Eco-Pur™
Installation Instructions & Maintenance Manual

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Technical Support
Call Toll Free: (866) OILPURE
(866) 645-7873 Ext. 4

Technologies For a Greener Future
OPS prides itself on being a green company and is committed to protecting the environment by providing high-quality “green” products, and technologies for a wide range of industrial and commercial applications. Our goal is to aggressively reduce consumption of petroleum and synthetic based lubricants and fluids.

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Installation

⚠️ Safety Precautions Before Beginning Work

- Work in a clean, well-lit area.
- Wear proper safety apparel.
- Chock wheels.
- Ensure the engine has sufficiently cooled to prevent burn injuries.
- Disconnect batteries.

Ensure the voltage (12V or 24V) of the system being installed matches that of the truck. (See Section 4).

Notes for all Hose Connections

- To expand hoses and ease assembling over barbed fittings, use a heat gun or soak the hose ends in hot water. (Shake off any water from the hoses.)
- To ease the assembly of the adaptor into the hose end, apply light oil such as silicon spray or WD40 inside the hose end. **DO NOT** use grease or engine oil for this purpose.
- To protect the ¼” hose from abrasion, slit and wrap a ½” hose over each ¼” hose where it comes close to moving or vibrating parts (Fig. 1). Also, to help the ¼” hose hold its shape and prevent kinking, add the ½” hose to the parts of the hose that bend.

![Figure 1: Protecting Hose Assembly](image)

- Ensure that all hoses are of adequate length to prevent kinking.
- Route all hoses away from extremely hot parts, like exhaust components.
- Route all hoses away from moving parts.
- Use tie straps (provided) to secure hoses in place.
• Ensure the hose is the proper length before sliding it 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 or thread sealant on all NTP threads (used on the hose adaptors).
• Use the shortest length of hose that will meet these guidelines.
• Use two wrenches when tightening fittings to ensure a secure connection.

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**Before Installing This System**

- For optimal performance, OPS recommends changing the oil and filters at time of installation.
- ! Be sure to handle used oil in compliance with all applicable laws. This usually includes making provisions for recycling.
- ! Always wear proper personal protection equipment such as oil-resistant gloves and safety glasses when handling oil products.

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**Technical Support**

<table>
<thead>
<tr>
<th>Call Toll Free:</th>
<th>(866) OILPURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(866) 645-7873 Ext. 4</td>
</tr>
</tbody>
</table>
Eco-Pur™ On-Board Fluid Cleaning System

Figure 2: Major Components
Section 1 – Locate the Supply and Return Ports on Vehicle/Equipment

Supply Port

This port supplies the Eco-Pur System with pressurized lubricating oil. Typical locations may include:

- Pressurized ports on the engine block.
- The filter head assembly.
- Auxiliary components with an oil supply line (i.e. an air compressor) where applicable.

Return Port

This port returns oil by gravity from the Eco-Pur System. Typical locations may include:

- Access ports on the oil pan.
- Auxiliary dipstick or oil-fill tube port.
- Access plates (which may require drilling and tapping to accept a return fitting).
- Auxiliary drain plugs.

Note: If there are multiple options for the Return Port, select the one that is lowest on the engine, as this provides the most options for mounting Eco-Pur.
Section 2 – Mounting the System

Select a location

Selecting the optimal mounting location is key to insuring that the Eco-Pur System operates properly.

⚠️ DO NOT MOUNT DIRECTLY TO ENGINE.

Follow these guidelines when determining a final mounting location, which should:

- Position the System’s return fitting at least 12” above the oil level in the oil pan.
- Allow the system to be mounted vertically.
- Allow easy access to the filter.
- Provide at least 1-½” (38 mm) clearance below the bottom of the filter and any obstruction.
- Provide room for supply and return hoses.
- Allow room to access the oil sample valve.
- Allow the hood to close.
- Be capable of supporting 175 lbs (80 kg) to handle forces exerted during normal operation.
- Facilitate hose routing.
- Minimize interference to nearby serviceable components.
- Allow clearance from spring hangers, steering components and wheel turning radius when mounting to frame rail.

