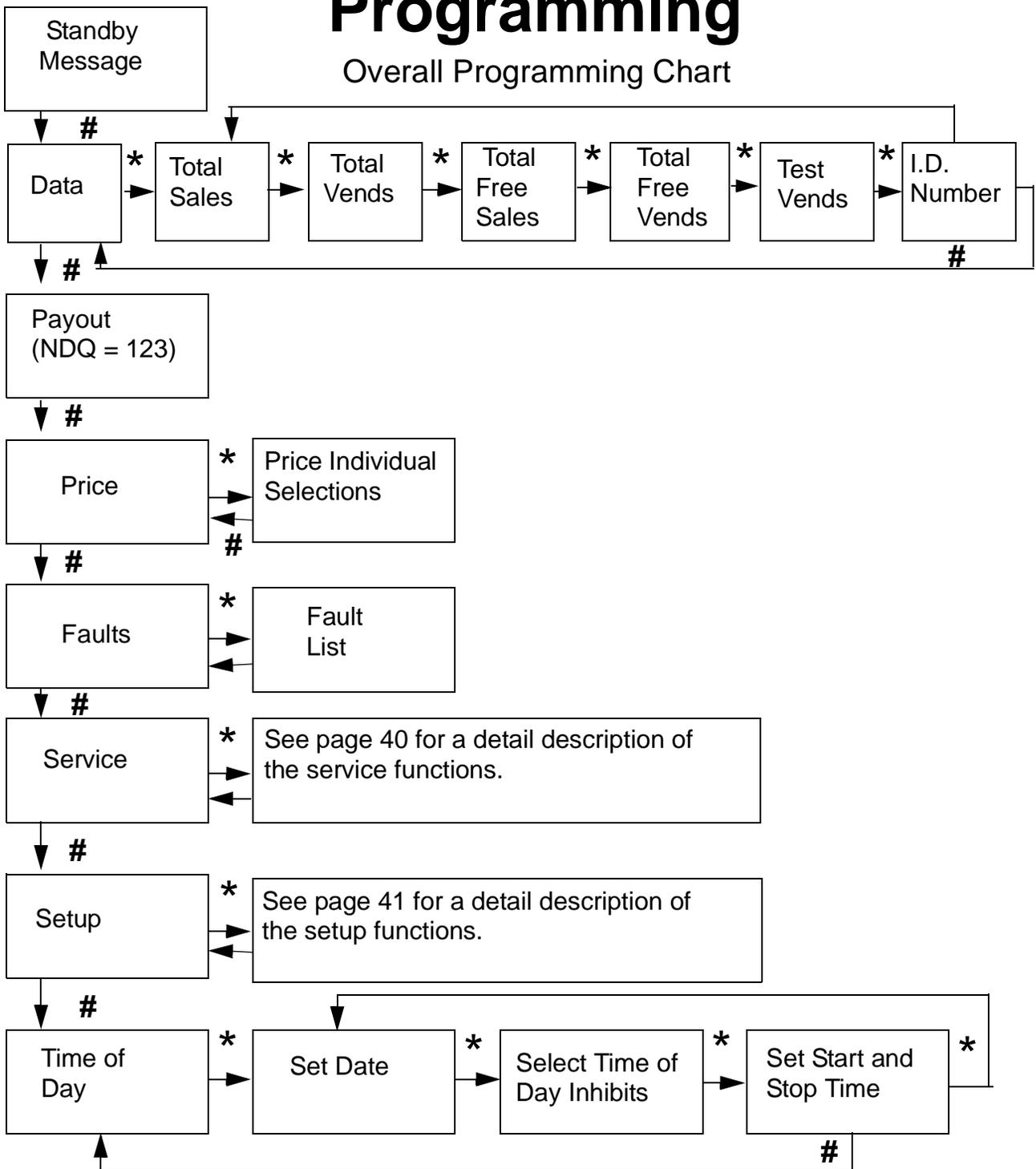
From within a function, press once to return to the beginning of the function; press and hold to return to the standby message.

