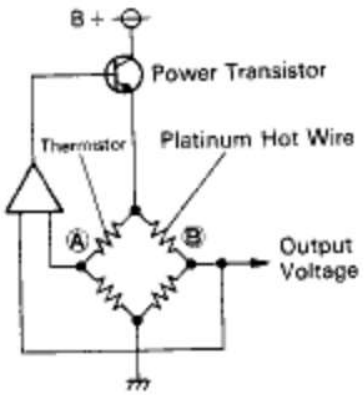
DTC P0100 Mass Air Flow Circuit Malfunction

CIRCUIT DESCRIPTION

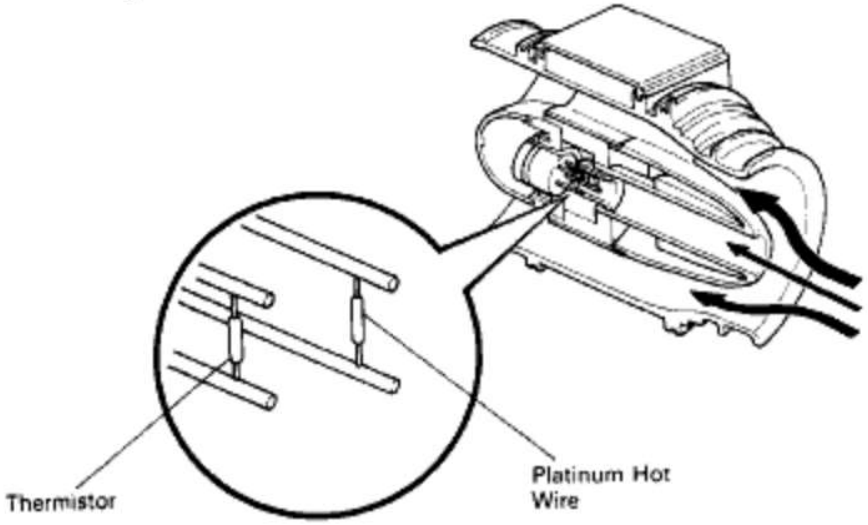
The mass air flow meter uses a platinum hot wire. The hot wire air flow meter consists of a platinum hot wire, thermistor and a control circuit installed in a plastic housing. The hot wire air flow meter works on the principle that the hot wire and thermistor located in the intake air bypass of the housing detect any changes in the intake air temperature.

The hot wire is maintained at the set temperature by controlling the current flow through the hot wire. This current flow is then measured as the output voltage of the air flow meter.

The circuit is constructed so that the platinum hot wire and thermistor provide a bridge circuit, with the power transistor controlled so that the potential of (A) and (B) remains equal to maintain the set tem–perature.



FI6928



FI6972

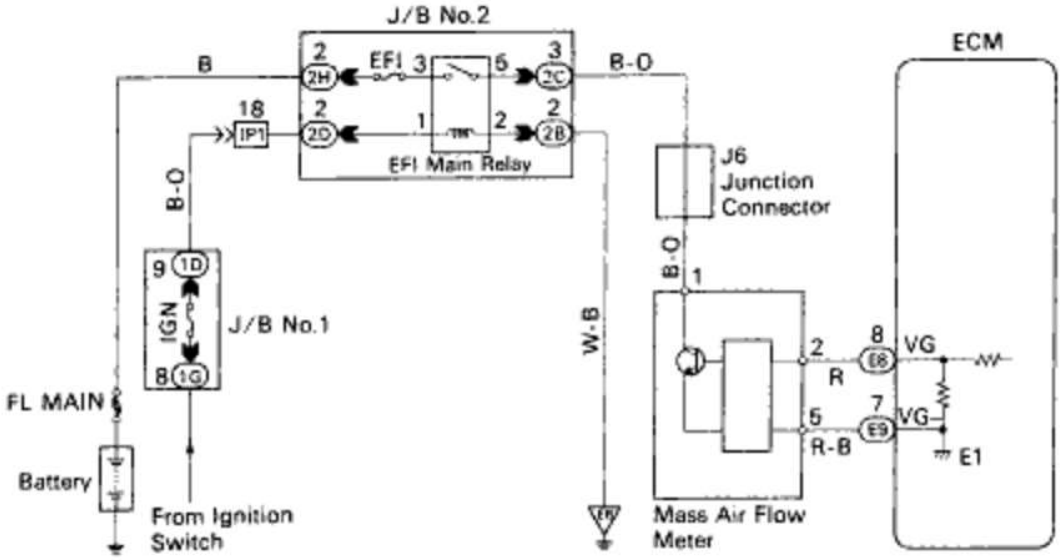
DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0100	Open or short in mass air flow meter circuit with engine speed 4,000 rpm or less.	• Open or short in mass air flow meter circuit • Mass air flow meter • ECM

If the ECM detects diagnostic trouble code ”P01 00” it operates the fail safe function, keeping the ignition timing and injection volume constant and making it possible to drive the vehicle.

HINT: After confirming DTC P01 00 use the OBDII scan tool or TOYOTA hand–held tester to confirm the mass air flow ratio from "CURRENT DATA".

Mass Air Flow Value (gm/sec.)	Malfunction
0.0	• + B circuit open • VG circuit open or short
271.0 or more	• VG– circuit open

WIRING DIAGRAM



F17047

DIAGNOSTIC CHART

1	Connect the OBDII scan tool or TOYOTA hand–held tester, and read value of mass air flow rate.	Type II	Go to step 5

Type I

2	Check voltage of mass air flow meter power source.	NG	Check for open in harness and connector between EFI main relay and mass air flow meter.

OK

3	Check voltage between terminal VG and body ground.	OK	Check and replace ECM.

NG

4	Check for open and short in harness and connector between mass air flow meter and ECM.	NG	Repair or replace harness or connector.

OK

Replace mass air flow meter.

5	Check continuity between terminal VG– and body ground.	NG	Check and replace ECM.

OK

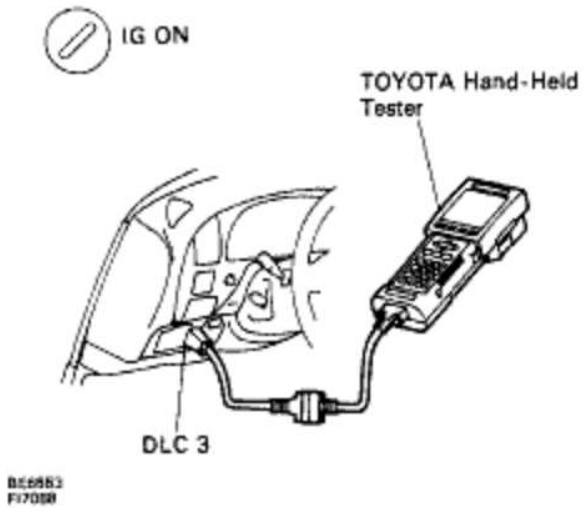
6	Check for open in harness and connector between mass air flow meter and ECM.	NG	Repair or replace harness or connector.

OK

Replace mass air flow meter.

INSPECTION PROCEDURE

1 **Connect the OBDII scan tool or TOYOTA hand–held tester, and read value of mass air flow rate.**



P (1) Remove the fuse cover on the instrument panel.
(2) Connect the OBDII scan tool or TOYOTA hand–held tester to the DLC 3.
(3) Turn ignition switch ON and OBDII scan tool or TOYOTA hand–held tester main switch ON.
(4) Start the engine.

C Read mass air flow rate on the OBDII scan tool or TOYOTA hand–held tester.

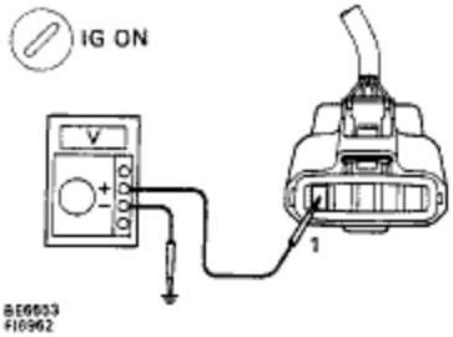
Result

	Mass air flow rate
Type I	0.0 gm/sec.
TypeII	271.0 gm/sec. or more

Type I

Type II → **Go to step 5 .**

2 **Check voltage of mass air flow meter power source.**



P (1) Disconnect the mass air flow meter connector.
(2) Turn ignition switch ON.

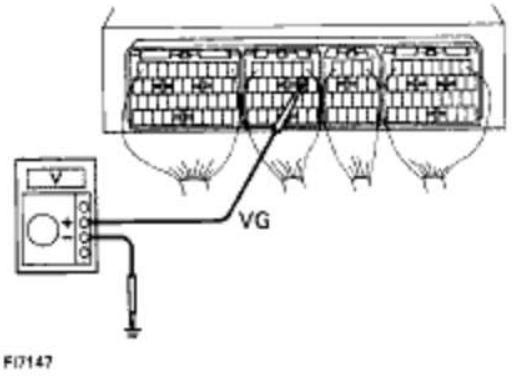
C Measure voltage between terminal 1 of mass air flow meter connector and body ground.

OK **Voltage: 9 –14 V**

OK

NG → **Check for open in harness and connector between EFI main relay and mass air flow meter (See page IN–31).**

3 **Check voltage between terminal VG of ECM and body ground.**



P (1) Remove glove compartment.
(See page EG2–309)
(2) Start the engine.

C Measure voltage between terminal VG of ECM and body ground while engine is idling.

OK **Voltage: 1.1 – 1.5 V**
(P position and A/C switch OFF)

NG → **OK** → **Check and replace ECM (See page IN–36).**

4 **Check for open and short in harness and connector between mass air flow meter and ECM (See page IN–31).**

OK → **NG** → **Repair or replace harness or connector.**

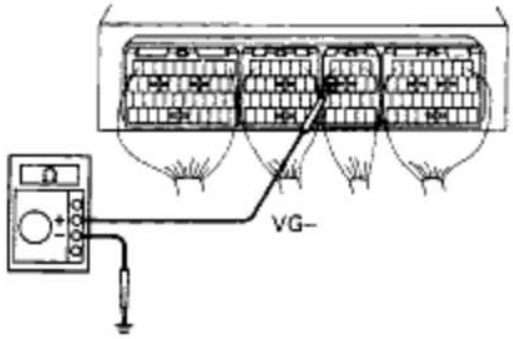
Replace mass air flow meter.

5 **Check continuity between terminal VG of ECM and body ground.**

P Remove glove compartment (See page EG2–309).

C Check continuity between terminal VG– of ECM and body ground.

OK **Continuity (1 or less)**



FI7148

OK

NG → **Check and replace ECM (See page IN–36).**

6 **Check for– open in harness and connector between mass air flow meter– and ECM (See page IN–31).**

OK

NG → **Repair or replace harness or connector.**

Replace mass air flow meter.

DTC P0101 Mass Air Flow Circuit Range Performance Problem

CIRCUIT DESCRIPTION

Refer to mass air flow circuit malfunction on page EG2–444.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0101	Conditions a) and b) continue with engine speed 900 rpm or less. (2 trip detection logic) a) Closed throttle position switch: ON b) Mass air flow meter output) 2.2 V	• Mass air flow meter

WIRING DIAGRAM

Refer to mass air flow circuit malfunction on page EG2–445.

DIAGNOSTIC CHART

1	Are there any other codes (besides DTC P0101) being output?	YES	Go to relevant diagnostic trouble code chart.

NO

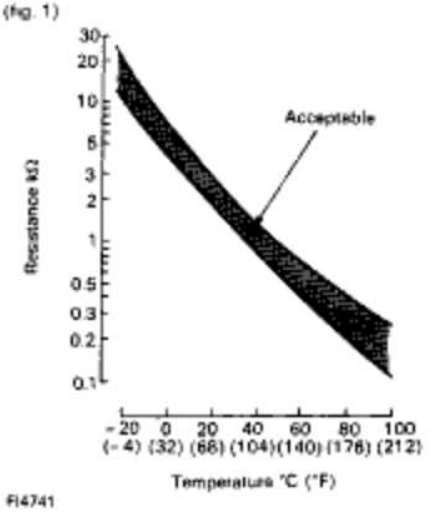
Replace mass air flow meter.

DTC P0110 Intake Air Temp Circuit Malfunction

CIRCUIT DESCRIPTION

The intake air temp. sensor is built into the air flow meter and senses the intake air temperature.
A thermistor built in the sensor changes the resistance value according to the intake air temperature.
The lower the intake air temperature, the greater the thermistor resistance value, and the higher the intake air temperature, the lower the thermistor resistance value (See Fig. 1.).
The intake air temperature sensor is connected to the ECM (See next page). The 5V power source voltage in the ECM is applied to the intake air temperature sensor from the terminal THA via a resistor R.
That is, the resistor R and the intake air temperature sensor are connected in series. When the resistance value of the intake air temperature sensor changes in accordance with changes in the intake air temperature, the potential at terminal THA also changes. Based on this–signal, the ECM increases the fuel injection volume to improve driveability during cold engine operation.
If the ECM records the diagnostic trouble code ”P0110”, it operates the fail safe function in which the intake temperature is assumed to be 20 C (68 F). Intake Air Ter

(fig. 1)



(Reference)

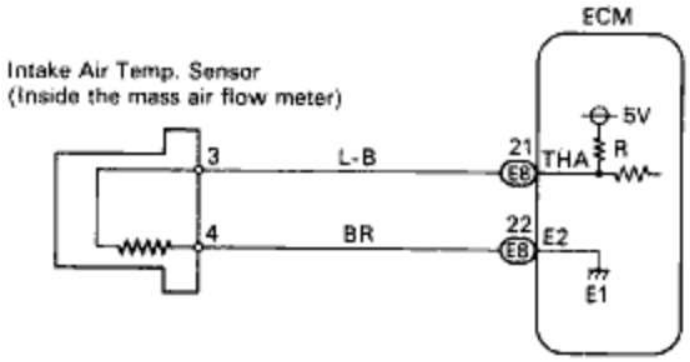
Intake Air Temp. °C (° F)	Resistance (kΩ)	Voltage M
– 20 (– 4)	16.2	4.3
0 (32)	5.9	3.4
20 (68)	2.5	2.4
40 (104)	1.1	1.4
60 (140)	0.6	0.9
80 (176)	0.3	0.5
100 (212)	0.1	0.2

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0110	Open or short in intake air temp. sensor circuit.	• Open or short in intake air temp. sensor circuit. • Intake air temp. sensor • ECM

Hint; After confirming DTC P01 10 use the OBDII scan tool or TOYOTA hand–held tester to confirm the intake air temperature from ”CURRENT DATA”.

Temperature Displayed	Malfunction
– 40 C (–40 F)	Open circuit
120 C (248 F) or more	Short circuit

WIRING DIAGRAM



FI6448

DIAGNOSTIC CHART

HINT; If diagnostic trouble codes "P0110" (intake air temp. circuit malfunction), "P0115" (engine coolant temp. circuit malfunction), "P0120" (throttle position circuit malfunction) are output simultaneously, E2 (sensor ground) may be open.

1	Connect the OBDII scan tool or TOYOTA hand–held tester and read value of intake air temp.	NG	– 40 C (– 40 F) ..... Go to step 2 120 C (248 F) or more .. Go to step 4

OK

Check for intermittent problems.

2	Check for open in harness or ECM.	OK	Confirm good connection at sensor. If OK, replace mass air flow meter.

NG

3	Check for open in harness or ECM.	OK	Open in harness between ECM and intake air temp. sensor.

NG

Confirm good connection at ECM. If OK, replace ECM.

4	Check for short in harness and ECM.	OK	Replace mass air flow meter.

NG

5	Check for short in harness or ECM.	OK	Repair or replace harness or connector.

NG

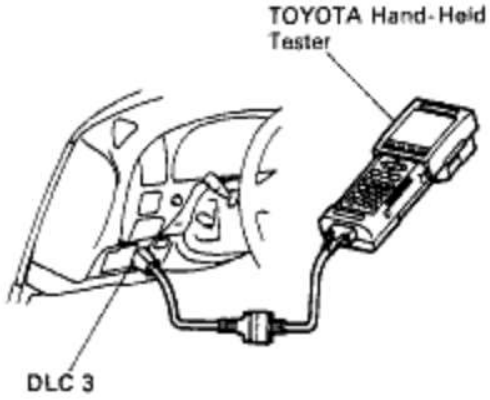
Check and replace ECM.

INSPECTION PROCEDURE

HINT: If diagnostic trouble codes "P0110" (intake air temp. circuit malfunction), "P0115" (engine coolant temp. circuit malfunction), "P0120" (throttle position circuit malfunction) are output simultaneously, E2 (sensor ground) may be open.

1 **Connect the OBDII scan tool or TOYOTA hand–held tester, and read value of intake air temperature.**

IG ON



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P (1) Remove the fuse cover on the instrument panel.

(2) Connect the OBDII scan tool or TOYOTA hand–held tester to the DLC 3.

(3) Turn ignition switch ON and OBDII scan tool or TOYOTA hand–held tester main switch ON.

C Read temperature value on the OBDII scan tool or TOYOTA hand–held tester.

OK Same as actual intake air temperature.

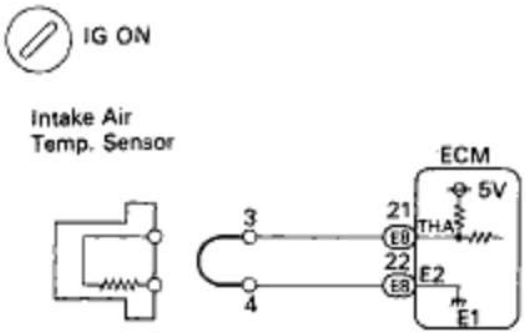
Hint If there is open circuit, OBDII scan tool or TOYOTA hand–held tester indicates – 40 C (– 40 F).
If there is short circuit, OBDII scan tool or TOYOTA hand–held tester indicates 120 C (248 F) or more.

OK

NG – 40 C (– 40 F) ..... Go to step 2
120 C (248 F) or more ... Go to step 3

Check for intermittent problems.
(See page EG2–417)

2 Check for open in harness or ECM.



P (1) Disconnect the mass air flow meter connector.
(2) Connect sensor wire harness terminals together.
(3) Turn ignition switch ON.

C Read temperature value on the OBDII scan tool or TOYOTA hand–held tester.

OK **Temperature value: 120 C (248 F) or more**

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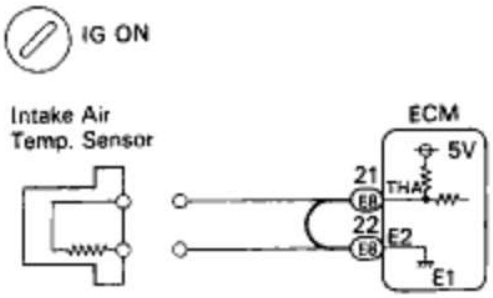
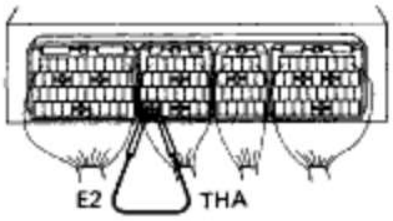
FI7065

NG

OK → **Confirm good connection at sensor. If OK, replace mass air flow meter.**

3 Check for open in harness or ECM.





P (1) Remove glove compartment.
(See page EG2–309)
(2) Connect between terminals THA and E2 of ECM E8 connector.
HINT: Mass air flow meter connector is disconnected. Before checking, do a visual and contact pressure check for the ECM connector. (See page EG2–418)

C (3) Turn ignition switch ON.
Read temperature value on the OBDII scan tool or TOYOTA hand–held tester.

OK **Temperature value: 120 C (248 F) or more**

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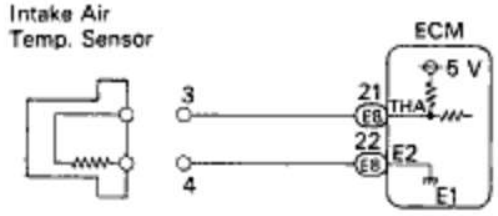
FI7031

NG

OK → **Open in harness between terminals E2 or THA, repair or replace harness.**

Confirm good connection at ECM. If OK, replace ECM..

4 Check for short in harness and ECM.



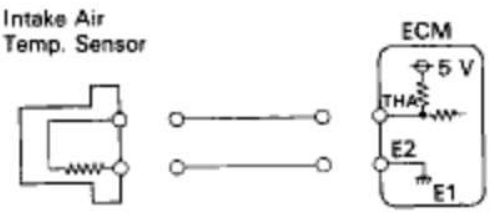
B66853
F17084

P (1) Disconnect the mass air flow meter connector.
(2) Turn ignition switch ON.
C Read temperature value on the 0BDII scan tool or TOYOTA hand–held tester.
OK **Temperature value: – 40 C (– 40 F).**

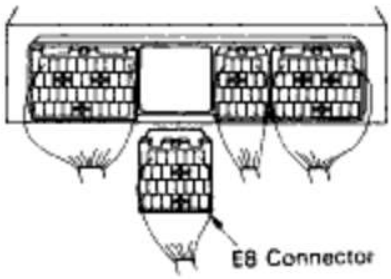
NG

OK **Replace mass air flow meter.**

5 Check for short in harness or ECM.



P (1) Remove glove compartment.
(See page EG2–309)
(2) Disconnect the E8 connector of ECM.
HINT: Mass air flow meter connector is disconnected.
(3) Turn ignition switch ON.
C Read temperature value on the OBDII scan tool or TOYOTA hand–held tester.
OK **Temperature value: –40 C (–40 F)**



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F17034

NG

OK **Repair or replace harness or connector.**

Check and replace ECM (See page IN–36).

DTC P0115 Engine Coolant Temp Circuit Malfunction

CIRCUIT DESCRIPTION

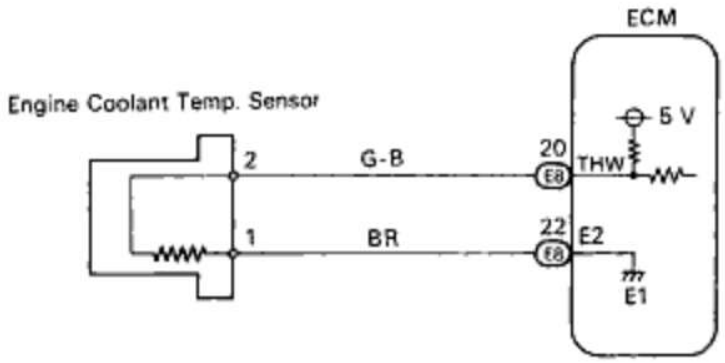
A thermistor built into the engine coolant temperature sensor changes the resistance value according to the coolant temperature.
The structure of the sensor and connection to the ECM is the same as in the intake air temp. circuit malfunction shown on page EG2–451.
If the ECM records the diagnostic trouble code P01 15, it operates the fail safe function, keeping the engine coolant temp. at a constant 80_2C (176_2F).

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0115	Open or short in engine coolant temp. sensor circuit.	• Open or short in engine coolant temp. sensor circuit. • Engine coolant temp. sensor. • ECM

HINT: After confirming DTC P01 15 use the OBDII scan tool or TOYOTA hand–held tester to confirm the engine coolant temperature from ”CURRENT DATA”.
Temperature Displayed Malfunction

– 40_2C (– 40_2F)	Open circuit
120_2C (248_2F) or more	Short circuit

WIRING DIAGRAM



FI5448

DIAGNOSTIC CHART

HINT: If diagnostic trouble codes "P0110" (intake air temp. circuit malfunction), "P0115" (engine coolant temp. circuit malfunction) and "P0120" (throttle position circuit malfunction) are output simultaneously, E2 (sensor ground) may be open.

1	Connect the OBDII scan tool or TOYOTA hand–held tester and read value of engine coolant temp.	NG	– 40°C (– 40°F) ..... Go to step 2 120°C (248°F) or more .. Go to step 4

OK

Check for intermittent problems.

2	Check for open in harness or ECM.	OK	Confirm good connection at sensor. If OK, replace engine coolant temp. sensor.

NG

3	Check for open in harness or ECM.	OK	Open in harness between ECM and engine coolant temp. sensor.

NG

Confirm connection at ECM. If OK, replace ECM.

4	Check for short in harness and ECM.	OK	Replace engine coolant temp. sensor.

NG

5	Check for short in harness or ECM.	OK	Repair or replace harness or connector.

NG

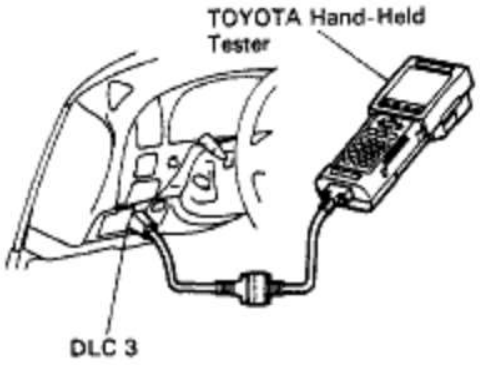
Check and replace ECM.

INSPECTION PROCEDURE

HINT; If diagnostic trouble codes "P0110" (intake air temp. circuit malfunction), "P0115" (engine coolant temp. circuit malfunction), "P0120" (throttle position circuit malfunction) are output simultaneously, E2 (sensor ground) may be open.

1 **Connect the OBD II scan tool or TOYOTA hand–held tester, and read value of engine coolant temperature.**

IG ON



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R17088

P (1) Remove the fuse cover on the instrument panel.
(2) Connect the 0BDII scan tool or TOYOTA hand–held tester to the DLC 3.
(3) Turn ignition switch ON and OBDII scan tool or TOYOTA hand–held tester main switch ON.

C Read temperature value on the OBDII scan tool or TOYOTA hand–held tester.

OK Same as actual engine coolant temperature.

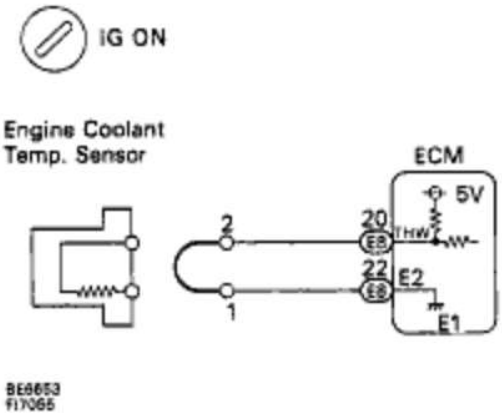
Hint If there is open circuit, OBD II scan tool or TOYOTA hand–held tester indicates – 40_2C (– 40_2 F).
If there is short circuit, OBD II scan tool or TOYOTA hand–held tester indicates 120_2C (248_2F) or more.

OK

NG **– 40_2C (– 40_2F) ..... Go to step 2.**
120_2C (248_2F) or more . . Go to step 3.

Check for intermittent problems.
(See page EG2–417)

2 **Check for open in harness or ECM.**



P (1) Disconnect the engine coolant temp. sensor connector.
(2) Connect sensor wire harness terminals together.
(3) Turn ignition switch ON.

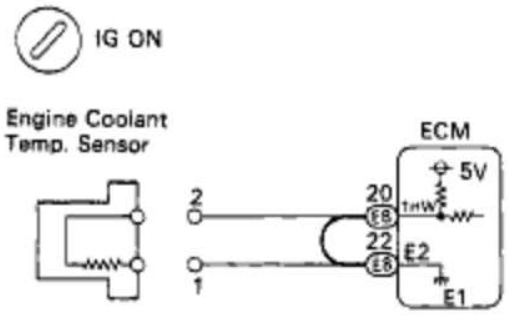
C Read temperature value on the OBDII scan tool or TOYOTA hand–held tester.

OK **Temperature value: 120$_2$C (248$_2$F) or more**

NG

OK → **Confirm good connection at sensor. If OK, replace engine coolant temp. sensor.**

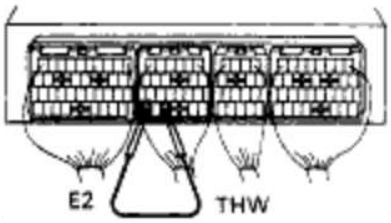
3 **Check for open in harness or ECM.**



P (1) Remove glove compartment.
(See page EG2–309)
(2) Connect between terminals THW and E2 of ECM E8 connector.
HINT: Engine coolant temp. sensor connector is disconnected. Before checking, do a visual and contact pressure check for the ECM connector.
(See page EG2–418)

C (3) Turn ignition switch ON.
Read temperature value on the OBDII scan tool or TOYOTA hand–held tester.

OK **Temperature value: 120$_2$C (248$_2$F) or more**

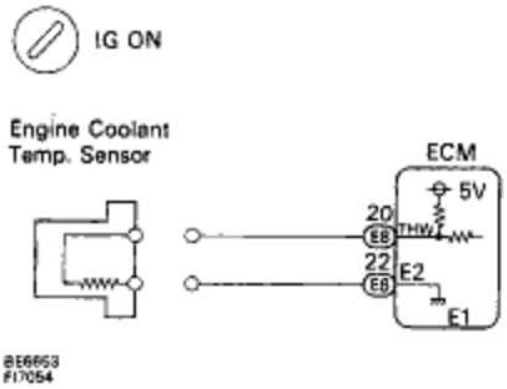


NG

OK → **Open in harness between terminals E2 or THW, repair or replace harness.**

**Confirm good connection at ECM.
If OK, replace ECM .**

4 **Check for short in harness and ECM.**

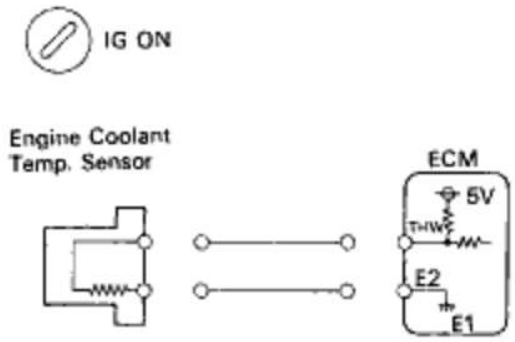


P (1) Disconnect the engine coolant temp. sensor connector.
(2) Turn ignition switch ON.
C Read temperature value on the OBDII scan tool or TOYOTA hand–held tester.
OK **Temperature value: – 40_2C (– 40_2F)**

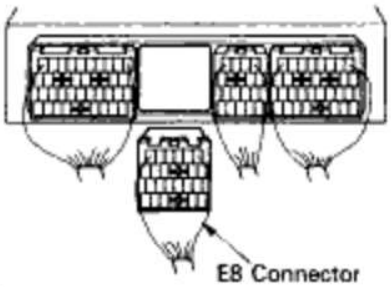
NG

OK → **Replace engine coolant temp. sensor.**

5 **Check for short in harness or ECM.**



P (1) Remove glove compartment.
(See page EG2–309)
(2) Disconnect the E8 connector of ECM.
HINT: Engine coolant temp. sensor connector is dis–connected.
(3) Turn ignition switch ON.
C Read temperature value on the OBDII scan tool or TOYOTA hand–held tester.
OK **Temperature value: –40_2C (–40_2F)**



NG

OK → **Repair or replace harness or connector.**

Check and replace ECM (See page IN–36).

DTC P0116 Engine Coolant Temp Circuit Range Performance Problem

CIRCUIT DESCRIPTION

Refer to engine coolant temp. circuit malfunction on page EG2–457.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0116	20 min. or more after starting engine, engine coolant temp. sensor value is 30°C (86°F) or less. (2 trip detection logic)	• Engine coolant temp. sensor. • Cooling system.

DIAGNOSTIC CHART

HINT: If diagnostic trouble codes "P0115" (engine coolant temp. circuit malfunction) and "P0116" (engine coolant temp. circuit range/ performance) are output simultaneously, engine coolant temp. sensor circuit may be open.
Perform troubleshooting of diagnostic trouble code P0115 first.

1	Are there any other codes (besides DTC P0116) being output?	YES	Go to relevant diagnostic trouble code chart.

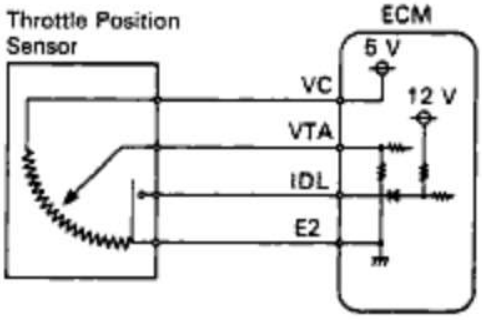
NO

Replace engine coolant temp. sensor. (See page EG2–282)

DTC P0120 Throttle Position Circuit Malfunction

CIRCUIT DESCRIPTION

The throttle position sensor is mounted in the throttle body and detects the throttle valve opening angle. When the throttle valve is fully closed, the IDL contacts in the throttle position sensor are on, so the voltage at the terminal IDL of the ECM becomes 0V. At this time, a voltage of approximately 0.7 V is applied to terminal VTA of the ECM. When the throttle valve is opened, the IDL contacts go off and thus the power source voltage of approximately 12 V in the ECM is applied to the terminal IDL of the ECM. The voltage applied to the terminal VTA of the ECM increases in proportion to the opening angle of the throttle valve and becomes approximately 3.5 – 5.0 V when the throttle valve is fully opened. The ECM judges the vehicle driving conditions from these signals input from terminals VTA and IDL, and uses them as one of the condithins for deciding the air–fuel ratio correction, power increases correction and fuel–cut control etc.