Mounting Notes

- The universal bracket (provided) supports 6 different Eco-Pur placement positions. Select the mounting direction that best facilitates hose routing and oil sample valve access, and protects the unit from moving parts.
- The bracket typically mounts directly to the frame, Firewall or support structure of another component, such as a radiator or air filter. If such a location cannot be found, you may need to fabricate a secondary bracket to position the unit properly.
- If mounting to the Firewall, be sure to check the opposite side for wiring or components that could be damaged during the installation process.
- 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.
If a suitable location for the system cannot be found, the Electronic Control Unit (ECU) can be separated from the housing and mounted in an alternate location within 4' of the rest of the housing.

*If you’re unable to determine a proper mounting location, call OPS Technical Services at 1-866-OIL-PURE (645-7873) (Ext. 4 for support.)*

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**Mounting the Bracket (provided)**

- Identify existing holes or mark new mounting holes using the bracket as a template (a minimum of 2 holes are required to mount the bracket; 3-4 are recommended).
- Drill 3/8" mounting holes.
- Mount the bracket using 5/16" Bolts, Split Washers and Nuts (Fig. 3).

---

**Mounting the Housing to the Bracket**

- Remove the protective red plastic plug in the brass orifice. **DO NOT REMOVE THE BRASS ORIFICE.**
- Position the housing on the bracket.
- Secure with four (4) ¼-20 Bolts, Split Washers and Nuts (Fig. 4). **Torque bolts to a maximum of 10 ft. lbs. DO NOT OVER TIGHTEN.**

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Remote mounting of the ECU (if necessary)
In rare circumstances, a remote ECU installation may be required. If so, contact OPS for an extension harness.
- Locate, in a protected location, within 4’ of Eco-Pur unit.
- Drill mounting holes for #10-24 cap head screws.
- Mount using (4) #10-24 cap head screws, star washer and nuts.
- Attach male connector of extension harness to female connector from Eco-Pur unit.
- Attach female connector of extension harness to electronic control unit.
- Secure harness with cable ties.

Section 3 – Installing Fittings and Connecting Hoses

Note: After suitable location for ECO-PUR unit has been established proceed with hose fabrication and installation.
Note: Always use Teflon tape or thread sealant for all NPT (pipe-thread) connections.

Hose (provided) Specifications
- ¼” Supply Hose, use Parker 836 high temperature push lock hose (or equivalent).
- ½” Return Hose, use Parker 801 general-purpose push lock hose (or equivalent).
- ¼” Vent Hose, general-purpose hose.

Connecting to the Supply Line
Connecting to the selected oil supply source may require the insertion of a T-fitting, replacing a plug with a hose fitting, or the use of an adaptor fitting and hose fitting. The fittings for the supply hose will have ¼” barbs on one end.
Once the oil supply port has been identified install the required adaptor if necessary.
Measure the distance from this source to the inlet port on the shut-off valve on the housing. Run a tape measure along the route you will use for this hose. Add adequate distance to the measured length to accommodate engine vibration, movement and hose-bend radius.
- Cut the ¼” Push Lok hose to length.
• Insert the ¼" Barb x #4 JIC fitting into one end of the supply hose for connection to the inlet port on the shut-off valve on the filter unit. (see Notes for Hose Connections, page 3 and 4)

• Insert the required ¼" hose barb fitting in the other end of the hose for connection to the adaptor (if used) or directly to the pressurized oil source on the engine. Attach the hose to the oil supply port on the engine block or adaptor used in the oil supply port.

  The ¼" Barb x #4 JIC fitting can now be connected to the inlet port on the shut-off valve on the filter.

• Using cable ties, secure lines to minimize chafing and wear.

---

**Connecting the Oil Return Line**

Connecting to the selected oil return port may require the insertion of a T-fitting, replacing a plug with a hose fitting, or the use of multiple fittings. The fitting(s) will connect to a ½" return hose.

