

### CHART C-12A (Page 1 of 2)

#### ELECTRIC COOLING FAN CONTROL CIRCUIT DIAGNOSIS (NON A/C AND EARLY PRODUCTION A/C) 5.7L (VIN P) "F" CARLINE (SFI)

#### **Circuit Description:**

The cooling fans are controlled by the PCM based on various inputs. Battery voltage is supplied to the primary fan relay on terminal "D1" and on "F4" of the secondary fan relay. Ignition voltage is supplied to terminal "D5" of the primary fan relay and "F2" of the secondary fan relay. Grounding CKT 335 (relay terminal "D2") will energize the primary cooling fan relay (Fan 1) and supply battery voltage to the primary cooling fan motor. Grounding CKT 473 (relay terminal "F5") will energize the secondary cooling fan relay (Fan 2) and supply battery voltage to the secondary fan motor.

When certain Diagnostic Trouble Codes (DTCs) are set, the PCM will enable the cooling fans.

Chart Test Description: Number(s) below refer to circled number(s) on the diagnostic chart.

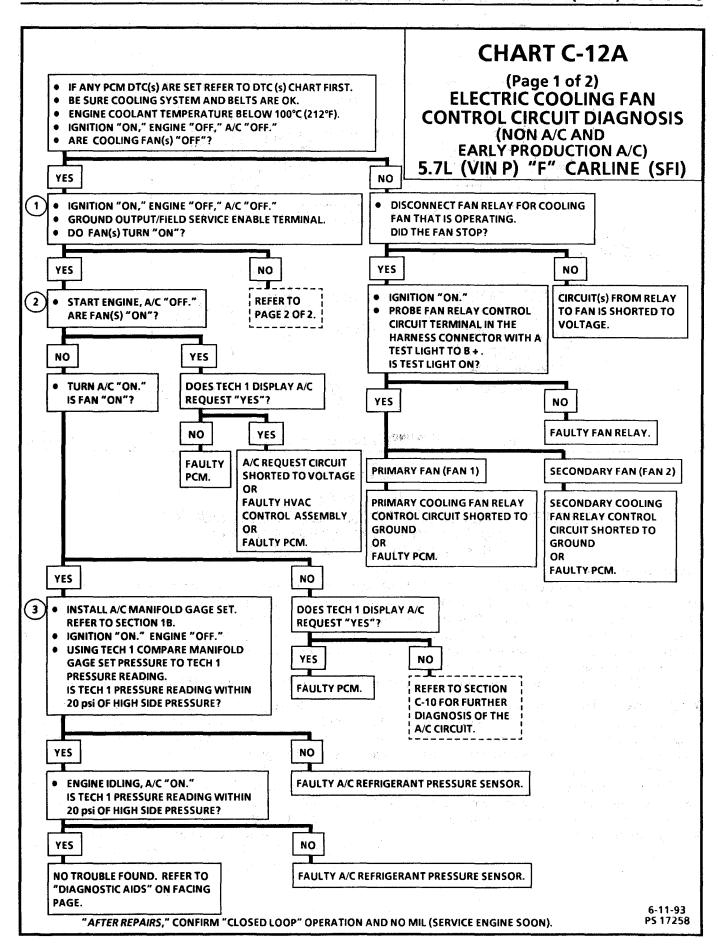
- 1. With the output/field service enable terminal grounded, the cooling fan control driver(s) will close, which should energize the fan control relay(s).
  - If vehicle is equipped with one cooling fan (non A/C) and cooling fan operation is OK, refer to diagnostic aids below for further diagnosis of cooling system.
- 2. Engine coolant temperature must be below 100°C (212°F) to perform this step. The cooling fans should come "ON" anytime A/C system is operating.
- 3. Comparing Tech 1 pressure and manifold gage set pressure will determine if the A/C refrigerant pressure sensor is out of range. An out of range A/C refrigerant pressure sensor can cause the cooling fans to operate at the wrong times.

