



Oil Purification Systems, Inc.

Installation Instructions

for

**Freightliner Columbia Trucks with
Mercedes 4000**

Document Part Number	_____
Document Edition Number	_____ 1.0 _____
Edition Release Date	_____ July 2007 _____



Table of Contents

Safety Precautions	2
General Precautions.....	2
Notes for all Hose Connections:.....	2
Before Installing This System.....	2
Section 1 – Mounting the Evaporator	3
Section 2 – Mounting the Filter.....	5
Section 3 – Supply and Return Line Hoses	7
Hose Specifications	7
Accessing the Supply Line Port	7
Connecting the Filter to the Evaporator	8
Accessing the Return Line Port	8
Section 4 – Adjusting the Metering Valve.....	10
Checking and Adjusting the Flow Rate	10
Section 5 – Electrical Connections	12

Copyright Notice:

Copyright © 2006 Oil Purification Systems, Inc. All Rights Reserved. OPS-1 is a trademark of Oil Purification Systems, Inc. OPS-1 Patented 6,287,455. Patents Pending in the United States and other countries. Other trademarks and trade names that may be used in this document to refer to either entities claiming the marks and names or their products, OPS disclaims any proprietary interest in trademarks and trade names; such marks and names are owned by their respective holders.

Safety Precautions

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

General Precautions

- Ensure the voltage of the system being installed matches that of the truck.
-

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).
-

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.
-

Technical Support Call Toll Free (866) OILPURE

Section 1 – Mounting the Evaporator

Mount the Evaporator to the bracket that holds the engine's air filter in place.

1. Make a mounting bracket for the Evaporator to match the following dimensional drawing. See Figure 1.

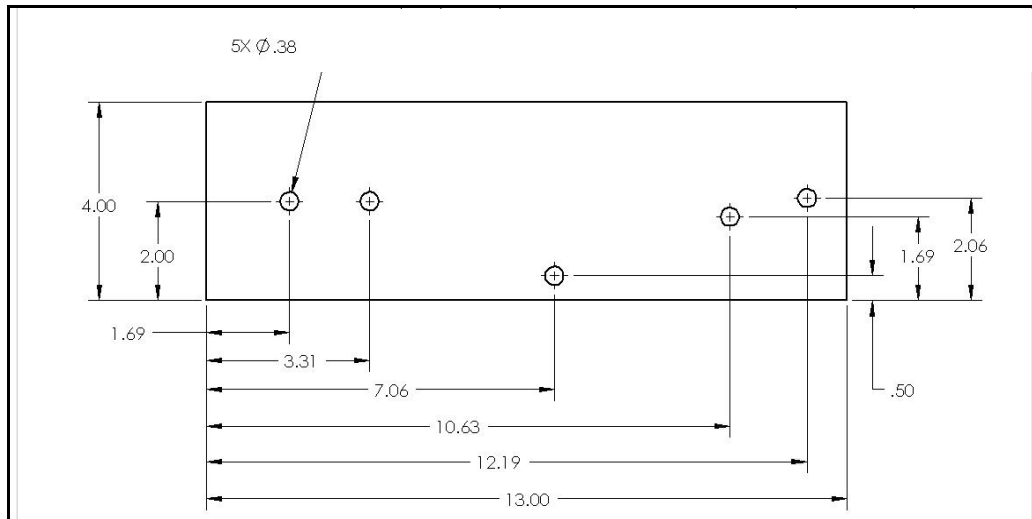
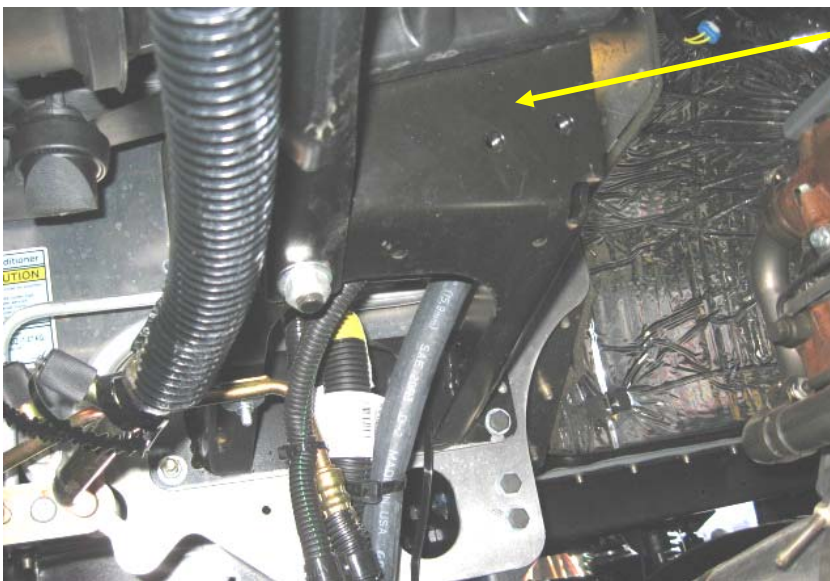


