



KIT KAT CANDY VENDING MACHINE

Model 3087-KK



SERVICE MANUAL

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Record the Model Number and Serial Number of your machine below.

The Model and Serial numbers are needed for you to obtain quick service and parts information for your machine. The numbers are given on the identification plate located on the back side of the cabinet of the machine.

MODEL NUMBER: _____

SERIAL NUMBER: _____

SPECIFICATIONS

Physical Dimensions

	IMPERIAL	METRIC
Width	41 Inches	1.05 Meter
Depth	37 Inches	0.94 Meter
Height	72 Inches	1.8 Meter
Weight	771 Pounds	350.4 Kg

Electrical

230 Volt AC: 50 Hz, 3.75 Amps ($\pm 10\%$)

115 Volt AC: 60 Hz, 7.5 Amps ($\pm 10\%$)

Transformer:

24 Volt AC, 4 Amp at 50% Duty Cycle

Refrigeration System

Type: 1/4 Hp Hermetically Sealed

Controls: Electronic

Refrigerant: R-134a

Charge: 7.7 Ounces

Factory Configured Capacity

	SHELVES	MOTORS	ITEMS
Confectionery	6	60	1079
Combo	6	52	843

AUGER CAPACITY	SPACING	
	Imperial	Metric
11	1-3/16"	3 cm
13	15/16"	2.4 cm
18	21/32"	1.7 cm

Pricing

Five digit, dependent on scaling factor from either the Coin Mechanism, Bill Validator, or Card Reader

Coinage

Any MDB peripheral device

INTRODUCTION

This manual provides service and programming instructions for the proper operation of the Kit Kat Candy Vending Machine.

This vendor has a microprocessor-based control system to control and monitor the vending machine, coin mechanism, bill validator, card reader and other configured options. The controller can operate up to 72 motor-driven augers for product delivery. The vendor is configured at the factory to customer specifications.

Each vendor consists of six trays with a maximum of ten motors on each tray for a maximum of sixty motors. The controller can be programmed for a maximum of 36 different selections with up to 24 motors per selection.

Features include:

- Multi Drop Bus (MDB) coin and currency handling mechanisms
- DEX/UCS for MIS data transfer using the Vending Industry Data Transfer Standard
- Self-diagnostics and cash accountability
- Force Vend and Multi Vend features
- Hermetically sealed refrigeration system with ozone-friendly R-134a refrigerant
- Programmable electronic control of the refrigeration and heater
- Relay-controlled evaporator fans
- Motorized delivery, electronically controlled
- Motor time-out and overload protection is provided, including the delivery door motor.

CAUTION:

This vendor utilizes DC motors. Do not attempt to turn augers by hand. Motor damage could occur.

- Audible feedback indicates when a product has been vended or when an error condition exists.
- No change or loss of program/memory because a power failure or voltage spike.

UNPACKING

This vendor was thoroughly inspected before leaving the factory and the delivering carrier has accepted this vendor as their responsibility. Note any damage or irregularities at the time of delivery and report them to the carrier. Request a written inspection report from the claims inspector to file any claim for damage. File the claim with the carrier (not the manufacturer) within 15 days after receipt of the machine.

Carefully remove the outside packing material so as not to damage the finish or exterior of the machine. Adhesive residue can be removed with denatured alcohol or common household vinegar.

Inspect the machine for concealed shipping damage. Report any damage hidden by the shipping material directly to the delivering carrier on a hidden damage report.

Record the model number and serial number of the vendor for your records. These numbers can be found on the Serial Plate on the rear of the cabinet and/or inside the vendor. Refer to these numbers on all correspondence and inquiries pertaining to this vendor.

Remove the Knock-A-Way Support by placing a 2x6 under the vendor, inserting a screwdriver into the groove and splitting it in two. Turn the leveling screws in as far as possible. See Figure 1.

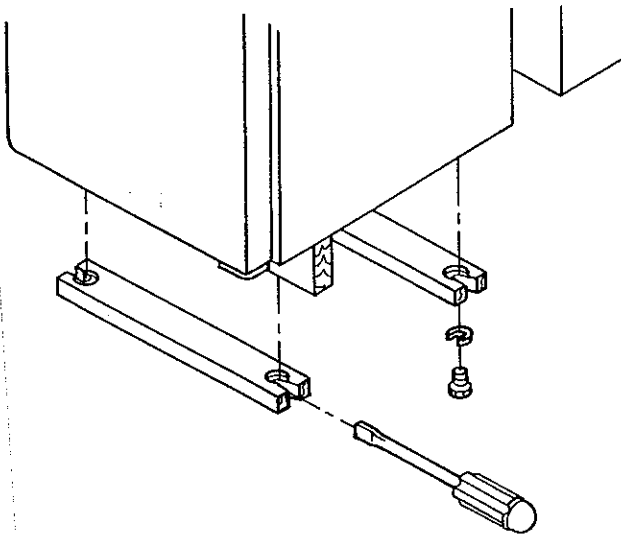


Figure 1. Removing the Knock-A-Way Support

INSTALLATION

Consult local, state and federal codes and regulations before installation of the vendor.

1. Position the vendor in its place of operation no further than six feet (1.83 m) from the power outlet or receptacle
2. Check that the door will open fully without interference.
3. Leave at least six inches (15 cm) of space between the back of the machine and any wall or obstruction for proper air circulation.
4. Level the vendor, making sure all levelers are touching the floor. The vendor must be level for proper operation and acceptance of coins through the coin mechanism.
5. Retrieve the keys to the vendor from the coin return cup.
6. Open outer door and remove all internal packing material.

Grounding & Electrical

Before connecting the vendor, the integrity of the main electrical supply must be checked for correct polarity, presence of ground (earth) and correct voltage. These checks should be repeated at 6-month intervals with the routine safety electrical testing of the vendor itself.

For proper operation of any equipment utilizing electronically controlled components, the equipment should be placed on an isolated or dedicated noise-free circuit.

For 115-Volt vendors the circuit should be a minimum 15 Amp, 60 cycle, properly polarized and grounded.

For 230-Volt vendors the circuit should be a minimum 7.5 Amp, 50 cycle, properly polarized and grounded.

To verify that the receptacle is properly grounded and polarized, insert one probe of a Multi-Meter (set to check AC line voltage) or a test light in the ground terminal (hole) and the other probe into the hot terminal of the outlet.

