

Ray-Tech Infrared Corp.

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RC15-T

Owners Manual

RAY-TECH RC15-T MANUAL

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1. GENERAL:

This machine is designed to reclaim and store used or new asphalt in a fifteen (15) ton box without burning or damaging the asphalt. This unit is designed to mount on a truck chassis. It features three (3) shovel doors on the rear of the unit. Additionally, this unit can be fitted with other options that would mount to the chassis.

2. CONSTRUCTION:

- A) **Storage Bin:** Double and triple walled construction. The hopper and sidewalls are fabricated of 12 gauge steel, and the deck is 10 gauge steel.
- 1) **Insulation:** The third middle wall of 16 gauge steel supports 2" thick rigid insulation with a 1" air space. The inside of the middle wall is coated with 1250 degrees F aluminum paint, for proper infrared reflection and heat distribution around the inner material wall.
 - 2) **Loading Doors:** Top loading, hydraulic operation, with a wide opening to form a chute for maximum loading efficiency. Doors are fabricated of 12 gauge steel, with 2" rigid insulation, securely held in place with reinforced 16 gauge steel.
 - 3) **Shoveling Doors:** Hydraulic operation. Three (3) vertical track doors at rear of unit, with double action linkage, positive safety lock, and shear angle base for maximum positive cutoff. Doors are fabricated of 10 gauge steel, with 1" rigid insulation and 12 gauge steel insulation securing wall.

3. RECLAIMER HEATING SYSTEM:

- A) **Energy Converters:** Four (4) 50,000 BTU and four (4) 35,000 BTU infrared type wire mesh faced converters, secured under shoveling doors in heating chamber, in such a way as to provide a balanced heat distribution and thereby ensure maximum efficiency of each converter. Independent thermostatic control of each converter, to more accurately control temperatures of the asphalt.
- B) **Electronic Ignition:** Consisting of electronic module, flame sensing probe and direct spark electrode.
- C) **Safety Control and Flame Protection:** A 100% shut-off gas valve, controlled by the electronic module, automatically shuts down ignition and gas valve if no flame is present for 12 seconds. Regulator to reduce withdrawal pressure to 11" water column. High pressure hose with reusable fitting. External emergency shut-off valve.
- D) **Fuel:** 100% propane gas (vapor withdrawal) drawn from one (1) 85 gallon tank, with automatic switchover valve.

4. TEMPERATURE CONTROLS:

- A) A combination of sensing devices, thermostats and timers control the reclaiming and holding cycles automatically.
- B) The reclaiming cycle will maintain a skin temperature not to exceed 320 degrees F. When material is completely reclaimed, the skin temperature will automatically drop and hold at a temperature between 280 degrees and 300 degrees.
- C) Maximum complete reclaim time is 16 hours. Unit will hold reclaimed/plant mix approximately 48 hours without damage to asphalt.
- D) Will reclaim in *Minus 10 Degree F* ambient temperatures.

5. MOUNTING:

Mounted on truck chassis with sub frame and dumping hoist provided by a truck body up fitter.

6. ELECTRICAL SYSTEMS:

- A) Reclaimer Gas Controls: Electrical gas controls are 12 volts, powered by truck's 12V battery.
- B) Lights/Connector: Two (2) LED (Light Emitting Diode) *red brake/running /directional* light assemblies mounted at each bottom rear corner, with two (2) LED *amber hazard* lights at top rear center.

7. SAFETY FEATURES:

- A) Ladder with catwalk for hopper access.
- B) Amber reflectors - front and sides. Red reflectors – rear and sides.
- C) LED Type Safety and Hazard lights (refer to “Electrical Systems”).
- D) Safety controls (refer to “Heating system”).

8. PAINT:

- A) Storage bin – Black.
- B) All parts prime coated with catalyzed etching primer, followed with two (2) coats of acrylic urethane finish colors.

9. DIMENSIONS:

Length:	19' 4"
Width:	7' 6"
Width with Doors Open:	9' 9"
Height:	6' 11"
Height with Doors Open:	8' 0"

10. WEIGHT:

Weight:	12,575 lbs.
Gross Weight:	43,250 lbs.

11. PERFORMANCE SPECIFICATION:

While everyone has equipment warranties, Ray-Tech Infrared is unique in that we also have a performance specification that acts as a guarantee of our equipment's *performance* under proper working conditions and operation procedures.

