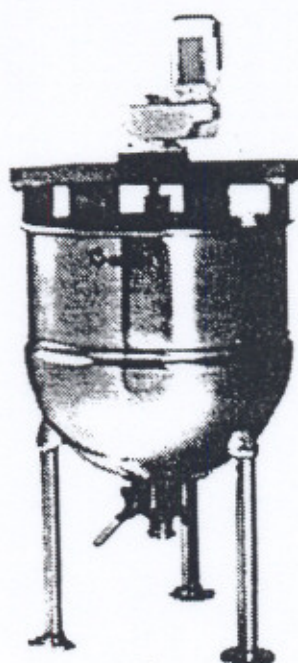


# Groen

## INSTALLATION AND OPERATING MANUAL

GROEN MODEL "RA"

KETTLE



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## CAUTION STATEMENTS

### **IMPORTANT - READ FIRST**

The Groen kettle you have purchased has been crafted from high quality materials and inspected to insure that you receive the best possible product. With reasonable care and periodic maintenance, your GROEN kettle should provide years of faithful service.

### **IMPORTANT FACTS**

Operators should be properly trained in the operation of the equipment. Unit must be installed by qualified personnel. Improper installation can result in injury to personnel and/or damage to the equipment.

PLEASE READ THIS MANUAL, CAREFULLY BEFORE YOU INSTALL OR OPERATE YOUR GROEN EQUIPMENT. It contains information you will need to install, operate, and maintain the equipment properly.

Avoid any exposure to escaping steam.

The kettle will stay hot for a time after the steam valve has been closed. Be careful not to touch hot surfaces !!

## UNPACKING THE KETTLE

The kettle will arrive completely assembled in a crate. Immediately upon receipt, inspect the crate carefully for exterior damage; then open the crate and inspect the kettle for concealed damage. Report any shipping damage or incorrect shipments to the delivery agent. If you later find additional damage file a "concealed damage" claim with the carrier.

To remove the kettle from the crate, pull the side boards loose from the top of the crate taking care not to damage the unit with tools or nails. Remove the top, sides, and then the cross-pieces that hold the kettle down. When installation is to begin, use proper equipment to lift the kettle straight up off the skid being careful not to damage the kettle.

Tall kettles are assembled using short mild steel "shipping legs" which are screwed into couplings on the kettle's leg sockets (leg attachment pads). After uncrating the kettle, the user will need to remove these short legs and install the longer legs sent with the kettle.



## DESCRIPTION

Your Groen Model "" mixing kettle is a stainless steel, stationary processing unit fitted with a 2/3 jacket to provide fast heating and/or cooling of the hemispherical bottom. The single agitator is driven by a totally enclosed fan cooled single speed motor, mounted directly to an oil-filled gear case. This drive turns the agitator at 36 RPM in kettles sized 150 gallons or less and 25 RPM in kettles sized 200 gallons and larger. This provides positive, thorough agitation of the product.

The product outlet is furnished as per your specifications. The kettle interior has a number 4 finish and a semi-deluxe buff finish is provided on the exterior. The kettle is supported on three (3) or four (4) stainless steel or painted mild steel legs.

Your Groen kettle operates efficiently at a minimum of 5 psig steam pressure and maximum of the stamped rate shown on the nameplate. SAFETY VALVE IS MANDATORY FOR SAFE OPERATION. We recommend a pressure regulator, strainer, steam trap, and check valve for efficiency and to meet regulatory requirements.

