

Included in Pathfinder™ 2002 software for the OTC Genisys™ Scan Tool, Repair-Trac™ provides quick fixes for pattern failures on high mileage, after-warranty vehicles.

Repair-Trac #7411

VEHICLES: 1993-1997 Chrysler, LH body

ENGINES: 3.3L and 3.5 L

SYSTEM: Emissions/PCM/Fuel

SYMPTOM/PROBLEM: 5 volts seen on the O2 sensor circuit accompanied by a code 21 (O2 sensor shorted to voltage). The Powertrain Control Module (PCM) has detected an open circuit in the O2 sensor.

OUR TEST & FIX: Measure the voltage on all 4 wires at the O2 sensor. There should be two ground wires that have no more than 50mv with the vehicle running and the sensor connected, one wire with battery voltage for the heater, and the signal wire which should be switching from approximately 0.2 to 0.8 volts. If the signal wire is at 5 volts, there is an open in the sensor and it needs to be replaced.

BACKGROUND: In 1990, Chrysler changed the design of its PCM, and went to a Single Board Engine Controller (SBEC). One change that was noticed with this transformation was that the O2 sensor went to 5 volts when open-circuited. The purpose of this voltage is to monitor an open circuit or a heater failure. If, when running with the engine coolant temperature sensor at approximately 176°F and the O2 sensor voltage above 1.2 volts for over 2.5 seconds, a code 21 (O2 sensor shorted to voltage) will set. This is somewhat deceiving since the voltage will go high open circuit or with a heater or ground failure. The voltage is really low current. When monitoring the circuit, if the sensor is disconnected, the voltage will immediately go to 0.5 volt and then will slowly climb to nearly 5 volts either on a scan tool or DVOM. This is a normal condition and not a problem with the PCM.

Note: On the Jeep Truck Engine Controller (1996 and newer) this 5-volt reference is also used to run the heater test. With the engine at idle immediately after a cold-start ... and with engine coolant temperature sensor less than 147°F ... and with the battery temp sensor within 27°F of the coolant temperature sensor reading ... if the O2 sensor voltage stays above 3 volts for 30 to 90 seconds, then the heater failure code will set.

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