



INSTRUCTIONS

ELECTRIC WATER PUMP / FAN ENGINE COOLING CONTROLLER

1. OVERVIEW

This compact, weather resistant, all solid-state unit controls both an electric water pump and fan providing fully automatic engine cooling for competition vehicles. We provide two versions of the controller since alcohol engines typically run cooler and develop heat more slowly than gas engines. In both versions the water pump turns on sooner and turns off later than the fan to allow smooth, even temperature transitions.

An Override input is provided and designed especially for drag race applications. When the Override is activated, both the water pump and fan will turn on regardless of engine temperature. The water pump and fan will continue to run for 15 seconds after the Override signal is deactivated, making it ideal for competition to provide maximum cooling and consistent electrical loads under race conditions.

The unit is short circuit and overload protected and features automatic detection and indication of Temperature Sensor faults as well as internal over-temperature conditions. In the event that a sensor fault is detected, the water pump and fan will turn on and run continuously in fail-safe mode to prevent over-heating.

SPECIFICATIONS

Battery Voltage	10 - 20 VDC
Fan Control Range, Gas Version	160°F (on) - 125°F (off)
Fan Control Range, Alcohol Version	145°F (on) - 140°F (off)
Water Pump Load	8 - 10 amps, typical
Fan Load	10 - 20 amps, typical
Combined Total Load	35 amps, Max

2. SPECIAL TOOLS REQUIRED

Proper wire terminations are essential for the safety, operation, and long term durability of your vehicle's electrical system. To install this Control Unit you will need a heat gun and quality crimp tools.

A crimp tool such as the one shown should be used to crimp the non-insulated closed barrel terminals provided in this kit. Note that the wire insulation butts up firmly against the terminal and that the crimp tool creates a dimple in the terminal, securing the conductor without breaking any strands. Use a heat gun and a piece of heat shrinkable sleeving included in the kit to insulate each crimped terminal. When the sleeving is heated it should shrink tight around the terminal and the wire insulation. In this way the sleeving acts not only as an insulator but also as a strain relief to minimize bending of the conductor at the crimped connection, which can cause eventual breakage.



Proper Crimp



Crimp Tool

3. MOUNTING AND GROUNDING

MAKE SURE THE BATTERY IS DISCONNECTED BEFORE PROCEEDING. The Control Unit should be mounted before you begin connecting any wires. Mount the unit as far away from heat sources as possible, especially exhaust headers or manifolds. It is normal for the controller to get a little warm when operating so it should be mounted to a metal panel that can dissipate heat.

All ground connections to the chassis must be clean, free from rust and paint where the connection is made. Refer to the wiring diagram for making all other connections. When finished, install the vinyl caps over the two stud terminals for protection.

4. TEMPERATURE SENSOR

The Temperature Sensor is built into the 3/8" ring terminal on one end of the Temperature Sensor Cable assembly. The sensor ring terminal should be mounted under a bolt on the end of one of the cylinder heads in order to accurately read engine temperature. If that is not possible, use an intake manifold bolt that's close to a water jacket. **Hold the sensor to prevent turning and possibly damaging the sensor leads while tightening the bolt.**

Cut the cable to desired length, leaving at least six inches of extra length and connect the wire leads of the Temperature Sensor cable to the Controller as shown on the wiring diagram. Three inputs are provided for fine adjustments to the Fan turn-on temperature. Start by connecting the red Sensor lead to the yellow TMP-1 input. Later you can move to the orange TMP-2 or red TMP-3 input to increase the turn-on temperature a few degrees. Sensor wire leads can be extended if necessary to lengthen the cable to the Control Unit.

5. TESTING - READ THIS ENTIRE PROCEDURE BEFORE BEGINNING

Once you have completed installation, make sure the Ignition and Water Pump/Fan switches are turned OFF, then re-connect the Battery. The engine should be cold.