## INSTALLATION

1. Install the kettle on a level surface and bolt the leg flanges to the floor.
2. Connect the steam supply to the steam inlet fittings. Kettle 80 gal. and larger have two steam inlets; the second inlet should be used when steam pressure is less than 20 psi. To obtain full heating capacity of the kettle use a steam supply line the same pipe size as the steam inlet fitting. Install flow control valves (manual or automatic) to control heating rate and final temperature; see figures 1- through 6.
3. The installer must supply a relief valve rated to relieve at a pressure no higher than the MAWP stamped on the kettle's National Board nameplate. The valve should be installed in the steam supply line at a point between the kettle jacket and the nearest shutoff or control valve. The relief valve must be sized and installed in accordance with ASME Pressure Vessel Code and all local code requirements. All relief valves are to be supplied by the kettle user.
4. **DO NOT** adjust the pressure setting of the relief valves, and **DO NOT** allow the relief valve outlets or levers to be blocked. Route relief valve discharge lines so that personnel can not be injured when the valve relieves.
5. Install a condensate line from the kettle jacket to the boiler return line or to a drain. Include a strainer, check valve, steam trap, and shut off valve in the condensate line. to be able to test the effectiveness of the steam trap, install a tee and drain valve upstream of the trap. If you suspect the trap isn't opening, open the drain valve and allow water to flow to the floor. If more than about 1 quart of water is discharged then the trap is probably stuck closed and should be replaced.
6. Connect electrical power to motors, variable frequency motor speed controllers, lights, or limit switches which may have been included with the kettle. Local electrical codes must be observed.
7. Proper motor starters, controls and disconnects must be provided and installed in accordance with local electrical codes. Rotation of the primary agitator must be clockwise as viewed from above.
8. Tilting bridge kettle designs have a tilt limit switch mounted near the bridge pivot point. This switch must be wired in the motor control circuits so that all agitator motors are de-energized when the bridge is approximately 2" off the rim of the kettle. This must be done by the kettle installer.

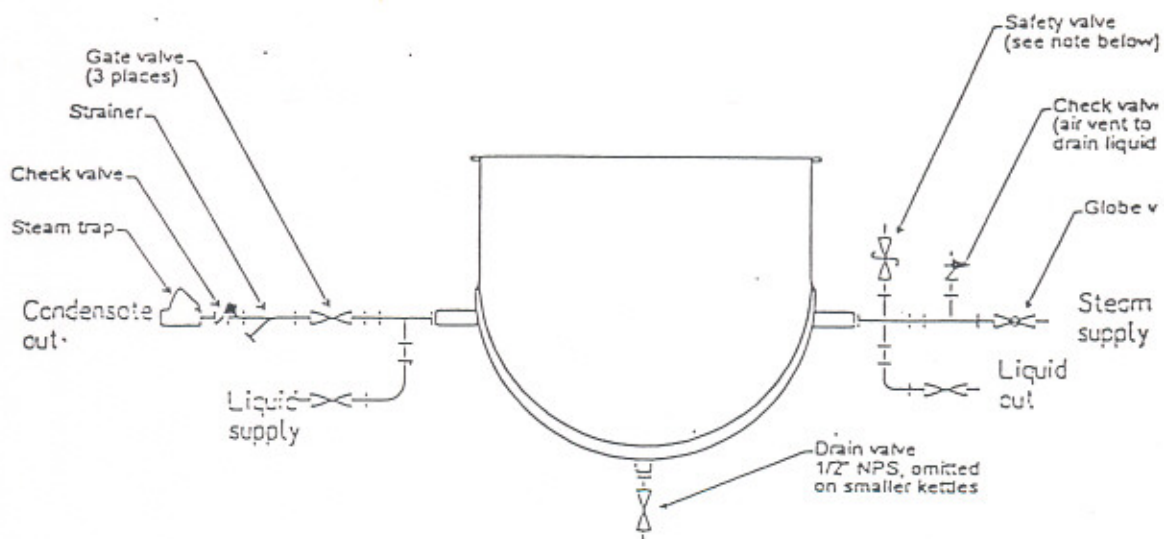
## Installation continued

**CAUTION:** The tilt limit switch must be installed and adjusted to shut off the agitator motors when the bridge is elevated. See the proceeding note.

9. When a tilting kettle is supplied with rotary unions at the jacket connections be sure to use a short length of flexible pipe (6 to 12" of braided steam hose) to attach the steam and condensate (and coolant) lines to the unions. Unions will leak when metal piping is attached directly to them.

Use the piping diagrams on this page for kettles which tilt to discharge there product (Groen all tilting models). All steam and condensate piping (including valves, traps, etc.) is to be supplied by the kettle purchaser. Inverted bucket steam traps are recommended when steam pressure is 25 psi or higher; Use thermostatic traps at pressures less than 25 psi.

### RECOMMENDED PIPING GROEN TILTING KETTLE STEAM HEATING AND LIQUID COOLING



NOTE: Pipe safety valve discharge to a point 3" off the floor



## INSTALLATION CONTINUED

Use the piping diagrams on this page for kettles which do not tilt to discharge their product. All steam and condensate piping (including valves, traps, etc.) is to be supplied by the kettle purchaser. Inverter bucket steam traps are recommended when steam pressure is 25 psi or higher; use thermostatic traps at pressures less than 25 psi.

