



Heating Bitumen in Transport Trailers



Operation



Maintenance



Safety



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M-304-13

Heating Bitumen in Transport Trailers

March 2013

HOW TO ORDER PARTS

To assure prompt delivery when ordering parts, please furnish the following information: **1)** Complete name and address of consignee. **2)** Method of shipment preferred. **3)** Is shipment to be prepaid or collect? **4)** Serial numbers of units to which parts apply. **5)** Complete part numbers and descriptions. **6)** Any special instructions. Part numbers beginning with 9250000 are category numbers and must include descriptive term to complete the order (such as, length, color, etc.). These items when listed in the parts manual will indicate what information must be included.

Specify unit serial number when ordering parts!

WARRANTY

E.D. Etnyre & Co. warrants to the original Purchaser, its new product to be free from defects in material and workmanship for a period of twelve (12) months after date of delivery to original Purchaser. The obligation of the Company is limited to repairing or replacing any defective part returned to the Company and will not be responsible for consequential damages or any further loss by reason of such defect.

The company excludes all implied warranties of merchantability and fitness for a particular purpose. There are no warranties, express or implied, which extend beyond the description of the goods contained in this contract.

This warranty does not obligate the Company to bear the cost of machine transportation in connection with the replacement or repair of defective parts, nor does it guarantee repair or replacement of any parts on which unauthorized repairs or alterations have been made or for components not manufactured by the Company except to the extent of the warranty given by the original Manufacturer.

This warranty does not apply to:

- (1) Normal start-up services, normal maintenance services or adjustments usually performed by the selling dealer, factory service representative or customer personnel.
- (2) Any product manufactured by E.D. Etnyre & Co. purchased or subjected to rental use.
- (3) Any product or part thereof which shows improper operation, improper maintenance, abuse, neglect, damage or modification after shipment from factory.
- (4) Any product or part thereof damaged or lost in shipment. Inspection for damage should be made before acceptance or signing any delivery documents releasing responsibility of the delivering carrier.

This warranty and foregoing obligations are in lieu of all other obligations and liabilities including negligence and all warranties of merchantability or otherwise, express or implied in fact or by law.



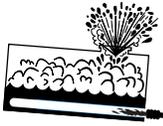
E. D. ETNYRE & CO., Oregon, Illinois 61061-9778
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WARNING LABELS

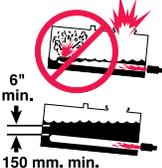
WARNING



Before lighting burner unlatch manhole to prevent pressure in tank. Explosion can occur causing death or serious injury.

3390678

WARNING



6" min.
150 mm. min.

Do not light burners unless flues are covered. Explosion can occur causing death or serious injury.

Lower Burner
Lit. Gal.

Upper Burner
Lit. Gal.

3390638

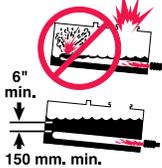
CAUTION



Hot surface. Remain clear until cool.

3390634

WARNING



6" min.
150 mm. min.

Do not light burners unless flues are covered. Explosion can occur causing death or serious injury.

Lower Burner
Lit. Gal.

Upper Burner
Lit. Gal.

3390638

WARNING



Before lighting burner unlatch manhole to prevent pressure in tank. Explosion can occur causing death or serious injury.

3390678

WARNING

Do not attempt any operation which is not described in the manuals. Other operations could cause serious injury or death.

Read, understand and follow the manuals when operating or performing maintenance.

Please notify Etnyre Service if you bought this machine used.

For service, instructions, or to get manuals, call Etnyre Service at 800-995-2116.

