KASI INFRARED

PATRIOT

OPERATOR'S MANUAL

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BEFORE OPERATING FOR THE FIRST TIME

THOROUGHLY REVIEW THE OWNERS' MANUAL!

GENERAL-

- Ensure that no water has accumulated in the infrared converter manifold. Do this by removing **and replacing** the ¼" plug on the manifold. Note: the manifold is the welded pipe fixture that the 2 blower motors are attached to. The drain plugs are located on the bottom of each manifold when the chamber is in the upright position.

SAFETY-

- Familiarize yourself with all the safety features.

ELECTRIC-

- Plug the unit into a 110 AC outlet for at least 12 hours to ensure that the batteries are fully charged. When plugged in, immediately check the meters on the chargers to insure charging activity.

PROPANE-

- Ensure that the tanks have been properly purged. This is a very important process and should be done by an employee from the propane company.
- Attach all POL fittings to the tanks. REMEMBER THAT GAS CONNECTIONS ARE REVERSE THREADED.
- Check each connection for leaks.

TOOLS-

- Be sure to have all necessary tools loaded on board the vehicle. The list of recommended tools is on the following page.

VISUAL INSPECTION-

- Visually inspect the entire unit checking to see that no damage was incurred, or any attachments came loose during shipment.

IMPORTANT - AFTER 20 HOURS OF OPERATION YOU MUST CHECK AND RETIGHTEN THE UNIONS JOINING THE INFRARED CONVERTERS TO THE MANIFOLD.

2

THE INFRARED PROCESS

The purpose of this presentation is to outline the step-by-step process for utilizing the **Infrared Restoration Process** for the permanent repair of asphalt pavement. The Infrared Restoration process is often more an art than a science, therefore we ask that you use this information as a rule of thumb, rather than specific instructions.

STEP 1- SETUP

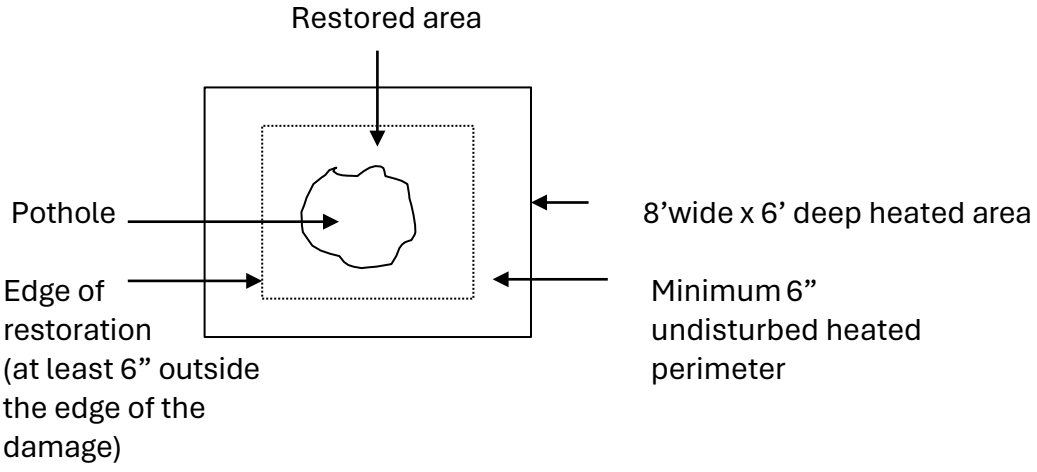
Upon arriving at the job site, the first concern should always be to ensure a safe work area. The arrow board should be activated to properly direct traffic from behind. Signs and cones should be put out in conformance with DOT recommended safety procedures. It is important to ensure that adequate room is allowed on the sides of the equipment to provide the laborers safe access to the reclaimer for asphalt and to allow the raker to work on the sides of the patch. We recommend 5 feet minimum on both sides of the equipment.

STEP 2- PREPARATION

The area must be swept clear of standing water, loose asphalt, and dirt. Any foreign material will significantly impede the infrared restoration process.