If the receptacle is not properly grounded or polarized, you should contact a licensed electrician to correctly polarize and/or ground the receptacle to ensure safe operation.

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

Shown in Figure 2 and Figure 3 are two properly grounded and polarized wall outlets. Figure 2 shows two 230-Volt wall outlets. Figure 3 shows a 115-Volt, two-wire outlet with a three-prong adapter in place.

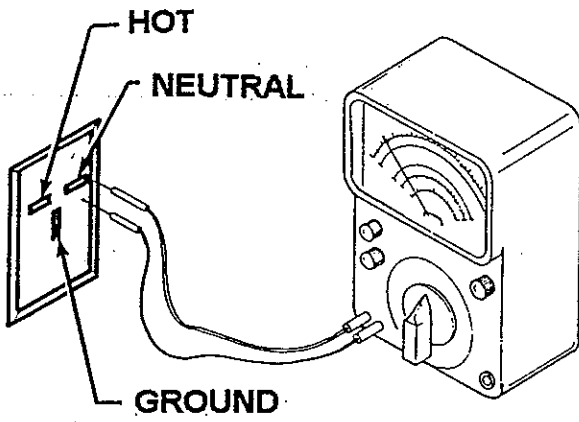


Figure 2. 230-Volt Outlets

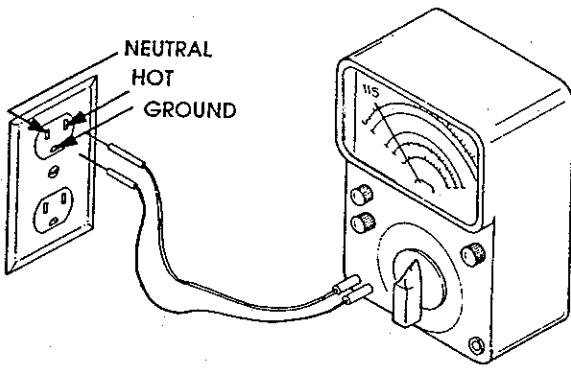


Figure 3. 115-Volt Outlets

Power Switch

The vendor has a Power Switch operated by the outer door. When the door is closed, the switch is placed ON, putting the vendor in the *Sales Mode*. When the door is opened, the switch is placed OFF, removing power to the machine. See Figures 4 and 5.

To operate the machine with the door open, the switch must be manually placed in the ON position: pull the switch stem to the extreme extended position. See Figure 5.

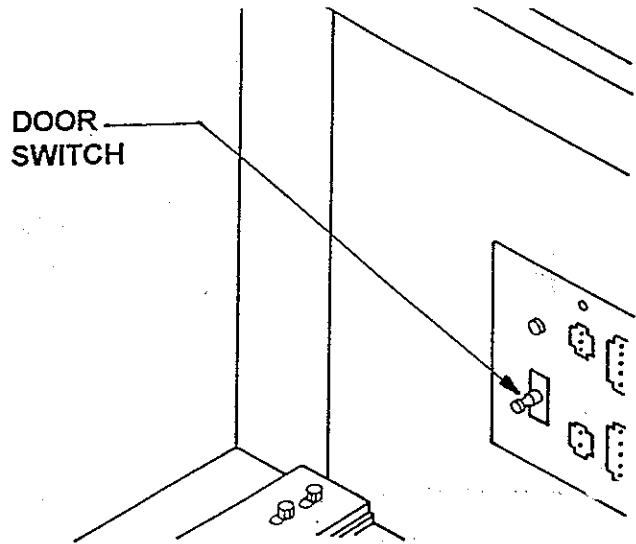


Figure 4. Location of Interlock Switch

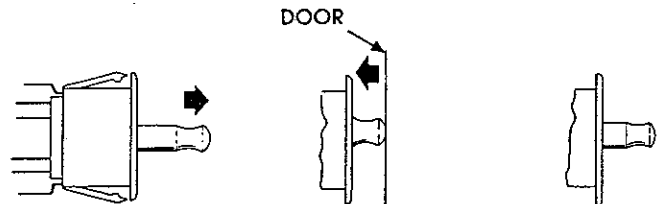


Figure 5. Interlock Switch Operation

CONTROLLER FUNCTIONS

There are two modes of operation.

- *Sales Mode*: The vendor accepts deposits, pays out change and dispenses product to the customer. The digital display and the LEDs are used to communicate with the operator and the customer.
- *Service Mode*: Used by the operator to program and service the machine. The digital display is used to communicate with the operator.

Sales Mode

.00 displays. The decimal point position is determined by the coin mechanism attached.

When no credit has been established and a button is pushed, the price for that selection displays for approximately three seconds.

When credit is deposited the amount displays. Five digits are available. The credit value displays until either a vend or a coin return command occurs.

When a coin mechanism and a card reader are both configured, the credit is either all coin mechanism or all card reader, not a mixture from both.

Vend Cycle

If a selection is made and a vend cannot take place, (assuming that sufficient credit and change are available) three beeps sound and the "PRODUCT SELECTED SOLD OUT - PLEASE CHOOSE ANOTHER" LED flashes.

When a selection is made with sufficient credit:

- The controller beeps and the "PLEASE WAIT - YOUR SELECTION IS ON ITS WAY" LED flashes.
- The delivery door motor runs to open the delivery door and the selection motor runs.
- The delivered product trips the delivery door sensor, verifying the vend has completed.

- The delivery door motor runs, closing the delivery door.
- The product price is deducted from the credit, change (if any) is returned and the corresponding MIS data are updated.
- Two beeps sound and **.00** displays.

LEDs

If the payout tubes in the coin mechanism are below the low-level sensors, the "PLEASE USE CORRECT CHANGE" LED flashes.

If no motors have been assigned or if the motor has been recorded as faulty, the "PRODUCT SELECTED SOLD OUT - PLEASE CHOOSE ANOTHER" LED flashes.

Empty Condition Check

When an auger is rotated and fails to drop a product within approximately five seconds, that auger is tried a second time. If it still does not drop a product, it is flagged as empty and will not be run again until it is reset.

If all assigned augers are empty, the "PRODUCT SELECTED SOLD OUT - PLEASE CHOOSE ANOTHER" LED flashes and three audible beeps sound.

Opening and closing the outer door will reset selections that have been disabled due to empty conditions.

