Cleveland

Electric Table Top Kettle Maintenance and Safety Inspection Checklist

DANGER: WORKING ON MACHINES WITH POWER COULD RESULT IN SEVERE ELECTRICAL SHOCK.

DANGER:
EXTREMELY HOT SURFACES.
WORK ONLY ON COLD KETTLE.

NOTE: The following instructions are intended for use by qualified service personnel.

Regular inspection and maintenance of units is essential to obtain trouble free and safe operation of equipment. **The following steps should be completed IN SEQUENCE every year or more frequently, if unit is in a high volume facility.**

A/ KETTLE PREPARATION

1. **Disconnect main power at fused disconnect switch.**
2. Kettle should be cold. If necessary add water to kettle pot to cool unit.
3. The pressure Gauge should now show a vacuum and have no moisture or discolouration on its' face. If gauge has moisture on its' face replace gauge.
4. Gauge must be showing a vacuum prior to proceeding. If not check for leaks, and repair kettle prior to proceeding. Refer to REFERENCE SECTION (KETTLE VENTING INSTRUCTIONS).

Photo of Pressure Gauge in Vacuum.

B/ MECHANICAL CHECKS

1. Inspect controls, replace damaged seals, switches, LED's etc..
2. Remove the console cover and check that the seal is not cracked or split. Replace seal, screws, missing or worn nylon anchor nuts. **Leave cover off**.
3. Remove the kettle bottom cover and check that the seal is not cracked or split. **Leave cover off**.

4A. FOR UNITS WITH TILT HANDLE -

A. Check handle for tightness. If loose apply lock tight and reinstall. Check handle knob is on end of handle and firmly tightened. If missing replace, if loose apply lock tight and reinstall.

B. Check that kettle tilts smoothly and there is no excessive wear in the trunnion bearings. Add grease to nipples as required or for older units without grease nipples refer to REFERENCE SECTION (BEARING LUBRICATION PROCEDURE).

Photo of Grease Nipples.

4B. FOR UNITS WITH TILT CRANK -

A. Check that the kettle tilts smoothly. If there is excess play adjust the worm to gear clearance with Locking Nuts or Adjusting Screw as required.

B. Check that there is no excessive wear in the trunnion bearings.

C. Apply grease to gear teeth.

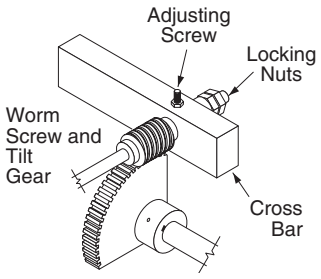


Illustration inverted for clarity.

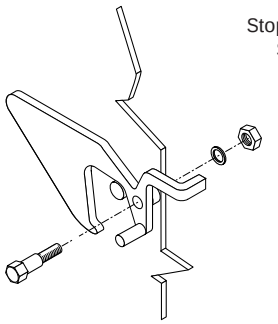
C/ MARINE LOCK TEST

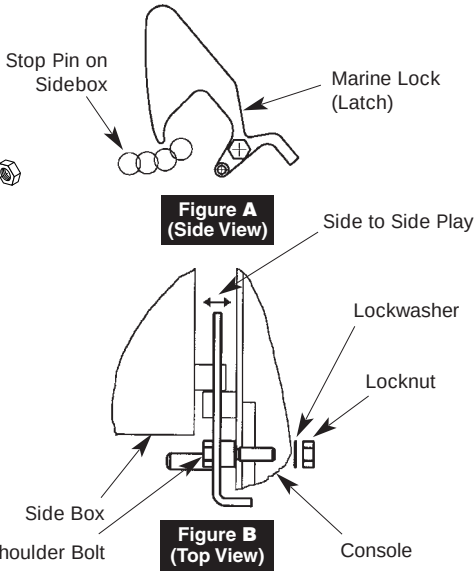
1. Check that lock mechanism is not bent or damaged.
2. Check that lock clears stop pin on side box without rubbing when kettle is tilted (Figure **A**).
3. Check side to side play. Lock should remain fully over stop pin when pushed to it's maximum side to side play (Figure **B**).
4. Check that the kettle when pushed fully upright forces the lock to a closed position. To check this:

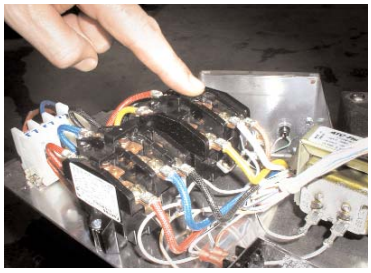
   A/ Hold the latch firmly in the unlocked position while tilting the kettle back to an upright position.