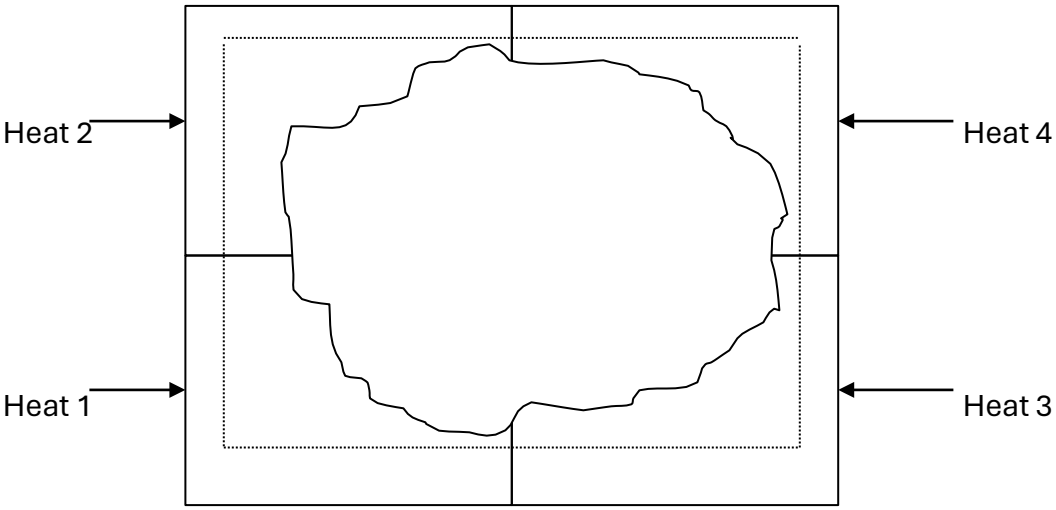
STEP 3- HEATER PLACEMENT

It is very important that the infrared chamber is properly positioned over the repair.
The area to be restored must be squared off insuring that all the edges are at least 6" away from the damage. It is important that an additional 6" perimeter of the heated surface is left undisturbed. This will ensure that when the repair is rolled that the hot asphalt in the restored area is fused to the hot existing road, thereby eliminating any seam.



IF THE DAMAGED AREA IS SO LARGE THAT IT CANNOT BE CONTAINED IN THE 8' X 6' HEATED AREA, CONSECUTIVE HEATS CAN BE USED TO RESTORE THE AREA.

MULTIPLE HIT HEATING PATTERN FOR A LARGE REPAIR



STEP 4- HEATING TIME

As a general rule, it will take 5-7 minutes for your Kasi Infrared heater to heat the asphalt pavement to 325 degrees, softening it to a depth of 2 inches in 60-degree ambient weather.

There are three major variables that impact the time it takes for infrared radiation to properly heat asphalt. They are the 3 M's. MATERIAL, MOISTURE, & MOTHER NATURE.

- MATERIAL. Not all asphalt is the same. Many factors affect the quality of the asphalt being worked with.

1. What was the mix design when the asphalt was originally batched?
2. How old is the asphalt? The age of the asphalt affects what percentage of the "maltenes" (light oils) has oxidized out. The dryer the material, the longer it takes to heat.
3. What size aggregate is in the material? The larger the stone the longer it takes to heat. ¾ inch binder mix can take as much as 2-3 minutes longer to soften than ¼ inch top.
4. What is the color of the asphalt? Because infrared rays must be absorbed into the asphalt, the lighter the color the longer it takes to heat. (The same way a black car gets hotter than a white car in the summer sun).

- MOISTURE. Infrared should not be used to rid an area of standing water. It will, however, remove moisture from wet pavement. Depending on how porous the asphalt is will determine how much moisture is in the pavement. The amount of moisture in the pavement will determine how much additional time it takes to properly heat.

- MOTHER NATURE. The combination of temperature and wind effect both the heating time and the amount of time you will have to work with the asphalt once heated. Obviously, it will take longer to heat the asphalt to 325 degrees if the outside temperature is 30 degrees versus 60 degrees. Also, once the infrared heater is removed from the patch the wind and the temperature will influence how much time the crew has to complete the repair. They will need to have sufficient time to rake, rejuvenate, add material, lute & roll the patch before it cools off. As a rule of thumb, the temperature with the wind chill factor can be no lower than 20 degrees for the infrared restoration process to work.

It is extremely important that pavement is heated for the proper length of time. If the heater is not on long enough, the asphalt will not be softened deep enough to insure a proper repair. If the heater is down too long, then the asphalt could burn which will ruin it. Please note that simply removing the ruined asphalt will not correct the problem. Remember that in order to ensure a seamless restoration it is necessary to leave at least 6 inches of heated asphalt undisturbed. If that asphalt is burned, then the seam will fail.

STEP 5- SCARIFYING

Once the heater is removed the damaged area must be squared off and scarified. To square it off take the back edge of a steel asphalt rake and cut into the asphalt. Push that material into the center of the repair. Once the outside edge is set turn the rake over and deeply scarify the entire area. At least 1-½ inches of asphalt should be disturbed. Leave the area roughly level with a slight trough at the edges.

STEP 6- REJUVINATING

Age and sunlight cause a percentage of the light oils present in new asphalt to oxidize out over time. We recommend that a small amount of “maltenes” rejuvenator be applied to the existing asphalt at this time. This is not acting as a tack coat. It is simply replacing exactly what was originally there.

Using a good quality commercial hand sprayer, apply a light coat of the rejuvenator over the entire area, including the edges. The rejuvenator we recommend is Cyclogen LE and is available through Kasi Infrared in 55-gallon drums. The Cyclogen should be mixed 1:1 with water.

