DTC	P1133/21	A/F SENSOR CIRCUIT RESPONSE MALFUNCTION(BANK1 SENSOR1)

DTC	P1153/28	A/F SENSOR CIRCUIT RESPONSE MALFUNCTION(BANK2 SENSOR1)

CIRCUIT DESCRIPTION

Refer to DTC P0125 on page 05–333.

DTC No.	DTC Detecting Condition	Trouble Area
P1133/21 P1153/28	After engine is warmed up, and during vehicle driving at engine speed 1,400 rpm or more and vehicle speed 60 km/h (38 mph) or more, if the response characteristic of A/F sensor becomes deteriorated (2 trip detection logic)	• Open or short in A/F sensor circuit • A/F sensor • Air induction system • Fuel pressure • Injector • ECM

WIRING DIAGRAM

Refer to DTC P0125 on page 05–333.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	CHECK OTHER DTC OUTPUT(BESIDES DTC P1133,P1153)

(a) Read the DTC using the hand–held tester.

YES ⟩ GO TO RELEVANT DTC CHART

NO

2	READ VALUE OF HAND–HELD TESTER(AIR FUEL RATIO SENSOR)

(a) Warm up the A/F sensor with the engine speed at 2,500 rpm for approx. 90 sec.

(b) Read the voltage of the A/F sensor on the screen of the hand–held tester when you perform all the following conditions.

HINT:

The voltage of the AFR+ or AFL+ terminal of the ECM is fixed at 3.3 V and the voltage of the AFR– or AFL– terminal is fixed at 3.0 V. Therefore, it is impossible to check the A/F sensor output voltage at the terminals (AFR+, AFL+/AFR–, AFL–) of the ECM.

Result:

Condition	A/F Sensor Voltage value
Engine idling	• Not remains at 3.30 V (0.660 V*) • Not remains at 3.8 V (0.76 V*) or more • Not remains at 2.8 V (0.56 V*) or less *: When you use the hand–held tester
Engine racing	
Driving at engine speed 1,500 rpm or more and vehicle speed 40 km/h (25 mph) or more, and operate throttle valve open and close	

HINT:

- During fuel enrichment, there is a case that the output voltage of the A/F sensor is below 2.8 V (0.56 V*), it is normal.
- During fuel cut, there is a case that the output voltage of the A/F sensor is above 3.8 V (0.76 V*), it is normal.
- If the output voltage of the A/F sensor remains at 3.30 V (0.660 V*) even after performing all the above conditions, the A/F sensor circuit may be open.
- If the output voltage of the A/F sensor remains at 3.8 V (0.76V*) or more, or 2.8 V (0.56 V*) or less even after performing all the above conditions, the A/F sensor circuit may be short.

*: When you use the hand–held tester.

OK → Go to step 9

NG

3	CHECK HARNESS AND CONNECTOR(ECM – A/F SENSOR)

NG → REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

4	CHECK AIR FUEL RATIO SENSOR(RESISTANCE) (See page 12–13)

NG → REPLACE AIR FUEL RATIO SENSOR

OK

5	CHECK AIR INDUCTION SYSTEM (See page 11–49)

NG → REPAIR OR REPLACE AIR INDUCTION SYSTEM

OK

6	CHECK EGR SYSTEM (See page 12–16)

NG → REPLACE EGR SYSTEM

OK

7	CHECK FUEL PRESSURE (See page 11–52)

NG → REPAIR OR REPLACE FUEL SYSTEM

OK

8	INSPECT FUEL INJECTOR ASSY (See page 11–52)

NG → REPLACE FUEL INJECTOR ASSY

OK

REPLACE AIR FUEL RATIO SENSOR

9	PERFORM CONFIRMATION DRIVING PATTERN

GO

10	CHECK READ OUTPUT DTC(BESIDES DTC P1133,P1153)

YES → CHECK AND REPLACE ECM

NO

11	CONFIRM VEHICLE RUNS OUT OF FUEL IN THE PAST

NO → CHECK FOR INTERMITTENT PROBLEMS

YES

DTC P1133 OR P1153 IS CAUSED BY RUNNING OUT OF FUEL