

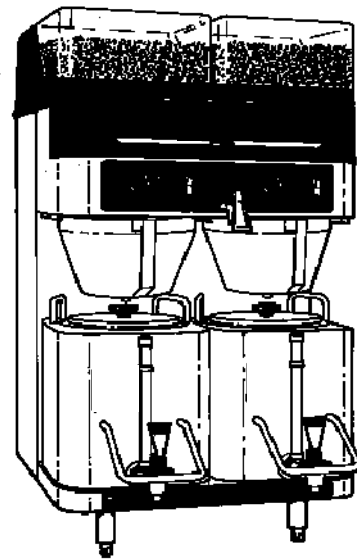
American Metal Ware® Brewers

Operation and Instruction Manual

for
Model: P400GNB-E

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Model P400GNB-E

*Prior authorization must be obtained
from Grindmaster Corporation
for all warranty claims.*



GRINDMASTER™
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Warning Labels

The following warning and caution statements are contained in different sections of this manual. Please read this manual and follow all safety precautions when operating or servicing this equipment.



WARNING: ELECTRIC SHOCK HAZARD

ONLY QUALIFIED SERVICE PERSONNEL SHOULD PERFORM INSTALLATION OF THIS APPLIANCE. IMPROPER INSTALLATION COULD RESULT IN ELECTROCUTION.

CAUTION: HOT LIQUID HAZARD

WATER USED FOR BREWING COFFEE IS VERY HOT. USE CAUTION WHEN BREWING, POURING OR TRANSPORTING COFFEE. NEVER ATTEMPT TO MOVE THE BREWER WITHOUT FIRST DRAINING THE WATER TANK. ACCIDENTAL SPILLS MAY RESULT IN SEVERE BURNS.



WARNING: BURN HAZARD

HOT LIQUIDS AND SURFACES ARE PRESENT IN THIS EQUIPMENT. TO AVOID BURNS USE CAUTION WHEN CLEANING. RINSE POTS WITH COLD WATER BEFORE CLEANING. USE GLOVES OR HEAVY CLOTH WHEN REMOVING HOT PARTS FROM BREWER.



WARNING: ELECTRIC SHOCK HAZARD

NEVER USE THE GROUND CONDUCTOR AS A NEUTRAL. THIS COULD CAUSE ELECTROCUTION.

CAUTION: HOT LIQUID HAZARD

COFFEE BASKET CONTAINS VERY HOT LIQUID UNTIL THE DRIP-THROUGH IS COMPLETED. EARLY REMOVAL OF THE BASKET COULD RESULT IN BURNS.



WARNING: ELECTRIC SHOCK HAZARD

DANGEROUS ELECTRIC VOLTAGES ARE PRESENT NEAR ADJUSTABLE COMPONENTS. ONLY QUALIFIED SERVICE PERSONNEL SHOULD MAKE ADJUSTMENTS.



WARNING: ELECTRIC SHOCK HAZARD

DANGEROUS ELECTRIC VOLTAGES ARE PRESENT NEAR COMPONENTS TO BE CLEANED AND SANITIZED. ONLY QUALIFIED SERVICE PERSONNEL SHOULD PERFORM THIS SERVICE. POWER TO THE UNIT MUST BE DISCONNECTED PRIOR TO CLEANING AND SERVICING THIS UNIT.

Start Up Procedures



WARNING: ELECTRIC SHOCK HAZARD!

ONLY QUALIFIED SERVICE PERSONNEL SHOULD PERFORM INSTALLATION OF THIS APPLIANCE. IMPROPER INSTALLATION COULD RESULT IN ELECTROCUTION.

See rough-in drawing in this manual for dimensions and locations of electrical and water input.

Set-up / Position

- 1) Remove the brewer from the packing material and attach the 4" legs.
- 2) Position the brewer on a strong, stable table or counter top. Check the level front to back and side to side. Adjust the legs to the correct level.

IMPORTANT: The person installing this appliance is responsible for ensuring that electric and water connections meet the requirements of the national electric code, national plumbing code and any local ordinances.

Water Hook-up

- 1) The water line may enter through hole at the rear or through the bottom of the brewer. Use the left hand opening for water.
- 2) Use 3/8" copper or flexible water line to prevent strain. Do not use low temperature plastic tubing. The connector on the fill valve is a 3/8" male flare fitting.
- 3) Water line pressure must be from 30 to 70 psi.
- 4) Hot (up to 160°F) or cold water may be used. Hot water offers faster recovery between brews.
- 5) Install a shut-off valve near the brewer.
- 6) Installing a filtering system can improve the taste of brewed coffee and extend the life of the brewer. The use of a filter is especially important if your water has a high calcium (lime), chlorine or iron content. Contact our Technical Service department to select the filter for your water conditions.

Electrical Hook-up

- 1) The electric ratings for your brewer are printed on its nameplate. The electrical rating is one of the following:
 - 120/208-240 Volt, 1 Phase, 4 supply wires (standard configuration)
 - 208-240 Volt, 1 Phase, 3 supply wires (no neutral line)
 - 120/208-240 Volt, 3 Phase, 5 supply wires
 - 208-240 Volt, 3 Phase, 4 supply wires (no neutral line)
- 2) The brewer should be connected to its own circuit with a fused disconnect switch or a circuit breaker near the brewer.
- 3) Attach the appropriately sized cord to the brewer with a cord grip for the 1 1/2" electric input opening. The cord may enter through hole at the rear or through the bottom of the brewer. Use an oil resistant cord such as type SO, SOO, SAO, STOO, SEO, SJO, SJOO, SJTO, SJTOO, SJEO, HSO, HSOO, HSJO or HSJOO. Alternatively, flexible conduit and type THHN wires may be used. Use only copper conductors.
- 4) Standard configuration is 1 phase, 4 wire. Connect the three lines (L1, L2, and neutral) to the terminal block. The neutral line must be connected to the N terminal. If your building wiring does not offer a neutral line, the correct model must be used, see item 1. If the brewer is wired for three phase, lug L3 is provided on the terminal block.

Start Up Procedures (cont.)



WARNING: ELECTRIC SHOCK HAZARD

NEVER USE THE GROUND CONDUCTOR AS A NEUTRAL. THIS COULD CAUSE ELECTROCUTION.

- 5) The body of the brewer must be grounded. A ground lug is provided for this purpose.

Initial Start-up

- 1) Turn on the water supply to the brewer. Check for leaks at the supply line to the fill valve connection.
- 2) Replace the front access panel.
- 3) Turn on the electric supply. The brewer will begin to fill. If the Water Hot light begins flashing during this initial filling, then the water fill valve has been on for more than 5 minutes. This is an error mode, and the unit must be reset. To reset, remove the control board access cover. Press the Select button for 10 seconds to reset the controller and resume filling.
- 4) Once the brewer is full, it will take 15 - 35 minutes to heat. The Water Hot light will turn on when the water is up to the proper brewing temperature.
- 5) Insert the brew baskets and place a shuttle over the warmer shelf. Brew at least 1 batch from each side. Check the level in the container to be sure the brew volume is correct. Remember that when using coffee, the level will be lower. Do this for both batch sizes when provided. The water must be hot to check the levels. If adjustments are needed, see the **Adjustments section** of this manual.

User Control Functions

There are 2 sets of controls on the exterior of the P400GNB unit, 1 set of controls per brew station. Each set of controls consists of a touchpad and a red Stop switch. A water faucet and a red Water Hot light are located between the 2 sets of touchpad controls.

Touchpad Functions (Refer to Figure A): Each touchpad has 3 switch pads with symbols above each switch pad that illuminate the selected operation.

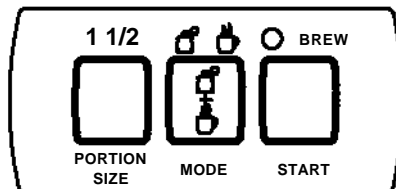


Figure A

The 1st switch (left position) is used to select the PORTION SIZE desired: 1/2 gal, 1 gal and 1 1/2 gal. Default setting is 1 1/2 gal. Pressing the button repeatedly cycles through the 3 settings.

The 2nd switch (middle position) is used to select the operating Mode: Grind Only, Brew Only and Grind'n Brew. Default setting is Grind'n Brew. Pressing the button repeatedly cycles through the 3 settings.

The 3rd switch (right position) is used to Start the operation. Pressing this switch starts the grinding operation, then follows with the brewing operation. During the brewing operation, a red dot will illuminate indicating that brewing is in progress. After the brew time is elapsed, the red dot will flash during the drip through phase of the brewing cycle. Throughout the grinding and brewing operations, the touchpad functions are locked out from making any changes.

NOTE: Before any operation is to be performed, the brew basket and shuttle must be in place.

Stop Switch Function: Pressing the Stop switch any time during the cycle will terminate the cycle prematurely and reset the controller to a waiting status.

Start Up Procedures (cont.)

NOTE: After stopping the cycle prematurely, there may be a period of time needed to wait for the drip through of hot water to occur. This is a result of the brew basket collecting the hot water during a normal brewing cycle.

Hot Water Light: This light will illuminate when the water has reached the proper brewing water temperature. The Water Hot light is also used to display Error Codes. Go to **Error Code** section of the **Troubleshooting Guide** for the specific details.