Jammed Motor Condition

The controller will not run motors that have been flagged as "jammed" or that have not been assigned. A motor jam is detected when power is applied to a motor and the motor fails to return to the home position within about six seconds.

Motors flagged as jammed must be successfully run in the *Service Mode* to be reset. Follow the instructions outlined in "Test Vend Selections" section of this manual.

Service Mode

To change any settings or programs in the vendor, the controller must be placed in the *Service Mode*.

Upon entering the *Service Mode*, any detected errors cause an error code to display. Error codes should be recorded before continuing. For an explanation, see Table 2.

In the *Service Mode* there are three different levels:

- Level 1: Used for Price Setting, Coin Dispensing, Test Vending and MIS data.
- Level 2: Used to assign motors to selections, Force Vend option, Multi-Vend option, Bill Escrow, Accounting Reset, Verify Motors and Refrigeration System settings.
- Level 3: Used for Sensor Test, Health Safety Programming and DEX/ID Input.

Button Configuration and Functions

The selection buttons must be configured for the number of selections available in the machine.

- 123 Configuration offers 12 selections.
- ABC Configuration offers 36 selections.

The configuration will affect the programming functions of the buttons. See Figure 6.

EXAMPLE

When you are directed to push button 1:

123 configuration: button 1 is the top, left button.

ABC configuration: button 1 is the top, right button.

Identifying a Selection

When instructed to identify a selection, press the one or two buttons for that selection. In the 123 Configuration, only one button will be pushed. In the ABC Configuration, a letter and a number will be pushed.

123		ABC	
1	2	A	1
3	4	B	2
5	6	C	3
7	8	D	4
9	10	E	5
11	12	F	6

Figure 6. Button Configurations

Accessing the Service Modes

To access the *Service Mode*, open the outer door, pull the door interlock switch stem out, and push the Service Mode Button on the Control Board the required number of times. See Table 1. See Figure 7 for the Service Mode Button location.

Table 1. Accessing the Service Modes

LEVEL	PUSH SERVICE MODE BUTTON	THEN
1	1 time	
2	2 times	Enter Security Code 321
3	3 times	Enter Security Code 531

Exiting the Service Mode

To exit the *Service Mode*, push the Service Mode Button.

NOTE

In some programming modes a 'Save' command must be used to properly save the input.

The controller will automatically exit the *Service Mode* if no button is pushed for approximately sixty (60) seconds.

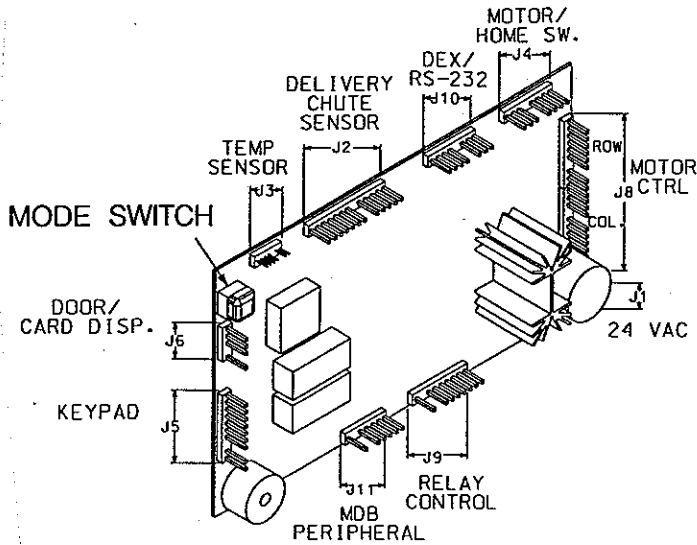


Figure 7. Service Mode Button Location

Service Mode - Level 1

To enter Level 1 push the *Service Mode Button* once. **L1** displays, providing no errors have been detected. If errors are detected, an error code (or codes) displays. Record these codes before continuing. See Table 2.

Error Codes

Error codes are recorded and displayed when the controller is placed into Level 1 of the *Service Mode*. Table 2 indicates error codes and the steps to clear or reset.

Table 2. Error Codes

CODE	CAUSE	TO RESET
E2 xx	Defective Motors	Test Vend All Defective Motors
E3	Bad Pricing Check	In Price Setting Mode Set Correct Price
E4	Defective Left Product Sensor	Check Alignment - Perform Sensor Check
E5	Defective Right Product Sensor	Check Alignment - Perform Sensor Check
E6	Defective Refrigeration & Fans	Fix problem; Enter and exit <i>Service Mode</i>
E7	Defective Delivery Door Motor	Test Vend Any Selection
E8	Defective Button	Correct Button Function
E9	Control Board Failure	Fix memory error; Power Off - Power On
E10	No Response From Coin Mech	Fix Communication Link With Coin Mech
E11	Defective Coin Tube Sensor	Correct Coin Mech Status
E12	Coin Mech Unplugged	Correct Coin Mech Status
E13	Coin Mech Coin Tube Jammed	Correct Coin Mech Status
E14	Coin Mech Coin Path Jammed	Correct Coin Mech Status
E15	Defective Delivery Door Switch	Test Vend Any Selection

Price Setting

1. With **L1** displaying, push button 1. **SEL** displays.
2. Identify the selection to be priced. The current vend price displays.
3. Push the numerical button again to increment the vend price.

EXAMPLE

If the vendor is configured 123, press the button a second time.
 If the vendor is configured for ABC, for selection B5, press 5 again.

To toggle between incrementing (+) and decrementing (-) the value, release the button for three seconds and push it again.

- When the desired vend price displays, push another button or the Service Mode Button.

Vend prices can be verified in the *Sales Mode*. With no credit established, identify the selection to display the corresponding. If the selection has no motors assigned, the "PRODUCT SELECTED SOLD OUT-PLEASE CHOOSE ANOTHER" LED flashes.

Coin Dispensing

In this mode, coins deposited through the coin mechanism and loaded into the payout tubes are monitored and the tube status is updated. The values of the coins display as they are deposited

- With **L1** displaying, push button 2. **C** displays.
- Push button 1. **FILL** displays.
- To dispense coins:

PUSH BUTTON	TO DISPENSE
2	lowest value coin
3	next lowest value coin
4	next greatest value coin
5	greatest value coin (if four coin tubes)

- Push button 6 to return to Level 1 of the *Service Mode*.