3390678

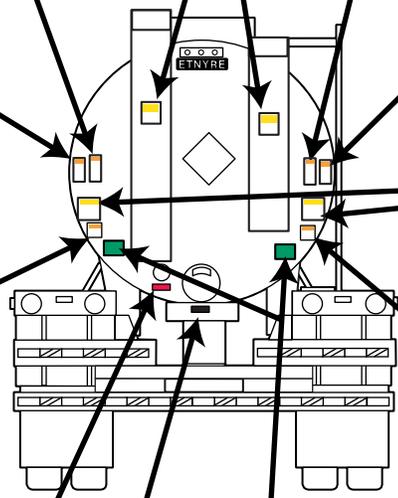
MAXIMUM ALLOWABLE CARGO TEMPERATURE IS °F.

E. D. ETNYRE & CO. OREGON, ILL. U.S.A. 3390192

CAUTION

ALWAYS OPEN MANHOLE COVER BEFORE OPENING THIS VALVE. "PREVENT VACUUM-SAVE TANK"

3390648



CAUTION

- IF MOISTURE IS PRESENT DO NOT HEAT MATERIAL OVER 200 DEGREES F.
- WHEN HEATING MATERIAL, POSITION UNIT BROADSIDE TO WIND, IF POSSIBLE.
- USE KEROSENE OR FUEL OIL (NOT GASOLINE) ON GENERATING OR LOW PRESSURE BURNERS.
- DO NOT OPERATE BURNER UNATTENDED (UNLESS SAFETY CONTROLS ARE PROVIDED) OR WHILE VEHICLE IS IN TRANSIT OR IN CONFINED AREA.
- ALLOW SUFFICIENT SPACE IN TANK FOR EXPANSION OF MATERIAL WHEN HEATING.
- COVER FLUES AT LEAST 6" BEFORE HEATING MATERIAL.
- AVOID HEATING MATERIAL IN LEAKING TANK.
- USE TORCH (NOT MATCH OR LIGHTER) TO IGNITE BURNER.
- WHEN BURNERS GO OUT, ALLOW FLUES TO VENTILATE BEFORE REIGNITION.
- DO NOT HEAT MATERIAL BEYOND MANUFACTURERS RECOMMENDED TEMPERATURE.

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SAFETY INSTRUCTIONS

High Pressure Fuel Oil Burners

- Read and understand detailed instructions in manual.
- Ensure that there is at least 6 inches (150mm) of material over the flues before proceeding.
- Open covers or dampers on exhaust stacks.
- Suspend thermometer from manhole if material does not cover thermometer well.
- Set controls for circulate in tank.
- Circulate material; approx. 150 GPM (600 lpm).
- To light lower burner, turn on lower burner start switch and hold until burner has lit.
- To light upper burner, turn on upper burner start switch and hold until burner has lit.
- Do not heat material higher than the spraying temperature recommended by the material supplier.
- To shut down, turn off burner power switch.
- After shutting down burners, close stack covers or dampers to prevent heat loss.

E.D. ETNYRE & CO., Oregon, Illinois, U.S.A. 61061 3390670A

WARNING

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HEATING BITUMEN IN TRANSPORT TRAILERS

WARNING

- A fully charged dry chemical type fire extinguisher must be within easy reach whenever the burners are operating or there is an open flame near the distributor. Minimum dry chemical capacity of the fire extinguisher should be 10 pounds.
- To prevent an explosion or fire hazard: Flues **MUST** be covered by a minimum of 6 inches of material when the burners are in operation.
- To prevent an explosion or fire hazard: Do not remove material from tank in any manner when the burners are in operation.
- To prevent an explosion or fire hazard: Position unit broadside to wind whenever possible to prevent volatile fumes from drifting toward burners
- To prevent an explosion or fire hazard: Do not drive unit when burners are operating.
- To prevent an explosion or fire hazard: Do not operate burners if tank is damaged or leaking.
- To prevent an explosion or fire hazard: When burners go out, allow flues to ventilate for several minutes before relighting burners.
- To prevent an explosion or fire hazard: Do not heat material beyond the manufacturers recommended temperature.
- To prevent foaming or violent eruption, do not heat material over 200°F if moisture is present in tank.
- To prevent possible burns from material overflow, allow sufficient space in tank for expansion of material when heating.
- To prevent an explosion or fire hazard: Never use gasoline in place of kerosene or diesel fuel in high pressure generating burners.
- To prevent possible burns: Always use a torch to light the burners. Never attempt to light the burners with a match or pocket lighter.

