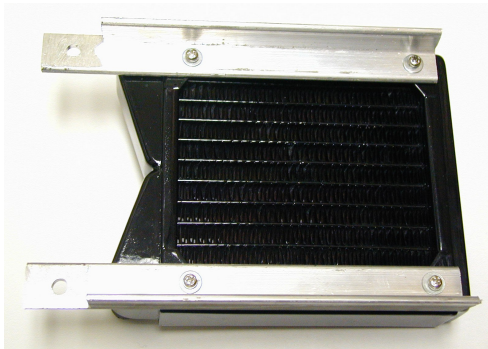


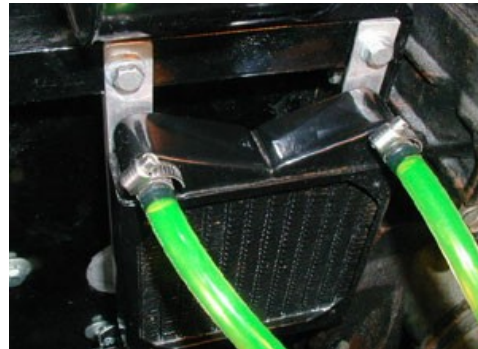
NetGain Controls, Inc. - WarP-Drive Liquid Cooling Kit Installation Instructions

Thanks for your purchase of the *WarP-Drive* Liquid Cooling Kit. This set of components has been carefully chosen to provide you with practical, functional means of liquid cooling a WarP-Drive motor controller, or any other device requiring liquid cooling. If installed properly, this kit should provide a lifetime of cooling service. Please carefully read these instructions to ensure that everything is installed correctly.

1. Plan the layout of each component in the kit. The reservoir should be mounted at the highest “elevation” in the cooling loop. The other items in the kit can be at whatever position lower than the reservoir that is most convenient. In general, placing the pump at the lowest point in the system will make purging easier (see the figure in step 6 for an overview of the component layout). Also, placing the pump close to the reservoir will help in priming the pump. Try to keep all of the components as close together as possible. Even though the pump has been potted to protect against damage from moisture, it should be placed in a location that is as free from water and moisture as possible.
2. Mount the radiator in a place where it can get good airflow. The inlet and outlet should either be mounted upwards or to the side – not downwards. It is likely that custom mounts will have to be designed for your particular mounting scheme. The images below show some examples of how to mount the radiator. The provided mounting screws might need to be cut to size to fit your mounts. **If the mounting screws are not properly sized, they can pierce the fins of the radiator when tightened.** Be extremely careful when installing to avoid this.



Example of aluminum brackets for mounting radiator (old style radiator)



Radiator mounted in vehicle (old style radiator)

3. If a fan will be used, mount it now. Use the same caution as in step 3 to avoid piercing the radiator with the mounting screws. The fan can be switched on from the same relay used later in step 5.
4. Mount the pump using the provided clamp. The outlet and inlet of the pump should be mounted horizontally (not vertically) for optimal performance.
5. Connect the electrical connector to the pump. The provided relay can be used to switch on the pump (and fan if used). Description of the terminals and their respective connections can be found in the “Additional Notes” section of this document. The relay should be mounted in a moisture-free location. Route the electrical wires to the relay mounting point. **Do not turn on the pump at this time!** See the section in the “Additional Notes” for instructions on