H This key allows you to switch between two or more choices.

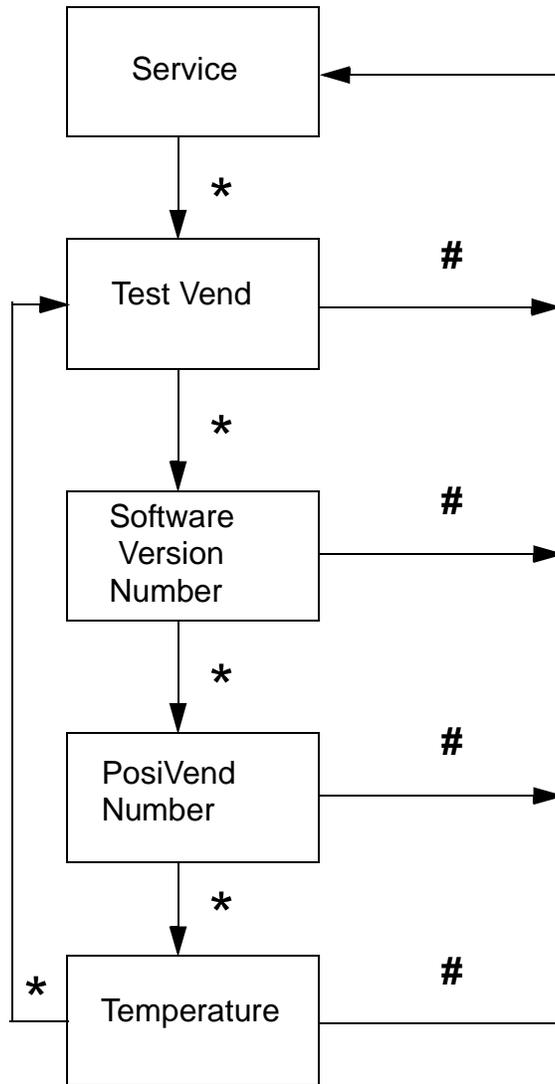
J This is the "action" key. It will start tests, fill the water tank, etc.

