

AJ16 4.0 Liter Engine Management System

Ignition Control (continued)

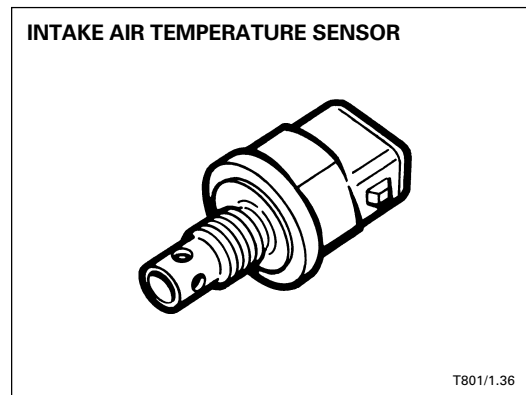
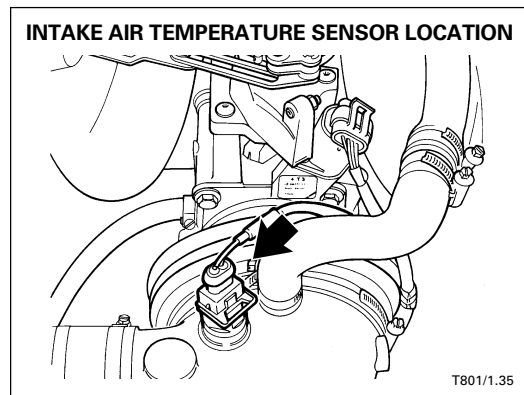
Ignition Secondary Control (continued)

Intake air temperature sensor (IATS)

The intake air temperature sensor (IATS) is a negative temperature coefficient (NTC) thermistor identical to the sensor used in AJ6 engine management systems, however, the connector and leads are revised. Intake air temperature is determined by the ECM by a change in resistance within the sensor. The ECM applies 5 volts to the sensor and monitors the voltage across the pins to detect the varying resistance.

IATS Monitoring for OBD II

The IATS range is checked for values outside of normal limits. A fault must occur on two consecutive trips before the CHECK ENGINE MIL is activated. Refer to Systems Readiness Test, page 53.



Intake air temperature sensor – temperature versus resistance:

| Intake air temperature | | Resistance (kilo ohms) |
|------------------------|-----|---------------------------|
| °F | °C | |
| 14 | -10 | 9.20 |
| 32 | 0 | 5.90 |
| 50 | 10 | 3.70 |
| 68 | 20 | 2.50 |
| 86 | 30 | 1.70 |
| 104 | 40 | 1.18 |
| 122 | 50 | 0.84 |
| 140 | 60 | 0.60 |
| 158 | 70 | 0.435 |
| 176 | 80 | 0.325 |
| 193 | 90 | 0.25 |
| 212 | 100 | 0.19 |

Intake air temperature sensor – temperature versus typical approx. voltage:

| Intake air temperature | | Voltage |
|------------------------|-----|---------|
| °F | °C | |
| 14 | -10 | 4.05 |
| 32 | 0 | 3.64 |
| 59 | 15 | 2.89 |
| 78 | 25 | 2.42 |
| 86 | 30 | 2.20 |
| 104 | 40 | 1.78 |
| 122 | 50 | 1.44 |
| 140 | 60 | 1.17 |
| 158 | 70 | 0.95 |
| 176 | 80 | 0.78 |
| 193 | 90 | 0.65 |
| 212 | 100 | 0.55 |

Torque-based transmission shifting

Transmission shift quality is enhanced by "torque-based shifting". The ECM continuously provides the transmission control module (TCM) with a pulse width modulated (PWM) signal that represents the engine load. This signal is generated by the ECM based on the injector pulse duration.

When a shift is to occur, the TCM calculates the necessary torque reduction and provides a PWM "ignition retard request" signal to the ECM. The PWM torque reduction signal will vary between 20% and 90% (20% = 0° ignition retard; 90% = maximum ignition retard). The actual amount of retard is applied to the ignition advance angle after other corrections are applied.

NOTES