**Because this connection is gravity fed, you must:**

- Choose a location with the straightest access to the return port.
- Assure all hose slopes downward for the entire run of the return line.
- Remove all kinks or sharp bends in the hose.
- Follow all rules applicable to all hoses.

**Return Hose Fabrication**

- Install adaptor in oil return port (if necessary for connection of return hose).
- Measure the distance from this port to the return port of the housing. Run a tape measure along the route you will use for this hose. Add adequate distance to the measured length to accommodate engine vibration, movement and hose-bend radius.
- Cut the ½" Push-Lok hose to length.
- Insert the ½" hose barb fitting and check valve assembly (Fig. at right), suitable for connecting the return hose to the engine or oil pan (or adaptor if used). (See Notes for Hose Connections, page 3 and 4).
- Insert the ½" Barb x 90 degree #8 JIC fitting supplied on evaporator in the other end of return hose.
• Insert the required fitting and hose into the selected return port on the engine or oil pan. Now attach the 90 degree fitting to the return port on the evaporator.

• Using cable ties, secure lines to minimize chafing and wear.

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**Attach Vent Tube (10" of \(\frac{1}{4}\) hose, provided)**

- Push Hose onto vent hose barb located on the external check valve (see figure below). The valve may be rotated 45 degrees in either direction to provide clearance if necessary. **Do not rotate it further as it will not function properly.**
- Secure hose to barb using a cable tie.
- Route hose down and secure with additional ties.
Section 4 – Electrical Connections

Selecting an electrical source
Although several electrical sources can be used for the Eco-Pur System, an Alternator Positive Terminal is recommended.

![Electrical Connection Diagram]

**Figure 5: Electrical Connection**

**Notes**
- Ensure the system voltage of the equipment matches the voltage of the Eco-Pur System you are installing:
  - Heaters with **BLACK** wires (See Fig. 6) are for a **12V** system.
  - Heaters with **WHITE** wires (See Fig. 6) are for a **24V** system.
- Use wire ties to secure all wires away from moving parts or extreme heat.
- Use care when removing the nut from the positive terminal on the back of the alternator. Be sure the nut alone is turning and that you are not also turning the stud. Internal alternator component damage may occur if the stud turns.
- Clean the alternator post to insure a good connection.
- Use wire loom (provided) to protect all wiring.

**Attach Power Harness**
- Attach female connector (6 Pin) to Electronic Control Unit.
- Add in-line fuse to red wire and terminate with ring terminal.
- Attach in-line fuse to electrical source.
- Terminate black wire with ring terminal and attach to ground.

**Note:** Use wire ties to secure all wires away from moving parts or extreme heat.

**Section 5 – Operational Test**
- **Install Spin-on filter.** (See Section 7)
- Fill and check oil levels before the operational testing. (Do not pre-fill spin-on filter)
- Start engine.
- Ensure the Shut-off Valve is in the ON position (See Fig. 7).
Verify power to system; green light on ECU is on steady (See Fig 8).
Verify operation of system; green light on steady and red light on steady or flashing.
Check for leaks. If a leak is detected turn the shut-off valve to OFF position. Repair if needed.

Figure 7: Shut-Off Valve (Shown Open)

Figure 8: ECU LED’s
Maintenance

Section 6 – Service Parts

<table>
<thead>
<tr>
<th>Part Description</th>
<th>P/N</th>
<th>Part Description</th>
<th>P/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eco-Pur™ – 12V G-100-B</td>
<td>G-100-B</td>
<td>Replacement Filter 4&quot;</td>
<td>M-210-A</td>
</tr>
<tr>
<td>Eco-Pur™ – 24V G-101-B</td>
<td>G-101-B</td>
<td>Replacement Filter 6&quot;</td>
<td>M-211-A</td>
</tr>
<tr>
<td>Sampling Valve P-113-A</td>
<td></td>
<td>Replacement Filter 8&quot;</td>
<td>M-212-A</td>
</tr>
<tr>
<td>Shut-off Valve P-104-A</td>
<td></td>
<td>Replacement Filter 10&quot;</td>
<td>M-213-A</td>
</tr>
</tbody>
</table>

Section 7 – Replacing the OPS Oil Filter Element

Replace the OPS Spin-On Filter at the oil service interval recommended by the vehicle manufacturer. If unsure of the proper interval, consult the table on page 19.