Programming

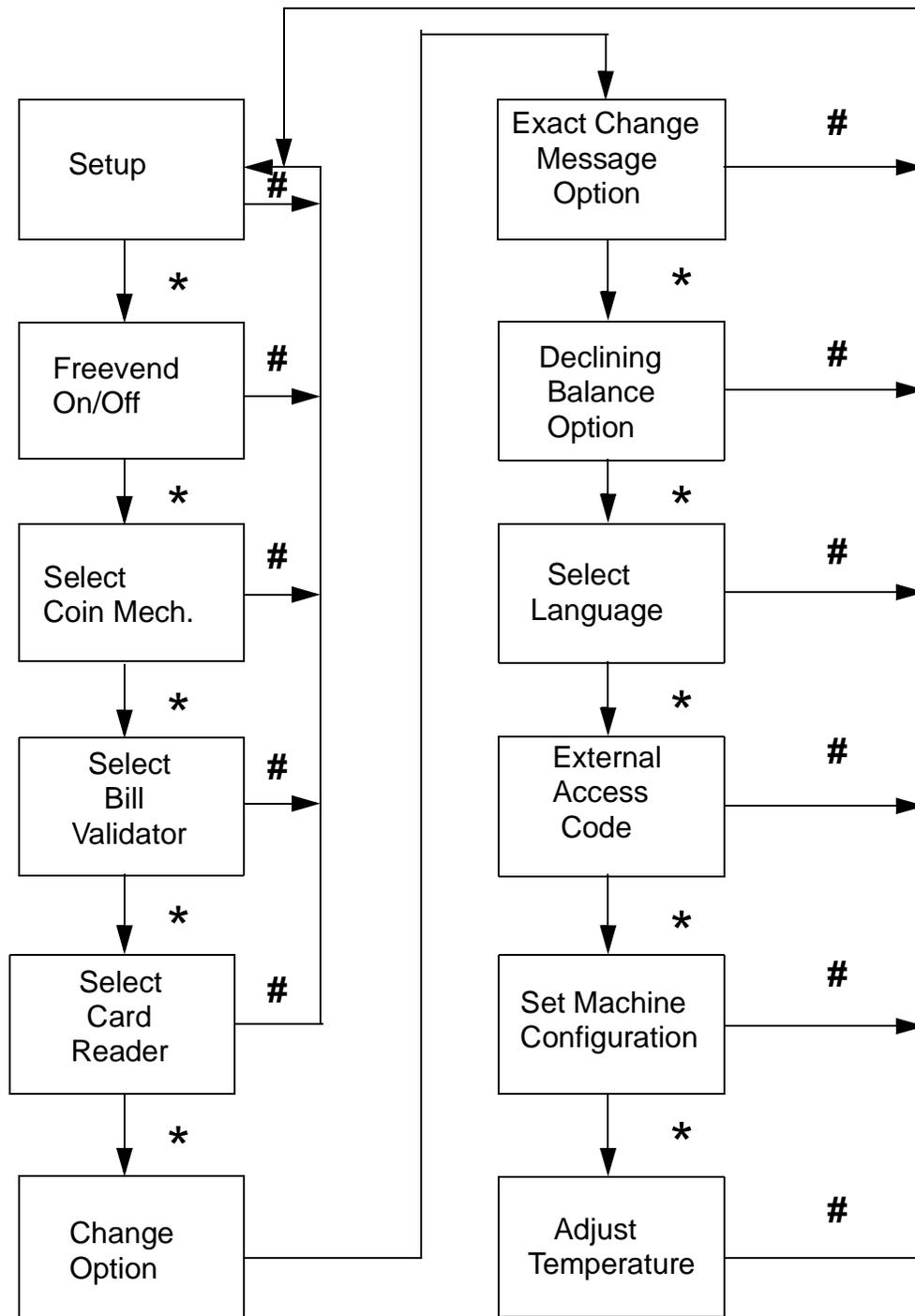
Overall Programming Chart



Service Flow Chart



SETUP FLOW CHART



Section 8: Programming Procedures

DATA

Data can be viewed by tray and also by individual selections. By following the steps below and then pressing the tray letter you can view the tray or by pushing the selection you can view the selection.

View several types of sales data:

Note:

All data is **not** resettable.

1. Pull out the door switch button to the ON position.
2. Press **#** until the display reads **Data**.
3. If you have the DEX option, press **J** to transfer data into your DEX unit.
4. Press *****. The display shows ****\$.00**. This is the dollar and cents amount of machine sales.
5. Press *****. The display shows **** 0**. This is the total count of all vends.
6. Press *****. The display shows **_0.XX**. This is the dollar and cents amount of free vend "sales". (Does not display if the total is zero.)
7. Press *****. The display shows **_0.XX**. This is the total count of free vends. (Does not display if the total is zero.)
8. Press *****. The display shows **TST XX**. This is the total count of test vends. (Does not display if the total is zero.)
9. Press *****. The display shows **I.D.00000000**. This is the machines id number, normally used in dex mode to identify the machine.
10. Press ***** to return to step 4, or press to exit.

PAYOUT (Does not apply to Machines with EXE coin mechanisms.)

Pay out coins:

1. Pull out the door switch button to the ON position.
2. Press **#** until the display shows **PAY = 1.2.3** (MDB mech.) This is telling you that pressing **1** pays out nickels, pressing **2** pays out dimes, and pressing **3** pays out quarters.
3. Press the appropriate key once to pay out one coin.
4. Press and hold the appropriate key to pay out coins continuously.
5. Press and hold the **#** to return to the standby message.