Coins can be dispensed from the coin mechanism with optional payout switches.

Test Vend Selections

Any motor flagged as faulty when entering the *Service Mode* must be run successfully in this mode to clear the error from the controller.

The product delivery sensor is not used during this test vend sequence and MIS accounting information is not affected.

- With **L1** displaying, push button 3. **SEL** displays.
- Identify a selection. All motors assigned to that selection run in the order they were programmed.

- The controller will beep three times if any assigned motor fails to run or to complete a cycle correctly.
- To exit, push the Service Mode Button.

MIS - Displaying Accounting Data

- With **L1** displaying, push button 4. **A** displays.
- Press the button indicated in table 3 for the desired category of data.
- The most significant digits of the Resettable totals display first. Push the same button again to display the final five digits.
 - Resettable totals: A total of activity since the totals were reset.
- Press the same button again to display the most significant digits of the Non-Resettable Totals. Push the button a fourth time to display the final five digits.
 - Non-resettable totals: A running total of all activity.

Table 3. MIS - Displaying Accounting Data

TO DISPLAY	PUSH
Total Cash Sales (max. \$99,999.99)	1
Total Vends (max. 65,525)	2
Sales by Selection	3
Vends by Selection	4
DEX Download	5

EXAMPLE

A displays. Push button 1 for Total Cash Sales
 01 displays \$1,000
 Push button 1 again
 234.75 displays \$234.75
 Indicates \$1,234.75 total cash sales.
 Push button 1 again
 00 displays \$0
 Push button 1 again
 425.25 displays \$425.25
 Indicates \$425.25 cash sales since last reset

Reset Accounting Data

1. With **L1** displaying, push button 5. **r-no** or **r-yes** displays.
2. To reset the resettable data, press button 5 to toggle the display to **r-yes**.
3. Press button 6 to save the setting.

Service Mode - Level 2

To enter Level 2 push the Service Mode Button two times. **CODE 2** displays. The code is 321.

Push selection buttons 3, 2, 1, in that order. **L2** displays. If the wrong buttons are pushed, or if not pushed in the order indicated, **ERROR** displays for three seconds and access to this level is denied.

Assign Motors to Selection

1. When **L2** displays push button 1. **SEL** displays.
2. Identify the selection to to be edited. The selection number displays along with a motor number. This motor number is the next motor following the previously assigned motor. (i.e., if motor number E-02 was previously assigned, E-03 would be displayed)
3. Push button 2 to scroll the motor numbers up; release button 2 for three seconds and push it again to scroll down.
4. When the desired motor displays:

- Push button 3 to assign to selection.

If the displayed motor has been previously assigned to a selection, the controller will beep three times and not reassign that motor. However, if button 3 is pushed again, the motor number being displayed is assigned to the current selection and removed from the other selection.

- Push button 4 to remove the displayed motor from the current selection.
- Push button 5 to remove all motors from the current selection.

- Push button 6 to save the setting. **SEL** displays and another selection can be edited.

Table 4. Button Functions

BUTTON	FUNCTION
2	Scroll the motor numbers in the display.
3	Assign the displayed motor number.
4	Removes the displayed motor from the selection being edited.
5	Removes all motors from the selection being edited.
6	Saves settings.

Pushing the Service Mode Button will exit the *Service Mode*.

Verify Motor Assignment

1. With **L2** displaying, push button 4. **SEL** displays.
2. Identify a selection. The motors assigned to that specific selection are scrolled in the display until the *Service Mode* is exited or another selection is identified.
3. Push the Service Mode Button to exit.

No Change Vending

If a coin tube reaches the low level when this mode is OFF, the customer may be short-changed. When this mode is ON, correct change must be inserted for a vend to take place.

1. When **L2** displays, push button 5. **OP** displays.
2. Push button 5 to toggle the status between **C-ON** and **C-OFF**.
3. Push button 6 to save the displayed status.

OFF: When a coin tube reaches the low level the "USE CORRECT CHANGE" LED lights. If a vend is made with an over-deposit, the vend is made and payout is attempted. However, any coins in the low-level coin tubes cannot be returned. The customer may be short-changed.

ON: When a coin tube reaches the low level, the "USE CORRECT CHANGE" LED lights only

when a vend is requested and a payout on over-deposit is necessary. At that time the credit is returned. Correct change must be inserted for a vend to take place.

Setting Keypad Configuration

1. When **L2** displays, push button 6. **OP** displays.
2. Push button 1 to toggle the keypad configuration between **123** and **Abc**. See Figure 6.
3. Push button 6 or the Service Mode Button to save the displayed configuration.

Service Mode - Level 3

Push the Service Mode Button three times. **CODE 3** displays. The code is 531. Push the selection buttons 5, 3 and 1, in order.

L3 displays. If the wrong buttons are pushed, or if not pushed in the order indicated, **ERROR** displays for three seconds and access to this level is denied.

Sensor Test

This mode tests the operation of the delivery sensors. With **L3** displaying, push button 1. If the optical sensor beam is evident and functional, **1** displays. **0** displays if the optical sensor's beam is broken. The machine will also beep once per second until the beam is seen again.

Push button 6 to exit the *Service Mode*.

Force Vend

Use this mode to prevent the customer from receiving change without making a purchase. It forces the customer to select a product if the credit is greater than or equal to the lowest programmed vend price in the machine.

If the customer's initial selection reverts to an "empty" state during the vend cycle, then the machine will allow the credit to be returned via the manual escrow return request. The Coin Return Button must be pushed.

1. When **L3** displays, push button 2. **OP** displays.
2. Push button 2. **F-ON** or **F-OFF** displays.
3. Push button 2 again to toggle it.
4. Push button 6 or the Service Mode Button to save the displayed status.

Multi-Vend

This feature, when on, enables multiple purchases to be made as long as adequate credit is available. Instead of immediately returning the over-deposit after a vend, the credit displays. To receive change on an over-deposit the Coin Return button must be pushed.

1. When **L3** displays, push button 3. **OP** displays.
2. Push button 3, either **L-no** or **L-yES** displays.
3. Push button 3 again to toggle the setting.
4. Pushing button 6 or exiting the *Service Mode* will save the displayed status.

Maximum Change

(Available only when Multi-Vend is set ON.) When set ON, this feature sets the maximum amount of change to be returned.