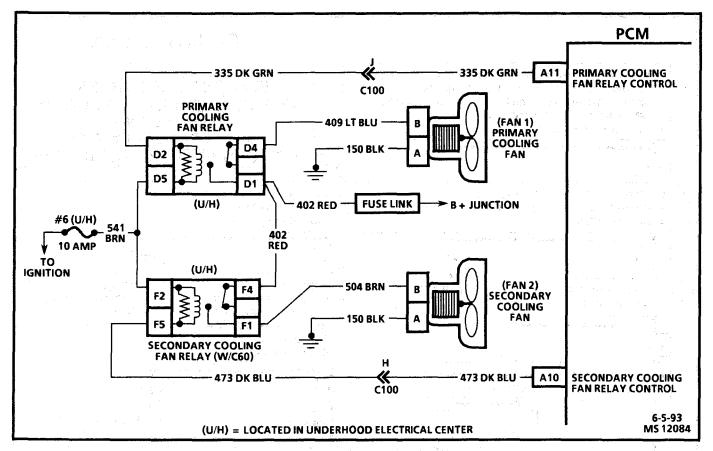
**Diagnostic Aids:** If the owner complained of an overheating problem, it must be determined if the complaint was due to an actual boil over, or the warning indicator light, or engine coolant temperature gage indicated overheating.

The gage accuracy can also be checked by comparing the Engine Coolant Temperature (ECT) sensor reading using a Tech 1 and comparing its reading with the gage reading.

If the engine is actually overheating and the gage indicated overheating, but the cooling fan is not coming "ON," the Engine Coolant Temperature (ECT) sensor has probably shifted out of calibration and should be replaced.

If the engine is overheating and the cooling fans are "ON," the cooling system should be checked, refer to SECTION 6B.





### **CHART C-12A**

# (Page 2 of 2) ELECTRIC COOLING FAN CONTROL CIRCUIT DIAGNOSIS (NON A/C AND EARLY PRODUCTION A/C) 5.7L (VIN P) "F" CARLINE (SFI)

### **Circuit Description:**

The cooling fans are controlled by the PCM based on various inputs. Battery voltage is supplied to the primary fan relay on terminals "D1" and "F4" of the secondary fan relay. Ignition voltage is supplied to terminal "D5" of the primary fan relay and "F2" of the secondary fan relay. Grounding CKT 335 (relay terminal "D2") will energize the primary cooling fan relay (Fan 1) and supply battery voltage to the primary cooling fan motor. Grounding CKT 473 (relay terminal "F5") will energize the secondary cooling fan relay (Fan 2) and supply battery voltage to the secondary fan motor.

The PCM will enable the cooling fans, when certain Diagnostic Trouble Codes (DTCs) are set.

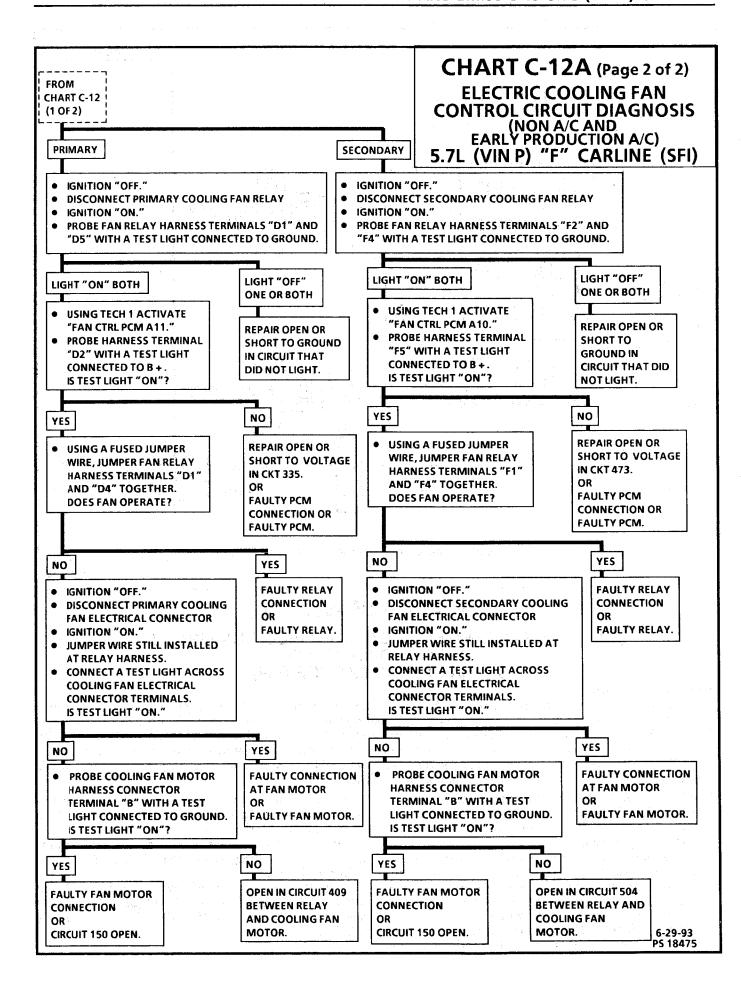
**Diagnostic Aids:** If the owner complained of an overheating problem, it must be determined if the complaint was due to an actual boil over, the warning indicator light, or engine coolant temperature gage indicated overheating.

