

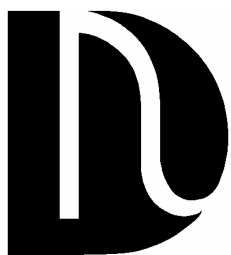
DIXIE-NARCO

SERVICE MANUAL SERIES 90 TWO/FOUR PRICE VENDERS

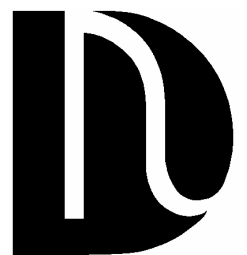
(With Vend/Cam-Hold/By-Pass Switches)

Beginning Serial# 0001-6000CO

April 1997



803,902,620.01



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GENERAL INFORMATION

VENDER SAFETY PRECAUTIONS

Please read this manual in its entirety. This service information is intended to be used by a qualified service technician, who is familiar with proper and safe procedures to be followed when repairing, replacing or adjusting any Dixie-Narco vender components. All repairs should be performed by a qualified service technician who is equipped with the proper tools. Use only genuine Dixie-Narco Factory replacement components.

Repairs and/or servicing attempted by untrained persons can result in hazards developing due to improper assembly or adjustments while performing such repairs. Persons not having the proper background may subject themselves to the risk of injury or electrical shock which can be serious or even fatal.

PRODUCT IDENTIFICATION

The age of Dixie-Narco products is determined by the date code incorporated in the serial number.

The vender serial number takes the form xxxx-yyyzzz. The first 4 digits (xxxx) identify the specific vender. The next 4 digits (yyyy) identify the manufacturing run that the vender was built in. The last two alpha characters (zz) identify the quarter and the year the vender was built. The first alpha character identifies the quarter:

A = 1st quarter
B = 2nd quarter
C = 3rd quarter
D = 4th quarter

The second alpha-character identifies the year:

O = 1990	U = 1996
P = 1991	V = 1997
Q = 1992	W = 1998
R = 1993	X = 1999
S = 1994	Y = 2000
T = 1995	

INSTALLATION / SET-UP / **GENERAL MAINTENANCE** **SERIES 90 CAN & BOTTLE VENDER**

RECEIVING INSPECTION

Upon receipt, inspect the vender for shipping damage. If there is any damage, have the driver note the damage on the Bill of Lading and notify Dixie-Narco. Although the terms of the vender sale require that the consignee originate shipping damage claims, Dixie-Narco will gladly help if you must file a claim.

UNPACKING THE VENDERS

Remove the stretch wrap and top cover from the vender. If flavor cards were shipped with your vender they will be in an envelope affixed to the back of a vender in the shipment or in the cash box.

NOTE

DO NOT STORE THE VENDER OUTSIDE WITH THE STRETCH WRAP ON. THIS COULD CAUSE THE STRETCH WRAP TO BOND TO THE VENDER'S SURFACE, WHICH COULD DAMAGE THE FINISH.

Remove the shipping boards from the bottom of the vender. The shipping boards are attached by the leveling legs. Remove the shipping boards by **unscrewing** the leveling legs. This will avoid unnecessary damage to the leveling legs or the base. A 1½ inch "socket type" wrench should be used on the bottom of the leveling legs. Be sure to replace the legs after removing the shipping boards.

To open the vender, locate the door lock keys which are secured inside the coin return cup. After unlocking the door, rotate the "T"-handle counter-clockwise until the door can be opened. Once inside, check the coin box on the door for any additional parts, pricing labels, or information concerning factory equipped accessories. Check the "T"-handle for proper alignment and locking functions. Check the lamps for proper installation.

WARNING!



Ensure that power is disconnected from the vender or that the power interrupt switch (if provided) is not defeated before inspecting or replacing the lamps. Failure to comply with these instructions may subject the user to the risk of injury or electrical shock, which can be serious or fatal.

ELECTRIC POWER NEEDED

Refer to the vender serial number plate to determine the proper voltage and frequency the machine requires (domestically this requirement is 115 Volts, 60 Hertz). Domestic venders will operate properly at +/- 10% of the specified voltage. For domestic models this is between 103 volts and 127 volts. Single phase, alternating current is required. The vender must be plugged in its own properly rated circuit with its own circuit protection (fuse/circuit breaker).

DO NOT USE AN EXTENSION CORD.

GROUND THE VENDER

The vender is equipped with a three wire power supply cord and MUST be plugged in a properly grounded outlet.

DO NOT REMOVE THE GROUND PIN OR IN ANY WAY BYPASS THE GROUNDING OF THE VENDER

If the outlet will not accept the power cord plug, contact an electrician to install a proper AC outlet.

WARNING!



Failure to comply with these instructions may subject the user to the risk of injury or electrical shock, which can be serious or fatal.

COIN CHANGERS AND OTHER ACCESSORIES

The Series 90 vender must have a 115 Volt 2/4 Price Coin Changer installed. Some styles can have a bill acceptor installed. If the coin changer and other accessories are not factory installed refer to the instructions received from the manufacturer of the coin changer and other accessories for proper set-up and installation.

INSTALLING A COIN CHANGER

Open the main door. Hang the coin changer on its mounting plate and secure it by tightening the three securing screws in the vender. Set the vend prices according to the manufacturer's instructions. Plug the coin changer in the 8-pin Jones socket in the vender. Manually load all the coin changer tubes with at least ten coins each and "prime" the coin changer by making one correct change transaction.

BILL ACCEPTORS

Note: If a bill acceptor is not factory installed a bill acceptor interface harness may be required. Contact the bill acceptor manufacturer or Dixie-Narco for interfacing information.

PLACING THE VENDER ON LOCATION

CAUTION!

DO NOT TRANSPORT THE VENDER TO OR FROM THE LOCATION WHEN IT IS LOADED WITH PRODUCT; DAMAGE TO THE VENDER MAY RESULT.

The vender must be located on a solid, flat, and level surface. The vender must be positioned close enough to an electrical outlet that an extension cord is not required. If securing the vender to the floor or wall is required, call the Dixie-Narco Factory Service Department or your Dixie-Narco Representative for suggestions.

LEVEL THE VENDER

Level the vender. When the vender is level the door can be opened to any position and it will not move by itself. Open the door to several different positions before deciding the vender is level. A carpenter's level will help verify that the machine is level.

Make sure that all of the leveling legs are in contact with the floor. If you cannot level the vender, select another location. Do not place any objects under the machine.

DANGER!

The vender must be properly located and leveled to minimize the risk of injury or death from tipping in the event of user misuse or vandalism.

SPACE THE VENDER

Do not block the rear of the vender. Keep the vender 4 inches (10 cm) from the wall to insure adequate airflow to the condenser and compressor. At the front of the vender, make sure that nothing obstructs the air intake at the bottom of the main door. At the rear of the vender, make sure nothing obstructs the air exhaust at the bottom of the cabinet.

INITIAL LOADING

Oscillators must be in the extreme left or right position to insure proper loading. When loading wide columns, the first row of cans should be loaded on the bottom bar of the oscillator. The second row of cans must be loaded on the top bar of the oscillator. Rotors must be in the "cup" position to receive the first cans. When loading narrow columns lay the rows in the column until the column is full.

Do not fill the columns to the top of the cabinet. Allow about 3 inches (7.6 cm) at the top of the column because the can stack will move up and down in the column during the vend cycle. Correct loading will prevent service calls and insure proper vending.

After loading a vender for the first time, test vend each selection with money until the first can is delivered. This will ensure that the vender is loaded and working properly.

NOTE: TO INSURE PROPER AIR FLOW THROUGH THE EVAPORATOR, DO NOT PLACE CANS (OR OTHER FOREIGN OBJECTS) IN THE BOTTOM OF THE TANK.

INSTALLING FLAVOR CARDS

The flavor cards may be inserted one of two ways: 1) in the select buttons, or 2) in the flavor card carrier.

- 1.) Swing the coin changer mounting plate away from the outer door, exposing the back of the select buttons. The flavor cards are inserted in the back of the select buttons from either side. Ensure the flavor cards are placed in the select buttons that correspond to the column in which the product is loaded.

- 2.) Swing the coin changer mounting plate away from the outer door, exposing the back of the select panel. Remove the flavor card carrier. Ensure the flavor cards are placed in the select button flavor card carrier position that corresponds to the column in which the product is loaded. Install the flavor card carrier back into position.

CLEANING THE VENDER

WHAT TO CLEAN



DO NOT USE A WATER JET OR NOZZLE TO CLEAN THE VENDER.

SIGN FACE

The polycarbonate sign face requires proper cleaning to prolong the service life of this item. It is recommended that you periodically clean the sign face as follows:

1. Rinse the sign with a soft cloth or sponge soaked in warm water.
2. If necessary, use a mild soap to loosen any dirt or grime. To prevent damage, **DO NOT SCRUB** or use a brush or squeegee, as some signs have a clear ultraviolet resistant coating to prevent yellowing.
3. Repeat the above steps as necessary, then dry using a soft cloth to prevent spotting.

CABINET

1. Wash the cabinet with a good detergent or soap mixed in warm water.
2. Wax the vender often with a good grade of automobile wax.
3. Any corrosion inside the vender should be removed with fine steel wool and the area should be painted with aluminum paint.
4. Repair any scratches on painted surfaces to prevent corrosion.

WARNING!



THE COMPRESSOR ELECTRICAL CIRCUIT IS ALWAYS LIVE WHEN THE PLUG IS CONNECTED TO AN ELECTRICAL OUTLET.

REFRIGERATION CONDENSER

1. Check the condenser periodically for dirt or lint build up.
2. Remove the build up with a brush or vacuum, or blow the dirt out of the condenser with compressed air and approved safety nozzle.
3. Ensure nothing obstructs air intake at the bottom of the main door.
4. Ensure nothing obstructs air exhaust at the rear of the cabinet.