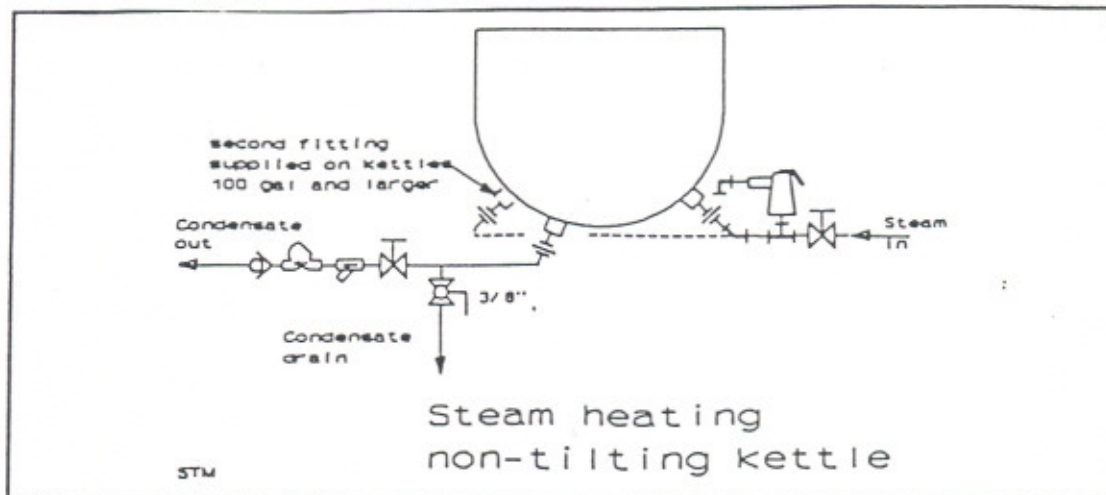


Figure 1

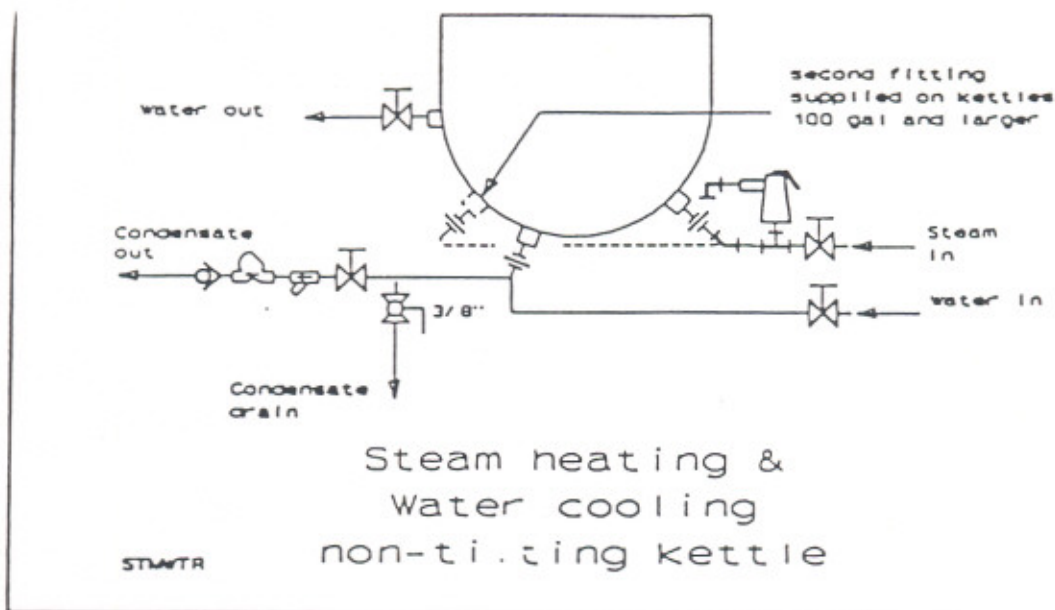


Figure 2

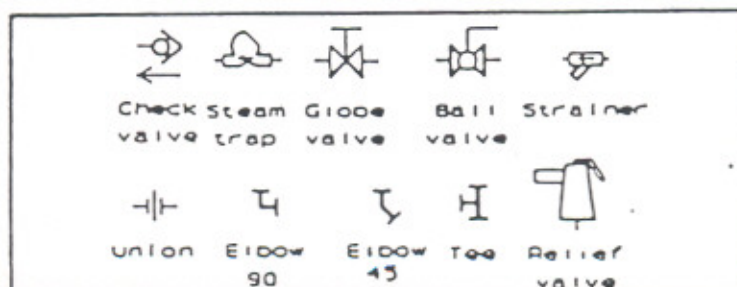


Figure 3



## OPERATION

### HEATING APPLICATIONS

**CAUTION:** The kettle jacket is quite hot and will cause a painful burn to anyone who touches it and will stay hot for a short time even after the steam valve has been shut off.

#### Manual Mode

Fill the kettle with product and start the agitator. To heat the kettle contents, open the steam supply and condensate return valves to start the heating process. Be sure to stop agitator whenever you measure product temperature with a handheld thermometer. As the product approaches the desired temperature you will want to partially close the steam supply valve in order to prevent overheating (because of the heat held in the kettle's steel you'll need to make this adjustment slightly before the product reaches temperature). If you want to simmer at that temperature you'll need to partially close the valve even more. If you draw off product in small batches you'll need to continually re-adjust the steam valve to prevent over heating of the remaining product.

#### Automatic mode

Groen can provide an electrical control panel complete with temperature sensor and steam valves to automate the kettle heating process. This controller can improve your product quality by preventing over-heating or over-simmering y automatically reducing the steam supply to the kettle as the product nears the desired temperature. If you wish to add this controller to your new (or existing) kettles call your Groen representative.

### Heating and Cooling Applications

**CAUTION:** The kettle jacket is quite hot and will cause a painful burn to anyone who touches it and will stay hot for a short time even after the steam valve has been shut off.