Hot Water Faucet: Hot water may be taken from this faucet at any time as needed.

Automatic Bypass: When brewing on the largest setting, the unit will enable the bypass valve automatically. This is desirable to accelerate the water flow rate through the brew basket with brewing the largest volume. This allows the correct extraction rate to be achieved for most customers.

Pre-Infusion: Pre-Infusion increases the extraction level achieved with this unit. The brewing cycle is temporarily halted during the first portion of the cycle then resumed. This feature is standard on the unit but may be disabled if not desired. To disable this feature, the touchpad assemblies need to be replaced. Contact our Technical Service Department.

Low Temp No Brew: This feature prevents the operator from brewing coffee before the desired water temperature has been reached. This feature is standard on the unit but may be disabled if not desired.

Temperature and Timing Controls (Refer to Figure B)

Temperature and the various programmable timers are set by the dial and keypad located on the control board.

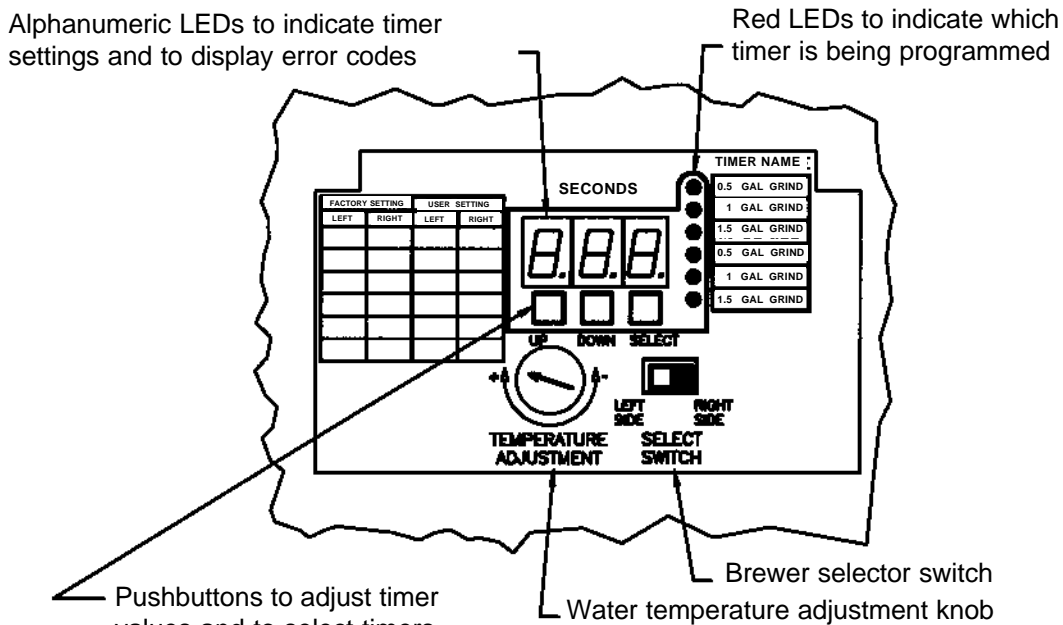


Figure B

This control board is located behind the lower front panel and is accessed by removing the control board access panel.

The controller stores 12 independent timer values, 6 per brew station. Each of the 6 timers is associated with a LED light. The top 3 LEDs control the duration of the grinding processes and are displayed in 1/10 second increments. The bottom 3 LEDs control the duration of the brewing processes and are displayed in 1 second increments.

Start Up Procedures (cont.)

Brewer Selector Switch

The brewer selector switch is a 2 position slide switch located on the main controller. It is used to select the left or right side timers for programming. In the left position, the left brew station is being programmed; in the right position, the right brew station is being programmed. To switch from side to side, slide switch to the desired position.

Pushbutton Keypad

The pushbuttons serve 4 functions. These functions are to:

- 1) select the appropriate timer,
- 2) adjust the stored timing value,
- 3) instruct the controller to store a displayed value
- 4) reset the controller after an error has been registered.

The pushbutton to the right on the controller is used for 1, 3 and 4. The pushbutton to the left on the controller is used to increase the displayed value. The middle pushbutton is used to decrease the displayed value.

To select the appropriate timer once the correct brew side has been selected, press the Select pushbutton until the correct brew size LED is lit.

To adjust the stored timing value, press the left pushbutton to increase the displayed value or press the middle pushbutton to decrease the displayed value.

To store a displayed value press the Select button once.

To reset the controller after an error has been registered, press the right pushbutton and hold for 10 seconds.

Temperature Adjustment Knob

Temperature adjustment is accomplished by rotating the small knob to the left of the brewer selector switch. Clockwise rotation will increase the temperature setpoint while counter-clockwise rotation will decrease the setpoint.

Operation

CAUTION: HOT LIQUID HAZARD

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- 1) Place an empty, warm shuttle under the sprayhead. Turn on the warmer.
- 2) If the shuttle is not warm, allow the warmer to heat the shuttle. A short brew of water will speed this. A cold shuttle will significantly lower the temperature of the brewed coffee.
- 3) Remove the filter basket and line with a filter paper. Paper size is 13" x 5" for the BB1.5, (standard brew basket), and 14" x 5" for the larger, BB2.0.
- 4) Fill the hoppers with whole coffee beans only. Your coffee supplier can help you select the right amount of coffee and grind. Coffee brewing experts recommend 6.5 - 8 oz. of coffee per gallon of water for most applications. A full shuttle is 1.4 gal.
- 5) Slide the brew basket into the brewer making sure the spout lines up with the top of the shuttle or airpot.
- 6) Select the batch size through the touchpads. Check the Water Hot light. If it is lit, press the Start switch on the touchpad. If the Water Hot light is not lit, wait and press Start when it illuminates.
- 7) Brew time is about 4 minutes for a full shuttle, less for smaller batches. After the brew, allow the coffee to drip for 1 - 2 minutes.

Operation (cont.)

CAUTION: HOT LIQUID HAZARD

COFFEE BASKET CONTAINS VERY HOT LIQUID UNTIL THE DRIP-THROUGH IS COMPLETED. EARLY REMOVAL OF THE BASKET COULD RESULT IN BURNS.

- 8) Dump the grounds from the basket and rinse for the next brew. Coffee is ready to serve.
- 9) The shuttle may be placed on remote warming stations. Use caution when moving a full shuttle.

Adjustments



WARNING: ELECTRIC SHOCK HAZARD

DANGEROUS ELECTRIC VOLTAGES ARE PRESENT NEAR ADJUSTABLE COMPONENTS. ONLY QUALIFIED SERVICE PERSONNEL SHOULD MAKE ADJUSTMENTS.

Components for adjustment of grinding and brewing timing and of temperature are accessible behind the access panel located on the lower front panel. The grinder adjustments are located behind the upper front cover.

Setting the Grind Profile

- 1) Turn off electric power to the unit at the main breaker assigned to the unit.
- 2) Remove the upper front panel and shield by removing the screws on the sides of the panel.
- 3) Loosen the adjusting screw lock nut by turning it counter-clockwise.
- 4) Turn the slotted adjusting screw clockwise to make the grind coarser or counter-clockwise to make the grinds finer.
- 5) After adjustment has been made, re-tighten the adjusting screw lock nut.
- 6) Visually inspect the grind profile with a small portion of coffee and readjust if necessary.
- 7) Reinstall the upper front panel and shield as it was removed.

Setting the Grinder Throw Weights

The throw weight is adjusted by setting the timer values of the controller after the desired grind profile is achieved. Refer to **Temperature and Timing Controls section** for more information on controls.

Before adjusting throw weight, grind a batch of coffee and measure the coffee weight. Record this value.

To adjust throw weight:

- 1) Remove the controller access panel.
- 2) Slide the brewer selector switch to the appropriate position.
- 3) Press the Select button momentarily; a LED will light up to indicate which timing selection is being displayed on the alphanumeric display. Scroll down the selection list to the grinder timer to be adjusted.
- 4) After selecting the appropriate side and portion timer, adjust the timer value to the desired value by pressing the Up or Down buttons on the controller. Increasing the timer value increases the coffee throw, decreasing the number decreases the throw. Hold down the Up or Down button to scroll quickly to the desired value. Once the desired value is displayed, press the Select button on the controller to save this new value. Grind a batch of coffee and measure weight dispensed. Repeat this procedure as necessary until desired throw weight is dispensed.
- 5) Replace the access panel.

Adjustments (cont.)

Water Temperature Adjustment

Brew water temperature can be adjusted by turning the knob on the main controller located behind the controller access panel. Temperature adjustment range is 175°F - 202°F. Adjustment for temperature should be made after measuring the temperature of the water dispensed from the sprayhead by the following procedure:

- 1) Remove the sprayhead from the brewer and set aside.
- 2) Place a shuttle without the lid under the outlet.
- 3) Press Start and, using a thermometer, measure the temperature of the water being dispensed.
- 4) If a higher temperature is desired, rotate the Temperature Adjustment knob clockwise. If a lower temperature is desired, rotate the Temperature Adjustment knob counter-clockwise.
- 5) If water temperature setting has been increased, wait until heater has cycled and then follow steps 3 and 4 again. If water temperature setting has been decreased, brew a large portion of water and repeat steps 3 and 4.
- 6) Continue this procedure until desired brew temperature is achieved.
- 7) Replace sprayhead.

