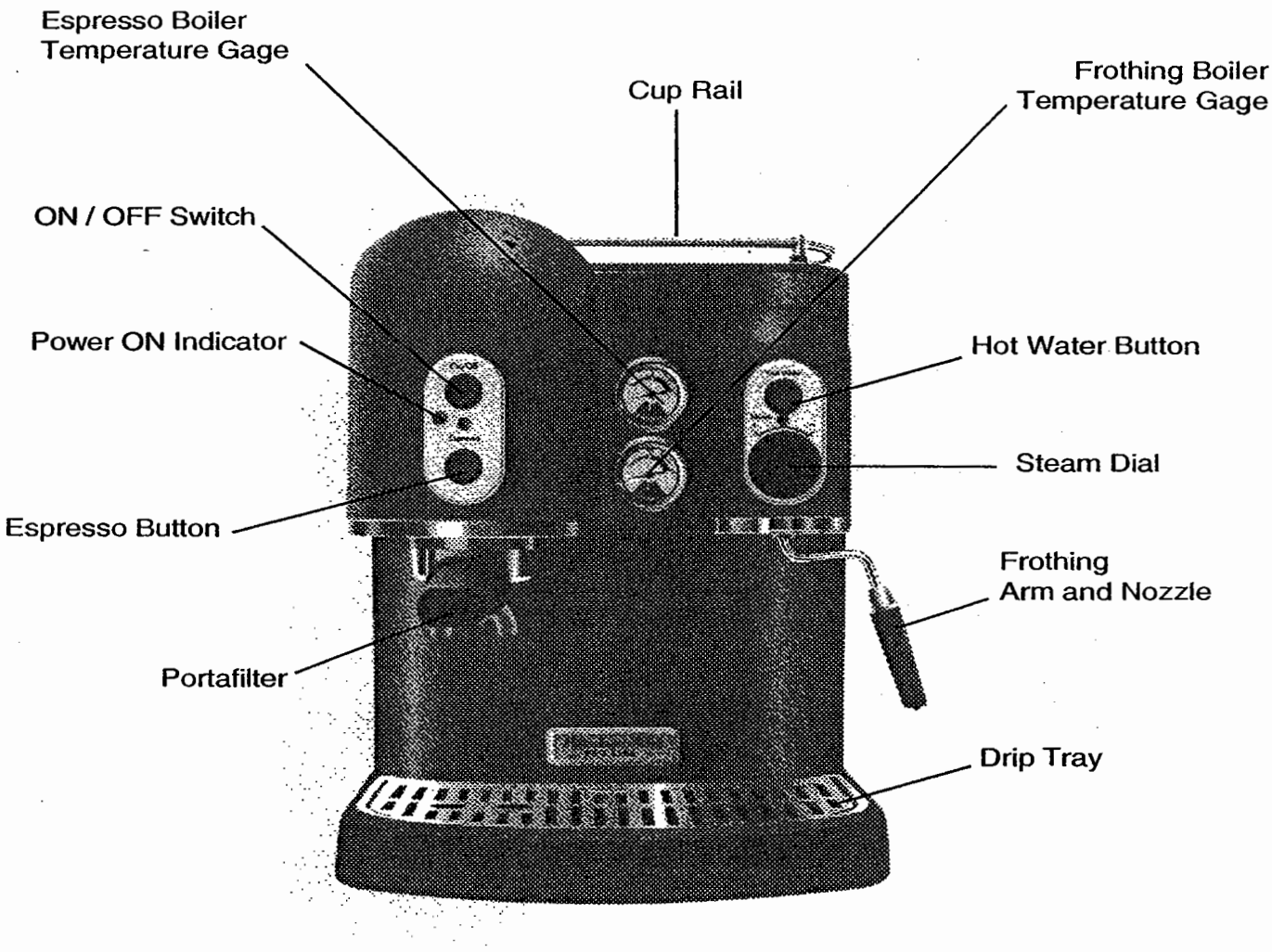
KitchenAid®

PRO LINE™

Espresso Machine

MODEL:
KPES100



KPES100
PRO LINE
ESPRESSO MACHINE

PURPOSE - The purpose of this service manual is to familiarize the professional housewares technician with the techniques required to repair the KPES100 KitchenAid Pro Line Espresso Machine.

IMPORTANT SERVICE WORKPLACE SAFETY RECOMMENDATIONS

This Espresso Machine Service Manual is written for the Professional Service Technician who has familiarity with KitchenAid Pro Line Appliances.

The following Safety Guidelines should be adherred to when servicing this product.

- The workplace will be dry and sanitary at all times and all units should be inspected for cleanliness before any work is started.
- Visually inspect the Espresso Machine requiring service in a well luminated area.
- A mild, non-abrasive dishwashing soap solution and clean towel can be used to wash any Espresso Machine requiring attention.
- The hands of the Service Technician should be clean at all times during the service procedure.
- The work place for the Espresso Machine will have properly polarized AC outlets that adhere to all Local Electrical Codes that are applicable at the time of the repair.
- The Espresso Machine Power Cord should always be inspected first before testing the unit's operation.
- Do not run the Espresso Machine if the Power Cord is damaged--replace with a new Cord Assembly.
- All disassembly and assembly procedures discussed in this manual should be conducted with the Toaster disconnected from the AC Supply.
- Do not leave the Espresso Machine unattended while running the unit for testing.
- Always unplug the Espresso Machine immediately after concluding electrical tests.
- The Service Technician should wear Protective Eyeware at all times when conducting a repair on the Espresso Machine.

TOOL RECOMMENDATIONS - The following tools are necessary to service the KitchenAid Pro Line Espresso Machine.

- Phillips Screwdriver Set
- Metric Wrench Set
- Small Metric Hex Driver Set
- Needle Nose Pliers
- Volt / Ohm Meter

The following equipment will greatly assist the technician in servicing the KitchenAid Pro Line Espresso Machine.

- In-Line Wattmeter
- Stop Watch
- Thermometer

THIS MANUAL - Due to the nature of the product this KitchenAid Pro Line Espresso Machine Service Manual will first review the Theory of Operation, Care and Cleaning, How to Test the Product, then review the actual Service Procedures.

- ESPRESSO MAKER OPERATION
- CARE AND CLEANING
- PRODUCT TESTING
- PROBLEM DIAGNOSIS

THEORY OF OPERATION

The KitchenAid Authorized Service Professional will be impressed with the quality and servicability of the Pro Line Espresso Maker. Pay particular attention to the "Care and Cleaning" Section as the methods discussed here are crucial for your service success.

ART AND TECHNIQUE - Great Espresso is a combination of artistry and technique that is intimately tied to the performance of the espresso machine.

The KitchenAid Pro Line Series Espresso Machine blends commercial quality with innovative design to bring a new experience of espresso into the home.

Dual boilers generate an optimal brewing temperature and abundant steam for frothing without the wait a single-boiler machine requires when switching tasks.

The commercial-size brew group is chrome-plated brass for exceptional temperature stability and the self-priming water pump easily supplies the 9 bars of pressure, perfect espresso demands.

A 3-way solenoid valve instantly vents pressure after brewing, preventing a messy spray of coffee grounds when the portafilter is removed.

CONVENIENCE - Separate stations for brewing and frothing provide an immense workspace. Instead of a simple indicator lights, dial gauges provide a continuous readout of boiler temperatures.

The frothing arm swivels horizontally and vertically for convenient use and the volume of steam is fully adjustable. The outstanding style and performance of the Pro Line Series Espresso Machine is matched by a rugged die-cast metal construction that will last for years.

ESPRESSO MACHINE FEATURES

ON/OFF POWER SWITCH - Press once to turn the espresso machine "On", press again to turn the espresso machine "Off".

POWER-ON INDICATOR - When the espresso machine is "On" the indicator light will be illuminated.

ESPRESSO BUTTON - Press the espresso button to activate the water pump for brewing espresso. To stop brewing, press the espresso button a second time.

HOT WATER BUTTON - When the steam dial is open, press and hold the hot water button to activate the water pump and dispense hot water from the frothing arm.

The pump shuts off automatically when the button is released.