1. When **L3** displays, push button 3. **CXXXX** displays.
Push button 3 again to increase or decrease the amount displayed.
2. Push button 6 or exit the *Service Mode* to save the displayed status.

Bill Escrow

This feature (used only with a validator with escrow capabilities) enables the vendor to be used as a change machine.

1. When **L3** displays, push button 4. **OP** displays.
2. Push button 4 again. **B-ON** or **B-OFF** displays.
3. Push button 4 again to toggle the setting.
4. Push button 6 or exit the *Service Mode* to save the displayed status.

Refrigeration and Heater Settings

This mode is used to set the operating parameters within the refrigeration system.

Table 5. Controller Default Settings

SETTING	DEFAULT	RANGE - MIN/MAX
Compressor Cut-Out	70°F 21,1°C	32°F - 70°F 0°C - 21.1°C
Compressor Cut-In	60°F 15°C	32°F - 70°F 0°C - 21.1°C
Heater Cut-In	12°F/7°C Below Compressor Cut-In	
Heater Cut-Out	20°F/11°C Below Compressor Cut-In	
Defrost Time	10 Minutes	10-30 Minutes

Pushing button 4 in this mode will display the current machine temperature. Anytime during the following, pushing button 6 will abort the sequence at that point and return the controller to Level 3 of the *Service Mode*.

1. When **L3** displays, push button 5. Either **C** (Celsius) or **F** (Fahrenheit) displays. Push button 5 again to toggle the setting until the desired value (Celsius or Fahrenheit) shows.

Celsius is displayed in 0.5° increments and Fahrenheit is displayed in whole degrees.
2. Push button 1 to display the **compressor cut-out** temperature. Push button 1 to increment or decrement the temperature setting. Release and push the button again to

scroll the temperature in the opposite direction.

If the setting reaches its limit, **off** displays. If **off** is saved, the setting goes to its default value and the refrigeration failure mode is ignored.

3. Push button 3 to save the displayed setting.
4. The **compressor cut-in** temperature displays. Press button 1 to increment or decrement the setting. Push button 3 to save.

NOTE

The cut-in temperature must be at least 9°F/5°C above the cut-out setting

5. The **heater cut-in** temperature setting displays. Button 1 will increment or decrement the setting. Push button 3 to save the displayed value.

The default setting is 20°F/11°C below the compressor cut-out setting. It can not be set closer than 9°F/5°C to the compressor cut-out setting.
6. The **heater cut-out** temperature setting displays. Button 1 will increment or decrement the setting. Push button 3 to save.
7. The **defrost time** setting displays: **D-xx** where **xx** can be set from 10 to 30 minutes by pushing button 1. Push button 3 to save.

Health Safety Programming

The Health Safety programming prevents the sale of items if the temperature inside the cabinet area exceeds 45°F/7°C. Due to the operating range of this vendor this feature should be turned off at all times.

When **L3** displays, push button 5. Push button 4. **HSEL** displays. If any selection numbers display, push that button again. The number should disappear. Make sure no selections are programmed into the health safety. To exit this mode, push the Service Mode Button.

FUNCTIONS & OPERATION

Refrigeration & Heater Control

NOTE

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

When the temperature is above the cut-in temperature programmed, the unit is turned on (unless the heater was on less than two hours before). When the refrigeration unit reaches the cut-out temperature it is turned off.

If the refrigeration unit runs for more than two hours without reaching the cut-out temperature, the unit is turned off for the programmed defrost time. It will then be turned on again. If the cut-out temperature is not reached within one hour and the cabinet temperature is above 72°F/22°C, the system is turned off, no credit is accepted and the machine operation is disabled. Dashes display. The error code displays when the *Service Mode* is entered. Refer to the "Error Codes" section of this manual for more information.

Opening and closing the outer door will reset this condition.

Optional Heater Operation

If the temperature in the cabinet is at or below the heater cut-in temperature and the refrigeration unit has not run in the last two hours, the heater is turned on. The heater is turned off once the heater cut-out temperature is reached.

Refrigeration Troubleshooting

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

CAUTION:

Breaking the refrigerant joints or seals on the system voids the unit warranty. Failure to keep the condenser coil clean and free of debris voids the unit warranty.

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

NOTE

Most refrigeration problems are electrical.

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

- Low Charge - usually caused by leaks; look for oil around seals and welds. Unit will not cool properly. The capillary tube is frosted before it enters the evaporator inlet tube.
- Restriction in Systems (unit frost, then melts) - not cooling properly.
- Bad valves - unit does not cool properly; noisy compressor.

Compressor will not start

- Compressor has no power
- Machine not plugged in.
- Tripped breaker or blown fuse.
- Faulty wall outlet.
- Short or tear in power cord.
- Thermistor circuit is open. Check with the Multi-Meter.
- Improper wiring.
- Low voltage: 5% below. Check the power source with the Multi-Meter.
- Overload defective: Trips too fast. Check overload with the Multi-Meter.

- Start relay defective: Check start relay with the Multi-Meter.
- Compressor has open windings. Check compressor windings with a Multi-Meter.
- Defective refrigeration relay.
- Unplug power to the machine; remove the relay plate. Use an insulated jumper wire to short the wires on relay terminals 2 and 4 or 6 and 8; then restore power to the machine. The compressor should start, indicating a problem in the control circuit.

Check relay terminals 1 to 0 with a Multi-Meter. Should have 24VDC applied to them.

- No DC voltage: Check control board output terminal for a loose connection.

Compressor trips on Overload

- Improper voltage: 5-10% above, 5% below. Check power source with Multi-Meter.
- Overload defective: Trips too fast. Check overload with Multi-Meter.
- Relay defective: Won't open after starting. Check relay with Multi-Meter.
- Compressor has shorted windings: Check compressor windings with Multi-Meter.
- Short in other component: Isolate and eliminate each electrical component until short is found.
- Compressor is too hot.
 - ◆ Dirty condenser.
 - ◆ Faulty condenser motor or blade.
 - ◆ Restricted air flow.

CAUTION:

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

Noisy or vibrating unit

- Components rubbing or touching each other.
 - ◆ Check fan blades and motor.

- ◆ Loose shrouds and harness.
- ◆ Copper tubing.
- ◆ Loose or unsecured parts.
- Worn or aged grommets.
- Compressor
 - ◆ Bad valves
 - ◆ Slugging
 - ◆ Bad windings (See Schematic 1.)
 - ◆ Low voltage

Unit short cycles

- Thermistor defective or not mounted in the return air duct.
- Defective control board.
- Temperature setting set too warm. See "Refrigeration Settings" section of this manual.