Brew Timing/Brew Volume Adjustment

Brew volume is adjusted by adjusting the timer values of the controller (refer to **Temperature and Timing Controls section**).

Before adjusting brew timing, brew a batch of water and measure the brew volume. Record this value.

To adjust brew timing:

- 1) Remove the controller access panel.
- 2) Slide the brewer selector switch to the appropriate position.
- 3) Press the Select button momentarily; a LED will light up to indicate which timing selection is being displayed on the alphanumeric display. Scroll down the selection list to the timer to be adjusted. Note the timer value displayed. The new timing should be calculated by the following:

$$\text{Desired brew time} = \frac{\text{Desired brew volume}}{\text{Current brew volume}} \times \text{Current brew time}$$

- 4) After selecting the appropriate side and portion timer, adjust the timer value to the desired value by pressing the Up or Down buttons on the controller. Increasing the timer value increases the brew dispensing time; decreasing the number decreases the time. Hold down the Up or Down button to scroll quickly to the desired value. Once the desired value is displayed, then press the Select button on the controller to save this new value.
- 5) Brew a batch of water and measure volume dispensed. Repeat procedure as necessary until desired volume is dispensed.
- 6) Replace the access panel.

Adjustments (cont.)

Bypass Adjustment (Refer to Figure C)

The bypass valve adjusts the amount of water that bypasses coffee grounds and dilutes the final brew. The factory setting is no bypass. Bitter coffee is brewed when the amount of ground coffee is too small. Therefore, if your coffee is brewing too strong, it is better to adjust the bypass valve instead of reducing the amount of coffee.

NOTE: Always adjust bypass before adjusting brew timing because bypass affects brew rate.

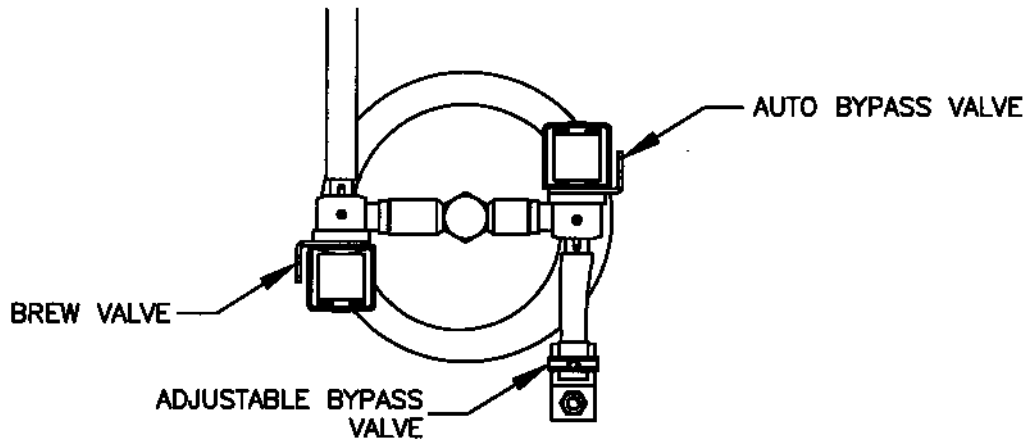


Figure C

To Adjust the Bypass:

- 1) Turn off electrical power to the brewer and remove the upper front panel and shield.
- 2) Locate the bypass valve to be adjusted. The bypass valve is located to the right and in front of the brew tee.
- 3) Open the valve by turning the valve handle counter-clockwise to the desired setting. (Refer to the information below.)

Bypass Setting	Bypass: % Of Total Brew
Closed	0
1 revolution	8
2 revolutions	12
3 revolutions	22
4 revolutions	33

- 4) Measure the bypass setting:
 - a) Remove the brew basket.
 - b) Place an empty shuttle (with lid removed) under the sprayhead.
 - c) Place a measuring cup under the bypass outlet.
 - d) Press Start and brew water for about 30 seconds or until the measuring cup is almost full.
 - e) Record the amount of water in the bypass measuring cup.
 - f) Add the water from the measuring cup to the shuttle; measure the total volume and record.

Bypass % is calculated as:

$$\text{Bypass \%} = (\text{Bypass volume from measuring cup} / \text{total volume in shuttle}) \times 100$$

- 5) Adjust the bypass valve setting and repeat the measuring process until the valve is set as desired.

Care and Cleaning



WARNING: BURN HAZARD

HOT LIQUIDS AND SURFACES ARE PRESENT IN THIS EQUIPMENT. TO AVOID BURNS USE CAUTION WHEN CLEANING. RINSE HOT PARTS WITH COLD WATER BEFORE CLEANING. USE GLOVES OR HEAVY CLOTH WHEN REMOVING HOT PARTS FROM BREWER.

Cleaning After Each Brew

Dispose of grounds and rinse brew baskets. Rinse shuttles before using them again.

Daily Cleaning

The following cleaning procedure should be done on a daily basis.

- 1) Turn both warmer switches off. Remove the shuttle, and drain any remaining coffee from it. Thoroughly clean the shuttle and the sight glass. Rinse and let air dry. Do not place the shuttle back on the warmer.
- 2) Remove the brew baskets from each side. Discard any contents in brew baskets. Clean and rinse the brew baskets. Do not place them back on the unit.
- 3) Remove the spray head assembly from the spray tee assembly (refer to Figure D). Pull the tab located at the front of the spray head until it hits the forward stop. The sprayhead will drop straight down and away from the spray tee nut. Clean and rinse the spray head assembly and let air dry.
- 4) Clean the inside of the spray dome around the grinder outlet chute. Use the brush provided to clean the grinder outlet chute (refer to Figure E). Move the finger tab on the shutter door toward the rear. Use the brush to clean up inside the grinder outlet chute above the shutter door.

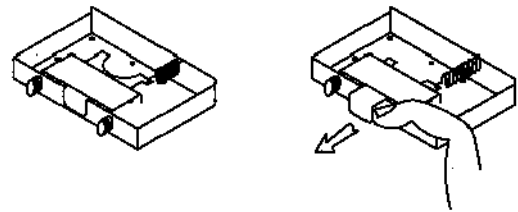


Figure D

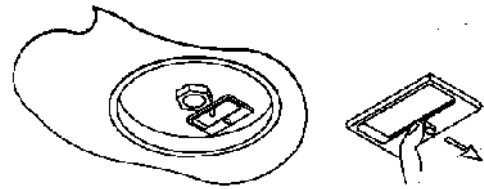


Figure E

IMPORTANT: Do not insert the brush into the chute past the stops on the brush.

Be sure to remove all the residue from the grinder outlet chute both above and below the shutter door. Remove the brush and release the finger tab on the shutter door.

- 5) Once the spray dome and grinder outlet chute are clean, the spray head assembly may be reinstalled onto the spray tee outlet nut. Hold the tab forward on the spray head until it hits the stop. Place the spray head up inside the spray dome. Release the hold down tab. Be sure it seats above the nut, then lock the spray head in place inside the spray dome.
- 6) Do not replace the basket and shuttle on the unit. This allows the shutter mechanism to cycle and remove any remaining residues overnight.
- 7) The following day, clean any coffee that may have fallen from the warmer area.
- 8) Place filters into the brew baskets, and install the baskets onto the unit. Place a clean shuttle onto each warmer. Select the brew size and start the unit. Once the brew cycle has started, turn the warmer switches on.

NOTE: Cleaning brush part number is [A551-079](#).

Cleaning During Regularly Scheduled Maintenance

To be done by a service technician during regular scheduled maintenance (not to exceed 6-month intervals)

Care and Cleaning (cont.)



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The service technician must perform the following:

- Clean and sanitize the hopper cradle assembly
- Clean and sanitize the grinder mechanism (both stations)
- De-liming the water tank
- General cleaning and sanitizing of interior of cabinetry

Removal of Hopper Cradle Assembly

- 1) Remove the 4 screws that attach the upper front panel to the unit. Then remove the upper front panel. Remove the shield by removing the 3 screws.
- 2) Pull the bean shut off valve forward to block the flow of coffee beans to the grind chamber. This should be done for both hoppers.
- 3) Remove the 2 screws that attach the hopper cradle assembly to the front unit.
- 4) Lift the front edge of the hopper cradle assembly; push back a few inches to release the hopper cradle assembly from the rear locating pins. Lift and remove the assembly from the unit.
- 5) Re-assembly is performed in the reverse order of disassembly.

Cleaning and Sanitizing the Hopper Cradle Assembly

- 1) Remove the hopper cradle assembly as described above.
- 2) Empty the hoppers of coffee beans.
- 3) Remove the bean shut-off valves from the hopper necks.
- 4) Remove the hoppers from the cradle assembly by removing the wing nuts and bolts.
- 5) All parts that are in contact with food must be washed with warm soapy water, rinsed, sanitized and air-dried.

NOTE: The person cleaning the parts should do so with clean hands.

- 6) Reassemble hopper cradle assembly in reverse order of disassembly.