Figure 1 – The Evaporator Mounting Bracket

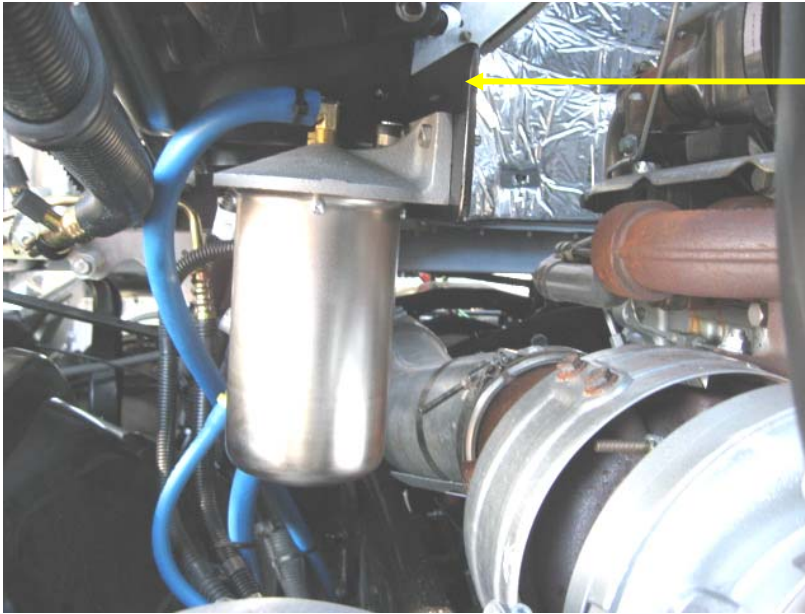
2. Position the Evaporator bracket against the rear side of the air filter bracket and to the inside edge of the air cleaner support. Select a location that allows routing of supply and return hoses as well as the wiring connections. See Figure 2.



Use this existing bracket as a mounting point for the Evaporator.

Figure 2 – Air Cleaner Bracket

3. Use the holes in the Evaporator bracket as a template for drilling the 3/8" holes in the air filter bracket. (**NOTE:** Placing a strip of masking tape under the evaporator bracket makes it easier to mark the air filter bracket for drilling.) Use 3/8" hardware to attach the Evaporator bracket to the air filter bracket.
4. Use the 5/16" hardware provided to attach the Evaporator to the Evaporator bracket. See Figure 3.



Mount the
Evaporator Bracket
in this position.

Figure 3 – Mounting the Evaporator and its Bracket

Section 2 – Mounting the Filter

Mount the Filter mounting bracket to the passenger side of the frame, using the bolts on the existing bumper bracket.