FI6571

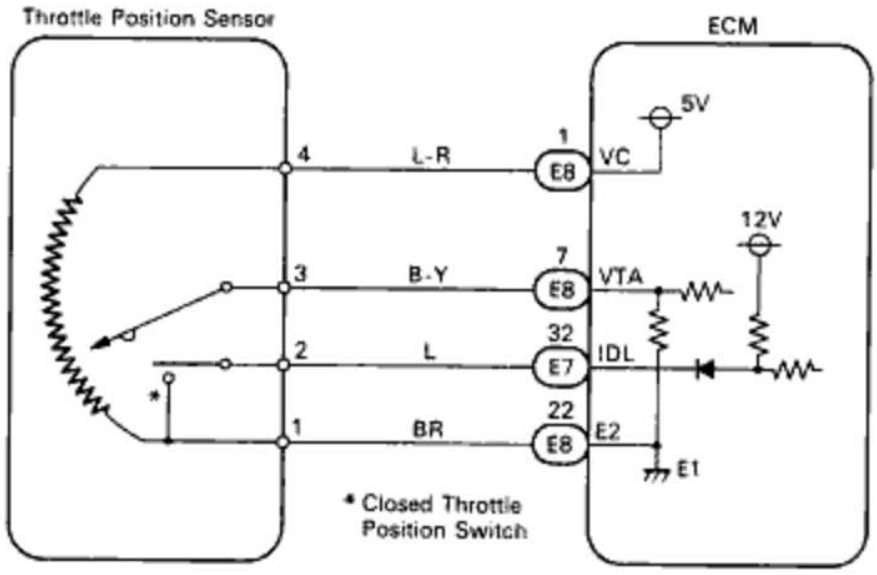
DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0120	Condition a) or b) continues. a) VTA (0.1 V, and closed throttle position switch is OFF. b) VTA) 4.9 V	• Open or short in throttle position sensor circuit. • Throttle position sensor. • ECM

HINT:

- If there is open circuit in IDL line, diagnostic trouble code P0120 does not indicate,
- After confirming DTC P0120 use the OBDII scan tool or TOYOTA hand–held tester to confirm the throttle valve opening percentage and closed throttle position switch condition.

Throttle valve opening position expressed as percentage		Trouble Area
Throttle valve fully closed	Throttle valve fully open	
0%	0 %	VC line open VTA line open or short
Approx. 99%	Approx. 100%	E2 line open

WIRING DIAGRAM



FI6673

DIAGNOSTIC CHART

HINT: If diagnostic trouble codes P0110, P01 15 and P0120 are output simultaneously, E2 (sensor ground) may be open.

TOYOTA hand–held tester

1	Connect the TOYOTA hand–held tester and read the throttle valve opening percentage.	OK	Check for intermittent problems.

NG

2	Read closed throttle position switch condition.	OK	G o to step 5

NG

3	Check voltage of terminal VC.	NG	Go to step 6

OK

4	Check throttle position sensor.	NG	Replace throttle position sensor.

OK

5	Check voltage of terminal VTA and E2 of ECM.	NG	Check for open and short in harness and connector between ECM and throttle position sensor (VTA line).

OK

Check and replace ECM.

6	Check voltage of terminal VC and E2 of ECM.	NG	Check and replace ECM.

OK

Check for open in harness and connector between ECM and sensor (VC line).

OBDII scan tool (excluding TOYOTA hand–held tester)

1	Connect the OBDII scan tool and read the throttle valve opening percentage.	OK	Check for intermittent problems.

NG

2	Check voltage of terminal IDL and E2 of ECM.	OK	Go to step 5

NG

3	Check voltage of terminal VC on wire harness side connector.	NG	G o to step 6

OK

4	Check throttle position sensor.	NG	Replace throttle position sensor.

OK

5	Check voltage of terminal VTA and E2 of ECM.	NG	Check for open and short in harness and connector between ECM and throttle position sensor (VTA line).

OK

Check and replace ECM.

6	Check voltage of terminal VC and E2 of ECM.	NG	Check and replace ECM.

OK

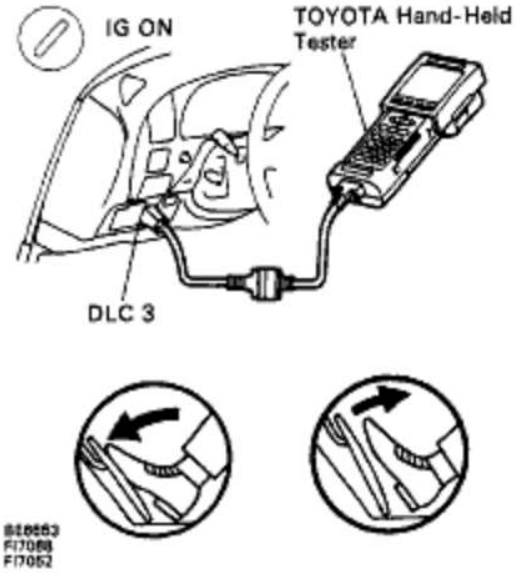
Check for open in harness and connector between ECM and sensor (VC line).

INSPECTION PROCEDURE

TOYOTA hand–held tester

HINT: If diagnostic trouble codes P01 10, P01 15 and P0120 are output simultaneously, E2 (sensor ground) may be open.

1 **Connect the TOYOTA hand–held tester and read the throttle valve opening percentage.**



P (1) Remove the fuse cover on the instrument panel.
(2) Connect the TOYOTA hand–held tester to the DLC 3.
(3) Turn ignition switch ON and TOYOTA hand–held tester main switch ON.

C Read the throttle valve opening percentage.

OK

Throttle valve	Throttle valve opening position expressed as percentage
Fully open	Approx. 70%
Fully closed	Approx. 10%

NG

OK **Check for intermittent problems (See page EG2–417).**

2 **Read closed throttle position switch condition.**

P (1) Remove the fuse cover on the instrument panel.
(2) Connect the TOYOTA hand–held tester to the DLC 3.
(3) Turn ignition switch ON and TOYOTA hand–held tester main switch ON.

C Read closed throttle position switch condition.

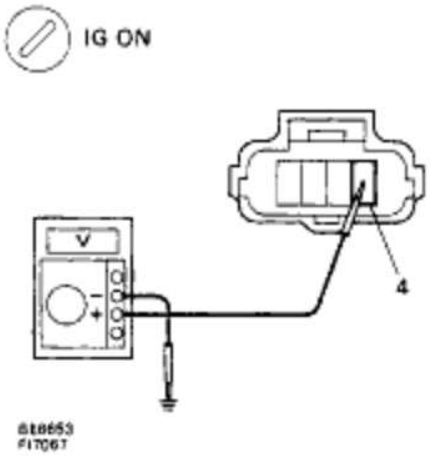
OK

Throttle valve	Closed throttle position switch condition
Fully open	OFF
Fully closed	ON

NG

OK **Go to step 5**

3 **Check voltage between terminal VC of wire harness side connector and body ground.**



P (1) Disconnect the throttle position sensor connector.
(2) Turn ignition switch ON.

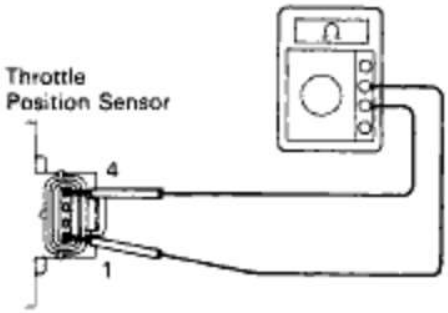
C Measure voltage between terminal VC of wire harness side connector and body ground.

OK **Voltage: 4.5 – 5.5 V**

OK

NG → **Go to step 6**

4 **Check throttle position sensor.**

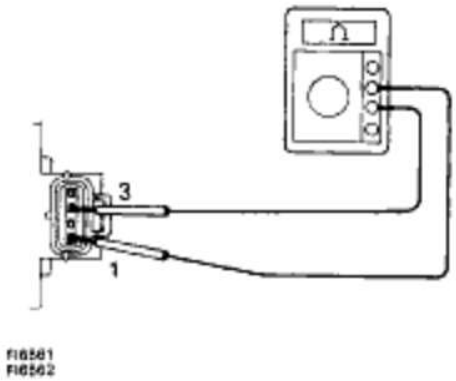


P Disconnect the throttle position sensor connector.

C Measure resistance between terminals 4, 3 and 1 of throttle position sensor.

OK

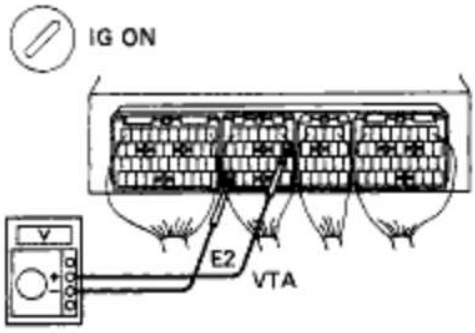
Terminals	Throttle valve	Resistance
1 –4	–	4.25 – 8.25 kΩ
1 –3	Fully closed	0.3 – 6.3 kΩ
	Fully open	3.5 – 10.3 kΩ



OK

NG → **Replace throttle position sensor.**

5 **Check voltage between terminals VTA and E2 of ECM.**



BE6653
FI7044

P (1) Remove glove compartment.
(See page EG2–309)
(2) Turn ignition switch ON.

C Measure voltage between terminals VTA and E2 of ECM.

OK

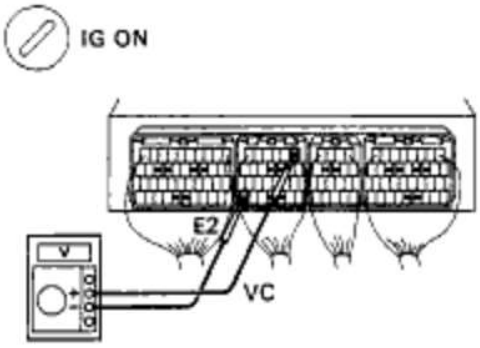
Throttle Valve	Voltage
Fully closed	0.3 – 0.8 V
Fully open	2.7 – 5.2 V

OK

NG **Check for open and short in harness and connector between ECM and throttle position sensor (VTA line) (See page IN–31).**

Check and replace ECM (See page IN–36).

6 **Check voltage between terminals VC and E2 of ECM.**



BE6653
FI7229

P (1) Remove glove compartment.
(See page EG2–309)
(2) Turn ignition switch ON.

C Measure voltage between terminals VC and E2 of engine control module connector.

OK **Voltage: 4.5 – 5.5 V**

OK

NG **Check and replace ECM (See page IN–36).**

Check for open in harness and connector between ECM and sensor (VC line) (See page IN–31).

INSPECTION PROCEDURE

OBD II scan tool (excluding TOYOTA hand–held tester)

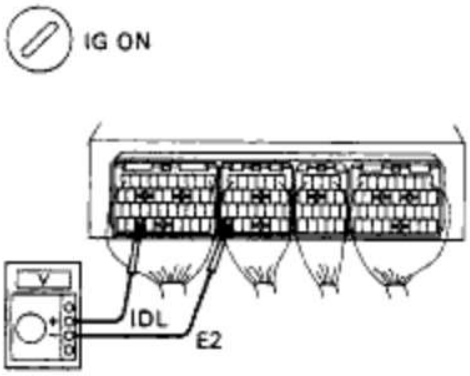
HINT: If diagnostic trouble codes P0110, P0115, and P0120 are output simultaneously, E2 (sensor ground) may be open.

1 Connect the OBD II scan tool and read the throttle valve opening percentage (See page EG2–467, step 1).

NG

OK → Check for intermittent problems. (See page EG2–417)

2 Check voltage of terminal IDL and E2 of ECM.



BE6653
FI7040

P (1) Remove glove compartment. (See page EG2–309)
(2) Turn ignition Switch ON.

C Measure voltage between terminals IDL and E2 of ECM.

OK

Throttle Valve	Voltage
Fully closed	0 – 3.0 V
Fully open	9–14V

NG

OK → Go to step

3 Check voltage between terminal VC of wire harness side connector and body ground (See page EG2–468, step 3).

OK

NG → Go to step 6

4 Check throttle position sensor (See page EG2–468, step 4).

OK

NG → Replace throttle position sensor.

5	Check voltage between terminals VTA and E2 of ECM (See page EG2–469, step 5).

OK → Check and replace ECM (See page IN–36).

NG → Check for open and short in harness and connector between ECM and throttle position sensor (VTA line) (See page IN–31).

6	Check voltage terminals VC and E2 of ECM (Seepage EG2–469, step 6).

OK → Check for open in harness and connector between ECM and sensor (VC line) (See page IN–31).

NG → Check and replace ECM (See page IN–36).

DTC P0121 Throttle Position Circuit Range Performance Problem

CIRCUIT DESCRIPTION

Refer to throttle position circuit malfunction on page EG2–463.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0121	When closed throttle position switch is ON, condition a) continues. (2 trip detection logic) a) VTA) 2.0 V	• Throttle position sensor.

DIAGNOSTIC CHART

1	Are there any other codes (besides DTC P0121) being output?	YES	Go to relevant diagnostic trouble code chart.

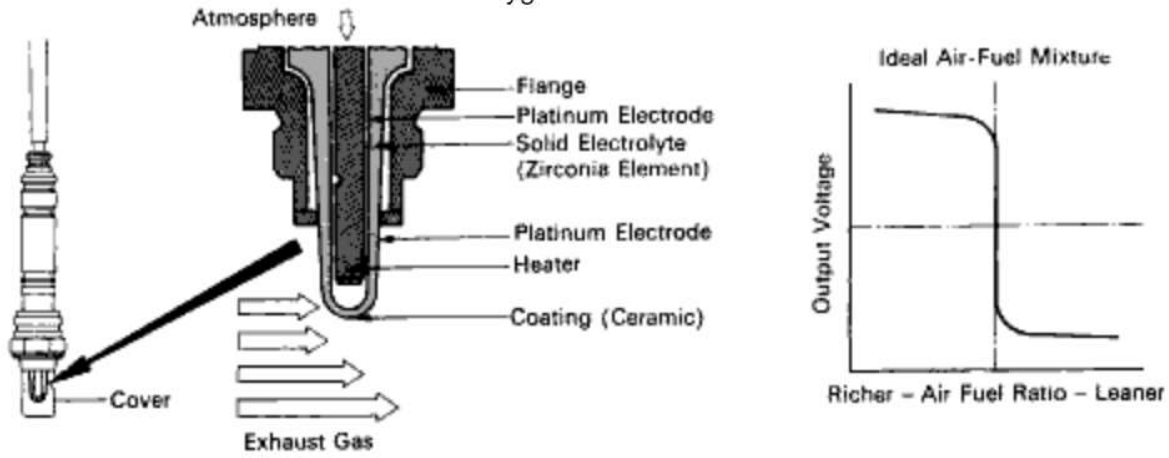
NO

Replace throttle position sensor.

DTC P0125 Insufficient Coolant Temp for Closed Loop Fuel Control

CIRCUIT DESCRIPTION

To obtain a high purification rate for the C0, HC and NOx components of the exhaust gas, a three–way catalytic converter is used, but for the most efficient use of the three–way catalytic converter, the air–fuel ratio must be precisely controlled so that it is always close to the stoichiometric air–fuel ratio.
The oxygen sensor has the characteristic whereby its output voltage changes suddenly in the vicinity of the stoichiometric air–fuel ratio. This characteristic is used to detect the oxygen concentration in the exhaust gas and provide feedback to the computer for control of the air–fuel ratio.
When the air–fuel ratio becomes LEAN, the oxygen concentration in the exhaust increases and the oxygen sensor informs the ECM of the LEAN condition (small electromotive force: 0 V).
When the air–fuel ratio is RICHER than the stoichiometric air–fuel ratio the oxygen concentration in the exhaust gas is reduced and the oxygen sensor informs the ECM of the RICH condition (large electromotive force:1V)
The EMC judges by the electromotive force from the oxygen sensor whether the air–fuel ration is RICH or LEAN and controls the injection time accordingly. However, if malfunction of the oxygen sensor causes output of abnormal electromotive force, the EMC is unable to perform accurate air–fuel ration control.
The main heated oxygen sensors include a heater which heats the Zirconia element. The heater is controlled by the EMC. When the intake air volume is low (the temperature of the exhaust gas is low) current flows to the heater to heat the sensor for accurate oxygen concentration detection.



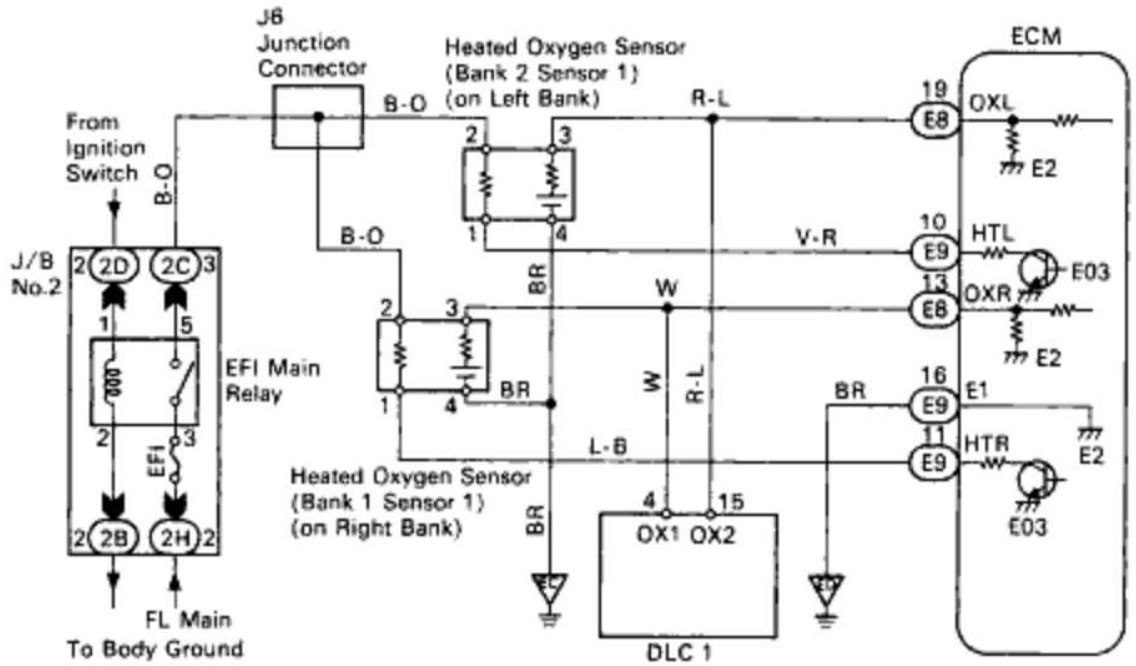
DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0125	After the engine is warmed up, heated oxygen sensor output does not indicate RICH even once when conditions a) and b) continue for at least 2 minutes. a) Engine speed: 1,500 rpm or more b) Vehicle speed: 40 km/h (25 mph) or more	• Open or short in heated oxygen sensor circuit. • Heated oxygen sensor.

HINT: After confirming DTC P0125 use the 0BDll scan tool or TOYOTA hand–held tester to confirm voltage output of heated oxygen sensor from current data.
If voltage output of heated oxygen sensor is 0 V, heated oxygen sensor circuit may be open or short.

DIAGNOSTIC CHART

1	Connect the OBDII scan tool or TOYOTA hand–held tester and read value for voltage output of heated oxygen sensor.	OK	Check and replace ECM.
NG			
2	Check for open and short in harness and connector between ECM and heated oxygen sensor.	NG	Repair or replace harness or connector.
OK			
Replace heated oxygen sensor.			

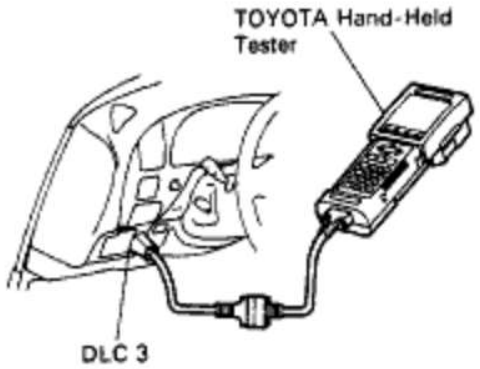
WIRING DIAGRAM



FI7013

INSPECTION PROCEDURE

1 **Connect the OBDII scan tool or TOYOTA hand–held tester and read value for voltage output of heated oxygen sensor.**



P (1) Remove the fuse cover on the instrument panel.
(2) Connect the OBDII scan tool or TOYOTA hand–held tester to the DLC 3.
(3) Warm up engine to normal operating temper–ature.

C Read voltage output of heated oxygen sensor (bank 1,2 sensor 1) when engine is suddenly raced.

Hint Perform quick racing to 4,000 rpm three times us–ing accelerator pedal.

OK **Both heated oxygen sensors [(bank 1 sensor 1) (bank 2 sensor 1)] output a RICH signal (0.45 V or more) at least once.**

NG

OK → **Check and replace ECM (See page IN–36).**

2 **Check for open and short in harness and connector between ECM and heated oxygen sensor (See page IN–31).**

OK

NG → **Repair or replace harness or connector.**

Replace heated oxygen sensor.

DTC P0130 P0150 Heated Oxygen Sensor Circuit Malfunction (Bank 1 Sensor 1 Bank 2 Sensor 1)

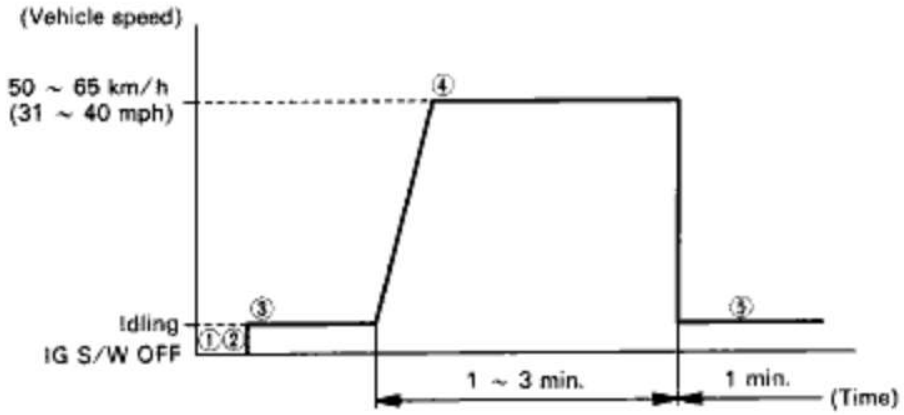
CIRCUIT DESCRIPTION

Refer to ”Insufficient coolant temp. for closed loop fuel control” on page EG2–473.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0130 **P0150**	Voltage output of heated oxygen sensor remains at 0,4 V or more, or 0,55 V or less, during idling after the engine is warmed up. (2trip detection logic)	• Heated oxygen sensor • Fuel trim malfunction

H I NT: Bank 1 refers to the bank that includes cylinder No.1.
Bank 2 refers to the bank that does not include cylinder No,1.
Sensor 1 refers to the sensor closer to the engine body.
The heated oxygen sensor’s output voltage and the short–term fuel trim value can be read using the OBDll scan tool or TOYOTA hand–held tester.

CONFIRMATION DRIVING PATTERN



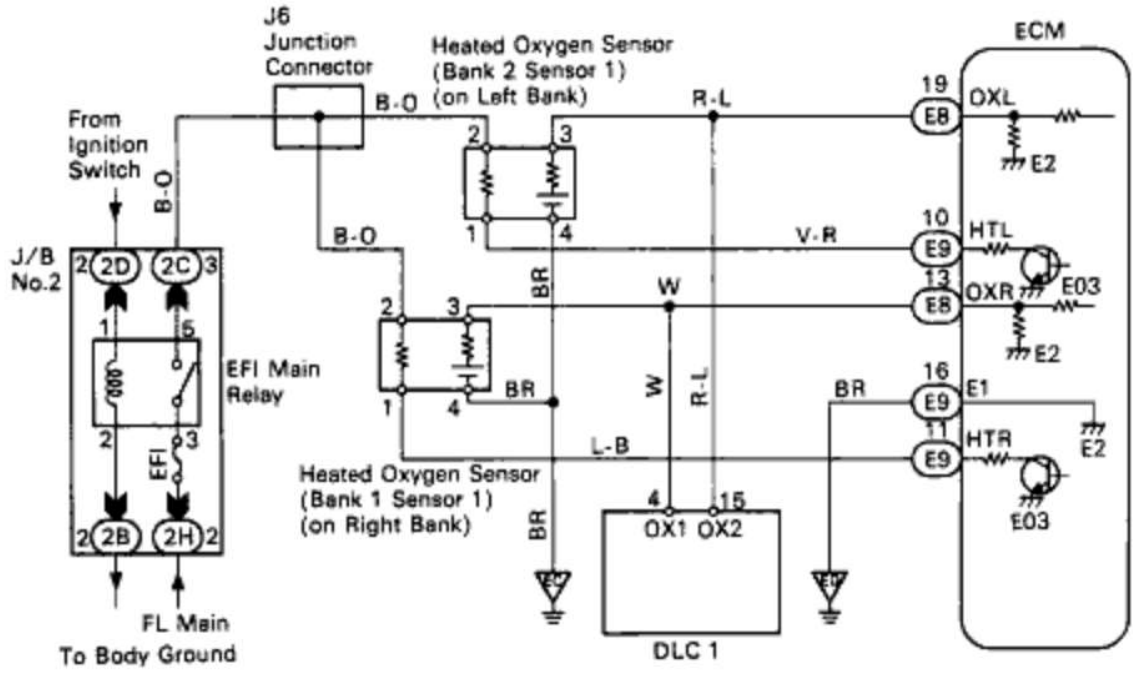
R17130

(1)Connect the TOYOTA hand–held tester to the DLC 3.
(2)Switch the TOYOTA hand–held tester from normal mode to check mode (See page EG2–403).
(3) Start the engine and warm it up with all accessory switches OFF.
(4) After the engine is warmed up, drive at 50 – 65 km/h (31 – 40 mph) for 1 – 3 minutes to warm up the heated oxygen sensor.
(5) After driving let the engine idle for 1 minute.
HINT: If a malfunction exists, the MIL will light up during step (5) .
NOTICE: If the conditions in this test are not strictly followed, detection of the malfunction will not be possible.
If you do not hove a TOYOTA hand–held tester, turn the ignition switch OFF after perform–ing steps (3) to (5), then perform steps (3) to (5) again.

DIAGNOSTIC CHART

1	Check for open and short in harness and connector between ECM and heated oxygen sensor.	NG	Repair or replace harness or connector.
OK			
2	Check heated oxygen sensor data.	OK	Check fuel trim system.
NG			
3	Check output voltage of heated oxygen sensor.	OK	Perform confirmation driving pattern.
NG			
Replace heated oxygen sensor.			

WIRING DIAGRAM



F07013

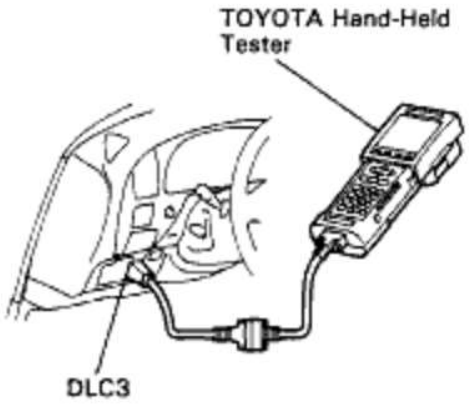
INSPECTION PROCEDURE

1 **Check for open and short in harness and connector between ECM and heated oxygen sensor (See page IN–31).**

OK

NG → **Repair or replace harness or connector.**

2 **Check for heated oxygen sensor data.**



P (1) Remove the fuse cover on the instrument panel.
(2) Connect the OBD II scan tool or TOYOTA hand–held tester to the DLC 3.
(3) Warm up engine to normal operating temperature.

C Read the heated oxygen sensor output voltage and short–term fuel trim.

Hint Read the values for the same bank.

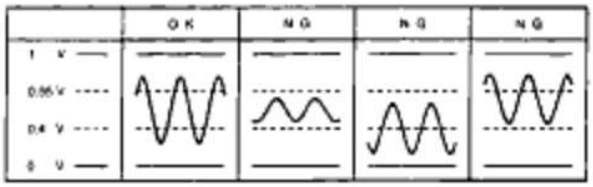
Result

Pattern	Heated oxygen sensor output voltage	Short–term fuel trim
①	Lean condition (Changes at 0.55 V or less)	Changes at about +20%
②	Rich condition (Changes at 0.4 V or more)	Changes at about –20%
③	Except (1) and (2)	

F17088

③ → (1),(2) → **Check fuel trim system. (See page EG2–486).**

3 **Check the output voltage of heated oxygen sensor during idling.**



P Warm up the heated oxygen sensor with the engine at 2,500 rpm for approx. 90 sec.

C Use the OBD II scan tool or TOYOTA hand–held tester read the output voltage of the heated oxygen sensor during idling.

OK **Heated oxygen sensor output voltage: Alternates repeatedly between less than 0.4 V and more than 0.55 V (See the adjacent table).**

P18349

NG → **Replace heated oxygen sensor.**

OK → **Perform confirmation driving pattern. (See page EG2–477).**

DTC P0133 P0153 Heated Oxygen Sensor Circuit Slow Response (Bank 1 Sensor 1 Bank 2 Sensor 1)

CIRCUIT DESCRIPTION

Refer to "Insufficient coolant temp. for closed loop fuel control" on page EG2–473.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0133 P0153	Response time for the heated oxygen sensor's voltage output to change from rich to lean, or from lean to rich, is 1 sec. or more during idling after the engine is warmed up. (2 trip detection logic)	• Heated oxygen sensor

HINT: Bank 1 refers to the bank that includes cylinder No.1.
Bank 2 refers to the bank that does not include cylinder No.1.
Sensor 1 refers to the sensor closer to the engine body.

DIAGNOSTIC CHART

1	Are there any other codes (besides DTC P0133, P0153) being output?	YES	Go to relevant diagnostic trouble code chart.

NO

Replace heated oxygen sensor.

DTC P0135 P0141 P0155 Heated Oxygen Sensor Heater Circuit Malfunction (Bank 1 Sensor 1 – Bank 1 Sensor 2 – Bank 2 Sensor 1)

CIRCUIT DESCRIPTION

Refer to ”Insufficient coolant temp. for closed loop fuel control” on page EG2–473.

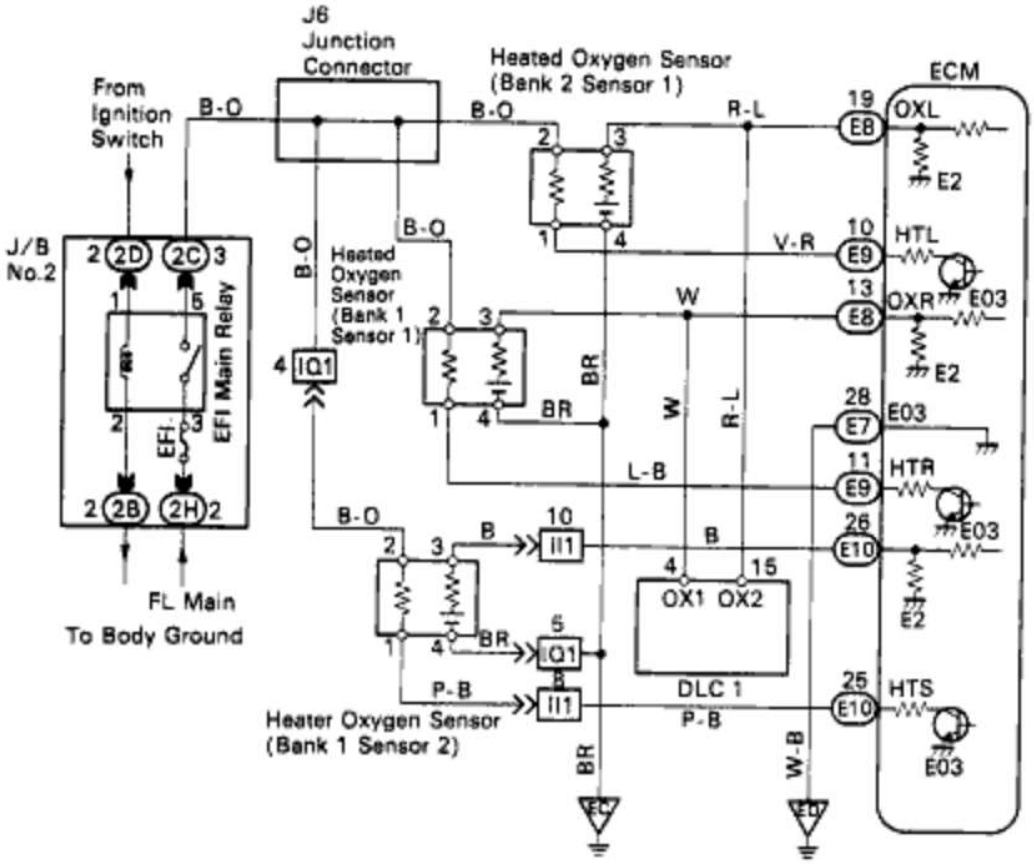
DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0135 P0141 P0155	When the heater operates, heater current exceeds 2 A or voltage drop for the heater circuit exceeds 5 V. (2 trip detection logic)	• Open or short in heater circuit of heated oxygen sensor. • Heated oxygen sensor heater • ECM
	Heater current of 0.25 A or less when the heater operates. (2 trip detection logic)	

H I NT: Bank 1 refers to the bank that includes cylinder No.1.
Bank 2 refers to the bank that does not include cylinder No.1.
Sensor 1 refers to the sensor closer to the engine body.
Sensor 2 refers to the sensor farther away from the engine body.

DIAGNOSTIC CHART

1	Check voltage of terminals HTR, HTS, HTL.	OK	Check and replace ECM.
NG			
2	Check resistance of heated oxygen sensor heater.	NG	Replace heated oxygen sensor.
OK			
Check and repair harness or connector between main relay and heated oxygen sensor and ECM.			

WIRING DIAGRAM

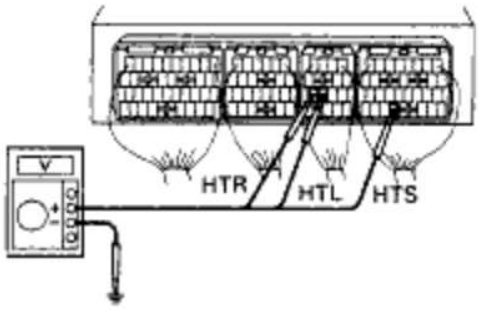


R17077

INSPECTION PROCEDURE

1 **Check voltage between terminals HTR, HTS, HTL of ECM connector and body ground.**

IG ON



B66653
FI7033

P (1) Remove glove compartment
(See page EG2–309).
(2) Turn ignition switch ON.

