

# DTC P1217 ENGINE OVER TEMPERATURE

## DTC P1217 ENGINE OVER TEMPERATURE

PPF:00000

### Description SYSTEM DESCRIPTION

ABS009LK

#### NOTE:

If DTC P1217 is displayed with DTC U1000 or U1001, first perform the trouble diagnosis for DTC U1000, U1001. Refer to [EC-176, "DTC U1000, U1001 CAN COMMUNICATION LINE"](#).

### Cooling Fan Control

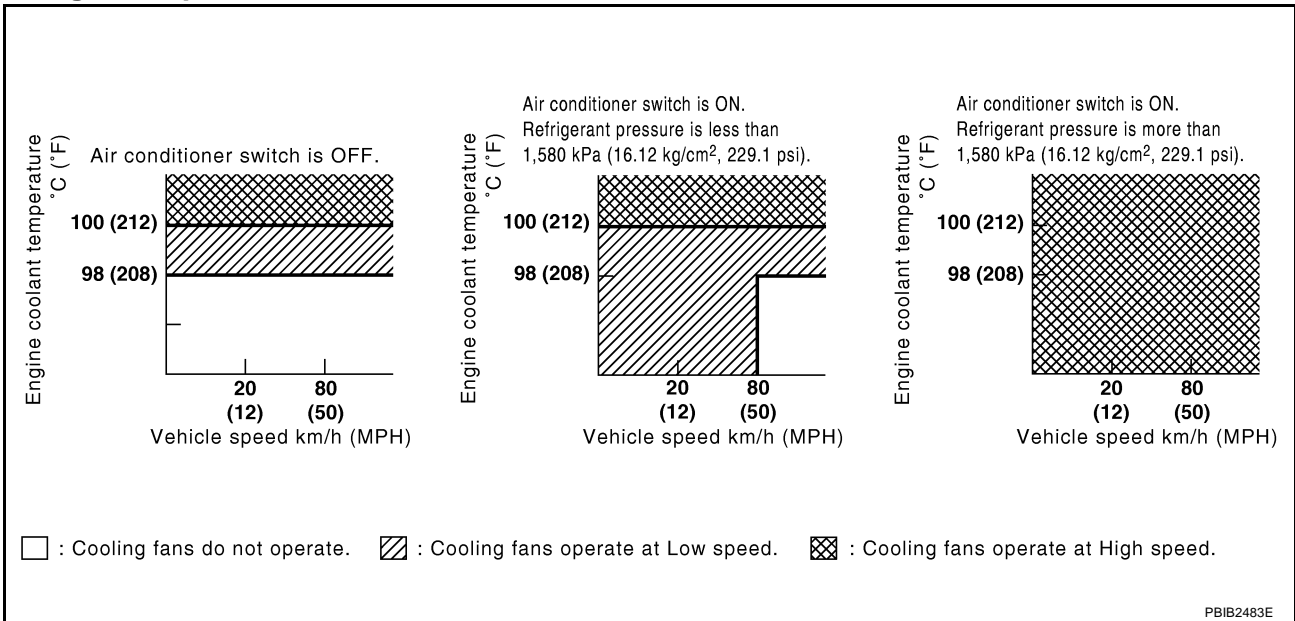
| Sensor   | Input Signal to ECM         | ECM function        | Actuator                         |
|--|-----------------------------|---------------------|----------------------------------|
| Crankshaft position sensor (POS)<br>Camshaft position sensor (PHASE) | Engine speed*1              | Cooling fan control | IPDM E/R<br>(Cooling fan relays) |
| Battery  | Battery voltage*1           |                     |                                  |
| Wheel sensor   | Vehicle speed*2             |                     |                                  |
| Engine coolant temperature sensor                                    | Engine coolant temperature  |                     |                                  |
| Air conditioner switch   | Air conditioner ON signal*2 |                     |                                  |
| Refrigerant pressure sensor  | Refrigerant pressure        |                     |                                  |

\*1: The ECM determines the start signal status by the signals of engine speed and battery voltage.

\*2: This signal is sent to ECM through CAN communication line.

The ECM controls the cooling fan corresponding to the vehicle speed, engine coolant temperature, refrigerant pressure, and air conditioner ON signal. The control system has 3-step control [HIGH/LOW/OFF].

### Cooling Fan Operation



# DTC P1217 ENGINE OVER TEMPERATURE

## Cooling Fan Relay Operation

The ECM controls cooling fan relays in the IPDM E/R through CAN communication line.

| Cooling fan speed | Cooling fan relay |     |     |
|-------------------|-------------------|-----|-----|
|                   | 1                 | 2   | 3   |
| Stop              | OFF               | OFF | OFF |
| Low               | ON                | OFF | OFF |
| High              | ON                | ON  | ON  |

## COMPONENT DESCRIPTION

### Cooling Fan Motor

The cooling fan operates at each speed when the current flows in the cooling fan motor as follows.

| Cooling fan speed | Cooling fan motor terminals |         |
|-------------------|-----------------------------|---------|
|                   | (+)                         | (-)     |
| Low               | 1                           | 4       |
|                   | 2                           | 3       |
| High              | 1 and 2                     | 3 and 4 |

## CONSULT-II Reference Value in Data Monitor Mode

ABS009LL

Specification data are reference values.