STEP 7- ADDING NEW ASPHALT & FINISH RAKING

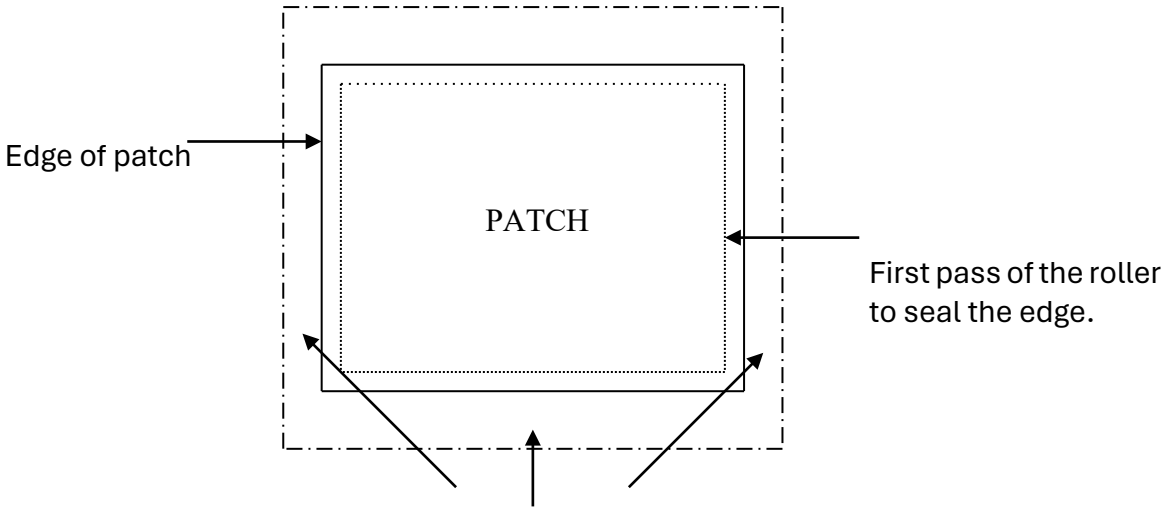
To ensure proper grade and a level patch, new material will need to be added to the repair. You will want to ensure that the restoration closely matches the surface texture of the restoration is determined by several things. First, what type of material is the original surface and what type of new material is being added. You would not want to add 3/8” top mix to a surface made up of overlay sand mix. Second, the “lute man’s” raking skills. All handwork requires special effort to ensure that the material is not segregated with all the stone on top.
Third, compaction, which we will talk about later.

The raker determines how much asphalt is needed and the material is then wheel barrowed from the reclaimer to the patch. The virgin asphalt is raked evenly throughout the patch being sure to pull this new material into the trough created around the edges. The entire patch is then lured smooth and level.

STEP 8- COMPACTION

The asphalt is now ready to be compacted. We strongly recommend that a roller be used in lieu of a plate compactor. Because the infrared restoration process only disturbs 2-3 inches of compaction it is not necessary to use a large ride on roller for this process. However, it is important to have sufficient total applied force to insure proper compaction. There are a number of quality single drum, vibratory walk behind rollers which do an excellent job. We recommend that a total of at least 2,000 lbs. per square inch applied force be used.

As soon as the raking is finished begin rolling immediately. The rolling pattern should always begin with the edges. This is to seal the seam between the repair and the existing pavement. Use approximately 2 inches of the drum to pinch the new asphalt to the existing road. After the edges are sealed the remainder of the patch is rolled.



STEP 9 - FINISH

After the rolling is completed, we recommend that the patch be lightly dusted with stone dust or some other fine material. This removes any residual tackiness and allows the repair to immediately accept traffic.

Sweep up any mess, pack up the truck, remove the traffic protection, and you're finished.

COLD WEATHER APPLICATION

After initial heating, edging, scarifying and rejuvenating the chamber must be applied for 1-2 minutes to re-heat the cooled surface. Fresh mix is then added and luted to compaction grade. If the surface has again cooled, and additional re-heat of 1 minute should be applied prior to compaction. (Make certain anti-freeze has been added to roller water in sub-freezing temperatures and the rejuvenator has been kept warm.)

RECOMMENDED HAND TOOLS FOR INFRARED REPAIR

- 30" X 7' LUTE
- STEEL ASPHALT RAKE
- TWO SHOVELS (1-LONG HANDLE / 1-ASPHALT)
- TAMPER (LIFETIME PLASTIC HANDLES)
- TRAFFIC CONES (TWENTY 18” CONES)
- WIRE BROOM
- WHEELBARROW (CONTRACTOR TYPE)
- PAINT SCRAPPER
- MEASURING WHEEL
- SPRAY PAINT MARKING TOOL (W/ 2 CANS MARKING PAINT)
- 25' TAPE MEASURE
- CHALK LINE W/ 5 LBS. CHALK
- SELF IGNITING HAND TORCH
- INDUSTRIAL SPRAYER 3.5 GAL
- ASPHALT REJUVINATOR

3

OPERATING INSTRUCTIONS

RECLAIMER:

1. Ensure that all tanks are properly filled and open.
2. Be sure that the master disconnect switch (located on the roadside of platform) and the truck charge switch (located on the curbside of platform) are in the **ON** position.
3. Enter the Reclaimer Screen, then turn on the reclaimer one side at a time. Once activated, the internal operating sequence for the electronic ignition system is as follows:

- The surface igniter glows for 7 seconds.
- The gas solenoid opens (an audible click is heard) and stays open for 7 seconds.
- The surface igniter turns off and senses for heat created by the properly functioning heater.
- If flame is sensed, the gas solenoid remains open, and the system stays on.
- If NO flame is sensed, the controller instantly closes the solenoid and shuts down the system.
- The system must be restarted manually by turning the switch off and then on again. If the flame is lost during normal operation, it automatically attempts to restart the system:
- The surface igniter senses the loss of flame.
- The controller shuts off the gas solenoid.
- The surface igniter is turned on and glows for 7 seconds.
- The gas solenoid is opened for 7 seconds.
- If flame is sensed, the gas solenoid remains open, and the system stays on.
- If NO flame is sensed, the controller instantly closes the solenoid and shuts down the system.

4. When starting the system for the first time, or after changing tanks, the system may require 1 or 2 manual restart attempts before the system is purged of air.
5. Once the system is activated, it requires no other action.

Note: When reclaiming asphalt, both sides of the reclaimer must be operating. In warm weather, when maintaining asphalt in only one side of the reclaimer, you can shut down the system on the empty side.

PAVEMENT HEATER:

1. Ensure that all propane tanks are filled and open.
2. Be sure that the master disconnect switch (located on the roadside of platform) and the truck charge switch (located on the curbside of platform) are in the **ON** position.
3. Use elevator lever to lift chamber off locking lugs, once clear, use tilt lever to tilt the chamber approximately ½ way. Serious damage may occur if the chamber is not clear off locking lugs. Enter the blower screen and turn on both blowers.
4. Enter the blower control screen and activate both blowers.
5. Using a small hand torch, light each converter.

NEVER STAND DIRECTLY BELOW THE CHAMBER.

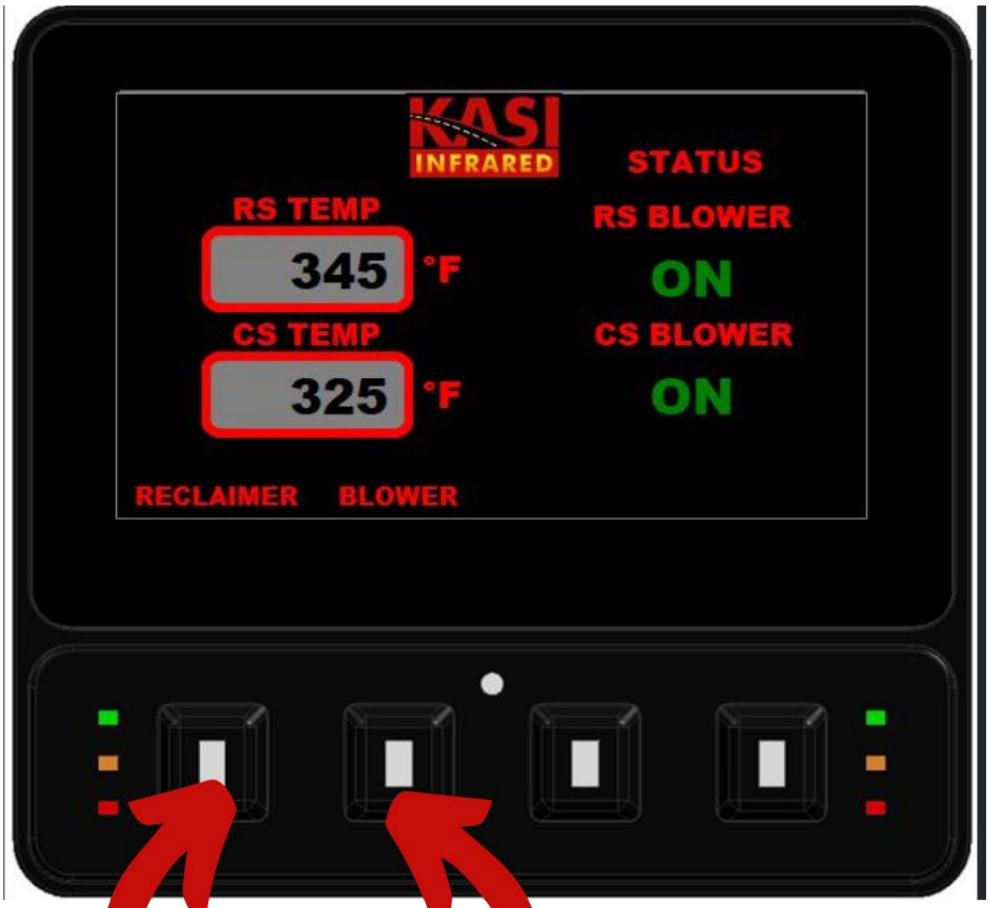
6. Observe that all 8 converters are lit and beginning to glow red (emitting infrared).
7. Lower the chamber over the asphalt.

SHUTTING DOWN THE HEATER:

1. Enter the blower screen and turn off both blowers.
2. Raise the chamber using elevator lever.
3. Tilt up chamber using tilt lever. Be sure locking lugs clear locking posts when nearing vertical position.
4. Use elevator lever to lower chamber into locked resting position.