STEAM DIAL - To dispense steam or hot water through the frothing arm, open the steam dial by turning it counter-clockwise. The volume of steam is controlled by the dial position; rotate the dial counter-clockwise for more steam and clockwise for less steam. To turn off steam, close the steam dial by rotating it clockwise until it stops.

BREW HEAD - The commercial-size brew head is chrome-plated brass for exceptional durability and brew temperature stability. Brewing boiler is bolted directly to group head, so brew group heats quickly and thoroughly.

FROTHING ARM AND NOZZLE - Dispenses steam or hot water through the frothing arm. The arm pivots horizontally and vertically to provide a convenient position. Nozzle enhances frothing and is removable for cleaning.

DRIP TRAY - Large, removable drip tray catches spills and is dishwasher-safe if placed in the top rack. Tray features a movable stainless steel drip plate.

DRIP TRAY FULL INDICATOR - The red indicator tip rises above the drip plate when the drip tray is nearly full.

WATER RESERVOIR - The removable 2 Liter (67 Ounce) water reservoir slides left or right for easy filling and features easy-to-see "Max" and "Min" fill lines. The translucent reservoir shows the water level at a glance and is dishwasher (top rack) safe.

CUP RAIL - The top of the unit accomodates 4 to 6 espresso cups for warming. Stainless steel cup rail helps prevents cup breakage.

ESPRESSO BOILER TEMPERATURE GAUGE - The dial gauge indicates when espresso boiler has reached optimum brewing temperature.

FROTHING BOILER TEMPERATURE GAUGE - The dial gauge indicates when frothing boiler has reached optimum steaming temperature.

PORTAFILTER - A commercial-sized portafilter features chrome-plated brass construction and an easy-to-grip flared handle. Attaches to the brew head with a firm twist to the right.

FILTER BASKETS - Stainless steel filter baskets snap into the portafilter. Use the small capacity basket for a single shot (1 ounce) of espresso and the large capacity basket for double shots (2 ounce). The small basket also accomodates paper coffee pods.

FROTHING PITCHER - The 8.5 ounce capacity stainless steel pitcher is invaluable for frothing.

TAMPER - Evenly tamps coffee into the filter basket.

COFFEE SCOOP AND SHOWER-SCREEN BRUSH - Use one level scoop of coffee for each shot (1 ounce) of espresso.

The shower screen brush will help keep the brew head and shower screen free of grounds.

DUAL BOILERS - Separate boilers eliminate the wait single-boiler machines require when switching between frothing and brewing. Boiler heating elements never touch water; they are located on the outside of the boiler for superb brew temperature consistency and burnout resistance. Quick heating boilers reach operating temperatures in less than 6 minutes.

DRIP-FREE SYSTEM WITH 3-WAY SOLENOID VALVE - A 3-way solenoid valve virtually eliminates drips by instantly reducing pressure in the brew group when the pump is switched off. The portafilter can be removed immediately after brewing without a messy spray of coffee grounds.

15 BAR PUMP - Self-priming water pump comfortably supplies the 9 bars (130 pounds per square inch) of pressure that perfect espresso demands.

SAFETY PRECAUTIONS

The KitchenAid Authorized Service Professional should know all of the safety precautions recommended to the customer before servicing the Espresso Maker. Most of these recommendations are common sense, but they are extremely important.

IMPORTANT SAFEGUARDS (For the Customer and the Servicer.)

1. Read all instructions in the "Guide to Professional Results" booklet provided with the Pro Line Espresso Maker. (DZW703)
2. Do not touch hot surfaces on the Espresso Maker. Always use handles or knobs.
3. To protect against electrical shock, do not immerse cord, plugs, or Espresso Maker in water or other liquids.
4. Close supervision is necessary when any appliance is used by or near children.
5. Unplug Espresso Maker from the electrical outlet when not in use and before cleaning. Allow to cool before putting on and taking off parts.
6. Do not operate any appliance with a damaged cord or plug, or after the appliance malfunctions or has been damaged in any manner. Tell customer to return appliance to the nearest authorized service facility for examination, repair or adjustment.
7. The use of accessory attachments not recommended by KitchenAid and may cause injurys.
8. Do not use the Espresso Maker outdoors.
9. Do not let the cord hang over the edge of a table or counter, or touch hot surfaces.
10. Do not place the unit on or near a hot gas or electric burner, or in a heated oven.
11. Do not use the Espresso maker for other than it's intended use.
12. Use extreme caution when using hot steam.

ESPRESSO MAKER ELECTRICAL REQUIREMENTS

1. The U.S. Model KitchenAid Pro Line Espresso Maker uses 120V A.C. - 60 Hz.

2. This Pro Line Espresso Maker uses a 3-prong outlet. If the plug does not fit, contact a qualified electrician.

3. Do not use an electrical outlet adapter.

4. Do not use an extension cord with this product. Check the power cord for damage or abuse and replace if necessary.

ESPRESSO MAKER OPERATION

The operation of the Pro Line Model KPES100 Espresso Maker is fun and easy to learn. Review the operating instructions listed below carefully, so that you will be familiar with the product.

This section deals with basic:

- Espresso Making
- Frothing Use
- Cleaning and Storage Considerations

The technician's general knowledge of the product operating philosophy is crucial to service success.

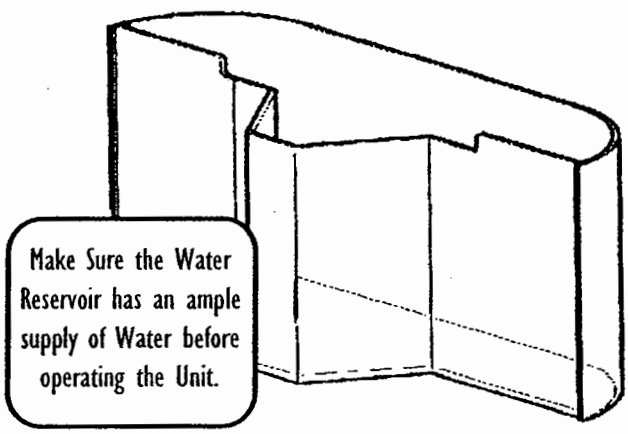
OPERATING INSTRUCTIONS - FIRST TIME USE

Look at the exploded drawings in this manual to familiarize yourself with component locations.

1. Attach the Cup Rail by alligning the (3) rail posts with the holes on top of the espresso machine. Once alligned, simply press the rail posts into the holes.

2. Remove and wash the the water reservoir by carefully pulling it from the espresso machine. Use warm soapy water and rinse with clean water.

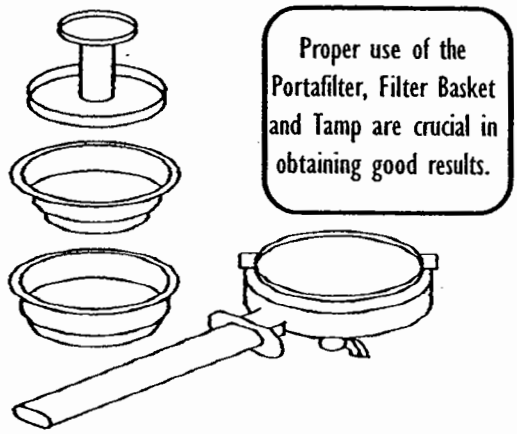
Properly filling the Espresso Maker Water Reservoir is extremely important.



Each 1/2" of water level in the reservoir is (1) Cup of Water. Always keep water in the reservoir!

3. Place the reservoir back into the espresso machine, making sure the water pick-up tubes are correctly placed inside the reservoir. The ribs on the bottom of the reservoir fit into the grooves on the base of the lower housing.

The Portafilter shown below, should be positioned under the Brew Head. Rotate the handle to the left slightly to insert and then rotate the Portafilter counter-clockwise to lock into position.



Either the small "One Shot" or large "Two Shot" Filter Basket shown above can be inserted into the Portafilter, depending on the amount of espresso the customer wants to brew.

Coffee must always be properly tamped or compressed for best results.

NORMAL ESPRESSO MACHINE OPERATION

IMPORTANT: The boilers of course need to be filled and rinsed before the espresso machine is used for the first time. The boilers will also need to be filled when:

- The espresso machine has not been used for a prolonged period.
- The water reservoir runs dry during use.
- Multiple beverages are steamed without brewing espresso or dispensing hot water.