| MONITOR ITEM | CONDITION  | SPECIFICATION  |
|--------------|--|--|
| AIR COND SIG | ● Engine: After warming up, idle the engine                                  | Air conditioner switch: OFF<br>OFF   |
|              |  | Air conditioner switch: ON<br>(Compressor operates.)<br>ON                 |
| COOLING FAN  | ● Engine: After warming up, idle the engine<br>● Air conditioner switch: OFF | Engine coolant temperature is 97°C (206°F) or less<br>OFF                  |
|              |  | Engine coolant temperature is between 98°C (208°F) and 99°C (210°F)<br>LOW |
|              |  | Engine coolant temperature is 100°C (212°F) or more<br>HI                  |

## On Board Diagnosis Logic

ABS009LM

If the cooling fan or another component in the cooling system malfunctions, engine coolant temperature will rise.

When the engine coolant temperature reaches an abnormally high temperature condition, a malfunction is indicated.

**This self-diagnosis has the one trip detection logic.**

| DTC No.       | Trouble diagnosis name             | DTC detecting condition   | Possible cause  |
|---------------|------------------------------------|---|---|
| P1217<br>1217 | Engine over temperature (Overheat) | <ul style="list-style-type: none"> <li>● Cooling fan does not operate properly (Overheat).</li> <li>● Cooling fan system does not operate properly (Overheat).</li> <li>● Engine coolant was not added to the system using the proper filling method.</li> <li>● Engine coolant is not within the specified range.</li> </ul> | <ul style="list-style-type: none"> <li>● Harness or connectors (The cooling fan circuit is open or shorted.)</li> <li>● Cooling fan</li> <li>● IPDM E/R (Cooling fan relays)</li> <li>● Radiator hose</li> <li>● Radiator</li> <li>● Radiator cap</li> <li>● Water pump</li> <li>● Thermostat</li> </ul> <p>For more information, refer to <a href="#">EC-517</a>.<br/><a href="#">"Main 12 Causes of Overheating"</a>.</p> |

# DTC P1217 ENGINE OVER TEMPERATURE

## CAUTION:

When a malfunction is indicated, be sure to replace the coolant. Refer to [CO-10, "Changing Engine Coolant"](#) . Also, replace the engine oil. Refer to [LU-10, "Changing Engine Oil"](#) .

1. Fill radiator with coolant up to specified level with a filling speed of 2 liters per minute. Be sure to use coolant with the proper mixture ratio. Refer to [MA-13, "ANTI-FREEZE COOLANT MIXTURE RATIO"](#) .
2. After refilling coolant, run engine to ensure that no water-flow noise is emitted.

## Overall Function Check

ABS009LN

Use this procedure to check the overall function of the cooling fan. During this check, a DTC might not be confirmed.

## WARNING:

Never remove the radiator cap when the engine is hot. Serious burns could be caused by high pressure fluid escaping from the radiator.

Wrap a thick cloth around cap. Carefully remove the cap by turning it a quarter turn to allow built-up pressure to escape. Then turn the cap all the way off.

### WITH CONSULT-II

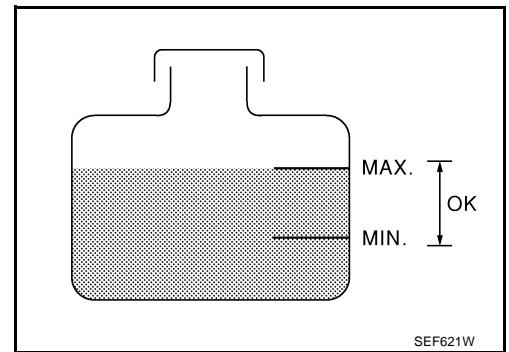
1. Check the coolant level in the reservoir tank and radiator.

#### NOTE:

**Allow engine to cool before checking coolant level.**

If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to [EC-511, "Diagnostic Procedure"](#) .

2. Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to [EC-511, "Diagnostic Procedure"](#) .
3. Turn ignition switch ON.
4. Perform "COOLING FAN" in "ACTIVE TEST" mode with CONSULT-II.
5. If the results are NG, go to [EC-511, "Diagnostic Procedure"](#) .



| ACTIVE TEST    |        |
|----------------|--------|
| COOLING FAN    | OFF    |
| MONITOR        |        |
| COOLANT TEMP/S | XXX °C |
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |

Diagram showing a table for monitoring the active test results. The table has columns for COOLING FAN (OFF) and COOLANT TEMP/S (XXX °C). The diagram is labeled SEF646X.

### WITH GST

1. Check the coolant level in the reservoir tank and radiator.

#### NOTE:

**Allow engine to cool before checking coolant level.**

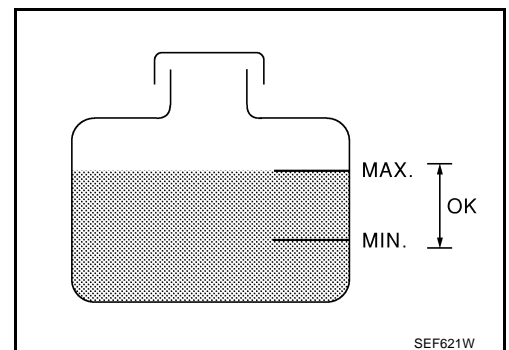
If the coolant level in the reservoir tank and/or radiator is below the proper range, skip the following steps and go to [EC-511, "Diagnostic Procedure"](#) .