1. Make a Filter bracket as shown in the following dimensional drawing. See Figure 4.

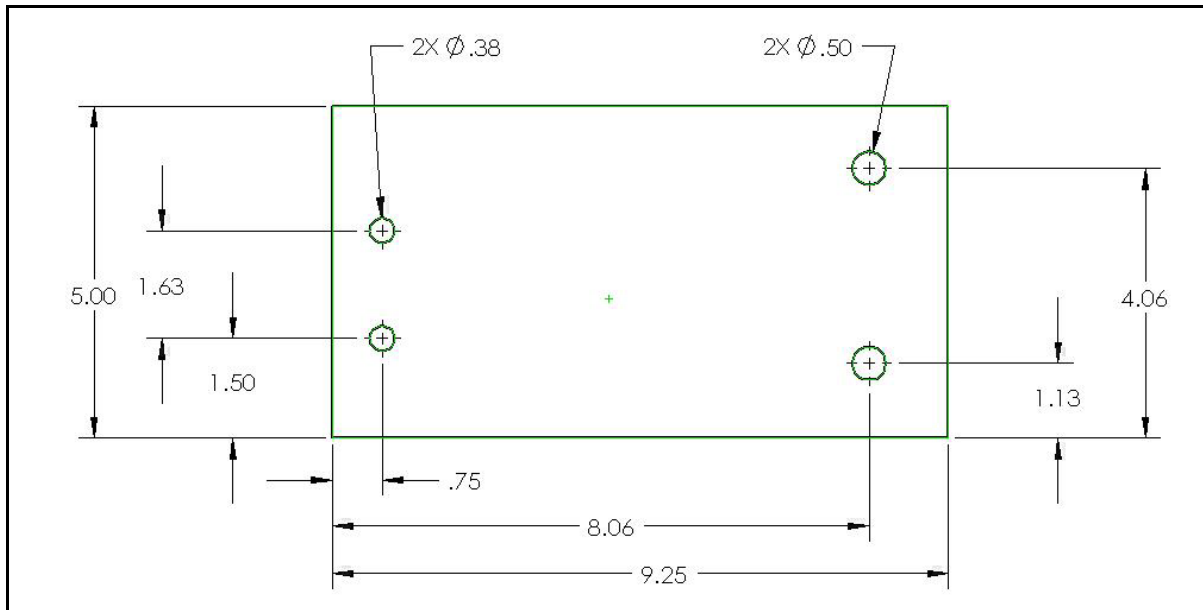


Figure 4 – Dimensional Drawing of the Filter Mounting Bracket

2. Locate the right bumper bracket bolts that will also serve as the attachment points for the Filter mounting bracket.
3. Attach the Filter bracket to the bumper bracket.
 - The larger holes (at the lower part of the bracket) attach to the bumper bracket using the existing bolts.
 - The Filter attaches to the smaller holes (at the upper part of the bracket), using the 5/16" hardware provided.

See Figure 5.



The Filter bracket mounts to frame rail attaching to the existing bumper bracket bolts.

Figure 5 – Filter and Bracket Mounted to Existing Bumper Bracket

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 Line Port:

There is a plug on the passenger side of the block, below the turbocharger assembly, which will be the source of pressurized oil that flows into the OPS Filter.

1. Locate the plug. See Figure 6.

Locate this plug just below the turbocharger assembly.