   B/ The kettle sidebox will force the lock into a new position.

   C/ Hold the lock in this position and try to tilt the kettle forward. The latch should prevent the kettle from tilting.
5. Check shoulder bolt is firmly seated against console body.
6. Check on inside of console box that shoulder bolt locknut is secure.







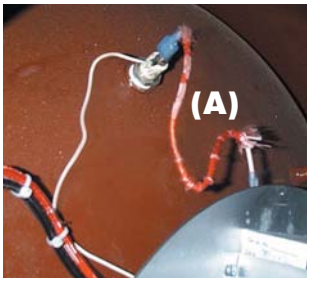
D/ CONTACTOR TEST

1. Remove nut holding component mounting plate to console.
2. Pull plate out and place on top of console. (Depending on how the installer wired the kettle you may have to remove the supply wire and reconnect).
3. Physically push in on contacts of each contactor to check for free movement. Especially look for contacts that are welded closed. Visually inspect for pitting on contactor points. Replace contactor(s) if required.

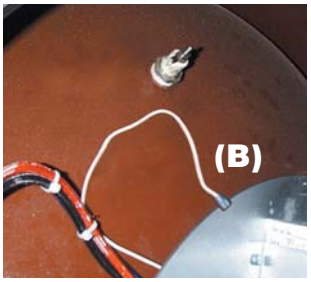
E/ LOW WATER LEVEL PROBE:

Installation Check:

✔ **Probe properly attached**



✘ **Probe bypassed by running (A) an additional wire**

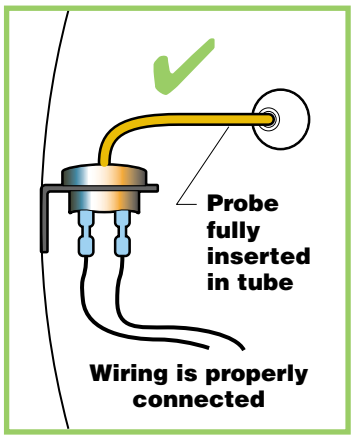


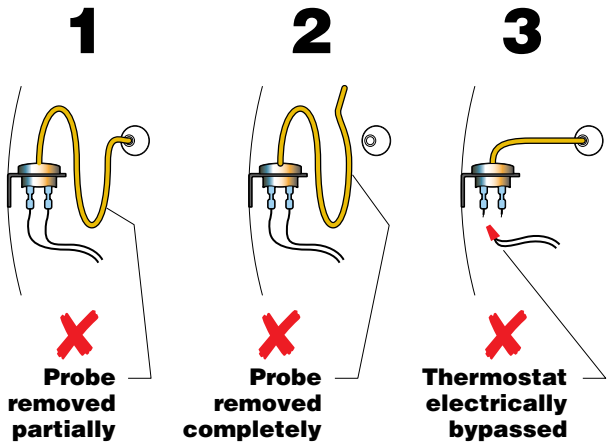
✘ **Probe bypassed by (B) grounding the connecting wire**

Functional Test:

1. **Turn main power on at fused disconnect switch.**
2. Turn kettle on and set temperature to maximum.
3. Green light will come on and contactors close.
4. Tilt kettle over. After approximately a five-second delay the red light will come on, green light go off and the contactors will disengage.
5. Turn kettle upright. Green light will come back on and contactors reengage.
6. Turn kettle off
7. If unit does not function as above, make required repairs.
8. **Disconnect main power at fused disconnect switch.**

F/ SAFETY THERMOSTAT INSTALLATION CHECK:

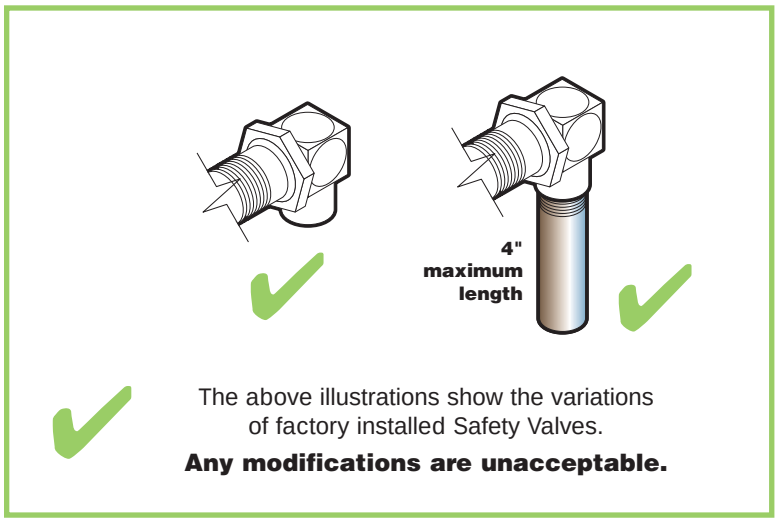




Incorrect Installations

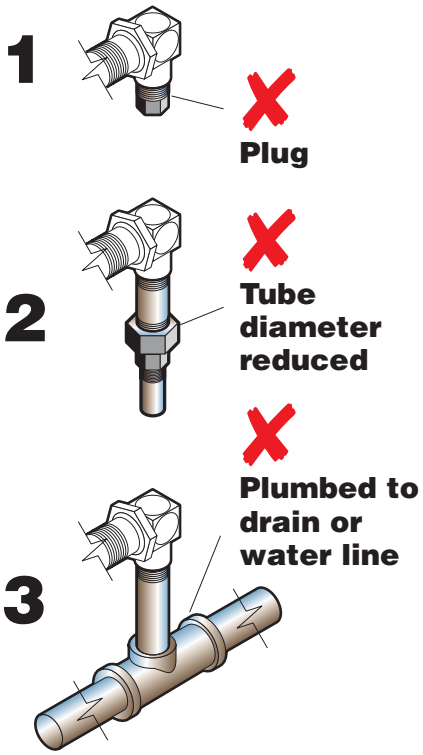
1. Safety thermostat probe is not completely inserted into tubing (except KET-3-T that has a small loop).
2. Safety thermostat probe is removed from tubing.
3. Safety thermostat electrical connection is bypassed.

G/ SAFETY VALVE INSTALLATION CHECK:



The above illustrations show the variations of factory installed Safety Valves.

Any modifications are unacceptable.



Incorrect Installations

1. Safety valve has plug threaded into the discharge opening preventing any steam from escaping.
2. Safety valve's tube diameter has been reduced.
3. Safety valve is plumbed to a drain or water line creating back pressure and reducing flow.

Physical Checks

Check that the PSI rating on the valve matches MAWP (maximum allowable working pressure) on the plate welded to the kettle.

Secondly, check that the Safety Valve has a "UV" stamp.

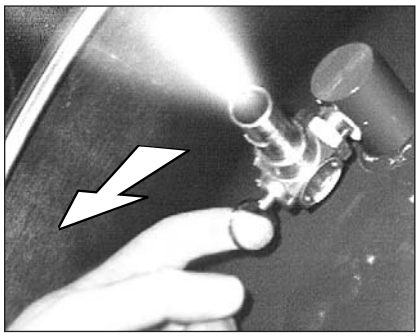
Third, Check that the valve is not damaged in any way.

If any of the above criteria is not met, replace valve.

H/ SAFETY VALVE PERIODIC TEST:

DANGER: PRESSURE RELIEF VALVE WILL EXHAUST HIGH TEMPERATURE STEAM. CONTACT WITH SKIN COULD RESULT IN SERIOUS BURNS. KEEP FACE, HANDS AND BODY CLEAR OF DISCHARGE.

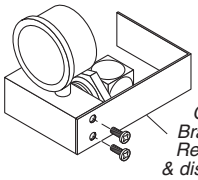
WARNING: Kettle surface will be hot and steam will be released during testing. Take necessary precautions including the use of gloves and eye protection to prevent personal injury.



Old Style Units (used prior to August 1999): Valve located under the kettle.

New Style Units (used after August 1999): Valve located at right side of kettle.