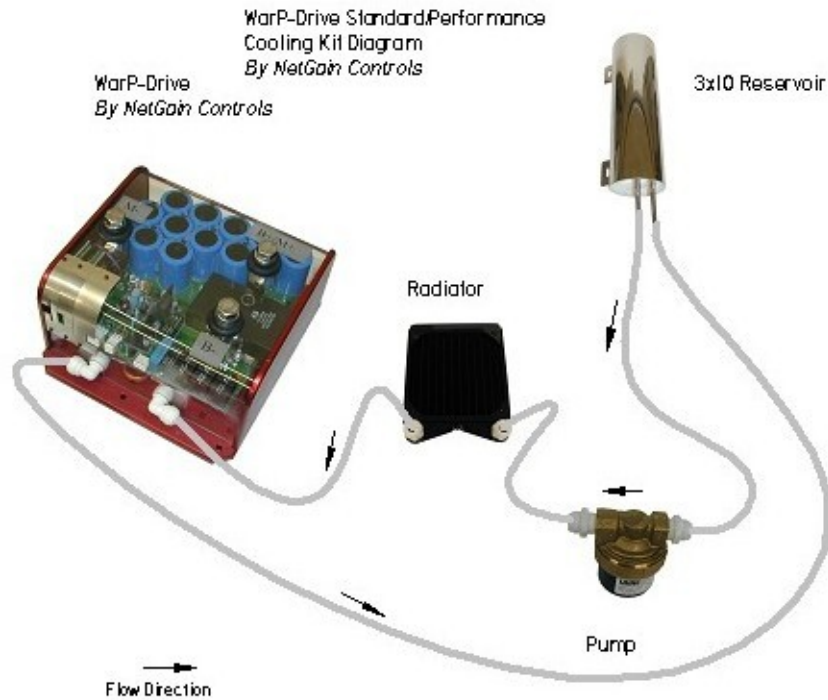
connecting the relay.

6. With the reservoir, radiator, and pump securely mounted, the tubing can be connected to each of the devices.

The suggested routing is described below. Plan the layout according to this routing scheme before cutting the tubing. Then begin cutting sections and installing a section at a time. Place the small clamps provided over the tubing before attaching to each component. Do not secure the tubing in any way to your chassis at this point. This will allow for the tubing to be flexed during purging later.

Starting at the pump: pump outlet, radiator inlet (either port), radiator outlet, inlet of whatever device you are liquid cooling (for the WarP-Drive, the inlet can be either port), device outlet, reservoir inlet (the long tube), reservoir pump inlet (short tube), pump inlet. With the exception of the connections to the 3x10 reservoir, the hose can simply be inserted into each fitting on the controller, radiator, and pump. To connect to the reservoir, the black hose clamps must be used.

The picture below illustrates the basic installation configuration with a WarP-Drive. NOTE: This setup is for the Standard or Performance Kits. For Light kit installation, the pump connects directly to the WarP-Drive.



7. Once the tubing has been routed and the connections are secure, the system can be filled with coolant. Any high-quality automotive anti-freeze will work fine. Slowly fill the system through the fill-cap on the reservoir. Check for leaks and adjust connections if needed. Fill the system with as much coolant as possible, then move on to step 9 for tips on purging air out of

the system. **Do not turn on the pump until it has been primed with liquid!**

8. The easiest way to get the pump primed is to mount it close to and below the reservoir. As you fill the reservoir with liquid, it will naturally flow into the pump. When you see liquid coming out the exit side of the pump, you know that the pump has been sufficiently primed. At this point, you can turn the pump on. Liquid should quickly fill the entire system, and large bubbles will disappear. Verify that there is sufficient coolant in the reservoir. When the pump is powered, coolant should begin to immediately flow. If this is not the case, work the tubing to cause coolant to enter as much of the tubing as possible.
9. The tubing can now be secured (if desired) to the chassis. Verify that the pump turns on when the device to be cooled is turned on. This completes the installation process.

Additional notes:

- Check for leaks at all the joints after operating for a few minutes. Check again after a few hours of operation, and again after about a week.
- Check coolant level at least twice a year. Coolant should be 1 to 1 1/2" from the top. Add coolant if necessary.
- Do not over-tighten the cap on the reservoir.
- The included Tyco (EVS P/N 101-V23232-A0001-X003) relay has the following connections:

<i>Pin</i>	<i>Connection</i>
1, 2	These are the control pins. One will go to ground, the other to the +12V control input (e.g. the Hairball main contactor pin). The provided relay has built-in protection against switching spikes, so external suppression (such as with a diode) is not necessary.
3	+12V through a 10 amp fuse.
5	Pump positive lead (also fan positive lead if a fan is used). Negative lead on pump (and fan if used) will go directly to chassis ground.