COIN ACCEPTOR

Follow the Coin Acceptor Manufacturer's instructions.

LUBRICATING THE VENDER

The vender refrigeration system does not require any field lubrication. The hermetic refrigeration system and fan motors are manufactured with lifetime lubrication.

<i>TIME</i>	<i>COMPONENT</i>	<i>LUBRICANT EXAMPLE</i>
Every 6 Months (or as needed)	Main Door 1. Lock Bolt & Nut Retainer 2. Hinge Pivot Points	Mechanics Friend
	Inner Door 1. Hinge Pivot Points	Mechanics Friend
Every Year (or as needed)	Inner Door 1. Door Gasket	Petroleum Jelly

TEMPERATURE CONTROL ADJUSTMENTS

Adjustment #1 - Temperature Adjustment

Turn the adjustment clockwise for colder product and counter-clockwise for warmer product. This will change the cut-out temperature only, the cut-in temperature remains constant.

Adjustment #2 - Altitude Adjustment

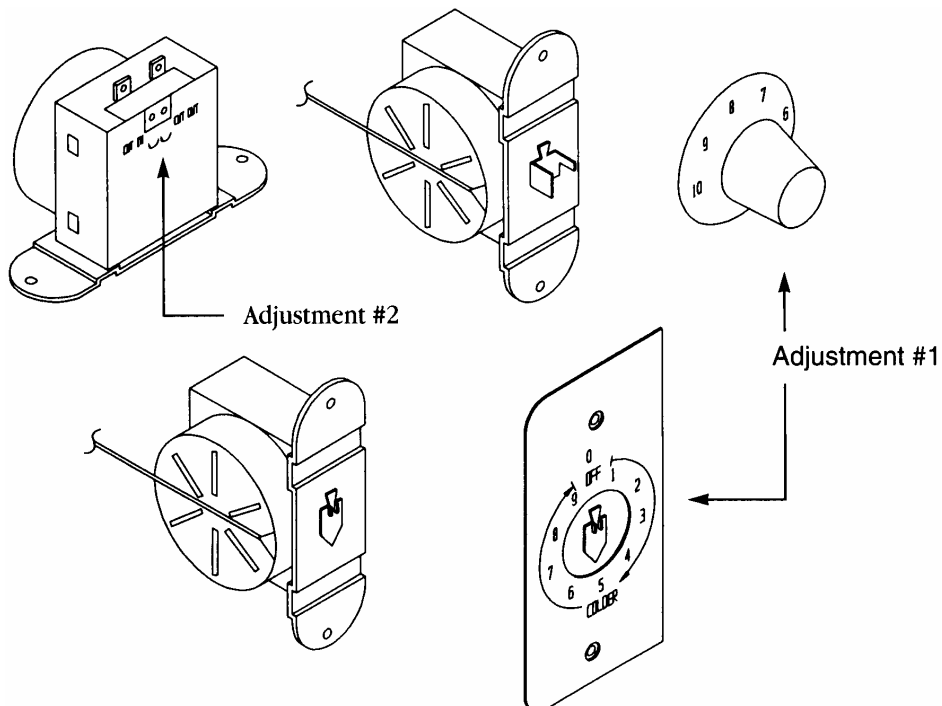


WARNING

DISCONNECT POWER TO THE VENDING MACHINE BEFORE PROCEEDING WITH THIS ADJUSTMENT.

The control is factory set for an altitude of 152 M (500 ft.). For higher altitudes, adjust the inside range screws to prevent freeze-up of the product. Adjust the inside range screws as follows.

ALTITUDE		CUTLER-HAMMER 9531N272
Meters	Feet	Turn both screws counter clockwise
610	2,000	1/8 Turn
1219	4,000	1/4 Turn
1829	6,000	1/2 Turn
2438	8,000	5/8 Turn

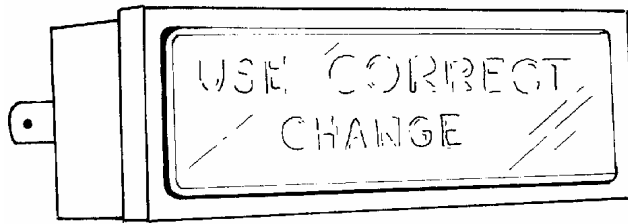


CHECK IT OUT

WHAT TO DO	WHAT SHOULD HAPPEN
<p>Plug the power cord in.</p>	<p>The compressor, condenser fan, and evaporator fan run, "Use Correct Change" window lights and "Sold Out" lamps light. The fluorescent tubes light.</p>
<p>Load at least six beverages in each column.</p>	<p>Sold out lights go off.</p>
<p>Close the vender door, put in correct change, and push a select button.</p>	<p>Product is dispensed and delivered.</p>
<p>If a dollar bill validator is used: Load the changer with at least 10 quarters, 10 dimes, and 10 nickels. Prime the coin changer, insert \$1 bill in the validator.</p>	<p>Correct change is paid back.</p>
<p>Push a select button.</p>	<p>Product is dispensed and delivered.</p>
<p>Once the vender is placed on location, load the changer money tubes. Fully load the vender with product and allow it to run overnight.</p>	<p>Return to the vender the next day and vend a product from each column. A cold product is dispensed from each column and correct change is returned. The first product vended has a temperature of 0⁰ C (32⁰ F) to 1⁰ C (34⁰ F).</p>

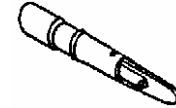
ELECTRICAL PARTS AND FUNCTIONS

CORRECT CHANGE LAMP



Correct Change Lamp
904,700,180.31
(English)

OR

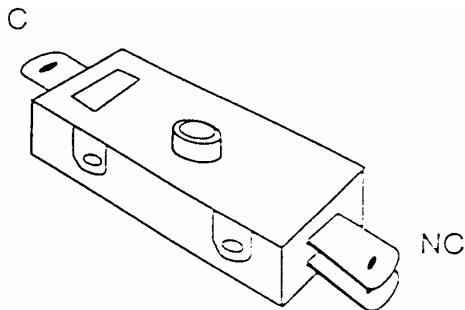


Correct Change Lamp
804,700,540.21
(125 VAC)

The Correct Change Lamp is mounted in the Coin Insert Casting.

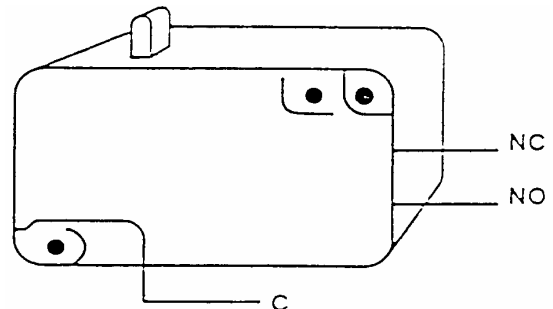
The Correct Change Lamp is controlled by the Coin Changer and is "OFF" when coins are in the tubes of the coin changer.

SELECT SWITCH



804,100,510.01

OR



Select Switch
804,100,710.21

The Select Switch is located in the Select Panel behind the press button and is secured with two (2) screws.

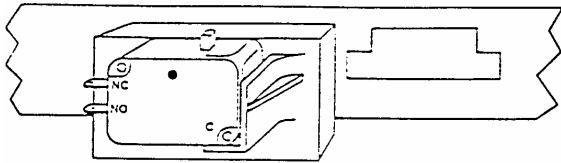
The Normally Closed contact of the Select Switch is in the Select Panel Circuit.

The Normally Open contact of the Select Switch is in the Sold-Out Lamp and Vend Motor Coil Circuits. When a Select Button is pressed, the Normally Open contact closes and completes the Sold-Out Lamp Circuit and the Vend Motor Coil Circuit.

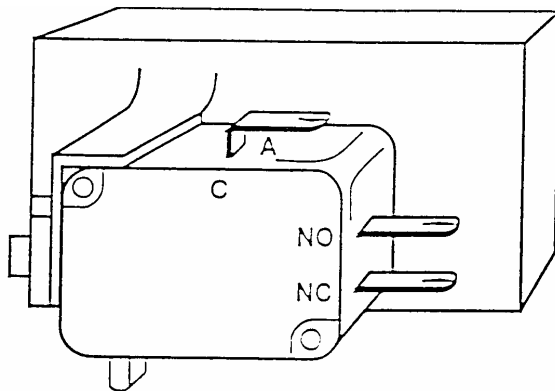
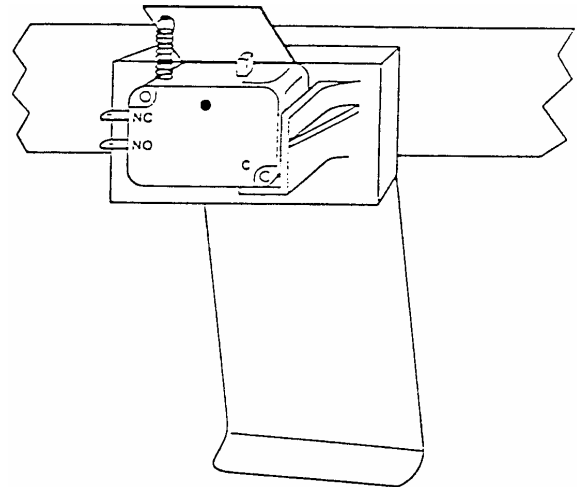
SOLD OUT SWITCHES (2 in a cluster)

The Sold-Out Switch Cluster is located on the Front Mechanism Plate under the Vend Motor Cover.

The Sold-Out Switches are the "snap-in" type. To install, place the switch in position over the opening, push in and at the same time slide to the right.