Unit operates long or continuously

- Thermistor defective or not mounted in the return air duct.
- Refrigeration relay shorted.
- Air flow restricted
 - ◆ Faulty evaporator motor or blades causing coils to ice over.
 - ◆ Loose connections on evaporator motor. (One motor not running.)
 - ◆ Air flow blocked by product in front of evaporator or air duct openings
- Gasket leak around door.
- Excessive load: After loading, unit runs longer to pull out excessive heat from product.
- Shortage of refrigerant or restriction.
- Bad controller.

Refrigerated space too cold

- Thermistor defective. Check with Multi-Meter.
- Refrigeration control setting too cold. See "Refrigeration Settings" section of this manual.
- Refrigeration relay bad. Check with Multi-Meter.
- Faulty control board.

Refrigerated space too warm

- Thermistor defective. Check with Multi-Meter.
- Refrigeration control setting too warm. See "Refrigeration Settings" section of this manual.
- Refrigeration relay bad
- Faulty control board
- Restricted evaporator space
 - ◆ Evaporator motor or blades faulty, causing the coils to ice over the evaporator
 - ◆ Condenser air flow restricted
 - ◆ Plugged or dirty condenser
 - ◆ Condenser motor or blades bad
 - ◆ Blade stuck
 - ◆ Condensing space restricted
 - ◆ Unit placed too close to a wall.
- Compressor - bad valves
 - ◆ Capillary tube will start frosting 8 to 10 inches (20-25 cm) past evaporator connection tube.
 - ◆ Check for oil around brazed connections.

Troubleshooting circuits with Multi-Meter

- To check the power source, use the voltage section of the Multi-Meter. Should measure within 5-10% above, 5% below.

- Check overload.

NOTE

Power must be off and fan circuit open.

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

- Check relay (See Figure 8.) Unscrew lead terminals and remove relay from compressor. (NOTE: keep relay upright)

Check terminals 1 and S, or L and S with the Multi-Meter. Replace relay if continuity exists.

- Check thermistor with the Multi-Meter.
- Check compressor windings as shown in Figure 8.

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

WARNING:

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

Table 6. Winding Resistance

APPROX. RESISTANCE ACROSS TERMINALS	
COMMON to START:	12 Ohms
COMMON to RUN:	2 Ohms
RUN to START:	14 Ohms
COMMON to SHELL:	No Continuity

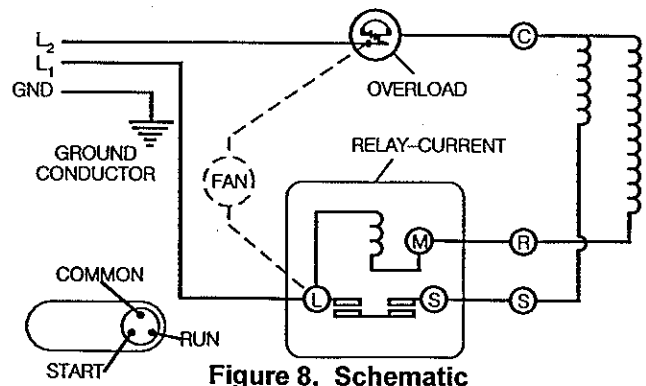


Figure 8. Schematic

LOADING PRODUCTS

To load products, lift the tray slightly and pull forward until the tray stops. The upper-most trays tilt for easier loading.

Load products from front to back, making sure all items fit freely between the augers. Do not attempt to force oversized items or packages into the spaces. Do not skip a space. Place the product on the bottom of the compartment on the product augers.

When finished loading each tray, return the tray to its proper operating position. All trays must be pushed to the rear of the cabinet and properly seated in the "detent" position.

The size of the item being vended must be larger than the diameter of the auger being used to vend properly. Undersize items could cause vend problems. If the product does not fit the auger properly, use a different pitched auger. See your distributor or service entity for available augers.

Tables 7 and 8 indicate the configurations when shipped. If the configuration is changed, make sure the programming of the controller agrees with the new configuration.

The bottom of the product should be placed on the bottom of the compartment above the product auger in the compartments that have a 360° motor. In compartments with the 180° motors, the product should be placed between the auger spaces with the product resting on the compartment floor.

Each auger can be rotated in 20-degree increments, changing the "drop-off" point of the product. Tables 7 and 8 and Figure 9 show the factory configuration of the trays timed for the products indicated. If new or different products are added and re-timing of the location of the auger is necessary, test vend the new location thoroughly.

Table 7. Confectionery Configuration

PRODUCT	BUTTON *	AUGER COUNT	MOTOR	AUGER TIMING
Nik Nak	1	9	360°	6 o'clock
Hula Hoops	2	9	360°	6 o'clock
Fruit Pastilles	3	2 x 13	180°	10 o'clock
Rolo	4	2 x 13	180°	10 o'clock
Toffee Crisp	5	11	360°	6 o'clock
Drifter	6	18	360°	6 o'clock
Lion Bar	7	11	360°	6 o'clock
Aero	8	18	360°	6 o'clock
Yorkie Milk	9	18	360°	6 o'clock
Polo Mints	10	2 x 13	180°	10 o'clock
Polo Fruits	11	2 x 13	180°	10 o'clock
Kit Kat	12	18	360°	6 o'clock

* 123 Configuration

Table 8. Combo Configuration

PRODUCT	BUTTON *	AUGER COUNT	MOTOR	AUGER TIMING
Polo Fruits	1	2 x 13	180°	10 o'clock
Drifter	2	18	360°	6 o'clock
Crunch White	3	18	360°	6 o'clock
Chunky Aero	4	18	360°	6 o'clock
Fruit Pastilles	5	2 x 13	180°	10 o'clock
Toffee Crisp	6	11	360°	6 o'clock
Aero P'mint	7	18	360°	6 o'clock
Lion Bar	8	11	360°	6 o'clock
Rolo	9	2 x 13	180°	10 o'clock
Yorkie Milk	10	18	360°	6 o'clock
Polo Mints	11	2 x 13	180°	10 o'clock
Kit Kat	12	18	360°	6 o'clock