PRICE

Set prices for all the selections in your merchandiser:

The price display:

1. Pull out the door switch button to the ON position.
2. Press **#** until the display shows **PRICE**.
3. Press ***** and the display shows **A0 .XX**. "XX" is the price for the A0 selection.
4. Press ***** until the selection you want to price is displayed. **Note:** Only selections which are actual present in the machine can be accessed this way, except selection **H**, which can always be priced.

OR

Press the letter and number of the selection you want to price, and it will be displayed immediately. **Note:** All selections in the machine are accessible in this way.

5. Enter a new price with the number keys.

6. Repeat steps 4 and 5 until you have priced all the selections.

OR

7. Press **#** to return to the **PRICE** display, or hold **#** to exit.

FAULTS

Display all the active faults on your merchandiser:

1. Pull out the door switch button to the ON position.
2. Press **#** until the display shows **FAULTS**.
3. Press **⊗** to see the list of faults:

FAULT TABLE

NO ERRORS	There are no faults on the machine.
KEYPADXY	Key(s) "X" and "Y" are stuck.
ROMERROR	The EPROM is bad
RAMERROR	RAM is not initialized or is not compatible with the currently loaded software. If this message appears, initialize your RAM by performing the following procedure: NOTE: Initializing RAM will erase all your data and drink settings. Be sure you have written this information down before continuing. Press AND HOLD C You will see CLEARING in the display. Continue holding until two beeps are heard and the display shows FINISHED.
HC.ERR XX°F	The health control has been set. "XX°F" is the maximum temperature reached.
TEMP REF	The temperature reference on the main PCB cannot be read.
TEMP SNS	The temperature sensor cannot be read.
TEMP RANGE	The temperature sensor is out of range.
CHK DBV?	Problem with the bill validator.
MECH ERR	Problem with the coin mechanism.
NONE READY	Time of day inhibit is active, or all selections are out of service.

FAULT TABLE (CONTINUED)

CHKPRICE	Illegal price is detected.
CARDERR	Problem with the card reader.
EMPTY XX	Spiral "xx" failed to deliver after 3rd attempt.
FOOD XXX	The food door has failed.
POSI.VD X	If 1-9, a sensor is being blocked.
POSI.VD H	Gum and mint sensor blocked.
POSI.VD COMM.	There is a problem with communication, check harness.
POSI.VD OK	A problem previously has been corrected.
POSI.VD CAL	A high calibration is being reported. Press "H" to see sensor values.

When the first fault item (if any) repeats, you have seen all the faults.

When active faults exist, pulling the door switch will automatically display FAULTS.

4. Press **⊗** to see more faults, or **#** to exit.

SERVICE

Enter the service menu.

1. Press **#** until the display shows **Service**.
2. Press **⊗** . The display shows **TEST.00**. You can test vend selections. If you insert money into the machine, the zeroes in the display will be replaced by credit. After the vend is made you money will be returned.

Note:

You may make one more test vend
if you close the door while you are in the test vend mode.

3. Press **⊗** . The display shows **VER XXX.XX**. This is your current version of software in the machine.
4. Press **⊗** . The display shows **POSI XXX.XX**. This is you current PosiVend Software.

5. Press **⊗** . The display shows **XX°F**. You current temperature of the merchandiser is displayed.(Only if you merchandiser is refrigerated.)

SETUP

Configure various machine functions:

1. Pull out the door switch button to the ON position.
2. Press **#** until the display shows **Setup**.
3. Press **⊗** . The display shows either **FREE ALL** or **FREE OFF**. When **FREE ALL** is displayed, all selections are free. Press **H** to which between **ALL** and **OFF**.
4. Press **⊗** . The display shows either **DUMB MECH**, **MDB MECH**, **EXEC MECH**, or **NO MECH**. Press **H** to switch between these coin mech. options.
5. Press **⊗** . The display shows the bill validator choices. Press **H** to switch between the choices: **SER. 1.2.5.10.20** = A serial validator is installed. Press **1** , **2** , **5** , **6** , or **7** (respectively) to display the bill (s) which will be accepted.