Note: If making numerous heats in one location the pavement heater may be left on while moving the unit. However, when moving to a new location the heater must be shut off and properly stowed.

EZ-OP COMPUTER CONTROLS:



PUSH TO ENTER RECLAIMER SCREEN

PUSH TO ENTER BLOWER SCREEN

PUSH TO ACTIVATE RECLAIMER ROADSIDE BURNER

PUSH TO ACTIVATE RECLAIMER CURBSIDE BURNER

PUSH TO ENTER RECLAIMER SETTINGS MENU

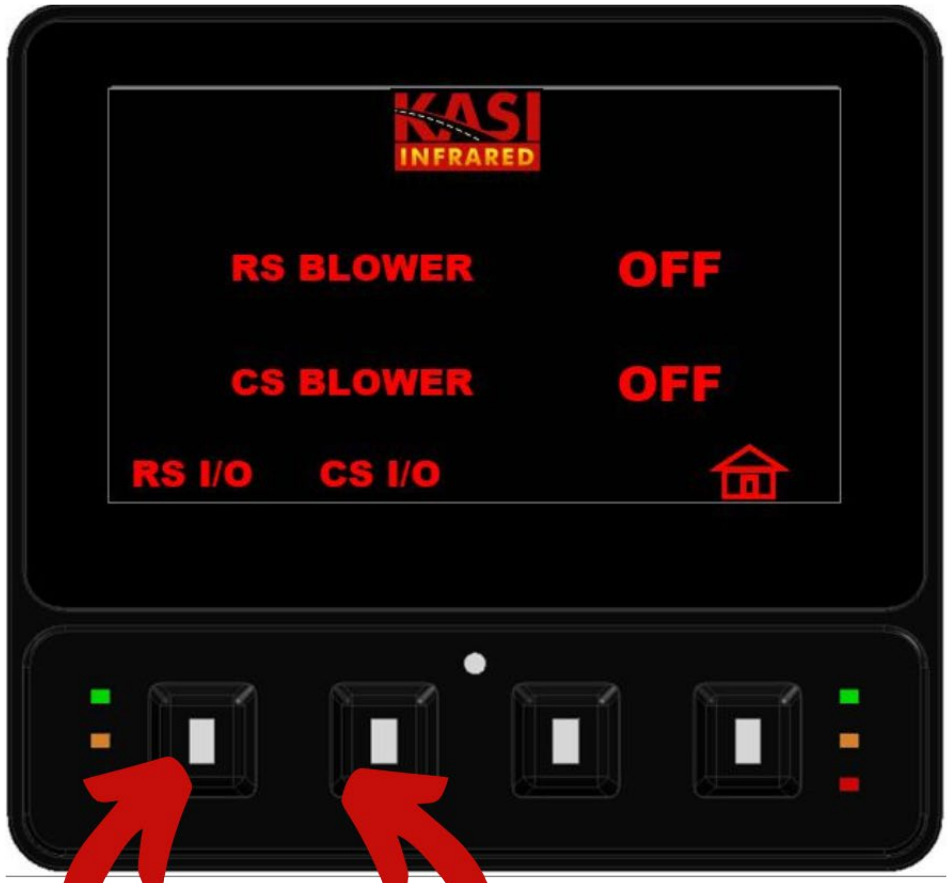
PUSH TO RETURN TO MAIN SCREEN

PUSH TO CYCLE THROUGH OPTIONS (YELLOW HIGHLIGHT)

PUSH TO INCREASE VALUE

PUSH TO DECREASE VALUE

PUSH TO RETURN TO RECLAIMER SCREEN



PUSH TO TURN ON ROADSIDE BLOWER

PUSH TO TURN ON CURBSIDE BLOWER

TROUBLESHOOTING:

WHEN I TURN ON THE BLOWER SWITCH NOTHING HAPPENS.

- Check for presence of electrical power.
- Ensure that the water level of the batteries is OK.
- Ensure the battery charger is operating properly and that the batteries are fully charged.
- Check all connections on the batteries to be sure none came loose or that corrosion is impeding the electrical flow.
- Check and see that there is 12VDC power at the power side of the fuse block.
- Check to see that the circuit breaker is functioning. Is there 12VDC power on the output side of the fuse block for the blower motor? Ensure that there is 12VDC at the blower motor.
- Turn the switch on and place your hand onto the blower motor to determine if it is heating up, which would indicate that the blower is obstructed and not allowed to spin. In the unlikely event that it is obstructed the blower motor will need to be disassembled and the problem corrected.

THE BLOWER MOTOR SPINS WHEN THE SWITCH IS TURNED ON, HOWEVER NO GAS IS COMING OUT.

- Check to make sure that the propane tanks have fuel in them, are open and that the excess flow check valves are not engaged.
- As you turn on the blower motor listen inside the blower motor box for the click that indicates that the gas solenoid valve has opened. If the gas valve is not opening, blower motor speed threshold has not been met and/or voltage is too low.