Reclaimer: The asphalt pavement will attain a 270°F minimum average mix temperature after twelve (12) hours of heating time, at a 50°F ambient temperature day, using broken asphalt or standard asphalt mix design.

EQUIPMENT SETUP PROCEDURE AND OPERATION

BEFORE USING YOUR MACHINE, PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY:

1. The reclaimer/hotbox and valves have all been preset and tested at the factory. **No adjustments should be needed.**
2. After placing and securing the propane cylinders (vapor withdrawal only) in tank holders, connect hose fittings to cylinders (left hand thread) and tighten firmly. **Open cylinders very slowly** (if this is opened too fast, safety check valve will subsequently not permit propane flow).

RECLAIMER PROCEDURE AND OPERATION

- 1) Open both propane cylinders very SLOWLY until fully open (if cylinders valves are opened to fast, a safety check valve will not permit propane flow). If this happens, turn off the cylinder valve and start over – SLOWLY.
- 2) Turn on the switches on the control panel for the reclaim / hotbox. A red light should turn on, the igniters will spark, the gas valves will open (with a click) and the burners will light. If this is the first time with new cylinders, or if the unit has sat for a few days, you might need to turn off the switches, wait 10-15 seconds and turn them back on again. You might need to do this three or four times before all air is purged from the system.
- 3) The reclaimer has been designed to begin running on timers. The burners will light for nine minutes and turn off for three to keep the material from overheating. When the material has reached a certain temperature, the thermostat takes over, lighting the burners as heat is called for. The normal cycle for reclaiming is 12-16 hours.

Periodically check the burners and tiles. Thermostats, timers and temperature controls are pre-set at the factory and should not require adjustment in the field.

GENERAL EQUIPMENT MAINTENANCE

Ray-Tech Pavement Heater units are designed for minimal maintenance and long life, with the heater units, valves, pressure switches and motors all being preset and tested at the factory. **No adjustments should be needed.**

Propane Supply System

All hoses when connected should be firmly tightened and checked for leaks. You can check for gas leaks with a soap and water solution sprayed on the fittings. Equipment should NEVER be operated if there is a propane leak or if the odor of gas is present. Plastic caps should be placed on tank connectors when not in use.

Reclaimer/Hotbox

The reclaimer requires some routine maintenance to ensure it will continue to work to its full capacity. All moveable parts such as the top loading door hinges and battery compartment door hinges should be cleaned after every use. Not cleaning them could lead to asphalt buildup which

may cause stress to these parts and lead to breakage. All vents to the box should be cleaned daily as well. If vents become clogged, heat cannot properly exit the unit and this will lead to equipment damage or burning of your asphalt.

The burner compartment should be inspected often to ensure the burners are working correctly. A troubleshooting reference is included below. All wiring to and from the burners, as well as hoses for the fuel, should be checked and tightened as needed.

Cleaning of asphalt from inside the box should be done with a flat tool such as a square spade. Use of picks, iron bars and any other such implement can damage the inside walls and will actually make the process of removing asphalt harder later on by creating dips and crevices for material to get stuck in.

TROUBLESHOOTING YOUR RECLAIMER/HOTBOX

If burners do not ignite:

- Check battery to make sure there is a minimum of 12 volts. If there is not 12 volts, recharge or replace as necessary.
- Check gas tank to make sure there is gas in it, and that the valve is completely on.
- Check fuse in control box to make sure the fuse that goes to the reclaimer/hotbox is good.
- Turn the control box switch to on, the red light should come on.
- Look inside the burner door to make sure the igniters are sparking. If they are, listen for a faint click about 6 seconds after the switch is turned on, which is the gas valve opening. If the valve opens but the burner does not light, there may be air in the lines. Turn off the switch for 10 seconds and try again. Burner should light on the second or third try.
- If igniter does not spark, the gap on the electrode needs to be checked to make sure the gap is not excessive and that it is 1/16" to 1/8" from face of the burner. If there is still no spark, check all wiring to the Electronic Module (ECM) and igniter, checking for 12 volts at the red wire on the ECM. If there are no problems there you may have a bad ECM.

