



# RAY-TECH INFRARED

## Infrared Heaters

### User Manual

The following manual will cover Ray-Tech Infrared's extensive line of walk behind, trailer mounted and truck mounted infrared heaters.

Our heaters operate on propane fuel with manual ignition. They feature all stainless steel or nickel alloy parts to hold up to the high heat produced over years of work.

All of our heaters operate with virtually the same types of components and therefore operate with the same heating results. Temperature at the heat source will reach an average of 1875°F which translates to a very effective and efficient amount of infrared light rays directed onto the asphalt surface. We guarantee our heating times at 6 to 8 minutes for a full depth and even heat across the entire patch area.

**If you have questions about your machine or troubleshooting, please contact your dealer. If there is no dealer servicing your area, contact Ray-Tech directly at the phone number or email below:**

### Ray-Tech Infrared Factory Assistance

1-800-884-2072

[sales@raytechinfrared.com](mailto:sales@raytechinfrared.com)

**Phone Hours:** Monday through Friday / 8:00 - 4:30



# COMPONENTS

This section will define the terms we use for the different components of all of our reclaimer models. Some models will include more or less of each part.

## Heating Chamber



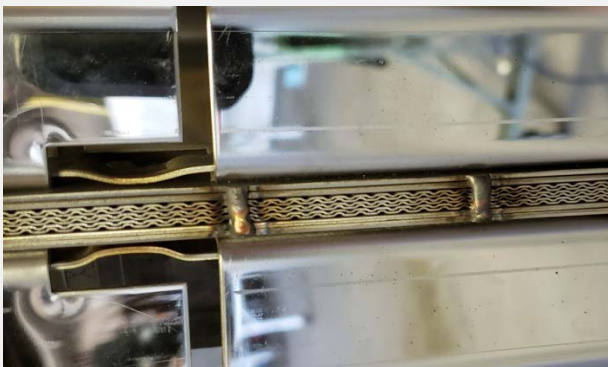
The heating chamber is the entire back portion that lowers down onto the asphalt to do the heating. The chamber contains the converters and inconel grids. Along the bottom of the chamber, there is a manifold that the gas/air mixture is pushed throughout.

## Converter



The converter consists of a stainless tube/manifold with a welded ribbon style orifice and stainless reflectors on either side. The gas/air mixture is pushed through the manifold and out through the ribbon orifice at which point it is manually ignited.

## Welded Ribbon Orifice (Close-Up)



The orifice is where the fuel comes out and where ignition will take place. During operation, you won't see the orifice as it is covered by the inconel grids.

## Inconel Grid



While the ribbon orifice strip is the source of the heat, the inconel grid is the source of the infrared light rays. The flame from the orifice heats the grids up to 1875°F and makes them glow cherry red in about 30 seconds. The grids then emit infrared light rays.



# COMPONENTS

### 24V Gas Valve



The 24V gas valve opens as soon as the blower motor switch is turned on.

### Needle Valve



The needle valve allows you to fine tune the gas flow to the blower motors. If you remove the cap (pink topped cap in picture), you will find a hex fitting inside. Turning it clockwise will close the valve and counter-clockwise will open it.

### Pressure Switch



The pressure switch senses the pressure at the chamber manifold. Once it reaches the desired pressure, it sends the signal to the 24V gas valve to allow gas to flow to the blower motors. This prevents gas flow until the blower motors are properly up to speed.

### Winch Relay



The winch relay operates the up and down function of the winch that raises and lowers the heating chamber.



# COMPONENTS

## Blower Motor & Housing



Each heater will have one or more blower motor w/ a fan and housing. Motors will be either 24 volt or 115 volt and will be either brushed or brushless. Brushed motors feature brushes and armatures while brushless do not. The blowers mix gas and air and force the mixture throughout the chamber.

## Switchover Regulator



Any reclaimer with two propane tanks will have a switchover regulator. Both tanks are hooked into the regulator and once one tank is empty, the little window on the switch will turn red. At that time, you need to turn the switch towards the full tank.