or

MDB. 1.2.5.10.20 = An MDB validator is installed. Configure the validator as follows:

- Press **1** , **2** , **5** , **6** , or **7** (respectively) to display the bill (s) which will be accepted. For Example, the display shows **MDB. 1.2.5.10.20**. This means that the validator accepts \$1, \$2, \$5, \$10, and \$20 bills.
- Press **⊗** until the display shows **MDB. <*>**. This means the machine recognizes that an MDB bill validator which accepts non-standard bills or tokens is connected and operating.
- Press **J** to enter the list of bill(s) or tokens which will be accepted.
- Press **⊗** to scroll through the list that you set up earlier. Each bill in the list is displayed. For example, the display will show **5.00 ON** when the validator is told

to accept \$5.00 bills. When all bills have been displayed, the display shows the token screen: **TKN ON** or **TKN OFF**.

- Press **(H)** to turn a particular selection ON or OFF.
- Press **(#)** when you have completed the list. **MDB. <*>** will again be displayed.

or

PULSE DBV = A pulse validator is installed.

or

NO DBV = No bill validator installed.

6. Press **(*)**. The display shows either: **NO CARD** = no card reader is installed. **DUMB CARD** = A dumb (12 pin) card reader is installed, **MDB CARD** = An MDB card reader is installed. Press **(H)** to switch between the choices.

7. Press **(*)**. The display shows **CHANGE X.XX**. Change will be given for coins or bills up to this denomination without the customer having to make a selection. For example, if **1.00** is displayed, the machine will give the customer change for a dollar without requiring a selection. Entering **0.00** means that no change will be given.

8. Press **(*)**. The display shows: **LOW.MSG X.XX**. The customer will see **USE EXACT CHANGE** in the display when the amount of available change in the coin mechanism falls below the level you set for **X.XX**. Enter a value with the number keys. For example, if **LOW.MSG 1.00** is selected, the customer sees the **USE EXACT CHANGE** message when less than a dollar's worth of change is in the coin mechanism.

9. Press **(*)**. The display shows either: **DECLINE.ON** = More than one vend is allowed, with a declining balance. This means that the customer can choose multiple products until the amount of credit is lower than the lowest priced product in the machine.

or

DECLINE.OFF = A declining balance is not allowed. Press **(H)** to switch between these two choices.

10. Press **(*)** . The display shows either **ENGLISH, DEUTSCH, FRANCAIS, ESPANOL, PORTUGUES, SWEDISH, NEDERLANDS** or **FINNISH**. Press **(H)** to select the appropriate language for your display.

11. Press **(*)** . The display shows **NR 0000**. This feature is used to set a code in order to retrieve sales data from the outside of the machine. Use the number keys to enter a new code, if desired.

To view data from outside of the machine:

- Press **(*)** to view the total sales.
- Press **(*)** to view the total vends.
- You can also view by each tray by simply pushing the tray letter.
- Press **(*)** . The display shows the currently set machine configuration. **DO NOT**

CHANGE THIS CONFIGURATION UNLESS YOU KNOW IT IS INCORRECT!

Improper machine operation will result from an incorrect configuration setting. The possible configurations are:

CONF.0	= SNACK	Your machine is an all tray machine.
CNF.1	=CHLLD	Your machine is a chilled snack only.
CNF.2	=CAN	Your machine has a can module.
CNF.3	=CH.CAN	Your machine has a can module and the snack portion is chilled.
CNF.4	=FOOD	Your machine has a food module utilizing the health control.
7.=	OUTDOOR	Your machine has a refrigeration system with no health control.

- Press **(H)** to change the configuration.

12. Press **(*)** . The display shows **+/- +XX°F**. This is the currently set temperature for the merchandiser.

- Press **(H)** to change the display units from Fahrenheit to Celsius.