2. Confirm whether customer filled the coolant or not. If customer filled the coolant, skip the following steps and go to [EC-511, "Diagnostic Procedure"](#) .
3. Start engine.

## CAUTION:

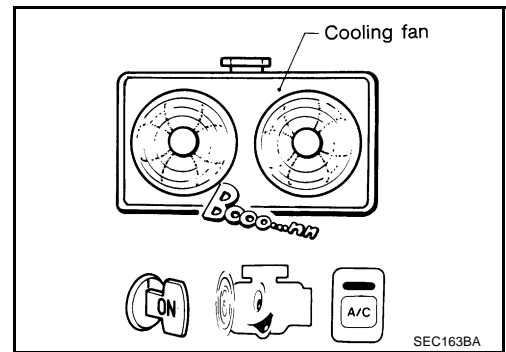
**Be careful not to overheat engine.**

4. Turn air conditioner switch ON.
5. Turn blower fan switch ON.



## DTC P1217 ENGINE OVER TEMPERATURE

6. Make sure that cooling fan operates at low speed.  
If NG, go to [EC-511, "Diagnostic Procedure"](#).  
If OK, go to the following step.
7. Turn ignition switch OFF.
8. Turn air conditioner switch and blower fan switch OFF.
9. Disconnect engine coolant temperature sensor harness connector.
10. Connect 150Ω resistor to engine coolant temperature sensor harness connector.

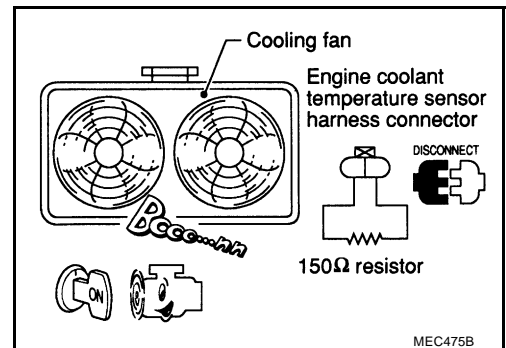


11. Restart engine and make sure that cooling fan operates at higher speed than low speed.

**CAUTION:**

**Be careful not to overheat engine.**

12. If NG, go to [EC-511, "Diagnostic Procedure"](#).



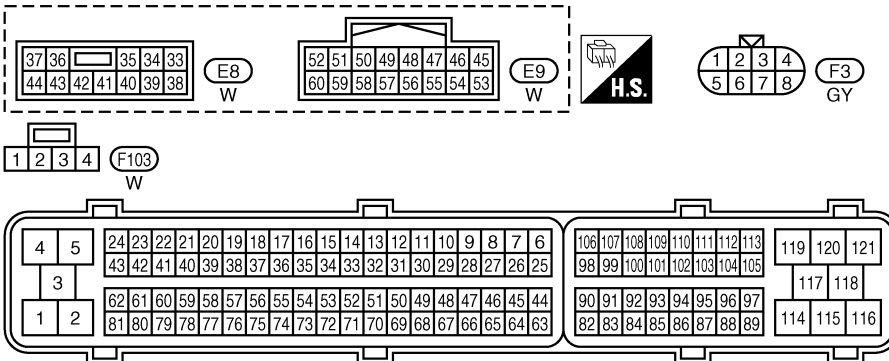
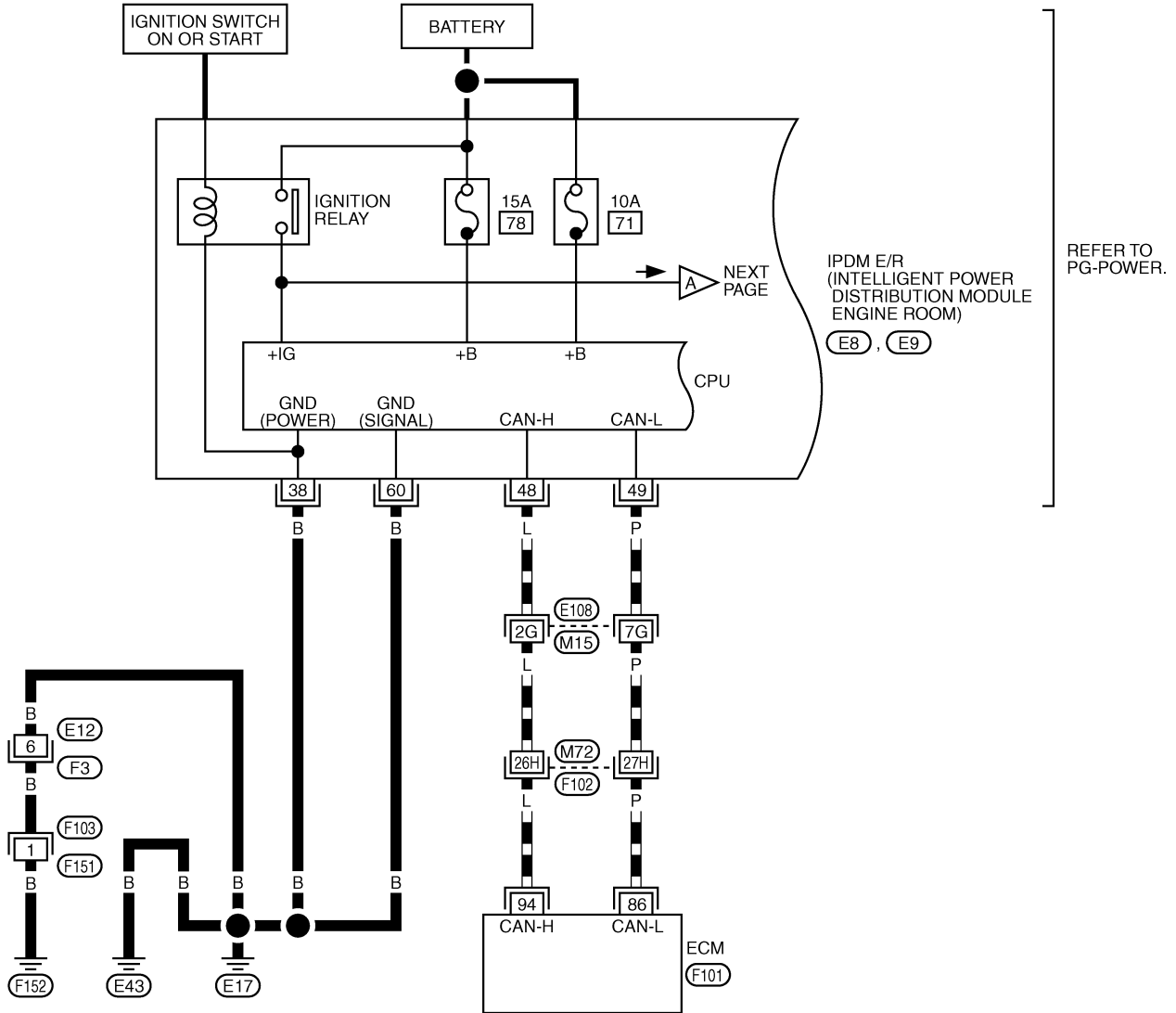
# DTC P1217 ENGINE OVER TEMPERATURE