If burners ignite but do not stay lit:

- If more than one burner lights but does not stay lit, it is likely that there is a grounding problem with the gray control modules. Check that there is a good connection between the yellow ground wire from the control module and the chassis.
- On days when humidity is extremely high, the unit may have trouble lighting or staying lit. Enough moisture collects in the ceramic tiles of the converters to prevent proper combustion. A hair dryer may be used to dry the ceramic components. Do not use a heat gun as this may damage components.
- If the ceramic tiles become loose or cracked, or the fibrefrax become loose and worn from extended over-the-road vibration, you may experience "popping" and "crackling" indicating that the converter is not burning properly. You may also hear a roaring,

indicating that the flame is burning inside of the burner. If you experience any of these conditions, make repairs AS SOON AS POSSIBLE, or severe damage will happen to the burners.

- If the burners light but do not stay lit, it may be a gas problem or an electrical problem. In order to distinguish between the two, you will need a torch. Carefully and safely hold the torch flame on the tip of the flame sensor and turn the unit on. If the burner now stays lit, the flame sensor is not receiving enough heat from the converter. If it does not stay lit, the sensor is faulty and the igniter needs to be replaced. The flame sensor should be 1/16" from the surface of the converter. If it is not, adjust as necessary. Otherwise the problem is with the gas supply. Check all lines and connections for leaks.
- If the burners light but do not turn bright orange, the solenoid valve may not be opening completely. In this case, the solenoid valve needs to be cleaned or replaced.

If the material is cold after reclamation period:

- Check and clean all interior wall vents to insure that hot air is circulating. If vents are clear and there is still no hot air circulating, check burners.

**OPTIONAL EQUIPMENT:
TIME DELAY SYSTEM (T.D.S.) OPERATING INSTRUCTIONS**

1. Set the T.D.S. Timer to the desired hours to start reclaiming.
2. There is a T.D.S. security switch inside the battery box. Make sure you turn the security switches for the T.D.S. and both Reclaimer Heaters in the "on" position.
3. Switch the T.D.S. to the "on" position.
4. Turn both reclaim side control toggle switches to the "on" position.

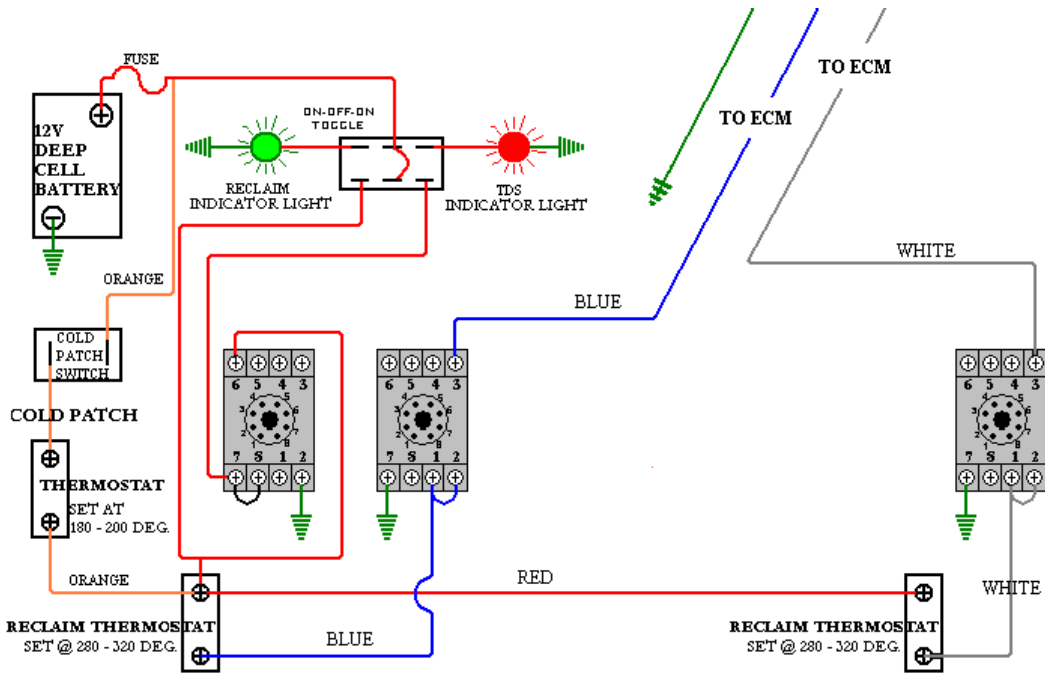
At this time the green light (T.D.S.) only will be illuminated. When the reclaiming cycle starts, the two red lights and the green light will be illuminated. This indicates that the unit is reclaiming. The T.D.S. System is not field serviceable. After reclaiming the material, the T.D.S. switch can be turned "off". The Reclaimer will continue to reclaim / hold the asphalt at the desired working temperature.