## Brushless Motor Controls



If your blower motors are brushless, they will each be wired to a control board. This control board is located inside a sealed enclosure and will control the motor speed and torque.

## Two Stage Regulator



Any reclaimer with one propane tank will have a two stage regulator. The propane tank is simply fed through this regulator without any need to do anything else with this component.



# BASIC OPERATION

Ray-Tech heaters are designed for easy and reliable operation. Below is a basic step-by-step walkthrough of any Ray-Tech heater:

## 1) PROPANE

When you get your reclaimer, the first step is to get your propane tanks filled. Most new tanks are purged at the factory, but you should let your propane company know that they are brand new just in case they need to be purged before filling. Once filled, screw in the threaded POL fittings on the gas hoses and turn the tanks on very slowly. The POL fittings have a little ball inside that prevents fast gas leaks, so turning the tanks on quickly may push that ball to plug the fitting temporarily. Finally, check for leaks by spraying a mixture of soapy water on the connections to check for bubbles.

## 2) IGNITION

Almost all of our heater models are manually ignited. First, position your chamber either upright or at a 45° angle. Next, turn on the blower motor switch (or both switches if there are two motors) and walk to the rear of the heating chamber. Finally using a handheld torch, touch the end of the torch to each row of converters. You should hear the gas ignite as you touch each row. The inconel grids will glow cherry red in roughly 30 seconds and you are ready to heat.

## 3) HEATING

Different repairs or work types may require slightly different methods of heating. The general process of heating for most repairs begins by sweeping off the repair area and lowering the chamber down. The ideal position for the chamber is typically horizontal to the ground with the bottom lip of the chamber approximately 4 to 6 inches off the asphalt surface. Let the chamber heat the asphalt for 4 to 5 minutes then check a small spot with the corner of a rake. Total heat times are usually 6 to 8 minutes for a full depth, even heat.



# BASIC OPERATION

## 4) MOVING HEATER

When you are done with a repair and you're ready to move to the next spot, simply shut off the blower motors and raise and fasten the chamber. If the next repair is just down the road/parking lot within sight, you can leave the chamber running and lit while you move the machine. Just use your own judgement to be safe!

## 5) END OF DAY CLEANUP

End of day cleanup is very easy with our heaters. Typically you will want to begin by cleaning off your tools with a scraper so they're ready for your next workday. Next, ensure all gas tanks are turned off and the chamber is in the upright and locked position. Finally, don't forget to plug in your machine for the night so it is ready and charged for the next day.

## Common Tools

The most helpful tools to have on the jobsite with a reclaimer are as follows:

- 1) Push Broom - To clean out holes to be filled.
- 2) Square Shovel - To remove asphalt from reclaimer (if applicable).
- 3) Iron Rake - To work the heated repair area.
- 4) Asphalt Lute - To level the worked repair area.
- 5) Hand Tamper - For precision compaction.
- 6) Roller / Plate Compactor - For general compaction.
- 7) Putty Knife / Scraper - To clean asphalt off tools.
- 8) Wheelbarrow - To move asphalt from reclaimer to patch (if applicable).
- 9) Handheld Torch - To light heating chamber.



# General Maintenance Schedule

The table below gives the recommended frequency of common maintenance checks that you should carry out on your machine:

Component	Action	Schedule
Vents / Louvers	Clean Out	Every Operating Day
Batteries	Charge	Every Night Before Use
Gas Connections	Check / Tighten	Every Operating Day
Inconel Grids	Check for Burnouts <small>(Cause: Worn out grids or plugged up converter orifice)</small>	Weekly
Inconel Grids	Check For Hotspots <small>(Cause: Plugged up converter orifice / Fix: Clean out entire orifice)</small>	Weekly
Converters	Tighten All Connections	Bi-Weekly
Winch Cable	Check For Damage	Bi-Weekly
Chamber Pivot Point	Grease Fitting	Bi-Weekly
Batteries	Check Fluid Level	Monthly
Batteries	Charge	Monthly <small>(if parked for extended period)</small>
Hydraulics *	Check Connections	Weekly
Hydraulics *	Check Fluid	Weekly