#### Manual Mode

To drain coolant from the kettle jacket, first close the water supply valve then open the water drain valve (the vacuum breaker valve will open automatically). When coolant has drained from the jacket, close the water drain valve, (the vacuum breaker will close automatically) and open the steam condensate shut-off valve. fill the kettle with product and start one or both agitators. Open the steam supply valve to start the heating process. As the product approaches the desired temperature you will want to partially close the steam supply valve in order to prevent overheating (because of the heat held in the kettle's steel you'll need to make this adjustment slightly the product reaches temperature). If you want to simmer at that temperature you'll need to partially close the valve even more.

When ready to cool the product, first close the steam supply and condensate shut-off valves, open the water supply and then open the water drain valve. Note that water tends to deposit scale when it is heated (comes in contact with a hot kettle). As scale develops the heat/cool times will become longer. Un-softened well water is especially prone to depositing scale. See the cleaning instructions for guidelines for removing scale. Once the desired temperature has been reached stop the coolant flow and agitator then drain product out of the kettle.

#### Automatic Mode

Groen can provide an electrical control panel complete with temperature sensor and steam/coolant valves to automate the kettle cook/cool process. This controller can improve your product quality by preventing over-heating by automatically reducing the steam supply to the kettle as the product nears the desired temperature and over-simmering and/or long process times by automatically starting the cooling cycle. If you wish to add this controller to your new (or existing) kettles call your Groen representative.

## MODEL RA JACKETED MIXING KETTLE

### ALL-INCLUSIVE MIXING ACTION

The mixing action of the GROEN MODEL RA is complete and highly efficient. The diagram illustrates how the finger-like scrapers carry the material away from the kettle walls into the left baffle, past the batch heart and beyond the right baffle back to the heated walls. Nothing escapes the scrapers or the mixing baffles. The result is positive, thorough agitation of the product.

