AUTOMATIC PRODUCTS international, ltd.

ROBO Quencher™

Quench Your Thirst Without The Burst.™

MODEL 511

COLD BEVERAGE MERCHANDISER

SERVICE MANUAL

OPERATING SYSTEM

PARTS MANUAL

Please Do Not
Remove Manual
from Machine

AUTOMATIC PRODUCTS international, ltd.

A Higher Standard.

75 West Plato Boulevard ◆ St. Paul , Minnesota 55107-2095

RQ511 V3.0 05/06

Part # 57500001

Express Warranty

Automatic Products international ltd. (APi) expressly warrants these automatic merchandisers (the "Unit"), manufactured by it, to be free under normal use and service from defects in material or workmanship for a period of two (2) years from the date of delivery of this Unit to the original purchaser. This warranty extends only to the original purchaser of the Unit. The exclusive remedy for this warranty is limited to the repair or replacement, at APi's sole option, of any part or parts of the Unit that are returned to APi or to the authorized dealer or distributor of APi from whom the unit was purchased with all transportation charges prepaid, and which, on APi's examination, shall, conclusively appear to have been defective. This warranty does not:

a. extend to any Unit, or part thereof, that was subjected to misuse, neglect, or accident by other than APi after its delivery to the original purchaser;
b. extend to any Unit, or part thereof, that was modified, altered, incorrectly wired or improperly installed by anyone other than APi or used in violation of the instructions provided by APi;
c. extend to a Unit which has been repaired or altered by anyone other than APi or authorized dealer/distributor;
d. extend to a Unit which has had the serial number removed, defaced or otherwise altered;
e. extend to plastic or glass windows, lamps, fluorescent tubes and water contact parts;
f. extend to any unit used outdoors
g. extend to accessories used with the Unit that were manufactured by some person or entity other than APi.

APi DISCLAIMS ALL OTHER WARRANTIES OF ANY KIND AS TO THE UNIT AND ALL WARRANTIES OF ANY KIND AS TO ANY ACCESSORIES. THIS DISCLAIMER OF WARRANTIES INCLUDES ANY EXPRESS WARRANTIES OTHER THAN THE LIMITED WARRANTY PROVIDED ABOVE AS TO THE UNIT AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AS TO THE UNIT AND ANY ACCESSORIES. UNDER NO CIRCUMSTANCES SHALL APi BE RESPONSIBLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES, LOSSES OR EXPENSES ARISING FROM OR IN CONNECTION WITH THE USE OF, OR THE INABILITY TO USE, THE GOODS FOR ANY PURPOSE WHATSOEVER. No representative of APi or any other person is authorized to assume for APi, or agree to on the behalf of APi, any other liability or warranty in connection with the sale of this Unit.

APi reserves the right to make any changes or improvements in its products without notice and without obligation and without being required to make corresponding changes or improvements in Unit theretofore manufactured or sold.

AUTOMATIC PRODUCTS international, ltd.

A Higher Standard.

To achieve the most trouble-free operation from your AP511 Cold Beverage Merchandiser, it is recommended that this service manual be thoroughly read and the instructions followed pertaining to installation, servicing and maintaining of the unit.

Should you have questions pertaining to this manual or the vendor, please contact your APi distributor or write directly to:

Automatic Products int. ltd.
75 West Plato Blvd.
St. Paul, MN. 55107 USA
651-224-4391
651-602-3558 (fax)

INTRODUCTION

The Automatic Products 511 Beverage Merchandiser is the state of the art in vending technology. The 511 features a robotic delivery system with current limiting motors. The AP 511 introduces a unique delivery mechanism that eliminates the agitation of a carbonated beverage that is usually experienced with the delivery of these products from other machines. The design of the product storage shelves permits the use of a wide variety of packaging, ranging from a standard 12 ounce can to most 20 ounce plastic and glass bottles available in the beverage marketplace today. The easy to understand, numerical key pad selection panel provides access to all setup and diagnostic service modes. All selections can be individually priced with the use of an Multi-Drop Buss (MDB) type coin mechanism and bill validator.

HOW TO USE THIS MANUAL

This manual is divided into four basic parts:

1. Unpacking and Installation.
2. Optional Equipment & Refrigeration
3. Components and Refrigeration.
4. Operating System.
5. Programming
6. Troubleshooting
7. Parts

WATCH THROUGHOUT THE MANUAL FOR THIS SPECIAL ♦ DIAMOND MARK. THIS INDICATES A POINT OF SPECIAL INFORMATION OR A HINT THAT WILL ASSIST YOU IN SETTING UP,OPERATING OR TROUBLESHOOTING THE MACHINE.

CAUTION: Certain procedures in both the operating section and the service section require that voltage be on in the machine. Only trained personnel should perform this function. Exercise extreme caution while performing these procedures. These procedures will be marked with the lightening bolt symbol as it appears at left.

CAUTION: Certain procedures in both the operating section and the service section requires a qualified trained technician to perform the particular task at hand. These procedures will be marked with the exclamation symbol as it appears at left.

CAUTION: It is important that this machine is hooked up to the proper voltage and polarity for your country. Use a Voltmeter to verify voltage and polarity. Should the reading be any different than a normal reading for your country or if you are unsure of what the reading should be contact an electrician.

CAUTION: Different Countries may have unique plug arrangements. Ensure that the properly grounded before operating.

CAUTION: For 230Vac applications, the power cord in this machine is of a type Y attachment. If the power cord is damaged, it must be replaced by: the manufacturer, it's service agent, or a similarly qualified person, in order to avoid a hazard.

FEATURES OF THE APi 511 BEVERAGE MERCHANDISER

STANDARD FEATURES

- Capacity up to 320 beverages
- Maximum of 40 different selections
- Multi Drop Bus capabilities
- Fault Diagnostics
- First in first out shelf loading
- Health control for vending dairy products

PRICING

- Individual pricing by selection
- Free Vend Feature
- Software contained Accountability:
- vend counter, cash total

DISPLAY

- User friendly four character, seven segment display to help with the selection process and provide customer feedback
- LED segments to indicate:
- Credit
- Selection price
- Remove product
- Diagnostic messages

SPECIFICATIONS

Ratings:

120v, 60 hz, 11amps, 1320watts
230v, 50hz, 5amps, 1150watts

Noise Level:
Operates at less than 70dba (A)
Sound pressure levels measured
Per ISO 11201:1995

Dimensions:

Height: 72 inches (1830mm)
Depth: 34-1/8 inches (864mm)
Width: 44-3/8 inches (1130mm)
Shipping wt. 922 lbs.

REFRIGERATION

Compressor - 1/2 Horse Power
Refrigerant - R134A
Charge - 13.0 oz. (.37 kg.)
Design Pressures:
High side-200 psi
Lowside-135psi

Electrical

A grounded electrical outlet rated at 120 volts 15 amp must be available within six feet of the vendor.

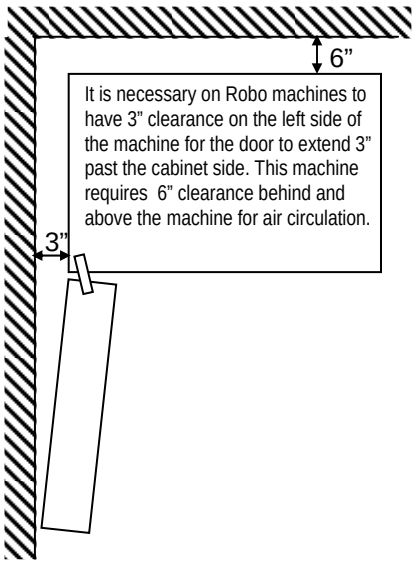
COIN MECHANISMS

◆ **IMPORTANT!** DO NOT PLUG COIN MECHANISM INTO THE CONTROL BOARD WITH POWER ON. THIS MAY RESULT IN DAMAGE OF THE COIN MECHANISM AND LOGIC CONTROL BOARD.

◆ **IMPORTANT!** Only the MDB coin mechanisms and bill validators listed on page 6 should be used in this machine.

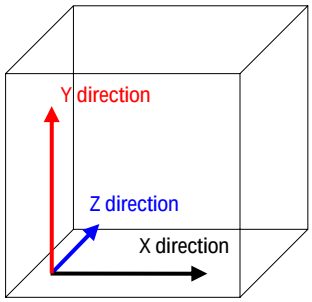
ACCEPTABLE AMBIENT OPERATING TEMPERATURE RANGE

All equipment manufactured by Automatic Products Int. Ltd. Is designed to operate in a temperature range of 10° C to 38° C (50° F to 100° F)In still air (75% R.H. non-condensing). The machine is capable of being stored in a temperature range of –18°C to 68°C (0°f to 155°F).



Robo Quecher[tm] Dictionary

As production of the Robo Quencher[tm] continues to increase, and more operators become familiar with the robotic delivery assembly used in the machine, we need to define some of the terms coming into common use when working with or talking about Robo Quencher[tm]. Here is a glossary of those terms:



X, Y, and Z Axis -Based on the coordinate system first defined by Rene Descartes almost 500 years ago, the X, Y, Z coordinates help define the direction the Auto Glide[tm] assembly moves to select and deliver the customer's beverage. The X direction is left and right, the Y direction is up and down, and the Z direction is in and out, or front to back. The majority of the mechanical components in the Robo Quencher[tm] derive their name from the function it performs during the vend sequence.

Initialization -This is the process that the Auto Glide[tm] assembly goes through whenever the machine is powered up with this assembly not in its Home position, or if the vend process is interrupted. Successful completion of Initialization can be used as a diagnostic tool.

XY Bar -The XY Bar is the five-foot long vertically mounted bar that moves across the front of the selections when a customer makes a selection. This bar contains the X Motor, the Y position Home Switch and the Cage assembly.

X Motor -The X Motor moves the XY Bar left and right to the proper column during the vend sequence. The X motor determines its position with an optical sensor passing over a series of slots in the X Timing Bar.

Y Position Switch -The Y Position switch is located about 1/3 up from the bottom of the XY Bar. As the Auto Glide[tm] assembly goes through the Initialization process, this switch provides a fixed point of reference.

Cage -The Cage (or shuttle) is the rectangular assembly mounted on XY Bar that collects the beverage and delivers it to the home position. The Cage assembly contains the Y Motor in the top of the assembly, the Z Motor and it's position switches in the base of the Cage, and Golden Eye detection assembly to ensure a product is delivered every vend. The floor of the Cage is known as the Shoe, and provides a stable ridged platform onto which the selected beverage slides into the Cage. The Shoe also contains an alignment mark for use during an XY Alignment Procedure.

XY Alignment Procedure -This procedure should be performed every time the machine is moved. After the machine has been leveled front to back and side to side, this procedure confirms that the XY Bar is plumb to the shelves by checking the Cage alignment with the four corner selections.

Z Motor -The Z Motor is located in the bottom of the Cage and pushes the bottom of the Cage towards the Escapement on the end of a beverage shelf. This motion opens the Escapement, which allows the beverage to slide into the cage. The Z Motor's action is controlled by two micro-switches, which when actuated by a gear track, identify whether the Cage is in a normal or extended position.

Cage Lock Motor -This motor is located directly below the Cage in its home position. The Cage Lock Motor rotates to extend a locking bar into the base of the Cage to prevent the Cage from being moved from its home position when the Delivery Door is opened to permit removal of the beverage.

APi 511 UNPACKING AND INSTALLATION

The 511 Robo Quencher™ Beverage Merchandiser is assembled and packed so that a minimum amount of time is necessary for preparation to install it on location. The following steps are recommended to insure correct unpacking.

UNPACKING

1. Shipping Damage: Thoroughly inspect the exterior of the carton for damage which may have occurred during shipment. Report any damage to delivery carrier and follow their instructions.

2. Remove shipping carton, plastic bag from vendor and remainder of packing material. Inspect exterior of cabinet for damage.

◆SAVE SHIPPING CARTON FOR REUSE IF MACHINE IS TO BE RESHIPPED.

3. Removing Vendor with a Fork Lift Truck:
From the side of the vendor tip the vendor backward and run forks under the cabinet.

4. Remove clip from lock handle and open front door. If machine is equipped with a lock, the keys will be in the coin return cup. Inspect cabinet interior for evidence of damage.

NOTE: Because the weight concentration is toward the back of the cabinet, trucking and lifting should be done from the back. CAUTION should be taken when trucking from side.

5. On machines with lock in place, unlock and turn handle to open door. When no lock is furnished, remove clip and turn handle. Swing door to its full open position. Remove all packing tape and paper from various areas of machine.

6. **Warranty.** The warranty card is shipped in the service envelope. It must be filled out in full and mailed at once to insure coverage.

CLEANING

The 511 Robo Quencher™ will do the best product merchandising job for you if it is kept clean. The display window can be cleaned with any good glass cleaner. The exterior and interior surfaces should be cleaned with warm water and mild detergent. Rinse thoroughly and dry all surfaces.

CAUTION: Do not use any cleaners containing silicon as this could cause electrical failures.

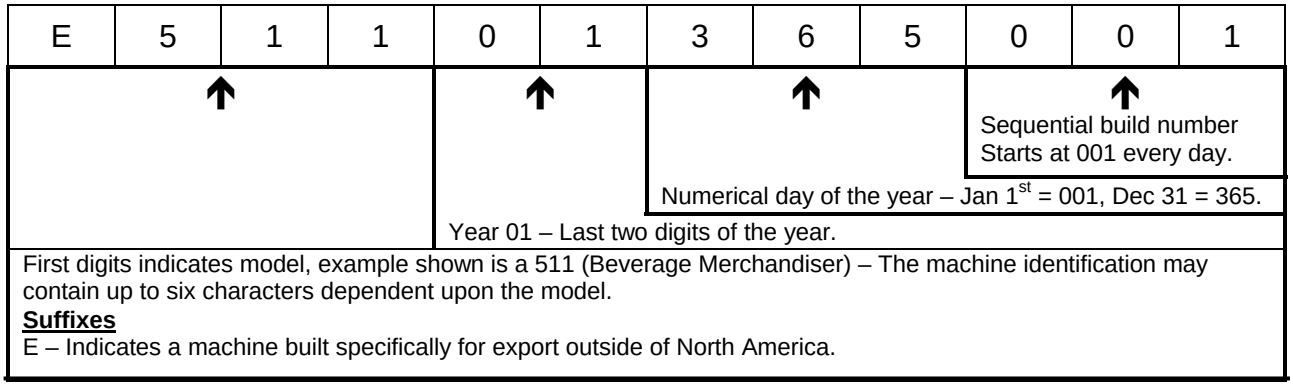
The main product shelves can be best cleaned with the product slides removed from the machine. The slides can easily be removed by pushing the slide back and lifting up and out on the front of the slide.

The product slides can be cleaned with hot soapy water, and should be dried thoroughly before returning them to the product shelves. DO NOT USE ANY ABRASIVE MATERIALS ON THE PRODUCT SLIDES. Abrasive materials will damage the finished surface of the slides.

Clean the acceptor on the coin mechanism frequently as accumulated dirt in this area can cause coins to hang or not be accepted. Follow recommended cleaning procedures as described by the manufacturer.

The delivery cage and sensor assembly should be cleaned with a damp cloth during each service visit. Wiping down the delivery cage assembly will prevent any syrup or dirt build up interfering with proper operation of the unit or the optical sensors. Wiping down the product delivery cage sensor will also prevent malfunctions from occurring.

The delivery door assembly can easily be removed from the door for cleaning. Once the bottle shield is removed, the delivery door assembly can easily be removed by removing two Phillip screws along the top of guide bracket below the coin slot assembly. The delivery door assembly can then be disassembled on a bench for cleaning.



INSTALLATION

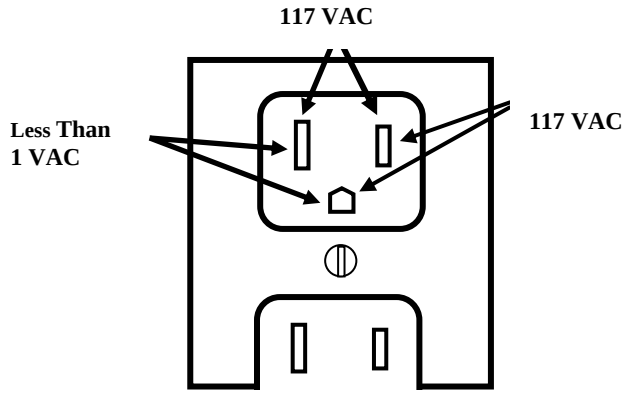
Leveling the machine:
Leveling the machine once it has been delivered to a location is critical for the proper function of the machine. The four leveling screws in the legs are the means of leveling the machine. After positioning the machine, level machine in front to rear and right to left directions

INSTALL AIR DEFLECTOR
Install air deflector on rear screen outlet by loosening the mounting screws and placing the keyholes over the screw heads, and tightening the screws.

CAUTION: **THIS MACHINE IS DESIGNED FOR INDOOR USAGE ONLY. ANY OTHER USAGE MAY VOID THE MANUFACTURERS WARRANTY.**

CAUTION: THE FOLLOWING PROCEDURE REQUIRES THAT THE MACHINE HAVE POWER APPLIED AND A POTENTIAL ELECTRICAL SHOCK HAZARD EXISTS.

Voltage and Polarity Check:
It is important that this machine is hooked up to the proper voltage and polarity. Using a voltmeter, perform the following checks from the illustration below.



◆ Note: should the readings be different from above, have a certified electrician correct the problem.

CAUTION: **Certain procedures may cause moving parts to operate & the potential for injury may exist. Exercise caution when power is applied as parts may move without warning.**

Coin Mechanism Installation:
With the monetary door fully open, locate the control board mounted to upper left side of the inner door. Locate the mode switch on the control board and press the mode switch one time and press 11. The XY mechanism lock will release and move left to a standby position. Turn main power switch off and swing the coin mech cover to the left to install the coin mechanism. Install the coin mechanism hold down screw provided. Plug coin mechanism into six pin MDB plug provided.

Dollar Bill Validator Installation:
Locate the control board on the monetary door. Below the control board will be a filler plate held in place with four nuts. Remove the filler plate and install dollar bill validator in place using the same hardware. Connect the Acceptor harness into the six pin MDB harness routed from the coin mechanism. Plug the other six pin MDB connector from the validator harness onto the P2 pin out connector on the control board.

LOADING PRODUCT SHELVES:
Open the right and left doors to full open position. Lift the red shelf locking lever to release the shelf. Place the first three bottles into position desired, slightly push the product bottles back and insert the next product bottle. Follow the same procedure for loading the remainder of the machine.

SET SELECTION PRICE:
Price settings are done individually. Maximum price capability is $99.95. For price setting instructions refer to Quick Set-Up Reference Sheet.
Install selection price tabs:
Price tabs are included in all manual packets. Price tabs are to be installed onto the dispensing gate above the item selection label.

SET / CHECK TEMPERATURE:
The cabinet temperature is settable from +32° to +50° Fahrenheit (0°c-+10°c) inclusive in 1 degree increments. For temperature setting instructions refer to Quick Set-Up Reference Sheet. Factory default temperature setting is 35°F
Cabinet temperature can be checked by depressing and holding the (<) or (>) arrow key on selector key pad for three seconds. The temperature of the cabinet will then appear on the display as follows: the (>) arrow key will display Fahrenheit / the (<) arrow key will display Celsius.

Z MECH HEIGHT ADJUSTMENT:
After loading all product into machine, test each selection for proper dispensing into the Z mech. If product is not dispensing correctly into Z mech (i.e.- tilting forward) adjust the height of the Z mech so that the lower edge is 1 click (button press) below the slide. For Z mech height adjustment, please refer to Quick Set-Up Reference Sheet.

POWER SUPPLY:
The 120 VAC power cord from the wall outlet enters the rear of the machine and plugs into the main junction box located in the upper right side the cabinet above the coin mechanism. The voltage output to the board is 24 volts and is connected to the P3 position of the control board.

LIGHTING SYSTEM:
There is only one florescent lamp in the 511 Beverage Merchandiser. The lamp is located in the top of the cabinet and lights up the main product area.

MAIN PRODUCT SHELVES:
There are five rows of eight columns. Each selection has a dual dispensing gate mounted to the front of the shelf. All columned shelves are identical and interchangeable. The paired columned shelves are supported vertically to prevent warping due to product weight.