*\* If applicable to your machine*



# Troubleshooting

Every heater that leaves Ray-Tech is tuned in to work at peak efficiency and should need no adjustment to any of the components. Over time however, you may need to adjust or troubleshoot some operation issues. Below are some steps you should take prior to contacting your dealer or Ray-Tech:

## Blower Motor Does Not Turn On

- Check battery connections and make sure you have a minimum of 24 volts going to the motors. If below 24 volts, recharge or replace as necessary.
- With a voltage meter, trace the line from the battery bank to the blower motor to ensure the proper 24 volts is making it all the way to the motor.
- Check fuse in control box to make sure it is still good.

## Blower Motor Turns On But Chamber Does Not Light

- Check gas tank to make sure there is fuel and ensure valve is completely open.
- While holding your hand on the 24V gas valve, have someone turn the blower on. You should hear and feel a slight click as the gas valve opens. Try the same with the other motors' gas valve for comparison. If you do not feel the click on one of them, you will likely need to replace the gas valve.

## Chamber Glow Is Weak

- Check gas tank to make sure there is fuel and ensure valve is completely open.
- Check to make sure you have 24 volts to your motor. If below 24 volts, recharge your batteries.
- If none of the above, you may need to adjust your air / fuel ratio. Here are the steps to follow:
  - 1) Completely close the air intake on the blower motor housing.
  - 2) Open the air intake back up so that roughly half of the hole is showing.
  - 3) Completely close the needle valve with a hex wrench by turning it clockwise.
  - 4) Open the needle valve back up by turning it 6 1/2 turns counter clockwise.
  - 5) Try the chamber again to see if the heat has improved. You may need to play around with the air intake and needle valve to fine tune it. Sometimes altitude plays a part in this so it could vary by region. The goal is to have a solid glow without any flames extending beyond the inconel grids.





# Recommended Spare Parts

We highly recommend stocking some common replacement parts, even if you shouldn't need them for a long time. In the case that something may fail on your machine, it is best to have as little downtime as possible! Below is a table showing the recommended parts and quantity of each that you should keep on hand for each model reclaimer:

	Mini Tech Mini Fusion Mini Fusion Y	Mini Tech Xtend	Tech 20	Tech 36	Tech 48 Combos TMV's	Tech 78	Tech 108	Fusions
<b>Blower Motor *</b>	1	1	1	1	1	1	1	1
<b>Blower Motor Control</b>	1	1	1	1	1	1	1	1
<b>2 Stage Regulator</b>	1	1	1	1	1	1	1	1
<b>Pressure Switch</b>	1	1	1	1	1	2	1	1
<b>24V Gas Valve</b>	1	1	1	1	1	2	1	1
<b>15" Inconel Grid</b>	N/A	N/A	2	N/A	4	6	N/A	N/A
<b>18" Inconel Grid</b>	2	3	2	6	4	6	4	2

\* **Blower Motors:** Ray-Tech tries to keep well stocked with blower motors, but we sometimes have seasonal or unusual increases in blower sales. If we are out, it could take one or two months before receiving a new shipment. Having an extra motor on hand is **HIGHLY** recommended to prevent costly downtime in case of a failure. If you do experience motor failure, please return your motor to Ray-Tech for repair evaluation. **DO NOT** open the wiring box on motor or warranty will be voided. Contact Ray-Tech with any questions before motor returns.