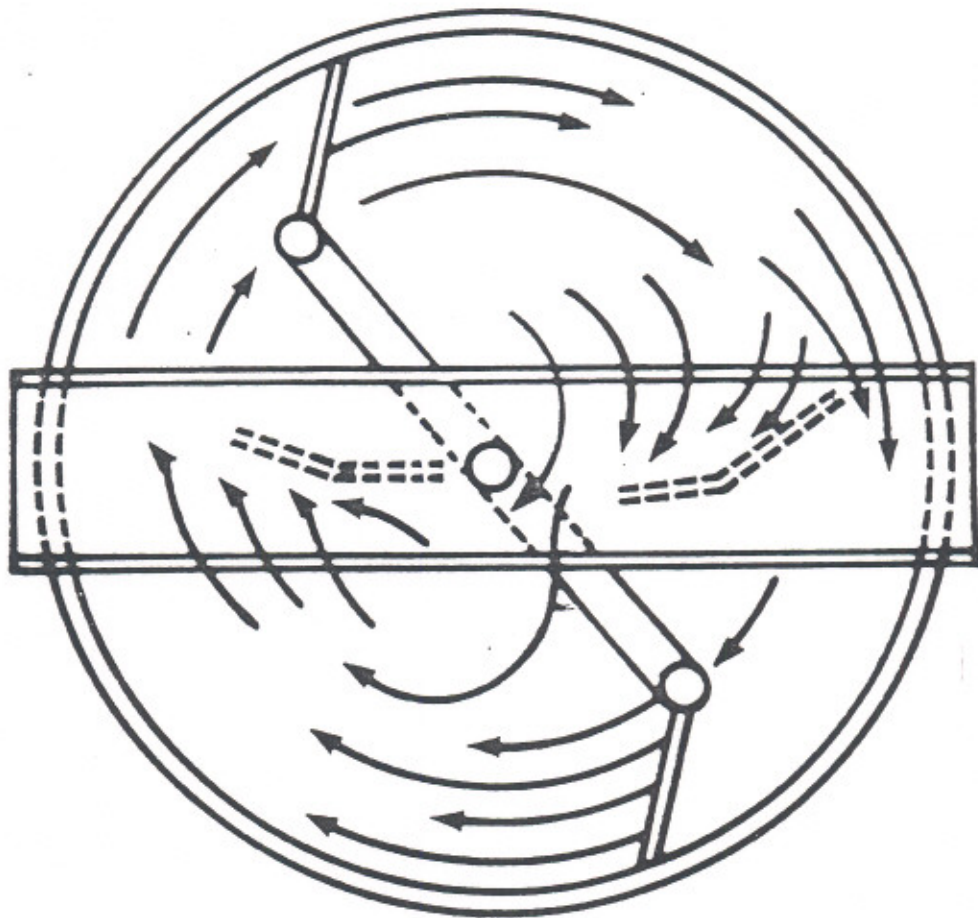


FIGURE 1



# QUICK DISCONNECT COUPLING

SHAFT

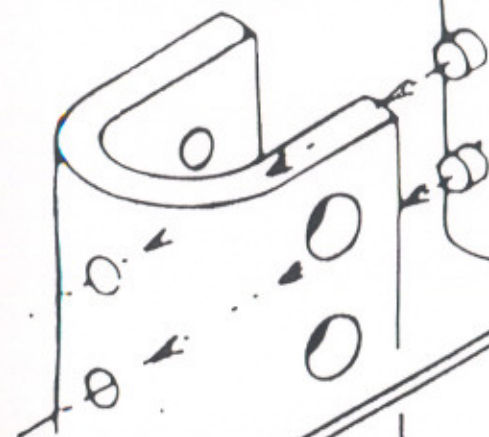
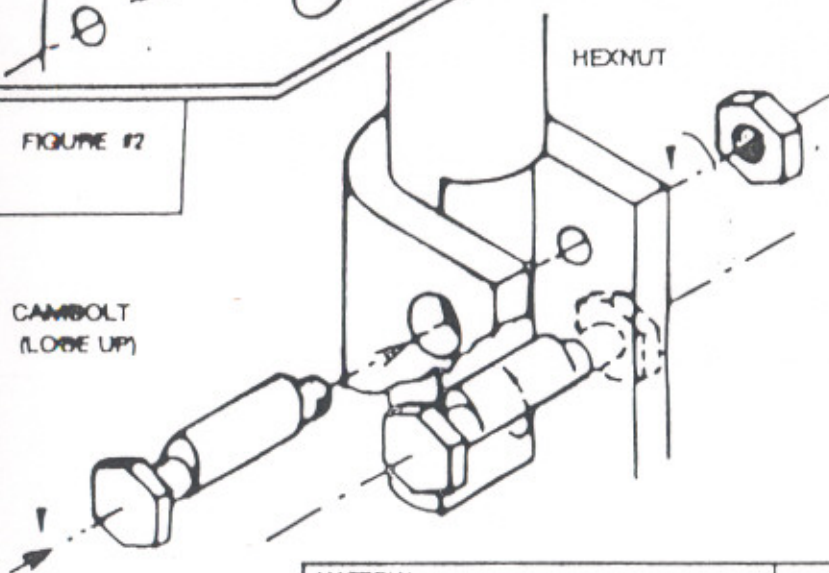