PRODUCT DELIVERY ASSEMBLY:
The delivery door is located below the T-handle on the monetary door. The Z mechanism is located in the main cabinet. In standby, the Z mechanism is positioned and locked in place directly in front of the coin mechanism. The product delivery assembly consists of five primary components:

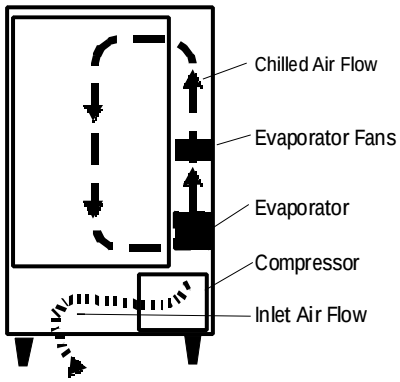
1) X mech moves the delivery assembly left to right.
2) Y mech moves up and down.
3) Z mech moves in and out engaging the dispensing gate.
4) Product Delivery Door (Home Position)
5) Lock motor locks Z mech while bottle is in the Z mech.

When a selection is made, the control board insures that the delivery door is closed, the Z mechanism is empty. If all systems are ready, the cage lock is released, the X axis motor locates vertical column using a optical sensor and the Y axis motor (locates shelf position using an optical encoder) hovers to selected item. The Z Mech motor is activated engaging the dispensing gate and stops when the Z mech out switch is made. When the dispensing gate is engaged the product will slide into the Z mech. The Z mech will wait one second to confirm a product has been dispensed or until the sensor is blocked. If a product is not present in the Z mech, the Z mech will return home and display sold-out. If a product is present, the Z mech will run until the Z in switch is activated. Once this occurs, the Z mech will return to the home position and lock in place. The delivery door then opens, and remains open until the product is removed.

REFRIGERATION UNIT
The refrigeration unit is located in the bottom right side of the main cabinet. The air inlet for the compressor is located on the bottom left side of the cabinet and is protected by a removable screen. An air deflector is included with each machine and should be installed on the mounting screws on the rear of the machine. The purpose of the air deflector is to ensure proper air flow and correct heat transfer, and to prevent the machine from being pushed up against the wall.

IMPORTANT: THE AIR INLET SCREEN SHOULD BE CHECKED AND CLEANED EACH VISIT!

The evaporator is mounted above the compressor assembly, and when installed, is entirely within the insulated cabinet. The single evaporator fan is mounted above the evaporator. The chilled air is circulated up through a large duct on the right side of the cabinet, forced out over the top of the product shelves area and is then drawn down to the inlet of the evaporator and is pulled through the evaporator by the one fan.



Refrigeration Air Flow and Primary Refrigeration Components

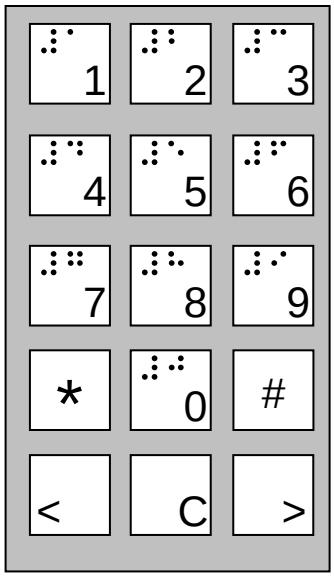
The temperature is controlled by a solid state temperature sensing device, located on the right panel of the cabinet and is connected to the control board. The control board then activates a low voltage relay that controls the operation of the compressor.

INSTALL AIR DEFLECTOR:
Install air deflector on rear screen outlet by loosening the mounting screws and placing the keyholes over the screw heads and tightening the screws.

Operating Systems

Control Board & Display
The control board contains all of the decision-making control and the display. All peripherals plug into the control board. The display on the control board indicates: Credit, Price of the Product, Diagnostic Information and Options (In Service Mode). In addition, there are (2) LED's that indicate Make Another Selection and Use Correct Change

Keypad
The Selection keypad (pictured below) is located on the front of the monetary door The Selection Keypad is used as an input source for settable data when in Service Mode. The keypad is only active for service functions when the monetary door is open, so even in the event of vandalism to the control bezel; no access to the service functions is permitted.



Coin Mechs, Validators and Card Readers:
The Robo Series Machines support MDB protocol only.

	MDB Coin Mechanism	MDB Bill Validator
Mars	TRC-6510 TRC-6512 VN-4510	VN2502-U5M VN2512-U5M
CoinCo	9302-GX, USQ-G701 USQ-G703 USQ-L701	MAG 32 MAG 52
Conlux	USLZ-004-01F CCM 5 G	USLZ-004-01F

The Robo Series will automatically determine at power up which peripherals are connected and configure itself accordingly.

CAUTION: Do not attempt to move the machine while it is loaded with product. Possible injury or damage to the machine may occur. Transport machine empty only!

Operating Systems

INTRODUCTION

The APi 511 Beverage Merchandiser is user friendly and allows the user to move freely through the programming by choosing selected keys. It provides ease for insertion, modification, and deletion of operational parameters and data. In addition, the program system provides the user with status and diagnostic messages to aid in the use and service of the machine.

OPERATIONAL MODE

The operational mode provides the machine with the ability to vend products. The machine is in Operational Mode whenever the monetary door of the machine is closed. Upon opening the monetary door, the machine will remain in Operational Mode until the Mode Switch on the Control board is depressed at which time it will enter the Service Mode.

SERVICE MODE

The Service mode is entered by depressing and releasing the Mode Switch, on the Control Board. A second depression of the Mode Switch will exit the Service Mode and return the Control Board to the Operate Mode. Entrance into the Service mode will clear any current credit and disables all credit acceptance. In addition, entering the Service Mode, displays diagnostics information until an additional Service Mode function has been selected. Diagnostics information includes MDB errors and defective or jammed arm movement motor codes. If there are no errors are present “nOnE” will be displayed. If errors are present “n x” will be displayed where x is the number of errors. Errors may be viewed by using the arrow keys showing the most recent error first, or you may skip viewing errors by pressing other service keys. When you have viewed all the errors or you press the # key, “CLrn” will appear to allow you to clear the errors. The # key may then be used to toggle between ‘y’ and ‘n’. To exit the **C** key must be pressed. The ‘y’ or ‘n’ choice is only made if you exit with the **C** key (not the mode key).

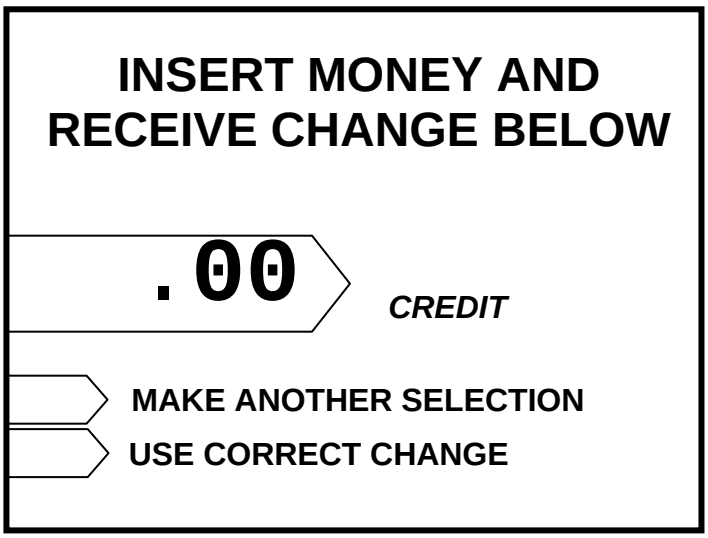
The following table lists the Multi-Drop Bus errors that may be displayed in the Diagnostics Mode:

Multi-Drop Bus Error	**Display**
Invalid changer scale factor	“CscF”
Defective coin tube sensor	“tSnS”
Coin jam detected	“CJAM”
Coin tube jam detected	“tJAM”
Coin acceptance problem detected	“CnEr”
Acceptor unplugged	“AcEr”
Coin changer ROM checksum bad	“ChEr”
Invalid acceptor scale factor	“bScF”
Defective bill sensor	“bSnS”
Bill jam detected	“bJAM”
Bill stacker is full	“StFL”
Bill cash box is out of position	“Cshb”
Bad bill motor detected	“bMtr”
Bill acceptor ROM checksum bad	“bLEr”
Invalid card reader scale factor	“rScF”
Card error detected	“CdEr”
Invalid card detected	“bCrd”
Card reader jam detected	“rJAM”
Communications error detected	“CoEr”
Card reader failure	“brdr”

Operating Systems

Power Up State

Following a power-up or reset condition, the display will show "----"and then credit available will show on the display



Operate Mode

Upon closing the door, the display will show the firmware revision level and then enter operational mode.

Standby

In stand by, zeros will be shown along with the designated decimal point. Accumulated credit will be shown until a selection is made. Position of the decimal point is determined by the MDB peripherals.

Keypad echo

When the first numeric key is pressed the display will show the selection number in the second leftmost digit. This character will remain for 5 seconds or until another key is pressed. If a second numeric key is entered, the pair will be shown on the display for one second and then the associated price for the product will display. If the selection is disabled the display will show **"d".** and flashes the " Make Another Selection " LED.

Credit Accumulation

Credit may be accumulated through a coin mechanism, bill acceptor or card reader. Card reader credit cannot be mixed with coin and/or bill credit during a single transaction or vend. Credit acceptance will be disabled when the accumulated credit equals or exceeds the highest priced item. Credit accumulation from any source is disabled or escrowed if change is not available. If the amount of card reader credit available exceeds the maximum displayable credit, the maximum credit will be displayed.

Vend process

After a keypad entry is made the control board determines if sufficient credit is available for the selection attempted. If the credit is greater than or equal to the selection price, a vend attempt will be made for that selection. During this time, the selection will be shown on the display. If credit is less than the selection price, the price will be displayed and the Use Correct Change LED will flash for 5 seconds or until a new selection key is pressed.

Change payment

Change will be returned after the vend is complete. The amount of change to be returned will be displayed until all coinage is paid back. The least amount of coins available will be paid back for all credit returns.

Use Correct Change LED

If the level of the changer's least value coin tube is below the lowest sensor, the "Use Correct Change" LED will be illuminated continuously. If the machine is unable to vend the selected item because of low change, the "Use Correct Change" LED will flash 5 times.

Make Another Selection LED

If the machine is unable to vend the selected item, the "Make Another Selection "LED will be flash 5 times.
In the case of a sold out condition the LED will flash and the display will read "SOLD OUT" for 30 seconds or until a keypress.

Operating Systems

Token Vends
Following the acceptance of a token, the display will show "FrEE". Further credit acceptance is disabled and a single item may be selected to vend for the token credit.

Accountability Information
All MIS data is stored as both resettable and non-resettable with the exception of Machine Identification Number, Machine Serial Number, Software Version Number, Number of MIS Resets, Number of Machine Resets, Door Open History, and Value of Coins in Tubes which shall be stored as non-resettable only. All vend counters will roll over at 7 digits (9,999,999). All cash counters will roll over at 8 digits including the decimal point (999,999.99).

Vend accounting (MIS) is updated as follows:
* Indicates which field is updated for a given vend type.

	Vend Type			
Field	Token	Vend	Testvend	Freevend
#VENDS	*	*		*
$VENDS (Sale Price)		*		
#/PROD	*	*		*
$/PROD (Sale Price)		*		
#/TESTVEND			*	
# /FREE				*
$ /FREE				*
# /TOKEN	*			
$ /TOKEN	*			

Table 1: MIS Field Update Chart

Operating Systems

DEX/UCS

The Robo Series supports DEX/UCS Communications Protocol - NAMA Vending Industry Data Retrieval Standard. The machine will automatically recognize the DEX/UCS device when it is plugged into the control board and will recognize when the device initiates the communication protocol. The transmission/reception of data to the device will then take place automatically. The MIS data stored by the machine for a DEX/UCS download is as follows:
The MIS data stored by the machine shall be as follows:

NAME	DEX HEADER FIELD	HISTORICAL FIELD	RESETABLE FIELD
MACHINE SERIAL #	ID101		
MACHINE ID #	ID102		
MACHINE VERSION #	ID103		
MACHINE LOCATION	ID104		
MACHINE ASSET #	ID106		
CONTROL BOARD SERIAL #	CB101 = “API” + 17 DIGIT SERIAL #		
CONTROL BOARD ID #	CB102 = “ROBO”		
CONTROL BOARD SW VERSION #	CB103 = LATEST REVISION		
DECIMAL POINT POSITION	ID401		
TOTAL VALUE OF SALES		VA101	VA103
# OF VENDS		VA102	VA104
# OF TEST VENDS		VA202	VA204
# FREE VENDS		VA302	VA304
VALUE FREE VENDS		VA301	VA303
BILL VALIDATOR SERIAL #	BA101		
BILL VALIDATOR ID #	BA102		
BILL VALIDATOR SW VERSION #	BA103		
COIN CHANGER SERIAL #	CA101		
COIN CHANGER ID #	CA102		
COIN CHANGER SW VERSION #	CA103		
VALUE OF CASH SALE		CA201	CA203
# OF CASH SALES		CA202	CA204
VALUE OF BILLS STK'D		CA308	CA304
VALUE OF CASH IN		CA305	CA301
VALUE OF COINS TO TUBES		CA307	CA303
VALUE OF COINS ROUTED TO THE CASH BOX		CA306	CA302
VALUE OF CASH DISPENSED		CA403	CA401
VALUE OF CASH MANUALLY DISPENSED		CA404	CA402
VALUE OF EXACT CHANGE VENDS		CA902	CA901
TUBE FILL VALUE		CA1002	CA1001
CURRENT VALUE OF COINS IN TUBES		CA1501	
# OF TOKEN VENDS		TA202	TA204
VALUE OF TOKEN VENDS		TA201	TA203
CASHLESS SERIAL #	DA101		
CASHLESS ID #	DA102		
CASHLESS SW VERSION #	DA103		
# OF CASHLESS VENDS		DA202	DA204
VALUE OF CASHLESS VENDS		DA201	DA203
LOOP HEADER	LS101 = (0001)		
VALUE OF VENDS BY SELECTION NUMBER	PA101 = (SELECTION #) (# = 10 TO 40) PA102 = PRICE	PA202	PA204
# OF VENDS BY SELECTION NUMBER		PA201	PA203
# OF FREE VENDS BY SELECTION NUMBER		PA401	
LOOP TRAILER	LE101 = (0001)		
# OF READS WITH RESET	EA301		
# OF READS	EA309		
# OF MIS RESETS	EA3010		
# OF DOOR OPENS	EA201 = “EGS” EA205 = CURRENT STATUS 1 = DOOR CURRENTLY OPEN	EA203	EA202
# OF HEALTH SHUT DOWNS	EA201 = “EJH”	EA203	EA202
# OF INITIALIZATIONS	EA201 = “ECU”	EA203	EA202
# OF X MOTOR FAILURES	EA201 = “EJL01”	EA203	EA202
# OF Y MOTOR FAILURES	EA201 = “EJL02”	EA203	EA202
# OF Z MOTOR FAILURES	EA201 = “EJL03”	EA203	EA202

Programming

Service Modes (quick reference)
See the following pages for more detailed information on each of the service modes listed below.
To access the Service Mode press the mode button on the control board, the display will prompt **Sr** or scroll through a list of errors (if any). The last error will remain on the display until a Service mode is entered. To access the service modes, enter one of the mode numbers below.

MODE NUMBER	
01	Price Assignment
02	Test Vend
03	Multiple Vend Setup
04	Bill Escrow Setup
05	Force Vend Setup
06	Free Vend Setup
08	Historical Total Value of Sales
09	Historical Total # of Vends
11	Coin Mechanism Access Mode
12	Historical Value of Sales By Selection
13	Historical # of Vends By Selection
15300	Allows setting a 17 # character serial number
17200	Allows setting 17 numeric character Machine Asset number.
18400	Allows setting 17 numeric character location ID
20	Refrigeration Setup
21	Health Timer Setup
22	Machine Setup And Tests
24	Tube Fill Mode

Service Mode Numbers

01 - Price Assignment
The display will prompt **Prc**.
Enter the price to be set using the numeric keypad.
Press [#] and the display will prompt **"S"** for Selection.
Enter all the selection numbers to be set at the price entered in the previous step.
Press [#] to enter another price or C to lock in and go back to the service mode.

02 - Test Vend
The display will prompt **SL**.
Enter the selection numbers to be tested.
Press [C] or close door to exit.

03 - Multiple Vend Setup
The display will prompt **nuL n**.
Use [#] to toggle between **n** (no) & **Y** (yes).
Press [C] or close door to exit.

04 - Bill Escrow Setup
The display will prompt **ESc n**.
Use [#] to toggle between **n** (no), **F** (first bill) or **L** (last bill).
Press [C] or close door to exit.

05-Force Vend Setup
The display will prompt **Fu n**.
Use [#] to toggle between **n** (no) & **Y** (yes).
Press [C] or close door to exit.

06 - Free Vend Setup
The display will prompt **Fr n**.
Use [#] to toggle between **n** (no) & **Y** (yes).
Press [C] or close door to exit

Accountability
The first four digits are displayed for two seconds followed by the second four digits.
Press [C] to exit.

08 - Historical Total Value of Sales.

09 - Historical Total # of Vends.

11-Coin Mechanism Access Mode
The cage will move out of the home position and coins can be added to inventory of the coin mechanism.

12-Historical Value of Sales By Selection
Upon entering, the control board displays**"HVSS"**and waits for a selection to be entered.

13-Historical # of Vends by Selection
Upon entering, the control board displays **"HNSS"**and waits for a selection to be entered.

15300-Set Serial Number
Upon entering, the display clears and is ready to accept a 17 digit serial #.Once the code is entered the # key must be pushed.

17200-Set machine ID
Upon entering, the display clears and is ready to accept a 20 digit machine ID.Once the code is entered the # key must be pushed to enter the new number.

18400-Set Location ID
Upon entering the display clears and is ready to accept a 20 digit location ID.Once the code is entered the # key must be pushed to enter the new number.

20 - Refrigeration Setup
Upon entering the “Refrigeration” setup mode the display shows the current “Refrigeration” temperature. The < or > key may then be used to increase or decrease the temperature respectively.

21 - Health Timer Setup
The # key may then be used to toggle the “Health Timer” option ON/Off.

22 - Machine Setup and Tests
Vend Position: “Row” then “Column”
Go Home: “*” then “1”
Safe Area: “*” then “4”
Z Mech Extend: “*” then “7”
Z Mech Retract: “*” then “8”
Set Row: “*” then “3”
Set Selection: “*” then “9”
Product Door Open: “*” then “5”
Product Door Close: “*” then “6”

24-Tube Fill Mode
The display will prompt” tF--“and waits for coins to be inserted into the top of the changer. As the coins are inserted the display will show the value of the coins entered.

Programming

Service Mode (detailed)

The Service Modes allow you to update all the prices and options in the machine. Upon opening the machine door and depressing the Service button located on the bottom left corner of the control board, the control board enters the Service mode. If a period of no activity occurs for 5 minutes, the controller will automatically revert to the Operate mode. Entrance to the Service mode clears any current credit. In addition, entering the Service mode, will display the # of errors, each error may be scrolled through using the arrow keys. When you have viewed all the errors,"CLrn" will appear to allow you to clear the errors.The # key may then be used to toggle between y and n.To exit the C key must be pressed. Diagnostics information includes Multi-Drop Bus errors and defective or jammed motor codes. If no errors are present the display will prompt **Sr** for service.

Entering one of the service mode numbers below allows access to that service mode. **Example: entering 01 will take you into price assignment.**

Service Mode Numbers

01 - Price Assignment
Upon entering the price assignment mode 01 the controller will display **"Prc "** for 2 seconds and then **" . "**.
Enter the price to be set using the numeric keypad.
Press [#] and the display will prompt **"S"** for Selection.
Enter all the selection numbers to be set at the price entered in the previous step.
Press [#] to enter another price or C to lock in and go back to the service mode.
The maximum price is that can be set at $99.99 due to the display limitations. (The display format is dependent upon scale factor and decimal point position provided by the credit peripherals connected.)

