

INSTRUCTIONS

DUAL OUTPUT FAN CONTROLLER

1. OVERVIEW

Congratulations on your purchase of the latest technology in cooling fan control. This compact, weather resistant controller can be mounted inside or outside the vehicle cabin. It also 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 Fan will turn on and run continuously in fail-safe mode to prevent over-heating.

Three sensor inputs allow for simple one-time setup of temperature control, and an input for the A/C Clutch will turn on the Fan when the air conditioner is used. It should be emphasized, however, that no fan controller can prevent overheating. If your vehicle overheats when the fan is running, a fan controller will not solve the problem. The job of the Fan Controller is to operate the fan efficiently, turning on the fan only when the radiator alone cannot provide enough cooling. The benefit of this efficiency is prolonged life of the Fan and Alternator.

SPECIFICATIONS

| | |
|---|--|
| Battery Voltage | 10 - 16 VDC |
| Fan Load | 1 or 2 Fans, total of 30 amps max, running |
| Temperature Range 1, Yellow stripe lead | 180° - 190° F, typical |
| Temperature Range 2, Orange stripe lead | 190° - 200° F, typical |
| Temperature Range 3, Red stripe lead | 205° - 215° F, typical |

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 Fan 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 Fan Controller should be mounted before you begin connecting any wires. We recommend mounting the unit inside the vehicle cabin but it can be mounted outside the cabin, even in the engine bay if necessary, 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 the fan so it should be mounted to a metal panel that can dissipate heat such as the fender well, firewall, frame, or body panel.

For maximum cooling and longer fan life we recommend connecting the fan and controller ground leads directly to Battery Ground. If you connect the ground leads to the chassis, metal 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 ring terminal should be mounted under the **shortest** thermostat housing bolt on the engine in order to accurately read engine temperature. If that is not possible, use an intake manifold bolt that's close to a water jacket. **Install a flat washer between the ring terminal and mounting bolt and 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 to the Controller as shown on the wiring diagram. Sensor wire leads can be extended if necessary to lengthen the cable to the Controller.

5. TESTING - READ THIS ENTIRE PROCEDURE BEFORE BEGINNING

Once you have completed installation, make sure the Ignition Switch and A/C system are both turned OFF. **Double check Battery polarity then re-connect the Battery.** The engine should be cold.

5.1 Turn the Ignition Switch to the Run position but do not start the vehicle. Verify the Red Status LED illuminates on the Fan Controller. The Fan(s) should not turn on. If the LED flashes, count the number of flashes and refer to the table on the wiring diagram to diagnose the Temperature Sensor Cable problem. Note that the Fan will turn on if an open or short is detected on the Sensor cable. This is a fail-safe feature to prevent engine overheating if this type of fault occurs.