C Measure voltage between terminals HTR, HTS, HTL of ECM connector and body ground.

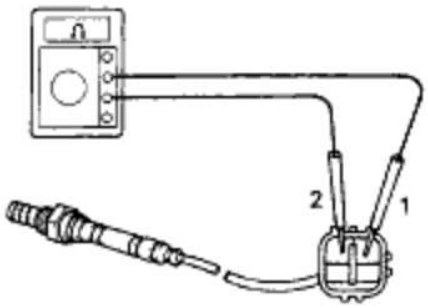
Hint Connect terminal HTR to bank 1 sensor 1.
Connect terminal HTS to bank 2 sensor 1.
Connect terminal HTL to. bank 2 sensor 1.

OK **Voltage: 9 –14 V**

NG

OK → **Check and replace ECM (See page IN–36).**

2 **Check resistance of heated oxygen sensor heater.**



FI0613

P Disconnect heated oxygen sensor connector.

C Measure resistance between terminals 1 and 2 of heated oxygen sensor connector.

OK **Resistance: 11 –16 at 20_2C (68_2F)**

OK

NG → **Replace heated oxygen sensor.**

Check and repair harness or connector between main relay and heated oxygen sensor and ECM.

DTC P0136 Heated Oxygen Sensor Circuit Malfunction (Bank 1 Sensor 2)

CIRCUIT DESCRIPTION

Refer to "Insufficient coolant temp. for closed loop fuel control" on page EG2–473.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P01 36	Voltage output of the heated oxygen sensor (bank 1 sensor 2) remains at 0.4 V or more or 0.5 V or less when the vehicle is driven at 50 km/h (31 mph) or more after the engine is warmed up. (2 trip detection logic)	• Heated oxygen sensor

HINT: Bank 1 refers to the bank that includes cylinder No.1.
Sensor 2 refers to the sensor farther away from the engine body.

DIAGNOSTIC CHART

1	Are there any other codes (besides DTC P01 36) being output?	YES	Go to relevant diagnostic trouble code chart.
NO			
2	Check for open and short in harness and connector between ECM and heated oxygen sensor.	NG	Repair or replace harness or connector.
OK			
3	Check the output voltage of the heated oxygen sensor.	OK	Check that each connector is properly connected.
NG			
Replace heated oxygen sensor.			

WIRING DIAGRAM

Refer to page EG2–482 for the WIRING DIAGRAM.

INSPECTION PROCEDURE

1 Are there any other codes (besides DTC P0136) being output?

NO

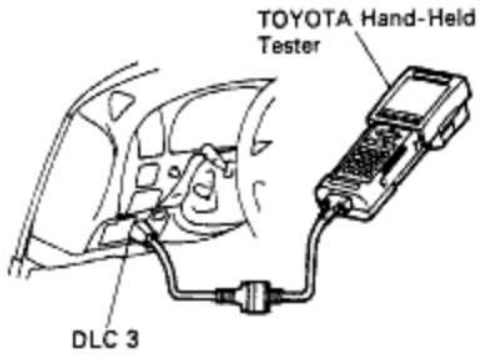
YES → Go to relevant diagnostic trouble code chart.

2 Check for open and short in harness and connector between ECM and heated oxygen sensor (See page IN–31).

OK

NG → Repair or replace harness or connector.

3 Check the output voltage of heated oxygen sensor (bank 1 sensor 2).



FI7088

P (1) Remove the fuse cover on the instrument panel.

(2) Connect the OBDII scan tool or TOYOTA hand–held tester to the DLC 3.

(3) After warming up the engine, race the engine at 2,500 rpm for 3 mins.

C Read the output voltage of heated oxygen sensor (bank 1 sensor 2) when racing the engine after 3 mins. have elapsed.

OK **Heated oxygen sensor output voltage: Alternates from 0.4 V or less to 0,5 V or more.**

NG

OK → Check that each connector is properly connected.

Replace heated oxygen sensor.

DTC P0171 System too Lean (Fuel Trim)
DTC P0172 System too Rich (Fuel Trim)

CIRCUIT DESCRIPTION

”Fuel trim” refers to the feedback compensation value compared against the basic injection time. Fuel trim includes short–term fuel trim and long–term fuel trim.
”Short–term fuel trim” is the short–term fuel compensation used to maintain the air–fuel ratio at its ideal theoretical value. The signal from the heated oxygen sensor indicates whether the air–fuel ratio is RICH or LEAN compared to the ideal theoretical value, triggening a reduction in fuel volume if the air–fuel ratio is rich, and an increase in fuel volume if it is lean.
”Long–term fuel trim” is overall fuel compensation carried out long–term to compensate for continual deviation of the short–term fuel trim from the central value due to individual engine differences, wear over time and changes in the usage environment.
If both the short–term fuel trim and long–term fuel trim are LEAN or RICH beyond a certain value, it is detected as a malfunction and the MIL lights up.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0171	When the air fuel ratio feedback is stable after engine warming up, the fuel trim is considerably in error on the RICH side. (2 trip detection logic)	• Air intake (hose loose) • Fuel line pressure • Injector blockage • Heated oxygen sensor malfunction • Mass air flow meter • Engine coolant temp. sensor
P0172	When the air fuel ratio feedback is stable after engine warming up, the fuel trim is considerably in error on the LEAN side. (2 trip detection logic)	• Fuel line pressure • Injector leak, blockage • Heated oxygen sensor malfunction • Mass air flow meter • Engine coolant temp. sensor

HINT;

- When DTC P0171 is recorded, the actual air–fuel ratio is on the LEAN side. When DTC P0172 is recorded, the actual air–fuel ratio is on the RICH side,
- Fuel trim applies separately to bank 1 and bank 2, so the ECM lights up the MIL if a problem occurs with either bank.
- You can tell which bank is malfunctioning by looking at the short–term fuel trim and long–term fuel trim, thus allowing you to focus your inspection.
- If the total of the short–term fuel trim value and long–term fuel trim value for each bank is within ± 25%, the system is functioning normally.

DIAGNOSTIC CHART

1	Check air induction system.	NG	Repair or replace.
OK			
2	Check heated oxygen sensor data.	NG	Check heated oxygen sensor.
OK			
3	Check fuel pressure.	NG	Check and repair fuel pump, pressure regulator, fuel pipe line and filter.
OK			
4	Check injector injection.	NG	Replace injector.
OK			
5	Check mass air flow meter and engine coolant temp. sensor	NG	Repair or replace.
OK			
6	Check for spark and ignition.	NG	Repair or replace.
OK			
Check and replace ECM.			

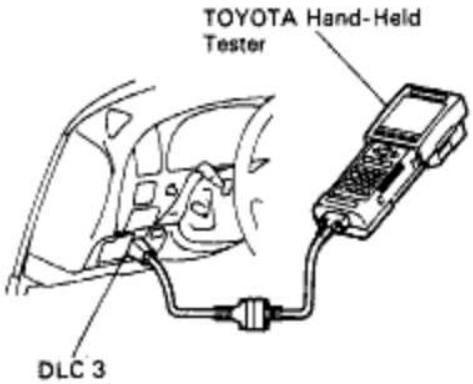
INSPECTION PROCEDURE

1 Check air induction system (See page EG2–221).

OK

NG → Repair or replace.

2 Check for– heated oxygen sensor data.



F17CB8

P (1) Remove the fuse cover on the instrument panel.
(2) Connect the OBDII scan tool or TOYOTA hand–held tester to the DLC 3.
(3) Warm up engine to normal operating temper–ature.

C Read the heated oxygen sensor output voltage and short–term fuel trim.

Hint Read the values for the same bank.

OK

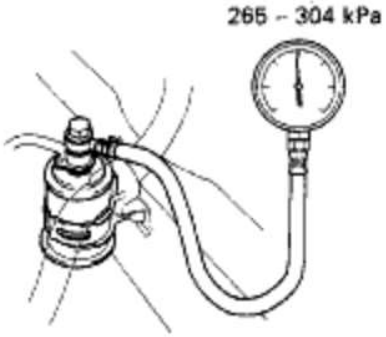
Pattern	Heated oxygen sensor out put voltage	Short–term fuel trim
①	Lean condition Changes at 0.55 V or less	Changes at about + 20%
②	Rich condition Changes at 0.4 V or more	Changes at about – 20%

OK

NG → Check for heated oxygen sensor (See page EG2–476).

3 **Check fuel pressure.**

IG ON



B85663
P00003

P (1) Install the SST (pressure gauge) to the fuel filter output (See page EG2–231).
SST 09268–45012
(2) Turn ignition switch ON.
(3) Connect the TOYOTA hand–held tester to data link connector 3 on the vehicle.
(4) Use ACTIVE TEST mode to operate the fuel pump.

Hint Connecting terminals B and FP of data link con–nector 1 allows the fuel pump to be operated.

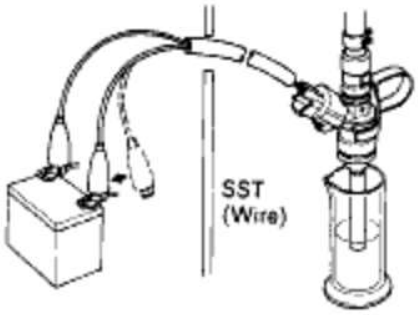
C Measure the fuel pressure

OK **Fuel pressure: 265 – 304 kPa (2.7 – 3.1 kg f/cm^2, 38 – 44 psi)**

OK

NG **Check and repair fuel pump, pressure regulator, fuel pipe line and filter. (See page EG2–230).**

4 **Check injector injection.**



P01077
P01010

P Remove the delivery pipe and injectors from the bank that has the malfunction (See page EG2–246).

C Check injection volume of injector (See page EG2–250).

OK **Injection volume:**
56 – 69 cm^3/15 sec. (3.4 – 4.2 cu in.)
Difference between each injector:
Less than 6 cm^3 (0.4 cu in.)
Fuel drop (leakage):
One drop or less per minute.

OK

NG **Replace injector.**

5	Check mass air flow meter– and engine coolant temp. sensor (See page EG2–444, 457).

OK → NG → Repair or replace.

6	Check for spark and ignition (See page IG–84).

OK → NG → Repair or replace.

Check and replace ECM (See page IN–36).

DTC P0201 P0202 P0203 P0204 P0205 P0206 Injector Circuit Malfunction (Cylinder 1–6)

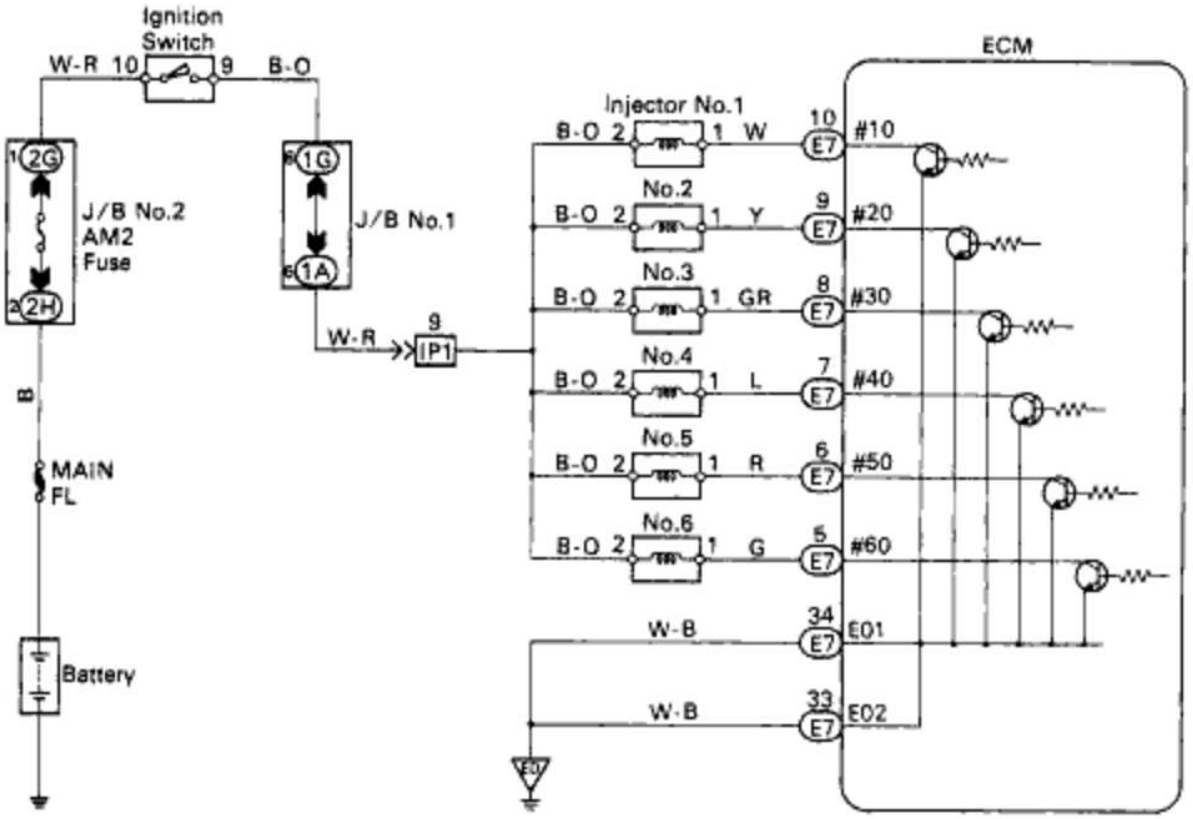
CIRCUIT DESCRIPTION

The injectors are located in the intake manifold. They inject fuel into the cylinders based on signals from the ECM.
The ECM detects a malfunction of the injector circuit by counting the number of misfires of a specific cylinder.
For an explanation of misfire detection requirements, see page DTC P0301.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0201 **P0202** **P0203** **P0204** **P0205** **P0206**	A specified cylinder misfire continuously. (2 trip detection logic)	• Open or short in injector circuit • Injector blockage, seized • Ignition system • Valve clearance not to specification • Compression pressure

See the Diagnostic Chart and Inspection Procedure under ”Misfiring”.

WIRING DIAGRAM



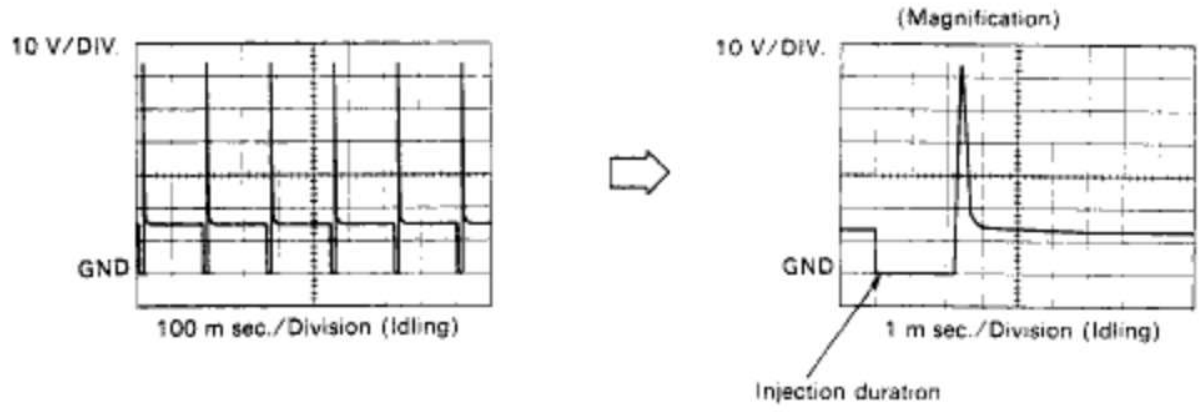
FI6833

Reference INSPECTION USING OSCILLOSCOPE

INJECTOR SIGNAL WAVEFORM

- With the engine idling, measure between terminals #10 – #60 and E01 of ECM.

HINT: The correct waveform appears as shown in the illustration below.



FI6838 FI6839

DTC P0300 Random Misfire Detected

DTC P0301 P0302 P0303 P0304 P0305 P0306 Misfire Detected (Cylinder 1–6)

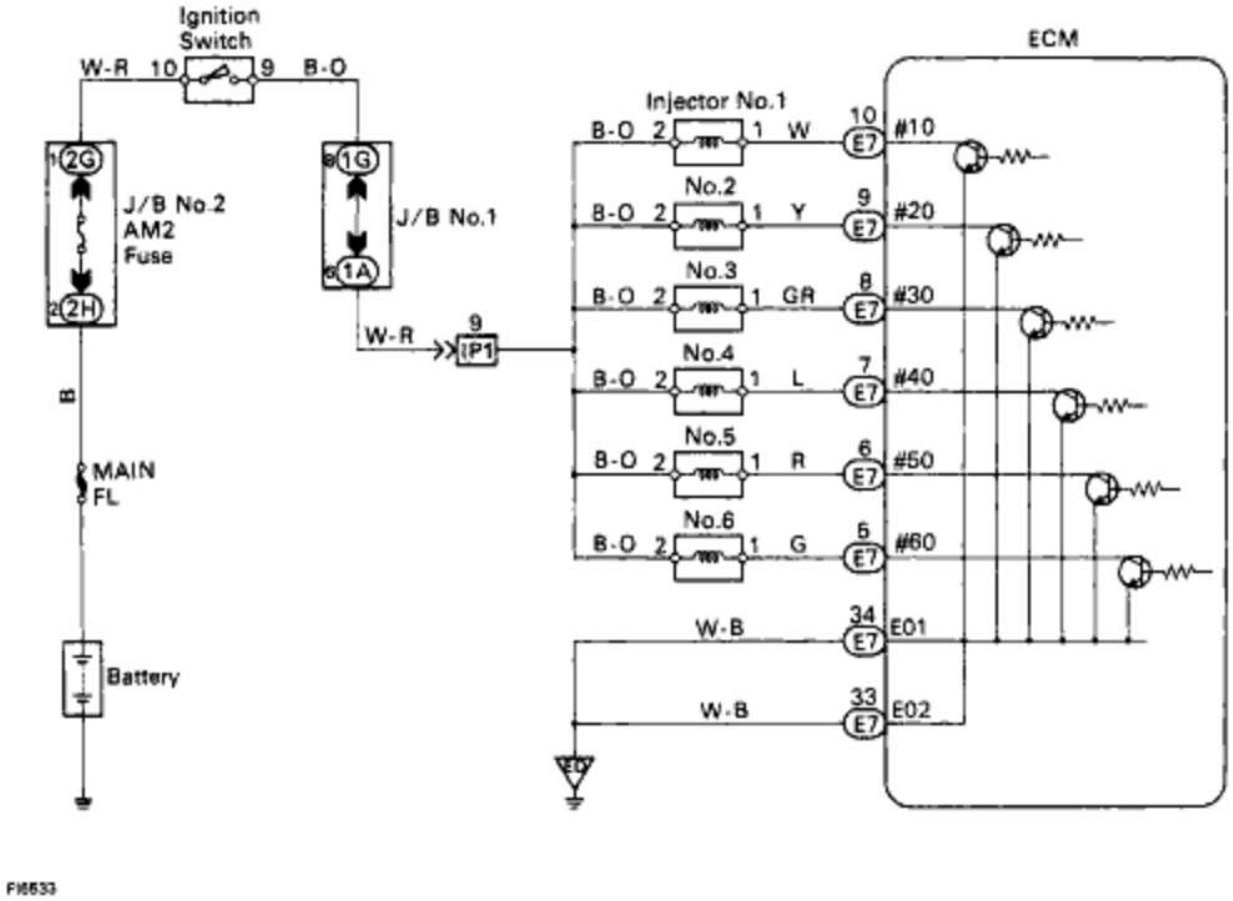
CIRCUIT DESCRIPTION

Misfire: The ECM uses the crankshaft position sensor and camshaft position sensor to monitor changes in the crankshaft rotation for each cylinder.
The ECM counts the number of times the engine speed change rate indicates that misfire has occurred. And when the misfire rate equals or exceeds the count indicating that the engine condition has deteriorated, the MIL lights up.
If the misfire rate is high enough and the driving conditions will cause catalyst overheating, the MIL blinks when misfiring occurs.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0300	Misfiring of multiple cylinders is detected during the same 200 or 1,000 revolutions.	• Ignition system • Injector • Fuel line pressure • EG R • Compression pressure • Valve clearance not to specification • Valve timing • Mass air flow meter • Engine coolant temp. sensor
P0301 **P0302** **P0303**	For each 200 revolutions of the engine, misfiring is detected which can cause catalyst overheating. (This causes MIL to blink)	
P0304 **P0305** **P0306**	For each 1,000 revolutions of the engine, misfiring is detected which causes emissions deterioration. (2 trip detection logic)	

HINT; When the code for a misfiring cylinder is recorded repeatedly but no Random Misfire code is recorded, it indicates that the misfires were detected and recorded at different times.

WIRING DIAGRAM



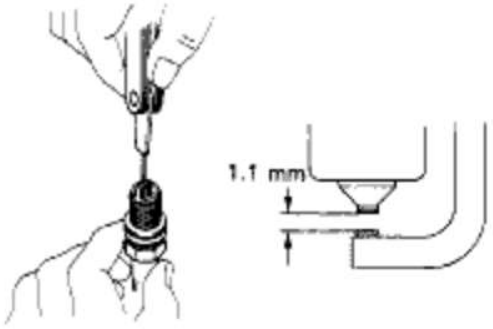
FI6533

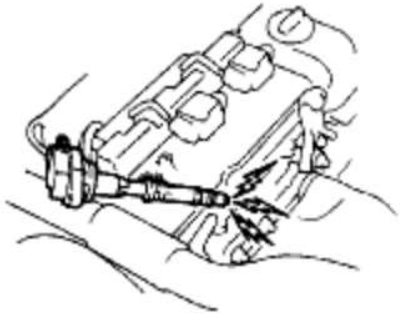
DIAGNOSTIC CHART

1	Check spark plug and spark of misfiring cylinder.	NG	Replace or check ignition system.
OK			
2	Check voltage of ECM terminal for injector of failed cylinder.	OK	Go to step 4
NG			
3	Check injector of misfiring cylinder.	NG	Replace injector.
OK			
Check for open and short in harness and connector between injector and ECM.			
4	Check fuel pressure.	NG	Repair or replace fuel pump.
OK			
5	Check injector injection.	NG	Replace injector.
OK			
6	Check EGR system.	NG	Repair EGR system.
OK			
7	Check mass air flow meter and engine coolant temp. sensor.	NG	Repair or replace.
OK			
Check engine mechanical systems.			

INSPECTION PROCEDURE

1 **Check spark plug and spark of misfiring cylinder.**





IG0317 IG0151
F17084

P (1) Remove ignition coil (See page IG–87).
(2) Remove spark plug.

C (1) Check the carbon deposits on electrode.
(2) Check electrode gap.

OK **(1) No large carbon deposit present.
Not wet with gasoline or oil.**
**(2) Electrode gap: 1.1 – 1.3 mm
(0.043 – 0.051 in.)**

P (1) Install the spark plug to the ignition coil, and connect the ignition coil connector.
(2) Ground the spark plug.
(3) Disconnect injector connector.

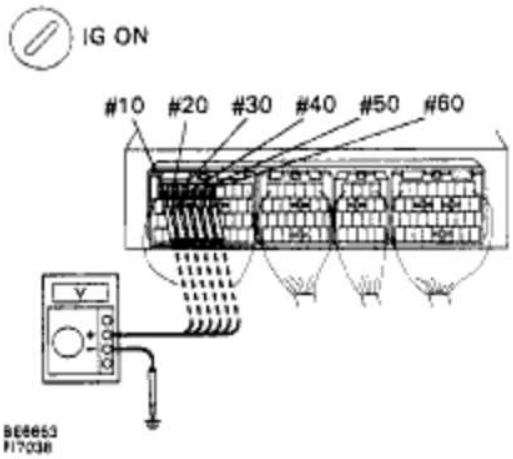
C Check if spark occurs while engine is being cranked.
NOTICE: To prevent excess fuel being injected from the injectors during this test, don't crank the engine for more than 5–10 seconds at a time.

OK **Spark jumps across electrode gap.**

OK

NG → **Replace or check ignition system (See page IG–84).**

2 **Check voltage of ECM terminal for injector of failed cylinder.**



BE6853
F17038

P (1) Remove glove compartment (See page EG2–309) .
(2) Turn ignition switch ON.

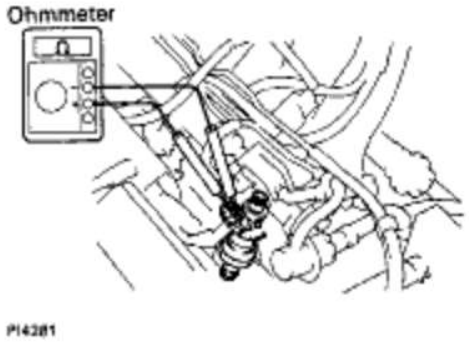
C Measure voltage between applicable terminal of ECM and body ground.

OK **Voltage: 9 – 14 V**

NG

OK → Go to step 4

3 **Check injector of misfiring cylinder.**



P Disconnect injector connector (See page EG2–243).

C Measure resistance of injector.

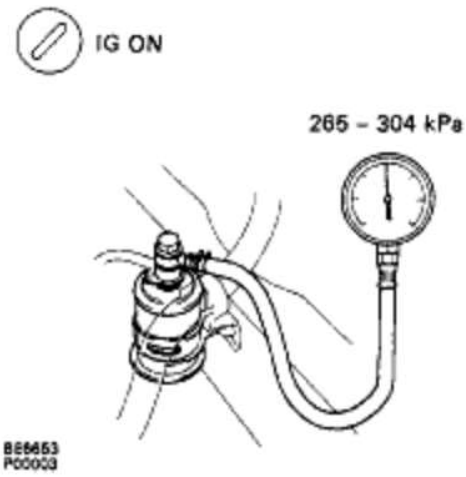
OK **Resistance: 5 – 23 Ω at 20₂C (68₂F)**

OK

NG **Replace injector.**

Check for open and short in harness and connector between injector and ECM (See page IN–31).

4 **Check fuel pressure.**



P (1) Install the SST (pressure gauge) to the fuel filter outlet. (See page EG2–231).
SST 09268–45012
(2) Turn ignition switch ON.
(3) Connect the TOYOTA hand–held tester to the DLC3.
(4) Use ACTIVE TEST mode to operate the fuel pump.
HINT: The fuel pump can be operated by connecting terminals B and FP of data link connector 1.

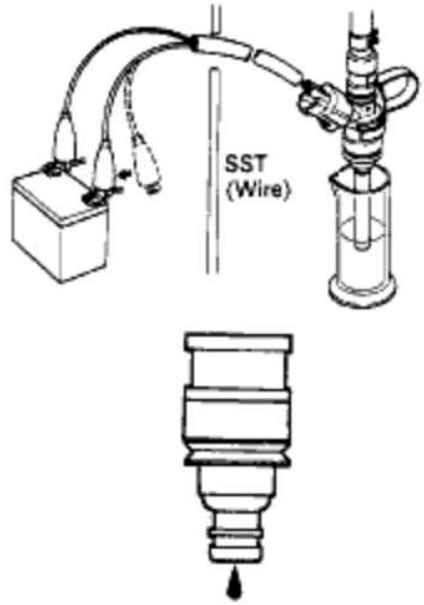
C Measure the fuel pressure.

OK **Fuel pressure: 265 – 304 kPa (2.7 – 3.1 kgf/cm², 38 – 44 psi)**

OK

NG **Check and repair fuel pump, pressure regulator, fuel pipe line and filter (See page EG2–230).**

5 Check injector injection.



P01077
P01010

P Remove delivery pipe and injectors (See page EG2–246) .

C Check injection volume of injector (See page EG2–250) .

OK **Injection volume:**
56 – 69 cm³/15 sec. (3.4 – 4.2 cu in.)
Difference between each injector:
Less than 6 cm³ (0.4 cu in.)
Fuel drop (leakage):
One drop or less per minute.

OK → **6** Check EGR system (See page EG2–207).

NG → Replace injector.

OK → **7** Check mass air flow meter and engine coolant temp. sensor (See page EG2–444, 457).

NG → Repair EGR system.

OK → Check engine mechanical systems.
- Compression pressure (See page EG2–36).
- Valve clearance (See page EG2–13).
- Valve timing (See page EG2–52).

NG → Repair or replace.

DTC P0325 P0330 Knock Sensor Circuit Malfunction (Knock Sensor 1 Knock Sensor 2)

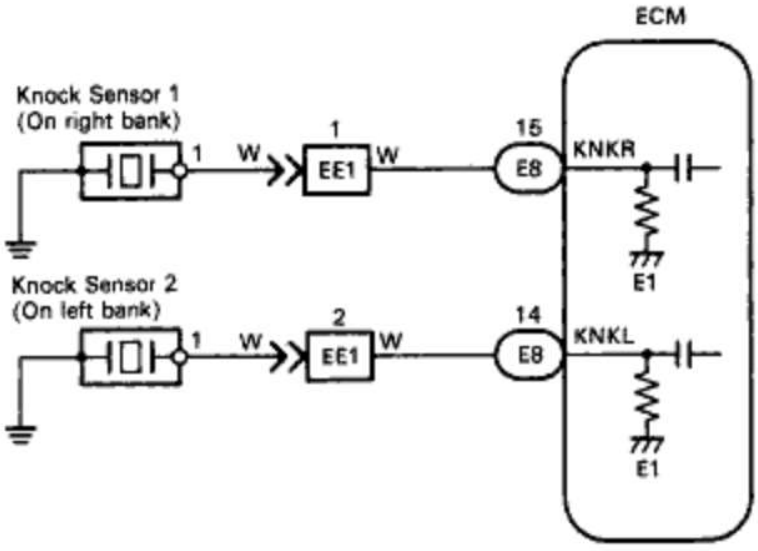
CIRCUIT DESCRIPTION

Knock sensors are fitted one each to the right bank and left bank of the cylinder block to detect engine knocking. This sensor contains a piezoelectric element which generates a voltage when it becomes deformed, which occurs when the cylinder block vibrates due to knocking. If engine knocking occurs, ignition timing is retarded to suppress it.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0325	No knock sensor 1 signal to ECM with engine speed 2,000 rpm or more.	• Open or short in knock sensor 1 circuit. • Knock sensor 1 (looseness). • ECM
P0330	No knock sensor 2 signal to ECM with engine speed 2,000 rpm or more.	• Open or short in knock sensor 2 circuit. • Knock sensor 2 (looseness). • ECM

If the ECM detects the above diagnosis conditions, it operates the fail safe function in which the corrective retard angle value is set to the maximum value.

WIRING DIAGRAM



FI9610

DIAGNOSTIC CHART

HINT: DTC P0325 is for the right bank knock sensor circuit.
DTC P0330 is for the left bank knock sensor circuit.

1	Check knock sensor circuit.	Type II	G o to step 3

Type I

2	Check for open and short in harness and connector between EE1 connector and ECM.	NG	Repair or replace harness or connector.

OK

Check and replace ECM.

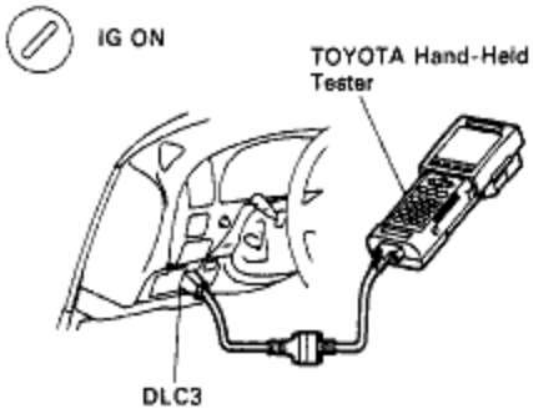
3	Check for open and short in harness and connector between EE1 connector and knock sensor.	NG	Repair or replace harness or connector.

OK

Replace knock sensor.

INSPECTION PROCEDURE

1 **Connect the OBDII scan tool or TOYOTA hand–held tester and check the knock sensor circuit.**



P (1) Remove the fuse cover on the instrument panel.

(2) Connect the OBDII scan tool or TOYOTA hand–held tester to the DLC 3.

(3) Disconnect the wire to wire connector EE1.

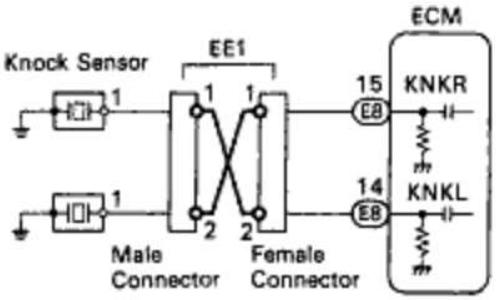
(4) Connect the terminals of the disconnected EE1 male connector and EE1 female as follows.

Male connector ↔ Female connector
Terminal 1↔ Terminal 2
Terminal 2↔ Terminal 1

(5) Turn ignition switch ON and OBDII scan tool or TOYOTA hand–held tester main switch ON.

(6) After the engine is warmed up, perform quick racing (4,000 rpm) three times.

C Check the diagnostic trouble code.



Type I	DTC same as when vehicle brought in. P0325→ P0325 or P0330→ P0330
Type II	DTC different to when vehicle brought in. P0325→ P0330 or P0330→ P0325

Type I

Type II → Go to step 3.

2 **Check for open and short in harness and connector between EE1 connector and ECM (See page IN–31).**

OK

NG → **Repair or replace harness or connector.**

Check and replace ECM (See page IN–36).