1. **Turn main power on at fused disconnect switch.**
2. With the kettle empty of product, turn unit ON and set temperature control knob to 10 (Max.). Allow the kettle to heat until the unit cycles off.
3. **Switch unit OFF and disconnect main power at fused disconnect switch**.
4. *For units build after August 1999 with guard protecting the valve, remove and discard the guard (the guard is no longer required and must not be replaced).*
5. Stand to the side of the pressure relief valve discharge tube and pull valve open for a maximum of one second. Repeat test three to four times. Each time the mechanism should move freely and be accompanied by a rapid escape of steam and seat completely when released.



Guard Bracket: Remove & discard.

If valve appears to be sticking, or does not seat replace pressure relief valve.

If foreign material is discharged then drain and flush kettle and replace pressure relief valve.

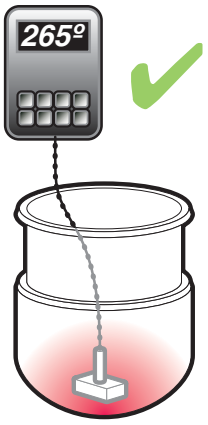
See REFERENCE SECTION (KETTLE JACKET DRAINING AND FILLING PROCEDURES) for full instructions on the correct method for refilling kettle jacket.

WARNING: Improper refilling of kettle jacket will result in irreversible damage to unit.

6. Add cold water to the kettle and check for a vacuum. If a good vacuum is not obtained, see REFERENCE SECTION (KETTLE VENTING INSTRUCTIONS).

I/ CALIBRATING PROCEDURE

1. **Turn main power on at fused disconnect switch.**
2. Insure the unit has a vacuum before you begin calibrating procedures. If unit requires venting see REFERENCE SECTION (KETTLE VENTING INSTRUCTIONS).
3. Turn kettle ON and set temperature dial to 10 (Max.).
4. Allow the unit to cycle twice (the green light must go on and off).
5. Check temperature of the inner kettle surface with a digital surface thermometer. For accurate readings move probe around bottom of kettle to locate the hottest location.
6. Temperature should be between 260° F and 265° F. Pressure gauge should read between 18-28 PSI.
7. Using a screw driver adjust temperature by turning the potentiometer on the black box. Turn very little. Turn clockwise to INCREASES and counter-clockwise to DECREASE temperature.
8. Allow the unit to cycle twice.
9. Re-check temperature.
10. Repeat steps 7 - 9 until unit is calibrated..



260° - 265° MAXIMUM KETTLE TEMPERATURE

Take reading from hottest spot in bottom of kettle.

J/ SAFETY THERMOSTAT FUNCTIONAL TEST

DANGER: PRESSURE RELIEF VALVE WILL EXHAUST HIGH TEMPERATURE STEAM. CONTACT WITH SKIN COULD RESULT IN SERIOUS BURNS. KEEP FACE, HANDS AND BODY CLEAR OF DISCHARGE.

WARNING: THIS TEST MUST ONLY BE PERFORMED AFTER THE OPERATION OF THE SAFETY RELIEF VALVE HAS BEEN VERIFIED.

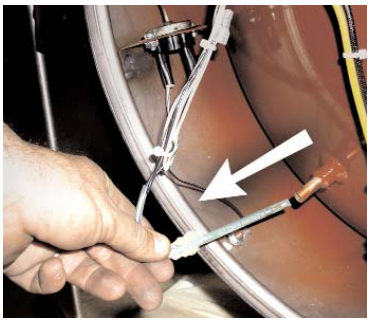


Photo of Thermistor being removed.

1. Remove thermistor from thermistor tube and leave open to the air.

2. Turn temperature dial to maximum (#10).

WARNING: Stay clear of pressure relief valve. It will start to open at approximately 45 PSI and release steam.

NOTE: If pressure relief valve opens prematurely, replace pressure relief valve.

3. As the temperature rises listen for contactors to disengage (at approximately 280° - 290° F / 40-50 PSI).

4. Replace safety thermostat if contactors do not disengage before safety relief valve is wide open.

5. Using a meter check contactors to ensure all legs are open.

6. Re-install Thermistor and silicon in place.

K/ RETURNING KETTLE TO PRODUCTION

1. Disconnect main power at fused disconnect switch.

2. Reassemble kettle ensuring all seals and fasteners are in place.

3. Reconnect main power at fused disconnect switch.

L/ RECORD OF TESTING LOG

Model Number _____

Serial Number _____

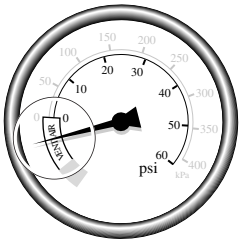
When all steps and required repairs have been completed, fill out a line in the chart below. This will be your record that the required maintenance and safety checks have been successfully completed.