Removal of Grinder Assembly (Both Stations)

- 1) Remove the hopper cradle assembly as described above.
- 2) Remove motor base mounting bolt from unit (one per motor assembly).
- 3) Disconnect electrical connection to motor at harness connector.
- 4) Slide motor assembly toward center of unit and lift it out of the cabinet.
- 5) Reinstallation is performed in the reverse order of removal.

NOTE: The grinder assembly may be installed in either left or right brew station.

Cleaning and Sanitizing the Grinder Mechanism (Both Stations)

- 1) Loosen the 2 slotted screws that hold the grind cap onto the grind head. Rotate the grind cap counter-clockwise and pull the cap forward to remove it from the assembly.
- 2) Rotate the feedworm assembly so the sweeps line up with the notches in the grind head. Pull the feedworm assembly forward and off of the motor shaft.
- 3) All parts that are in contact with food must be washed with warm soapy water, rinsed, sanitized and air-dried.

Care and Cleaning (cont.)

NOTE: Care should be taken not getting the grinder motor wet. Also, the person cleaning the parts should do so with clean hands.

- 4) To reinstall the feedworm assembly, slide the feedworm onto the motor shaft. Rotate the feedworm so the sweeps line up with the notches in the grind head. Slide the feedworm into the grind head. While pushing inwards, rotate the feedworm so the sweeps hold the feedworm in place.
- 5) Insert the shear drive into the feedworm. Using a screwdriver, rotate the shear drive so the slots line up.
- 6) Reassemble the remaining components in the reverse order of disassembly.

Cleaning and Sanitizing the Spout Assembly (Both Stations)

- 1) Remove the grinder assembly as described above.
- 2) Remove the 2 screws that hold the spout assembly to the sheet metal body and remove the spout assembly.
- 3) Remove the 4 screws that hold the upper & lower spout housings together.
- 4) All parts that are in contact with food must be washed with warm soapy water, rinsed, sanitized and air-dried.

NOTE: The person cleaning the parts should do so with clean hands.

- 5) Reassemble the components in reverse order of assembly.

De-liming the Water Tank

- 1) Disconnect power and remove the hopper cradle assembly as described above.
- 2) Disconnect the wire leads to the water heating elements, thermistor, thermodisc and water probe. **Note the positions of each wire going to the heaters and the other components.**
- 3) Remove the tank cover by removing the 3 retaining wing nuts and lifting the cover.
- 4) De-lime the water tank using a commercial grade urn cleaner. Follow the recommendations from the manufacturer of the urn cleaner. Excessive amounts of cleaner will attack the stainless steel; therefore, caution should be used.
- 5) Scrub the liner interior with a plastic bristle brush.
- 6) After de-liming tank, remove the brew valves and bypass valves so they can be serviced.
- 7) After de-liming the tank and associated components, all parts must be washed with warm soapy water, rinsed, sanitized and air-dried.

NOTE: The person cleaning the parts should do so with clean hands.

- 8) Reassemble the components in reverse order of disassembly.

NOTE: When reinstalling the heater wires, be sure to return the wires to their original connection point. Miswired heaters can cause unbalanced electrical loads and damage the unit.

Service

Service Procedures for Other Components Not Discussed in Cleaning Procedures



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ONLY QUALIFIED SERVICE PERSONNEL SHOULD MAKE ADJUSTMENTS.

Service (cont.)

The remainder of this manual contains information to aid the service person making repairs to this equipment. This page has information on performing common service tasks. A **Troubleshooting section** follows and can be used to help determine the cause of problems with the equipment.

An illustrated parts breakdown follows and will help correctly identify replacement parts. For factory assistance, call 1-800-568-5715 between 8:00 a.m. and 6:00 p.m. Eastern time.

Finally, wiring diagrams are provided for the various models covered by this manual.

To Drain the Water Tank

- 1) Turn off power to the brewer and allow the brewer to cool before draining.
- 2) Remove the lower front panel.
- 3) Pinch or clamp the tube from the fill valve to the tank and disconnect the tube from the fill valve. Place tube over a drain, release the clamp, and allow the tank to drain.

To Remove the Brew Valve

- 1) Turn off power to the brewer.
- 2) Remove the hopper cradle assembly as described in the **Removal of Hopper Cradle Assembly procedures** within the **Care and Cleaning section** of this manual.
- 3) Disconnect the wires attached to the valve.
- 4) Follow the **To Drain Water Tank procedure** on page 12 to drain the water tank below the brew valve's water level.
- 5) Tilt the inlet of the valve downward and pull sideways to disconnect the valve from the spray tee. Disconnect the tubing from the valve.

To Remove and Replace the Heaters

- 1) Turn off power to the brewer.
- 2) Remove the hopper cradle assembly as described in the **Removal of Hopper Cradle Assembly procedures** within the **Care and Cleaning section** of this manual.
- 3) Disconnect the wire leads to the heating elements, thermistor, thermodisc and water probe. Note the positions of each wire going to the heating element and the other components.
- 4) Remove the tank cover after removing the 3 wing nuts securing the cover to the tank. Lift the tank cover with the heating element attached.
- 5) Remove the heating element from the tank cover.
- 6) Replace heater with sealing washers in the same configuration; hold the element so that it does not twist when tightening nuts.

NOTE: Make sure the thermodisc and bracket are returned to their original positions secured by the heating element.

- 7) Replace the tank cover ensuring that the lid seal is positioned correctly.
- 8) Replace the heater wires; ensure that all electrical connections are secure. Replace the covers to the unit and reconnect power.

Troubleshooting

The following procedures must be performed by a qualified service technician.

BREWING PROBLEMS		
Problem	Possible Causes	Solutions
Weak coffee	<ul style="list-style-type: none"> • Not enough coffee used. • Grind is too coarse. • Water not hot enough. 	<ul style="list-style-type: none"> • Readjust coffee portion. • Readjust grind to a finer grind. • Check sprayhead temperature, should be greater than 185°F.
Strong coffee	<ul style="list-style-type: none"> • Too much water used. • Coffee bed has dry areas. • Too much coffee used. 	<ul style="list-style-type: none"> • Adjust brew time at the controller. • Spray deflector broken or missing. • Readjust coffee portion.
Bitter coffee	<ul style="list-style-type: none"> • Grind is too fine. 	<ul style="list-style-type: none"> • Coarsen grind setting.
Grounds in coffee	<ul style="list-style-type: none"> • Paper filter collapsed during brewing. 	<ul style="list-style-type: none"> • Use proper filter.
Brew basket overflowed	<ul style="list-style-type: none"> • Too much coffee. • Coffee ground too fine. • Double batching. 	<ul style="list-style-type: none"> • Use no more than 9 oz. of coffee. • Coarsen grind. • You must dump old coffee and use fresh new filter for each brew.
Unpleasant taste	<ul style="list-style-type: none"> • Water tank or brew basket needs cleaning. • Taste is coming from water supply. 	<ul style="list-style-type: none"> • Clean, sanitize (de-lime). • Install a water filtration system.
Brew volume too large or too small	<ul style="list-style-type: none"> • Portion selected on touchpad not correct. • Timer not set properly. • Water service not supplying adequate water pressure or flow rate. • Sprayhead clogged. • Brew valves clogged with lime deposits. 	<ul style="list-style-type: none"> • Adjust timer to desired value or select different portion size. • Adjust timer to desired value. Compare timer setting to either factory setting or initial user setting to determine if it has been changed. • Water pressure measured at the unit's water inlet valve should be between 30 psi to 70psi delivering a minimum of 1 1/2 gallons per minute. • Remove sprayhead for cleaning. Follow cleaning procedures for sanitizing. • Clean lime from valve. Seat, cup or entire valve may need replacement.

Troubleshooting (cont.)

BREWING PROBLEMS		
Problem	Possible Causes	Solutions
Brew volume erratic (NOTE: Small variations from batch to batch are normal.)	<ul style="list-style-type: none"> • Water supply pressure fluctuates. • Fill valve faulty or clogged. 	<ul style="list-style-type: none"> • Plumb water supply so that water pressure is not significantly affected by other appliances. • Check for power at fill valve when unit is calling for water. If water flow is slow or valve not operating, repair valve. In normal operation, the fill valve should cycle several times throughout the brewing cycle.
Brew Only or Grind'n Brew cycle will not start	<ul style="list-style-type: none"> • Water not up to proper brewing temperature. • Touchpad defective. 	<ul style="list-style-type: none"> • Wait for water to reach proper brewing temperature. • Exchange touchpad with another unit. If problem is corrected, original unit faulty.
During Brew Only or Grind'n Brew, the brewing cycle does not brew	<ul style="list-style-type: none"> • Brew valve faulty. • Blown fuse on control board. 	<ul style="list-style-type: none"> • Check if brew valve is energized with 120 Vac. If valve is energized and not opened, replace part. • Check and replace fuse if blown.
Sprayhead will not stop dripping water	<ul style="list-style-type: none"> • Brew valve does not close completely. 	<ul style="list-style-type: none"> • Visually inspect valve. Clean lime from valve. Seat, cup or entire valve may need replacement.
Water boiling in water tank	<ul style="list-style-type: none"> • Temperature in water tank too hot. 	<ul style="list-style-type: none"> • Reduce the water tank temperature. Adjustment knob is located on the control board face.