THE CONVERTERS ARE VERY DIFFICULT TO LIGHT.

- If it is windy out, the wind may be immediately blowing out the flame. To overcome that, try holding the torch in one area of the grid for up to 15-20 seconds. By doing that you will be heating up the converter and letting the flame take hold. Otherwise, you can lower the chamber closer to the ground to help minimize the effects of the wind.

NEVER STAND UNDER A PARTIALLY LOWER CHAMBER.

- Ensure that the batteries are charged. If the batteries are nearing full discharge, they will not put out the voltage required to spin the blowers properly. You should be able to notice the difference by the sound of the motors. You can also check the voltage at the blower motors or on the screen to insure at least 12VDC.
- Sometimes driving rain or cleaning of the converters will cause water to build up in the manifold (The blower motor attaches to the manifold). Water in the manifold interferes with the flow of the gas/air mixture. With the chamber in the upright position, you will observe a small drain plug on the part of the manifold. Using a 7mm open-end wrench remove the plug and allow the water, if any, to drain. Replace the plug and try again to light the converters. (Never place the plug down. Hold it in your hand so that you cannot forget to replace it)

4

LOADING THE RECLAIMER

VIRGIN MATERIAL

When the upper doors are opened, they form a chute that is more than adequate for loading at the asphalt plant. We caution you however to take care to properly align the re-claimer directly under the plant. A small alignment problem does not really matter for a 20-ton dump truck, however it could create quite a mess around the reclaimer.
After loading the reclaimer, pull off to a quiet spot to clean any asphalt off the hinge plate. Asphalt build-up there could ultimately damage the doors. Although not critical, it also makes sense to knock down the pile to level out the load inside the box. This increases heating efficiency.

Because it is heated, the lining of the reclaimer does not need to be sprayed with a release agent before loading. The unit should be turned on after being loaded, however, it will not harm the machine or the material if it is turned on shortly before loading. The ideal plant mix temperature is between 275-325 degrees F. If the plant is batching material at higher temperatures, we suggest allowing some time for the asphalt to cool before turning on the unit.

Please note that when asphalt is batched at temperatures above 325 degrees the maximum holding time is shortened. It is important that you know, especially during the winter months, what temperature the plant is batching at.

STOCKPILED MATERIAL

The material discharged from the reclaimer is only as good as the material put into it. Care must be taken to ensure that only clean asphalt is loaded into the reclaimer. This means that if you are using previously excavated asphalt, all dirt and other foreign material must be cleaned from the asphalt. If your stockpile consists of only virgin mix that has been allowed to cool, dirt typically is not a problem.
Whichever material is used, it must be carefully bucket loaded into the unit. As with virgin material, be sure to clean off the hinge plate. When reclaiming, it is important to load the reclaimer as full as possible. The material on the top helps to collapse the bottom material as it heats up. This helps the reclaiming process. The reclaiming

process will take up to 14 hours, therefore be sure to schedule this operation the day before the material will be needed.
Whether using plant mix or stockpiled material we recommend that the reclaimer be thoroughly cleaned out when emptied.

MILLINGS

We do not recommend using millings in the reclaimer. As we said earlier, the material out of the unit is only as good as the material put in. Millings are extremely dirty. The milling process cuts the aggregate and that leaves many uncoated surfaces. In addition, there is a tremendous amount of dust created and the diameters and percentages of coarse and fine aggregates are not a standard mix design any longer. All this combines to make a very poor patching material.

5

THE GAS SYSTEM

The Kasi Patriot contains one gas system with fuel supplied by common manifolds and regulators.

FUEL SUPPLY: Five 100-pound vapor draw propane cylinders supply the fuel for this unit. The tanks are connected to common manifolds with hand tightening, soft nose, excess flow check POL. These terms are explained as follows:

The soft nose designation means that there is an O-ring on the tip. This O-ring acts as a seal to inhibit gas from leaking. It is always good practice to quickly open and close each valve before connecting the tank to the unit. This action will blow out any dirt in the valve and prevent it from entering the gas system. If after tightening the POL you notice a gas leak, you will need to change the O-ring.

The hand-tightening feature eliminates the need for using as wrench to tighten the POLs to the tank. Remember that gas fittings are *reverse* threaded therefore you turn them counterclockwise to tighten them.

The excess flow check feature prevents gas from continuing to escape if a gas hose is cut or damaged. This device, inside the POL fitting, senses any significant change in gas flow and shuts off the gas. Because of this feature it is important to open the valves slowly when connecting to the unit. If the valves are open too quickly you will hear a slight click, which means that the flow check has shut the gas off. If the flow check engages, normally you can just shut the gas off and reopen the valve slowly to reset the flow check.

RECLAIMER SYSTEM: This is a single, naturally aspirated, gas system.

Gas flows from the regulator to each of the 2-reclaimer heaters. A gas solenoid controls the flow of gas to the burners. The solenoid is operated automatically by the electronic ignition control module (Brain box). After passing through the solenoid the gas goes directly to the burner with it is naturally mixed with the air needed for combustion.
The amount of fuel consumed by the reclaimer will depend on whether the reclaimer is being used to reclaim cold asphalt or simply maintain hot plant mix.