3	Check for open and short in harness and connector between EE1 connector and knock sensor (See page IN–31).

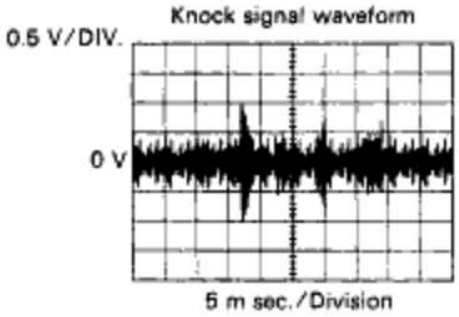
HINT: If DTC P0325 has changed to P0330, check the knock sensor circuit on the right bank side.
If DTC P0330 has changed to P0325, check the knock sensor circuit on the left bank side.

OK

NG → Repair or replace harness or connector.

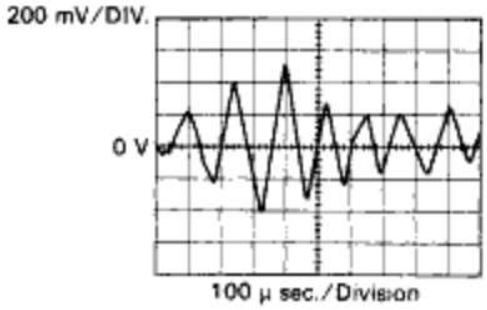
Replace knock sensor.

Reference **INSPECTION USING OSCILLOSCOPE**



- With the engine racing (4,000 rpm) measure between terminals KNKR, KNKL of ECM and body ground.

HINT: The correct waveform appears as shown i n the illustration on the left.



- Spread the time on the horizontal axis, and confirm that period of the wave is 141 ∝ sec.
  (Normal mode vibration frequency of knock sensor: 7.1 KHz).

HINT: If normal mode vibration frequency is not 7.1 KHz, the sensor is malfunctioning.

F16510
F16507

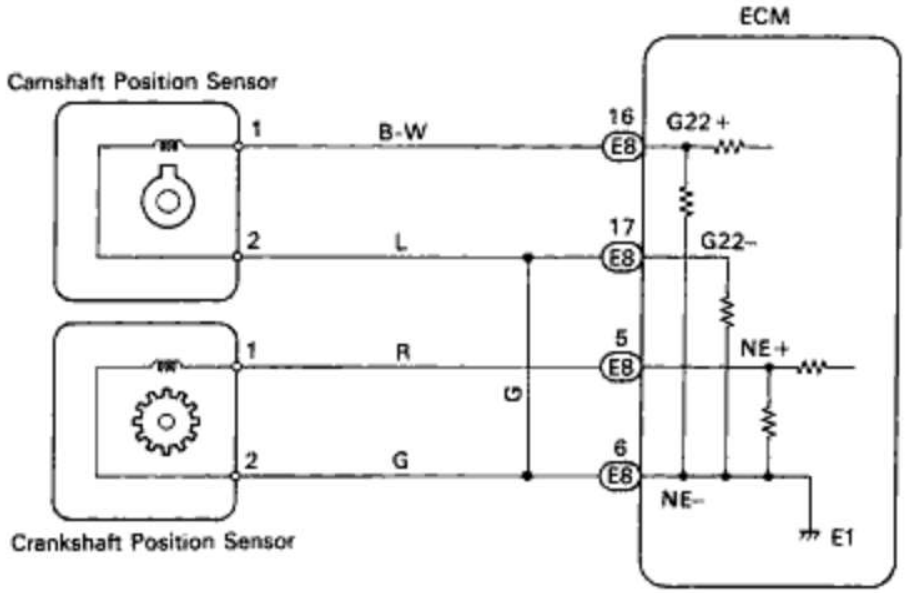
DTC P0335 Crankshaft Position Sensor Circuit Malfunction

CIRCUIT DESCRIPTION

Crankshaft position sensor (NE signal) consist of a signal plate and pick up coil.
The NE signal plate has 34 teeth and is mounted on the crankshaft. The NE signal sensor generates 34 signals for every engine revolution. The ECM detects the standard crankshaft angle based on the G22 signals, and the actual crankshaft angle and the engine speed by the NE signals.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P4335	No crankshaft position sensor signal to ECM during cranking. (2 trip detection logic)	• Open or short in crankshaft position sensor circuit. • Crankshaft position sensor. • Starter • ECM
	No crankshaft position sensor signal to ECM during engine running.	

WIRING DIAGRAM



FI7016

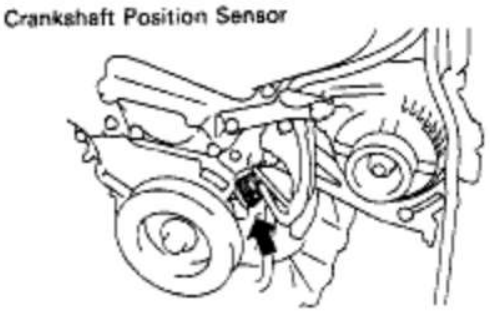
DIAGNOSTIC CHART

HINT: Perform troubleshooting of diagnostic trouble code P0335 first, If no trouble is found, trou–bleshoot the following mechanical systems.

1	Check resistance of crankshaft position sensor.	NG	Replace sensor.
OK			
2	Check for open and short in harness and connector between ECM and crankshaft position sensor.	NG	Repair or replace harness or connector.
OK			
3	Inspect sensor installation and teeth of signal plate.	NG	Tighten the sensor. Replace signal plate.
OK			
Check and replace ECM.			

INSPECTION PROCEDURE

1 **Check resistance of crankshaft position sensor.**



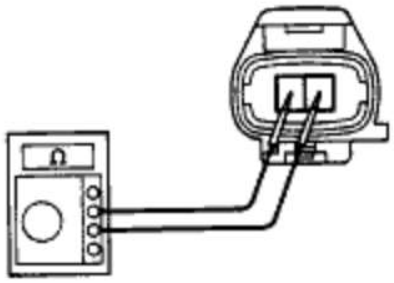
P Disconnect crankshaft position sensor connector.

C Measure resistance of crankshaft position sensor.

OK

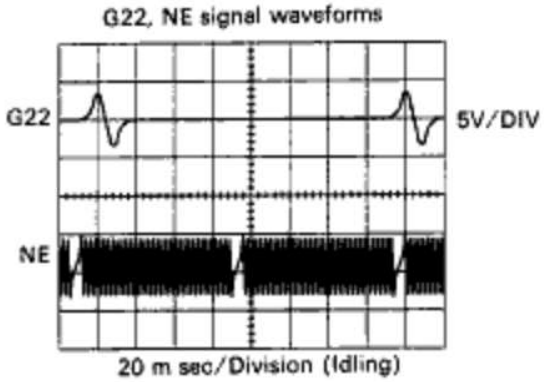
	Resistance
Cold	1,630 – 2,740 Ω
Hot	2,065 – 3,225 Ω

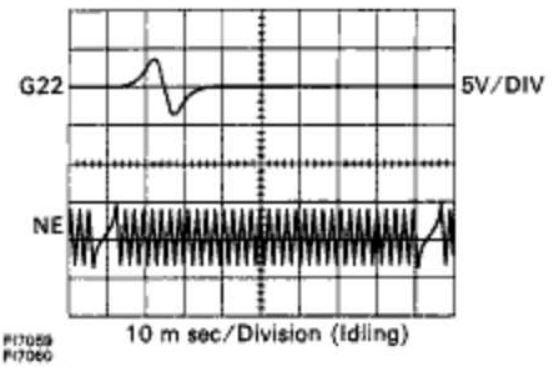
"Cold" is from -10_2C (14_2 F) to 50_2C (122_2 F) and "Hot" is from 50_2C (122_2F) to 1 00_2C (212_2F).



FI7067
FI7066

Reference INSPECTION USING OSCILLOSCOPE





FI7059
FI7060

- During cranking or idling, check between terminals G22(+) and G22 (–) , NE(+) and NE (–) of engine control module.

HINT: The correct waveforms appear as shown in the illustration on the left.

OK

NG **Replace crankshaft position sensor.**

2	Check for open and short in harness and connector between ECM and crankshaft position sensor (See page IN–31).

OK → NG: Repair or replace harness or connector.

3	Inspect sensor installation and teeth of signal plate.

OK → NG: Tighten the sensor. Replace signal plate.

Check and replace ECM (See page IN–36).

DTC P0336 Crankshaft Position Sensor Circuit Range Performance

CIRCUIT DESCRIPTION

Refer to crankshaft position sensor circuit malfunction on page EG2–503.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0336	Deviation in crankshaft position sensor signal and camshaft position sensor signal. (2 trip detection logic)	• Mechanical system malfunction. (Skipping teeth of timing belt, belt stretched.) • ECM

DIAGNOSTIC CHART

1	Check valve timing (Check for loose and jumping teeth of timing belt) (See page EG2–52).	NG	Adjust valve timing. (Repair or replace timing belt.)

OK

Check and replace ECM (See page IN–36).

DTC P0340 Camshaft Position Sensor Circuit Malfunction

CIRCUIT DESCRIPTION

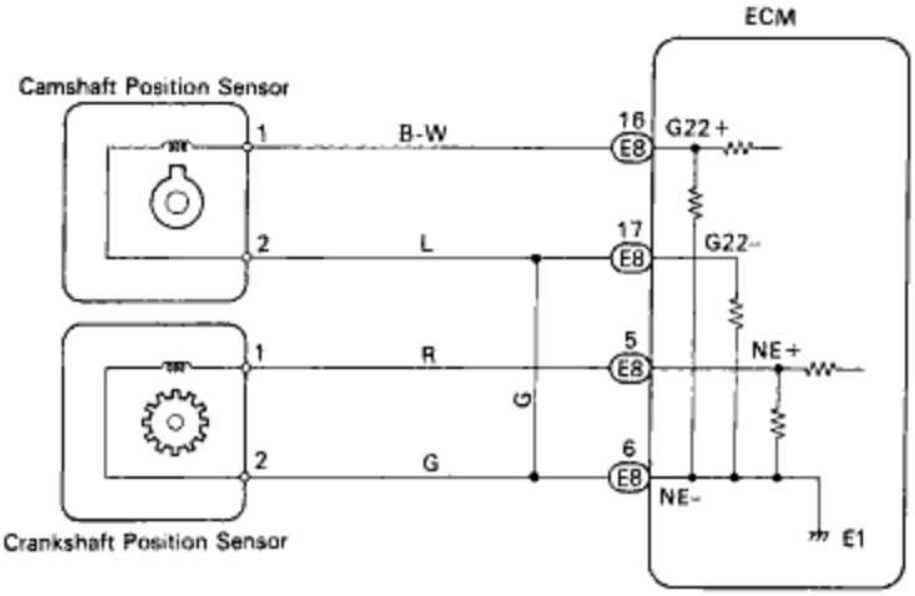
Camshaft position sensor (G22 signal) consist of a signal plate and pick up coil.
The G22 signal plate has one tooth, on its outer circumference and is mounted on the left bank camshafts. When the camshafts rotate, the protrusion on the signal plate and the air gap on the pick up coil change, causing fluctuations in the magnetic field and generating an electromotive force in the pick up coil.
The NE signal plate has 34 teeth and is mounted on the crankshaft. The NE signal sensor generates 34 signals for every engine revolution. The ECM detects the standard crankshaft angle based on the G22 signal and the actual crankshaft angle and the engine speed by the NE signals.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0340	No camshaft position sensor signal to ECM during cranking. (2 trip detection logic)	• Open or short in camshaft position sensor circuit. • Camshaft position sensor. • Starter. • ECM
	No camshaft position sensor signal to ECM during engine running.	

DIAGNOSTIC CHART

1	Check resistance of camshaft position sensor.	NG	Replace sensor.
OK			
2	Check for open and short in harness and connector between ECM and camshaft position sensor.	NG	Repair or replace harness or connector.
OK			
3	Inspect sensor installation.	NG	Tighten the sensor.
OK			
Check and replace ECM.			

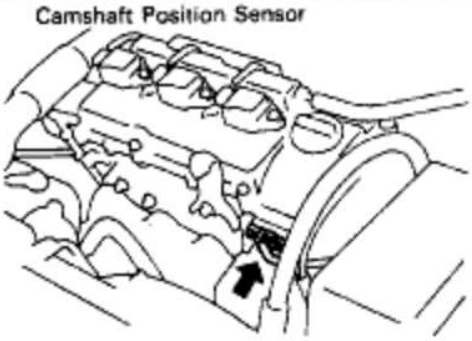
WIRING DIAGRAM

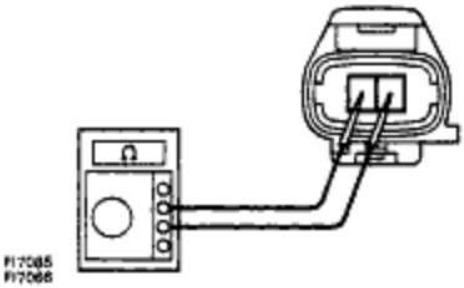


FI7016

INSPECTION PROCEDURE

1	Check resistance of camshaft position sensor.





P Disconnect camshaft position sensor connector.

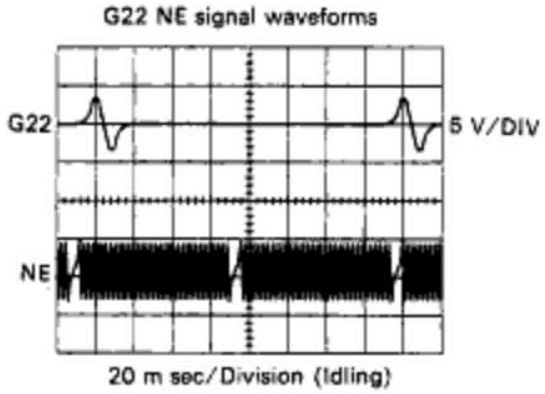
C Measure resistance of camshaft position sensor.

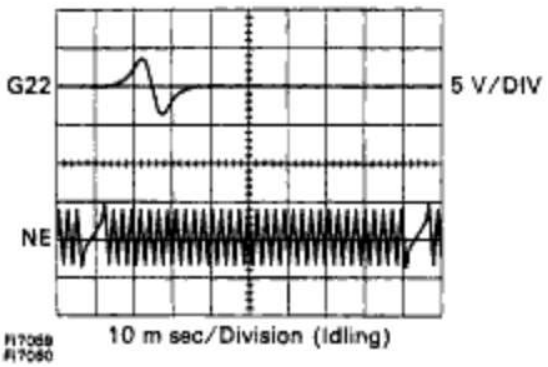
OK

	Resistance
Cold	835 – 1,400Ω
Hot	1,060 – 1,645Ω

"Cold is form -10_2C (140_2F) to 50_2C (122_2F) and "Hot" is form 50_2C (122_2 F) to 100_2C (212_2F).

Reference INSPECTION USING OSCILLOSCOPE





- During cranking or idling, check between terminals G 22(+) and G22(–), NE(+) and NE (–) of engine control module.

HINT: The correct waveforms appear as shown in the illustration on the left.

OK

NG Replace camshaft position sensor.

2	Check for open and short in harness and connector between ECM and camshaft position sensor (See page IN–31).

OK → Repair or replace harness or connector. (NG)

3	Inspect sensor installation.

OK → Check and replace ECM (See page IN–36).

NG → Tighten the sensor.

DTC P0401 Exhaust Gas Recirculation Flow Insufficient Detected

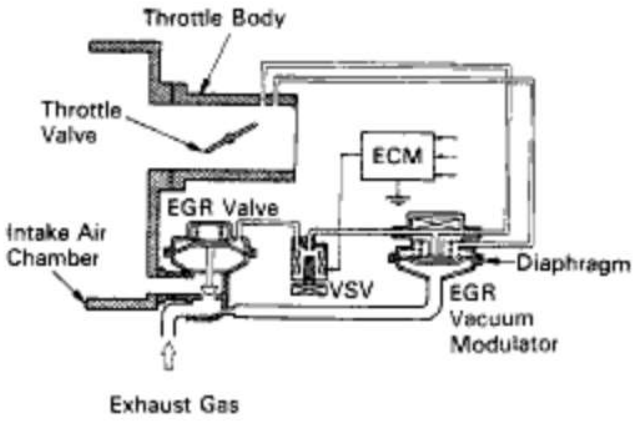
CIRCUIT DESCRIPTION

The EGR system recirculates exhaust gas, which is controlled to the proper quantity to suit the driving conditions, into the intake air mixture to slow down combustion, reduce the combustion temperature and reduce NOx emissions. The amount of EGR is regulated by the EGR vacuum modulator according to the engine load.

If even one of the following conditions is fulfilled, the VSV is turned ON by a signal from the ECM. This results in atmospheric air acting on the EGR valve, closing the EGR valve and shutting off the exhaust gas (EGR cut–off).

Under the following conditions, EGR is cut to maintain driveability.

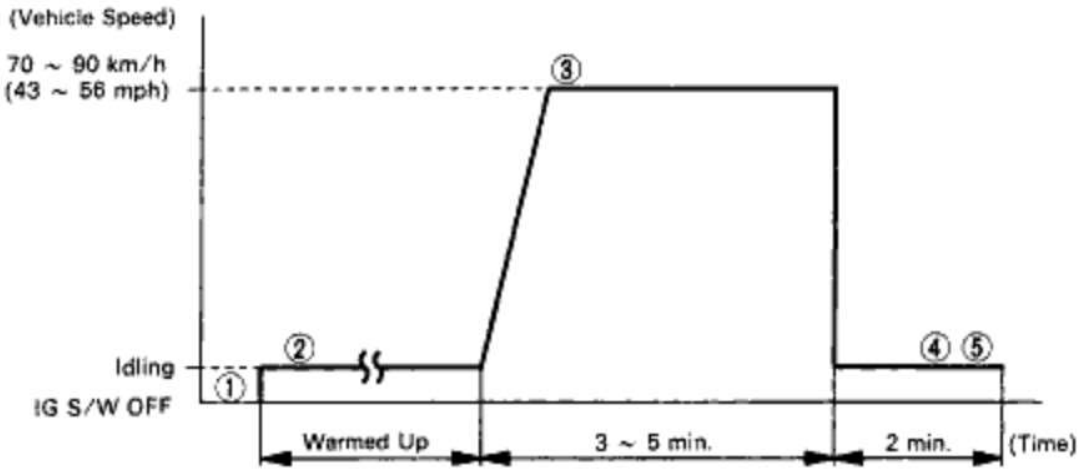
- Coolant temp. below 60_2C (140_2F).
- During deceleration (throttle valve closed).
- Light engine load (amount of intake air very small).
- Engine racing.



714825

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0401	After the engine is warmed up and run at 80 km/h (50 mph) for 3 to 5 minutes, the EGR gas temperature sensor value does not exceed 40_2C (104_2F) above the ambient air temperature. (2 trip detection logic)	• EGR valve stuck closed. • Short in EGR VSV circuit. • Open in EGR gas temp. sensor circuit. • EGR hose disconnected. • ECM

SYSTEM CHECK DRIVING PATTERN



① Connect the OBDII scan tool or TOYOTA hand–held tester to the DLC 3.

② Start and warm up the engine with all accessories switched OFF.

③ After the engine is warmed up, run the vehicle at 70 – 90 km/h (43 – 56 mph) for 3 min, or more.

④ After driving, idle the engine for about 2 mins.

⑤ After idling, check the ”READINESS TESTS”. If ”COMPL” (test completed) is displayed and the MIL does not light up, the system is normal. If ”INCPL” is displayed, run the vehicle again and check it.
HINT: If a malfunction exists, the MIL will light up during step (4).

DIAGNOSTIC CHART
TOYOTA hand–held tester

1	Connect the TOYOTA hand–held tester and read value of EGR gas temperature.	OK	Go to step 4

NG

2	Check for open in harness or ECM.	OK	Confirm good connection at sensor. If OK, replace EGR gas temp. sensor.

NG

3	Check for open in harness or ECM.	OK	Open in harness between terminals E2 or THG. Repair or replace harness.

NG

Confirm connection at ECM, If OK, replace ECM.

4	Check connection of vacuum hose, EGR hose.	NG	Repair or replace.

OK

5	Check the VSV for EG R,	OK	Go to step 7

NG

6	Check operation of the VSV for EG R.	NG	Replace VSV for EG R.

OK

Check for short in harness and connector between VSV and ECM.

7	Check EGR Vacuum modulator.	NG	Repair or replace.
OK			
8	Check EGR Valve.	NG	Repair or replace.
OK			
9	Check value of EGR gas temp. sensor.	NG	Replace EGR gas temp. sensor.
OK			
Check and replace ECM.			

OBD II scan tool (excluding TOYOTA hand–held tester)

1	Check resistance of EGR gas temp. sensor.	NG	Check and replace EGR gas temp. sensor.

OK

2	Check for open in harness or ECM.	OK	Go to step 4

NG

3	Check for open in harness or ECM.	OK	Open in harness between terminals E2 or THG. Repair or replace harness.

NG

Confirm connection at ECM. If OK, replace ECM.

4	Check connection of vacuum hose, EGR hose.	NG	Repair or replace.

OK

5	Check the VSV for EG R.	OK	Go to step 7

NG

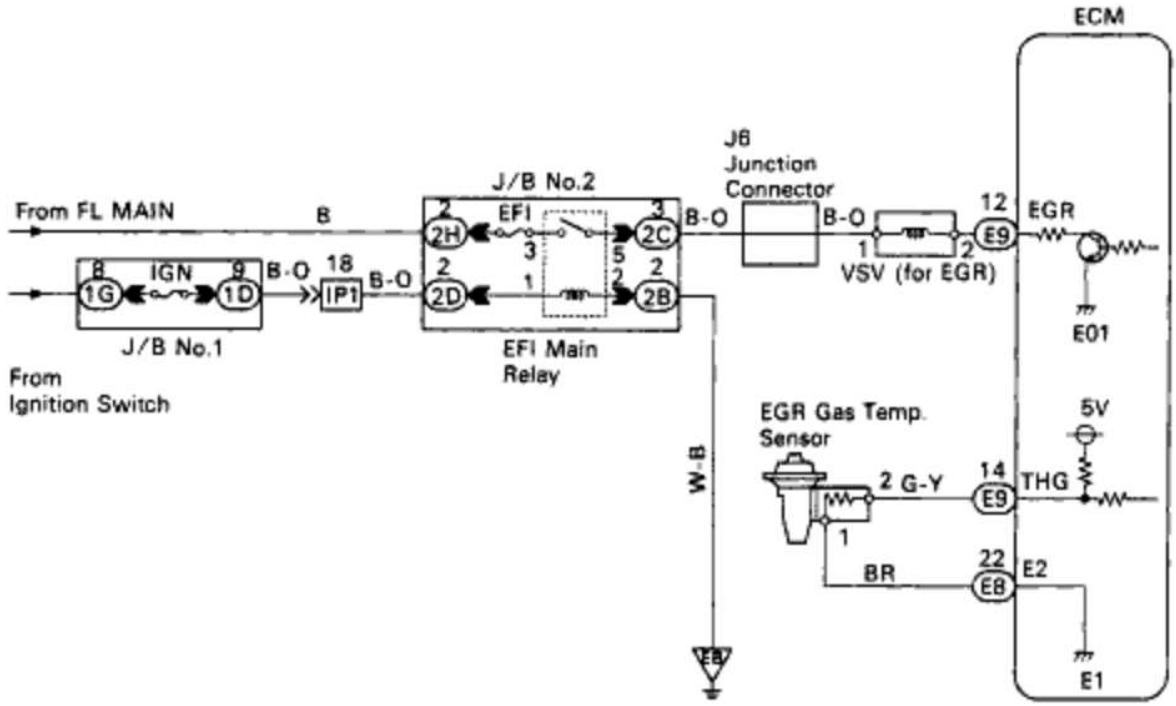
6	Check operation of the VSV for EG R.	NG	Replace VSV for EG R.

OK

Check for open in harness and connector between J/B No,2 and ECM.

7	Check EGR vacuum modulator.	NG	Repair or replace.
OK			
8	Check EGR valve.	NG	Repair or replace.
OK			
9	Check resistance of EGR gas temp. sensor.	NG	Replace EGR gas temp. sensor.
OK			
Check and replace ECM.			

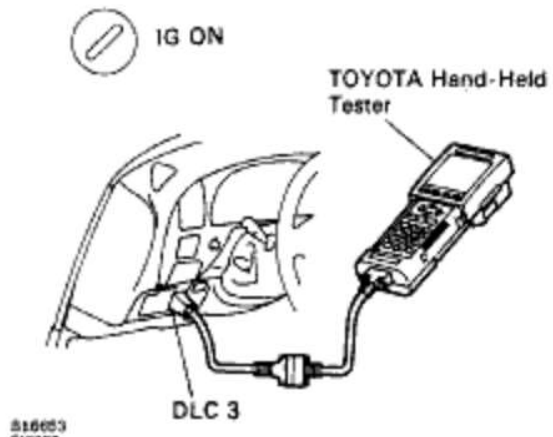
WIRING DIAGRAM



FI7020

INSPECTION PROCEDURE
TOYOTA hand–held tester

1 **Connect the TOYOTA hand–held tester and read value of EGR gas temperature value.**



P (1) Remove the fuse cover on the instrument panel.
(2) Connect the TOYOTA hand–held tester to the D LC 3.
(3) Turn ignition switch ON and TOYOTA hand–held tester main switch ON.

C Read EGR gas temperature on the TOYOTA hand–held tester.

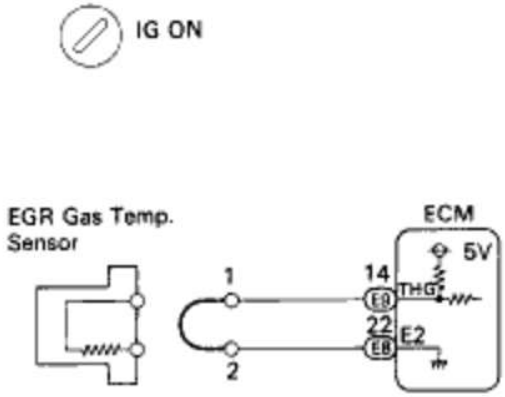
OK **EGR gas temp.: 10_2C (50_2F) or more.**

Hint If there is an open circuit, the TOYOTA hand–held tester indicates 3.1 $_2$C (37.6$_2$F).

NG

OK → **Go to step 4**

2 **Check for open in harness or ECM.**



P (1) Disconnect the EGR gas temp. sensor connector.
(2) Connect sensor wire harness terminals together.
(3) Turn ignition switch ON.

C Read EGR gas temperature on the TOYOTA hand–held tester.

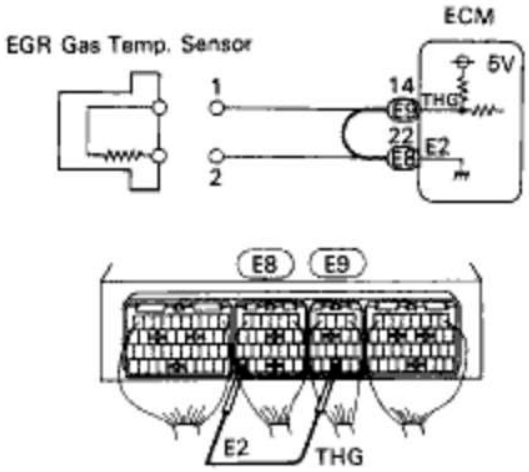
OK **EGR gas temp.: 159.3$_2$C (318.7$_2$F)**

NG

OK → **Confirm good connection at sensor.**
If OK, replace EGR gas temp. sensor.

3 **Check for open in harness or ECM.**

IG ON



B66663
FI7057
FI7104

P (1) Remove glove compartment (See page EG2–309).
(2) Connect between terminals THG and E2 of ECM E8 and E9 connectors.
HINT: EGR gas temp. sensor connector is disconnected.
Before checking, do a visual check and contact pressure check for the ECM connector (See page EG2–418).

C Read EGR temperature on the TOYOTA hand–held tester.

OK **EGR gas temp.: 159.3$_2$C (318.7$_2$F)**

NG

OK → **Open in harness between terminals E2 or THG. Repair or replace harness.**

Confirm connection at ECM.
If OK, replace ECM.

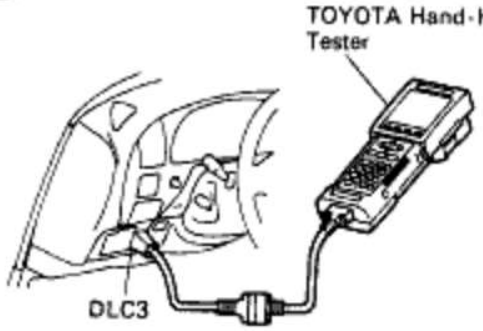
4 **Check the connection of the vacuum hose, EGR hose (See page EG2–287).**

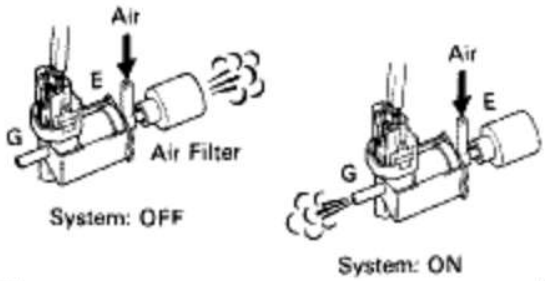
OK

NG → **Repair or replace.**

5 **Check the VSV for EGR.**

IG ON





BE6653
FI7088
FI7076
FI7075

P Select the active test mode on the TOYOTA hand–held tester.

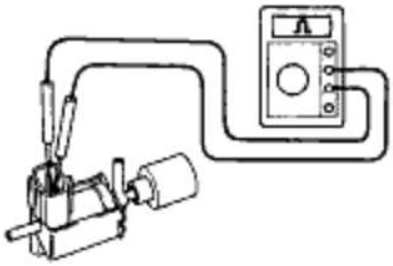
C Check operation of EGR VSV, when it is operated by the TOYOTA hand–held tester.

OK **EGR system is OFF:**
The air from pipe E is flowing out through the air fitter.
EGR system is ON:
The air from pipe E is flowing out pipe G.

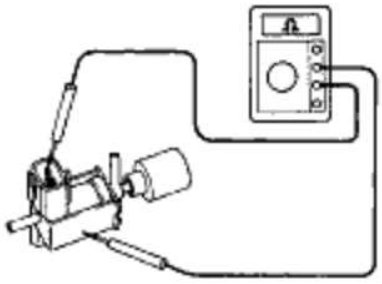
NG

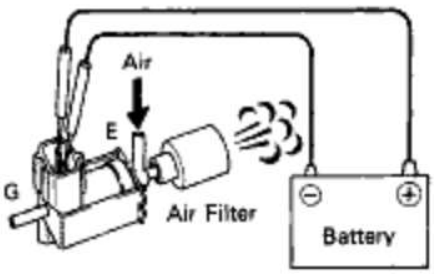
OK → Go to step 7

6 **Check operation of the VSV for EGR.**

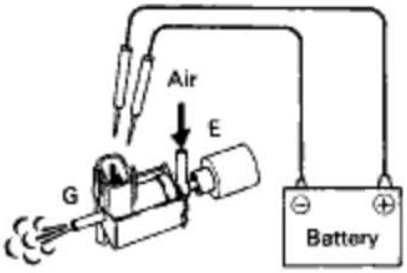


P (1) Remove EGR VSV.
(2) Disconnect EGR VSV connector.
C (1) Measure resistance between terminals.
(2) Measure resistance between each terminal and the body.
OK **(1) Resistance: 26 – 46 at 20$_2$C (68$_2$F)**
(2) Resistance: 1 M or higher.





C Check operation of EGR VSV when battery voltage is applied, and is not applied to the terminals of EGR VSV connector.
OK **Battery voltage is applied:**
The air from pipe E flows out through the air filter.
Battery voltage is not applied:
The air from pipe E flows out through pipe G.



EC2939
EC2940
EC2941
EC2942

OK

NG **Replace VSV for EGR.**

Check for short in harness and connector between VSV and ECM (See page IN–31).

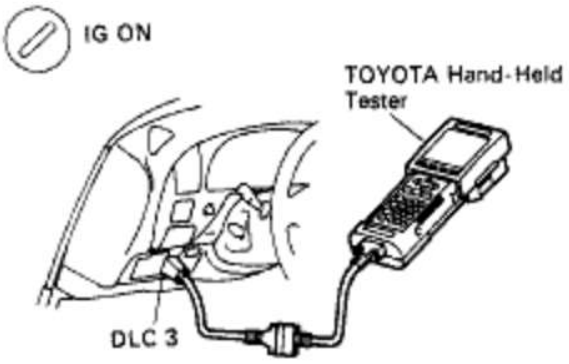
7 Check EGR vacuum modulator (See page EG2–210).

OK → NG: Repair or replace.

8 Check EGR valve (See page EG2–211).

OK → NG: Repair or replace.

9 Check value of EGR gas temp. sensor.



BE6653
F17088

P (1) Connect the TOYOTA hand–held tester to the DLC3.
(2) Turn ignition switch ON and TOYOTA hand–held tester main switch ON'
(3) Select the active test mode on the TOYOTA hand–held tester.
(EGR system ON)
(4) Race the engine at 4,000 rpm for 3 mins.

C Measure the EGR gas temp. while racing engine at 4,000 rpm.

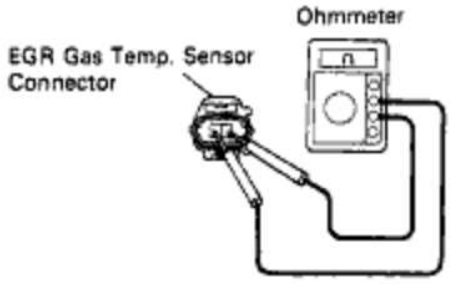
OK **EGR gas temp. after 3 mins.: 140_2C (284_2F) or more**

OK → NG: Replace EGR gas temp. sensor.

Check and replace ECM (See page IN–36).

OBDII scan tool (excluding TOYOTA hand–held tester)

1 **Check resistance of EGR gas temp. sensor.**



P Disconnect EGR gas temp. sensor connector.