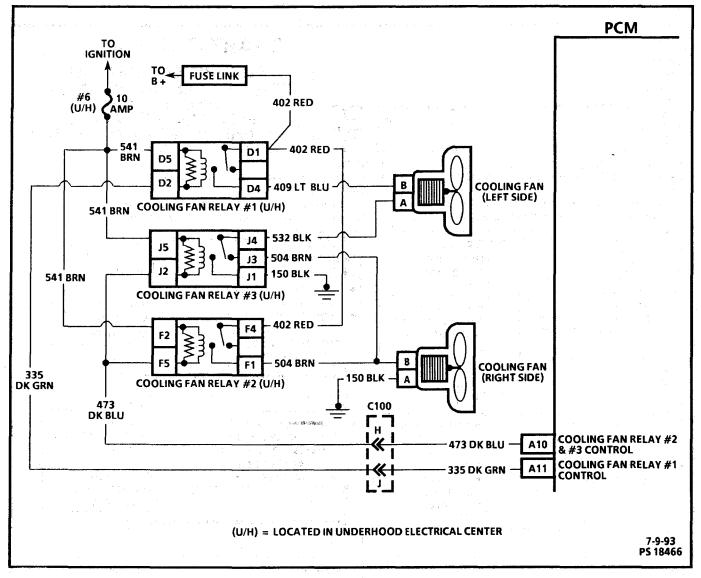
The gage accuracy can also be checked by comparing the Engine Coolant Temperature (ECT) sensor reading using a Tech 1 and comparing its reading with the gage reading.

If the engine is actually overheating and the gage indicated overheating, but the cooling fan is not coming "ON," the Engine Coolant Temperature (ECT) sensor has probably shifted out of calibration and should be replaced.

If the engine is overheating and the cooling fans are "ON," the cooling system should be checked, refer to SECTION 6B.

The PCM will command fan 1 "ON" at 108°C (226°F) and "OFF" at 105°C (221°F) and an 2 "ON" at 113°C (235°F) and "OFF" at 110°C (230°F).





## CHART C-12B (Page 1 of 4)

## ELECTRIC COOLING FAN CONTROL CIRCUIT DIAGNOSIS (LATE PRODUCTION A/C) 5.7 (VIN P) "F" CARLINE (SFI)

**Circuit Description:** 

The cooling fans are controlled by the PCM based on various inputs. Ignition voltage is supplied to all three cooling fan relay coils on CKT 541. The PCM controls cooling fan relay #1 by providing the ground path through CKT 335. The PCM controls cooling fan relays #2 and #3 together by providing the ground path through CKT 473. When cooling fan relay #1 is energized the cooling fans are connected in series and operate together at low speed. When all three relays are energized the fans are connected in parallel and operate together at high speed. When certain DTCs are set, the PCM will enable cooling fans.

