



Oil Purification Systems, Inc.

Installation Instructions

for

Mack Trucks

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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 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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Section 1 – Mounting the Evaporator

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

1. Position the Evaporator's against the air filter bracket. Use the holes in the Evaporator bracket as a template for attaching the Evaporator to the air filter bracket. Select a location that allows routing of supply and return hoses as well as the wiring connections. See Figure 1.



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

Select a location that doesn't interfere with the vehicle's components and allows for hose and electrical connections.

Figure 1 – Positioning the Evaporator

2. Drill 5/16" holes in the vehicle's air filter bracket. See Figure 2.



Figure 2 – Drilling the Evaporator Mounting Holes

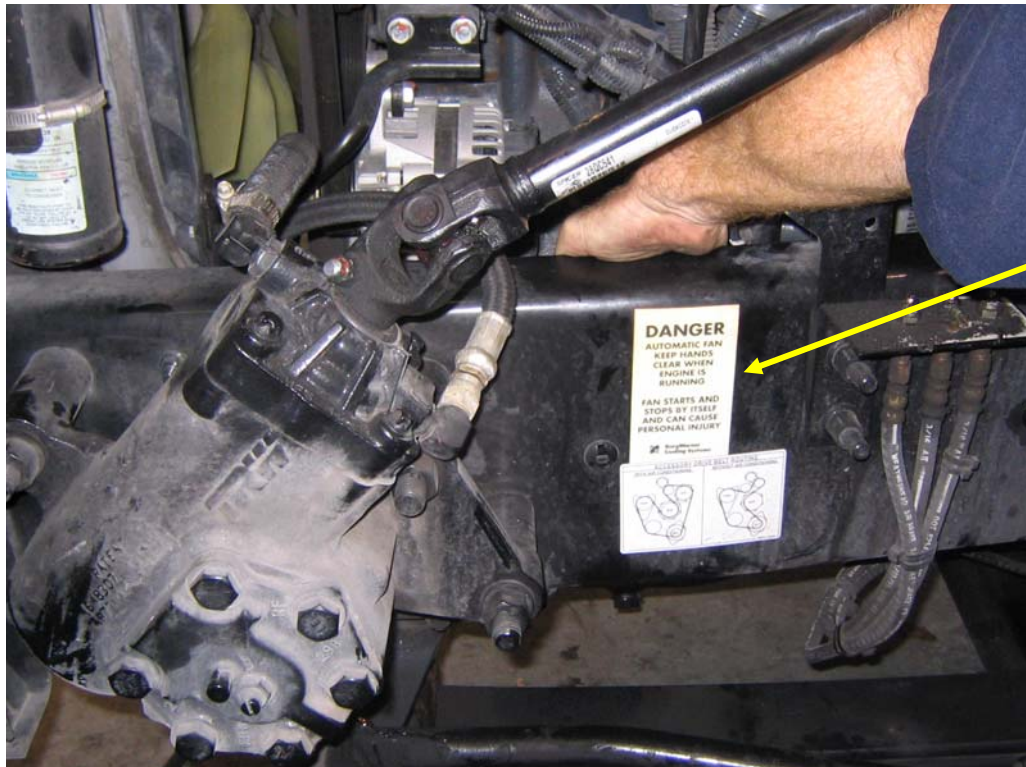
3. Use 5/16" bolts to attach the Evaporator to the air filter bracket.

Section 2 – Mounting the Filter

The Filter mounts to the driver side of the frame, just to the rear of the steering box.

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.

1. Locate the Filter mounting location. See Figure 3.



Filter mounts to this area.

Figure 3 – Locating the Filter Mounting Location

2. Drill two 5/16" holes in the frame, using the Filter mounting bracket as a template. See Figure 4.



Figure 4 – Drilling the Mounting Holes for the Filter

3. Use the supplied 5/16" bolts, nuts and lock washers to attach the Filter to the frame. See Figure 5. (**Note:** the hoses will not be attached to the Filter at this time.)



Figure 5 – Mounting 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 Line Port:

There is a plug on oil filter mounting bracket, just above the filter. You will replace this plug with a hose fitting 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 above the engine oil filter.