## Wiring Diagram

ABS009LO

### EC-COOL/F-01

: DETECTABLE LINE FOR DTC  
 : NON-DETECTABLE LINE FOR DTC  
 : DATA LINE

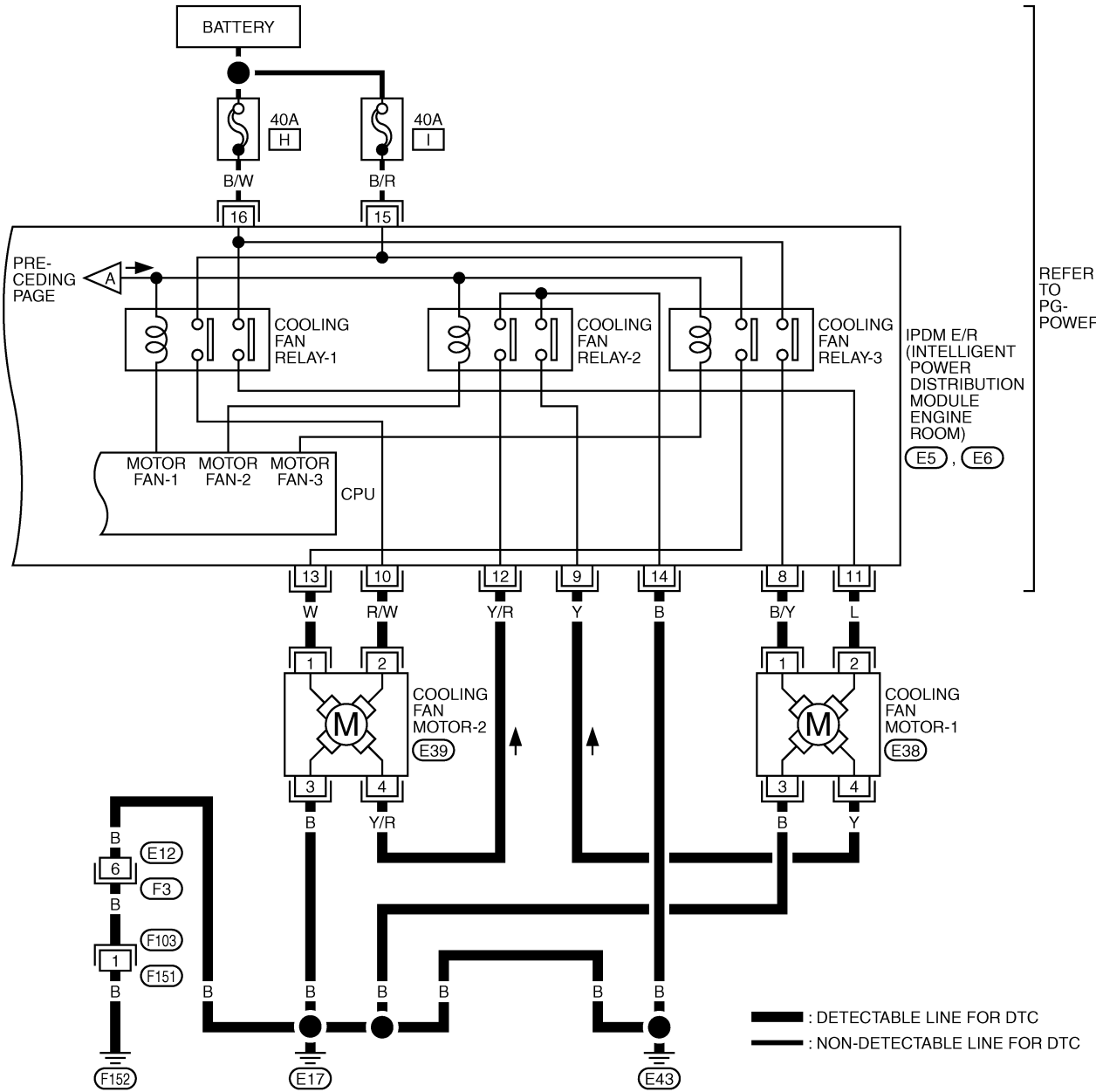


REFER TO THE FOLLOWING.  
 (E108 , F102) -SUPER MULTIPLE  
 JUNCTION (SMJ)

TBWT0629E

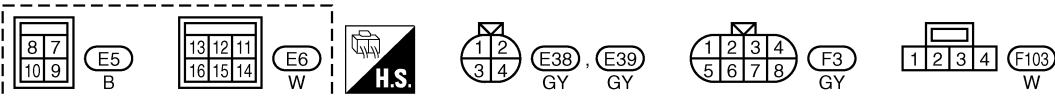
# DTC P1217 ENGINE OVER TEMPERATURE

EC-COOL/F-02



REFER TO PG-POWER.

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) (E5) (E6)



TBWT0630E

# DTC P1217 ENGINE OVER TEMPERATURE

ABS009LP

## Diagnostic Procedure

### 1. INSPECTION START

Do you have CONSULT-II?

Yes or No

- Yes >> GO TO 2.
- No >> GO TO 4.

### 2. CHECK COOLING FAN LOW SPEED OPERATION

#### ① With CONSULT-II

1. Start engine and let it idle.
2. Select "COOLING FAN" in "ACTIVE TEST" mode with CONSULT-II and touch "LOW" on the CONSULT-II screen.
3. Make sure that cooling fans-1 and -2 operate at low speed.

OK or NG

- OK >> GO TO 3.
- NG >> Check cooling fan low speed control circuit. (Go to [EC-514, "PROCEDURE A"](#).)

| ACTIVE TEST    |        |
|----------------|--------|
| COOLING FAN    | LOW    |
| MONITOR        |        |
| COOLANT TEMP/S | XXX °C |
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |

SEF784Z

### 3. CHECK COOLING FAN HIGH SPEED OPERATION

#### ① With CONSULT-II

1. Touch "HIGH" on the CONSULT-II screen.