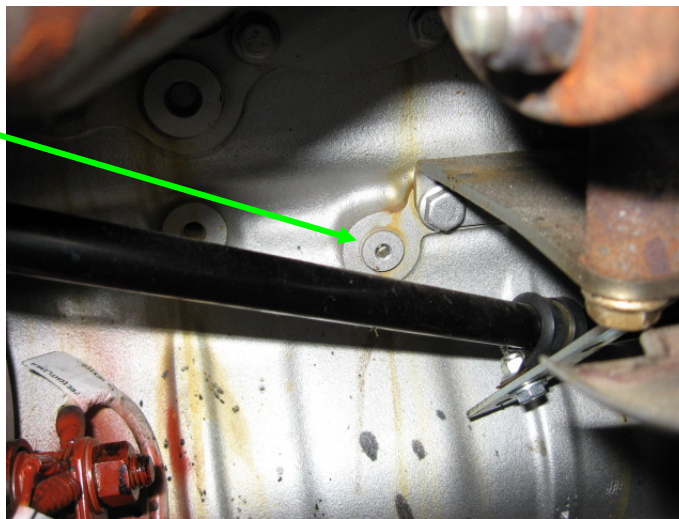


Figure 6 – The Oil Supply Line Plug

2. Remove the plug and replace it with the supplied hose adapter. See Figure 7.

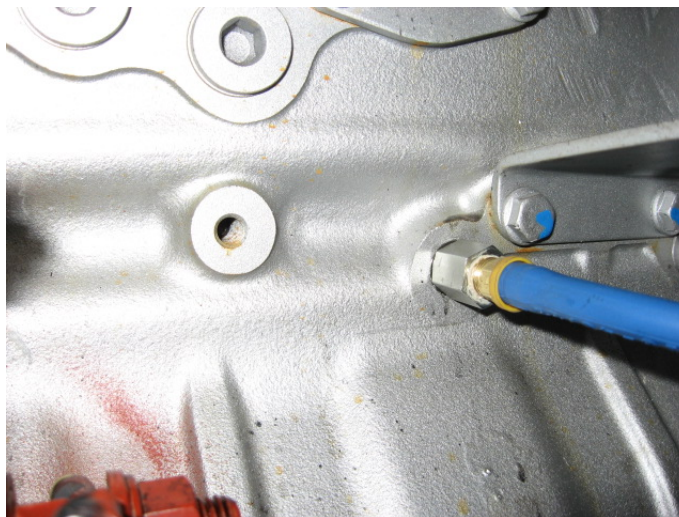


Figure 7 – The Oil Supply Port

3. Measure the distance from this fitting 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.
4. Cut the hose to length.
5. Slide the ¼” hose over the supplied ¼” barbed hose fitting.
6. Screw the hose fitting into the adapter already attached to the engine.
7. Slide the other end of the hose to the hose fitting that will go into the filter shut off valve.
8. 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.

Accessing the return line port

The gravity fed return line attaches the **return** side of the evaporator to a port located on the oil pan.

1. Remove the plug shown in Figure 8 and replace it with the adapter supplied with the kit.

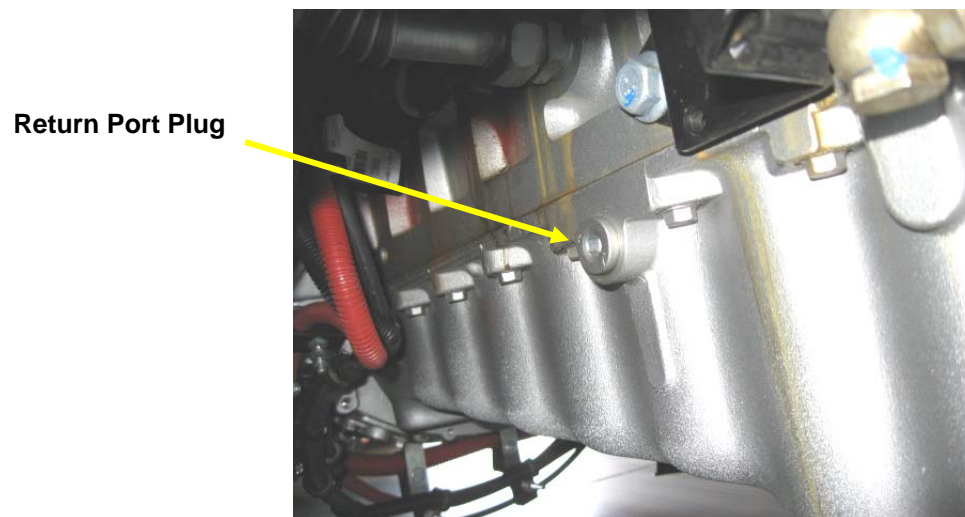


Figure 8 – Plug for Return Line

2. Install the adapter into the pan.

3. Attach the hose to the barb fitting.
4. Screw the fitting into the adapter already attached to the engine. See Figure 9.

