



# Oil Purification Systems, Inc.

## Installation Instructions

*For*

## Cummins ISX

|                         |                  |
|-------------------------|------------------|
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### Safety Precautions

- Before beginning work, ensure the engine has sufficiently cooled to prevent burn injuries.
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### General Precautions

- Ensure the voltage of the system being installed (12V or 24V) matches that of the truck.
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### Notes for all Hose Connections:

- Use a heat gun or soak the hose ends in hot water to expand them to ease assembling hoses over barbed fittings. Be sure to shake off any water from the hoses.
  - Apply light oil such as silicon spray or WD40 inside the hose end to ease the assembly of the adaptor into the hose end. *DO NOT* use grease or engine oil for this purpose.
  - Slide a ½" hose over each ¼" hose at those places where the hose comes close to moving or vibrating parts. This is to protect the ¼" hose from abrasion. Also add the ½" hose to the parts of the hose that bend. This will help the ¼" hose hold its shape and prevent crimping.
  - Route all hoses away from extremely hot components, such as exhaust pipes and the turbos.
  - Route all hoses away from moving parts, such as the radiator fan.
  - Use ties to secure the hoses in place.
  - Ensure the hose is the proper length before sliding them over the barbed hose fittings, as hoses must be cut to be removed from the fittings.
  - Leave a slight amount of slack in the hose to allow for engine vibration.
  - Use teflon tape on all NTP threads (used on the hose adaptors).
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### Before Installing This System

It is recommended that you perform an oil change on the vehicle before installing this system.

- Be sure to handle used oil in compliance with all applicable laws. This will usually include making provisions for recycling.
  - Always wear oil resistant gloves when handling used oil.
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**Technical Support** ..... Call Toll Free (866) OILPURE

## Parts Identification

The major components of this system are the Filter and the Evaporator. These are shown in the following illustrations.