Espresso Machine Set Up (Filling the Boilers)

1. Slide the water reservoir left or right to expose the top and fill with fresh cold water to the "max" fill line.

NOTE: Distilled or Mineral Water can damage the espresso machine and are not recommended.

2. Insert the female end of the electrical cord into the cord receptacle in the back of the espresso machine.

3. Plug the other end of the cord into a grounded 3-prong outlet.

4. Make sure the steam dial is closed (-) by rotating it clockwise as far as possible.

5. Press the "On/Off" power switch to turn the espresso machine on. When the espresso machine is "On", the power-on indicator will illuminate, the dial boilers will begin heating and the espresso and hot water functions will operate.

6. Place a coffee cup underneath the brew head. Do not attach the portafilter to the brew head.

7. Press the espresso button - it is not necessary to wait for the boiler to heat.

This activates the water pump and fills the brewing boiler with water. After a few seconds, water will flow from the brew head.

When the cup is full, press the espresso button again to stop the water pump. The brewing boiler is now ready to use.

8. Place the frothing pitcher under the nozzle of the frothing arm.

9. Slowly open the steam dial by turning the dial counter-clockwise, then press and hold the hot water button. This activates the water pump and fills the frothing boiler with water. After a few seconds, water will start flowing from the nozzle.

10. When the pitcher is about half full, release the hot water button and close the steam dial by rotating it clockwise until it stops. The frothing boiler is now ready to use.

11. If no espresso is desired at this time, press the "On/Off" power switch to turn the espresso machine "Off".

NOTE: Do not press the "Espresso" or "Hot Water" buttons without water in the reservoir as damage to the water pump may occur.

BREWING ESPRESSO

1. Make certain the water reservoir has an adequate supply of water. Be sure that the water level is between the "Max" and "Min" lines on the reservoir.

2. Select the small or large capacity filter basket.

Use the small capacity basket for a single shot (1 ounce) and the large capacity basket for a double shot (2 ounce) of espresso.

The small capacity basket can be used with paper coffee pods.

3. Press the filter basket into the portifilter until it snaps into place. Do not fill the portafilter with coffee at this time.

4. Position the portifilter underneath the brew head and allign the portafilter handle with the arrow located on the left side of the brew group housing.

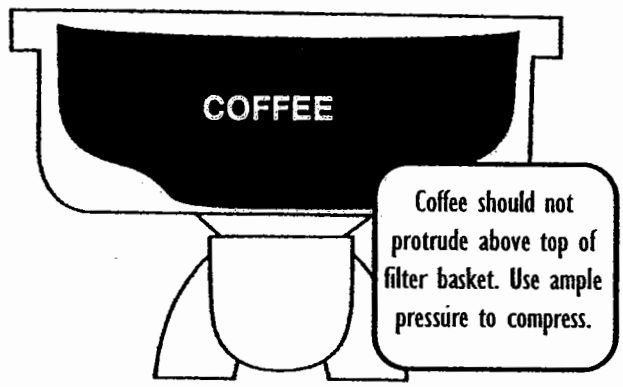
Raise the portafilter into the brew head and tighten it with a firm twist to the right. When in place, the portafilter handle will point forward or slightly to the right.

5. Press the "On/Off" power switch to turn the espresso machine "On".

6. Wait until the espresso machine has reached operating temperature; this will take approximately 6 minutes. When the espresso boiler temperature gauge needle climbs into the "ready" zone, the espresso machine is ready to brew.

7. Remove the portafilter from the brew head by moving the handle to the left. Place one level measure of ground coffee or a paper coffee pod in the small filter basket. Be sure to use a "fine" espresso-style grind for your coffee.

8. Using the tamper, tamp the coffee down firmly with a twisting motion. Make sure the surface of the coffee is as level as possible.



9. Sweep any excess grinds from the rim of the portafilter and insert the portafilter into the brew head.

10. Place one or two espresso cups on the drip plate under the spouts of the portafilter.

Press the espresso button and espresso will start to flow into cups. When the desired amount of espresso has been brewed (1 or 2 ounces) press the espresso button to stop brewing. **NOTE:** Do not remove the portafilter when brewing.

11. The espresso machine is equipped with a 3-way solenoid valve that instantly releases pressure in the brew group when the water pump is switched off, so the portafilter can be removed immediately after brewing. Remove the portafilter by moving the handle to the left. When removing coffee grounds from the filter basket, avoid striking the portafilter handle.

12. After removing the portafilter, place a cup under the brew head and press the espresso button for a second or two.

This added step cleans the shower screen and flushes any used coffee oils and grounds that have migrated into the brew head.

13. For more espresso, simply repeat steps 6 through 12, just be sure to watch your reservoir level and refill with water when needed.

BARISTA TIPS

When brewing multiple shots of espresso it is important to maintain the temperature and to keep the filter basket clean.

1. Use a towel to clean and dry the filter basket before re-filling with coffee. This will help insure even coffee extraction.

2. To maintain the proper brewing temperature, it is important to keep the brew group warm.

So do not rinse the portafilter with cold tap water. If you have other tasks, keep the empty portafilter on the brew head to keep it warm.

ESPRESSO CARE AND CLEANING

Keeping the Pro Line Series Espresso Machine clean is vital to brewing the best espresso possible.

Stale coffee oils on the portafilter, filter baskets and shower screen will ruin the flavor of the most expertly prepared coffee and any milk left on the frothing arm should be removed.

BEFORE CLEANING THE ESPRESSO MACHINE

1. Turn "Off" the espresso machine.
2. Unplug the espresso machine from the wall outlet.
3. Let the espresso machine and any attached parts or accessories cool.

CLEANING THE FROTHING ARM AND NOZZLE

The frothing arm and nozzle should always be cleaned after milk is frothed.

1. Remove the frothing sleeve from the frothing nozzle by pulling it downward. The frothing sleeve can be washed in warm, soapy water. Make sure any openings in the sleeve are free of residue.
2. Wipe the frothing arm and nozzle with a clean damp cloth. Do not use an abrasive scouring pad.
3. Plug into a grounded 3 prong outlet.
4. Turn the espresso machine "On" and let the boilers reach operating temperature.

Point the frothing arm into an empty cup and open the steam dial momentarily to run steam through the frothing nozzle. This will clean the nozzle tip.

CLEANING HOUSING, FILTERS, DRIP TRAY, DRIP PLATE, RESERVOIR AND PITCHER

Do not use abrasive cleansers or scouring pads when cleaning the espresso machine or any espresso machine part or accessory.

1. Wipe the espresso machine housing with a clean damp cloth and dry with a soft cloth.
2. Wash the portafilter in warm, soapy water and rinse with clean water. Dry with a soft cloth. Do not wash the portafilter in a dishwasher.
3. The filter baskets, drip tray, drip plate, water reservoir and frothing pitcher can be washed in the top rack of the dishwasher or by hand in warm soapy water. If washing by hand, be sure to rinse with clean water and dry with a soft cloth.
4. Use the shower screen brush or a damp cloth to brush or wipe coffee grounds from the brew head gasket and shower screen.

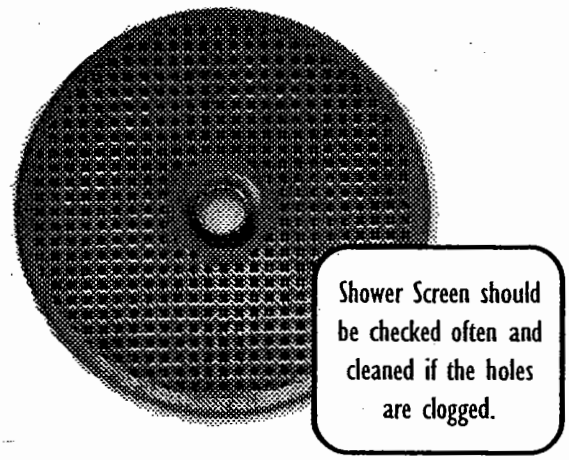
CLEANING THE SHOWER SCREEN

Once every 75 to 100 shots of espresso, the shower screen should be removed from the brew head to clean it throughly.