# Safety Precautions

We include this section to point out situations that can lead to accidents before, during or after the use of your equipment. The following steps 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 operation of your machine.
- 2) Perform daily checks of your machine. Make sure gas and hydraulic fittings are tight and leak free. A visual check should ensure valves, switches and handles are clear of obstructions or slipping hazards. Remove any loose items that may fall off during transport. Clear any leaks or grease of any type that could cause an accident.
- 3) Avoid fire hazards. Allow your machine to cool down some before changing or refilling fuel tanks. Check for potential fire or spark sources during refilling. Keep flames and sparks away from batteries as well as they can produce a flammable gas. Remove trash, oily rags or other flammable materials from the machine before use.
- 4) Keep personal safety items on hand. We recommend a 10+ lb type ABC or CO2 fire extinguisher for all our machines. A commercial grade first aid kit with burn packs is also a good idea.
- 5) Dress appropriately. We recommend long pants, long sleeve shirts, heat resistant gloves, hard soled work boots, eye protection and safety vests during operation. If this is not possible, just be smart and be aware of any hazard points on the machine or at your worksite.

## Burns

In the event of an asphalt burn, cool the affected area immediately. Submerge area if possible in cool or cold water. We recommend visiting a physician or hospital soon afterwards as you may require assistance in removing asphalt from the burn. For serious burns, visit the nearest hospital immediately. DO NOT attempt to remove asphalt with solvent products. Natural separation will occur in 48 - 72 hours if not removed by a physician. If immediate removal is necessary, soak bandage in mineral oil and place over area for 2 - 3 hours.

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

## REMEMBER

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



# Limited Lifetime Equipment Warranty

**This warranty covers workmanship and defects of Ray-Tech Infrared manufactured products to the original owner. Owner must register equipment with Ray-Tech Infrared within 30 days of purchase. Warranty may not be transferred. This warranty excludes normal wear and tear and associated components. Failure to follow prescribed General Maintenance Schedule will void warranty.**

We warrant to the original owner that all Ray-Tech manufactured components will be free from defects in workmanship, under normal use and maintenance, for the working lifetime of the equipment.

Notwithstanding the preceding paragraphs, some components carry individual warranty periods

• Ray-Tech manufactured winches	10 Years
• Ray-Tech manufactured heating chambers	10 Years
• Ray-Tech manufactured reclaimer boxes (warranted for burnout)	10 Years
• Ray-Tech manufactured converters (in heating chamber)	5 Years
• Ray-Tech manufactured inconel grids	6 Months
• Blower motors and blower motor controls	1 Year *
• Electrical components	Limited 60 Days

*\* Pending return to Ray-Tech Infrared and evaluation by original manufacturer.*

Excluded from this warranty are all products, parts and components not manufactured by Ray-Tech Infrared as well as all normal wear and tear items and any labor costs incurred. This includes but is not

Tires / Motors / Wiring / Wiring Components / Burners / Matting / Ceramic Tiles / Fiberfrax

During this warranty period all warranty claims will be approved or disapproved at Ray-Tech Infrared's sole discretion. Ray-Tech Infrared's obligation under this warranty is limited to the above and does not apply to situations of improper installation, misuse, maladjustment, abnormal operating conditions or lack of routine maintenance. Components damaged by misuse, negligence or accidents are excluded from this

All other warranties expressed, implied or statutory are hereby excluded and disclaimed to the extent that they exceed the warranties granted herein. In no event shall Ray-Tech Infrared be liable for consequential or incidental damages. No agreement extending this warranty shall be binding upon Ray-Tech Infrared unless in writing and signed by Ray-Tech Infrared's duly authorized officers.

*This warranty applies to equipment sold to customers located in North America only.*

*This Warranty applies to all equipment purchased on or after February 4, 2019 or until a new warranty is created.*



# RAY-TECH INFRARED

## PRODUCT WARRANTY REGISTRATION

NAME

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COMPANY NAME

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PHONE

---

EMAIL

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CITY/STATE/ZIP

---

MACHINE MODEL

---

SERIAL OR VIN

---

DATE OF PURCHASE

---

WHERE YOU PURCHASED IT

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Fill out entire form and return to Ray-Tech Infrared within 30 Days of purchase. Form can be emailed or mailed to the addresses below:

**MAIL**

Ray-Tech Infrared  
Attn: Wesley Van Velsor  
PO BOX 1119  
Charlestown, NH 03603

**EMAIL**

[sales@raytechinfrared.com](mailto:sales@raytechinfrared.com)