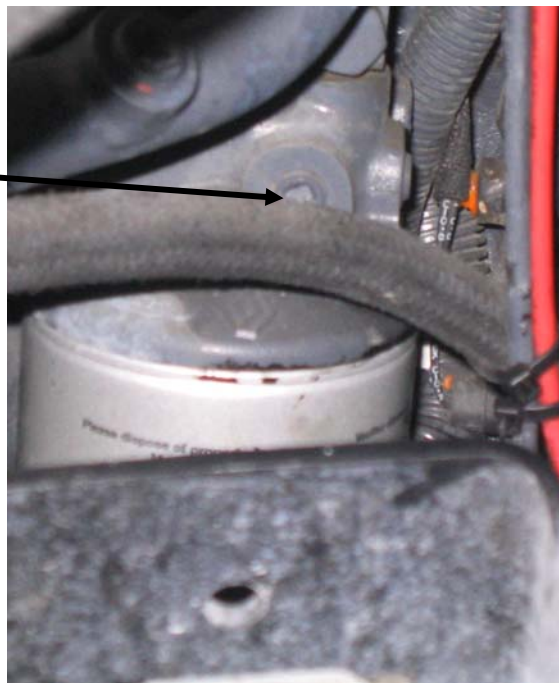


Figure 6 – The Oil Supply Line Plug

2. Remove the plug and replace it with the supplied hose adapter.
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.
8. Attach the second hose fitting into the **source** side of the filter.

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 engine block, just above the oil pan. This port is located behind the filter for the air brake system.

1. Bleed the air from the air brake system and remove the filter.
2. Locate the 45° hose fitting adaptor and grind off the corners of the fitting as shown in Figure 7. This will allow you to screw the fitting adaptor into the engine block.

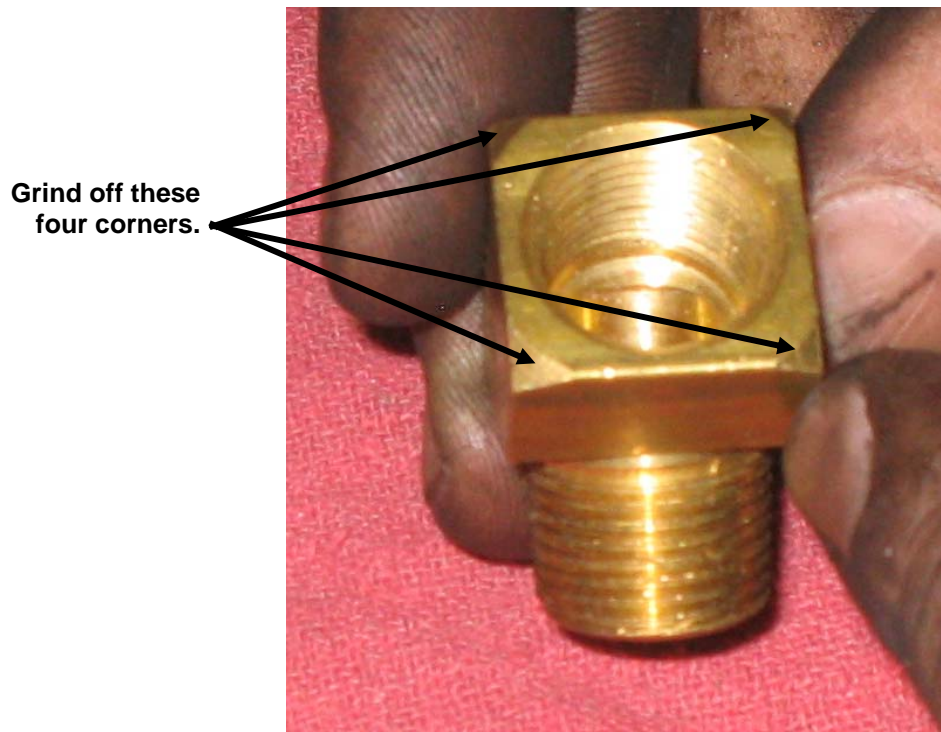
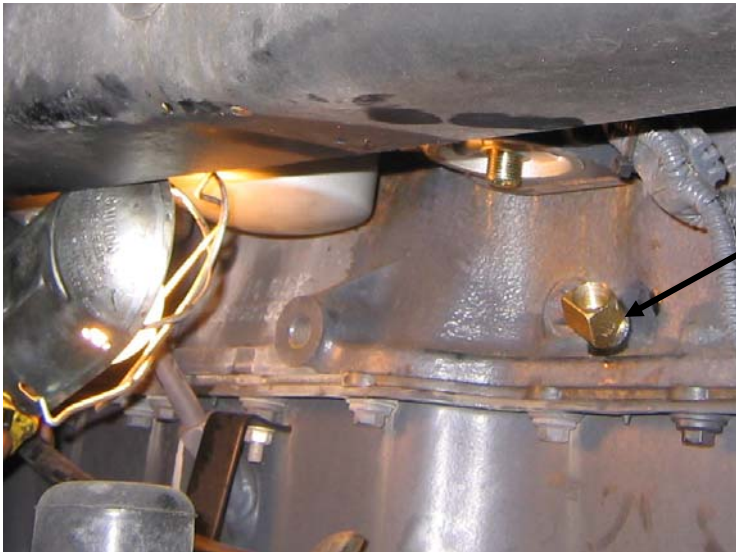


Figure 7 – Grinding the Corners off of the Fitting Adaptor

3. Remove the plug from the engine block and replace it with the 45° hose fitting adaptor. Use teflon tape on the pipe threads. See Figure 8.