NOTE: Hold the Shower Screen up to a bright light and be sure that the holes are visible.

In heavy use applications a spare Shower Screen is highly recommended.

1. Using a short Phillips Screwdriver, remove the screw at the center of the shower screen by turning it counter-clockwise. Once the screw is free, the shower screen should drop from the brew head.



2. Wash the shower screen in warm soapy water and rinse with clean water.
3. Place the shower screen into the brew head with the smooth side facing down and attach with the shower screen screw. Turn the screw clockwise until snug.

NOTE: When the shower screen is attached, the tapered center screw should be flush with the surface of the screen.

If the tapered screw is not flush, remove the screen, turn the screen over and re-attach.

PRIMING AFTER LONG PERIODS OF NON-USE

For the best tasting espresso, prime the machine with fresh water after a long period of non-use.

Priming will also ensure that the boilers are filled and the espresso machine is ready to operate.

1. Remove the reservoir, empty any stale water, replace and fill the reservoir with fresh water to the "Max" fill line.
2. Fill the boilers with fresh water.

If you need to review instructions go to the First Time Use Section on Page 5.

DESCALING

Calcium deposits ("scale") from water will build up in the espresso machine over time and may impair espresso quality.

Scale should be removed every four months and your local hard-water conditions may require more frequent de-scalings.

Use a packaged descaling agent or decalcification tablets to remove scale.

1. Remove the shower screen from the brew head as discussed earlier, with the small Phillips Screwdriver.

2. Make certain the water reservoir is empty. Following the directions on the descaling agent packet, mix the descaling solution and add it to the reservoir.

3. To catch the cleaning solution, place a large cup under the brew head (do not attach the portafilter) and another cup under the frothing nozzle.

4. Press the "On/Off" power switch to turn the espresso machine "On". It is not necessary for the boilers to heat before proceeding to the next step.

5. Press the espresso button and dispense the cleaning agent through brew head for 15 seconds; press the espresso button again to shut "Off".

6. Open the steam dial by turning it counterclockwise, then press and hold the hot water button for 15 seconds to dispense cleaning agent through the frothing arm and nozzle.

7. Press the "On/Off" power switch to turn the Espresso machine "Off".

8. Wait 20 minutes, then repeat steps 4 through 7. Every 20 minutes, keep repeating steps 4 through 7 until nearly all the solution in the reservoir has been run through the espresso machine. Do not allow the reservoir to run completely dry.

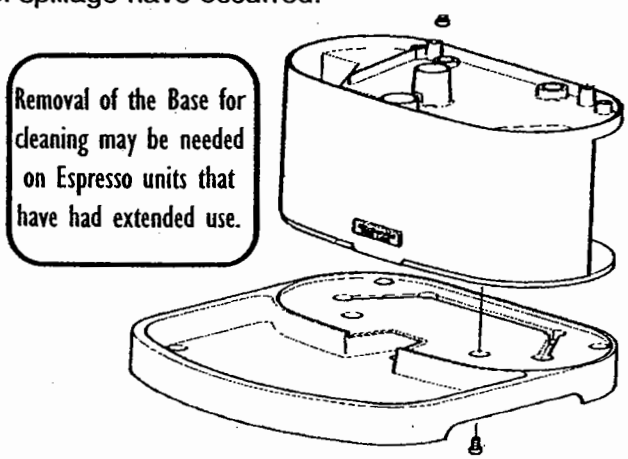
9. Remove the water reservoir and rinse with fresh water, then replace and fill with fresh water to the "Max" fill line.

Press the "On/Off" power switch to turn the espresso machine "On" and flush the espresso machine by quickly dispensing the contents of the reservoir, alternating between the brew head and frothing arm.

Do not allow the water reservoir to run completely dry.

10. Attach the shower screen to the brew head. Rinse the reservoir with clean water and be sure to add additional water to the reservoir for brewing.

NOTE: Removal of the Base of the Espresso Machine may sometimes be necessary if large amounts of spillage have occurred.



Remove the (6) Allen Bolts that hold the base to the Cabinet Main Body and clean the soiled surfaces with a warm soap and water solution.

PROLINE ESPRESSO MACHINE TEST PROCEDURES

Testing the Expresso Maker is simple and this procedure will familiarize the technician with proper operation, so that "nuisance problems" are reduced.

- **Espresso Pump Test**
- **Frothing Pump Test**
- **Espresso Boiler Test**
- **Frothing Boiler Test**

ESPRESSO MAKER TESTING

Testing the Pro Line Model KPES100 will require a clean, dry and well lighted workplace. To protect the finish of the unit, the workplace surface should be cushioned with a protective cloth or carpet.

Your Electrical Service Workplace should comply with all Local, Regional and National Electrical Codes.

TEST ITEMS REQUIRED:

To perform the Espresso Maker Tests you will need:

1. The Reservoir filled with (8) Cups of Water.
2. The 8.5 Ounce Frothing Pitcher.
3. A 4-Cup Graduated Scale Pitcher.
4. A Watch, Timer or Stop-Watch.
5. A Maximum Reading Thermometer capable of reading 180 Degrees Farenheit.
6. An Inline Wattmeter capable of reading 1500 Watts.
7. Pencil and Paper to record the unit's performance.

PREPARING THE TEST UNIT:

The purpose of these Test Procedures is to confirm proper operation of the Espresso Maker and aid the new Service Technicial in understanding the systems operation.

IMPORTANT: Always begin the test with the unit DISCONNECTED from the AC Mains.

1. Fill the unit's Reservoir with (8) Cups of Tap Water. This would be 4" above the bottom of the Reservoir, near Maximum Capacity.

Carefully position the Reservoir in the Espresso Maker and be sure that the tubing is properly positioned. NOTE: Distilled or Mineral Water should not be used in the Espresso Maker.

Be sure that the Hoses that access the Reservoir are not kinked!

WATER LEVEL - Notice how the Espresso Maker stores (1) Cup of Water for every 1/2" of Water level in the Reservoir.

A (6) Cup Level would be 3" above the bottom of the Reservoir.

For the Test use (8) Cups of water (4" above the bottom) so that an ample supply is available.

2. Attach the Portafilter to the unit with a Filter Basket inserted. No Coffee will be needed for this test.

3. Be sure that the Steam Dial Knob is turned fully clockwise (-) in the closed position.

4. Check the "On/Off" button on the Espresso Bezel. Push it in ("On") and then push it again so that the button extends outward ("Off").

In the "Off" position, connect the AC Cord to the back of the Espresso Maker and plug the end into the Inline Wattmeter that is connected to the AC Mains.

Use at least 8-Quarts of water for these tests as you will be pumping water through each Boiler for 1 minute.

CONTAINERS - A typical serving of Espresso is (1) or (2) Ounces. During this Test, after confirming operating temperature, you are going to run the Espresso and Frothing Dispensers for a full minute and dispense 3 Cups of hot water into a Measuring Pitcher.

Use a Pitcher that has 1-Cup Increments to verify results!

LOW TEMPERATURE BOILER AND PUMP TEST:

In this LOW TEMPERATURE Test you want to confirm pump operation before the Espresso and Frothing Boilers heat up.

Be sure that there is an ample supply of water in the Resevoir. (8 Cups)

Before you begin, remove the Shower Screen and make sure that it is not clogged.

Do not be concerned with flow rate, as you will confirm the water flow in the HIGH TEMPERATURE Test that follows.

OPTIONAL - If you have the Espresso Machine plugged into an inline wattmeter, you can confirm the Boiler Wattage (1300 Watts) and the additional Solenoid Valve Wattage (90 Watts) when turning the unit "On".

1. Press the "On" button and confirm that the BLUE indicator light is energized.

Hold a cup under the Portafilter. Immediately press the "Espresso" button for 2 seconds - release and confirm cool water starts flowing liberally through the Portafilter. Quickly press the "Espresso" button to stop the water flow.

Shut the Espresso Maker "Off".

2. Press the "On" button and confirm that the BLUE indicator light is again energized. Hold the Frothing Pitcher under the Frothing Nozzle. Quickly turn the Steam Dial fully counter-clockwise (+).