FIGURE #1

FIGURE #2

CAMBOLT  
(LOBE UP)

HEXNUT



1. Guide the two protruding pins of the shaft into the two corresponding holes in the disconnect coupling as shown in figure #1.
2. While holding one cam bolt with the lobe of the cam pointing up, insert it thru the larger of the coupling side holes, past the flat part of the shaft, and thru the smaller hole on the opposite side of the coupling. Be sure that the lobe of the cam bolt is on the top. (Refer to figure #2)
3. Turn cam bolt toward the shaft 1/8 turn, or until the lobe of the cam bolt is snug against the flat side of the shaft. (Refer to figure #2)
4. Fasten cam bolts in place with two hexnuts. Tighten securely. Check connection for slippage or loose bolts before operating.

MATERIAL

FINISH

ASME APPROVAL  
DATE  
CALCULATIONS  
WELD REF  
Q.A

**G GROEN**

INSTRUCTIONS FOR  
CONNECTION OF  
DISCONNECTION COUPLING

**A - 8378**

MARK REVISION BY DATE  
REF. DYMOS

DR CK  
DATE 6/23/77  
SCALE  
NEXT ASSY SHT  
P/N 3784  
W.P PSI

LWM  
SHT OF

NOTICE - THIS DRAWING IS THE SOLE PROPERTY OF THE DOVER CORPORATION AND THE INFORMATION SHOWN MAY NOT BE REPRODUCED WITHOUT THE COMPANY'S WRITTEN PERMISSION

**GENERAL CLEANING INSTRUCTIONS**  
**FOR**  
**GROEN STEAM JACKETED COOKING AND PROCESSING KETTLES**

**NECESSARY TOOLS:** Long-handled kettle brush in good condition.  
Short-handled kettle brush in good condition.  
Suitable brush for outlet port and valve.  
Caustic-type cleaner.  
Acid-type cleaner.  
Chlorinated cleaner sanitizer.

**IMPORTANT:** To make the cleaning job easier.....

1. Clean as soon as possible after cooking.
2. Measure all cleaning and sanitizing solutions to proportions recommended by their manufacturer to be suitable for kettle materials of construction.
3. Avoid heating kettle with only residual product after discharge to avoid burn on.
4. Care and precaution should be taken when handling cleaning solutions; follow their manufacturer's instructions closely.

**PROCEDURES:**

1. Flush kettle thoroughly with lukewarm water and drain to remove as much loose waste product as possible. Use a hose if available. Avoid spraying water on electric motors, gear boxes, electric components, etc. If the unit is in continuous use, thoroughly clean and sanitize both interior and exterior at least once every 24 hours.
2. Use kettle brushes and non-abrasive pads or tools to remove large amounts of product residue.
3. Prepare hot cleaning solutions and follow procedures as outlined by their manufacturer.
4. Rinse the kettle thoroughly with water after each use, then let it drain completely.

5. After all cleaning and sanitizing procedures, it is recommended that the kettle be drained and all surfaces are allowed to air dry.
6. Best sanitation practice recommends sanitization of each place of equipment immediately prior to use. This is in addition to normal cleaning procedures. A chlorinated cleaner-sanitizer prepared as per manufacturer's instructions should be used.

**IMPORTANT:**

Never use steel wool, metal sponges or scouring powders. They scratch and injure the equipment surface, which also shortens the life and ruins the appearance of this fine equipment.

**CAUTION:**

**NEVER leave a chlorine sanitizer in contact with stainless surfaces longer than 30 minutes. Longer contact can cause corrosion.**

Sanitize the equipment by use of a sanitizing solution equivalent to one that supplies 200 parts per million available chlorine. Don not exceed 200 ppm as this will cause corrosion (brown spotting) of the stainless.

**WARNING:**

Most cleaners are harmful to the skin, eyes, mucus membranes and clothing. Precaution should be taken to wear rubber gloves, or face shield and protective clothing. These are minimum precautions to be taken. Carefully read directions and all warnings on the label of the cleaner to be used.