1. Stop the engine and allow the vehicle to cool.

2. Position shut-off valve to OFF.

3. Place an oil drain pan below the Filter.

4. Remove the used filter either by hand or with a filter wrench/strap. When using a filter wrench/strap make sure the tool is positioned within 2 inches of the top.

5. Before installing the new filter, lubricate the O-ring with clean oil (do not pre-fill filter). Tighten by hand until the gasket contacts the base, then rotate an additional 3/4 turn to ensure proper seating. DO NOT USE A FILTER WRENCH AND DO NOT OVERTIGHTEN as this may damage the unit.

6. Check the engine oil level. Fill, as necessary.

7. Start the engine. Open the Shut-off Valve and check for leaks.

8. Stop the engine. Check the oil level to ensure it is full.
9. Bring engine to operating temperature. Take an oil sample of **new** oil to establish a baseline for sample result interpretation. *(See *Taking An Oil Sample* in Section 8.)*

⚠️ Always wear proper personal protection equipment such as oil-resistant gloves and safety glasses when handling oil products.
Section 8 – Taking an Oil Sample

Frequency

We recommend that you:

- Change the OPS oil filter at every normal service interval as recommended by the engine manufacturer.
- Change the OPS and OEM filters at every other service interval as recommended by the engine manufacturer.
- Take oil samples at the normal service intervals. Shorten this interval if results of the previous oil sample indicated a potential problem.

Procedure

1. Start the vehicle and bring the engine up to operating temperature.

2. With the engine running, remove the Safety Cap from the Sampling Valve. (See Fig 2. on page 5.) To ensure an accurate sample reading, purge the sampling valve to flush out impurities that may have settled in the valve opening.

3. Hold a clean sampling bottle (See Fig. 9) under the Sampling Valve and push on the button until the bottle is filled to line. **DO NOT completely fill the sample bottle because it may cause leaking during shipping.**

4. Screw the cap tightly onto the sample bottle.

5. Screw the Safety Cap back onto the Sampling Valve.

*Figure 9 – Sample bottle and shipping container
(Be sure to completely fill out the information on the label.)*
Section 9 – Submitting the Oil Sample

NOTES:

- On the sample bottle enter: Company Name, the Company Vehicle Unit number into the Unit ID: field and date (Fig. 9).

- On the sample processing form below, you must complete all of the items in bold in order to receive a complete sample analysis (Fig. 10). (An OPS Serial # is no longer required.)

- Include mileage/hours on engine and mileage/hours on oil on sample bottle label. This important information helps oil analysts determine correct contamination levels.

1. Completely fill in the fields on the account registration form (required for first sample submission only) and the sample bottle label.
2. For U.S. Mail: apply address label for lab nearest your location (supplied with bottle label form), add proper postage and mail the mailing container.

3. For UPS in optional UPS Prepaid box: place mailing container in UPS box (provided), apply shipping label and drop in UPS box, bring to UPS Store or hand to a UPS Driver. *(UPS Prepaid boxes are available from OPS.)*