02 - Test Vend
Upon entering the Test Vend mode 02, the controller will display **"SL "**.
Enter the selection number to be tested. Once the selection is entered, a vend will be attempted. If the vend is successful, the controller display **"SL"** again. If the selected motor fails, the controller will display "FAiL" for 2 seconds and then display "**SL**" and wait for another selection to be entered. Test Vend will be turned off automatically on door closure. Press [**C**] or close door to exit.

03 - Multiple Vend Setup
Upon entering the "multi–vend" set up mode 03, the display shows the current "Multi-vend" state. Use [#] key to toggle the "Multi-vend" option between **"nul n"**, n = disabled or **"nul Y"** = enabled. Multi-vend enabled (nul Y) allows the customer to make additional selections as long as sufficient credit exists to purchase the lowest priced item in the machine. The customer may establish additional credit at any time when in this mode. If the customer presses the Coin Return Lever, the amount of available credit drops below the lowest priced item in the machine (by set price) or a 30 second time-out expires, change is returned regardless of the state of Multiple Vend. Multi-vend disabled ("nul n") will cause the change to be paid back immediately after product is removed.
Press [**C**] or close door to exit.

Multi-Vend State	Display
Multi-vend enabled	**"MULy"**
Multi-vend disabled	**"MULn"**

04 - Bill Escrow Setup

Upon entering the "Bill escrow" set up mode 04, the display shows the current "Bill escrow" state. The [#] key is used to toggle the "Bill escrow" option between FIRST/LAST/OFF. When Escrow FIRST is enabled the unit shall hold the first bill deposited in escrow until a vend is initiated. Once a vend is initiated the bill must be stacked before the product is dispensed. In this mode only one bill maybe used per vend. With this feature set to LAST all bills are stacked until credit is above the highest vend price, if change is available. With escrow OFF all bills accepted will be stacked immediately, providing there is sufficient change to payback. Press [C] or close door to exit.

Bill Escrow State	Display
Bill escrow first	**"EScF"**
Bill escrow last	**"EScL"**
Bill escrow disabled	**"EScn"**

05 - Force Vend Setup

Upon entering the "Force vend" set up mode 05 the display shows the current "Force vend" state. Use the [#] key to toggle the "Force vend" option between ON/OFF. When the force vend option is enabled, once credit has reached the lowest vend price set in the machine, the customer must purchase at least one item prior to requesting that any remaining credit be returned. Force Vend does not apply when debit cards are used or if all coins/bills are held in tubes/escrow. Press [C] or close door to exit.

Force Vend State	Display
Force vend enabled	**"Fu Y"**
Force vend disabled	**"Fu n"**

06 - Free Vend Setup

Upon entering the "Free vend" set up (mode 06) the display shows the current "Free vend" state. Use the [#] key to toggle the Free vend option between Y (ON) and N (OFF). When the "Free vend" option is enabled, the machine can be vended without credit. **NOTE: If free vend is enabled, it will stay enabled until it is disabled.** Press [C] or close door to exit.

Free Vend State	Display
Free vend enabled	**"Fr Y"**
Free vend disabled	**"Fr n"**

08 – Historical Total Value of Sales

Upon entering the Historical Total Value of Sales the display shows the sales displayed as an eight digit number. The eight digits are broken into two, four digit displays. First displayed, are the upper four digits for 2 seconds followed by the lower four (with decimal point location) for 2 seconds. These two fields will alternate every 2 seconds until this mode is exited. Press [C] or close door to exit.

09 - Historical Total # of Vends

Upon entering the Historical Total # of Vends the display shows the vends displayed as an eight digit number. The eight digits are broken into two, four digit displays. First displayed, are the upper four digits for 2 seconds followed by the lower four (with decimal point in the right most digit) for 2 seconds. These two fields will alternate every 2 seconds until this mode is exited. Press [C] or close door to exit.

11-Coin Mechanism Access Mode
The cage will move out of the home position and coins can be added to the inventory of the coin mechanism.

12-Historical Value of Sales by Selection
Upon entering the Historical Value of Sales by Selection code the controller displays **"HvSS"** and waits for a selection to be entered. Once the selection is entered the Historical Value of Sales for that selection is displayed as an eight digit number. The eight digits are broken into two, four digit displays. First displayed, are the upper four digits for 2 seconds followed by the lower four (with decimal point location dependant on the MDB peripherals) for 2 seconds. These two fields will alternate every 2 seconds until this mode is exited or another selection is entered.

13-Historical # of Vends by Selection
Upon entering the Historical # of Sales by Selection code the controller displays **"HnSS"** and waits for a selection to be entered. Once the selection is entered the Historical # of Sales for that selection is displayed as a seven digit number. The seven digits are broken into two, displays. First displayed, are the lower four digits for 2 seconds followed by the upper three for 2 seconds. These two fields will alternate every 2 seconds until this mode is exited.

15300-Set Serial Number
Upon entering the set Serial Number code, the screen is cleared and the system is ready to accept a 17 digit Serial Number. Once the desired code is entered the # key must be pushed to over write the previous information.

17200-Set Machine ID
Upon entering the set Machine ID code, the screen is cleared and the system is ready to accept an 20 digit Machine ID. Once the desired code is entered the # key must be pushed to over write the previous information.

18400-Set Location ID
Upon entering the set Location ID code, the screen is cleared and the system is ready to accept an 20 digit Location ID. Once the desired code is entered the # key must be pushed to over write the previous information.

20 - Refrigeration Setup
Upon entering the "Refrigeration" setup mode the display shows the current "Refrigeration" set temperature. The **{< >}** key may then be used to increase or decrease the set temperature respectively. The temperature is settable from +34° to +50° Fahrenheit inclusive in 1 degree increments. The compressor is turned on when the temperature reaches +4°F of the set temperature for 2 consecutive readings. The compressor will remain on until the temperature falls below -2°F of the set temperature for 2 consecutive readings. Once the current mode is left the displayed temperature is stored. The refrigeration system is enabled to run 1 minute after a door close. 40 minutes after a door close the machine will go into a defrost. After the door close defrost the machine functions as follows:
>Every 60 minutes of compressor runtime the machine will go into defrost
>The minimum length defrost is 5 minutes
>If the temperature is above 44 when it goes into defrost, the defrost is 5 minutes
>If the temperature is below 44 when it goes into defrost, the defrost ends when the temperature reaches 44 .

Refrigeration Temperature	Display
Refrigeration Display	**"rFxx"**

21 - Health Timer Setup

Upon entering the "Health Timer" setup mode the display shows the current "Health Timer" state. The **{#}** key may then be used to toggle the "Health Timer" option ON/OFF. When the "Health Timer" option is enabled, the entire machine will function as follows: After a door close or a defrost cycle the temperature is ignored for 30 minutes. After that time if the temperature is above 41^0F for 15 consecutive minutes or longer, the machine is shut down displaying "OUT OF ORDER" and having a error "Fd" on the display. When you open the door the display will read "HESD" to tell you the machine was in health shut down. To reset the health timer the monetary door must be open then power down and then up. If warm product is added to the machine the thermal mass will take a long time to get down to temperature and will likely go into a health shut down. .

Health Timer State	Display
Health Timer enabled	**"HLty"**
Health Timer disabled	**"HLtn"**

22 – Machine Set up and Test

Upon entering the Machine Setup and Tests, the display will read "tESt". The following modes are available using the key sequence listed.

Vend Position: Enter Selection Number

This will bring the Z Mech in front of the vend selection. "Z Mech Out" or In" is used to simulate a vend of a product or to check height. Height adjusting is done by depressing the left or right arrow keys to bring the Z Mech up or down respectively. To save the height for just that selection use the "Set Selection" or to set the entire row use the "Set Row". When finished with the selection either go to another selection or go home.

Go Home: "*" then "1"

Brings the Z Mech to the home position

Safe Area: "*" then "4"

This is a location just outside of home. It is used to adjust the height that you go into home. Height adjusting is done by depressing the left or right arrow keys to bring the Z Mech up or down respectively. To save the new height use the "Set Selection" .

Z Mech Extend: "*" then "7"

This will extend the Z Mech when you are at a vend selection

Z Mech Retract: "*" then "8"

This will retract the Z Mech when you are at a vend selection.

Set Row: "*" then "3"

If you are at a selection it will set that to be the vend height for the entire row

Set Selection: "*" then "9"

If you are at a selection it will set that to be the vend height for that selection.

Product Door Open: "*" then "5"

The cage lock will engage and then the product door will open.

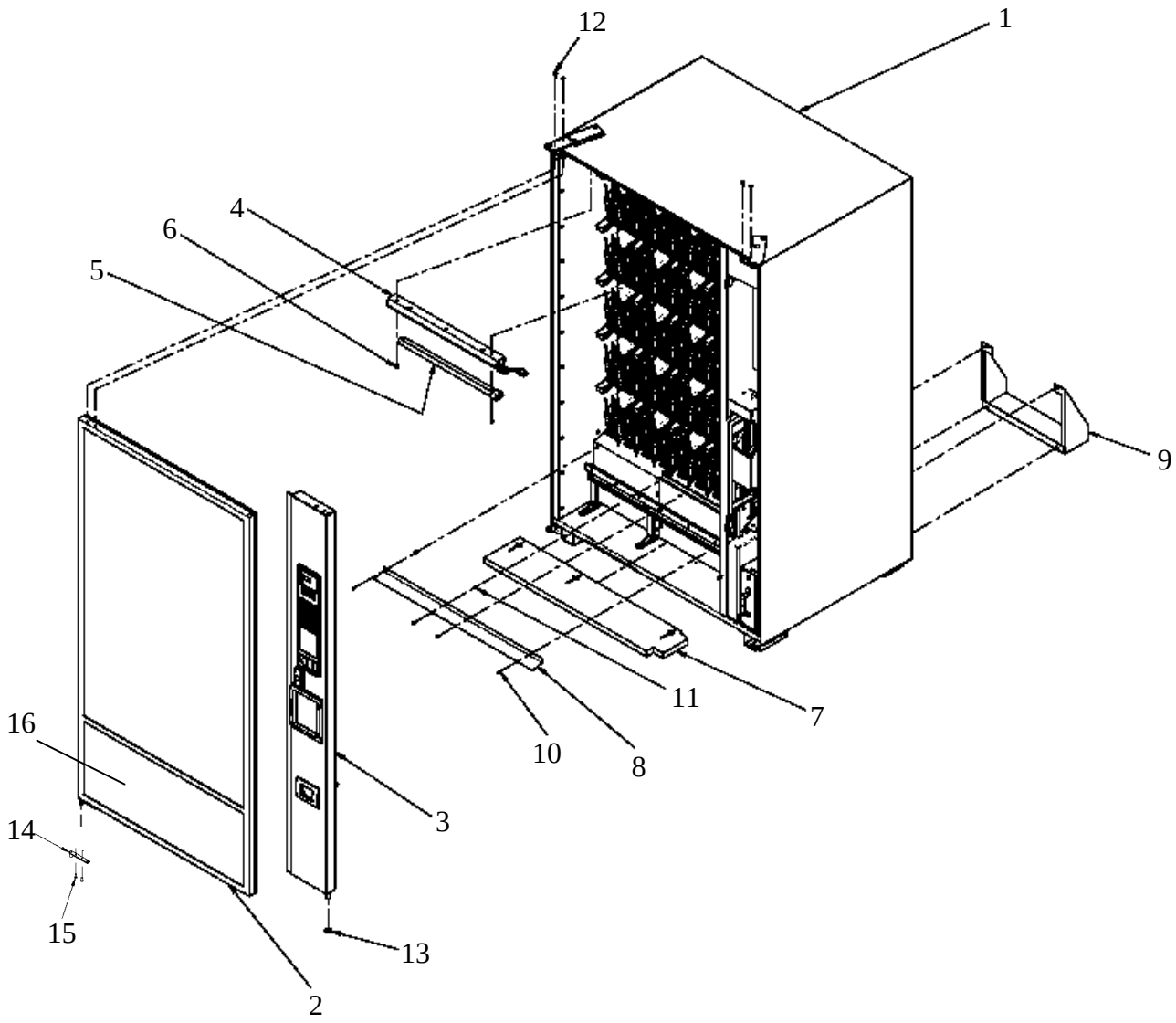
Product Door Close: "*" then "6"

The product door will close and then the cage lock will retract.

Tube Fill Mode

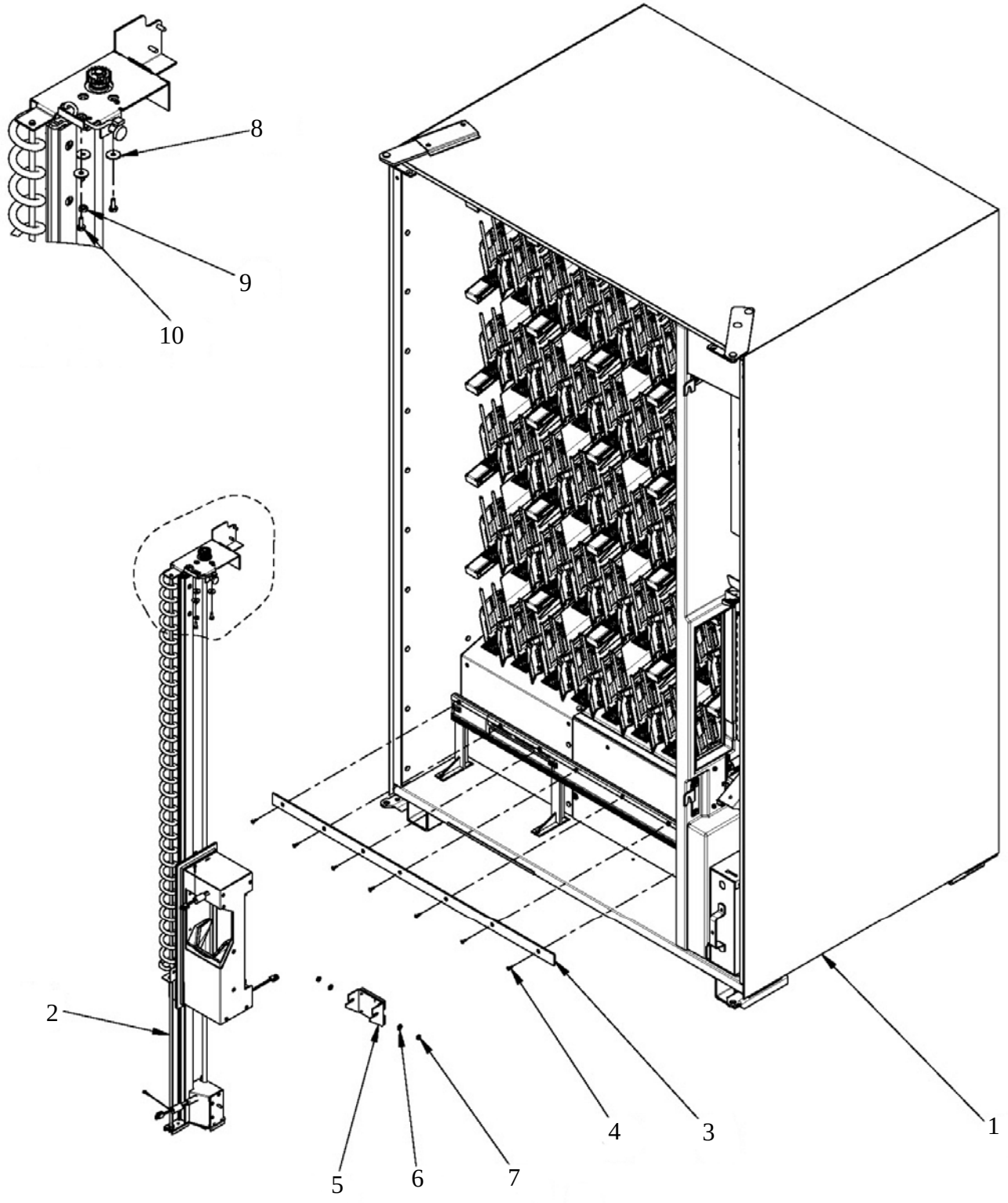
Upon entering the Tube Fill mode the controller will display "tF--" and wait for coins to be inserted into the top of the changer. As the coins are inserted the display will show the value of the coins inserted.

Cabinet



Key	Part Number	Description	Key	Part Number	Description
2	56600129	Door Assembly Complete, Thermal. Black	12	420003	1/4x20x3/4 Screw
2a	56600129-01	Door Assembly Complete, Thermal. Euro Gray	13	420010-19	Washer
3	56600125	Monetary Door, see page 5.08	14	56400059	Hinge Pivot Assy.
4	56600192	Lamp Assembly complete.	15	420003	Screw 1/4x20x3/4
	54400134	Lamp Cover (not shown)	16	56600223	Door Panel, Stick on
5	56900001	Lamp – Fluorescent 55 Watt			
6	53100018	Screw Hex/Wshr #8			
7	52200090	Insulation Base			
8	52000653	Deflector Base			
9	52000464	Air Deflectors			
10	53100018-01	Screw #8			
11	53100026	Washer-Plastic			

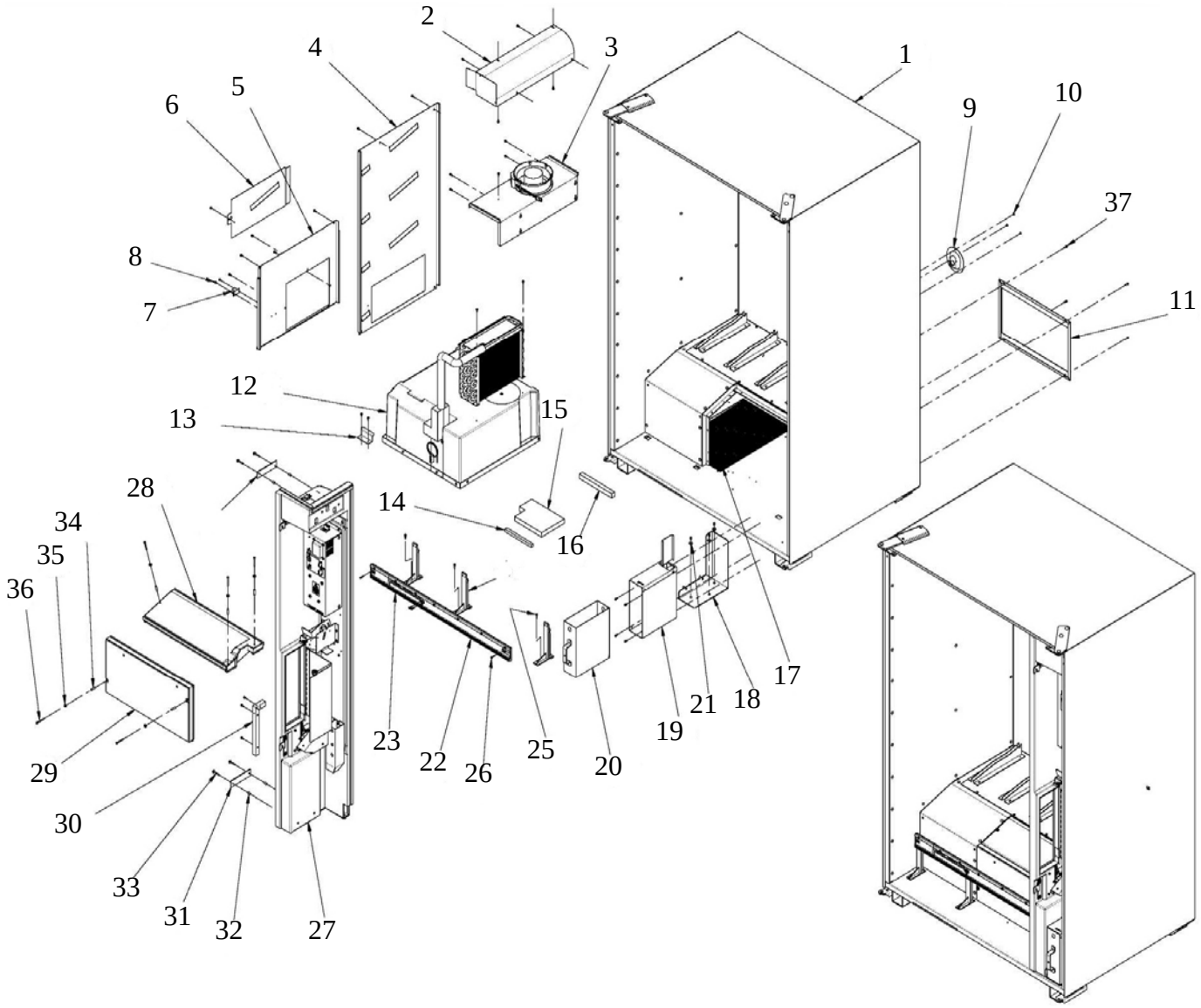
Shuttle Installation Assembly



Shuttle Installation Assembly

Key	Part Number	Description	Key	Part Number	Description
1		Cabinet			
2	56600161	Y bar/Carriage Assy.			
3	53400023	Rail-Bottom Guide			
4	102-8R12	Screw-#8-32x1/2			
5	56600177	Bottom Slide Assy.			
6	5300054	Washer-Latch Pin			
7	437-10	Keps Nut 10-24			
8	420010-9	Washer			
9	438-8	Keps Nut 10-32			
10	164-8-8	Screw w/lock Washer			
	56000115	Leg Assembly (not shown)			
	53000106	Leg Leveler (not shown)			