- 5.1 Turn on the Water Pump/Fan switch to activate the Controller and verify the Red Status LED illuminates. The water pump and fan should not turn on unless an open or short is detected in the Temperature Sensor cable. This is a fail-safe feature to prevent engine overheating if this type of fault occurs. If a fault is detected, the LED will flash. Count the number of flashes and refer to the table on the wiring diagram to diagnose the Sensor Cable problem.
- 5.2 Test the Override feature by activating the Transbrake. Verify both the water pump and fan turn on. The water pump and fan will remain on for about 15 seconds after the Transbrake switch is released. If the water pump and fan do not turn on check the Status LED. A rapidly flashing LED indicates a short or overload on one of the outputs. If this occurs turn off Ignition and Water Pump/Fan switches and check Fuses and wiring. If no problem is found, the water pump or fan may be stalled or defective.
- 5.3 If the Status LED is illuminated but not flashing, and if the water pump and fan turn on and off using Override, then you're ready for warm engine testing. Start the engine and allow it to idle while monitoring the Water Temperature gauge. The water pump will turn on first as the engine begins to warm up (typically around 125 degrees). Let the engine continue to warm up and verify the Fan turns on at a safe temperature.
- 5.4 Turn off the engine and allow it to cool down until the Fan turns off. Wait for the Water Pump to turn off a short time later, then repeat the previous step to verify the Fan turn-on temperature for the warm engine. If you want to increase the turn-on temperature for the Fan move the red temperature sensor lead from the yellow TMP-1 input to the orange TMP-2 or red TMP-3 input. The TMP-3 input will increase the temperature by 5-10 degrees.
- 5.5 If the engine temperature gets too hot and the Fan doesn't turn on, turn the Ignition off and check the Controller Status LED for faults and make sure the Temperature Sensor is properly mounted to the cylinder head. Try moving the Sensor to another bolt on the cylinder head, intake manifold, or water pump to adjust the Fan turn-on temperature. **NOTE: Our experience has shown that the temperature difference from one location to another can be significant while the engine is warming up.**

5.6 Double-check all connections and remember to install the vinyl caps over the stud terminals for protection against accidental shorts. Use the heat shrink tubing in the kit to cover and insulate all electrical connections. Installation is complete. Occasionally check the Status LED for faults (Ignition must be turned on to power the Controller). Three flashes indicates the Controller is getting too hot. If this occurs the Fan or Water Pump may be drawing too much power, or the Controller is too close to heat sources.

6. TECHNICAL SUPPORT

Free 24/7 tech support is provided online at: www.coachcontrols.com
or call 423-790-7905 M-F, 9am-5pm eastern.

7. 2 YEAR WARRANTY

Coach Controls, Inc. warrants for a period of 2 years to the original purchaser of this product that it shall be free from defects in material and workmanship under normal use and service for which it was intended. Our obligation under this warranty shall be limited to the repair or replacement at our option. Coach Controls, Inc. shall not be liable for any injury, whether to person or property, or for any damages, whether direct, indirect, consequential, or special, or any other damage resulting from the use, or misuse, of this product. Any injury or damage so incurred will be limited to the original purchase price of the product.

Before returning any product, a Return Material Authorization (RMA) number must be obtained from Coach Controls, Inc. and conspicuously printed on the outside of the box. Any item(s) returned without an RMA will not be accepted.

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Engine Cooling Controller Wiring Diagram