### The Filter

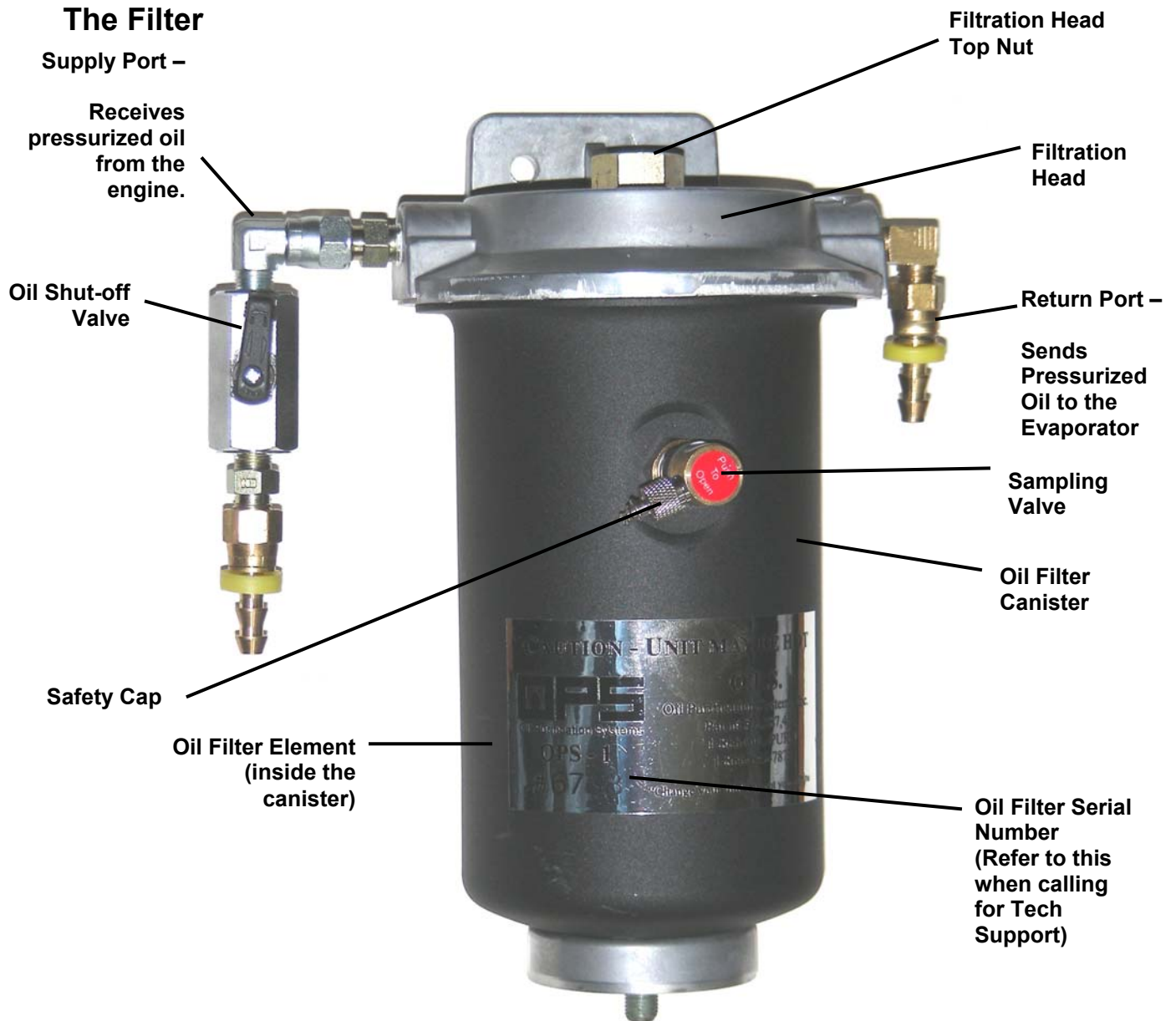


Figure 1 – The Filter Assembly

## The Evaporation Chamber

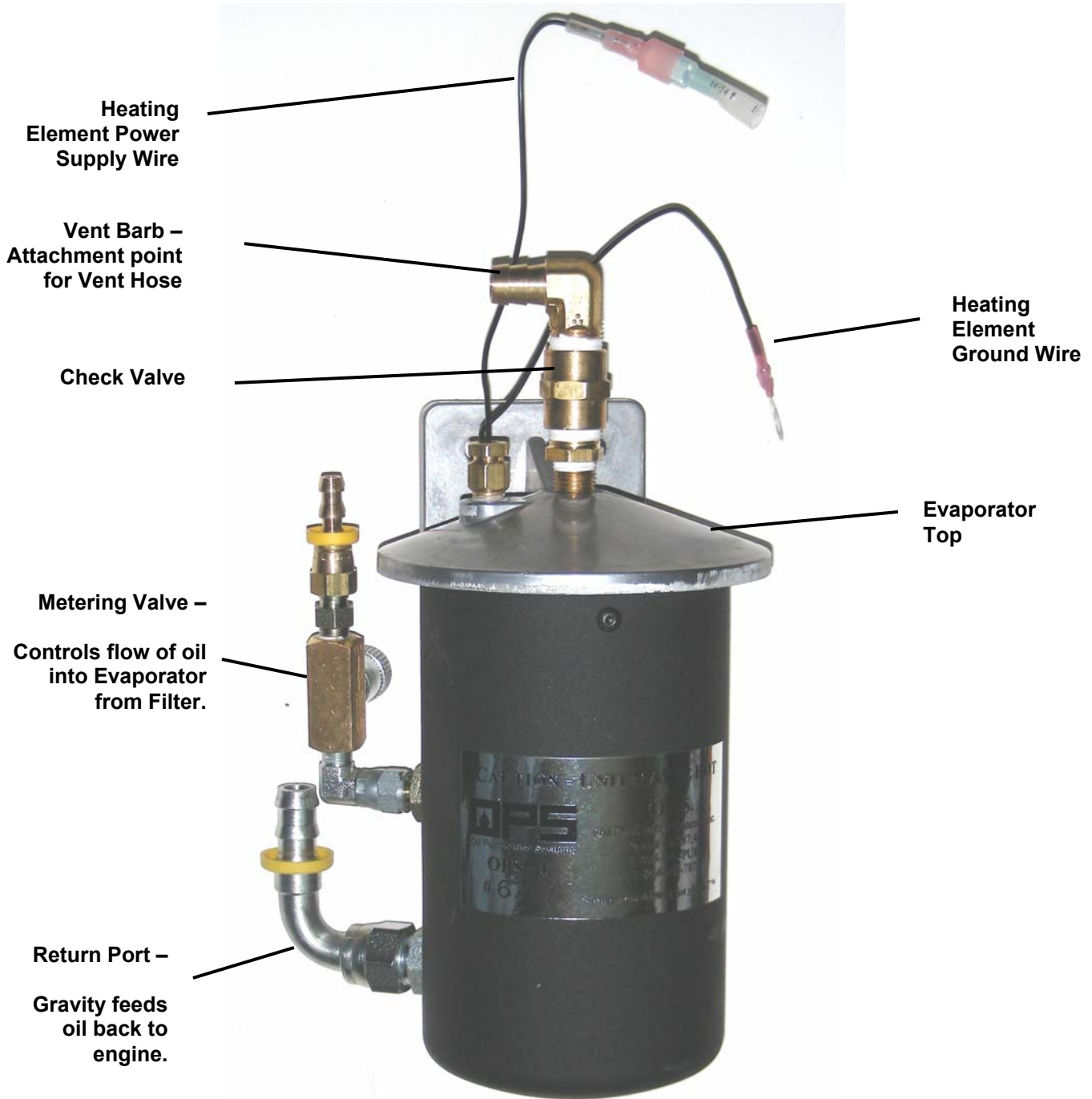
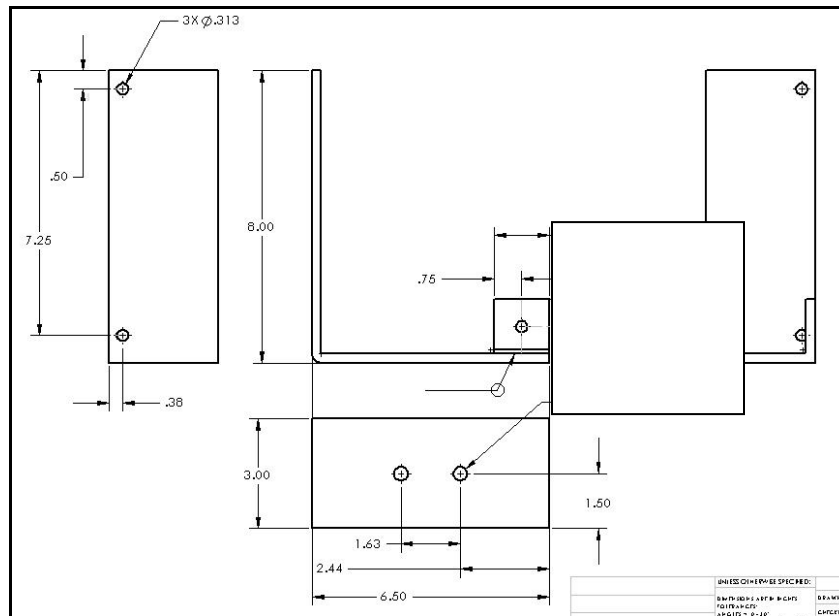


Figure 2 – The Evaporator Assembly

## Section 1 – Mounting the Evaporator

The Evaporator and windshield washer reservoir mount to a bracket that will replace the existing windshield washer reservoir bracket.

1. Make an L-bracket as shown in the dimensional drawing in Figure 3.



**Figure 3 – The Evaporator (and Reservoir) Mounting Bracket**

2. Unbolt the windshield washer reservoir from its mounting bracket and remove the bracket from the firewall.
3. Mount the L-bracket to the vehicle's firewall.
4. Attach the Evaporator and reservoir to the L-bracket as shown in Figure 4.



*Figure 4 – The L-Bracket*



## Section 2 – Mounting the Filter

The Filter is bolted directly to the vehicle's frame rail, on the driver's side.

1. Position the Filter on the outside of the driver's side frame rail as shown in Figure 5.



*Figure 5 – Mounting the Filter*

2. Use the Filter mounting bracket as a template to mark the frame rail for drilling. (**NOTE:** Place a strip of masking tape on the frame rail to make it easier to mark for drilling.)