C Measure resistance between terminals of EGR gas temp. sensor connector.

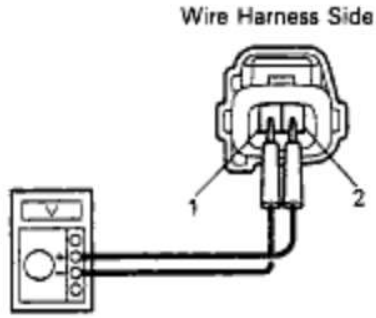
OK **Resistance: 600 k or less.**

Hint If there is open circuit, ohmmeter indicates 720 kΩ or more.

OK

NG → **Check and replace EGR gas temp. sensor (See page EG2–303).**

2 **Check for open in harness or ECM.**



P Disconnect EGR gas temp. sensor connector.

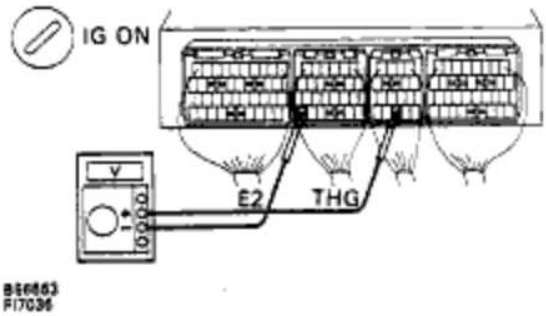
C Measure voltage between terminals of EGR gas temp. sensor wire harness side connector.

OK **Voltage: 4.5 – 5.5 V**

NG

OK → **Go to step 4**

3 **Check for open in harness or ECM.**



P (1) Remove glove compartment (See page EG2–309) .
(2) Turn ignition switch ON.

C Measure voltage between terminals THG and E2 of ECM.
HINT: EG R gas temp. sensor connector is dis–connected.

OK **Voltage: 4.5 – 5.5 V**

NG

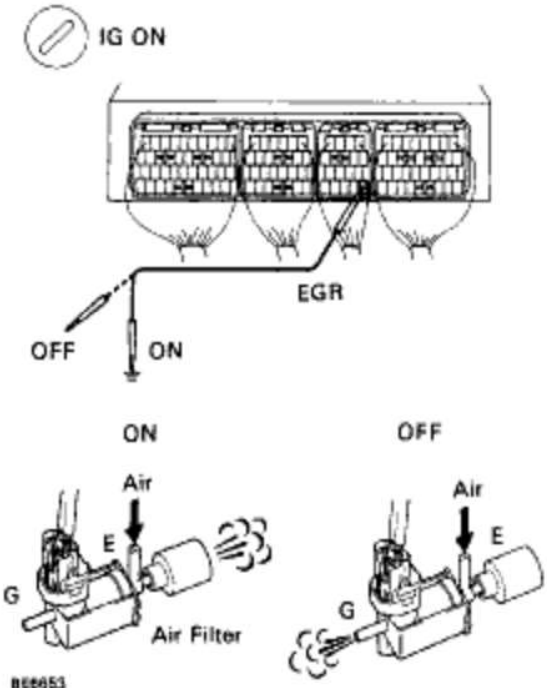
OK → **Open in harness between terminals E2 or THG. repair or replace harness.**

**Confirm connection at ECM.
If OK, replace ECM.**

4 Check connection of vacuum hose, EGR hose (See page EG2–287).

OK → NG: Repair or replace.

5 Check the VSV for EGR.



P (1) Remove glove compartment (See page EG2–309).
(2) Turn ignition switch ON.

C Check EGR VSV function
(1) Connect between terminal EGR of ECM and body ground. (ON)
(2) Disconnect between terminal EGR of ECM and body ground (OFF).

OK **(1) VSV is ON:**
The air from pipe E flows out through the air filter.
(2) VSV is OFF:
The air from pipe E flows out through pipe G.

NG

OK → Go to step 7

6 Check operation of the VSV for– EGR (See page EG2–522, step 6).

OK

NG → Replace VSV for EGR.

Check for open in harness and connector between J/B No.2 and ECM (See page IN–31).

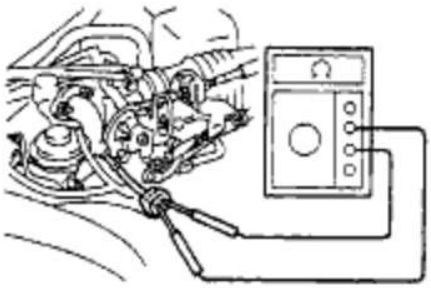
7 Check EGR vacuum modulator (See page EG2–210).

OK → NG: Repair or replace.

8 Check EGR valve (See page EG2–211).

OK → NG: Repair or replace.

9 Check resistance of EGR gas temp. sensor.



P171 76

P (1) Disconnect EGR gas temp. sensor connector.
(2) Start the engine and warm it up.
(3) Disconnect EGR VSV connector.
(4) Race the engine at 4,000 rpm for 3 mins.

C Measure the resistance of the EGR gas temp. sensor while racing the engine at 4,000 rpm.

OK **Resistance of EGR gas temp. sensor after 3 mins: 4.3 k or less**

Resistance: 188.6 – 439.0 kΩ at 20_2C (68_2F)

OK → NG: Replace EGR gas temp. sensor.

Check and replace ECM (See page IN–36).

DTC P0402 Exhaust Gas Recirculation Flow Excessive Detected

CIRCUIT DESCRIPTION

Refer to Exhaust gas recirculation flow insufficient detected on page EG2–512.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0402	EG R gas temp. sensor value is high during EG R cut–off when engine is cold (Race engine at about 4,000 rpm without load so that vacuum is applied to port E). (2 trip detection logic)	• EGR valve stuck open • EGR VSV open malfunction • Open in EGR VSV circuit • Short in EGR gas temp. sensor circuit • ECM
	EG R valve is always open (2 trip detection logic)	

See DTC P0401 for System Check Driving Pattern and Wiring Diagram.

DIAGNOSTIC CHART
TOYOTA hand–held tester

1	Connect the TOYOTA hand–held tester and read value of EGR gas temperature.	OK	G o to step 4

NG

2	Check for short in harness and ECM.	OK	Replace EGR gas temp. sensor.

NG

3	Check for short in harness or ECM.	OK	Repair or replace harness or connector.

NG

Check and replace ECM.

4	Check the VSV for EG R.	OK	Check EGR valve.

NG

5	Check operation of the VSV for EG R.	NG	Replace VSV for EG R.

OK

Check for open in harness and connector between J/B No.2 and ECM.

OBD II scan tool (excluding TOYOTA hand–held tester)

1	Check resistance of EGR gas temp. sensor.	NG	Replace EGR gas temp. sensor.

OK

2	Check for short in harness and connector between EGR gas temp. sensor and ECM.	NG	Repair or replace harness or connector.

OK

3	Check the VSV for EG R.	OK	Check EGR valve.

NG

4	Check operation of the VSV for EG R.	NG	Replace VSV for EG R.

OK

5	Check for open in harness and connector between J/B No.2 and ECM.	NG	Repair or replace harness or connector.

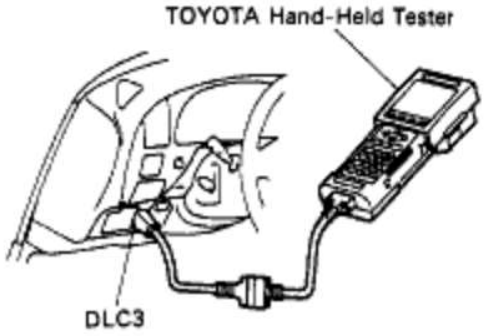
OK

Check and replace ECM.

INSPECTION PROCEDURE
TOYOTA hand–held tester

1 **Connect the TOYOTA hand–held tester and read EGR gas temperature value.**

IG ON



P (1) Remove the fuse cover on the instrument panel.
(2) Connect the TOYOTA hand–held tester to the D LC 3.
(3) Turn ignition switch ON and TOYOTA hand–held tester main switch ON.

C Read EGR gas temperature on the TOYOTA hand–held tester.

OK **EGR gas temp.: 150$_2$C (302$_2$F) or less. (Not immediately after driving)**

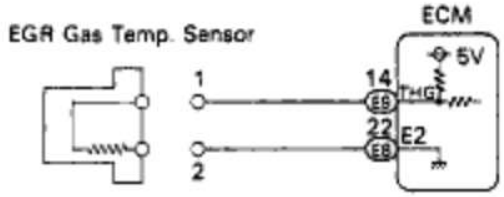
Hint If there is a short circuit, the TOYOTA hand–held tester indicates 159.3$_2$C (318.7$_2$F) .

NG

OK → **Go to step 4**

2 **Check for short in harness and ECM.**

IG ON



P Disconnect the EGR gas temperature sensor connector.

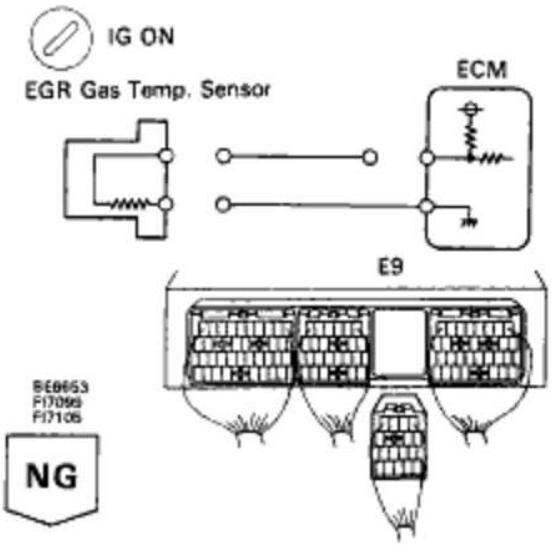
C Rear EGR gas temperature on the TOYOTA hand–held tester.

OK **EGR gas temp.: 3.1$_2$C (37.6$_2$F)**

NG

OK → **Replace EGR gas temp. sensor.**

3 **Check for short in harness or ECM.**



P (1) Remove glove compartment
(See page EG2–309) .
(2) Disconnect the E9 connector of ECM.
HINT: EGR gas temp. sensor is disconnected.

C Read EGR gas temp. on the TOYOTA hand–held tester.

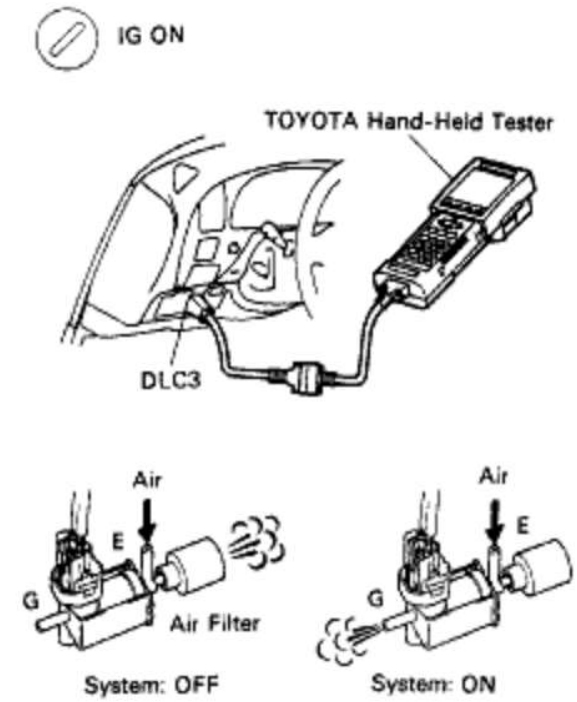
OK **EGR gas temp.: 3.1 $_2$C (37.6$_2$F)**

NG

OK **Repair or replace harness or connector.**

Check and replace ECM (See page IN–36).

4 **Check the VSV for EGR.**



P Select the active test mode on the TOYOTA hand–held tester.

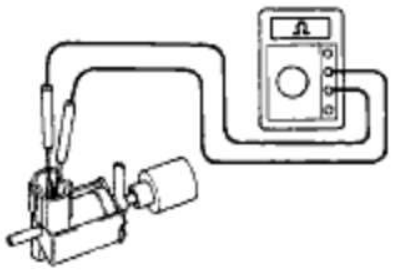
C Check operation of EGR VSV, when it is operated by the TOYOTA hand–held tester.

OK **EGR system is OFF:**
The air from pipe E flows out through the air filter.
EG R system is ON:
The air from pipe E flows out through pipe G.

NG

OK **Check EGR valve (See page EG2–211).**

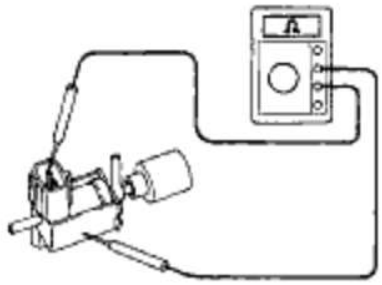
5 **Check operation of the VSV for EGR.**

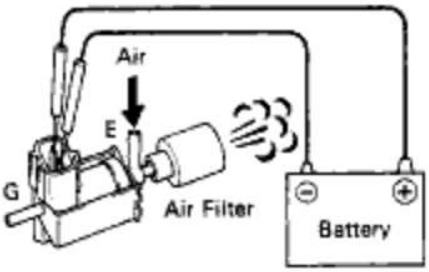


P (1) Remove EGR VSV.
(2) Disconnect EGR VSV connector.

C (1) Measure resistance between terminals.
(2) Measure resistance between each terminal and the body.

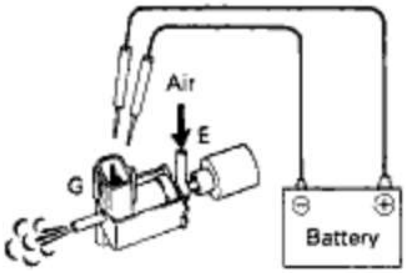
OK **(1) Resistance: 26 – 46 at 20$_2$C (68$_2$F)**
(2) Resistance: 1 M or higher.





C Check operation of EGR VSV when battery voltage is applied, and not applied to the terminals of EGR VSV connector or not.

OK **Battery voltage is applied:**
The air from pipe E flows out through the air filter.
Battery voltage is not applied:
The air from pipe E flows out through pipe G.



EC2939
EC2940
EC2941
EC2942

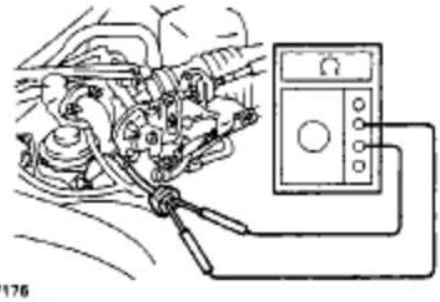
OK

NG **Replace VSV for EG R.**

Check for open in harness and connector between J/B No.2 and ECM (See page IN–31).

OBDII scan tool (excluding TOYOTA hand–held tester)

1 Check resistance of EGR gas temp. sensor.



P Disconnect EGR gas temp. sensor connector (See page EG2–303) .

C Measure resistance between terminals of EGR gas temp. sensor connector.

OK **Resistance: 2.5 k or more.**
(Not immediately after driving)

Hint If there is short circuit, ohmmeter indicates 200Ω or less.

OK

NG → Replace EG R gas temp. sensor.

2 Check for short in harness and connector between EGR gas temp. sensor and ECM (See page IN–31)..

OK

NG → Repair or replace harness or connector.

3 Check the VSV for EGR (See page EG2–525, step 5).

NG

OK → Check EGR valve (See page EG2–211).

4 Check operation of the VSV for EGR (See page EG2–532, step 5).

OK

NG → Replace VSV for EG R.

5 Check for open in harness and connector between J/B No.2 and ECM (See page IN–31).

OK

NG → Repair or replace harness or connector.

Check and replace ECM (See page IN–36).

DTC P0420 Catalyst System Efficiency Below Threshold

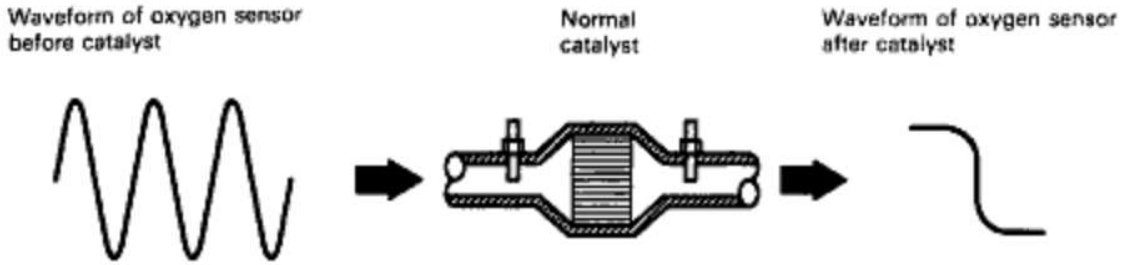
CIRCUIT DESCRIPTION

The ECM compares the waveform of the oxygen sensor located before the catalyst with the waveform of the oxygen sensor located after the catalyst to determine whether or not catalyst performance has deteri–orated.

Air–fuel ratio feedback compensation keeps the waveform of the oxygen sensor before the catalyst re-peatedly changing back and forth from rich to lean.

If the catalyst is functioning normally, the waveform of the oxygen sensor after the catalyst switches back and forth between rich and lean much more slowly than the waveform of the oxygen sensor before the catalyst.

But when both waveforms change at a similar rate, it indicates that catalyst performance has deteriorated.

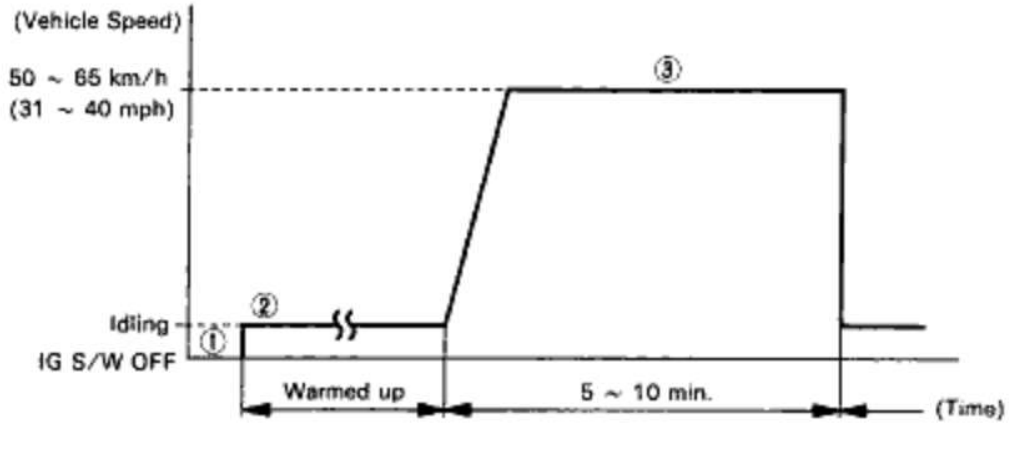


R17081

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0420	After the engine is warmed up and the vehicle driven for 5 min. at 32 – 80 km/h (20 – 50 mph), the waveforms of the heated oxygen sensors, bank 1, 2 sensor 1 and bank 1 sensor 2 have the same amplitude.	• Three–way catalytic converter • Open or short in heated oxygen sensor circuit • Heated oxygen sensor

HINT: Only on U.S. vehicles does the MIL light up when a malfunction is detected.

SYSTEM CHECK DRIVING PATTERN



F17132

① Connect the OBDII scan tool or TOYOTA hand–held tester to the DLC3.
② Start and warm up the engine with all accessories switched OFF.
③ After the engine is warmed up, run the vehicle at 50 – 65 km/h (31 – 40 mph) for 5 – 10 min.
HINT: If a malfunction exists, the MIL will light up during step (3) .

DIAGNOSTIC CHART

1	Are there any other codes (besides DTC P0420) being output?	YES	Go to relevant diagnostic trouble code chart.

NO

2	Check heated oxygen sensor. (See page EG2–476).	NG	Repair or replace.

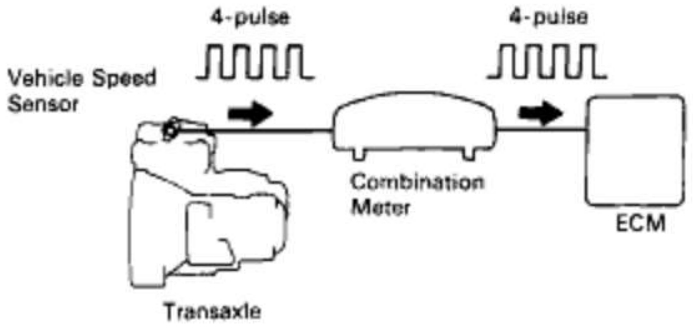
OK

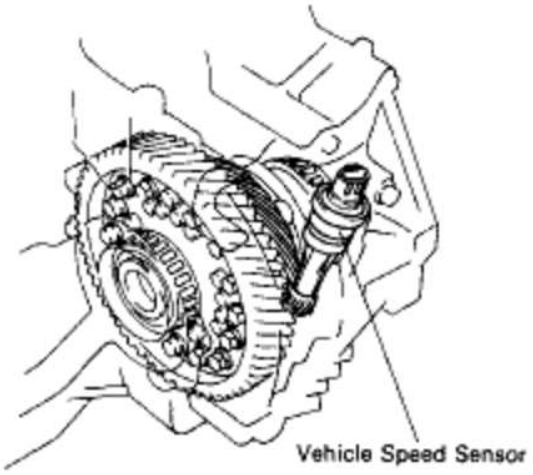
Replace three–way catalytic converter.

DTC P0500 Vehicle Speed Sensor Malfunction

CIRCUIT DESCRIPTION

The vehicle speed sensor outputs a 4–pulse signal for every revolution of the rotor shaft, which is rotated by the transmission output shaft via the driven gear. After this signal is converted into a more precise rectangular waveform by the waveform shaping circuit inside the combination meter, it is then transmitted to the ECM. The ECM determines the vehicle speed based on the frequency of these pulse signals.

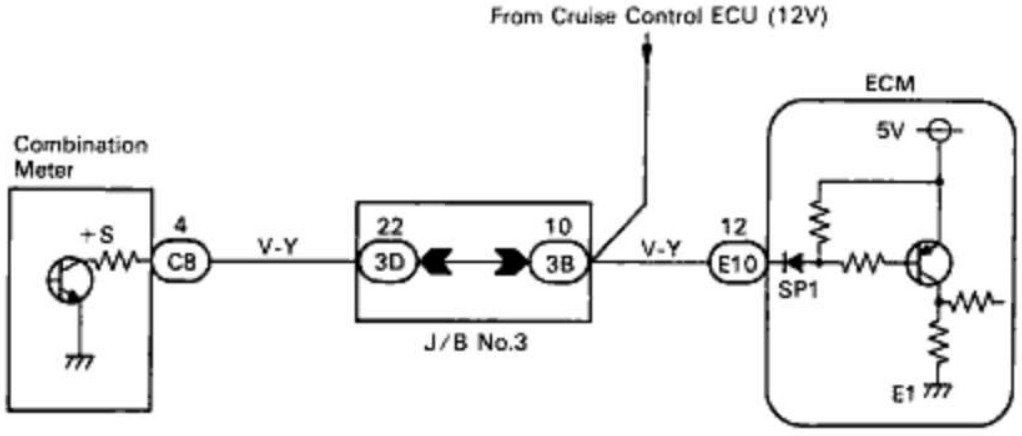




G00515 G00514

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0500	No vehicle speed sensor signal to ECM under conditions (a) and (b). (a) Park/neutral position switch is OFF. (b) Vehicle is being driven.	• Open or short in vehicle speed sensor circuit. • Vehicle speed sensor • Combination meter • ECM

WIRING DIAGRAM



FI7138

DIAGNOSTIC CHART

1	Check operation of speedometer.	NG	Check speedometer circuit
OK			
2	Check for short in harness and connector between terminal SP1 and body ground.	NG	Repair or replace harness or connector.
OK			
3	Check voltage of terminal SP1.	NG	Check for open in harness and connector between J/B No.3 and ECM.
OK			
4	Check for open in harness and connector between J/6 No.3 and combination meter.	NG	Repair or replace harness or connector.
OK			
Check and replace ECM.			

INSPECTION PROCEDURE

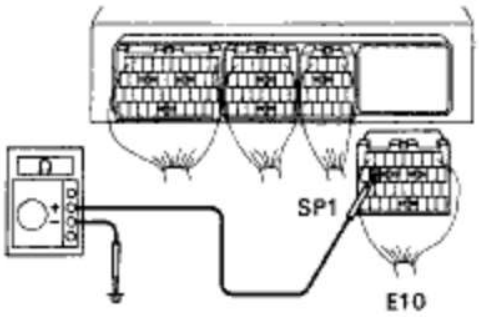
1 **Check operation of speedometer.**

C Drive the vehicle and check if the operation of the speedometer in the combination meter is normal,
HINT: The vehicle speed sensor is operating normally if the speedometer display is normal.

OK

NG **Check speedometer circuit. See combination meter troubleshooting on page BE–66.**

2 **Check for short in harness and connector between terminal SP1 of ECM and body ground.**



FI7024

P (1) Remove glove compartment
(See page EG2–309).
(2) Disconnect the E10 ECM connector.

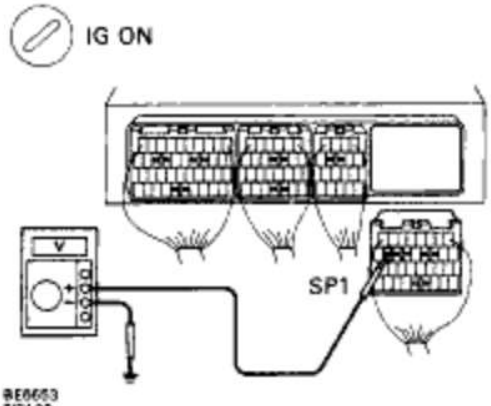
C Check continuity between terminal SP1 of ECM and body ground.

OK **No continuity (1 M or higher)**

OK

NG **Repair or replace harness or connector.**

3 **Check voltage between terminal SP1 of ECM and body ground.**



BE6663
FI7129

P Turn ignition switch ON.

C Measure voltage between terminal SP1 of ECM and body ground.

OK **Voltage: 9 –14 V**

OK

NG **Check for open in harness and connector between J/B No.3 and ECM (See page IN–31).**

4	Check for open in harness and connector between J/B No.3 and combination meter (See page IN–31).

OK

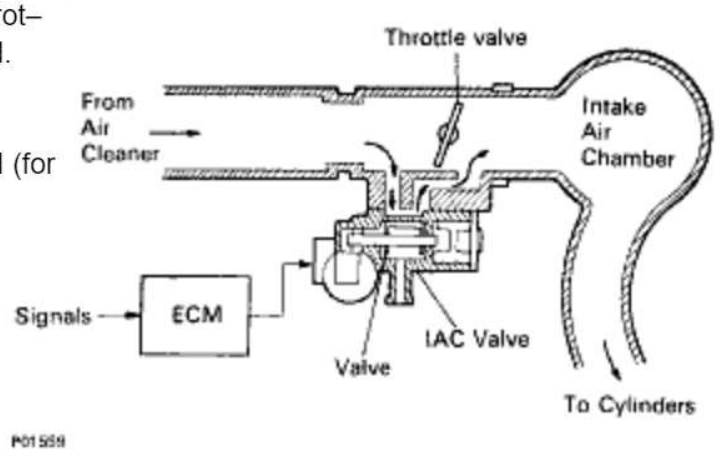
NG → Repair or replace harness or connector.

Check and replace ECM (See page IN–36).

DTC P0505 Idle Control System Malfunction

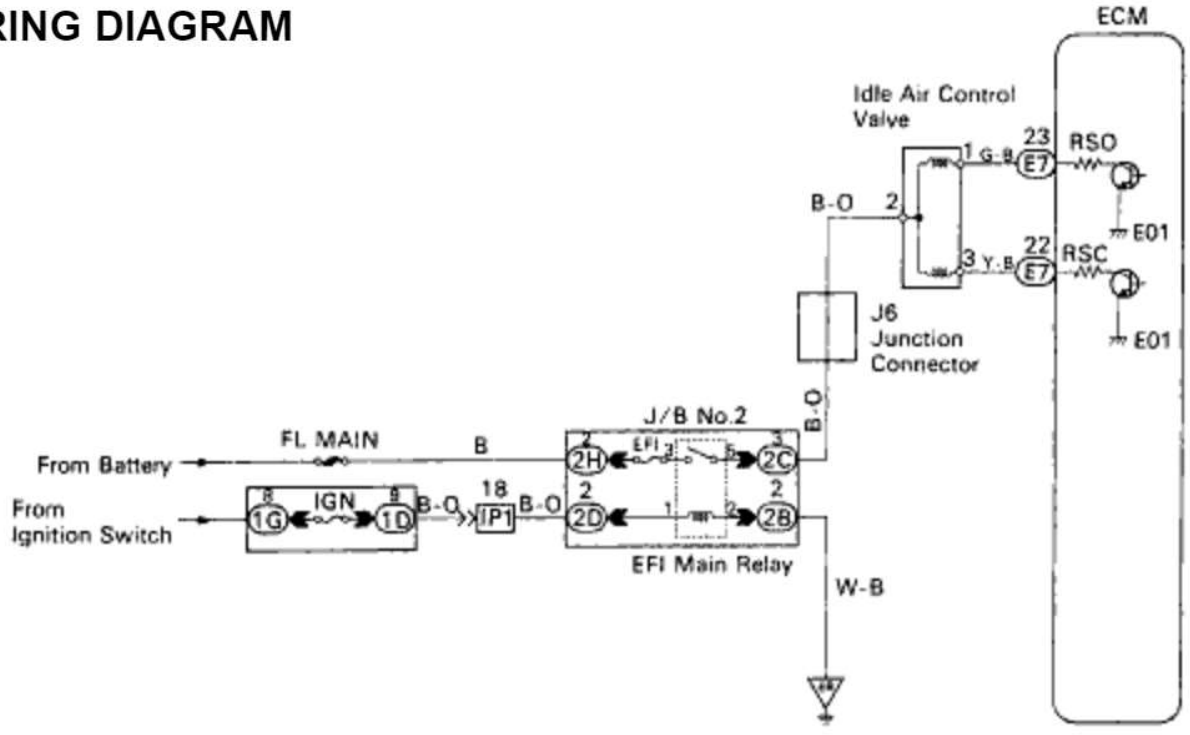
CIRCUIT DESCRIPTION

The rotary solenoid type IAC valve is located in front of the intake air chamber and intake air bypassing the throttle valve is directed to the IAC valve through a passage.
In this way the intake air volume bypassing the throt–tle valve is regulated, controlling the engine speed.
The ECM operates only the IAC valve to perform idle–up and provide feedback for the target idling speed and a VSV for idle–up control is also added (for air conditioning).



DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0505	Idle speed continues to vary greatly from the target speed. (2 trip detection logic)	• IAC valve is stuck or closed • open or short in IAC valve circuit • Air conditioner idle up VSV • Air intake (hose loose)

WIRING DIAGRAM



DIAGNOSTIC CHART

1	Check air induction system.	NG	Repair or replace.
OK			
2	Check A/C idle up VSV.	NG	Repair or replace.
OK			
3	Check voltage terminals RSO, RSC.	OK	G o to step 5
NG			
4	Check IAC valve.	NG	Replace IAC valve.
OK			
Check for open and short in harness and connector between J/B No.2 and IAC valve, IAC valve and ECM.			
5	Check operation of the IAC valve.	NG	Repair or replace IAC valve.
OK			
Check and replace ECM.			

INSPECTION PROCEDURE

1 Check air induction system (See page EG2–221).

OK

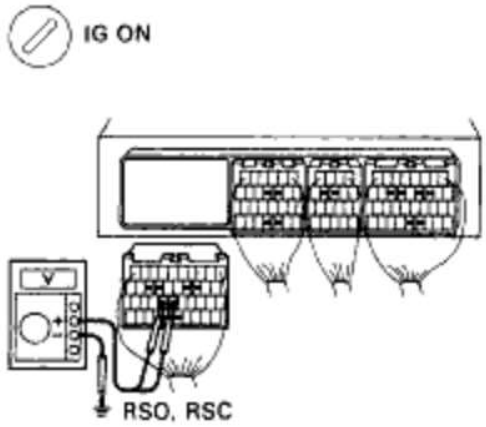
NG → Repair or replace.

2 Check A/C idle up VSV (See page EG2–570).

OK

NG → Repair or replace.

3 Check voltage terminals RSO, RSC.



P (1) Remove glove compartment (See page EG2–309).
(2) Disconnect the ECM connector (P).
(3) Turn ignition switch ON.

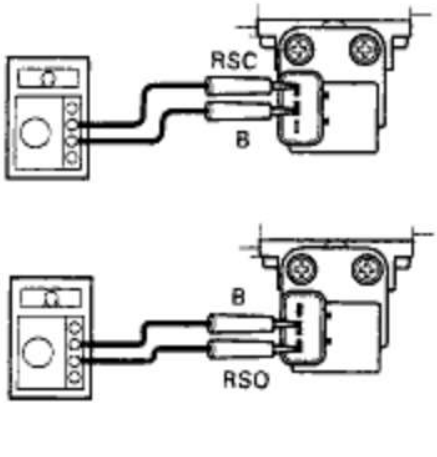
C Measure voltage between terminals RSO, RSC of ECM connector and body ground.

OK **Voltage: 9 –14 V**

NG

OK → Go to step 5.

4 Check IAC valve.



F17083
F17082

P Disconnect the IAC valve connector.

C Check continuity between terminals RSO, RSC and B of IAC valve connector.