CONFIGURE DEX OPTIONS

1. Open the cabinet door and pull out the interlock switch.
2. Press **(#)** until the display reads **SETUP**.
3. Press **(D)** until one of the following is displayed:

- **DEX ONLY** -data remains in memory after it is downloaded into a data collection device
 - **DEX + CLR**-resettable data is cleared after it is downloaded into a data collection device
 - **DEX NR**-a special DEX option. All sales data will become non-resettable. Consult your DEX supplier before choosing this option.
4. Press **(H)** to toggle through the list and select the desired DEX option.
 5. Press **(X)** until one of the following displays:
 - **CA304=N.O.**-the value of bills in the stacker will be transmitted in a dollar count format. For example: 2 for two dollars.
 - **CA304=N.C.**-the value of bills in the stacker will be transmitted in a cash format. For example: 200 for two dollars.
 6. Press **(H)** to switch between the two.
 7. Press **(X)** until one of the following displays:
 - **LAST.VND.ON**-the DEX device will transmit the date and time of the last vend for each selection.
 - **LAST.VND.OFF**-the DEX device will NOT transmit the date and time of the last vend for each selection.
 8. Press **(H)** to switch between the two.

DOWNLOAD DEX DATA

1. Open the cabinet door and pull out the interlock switch.
2. The DEX connector is a round female stereo jack that hangs down from the controller card approximately behind the bill validator. Plug your data collection device into the connector (if available) or into connector J36 on the controller PCB.
3. Start the communication program on the data collection device.
4. Press **(#)** until the display shows **DATA**.
5. Press **(J)** to initiate the **DEX** data transfer.

Note: Some Dex devices will automatically download as soon as they are plugged in.

6. Press **(X)** to return to step 3, or **(#)** to exit.

TIME OF DAY FEATURE

You can set the clock and calendar features of your machine, as well as set up to four intervals during the day when the machine will be inactive.

1. Pull out the door switch button to the ON position.
2. Press **#** until the display shows **TIME HH.MM**. This is the currently set time, expressed in 24-hour format.
 - If desired, set the time using the number keys. Remember to express the time in 24-hour format: 2:00 pm = 14.00.
3. Press ***** . The display shows the current date: **MM/DD YY**. For example, 07/25 97 is July 25, 2004.
 - If desired, set the month, day, and year using the number keys.
 - To change to the European date format (DD-MM), press **H**. The display changes to 25-07 04. **Note:** That the slash (/) in the U.S. format is replaced by a dash (-) in the European format.
4. Press ***** . The display shows **INHIB 1 - 3 -**. This shows the number of active "time-of-day inhibit" periods. In this example, inhibit periods 1 and 3 are active. To turn on or off the inhibit periods, press the corresponding number key (1, 2, 3, or 4).
 - Press ***** . The display shows **1.STRT 10.00**. This is the start time of the first inhibit period, expressed in 24-hour time format. This example shows period #1 beginning at 10:00 am. If desired, enter a new start time using the number keys.
 - Press ***** . The display shows **1.STOP 14.00**. This is the stop time of the first inhibit period, expressed in 24-hour time format. This example shows period #1 ending at 2:00 pm. If desired, enter a new stop time using the number keys.

The machine will not vend between the hours of 10:00 am and 2:00 pm every day.

 - Press ***** . The display shows **3.STRT 0.00**. This is the start time of inhibit period #3. Notice that the display did not show inhibit period #2, since it was inactive (see step 4). This time period and any others are treated exactly the same as inhibit period #1.
5. Press ***** to return to step 2 or press **#** to exit.

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Defective parts will be repaired or replaced free of charge when the defective part is returned, with transportation charges prepaid by purchaser, to a destination designated by CRANE MERCHANDISING SYSTEMS.

This warranty does not include any cost of service rendered or repairs made by customer or its agents on Merchandiser, or parts, unless authorization to incur such expense has been given in writing by CRANE MERCHANDISING SYSTEMS prior to incurring such expense. This warranty covers labor and service charges performed by CRANE MERCHANDISING SYSTEMS service technicians for the first 90 days of ownership from date of shipment.

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