<table>
<thead>
<tr>
<th>Component Interval</th>
<th>Service Requirement</th>
<th>Sample Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine - Transportation 20,000 miles or OE recommended interval</td>
<td>Sample oil and change the OPS filter</td>
<td>OPS sampling valve</td>
</tr>
<tr>
<td>Engine – Vocational Application 250 hours or OE recommended interval</td>
<td>Sample oil and change the OPS filter</td>
<td>OPS sampling valve</td>
</tr>
<tr>
<td>Engine – Transit Bus 3,000 miles or OE recommended interval</td>
<td>Sample oil and change the OPS filter</td>
<td>OPS sampling valve</td>
</tr>
<tr>
<td>Hydraulic Systems 250-500 hours</td>
<td>Sample oil and change the OPS filter</td>
<td>OPS sampling valve</td>
</tr>
<tr>
<td>Gearboxes or other Industrial fluids 250-500 hours</td>
<td>Sample oil and change the OPS filter</td>
<td>OPS sampling valve</td>
</tr>
</tbody>
</table>

*Table 1: Suggested Sampling Intervals & Methods*
## Section 10 – Troubleshooting

<table>
<thead>
<tr>
<th>Issue</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leak at filter-to-base Seal</td>
<td>• Check for dirt around O-Ring &amp; that it’s seated properly</td>
</tr>
<tr>
<td></td>
<td>• Ensure proper installation (i.e.: Seal lubricated before installation and filter is properly tightened)</td>
</tr>
<tr>
<td>Leak at Vent Hose</td>
<td>• Ensure return line is not kinked</td>
</tr>
<tr>
<td></td>
<td>• Check for excessive engine blowby</td>
</tr>
<tr>
<td></td>
<td>• Ensure return hose is sloped downward</td>
</tr>
<tr>
<td></td>
<td>• Ensure the evaporator is higher than the return port</td>
</tr>
<tr>
<td></td>
<td>• If the vent leaks at the threads, reseal connection with Teflon tape</td>
</tr>
<tr>
<td>Leak at hose connections</td>
<td>• Ensure that all connections are properly tightened</td>
</tr>
<tr>
<td></td>
<td>• Verify use of thread tape or sealant on all NPT (pipe) threads</td>
</tr>
<tr>
<td>Leaks anywhere on filter body</td>
<td>• Call OPS Toll Free: (866) OILPURE (645-7873) Ext 4</td>
</tr>
<tr>
<td>ECU does not light up at all</td>
<td>• Check for proper power source (fused connection)</td>
</tr>
<tr>
<td></td>
<td>• Check fuse</td>
</tr>
<tr>
<td></td>
<td>• Check for proper ground</td>
</tr>
<tr>
<td></td>
<td>• Check pressure switch operation</td>
</tr>
<tr>
<td>Red light does not come on after system cold startup</td>
<td>• Ensure that the shutoff valve is in the on position (handle in line with the valve body)</td>
</tr>
<tr>
<td></td>
<td>• Check battery voltage is 13.2 volts or higher for a 12 Volt system and 27 Volts or higher for a 24 Volt system</td>
</tr>
<tr>
<td></td>
<td>• Check to see that the power cable (Red and Black wires) to the Eco-Pur is not more than 10 feet.</td>
</tr>
<tr>
<td></td>
<td>• <em>Note – It is normal for the RED light to flash or remain off for a few seconds during operation.</em></td>
</tr>
<tr>
<td>Evaporator Vent is emitting smoke</td>
<td>• Ensure the evaporator and vehicle voltages match</td>
</tr>
<tr>
<td>Oil Analysis indicate high levels of liquid contamination</td>
<td>• Use a direct current (DC) amp probe to verify amperage from the evaporator canister heating element. (Normal operating range is ~4.5 – 5.5 amps.)</td>
</tr>
</tbody>
</table>

If you have any additional issues, questions or concerns, call a Field Service Tech at 866-OILPURE (645-7873), ext. 4.
Oil Purification Systems, Inc. (“OPS”) warrants that Eco-Pur 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 Eco-Pur is properly installed, operated, and maintained, and, in each instance, in accordance with the documentation.

Should Eco-Pur 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 Eco-Pur or part thereof; or
2. REPLACE Eco-Pur 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 Eco-Pur 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.
2176 Thomaston Ave.
Waterbury, Connecticut 06704

and return Eco-Pur 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 Eco-Pur and the engine, and such other information as requested by OPS.

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