

Ray-Tech Infrared Corp.

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4 Ton SR8000

Owners Manual

RAY-TECH SR8000 MANUAL

TABLE OF CONTENTS

General.....	3
Construction.....	3
Heating System.....	3
Temperature Controls.....	4
Mounting.....	4
Electrical Systems.....	4
Safety Features.....	4
Paint.....	4
Dimensions.....	4
Weight.....	5
Optional Equipment.....	5
Equipment Setup Procedure and Operation.....	5
Hotbox Procedure and Operation.....	5
General Equipment Maintenance.....	5-6
Troubleshooting Hotbox.....	6-7
Recommended Ray-Tech Spare Parts.....	7
Safety Precautions.....	11
Warranty.....	12
Routine Maintenance Checklist.....	13

ILLUSTRATIONS

Drawing # 1 – Wiring Diagram (Pg. 8)

Drawing # 2 – Rear Machine View Parts (Pg. 9)

Drawing # 3 - Igniter Positioning (Pg. 9)

Drawing # 4 – Front Machine View Parts (Pg. 10)

Drawing # 5 – Tile Replacement (Pg.10)

1. GENERAL:

Manufactured for road maintenance and patching programs. This is a self-contained four (4) ton capacity Infrared Storage Unit, designed to hold and store plant mix asphalt, at proper working temperatures, for extended periods of time. Unit is trailer mounted with two (2) shoveling doors at rear of unit, 7,000 lb. axles and electric brakes.

2. CONSTRUCTION:

- A) **Chassis:** 5" x 3½" x ⅜" angle iron, front boxed. 4" x 5.4 channel cross members. One piece wrap-around industrial grade ⅜" nose plate, with a ten (10) hole channel welded to the front for a nine (9) position adjustable tow ring, or an optional ball coupler. The entire chassis, including attaching parts, is assembled by spray-arc welding.
- B) **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, manual 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:** Manual 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. Shovel holders, of 10 gauge steel, are mounted on all doors. Access height is approximately thirty (30) inches from ground level, with a fourteen (14) inch deep shoveling rack.
- C) **Solvent Storage Tank:** Twelve (12) gallon capacity spill proof container, mounted to the trailer frame, fabricated of 12 gauge steel with bottom draw off, for cleaning rakes and shovels.

3. HEATING SYSTEM:

- A) **Energy Converters:** Two (2) 22,000 BTU infrared type ceramic 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 two (2) 100 lb. cylinders (both included), with automatic switchover valve.
- E) **Tank holders:** Heavy-duty hinged steel brackets, with lockable cover.

4. TEMPERATURE CONTROLS:

- A) Power switches, batteries and battery chargers are located behind lockable doors.
- B) Thermostats control the holding temperature automatically.
- C) Unit will hold plant mix approximately 48 hours without damage to asphalt.

5. MOUNTING:

A dual axle trailer, with each axle rated at 7,000 lbs., leaf spring tandem with steel wheels. The four (4) tires are 9.5 x 16.5 with 10 ply rating, load range E (3,170 lbs each). The unit also has electric brakes on all four (4) wheels, and the fenders are 3/16" diamond plate. In front of the unit is a heavy duty nose leveling jack, a 1⁵/₈" tow ring with 3" ID, and two (2) high tensile 3/8" safety chains, with clevis hooks.

6. ELECTRICAL SYSTEMS:

- A) Gas Controls: Electrical gas controls are 12 volts, powered by a 12 volt deep cell storage battery. Charger mounted in unit, with outlet plug for easy connection to 110 volt power supply.
- 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 (winch hood), and license plate light. Hazard lights are switch selectable, on the trailer, for *tow vehicle/on-board battery 12 VDC* activation. Indicator light for reclaiming. 7 pole RV style Cole Hersee trailer connector with adequate length of connecting wires to allow for turning, spring held to protect wires.

7. SAFETY FEATURES:

- A) Externally mounted grab handles on each corner.
- B) Electronically operated breakaway switch (w/electric brakes).
Hydraulic brakes have hydraulic breakaway switch.
- C) Lockable front doors to protect controls from tampering.
- D) Lockable propane tank valve cover.
- E) Amber reflectors - front and sides. Red reflectors – rear and sides.
- F) LED Type Safety and Hazard lights (refer to “Electrical Systems”).
- G) Safety controls (refer to “Heating system”).
- H) Rope Pulls – for ground level operation of loading doors (prevents risk of standing upon fenders to open doors).

8. PAINT:

- A) Chassis and frame – Black.
- B) Storage bin – Ray-Tech Safety Lime Green.
- C) All parts prime coated with catalyzed etching primer, followed with two (2) coats of acrylic urethane finish colors.