Sold-Out Switch Cluster
804,100,910.01



SOLD-OUT SWITCH CLUSTER

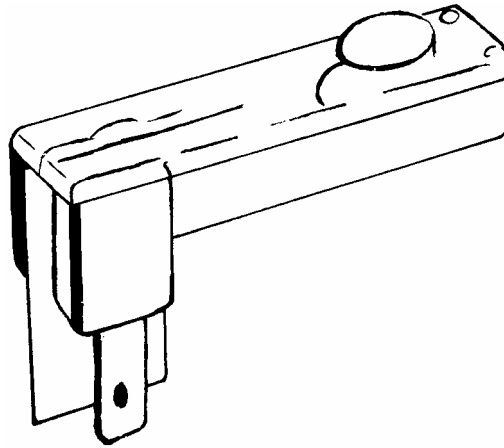
A) **Front Sold Out Switch (one per column)**

- The Common terminal of the front Sold-Out Switch receives power from the Vend Motor Switch Circuit.
- The Normally Closed contact of the front Sold-Out Switch is in the Coin Changer Inhibit Circuit. This Normally Closed contact (kept closed by can or bottle) is in parallel with all the other Normally Closed contacts of the Front Sold-Out Switches and when all are open, the Coin Changer will not accept coins.
- The Normally Open contact of the front Sold Out Switch is in the Sold-Out Lamp Circuit. The Normally open contact illuminates the Sold-Out Lamp when a column is empty of product.

B) **Vend Sold Out Switch (one for each vending circuit)**

- The Normally Closed contact of the Vend Sold Out Switch is in the Vend Motor Circuit. This Normally Closed contact (held closed by can or bottle) stays closed in the Vend Motor Circuit so the Vend Motor Circuit can be completed.
- The Normally Open contact of the Vend Sold Out Switch has no function.

SOLD OUT LAMPS

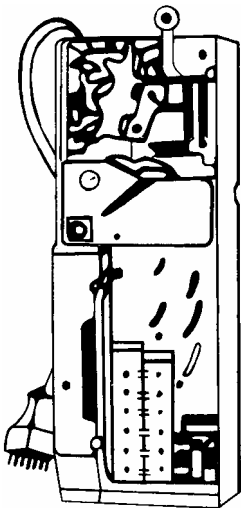


Sold-Out Lamp
804,700,510.01

The Sold-Out Lamps (one for each vending circuit) are secured to the back or to the Select Buttons in the Selector Panel.

The Sold-Out Lamp is turned on by the closing of the Normally Open contact of the Vend Sold-Out Switch.

COIN CHANGER



Coin Changer

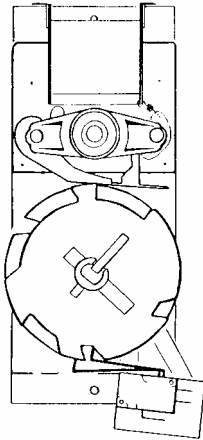
There are Coin Changers available which contain either two or four circuits to enable the vender to operate with two or four different priced items.

Inside the Coin Changer are circuits called Price Lines. The Price Lines are in the Vend Motor Circuits and complete the Vend Motor Circuits so that a selection can be made.

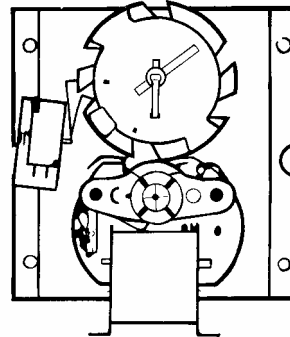
The Price Lines are connected to the vender through the Changer Socket which is a part of the Vender Wiring Harness.

Four Price Coin Changer	
Price Line #	Changer Socket Pin #
1	3
2	4
3	7
4	8
Two Price Coin Changer	
Price Line #	Changer Socket Pin #
1	3
2	4

VEND MOTOR



For Narrow Column



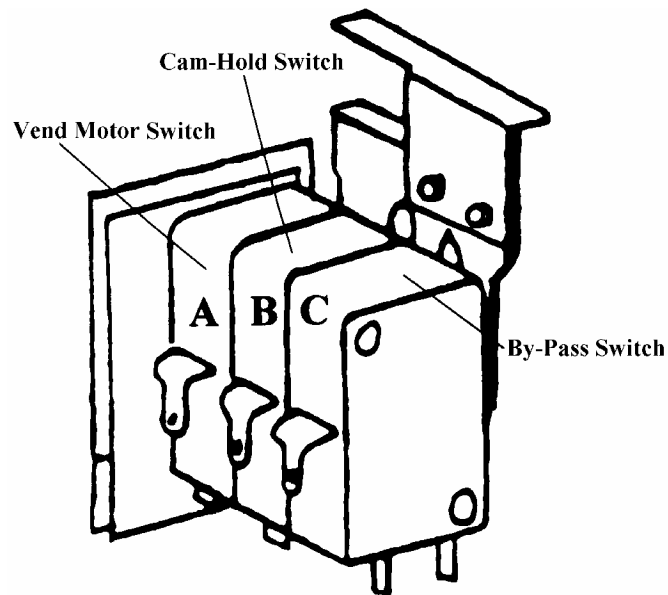
For Wide Column

The Vend Motor (one for each vending stack) is mounted on a bracket on the Front Mechanism Plate.

The Vend Motor is in the Vend Motor Coil Circuit. The Vend Motor runs when a select button is pushed. The Normally Open contact of the Select Switch closes and completes the Vend Motor Coil Circuit. The Vend Motor continues to run through the Normally Open contact (closed by the Vending Cam) of the Vend Motor Switch. The Vend Motor stops when the Vend Motor Switch arm drops off the high side of the Vend Motor Cam, and the Normally Open contact of the Vend Motor Switch opens.

CLUSTER (TRIPLE) SWITCH

The Vend Motor, Cam-Hold, and the By-Pass Switches are secured together to make the Cluster (Triple) Switch. The Cluster (Triple) Switch, one per Vend Motor, is located on the Vend Motor Assembly and secured by two screws.



A) Vend Motor Switch

- The Normally Open contact of the Vend Motor Switch is in the Vend Motor Coil Circuit. This contact closes to keep the Vend Motor operating until the arm of the Vend Motor Switch drops off the high side of the Vending Cam at the end of the Vend Cycle.
- The Normally Closed contact of the Vend Motor Switch is in series with all the other Normally Closed contacts of the Vend Motor Switches to send power to the next Vend Motor Switch to its right and on to the Coin Changer Inhibit Circuit.

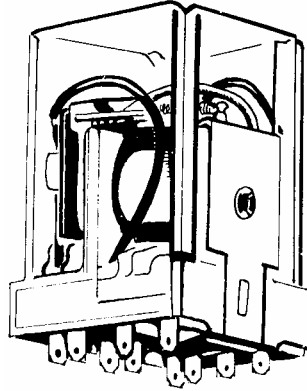
B) Cam-Hold Switch

- The Normally Open contact of the Cam-Hold Switch is in the Coin Changer Inhibit Circuit and is in series with the other Normally Open contacts of the Cam-Hold Switches. This contact opens and cancels credit when the arm of the Cam-Hold Switch drops off the high side of the Vending Cam.
- The Normally Closed contact of the Cam-Hold Switch is in the Vend Motor Coil Circuit. This contact supplies power to run the Vend Motor while both the Vend Motor Switch and the Cam-Hold Switch arms are in the notch of the Vend Cam.

C) By-Pass Switch

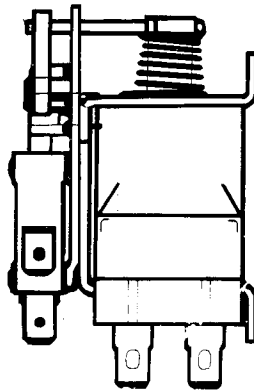
- The Normally Open contact of the By-Pass Switch forms a circuit around Vend Motor Switch to keep the Coin Changer Inhibit Circuit closed if the Vend Motor stops while the arm of the Vend Motor Switch is on high cam. This ensures that all other vending circuits are operative.
- The Normally Closed contact of the By-Pass Switch is in the Counter circuit. Shortly after the beginning of the vending cycle, the arm of the By-Pass Switch drops off the high side of the Vending Cam. At this time the Normally Closed contact closes, sending current to the Counter.

VEND RELAY



The Vend Relay is not used in Two/Four Price venders.
The Vend Relay Function is an integral part of the Coin Changer itself.

SEQUENCE RELAY (Not on all Venders)



The Sequence Relay, if used, is located on a bracket adjacent to the Vend Relay Socket on the main door and is secured with two screws.
When a credit is set up by the Coin Changer and Select Switch #1 is pressed, the Normally Open contact of Select Switch #1 completes the Sequence Relay Coil Circuit.

