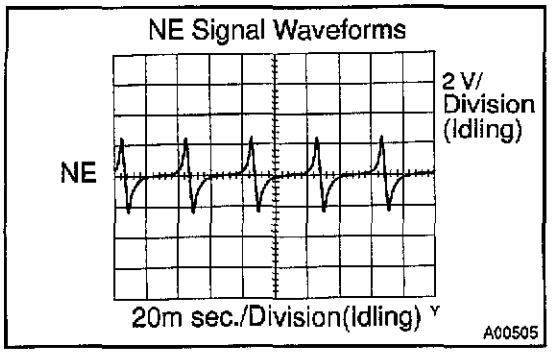
DIHN-01

DTC	12	NE Signal Circuit

CIRCUIT DESCRIPTION

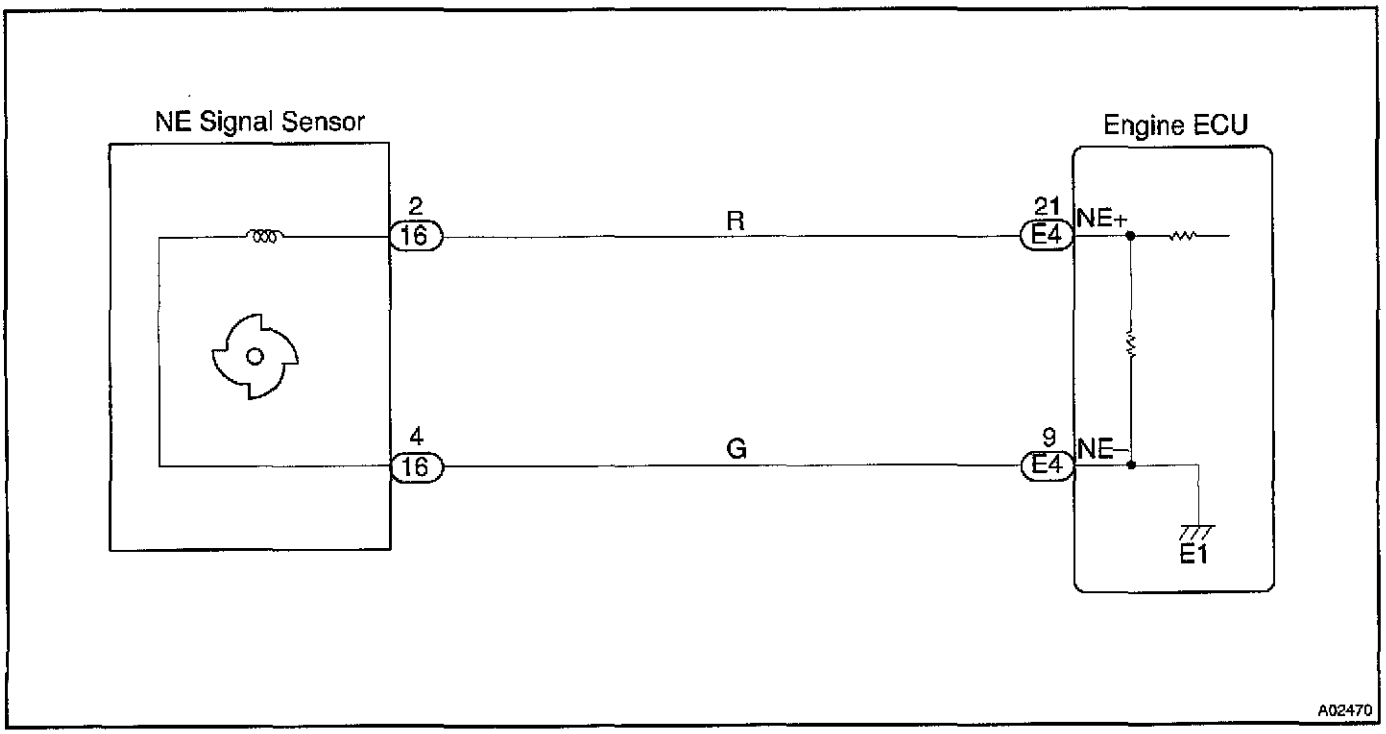
The IIA in the Engine Control System contains signal plate and a pickup coil for NE signal.
The NE signal plate has 4 teeth on its outer circumference. The NE signal sensor generates 4 signals for every engine revolution. The ECU detects the engine speed by the NE signals.

DTC No.	Detection Item	Trouble Area
12	No NE signal to ECU during cranking	• Open or short in NE circuit • IIA • Open or short in STA circuit • Engine ECU



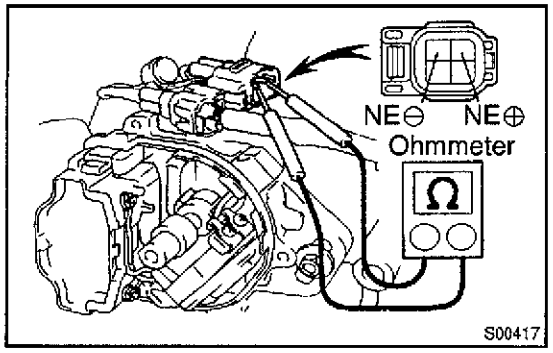
Reference: INSPECTION USING OSILLOSCOPE
During cranking or idling, check between terminals NE+ and NE– of engine ECU.
HINT:
The correct wavaforms are as shown.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check resistance of pickup coil in distributor (NE).



PREPARATION:
Disconnect distributor connector.
CHECK:
Measure resistance between each terminal shown in table below
OK:

		Resistance
NE Pickup Coil (NE⊕ – NE⊖)	Cold	370 – 550 Ω
	Hot	475 – 650 Ω

"Cold" is from –10°C (14°F) to 50°C (122°F) and "Hot" is from 50°C (122°F) to 100°C (212°F).

NG → **Replace distributor housing.**

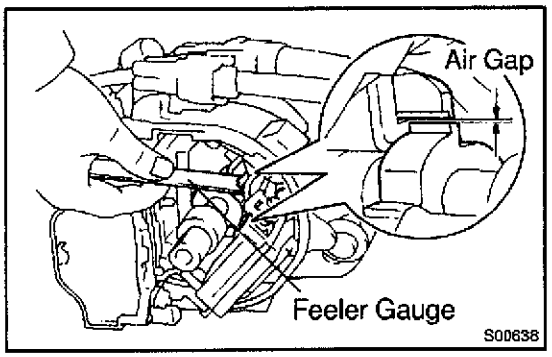
OK

2	Check for open and short in harness and connector between engine ECU and distributor (See page IN–21).

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

OK

3	Check air gap.



PREPARATION:
Remove distributor cap, rotor and dust cover.
CHECK:
Using a feeler gauge, measure the air gap between the signal rotor and pickup coil projection.
OK:
Air gap: 0.2 – 0.4 mm (0.008 – 0.016 in.)

NG → **Replace distributor housing.**

OK →

Check and replace engine ECU.

DIHO–01

DTC	13	NE Signal Circuit

CIRCUIT DESCRIPTION

Refer to NE signal circuit on page DI–20.

DTC No.	Detection Item	Trouble Area
13	No NE signal to ECU for 0.3 sec. or more at 1,500 rpm or more	• Open or short in NE circuit • IIA • Engine ECU

This code indicates that an intermittent problem of the NE signal from the distributor to the ECU has occurred, but that it has returned to normal. Note that although this problem may not necessarily appear at the time of inspection, it cannot be ignored because this diagnostic trouble code is output, indicating that there is or was a malfunction in the NE signal circuit; this "malfunction" is usually a loose connector.
The distributor connector and the NE terminal of the ECU connector must therefore be checked for the following:

(1) Loose connectors
(2) Dirty connector terminals
(3) Loose connector terminals

DI1HP-01

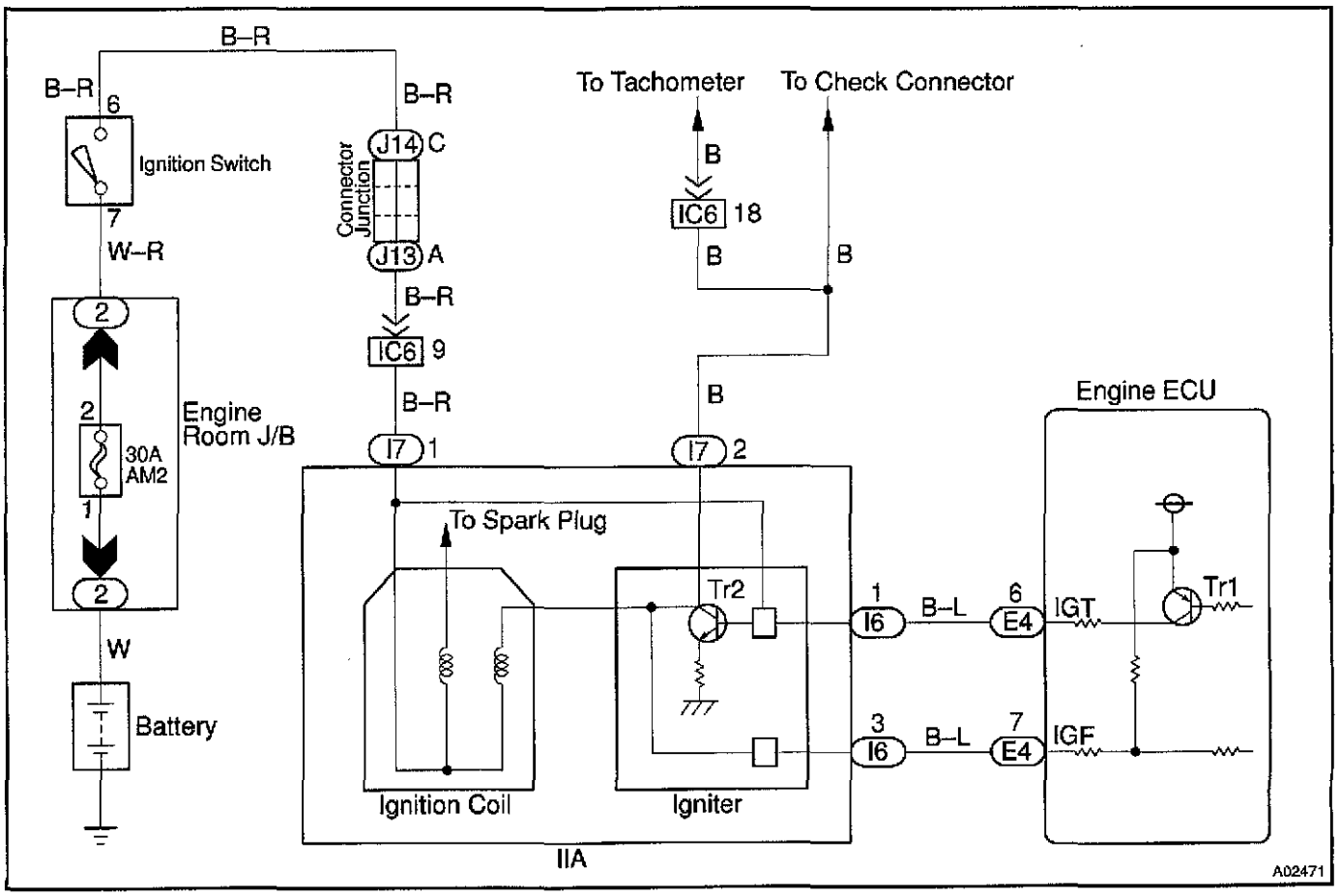
DTC	14	Ignition Signal Circuit

CIRCUIT DESCRIPTION

The ECU 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 speed and ignition timing one revolution ago, that is, the time the Tr2 turns ON.
When it reaches the ignition timing, the ECU 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 ECU.
The ECU stops fuel injection as a fail safe function when the IGF signal is not input the ECU.

DTC No.	Detection Item	Trouble Area
14	No IGF signal to ECU for 4 consecutive IGT signal	• Open or short in IGF or IGT circuit from IIA to engine ECU • Igniter • Engine ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check spark plug and spark (See Pub. No. RM467E).

NG → Go to step 4.

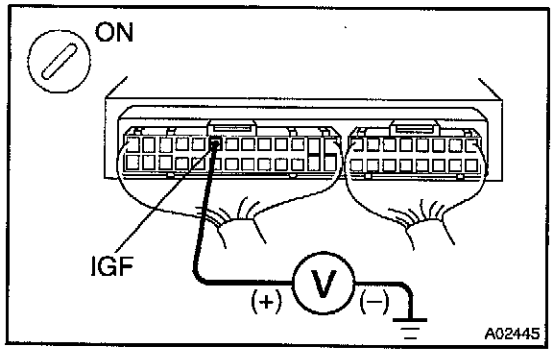
OK

2	Check for open and short in harness and connector in IGF signal circuit between engine ECU and IIA (See page IN–21).

NG → Repair or replace harness or connector.

OK

3	Disconnect IIA connector and check voltage between terminal IGF of engine ECU connector and body ground.



PREPARATION:

(a) Disconnect IIA connector.
(b) Remove the glove compartment.(See page FI–60)
(c) Turn ignition switch ON.

CHECK:

Measure voltage between terminal IGF of ECU connector and body ground.

OK:

Voltage: 4.5 – 5.5 V

OK → Replace igniter.

NG

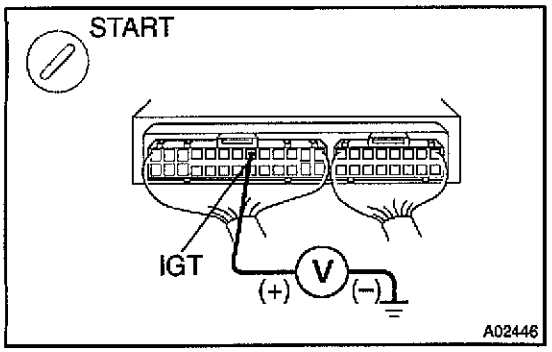
Check and replace engine ECU (See page IN–21).

4	Check for open and short in harness and connector in IGT signal circuit between engine ECU and IIA (See page IN–21).

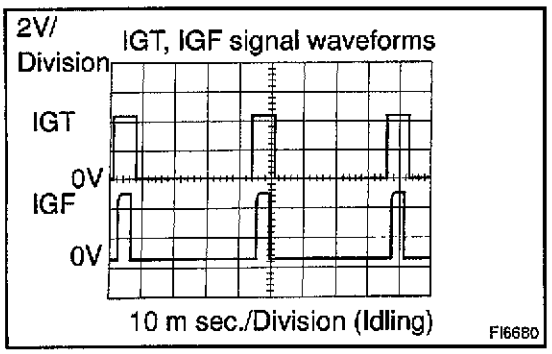
NG → Repair or replace harness or connector.

OK

5	Check voltage between terminals IGT of engine ECU connector and body ground.



PREPARATION:
Remove the glove compatment.(See page FI–60)
CHECK:
Measure voltage between terminal IGT of ECU connector and body ground when engine is cranked.
OK:
Voltage: More than 0.1 V and less than 4.5 V

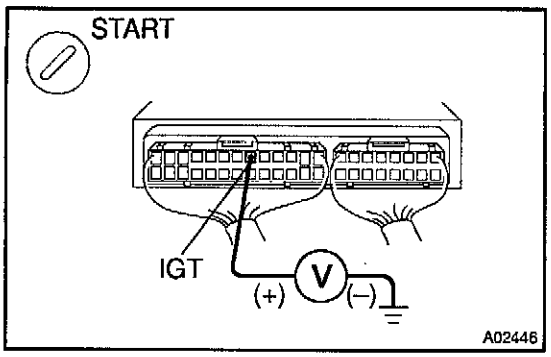


Reference: INSPECTION USING OSCILLOSCOPE
During idling, check waveform between terminals IGT and E1 of ECU.
HINT:
The correct waveform are as shown.

NG → Check and replace engine ECU (See page IN–21).

OK

6	Disconnect IIA connector and check voltage between terminal IGT of engine ECU connector and body ground.



PREPARATION:
(a) Disconnect igniter connector.
(b) Remove the glove compatment.(See page FI–60)

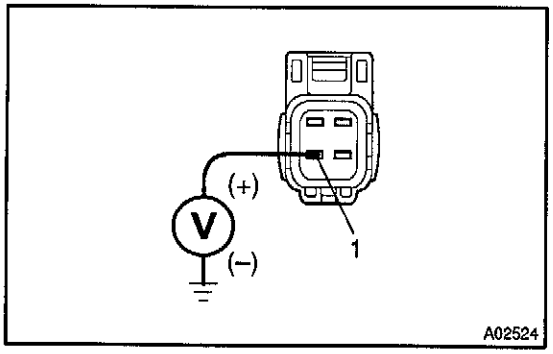
CHECK:
Measure voltage between terminal IGT of ECU connector and body ground when engine is cranked.

OK:
Voltage: More than 0.1 V and less than 4.5 V

NG → **Check and replace engine ECU (See page IN–21).**

OK

7	Check voltage of IIA power source .



PREPARATION:
Disconnect IIA connector.

CHECK:
Measure voltage between terminal 1 of IIA connector and body ground, when ignition switch is turned to "ON" and "START" position.

OK:
Voltage: 9 – 14 V

NG → **Check for open and short in harness and connector between ignition switch and IIA (See page IN–21).**

OK

8	Check ignition coil (See Pub. No. RM467E).

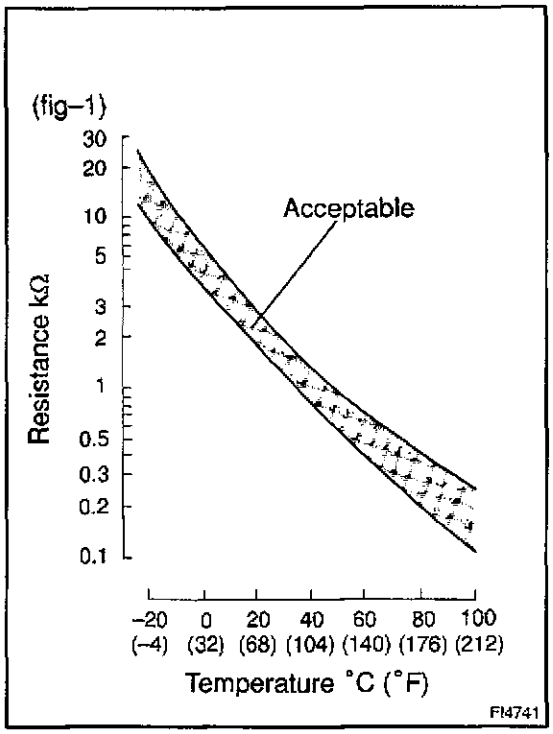
NG → Replace ignition coil.

