

# 4-10 DRIVEABILITY AND EMISSIONS CONTROLS

will prove fatal in sufficient quantities. Always drain coolant into a sealable container. Coolant should be reused unless it is contaminated or is several years old.

- Remove the air cleaner outlet tube if necessary.
- Detach the ECT sensor connector.
- Remove the ECT sensor from the intake manifold.

**To install:**

- Coat the sensor threads with Teflon® sealant.
- Thread the sensor into position and tighten to 6–8 ft. lbs. (8–13 Nm).
- Attach the ECT sensor connector.
- Install the air cleaner outlet tube.
- Connect the negative battery cable.
- Refill the engine cooling system.
- Start the engine and check for coolant leaks.
- Bleed the cooling system.

## Intake Air Temperature Sensor

### OPERATION

♦ See Figure 49

The Intake Air Temperature (IAT) sensor determines the air temperature inside the intake manifold. Resistance changes in response to the ambient air temperature. The sensor has a negative temperature coefficient. As the temperature of the sensor rises the resistance across the sensor decreases. This

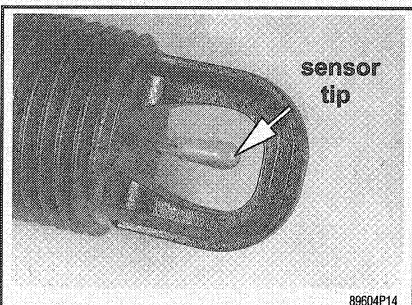


Fig. 49 The tip of the IAT sensor has an exposed thermistor that changes the resistance of the sensor based upon the force of the air rushing past it

provides a signal to the PCM indicating the temperature of the incoming air charge. This sensor helps the PCM to determine spark timing and air/fuel ratio. Information from this sensor is added to the pressure sensor information to calculate the air mass being sent to the cylinders. The IAT is a two-wire sensor, a 5-volt reference signal is sent to the sensor and the signal return is based upon the change in the measured resistance due to temperature.

### TESTING

♦ See Figures 50 and 51

- Turn the ignition switch **OFF**.
- Disconnect the wiring harness from the IAT sensor.
- Measure the resistance between the sensor terminals.
- Compare the resistance reading with the accompanying chart.
- If the resistance is not within specification, the IAT may be faulty.
- Connect the wiring harness to the sensor.

### REMOVAL & INSTALLATION

#### 1988–95 Models

- Disconnect the negative battery cable.
- Detach the electrical connector from the IAT sensor.
- Using a suitable socket and drive tool, remove the IAT sensor from the air inlet.



Fig. 50 The IAT sensor can be monitored with an appropriate and Data-stream capable scan tool

- On the 5.0L engine Lincoln models, the IAT sensor is located in the intake manifold

**To install:**

- Coat the sensor threads with Teflon® sealant.
- Thread the sensor into position and tighten it to 6–8 ft. lbs. (8–13 Nm).
- Attach the electrical connector to the IAT sensor.
- Connect the negative battery cable.

#### 1996–00 Models

- Disconnect the negative battery cable.
- Detach the electrical connector from the IAT sensor.
- Turn the sensor 90° counterclockwise and remove the IAT sensor from the air cleaner lid.
- Remove the sensor O-ring and inspect it. Replace as necessary.

**To install:**

- The installation is the reverse of the removal.

## Mass Airflow Sensor

### OPERATION

♦ See Figure 52

The Mass Air Flow (MAF) sensor directly measures the mass of air being drawn into the engine. The sensor output is used to calculate injector pulse width. The MAF sensor is what is referred to as a "hot-wire sensor". The sensor uses a thin platinum wire filament, wound on a ceramic bobbin and coated with glass, that is heated to 200°C (417°F) above the ambient air temperature and subjected to the intake airflow stream. A "cold-wire" is used inside the MAF sensor to determine the ambient air temperature.

Battery voltage from the EEC power relay, and a reference signal and a ground signal from the PCM are supplied to the MAF sensor. The sensor returns a signal proportionate to the current flow required keeping the "hot-wire" at the required temperature. The increased airflow across the "hot-wire" acts as a cooling fan, lowering the resistance and requiring more current to maintain the temperature of the wire. The voltage in the circuit measures the increased current. As current increases, voltage increases. As the airflow increases the signal return voltage of a normally operating MAF sensor will increase.

Temperature		Engine Coolant/Intake Air Temperature Sensor Values
°F	°C	
248	120	1.18
230	110	1.55
212	100	2.07
194	90	2.80
176	80	3.84
158	70	5.37
140	60	7.70
122	50	10.97
104	40	16.15
86	30	24.27
68	20	37.30
50	10	58.75

Fig. 51 IAT resistance-to-temperature specifications

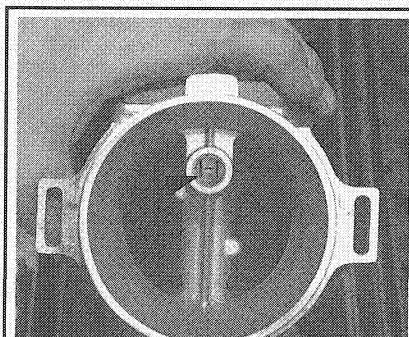


Fig. 52 The exposed "hot wire" of the MAF sensor