There will be no steam at this point, but the Steam valve must be "Open" (+) for water to flow. Immediately press the "Hot Water" button and hold. Confirm that cool water flows liberally through the Frothing Nozzle.

Quickly - release the "Hot Water" button to stop the water flow. Turn the Steam Dial fully clockwise (-). Shut the Espresso Maker "Off".

IMPORTANT - Proceed with the High Temperature Test if cool water flows through both the Espresso and Frothing sides of the unit.

The Unit PASSES this LOW TEMPERATURE Test if:

- The Blue Indicator Light comes "On"
- Cold Water flows through Espresso Boiler
- Cold Water flows through Frothing Boiler

OPTIONAL:

- Wattmeter shows full Boiler Power (1300 Watts) when "On"
- Wattmeter shows full Boiler Power 1300 Watts) plus Solenoid Valve (90 Watts) when Dispensing Water.

HIGH TEMPERATURE BOILER AND PUMP TEST:

1. Press the "On" button and confirm that the BLUE indicator light is energized. Note the start time on your watch. The In-Line Wattmeter will be reading around 1300 watts at this time as the Boilers are warming up the water.

2. Observe the "Espresso" Temperature Gauge. The pointer on the Gauge should be moving from ambient temperature, towards the "Ready" position.

3. Observe the "Frothing" Temperature Gauge. The pointer on the gauge should be moving from ambient temperature to the "Ready" position.

4. The Espresso Maker Thermostat should eventually cycle the Boiler Heating Elements and the Wattmeter will show just a few (Zero) watts. Record the time results (Nominal 6 Minutes) and confirm that both the "Espresso" and "Frothing" Gauges have reached the "Ready" positions.

5. Place an empty 4-Cup Measuring Pitcher underneath the Porta Filter. Press the "Espresso" button firmly for 2 seconds and release. Liquid should be flowing from the Portafilter.

The Inline Wattmeter reading will increase slightly (+90 Watts) to confirm the Pump operation. Note your start time and allow hot water to flow for 1-full minutes time. After 1-minute press the "Espresso" button to shut the Pump "Off" and confirm that 3-Cups of Hot Water have flowed into the pitcher.

NOTE: During the test pay close attention to the Water Level in the Reservoir. At this stage there should be 5-Cups left in the Resevoir.

6. Quickly place a Maximum Reading Thermometer into the 4-Cup Measuring Pitcher and observe the "Espresso" Temperature. This temperature will be in the 150 F range.

7. Record your Espresso Water Flow and Temperature results and pay attention to the In-Line Wattmeter. After a few minutes it will indicate cycling as the Thermostat shuts the Boilers Heating Elements "On" (1300 Watts) and "Off" (Zero Watts). Confirm that the Thermostat cycles a few times and record on paper. Empty your 4-Cup Measuring Pitcher.

8. Carefully place your empty 4-Cup Pitcher under the Frothing Nozzle. Turn the Steam Valve (BE CAREFUL) fully counter-clockwise (+) and then push and HOLD the "Hot Water" button for 1-full minute. The Inline Wattmeter reading will increase slightly to confirm the Pump operation. After 1-full minute release the "Hot Water" button to shut the Pump "Off" and confirm that 2.5-Cups of Hot Water have flowed into the 4-Cup pitcher. About 0.5 Cups of water have been depleted as Steam.

NOTE: During the Test pay close attention to the Water Level in the Resevoir. At this stage there should be 2-Cups left in the Reservoir.

8. Quickly place a Maximum Reading Thermometer into the 4-Cup Measuring Pitcher and observe the "Frothing" Temperature. This temperature will be in the 180 F range.

9. Record your Frothing Water Flow and Temperature results and pay attention to the In-Line Wattmeter. After a few minutes it will start cycling as the Thermostat shuts the Boilers "On" (1300 Watts) and "Off" (Zero Watts). Confirm that the Thermostat cycles a few times and record on paper.

10. At this point disconnect the Espresso Maker from the Inline Wattmeter and allow the boilers to cool down.

The Unit PASSES this HIGH TEMPERATURE Test if:

- Blue Indicator Light comes "On"
- Espresso Gauge moves to "Ready" position
- Frothing Gauge moves to "Ready" position
- Wattmeter initially shows full power (1300 Watts)
- Wattmeter shows no power when Water Temperature in Boilers reaches correct value.
- Espresso Water Temperature reaches 150° F.
- Frothing Water Temperature reaches 180° F.
- The Espresso flow rate is 3 Cups in 1-Minute.
- The Frothing Water Fow Rate is 2.5 Cups in 1-Minute.

APPENDIX

Problem Guide

- **PROBLEM:** Water Flow is slow through **Portafilter**. (Maximum flow is 3-Cups per minute.)
- **CAUSE:** Shower Screen is plugged or Reservoir Pick Up Tubes damaged or kinked.
- **SOLUTION:** Remove and Clean Shower Screen. Replace damaged Reservoir Pick Up Tubes.

- **PROBLEM:** Water Flow is slow through **Frothing Arm**. (Maximum flow is 2.5-Cups per minute.)
- **CAUSE:** Frothing Arm is obstructed. Reservoir Pick Up Tubes damaged or kinked.
- **SOLUTION:** Remove and Clean Frothing Arm. Replace Reservoir Pick Up Tubes.

- **PROBLEM:** Water flow is erratic through **Portafilter** and **Frothing Arm**.
- **CAUSE:** System is constricted and needs to be descaled.
- **SOLUTION:** Descale the System. (See Page 7.)

- **PROBLEM:** Espresso has a **weak flavor** on the **first cycle**.
- **CAUSE:** Boiler has not reached "Ready" Temperature. Portafilter is cold.
- **SOLUTION:** Allow more time for warm up. Pre-Heat the Portafilter before brewing.

- **PROBLEM: Frothing Arm** / Nozzle are leaking or dripping.
- **CAUSE:** Steam Valve Group Assembly (OPEN) fault.
- **SOLUTION:** Replace Steam Valve Assembly. Use correct Metric Tool.

- **PROBLEM: Leaking** Coffee underneath unit.
- **CAUSE:** Drip Tray misalignment, missing or broken.
- **SOLUTION:** Check to see if the drip tray is positioned correctly.

- **PROBLEM: Leaking** Water underneath unit.
- **CAUSE:** All tubes kinked or cracked. A Boiler is Cracked.
- **SOLUTION:** Check the Pump System tubes and Boiler. Replace using correct Metric Tools.

- **PROBLEM:** Push **Buttons** do not work.
- **CAUSE:** Defective Switches.
- **SOLUTION:** Replace defective switch.

- **PROBLEM:** The Espresso **always** has a **weak flavor**.
- **CAUSE:** Customer is using an improper Coffee Grind. Boiler has not reached "Ready" Temperature.
- **SOLUTION:** A fine Coffee Grind is necessary for espresso. Allow more time for 150° F warm up.

- **PROBLEM:** Espresso and Frothing Boilers do not reach "Ready" temperatures.
- **CAUSE:** Switch, Relay, Thermostat or Heating Element (Open) fault.
- **SOLUTION:** Check continuity—replace appropriate component. (See Resistance data in Appendix.)

- **PROBLEM:** Espresso machine has a **rancid odor**.
- **CAUSE:** Residue of old Cream from Frothing Arm in Drip Tray area.
- **SOLUTION:** Remove Drip Tray Grid and Base from Pedestal and clean with a mild Soap Solution.

- **PROBLEM: Spillage** occurs when Portafilter is removed from brew head.
- **CAUSE:** The 1-10 bar Espresso Boiler (Relief) Valve is closed or blocked.
- **SOLUTION:** Check Resistance of Valve. Check the valve's hose for blockage or kinking.