OK

Replace igniter.

DTC	22	Water Temp. Sensor Circuit

CIRCUIT DESCRIPTION

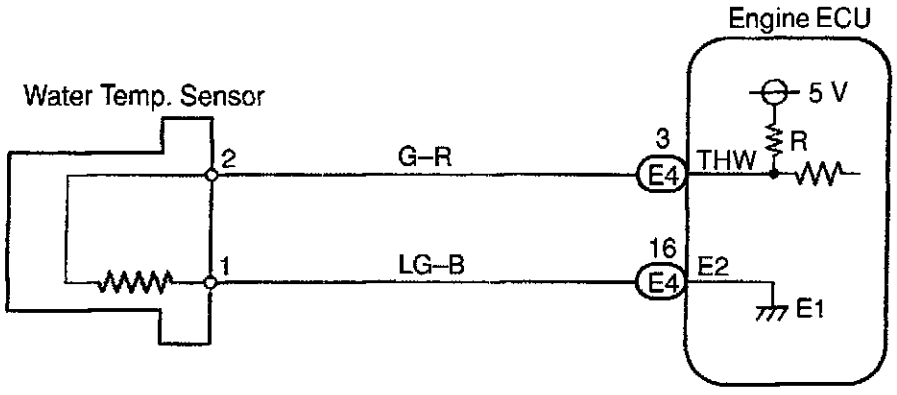


The water temperature sensor senses the coolant temperature. A thermistor built into the sensor changes the resistance value according to the coolant temperature. The lower the coolant temperature, the greater the thermistor resistance value, and the higher the coolant temperature, the lower the thermistor resistance value (See Fig.1).

The water temperature sensor is connected to the ECU (See below). The 5 V power source voltage in the ECU is applied to the water temperature sensor from the terminal THW via a resistor R. That is, the resistor R and the water temperature sensor are connected in series. When the resistance value of the water temperature sensor changes in accordance with changes in the coolant temperature, the potential at the terminal THW also changes. Based on this signal, the ECU increases the fuel injection volume to improve driveability during cold engine operation. If the ECU detects the diagnostic trouble code 22, it operates the fail safe function in which the engine coolant temperature is assumed to be 80°C (170°F).

DTC No.	Detection Item	Trouble Area
22	Open or short in water temp. sensor circuit for 0.5 sec. or more	• Open or short in water temp. sensor circuit • Water temp. sensor • Engine ECU

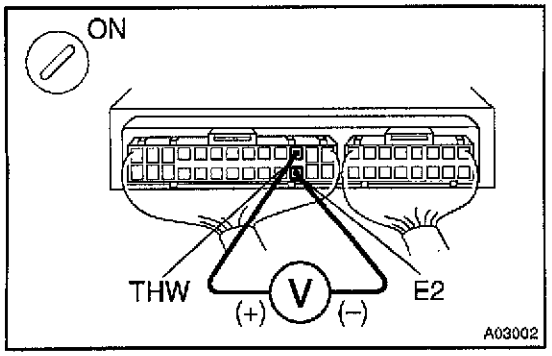
WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
If diagnostic trouble code "22" (water temperature sensor circuit), "24" (intake air temperature sensor circuit), "31" (vacuum sensor circuit) and "41" (throttle position sensor circuit) are output simultaneously, E2 (sensor ground) may be open.

1	Check voltage between terminals THW and E2 of engine ECU connector.



PREPARATION:
(a) Remove the glove compartment.(See page FI–60)
(b) Turn ignition switch ON.

CHECK:
Measure voltage between terminals THW and E2 of engine ECU connector.

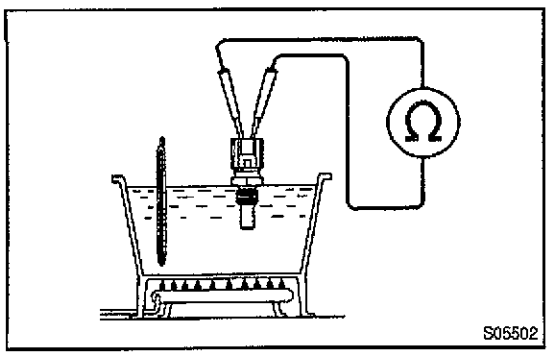
OK:

Engine Coolant Temp.	Voltage
20°C (68°F) (Engine is cool)	0.5 – 3.4 V
80°C (176°F) (Engine is hot)	0.2 – 1.0 V

OK → **Check for intermittent problems (See page DI–3).**

NG

2	Check water temp. sensor.



PREPARATION:
Disconnect the water temp. sensor connector.

CHECK:
Measure resistance between terminals.

OK:
Resistance is within acceptable zone on chart.

Engine Coolant Temp.	Resistance
20°C (68°F)	2 – 3 kΩ
80°C (176°F)	0.2 – 0.4 kΩ

NG → **Replace water temp. sensor.**

OK

3	Check for open and short in harness and connector between engine ECU and water temp. sensor (See page IN–21).

NG → Repair or replace harness or connector.

OK

Check and replace engine ECU.

DI1HR–01

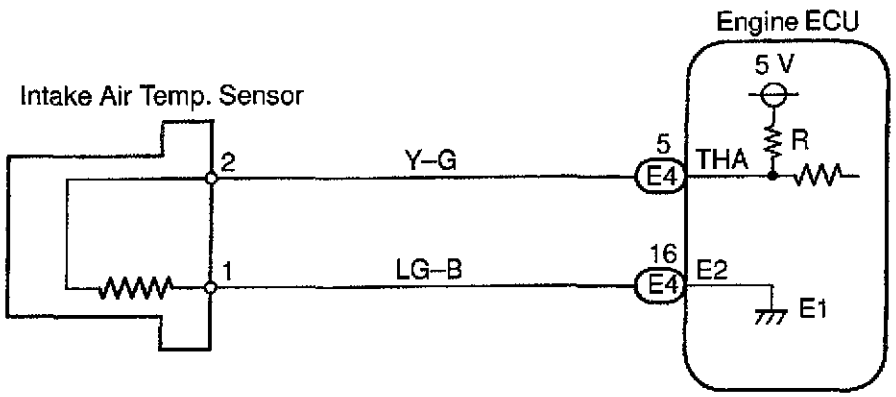
DTC	24	Intake Air Temp. Sensor Circuit

CIRCUIT DESCRIPTION

The intake air temp. sensor is built into the air cleaner cap and senses the intake air temperature.
The structure of the sensor and connection to the engine ECU is the same as in the water temp. sensor shown on page DI–29.
If the engine ECU detects the diagnostic trouble code "24", it operates the fail safe function in which the intake air temperature is assumed to be 20°C (68°F).

DTC No.	Detection Item	Trouble Area
24	Open or short in intake air temp. sensor circuit for 0.5 sec or more.	• Open or short in intake air temp. sensor circuit. • Intake air temp. sensor • Engine ECU

WIRING DIAGRAM

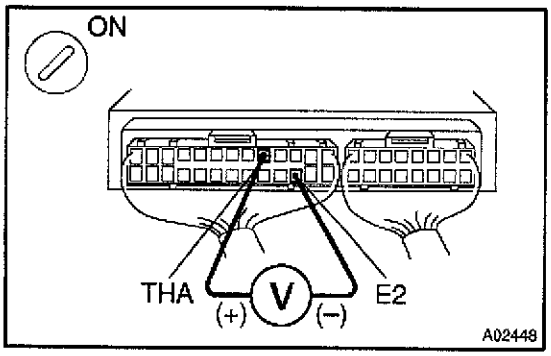


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INSPECTION PROCEDURE

HINT:
If diagnostic trouble code "22" (water temperature sensor circuit), "24" (intake air temperature sensor circuit), "31" (vacuum sensor circuit) and "41"(throttle position sensor circuit) are output simultaneously, E2 (sensor ground) may be open.

1	Check voltage between terminals THA and E2 of engine ECU connector.



PREPARATION:
(a) Remove the glove compatrment.(See page FI–60)
(b) Turn ignition switch ON.

CHECK:
Measure voltage between terminals THA and E2 of engine ECU connector.

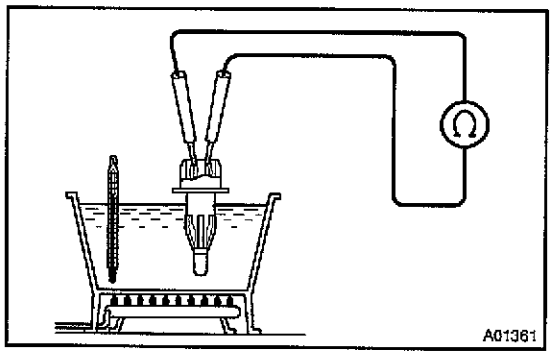
OK:

Engine Coolant Temp.	Voltage
20°C (68°F) (Engine is cool)	0.5 – 3.4 V
80°C (176°F) (Engine is hot)	0.2 – 1.0 V

OK → **Check for intermittent problems (See page IN–21).**

NG

2	Check intake air temp. sensor.



PREPARATION:
Disconnect the intake air temp. sensor connector.