RECOMMENDED SPARE PARTS

The list below are the parts and quantity of each that we recommend you keep in stock for quick repairs on the jobsite. Ray-Tech carries most parts in stock, but depending on the time of year there may be a delay in shipping:

<u>PART#</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
50100	12 Volt Timer	2
50101	Timer Base	2
51900-72	72" Heat Sensor	2
70105-L	50,000 BTU Matting	2
70105-M	35,000 BTU Matting	2
70111	Fibrefrax (per 50 Ft Package)	2
74033	12 Volt Gas Valve	2
55102	12 Volt Electronic Control Module	2
55103	Igniter/Sensor Probe	4
55104	High Voltage Igniter Wire	4
55105	ECM Wiring harness with Plug	2

DRAWING #1

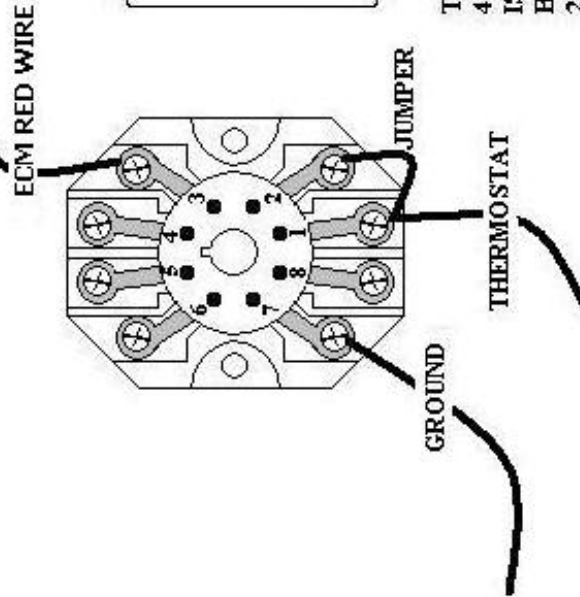


**RECLAIMER - TIMER AND THERMOSTAT WIRING
RAY-TECH INFRARED CORP.**

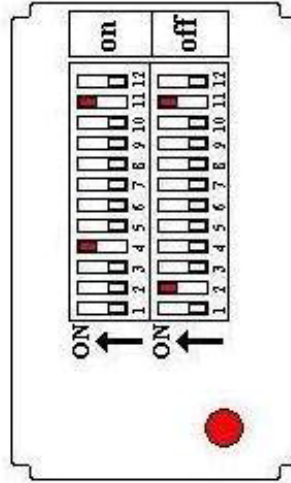
DRAWING #2

BASE WIRING

TIMER SETTING



PRESET AT RAY-TECH FOR 9 ON/3 OFF

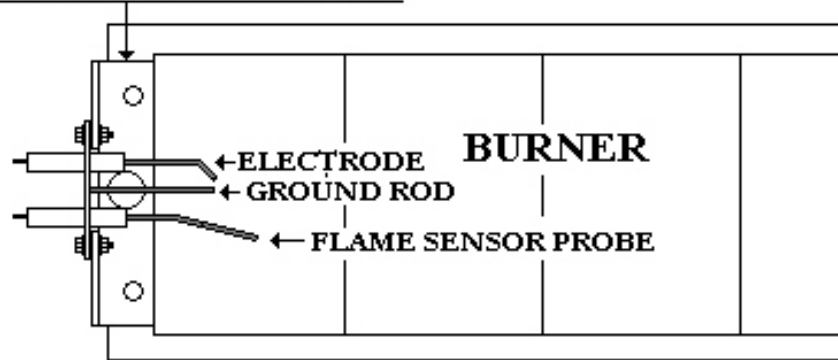


TOP ROW SET FOR 9 MINUTES ON.
 4 SLOT INDICATES 8 MINUTES AND 1 MINUTE IS FACTORY LOADED TO EQUAL 9.
 BOTTOM ROW SET FOR 3 MINUTES OFF.
 2 SLOT INDICATES 2 MINUTES AND 1 MINUTE IS FACTORY LOADED TO EQUAL 3.
 11 SLOT ON BOTH ROWS INDICATES TIMER IS WORKING IN MINUTE INTERVALS.