ERROR CODES		
Problem	Possible Causes	Solutions
Hot light flashing @ slow rate and ER1 code displayed on control board (Also unit will not heat water, perform any brewing function nor autofill)	<ul style="list-style-type: none"> • Fill valve opened for over 5 minutes (this may occur on initial fill - see Initial Start-up section). • Water service not on. • Water service not supplying enough water flow. 	<ul style="list-style-type: none"> • Refer to Initial Start-up section to reset the control board. • Ensure that water supply is on. • Water pressure measured at the unit's water inlet valve should be between 30 psi to 70 psi delivering a minimum of 1 1/2 gallons per minute.
Hot light flashing @ fast rate and ER2 code displayed on control board (Also unit will not heat water or perform any brewing function)	<ul style="list-style-type: none"> • Loose connections in the thermistor circuit. • Thermistor failure. 	<ul style="list-style-type: none"> • Ensure that connector CN7 is securely attached to controller and that thermistor is securely connected at disconnect. • Defective thermistor, replace.

Troubleshooting (cont.)

FILLING PROBLEMS		
Problem	Possible Causes	Solutions
Overfilling of water tank when power is off	<ul style="list-style-type: none"> • Fill valve installed backwards. • Fill valve not sealing properly. 	<ul style="list-style-type: none"> • Check direction of flow printed on valve. Water flows from the water supply to the water tank bottom. • Disassemble, clean and reassemble valve. If needed service kits are available.
Overfilling of water tank when power is on	<ul style="list-style-type: none"> • Water probe faulty or coated with lime. • Connection from control board to tank body or water probe faulty. • Faulty control board. 	<ul style="list-style-type: none"> • Remove water probe assembly and clean. • Secure connection of yellow wire to tank body and red wire to water probe assembly. Check control board connectors CN1 and CN7. • Short red wire to tank body (at yellow wire); if fill valve does not stop after 5 seconds then control board defective, replace.

PROBLEMS DISPLAYED BY INDICATOR LIGHTS		
Problem	Possible Causes	Solutions
No light illuminated on unit	<ul style="list-style-type: none"> • No power to the unit. • No power to the unit. 	<ul style="list-style-type: none"> • Check if warmer lights / warmer element operate. If not, restore power to unit. • Check connections at terminal block.
No light illuminated on either touchpad	<ul style="list-style-type: none"> • Touchpads not connected to control board. • Bad low voltage transformer. • Bad control board. 	<ul style="list-style-type: none"> • Connect touchpads to control board. Assure that the left touchpad is connected to the CN5 & right to CN6. • Check resistance across primary terminals and secondary terminals. If open circuit, replace part. • Check for 12 and 24 volts at control board connector CN1 pins 2, 3 & 4. If both voltages present, board defective. Replace.
No light illuminated on one touchpad	<ul style="list-style-type: none"> • Touchpad not connected to control board. 	<ul style="list-style-type: none"> • Connect touchpad to control board.
Water is hot but Water Hot light not illuminated	<ul style="list-style-type: none"> • Polarity of light connected reversed. • Part defective. 	<ul style="list-style-type: none"> • Red wire is connected to "+" terminal of LED light. • If polarity correct, defective part. Replace.

Troubleshooting (cont.)

GRINDING PROBLEMS		
Problem	Possible Causes	Solutions
No coffee being discharged into brew basket	<ul style="list-style-type: none"> • Bean shut-off valve pushed closed. • Motor disconnect not wired or crossed with opposite motor. • Motor circuit breaker tripped. • Shear plate broken. • Blown fuse on control board. 	<ul style="list-style-type: none"> • Pull bean shut-off valves forward to open passageway. • White and blue wires go to the left grinder assembly. Yellow and white wires go to the right motor assembly. • If tripped, then reset by removing chrome hole plugs on lower front panel. Use pencil or other non-metallic object to depress tripped circuit. Replace chrome hole plugs. • Follow shear plate replacement. • Fuse protects all relays on control board. If blown, replace.
Grind only or Grind'n Brew cycle does not start	<ul style="list-style-type: none"> • Water temperature not up to proper brewing temperature (if Low Temp No Brew is an option on unit). • Touchpad defective. 	<ul style="list-style-type: none"> • Unit will not operate until set temperature is reached. Wait for water to reach proper brewing temperature. • Exchange touchpad with another unit. If problem is corrected, original touchpad unit faulty.

HEATING PROBLEMS		
Problem	Possible Causes	Solutions
No Hot Water, Contactor does not pull in contacts	<ul style="list-style-type: none"> • Water is not at the water probe and error code ER1 is displayed on control board. • Thermodisc tripped due to overheating. • Thermodisc tripped due to nuisance. • Faulty connection in the heater circuitry from the control board through the heater relay, thermodisc and contactor. • Contactor coil faulty. • Heater relay faulty. • Fuse blown on control board. 	<ul style="list-style-type: none"> • Water fill valve has been open for more than 5 minutes. This causes error code ER1 to occur and shut down the tank heaters. Restore water to the unit and reset unit. • Reset thermodisc. Review unit to confirm no damage occurred due to overheating of water tank. • Reset thermodisc. If thermodisc does not reset or trips again, replace part. • Secure all wire connections of the heater circuit. Heater relay uses a 12 VDC coil; thermodisc and contactor use 120 VAC coil. • Check resistance of contactor coil. If open circuit, replace part. • Check resistance of contactor coil. If open circuit, replace part. • Check fuse on control board. If blown, replace.

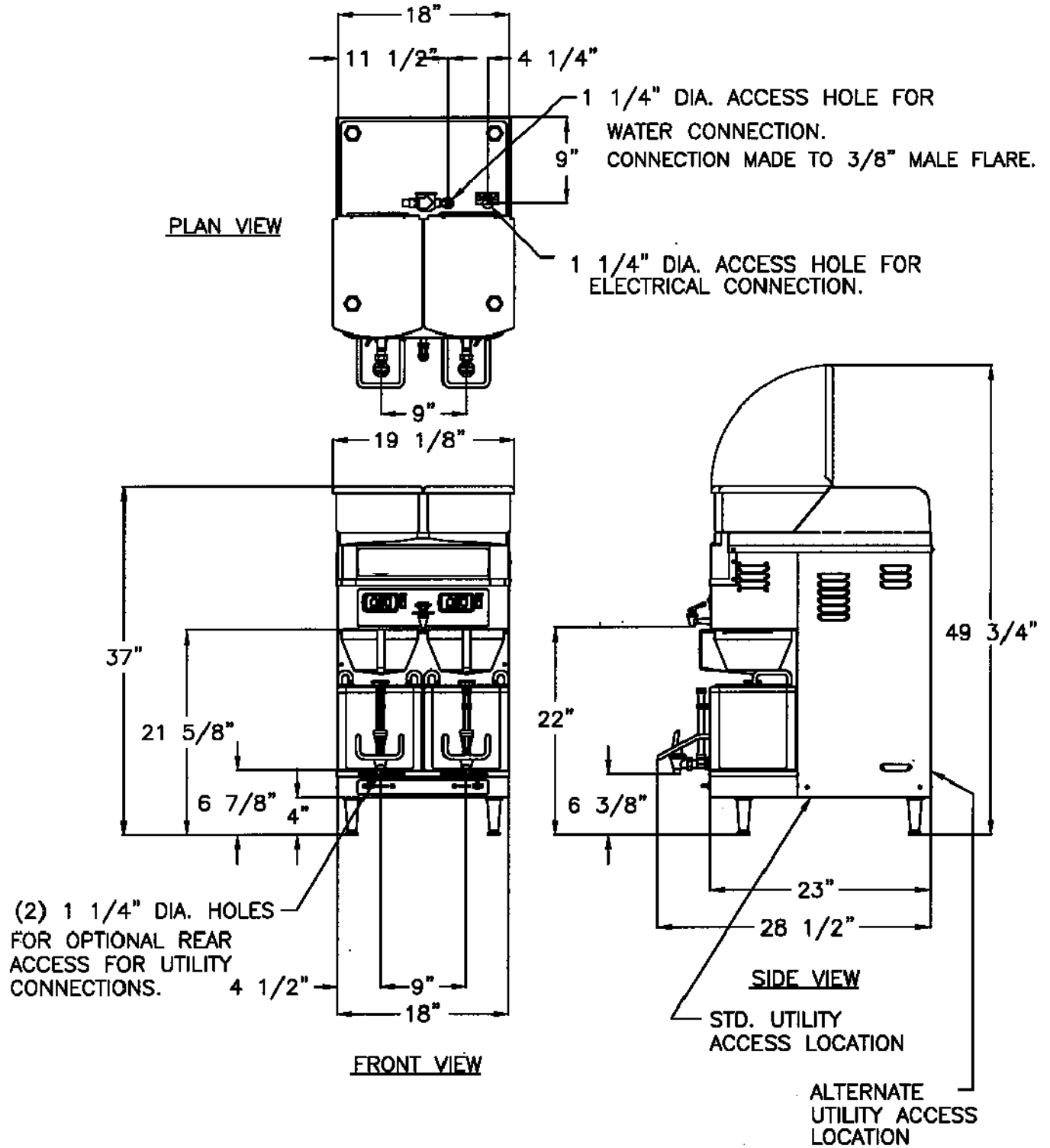
Troubleshooting (cont.)