Test Date	Comments List problems, parts, replaced parts etc.	Company Company performing testing	Name Print name of Technician	Signature Signature of Technician

REFERENCE SECTION

KETTLE VENTING INSTRUCTIONS

For units built prior to August 1999



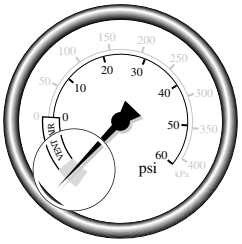
The following venting procedure should be followed when the Vacuum/Pressure Gauge needle is in the "VENT AIR" zone:

NOTE: Check for and eliminate leaks prior to venting (See REPAIRING LEAKS IN STEAM JACKETED KETTLE FITTINGS).

1. Turn kettle ON and set Temperature Control Knob to **10** (Max.), heat the empty kettle until unit cycles off.

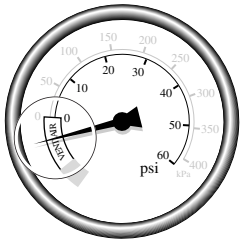
2. Loosen the 7/16" chrome plated brass venting valve nut approximately 1/2 turn. Allow kettle to vent for 2 minutes.

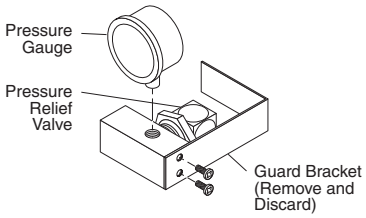
NOTE: If unit cycles ON, stop venting and wait for kettle to cycle OFF before continuing.



3. Turn kettle OFF. Add cold water to kettle until its surface temperature is below 100°F. The pressure gauge needle should be in the green zone, indicating a vacuum in the kettle's jacket.

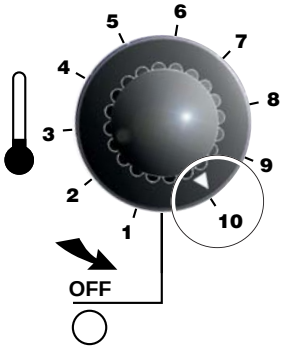
For units built after August 1999





The following venting procedure should be followed when the Vacuum/Pressure Gauge needle is in the "VENT AIR" zone:

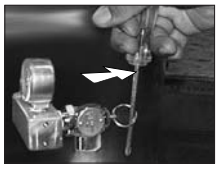
NOTE: Check for and eliminate leaks prior to venting (See REPAIRING LEAKS IN STEAM JACKETED KETTLE FITTINGS).



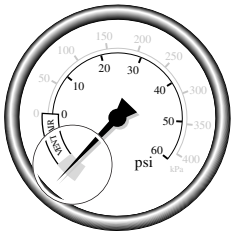
1. *For newer units with guard protecting the valve, remove and discard the guard (the guard is no longer required and must not be replaced).*

2. Turn kettle ON and set Temperature Control to **10** (Max.), heat the empty kettle until unit cycles off.

3. Vent kettle by pulling safety valve ring 8-10 times in short 2-3 second blasts with a 5 second interval between pulls.



NOTE: If unit cycles ON, stop venting and wait for kettle to cycle OFF before continuing.



4. Turn kettle OFF. Add cold water to kettle until its surface temperature is below 100°F. The pressure gauge needle should be in the green zone, indicating a vacuum in the kettle's jacket.

REFERENCE SECTION

RESERVOIR FILL PROCEDURES

For units built prior to August 1999

The kettle's water level must be maintained at the proper level to submerge the heater elements. Under normal operating conditions, the sealed water reservoir should never require the addition of water.

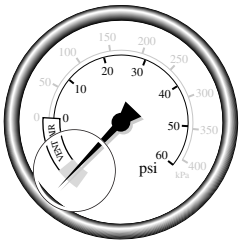
If the red "low water" light comes on during use (while the kettle is in an upright position), the water level has reached a critically low level. The low water protection control has automatically shut off the heater elements. The following procedure must be completed before further use:

NOTE: Have a qualified service technician repair the leakage problem and add water to the unit. Ensure that the red "low water" light is on when the kettle is upright. On tilting kettles, it is normal for the red light to come on when the kettle is in a tilted position, as the elements are not submerged in water at this point.