CHECK:
Measure resistance between terminals.

OK:
Resistance is within acceptable zone on chart.

Engine Coolant Temp.	Resistance
20°C (68°F)	2 – 3 kΩ
80°C (176°F)	0.2 – 0.4 kΩ

NG → **Replace intake air temp. sensor.**

OK

3	Check for open and short in harness and connector between engine ECU and intake air temp. sensor (See page IN–21).

NG → Repair or replace harness or connector.

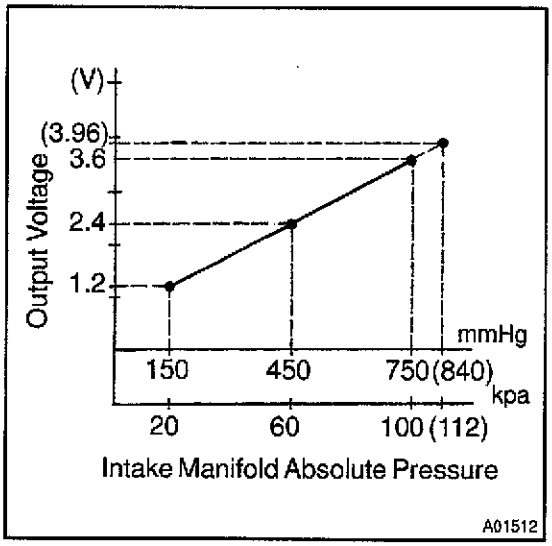
OK →

Check and replace engine ECU.

DITHS-01

DTC	31	Vacuum Sensor Circuit

CIRCUIT DESCRIPTION



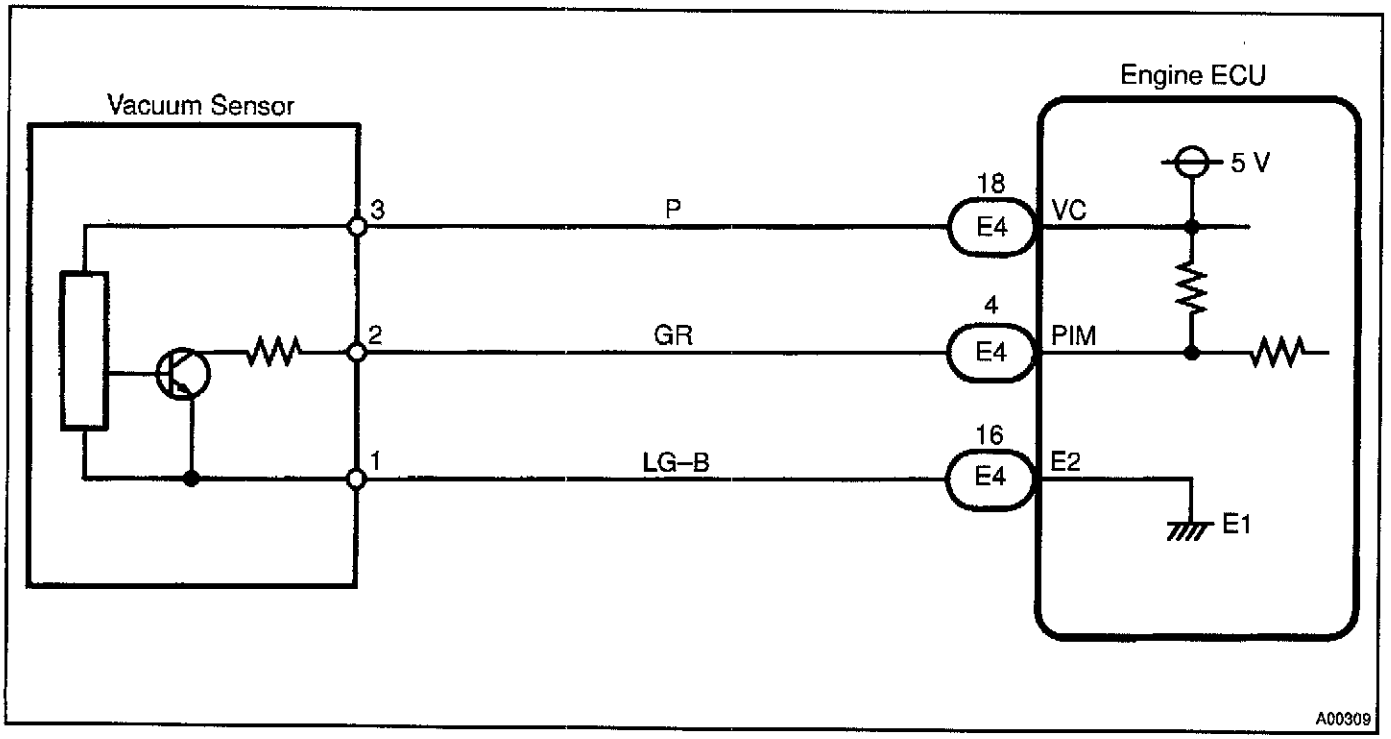
By a built–in sensor unit, the vacuum sensor detects the intake manifold pressure as a voltage. The ECU then determines the basic injection duration and basic ignition advance angle based on this voltage.

Since the vacuum sensor does not use the atmospheric pressure as a criterion, but senses the absolute pressure inside the intake manifold (the pressure in proportion to the preset absolute vacuum 0), it is not influenced by fluctuations in the atmospheric pressure due to high altitude and other factors. this permits it to control the air fuel ratio at the proper level under all conditions.

DTC No.	Detection Item	Trouble Area
31	Open or short in vacuum sensor circuit for 0.5 sec. or more	• Open or short in vacuum sensor circuit • Vacuum sensor • Engine ECU

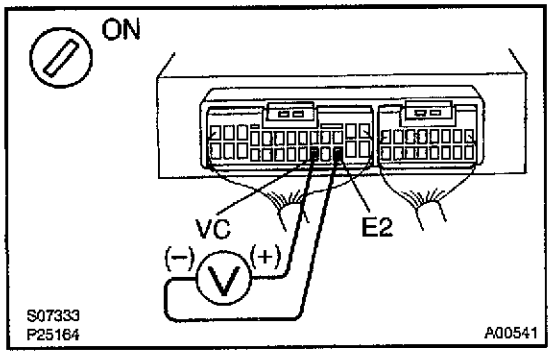
If the ECU detects diagnostic trouble code "31", it operates the fail safe function, keeping the ignition timing and fuel injection volume constant and making it possible to drive the vehicle.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check voltage between terminals VC and E2 of engine ECU connector.

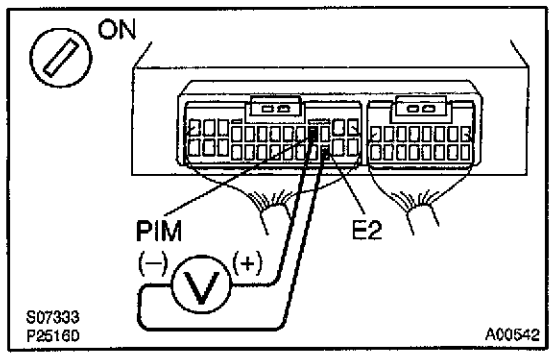


PREPARATION:
(a) Remove the glove compartment.(See page FI–60)
(b) Turn ignition switch ON.
CHECK:
Measure voltage between terminals VC and E2 of engine ECU.
OK:
Voltage: 4.5 – 5.5 V

NG → **Check and replace engine ECU.**

OK

2	Check voltage between terminals PIM and E2 of engine ECU connector.



PREPARATION:
(a) Remove the glove compartment.(See page FI–60)
(b) Turn ignition switch ON.
CHECK:
Measure voltage between terminals PIM and E2 of engine ECU.
OK:
Voltage: 3.3 – 3.9 V

OK → **When diagnostic trouble code 31 is displayed, check and replace engine ECU.**

NG

3	Check for open and short in harness and connector between engine ECU and vacuum sensor (See page IN–21).

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

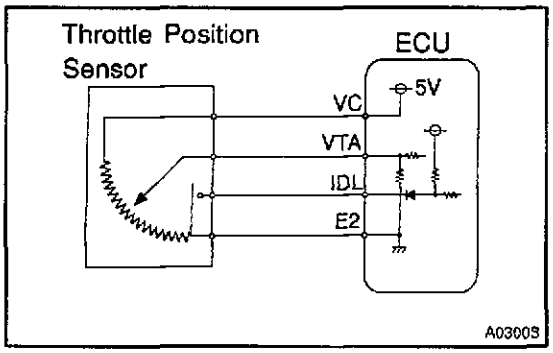
OK

Replace vacuum sensor.

