General Procedures for Pinpoint Testing

Inspection

The basic diagnostic procedure recommended for most sensor and actuator circuits is to disconnect the harness at the connector and inspect for corrosion, bent pins, spread pins or any condition that could cause a loose or intermittent connection.

Connector Checks to Ground (B-)

Measure the resistance of all wiring harness connectors to ground (preferably the negative battery cable) to determine if a short to ground condition is present. **It is important that during this test all accessories, including the dome light, be turned off. Current flow in the system will affect resistance readings. If the reading is fluctuating greatly, disconnect the battery and measure to the negative battery cable.**

- Signal return (marked A on all sensor circuits except IAT) should measure less than 5 ohms.
- The VREF and signal lines, with the processor connected, will normally measure greater than 50 k ohms.
- Power ground on an actuator circuit should measure less than 5 ohms. The control side of an actuator circuit will also normally measure greater than 50 k ohms.

Connector Voltage Checks

The next step is to turn the ignition key to the ON position and measure if the expected voltages are present at the connector. On circuits with expected voltages this test will verify the integrity of that circuit. On circuits without an expected voltage this test will determine if that circuit is shorted or miswired to a voltage source.

- Signal return (marked A on all sensor circuits except IAT) should measure less than 2.5 volts.
- VREF should measure 4.5-5.5 volts. If this is higher or lower than expected, disconnect sensors one at a time to determine if a sensor is biasing the circuit and refer to VREF pinpoint procedures.
- Signal lines will measure either 0-.25v if the circuit is designed to pull down when disconnected or a higher voltage (normally 4.6-5, or 12v) if it is designed as a pull up circuit. A pull up signal circuit that measures the expected value normally indicates a good circuit.
- Actuator circuits may be either on/off type circuits (normally 12 volts) or pulse width modulated circuits (12 volts controlled by a % duty cycle).
- Communication circuits are similar to sensor circuits when disconnected in that they will be designed to either pull up or pull down when disconnected. Measuring the expected voltage of a communication circuit when disconnected will often discern its condition.

Harness Resistance Tests

Harness resistance tests are performed when a circuit is suspected of having high resistance or being open. These tests are performed with the breakout box connected and ignition off. Measure resistance from the sensor connector end to the processor connector. If an open circuit or high resistance is encountered, the problem is most easily isolated by separating the circuit at the interim connectors (normally the 42-way connector) and measuring resistance through both halves of the circuit.