* 123 Configuration

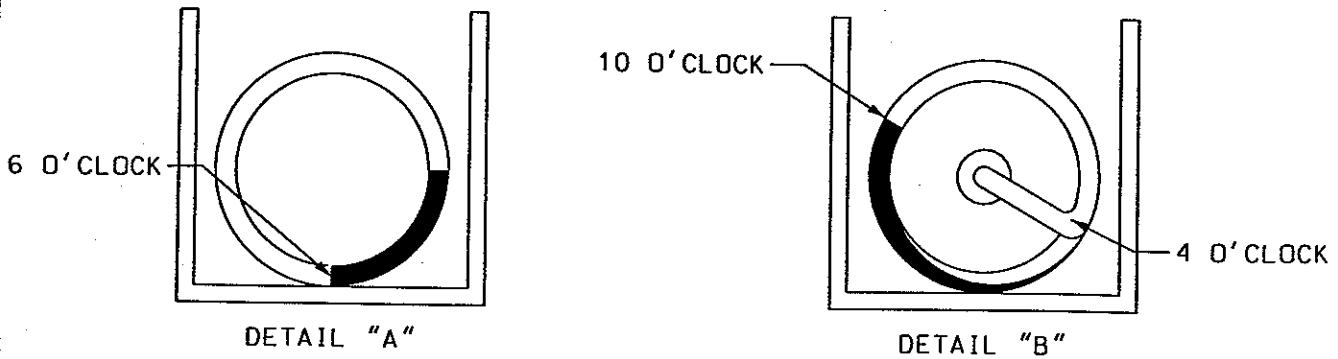


Figure 9. Auger Timing

Figure 10 illustrates a Confectionery model showing product location, timing of the augers and motor assignment of a typical machine loaded with product.

TRAY/ MOTOR	1	2	3	4	5	6	7	8	9	0
1 / A	Polo Fruits 2x13	Polo Fruits 2x13	Polo Fruits 2x13	Polo Fruits 18	Drifter 18	Drifter 18	Drifter 18	Drifter 18	Drifter 18	Drifter 18
2 / B	Aero Mint 18	Aero Mint 18	Aero Mint 18	Chunky Aero 18	Chunky Aero 18	Chunky Aero 18	Chunky Aero 18	Chunky Aero 18	Chunky Aero 18	Chunky Aero 18
3 / C	Rolo 2 x 13	Rolo 2 x 13	Rolo 2 x 13	Lion Bar 11	Lion Bar 11	Lion Bar 11	Lion Bar 11	Lion Bar 11	Lion Bar 11	Lion Bar 11
4 / D	Fruit Pastille 2 x 13	Fruit Pastille 2 x 13	Toffee Crisp 11	Toffee Crisp 11	Toffee Crisp 11	Toffee Crisp 11	Toffee Crisp 11	Toffee Crisp 11	Toffee Crisp 11	Toffee Crisp 11
5 / E	Crunch White 18	Crunch White 18	Crunch White 18	Kit Kat 18	Yorkie 18	Yorkie 18	Yorkie 18	Yorkie 18	Yorkie 18	Yorkie 18
6 / F	Polo Mints 2 x 13	Polo Mints 2 x 13	Polo Mints 2 x 13	Polo Mints 2 x 13	Kit Kat 18	Kit Kat 18	Kit Kat 18	Kit Kat 18	Kit Kat 18	Kit Kat 18

Figure 10. Typical Confectionery Tray Configuration - Total Capacity 1079 Items

Figure 11 illustrates a “Combo” model showing product location and motors assignment of a typical machine loaded with product.

TRAY 1	Nik Nak 9		Nik Nak 9		Nik Nak 9		Nik Nak 9		Nik Nak 9	
MOTOR	A1		A3		A5		A7		A9	
TRAY 2	Hula Hoops 11		Hula Hoops 11		Hula Hoops 11		Hula Hoops 11		Hula Hoops 11	
MOTOR	B1		B3		B5		B7		B9	
TRAY 3	Drifter 18	Drifter 18	Drifter 18	Drifter 18	Drifter 18	Lion Bar 11	Lion Bar 11	Lion Bar 11	Lion Bar 11	Lion Bar 11
MOTOR	C1	C2	C3	C4	C5	C6	C7	C8	C9	C0
TRAY 4	Fruit Pastille 2 x 13	Fruit Pastille 2 x 13	Rolo 2 X13	Rolo 2 X13	Toffee Crisp 11	Toffee Crisp 11	Toffee Crisp 11	Toffee Crisp 11	Toffee Crisp 11	Toffee Crisp 11
MOTOR	D1	D2	D3	D4	D5	D6	D7	D8	D9	D0
TRAY 5	Chunky Aero 18	Chunky Aero 18	Chunky Aero 18	Chunky Aero 18	Chunky Aero 18	Kit Kat 18	Yorkie 18	Yorkie 18	Yorkie 18	Yorkie 18
MOTOR	E1	E2	E3	E4	E5	E6	E7	E8	E9	E0
TRAY 6	Polo Mints 2 x 13	Polo Mints 2 x 13	Polo Mints 2 x 13	Polo Fruits 2 x 13	Polo Fruits 2 x 13	Polo Fruits 2 x 13	Kit Kat 18	Kit Kat 18	Kit Kat 18	Kit Kat 18
MOTOR	F1	F2	F3	F4	F5	F6	F7	F8	F9	F0

Figure 11. Typical Combo Tray Configuration – Total Capacity 843 Items

CHANGING TIMING AND TRAY SPACING

Difficult-to-vend items can be dispensed more dependably by retiming the augers. Larger items can be vended by altering tray spacing.

Timing

Each auger can be rotated in 20-degree increments for a different drop-off point. Most items can be vended successfully when the auger end is positioned at 6 o'clock.

To change the auger end positions:

1. Make sure the auger coupling is seated over the vertical rail or retaining rib on the tray.
2. Remove the motor cover.
3. Raise the motor slightly and pull forward on the auger until it separates from the motor. See Figure 12.
4. Rotate the auger to the desired position and re-insert the auger coupling into the motor.
5. Replace the motor cover and securely tighten.

Tray Spacing

The trays can be raised or lowered in one-inch (2.5 cm) increments to provide additional headroom for vending taller items.

NOTE

When increasing the headroom between two trays, a corresponding decrease in headroom of an adjoining tray will result.