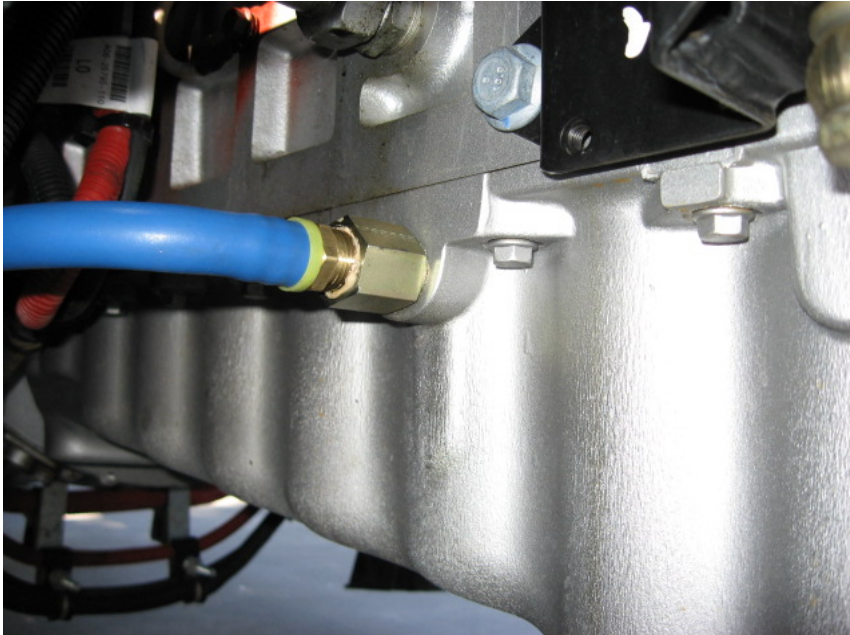


Figure 9 – Location of Return Port Fitting

5. Measure the distance from this flange 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.
6. Cut the hose to length.
7. Slide the hose end over the fitting that will attach to the adaptor you just screwed into the oil pan.
8. Attach the fitting that will go into the return side of the evaporator into the other end of the hose.
9. Route the second end of the hose next to the *return* side of the evaporator, and attach it to the evaporator.

As this connection is gravity fed, you must follow these guidelines:

- The hose must slope downward.
- Do not allow any kinks or sharp bends in this hose.
- Follow the rules applicable to all hoses.

Section 4 – Adjusting the Metering Valve

Checking and Adjusting the Flow Rate:

1. Open the Oil Shut-off Valve on the Filter. See Figure 10.

Oil Shut-off Valve

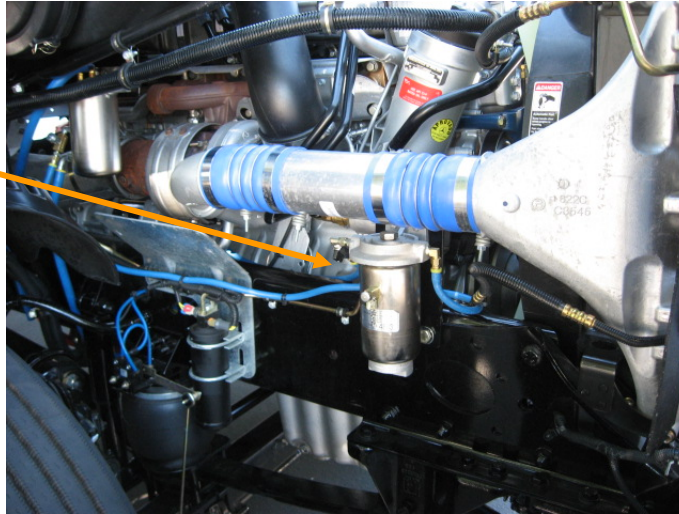


Figure 10 – Location of Shut-off Valve on the Filter

2. Start the engine and allow it to warm up to normal operating temperature and set the engine speed to 2,000 RPMs.
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.