HEATING PROBLEMS		
Problem	Possible Causes	Solutions
No hot water, contactor with contacts closed	<ul style="list-style-type: none"> • Line voltage connections at terminal block, contactor or heater terminals faulty. • Heating element faulty. • Contactor contacts faulty. 	<ul style="list-style-type: none"> • Secure all wire connections of the heater circuit. Confirm that supply voltage is present at the terminal block and is active. • Measure resistance of heating elements. If open circuit between terminals and / or tank body, replace parts. • Check contacts of contactor. If corroded or faulty, replace part.
Recovery time is very long	<ul style="list-style-type: none"> • Faulty heating element. • Low temp no brew function not allowing user to brew cold pot. 	<ul style="list-style-type: none"> • Check resistance across element with power conductors disconnected. If resistance is much less than 8 Ohms or much more than 15 Ohms, replace part. • Replace touchpad assemblies with assemblies without that option if desired.

If you still need help, call our Service Department at (800) 568-5715 (Monday thru Friday 8:00 a.m. - 6:00 p.m. Eastern time) or an authorized service center in your area. Please have the model and serial number ready so that accurate information can be given.

Prior authorization must be obtained from Grindmaster Corporation's Technical Services Department for all warranty claims.

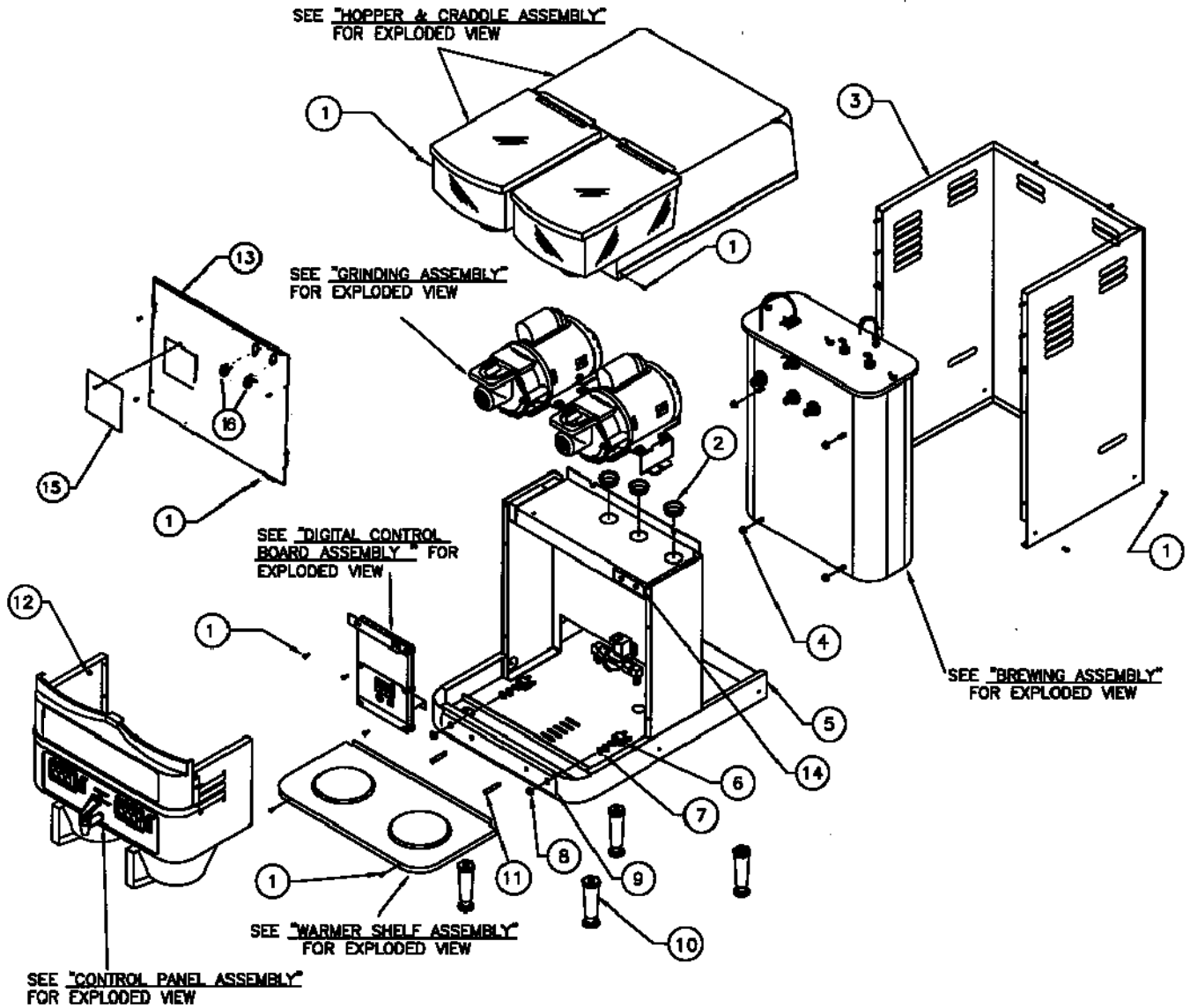
Installation Rough-In Drawings P400GNB-E



DWG: P400GNB-01 REVISION: REL

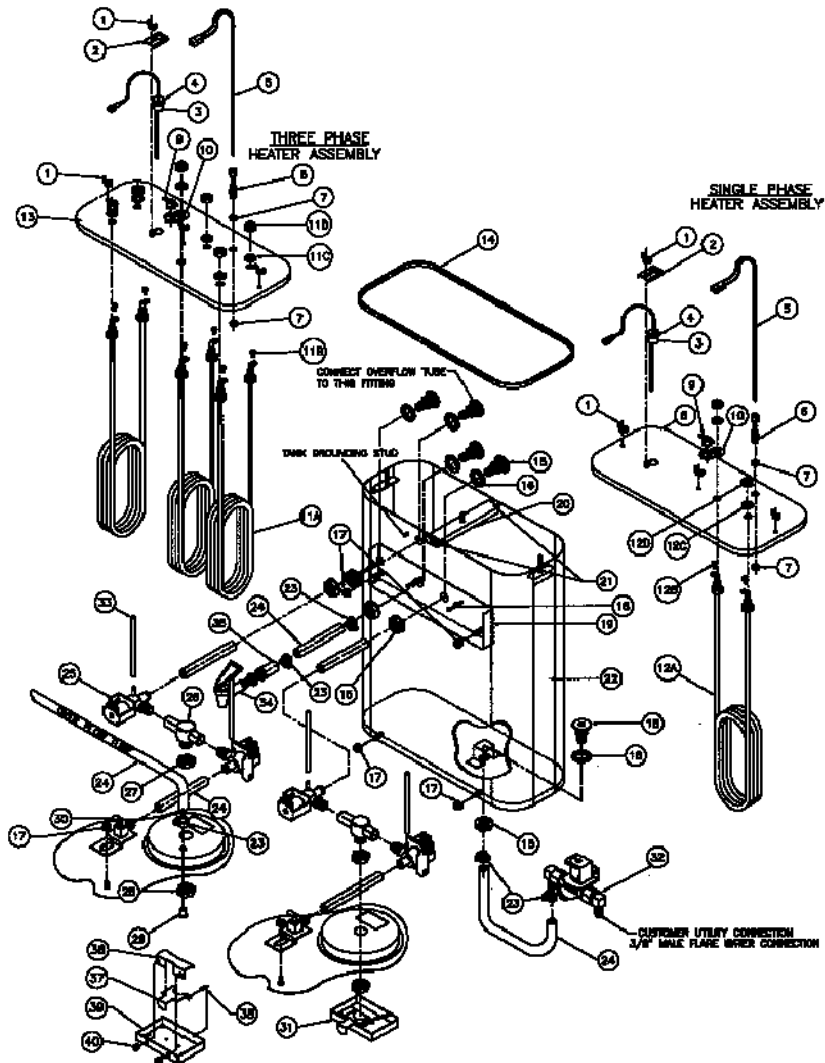
Exploded View P400GNB-E

ITEM NO.	PART NO.	DESCRIPTION
1	A539-113	SCREW, #6-32 x 3/8" PHILIPS TRUSS HD.
2	A548-015	HOLE BUSHING
3	A417-209	WELDMENT, CASING
4	A540-226	NUT, 1/4-20 WHIZ LOCK FLANGE ZINC
5	A415-005	WELDMENT, FRAME/BASE
6	A531-028	TOGGLE, ON/OFF SWITCH
7	A603015	1/2" TOOTH LOCKWASHER
8	A602005	NUT, TOGGLE
9	A545-252	DECAL, COLUMBIA WARMER
10	A545-034	4" LEG PLASTIC W/SS FOOT
11	A554-112	LIGHT, RED INDICATOR
12	A601029	NUT, #6-32 S/S HEX
13	A317-541	PANEL, LOWER FRONT
14	A546-206	DECAL, CIRCUIT BREAKER
15	A416-230	WELDMENT, ACCESS DOOR
16	A524-003	1/2" CHROME HOLE PLUG