OK

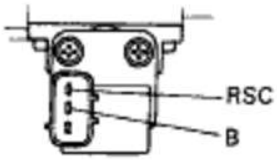
Terminals RSO and B	Continuity (Reference value 10 – 30Ω)
Terminals RSC and B	Continuity (Reference value 10 – 30Ω)

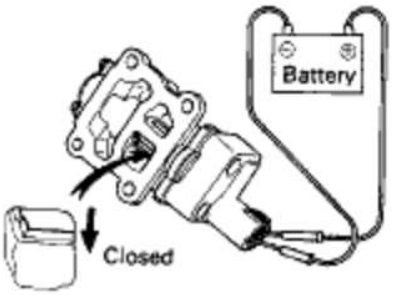
OK

NG → **Replace IAC valve.**

Check for open and short in harness and connector between J/B No.2 and IAC valve, IAC valve and ECM (See page IN–31).

5	Check operation of the IAC valve





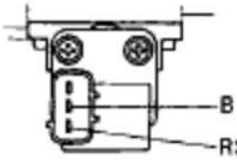
FIS039
FIS771

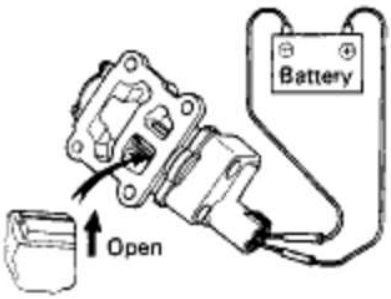
P Remove IAC valve (See page EG2–274).

C (1) Connect the positive (+) lead from the battery to terminal B and negative (–) lead to terminal RSC, and check that the valve is closed.
(2) Connect the positive (+) lead from the battery to terminal B and negative (–) lead to terminal RSO, and check that the valve is open.

OK **(1) The valve moves to close direction.**
(2) The valve moves to open direction.

Hint The ACTIVE TEST mode of the TOYOTA hand–held tester can be used to change the duty of the IAC valve as desired.





FIS039
FIS772

OK

NG **Repair or replace IAC valve.**

Check and replace ECM (See page IN–36).

DTC P0510 Closed Throttle Position Switch Malfunction

CIRCUIT DESCRIPTION

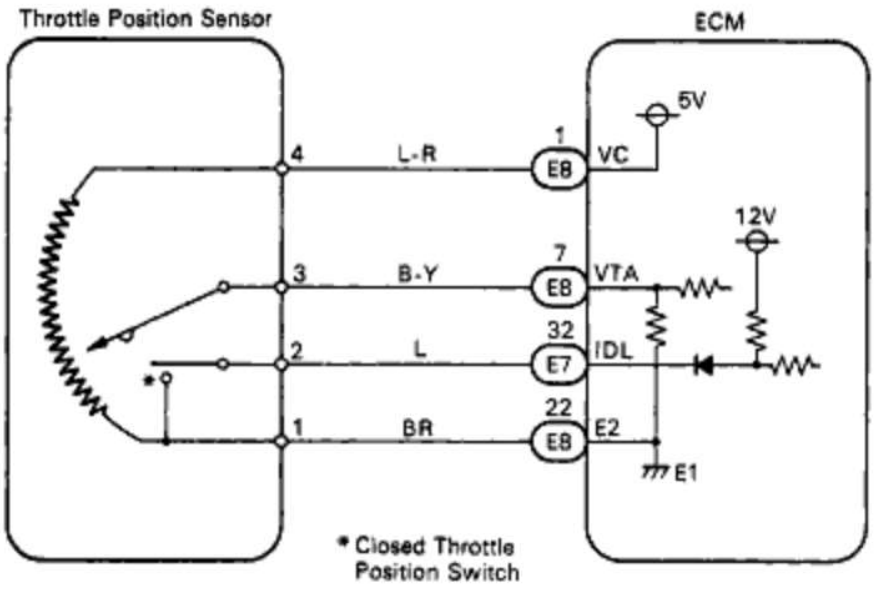
Refer to throttle Position Circuit on page EG2–463.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P0510	The closed throttle position switch does not turn ON even once when the vehicle is driven, (2 trip detection logic)	• Open in closed throttle position switch circuit. • Closed throttle position switch. • ECM

HINT: After confirming DTC P0510 use the TOYOTA hand–held tester to confirm the closed throttle position switch signal from "CURRENT DATA".

Throttle Valve	Closed throttle position switch signal	Malfunction
Fully Closed	OFF	Open Circuit
Fully Open	ON	Short Circuit

WIRING DIAGRAM



F16573

DIAGNOSTIC CHART

HINT: If diagnostic trouble codes "P0110" (intake air temp. circuit malfunction), "P0115" (engine coolant temp. circuit malfunction) and "P0120" (throttle position circuit malfunction) are output simultaneously, E2 (sensor ground) may be open.
TOYOTA hand–held tester

1	Check for open in harness or ECM.	OK	Confirm good connection at sensor. If OK, replace throttle position sensor.
NG			
2	Check for open in harness or ECM.	OK	Open in harness between ECM and throttle position sensor.
NG			
Confirm connection at ECM. If OK, replace ECM.			

OBDII scan tool (excluding TOYOTA hand–held tester)

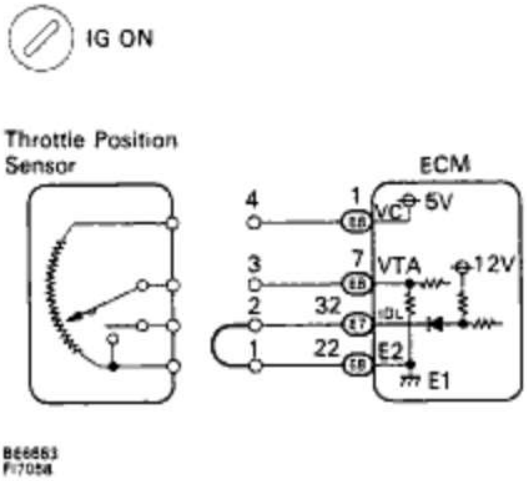
1	Check for open in harness or ECM.	OK	Confirm good connection at sensor. If OK, replace throttle position sensor.
NG			
2	Check for open in harness and connector between throttle position sensor and ECM.	NG	Open in harness between ECM and throttle position sensor.
OK			
Confirm connection at ECM. If OK, replace ECM.			

INSPECTION PROCEDURE

HINT: If diagnostic trouble codes P0110, P0115 and P0120 are output simultaneously, E2 (sensor ground) may be open.

TOYOTA hand–held tester

1 **Check for open in harness or ECM.**



P (1) Remove the fuse cover on the instrument panel.
(2) Connect the TOYOTA hand–held tester to the DLC 3.
(3) Disconnect the throttle position sensor con–nector.
(4) Connect sensor wire harness terminals be–tween terminals 1 and 2.
(5) Turn ignition switch ON.

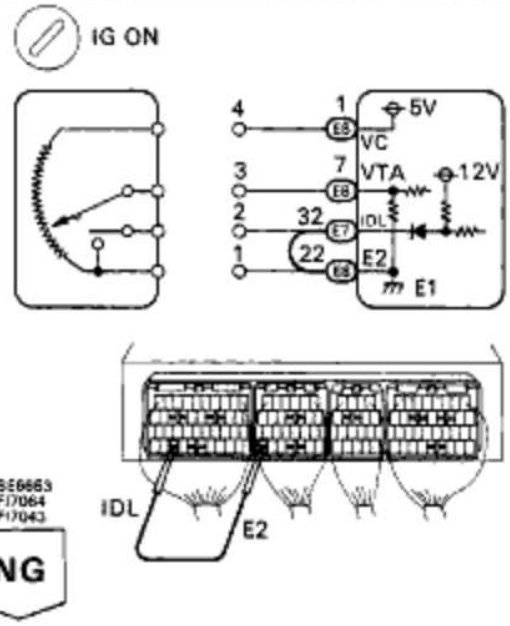
C Read CTP switch signal on the TOYOTA hand–held tester.

OK **CTP switch signal: ON**

NG

OK → **Confirm good connection at sensor. If OK, replace throttle position sensor.**

2 **Check for open in harness or ECM.**



P (1) Remove glove compartment.
(See page BO–309)
(2) Connect between terminals IDL and E2 of ECM connectors.
H I NT: Throttle position sensor connector is disconnected.
Before checking, do a visual check and contact pressure –check for the connector.
(See page EG2–418)
(3) Turn ignition switch ON.

C Read CTP switch signal on the TOYOTA hand–held tester.

OK **CTP switch signal: ON**

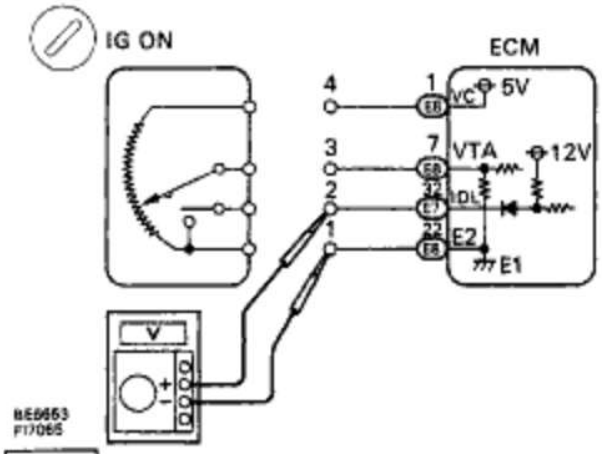
NG

OK → **Open in harness between ECM and throttle position sensor, repair or replace harness.**

Confirm connection at ECM. If OK, replace ECM.

OBDII scan tool (excluding TOYOTA hand–held tester)

1 Check for open in harness or ECM.



P (1) Disconnect the throttle position sensor connector.
(2) Turn ignition switch ON.

C Measure voltage between terminals 1 and 2 of throttle position sensor connector.

OK **Voltage: 9 –14 V**

NG

OK → Confirm good connection at sensor. If OK, replace throttle position sensor.

2 Check for open in harness and connector between throttle position sensor and ECM (See page IN–31).

OK

NG → Open in harness between ECM and throttle position sensor.

Confirm connection at ECM. If OK, replace ECM.

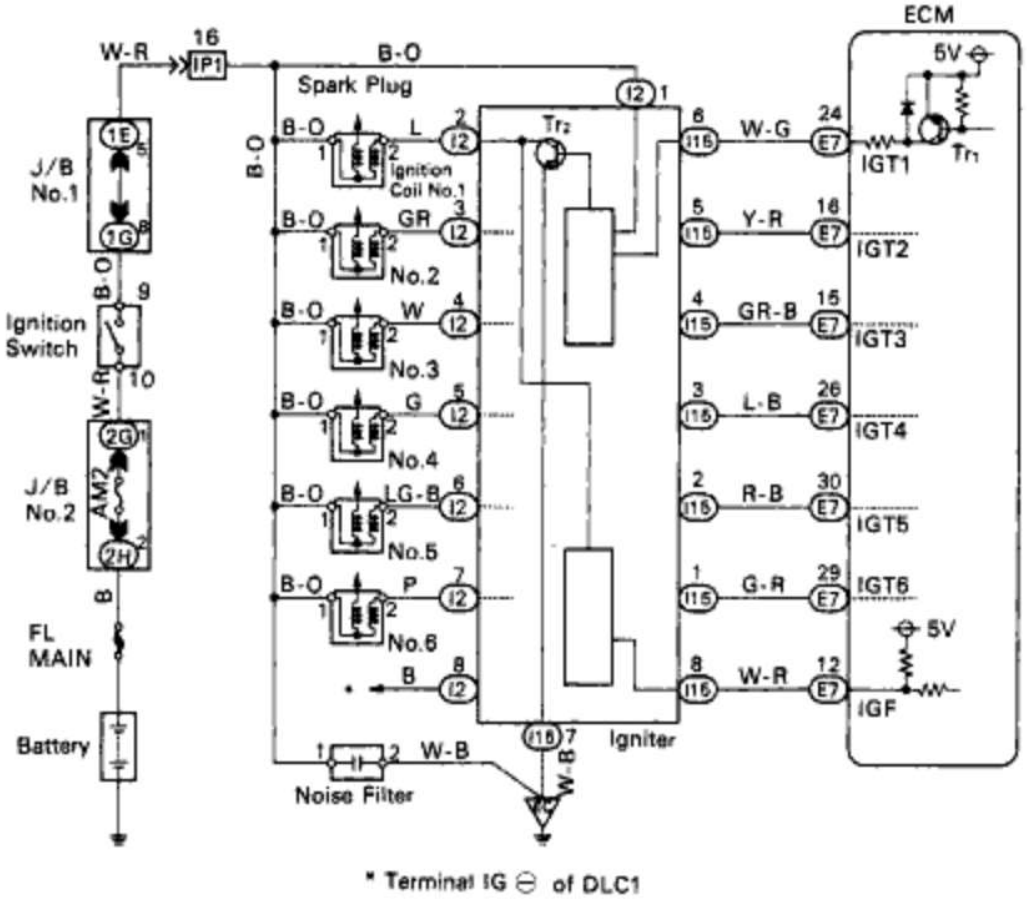
DTC P1300 Igniter Circuit Malfunction

CIRCUIT DESCRIPTION

The ECM determines the ignition timing, turns on Tr1 at a predetermined angle (”CA) before the desired ignition timing and outputs an ignition signal (IGT) ”1” to the igniter.
Since the width of the IGT signal is constant, the dwell angle control circuit in the igniter determines the time the control circuit starts primary current flow to the ignition coil based on the engine rpm and ignition timing one revolution ago, that is, the time the Tr2 turns on.
When it reaches the ignition timing, the ECM turns Tr1 off and outputs the IGT signal ”0”.
This turns Tr2 off, interrupting the primary current flow and generating a high voltage in the secondary coil which causes the spark plug to spark. Also, by the counter electromotive force generated when the primary current is interrupted, the igniter sends an ignition confirmation signal (IGF) to the ECM.
The ECM stops. fuel injection as a fail safe function when the IGF signal is not input to the ECM.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P1300	No IGF signal to ECM for 6 consecutive IGT signals during engine running.	• Open or short in IGF or IGT circuit from igniter to ECM. • Igniter • ECM

WIRING DIAGRAM



DIAGNOSTIC CHART

1	Check voltage igniter power source.	NG	Check and repair igniter power source circuit.

OK

2	Check voltage between terminals 2 – 7 of igniter connector (12) and body ground.	OK	G o to step 4

NG

3	Check ignition coil.	NG	Replace ignition coil.

OK

Check for open and short in harness and connector between J/B No.1 and ignition coil, ignition coil and igniter.

4	Check continuity between terminal 7 of igniter and body ground.	NG	Repair or replace harness or connector.

OK

5	Check voltage between terminal 8 of igniter connector (115) and body ground.	OK	Go to step 7

NG

6	Check for open and short in IGF circuit.	NG	Repair or replace harness or connector.

OK

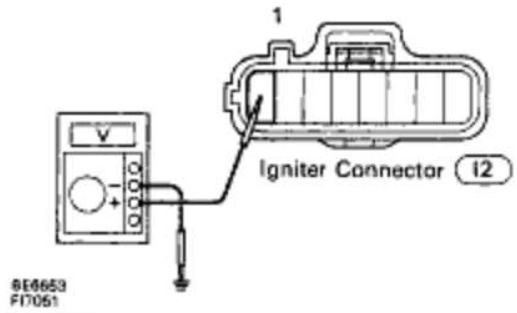
Check and replace ECM.

7	Check for open and short in IGT circuit.	NG	Repair or replace harness or connector.
OK			
8	Check voltage between terminals IGT 1 – 6 of ECM and body ground.	OK	Replace igniter.
NG			
Check and replace ECM.			

INSPECTION PROCEDURE

1 **Check voltage between terminal 1 of igniter connector (12) and body ground.**

IG ON



P (1) Disconnect igniter connector (12)
(2) Turn ignition switch ON.

HINT Connector 12 color is dark gray

C Measure voltage between terminal 1 of igniter connector 12 and body ground.

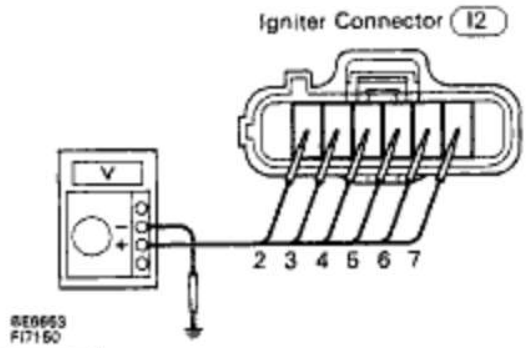
OK **Voltage: 9 –14 V**

OK

NG → **Check and repair igniter power source circuit.**

2 **Check voltage between terminals 2 – 7 of igniter connector and body ground.**

IG ON



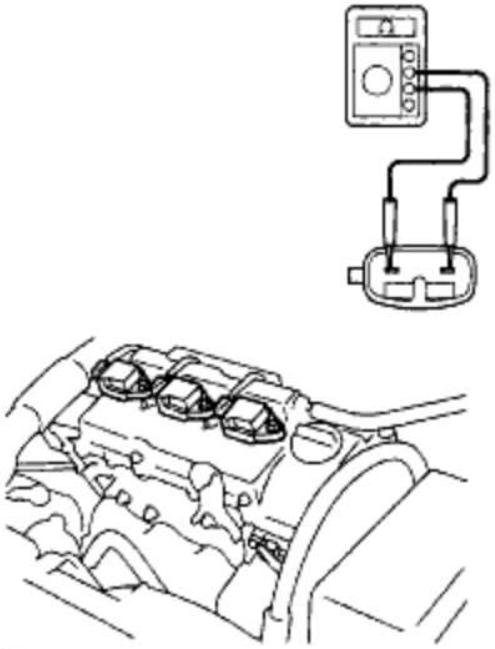
C Measure voltage between terminals 2 – 7 of igniter connector (12) and body ground.

OK **Voltage: 9 – 14 V**

NG

OK → **Go to step 4**

3 **Check ignition coil.**



P Disconnect ignition coil connector.
(See page IG–87).

Hint Refer to the wiring diagram and inspect the ignition coil connected to the terminal which was without voltage in step (2) .

C Measure resistance between terminals of ignition coil connector.

OK

	Resistance
Cold	0.54 – 0.84Ω
Hot	0.68 – 0.98Ω

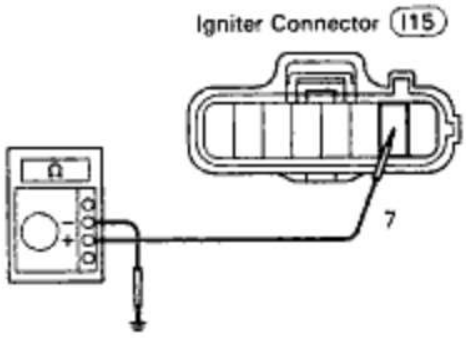
"Cold" is from -10_2C (14_2F) to 50_2C (122_2F) and "Hot" is from 50_2C (122_2F) to 100_2C (212_2F).

FI7078
FI7086

OK → **NG** → **Replace ignition coil.**

Check for open and short in harness and connector between J/B No.1 and ignition coil, ignition coil and igniter (See page IN–31).

4 **Check continuity between terminal 7 of igniter connector (I15) and body ground.**



P Disconnect igniter connector(I15)

Hint Connector (I15) is black.

C Check continuity between terminal 7 of igniter connector (I15) and body ground.

OK **Continuity (1 or less)**

FI7149

OK → **NG** → **Repair or replace harness or connector.**

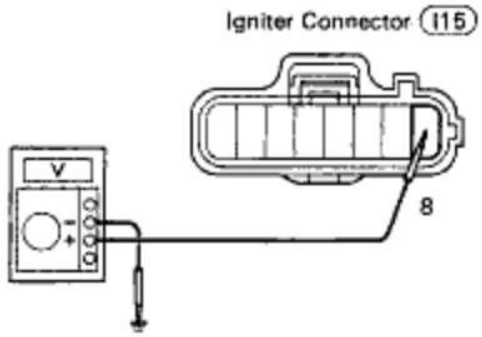
5	Check voltage between terminal 8 of igniter connector (I15) and body ground.

IG ON

P Turn ignition switch ON.

C Measure voltage between terminal 8 of igniter connector (I15) and body ground.

OK **Voltage: 4.5 – 5.5 V**



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F17151

NG

OK → Go to step (7)

6	Check for open and short in harness and connector between terminal IGF of ECM and igniter (See page IN–31).

OK

NG → Repair or replace harness or connector.

Check and replace ECM (See page IN–36).

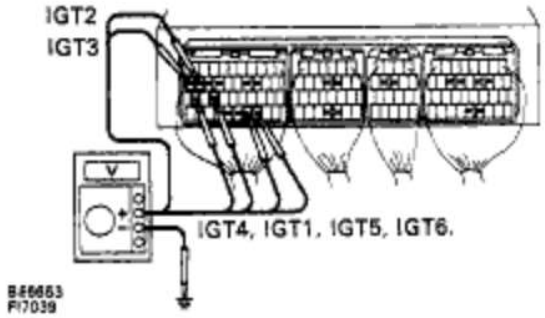
7	Check for open and short in harness and connector between terminals IGT1 – of ECM and igniter (See page IN–31).

OK

NG → Repair or replace harness or connector.

8	Check voltage between terminals IGT1 – 6 of ECM and body ground.

STA ON



P Remove glove compartment (See page EG2–309).

Hint Leave igniter connector 115 disconnected.

C Measure voltage between terminals IGT1 – 6 of ECM and body ground when engine is cranked.

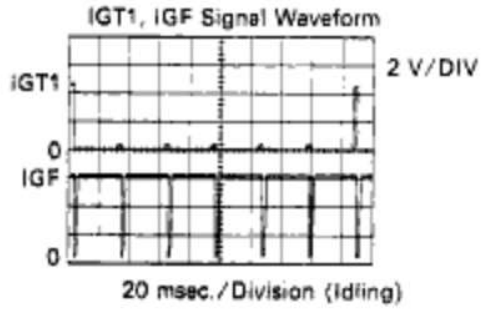
OK **Voltage: 0.5 – 1.0 v (Neither 0 v nor 5 v)**

NG

OK → Replace igniter.

Check and replace ECM (See page IN–36).

Reference INSPECTION USING OSCILLOSCOPE



- During idling, check waveform between terminal IGT1, IGF and E1 of ECM.

HINT: The correct waveform appears as shown in the illustration on the left, with rectangular waves.
IGT2, IGT3, IGT4, IGT5 and IGT6 signal wave–forms are the same as the IGT1 signal waveform.

DTC P1500 Starter Signal Circuit Malfunction

CIRCUIT DESCRIPTION

When the engine is cranked, the intake air flow is slow, so fuel vaporization is poor. A rich mixture is therefore necessary in order to achieve good startability. While the engine is being cranked, the battery voltage is applied to terminal STA of the ECM. The starter signal is mainly used to increase the fuel injection volume for the starting injection control and after–start injection control.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P1500	No starter signal to ECM.	• Open or short in starter signal circuit. • Open or short in ignition switch or starter relay circuit. • ECM

HINT: In this circuit, diagnosis can only be made in the check mode.

DIAGNOSTIC CHART

HINT: This diagnostic chart is based on the premise that the engine is cranked normally. If the engine is not cranked, proceed to the matrix chart of problem symptoms on page EG2–435.

1	Connect the TOYOTA hand–held tester and check STA signal.	OK	Proceed to next circuit inspection shown on matrix chart.

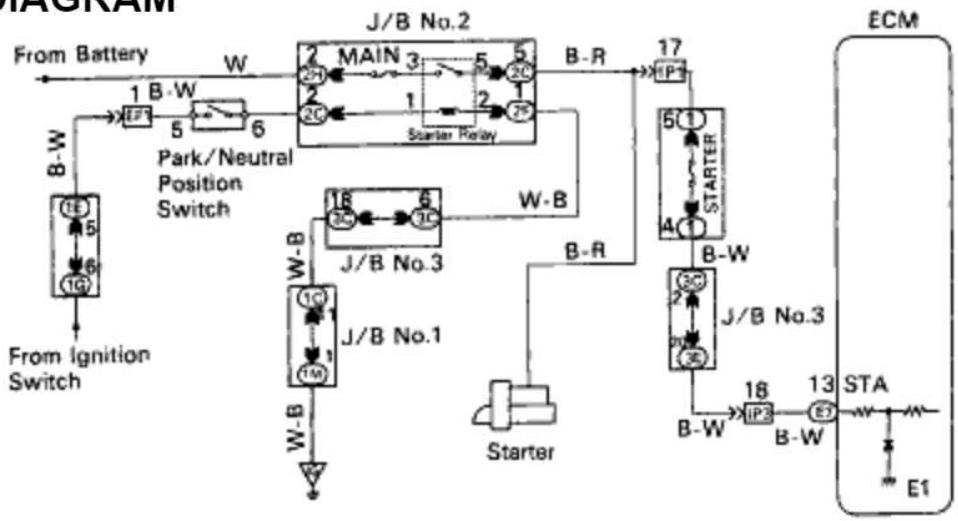
NG

2	Check for open in harness and connector between ECM and starter relay.	NG	Repair or replace harness or connector.

OK

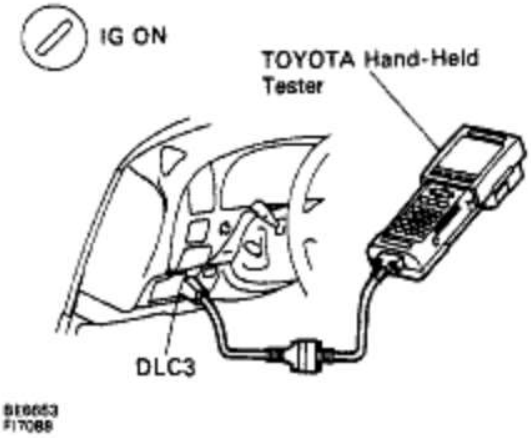
Check and replace ECM.

WIRING DIAGRAM



INSPECTION PROCEDURE

1 **Connect the TOYOTA hand–held tester and check STA signal.**



P (1) Remove the fuse cover on the instrument panel.
(2) Connect the TOYOTA hand–held tester to the DLC 3.
(3) Turn ignition switch ON and TOYOTA hand–held tester main switch ON.

C Read STA signal on the TOYOTA hand–held tester while starter operates.

OK

Ignition Switch Position	STA Signal
ON	OFF
START	ON

NG

OK → **Proceed to next circuit inspection shown on matrix chart (See page EG2–435).**

2 **Check for open in harness and connector between ECM and starter relay (See page IN–31).**

OK

NG → **Repair or replace harness or connector.**

Check and replace ECM (See page IN–36).

DTC P1600 EMC BATT Malfunction

CIRCUIT DESCRIPTION

Battery voltage is supplied to terminal BATT of the ECM even when the ignition switch is OFF for use by the diagnostic trouble code memory and air–fuel ratio adaptive control value memory, etc.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P1600	Open in back up power source circuit.	• Open in back up power source circuit. • ECM

HINT: If DTC P1600 appear, the ECM does not store another diagnostic trouble code.

DIAGNOSTIC CHART

1 Check voltage of terminal BATT.

OK → Check and replace ECM.

NG

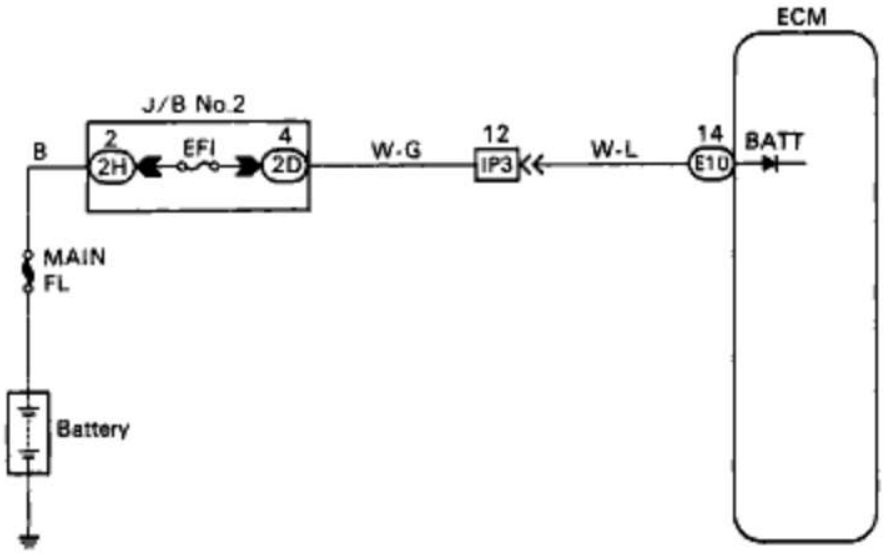
2 Check EFI fuse.

NG → Check for short in all the harness and components connected to EFI fuse.

OK

Check and repair harness or connector between battery, EFI fuse and ECM.

WIRING DIAGRAM



FI6681

INSPECTION PROCEDURE

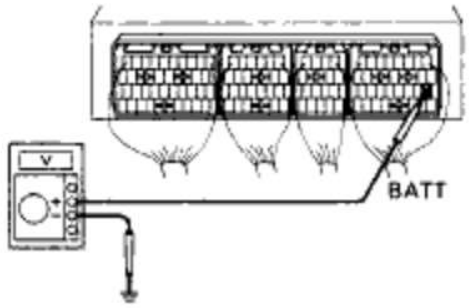
1 **Check voltage between terminal BATT of ECM connector and body ground.**

IG OFF

P Remove glove compartment.
(See page EG2–309)

C Measure voltage between terminal BATT of ECM connector and body ground.

OK **Voltage: 9 –14 V**



B66683
FI6807

NG

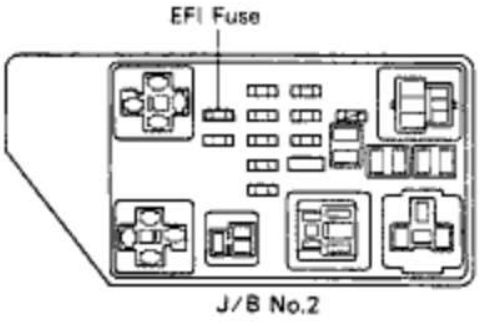
OK **Check and replace ECM (See page IN–36).**

2 **Check EFI fuse.**

P Remove EFI fuse from J/B No.2.

C Check continuity of EFI fuse.

OK **Continuity**



FI7078

OK

NG **Check for short in all the harness and components connected to EFI fuse.**

Check and repair harness or connector between battery, EFI fuse and ECM.

DTC P1605 Knock Control CPU Malfunction

CIRCUIT DESCRIPTION

Refer to knock sensor 1 circuit malfunction on page EG2–499.

DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P1605	Engine control computer malfunction. (for knock control)	• ECM

WIRING DIAGRAM

Refer to knock sensor 1 circuit malfunction on page EG2–499.

DIAGNOSTIC CHART

1	Are there any other codes (besides DTC P1605) being output?	YES	Go to relevant diagnostic trouble code chart.

NO

Check and replace ECM (See page IN–36).

DTC P1780 Park Neutral Position Switch Malfunction

CIRCUIT DESCRIPTION

The park/neutral position switch goes on when the shift lever is in the N or P shift position. When it goes on terminal NSW of the ECM is grounded to body ground via the starter relay thus the terminal NSW voltage becomes 0 V, When the shift lever is in the D, 2, L or R position, the park/neutral position switch goes off, so the voltage of ECM terminal NSW becomes battery voltage, the voltage of the ECM internal power source.

If the shift lever is moved from the N position to the D position, this signal is used for air–fuel ratio correction and for idle speed control (estimated control), etc.

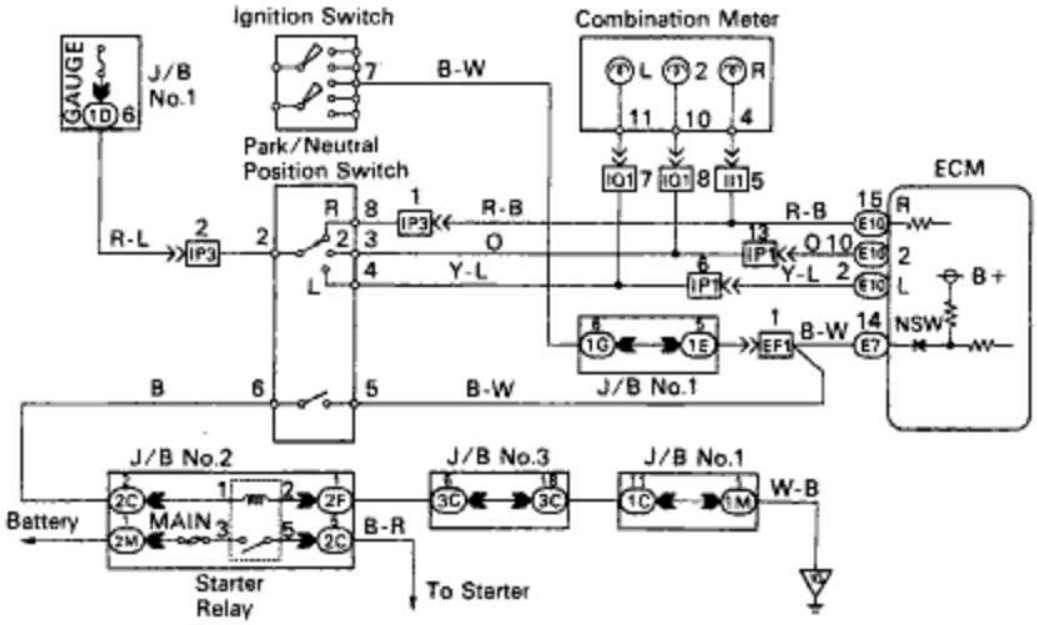
DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
P1780	Two or more switches are ON simultaneously for "N", "2" and "L" position. (2 trip detection logic)	• Short in park/neutral position switch circuit. • Park/neutral position switch. • ECM
	When driving under conditions a) and b) for 30 sec. or more the park/neutral position switch is ON (N position). (2 trip detection logic) a) Vehicle speed; 70 km/h (44 mph) or more b) Engine speed; 1,500 – 2,500 rpm	

HINT: After confirming DTC P1780 use the TOYOTA hand–held tester to confirm the PNP switch signal from "CURRENT DATA".