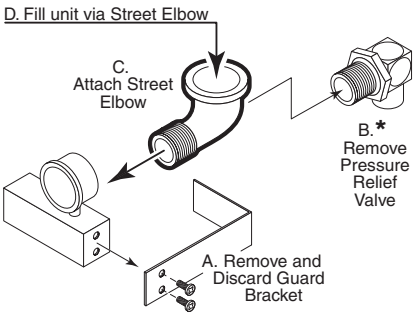
CAUTION: Only a mixture of distilled water and rust inhibitor should be used when adding water to a partially filled water reservoir. Local tap water conditions may cause kettle damage which is not covered under warranty. Rust inhibitor is purchased locally. Read directions and do not exceed manufacturer's recommendation (excessive rust inhibitor can also cause solidification).

DISTILLED WATER REQUIREMENTS

Kettle Capacity	When Red "Low Water Light" comes on, add Distilled Water	When the Reservoir is Completely Empty, Add Distilled Water
3 gallon	50 ounces	120 ounces
6 gallon	70 ounces	160 ounces
12 gallon	120 ounces	2 gallon
20 gallon	1 gallon	3 gallon



1. Ensure kettle is at room temperature and pressure gauge showing zero or less pressure.
2. Shut off power to the kettle at the fused disconnect switch.



***Important**- Pull ring on Pressure Relief Valve prior to removal to insure vessel is not pressurized.

Pressure Relief Valve/Gauge Assembly Drawing

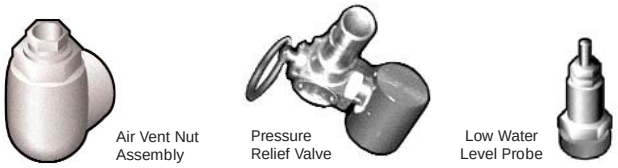
3. *For newer units with guard protecting the valve* (A)*, remove and discard the guard (the guard is no longer required and must not be replaced).*
4. Pull Pressure Relief Valve (B) open to insure vessel is not pressurized.
5. Remove Pressure Relief Valve (B).
6. Replace Pressure Relief Valve (B) with Street Elbow (C).
7. Add distilled water (D) through the Street Elbow (C), using a funnel if necessary. Refer to ***Distilled Water Requirements*** chart for the proper amount required.
8. Apply a thread sealant (i.e. Teflon tape) to the Pressure Relief Valve's (B) thread and replace.
9. Restore power to unit at the fused disconnect switch.
10. The kettle must now be vented. (Refer to the KETTLE VENTING INSTRUCTIONS).

Alternate Filling Instructions for older units.

1. Unscrew and remove the chrome plated brass venting valve nut located on the back of the kettle.
2. Hold the safety valve open while adding distilled water through the vent hole, using a funnel. Refer to chart for the proper amount required.
3. Place the chrome plated brass venting valve nut into the water fill hole and carefully tighten. Do not overtighten. Replace the bottom cover.

REFERENCE SECTION

DRAINING PROCEDURE



WARNING: THE FUSED DISCONNECT SWITCH MUST BE OFF BEFORE REMOVING THE KETTLES BOTTOM COVER.

Draining procedure

1. Open vent nut to insure there is no pressure within the kettle jacket.
2. Remove bottom covers.
3. Remove low water level probe and allow water to drain.
4. To rinse kettle jacket:

   a) On tilting kettles fill jacket from low water probe fitting.

   b) On Stationary kettles:

   1. Replace low water probe (hand tighten)

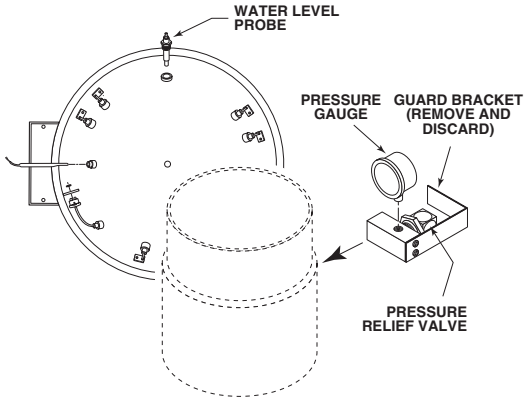
   2. Remove air vent nut assembly.