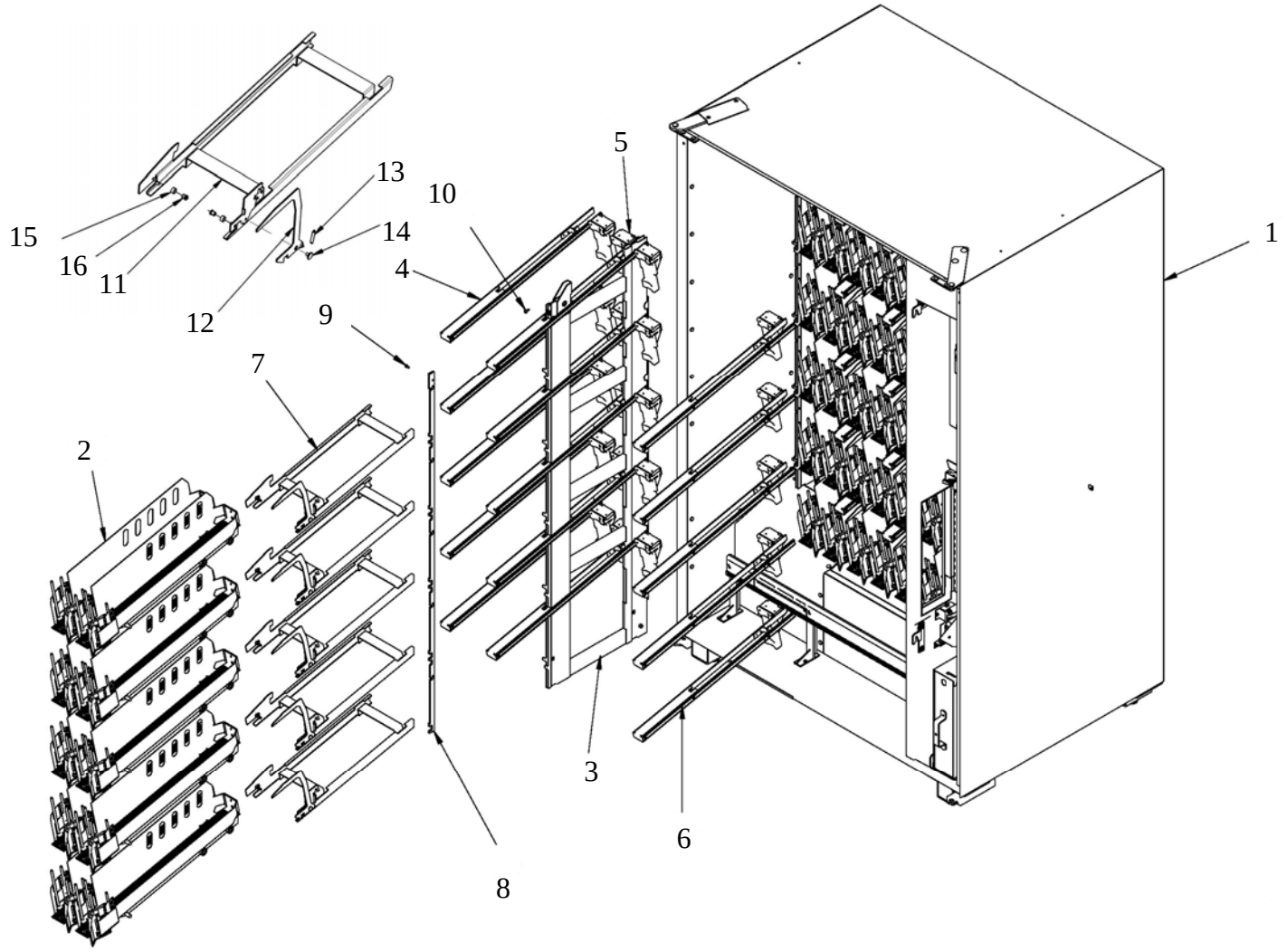
Cabinet with Liner and Inside Cabinet Parts



Cabinet with Liner and Inside Cabinet Parts

Key	Part Number	Description	Key	Part Number	Description
1	56600162	Cabinet Liner Assy.	33	53100025	Bolt
2	56000086	Air Deflector Assy.	34	53100027	Spacer-Barrier
3	56600102	Evaporator Fan / Bracket Assy.	35	53100023	Washer
4	56600131	Cover Assy. Evaporator Upper	36	53100024	Screw-Self Drilling
5	56600118	Cover Assy. Evaporator Lower	37	53100018-01	Screw
6	52000437	Cover –Evaporator Fan	38	52000674	Plate-Washer
7	56800048	Harness Temp. Probe			
8	53100018	Screw 8 x 1/2			
9	56800003	Line Cord Assy.			Harnesses
10	420078-1	Pop Rivet .125 x .265			
11	56600111	Back Vent Screen	39	56800041	Harness-Compressor Control
12		Refrigeration Assembly See Page 5.22	40	56800037	Harness-Fan Power
13	52000432	Refrigeration Mounting Bracket	41	56800038	Harness-Junction Box To Light
14	53300045	Foam Seal 1/2x1/2	42	56800040	Harness-Power Extension
15	53300043	Foam Seal			
16	53300042	Foam Seal			
17	56600107	Screen Assy. Inlet	3a	56700015	117v Fan Only
18	56400044	Bracket Assy. Lower	3b	56700015-01	230v Fan Only
19	56000091	Bracket Assy. Coin Box			
20	56000049	Coin Box			
21	420010-9	Washer			
22	53200009	Guide RH Lower			
23	53200008	Guide LH Lower			
24	53200010	Bracket Bottom Mounting			
25	53100024-01	Screw –Self Drilling			
26	53100043	Screw 8-32x3/4			
27	56600165	Barrier Assy. See Page 5.10			
28	56600136	Refrigeration Cover,Upper			
29	56600135	Refrigeration Cover,Lower			
30	52000400	Bracket-Front Barrier			
31	52000401	Washer			
32	53100029	Spacer Barrier			

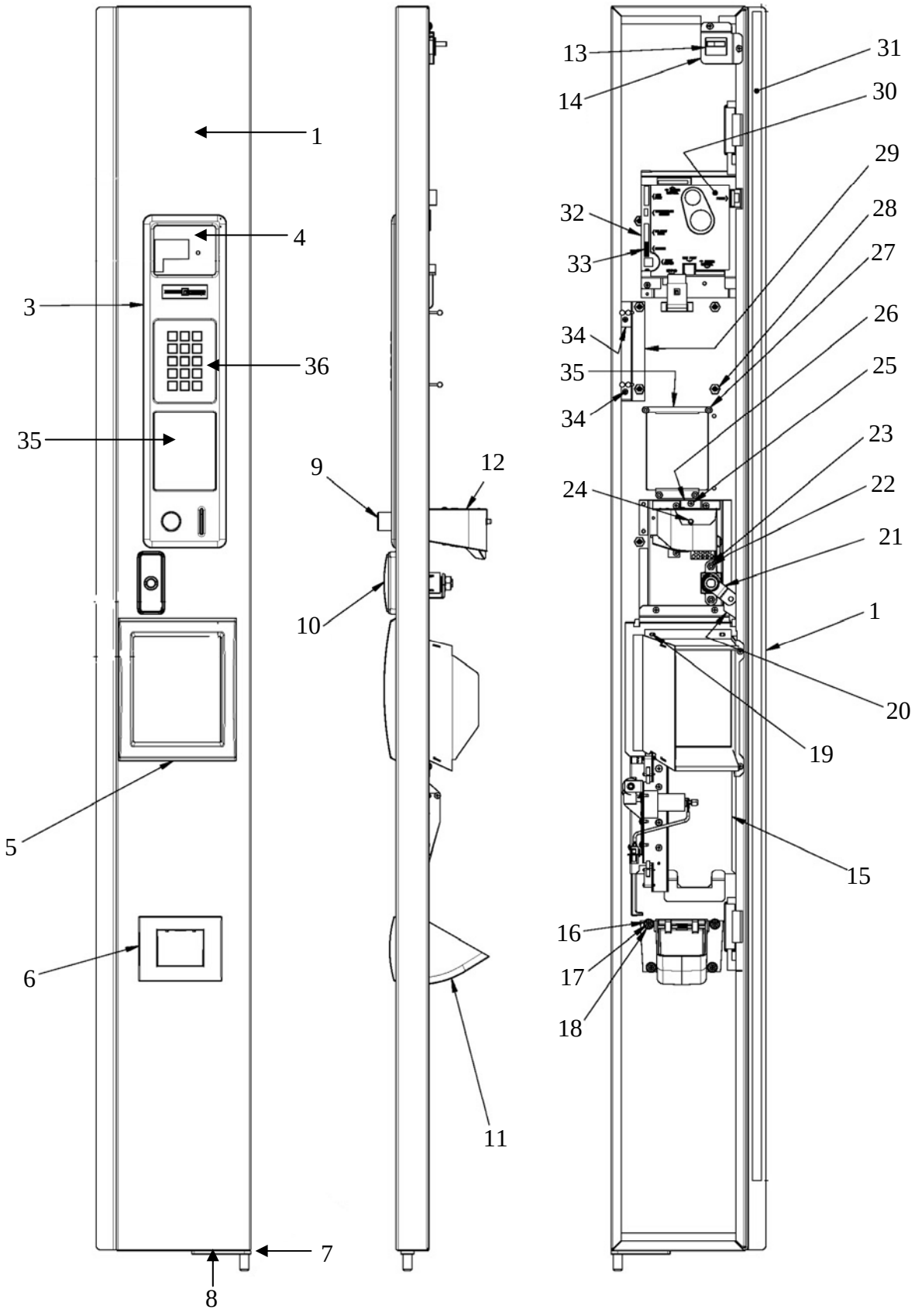
Cabinet Shelving



Cabinet Shelving

Key	Part Number	Description	Key	Part Number	Description
1	56600164	Cabinet Barrier & Chiller Assy.	35	57400013	Selection Tabs Complete Set (not shown)
2	56600200	Double Tray Assy.			
3	56400087	Frame Tray			
4	56600116	Pusher Right Assy.			
5	56600097	Pusher Assy. See Page 5.12			
6	56600117	Pusher Left Assy.			
7	56600171	Roller Track Assy.			
8	53000115	Lock Shelf Component			
9	166-8r6	Screw			
10	276-10r8	10-24x1/2 Screw			
11	56400081	Tray Base Assy.			
12	52000652	Latch Tray			
13	54000008	Spring - Tray Latch			
14	53000103	Rivet – Latch			
15	53000070	Roller - Tray			
16	53000055	Pin Tray Support			
17	56600163	Escapement Assy. – Four Post			
18	438-6	6-32 Keps Nut			
19	56600172	Tray Base – Roller Assy.			
20	56400041	Tray Sub-Assembly			
21	54400031	Tray Slides			
22	53200021	Base Escapement			
23	53200019	Gate Left			
24	53200020	Gate Right			
25	53200005	Gate Lock Right			
26	53200022	Gate Lock Left			
27	52000608	Link Gate			
28	53000086	Pin Gate Clevis			
29	53000085	Pin Gate Link			
30	53000046	Pin-Tray Long			
31	53000045	Pin-Tray Short			
32	53200025	Stop-Bottle			
33	54000010	Spring-Four Post			
34	57400004	Price Tabs 50-95 (eight of each price) Not Shown			
	57400005	Price Tabs 1.00-1.75 (eight of each price) Not Shown			
	57400006	Price Tabs 1.80-2.60 (eight of each price) Not Shown			

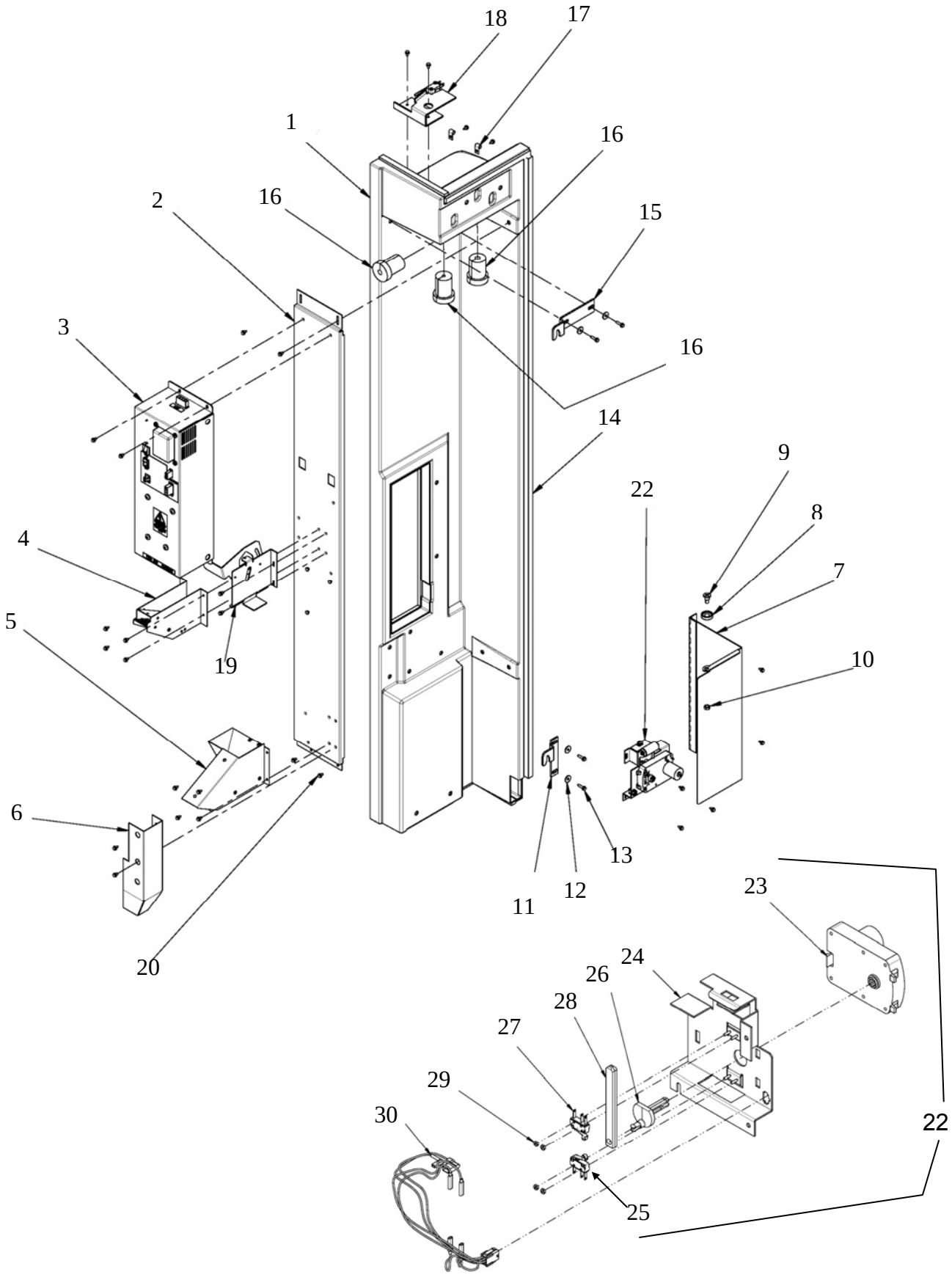
Monetary Door



Monetary Door

Key	Part Number	Description	Key	Part Number	Description
1	56600125	Monetary Door Assy.	20	56000055	Locking Bar Weldment
1a	56000056	Weldment Monetary Door	21	56400051	Lock Arm Assy.
3	16600266	Bezel Selector Assy.	22	118-10-12	Carriage Bolt 10-24x3/4
3a	14400034	Bezel Only	23	438-10	Keps Nut 10-24
3b	17400102-01	AP Logo For Bezel	24	56400034	Extension Rod Coin Return
3c	13800001	Selection Switch Membrane (not shown)	25	276-8R6	Screw 8-32x3/8
4	440390	Instruction Glass	26	201660	Coin Return Bracket
5	54400062	Trim-Dispense Door	27	404-8	Hex Nut 8-32
6	660581	Coin Cup Front Assy.	28	18443	Nut ¼
7	56400075	Hinge Pivot Assy.	29	52000684	Bracket Harness
8	420003	Screw ¼ 20x3/4	30	56600001	Board Cover
9	440289-5	Coin Return Button	31	53300038	Foam Seal 3/16x1/2
10	17200002	T-Handle Assy.	32	360258	Control Board
11	54400066	Coin Cup	33	56800036	Harness-Service & Compressor
12	56600069	Coin Chute Assy.	34	54000011	Clip-Wire
13	380258	Door Switch	35	660580	Validator Filler Plate
14	52000411	Door Switch Bracket	36	56000055	Locking Bar
15	56600182	Dispense Door Assy. See Page 5.18	37	14400033-01	Keypad Buttons
16	420144	Ferrule			
17	305-7R8	Screw #7x1/2			
18	420010-17	Washer			
19	56000072	Weldment Handwell			

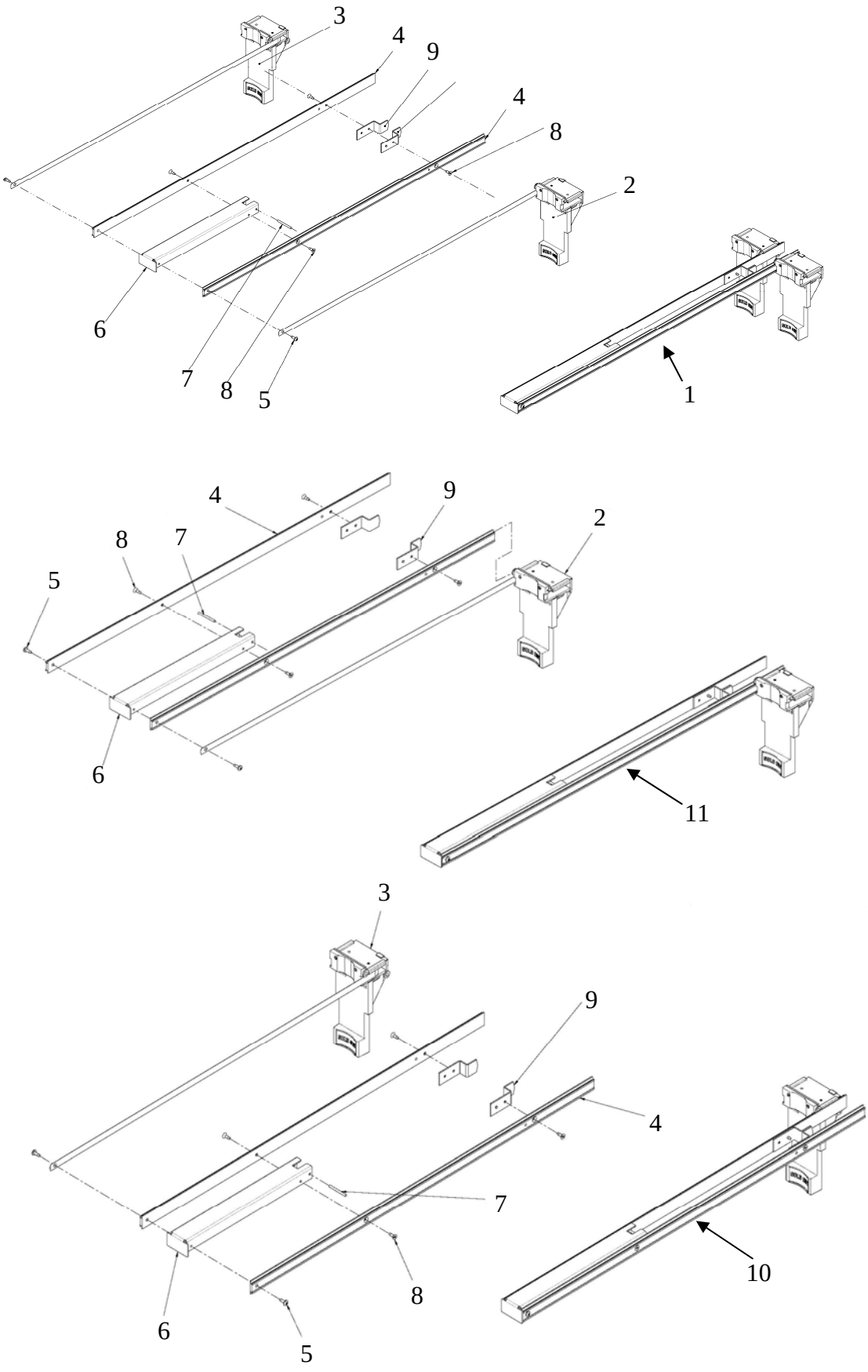
Barrier Assembly



Barrier Assembly

Key	Part Number	Description	Key	Part Number	Description
1	54400116	Front Panel Assy.	23	56700009	Motor 24v
2	56400048	Coin Mech. Support	24	56400049	Mount Home Lock
3	56600113	Power Supply Assy. See Page 5.20	25	53800009	switch
4	56600095	Coin Slide Assy.	26	54400096	Cam XYZ Lock
5	56600035	Coin Return Chute Assy.	27	53800009	Switch
6	52000323	Coin Chute Return	28	54400095	Bar XYZ Lock
7	56000076	Security Shield	29	404-2	Hex Nut 2-56
8	440362	Shelf Roller	30	56800018	Harness
9	300203	Shelf Roller Screw			
10	437-41	¼-28 Keps Nut			
11	52000330	Door Lock Catch Bottom			
12	4200010-9	Washer			
13	53100018-01	Screw 8-32 x3/4			
14	53300045	Foam Seal 1/2x1/2 64 inches			
15	52000316	Door Lock Catch Top			
16	53300047-01	Seal- Wiring Harness			
17	53100038	Clip-Wire			
18	56600188	Home Switch Assy.			
19	56600093	Coin Release Assy.			
20	53100018	Screw 8-32x3/8			
21	53300047	Seal-Wiring Harness			
22	56600084	Home Lock Motor Assy.			