High Pressure Generating Burners

1. Use clean, moisture free kerosene or #2 diesel fuel.

2. Circulating bitumen in the tank while heating is recommended for faster heating and reduced carbon formation on the flues. If the transport is equipped with an air motor circulating paddle, it should be operating while the burners are on. If the transport is not equipped with one then the heating should be done extremely slowly to avoid coke build-up on the bottom of the flues.

3. The correct fuel pressure is between 45 and 60 psi. If it is less, inspect the strainer for possible obstructions. If the strainer is clean be sure that the trailer air brake system is continuously charged with a minimum of 85 psi air pressure. If you are sure that the trailer air supply is adequate, check the fuel pressure regulator. An adjusting screw with a locknut is inside of the dome shaped cap. Do not exceed 60 psi pressure in the fuel tank.

4. Do not light the burners unless you are sure that the flues are covered with at least 6" of material over their full length. On tanks having 2 burners, it is only necessary to have the lower flue covered with 6 inches of material when using only the lower burner.

5. Open the dampers on the exhaust stacks.

6. To light the burners, spread wick in a pan, so that the fire will be under the coil and vaporizing plug; hold a finger over the vaporizing plug to prevent fuel from squirting into the flue and open the needle valve slightly. Shut the needle valve when the pan is 1/4 full. Ignite the wick and wait until gas issues from the vaporizing plug; then open the needle valve slightly. If the coil is generating properly, an almost colorless gas will issue from the vaporizing plug. Open the needle valve more, as necessary, to obtain a bright orange flame. On units having retractable burners, remove the holding pin and transfer the burner from the traveling position to the firing position.

7. A short blue flame that is easily extinguished indicates over generation in the coils, caused by too small a vaporizing plug opening, or carbon formation in the coil. Particles of carbon can be cleared from the vaporizing plug while the burner is in operation with the burner cleaner furnished with the unit. If the flame is still short and blue, bore out the vaporizing plug with a No. 51 drill.

8. A yellow smoky flame indicates that the needle valve is open too far, causing under generation. It can also be the result of too large a hole in the vaporizing plug.

9. Do not leave the burners unattended while lit.

10. Do not exceed the maximum temperature as specified by the bitumen supplier.

11. Do not remove any material from the transport while the burners are in operation, or any automatic burner controls are set to operate.

12. When the burners are not in use, close the exhaust stack dampers to prevent heat loss.

Heating Asphalt with Liquid Propane Gas (LPG) Burners

If the transport is equipped with an asphalt pump which is capable of circulating material in the tank, the note below will apply.

 IMPORTANT
Circulating the asphalt in the tank while heating is recommended for faster heating and reduced carbon formation on the flues. Only when the asphalt pump is “Frozen” is it acceptable to operate the burners without circulating asphalt in the tank. However, if the asphalt pump is frozen, carefully apply heat to the pump and start circulating the material as soon as possible.

 WARNING
Residual fuel in LPG burners will support a flame for several minutes after the fuel flow has been shut off. After using LPG burners, confirm that all flame has been extinguished before attempting any operation that could release flammable vapors. Failure to ensure that the flame is completely extinguished could result in an explosion or fire that can cause injury or death.

LPG Supply Tank Requirements

Use only liquid withdrawal type supply tanks for your LPG burners.

Two types of LPG supply tanks are available: tanks for liquid type burners and tanks for vapor type burners. The LPG burners on your Etnyre distributor require a supply tank for liquid type burners. Liquid type burners will operate from a vapor withdrawal tank, however the amount of heat delivered will be dramatically reduced, and the life of the burner will be shortened.

There are three different types of LPG burners: manual control burners, burners with outfire control, and burners with automatic ignition and temperature limiting control.