   3. Using a small funnel (one made of paper works great) slowly pour water into the kettle.
5. Allow kettle to drain again.
6. Repeat until water drains clear.

REFILLING UNIT

1. Apply a thread sealant (i.e. Teflon tape) to the water level probe threads and replace.
2. Fill unit with the required amount of corrosion inhibitor and distilled water. See REFILLS QUANTITY chart.
3. Turn kettle on and check for leaks at low water level probe and air vent nut. SEE VACUUM LEAK TEST.
4. Vent kettle. See KETTLE VENTING INSTRUCTIONS for proper procedure.

VACUUM LEAK TEST PROCEDURE



If the kettle will not hold vacuum, test for leaks at:

A. Water Level Probe (Remove bottom cover).

B. Pressure Relief Valve.

C. Pressure Gauge.

LEAK TEST PROCEDURE:

1. Heat kettle until unit cycles off.
2. Shut off power to the kettle at the fused disconnect switch.
3. Spread Bubble Type Leak Detector over suspected area and watch closely for bubbles.
4. Repair areas as required.

REPAIRING LEAKS IN STEAM JACKETED KETTLE FITTINGS

If unit will not hold a vacuum the most likely cause is a leak at one of the fittings.

Often, the easiest way to eliminate a leak is reseal the suspect areas.

1.	Water Level Probe	Remove, clean threads, apply teflon thread sealant and reinstall.
2.	Pressure Relief Valve	**A**/ Inspect for signs of leaks. Replace if required. **B**/ Remove, clean threads, apply teflon thread sealant and reinstall.
3.	Pressure Gauge	**A**/ Inspect face of gauge. If it contains moisture on the inside of face replace. **B**/ Remove, clean threads, apply teflon thread sealant and reinstall.

REFERENCE SECTION

KETTLE JACKET FILLING PROCEDURES

Under normal circumstances the kettle does not require the draining of all fluid. If the red “low water” light is on, follow the RESERVOIR FILL PROCEDURES.

If unit must be drained follow the procedures described on the following pages.

WARNING:
IMPROPER REFILLING OF KETTLE JACKET WILL RESULT IN IRREVERSIBLE DAMAGE TO UNIT.

Use only a mixture of water and rust inhibitor to refill kettle jacket (see instructions below).

Contact your local water treatment company and purchase rust inhibitor with the specifications described below.

Recommended Corrosion Inhibitors for Closed Systems.

DESCRIPTION

Recommended for our units is a blend of SODIUM NITRITE and BORAX for corrosion inhibition of ferrous metals and axoles for copper and copper alloy corrosion protection. Product should be formulated for hot or cold closed recalculating water systems.

Source the chemicals stated above from your local water treatment company. Mix only with water and follow manufactures recommended mixing rate.

DISPOSAL OF INHIBITOR

Do not dispose of chemicals in any system which may discharge into water supplies used for drinking or washing or that could accidentally discharge into such systems, or into stream accessible to animals.

Follow all Federal, State and local codes when disposing of product.

REFILL QUANTITIES *(water and corrosion inhibitor mixture)*

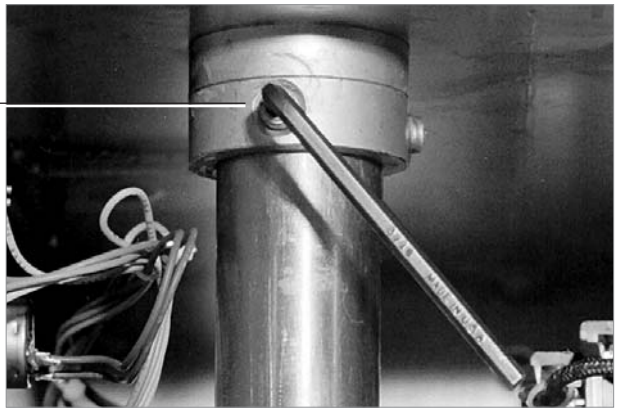
	Electric Kettles		Gas Kettles			Electric Kettles		Gas Kettles	
Kettle Size	U.S. Gallons	Liters	U.S. Gallons	Liters	Kettle Size	U.S. Gallons	Liters	U.S. Gallons	Liters
3 gallon	0.46	1.75	N/A	N/A	**30 gallon**	4.30	16.3	N/A	N/A
6 gallon	1.27	4.8	1.5	5.7	**40 gallon**	4.75	18.0	5.75	21.60
12 gallon	2.00	7.6	2.19	8.3	**60 gallon**	5.75	21.8	6.5	24.64
20 gallon	3.75	14.2	N/A	N/A	**80 gallon**	6.49	24.6	7	26.53
25 gallon	3.75	14.2	N/A	N/A	**100 gallon**	7.26	27.5	7.5	28.43