VEND MOTOR WIDE COLUMN

Mounted on the Vender with the Cluster (Triple) Switch on the left side (See Fig. 3). The Linkage and Drive Arm assembly is used to connect the Vend Motor to the Oscillator. (See Fig. 4)

Cluster (Triple) Switch
804,100,700.01 - 2/4 Price

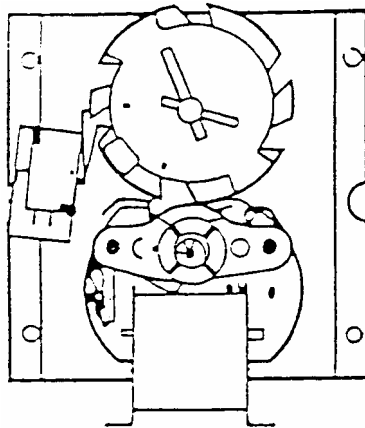


Fig. 3

Vend Motor - Wide Column - 2/4 Price
491,170,100.13 - 1 1/4" Deeper
497,170,100.13 - T-Models
Not Available At Print - E-Models

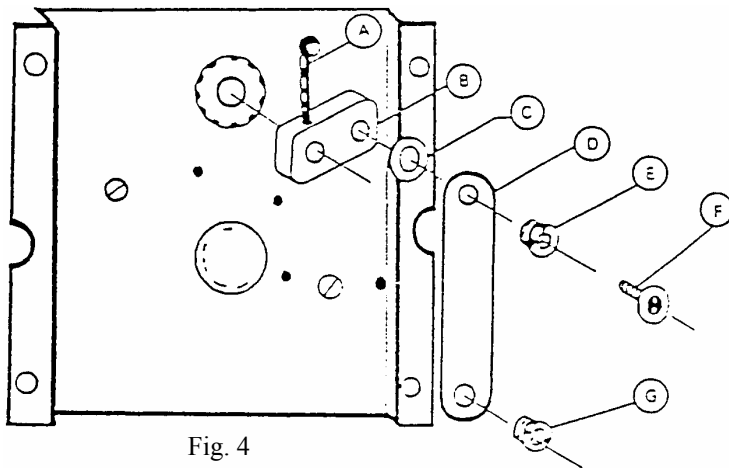


Fig. 4

OLD STYLE

A. Drive Pin	900,901,940.41
B. Drive Arm, Zinc	801,200,950.91
C. Washer	900,700,600.01
D. Linkage Arm, Zinc	801,201,030.01
E. Nyliner (Top)	901,803,160.01
F. Sems Screw	900,301,640.01
G. Nyliner (Bottom)	901,804,770.01

NEW PLASTIC STYLE

B. Drive Arm (Plastic)	801,806,160.21
D. Linkage Arm (Plastic)	801,806,170.01
F. Sems Phil Pan Screw	900,303,090.01

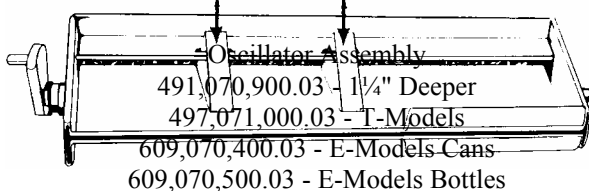
E-MODELS

B. Drive Arm (Zinc)	801,200,950.91
D. Linkage Arm (Zinc)	801,201,030.01
F. Truss Screw	900,303,180.01

Nyliner (Rear Stack)
801,803,170.01

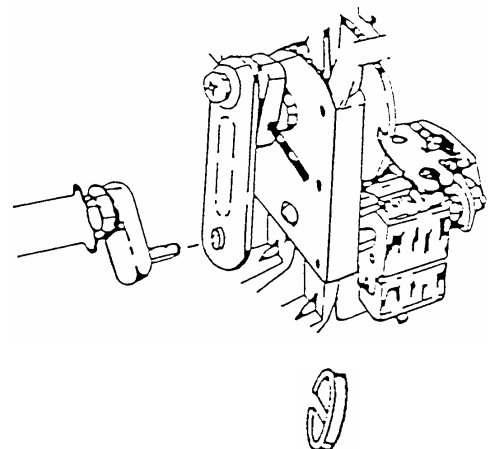


Can Retainer
801,807,870.21



Oscillator Assembly
491,070,900.03 - 1 1/4" Deeper
497,071,000.03 - T-Models

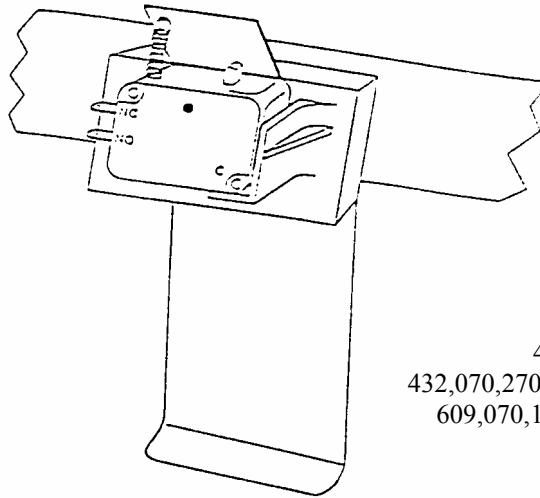
609,070,400.03 - E-Models Cans
609,070,500.03 - E-Models Bottles



Nyliner (front stack)
901,804,230.01

Sold-Out Spring
901,700,740.01

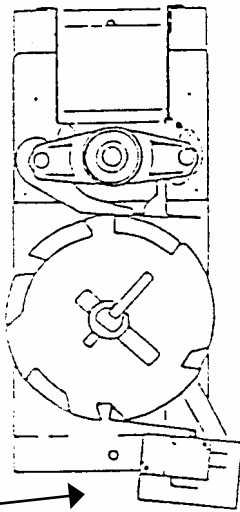
Sold-Out Switch Assy. Snap In
804,100,680.51 - 2/4 Price
(Insulator & Switch are one piece)



Sold-Out Paddle
Wide and Narrow
432,070,190.23 - Standard
432,070,270.03 - Large Product Special Use Only
609,070,190.03 - E-Model Special Use Only

VEND MOTOR NARROW COLUMN

Mounted on the Vender with the Cluster (Triple) Switches on the underside (See Fig. 1). The shaft of the Vend Motor slides into a slot in the Vend Rotor (See Fig. 2).

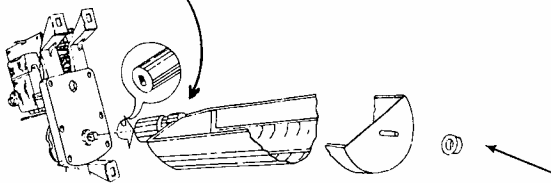


Vend Motor - Narrow Column (2/4 Price)
491,170,200.03 - 1 1/4" Deeper
497,170,200.03 - T-Models
Not Available At Print - E-Models

Cluster (Triple) Switch - 2/4 Price
804,100,700.01

Fig. 1

(No Nyliner Required)



Nyliner (Rear Stack)
#801,803,170.21

Vend Rotor
801,201,211.61 - 1 1/4" Deeper
801,201,230.01 - T-Model, Narrow
801,201,220.01 - T-Model, Wide
801,201,560.31 - E-Model

Fig. 2

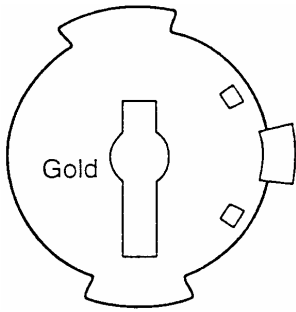
PRODUCT SHIMMING

Refer to the appropriate Technical Bulletin for proper set-up and vending procedures. Listed are a few of the more widely used Technical Bulletins relating to shimming.

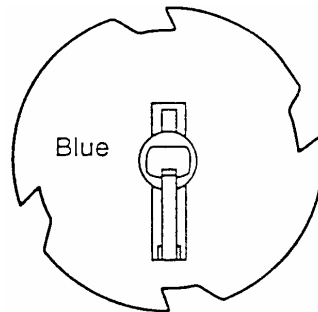
- TB 450 Miscellaneous Worldwide Can Shimming, Shimless Stack Series 90**
- TB 451 Miscellaneous Worldwide Plastic Bottle Shimming, T-Models**
- TB452 Miscellaneous Worldwide Non-Returnable Bottle Shimming, T-Models**
- TB 453 Miscellaneous Worldwide Plastic Bottle Shimming, Shimless Stack Series 90**
- TB 454 Miscellaneous Worldwide Non-Returnable Bottle Shimming, Shimless Stack Series 90**
- TB 455 Miscellaneous Worldwide Can Shimming, T-Models**
- TB 456 Miscellaneous Worldwide Returnable Bottle Shimming, Shimless Stack Series 90**
- TB 457 Miscellaneous Worldwide Returnable Bottle Shimming, Wide Stack Series 90**
- TB 473 Miscellaneous Worldwide Non-Returnable Bottle Shimming, Wide Stack Series 90**
- TB 474 Miscellaneous Worldwide Plastic Bottle Shimming, Wide Stack Series 90**
- TB 475 Miscellaneous Worldwide Can Shimming, Wide Stack Series 90**
- TB 476 Miscellaneous Worldwide Returnable Bottle Shimming, T-Models**

For shimming of venders or products not listed in the above Technical Bulletins, call the Dixie-Narco Service Department or contact your Dixie-Narco Representative.