2. Make sure that cooling fans-1 and -2 operate at higher speed than low speed.

OK or NG

- OK >> GO TO 6.
- NG >> Check cooling fan high speed control circuit. (Go to [EC-516, "PROCEDURE B"](#).)

| ACTIVE TEST    |        |
|----------------|--------|
| COOLING FAN    | HIGH   |
| MONITOR        |        |
| COOLANT TEMP/S | XXX °C |
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |

SEF785Z

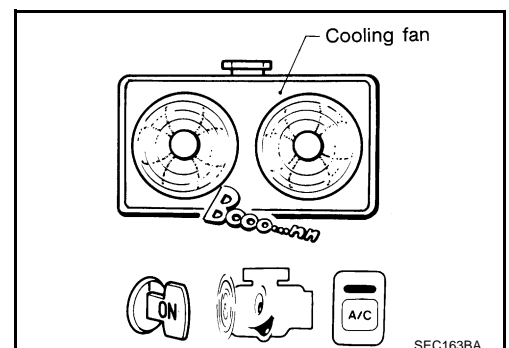
### 4. CHECK COOLING FAN LOW SPEED OPERATION

#### ⊗ Without CONSULT-II

1. Start engine and let it idle.
2. Turn air conditioner switch ON.
3. Turn blower fan switch ON.
4. Make sure that cooling fans-1 and -2 operate at low speed.

OK or NG

- OK >> GO TO 5.
- NG >> Check cooling fan low speed control circuit. (Go to [EC-514, "PROCEDURE A"](#).)



# DTC P1217 ENGINE OVER TEMPERATURE

## 5. CHECK COOLING FAN HIGH SPEED OPERATION

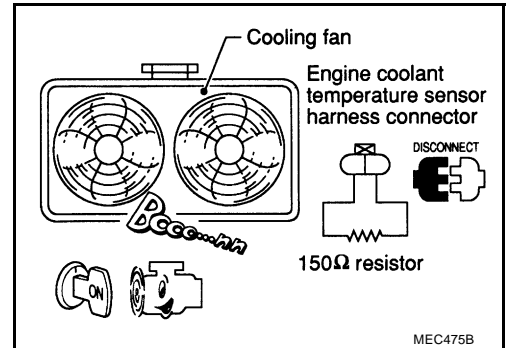
### ⊗ Without CONSULT-II

1. Turn ignition switch OFF.
2. Turn air conditioner switch and blower fan switch OFF.
3. Disconnect engine coolant temperature sensor harness connector.
4. Connect 150Ω resistor to engine coolant temperature sensor harness connector.
5. Restart engine and make sure that cooling fans-1 and -2 operate at higher speed than low speed.