Manual Control Burners

There are four valves associated with operation of the manual control burners: one at the supply tank, and three in the burner piping.

The two smaller valves (one at each burner) are bleeder type valves with a small hole drilled through the valve case. Propane liquid is supplied to the bleeder valve directly from the supply tank shutoff valve. Because of the bleeder hole in this valve, it is NOT possible to shut off all of the fuel to the lower burner by shutting the main valve at the burners. The main burner valve will only shut off the upper burner. The lower burner must be shut off using the supply tank valve.

The large valve located in the fuel line to the outside or upper burner is a positive cut off valve that allows all fuel to be cut off to the bleeder valve on the outside burner only.

 WARNING
Always shut off burners using the main shutoff valve on the supply tank

Burner Operation

Be sure that the main supply valve and the main burner valves are fully closed and the bleeder valves are turned fully clockwise before starting.

Open the dampers in the flue exhaust stacks.

Open the valve at the supply tank and immediately light the inside burner. As soon as the burner lights, open the bleeder valve. No preheating is necessary.

! IMPORTANT

- It is recommended that two persons be involved in lighting the first burner. When the main fuel valve is opened at the tank, there is an immediate trickle of gas passing through the inside burner valve. The longer the gas is allowed to collect in the flue, the more likely there will be a flashback when the burner is ignited. Having one person light the burner while the other opens the main supply valve will reduce the likelihood of a flashback.
- When the main fuel valve is opened at the bottle or tank, there is an immediate trickle of gas passing through the inside burner bleeder valve. Light the burner immediately

Check the fuel pressure at the pressure regulator. Too much pressure for a small asphalt tank will waste fuel. Too little pressure will increase heating time. Some experimentation with the pressure will allow you to determine the most efficient fuel pressure to use. For most transports, 40 psi is a good starting point.

If necessary, adjust the flame with the bleeder valve at the burner.

When the LPG burners are operating, the outside of the fuel line up to the first coil of the burner should frost over. If no frost forms it is an indication that the burners are operating on vapor instead of liquid. This condition must be corrected immediately to prevent damage to the burners.

If after the lines frost over, the flame starts to die down and the frost melts off the fuel line, it is likely that there is moisture in the fuel supply tank. Moisture in the fuel can form ice crystals that stop the fuel flow. Your local LPG supplier can add an anti-icing agent to prevent burner icing.

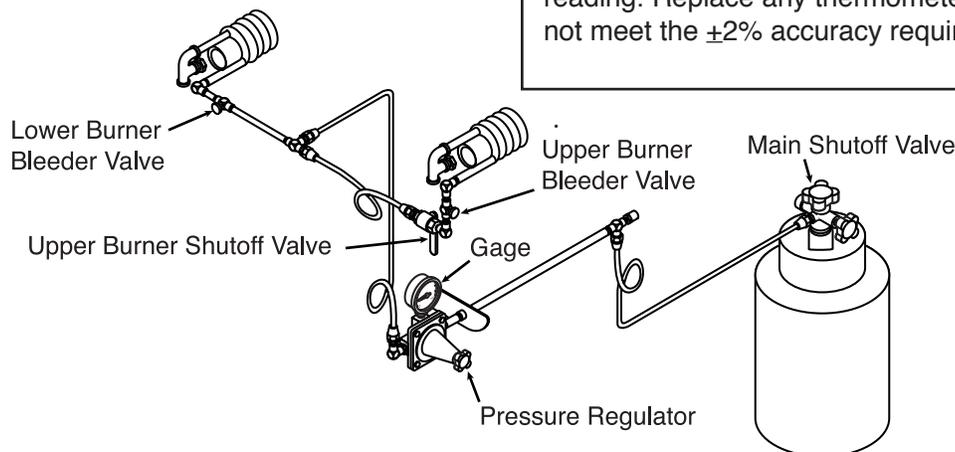


Figure 3. Manual Control LPG Burner System

! IMPORTANT

If there is at least 6" of material covering the entire length of the upper flue, the second burner can be lit.