Replace the stock plug from this location with the 45° fitting adaptor.

Figure 8 – Location of Return Port Fitting

4. 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.
5. Cut the hose to length.
6. Slide the hose end over the fitting that will attach to the adaptor you just screwed into the engine block.
7. Attach the hose to the 45° adaptor fitting. See Figure 9.



Figure 9 – Attaching the Hose to the Adaptor Fitting

8. Reattach the filter for the air brake system.
9. Attach the fitting that will go into the return side of the evaporator into the other end of the hose.
10. Route the second end of the hose next to the **return** side of the evaporator, but **do not** attach it to the evaporator at this time.

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.

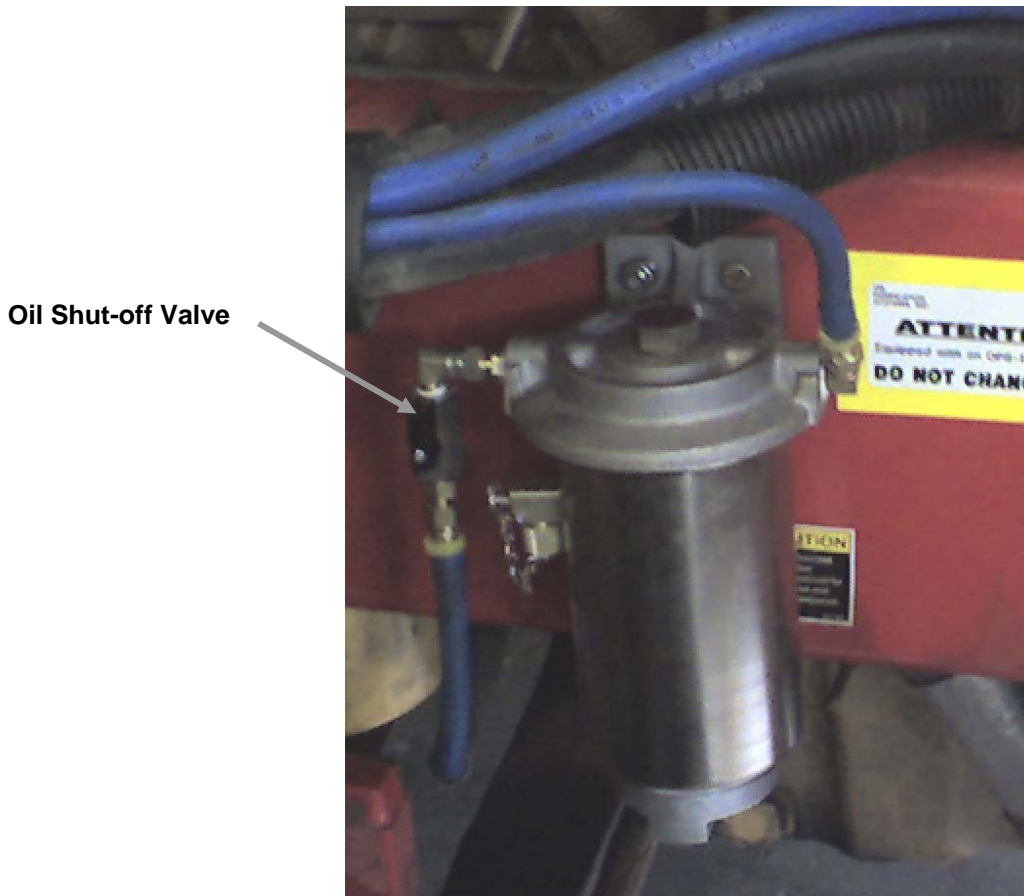


Figure 10 – Location of Shut-off Valve on the Filter

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.