Do not spray electrical components such as motors, switches or control panels with water and/or cleaning solutions.



## SCRAPER BLADE MAINTENANCE

1. Periodically inspect all scraper fingers, fittings, and valves for signs of damage or wear.
2. To replace agitator scraper fingers, remove the agitator (or raise the bridge if you have a tilting bridge unit) and pivot the scraper fingers until the gap in the back of the finger is aligned with the stop pin on the blade holder rod then slide the finger off the rod. When re-installing fingers make sure that the 1/4" wide face of the blade faces the center of the kettle (see Fig. 7)
3. For maintenance and repair instructions for other components on the kettle refer to the instructions from the respective companies.

**NOTE:** Use of any replacement part other than those supplied by Groen or the kettle accessory manufacturers **VOIDS ALL WARRANTIES.**  
Service performed by other than factory authorized personnel will **VOID ALL WARRANTIES.**

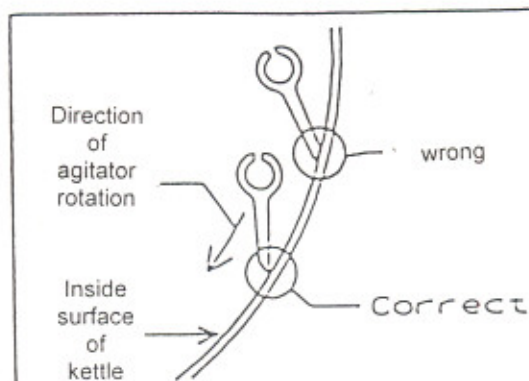


FIGURE 7: INSTALLATION OF GROEN SCRAPER FINGERS.

## TROUBLE SHOOTING

The kettle is designed to operate smoothly and efficiently if properly maintained. However, the following is a list of checks to make in the event of a problem. Work should be done by a qualified service representative, if an item on the list is followed by an asterisk (\*).

<u>SYMPTON</u>	<u>POSSIBLE CAUSE</u>	<u>CORRECTIVE ACTION</u>
Kettle does not heat.	Steam is off.	Open the steam inlet valve and main steam supply valve.
	Condensate return valve is closed.	Open the condensate valve.
	Steam is not being supplied.	Restart operation of the boiler *
	Steam pressure is too low.	Improve boiler operation and/or steam distribution to obtain adequate pressure at the kettle. *
	Steam supply line is blocked.	Locate and remove the blockage. *
	Condensate return line is blocked.	Locate and remove the blockage. *
	Steam trap is not operating (see note 1)	Repair or replace the trap. *
Safety valve leaks a large amount of steam.	Steam pressure regulator is set to high.	Adjust the regulator to obtain a pressure at the kettle that is no higher than the maximum pressure stated on the nameplate. *
	Defective safety valve.	Replace the safety valve with an identical valve. DO NOT attempt to repair a safety valve. DO NOT install a valve with a pressure rating higher than the maximum pressure stated on the nameplate. *
	Steam pressure regulator is defective.	Repair or replace the regulator. *

Safety valve leaks a small amount of steam.

Contamination of the valve seat keeps the valve from seating properly.

With full pressure in jacket, briefly lift the lever all the way up to blow the seat clean. Then let the lever snap down to seat the valve firmly.

**WARNING: AVOID ANY EXPOSURE TO ESCAPING STEAM.**

**NOTE 1:** Inverted bucket steam traps may perform poorly at very low steam pressures. If your kettle must operate frequent 1 pressures of 10 psi or less, install a trap designed for 1 pressure operation.



## MAINTENANCE AND SERVICE LOG

MODEL NO. \_\_\_\_\_

PURCHASED FROM \_\_\_\_\_

SERIAL NO. \_\_\_\_\_

LOCATION \_\_\_\_\_

DATE PURCHASED \_\_\_\_\_

DATE INSTALLED \_\_\_\_\_

PURCHASE ORDER NO. \_\_\_\_\_

DATE	MAINTENANCE PERFORMANCE	PERFORMED BY

## RECOMMENDED SPARE PARTS LIST

### Groen Components:

<u>PART NO.</u>	<u>DESCRIPTION</u>
066554	Finger, scraper, plastic
009518	Finger, scraper, metal
	Bottom bearing, small 1-5/8" OD, note 2
	Bottom bearing, large 2-1/8" OD, note 2
012240	Bolt, eccentric, 3/4" thread dia. (for large coupling)
009338	Nut, 3/4" (for large coupling)
005659	Lock washer 3/4" (for large coupling)
009389	Drive shaft coupling mounting stud 3/4" dia. (lg. cplg.)
009372	Bolt eccentric, 1/2" thread dia. (for small coupling)
002218	Nut, 1/2" (for small coupling)
005657	Lock washer 1/2" (for small coupling)
012090	Drive shaft coupling mounting stud 1/2" dia. (sm. cplg.)

