

# 1999 Dodge RAM 3500 PICKUP

Submodel: | Engine Type: L6 | Liters: 5.9

Fuel Delivery: FI | Fuel: DIESEL

## Intake Air Temperature (IAT) Sensor Testing

### INTAKE AIR TEMPERATURE (IAT) SENSOR

#### Description

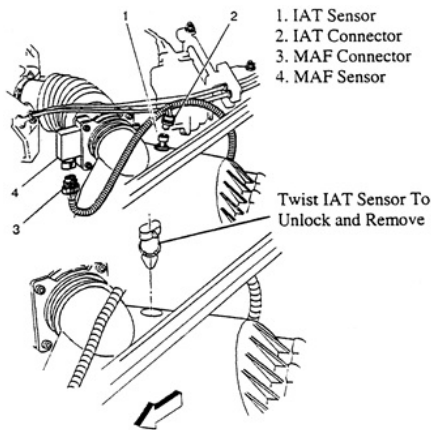
The Intake Air Temperature (IAT) sensor is variable temperature sensitive resistor that measures the temperature of the air in the intake system. Sensor resistance will change based on air temperature. The higher the temperature is, the lower the resistance. The Power Train Control Module (PCM) provides a reference voltage and monitors the voltage drop between a fixed value internal resistance and the sensor resistance. This is called a voltage divider circuit.

IAT sensor values are used by the PCM processor to assist with the calculation of idle speed, fuel mixture and spark advance.

Inaccurate voltages from the IAT sensor may affect pulse-width, idle quality, and tail pipe emissions. Intermittent signals may cause hesitation, stumble and surging. If an IAT sensor failure accompanies an Engine Coolant Temperature (ECT) sensor failure, cooling fan operation may also be affected.

Some manufacturers incorporate the Intake Air Temperature (IAT) sensor as part of the Mass Air Flow (MAF) sensor (Air Flow Meter).

#### Typical IAT sensor



#### Testing

1. Connect a scan tool to the data link connector (DLC) and check the datastream parameters for the IAT sensor. The IAT sensor temperature range varies between -40°F (-40°C) to 248°F (120°C). The IAT voltage range varies between 0V at 248°F (120°C) and 5V at -40°F (-40°C).
2. After the engine has been allowed to cool for an extended period the ECT and Intake air temperature (IAT) sensor should measure the approximate values.
3. To check the IAT for accuracy, allow the engine to reach operating temperature. Turn the engine off and let it sit for five minutes. Measure the air temperature near the IAT sensor and compare it to the scan tool value. The measurement should be approximately the same.
4. If the scan tool data for the IAT is not within the specified values perform a visual inspection on the sensor wiring harness, connector and related mechanical components as follows:
  - o Ensure that the connector tabs are fully locked
  - o Check for corroded terminals
  - o Bent pins
  - o Pins pulled back in the connector
  - o Terminal cavities spread open
  - o Harness damage
  - o Cooling system
  - o Thermostat
  - o Cooling fans
5. If the connectors, wiring harness and related mechanical components pass inspection, perform the following procedures to test the component, wiring and related modules.
  - A. Disconnect the IAT sensor connector.
  - B. Check the IAT sensor by performing a circuit resistance test. Use the Component Pin Data for circuit details. If the circuit is open or the resistance is not within the specified range, replace the IAT sensor. Otherwise, proceed to step C.
  - C. Check the IAT sensor for a short to ground at the sensor housing by performing a circuit resistance test between the sensor terminals and the sensor housing.
  - D. If there is continuity to the IAT sensor housing, replace the IAT sensor. Otherwise, proceed to step E.
  - E. Check the input signal circuit between the IAT sensor and PCM by performing a circuit resistance test. Use the Component Pin Data for circuit details.
  - F. Check the sensor return signal circuit between the IAT sensor and PCM by performing a circuit resistance test. Use the Component Pin Data for circuit details.
6. Repair/replace defective parts as needed and recheck the scan data.