DI1RT–01

DTC	41	Throttle Position Sensor Circuit

CIRCUIT DESCRIPTION

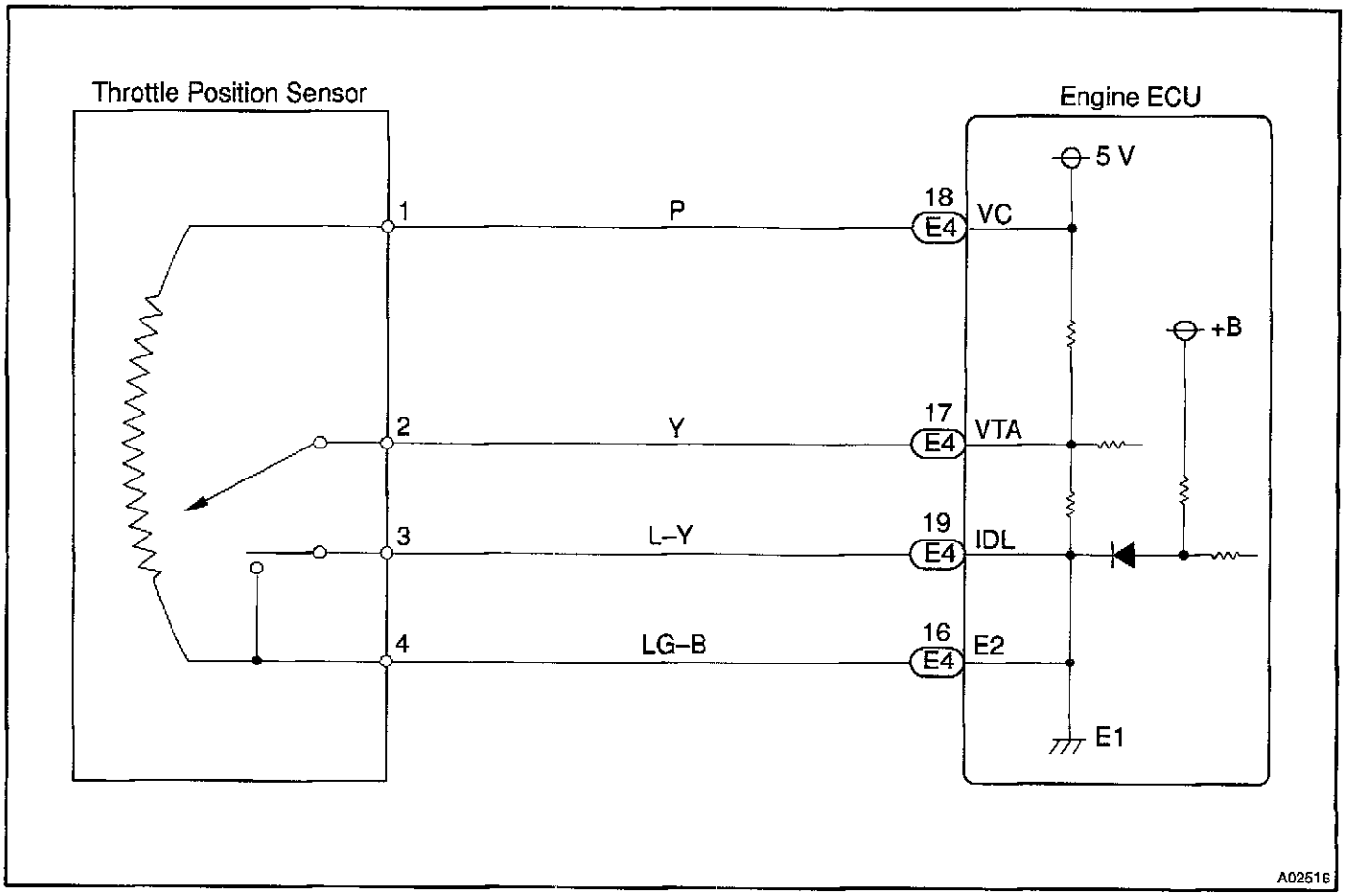


The throttle position sensor is mounted in the throttle body and detects the throttle valve opening angle. When the throttle valve is fully closed, a voltage of approximately 0.3 ~ 0.8 V is applied to the terminal VTA of the ECU. When the throttle valve is opened, the voltage applied to the terminal VTA of the ECU increases in proportion to the opening angle of the throttle valve and becomes approximately 3.2 – 4.9 V when the throttle valve is fully opened. The ECU judges the vehicle driving conditions from these signals input from the terminals VTA, and uses them as one of the conditions for deciding the air–fuel ratio correction, power increase correction and fuel–cut control etc.

DTC No.	Detection Item	Trouble Area
41	Open or short in throttle position sensor circuit for 0.5 sec. or more	• Open or short in throttle position sensor circuit • Throttle position sensor • Engine ECU

HINT:
When the connector for the throttle position sensor is disconnected, diagnostic trouble code 41 is not displayed. Diagnostic trouble code 41 is displayed only when there is an open or short in the VTA signal circuit of the throttle position sensor.

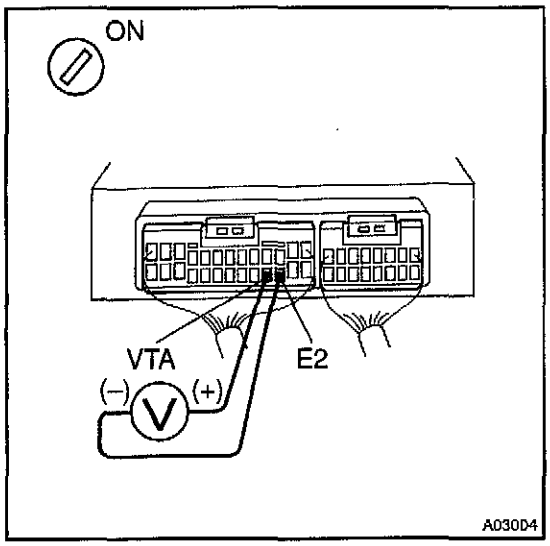
WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
If diagnostic trouble codes "22" (water temperature sensor circuit), "24" (intake air temperature sensor circuit) "31" (vacuum sensor circuit) and "41" (throttle position sensor circuit) are output simultaneously, E2 (sensor ground) may be open.

1	**Check voltage between terminals VTA and E2 of engine ECU connector.**



PREPARATION:
(a) Remove the glove compartment.(See page FI–60)
(b) Turn ignition switch ON.
(c) *Apply vacuum to the throttle opener.*

CHECK:
Measure voltage between terminals VTA and E2 of engine ECU connector when the throttle valve is opened gradually from the closed condition.

OK:

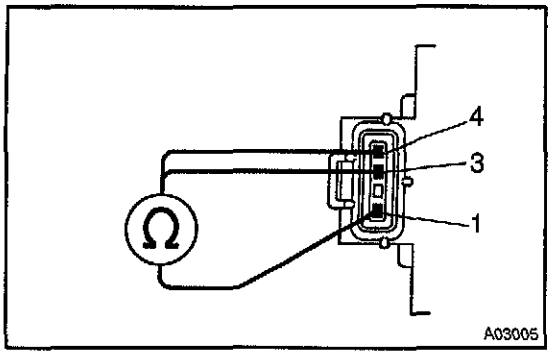
Throttle Valve	Voltage
Fully closed	0.3 – 1.0 V
Fully open	2.7 – 5.2 V

HINT:
The voltage should increase steadily in proportion to the throttle valve opening angle.

OK → **Check for problem symptoms table (See page DI–18).**

NG

2	Check throttle position sensor.



PREPARATION:
Disconnect throttle position sensor connector.
CHECK:
Measure resistance between terminals 3, 4 and 1 of throttle position sensor connector when the throttle valve is opened gradually from the closed condition.
OK:

Terminals	Throttle valve	Resistance
1 – 4	–	2.5 – 5.9 kΩ
1 – 3	Fully closed	0.2 – 5.7 kΩ
	Fully open	2.0 – 10.2 kΩ

HINT:
Resistance between terminals 1 and 3 should increrace gradually in accordance with the throttle valve opening angle.

NG → **Replace throttle position sensor .**

OK

3	Check for open and short in harness and connector between engine ECU and throttle position sensor (See page IN–21).

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

OK

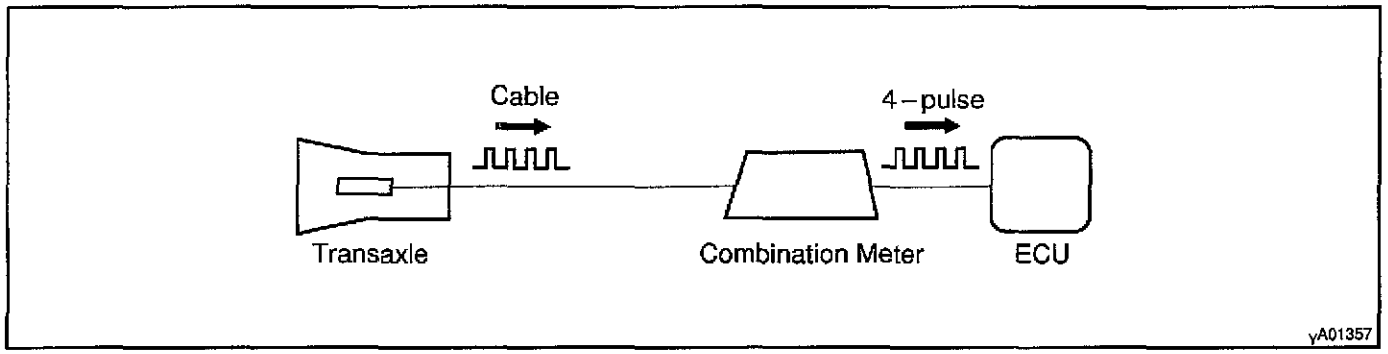
Check and replace engine ECU.