To ignite the second burner ensure that the bleeder valve on the burner is turned fully clockwise. Position a lit torch at the burner nozzle and open up the positive shutoff valve in the line to the burner. As soon as the low fire is established, the bleeder valve can be opened.

Never leave operating burners unattended.

When the desired temperature is reached, **close the main fuel supply valve, at the lpg tank, first.** Allow the burners to operate at full capacity until the fuel in the line from the tank burns out, then close both bleeder valves and the positive shutoff valve for the outside burner.

Close the exhaust stack dampers to prevent heat loss

! WARNING

When heating, temperatures within the tank can vary. Shut the burners off when the thermometer reaches a reading 10°F. lower than the desired temperature. Continue to circulate & monitor temperature until temperature stabilizes. Add remaining heat by operating burners for short periods, monitoring stabilized temperature after each period.

! WARNING

Calibration of thermometers should be verified to be within $\pm 2\%$ of full scale reading annually. Certification can be accomplished by a qualified laboratory or by comparing stabilized dial readings to the pencil thermometer reading. Replace any thermometer that does not meet the $\pm 2\%$ accuracy requirement.

Burners With Outfire Controls

Equipment Design

The burner and the burner control valves are identical to the manual operated burner system. However, burners with outfire controls are equipped with an outfire control box. The outfire controls consist of two thermocouples, a push button start switch, an electric fuel solenoid valve, a pressure regulator and a pressure gage.

The heat sensing thermocouples are positioned in each burner. If either burner loses its flame, the thermocouple senses the drop in temperature, and deactivates the fuel solenoid, and the fuel to both burners is shut off.

The only operational differences between the manual burners and burners with the optional outfire controls is the start up and shut down procedures. Unlike the manual burners, when the burners are equipped with outfire controls, no fuel flows to the burners when the main solenoid shutoff valve is closed.

Burner Operation with Outfire Controls

Turn on the Master Power switches.

Open the dampers in the exhaust stacks.

Ensure that the main burner control valve is closed and that the bleeder valves for both burners are turned fully clockwise.

⚠ IMPORTANT

It is recommended that two persons be involved in lighting the burners. One person should hold the torch while the other person opens the valves and holds the pushbutton in.

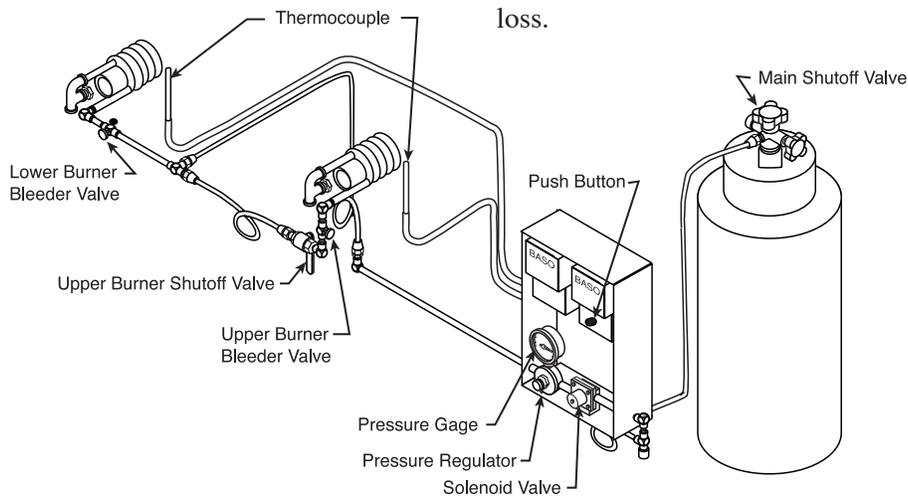


Figure 4. Outfire Control LPG Burner System

Open the main fuel supply valve at the tank.

No fuel will be flowing at this point.

As soon as the low fire is established at the inner burner, open the positive shutoff valve to the outside burner and light the outside burner on low fire.