Typical consumption is about 8-20 gallons per day depending on the size of the re-claimer. This assumes 24-hour operation.

INFRARED HEATER:

To precisely control the infrared heat over the entire 48 square foot heater it is necessary to artificially combine the gas and air mixture. This is accomplished in the following manner:
After leaving the regulator the gas flows into a gas orifice where the exact amount of propane to be consumed is preset at the factory.
From the orifice the gas flows through a solenoid. The solenoid is in a naturally closed position until the controller senses sufficient blower rpm, indicating that the blower is operating. Once the blower is operating, the solenoid moves to the open position allowing the gas to flow.
From there the gas flows to the blowers. At the blowers, the gas is mixed with the precise amount of air needed (preset at the factory) for proper combustion.
From that point the gas/air mixture is propelled to the converters, exiting out the orifices, where the mixture is ignited.
The orifice is covered by an inconnel grid, which then creates infrared rays.

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THE ELECTRICAL SYSTEM

OPERATION:

The main power switch is on the platform rail on the roadside side of the truck. Power from truck to platform switch is on curbside platform rail. Both should be on during operation.
The screen controls the power to the blower motors. Turning the blower switch buttons to the on position will send power to the blower motor and the gas solenoid. Turning on the reclaimer burner switches on the screen sends power to the thermostats and operates the burners.

MAINTENANCE:

Check battery water level monthly. Visual inspection to ensure connections are clean and secure.

BATTERY CHARGING:

After each days operation be sure to plug the unit into a 110-v extension cord. The charging inlet is on the roadside wall of platform.
Charger operation is as follows:

Red Light – Indicates that the charger is in charge mode.

Blinking Red - Indicates a fault in battery or charger.

Solid Green- Indicates that the battery is fully charged.

Since we utilize a battery maintainer this unit can be left plugged in for extended periods without damaging the battery.

DAILY PROCEDURE FOR CHARGING BATTERIES:

Step 1: Turn off master kill switch. It is imperative that no draw be on the batteries for the charger to start charge mode.
Step 2: Plug in AC power cord to outlet on roadside of machine. It may take up to 30 seconds for the charger to diagnose batteries and go into charge mode.
Step 3: Leave charger plugged in and charging until green charger light comes on. Generally, an overnight charge is the best method. It will not hurt or damage batteries to leave charger on overnight.

7

IMPORTANT REMINDERS FOR OPERATIONS

1. **CHAMBER LEVELING/HEIGHT CONTROL:**

   THE CHAMBER RAISE/LOWER VALVE BODY MUST BE PLACED IN NEUTRAL POSITION RELIEVING THE HYDRAULIC PRESSURE ON THE TWO CHAMBER RAISE/LOWER CYLINDERS BEFORE OPERATING.
   FAILURE TO DO SO WILL RESULT IN DAMAGE TO THE HYDRAULIC HEIGHT ADJUSTMENT MECHANISM.

2. **CHAMBER POSITION ON INCLINES:**

   THE CHAMBER MUST ALWAYS BE UPHILL FROM THE TRUCK WHEN ON AN INCLINE. FAILURE TO DO SO WILL CAUSE THE BLOWER MOTORS TO REACH THEIR THERMAL CUTOUT TEMPERATURE AND SHUT DOWN.

3. **LPG TANK POL VALVES:**

   WHEN OPENING THE LPG TANKS CARE MUST BE TAKEN TO JUST GENTLY CRACK EACH TANK VALVE BEFORE FULLY OPENING THEM. SHOULD THE POL VALVES TRIGGER THE TANKS MUST BE SHUT OFF AND PRESSURE RELIEVED FROM THE SYSTEM BY BRIEFLY TURNING THE MOTOR SWITCHES ON AND OFF AND THE TANK OPENING PROCESS REPEATED.

4. **BATTERY CHARGING:**

   BATTERY CHARGER/MAINTAINER MUST BE PLUGGED IN NIGHTLY DURING PERIODS OF DAILY OPERATION TO ENSURE THE BATTERIES STAY FULLY CHARGED.

   WHEN THE UNIT IS NOT IN DAILY OPERATION THE CHARGER/MAINTAINER SHOULD BE PLUGGED IN WHEN NOT IN USE.

5. **HYDRAULIC PTO:**
   PTO SWITCH IN THE CAB MUST BE IN THE OFF POSITION FOR ROAD TRAVEL. SEVERE DAMAGE WILL OCCUR TO THE PTO PUMP IF LEFT ON WHILE DRIVING AT HIGHWAY SPEEDS.

6. **BLOWER MOTORS:**
   CLEAN INTAKES AND IMPELLERS ONCE A MONTH TO REMOVE BUILD UP.

7. **INCONEL GRIDS:**
   WIRE BRUSH ONCE A MONTH TO KEEP INFRARED PRODUCTION AT OPTIMUM.

