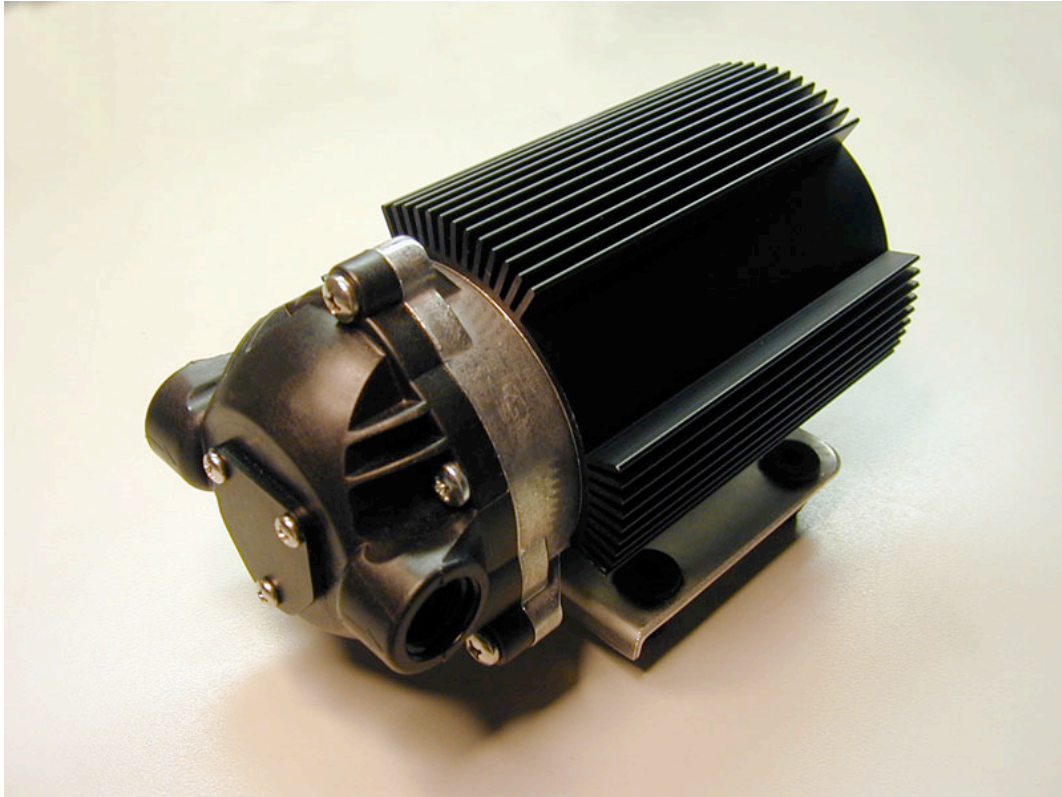


TurboWerx Base-Model Electric Scavenge Pump

Thank you for purchasing the TurboWerx Base-Model Electric Scavenge Pump. Please read through this entire document before starting any work. TurboWerx cannot be held responsible for any specific use or misuse of this product. If you still have any specific questions after reading this document, please contact the distributor or reseller where you purchased it, or contact TurboWerx at support@turbowerx.com.



Mounting

Choose a location with some air-flow. The least desirable location is a small boxed in region with no air-flow at all. Although the pump is very resilient, avoid locations that expose it directly to excessive water splashing.

It makes no difference whether the pump is mounted low, near the turbo, or up near the engine or on a firewall, or somewhere in between. The pump can self-prime from any height less than 5 ft. above the lowest point in the turbo drain plumbing. It can push the oil virtually any height or distance in any automotive and truck application.

The pump will run in any orientation – vertical, horizontal, upside down, and at any angle.

You are free to mount it however you like. However for minimum noise and maximum reliability, the recommended bolt/screw is a 1/4"-20, with a Nylon insert lock nut (aka "Aircraft nuts"), and a washer. The idea is to not compress the anti-vibration rubber mounts since this will increase noise transmitted through the mount. Tighten the lock nut where it just starts to deform the rubber. The Nylon insert lock nut will not loosen.

You may also remove the supplied mounting bracket and create your own. Simply remove the two self-tapping screws from underneath, but do not use screws that are any longer than the ones removed. Just be aware that pump noise will increase slightly without some similar rubber isolation.

Many installations mount the pump directly to the engine block or transmission. This helps reduce noise further since these are both very heavy non-resonant objects and they themselves are mounted on rubber isolation.

Electrical Connections

When the engine is running, there should be a minimum of 12V at the pump at all times.

The pump should be energized any time the engine is cranking or running. It is OK to have the pump running when the engine is off, such as when the key is in "Accessory" position. The pump draws only about 3-4 amps worst case, thus using a dedicated switched relay is not always needed.

The pump red wire should be connected to a key-switched, fuse-protected +12V source. Use 16 gauge or larger diameter for runs of less than 10ft. Use 14 gauge or larger diameter for runs of 10-20 ft. Always keep the wires away from any moving surfaces. Remember when the car is jacked up the suspension is fully extended – once it is back on the ground, many suspension pieces can move substantially. Keep wiring and plumbing away from these.