After 30 to 40 seconds, release the pushbutton and observe the pressure gage. If the pressure starts to drop rapidly, depress the pushbutton and hold it in for another 30 seconds. It may require a slight increase in fuel to the outside burner to adequately heat the thermocouple. Once both of the thermocouples are heated the pushbutton can be released.

⚠ IMPORTANT

In order to activate the thermocouples, both burners must be lit on low flame even if only one burner will be used for heating. Place the ignition torch at the inside burner nozzle and depress the pushbutton in the outfire control box. Continue to hold the pushbutton in until both burners are lit.

If both burners are to be used for heating, you can now open both bleeder valves. If only the inside burner is to be used for heating, open the bleeder valve on the inside burner and allow the outside burner to remain burning on low flame so the thermocouple will be heated. Remember, if either burner flame goes out, the outfire control will shut the solenoid valve cutting the fuel off to both burners.

When the desired product temperature is reached:

Close the main fuel supply valve at the tank.

After all the fuel is burned and there is no flame at either burner, turn both bleeder valves fully clockwise and close the positive cut off valve at the burners.

Close the exhaust stack dampers to prevent heat loss.

Burners with Automatic Ignition and Temperature Limiting Control

Equipment Description

The temperature limiting control box contains the temperature limiting control components as well as the automatic ignition circuitry.

The automatic ignition circuit consists of two 12V coils, two spark plugs, a pair of thermocouples, (one at each burner), and a momentary pushbutton switch. The 12V coils send high voltage to the spark plugs that causes sparks to arc intermittently at each pilot burner whenever there is fuel pressure in the line from the main supply tank. The thermocouples provide a signal that indicates when there is a flame at the pilot burners. The momentary pushbutton switch on the control box is used to fire the main burners once the pilot burners have ignited and the thermocouples have been heated sufficiently.

The temperature limiting control circuit consists of a temperature probe in the distributor tank that senses the asphalt temperature, a thermostatic switch in the control box and a temperature adjustment dial on the face of the control box. When the temperature of the asphalt in the distributor is heated to the temperature selected with the temperature adjustment dial, the thermostatic switch shuts down the burners.

Burner Operation with Auto Ignition & Temperature Limiting Control

Open the dampers on the exhaust stacks

Ensure that all burner valves are closed.

With this type of control, the inside or lower burner may be operated without opening the positive shut off valve to the outside burner. If both burners are to be used, the positive shutoff valve should be opened.

Open the main fuel valve at the supply tank. The spark plugs will begin to arc and will ignite the pilot burners.

Set the thermostat to the desired temperature.

Allow the pilot burners to heat the thermocouple probes for at least 2 minutes. When the pilot burners have heated the thermocouples sufficiently the sparker will stop. Press the cycle button to fire the main burners. The bleeder valves may then be opened.

On new or rebuilt units, monitor the product thermometer to make certain that the burners shut down when the desired temperature is reached. (as set on the temperature adjustment dial. If the burners do not shut down at the correct temperature, call the Etnyre Service Department for assistance in calibrating the thermostat.

Once the burner shuts off automatically, it will not restart until the cycle button is again depressed.

To shut the system down: Close the main fuel supply valve at the tank.

Increase the thermostat setting 50 to 75°F higher and push the start button. This will bring on the main burners and quickly burn off all of the fuel in the line between the tank and the control box. The pilot burners may continue to burn for a short time after the main burners cut off. Do not draw material from the tank as long as there is a flame present.

Close the exhaust stack dampers.