DRAWING #3

IGNITER/SENSOR PROBE POSITIONING

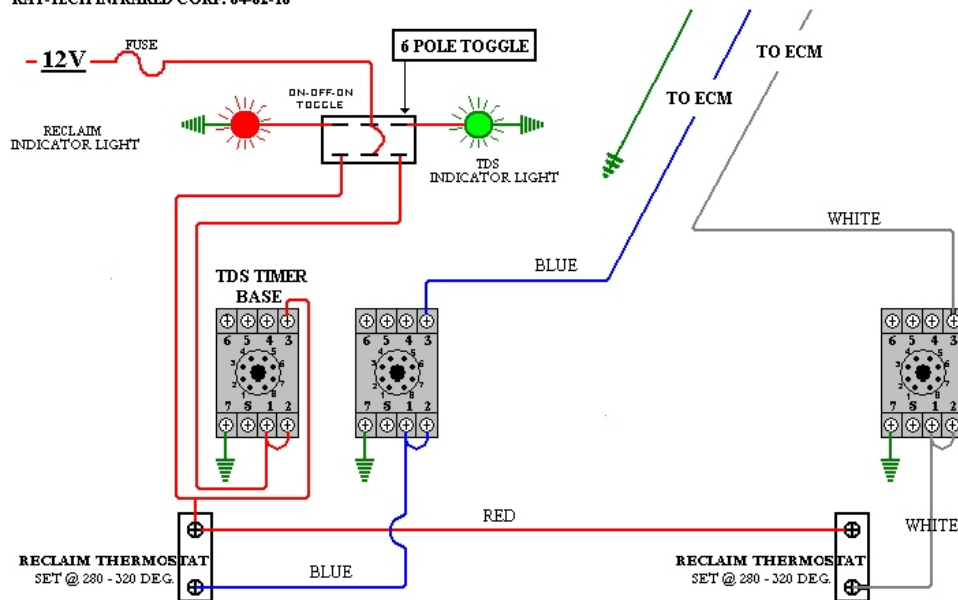
IGNITER/SENSOR PROBE BRACKET



BE SURE THE GROUND ROD IS AT THE BOTTOM WHEN ATTACHING TO BURNER.

DRAWING #4

MINI COMBO W/TDS RAY-TECH INFRARED CORP. 04-02-10



RECLAIMER - TIMER AND THERMOSTAT WIRING WITH TDS
RAY-TECH INFRARED CORP.

SAFETY PRECAUTIONS

We include this section to point out situations that may lead to accidents before, during or after the use of your equipment. The following steps may be obvious but should be followed:

- 1) Become familiar with your machine. Identify all stickers and signage and contact us for replacements if needed. Know where all controls, valves and switches are and understand what each one does before operating the machine.
- 2) Perform a daily check of your machine. It is a good idea to do a visual check of the machine before operation. Make sure tank fittings are tightened and that tanks are secured tightly if they were removed to be filled. Check that handles, valves and switches are clear of obstructions and wipe them clean of oils or greases. Remove any items that may fall off during moving or towing such as rags, gloves, tools, etc. Check for fuel, hydraulic fluid or other leaks.
- 3) Avoid fire hazards. Allow your machine to cool down before refilling the tanks. Do not have any open flames or sparks nearby when refueling. Keep flames and sparks away from batteries as they can produce gases as well. Remove trash, oily rags or other flammable materials from machine before use.
- 4) Keep safety items on hand. In the event that an accident does occur, you should have certain items nearby the machine and ready. We recommend 10+ lb type ABC or CO2 fire extinguisher, a commercial grade first aid kit (with burn packs) or separate burn packs.
- 5) Dress appropriately. We recommend long pants, long sleeve shirts, heat resistant gloves, hard soled work boots, eye protection and safety vests during operation.

FIRST AID: BURNS

In the event of an asphalt burn, cool the affected area immediately. Submerge area if possible in cool or cold water. We recommend bringing the victim to a physician or hospital soon afterward as they may require a physician's assistance with removing the asphalt from the burned area. For serious burns, proceed to a hospital or closest physician immediately. **DO NOT** attempt to remove asphalt with products containing solvents or ammonia. Natural separation will occur in 48 – 72 hours if not removed by a physician. If immediate removal is necessary, soak a bandage in mineral oil and place over the affected area for 2 – 3 hours.