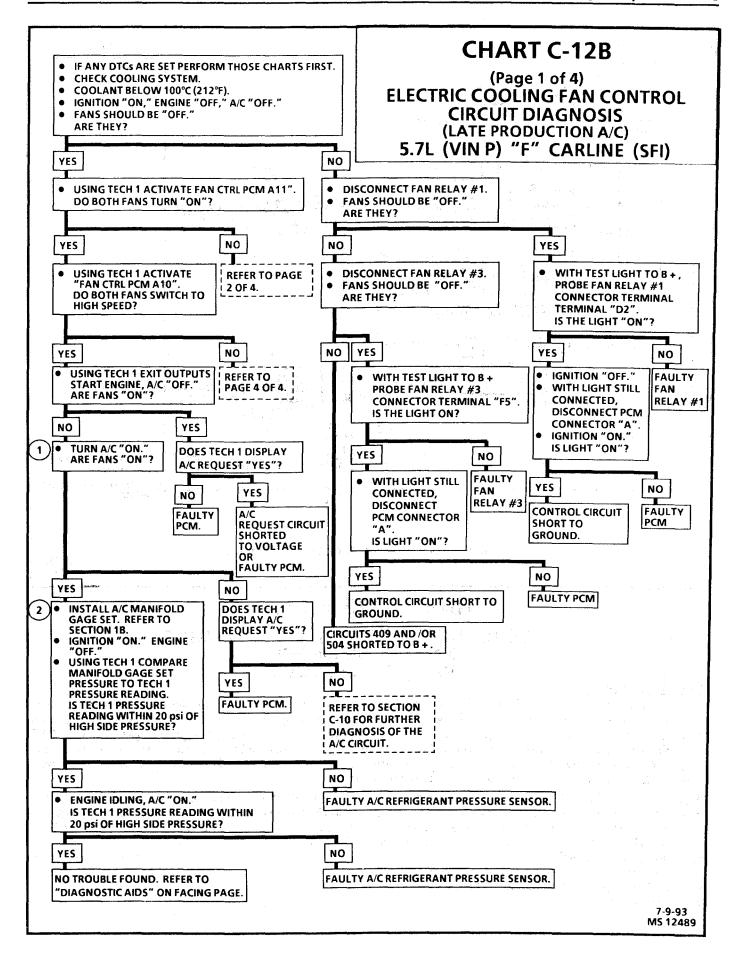
Chart Test Description: Number(s) below refer to circled number(s) on the diagnostic chart.

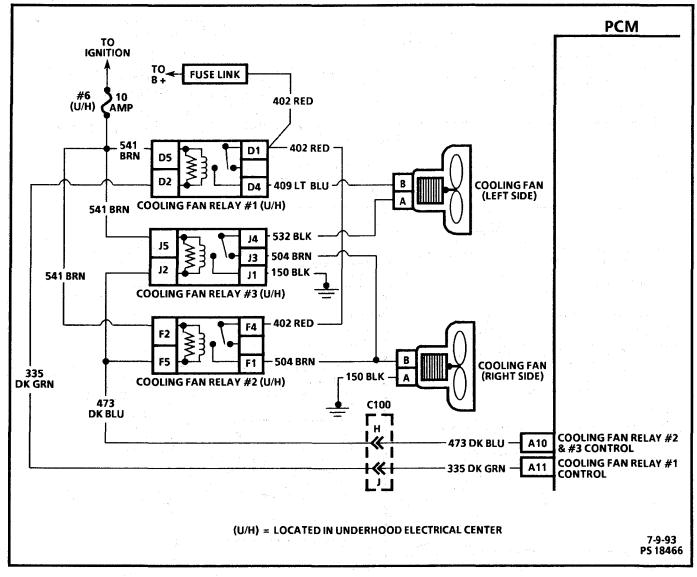
- The cooling fans should come "ON" anytime A/C system is operating.
- 2. Comparing Tech 1 pressure and manifold gage set pressure will determine if the A/C refrigerant pressure sensor is out of range. An out of range A/C refrigerant pressure sensor can cause the cooling fans to operate at the wrong times.

Diagnostic Aids: If the owner complained of an overheating problem, it must be determined if the

complaint was due to an actual boil over, or the warning indicator light, or engine coolant temperature gage indicated overheating.

If the engine is overheating and the cooling fans are "ON," the cooling system should be checked, refer to SECTION 6B.