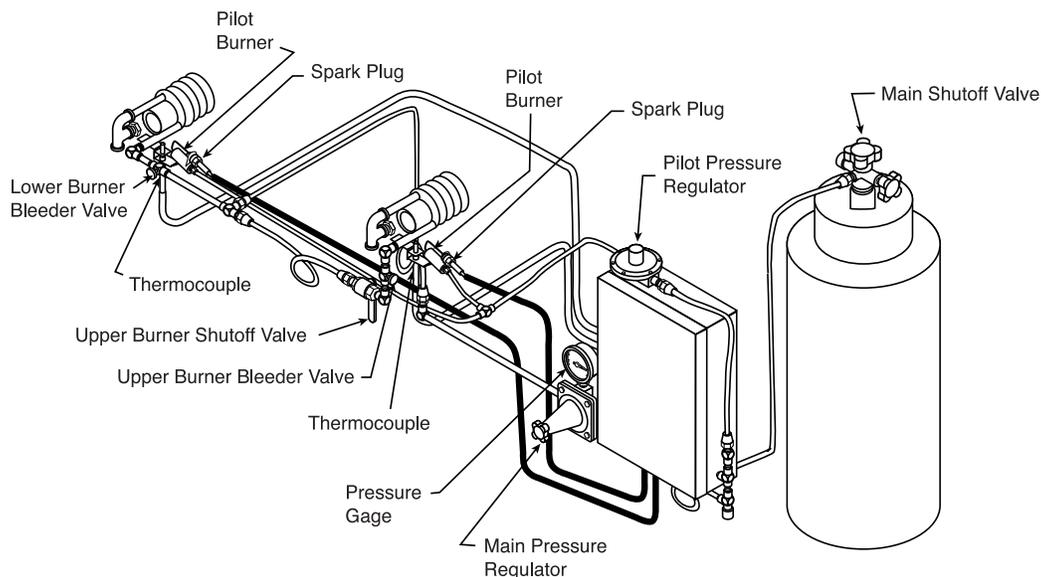


Figure 5. Automatic Ignition LPG Burner System

Electric Driven Burner Operation

- Open the dampers in the exhaust stacks.
- To light the burner, turn on the “Lower Burner Power” switch.
- If upper burner operation is desired, turn on the “Upper Burner Power” switch.
- Do not heat the material higher than the spraying temperature recommended by the asphalt supplier.
- To shut down the burners, turn off the burner power switches.

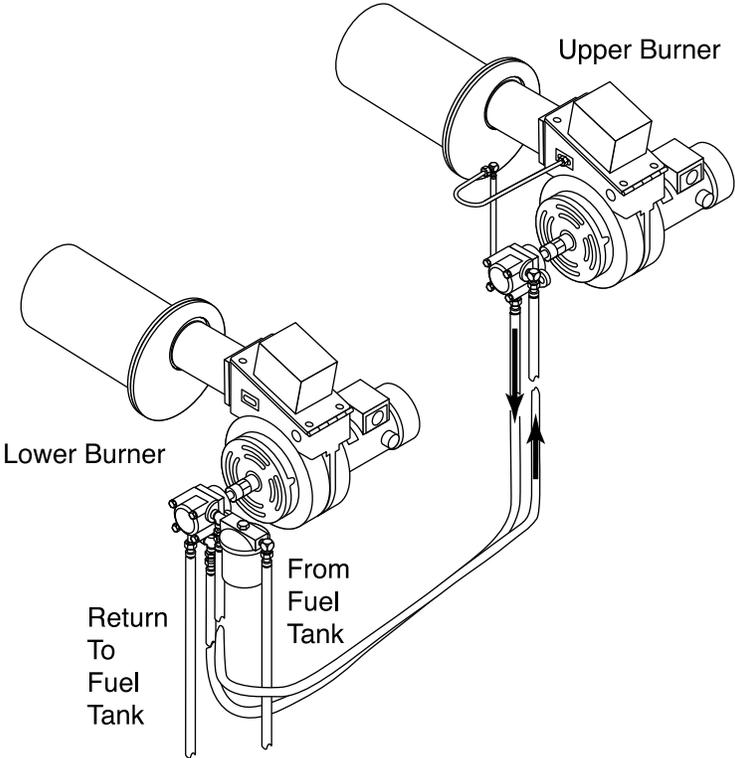


Figure 6. Electric Fuel Oil Burner System