8. **INFRARED CONVERTER UNIONS:**
   FOR THE FIRST MONTH OF OPERATION THE UNIONS MUST BE TIGHTENED ONCE OR TWICE A WEEK AS SETTLE IN.

9. **MANIFOLD DRAINS:**
   WHEN THE INFRAREED CHAMBER IS UP DURING RAINSTORMS, WATER CAN GAIN ENTRY THROUGH THE CONVERTERS. AFTER A RAINSTORM OPEN THE TWO MANIFOLD DRAINS AND TURN THE BLOWER MOTORS ON FOR 45 SECONDS TO EXPEL ANY MOISTURE. (WITH THE LPG TANKS OFF)

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MAINTENANCE SCHEDULE

		DAILY		WEEKLY		MONTHLY		QUARTERLY		6 MONTHS		YEARLY	
TRUCK													
U-BOLTS	CHECK FOR TIGHTNESS									x			
LIGHTS	CHECK FOR OPERATION	x											
FLUID LEVELS	CHECK	x											
TIRE PRESSURE	CHECK			x									
HOUSEKEEPING													
CLEAN ASPHALT FROM SURFACES		x											
CLEAN HAND TOOLS		x											
TOP OFF LPG TANKS		x											
FILL WATER TANK		x											
INCONEL GRIDS	WIRE BRUSH, INSPECT FOR WEAR					x							
ELECTRIC													
CHARGE BATTERIES		x											
CHARGER OPERATION	CHECK	x											
BATTERY WATER	TOP OFF	x											
BLOWER MOTOR INTAKE/IMPELLORS	CLEAN					x							
BATTERY TERMINALS	CHECK, CLEAN, TIGHTEN IF NEEDED					x							
GAS SYSTEM													
GENERAL	CHECK FOR LEAKS	x											
HOSES & FITTINGS	CHECK & REPLACE IF NEEDED											x	
O-RINGS	REPLACE											x	
RE-CLAIMER													
HINGES & TOP LOADING DOORS	CHECK & CLEAN	x											
HYDRAULICS													
HOSES & CONNECTIONS	~~CHECK~~ FOR ABRASIONS, TIGHTEN			x									
	INSPECT, REPLACE IF NEEDED							x					
FLUID LEVEL	CHECK & ADD IF NEEDED	x											
FLUID & FILTER	CHANGE											x	
CYLINDERS	INSPECT FOR LEAKS OR DAMAGE	x											
VALVES	CHECK FOR PROPER OPERATION	x											
PIVOT POINTS	CHECK FOR WEAR			x									
PINS & BUSHINGS	GREASE							x					
INSPECTION DATE:	NOTES:												
COPY THIS PAGE FOR INSPECTIONS													

Kasi Infrared Warranty Card

THIS CARD MUST BE READ, SIGNED AND RETURNED TO KASI INFRARED TO VALIDATE WARRANTY

All Kasi Infrared equipment is built to exact specifications in manufacturing and rigidly inspected before leaving our factory. It is warranted to be free from defects in material and workmanship under normal use and service for a period of twelve months from the date of purchase. KASI INFRARED's obligation is limited to repairing or replacing, F.O.B. Hickman, California U.S.A., any part of a Patriot which to KASI INFRARED's examination discloses to be thus defective. Therefore no compensation for transportation costs of any kind will be allowed. This warranty is in lieu of all other warranties, expressed or implied. This warranty shall not apply to defects resulting from accidents, alterations, or misuse. If in the opinion of KASI INFRARED's personnel, modifications, changes or additions made outside our factory have affected the operations of the equipment to render it faulty, this warranty shall be void. This warranty shall also be void if any parts not of KASI INFRARED's manufacturing have been incorporated, or if repairs are made without the authorization of KASI INFRARED. This warranty will also be void if the unit has been tampered with or opened without KASI INFRARED approval prior to commissioning. This warranty gives the Purchaser specific legal rights and Purchaser may have other rights which may vary from country to country. No warranty is made by KASI INFRARED with respect to engines, trade accessories or other items manufactured by others. Such engines, trade accessories and other items are sold subject to the warranties of their respective manufacturers, if any. Purchaser will have first purchaser warranty rights. With respect to equipment, materials, parts and accessories manufactured by others, KASI INFRARED will undertake to obtain for the Purchaser the full benefit of the manufacturer's warranties. KASI INFRARED will not be liable for any consequential damages, loss, or expense arising in connection with the sale, resale, use of, or inability to use its goods for any purpose whatsoever and KASI INFRARED's maximum liability shall not in any case, exceed the price of the goods claimed to be defective. KASI INFRARED will not be liable for the infringement of any patent by the Purchaser's use of any material delivered hereunder.

To start your warranty fill out the following and return to:
KASI INFRARED
P.O. Box 178
Hickman, CA 95323 USA

Model Number	Serial Number	Shipping Date	Date Received
Company Name			
Address where equipment is installed			
City	State or Province	Postal Code	Country
Mailing Address			
City	State or Province	Postal Code	Country
Signature of Authorized Representative		Print Name and Position Here	