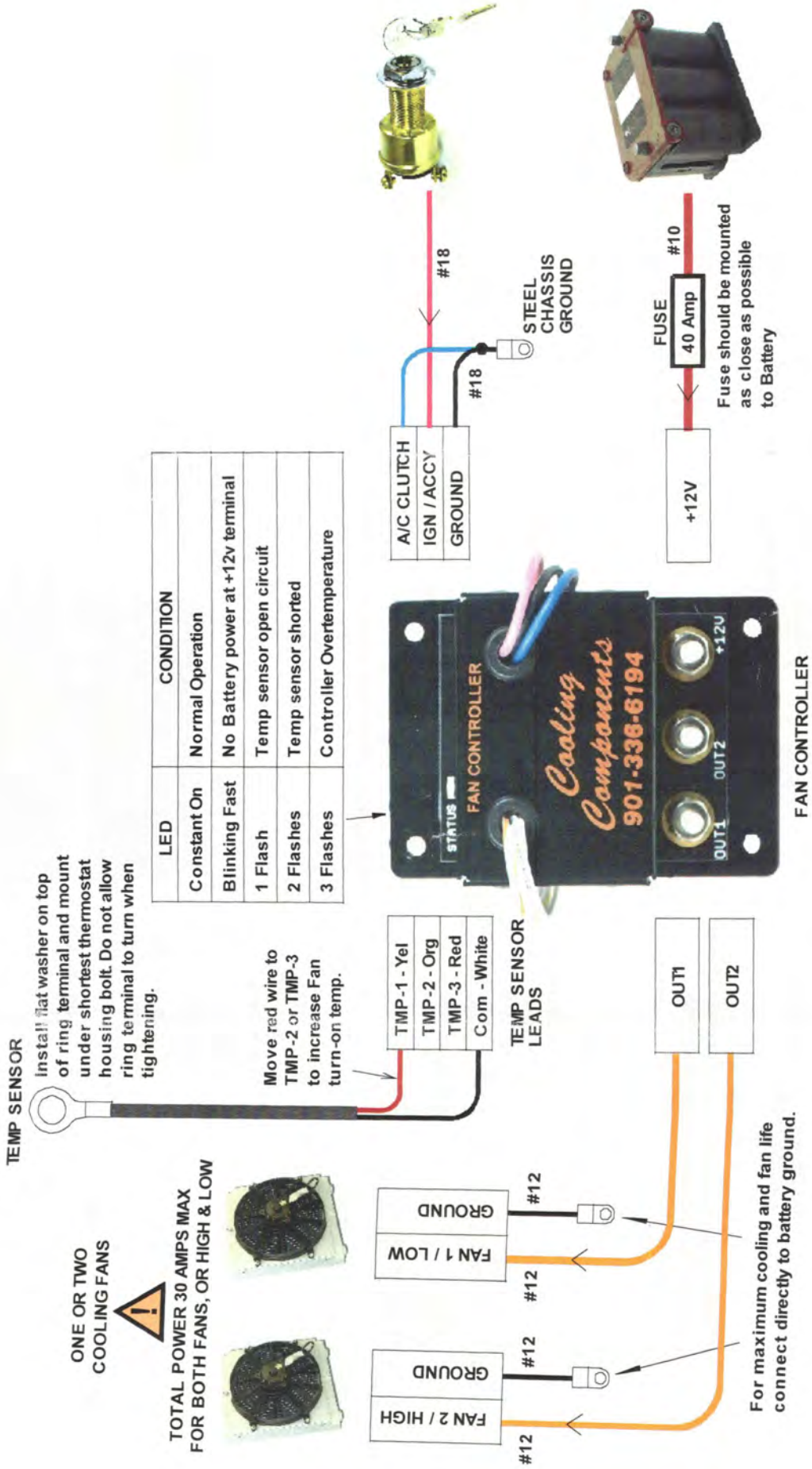
5.2 Start the car and turn on the A/C system (if equipped) and verify the Fan(s) turn on at high speed and remain on until the A/C switch is turned off. Note that the Fan(s) will run for about 15 seconds minimum. Even if you don't have an A/C system you can still perform this test by temporarily connecting the blue Fan Controller A/C Clutch wire to +12v. When finished with this test connect the blue A/C Clutch wire to ground if not used.

If the Fan(s) do not run check the Status LED. If it's flashing rapidly there's no battery power at the +12V stud terminal. Disconnect battery and check fuses and wire connections. If no problem is found, the Fan or Trinary Switch may be defective.