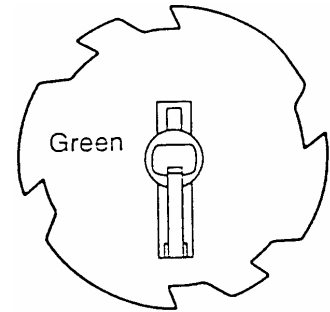
CAMS FOR VEND MOTORS



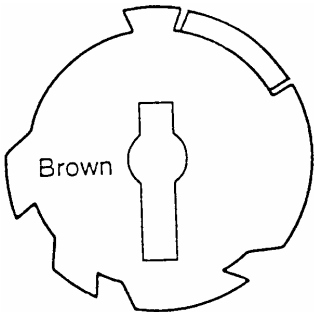
- 1. Adjustable Cam For:**
- a. DNCB 1/4" deeper wide column.
 - b. DNCB T-models single, double, or triple depth wide column.
 - c. Color of Cam is Gold.
 - d. Part #801,806,400.11



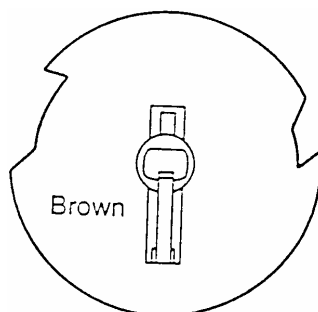
- 2. Vending Cam For:**
- a. DNCB 1/4" deeper single depth wide column.
 - b. DNCB T-models single depth wide column.
 - c. Color of Cam is Blue.
 - d. Part #801,806,390.11



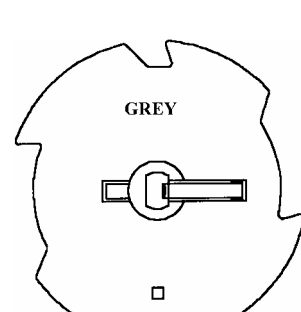
- 3. Vending Cam For:**
- a. DNCB T-models double or triple depth wide column.
 - b. Color of Cam is Green.
 - c. Part #801,806,410.01



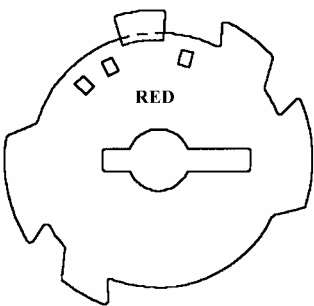
- 4. Adjustable Cam For:**
- a. DNCB 1/4" deeper narrow column.
 - b. DNCB T-models & E-models single, double, or triple depth narrow column.
 - c. Color of Cam is Brown.
 - d. Part #801,806,610.21



- 5. Vending Cam For:**
- a. DNCB 1/4" deeper narrow column.
 - b. DNCB T-models & E-models single, double or triple depth narrow column.
 - c. Color of Cam is Brown.
 - d. Part #801,806,180.21



- 6. Vending Cam For:**
- a. DNCB E-Models single, double, or triple depth wide column.
 - b. Color of Cam is Grey.
 - c. Part# 801,809,800.11



- 7. Adjustable Cam For:**
- a. DNCB E-Models single, double, or triple depth wide column.
 - b. Color of Cam is Red.
 - c. Part# 801,809,790.11

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CAM INSTALLATION AND REMOVAL

TO INSTALL A VENDING CAM:

1. Select the Vending Cam required (See page 21).
2. Locate the Hub at the center of the Cam (See Fig. 6).
3. With the Hub facing you, slowly slide the Cam on the front shaft of the Vend Motor while depressing the Lock Tab. (See fig. 6).
NOTE: See page 23 for timing of the Motors.
4. A distinct click will be heard, when the tab has locked into the locator hole of the Motor shaft.

CAUTION!

Depress the Switch Arm when installing the Cam to prevent possible damage to the Switch Arm.

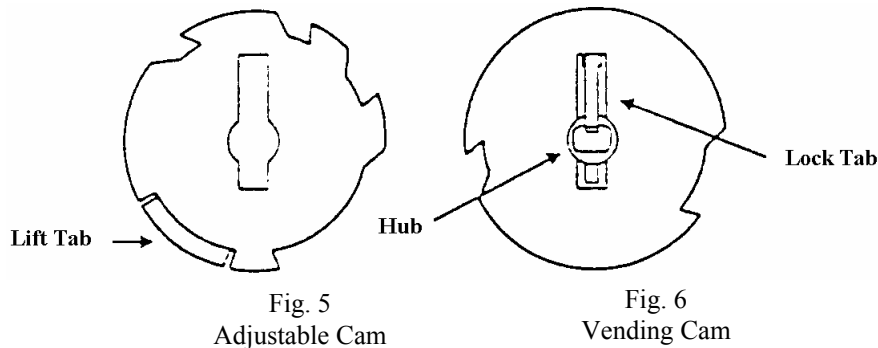
TO INSTALL AN ADJUSTABLE CAM:

1. Select the Adjustable Cam required. (See page 21).
2. Locate the Lift Tab on the outer edge of the Cam. (See fig. 5).
3. With the Lift Tab facing you, align the slot of the adjustable Cam with the Locking Tab of the vending Cam.
4. Place the Adjustable Cam on the Vending Cam.

CAUTION!

Depress the Switch Arm when installing the Cam to prevent possible damage to the Switch Arm.

5. Lift the Lock Tab of the Vending Cam, at the same time lift the Lift Tab of the Adjustable Cam and rotate the Adjustable Cam clockwise to the desired setting.



TO REMOVE AN ADJUSTABLE CAM:

1. Lift the Lift Tab and rotate the Adjustable Cam clockwise until the Vending Cam Lock Tab is aligned with the slot of the Adjustable Cam.
2. Remove the Adjustable Cam from the shaft of the Motor.

TO REMOVE THE VENDING CAM:

1. Depress (push in) the Lock Tab firmly to disengage it from the Motor shaft.
2. At the same time pull the Vending Cam towards you until it is removed from the Motor shaft.

TIMING

TO SET THE TIMING OF A NARROW COLUMN VEND MOTOR:

1. Make sure the hole through the rear shaft is in a horizontal plane. (If a pin were inserted in the hole, the pin would be horizontal.) See Fig. 8.
2. The Vend Rotor must be in the loading position when the Motor shaft is inserted in the end of the Rotor. See Fig. 8.
3. Insert the Motor shaft in the Rotor and secure the Motor.
4. Install the Vending Cam on the front shaft of the Motor making sure the Lock Tab is at the 9 o'clock position. See Fig 7.
5. Install the Adjustable Cam per the instructions given on page 22.

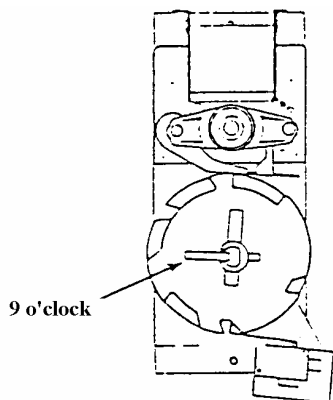


Fig. 7

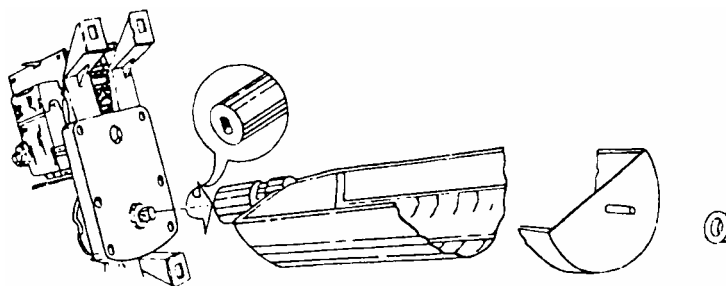


Fig. 8

TO SET THE TIMING OF A WIDE COLUMN VEND MOTOR.

1. Make sure the hole through the rear shaft is in a horizontal plane. (If a pin were inserted in the hole, the pin would be horizontal). See Fig 10.
2. Slide the Drive Arm (with linkage attached) on the rear shaft as shown. See Fig. 10.
3. Secure by installing the Groove Pin.
4. With the Oscillator in position, align the hole in the Linkage Arm with the pin of the Oscillator.
5. Slide the Linkage on the pin.
6. Install the Vending Cam on the front shaft of the Motor making sure that the Lock Tab is at 6 o'clock as shown. See Fig. 11.

NOTE: When the screw holding the Linkage Arm to the Drive Arm is at the 12 o'clock position (See Fig. 10), the Lock Tab will be at the 6 o'clock position (See Fig. 11).

7. Install the Adjustable Cam per the instructions on page 22 .

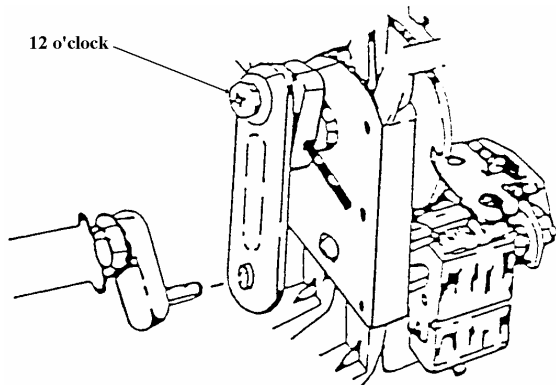


Fig. 10

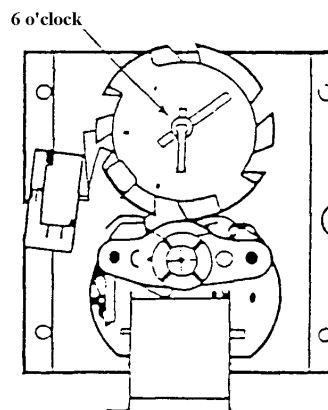
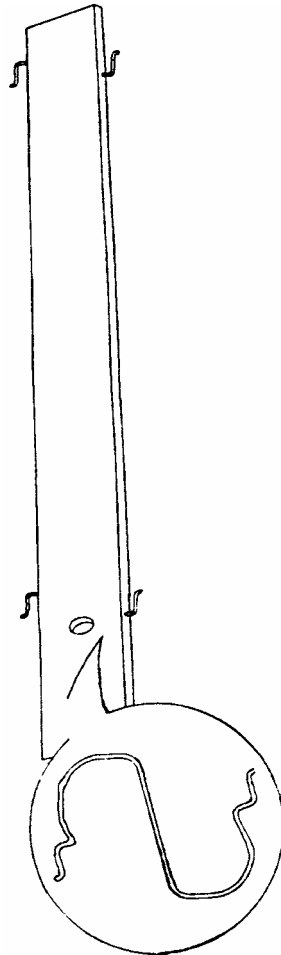


Fig. 11

REAR SPACER

The Rear Spacer, one for each column, is located vertically at the rear of the column. The Springs, adjustable by hand, slide into the holes in the column wall for cans and other package settings.