AVOID EQUIPMENT DAMAGE

When working on your machine, contact Ray-Tech with any questions about voiding parts warranties or damaging the equipment. Be especially careful when working with your blower motors and batteries. **When welding, disconnect all wires from battery terminals or batteries may be rendered useless or could explode. When working on blower motors, DO NOT open the cover of the motor itself. That will immediately void the warranty – no exceptions.**

Remember:

Ray-Tech cannot control the safe use of your machine. All of our equipment is manufactured with safety of the operator in mind and we incorporate safety precautions into every component.



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Ray-Tech Infrared Equipment Warranty

Ray-Tech Infrared Corp. warrants, to the original owner, all equipment of its own manufacture to be free from defects in material and workmanship for a period of **2 years** from the date of shipment. Parts not of Ray-Tech Infrared Corp. manufacture will carry the vendor or manufacturer's standard warranty.

Concurrently, Ray-Tech Infrared Corp. warrants specific parts for periods of time other than the two year term:

- All reclaimer/storage box hoppers are warranted against burnout for **10 years**.
- All winches (mfg. by Ray-Tech Infrared Corp.) are warranted for **10 years**.
- All trailer frames (mfg. by Ray-Tech Infrared Corp.) are warranted for **5 years**.
- All heating converters (mfg. by Ray-Tech Infrared Corp.) are warranted for **5 years**.
- All inconel grids (manufactured by Ray-Tech Infrared Corp.) are warranted for **6 months**.
- All blower motors are warranted for **1 year**. Determination of repair or replacement of blower motors will be at the sole discretion of Ray-Tech, pending evaluation of maintenance and abnormal operating/environmental conditions. * When working on blower motors DO NOT open the T-box on the motor itself. That will void the warranty. *
- All batteries and tires will be **pro-rated**.
- All electrical parts carry a **limited 60 day** warranty.

During the warranty period, Ray-Tech Infrared Corp will repair or replace defective parts at its sole discretion. The seller's obligation under this warranty is limited to the above and does not apply to replacement or repairs which are required as the result of improper installation, misuse, maladjustment, abnormal operating conditions or lack of routine maintenance. Parts damaged by misuse, negligence or accidents are excluded from this warranty. This warranty does not include the furnishing of services for maintenance or any problems arising from the foregoing causes. No claims for labor or other expenses will be recognized.

All other warranties, whether express, implied or statutory (such as warranties of merchantability or fitness for a particular purpose) are hereby excluded and disclaimed to the extent that they exceed the warranties granted herein. In no event shall the seller be liable for consequential or incidental damages. No agreement extending this warranty shall be binding upon the seller unless in writing and signed by seller's duly authorized officer or representative.

To maintain this warranty, the purchaser must perform maintenance and inspections as prescribed in the routine maintenance chart on the following page. This shall include prompt replacement or repair of worn or consumable parts and other such necessary repairs as may be required, according to use of the equipment. Disassembly of parts, other than that covered in the owner's manual, may void this warranty.

Routine Maintenance Checklist

Component	Part	Action	Schedule
Heating Chamber	Vents/Louvers	Clean Out	Every Operating Day
Heating Chamber	Grids	Check For Burnouts	Every Operating Day
Heating Chamber	Grids	Watch For Hot Spots	Every Operating Day
Heating Chamber	Converters	Clean Ribbon At Hot Spots	If Hot Spots Are Found
Heating Chamber	Converters	Tighten Connections	Every 1 – 2 Weeks
Chamber Winch	Cable	Check For Breaks/Damage	Every 1 – 2 Weeks
Chamber Winch	Grease Fitting	Check/Add Grease	Every 1 – 2 Weeks
Reclaimer	Vents/Louvers	Clean Out	Every Operating Day
Reclaimer	Top Door Hinges	Clean	Every Time Box Is Filled
Reclaimer	Burners	Check Tiles/Mesh For Damage	Weekly
Reclaimer	Burners	Check For Orifice Obstructions	Weekly
Batteries	Batteries	Top Off Battery Fluid	Monthly
Batteries	Batteries	Charge	Before Every Operating Day
Batteries	Batteries	Charge	Monthly (If not being used over winter)
Propane Tanks	Tank Connections	Tighten If Necessary	Every Operating Day