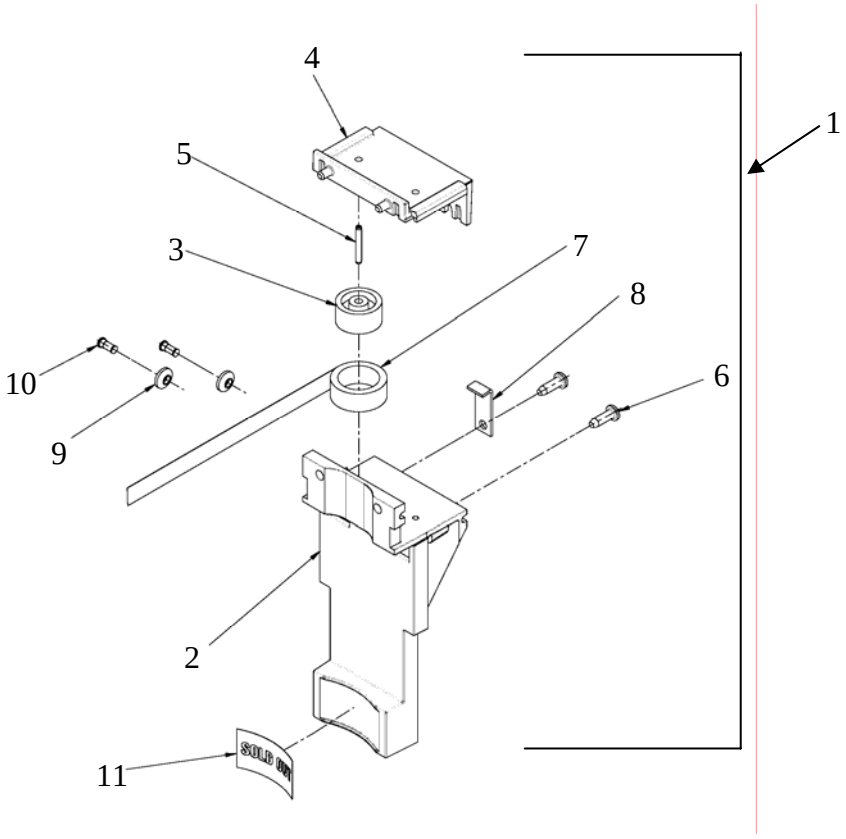
Pusher Assembly

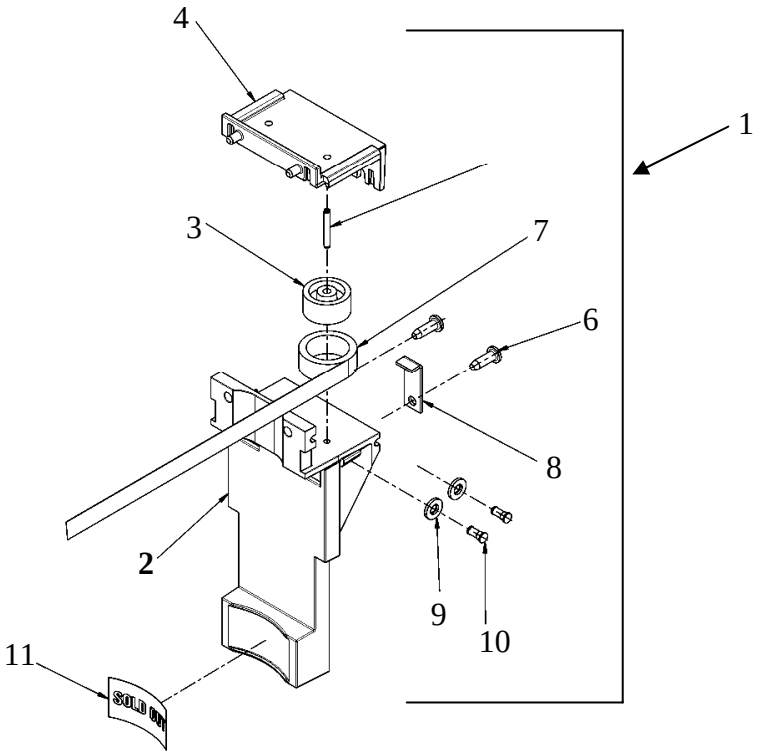


Pusher Assembly

Key	Part Number	Description	Key	Part Number	Description
1	56600097	Dual Pusher Assy.			
2	56600104	Pusher Assy. Right			
3	56600103	Pusher Assy. Left			
4	53400010	Rail-Pusher			
5	420078-9	Pop Rivet .125x.375			
6	52000408	Spacer - Push Rail			
7	53000060	Pin-Pusher Mounting			
8	262-6R6	Screw #6-32x3/8			
9	52000388	Latch-Pusher			
10	56600117	Pusher Right Assy. Complete			
11	56600116	Pusher Left Assy. Complete			

Pusher Assembly

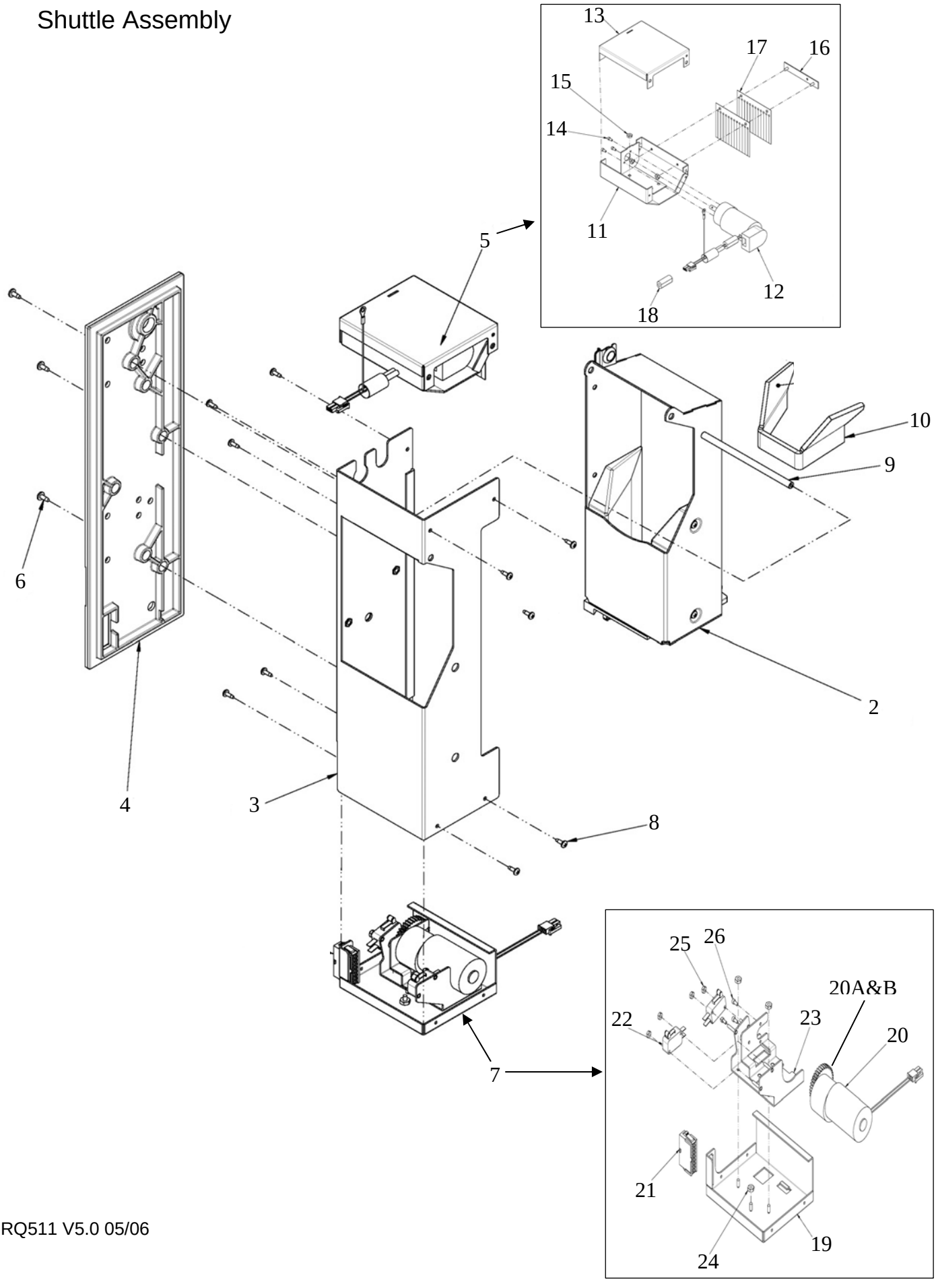




Pusher Assembly

Key	Part Number	Description	Key	Part Number	Description
1	56600104	Pusher Assy. Right			
2	54400086	Pusher Assy. Lower			
3	54400035	Hub-Spring			
4	54400085	Pusher Arm Upper			
5	53100014	Roll Pin			
6	305-7R8	Screw #7x1/2			
7	54000007	Spring-Pusher			
8	52000506	Clip-Pusher			
9	54400108	Wheel - Pusher			
10	53000082	Pin-Wheel			
11	57400011-01	Label-Sold Out			
12	56600103	Pusher Assy.-Left			

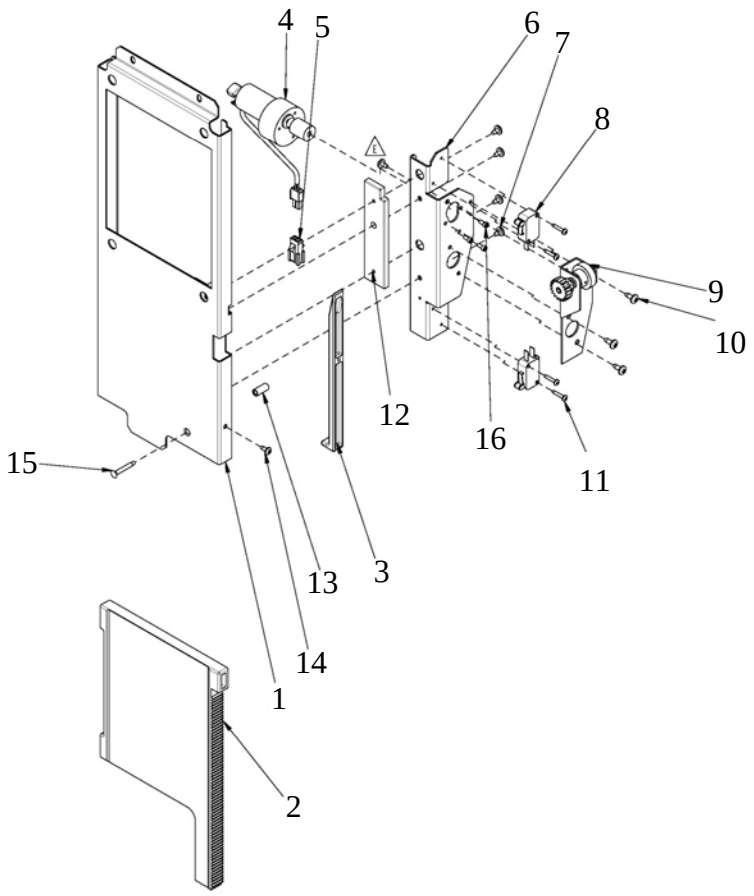
Shuttle Assembly



Shuttle Assembly

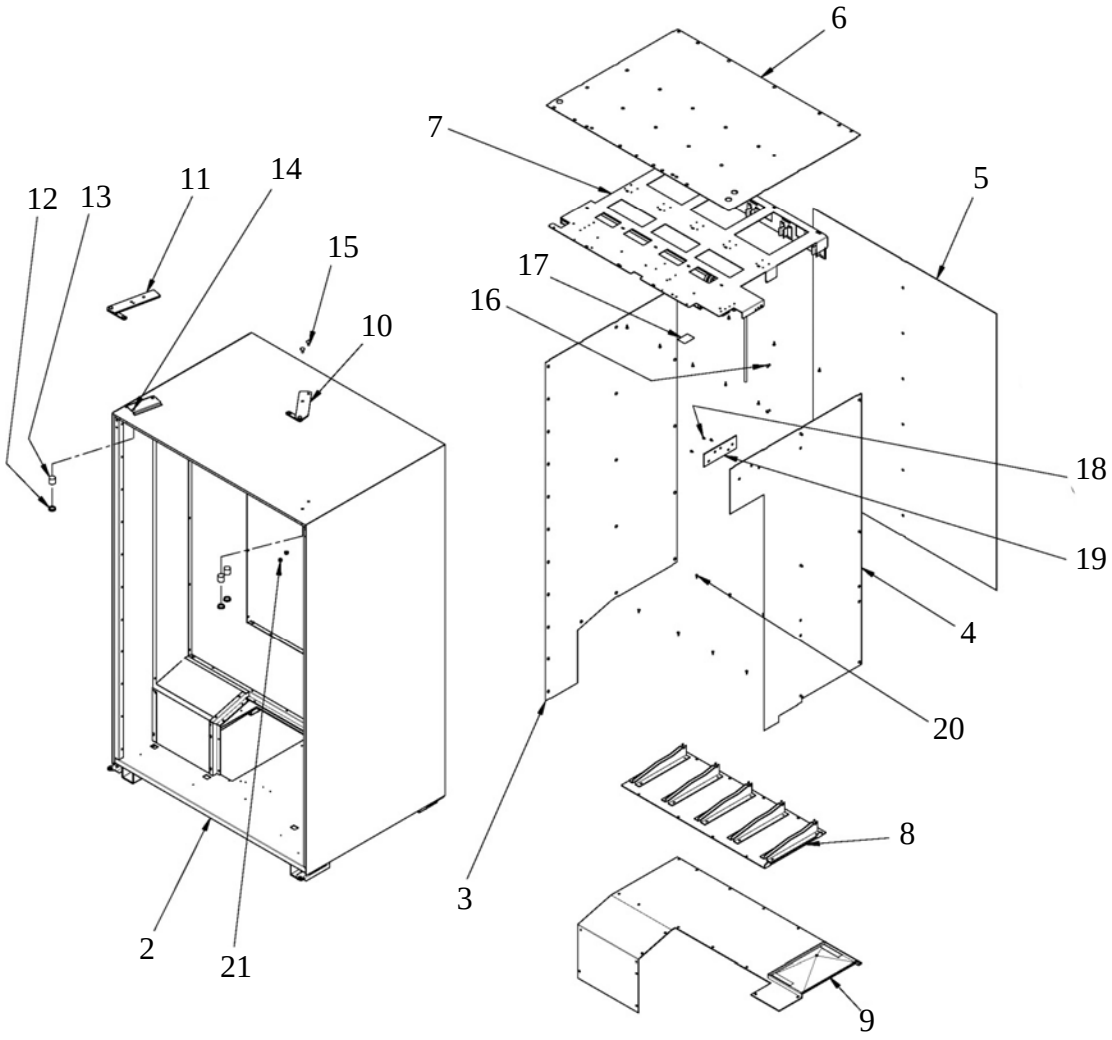
Key	Part Number	Description	Key	Part Number	Description
1	56600155	Shuttle Assy. Complete	19	56000111	Z Drive Chassis
2	56600153	Shoe Assy. See Page 5.19	20	56700016	Asm, Z Drive Motor Includes 20 A, B & C
3	56000108	Carriage Weldment	20A	53000003	Gear, Cage Drive, Z – Axis
4	54400120	Insulator	20B	801C094-10	Roll Pin, 3/32 Dia x 5/8lg
5	56600151	Carriage y Drive Assy.	20C	56700003	Z Drive Motor, Only
6	276-8R8	Screw 8-32x3/8	21	56800060	Harness Cage
7	56600152	Carriage Z Drive Assy.	22	53800009	Switch Robo Cage
8	276-6R6	Screw 6x3/8	23	56000107	Weldment-Z Motor Mounting
9	53000095	Shaft-Shoe	24	438-6	Keps Nut 6-32
10	52200095	Saddle	25	404-2	Keps Nut
			26	142-4-4	Screw #4-40x1/4
11	56000120	Chassis – Y drive			
12	56700005	Motor-Y Axis			
13	52000665	Cover-Y drive			
14	142-4-4	Screw #4-40x1/4			
15	438-6	Keps Nut 6-32			
16	56000129	Clamp			
17	53300049	Strip-Tip Abatement			