DIAGNOSTIC CHART

1	Check park/neutral position switch.	NG	Replace park/neutral position switch.
OK			
2	Check voltage between terminal NSW of ECM connector and body ground.	OK	Check and replace ECM.
NG			
Check for open and short in harness and connector between ECM and park/neutral position switch.			

WIRING DIAGRAM



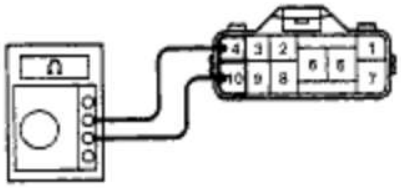
917141

INSPECTION PROCEDURE

1 Check park/neutral position switch.

P Disconnect park/neutral position switch connector.

C Check continuity between each terminal shown below when the shift lever is positioned to each range.



G23164

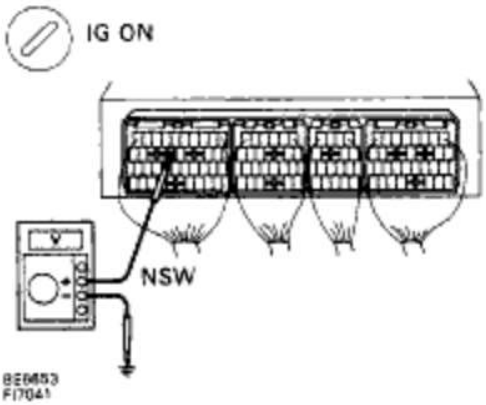
OK

Continuity

Shift Position \ Terminal	5	6	2	7	8	9	10	3	4
P	○—○		○—○						
R			○	—	○				
N	○—○		○	—	—	○			
D			○	—	—	—	○		
2			○	—	—	—	—	○	
L			○	—	—	—	—	—	○

OK → **NG** → **Replace park/neutral position switch.**

2 **Check voltage between terminal NSW of ECM connector and body ground.**



BE6853
FI7041

P Remove glove compartment.
(See page EG2–309)

C (1) Turn ignition switch ON.
(2) Measure voltage between terminal NSW of ECM connector and body ground when the shift lever is positioned to the following positions.

OK

Shift lever position	P or N	L,2,D or R
Voltage	0 V	9–14V

NG → **OK** → **Check and replace ECM (See page IN–36).**

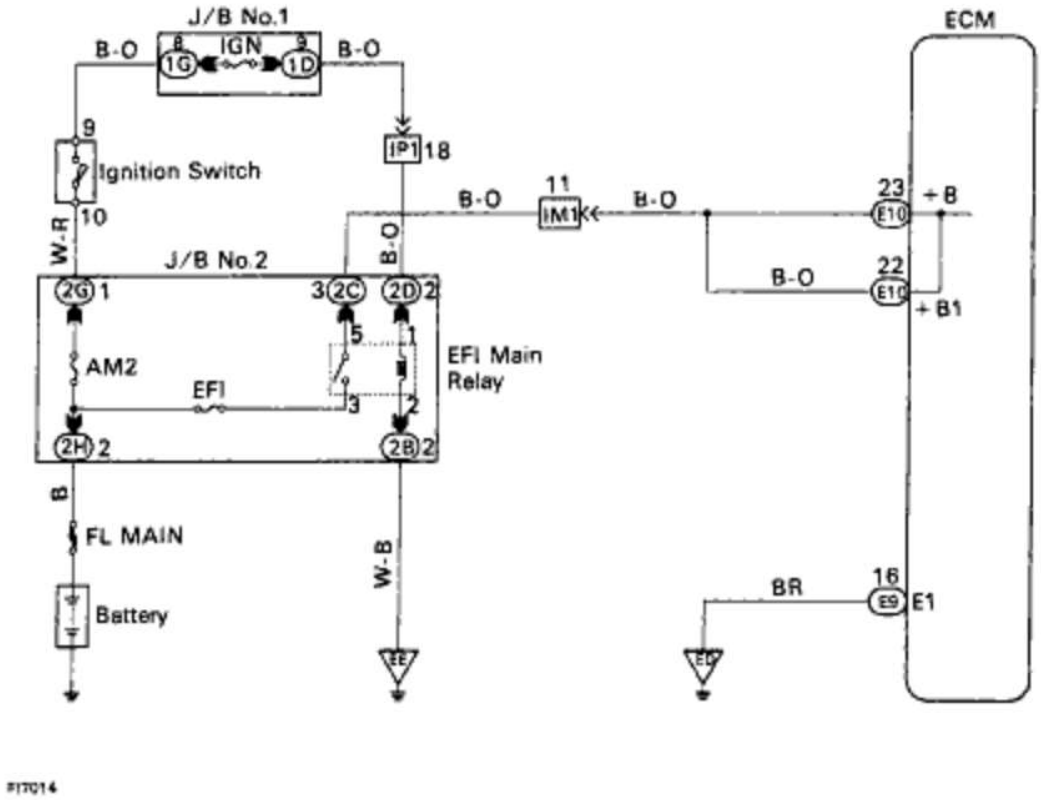
Check for open and short in harness and connector between ECM and park/neutral position switch (See page IN–31).

ECM Power Source Circuit

CIRCUIT DESCRIPTION

When the ignition switch is turned ON, battery voltage is applied to the coil, closing the contacts of the EFI main relay and supplying power to the terminals + B and + B1 of the ECM.

WIRING DIAGRAM



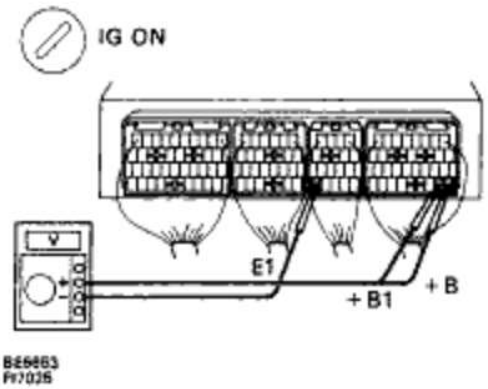
F17014

DIAGNOSTIC CHART

1	Check voltage of ECM power source.	OK	Proceed to next circuit inspection shown on matrix chart .
NG			
2	Check continuity between terminal E1 and body ground.	NG	Repair or replace harness or connector.
OK			
3	Check EFI main relay.	NG	Replace EFI main relay.
OK			
4	Check EFI fuse.	NG	Check for short in all the harness and components connected to EFI fuse.
OK			
5	Check for open in harness and connector between main relay and battery, main relay and ECM.	NG	Repair or replace harness or connector.
OK			
6	Check I G N fuse.	NG	Check for short in all the harness and components connected to IGN fuse.
OK			
7	Check ignition switch.	NG	Replace ignition switch.
OK			
Check for open in harness and connector between IG switch and main relay, main relay and body ground.			

INSPECTION PROCEDURE

1 **Check voltage between terminals + B, + B1 and E1 of ECM connector.**



P (1) Remove glove compartment.
(See page EG2–309)
(2) Turn ignition switch ON.

C Measure voltage between terminals + B, + 1B and E1 of ECM connector.

OK **Voltage: 9 –14 V**

NG

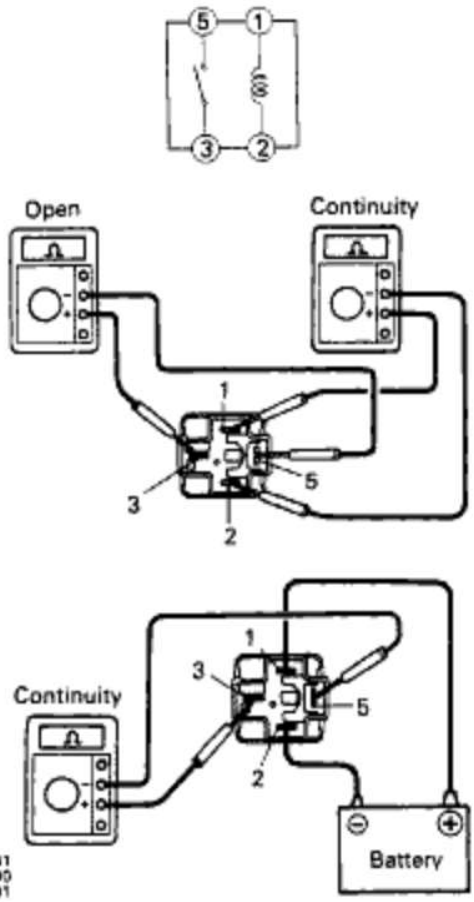
OK → **Proceed to next circuit inspection shown on matrix chart (See page EG2–435).**

2 **Check for open in harness and connector between terminal E1 of ECM and body ground (See page IN–31).**

OK

NG → **Repair or replace harness or connector.**

3 Check EFI main relay.



P Remove EFI main relay from J/B No–2.

C Check continuity between terminals of EFI main relay shown below.

OK

Terminals 3 and 5	Open
Terminals 1 and 2	Continuity (Reference value 72Ω)

C (1) Apply battery voltage between terminals 1 and 2.
(2) Check continuity between terminals 3 and 5.

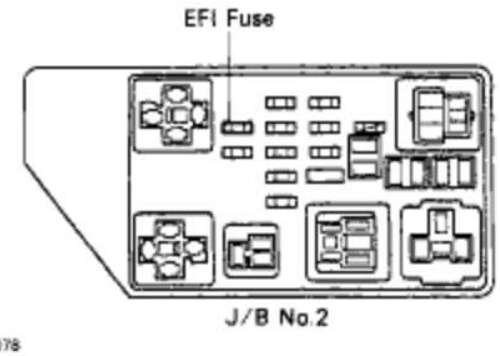
OK

Terminals 3 and 5	Continuity

OK

NG **Replace EFI main relay.**

4 Check EFI fuse.



P Remove EFI fuse from J/B No.2.

C Check continuity of EFI fuse.

OK **Continuity**

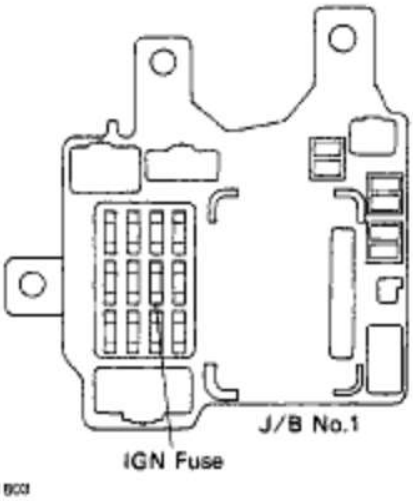
OK

NG **Check for short in all the harness and components connected to EFI fuse.**

5	Check for open in harness and connector between main relay and battery, main relay and ECM (See page IN–31).

OK → NG → Repair or replace harness or connector.

6	Check IGN fuse.



N01 [illegible]

P Remove IGN fuse from J/B No–1

C Check continuity of IGN fuse.

OK **Continuity**

OK → NG → Check for short in all the harness and components connected to IGN fuse.

7	Check ignition switch (See page BE–14).

OK → NG → Replace ignition switch.

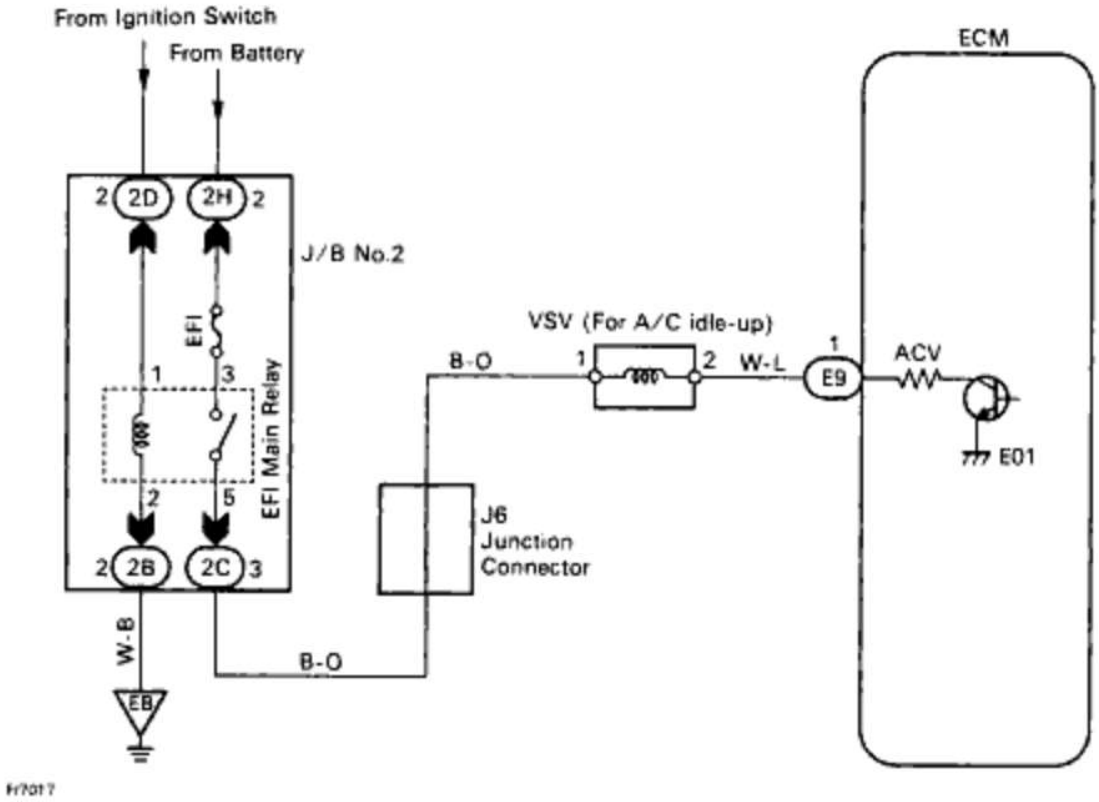
Check for open in harness and connector between IG switch and main relay, main relay and body ground (See page IN–31).

AC Idle Up Circuit

CIRCUIT DESCRIPTION

When the air conditioning operates (increased engine load), this circuit switch is on the VSV and increases the amount of bypass air to increase the idle speed, thus maintaining driveability.

WIRING DIAGRAM



DIAGNOSTIC CHART
TOYOTA hand–held tester

1	Connect the TOYOTA hand–held tester and check operation of A/C idle–up VSV.	OK	Check and repair air hose and air pipe.

NG

2	Check A/C idle–up VSV.	NG	Replace A/C idle–up VSV.

OK

3	Check for open and short in harness and connector between EFI main relay and ECM.	NG	Repair or replace harness or connector.

OK

Check and replace ECM.

OBDII scan tool (excluding TOYOTA hand–held tester)

1	Check A/C idle–up VSV.	NG	Replace A/C idle–up VSV.

OK

2	Check voltage between terminal ACV and body ground.	NG	Check and repair harness or connector.

OK

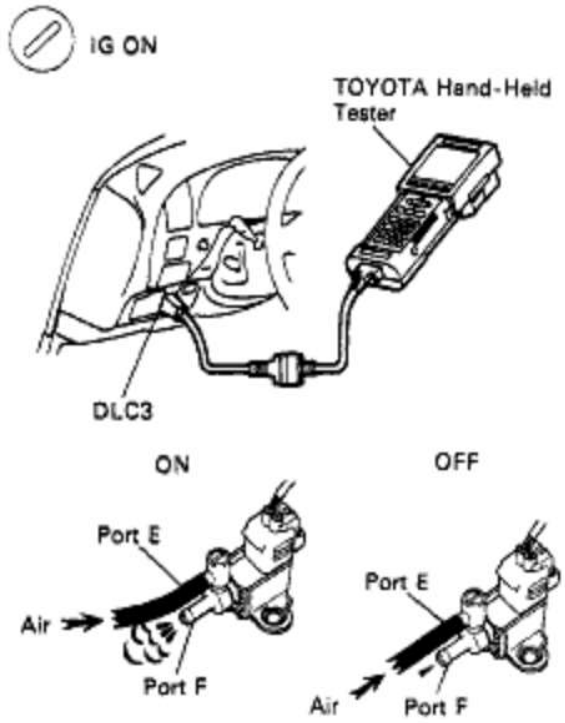
3	Check air hose and air pipe.	NG	Repair or replace.

OK

Check and replace ECM.

INSPECTION PROCEDURE
TOYOTA hand–held tester

1 **Connect the TOYOTA hand–held tester and check operation of A/C idle–up VSV.**



B86663
FI7068
FI7071 FI7072

P (1) Remove the fuse cover on the instrument panel.
(2) Connect the TOYOTA hand–held tester to the DLC 3.
(3) Turn ignition switch ON and TOYOTA hand–held tester main switch ON.
(4) Select the active test mode on the TOYOTA hand–held tester.

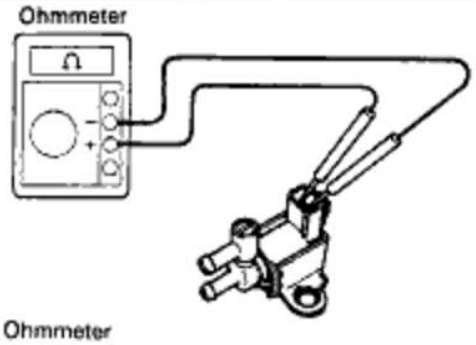
C Check operation of A/C idle–up VSV when A/C idle–up VSV is operated by the TOYOTA hand–held tester.

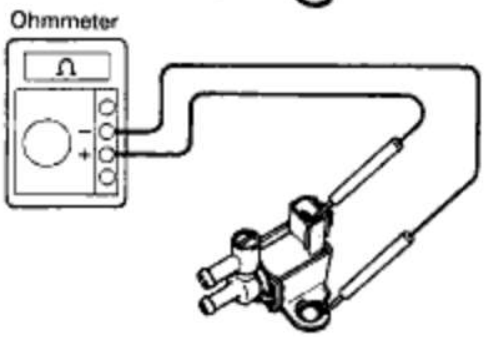
OK **A/C idle–up VSV is ON:**
The air from port E is flowing out through port F.
A/C idle–up VSV is OFF:
The air does not flow from port E to port F.

NG

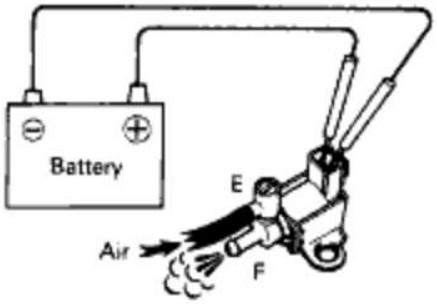
OK **Check and repair air hose and air pipe.**
(See page EG2–295)

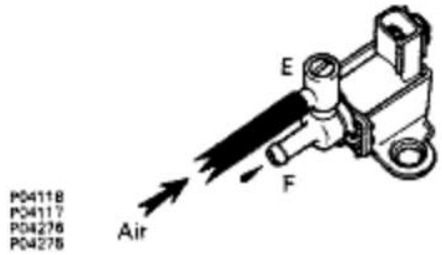
2 **Check A/C idle–up VSV.**





P (1) Remove A/C idle–up VSV.
(2) Disconnect A/C idle–up VSV connector.
C (1) Measure resistance between terminals.
(2) Measure resistance between each terminal and the body.
OK **(1) Resistance: 22 – 42 at 20_2C (68_2F)**
(2) Resistance: 1 M or higher





C Check operation of A/C idle–up VSV when battery positive voltage is applied to the terminals of A/C idle–up VSV connector or not.
OK **Battery positive voltage is applied:**
The air from pipe E is flowing out through pipe F.
Battery positive voltage is not applied:
The air from pipe E is not flowing out through pipe F.

OK

NG → **Replace A/C idle–up VSV.**

3 **Check for open and short in harness and connector between EFI main relay and ECM (See page IN–31).**

OK

NG → **Repair or replace harness or connector.**

Check and replace ECM (See page IN–36).

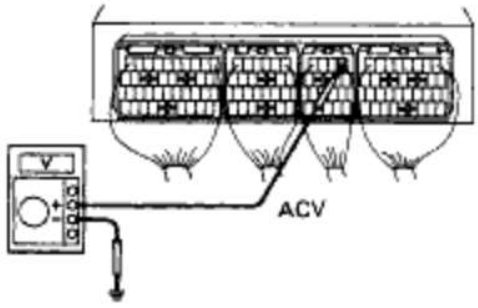
INSPECTION PROCEDURE
OBDII scan tool (excluding TOYOTA hand–held tester)

1 Check A/C idle–up VSV (See page EG2–573, step 2)

OK → **NG** → Replace A/C idle–up VSV.

2 Check voltage between terminal ACV of ECM connector and body ground.

IG ON



B66853
F17029

P (1) Remove glove compartment.
(See page EG2–309)
(2) Turn ignition switch ON.

C Measure voltage between terminal ACV of ECM connector and body ground.

OK Voltage: 9 –14 V

OK → **NG** → Check for open and short in harness and connector between EFI main relay and ECM (See page IN–31).

3 Check air hose and air pipe (See page EG2–295).

OK → **NG** → Repair or replace.

Check and replace ECM (See page IN–36).

Fuel Pump Control Circuit

CIRCUIT DESCRIPTION

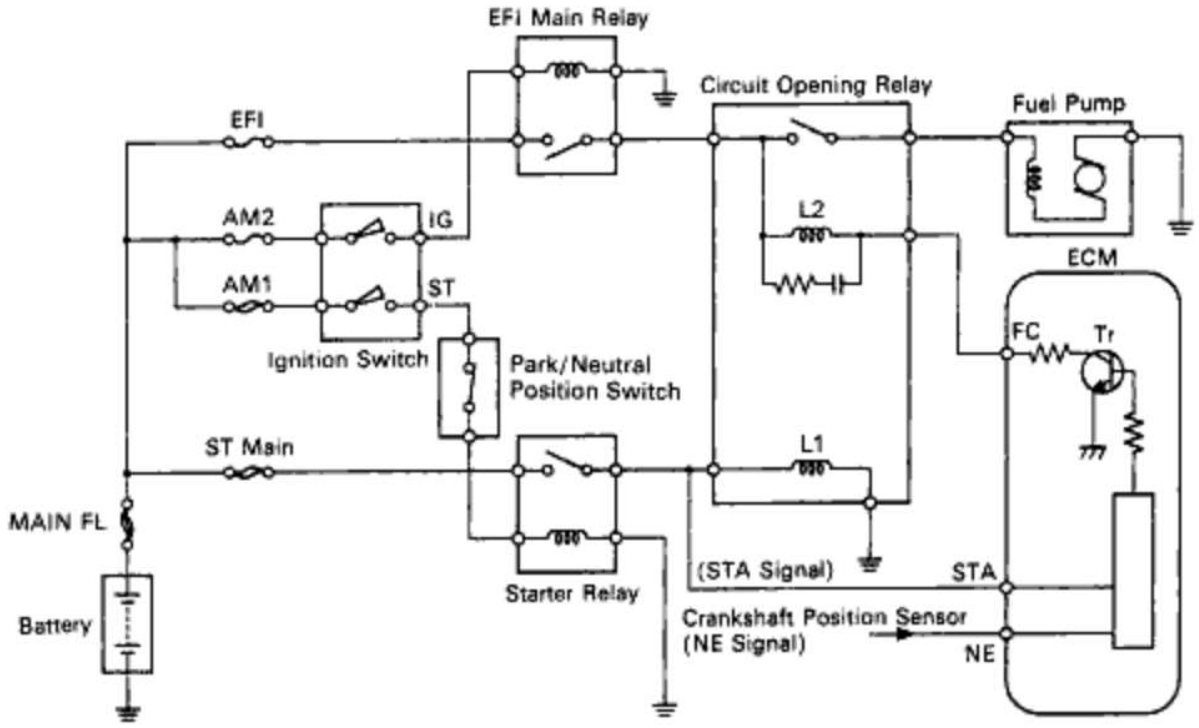
Fuel pump control

The fuel pump is switched on (low voltage at terminal FC) when STA is on or while the NE signal is input to the ECM.

In the diagram below, when the engine is cranked, current flows from terminal ST of the ignition switch to the starter relay coil, the starter relay switches on and current flows to coil L1 of the circuit opening relay. Thus the circuit opening relay switches on, power is supplied to the fuel pump and the fuel pump operates.

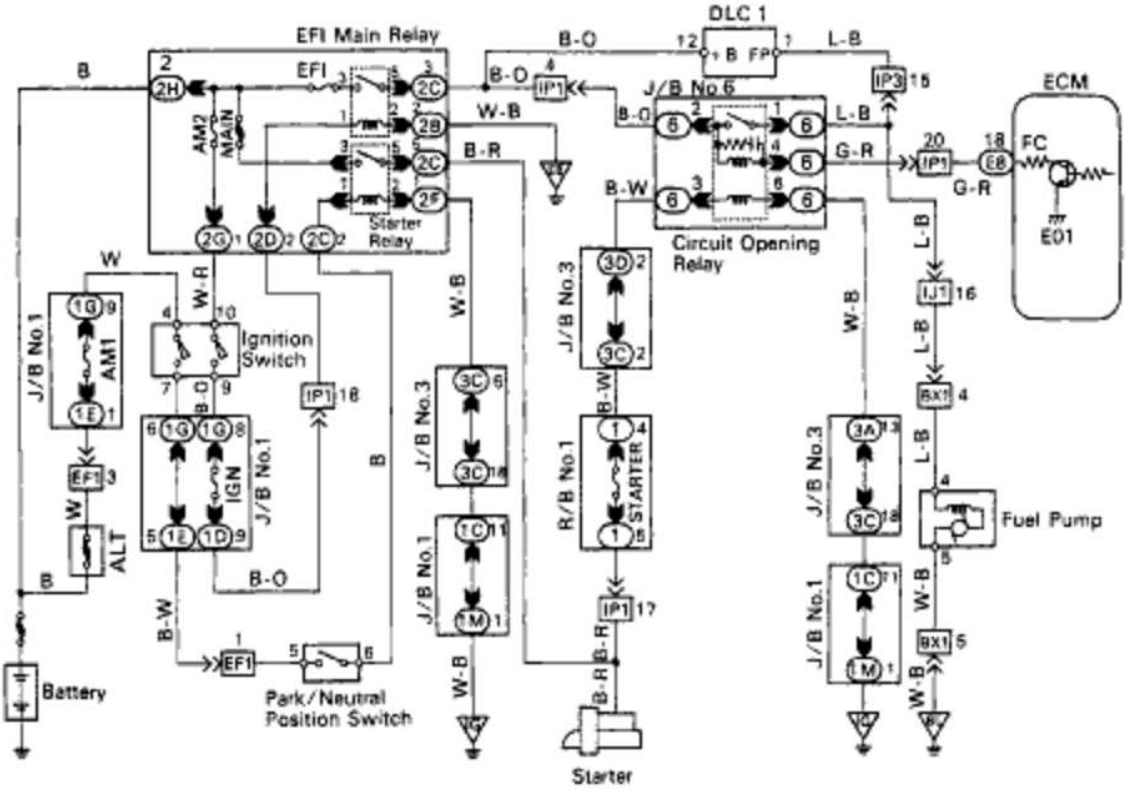
When the STA signal and NE signal are input to the ECM, Tr is turned ON, current flows to coil L2 of the circuit opening relay, the relay switches on and the fuel pump operates.

While the NE signal is generated (engine running), the ECM keeps Tr ON (circuit opening relay ON) and the fuel pump also keeps operating.



FI6722

WIRING DIAGRAM



FI7143

DIAGNOSTIC CHART
TOYOTA hand – held tester

1	Check fuel pump operation.	OK	Go to step 4

NG

2	Check for ECM power source circuit.	NG	Repair or replace.

OK

3	Check fuel pump.	NG	Repair or replace fuel pump.

OK

Check for open in harness and connector between terminal FP of DLC1 and fuel pump. fuel pump and body ground.

4	Connect the TOYOTA hand – held tester and check operation of fuel pump.	OK	Go to step 7

NG

5	Check circuit opening relay.	NG	Replace circuit opening relay.

OK

6	Check voltage terminal FC.	OK	Check and replace ECM.

NG

Check for open in harness and connector between ER main relay and circuit opening relay, circuit opening relay and ECM.

7	Check circuit opening relay.	NG	Replace circuit opening relay.

OK

8	Check voltage terminal 3 of circuit opening relay.	NG	Check for starter signal circuit.

OK

Check for open in harness and connector between terminal 6 of circuit opening relay and body ground,

OBD II scan tool (excluding TOYOTA hand – held tester)

1	Check fuel pump operation.	OK	Go to step 4

NG

2	Check for ECM power source circuit.	NG	Repair or replace.

OK

3	Check fuel pump.	NG	Repair or replace fuel pump.

OK

Check for open in harness and connector between terminal FP of DLC1 and fuel pump, fuel pump and body ground.

4	Check circuit opening relay.	NG	Replace circuit opening relay.

OK

5	Check voltage terminal FC.	OK	Check and replace ECM.

NG

6	Check for open in harness and connector between EFI main relay and ECM.	NG	Repair or replace harness or connector.

OK

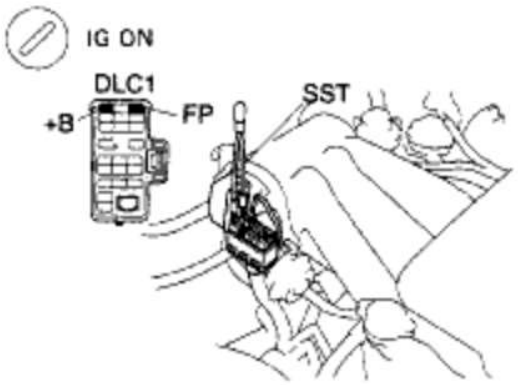
7	Check voltage terminal 3 of circuit opening relay.	NG	Check for starter signal circuit.

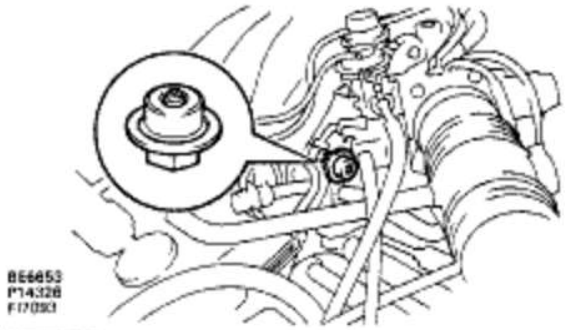
OK

Check for open in harness and connector between terminal 6 of circuit opening relay and body ground.

INSPECTION PROCEDURE
TOYOTA hand–held tester

1 **Check fuel pump operation.**





P (1) Be sure that enough fuel is in the tank.
(2) Turn ignition switch ON.
(3) Using SST, connect terminals FP and + B of DLC 1,
SST 09843–18020

C Check that pulsation damper screw rises up when terminals are connected.

Caution
Never make a mistake with the terminal connection position as this will cause a malfunction.

OK **The pulsation damper screw rises up.**

NG

OK → Go to step 4

2 **Check for ECM power source circuit (See page EG2–565).**

OK

NG → Repair or replace.

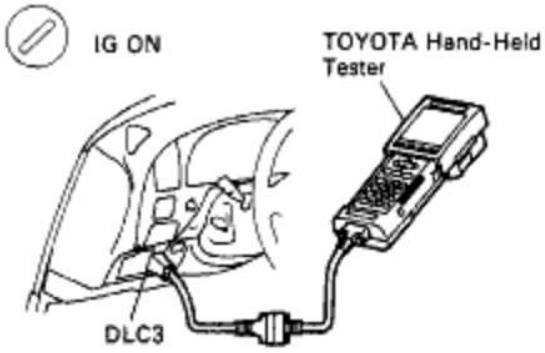
3 **Check fuel pump (See page EG2–234).**

OK

NG → Repair or replace fuel pump.

Check for open in harness and connector between terminal FP of DLC 1 and fuel pump, fuel pump and body ground (See page IN–31).

4	Connect the TOYOTA hand–held tester and check operation of fuel pump.



P (1) Remove the fuse cover on the instrument panel.
(2) Connect the TOYOTA hand–held tester to the DLC 3.
(3) Turn ignition switch ON and TOYOTA hand–held tester main switch ON.
(4) Select the active test mode on the TOYOTA hand–held tester.

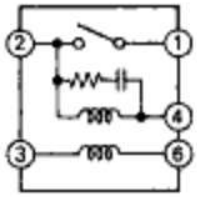
C Check that pulsation damper screw rises up when fuel pump is on by TOYOTA hand–held tester.

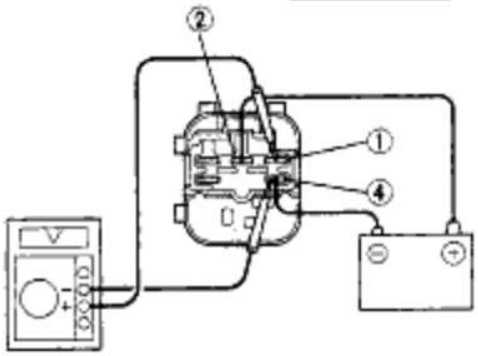
OK **The pulsation damper screw rises up.**

NG

OK → Go to step 7

5 **Check circuit opening relay.**





F17063
F17068

P Remove circuit opening relay from R/B No.6.

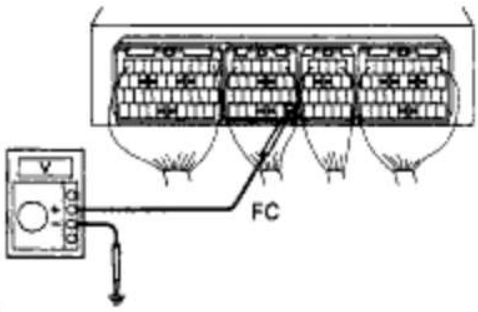
C (1) Apply battery voltage between terminals 2 and 4.
(2) Measure voltage between terminals 1 and 4.