To change tray spacing, follow these steps:

1. Pull out the tray to be adjusted until it stops.
2. Disengage the tray harness from its snap-open harness clamp on the right-hand wall.

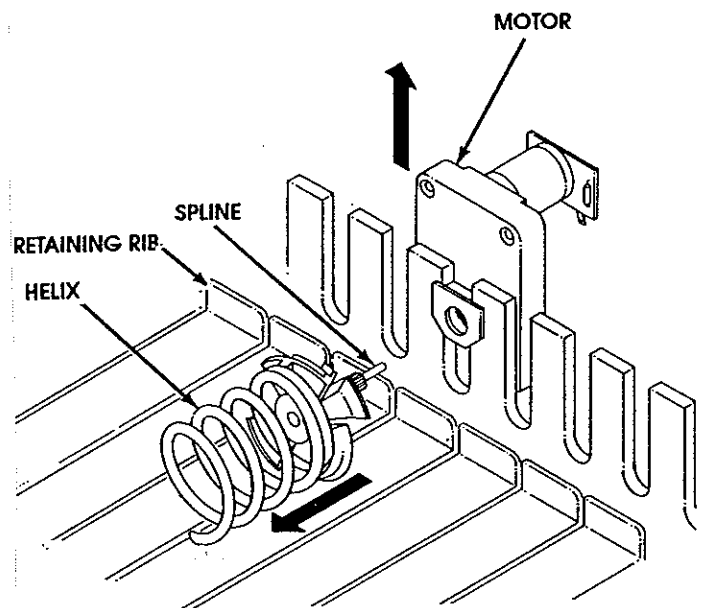


Figure 12. Separating the Auger and Motor

3. Disconnect the tray plug from its receptacle on the right side wall.
4. Lift up on the front of the tray and pull slightly forward (approximately 1/2 inch/1.25 cm) to clear the tray stop.
5. Lift up on the rear of the tray and remove it from the vendor.
6. Disengage both left and right tray rails from their corresponding slots on the left and right side walls: pull inward on the bottom front of each rail and pull its flange out of the slot.

7. Pull each rail forward to disengage its rear tab from the hole in the rear wall. See Figure 13.
8. Relocate both left and right rails by reversing steps 6 and 7.

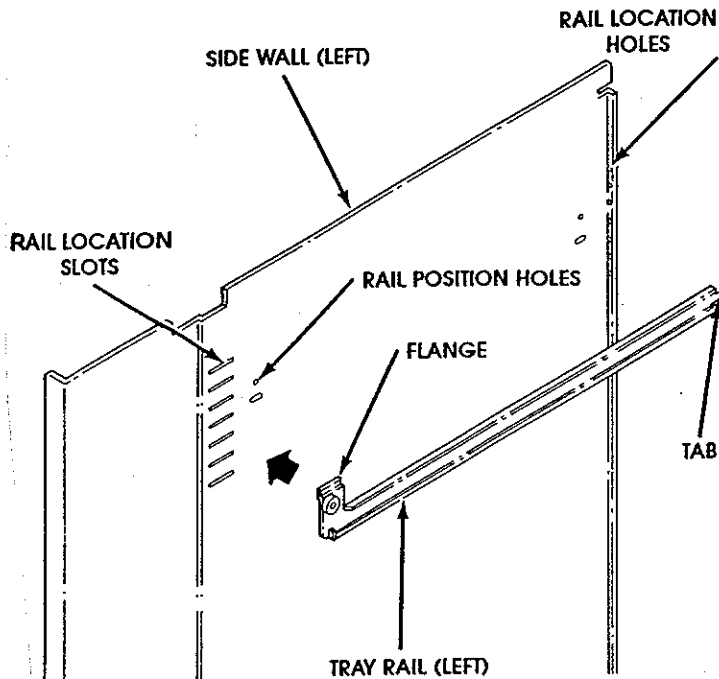


Figure 13. Removing a Tray Rail

NOTE

Rails must be level front to back and right to left.

9. Replace the tray by placing its rear rollers on the left and right rails and lifting up on the front of the tray as you push it back.
10. Install the tray plug into its receptacle on the right side wall.
11. Re-engage the tray harness into its harness clamp and snap the clamp closed.
12. Test vend the tray in its new position to assure that the tray plug is properly seated.

CARE & CLEANING

WARNING:

Always disconnect the power source before cleaning.

Cabinet Exterior

Wash with a mild detergent and water, rinse and dry thoroughly. Wipe occasionally with a quality car wax. Plastic exterior parts may be cleaned with a quality plastic cleaner.

Cabinet Interior

Wash with mild detergent and water. Eliminate odors by including baking soda or ammonia in the cleaning solution. Remove and clean drain hose to eliminate any deposits that may restrict condensate water flow.

The vend mechanisms must be kept clean. Any build-up can cause the mechanisms to malfunction. Use soap and water with great care so as not to get water into the electrical components.

To insure proper vending keep delivery slide area free of dirt and sticky substances.

Refrigeration System

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

Do not block the evaporator or any area of the air flow with product or supplies.

PARTS ORDERING PROCEDURE

When ordering parts, include the following:

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

NOTE

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

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

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

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

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

BEFORE CALLING FOR SERVICE

Please check the following

- Does your machine have at least 6" of clear air space behind it?
- If the power is turned on at the fuse box, is the machine the only thing that doesn't work?
- Is the machine plugged directly into the outlet?

WARNING:

**Extension cords can cause problems.
DO NOT USE EXTENSION CORDS.**

- Is the evaporator coil free of dust and dirt?
- Is the condenser coil free of dust and dirt?
- Is the compressor free of dust? (A blanket of dust can prevent the compressor from cooling off between workouts).
- Is the circuit breaker at the fuse box reset?
- Are evaporator fans running? Fold a sheet of 8 1/2" x 11" paper in half from top to bottom so it is now 8 1/2" x 5 1/2". Place the paper in front of the evaporator coil and see if the evaporator fans will blow the paper away.
- Is the condenser fan running? Fold a sheet of 8 1/2" x 11" paper in half. Place the paper in front of the condenser coils and see if it draws the paper to it.
- Is the shelf in front of the evaporator coil clear? (No tools or other air-restricting items).
- Is the cold control set as specified?

NOTE

Setting the temperature colder does not accelerate cooling of product.

SCHEMATIC

KIT KAT
SCHEMATIC
P/N 4206827
REV. D