D11HU-01

DTC	42	Vehicle Speed Sensor Signal Circuit

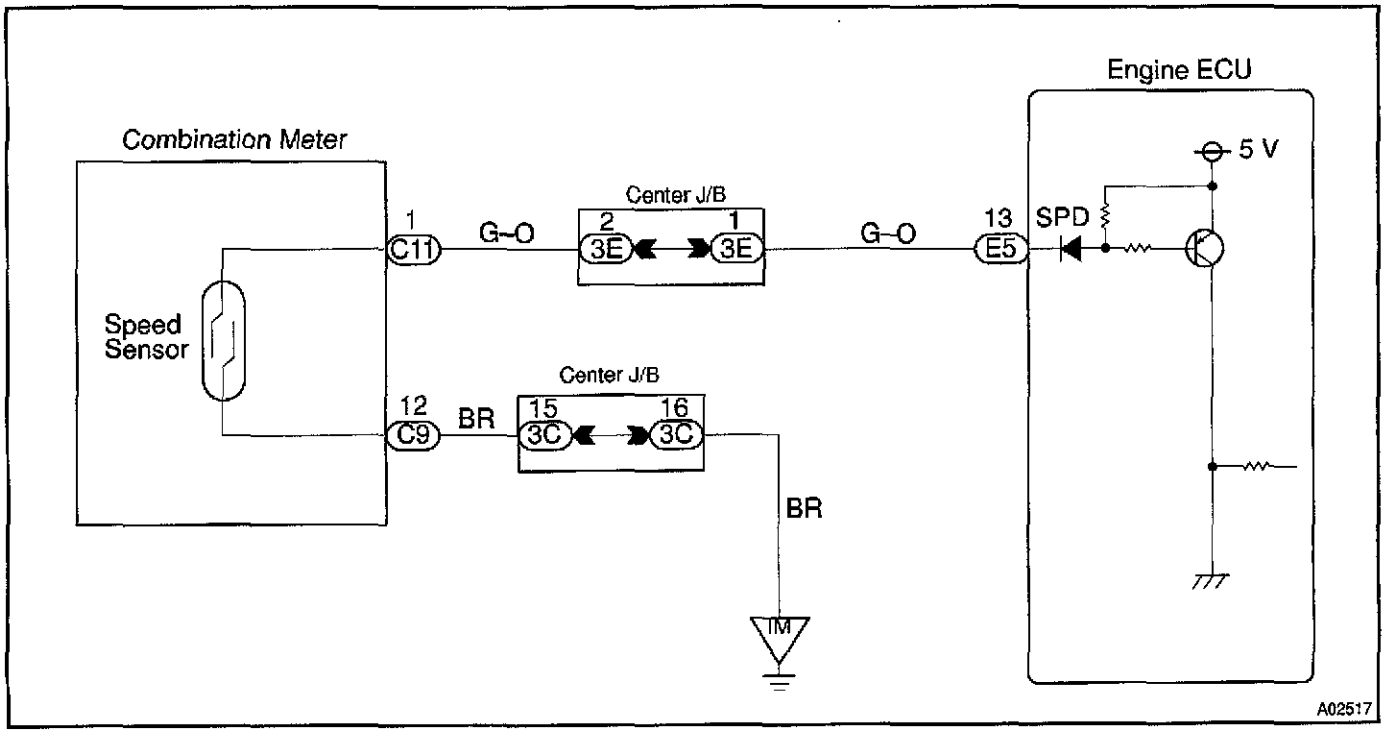
CIRCUIT DESCRIPTION

This sensor is mounted in the combination meter. It contains a magnet which is rotated by the speedometer cable.
Turning the reed switch ON and OFF 4 times for every revolution of the speedometer.
It is then transmitted to the ECU. The ECU determines the vehicle speed based on the frequency of these pulse signals.



DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
42	All conditions below are detected continuously for 8 sec. or more: (a) Vehicle speed signal: 0 km/h (0 mph) (b) Engine speed: 2,500 – 4,500 rpm (c) Water temp.: 80°C (176°F) or more (d) Load driving	• Open or short in vehicle speed sensor circuit • Vehicle speed sensor • Combination meter • Engine ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

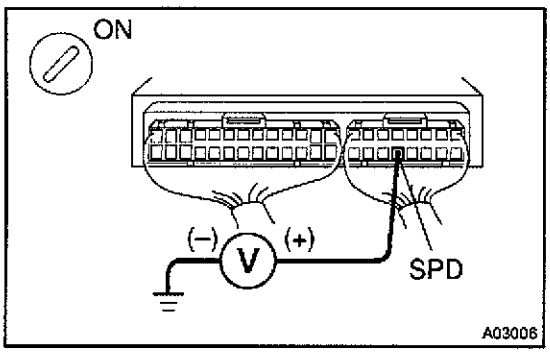
1	Check operation of speedometer.

CHECK:
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.

NG → **Check speedometer circuit. See combination meter troubleshooting.**

OK

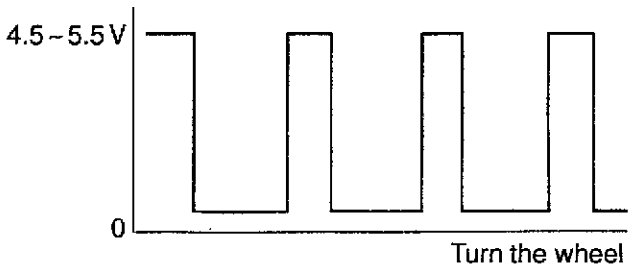
2	Check voltage between terminal SPD of engine ECU connector and body ground.



PREPARATION:
(a) Remove the glove compartment.(See page FI–60)
(b) Shift the shift lever to N position.
(c) Jack up one of the rear wheels.
(d) Turn ignition switch ON.

CHECK:
Measure voltage between terminal SPD of engine ECU connector and body ground when the wheel is turned slowly.

OK:
Voltage is generated intermittently.



NG → **Check and repair harness and connector between combination meter and engine ECU**

OK

Check and replace engine ECU.