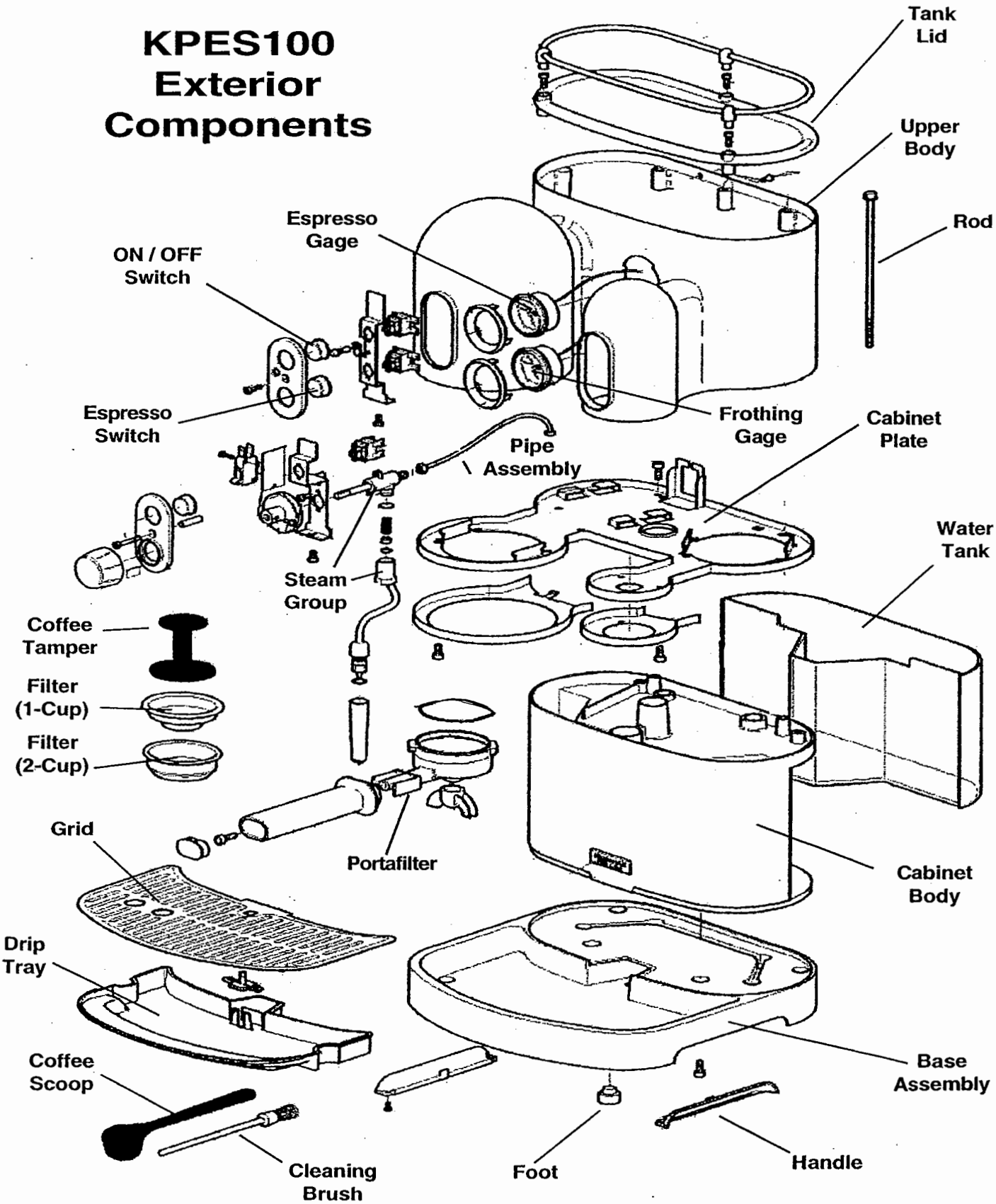
- **PROBLEM: Excess time** needed to reach "Ready" Temperature(s).
- **CAUSE:** Customer has low A.C. line voltage or is using an extension cord.
- **SOLUTION:** Do not use extension cord. Contact Electric Service provider.

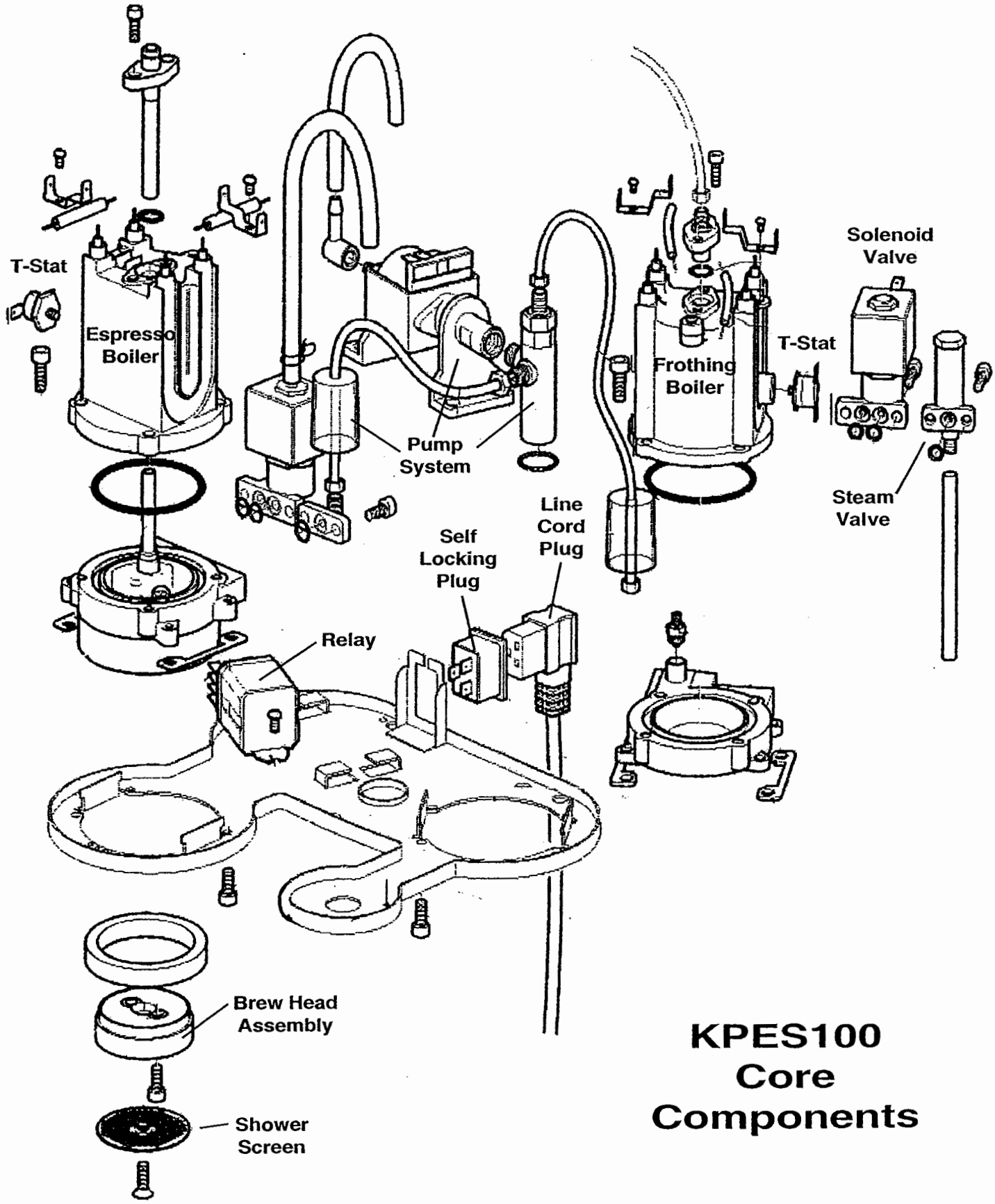
- **PROBLEM:** Espresso Maker **vibrates** during operation.
- **CAUSE:** Worn or soiled Base Rubber Feet. (Also check Water Valve Gasket orientation.)
- **SOLUTION:** Check condition of the (6) Rubber Feet and replace. Reseat Pump gasket in Cabinet.

- **PROBLEM:** Various **fasteners** are **damaged** or galled.
- **CAUSE:** Repair attempted without Metric Drives.
- **SOLUTION:** Replace any damaged fastener. Use correct Metric Tools.