Dispense Assembly



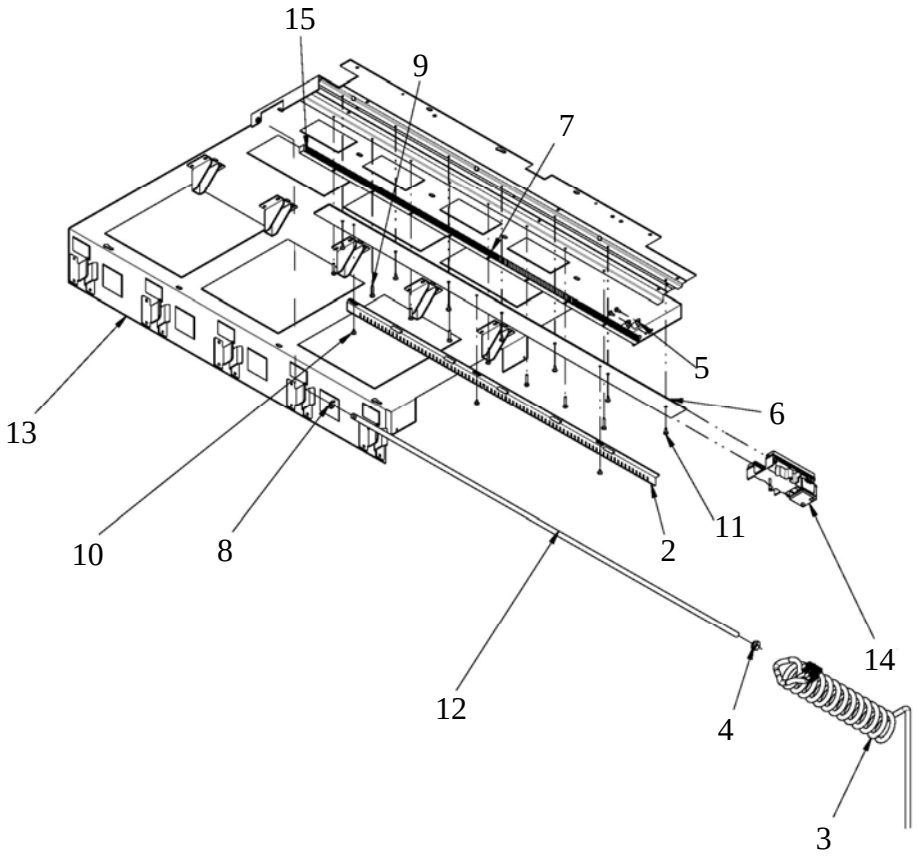
Key	Part Number	Description	Key	Part Number	Description
1	56600182	Dispense Door Assy.	14	217-6R5	Screw #6x5/16
1a	52000304	Bracket Only	15	203-6R16	Screw #6x32x7.8
2	54400061	Door-Dispense	16	142-4-4	Screw #4-40x1/4
3	54400126	Bracket Dispense Door Guide			
4	56600185	Motor Assy.			
5	56800034	Harness-Delivery Door			
6	52000661	Bracket Dispense Door Motor			
7	276-8R4	Screw 8-32x1/4			
8	53800007	Switch			
9	56600183	Dispense Door Gear Assy.			
10	276-8R6	Screw 8-32x3/8			
11	276-4R9	Screw #4-40x9/16			
12	54400109	Door Track			
13	53000111	Stand-Off Door			

Cabinet Liner



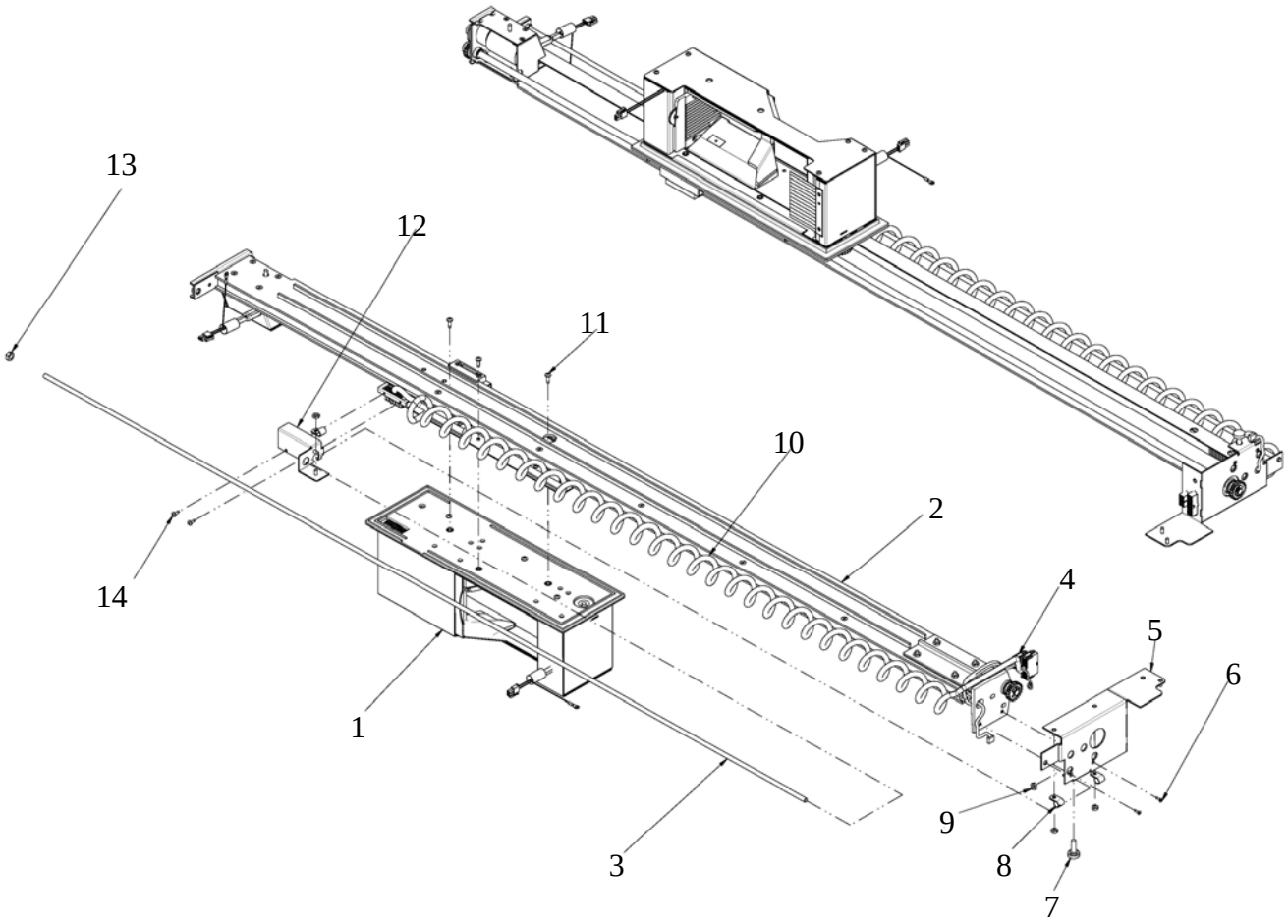
Key	Part Number	Description	Key	Part Number	Description
1	56600162	Cabinet Liner Assembly	12	420349	Hole Plug
2	56600157	Cabinet –Insulated	13	52200073	Insulation Hole Plug
3	57000011	Liner Cab Left Side	14	164-51-7	Screw w/Lockwasher
4	57000012	Liner Cab Right Side	15	27931	Carriage Bolt
5	57000010	Liner Back	16	53100001	Plastic Rivet
6	57000013	Liner Top	17	460642	Decal - Voltage
7	56600143	Upper Rail Assembly	18	53100018	Screw Hex 8-32 x 3/8
8	56000084	Lower Shelf Plate	19	56400045	Bracket Assy.
9	54400078	Liner Bottom	20	276-10R8	Screw 10-24 x ½
10	56400060	Hinge Assembly Upper Right	21	27932	Nut 5/16
11	56400058	Hinge Assembly Upper Left			

Upper Rail & Shelf Plate



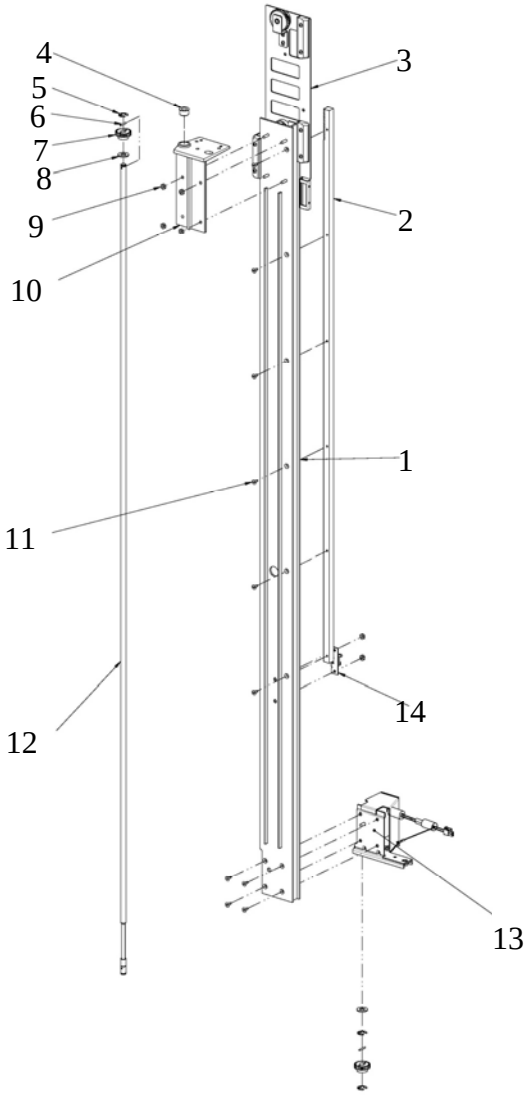
Key	Part Number	Description	Key	Part Number	Description
1	56600143	Upper Rail and Shelf Plate Asm			
2	52000650	Bar sensor			
3	56800053	Coiled Cable			
4	404-61	Hex Nut 3/8			
5	53100022	P Clamp 3/8			
6	53400021	Top Plate			
7	53000021	Rack X Axis			
8	751-37	Retaining Ring			
9	276-8R14B	Screw			
10	276-8R4	Screw			
11	276-8R6	Screw			
12	53000107	Shaft X Cable			
13	56000097	Upper Rail Weldment			
14	56600145	Upper Slide Assembly			
15	54250003	Super Lube Grease (not shown)			

Y Bar Assembly



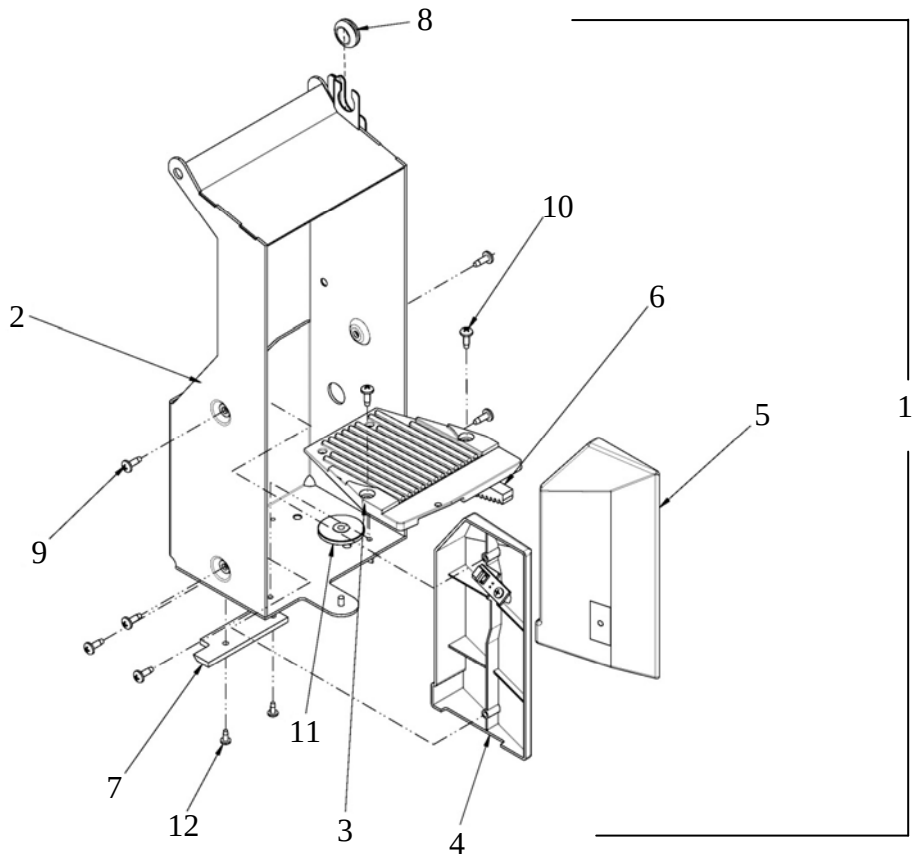
Key	Part Number	Description	Key	Part Number	Description
1	56600155	Shuttle Assembly			
2	56600178	Y Bar Assembly			
3	53000101	Shaft – Y Bar Cord			
4	56800045	Harness – Y Bar			
5	56400083	Upper Y-Bar Bracket Assembly			
6	242-4R6	#4-40 X 3/8 Flat Head Screw			
7	53100034	Actuator – Home Switch			
8	53100022	P Clamp			
9	438-8	8-32 Keps Nut			
10	56800054	Harness – Y Coil Cable			
11	166-8R8	#8 X 32 X ½ Screw			
12	56000123	Cable Connection Bracket Assembly			
13	438-41	¼ X 20 Keps Nut			
14	276-6R6	#6 X 3/8 Screw			

Y bar



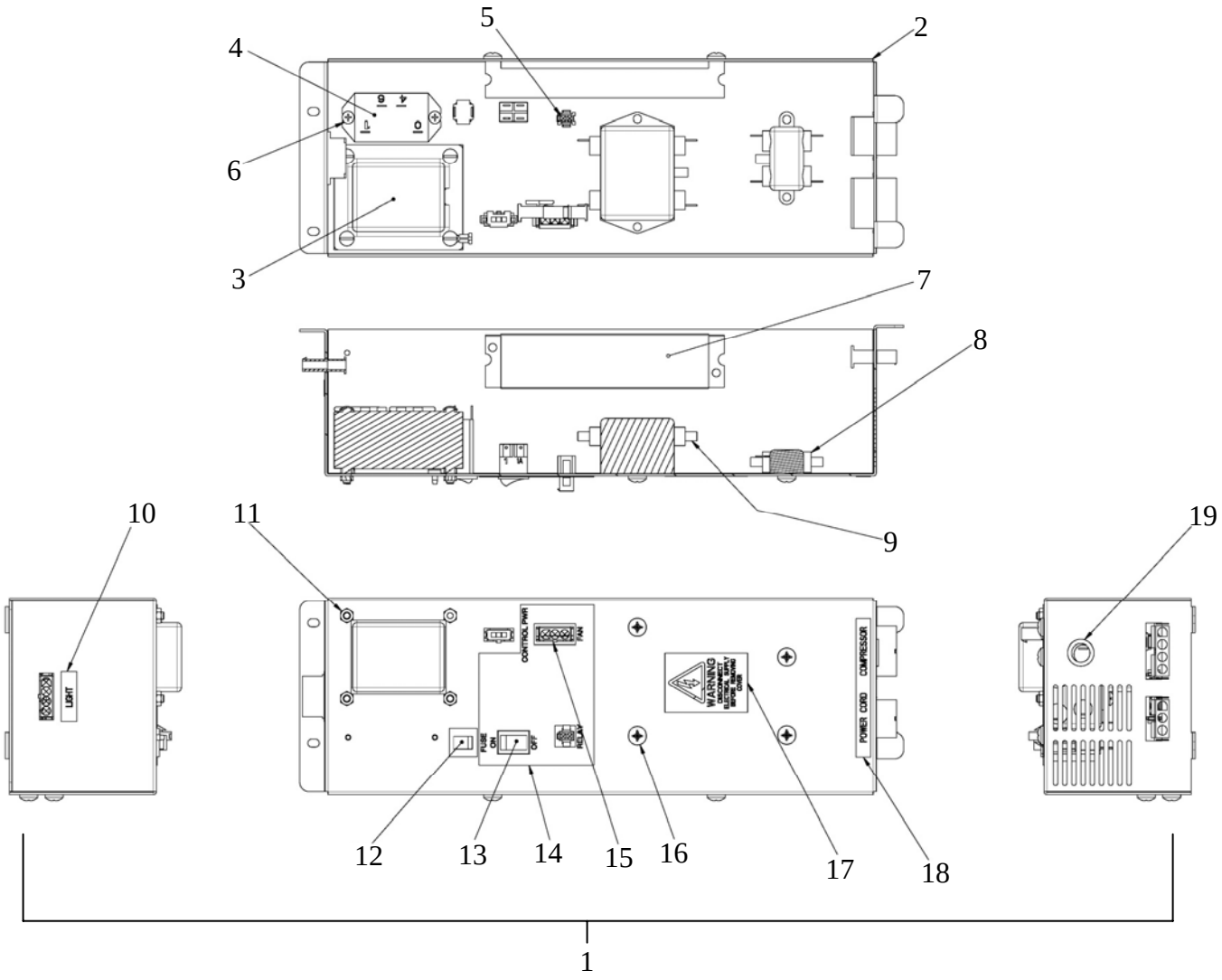
Key	Part Number	Description	Key	Part Number	Description
1	56400082	Y Bar Hardware Assembly	14	56600191	Y Switch Assembly
2	53000063	Rack – Y Axis			
3	56600154	Carriage to Y Bar Mount Assembly			
4	53100005	Bearing – Self Align			
5	751-37	Retaining Ring			
6	803-094-10	.094 X 5/8 Steel Dowel			
7	53000015	Gear - Mod X Drive			
8	53100004	Bearing – Thrust			
9	438-8	8-13 Keps Nut			
10	53200015	Y Bar Mounting – Gear			
11	262-8R6	#8 X 32 X 3/8 Screw			
12	53000102	Shaft – Shuttle			
13	56600176	X Drive Mount Assembly			
13a	56700006	X Motor Only			

Shoe Assembly



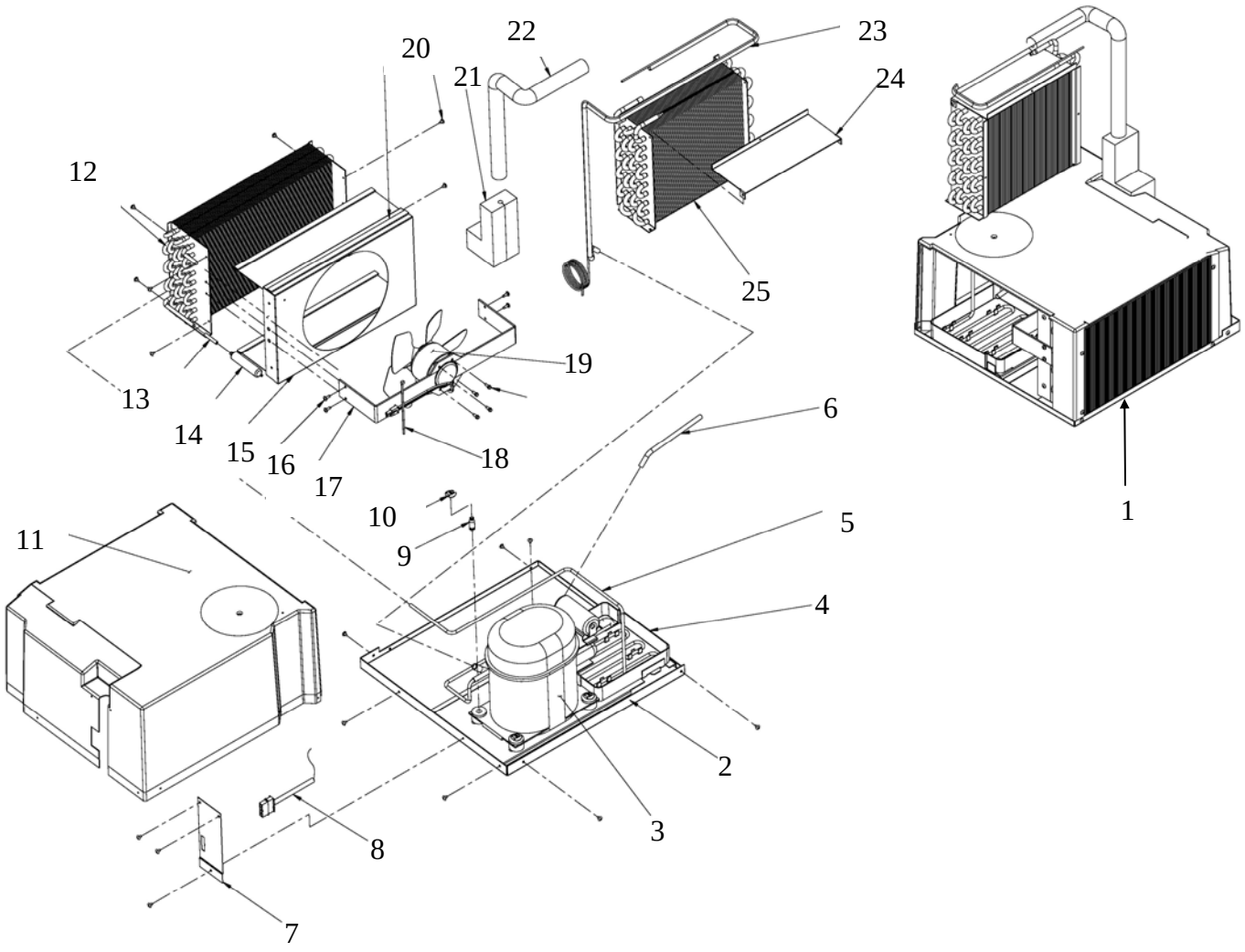
Key	Part Number	Description	Key	Part Number	Description
1	56600153	Shoe Assy.			
2	56000109	Shoe Weldment			
3	54400121	Cage Floor			
4	56600179	Bottle Guide Right Assy.			
5	56600180	Bottle Guide Left Assy.			
6	54400144	Gear-Cage Z -Axis			
7	53000093	Actuator Z Drive			
8	420135-4	Grommet 3/8 Id X 5/8 OD			
9	305-6R6	Screw 6X3/8			
10	276-6R6	Screw 6X3/8			
11	5440080	Cam – Cage Roller			
12	276-4R4	Screw #4-40x1/4			