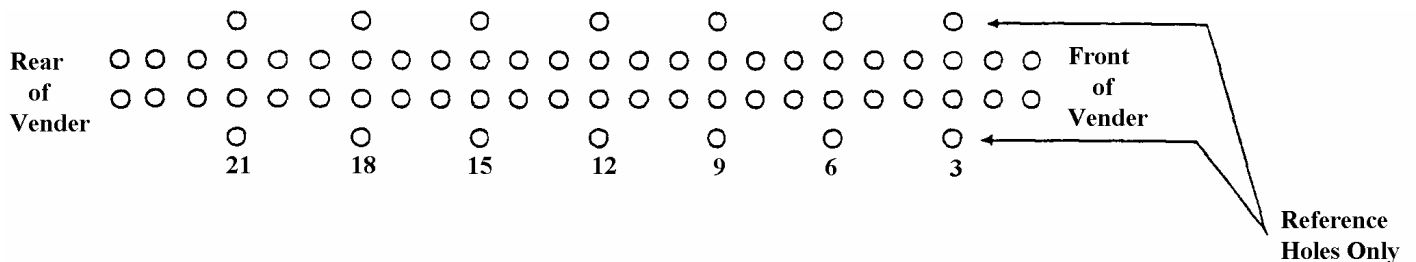
491,072,050.23 - Wide 79" Standard
 492,070,700.23 - Wide 72" Standard
 504,070,500.23 - Wide 56" Standard
 491,072,600.23 - Narrow 79" Standard
 492,070,800.23 - Narrow 72" Standard
 504,070,600.23 - Narrow 56" Standard

Rear Spacer Assemblies
 497,073,900.13 - Wide 600E
 497,074,000.13 - Wide 501E
 497,073,700.13 - Narrow 600E
 497,073,800.13 - Narrow 501E

497,073,100.23 - Wide 79" T-Models
 498,071,300.23 - Wide 72" T-Models
 497,073,200.23 - Narrow 79" T-Models
 498,071,400.23 - Narrow 72" T-Models

FOR REFERENCE ONLY

Rear Spacer adjustment holes located in the sidewalls of the stacks.



SEQUENCE OF OPERATION

VEND CYCLE - TWO/FOUR PRICE

Refer to the Wiring Diagrams on pages 38 and 39.

1.
 - A) Insert a coin to equal the vend price established for price line #1.
 - B) Coin travels in the Coin Changer.
2.
 - A) The coin...
 - B) activates the Coin Switch or Coin Sensor in the Coin Changer and...
3.
 - A) the Vend Relay inside the Coin Changer that controls Price Line #1 is energized and...
 - B) allows power to flow to the Select Switches on the Select Panel controlled by Price Line #1.
4.
 - A) A Select Button is pushed and the Normally Open contact in the Select Switch...
 - B) closes and completes the circuit to the Vend Motor coil. The Sold-Out Light illuminates. The Vend Motor begins to turn.
5.
 - A) A short time later, the arm of the By-Pass/Cam-Hold Switch drops in the notch of the Vend Cam and...
 - B) the Cam-Hold Switch goes in the Normally Closed condition opening the Inhibit circuit to the Coin Changer and closes the Vend Motor circuit.

The By-Pass switch goes in the Normally Closed condition, closing the Counter circuit.
6.
 - A) The open circuit to the Coin Changer Inhibit causes credit to be canceled in the Coin Changer...
 - B) removing power to the Select Panel of the vender.
7.
 - A) A short time later, the arm of the Vend Motor Switch rides to the high side of the Vend Cam.
 - B) The Vend Motor Switch goes in the Normally Open condition closing the main Vend Motor Circuit. The Vend Motor continues to run. The Sold-Out Lamp is illuminated.
8.
 - A) A short time later, the arm of the By-Pass/Cam-Hold Switch rides to the high side of the Vend Cam.
 - B) The Normally Open contacts of the By-Pass Switch again completes the By-Pass Circuit and the Normally Open contact of the Cam-Hold Switch closes to complete the Inhibit circuit allowing the coin changer to accept coins.
9.
 - A) The Vend Cam allows the arm of the Vend Motor Switch to drop in the notch of the Vend Cam.
10.
 - A) The Vend Motor and Sold-Out Lamp circuit is broken.
 - B) The Vend Motor stops running and the Sold-Out Lamp is no longer illuminated.
11.
 - A) The Normally Closed contact of the Vend Motor Switch closes.
 - B) We are back to the stand-by condition in the vender.

TROUBLESHOOTING

COMMON VENDING PROBLEMS TWO/FOUR PRICE VENDERS

Control Panel: Select Buttons and Select Switch locations are the same as Single Price Venders. It is important to remember the wiring and power to these Select Switches will be different because of the Four or Two different priced items available from these Select Switches. Refer to the Wiring Diagram on the inner door of the Vending Machine to determine the wiring of your vender.

1. Problem: Accepts coins and will not vend from one or more columns.
Troubleshooting:
 - A. Check vend price of item selected.
 - B. Refer to the Wiring Diagram on the Inner Door and verify the Select Switch(s) that are controlled by this vend price.
 - C. If all selections in this price line do not work, check the power to the first Select Switch in this series. (Remember the power must flow from the first Select Switch to the next Select Switch of this series.)
 - D. If the first Select Switch in this series is not defective, replace the Coin Changer. (The Coin Changer supplies power to the Select Switches in a Two/Four Price Vender.)

2. Problem: Accepts coins and will not vend from one column.
Troubleshooting:
 - A. Check the Normally Open contact of the Select Switch of the column that will not vend. (If the Sold-Out Lamp comes on when the button is pressed, the Select Switch is good.)
 - B. Check the Sold-Out Switch in the Vending Circuit.
 - C. Check the Vend Motor by depressing the Vend Motor Switch. If the Vend Motor runs the motor is good. (Remember, the power flows from the Coin Mechanism, to the Select Switch, to the Sold-Out Lamp, to the Sold-Out Switch, to the Vend Motor.)

3. Problem: Coin Mechanism rejects all good coins.
Troubleshooting:
 - A. Check all columns for product. The Sold-Out Lamps are off.
 - B. Check for proper voltage on pin #6 of the Coin Mechanism Socket. You should have about 110 VAC on pin #6. If there is no power on pin #6, a Cam-Hold Switch is defective in the series. To find the defective switch, run each motor by pressing the Vend Motor Switch and releasing as soon as the By-Pass/Cam-Hold Switch Arm falls into the notch. The motor that does not continue to run has the defective switch.
 - C. If you have power on pin #6 of the Coin Mechanism Socket, replace the Coin Mechanism.

4. Problem: The Vend Motor drifts, both switch arms drop in the notch and the Vend Motor keeps running.
- Troubleshooting:
- A. Check the Vend Motor switch. Replace the switch if it is defective.
 - B. Check the Vend Motor Switch Arm's relationship to the cam. If the arm is too close to the cam, bend the arm away from the cam slightly or replace the switch.
 - C. Check the (Brake) Pawl for looseness. (It should be loose and work freely.) Replace the Pawl if it is tight.
 - D. Check the (Brake) Pawl Spring. Replace the spring if it is elongated. Install the spring properly if it is off or missing.
 - E. Check the (Brake) Actuator to ensure it is loose and working freely. Clean the Stator if the actuator sticks to the stator due to syrup or dirt buildup. If the actuator is tight clean it at the pivot point. Replace the motor if it is still tight.
 - F. Check the two Brake Clutch projections. If the projections are broken replace the vend motor.
5. Problem: Two cans are delivered in a cycle and the next cycle is a dry vend (no cans delivered).
- Troubleshooting:
- A. Check the shimming to ensure it is correct.
 - B. Check the cam setting to ensure it is correct.
 - C. Check the oscillator or rotor is installed in the correct position.
6. Problem: Two cans are delivered in a cycle.
- Troubleshooting:
- A. Check the shimming to ensure it is correct.
 - B. Check the cam setting to ensure it is correct.
 - C. Check for a drifting motor by following the steps in problem 4.
7. Problem: Pre-Select condition exists. (i.e. Setup a credit and a product is automatically delivered - no select button is pushed.)
- Troubleshooting:
- A. Check if Select Switch is sticking, incorrectly wired, or defective. Replace the Select Switch if it is defective.
8. Problem: Free vend on one column. (i.e. Vender accepts coins and vends, then rejects coins but will vend again from the same selection)
- Troubleshooting:
- A. Check the By-Pass Switch and Vend Switch for sticking plunger, incorrect wiring, or defective switch. Replace Cluster Switch if either switch is defective.
9. Problem: Free vend on all columns. (i.e. Vender accepts coins and vends, then rejects coins but will vend again from any selection)
- Troubleshooting:
- A. Check the Coin Mechanism. Replace if defective.
 - B. Check for a pinched, mashed, or cut wire.
 - C. Remove power from vender and repair damaged wire.

***IF VENDER TROUBLESHOOTING PROCEDURES FAIL,
CONSULT THE DIXIE-NARCO FACTORY SERVICE.***

(800) 688-9090

or

(803) 266-5000

NOTE: HAVE THE VENDER MODEL# AND SERIAL# AVAILABLE.

REFRIGERATION

PARTS AND FUNCTIONS

MECHANICAL PARTS

COMPRESSOR MOTOR

The compressor motor (sealed in the compressor housing) drives the compressor with a shaft that is shared by both parts. It is started by the temperature control switch and the starting relay. It is stopped by the temperature control switch, and, if overloaded, by the thermal overload switch.

