

**Fig. 26.** Mass air flow sensor terminal identification on cars with DME M3.1 fuel injection.

8. With ignition off, disconnect harness connector from air flow sensor. Using a digital multimeter, check resistance at terminals listed.

**Air Flow Sensor Test Values (DME M3.1)**

- Terminals 5 and 6. . . . . 3-4 ohms

If any faults are found, check wiring to and from the ECM. Make ECM pinout test as listed in See **Table i**. Main power to air flow sensor comes from DME main relay.

**Mass air flow sensor (hot film), testing and replacing**

On cars with DME M3.3.1 a hot film mass air flow sensor is used. When the engine is running, a current is used to heat a thin film in the center of the sensor. This current is electronically converted into a voltage measurement corresponding to the mass of intake air.

**NOTE —**

*A burn-off cycle is not used on hot film sensors.*

If the hot film breaks or if there is no output from the air flow sensor, the ECM automatically switches to a "limp-home" mode and turns on the Check Engine light. The engine can usually be started and driven. The air flow sensor has no internal moving parts and cannot be serviced or adjusted.

**CAUTION —**

*Use only a digital multimeter when checking the mass air flow sensor. An analog meter can damage the air flow sensor.*

1. Disconnect harness connector from air flow sensor.
2. Turn ignition on and check for voltage and ground at connector. There should be ground at pin 1. There should be positive (+) battery voltage at pin 3. If any faults are found, check wiring to and from ECM. Make ECM pinout test. See **Table j**.

**NOTE —**

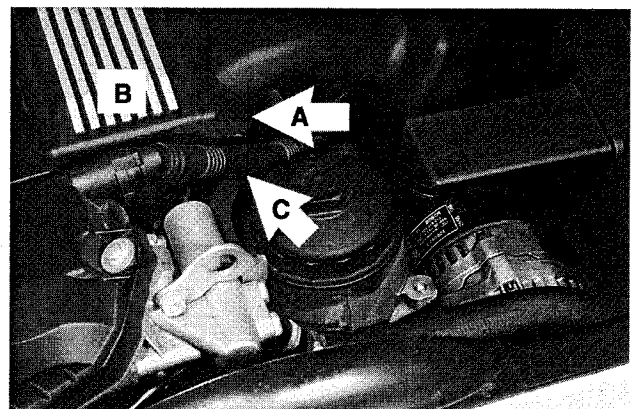
*Positive (+) battery voltage to air flow sensor comes from DME main relay when the ignition is switch on or engine running.*

**Engine coolant temperature (ECT) sensor, testing and replacing**

The engine coolant temperature (ECT) sensor sends continuous engine coolant temperature information to the ECM. As temperature increases sensor resistance decreases.

**ECT Sensor Location**

- M50/S50US engine . . . . . left side of cylinder head under intake manifold



**Fig. 27.** Engine coolant temperature (ECT) sensor (A) is located beneath top engine cover (B) and crankcase vent hose (C). M52 engine shown. M50 is similar.

1. Check ECM reference voltage to sensor:
  - Disconnect harness connector from ECT sensor.
  - Turn ignition key on.
  - Check for 5 volts between supply voltage wire (brown/red) wire of harness connector and ground.
  - Turn ignition key off.
  - If voltage is not present or incorrect, check wiring from ECM and check reference voltage output at ECM (pin 78). See **Table i** (DME 3.1) or **Table j** (DME 3.3.1)
2. Check ECT sensor resistance:
  - With harness connector disconnected, check resistance across sensor terminals.
  - Compare tests results to values in **Table f**.