#### OK or NG

OK >> GO TO 6.

NG >> Check cooling fan high speed control circuit. (Go to [EC-516](#), "PROCEDURE B".)



## 6. CHECK COOLING SYSTEM FOR LEAK

Apply pressure to the cooling system with a tester, and check if the pressure drops.

**Testing pressure: 157 kPa (1.6 kg/cm<sup>2</sup> , 23 psi)**

### CAUTION:

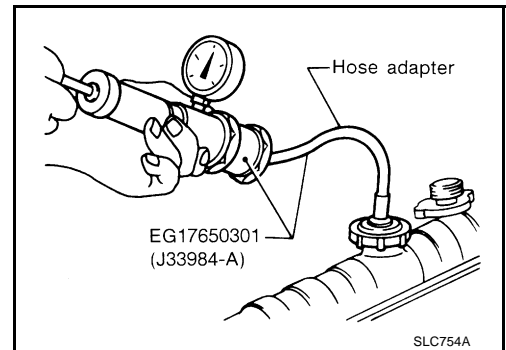
Higher than the specified pressure may cause radiator damage. Pressure should not drop.

#### OK or NG

OK >> GO TO 7.

NG >> Check the following for leak. Refer to [CO-10](#), "LEAK CHECK".

- Hose
- Radiator
- Water pump



## 7. CHECK RADIATOR CAP

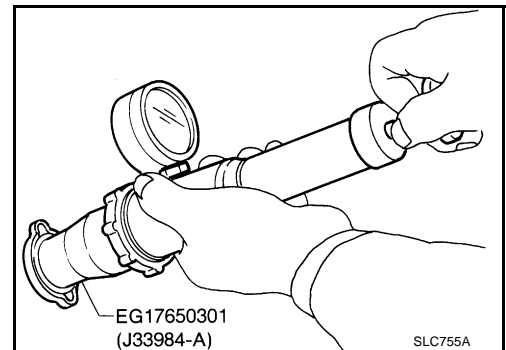
Apply pressure to cap with a tester.

**Radiator cap relief pressure: 59 - 98 kPa (0.6 - 1.0 kg/cm<sup>2</sup> , 9 - 14 psi)**

#### OK or NG

OK >> GO TO 8.

NG >> Replace radiator cap.



# DTC P1217 ENGINE OVER TEMPERATURE

## 8. CHECK THERMOSTAT

1. Check valve seating condition at normal room temperatures.  
**It should seat tightly.**
2. Check valve opening temperature and valve lift.

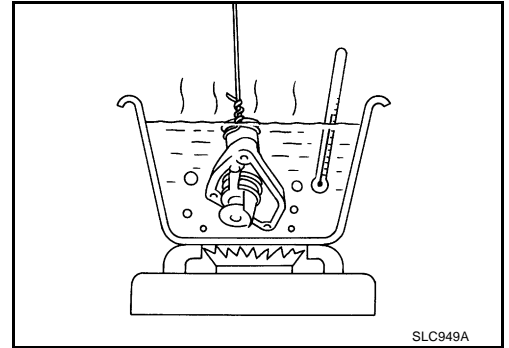
**Valve opening temperature: 76.5°C (170°F) [standard]**

**Valve lift: More than 8.6 mm/90°C (0.339 in/194°F)**

3. Check if valve is closed at 5°C (9°F) below valve opening temperature.  
For details, refer to [CO-28, "WATER INLET AND THERMOSTAT ASSEMBLY"](#) .

### OK or NG

- OK >> GO TO 9.  
NG >> Replace thermostat



## 9. CHECK ENGINE COOLANT TEMPERATURE SENSOR

Refer to [EC-232, "Component Inspection"](#) .

### OK or NG

- OK >> GO TO 10.  
NG >> Replace engine coolant temperature sensor.

## 10. CHECK MAIN 12 CAUSES

If the cause cannot be isolated, go to [EC-517, "Main 12 Causes of Overheating"](#) .

**>> INSPECTION END**

A  
EC  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

# DTC P1217 ENGINE OVER TEMPERATURE

## PROCEDURE A

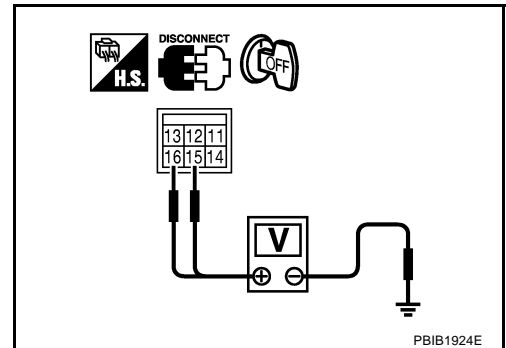
### 1. CHECK POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R harness connector E6.
3. Check voltage between IPDM E/R terminals 15, 16 and ground with CONSULT-II or tester.

**Voltage: Battery voltage**

OK or NG

- OK >> GO TO 3.  
NG >> GO TO 2.



### 2. DETECT MALFUNCTIONING PART

Check the following.