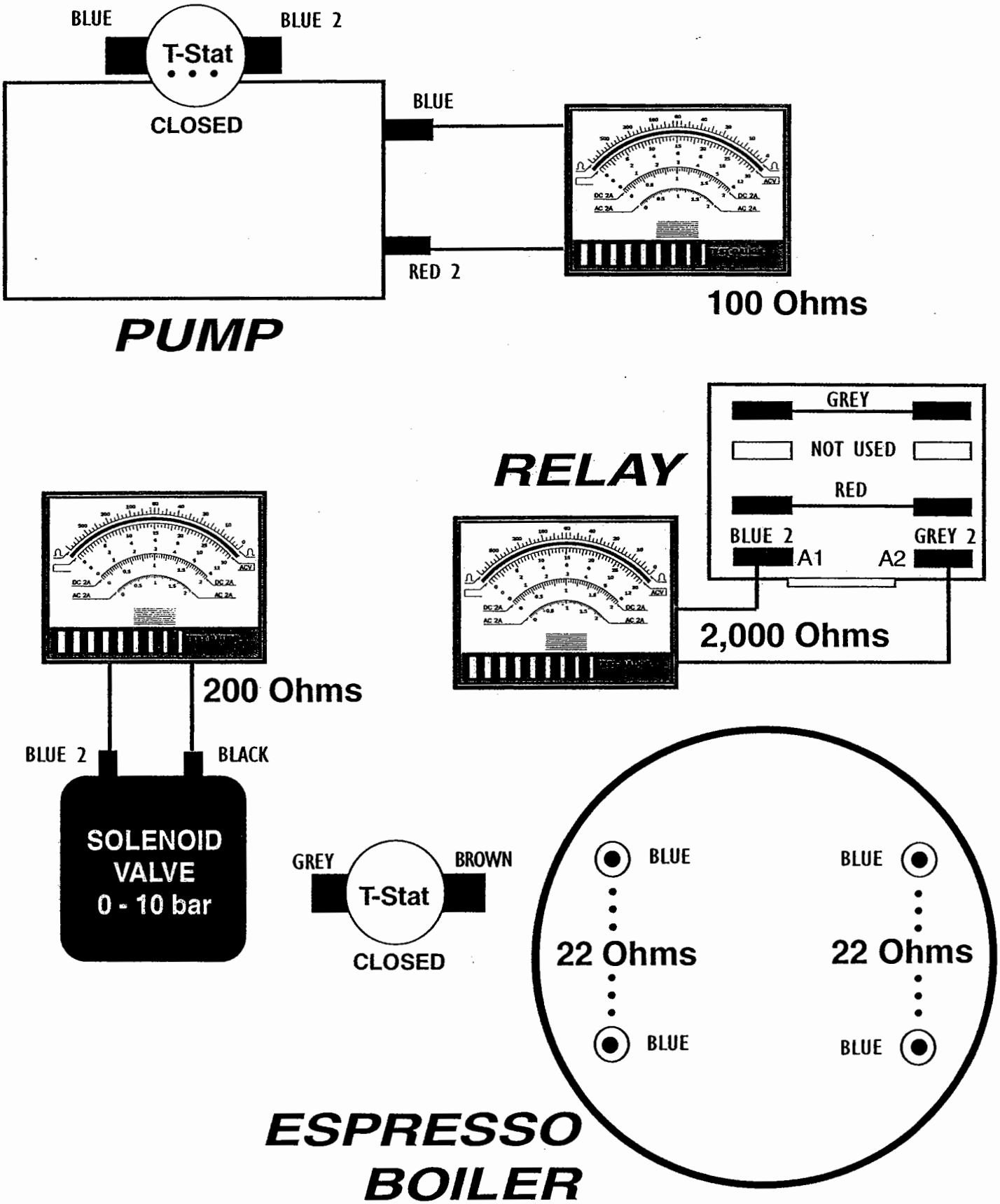
- **PROBLEM: Erratic Readings** on either Boiler Temperature Gauge.
- **CAUSE:** Loose Gauge Sensors at Boiler. Check Thermal Dressing of each Sensor.
- **SOLUTION:** Corrrect Clip position on Espresso Boiler. Tighten Phillips Screw on Frothing Boiler.

KPES100 Exterior Components





KPES100 Core Components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BLUE 2
T-Stat
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RED 2
100 Ohms
PUMP
GREY
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RED
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RELAY
2,000 Ohms
200 Ohms
BLUE 2
BLACK
SOLENOID VALVE
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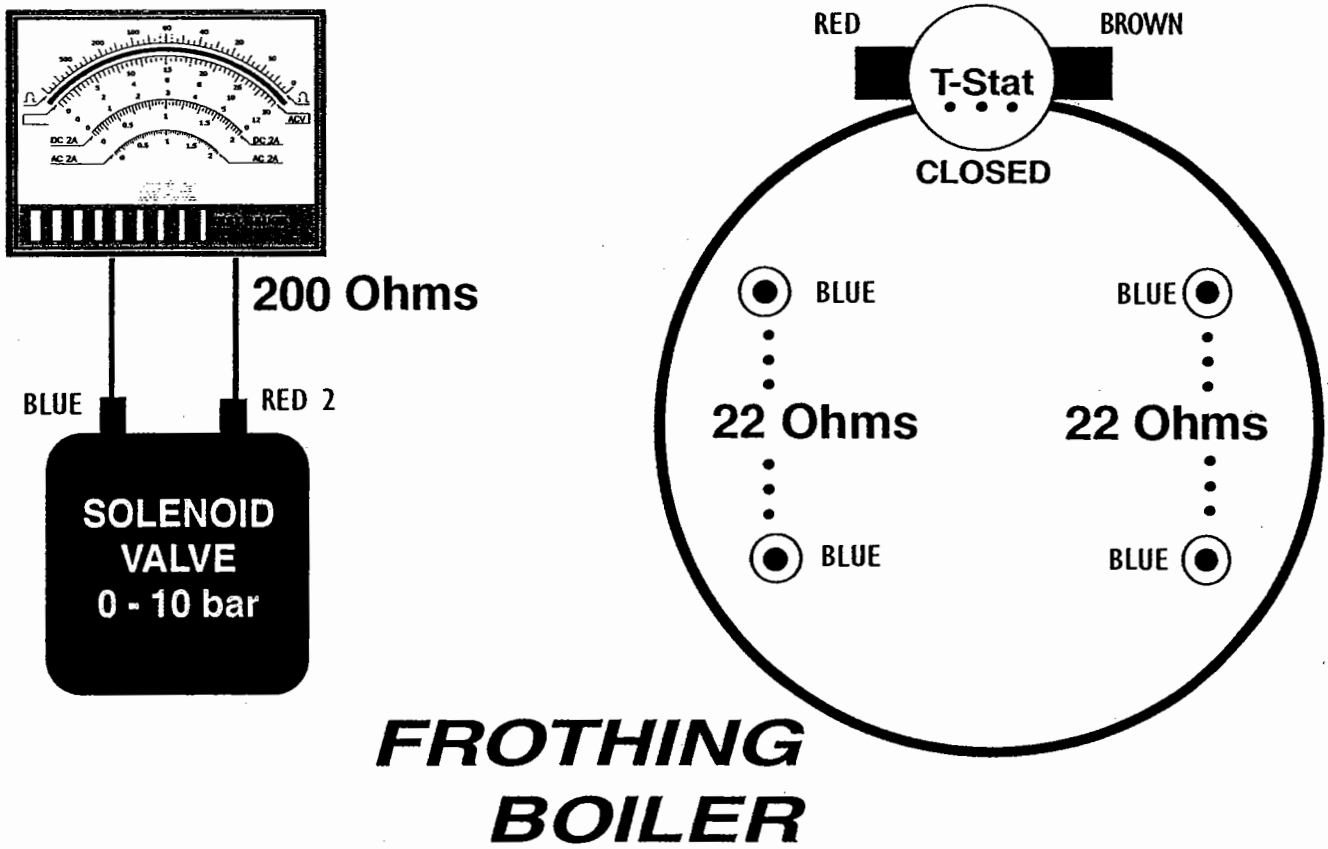
BLUE
ESPRESSO BOILER



FROTHING BOILER

WIRE COLOR is denoted for the terminals that are on the device.
Use a paper label and mark the wire(s) if you are servicing the device for the first time.