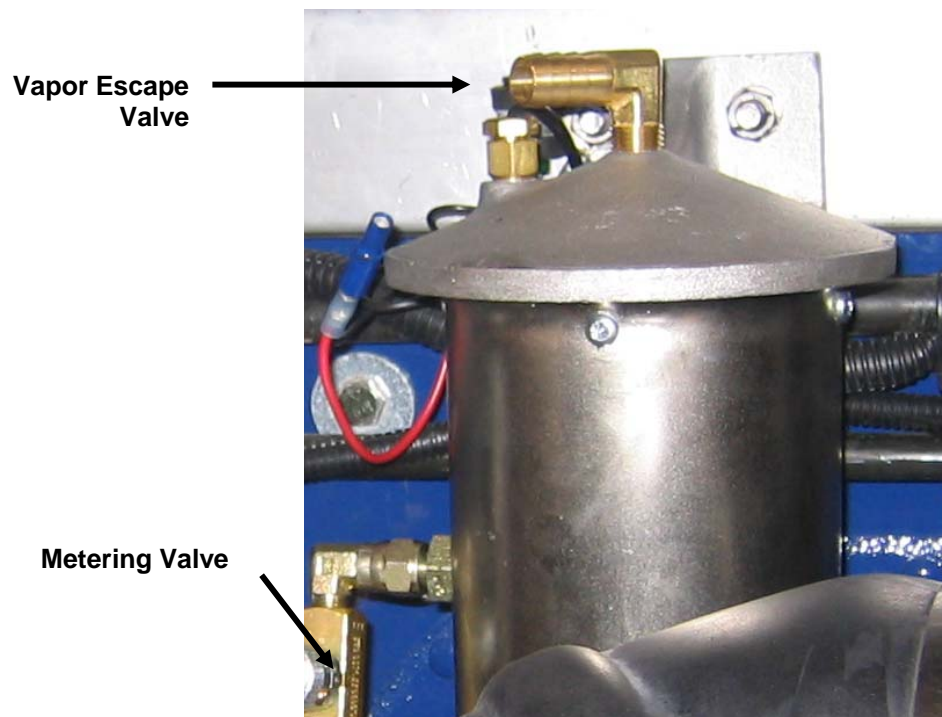


Figure 11 – Location of Vapor Escape Valve

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 proper rate is from 2.1 to 4.3 fluid ounces per minute (1 to 2 gallons per hour).
 - 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 accessory circuit in the fuse box. See Figure 12.



Figure 12– Electrical Connections

3. Install a 15 amp fuse into the fuse box for the circuit used for the Evaporator. See Figure 13.

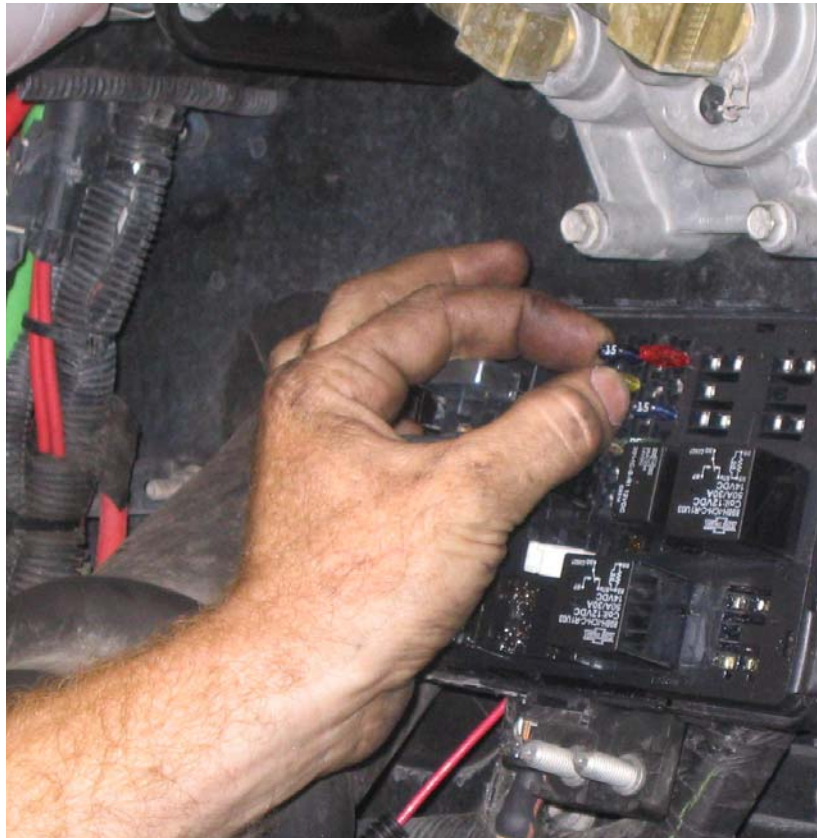


Figure 13 – Installing the Fuse