

THROTTLE POSITION SENSORS

Our transmission controller will work with almost any throttle position sensor. The most popular choices for adapting to carburetors are the GM throttle position sensors with a small steel lever on the end. The lever simplifies adaptation to carburetors, diesel injection pumps, and other applications. The TPS kit that we sell uses a GM TPS and includes mounting brackets for a Holley carburetor.

GM Throttle Position Sensor Connections

GM throttle position sensors have terminal designations marked as "A", "B" and "C". Unfortunately, the terminal designations on GM TP sensors are not consistent, and there are at least three different wiring schemes for these sensors. We have listed the terminal designations for the sensor used in our TPS kit below, but do not assume that this pin-out is valid for any other TPS. GM is consistent with the wiring colors for their TP sensors: Black is always ground, Grey is the 5 Volt reference feed to the sensor, and Blue is the signal output from the sensor. However, these colors will probably be incorrect if the connector came off of a different vehicle than the sensor, or if the plug was purchased from an auto parts store.

Ford Throttle Position Sensor Connections

Ford has two different color codes for throttle position sensors and several different connectors and pin-outs. The early-style color code mostly matches the wiring of our harnesses: Black is ground and should be tapped into the black main ground wire from Vehicle pin 16, Orange is the 5 Volt reference feed to the sensor, and Green is the signal output from the sensor. Later Ford applications use a different color code where Grey with a Red stripe is ground and should be tapped into our black main ground wire from Vehicle pin 16, Brown with a White stripe is the 5V reference feed to the sensor and should be connected to our orange wire on Vehicle pin 11, and Grey with a White stripe is the signal output from the sensor, which connects to our green wire on Vehicle pin 3. As with GM sensors, it is not safe to assume that the color code is correct if the plug came from an auto parts store or a different vehicle than the sensor.

TPS Connections for various Sensors

	Ground <i>Vehicle pin 16 Black</i>	+5V Reference <i>Vehicle pin 11 Orange</i>	TPS Signal Output <i>Vehicle pin 3 Green</i>
US Shift Kit	Yellow Pin A	Green Pin C	Red Pin B
RTD TPS Kit	TPS Pin A	TPS Pin C	TPS Pin B
GM	Black	Gray	Blue
Early Ford	Black	Orange	Green
Late Ford	Gray / Red	Brown / White	Gray / White

Identifying the Terminals of an Unknown TPS

This is a procedure for identifying the correct terminal connections of any potentiometer-style throttle position sensor (almost all three-terminal TP sensors). A DVOM or analog Ohmmeter is required.

- 1.** Set the meter to resistance mode and set it to a scale that can read up to 10K or 20K Ohms (if it is not auto-ranging). Please keep in mind when setting up and reading the meter that "K" means thousands of Ohms. In other words, 15K Ohms is the same as 15,000 Ohms.
- 2.** Connect the meter to two pins at a time while operating the lever or cam of the TPS. Watch the meter while rotating the sensor. Check all three pairs of pins until you find a pair that does not change resistance when you rotate the sensor. The two pins that do not change resistance are the fixed ends of the resistance element (+5V and ground). The remaining pin that did change is known as the "wiper". It is the moving contact that slides along the resistance element to give the varying voltage. This is the output terminal of the sensor and should be connected to our green wire (Vehicle pin 3).
- 3.** Next, with the sensor at the idle or closed throttle position, measure the resistance between the wiper (output) and each of the end terminals (the two whose resistance did not change in step 2) of the sensor. The end terminal with the lowest resistance to the wiper (at idle) is the ground terminal, and should connect to the black main ground wire of the TCS (Vehicle pin 16). The terminal with the higher resistance to the wiper is the 5 volt reference input to the sensor and should connect to the orange wire (Vehicle pin 11) in our harness.

General Guidelines for setting up Throttle Position Sensors

The linkage to a throttle position sensor should use most of the rotating range of the throttle position sensor. This can be adjusted by changing the ratio of the linkage. Also, please make sure that a small amount of the sensor's travel is being used at idle. You will want a TPS voltage at idle of at least 0.35 volts. This is done to allow the TCS to detect problems with the TP sensor. For instance, if the sensor becomes disconnected or the linkage falls off, the TPS voltage will fall below the set idle threshold. If the TPS voltage goes below the idle threshold, the TCS assumes that the TPS is bad and will switch to failsafe line pressure and default shift points. This is done to prevent damage to the transmission from low line pressure and will provide a safe "limp home" mode.