- 40A fusible links
- Harness for open or short between IPDM E/R and battery

>> Repair open circuit or short to ground or short to power in harness or connectors.

### 3. CHECK COOLING FAN MOTORS CIRCUIT

1. Disconnect cooling fan motor-1 harness connector and cooling fan motor-2 harness connector.
2. Disconnect IPDM E/R harness connectors E5, E8, E9.
3. Check harness continuity between the following; cooling fan motor-1 terminal 2 and IPDM E/R terminal 11, cooling fan motor-1 terminal 3 and ground, IPDM E/R terminal 38, 60 and ground, Refer to wiring diagram.

**Continuity should exist.**

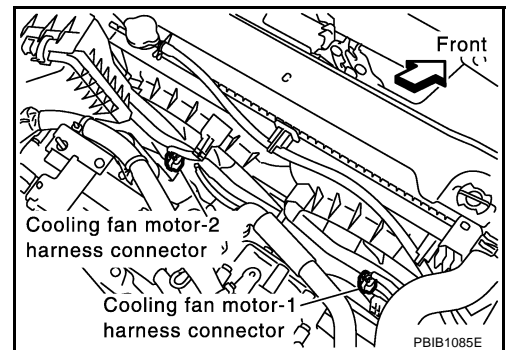
4. Check harness continuity between the following; cooling fan motor-2 terminal 2 and IPDM E/R terminal 10, cooling fan motor-2 terminal 3 and ground. Refer to wiring diagram.

**Continuity should exist.**

5. Also check harness for short to ground and short to power.

OK or NG

- OK >> GO TO 5.  
NG >> GO TO 4.



# DTC P1217 ENGINE OVER TEMPERATURE

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## 4. DETECT MALFUNCTIONING PART

---

A

Check the following.

- Harness connector E12, F3
- Harness connector F103, F151
- Harness for open or short between cooling fan motors-1, 2 and IPDM E/R
- Harness for open or short between cooling fan motors-1, 2 and ground
- Harness for open or short between IPDM E/R and ground

EC

C

>> Repair open circuit or short to ground or short to power in harness or connectors.

D

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## 5. CHECK COOLING FAN MOTORS

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Refer to [EC-517, "Component Inspection"](#) .

E

OK or NG

OK >> GO TO 6.

NG >> Replace cooling fan motors.

F

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## 6. CHECK INTERMITTENT INCIDENT

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Perform [EC-166, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT"](#) .

G

OK or NG

OK >> Replace IPDM E/R. Refer to [PG-17, "IPDM E/R \(INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM\)"](#) .

H

NG >> Repair or replace harness or connector.

I

J

K

L

M

# DTC P1217 ENGINE OVER TEMPERATURE

## PROCEDURE B

### 1. CHECK COOLING FAN MOTORS CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect cooling fan motor-1 harness connector and cooling fan motor-2 harness connector.
3. Disconnect all IPDM E/R harness connectors.
4. Check harness continuity between the following;  
cooling fan motor-1 terminal 1 and IPDM E/R terminal 8,  
cooling fan motor-1 terminal 4 and IPDM E/R terminal 9,  
IPDM E/R terminal 14, 38, 60 and ground,  
Refer to wiring diagram.

**Continuity should exist.**

5. Also check harness connector for short to ground or short to power.
6. Check harness continuity between the following;  
cooling fan motor-2 terminal 1 and IPDM E/R terminal 13,  
cooling fan motor-2 terminal 4 and IPDM E/R terminal 12,  
Refer to wiring diagram.

**Continuity should exist.**

7. Also check harness for short to ground and short to power.

OK or NG

- OK >> GO TO 3.  
NG >> GO TO 2.

### 2. DETECT MALFUNCTIONING PART

Check the following.

- Harness connector E12, F3
- Harness connector F103, F151
- Harness for open or short between cooling fan motors-1, 2 and IPDM E/R
- Harness for open or short between IPDM E/R and ground

>> Repair open circuit or short to ground or short to power in harness or connectors.

### 3. CHECK COOLING FAN MOTORS

Refer to [EC-517, "Component Inspection"](#) .

OK or NG

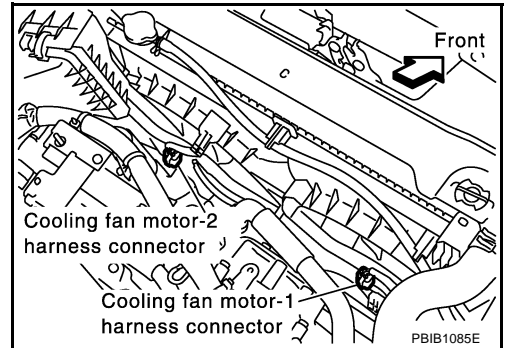
- OK >> GO TO 4.  
NG >> Replace cooling fan motors.

### 4. CHECK INTERMITTENT INCIDENT

Perform [EC-166, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT"](#) .

OK or NG

- OK >> Replace IPDM E/R. Refer to [PG-17, "IPDM E/R \(INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM\)"](#) .  
NG >> Repair or replace harness connectors.