**IMPORTANT NOTE:** Before drilling into the frame, check inside the frame rail for hoses or wiring that may be routed there. If hoses or wiring are present, move them out of the way or select a different location on which to mount the filter.

3. Drill the Filter mounting holes and use the 5/16" hardware provided to attach the Filter to the frame.

## Section 3 – Supply and Return Line Hoses

### Hose Specifications

- ¼” hose, use Parker 836 high temperature push lock hose, or the equivalent.
- ½” hose, use Parker 801 general purpose push lock hose, or the equivalent.

### Accessing the Supply Port:

1. Remove the pipe plug from the oil filter mount.
2. Install a hose adapter to replace the plug that was removed.

### Accessing the Return Port:

1. Remove the oil drain plug from the oil pan.
2. Install the hose adaptor to replace the oil drain plug. See Figure 6.



*Figure 6 – Location of Oil Return Port*

### Connecting the oil source to the Filter:

1. Measure the distance from the fitting on the oil filter mount to the source side of the filter. Run the tape measure along the same route you will use for this hose. Add 1.5 – 2.0 inches to accommodate engine vibration.
2. Cut the hose to length.
3. Slide the ¼” hose over the supplied ¼” barbed hose fitting.
4. Screw the hose fitting into the adapter already attached to the engine.
5. Slide the other end of the hose to the hose fitting that will go into the filter shut off valve.
6. Attach the second hose fitting onto the *shut off valve* on the side of the filter housing.

### Connecting the Filter to the Evaporator:

1. Measure the distance from the **return** port on the filter to the **source** port on the evaporator. Run the tape measure along the same route that the hose will follow. Add 1.5 to 2” slack for engine vibration.
2. Insert the hose fittings into each end of the hose.
3. Attach one fitting into the return side of the filter and the other to the source side of the evaporator.

### Connecting the Evaporator Return Line:

1. Measure the distance from the hose adaptor on the oil pan to the return port on the evaporator. Run the tape measure along the same route you will use for this hose. Add 1.5 – 2.0 inches to accommodate engine vibration.
2. Cut the hose to length.
3. Slide the hose end over the fitting that will attach to the adaptor you just screwed into the oil pan.
4. Attach the fitting that will go into the return side of the evaporator into the other end of the hose.
5. Route the second end of the hose next to the *return* side of the evaporator, and attach it to the evaporator.

### Venting the Evaporator:

1. Route the hose from the top of the Evaporator to just in front of the mud flap, as shown in Figure 7.



*Figure 7 – Venting Hose Termination*

## Section 4 – Adjusting the Metering Valve

The flow rate from the Filter to the Evaporator must be adjusted for each application. The recommended flow rate is 1-2 gallons per hour (2.1 – 4.3 ounces per minute).