COMPRESSOR

The compressor (sealed in the compressor housing) is a pump which draws cold, low pressure refrigerant gas from the evaporator and pumps hot, high pressure refrigerant gas out to the condenser.

CONDENSER

The condenser, located in the base of the vender, at the front, takes heat out of the hot, high pressure gas that comes from the compressor. The gas loses heat as it goes through the condenser coils, and changes into a liquid because it is still under pressure.

CONDENSER FAN

The condenser fan (between the condenser and the compressor motor), first draws air from the outside of the vender through the condenser. This air takes heat from the condenser first and then is blown over the compressor housing from which it also takes heat before going back outside of the vender. The condenser fan runs when the compressor motor runs.

FILTER/DRYER

The filter/dryer is in the liquid line between the condenser and the capillary tube. This dryer filters out any foreign particulate matter and also contains a desiccant to absorb any moisture that may be present in the system.

CAPILLARY TUBE

The capillary tube (between the condenser and the evaporator in the refrigerant line) has a very small inside diameter, and serves to control the refrigerant flow from the condenser into the evaporator.

EVAPORATOR

The evaporator (in the vender cabinet) takes heat from the air in the vender cabinet and transfers this heat to the liquid refrigerant. The liquid refrigerant is evaporated (boiled off) as a gas, and the gas is drawn out by the compressor.

EVAPORATOR FAN

The evaporator fan draws warm air from around the cans or bottles in the cooling compartment and blows it across the evaporator. As the air goes across the evaporator, it gives up heat to the evaporator, then goes back to the cans or bottles, and takes heat from them. This fan runs continuously when the vender is plugged in.

CONDENSATE PAN

The condensate pan (located in the compressor compartment) collects the water which runs from the evaporator. The water is evaporated into the surrounding air by means of soakers. The soakers extend down into the pan to absorb the water. Exposure to the surrounding air evaporates the water in the soakers.

ELECTRICAL PARTS

TEMPERATURE CONTROL

The temperature control is a temperature operated switch that controls power to the compressor and condenser fan motor in response to cabinet temperature. It consists of a capillary tube filled with a small amount of refrigerant connected to bellows and an electric switch. One end of the capillary tube is located in a slot in the evaporator housing. The other end is connected to the bellows and switch which are located in an enclosure in the lower right hand side of the cabinet. The pressure of the vapor in the capillary tube rises and falls with changes in cabinet temperature. As the cabinet temperature gets warmer or cooler, the vapor expands or contracts causing the bellows to operate the switch thereby turning the compressor on or off.

CAUTION! To adjust the temperature control, see page 10.

COMPRESSOR ~~THERMAL OVERLOAD ASSEMBLY~~

The thermal overload is a temperature activated switch that interrupts power to the compressor when excessive temperatures occur. This switch protects the compressor from the damage that will occur if the compressor continues to operate under adverse conditions. The overload also opens under abnormally high amp draws, protecting the motor windings from damage. Frequent overload trips may lead to warm product and be the first indication of a dirty condenser or other refrigeration related problems that require attention.

COMPRESSOR STARTING RELAY

The starting relay is a device that connects the start winding of the compressor during start up. The additional winding (start) helps the compressor motor come up to speed. Once it reaches speed the starting relay disconnects the start winding from the circuit.

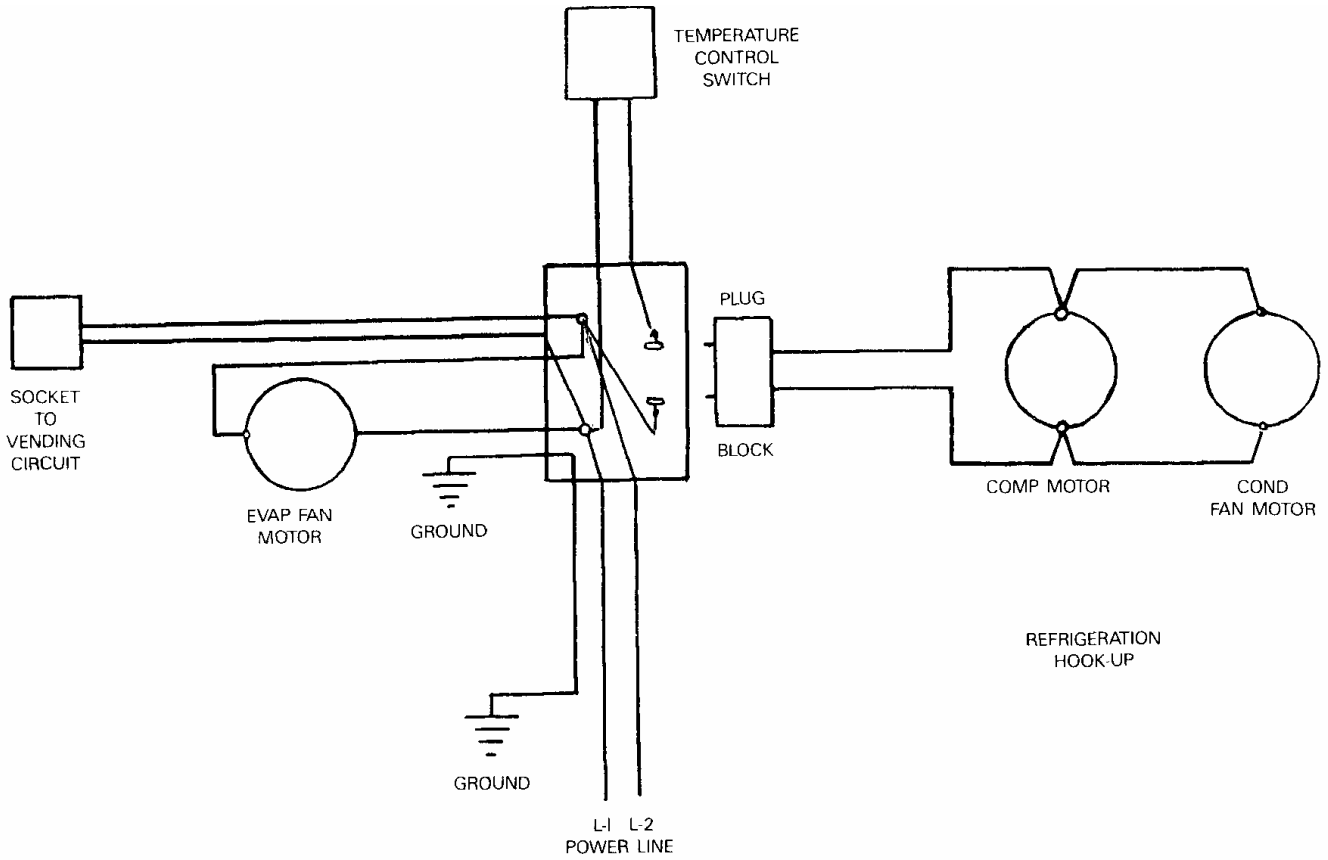
ELECTRICAL OPERATION

WHAT DOES IT	WHAT HAPPENS
WHEN THE VENDER TEMPERATURE GETS UP TO THE CUT-IN SETTING:	
The temperature control switch	closes the run winding circuit of the compressor motor. closes the start relay coil circuit. closes in the condenser fan motor circuit.
THE HEAVY CURRENT, DRAWN BY THE RUN WINDING, ALSO FLOWS IN THE START RELAY COIL, AND:	
The start relay coil	closes the start relay contacts and completes the start winding circuit of the compressor motor.
WHEN THE COMPRESSOR MOTOR GETS UP TO SPEED	
The spring in the relay	pushes the start relay contacts apart because
The start relay coil	no longer gets enough current to hold the contacts closed,
The start relay contacts	open in the start winding circuit of the compressor motor.
IF THE COMPRESSOR MOTOR DRAWS TOO MUCH CURRENT AND CAUSES THE THERMAL OVERLOAD ASSEMBLY TO GET TOO WARM	
The thermal overload switch	Opens the run winding circuit and disconnects the compressor motor.
WHEN THE THERMAL OVERLOAD ASSEMBLY COOLS DOWN AGAIN	
The thermal overload switch	Closes the run winding circuit and the start relay coil circuit of the compressor motor.
WHEN THE VENDER TEMPERATURE GETS DOWN TO THE CUT-OUT SETTING	
The temperature control switch	Opens in the run winding circuit of compressor motor. Opens in the starting relay coil circuit.

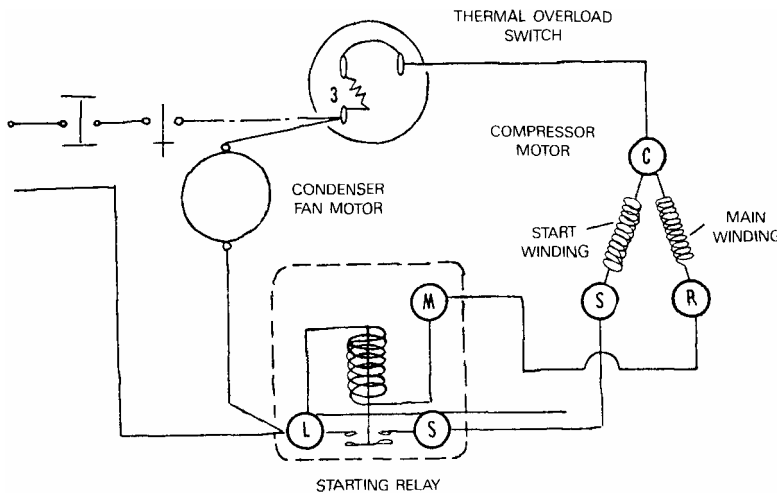
COMPRESSOR MOTOR RUN WINDING CIRCUIT

SWITCHES IN THE WIRING	WHAT THE SWITCHES DO	WHAT MAKES THE SWITCHES WORK
1. Temperature control switch	1. Turns the compressor and condenser fan motor on and off.	1. The temperature in the vender has come up to the cut-in point (or gotten down to the cut-out point) set on the temperature control switch.
2. Start Relay	2. Turns the start windings on & off.	2. The presence or absence of heavy current switches the relay which energizes or de-energizes the start windings.
3. Thermal Overload Switch	3. Protects the windings of the compressor.	3. Current drawn by the motor or heat from the compressor can raise the temperature of the thermal overload switch cut-out, which removes power from the compressor.