9. DIMENSIONS:

Length:	14' 2"
Width:	7' 3"
Width with Doors Open:	8' 8"
Height:	7' 6"
Height with Doors Open:	8' 9"

10. WEIGHT:

Weight:	3,900 lbs.
Gross Weight:	12,600 lbs. (increases w/options)

11. OPTIONAL EQUIPMENT:

- A. Compactor Platform: (with *manual* winch and swivel boom). Allows one man to load and unload compactor. Consists of ¼" x 24" x 24" platform, swing out boom and a hand winch rated at 1,500 lbs. with an automatic brake.
- B. Compactor Platform/Roller Cradle: (with *heavy-duty electric* winch and swivel boom). Same as above except heavy-duty electric winch.
- C. Surge Hydraulic Brakes: (Municipal Only)
- D. 12 Volt Lighting: To extend work period.
- E. Dumping Option

EQUIPMENT SETUP PROCEDURE AND OPERATION

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

1. The 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).

HOTBOX 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 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 hotbox has been designed to run on thermostats. The burners will light and stay lit until the preset temperature has been reached and then turn off to keep the material from overheating. The burners will re-light as heat is called for.

Periodically check the burners and tiles. Thermostats 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.

Hotbox

The hotbox 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 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:

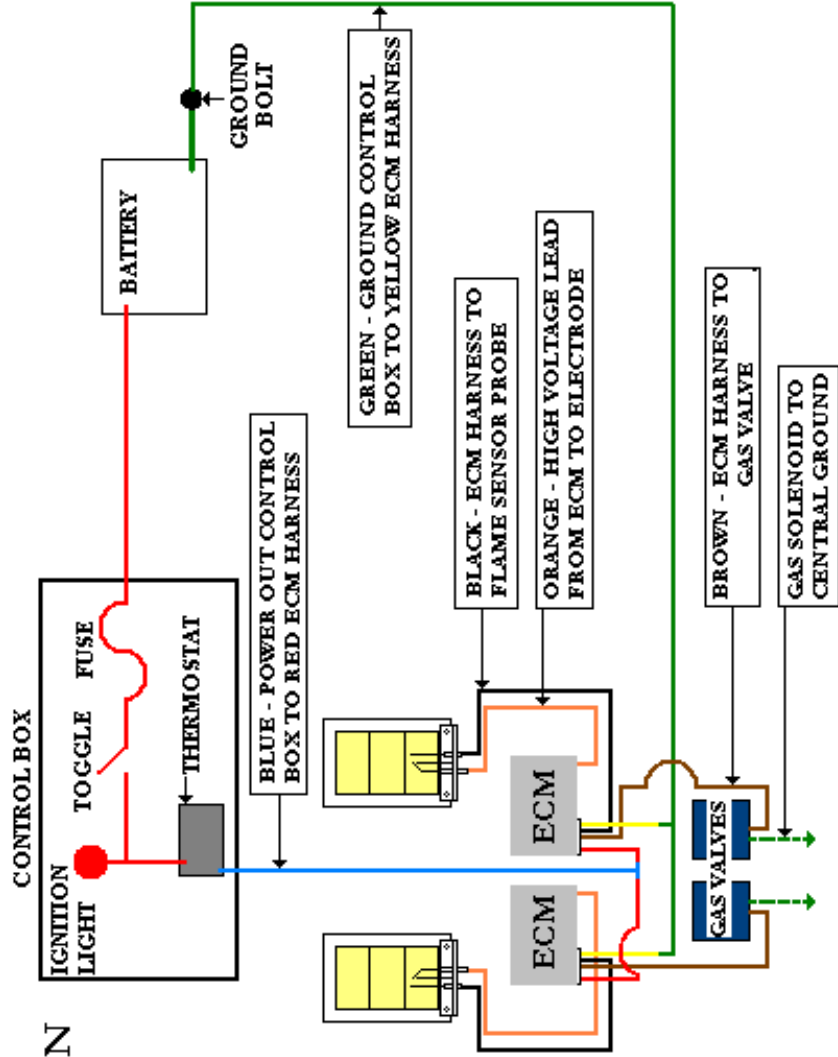
- Check and clean all interior wall vents to insure that hot air is circulating. If vents are clear and there is still no hot air circulating, check burners.