REFERENCE SECTION

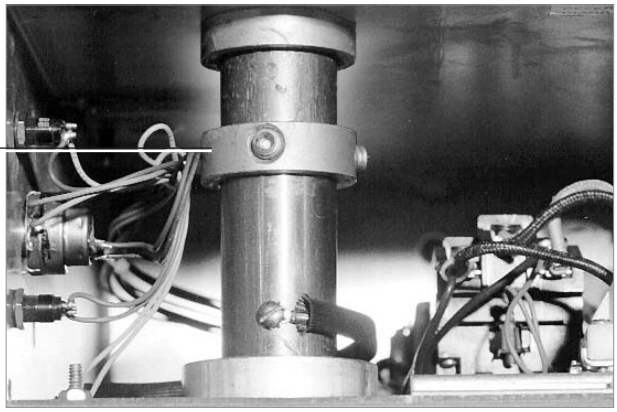
BEARING LUBRICATING PROCEDURE (for units prior to Feb. 2003)

1. Remove console cover.

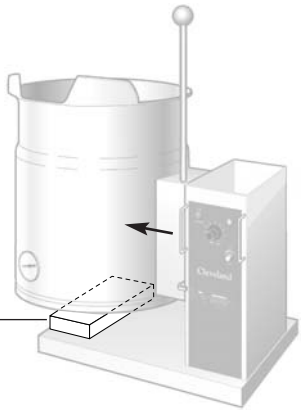
2. Loosen two Allen screws on locking ring.

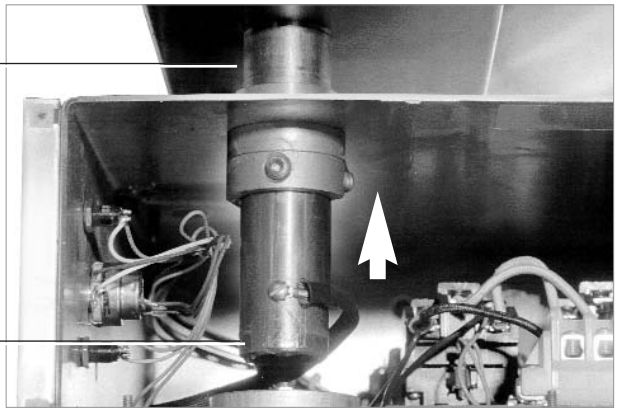


3. Pull locking ring to center of trunnion.



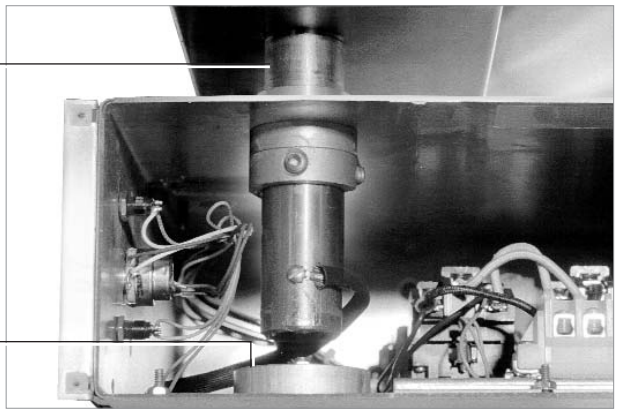
4. Pull kettle two inches away from console and rest on support block.





5. Clean newly exposed sections of trunnion.

6. Grease trunnion between kettle and console.



7. Repack outer needle bearing.

8. Push kettle back in place.

10. Reinstall trunnion and lock collar.

11. Replace console cover.