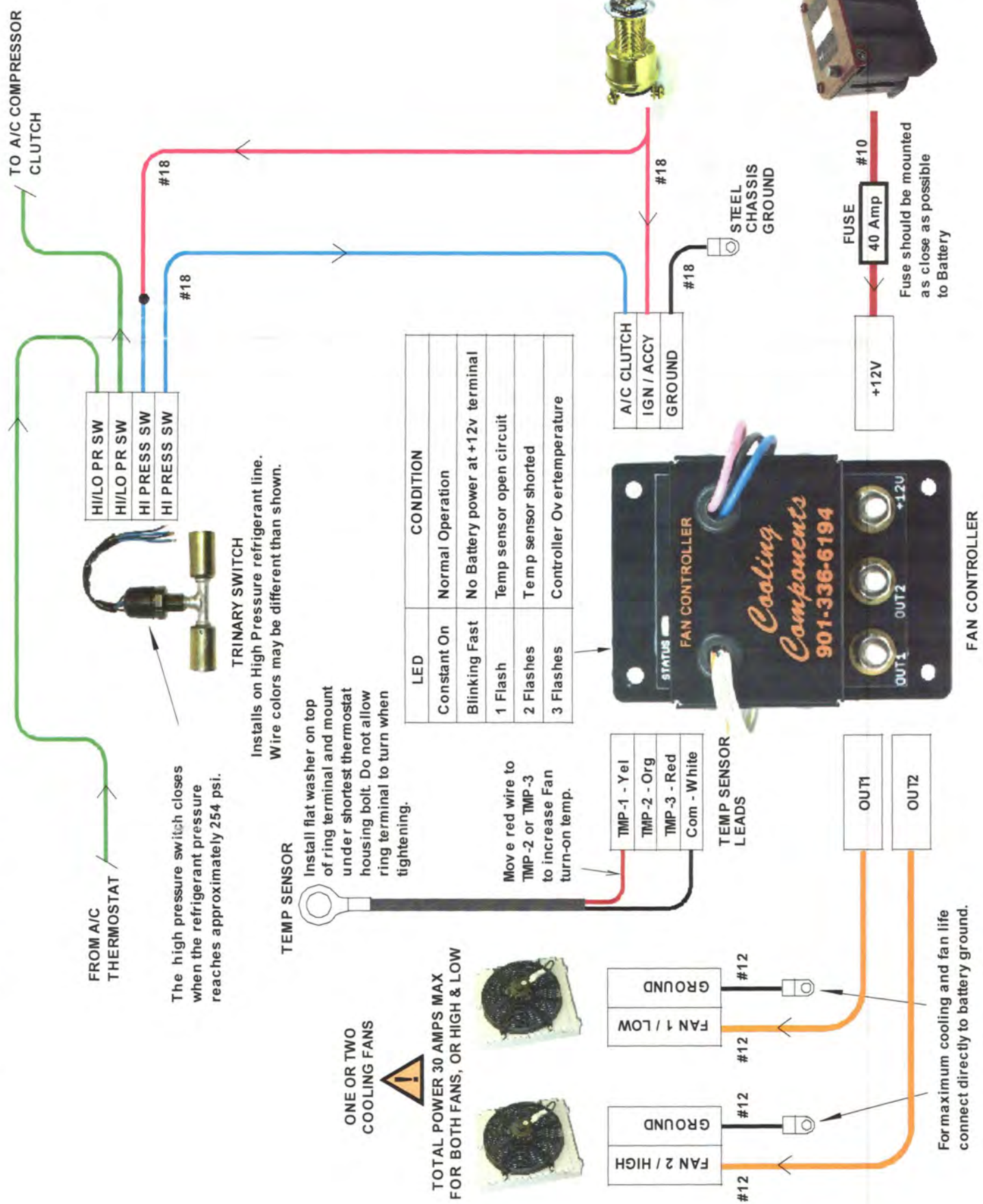
5.3 If the Status LED stays illuminated (flashing indicates some type of fault), and if the Fan turns on and off using the A/C Clutch signal lead, then you're ready for warm engine testing. The best way to get the engine up to temperature is to drive a couple of miles in moderate weather. There's really no easy way to test in cold weather (below 40 F) since the engine may never get warm enough to need the Fan. **On a cold engine the Thermostat will be closed, but as the engine heats up, the water temperature will usually climb 5-10 degrees above the Thermostat temperature before the Thermostat opens. When it opens and coolant begins to flow, the water temperature will come down quickly. At this point the Fan does not need to be on (and typically won't be) since the engine is being adequately cooled by radiator coolant.**