### Checking and Adjusting the Flow Rate:

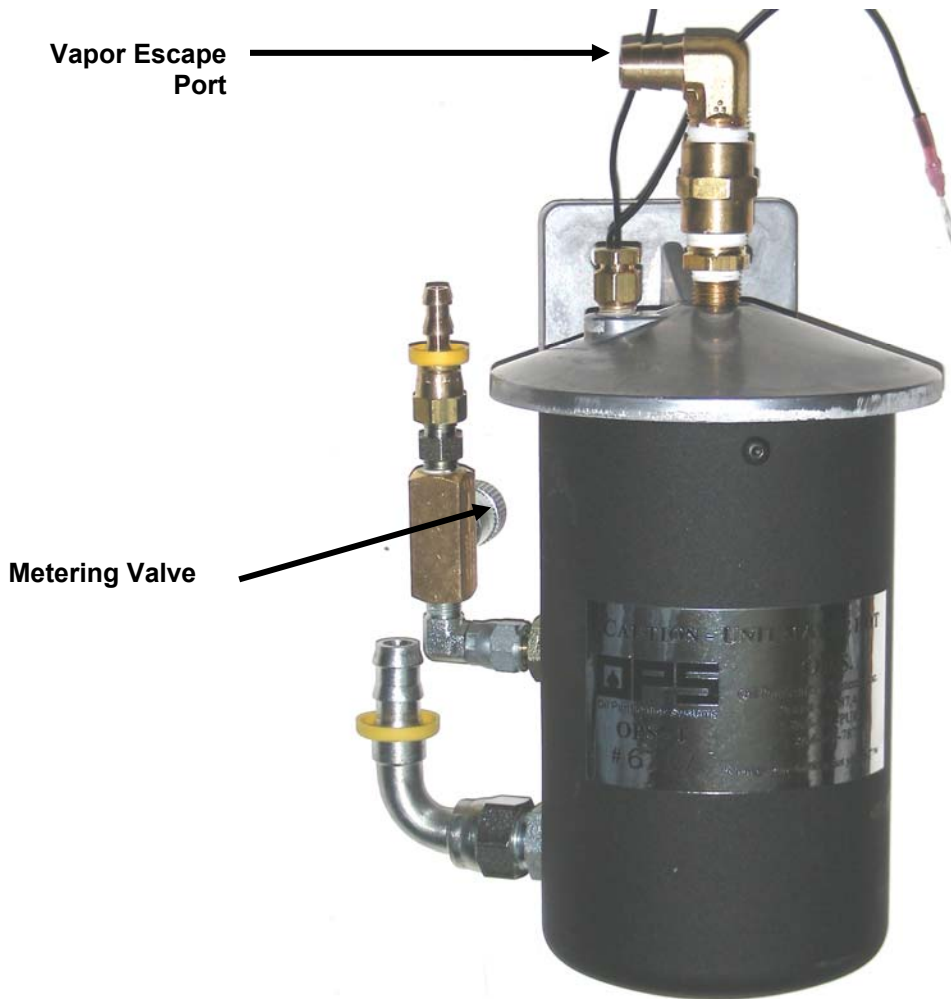
1. Open the Oil Shut-off Valve on the Filter. See Figure 8.

Oil Shut-off Valve



**Figure 8 – Location of Shut-off Valve on the Filter**

2. Start the engine and allow it to warm up to normal operating temperature and set the engine speed to 2,000 RPMs or the “normal operating” speed of the engine.
3. Check for leaks. If there are any, shut off the engine, repair the leaks, and restart the engine.
4. Close the Oil Shut-off Valve on the Filter.



**Figure 9 – Location of Vapor Escape Port**

5. Close the metering valve and remove it from the Evaporator.
6. Open the Oil Shut-off Valve on the Filter.
7. With an oil catch pan under the metering valve, open the metering valve all the way for several seconds and allow the full oil flow to flush out the oil lines.
8. Close the metering valve all the way.
9. Open the metering valve about 1-1/2 turns.
10. Check the flow rate in ounces per minute to verify it is between 2.1 and 4.3.
  - If this rate is not being met, open or shut the metering valve until this rate is attained.
  - Allow several minutes between each adjustment before taking the rate sample.
11. When the metering valve is correctly adjusted, use the supplied allen wrench to lock in the adjustment and then shut down the engine.

## **OPS Installation**

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12. Close the Shut-off valve on the Filter.
13. Reattach the metering valve to the Evaporator.
14. Using thread tape, tighten the elbow fitting to the top of the Evaporator.
15. Attach a vent hose to the vapor escape port on the top of the Evaporator.
16. Open the Shut-off valve on the Filter.
17. Restart the engine and check for leaks. Fix any leaks as necessary.

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## Section 5 – Electrical Connections

Power for the Evaporator is taken from an open circuit on the fuse panel.

### Notes:

- Ensure the voltage of the truck matches the voltage of the system you are installing.
  - Evaporators with **BLACK** conductors are for a **12V** system.
  - Evaporators with **WHITE** conductors are for a **24V** system.
- Use wire ties to secure all wires away from moving parts or extreme heat.
- Ensure the alternator has enough power to handle the additional load.
- Use the supplied 15 amp fuse and fuse holder to protect the circuit.

### Important:

- Select a spare (unused) circuit from the fuse panel, as using a computer-controlled circuit may cause error codes to display.
- Ensure the circuit select is “keyed”; that is, powered on only when the engine is running and not powered when the key is in the “accessory” or “off” position.



