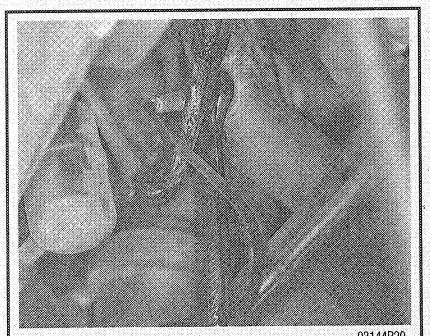
manifold or a boss located on the down pipe before the catalyst. Most of the oxygen sensors used on the sophisticated systems of today are heated internally for faster reaction when the engine is started cold. The oxygen sensor produces a voltage within zero and one volt. When there is a large amount of oxygen present (lean mixture), the sensor produces a low voltage (less than 0.4v). When there is a lesser amount present (rich mixture) it produces a higher voltage (0.6 –1.0v). The stoichiometric or correct air to fuel ratio will fluctuate between 0.4 and 0.6v. By monitoring the oxygen content and converting it to electrical voltage, the sensor acts as a rich-lean switch. The voltage is transmitted to the PCM.

Some models have two or more sensors, before the catalyst and after. This is done for a catalyst efficiency monitor that is a part of the OBD-II engine controls that are on all models from the 1995 model year on. The sensor before the catalyst measures the exhaust emissions right out of the engine, and sends the signal to the PCM about the state of the mixture as previously talked about. The second sensor reports the difference in the emissions after the exhaust gases have gone through the catalyst. This sensor reports to the PCM the amount of emissions reduction the catalyst is performing.

The oxygen sensor will not work until a predetermined temperature is reached, until this time the PCM is running in OPEN LOOP operation. OPEN LOOP means that the PCM has not yet begun to correct the air-to-fuel ratio by reading the oxygen sensor. After the engine comes to operating temperature, the PCM will monitor the oxygen sensor and correct the air/fuel ratio from the readings of the sensor. This is known as CLOSED LOOP operation.

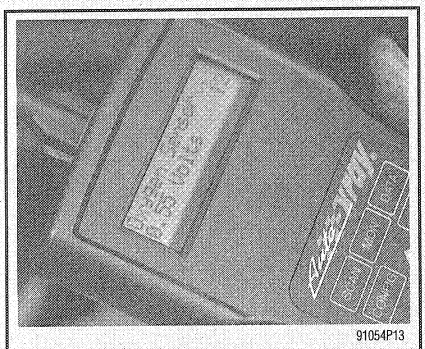
A heated oxygen sensor (HO2S) has a heating element that keeps the sensor at proper operating temperature during all operating modes. Maintaining correct sensor temperature at all times allows the system to enter CLOSED LOOP operation sooner.

In CLOSED LOOP operation the PCM monitors the sensor input (along with other inputs) and adjusts the injector pulse width accordingly. During OPEN LOOP operation, the PCM ignores the sensor input and adjusts the injector pulse to a preprogrammed value based on other inputs.



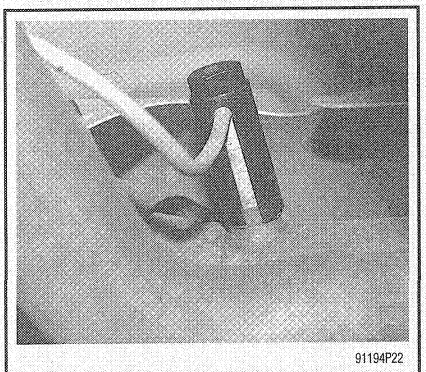
93144P20

Fig. 28 This is the location of the HO2 sensor on the 3.8L Continental—easilly accessible



91054P13

Fig. 29 The HO2S can be monitored with an appropriate and Data-stream capable scan tool



91194P22

Fig. 32 Place the socket onto the sensor and . . .

TESTING

See Figure 29

WARNING

Do not pierce the wires when testing this sensor; this can lead to wiring harness damage. Backprobe the connector to properly read the voltage of the HO2S.

1. Warm the engine to normal operating temperature.
2. Turn the engine **OFF**. Disconnect the HO2S.
3. Connect a voltmeter, and engine running, measure the voltage on the DC scale between terminals **HO2S** and **SIG RTN** (GND) of the oxygen sensor connector. Voltage should fluctuate between 0.01 –1.0 volts. If voltage fluctuation is slow or voltage is not within specification, the sensor may be faulty.

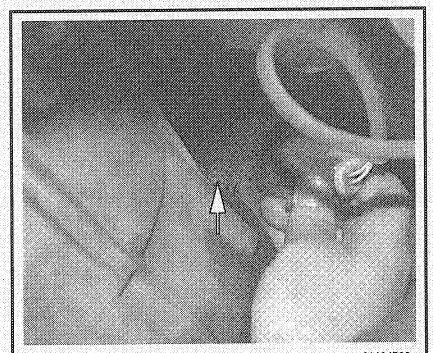
REMOVAL & INSTALLATION

See Figures 30 thru 36

➡An oxygen sensor socket/wrench is available from Ford or aftermarket manufacturers to ease the removal and installation of the oxygen sensor(s). If one is not available, an open-end wrench can be used.

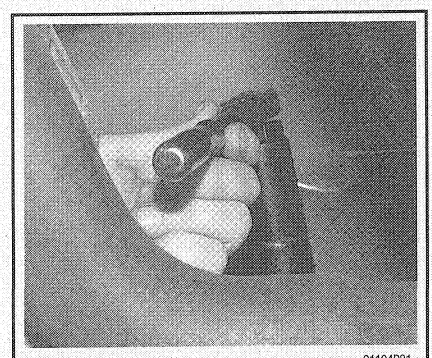
WARNING

The sensor uses a permanently attached pigtail and connector. This pigtail should



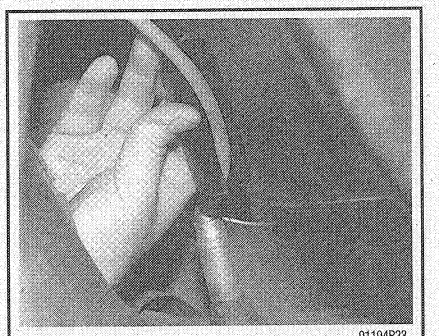
91194P20

Fig. 30 Detach the connector for the HO2S sensor



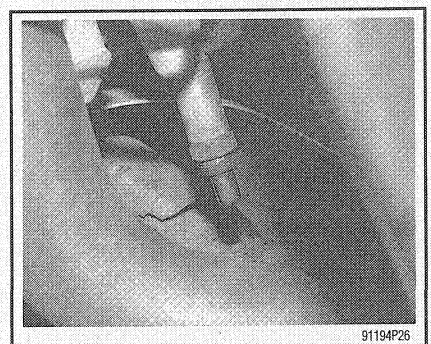
91194P21

Fig. 33 loosen the sensor using a suitable drive tool



91194P23

Fig. 31 A special socket is available to remove the HO2S sensor that contains a slot for the wire harness to slide out of



91194P26

Fig. 34 After the sensor is sufficiently loose using the drive tool, remove the sensor from the exhaust pipe by hand