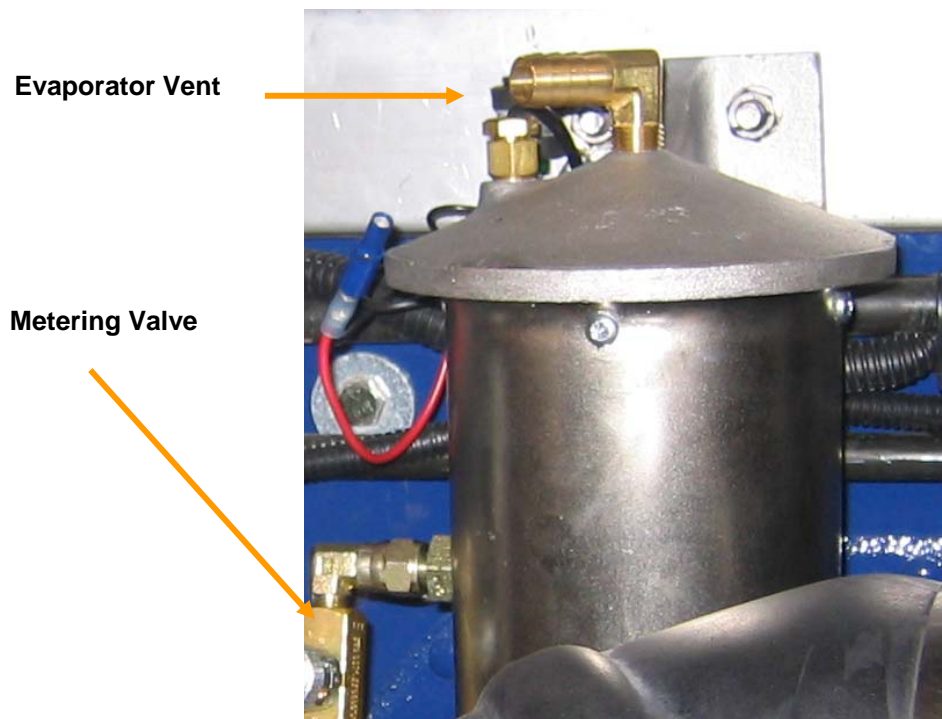


Figure 11 – Location of Vapor Escape Valve

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. The recommended flow rate should be set at 1.5 gallons per hours (plus or minus 0.5 gallons per hours)
 - 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.
12. Close the Shut-off valve on the Filter.
13. Reattach the metering valve to the Evaporator.
14. Attach a vent hose to the vapor escape valve on the top of the evaporator.
15. Open the Shut-off valve on the Filter.
16. Restart the engine and check for leaks. Fix any leaks as necessary.

Section 5 – Electrical Connections

Notes:

- Ensure the voltage of the truck matches the voltage of the system you are installing.
- 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.

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 keyed accessory circuit in the fuse box. See Figure 12.

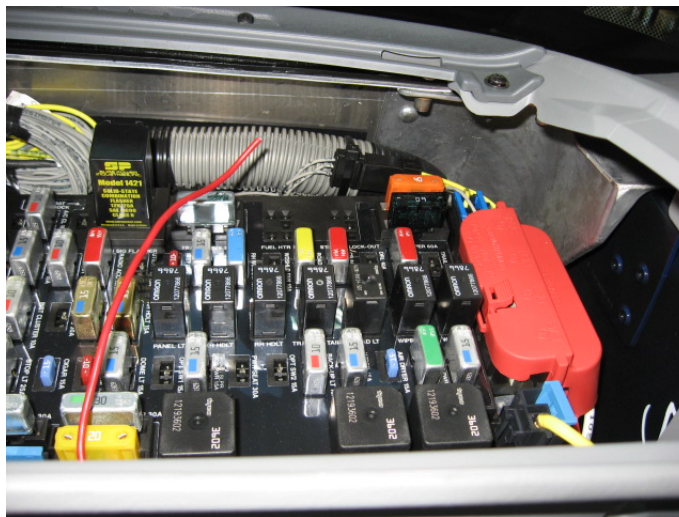


Figure 12– Electrical Connections

3. Under the red cover, the second terminal from the front is a keyed power source. Connect the fuse link to this terminal and the wire from the evaporator to fuse link. See Figure 12.