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TEMP SENSOR

Mount under bolt to front of cylinder head



Hold ring terminal when tightening bolt to prevent damage to cable / sensor

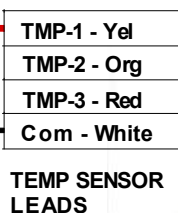
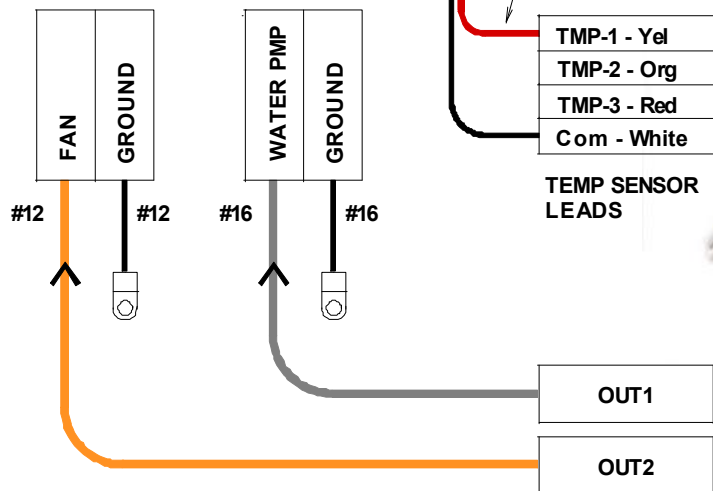


TOTAL POWER 35 AMPS MAX

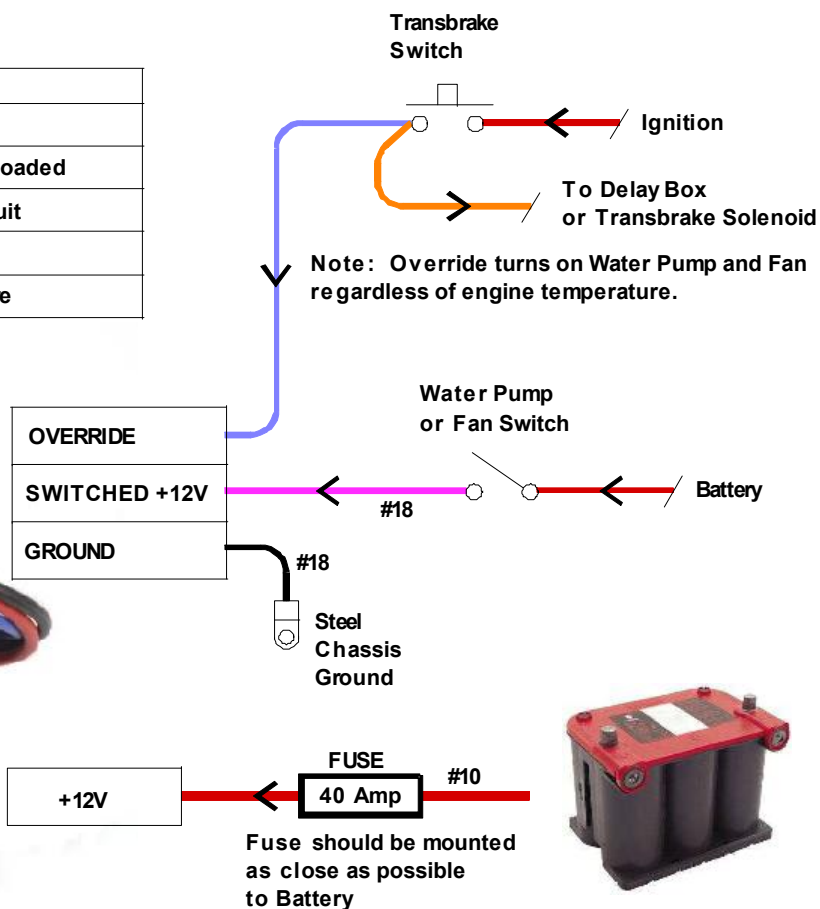


Move red wire to TMP-2 or TMP-3 to increase Fan turn-on temp a few degrees

LED	CONDITION
Constant On	Normal Operation
Blinking Fast	Output shorted or overloaded
1 Flash	Temp sensor open circuit
2 Flashes	Temp sensor shorted
3 Flashes	Controller Overtemperature



COOLING CONTROLLER



Fuse should be mounted as close as possible to Battery