## Procedure

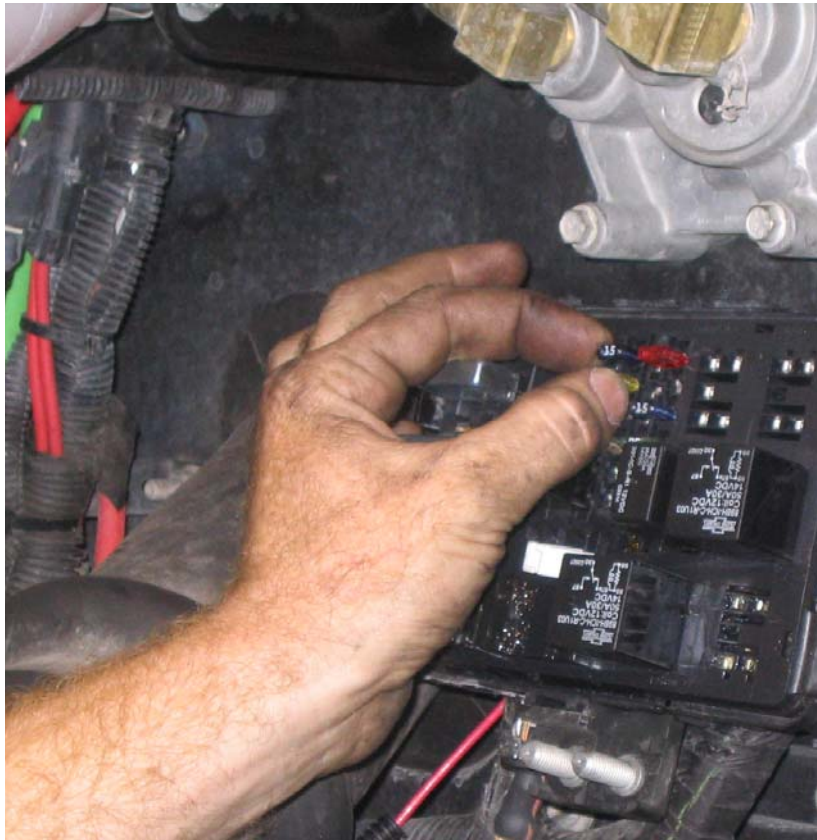
There are two wires sticking out from the top of the Evaporator.

1. Connect the ground wire to a suitable ground, such as the mounting bolts for the Evaporator.
2. Connect the power lead to a 15 amp accessory circuit in the fuse box. See Figure 10.



*Figure 10– Electrical Connections*

3. Install a 15 amp fuse into the fuse box for the circuit used for the Evaporator. See Figure 12.



*Figure 12 – Installing the Fuse*

**OIL PURIFICATION SYSTEMS, INC.**  
Five (5) Year Limited Warranty

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Oil Purification Systems, Inc. (“OPS”) warrants that OPS-1 shall be free from defects in materials and workmanship, and will substantially conform to its specifications for a period of five (5) years after the date of purchase (the “Period”), provided OPS-1 is properly installed, operated, and maintained, and, in each instance, in accordance with the documentation.

Should OPS-1 have been found and demonstrated to be defective during the Period for the reasons covered by this Limited Warranty, OPS, at its option, shall:

1. REPAIR OPS-1 or part thereof; or
2. REPLACE OPS-1 or part thereof.

In the event of a discrepancy between any purchase order accepted by OPS and this warranty, the terms of this warranty apply. OPS reserves the right to use either new, used, or refurbished parts.

This Limited Warranty does not cover any damages caused by you or due to external causes, including any act of God, natural disaster, accident, flood, war, sabotage, terrorism, military actions, or problems with the engine, e.g., failure to maintain the engine in accordance with its documentation (other than manufactures recommended oil changes). OPS does not warrant that OPS-1 will be free from design defects or errors.

To request warranty service from OPS, you need to contact OPS within five (5) calendar days following discovery of the defect or damage at the following telephone number: (866) OIL-PURE; or address:

Oil Purification Systems, Inc.  
One Reservoir Corporate Centre  
4 Research Drive  
Shelton, Connecticut 06484; and

return OPS-1 or the defective part for inspection, including in such package a copy of the applicable warranty card, a detailed description of the problem, proof of purchase, and detailed records associated with the installation and maintenance of OPS-1 and the engine, and such other information as requested by OPS.

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