NOTE: Before taking Resistance Measurements, disconnect the Espresso machine from the AC Mains. These Resistance Measurements are to be taken with the device in question out of the circuit. Always remove one of the wires before taking the Resistance reading.
(Values are ± 10 Percent. Accuracy will depend on Volt / Ohmmeter quality.)

1. There are (3) Thermostats Espresso Boiler, Frothing Boiler and Water Pump that should test CLOSED. These Thermostats should OPEN when the "Ready" Temperatures are reached.
2. The Solenoid Valve (0-10 bar) on the Espresso Boiler should show nominal Resistance of 200 Ohms. The center terminal is not used on the Solenoid Valve.
2. The Solenoid Valve (0-10 bar) on the Frothing Boiler should show nominal Resistance of 200 Ohms. The center terminal is not used on the Solenoid Valve.
4. Each side of the Espresso Boiler should measure 22 Ohms Resistance. There is a Thermal Safety Fuse at the top of the Espresso Boiler inside thermal plastic tubing that is NOT resettable.
5. Each side of the Frothing Boiler should measure 22 Ohms Resistance. There is a Thermal Safety Fuse at the top of the Frothing Boiler that is NOT resettable.
6. The Water Pump should measure 100 Ohms Resistance across the Terminals.
7. The Bottom Relay Terminals A1 and A2 should measure 2,000 Ohms Resistance.

Core Components

1. COMPONENT ACCESS: Access to the Pro Line Espresso maker's internal electrical components is easy, requiring simple hand tools, but some initial planning by the technician, should be considered before starting the process, due to the size of the product and the need for a storage / cleaning area.

• Remove, clean and store all loose items, like the Portafilter, Tamper, Drip Tray Grill and Cleaning Brush in a safe place, noting the unit's **Serial Number**. (Located at the rear of the Cabinet Body.)
• Have additional work or storage shelf space available for the Upper Boby, Base Assembly, Water Tank and Drip Tray, as these items have a large footprint and will most likely require cleaning.

2. CLEANING: Some service procedures can be performed with just the Upper Body removed, but on a mature unit, you should separate the Core Items (Water Pump, Boilers, Relay, Valves, Thermostats) mounted on the Cabinet Plate from the Exterior Cabinet Components, so that the Exterior Components can later be cleaned for re-assembly.

• Using a 10 mm Socket for the (3) long rods that span the Upper Body, a Phillips Screwdriver and the 3 mm, 4 mm and 5 mm Metric Hex Wrenches, the servicer will have little difficulty in reducing the product to the basic Core items neatly mounted of the Cabinet Plate.

Product Insight

2. PRODUCT KNOWLEDGE: The Pro Line Espresso Machine should be tested by the technician before service is started to confirm that a real problem exists. Many of the issues that will be encountered in the Espresso Machine service environment can be solved with proper cleaning, deliming or basic customer education. (Some general advice:)

• Check the condition of the **Power Cord** and **Socket** before running the unit.

• Always check the unit's **Shower Screen** for Blockage.

• Look carefully at the **Water Pick-Up Hoses** in the **Water Reservoir** for damage or abuse.

• Run the COLD and HOT Water Temperature Tests that are outlined in this Manual.

• If possible, find out the type of Coffee Grind the customer was using.

Replacement Parts

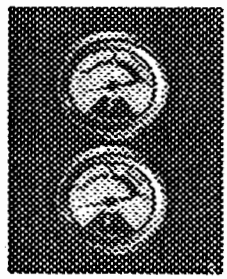
3. PARTS: When replacement parts are needed the KitchenAid Parts Manual **8204578** has taken a logical approach on the Core Items, so that everything needed can be ordered with a single part number.
The WATER PUMP, STEAM GROUP, ESPRESSO BOILER and FROTHING BOILER are available as complete assemblies, so that the chance for a proper repair is optiized. Taking this philosophy further.

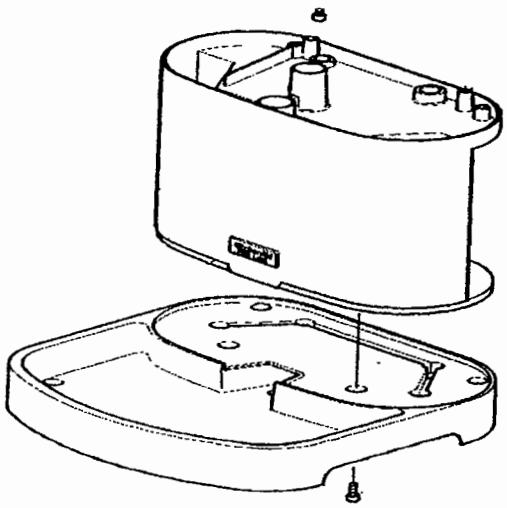
• Any Metric **Fasteners** found to be oxidized or abused should be replaced.

• Excessively Soiled low cost items like the **Shower Screen** or **Frothing Tip** should be replaced.

• Emphasis on the proper **Cleaning, Maintenance** and **Storage** of this product to the customer by the product specialist cannot be overemphasized.

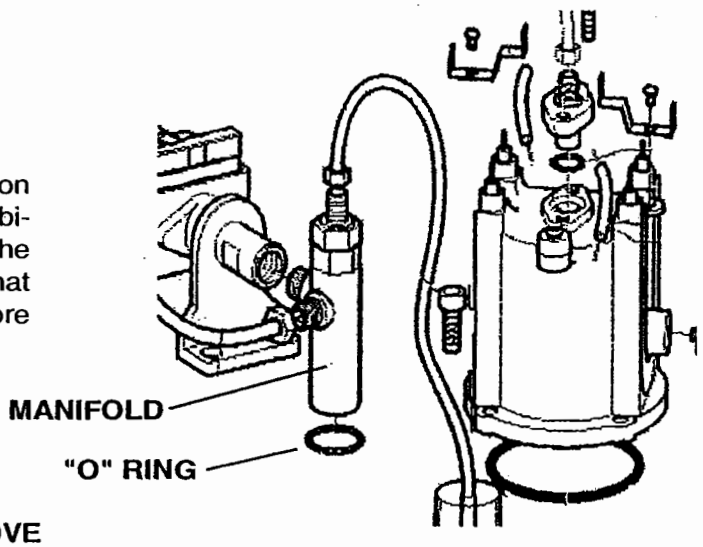
The Boiler Gauge Sensor Wires must be removed from the Boilers before the Upper Boby can be removed. The **Espresso Gauge** Sensor Wire is fastened to the Espresso Boiler with a Spring C-Clip. The **Frothing Gauge** Sensor Wire is held to the Frothing Gauge Boiler with a Phillips Screw. The Gauges can be removed from the Upper Body with a turn to the left.

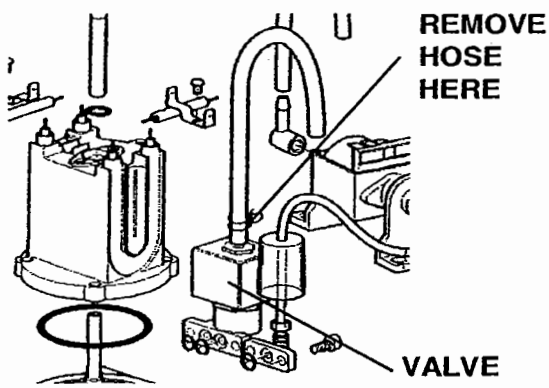




The **Base Assembly** and **Cabinet Body** shown on the left should be removed from the Cabinet Plate so the Technician will have access to the Core Components. These two items will normally require cleaning with a mild Soap Solution before reassembly. Be sure to replace any fastener that is oxidized or severely soiled.

The **Manifold** on the Water Pump shown on the right, is seated with an "O" Ring into Cabinet Body Opening. Check the condition of the "O" Ring during reassembly and be sure that the Cabinet Body opening is clean before inserting.





The **Black Hose** (Pipe SL) from the Espresso Boiler Valve (1- 10 bar) routes pressure through a hole in the Cabinet Body to the Drip Tray. When removing the Cabinet Body loosen the Spring Clip that connects the Hose to the Valve first. This will free the Cabinet Body for removal.

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