Power Supply Assembly



Key	Part Number	Description	Key	Part Number	Description
1	56600113	Power Supply Assy.	11	436-8	Keps Nut 8-32
2	52000423	Enclosure-Power Supply	12	380241-2	Circuit Breaker 5Amp
3	56800007	Transformer-120V	13	380243	Switch
4	56700008	Relay-24V	14	57400009	Label Power Supply
5	56800029	Harness Power Supply Relay	15	56800030	Harness Junction Box
6	276-8R6	Screw 8-32x3/8	16	216-41R8	Screw 1/4x1/2
7	56800051	Light Ballast	17	460642	Decal
8	380303	Filter-Light	18	57400010	Label-Power Cord
9	380304	Filter Power Supply	19	420040-2	Snap Bushing
10	57400008	Label			

Refrigeration Assembly



Key	Part Number	Description	Key	Part Number	Description
1	56600100	Refrigeration Assy.	16	276-10R8	10-24x1/2
2	56000083	Refrigeration Base Assy.	17	52000470	Bracket-Cond. Motor
3	56700010	Compressor 120 Volt	18	460044	Wire Tie
4	440459	Evaporator Pan	19	56700011	Condensor Fan Assy. 120 Volt
5	52100015	Discharge Tube		56700022	Motor Only, Condensor Fan
6	52100017	Process Tube	20	210-8R6	Screw #8x3/8
7	52000422	Bracket-Cond. Cover	21	53300041	Seal-Ref. Tube
8	56800027	Harness-Refigeration	22	420356	Tubing ½ ID
9	300225	Compressor Mounting Pin	23	52100014	Capilary Tube
10	420426	Compressor Mounting Clip	24	52000421	Bracket-Evap. Top
11	54400077	Cover	25	52100018	Evaporator Coil Assy.
12	52100012	Condensor Coil			
13	52100016	Tube			
14	420427	Drier			
15	52000418	Condensor Fan Shroud			

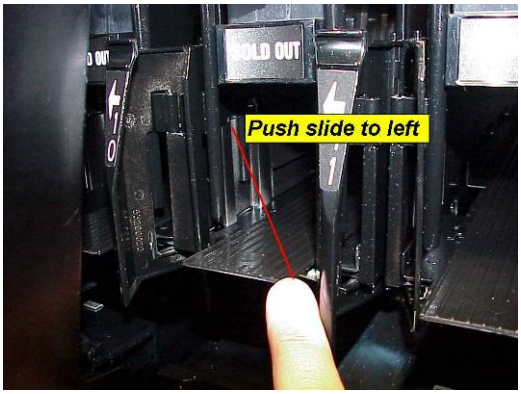
APi RoboQuencher ALIGNMENT & Set-Up Procedure

Tools: Phillips screw driver, straight edge (NOTE: Straight edge can be any item that will give a consistent measurement, ruler, file, pen or pencil etc.).

Step 1: Align Y bar to shelving
Step 2: Adjust X sensor bar
Step 3: Adjust cage vending height

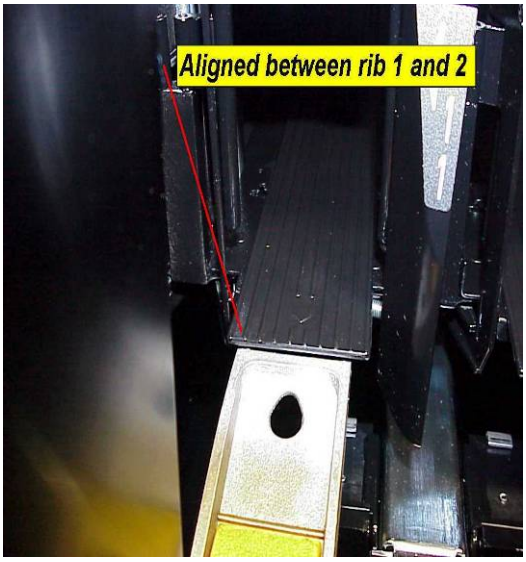
STEP #1

A. Machine needs to be powered up and at operating temperature (37F).
Push "service mode" button, located on control board.
Put in test mode (*22)
Push slide to the left, at selection 11. (Fig. 1).



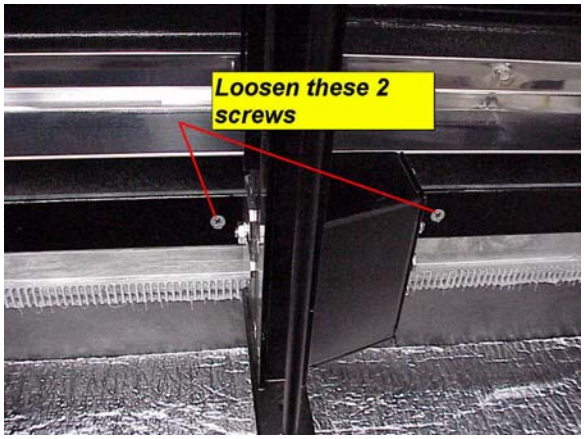
B. Press 10 on the keypad and send to selection 10.
Do NOT extend the cage as this may cause an incorrect reference.
Place straight edge on the right side of shuttle so it touches the slide.
Pick a reference point off of the left edge of the straight edge to either the slide or other point on gate. The reference point will then be used at selection 50 to determine if the Y bar is straight with the shelving.

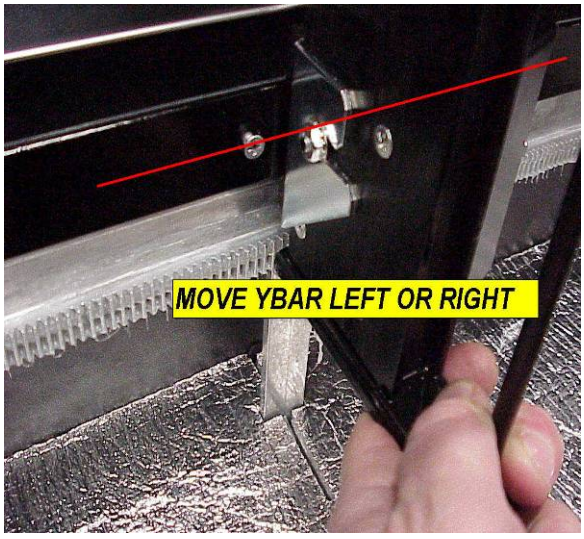
C. Press 50 to go to selection 50.
Use the straight edge and compare the reference point you had at selection 10. If both references are within 1/8" the Y bar is straight with the shelving press *1 to go home and proceed to step 2.If the reference points is off by more than 1/8" you need to move the bottom of the Y bar in the direction you are off. (proceed to step D)



D. RE-POSITIONING YBAR

Press *1 to send shuttle home, then press 33 to send shuttle to selection 33.
Loosen (2) screws shown in fig. 5.
Grasp the bottom of the YBAR assembly and pull towards you and shift the bottom of the bar 1 tooth (left or right, depending on offset found when measuring above).





Tighten screws and send YBAR home (*1).
Repeat steps A through D and verify settings are now the same.

Step # 2

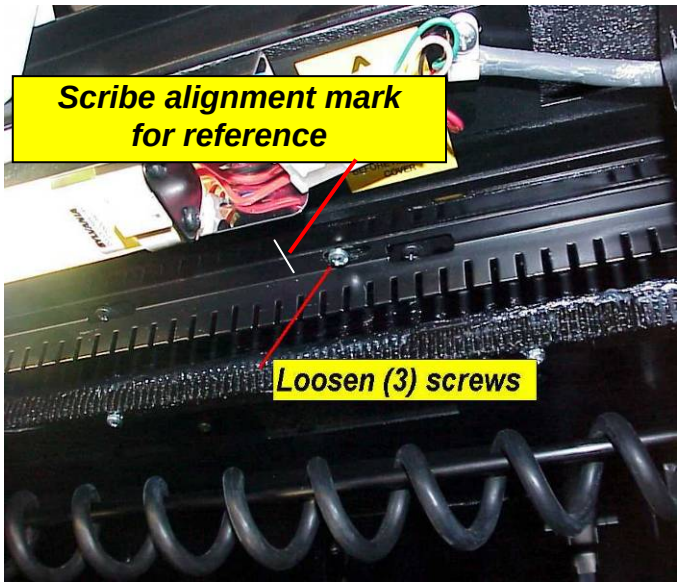
A. Enter 10 on the keypad, which will send the shuttle to location 10. Align a straight edge from the right side of shuttle to slide of selection 11.

If the rib is not aligned, measure the difference between the left edge of the straightedge and the left side of rib # 2.

Send back to home (*1), and proceed to step 3.

B. Loosen the 3 screws securing the x timing bar to the top of the cabinet interior. (fig. 3) Move the x sensor bar the direction that the shuttle needs to move to be aligned with the left edge of rib 2.

Repeat steps A and B to see that x sensor bar is aligned correctly.



Troubleshooting

Trouble Shooting RoboQuencher^{tm} Cage Product Sensors with a DMM

Test 1 and Test 2 can be done at either P-9 (Fig 1)on the RQ Control Board OR at the 16 pin connector (Fig 2) on the left edge of the cage

Test 1 - Check LED:
Power machine off
Unplug Y Motion Control connector
Set meter to diode check
Place red probe on pin 15 of the harness
Place black Probe on pin 16 of the harness
You should read over 1 Volt ← the **LED is good**
If you reverse the probes you should get nothing
If you get an infinite reading both ways, a harness is broken or the LED is faulty

Test 2 - Check the sensor:
Power down machine
Unplug Y Motion Control connector
Move the Z Mech to bottom/middle of the machine
Set meter to diode check
Place red probe on pin 14
Place black Probe on pin 11
There should be no reading or infinite reading
The sensor is on the right side of the Z Mech covered by a small clear cover. You need to take a flash light and point it in to the sensor. The more light you can provide directly on the sensor, the lower the voltage.
The meter should go from infinite to some value above 0 volts.
You may have to move the flashlight around so that you are pointing it into the sensor. If you see the meter leave the infinite reading the sensor is good.

If you get no reading when checking the Sensor with a meter and a flashlight, check the harness
from the board to the sensor in cage by performing Test 3.

Test 3 - Continuity of Sensor & Harness:

Remove right bottle guide by removing the two screws located on the right side of the Z Mech
Move the bottle guide so you can access the sensor wires in back
Blue wire (pin 1) in Z Mech goes to y motion control connector pin 11
White wire (pin2) in Z Mech goes to y motion control connector pin 14

If the harness to the sensor tests OK, Proceed to Test 4.

Y Motion Connector on Control Board

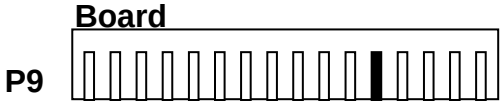
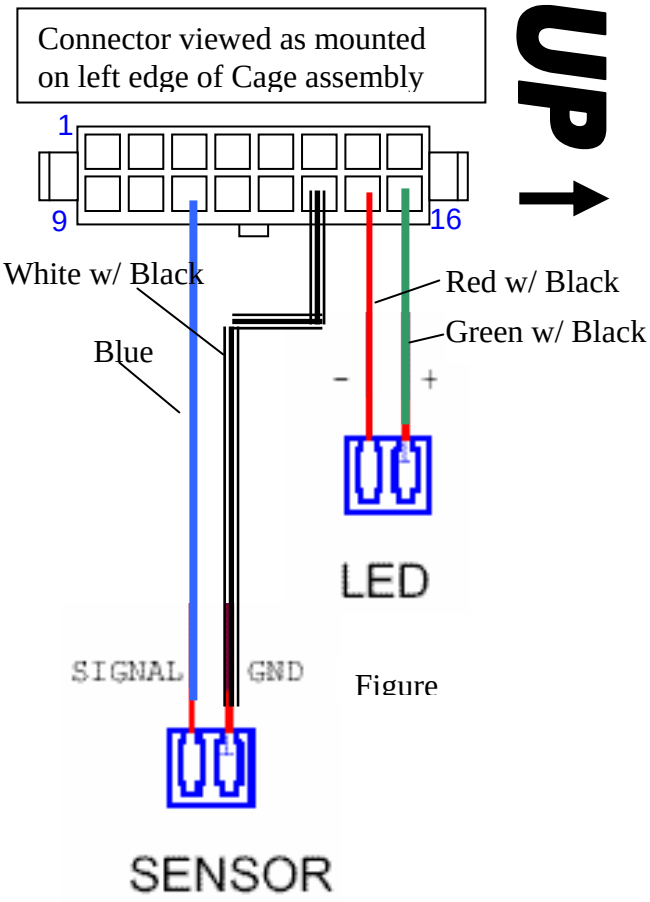


Figure 1



Figure

Test 4 – Control Board Power to Cage
To check control board:
Machine should be powered up
Set meter to volts DC
Place red probe on pin 15 (Y motion Control)
Place black probe on pin 13 (Y motion Control)
You should measure 5 Vdc

This is the 5Vdc supply to the components in the cage

Set meter to volts AC
Place red probe on pin 15
Place black probe on pin 16
You should measure above 0.200 Volts.

This is the pulsed signal being sent to the LED in the cage. If no voltage is detected, replace control board.

Robo Quencher Lubrication And Maintenance Schedule

The following illustrations show the lubrication points that we recommend be cleaned and lubed at the vend counts listed on the attached chart. The recommended lubricant is Super Lube part # 54250005, for the gear racks, and mineral oil for the shelf slides and X&Y bars.