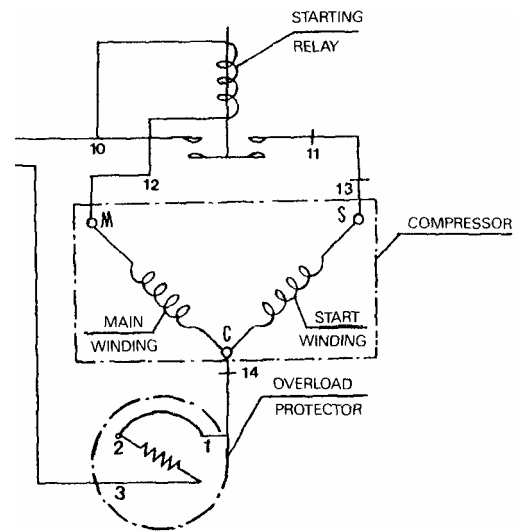
REFRIGERATION CIRCUIT DIAGRAMS



Tecumseh



Embraco



REFRIGERATION CYCLE

WHAT DOES IT	WHAT HAPPENS
The rising temperature in the vender	warms the temperature control bulb & the charge in it.
The charge in the control bulb	expands in the control tube and stretches the temperature control bellows.
The bellows	activates the temperature control switch.
The temperature control switch	turns the compressor motor on. turns the condenser fan motor on.
The compressor motor	drives the compressor.
The condenser fan motor	drives the condenser fan. Draws air through the condenser, cooling it and pushes air over the compressor cooling it.
The compressor	draws low pressure refrigerant gas from the evaporator, compresses the gas, and pumps it to the condenser.
The condenser	takes the heat out of the high pressure refrigerant gas.
More hot gas coming from the compressor	pushes the liquid refrigerant into the capillary tube.
The capillary tube	controls the flow of liquid refrigerant into the evaporator.
The evaporator	(Where the pressure is kept low by the suction of the compressor) transfers heat from the air to liquid refrigerant.
The liquid refrigerant	changes into gas at low pressure and is drawn into the compressor.
The falling temperature in the vender	cools the temperature control bulb and the charge in it to a pre-determined temperature.
The charge in the control bulb	shrinks & lets the temperature control bellows pull back.
The bellows	move and open the temperature control switch.
The temperature control switch	turns the compressor motor off. turns the condenser fan motor off.
The compressor	stops.
The condenser fan motor	stops.
(With the vender "Plugged In" the evaporator fan motor runs constantly)	

PRODUCT HOT

Possible Cause: **Compressor will not run.**

WHAT TO CHECK	SOLUTION
1. Is the vender plugged in? YES	1. NO , plug it in.
2. Is the compressor power cord plugged in? YES	2. NO , plug it in.
3. Is the temperature control on? YES	3. NO , turn it on.
4. Is there power at the wall outlet? YES	4. NO , consult an electrician.
5. Is the circuit breaker or fuse correct? YES	5. NO , replace or reset.
6. Is the vender power cord good? YES	6. NO , replace.
7. Is the compressor power cord good? YES	7. NO , replace.
8. Is the temperature control bulb located properly? YES	8. NO , correct.
9. Is the temperature control operational? YES	9. NO , replace.
10. Is the thermal overload operational? YES	10. NO , replace.
11. Is the start relay operational? YES	11. NO , replace.
12. Is the compressor operational? YES	12. NO , replace.
13. Consult the Dixie-Narco Factory Service 1-800-688-9090 or your Dixie-Narco Representative. NOTE: Have the vender Model & Serial number available.	

PRODUCT HOT

Possible Cause: **Compressor starts, but will not keep running.**

WHAT TO CHECK	SOLUTION
1. Is the temperature control knob set on its highest setting? YES	1. NO , adjust the knob to a higher setting.
2. Domestically, is the voltage supply between +/- 10% of rating on the serial plate? YES	2. NO , consult the power company.
3. Is the condenser clear of obstructions? YES	3. NO , clear or clean.
4. Is the condenser fan blade turning? YES	4. NO , free the obstruction or replace the blade if needed.
5. Is the condenser fan motor operational? YES	5. NO , replace.
6. Is the temperature control operational? YES	6. NO , replace.
7. Is the tube from the compressor to condenser free of kinks? YES	7. NO , repair or replace.
8. Is the capillary tube free of kinks? YES	8. NO , replace.
9. Is the thermal overload operational? YES	9. NO , replace.
10. Is the start relay operational? YES	10. NO , replace.
11. Consult the Dixie-Narco Factory Service at 1-800-688-9090 or your Dixie-Narco Representative. NOTE: Have the vender Model & Serial number available.	

PRODUCT HOT

Possible Cause: **Miscellaneous.**

WHAT TO CHECK	SOLUTION
1. Is the evaporator fan motor working? YES	1. NO , replace motor.
2. Has the refrigeration system lost its charge? No	2. YES , replace the refrigeration system.
3. Consult the Dixie-Narco Factory Service at 1-800-688-9090. or your Dixie-Narco Representative. NOTE: Have the vender Model & Serial number available.	

PRODUCT COLD BUT NOT COLD ENOUGH

Possible Cause: **Compressor runs, but won't cool product.**

WHAT TO CHECK	SOLUTION
1. Is the temperature control knob set properly? YES	1. NO , set properly.
2. Domestically, is the voltage supply between 103V and 127V? YES	2. NO , consult the power company.
3. Is the temperature control probe located properly? YES	3. NO , correct.
4. Is the condenser clear of obstruction? YES	4. NO , clear, clean, or space the vender properly.
5. Is the evaporator fan free of obstruction? YES	5. NO , free any obstruction or replace.
6. Is the condenser fan free of obstruction? YES	6. NO , free any obstruction or replace.
7. Is the evaporator free of ice? YES	7. NO , defrost & check the following: gasket seal, port door seal, refrigerant charge.
8. Is the temperature control operational? YES	8. NO , replace.
9. Is the evaporator fan operational? YES	9. NO , replace.
10. Is the condenser fan motor operational? YES	10. NO , replace.
11. Is the refrigerant tubing free of kinks? YES	11. NO , repair or replace.
12. Is the overload operational? YES	12. NO , replace.
13. Is the start relay operational? YES	13. NO , replace.
14. Is there refrigerant in the system? YES	14. NO , charge system and check for leaks.
15. Consult Dixie-Narco Factory Service 1-800-688-9090 or your DN Representative. NOTE: Have vender Model & Serial number available.	

PRODUCT TOO COLD OR FROZEN

Possible Cause: **Compressor runs too long or continuously**

WHAT TO CHECK	SOLUTION
1. Is the temperature control knob set properly? YES	1. NO , set properly.
2. Is the temperature control bulb located properly? YES	2. NO , correct.
3. Is the temperature control operational? YES	3. NO , replace.
4. Does the evaporator frost over completely while the system is running? YES	4. NO , check for leaks or low charge.
5. Consult the Dixie-Narco Factory Service at 1-800-688-9090 or your Dixie-Narco Representative. NOTE: Have the vender Model & Serial number available.	

NOISY REFRIGERATION UNIT

POSSIBLE CAUSES	SOLUTION
1. Are refrigerant lines free of contact with surfaces? YES	1. NO , correct.
2. Is the condenser fan blade obstructed or damaged? NO	2. YES , free any obstructions or replace the blade if needed.
3. Is the evaporator fan blade obstructed or damaged? NO	3. YES , free any obstructions or replace the blade if needed.
4. Is compressor noisy? NO	4. YES , replace.
5. Consult the Dixie-Narco Factory Service at 1-800-688-9090 or your Dixie-Narco Representative. NOTE: Have the vender Model & Serial number available.	

EXCESSIVE CONDENSATE

POSSIBLE CAUSES	SOLUTION
1. Is the door sealed properly? (This can be checked by inserting a piece of paper, thin plastic or paper currency between the cabinet and the door seal when the main door is open. When the door is closed properly, the paper should exert some resistance as it is pulled out.)	<p>1. YES, see step 4. NO, Ensure the door is closed tightly. If door still does not seal properly, see step 2.</p>
2. Is the motor cover interfering with the inner door?	<p>2. YES, reinstall motor cover properly. NO, see step 3.</p>
3. Has the machine been vandalized?	<p>3. YES, replace necessary components. NO, see step 4.</p>
4. Are soakers positioned properly?	<p>4. YES, see step 5. NO, place soakers upright in pan so that air will flow over & through the soakers.</p>
5. Are there 14 fiberglass soakers in the pan?	<p>5. YES, see step 6. NO, place 14 fiberglass soakers in the condensate pan.</p>
6. Are the condenser & evaporator free from obstruction?	<p>6. YES, see step 7. NO, remove all debris and/or cans from the area around the evaporator and condenser. Clean the evaporator & condenser coils with a stiff brush or compressed air.</p>
7. Is the delivery door misaligned?	<p>7. YES, A. Level the vender properly. B. Align the inner & outer doors so that the delivery door does not stick open. NO, see step 8.</p>
8. If all above steps fail...	<p>8. Consult the Dixie-Narco Factory Service at 1-800-688-9090. NOTE: Have the vender model & serial number available.</p>