DI1KV-01

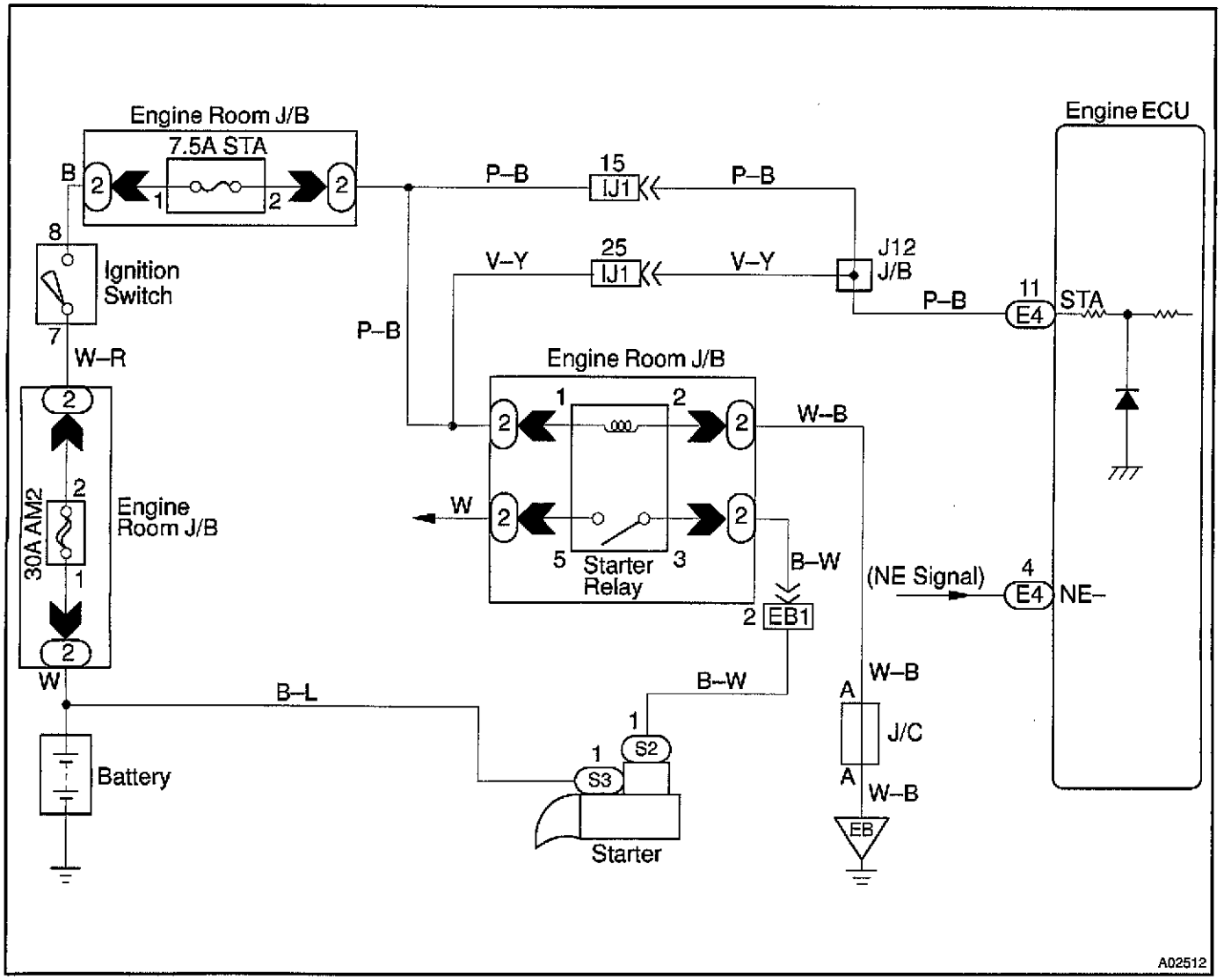
DTC	43	Starter Signal Circuit

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 positive voltage is applied to terminal STA of the ECU. The starter signal is mainly used to increase the fuel injection volume for the starting injection control and after–start injection control.

DTC No.	Detection Item	Trouble Area
43	No starter signal to ECU	• Open or short in starter signal circuit • Open or short in ignition switch or starter relay circuit • Engine ECU

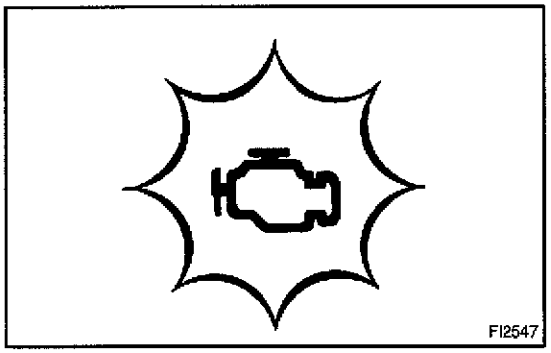
WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
This diagnostic chart is based on the premise that the engine is cranked normally. If the engine is not cranked, proceed to the problem symptoms table on page DI–18.

1	**Check output condition of diagnostic trouble code 43.**



PREPARATION:
Setting the test mode.
(a) Turn ignition switch OFF.
(b) Using SST, connect terminals TE2 and E1 of check connector.
SST 09843–18020
(c) Turn ignition switch ON. (Don't start the engine).
(d) Using SST, connect terminals TE1 and E1 of check connector.
SST09843–18020

CHECK:
Check if code "43" is output by the check engine warming light.

OK:
Code "43" is output.

CHECK:
Start the engine.
Check if the code "43" disappear.

OK:
Code "43" is not output.

OK → **Proceed to next circuit inspection shown on problem symptom table (See page DI–18).**

NG

2	**Check for open in harness and connector between engine ECU and starter relay (Marking: ST)(See page IN–21).**

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

OK

Check and replace engine ECU (See page IN–21).

DI1HW–01

DTC	51	Switch Condition Signal Circuit

CIRCUIT DESCRIPTION

Air Conditioning Switch Signal

The ECU uses the output from the air conditioning switch to determine whether or not the air conditioning is operating so that it can increase the idling speed of the engine if necessary.

Throttle Position Sensor IDL Signal

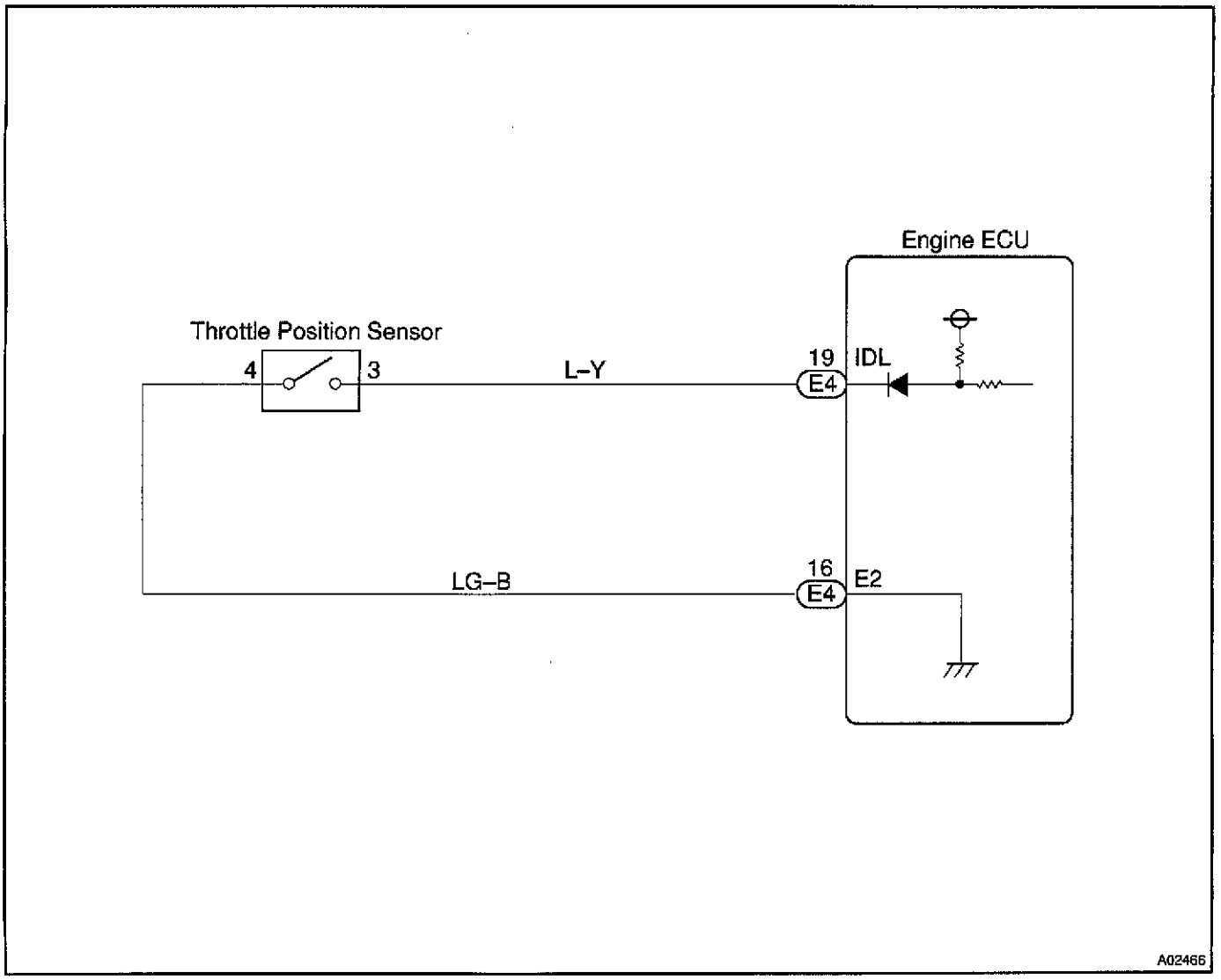
The IDL contacts are mounted in the throttle position sensor, and detects the idle condition.

DTC No.	Detection Item	Trouble Area
51	(1) 3 sec. or more after engine starts idle switch OFF (IDL1). (3) A/C switch ON.	• Throttle position sensor IDL circuit • Accelerator pedal and cable • A/C switch circuit • Engine ECU

HINT:

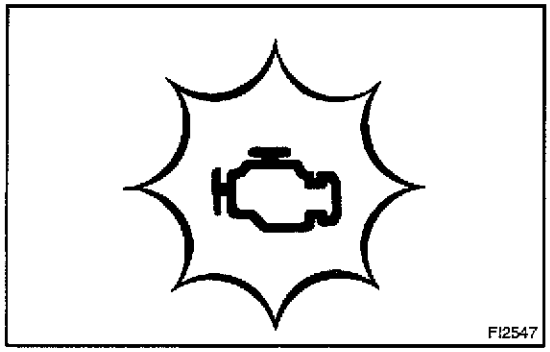
In this circuit, diagnosis can only be made in the test mode.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check output condition of diagnostic trouble code 51.



PREPARATION:

Setting the test mode.

(a) Turn ignition switch OFF.

(b) Using SST, connector terminals TE2 and E1 of check connector.
SST 09843–18020

(c) Turn ignition switch ON.
(For checking terminal A/C, start the engine.)

(d) Using SST, connect terminals TE1 and E1 of check connector.
SST 09843–18020

CHECK:

Check if code "51" is output by the check engine warning light.

OK:

	Condition	Code
Throttle Position Sensor (IDL)	Accelerator pedal released	Normal*1
	Accelerator pedal depressed	51*1
A/C Switch (A/C)	A/C SW ON	51
	A/C SW OFF	Normal

*1: Before the STA signal is input (ST is not ON), diagnostic trouble code 43 is also output.