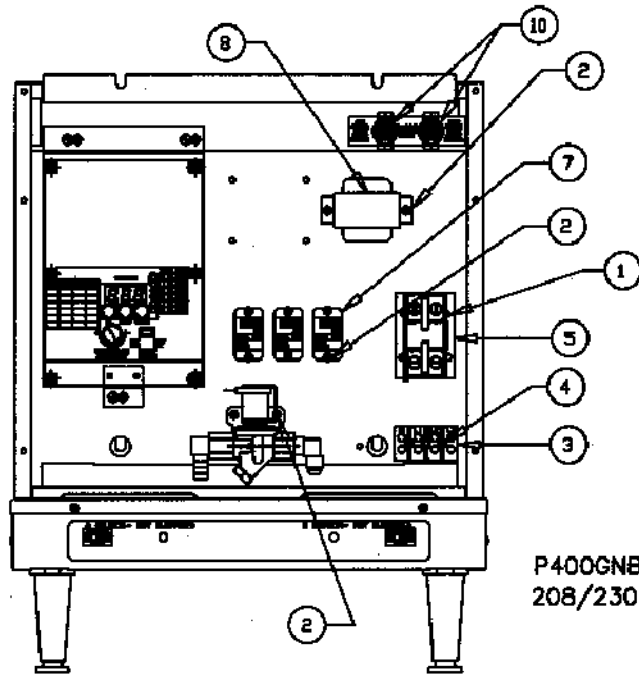


Exploded View P400GNB-E Brewing Assembly

ITEM NO.	PART NO.	DESCRIPTION
1	A540-203	NUT, 10-24 5/8 WING
2	A314-052	ELECTRODE KEEPER
3	A712-146	ELECTRODE ASSEMBLY
4	A521004	O-RING
5	A536-018	THERMISTOR PROBE
6	A528034	3/16" COMP. x 1/8" MPT BRASS MALE CONNECTOR
7	A600003	1/8" NPSL BRASS LOCKNUT 5/8" HEX x 1/2" THICK
8	A310-083	COVER TANK TOP
9	A536-023	THERMAL CUTOFF, MANUAL RESET
10	A314-585	BRACKET, MANUAL RESET THERMOSTAT
11	A536-010	5 KW 240V HEATER
12	A536-059	8.6 KW 240V HEATER
13	A310-086	COVER TANK TOP
14	A544-028	COLUMBIA TANK SEAL
15	A536-119	FITTING, 5/8 -18 THD x 1/2 BARB
16	A544-032	GASKET, FITTING
17	A540-286	NUT, 1/4-20 WHIZ LOCK FLANGE ZINC
18	A501028	#8-32 5/8 HEX NUT
19	A310-048	BATLE TANK
20	A314-305	BRACKET, CENTER TANK TOP
21	A603012	1/8" DIA. x 1/4" LONG POP RIVET
22	A410-033	WELDMENT, TANK BODY
23	A524011	CLAMP, HOSE HEYCO
24	A512012	3/8" x 5/8" SILICONE TUBING
25	A537-128	DELTRON DISPENSE VALVE VENTED
26	A618-016	SPRAY TEE ASSEMBLY
27	A540-115	NUT, 1/2-14 NPT JAM
28	A540-113	NUT, 1/2-14 SS SHOULDER
29	A548-042	BRASS FLANGED BUSHING
30	A718-111	BRASS BYPASS VALVE ASSEMBLY
31	A720-081	SPRAY HEAD ASSEMBLY - P400GNB
32	A718-198	ASSEMBLY, FILL VALVE
33	A512011	1/8" x 1/4" SILICONE TUBING
34	A537-043	FAUCET, RED HANDLED HOT WATER
35	AP7400-083	FITTING, HOT WATER FAUCET
36	A314-522	BRACKET, RETAINER SPRAY HEAD
37	A314-523	RETAINER SPRAY HEAD
38	A552-018	SPRING, 5/8 EXTENSION
39	A317-538	SPRAY HEAD
40	A540-227	NUT, 8-32 x 3/8" DIA. ROUND THUMB S/S

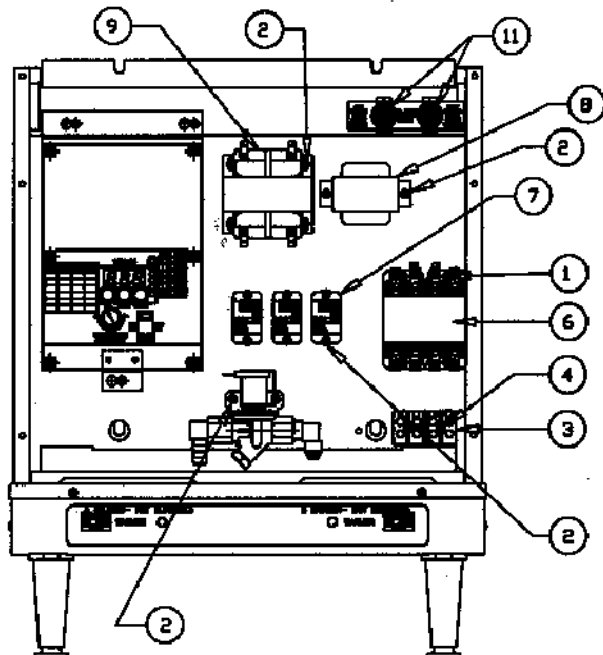


Exploded View P400GNB-E Electric Controls



P400GNB-E
208/230 VAC SINGLE PHASE

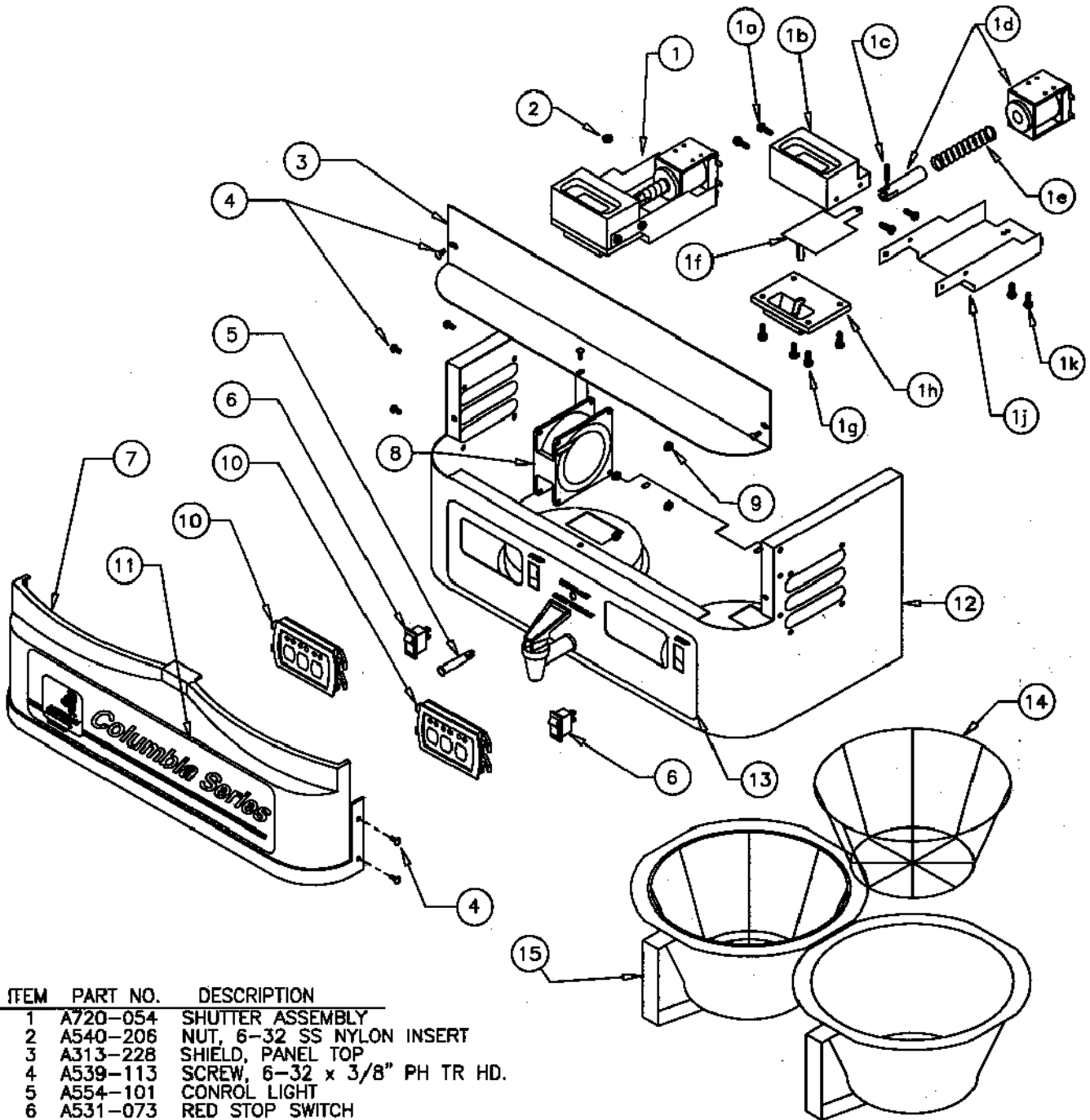
ITEM NO.	PART NO.	DESCRIPTION
1)	A539-101	SCREW, #6-32 x 1/2" SLOTTED TR. HD MACH.
2)	A539-113	SCREW, #6-32 x 3/8" PHILLIPS TRUSS HD.
3)	A531-035	TERMINAL BLOCK
4)	A539-110	SCREW, #6-32 x 1 1/8" ROUND HD. S/S
5)	A515027	POWER RELAY 2-POLE (STD. UNIT)
6)	A514005	POWER RELAY 4-POLE (THREE PHASE OPT.)
7)	A531-072	RELAY, 30 AMP 12Vac DC
8)	A554-109	TRANSFORMER, 120V
9)	A515043	TRANSFORMER, STEPDOWN (NO NEUTRAL OPT.)
10)	A532-007	15 AMP CIRCUIT BREAKER (STD. UNIT)
11)	A532-006	5 AMP CIRCUIT BREAKER (NO NEUTRAL OPT.)