## CHART C-12B (Page 2 of 4)

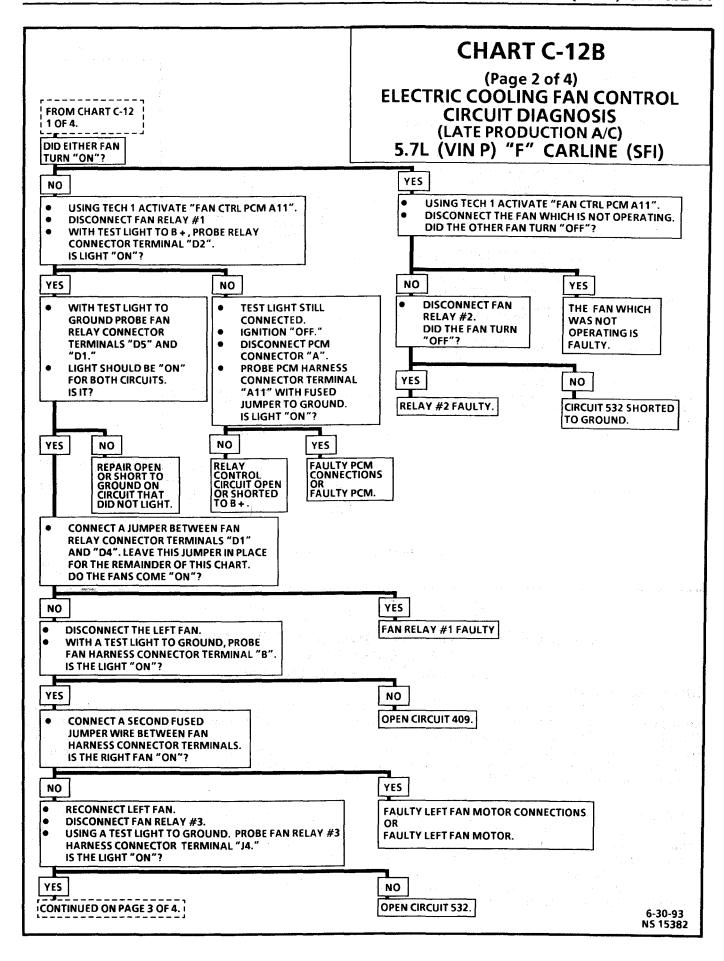
## ELECTRIC COOLING FAN CONTROL CIRCUIT DIAGNOSIS (LATE PRODUCTION A/C) 5.7 (VIN P) "F" CARLINE (SFI)

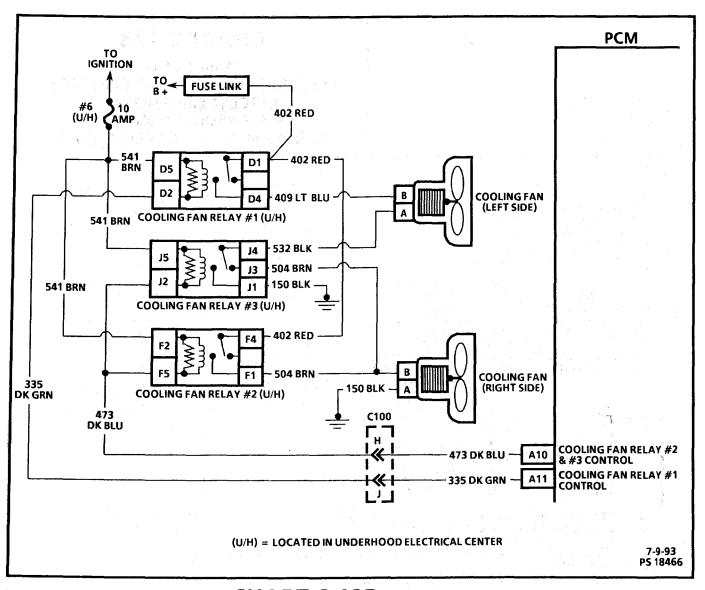
**Circuit Description:** 

The cooling fans are controlled by the PCM based on various inputs. Ignition voltage is supplied to all three cooling fan relay coils on CKT 541. The PCM controls cooling fan relay #1 by providing the ground path through CKT 335. The PCM controls cooling fan relays #2 and #3 together by providing the ground path through CKT 473. When cooling fan relay #1 is energerized the cooling fans are connected in series and operate together at low speed. When all three relays are energized the fans are connected in parallel and operate together at high speed. When certain DTCs are set, the PCM will enable cooling fans.

**Diagnostic Aids:** If the owner complained of an overheating problem, it must be determined if the complaint was due to an actual boil over, or the warning indicator light, or engine coolant temperature gage indicated overheating.

If the engine is overheating and the cooling fans are "ON," the cooling system should be checked, refer to SECTION 6B.