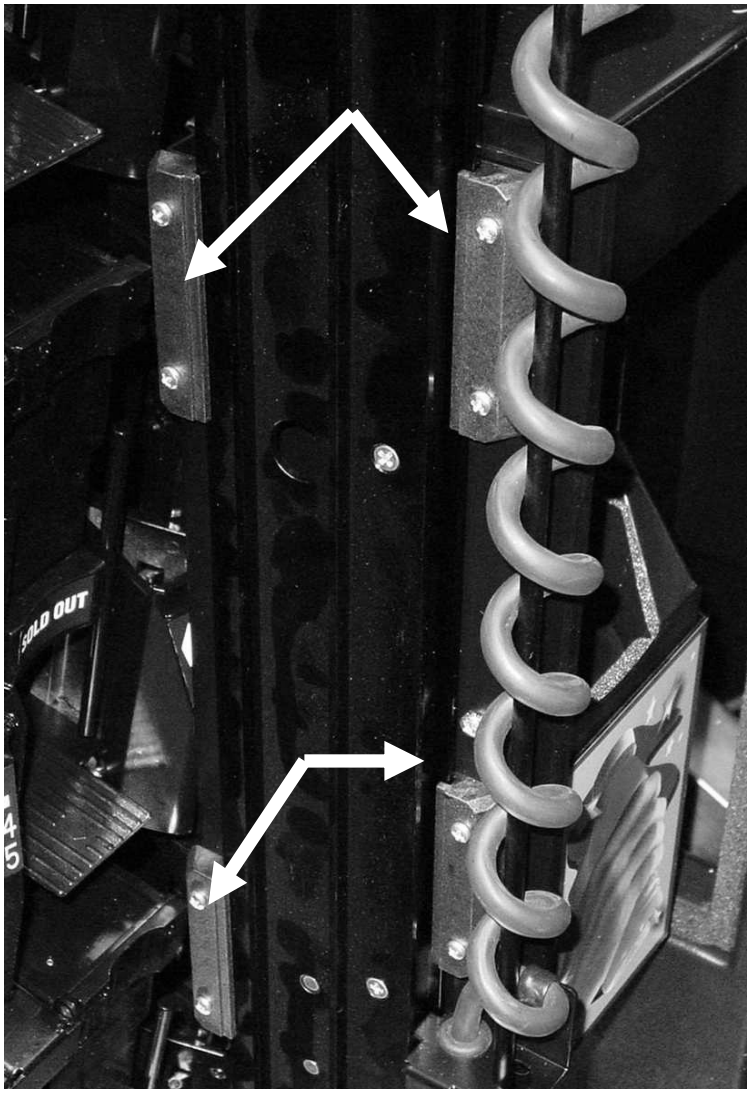


Figure 1

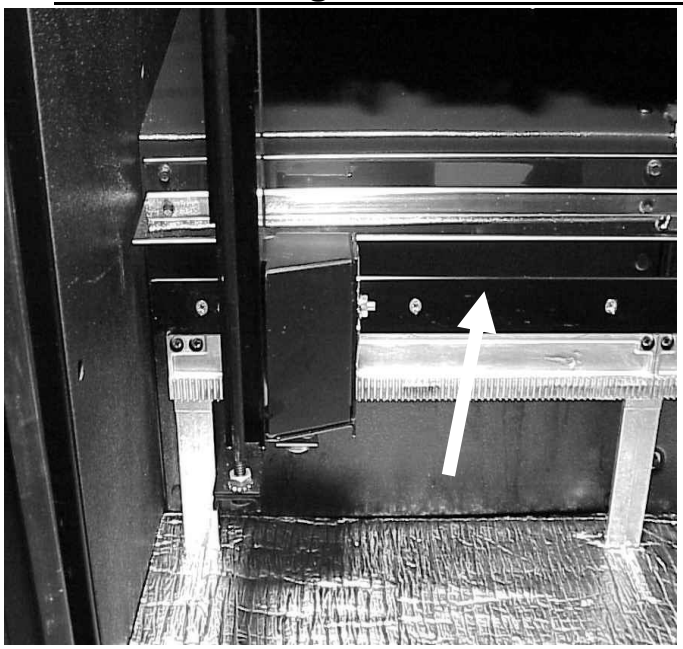


Figure 2

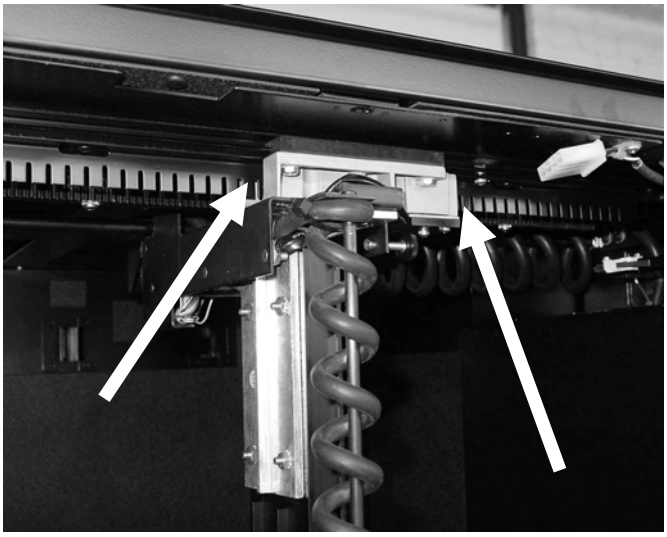


Figure 3

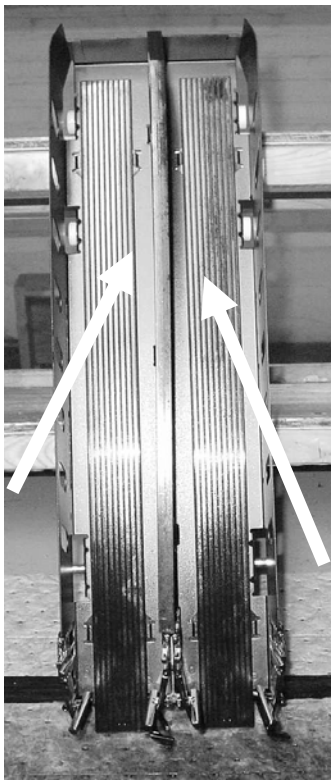


Figure 4

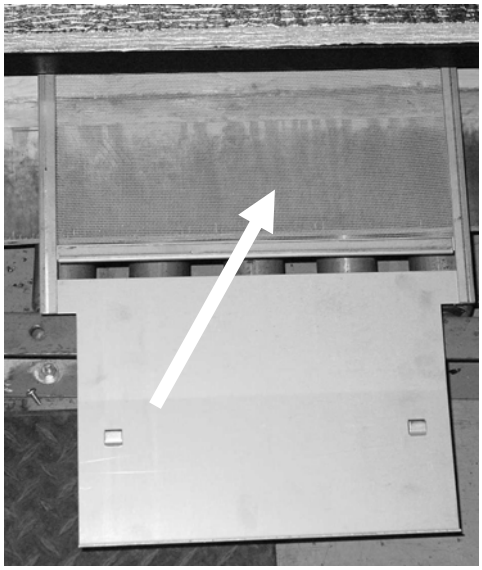


Figure 5

PREVENTATIVE MAINTENANCE
SERVICE SCHEDULE
for APi 511 Beverage Merchandiser

SERVICE REQUIRED AT EACH INTERVAL LISTED X MONTHS OR VENDS WHICHEVER COMES FIRST	Intervals by Months >>>	Each Visit	3	6	12	18
	Intervals by Vends >>>		5,000	10,000	20,000	30,000
Shuttle assembly (See Fig. 1)						
Shuttle shoe, and sensors		Clean	Clean/Inspect	Clean/Inspect	Clean/Inspect	Clean/Inspect
Lube the 4 black slider blocks (Y bar)				Oil	Oil	Oil
Foam pad			Inspect	Replace	Replace	Replace
Lower x bar slide assy. (See Fig.2)						
Lube the bottom rail guide				Oil	Oil	Oil
Lube the bottom gear rack					Grease	
Lube the bottom x motor slides				Oil	Oil	Oil
Upper x bar slide assy. (See Fig.3)						
Lube the upper rail guide				Oil	Oil	Oil
Lube the upper gear rack					Grease	
Lube the upper x rail slides				Oil	Oil	Oil
Shelf Tray assy. (See Fig.4)						
Shelf slides			Clean/Lube	Replace	Clean/Lube	Replace
Bottle Escapements (40)		Inspect	Inspect	Inspect	Inspect	Inspect
MISCELLANEOUS (See Fig.5)						
Intake screen		Clean				
Exhaust screen			Clean	Clean	Clean	Clean
Coin Mech. And Validator		Clean				
T-Handle					Lubricate	
Glass Door		Clean				
Condensing Unit Fins					Clean	
Any Spills		Clean				

For each month of use past 36 months, repeat the schedule at each interval indicated.

CLEAN Clean and sanitize as per Each Visit procedure found on previous pages.

INSPECT Visually inspect parts if there is a problem remove assembly from machine and Thoroughly clean, and inspect for wear or bent parts. If necessary: repair, adjust, clean, rebuild or replace.

REPLACE Recommended interval for replacement.

REBUILD Remove from machine, disassemble, clean and replace worn or corroded parts.

LUBRICATE Should be cleaned, inspected, and repaired before lubrication. Recommended Lubricant is a food grade, light weight mineral oil.

Troubleshooting

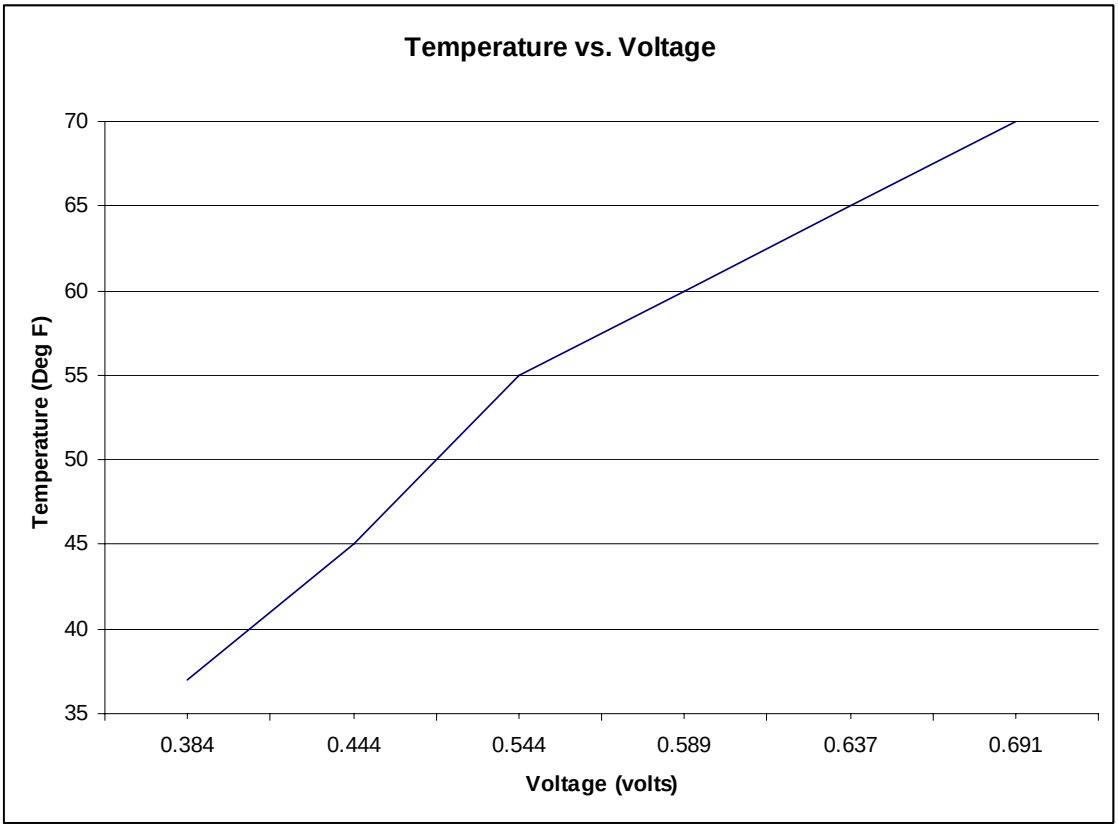
Temperature Probe Test

Press and hold either the ► (F°) or ◄ (C°) to read the reported current temperature.

If the temperature reads 255, that indicates that the temperature probe harness is disconnected from the board, or the probe harness has a broken wire.

To Test Temperature Probe for correct reading.
Set Meter to less than 5Vdc scale.
With machine power on, check pins P4-1 (-) to P4-4 (+) for 5Vdc – If no voltage is present – check for 24Vac at P1-1 & P1-3
Check pins P4-1 to P4-3 for a value as indicated on the chart above, depending upon the temperature inside the cabinet. A correct value indicates that the temperature probe is functioning correctly.
If the refrigeration unit is not running and the cabinet temperature is more than 5° above the set point, check P6-4 (+)and P6-5 (-)for 24Vdc, and check 4 pin connector on bottom of power box for 120Vac, between pins 1 and 3.

Temperature (Deg F)►	Temperature (Deg C)◄	Voltage (Volts)
37	2.8	0.384
45	7.2	0.444
55	12.8	0.544
60	15.5	0.589
65	18.3	0.637
70	21.1	0.691



Troubleshooting

During Reset	During a vend	Error Meaning	Solution
E0	60	Too many critical errors too fast	Clear errors, Power down, power up, allow machine to initialize
E2	62	Y home switch not found	Check P9, check Y home switch & harness
E3	63	At lease one lock switch stuck on	Check that both switches are not both on at the same time, check P1
E4	64	Y motor over current	Clean and re-lubricated "Y" bar and drive rod. Check for any obstructions on "Y" bar gear rack and glides. Check that the Y coil cable is free to move. Replace shuttle assembly.
E5	65	X motor over current	Clean and re-lubricate lower and upper "X" drive gear rack and slides. Check that the X home switch actuator is set properly. Check for any obstructions. Check that the X coil cable is free to move.
E7	67	Y motor out of control	Check P9, replace control board, replace shuttle assembly
E8	68	X motor out of control	Check P1, check motor wires, replace control board
E9	69	Lock motor out of control	Check P1, check motor and switch wires, replace control board
EA	6A	Z Mech motor out of control	Check P9, replace shuttle assembly, replace control board
EC	6C	Product vend door can't open	Check P5 on board, check motor and switch wires, clean track
ED	6D	Product vend door can't Close	Check P5 on board, check motor and switch wires, clean track
F0	50 or 70	Encoder pulses too fast	Check P9, replace shuttle assembly
F1	51 or 71	X home switch stuck	Check for obstruction holding switch closed, replace switch
F3	53 or 73	X Home switch noise	Clean and re-lubricate lower and upper "X" drive gear rack and slides. Check that the X home switch actuator is set properly. Check for any obstructions. Check that the X coil cable is free to move.
F4	54 or 74	X motor over current at start-up	Clean and re-lubricate lower and upper "X" drive gear rack and slides. Check for any obstructions. Check that the X coil cable is free to move.
F5	55 or 75	Lock motor over current at start-up	Check motor, replace control board
F6	56 or 76	Z Mech motor over current at start-up	Check P9, check motor and switch wires, replace shuttle assembly, replace control board
F7	57 or 77	Y motor over current or bad encoder	Clean and re-lubricated "Y" bar and drive rod. Check for any obstructions on "Y" bar gear rack and glides. Check that the Y coil cable is free to move. Check P9, replace shuttle assembly, replace control board
F8	58 or 78	X is binding, but not over current	Clean and re-lubricate lower and upper "X" drive gear rack and slides. Check that the X home switch actuator is set properly. Check for any obstructions. Check that the X coil cable is free to move. Re-adjust upper "X" bar guide to reduce "Y" bar twist. Check "X" motor gear box.
F9	59 or 79	Lock motor is binding, but not over current	Check for obstructions
FA	5A or 7A	Z Mech motor is binding, but not over current	Check for obstructions
FB	5B or 7B	Z Mech in/out switch stuck	Check switches, replace shuttle assembly
FC	5C or 7C	Product vend door out of control	Check P5 on board, check motor and switch wires, replace control board
FF		Both Z switches stuck on	
		Temperature shows greater than 250 ^{o}F	Probe unplugged
		Machine is warm	Check P6, pins 4 & 5 for 24VDC Check 2 pin connector for Refrigeration Relay on Power Box Check 4 pin connector to refrigeration unit on Power box for 120VAC between pins 1 & 3
		Machine is dark, no digits on display	Check wall outlet for correct voltage Check incoming power cord at power box Check power cord connector adjacent to refrigeration unit
Fd	Fd	Fd on display	Health Code has been tripped, power machine off and on to reset Health Code. Determine cause for Health Code intervention.

Clear Errors in a Roboquencher 511

1. Press Mode switch 1 time.
2. If errors are present, display will show nXX, where XX equals the number of errors present, up to a maximum of 15.
3. To view the errors, press the right arrow key, and the error code will show on the display, in order from most recent to earliest.
4. After the last error, the display will show cLrn (Clear N), press the # key to toggle this to cLrY (Clear Y), and then press the C to finish clearing errors.

ELECTRICAL CONNECTIONS

P1 XMOTION CONTROL
1 MOTOR X
2 MOTOR X COMMON
3 KEY
4 LOCK MOTOR
5 LOCK MOTOR COMMON
6 Y HOME SWITCH COMMON
7 Y HOME SWITCH
8 X POSITION SENSOR GROUND
9 X POSITION SENSOR SIGNAL
10 X POSITION +5 SUPPLY
11 SENSE SWITCH: SHELF INTERLOCK
12 X POSITION SENSOR LED DRIVE
13 X MOTOR HOME SWITCH
14 GROUND FOR SENSE SWITCHES
15 SENSE SWITCH: LOCK MOTOR LOCKED
16 SENSE SWITCH: LOCK MOTOR FREE

P2 MDB
1 34VDC
2 KEY
3 PWR GROUND
4 MASTER RXD
5 MASTER TXD
6 COMMUNICATION COMMON
7 N/C

P3 POWER
1 24 VAC
2 EARTH GROUND
3 24 VAC

P4 TEMPERATURE SENSOR
1 GROUND
2 KEY
3 TEMPERATURE SIGNAL
4 5 VDC

P5 DELIVERY DOOR
1 DELIVERY DOOR OPEN
2 DELIVERY DOOR CLOSE
3 KEY
4 DELIVERY DOOR SWITCH OPEN
5 DELIVERY DOOR SWITCH CLOSE
DELIVERY DOOR SWITCH COMMON

P6 SERVICE
1 DOOR SWITCH COMMON
2 KEY
3 DOOR SWITCH
4 24 VDC
5 REFRIGERATION RELAY CONTROL

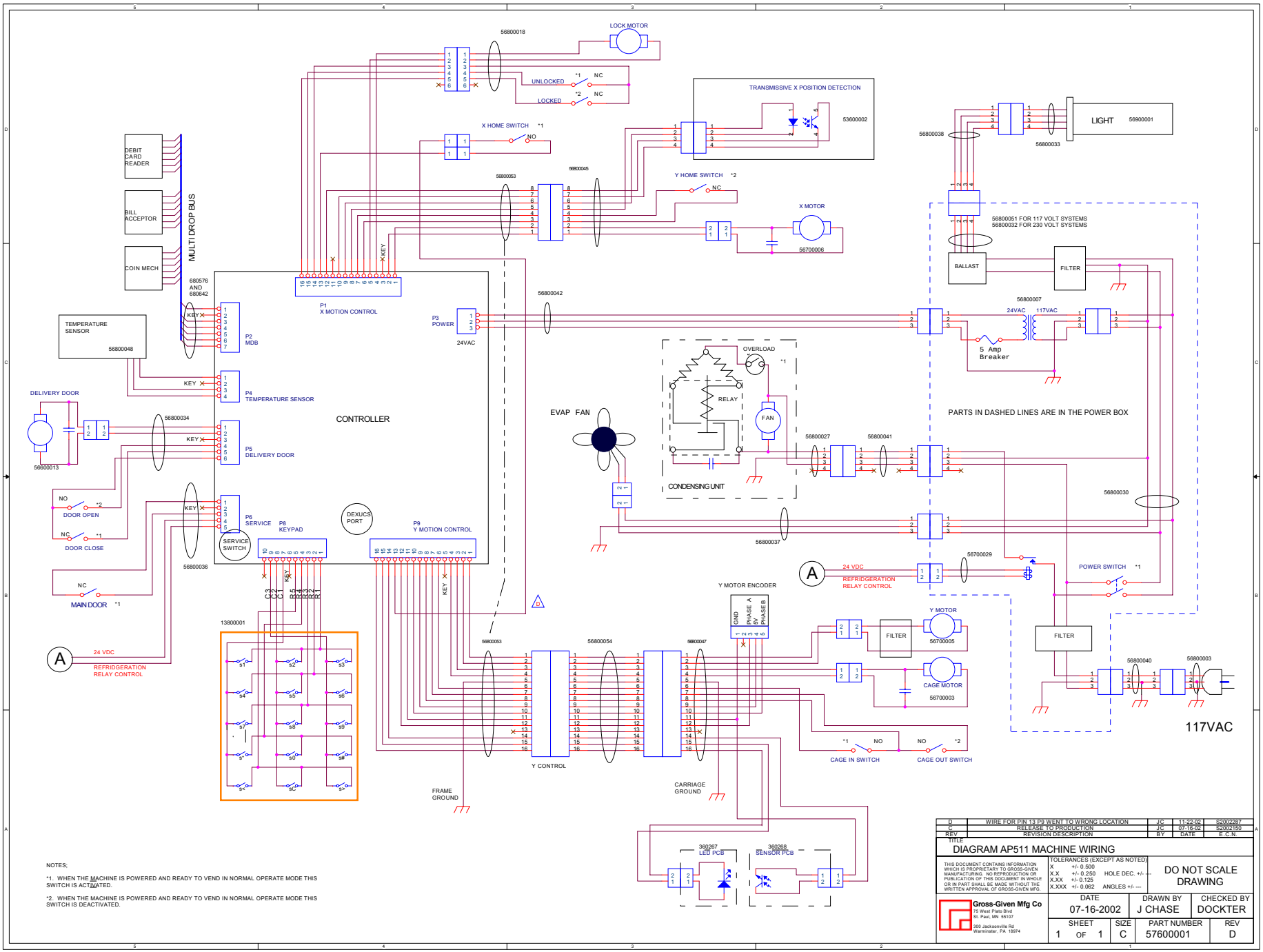
P7 RS232 SERIAL INTERFACE (PHONO PLUG)
1 RECEIVE DATA
2 GROUND
3 TRANSMIT DATA

P8 KEYPAD
1 ROW 1
2 ROW 2
3 ROW 3
4 ROW 4
5 ROW 5
6 KEY
7 COLUMN 1
8 COLUMN 2
9 COLUMN 3
10 COLUMN 4

P9 Y/Z MOTION CONTROL
1 MOTOR Y FORWARD
2 MOTOR Y REVERSE
3 Z MECH MOTOR OUT
4 Z MECH MOTOR IN
5 KEY
6 Z MECH SWITCH IN
7 Z MECH SWITCH OUT
8 Z MECH SWITCH COMMON
9 Y POSITION 5 V
10 Y POSITION SENSOR A
11 Y POSITION GROUND
12 Y POSITION SENSOR B
13 GROUND
14 PRODUCT PRESENT SENSOR
15 PRODUCT PRESENT LED +
16 PRODUCT PRESENT LED

KEYPAD MATRIX

Switch #	Connection A	Connection B
1	PIN 1	PIN 7
2	PIN 1	PIN 8
3	PIN 1	PIN 9
4	PIN 2	PIN 7
5	PIN 2	PIN 8
6	PIN 2	PIN 9
7	PIN 3	PIN 7
8	PIN 3	PIN 8
9	PIN 3	PIN 9
*	PIN 4	PIN 7
0	PIN 4	PIN 8
#	PIN 4	PIN 9
<-	PIN 5	PIN 7
C	PIN 5	PIN 8
->	PIN 5	PIN 9



NOTES;

*1. WHEN THE MACHINE IS POWERED AND READY TO VEND IN NORMAL OPERATE MODE THIS SWITCH IS ACTIVATED.

*2. WHEN THE MACHINE IS POWERED AND READY TO VEND IN NORMAL OPERATE MODE THIS SWITCH IS DEACTIVATED.

REV	REVISION DESCRIPTION	BY	DATE	E.C.N.
D	WIRE FOR PIN 13 P9 WENT TO WRONG LOCATION	JC	11-22-02	S2002287
C	RELEASE TO PRODUCTION	JC	07-16-02	S2002150

TITLE: DIAGRAM AP511 MACHINE WIRING

TOLERANCES (EXCEPT AS NOTED)
X +/- 0.500
X.X +/- 0.250 HOLE DEC. +/- ---
X.XX +/- 0.125
X.XXX +/- 0.062 ANGLES +/- ---

DO NOT SCALE DRAWING

Gross-Given Mfg Co
19 West Plato Blvd
St. Paul, MN 55107
300 Jacksonville Rd
Warminster, PA 18974

DATE	DRAWN BY	CHECKED BY
07-16-2002	J CHASE	DOCKTER

SHEET	SIZE	PART NUMBER	REV
1 OF 1	C	57600001	D