OK

Terminals 1 and 4	Same as battery

OK → **NG** → **Replace circuit opening relay.**

6 **Check voltage between terminal FC of ECM and body ground.**



S46653
F17030

P (1) Remove glove compartment (see page EG2–309).
(2) Turn ignition switch ON.

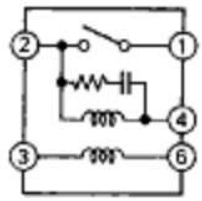
C Measure voltage between terminal FC of ECM and body ground.

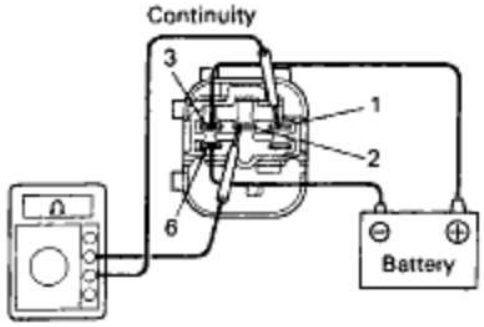
OK **Voltage: 9 –14 V**

NG → **OK** → **Check and replace ECM (See page IN–36).**

Check for open in harness and connector between EFI main relay and circuit opening relay, circuit opening relay and ECM (See page IN–31).

7 **Check circuit opening relay.**





FI7053
FI1909

P (1) Remove glove compartment (See page EG2–309).
(2) Remove circuit opening relay from R/B No.6.

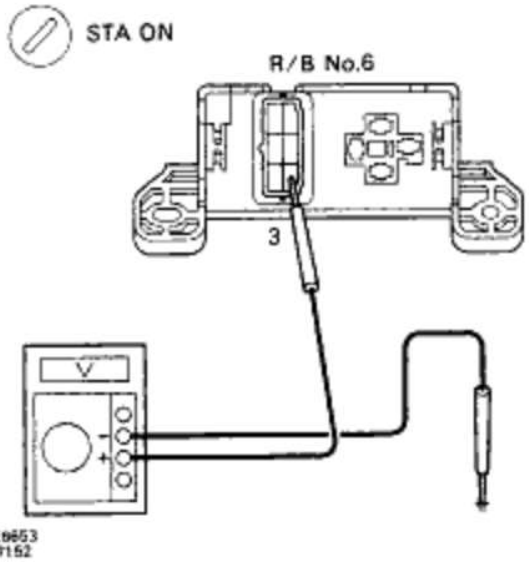
C (1) Apply battery voltage between terminals 3 and 6.
(2) Check continuity between terminals 1 and 2.

OK

Terminals 1 and 2	Continuity

OK → NG → **Replace circuit opening relay.**

8 **Check voltage between terminal 3 of R/B No.6 (for circuit opening relay) and body ground.**



B69653
FI7152

C Measure voltage between terminal 3 of R/B No.6 (for circuit opening relay) and body ground when engine is cranked.

OK **Voltage: 9 –14 V**

OK → NG → **Check for starter signal circuit (See page EG2–557).**

Check for open in harness and connector between terminal 6 of R/6 No.6 (for circuit opening relay) and body ground (See page IN–31).

OBDII scan tool (excluding TOYOTA hand–held tester)

1 Check fuel pump operation (See page EG2–580, step

NG

OK → Go to step 4

2 Check for ECM power source circuit (See page EG2–565).

OK

NG → Repair or replace.

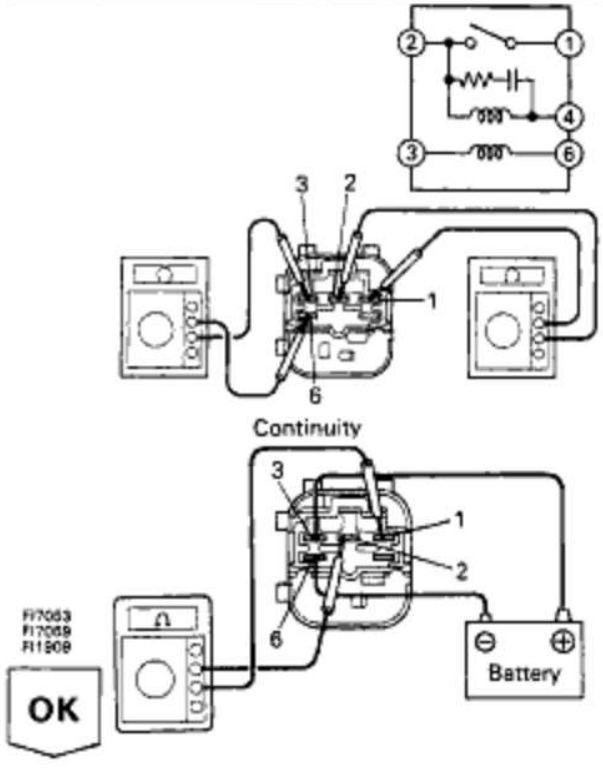
3 Check fuel pump (See page EG2–234).

OK

NG → Repair or replace fuel pump.

Check for open in harness and connector between terminal FP of DLC1 and fuel pump, fuel pump and body ground (See page IN–31)

4 Check circuit opening relay.



P (1) Remove glove compartment (See page EG2–309).
(2) Remove circuit opening relay from R/B No.6.

C Check continuity between terminals of circuit opening relay shown below.

OK

Terminals 1 and 2	Open
Terminals 3 and 6	Continuity (Reference value 30Ω)

C (1) Apply battery voltage between terminals 3 and 6.
(2) Check continuity between terminals 1 and 2.

OK

Terminals 1 and 2	Continuity

OK

NG → Replace circuit opening relay.

5	Check voltage between terminal FC of ECM and body ground (Seepage EG2–582, step 6

NG → OK: Check and replace ECM (See page IN–36).

6	Check for open in harness and connector between ER main relay and circuit opening relay, circuit opening relay and ECM (See page IN–31).

OK → NG: Repair or replace harness or connector.

7	Check voltage between terminal 3 of R/B No–6 (for circuit opening relay) and body ground (See page EG2–583, step 8).

OK → NG: Check for starter signal circuit (See page EG2–557).

OK: Check for open in harness and connector between terminal 6 of circuit opening relay and body ground (See page IN–31).

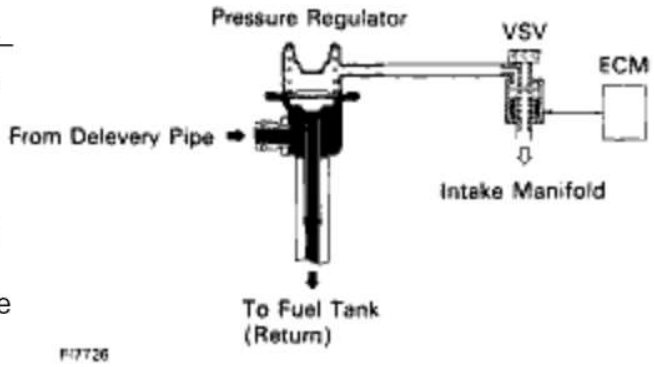
Fuel Pressure Control VSV Circuit

CIRCUIT DESCRIPTION

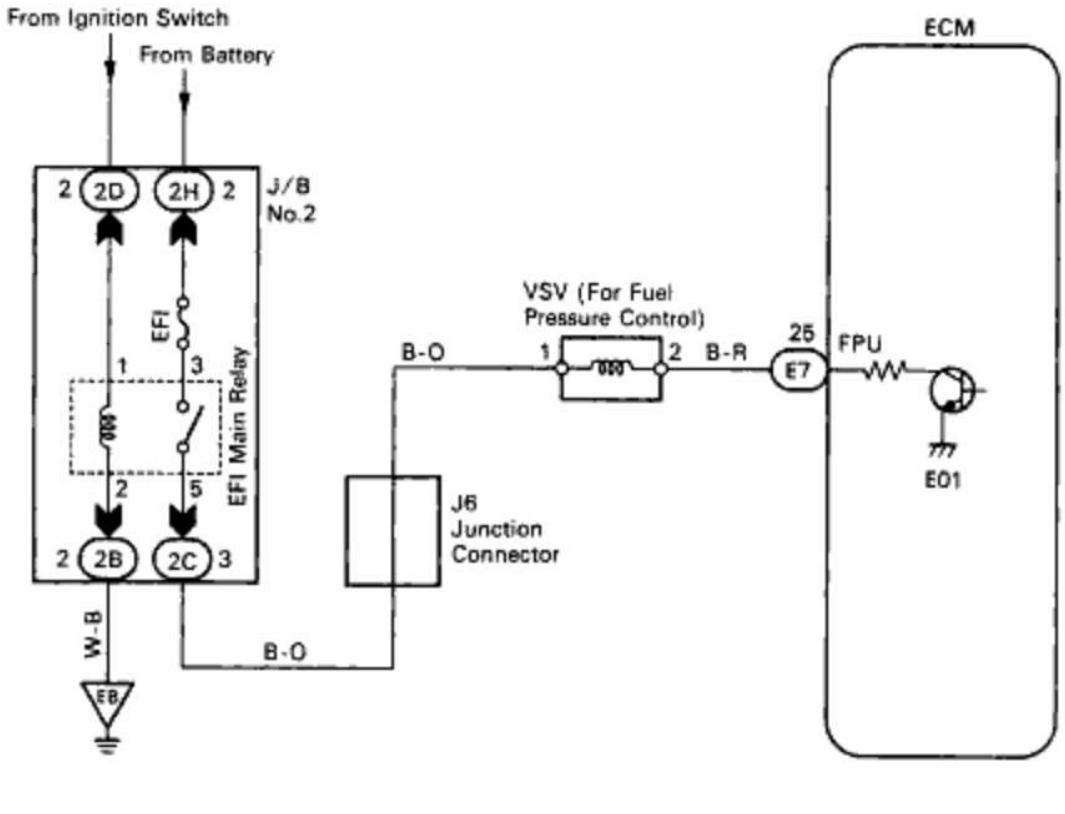
The ECM turns on a VSV (Vacuum Switching Valve) to draw the air into the diaphragm chamber of the pressure regulator if it detects that the temperature of the engine coolant is too high during engine starting.

The air drawn into the chamber increases the fuel pressure to prevent fuel vapor lock at high engine temperature in order to help the engine start when it is warm.

Fuel pressure control ends approx. 120 sec. after the engine is started.



WIRING DIAGRAM



DIAGNOSTIC CHART
TOYOTA hand–held tester

1	Connect the TOYOTA hand–held tester and check operation of fuel pressure control VSV.	OK	Check and repair fuel pressure regulator.

NG

2	Check fuel pressure control VSV.	NG	Replace fuel pressure control VSV.

OK

3	Check for open and short in harness and connector between EFI main relay and ECM.	NG	Repair or replace harness or connector.

OK

Check and replace ECM.

OBDII scan tool (excluding TOYOTA hand–held tester)

1	Check fuel pressure control VSV.	NG	Replace fuel pressure control VSV.

OK

2	Check voltage between terminal FPU and body ground.	NG	Check and repair harness or connector.

OK

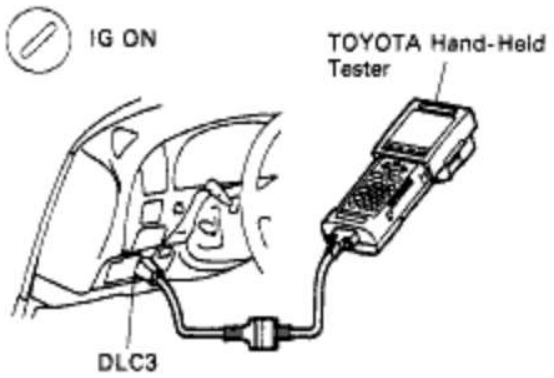
3	Check fuel pressure regulator.	NG	Repair or replace.

OK

Check and replace ECM.

INSPECTION PROCEDURE
TOYOTA hand–held tester

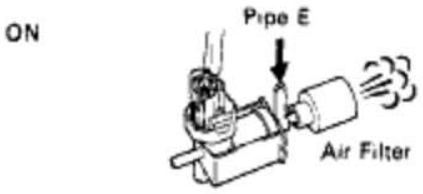
1	Connect the TOYOTA hand–held tester and check operation of fuel pressure control VSV.

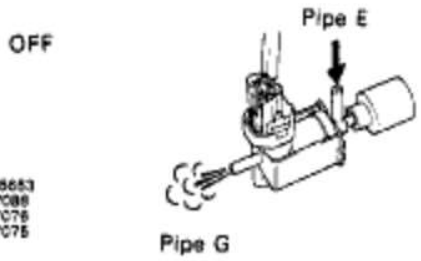


P (1) Remove the fuse cover on the instrument panel.
(2) Connect the TOYOTA hand–held tester to the DLC 3.
(3) Turn ignition switch ON and TOYOTA hand–held tester main switch ON.
(4) Select the active test mode on the TOYOTA hand–held tester.

C Check operation of fuel pressure control VSV when fuel pressure control VSV is operated by the TOYOTA hand–held tester.

OK **Fuel pressure control VSV is ON:**
The air from pipe E is flowing out through the air filter.
Fuel pressure control VSV is OFF:
The air from pipe E is flowing out through pipe G.



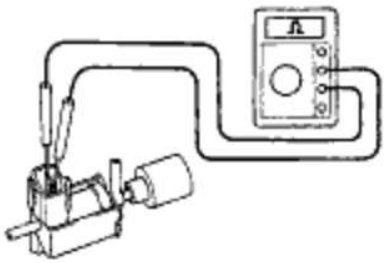


B65653
F17086
F17076
F17075

NG

OK → Check and repair fuel pressure regulator (See page EG2–240).

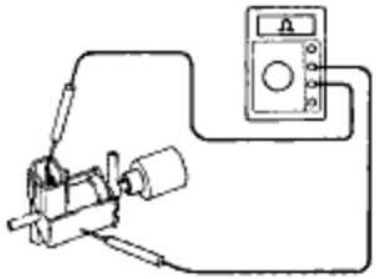
2 **Check fuel pressure control VSV.**

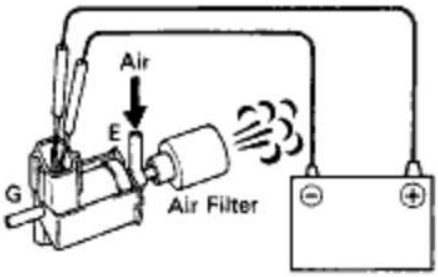


P (1) Remove fuel pressure control VSV.
(2) Disconnect fuel pressure control VSV connector.

C (1) Measure resistance between terminals.
(2) Measure resistance between each terminal and the body.

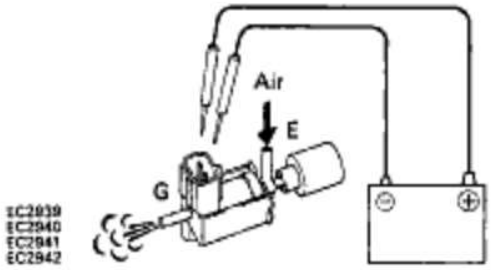
OK **(1) Resistance: 26 – 46 at 20°C (68°F)**
(2) Resistance: 1 M or higher





C Check operation of fuel pressure control VSV when battery positive voltage is applied to the terminals of fuel pressure control VSV connector or not.

OK **Battery positive voltage is applied:**
The air from pipe E is flowing out through the air filter.
Battery positive voltage is not applied:
The air from pipe E is flowing out through pipe G.



OK → NG → **Replace fuel pressure control VSV.**

3 **Check for open and short in harness and connector between EFI main relay and ECM (See page IN–31).**

OK → NG → **Repair or replace harness or connector.**

Check and replace ECM (See page IN–36).

INSPECTION PROCEDURE
OBDII scan tool (excluding TOYOTA hand–held tester)

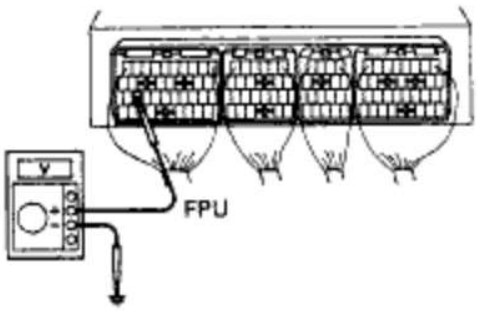
1 Check fuel pressure control VSV (See page EG2–589, step

OK

NG → Replace fuel pressure control VSV.

2 Check voltage between terminal FPU of ECM connector and body ground.

IG ON



BE6653
FI702B

P (1) Remove glove compartment (See page EG2–309).
(2) Turn ignition switch ON.

C Measure voltage between terminal FPU of ECM connector and body ground.

OK **Voltage: 9 –14 V**

OK

NG → Check for open and short in harness and connector between EFI main relay and ECM (See page IN–31).

3 Check fuel pressure regulator (See page EG2–240).

OK

NG → Repair or replace.

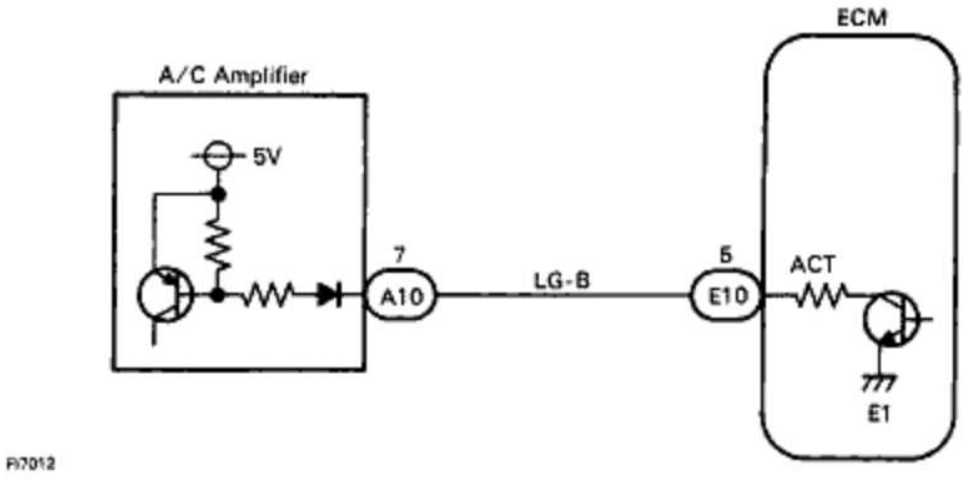
Check and replace ECM (See page IN–36).

AC Cut Control Circuit

CIRCUIT DESCRIPTION

This circuit cuts air conditioning operation during vehicle acceleration in order to increase acceleration performance. During acceleration with the vehicle speed at 25 km/h (16 mph) or less, engine speed at 1,600 rpm or less and throttle valve opening angle at 60_2 or more, the A/C magnet switch is turned OFF for several seconds.

WIRING DIAGRAM



DIAGNOSTIC CHART
TOYOTA hand–held tester

1	Connect the TOYOTA hand–held tester and check operation of air conditioning cut control.	OK	Proceed to next circuit inspection shown on matrix chart.
NG			
2	Check for open and short in harness and connector between ECM and A/C amplifier.	NG	Repair or replace harness or connector.
OK			
3	Check voltage terminal ACT.	NG	Check and replace A/C amplifier.
OK			
Check and replace ECM.			

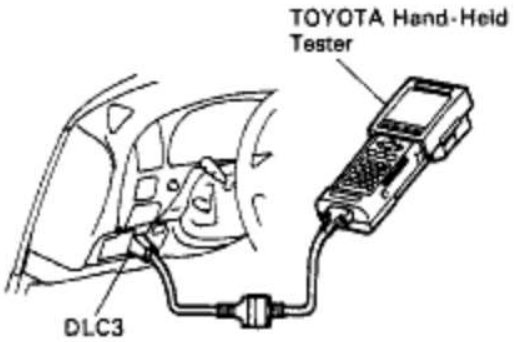
OBDII scan tool (excluding TOYOTA hand–held tester)

1	Check voltage terminal ACT.	OK	Check and replace ECM.
NG			
2	Check for open and short in harness and connector between ECM and A/C amplifier.	NG	Repair or replace harness or connector.
OK			
Check and replace A/C amplifier.			

INSPECTION PROCEDURE
TOYOTA hand–held tester

1 **Connect the TOYOTA hand–held tester and check operation of air conditioning cut control.**

IG ON



P (1) Remove the fuse cover on the instrument panel.
(2) Connect the TOYOTA hand–held tester to the DLC3.
(3) Turn ignition switch ON and TOYOTA hand–held tester main switch ON.
(4) Start the engine and air conditioning switch ON.
HINT: A/C magnet clutch is turned ON.
(5) Select the active test mode on the TOYOTA hand–held tester.

C Check operation of A/C magnet clutch cut when air conditioning cut control is operated by the TOYOTA hand–held tester.

OK **A/C magnet clutch is turned OFF.**

NG

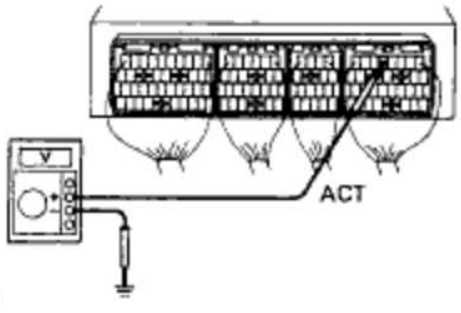
OK → **Proceed to next circuit inspection shown on matrix chart (See page EG2–435).**

2 **Check for open and short in harness and connector between ECM and A/C amplifier (See page IN–31).**

OK

NG → **Repair or replace harness or connector.**

3 **Check voltage between terminal ACT of ECM and body ground.**



P (1) Remove glove compartment (See page EG2–309).
(2) Start the engine.

C Measure voltage between terminal ACT of ECM connector and body ground when A/C switch is turned to ON and OFF.

OK

A/C switch condition	Voltage
ON	4.5 – 5.5 V
OFF	0 –2 V

OK

NG → **Check and replace A/C amplifier.**

Check and replace ECM (See page IN–36).

INSPECTION PROCEDURE
OBDII scan tool (excluding TOYOTA hand–held tester)

1	Check voltage between terminal ACT of ECM and body ground (See page EG2–593, step 3).

NG

OK → Check and replace ECM (See page IN–36).

2	Check for open and short in harness and connector between ECM and A/C amplifier (See page IN–31).

OK

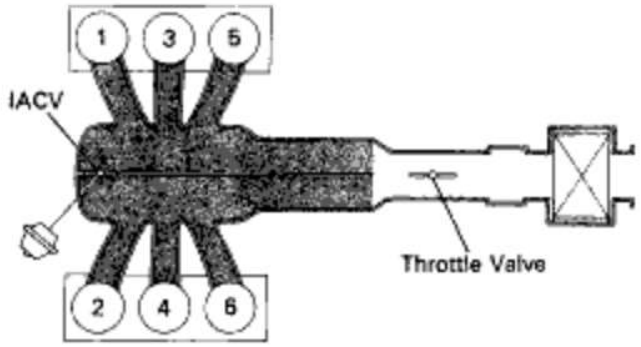
NG → Repair or replace harness or connector.

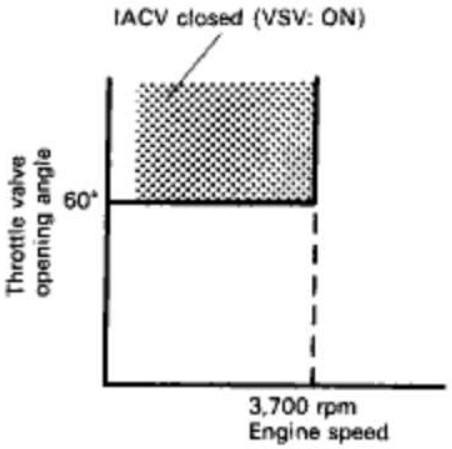
Check and replace A/C amplifier.

IACV Control VSV Circuit

CIRCUIT DESCRIPTION

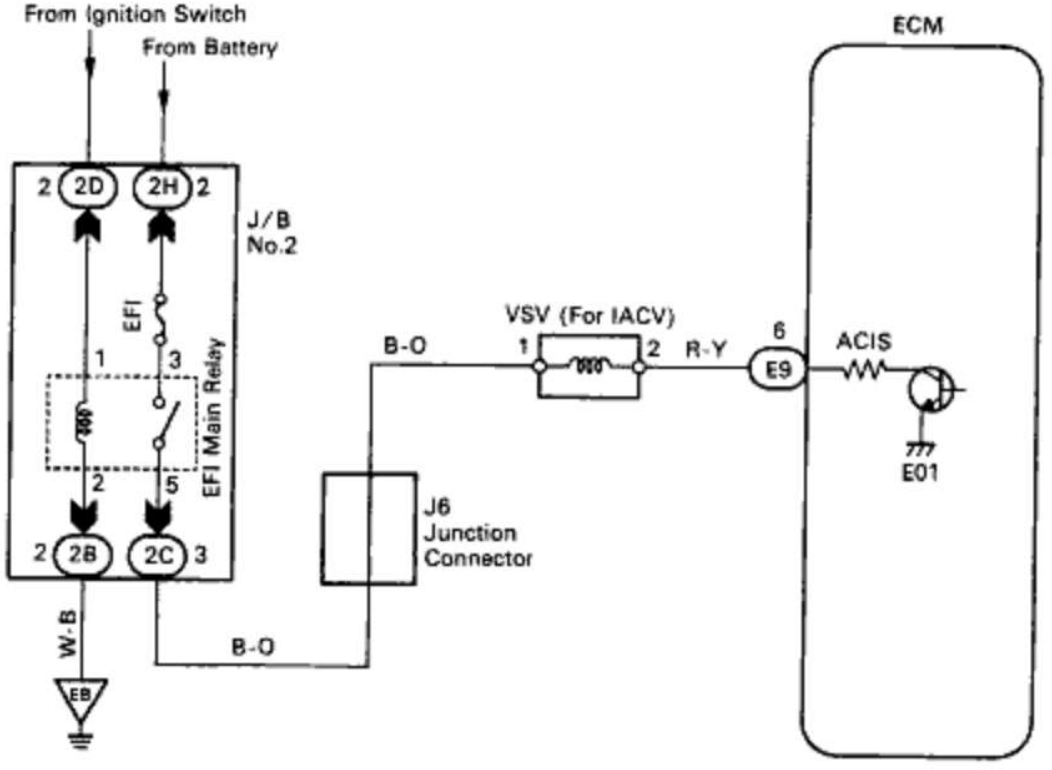
This circuit opens and closes the IACV (Intake Air Control Valve) in response to the engine load in order to increase the intake efficiency (ACIS: Acoustic Control Induction System).
When the engine speed is 3,700 rpm or less and the throttle valve opening angle is 60_2 or more, the ECM turns the VSV ON and closes the IACV. At all other times, the VSV is OFF, so the IACV is open.





FI7011 FI6670

WIRING DIAGRAM



FI7017

DIAGNOSTIC CHART
TOYOTA hand–held tester

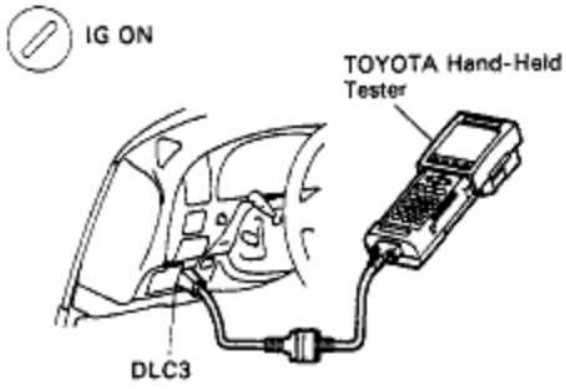
1	Connect the TOYOTA hand–held tester and check operation of IACV control VSV.	OK	Check for vacuum tank.
NG			
2	Check IACV control VSV.	NG	Replace IACV control VSV.
OK			
3	Check for open and short in harness and connector between EFI main relay and ECM.	NG	Repair or replace harness or connector.
OK			
Check and replace ECM.			

OBDII scan tool (excluding TOYOTA hand–held tester)

1	Check IACV control VSV.	NG	Replace IACV control VSV.
OK			
2	Check voltage between terminal ACIS and body ground.	NG	Check and repair harness or connector.
OK			
3	Check vacuum tank.	NG	Repair or replace.
OK			
Check and replace ECM.			

INSPECTION PROCEDURE
TOYOTA hand–held tester

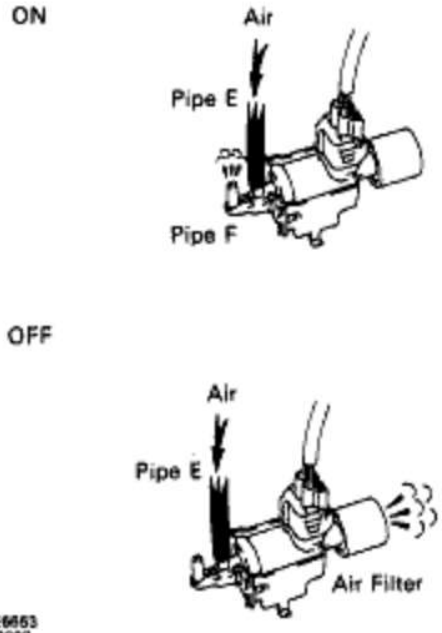
1 **Connect the TOYOTA hand–held tester and check operation of IACV control VSV.**



P (1) Remove the fuse cover on the instrument panel.
(2) Connect the TOYOTA hand–held tester to the D LC3.
(3) Turn ignition switch ON and TOYOTA hand–held tester main switch ON.
(4) Select the active test mode on the TOYOTA hand–held tester.

C Check operation of IACV control VSV when IACV control VSV is operated by TOYOTA hand–held tester.

OK **IACV control VSV is ON:**
The air from port E is flowing out through port F.
IACV control VSV is OFF:
The air from port E is flowing through the air filter.

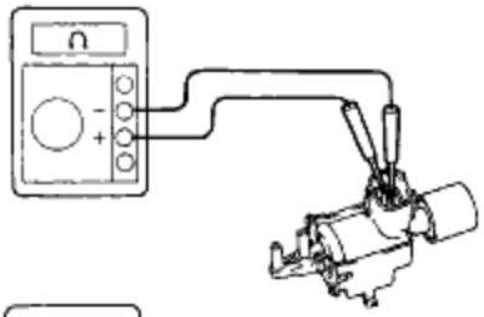


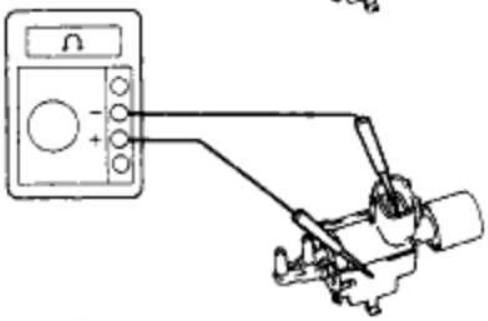
BE6663
FI7088
FI7073
FI7074

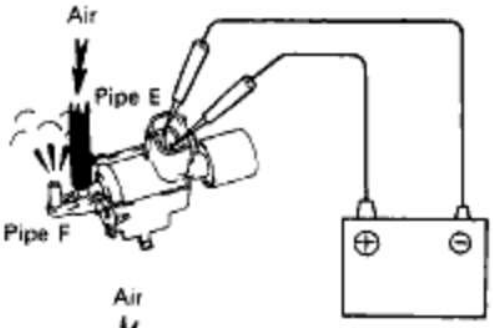
NG

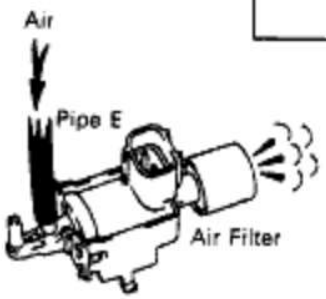
OK → **Check for vacuum tank (See page EG2–277).**

2 **Check IACV control VSV.**









FI6350
FI6348
FI6392
FI6393

P
(1) Remove IACV control VSV.
(2) Disconnect IACV control VSV connector.

C
(1) Measure resistance between terminals.
(2) Measure resistance between each terminal and the body.

OK
(1) Resistance: 26 – 46 at 20$_2$C (68$_2$F)
(2) Resistance: 1 M or higher.

C Check operation of IACV control VSV when battery positive voltage is applied to the terminals of IACV control VSV connector or not.

OK
Battery positive voltage is applied:
The air from pipe E is following out through pipe F.
Battery positive voltage is not applied:
The air from pipe E is flowing out through the air filter.

OK → NG → **Replace IACV control VSV.**

3 **Check for open and short in harness and connector between EFI main relay and ECM (See page IN–31).**

OK → NG → **Repair or replace harness or connector.**

Check and replace ECM (See page IN–36).

INSPECTION PROCEDURE
OBDII scan tool (excluding TOYOTA hand–held tester)

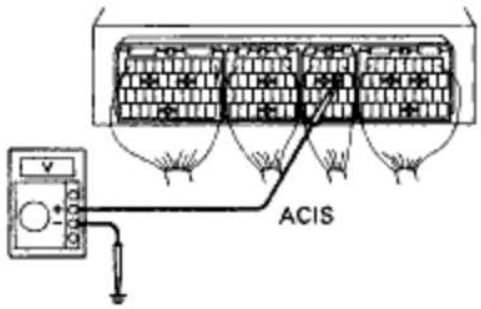
1 Check IACV control VSV (See page EG2–598, step 2)

OK

NG → Replace IACV control VSV.

2 Check voltage between terminal ACIS of ECM connector and body ground.

IG ON



BE6653
FI7026

P (1) Remove glove compartment (See page EG2–309).
(2) Turn ignition switch ON.

C Measure voltage between terminal ACIS of ECM connector and body ground.

OK **Voltage: 9 –14 V**

OK

NG → Check for open and short in harness and connector between EFI main relay and ECM (Seepage IN–31).

3 Check for vacuum tank (See page EG2–277).

OK

NG → Repair or replace.

Check and replace ECM (See page IN–36).