The other wire may be white or black. This needs to be connected to any good ground wire, or point on the chassis. Be sure and scrape away any paint, corrosion/oxidation, etc for chassis connections.

Reversing the polarity of the wiring will NOT reverse the flow of the pump. "IN" is always in, and "OUT" is always out.

After the electrical connections are completed, energize the pump and verify that it is getting no less than 1 volt below the voltage measured at the battery. First measure the voltage at the battery with the pump on. Then measure the voltage in the red wire as close to the pump body as possible. If you are measuring much below this, locate where the voltage drop is occurring, and correct. For some systems with unavoidable voltage drops,

it may require running the pump from a key-switched external relay connected directly to the battery through an in-line 10 amp fuse.

Pump plumbing

The inlet and outlet are 3/8" NPT. You can use most any fittings you need to but some restrictions must be observed:

When using metal fittings (brass/aluminum/steel, etc), then you should use thin Teflon thread sealer and a **maximum of 5 ft-lbs torque**. This will "feel" light, but since the body of the pump is reinforced fiber plastic, it can be damaged by over-torqueing. When using plastic Nylon fittings, Teflon thread sealer is not needed – simply tighten to 5 ft-lbs.

For some severe-duty applications, you can forego the Teflon and coat the threads with epoxy (or "JB Weld"). This works well, since it can still be broken later, and then peeled away manually. Be sure and clean the threads on the fitting and the pump head with some no-residue cleaner (brake-cleaner works well).

The pump inlet side should be plumbed from the pump to the turbo oil drain outlet or turbo's drip-tank with a minimum of 3/8" ID reinforced hose suitable for exposure to oil. Pressure rating is not important, since there is none in a scavenge application. It is **highly** recommended to use stainless steel braided hose, especially if the hose is with a few inches of exhaust pipes or turbo exhaust housing.

The pump outlet side can use smaller diameter plumbing. Plumbing size as small as –4 AN and –3 AN have been used successfully, where less cost and easier routing was desired, but larger diameter is the preference. In most cases, the return oil is plumbing into an existing fill or vent cap that has a direct pathway to the sump, e.g., cam tower vents, timing chain covers, oil filler caps, oil dip stick holes, air-oil separators inlets, etc.

Some installations have plumbed the returned oil directly into the bottom of the oil pan. This works well, since the pump will easily create the pressure needed to force the oil in.

Alternative applications

The pump can be used as a transmission fluid pump, to pump system coolant, and as a pressure pump for water/alcohol injection. It can handle diesel fuel as well. All the same conditions/suggestions above still apply.

Optional system check ideas

Some installers have pre-verified the system before actual driving. This can be done by setting up a small tank (1/2-1 gallon) directly below the turbo drain outlet or outlet line so that the oil accumulates in it while idling. The pump's inlet line is dropped into the tank

and rests near the bottom. While the engine is idling, you can observe the pump scavenge it out. This also allows you to verify any oil leaks, or any other mistake. Note that it might be easier to temporarily replace the installed lines with longer ones to route to the tank more easily.

If you are measuring the scavenge rate, please note that the full pump-rating is not achieved until the oil temperature reaches a minimum of 120F. In most applications, the engine oil temperature will reach 120F within 3 minutes at idle.

Troubleshooting

If you start to see blue oil smoke after a short while on the initial check out drive, stop and verify the pump is actually getting power (with the engine off, you can usually hear it with the ignition on the key in the Accessory position). The next thing to check is if it is actually pumping oil – if you can access the oil outlet line, feel the outside of it...it should feel very warm/hot from the oil being pumped through it. If not, either the pump is not getting power, or it's not able to draw in oil from the turbo outlet. In this case, verify that the oil is actually draining from the turbo into the lines or drip tank (see Optional System Check Ideas above). It's also possible that the line is pinched, kinked, or obstructed.

Specifications

Pumping Rate: 1.75GPM (105GPH) @ 12.8 volts.

Maximum Fluid Temperature: 300F (149C)

Current consumption: <3.5 amps

Inlet/Outlet fittings: 3/8" NPT female

Dimensions: 7.0" x 4.5" x 4.0"

Weight: 5 lbs

Product Warranty

Unless specified otherwise, TurboWerx offers a limited warranty on all products for a period of 90-days from the date of sale. Warranty covers defects in materials and workmanship. TurboWerx does not warrant any product for any specific application, including racing. Warranty is valid only for the original purchaser. Warranty is not transferrable. Warranty is

void from any misapplication, abuse, improper installation, or acts of God. TurboWerx will determine validity of warranty claim based on inspection and analysis of parts returned to TurboWerx. TurboWerx will, at its discretion, repair or replace any products found defective under the conditions set-forth herein. In the event replacement product not available, TurboWerx reserves to the right to choose a substitute of the nearest equivalent part available.

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