## CHART C-12B (Page 3 of 4)

## ELECTRIC COOLING FAN CONTROL CIRCUIT DIAGNOSIS (LATE PRODUCTION A/C) 5.7 (VIN P) "F" CARLINE (SFI)

**Circuit Description:** 

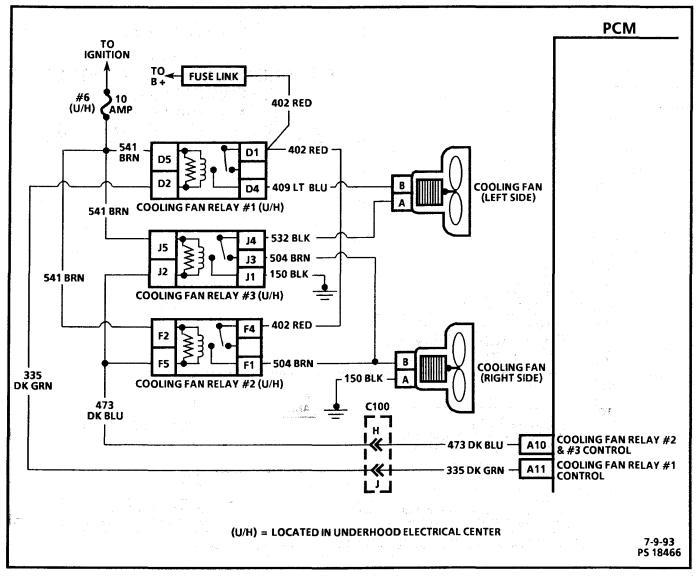
The cooling fans are controlled by the PCM based on various inputs. Ignition voltage is supplied to all three cooling fan relay coils on CKT 541. The PCM controls cooling fan relay #1 by providing the ground path through CKT 335. The PCM controls cooling fan relays #2 and #3 together by providing the ground path through CKT 473. When cooling fan relay #1 is energerized the cooling fans are connected in series and operate together at low speed. When all three relays are energized the fans are connected in parallel and operate together at high speed. When certain DTCs are set, the PCM will enable cooling fans.

**Diagnostic Aids:** If the owner complained of an overheating problem, it must be determined if the complaint was due to an actual boil over, or the warning indicator light, or engine coolant temperature gage indicated overheating.

If the engine is overheating and the cooling fans are "ON," the cooling system should be checked, refer to SECTION 6B.

6-30-93 PS 18463

## **CHART C-12B** (Page 3 of 4) **ELECTRIC COOLING FAN CONTROL CIRCUIT DIAGNOSIS** (LATE PRODUCTION A/C) 5.7L (VIN P) "F" CARLINE (SFI) CONTINUED FROM PAGE 2 OF 4 USING THE SECOND JUMPER WIRE, CONNECT FAN RELAY #3 HARNESS CONNECTOR TERMINALS "J4" AND "J3." DO THE FANS COME "ON"? NO YES RECONNECT FAN RELAY #3. DISCONNECT RIGHT FAN. WITH A TEST LIGHT TO GROUND, PROBE FAN HARNESS CONNECTOR TERMINAL "B". IS THE LIGHT "ON"? FAN RELAY #3 FAULTY. YES NO CONNECT THE SECOND JUMPER WIRE BETWEEN FAN HARNESS CONNECTOR TERMINALS. IS THE LEFT FAN "ON"? **CKT 504 OPEN BETWEEN** SPLICE AND FAN RELAY #3. YES NO **FAULTY RIGHT FAN MOTOR CONNECTIONS** CKT 150 OPEN. FAULTY RIGHT FAN MOTOR.



## CHART C-12B (Page 4 of 4)

## ELECTRIC COOLING FAN CONTROL CIRCUIT DIAGNOSIS (LATE PRODUCTION A/C) 5.7 (VIN P) "F" CARLINE (SFI)

### **Circuit Description:**

The cooling fans are controlled by the PCM based on various inputs. Ignition voltage is supplied to all three cooling fan relay coils on CKT 541. The PCM controls cooling fan relay #1 by providing the ground path through CKT 335. The PCM controls cooling fan relays #2 and #3 together by providing the ground path through CKT 473. When cooling fan relay #1 is energized the cooling fans are connected in series and operate together at low speed. When all three relays are energized the fans are connected in parallel and operate together at high speed. When certain DTCs are set, the PCM will enable cooling fans.

**Chart Test Description:** Number(s) below refer to circled number(s) on the diagnostic chart.

1. It may be necessary to raise the vehicle and observe the cooling fans from underneath during this test. Both fans should operate at low speed when "FAN CTRL PCM A11" is activated. Both fans should operate at high speed when "FAN CTRL PCM A10" is activated.

**Diagnostic Aids:** If the owner complained of an overheating problem, it must be determined if the complaint was due to an actual boil over, or the warning indicator light, or engine coolant temperature gage indicated overheating.

If the engine is overheating and the cooling fans are "ON," the cooling system should be checked, refer to SECTION 6B.