# DTC P1217 ENGINE OVER TEMPERATURE

## Main 12 Causes of Overheating

ABS009LQ

| Engine | Step | Inspection item  | Equipment  | Standard   | Reference page  |
|--------|------|--|--|--|---|
| OFF    | 1    | <ul style="list-style-type: none"> <li>Blocked radiator</li> <li>Blocked condenser</li> <li>Blocked radiator grille</li> <li>Blocked bumper</li> </ul> | <ul style="list-style-type: none"> <li>Visual</li> </ul>                                       | No blocking  | —   |
|        | 2    | <ul style="list-style-type: none"> <li>Coolant mixture</li> </ul>  | <ul style="list-style-type: none"> <li>Coolant tester</li> </ul>                               | 50 - 50% coolant mixture   | <a href="#">MA-13</a>   |
|        | 3    | <ul style="list-style-type: none"> <li>Coolant level</li> </ul>  | <ul style="list-style-type: none"> <li>Visual</li> </ul>                                       | Coolant up to MAX level in reservoir tank and radiator filler neck | <a href="#">CO-10</a>   |
|        | 4    | <ul style="list-style-type: none"> <li>Radiator cap</li> </ul>   | <ul style="list-style-type: none"> <li>Pressure tester</li> </ul>                              | 59 - 98 kPa (0.6 - 1.0 kg/cm <sup>2</sup> , 9 - 14 psi) (Limit)    | <a href="#">CO-15</a>   |
| ON*2   | 5    | <ul style="list-style-type: none"> <li>Coolant leaks</li> </ul>  | <ul style="list-style-type: none"> <li>Visual</li> </ul>                                       | No leaks   | <a href="#">CO-10</a>   |
| ON*2   | 6    | <ul style="list-style-type: none"> <li>Thermostat</li> </ul>   | <ul style="list-style-type: none"> <li>Touch the upper and lower radiator hoses</li> </ul>     | Both hoses should be hot   | <a href="#">CO-28</a>   |
| ON*1   | 7    | <ul style="list-style-type: none"> <li>Cooling fan</li> </ul>  | <ul style="list-style-type: none"> <li>CONSULT-II</li> </ul>                                   | Operating  | See trouble diagnosis for DTC P1217 ( <a href="#">EC-505</a> ). |
| OFF    | 8    | <ul style="list-style-type: none"> <li>Combustion gas leak</li> </ul>  | <ul style="list-style-type: none"> <li>Color checker chemical tester 4 Gas analyzer</li> </ul> | Negative   | —   |
| ON*3   | 9    | <ul style="list-style-type: none"> <li>Coolant temperature gauge</li> </ul>  | <ul style="list-style-type: none"> <li>Visual</li> </ul>                                       | Gauge less than 3/4 when driving                                   | —   |
|        |      | <ul style="list-style-type: none"> <li>Coolant overflow to reservoir tank</li> </ul>   | <ul style="list-style-type: none"> <li>Visual</li> </ul>                                       | No overflow during driving and idling                              | <a href="#">CO-10</a>   |
| OFF*4  | 10   | <ul style="list-style-type: none"> <li>Coolant return from reservoir tank to radiator</li> </ul>   | <ul style="list-style-type: none"> <li>Visual</li> </ul>                                       | Should be initial level in reservoir tank                          | <a href="#">CO-10</a>   |
| OFF    | 11   | <ul style="list-style-type: none"> <li>Cylinder head</li> </ul>  | <ul style="list-style-type: none"> <li>Straight gauge feeler gauge</li> </ul>                  | 0.1 mm (0.004 in) Maximum distortion (warping)                     | <a href="#">EM-119</a>  |
|        | 12   | <ul style="list-style-type: none"> <li>Cylinder block and pistons</li> </ul>   | <ul style="list-style-type: none"> <li>Visual</li> </ul>                                       | No scuffing on cylinder walls or piston                            | <a href="#">EM-137</a>  |

\*1: Turn the ignition switch ON.

\*2: Engine running at 3,000 rpm for 10 minutes.

\*3: Drive at 90 km/h (55 MPH) for 30 minutes and then let idle for 10 minutes.

\*4: After 60 minutes of cool down time.

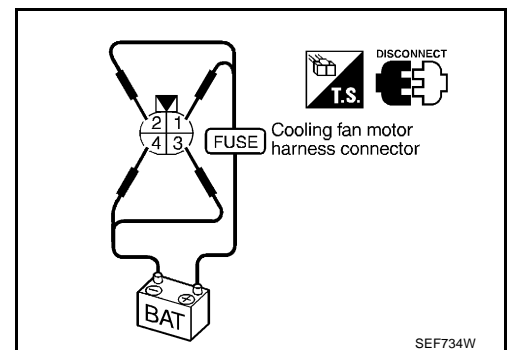
For more information, refer to [CO-6, "OVERHEATING CAUSE ANALYSIS"](#).

## Component Inspection COOLING FAN MOTORS-1 AND -2

ABS009LR

- Disconnect cooling fan motor harness connectors.
- Supply cooling fan motor terminals with battery voltage and check operation.

|                   | Speed | terminals |         |
|-------------------|-------|-----------|---------|
|                   |       | (+)       | (-)     |
| Cooling fan motor | Low   | 1         | 4       |
|                   | High  | 2         | 3       |
|                   | High  | 1 and 2   | 3 and 4 |



**Cooling fan motor should operate.**

If NG, replace cooling fan motor.