- NOTE: 1.) Small Quick Disconnect couplings fit 1-5/8" diameter drive shafts while large Quick Disconnect couplings fit 2-3/8" dia. drive shafts.
- 2.) Bottom bearings are used in kettles 400 gallon and larger when the primary agitator does not tilt out of the kettle. These bearings are plastic bushings pressed into the bottom of the primary agitator shaft.

To order any of the above parts please contact Groen Process Parts and Service.

NOTE: Please provide kettle model style, and number as well as the National Board Number (all are stamped on the National Board nameplate attached near the rim of each kettle; unjacketed kettles will not have a National board number) when order parts. This is important to service your needs properly.



**GROEN. PROCESS EQUIPMENT**

P.O. Box 549 • Cary, IL 60013

(847) 462-1865 Fax (847) 462-1950

***"Batch & Continuous Process Solutions"***

## CONDITIONS AND TERMS OF LIMITED THIRTY SIX MONTH WARRANTY

### LIMITED WARRANTY

Groen equipment has been skillfully manufactured, carefully inspected and packaged to meet rigid standards of excellence. Groen warrants its Equipment to be free from defects in material and workmanship for thirty-six (36) months from the date the equipment is shipped from Groen's factory (the warranty period \*) on the following conditions and subject to the following limitations:

1. This warranty is limited to Groen equipment sold to specific users and installed in the continental United States, Alaska, Hawaii, and Canadian Provinces of Ontario and Quebec. This warranty extends to subsequent commercial owner/users only if the transfer of ownership does not involve movement or reinstallation of the product.
2. Product must be inspected and registered with Groen by buyer upon receipt. Damage during shipment is to be reported to the carrier, and is not covered in this warranty.
3. Groen or an authorized service representative, will repair or replace, at Groen's sole election any Groen equipment including, but not limited to, drawoff valves, safety valves, gas and electric components found to be defective during the warranty period. This warranty includes all parts and labor costs for the warranty period. As to warranty service in the territory described above, Groen will absorb portal-to-portal transportation costs (time and mileage) during the warranty period.
4. This warranty does not cover normal maintenance, calibration, and regular adjustments, as specified in operating instructions or manuals (see operating manual for specific product); consumable parts such as scraper blades gaskets and packing; or defects caused by improper storage or handling prior to placing the Equipment; poor water quality, and/or abuse, carelessness of operation, or improper maintenance of the equipment.
5. This warranty is exclusive and is in lieu of all other warranties, expressed or implied, including any implied warranty or merchantability or fitness for a particular purpose, each of which is hereby expressly disclaimed. The remedies described above are exclusive and in no event shall Groen be liable for special, consequential or incidental damages for the breach or delay in performance of this warranty.
6. Groen equipment is for commercial use only. If sold as a component of another (O.E.M.) manufacturer's equipment, or if used as a consumer product such equipment is sold AS IS and without any written warranty.

Refer to the next page for items which the warranty does not cover.



## CONDITIONS AND TERMS OF LIMITED TWELVE MONTH WARRANTY (CONT.)

The warranty does NOT extend to:

1. Installation and start-up installations.
2. Malfunction as a result of improper maintenance.
3. Damage caused in shipment or damage as a result of improper use.
4. Normal maintenance as outlined in this manual.
5. Damage caused by hitting the unit with an implement or rubbing or scraping it with abrasive materials.
6. Simple adjustments like tightening fittings or adjusting valves.
7. Cleaning or maintenance of valves or steam lines.

### **CAUTION**

Use of any kettle replacement parts other than those supplied by Groen **VOIDS ALL WARRANTIES**. Kettle service performed by other than factory authorized personnel will **VOID ALL WARRANTIES**.

If you have any questions about warranty coverage, operating procedures, or maintenance, contact Groen Process Parts and Service. Phone (847) 439-2400.