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>
51900-72	72" Heat Sensor	1
70109	22,000 BTU Ceramic Plates	3
70110	Fibrefrax (per foot)	10 Ft
70111	Fibrefrax (per 50 Ft Package)	1
74033	12 Volt Gas Valve	1
55102	12 Volt Electronic Control Module	1
55103	Igniter/Sensor Probe	1
55104	High Voltage Igniter Wire	1
55105	ECM Wiring harness with Plug	1

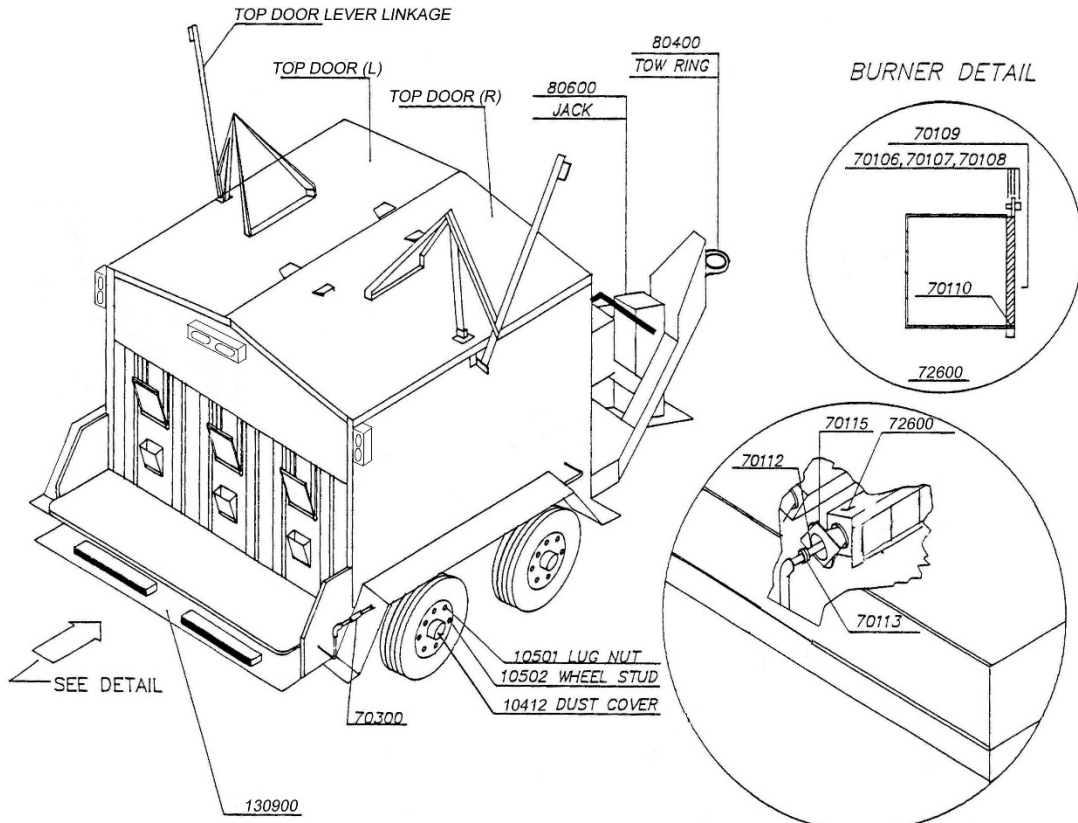
DRAWING #1



**ELECTRONIC IGNITION
WIRING DIAGRAM
RAY-TECH INFRARED CORP.
RAF 10-23-2005**