P400GNB-E
208/230 VAC 3 PHASE
WITH NO NEUTRAL

DWG.:P400GNB-121 REVISION: A

Exploded View P400GNB-E Control Panel Assembly



ITEM	PART NO.	DESCRIPTION
1	A720-054	SHUTTER ASSEMBLY
2	A540-206	NUT, 6-32 SS NYLON INSERT
3	A313-228	SHIELD, PANEL TOP
4	A539-113	SCREW, 6-32 x 3/8" PH TR HD.
5	A554-101	CONROL LIGHT
6	A531-073	RED STOP SWITCH
7	A548-101	PANEL, FRONT TOP
8	A533-037	FAN, 115 VAC
9	A601029	NUT, 6-32 HEX
10	A712-155	ASSEMBLY, TOUCH PAD
11	A546-250	DECAL, COLUMBIA SERIES
12	A417-172	WELDMENT, CONTROL PANEL
13	A546-251	DECAL, COLUMBIA CONTROL PANEL
14	AP400-346	COLUMBIA WIRE BASKET
15	ABB1.5SS	SS BREW BASKET

SHUTTER ASSEMBLY BREAKDOWN

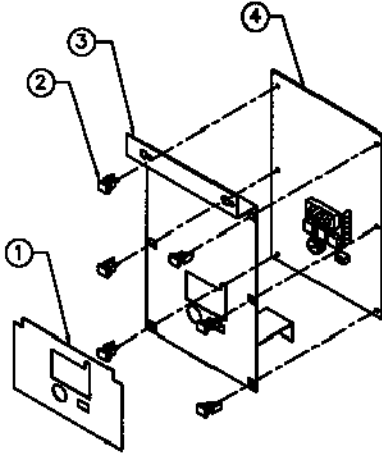
ITEM	PART NO.	DESCRIPTION
1a	A539-215	SCREW, 8-32x3/8" LG SS TR PH
1b	A548-104	HOUSING, UPPER SHUTTER SPOUT
1c	A551-078	SPRING PIN 1/8"x1/2" SS
1d	A554-122	SOLENOID, 240 VAC
1e	A551-077	SPRING, 0.700"ODx0.035"x3" LG
1f	A317-701	GUILLOTINE, SHUTTER
1g	A539-711	SCREW, 8-32x1/2" PH PAN
1h	A548-105	HOUSING, LOWER SHUTTER
1j	A314-606	BRACKET, SHUTTER SOLENOID
1k	A539-202	SCREW, 8-32x1/4" LG TR SL

DWG: P400GNB-116 REVISION: C

Other Exploded Views

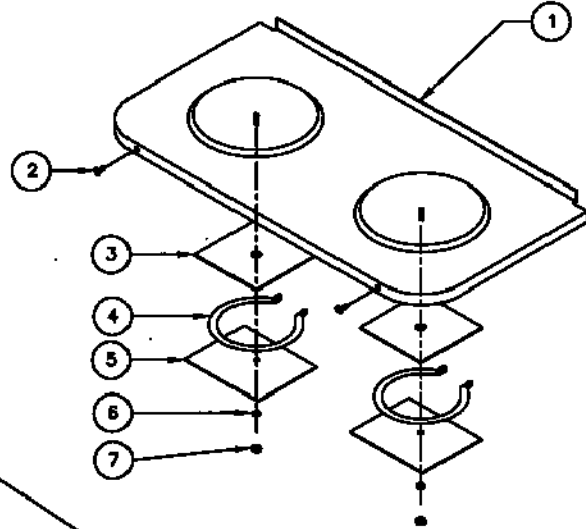
Digital Control Board Assembly

ITEM	PART NO.	DESCRIPTION
1)	A548-249	DECAL, CONTROLLER OVERLAY
2)	A548-114	STANDOFFS
3)	A414-043	WELDMENT, CONTROL BOARD SUPPORT
4)	A530-042	ELECTRONIC CONTROL BOARD



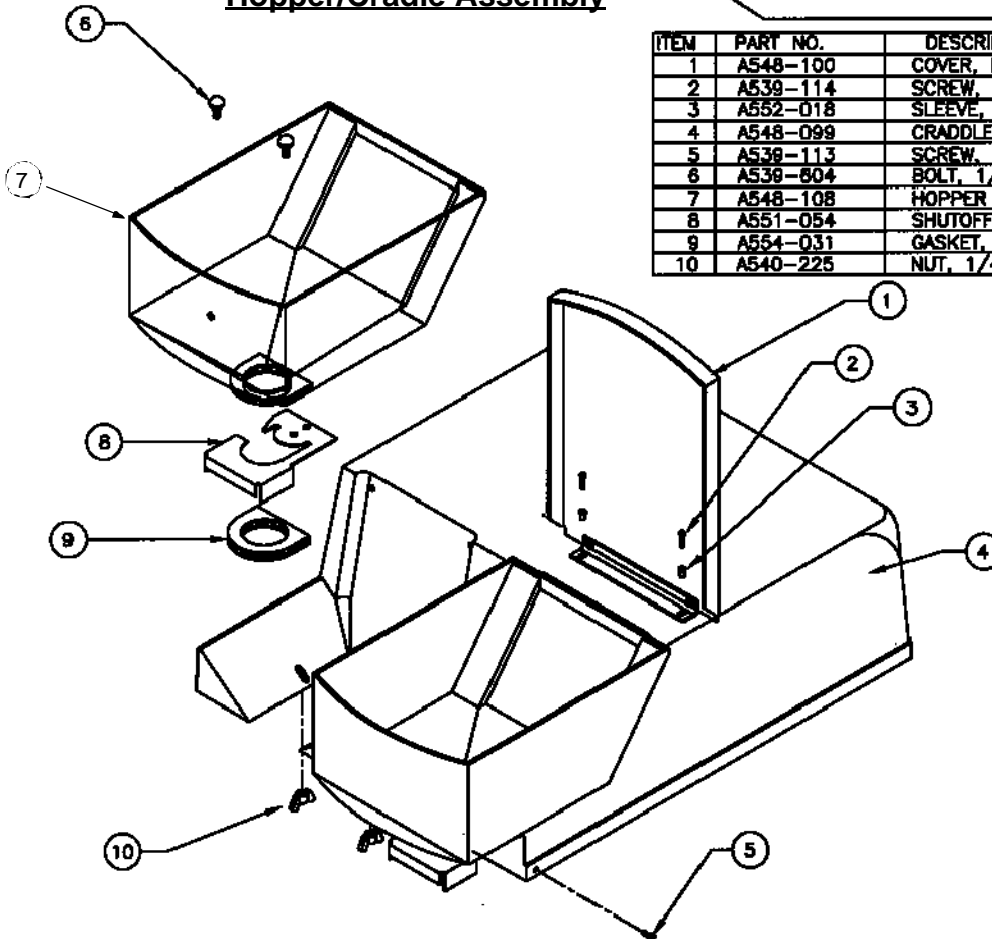
Warmer Shelf Assembly

ITEM	PART NO.	DESCRIPTION
1)	A317-540	SHELF, WARMER
2)	A539-113	SCREW, 6-32 x 3/8" PHILIPS TRUSS HD
3)	APT400-079	PLATE, COLUMBIA WARMER TRANSFER
4)	A535-018	ELEMENT, 115 V WARMER (STD. UNIT)
5)	A535-028	ELEMENT, 230 V WARMER (NO NEUTRAL OPT.)
6)	APT400-080	KEEPER, WARMER
7)	A541-501	WASHER, #10 EXTERNAL TOOTH S/S LOCK
7)	A601009	NUT, 8-32 S/S HEX



Hopper/Cradle Assembly

ITEM	PART NO.	DESCRIPTION
1	A548-100	COVER, HOPPER ASSEMBLY
2	A539-114	SCREW, 6-32 x 1/2 PH RD HD
3	A552-018	SLEEVE, FLANGED S/S .183 O.D.
4	A548-099	CRADLE, HOPPER ASSEMBLY
5	A539-113	SCREW, #6-32 x 3/8" PH TR HD
6	A539-804	BOLT, 1/4-20 x 1/2" S/S CARRIAGE
7	A548-108	HOPPER BEAN - ASSEMBLED
8	A551-054	SHUTOFF, BEAN HOPPER
9	A554-031	GASKET, HOPPER
10	A540-225	NUT, 1/4-20 WING NUT



DWG: P400GNB-119 REVISION: REL