- 5.4 When you return from the short warm-up drive allow the engine to idle and monitor the Water Temp gauge. After the entire engine coolant system reaches operating temperature, the Low Speed Fan (OUT1) will typically turn on around 190 degrees or less. If the temperature gets up to 200 degrees and the Fan still hasn't turned on, turn the Ignition off to stop the engine and make sure the Temperature Sensor red lead is connected to the yellow striped wire (TMP-1) on the Fan Controller. The TMP-1 sensor input provides the lowest turn-on temperature. You can also try moving the Temperature Sensor to another bolt on the water neck, water pump, or intake manifold. **NOTE: Our experience has shown that the temperature difference from one water neck bolt to another can be as much as 20 degrees while the engine is warming up.**
- 5.5 If you want a higher turn-on temperature, use the orange (TMP-2) or red striped wire (TMP-3) on the Fan Controller to increase the turn-on point. Repeat the test until you're satisfied with the turn-on temperature. Typically, Fan turn-off will be approximately 5-10 degrees less than the turn-on temperature. The High Speed Fan (OUT2) will typically turn on 5-10 degrees warmer than the Low Speed Fan (OUT1).
- 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 the unused Temperature Sensor inputs (TMP-1, TMP-2, and TMP-3). Installation is complete.
- 5.7 **Occasionally check the Status LED for faults (Ignition must be turned on to power the Controller). If you mounted the Controller in the engine compartment you should check the Status LED after driving, especially in hot weather. Three flashes indicates the Controller is getting too hot. It should continue to operate but may not provide enough engine cooling. Also, excessive heat may shorten the life of the Controller. Move the Controller inside the vehicle or to another location if this occurs.**

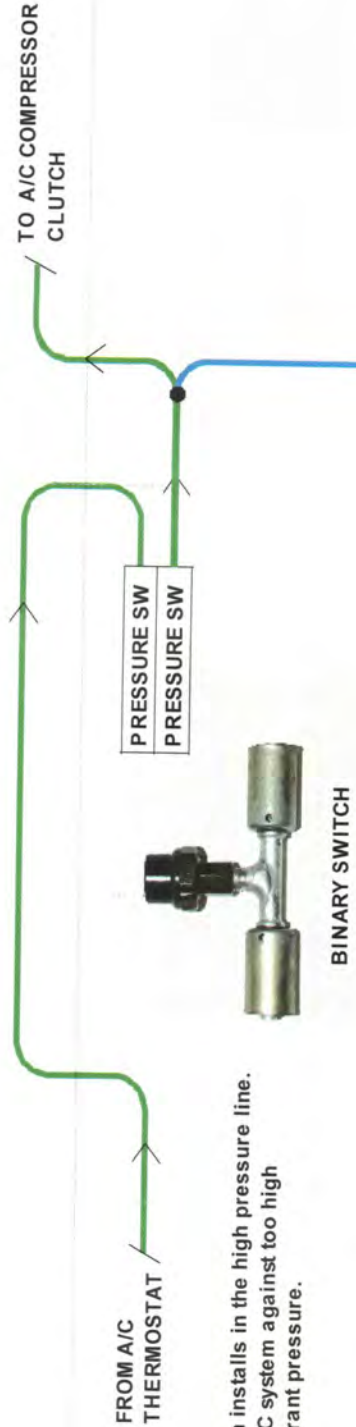
Dual Output Fan Controller with no A/C Wiring Diagram



Dual Output Fan Controller with Trinary Switch Wiring Diagram



Dual Output Fan Controller with Binary Switch Wiring Diagram



The Binary Switch installs in the high pressure line. It protects the A/C system against too high or too low refrigerant pressure.

ONE OR TWO COOLING FANS



TOTAL POWER 30 AMPS MAX FOR BOTH FANS, OR HIGH & LOW



TEMP SENSOR

Install flat washer on top of ring terminal and mount under shortest thermostat housing bolt. Do not allow ring terminal to turn when tightening.

Move red wire to TMP-2 or TMP-3 to increase Fan turn-on temp.

TMP-1 - Yel
TMP-2 - Org
TMP-3 - Red
Com - White

TEMP SENSOR LEADS

| LED | CONDITION |
|---------------|-----------------------------------|
| Constant On | Normal Operation |
| Blinking Fast | No Battery power at +12v terminal |
| 1 Flash | Temp sensor open circuit |
| 2 Flashes | Temp sensor shorted |
| 3 Flashes | Controller Overtemperature |

FAN 2 / HIGH #12 GROUND #12

FAN 1 / LOW #12 GROUND #12

OUT1
OUT2

For maximum cooling and fan life connect directly to battery ground.



A/C CLUTCH
IGN / ACCY
GROUND

STEEL CHASSIS GROUND

FUSE #10
40 Amp

Fuse should be mounted as close as possible to Battery