STO-RAY

DRAWING #2



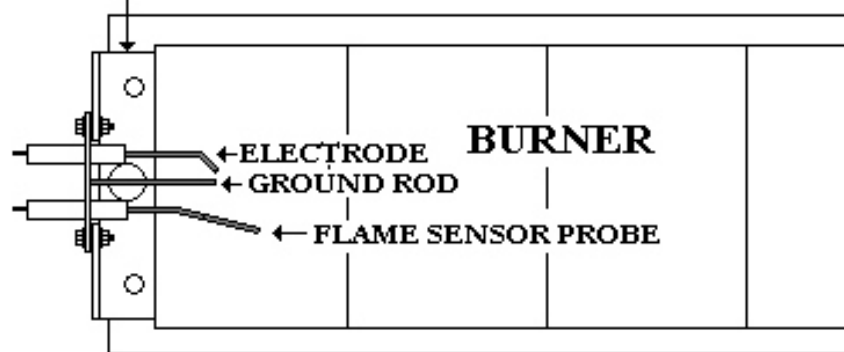
DRAWING # 2

DETAIL OF
BURNER SYSTEM

DRAWING #3

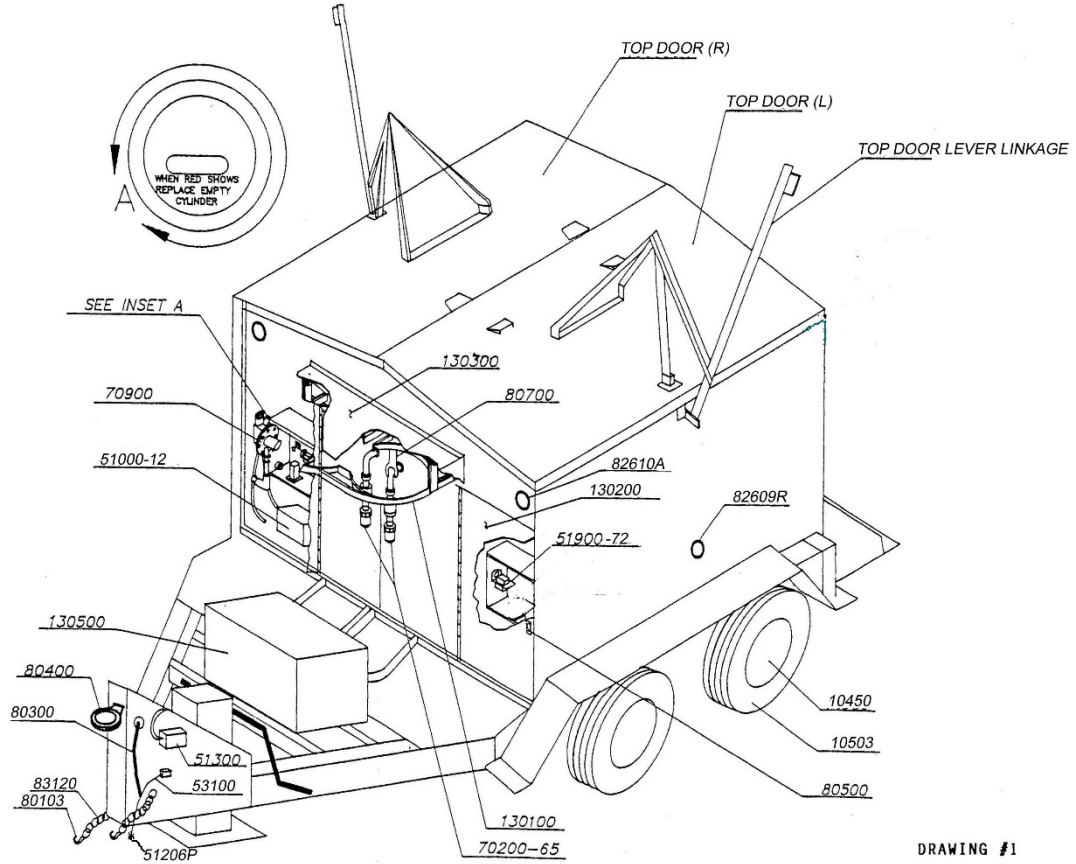
IGNITER/SENSOR PROBE POSITIONING

IGNITER/SENSOR PROBE BRACKET



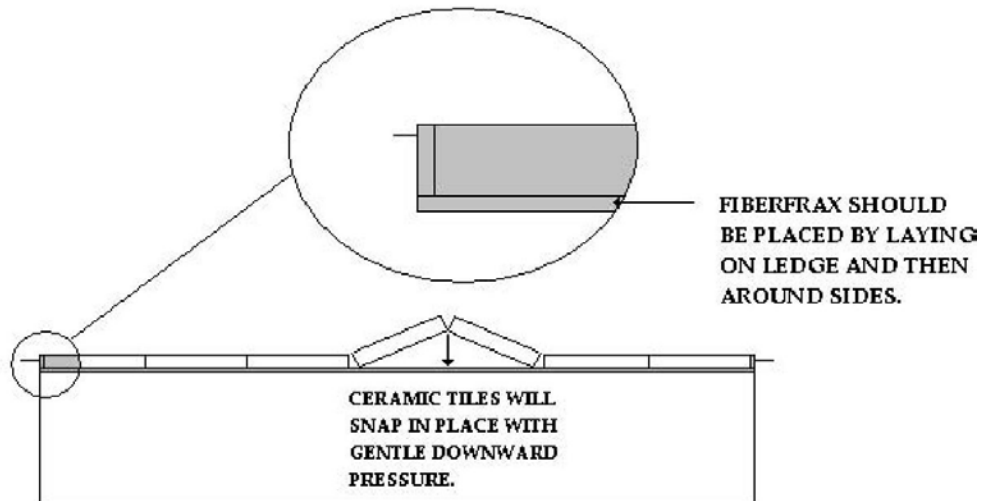
**BE SURE THE GROUND ROD IS AT THE BOTTOM
WHEN ATTACHING TO BURNER.**

DRAWING #4



DRAWING #1

DRAWING #5



TILE REPLACEMENT
RAY-TECH INFRARED CORP.
RAF 04-25-06

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