HINT:

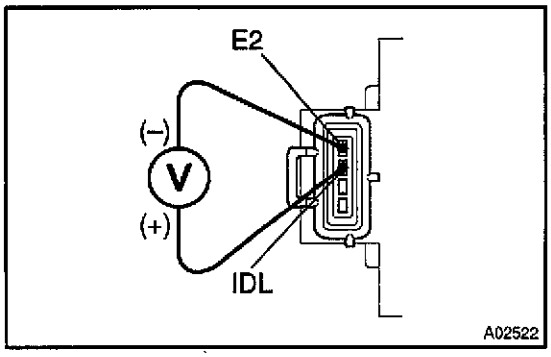
Diagnostic trouble code 42 output with vehicle speed 3 mph (5 km/h) or below

NG → **IDL.....Go to step 2, A/C.....Go to step 3.**

OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI–18).

2	Check resistance of throttle position sensor.



PREPARATION:
Disconnect throttle position sensor connector.
CHECK:
Measure resistance between terminals IDL and E2 of throttle position sensor connector.
OK:

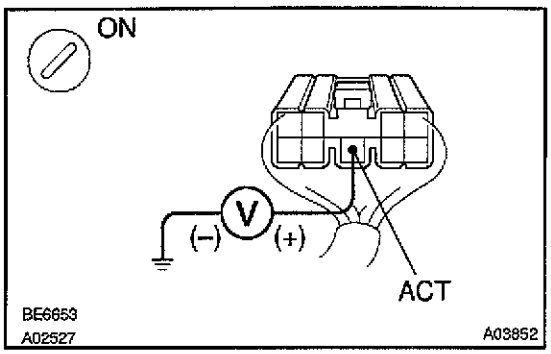
Throttle Valve	Resistance
Fully closed	Less than 2.3 kΩ
Opened	Infinity

NG → **Adjust or replace throttle position sensor (See page FI–31).**

OK

Check and repair harness or connector between engine control module and throttle position sensor.

3	Disconnect A/C amplifier connector, check voltage between terminal ACT of A/C amplifier connector and body ground.



PREPARATION:
(a) Remove glove compartment.(See page FI–60)
(b) Disconnect A/C amplifier connector.
(c) Turn ignition switch ON.
CHECK:
Measure voltage between terminal ACT of A/C amplifier connector and body ground.
OK:
Voltage: 9 – 14 v

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

NG

4	**Check for open and short in harness and connector between engine ECU and A/C amplifier (See page IN–21).**

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

OK

Check and replace engine ECU.

DI1HX-01

Starter Signal Circuit *

CIRCUIT DESCRIPTION

Refer to DTC43 (Starter Signal Circuit) on page DI–42.

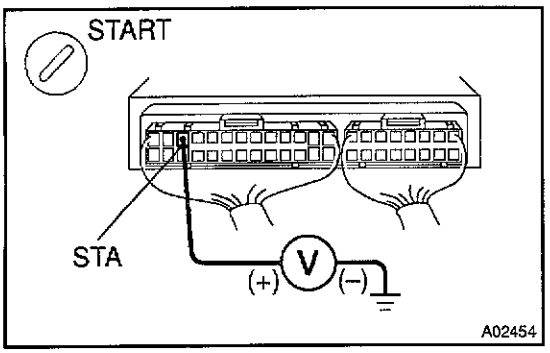
WIRING DIAGRAM

Refer to page DI–42 for the WIRING DIAGRAM.

INSPECTION PROCEDURE

HINT:
This diagnostic chart is based on the premise that the engine is being cranked under normal conditions. If the engine does not crank, proceed to the problem symptoms table on page DI–18.

1	**Check the starter signal.**



PREPARATION:
Remove the glove compartment.(See page FI–60)
CHECK:
Measure voltage between terminal STA of engine ECU connector and body ground during cranking.
OK:
Voltage: 6.0 V or more

OK → **Proceed to next circuit inspection shown on problem symptoms table (See page DI–18).**

NG

2	**Check for open in harness and connector between engine ECU and starter relay (See page IN–21).**

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

OK

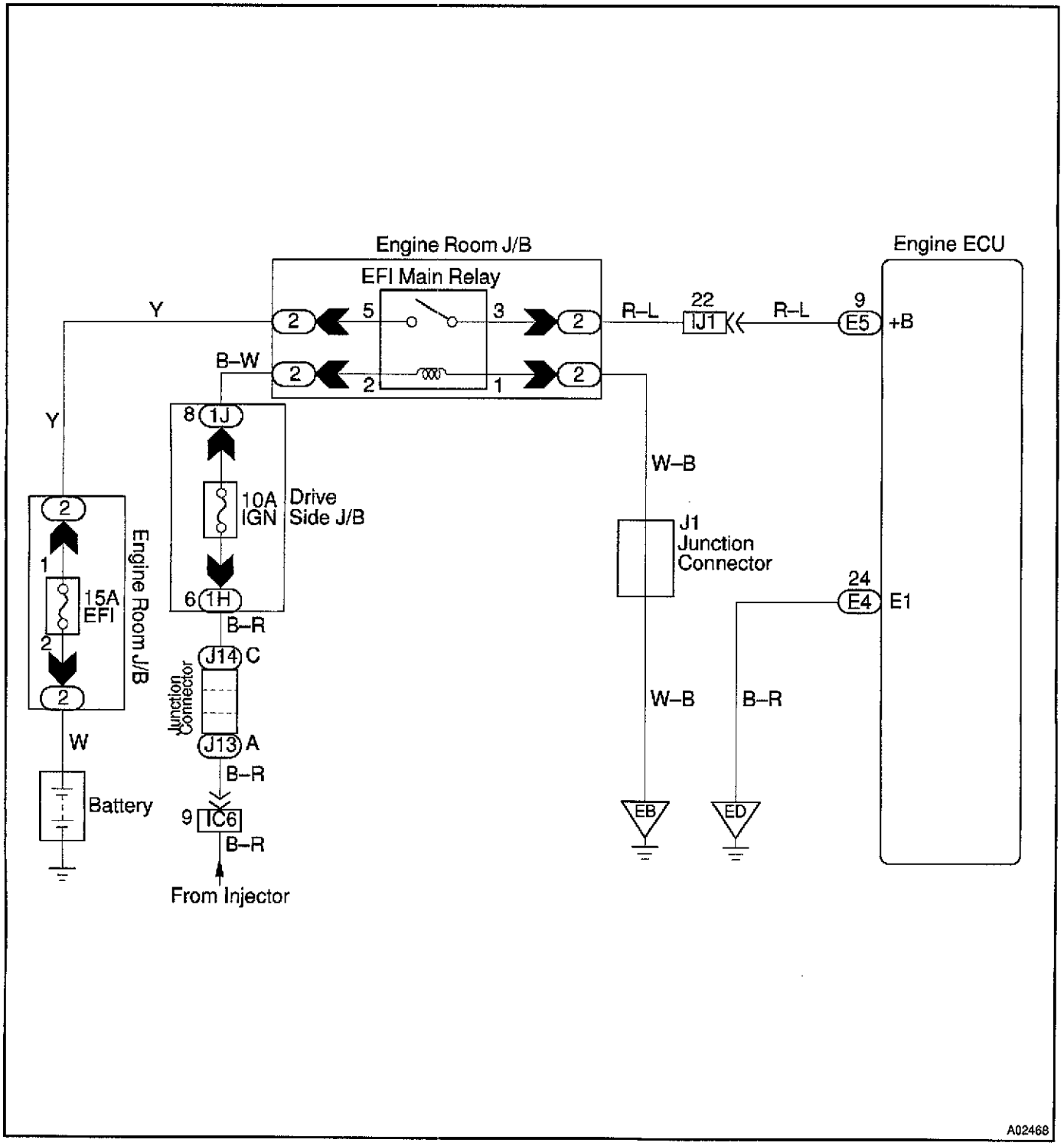
Check and replace engine ECU.

ECU Power Source Circuit

CIRCUIT DESCRIPTION

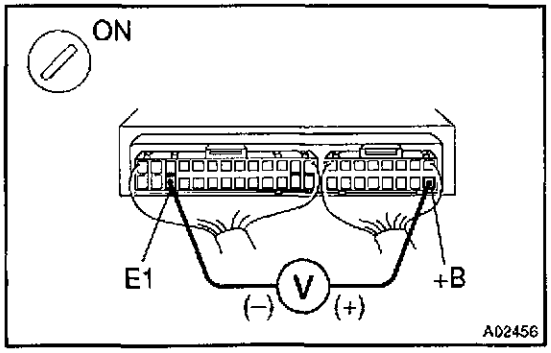
When the ignition switch is turned ON, battery positive voltage is applied to the coil, closing the contacts of the EFI main relay and supplying power to the terminal +B of the ECU.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals +B and E1 of engine ECU connector.**



PREPARATION:

(a) Remove the glove compartment.(See page FI–60)

(b) Turn ignition switch ON.

CHECK:

Measure voltage between terminals +B and E1 of engine ECU connector.

OK:

Voltage: 9 – 14 V

OK	**Proceed to next circuit inspection shown on problem symptoms table (See page DI–18).**

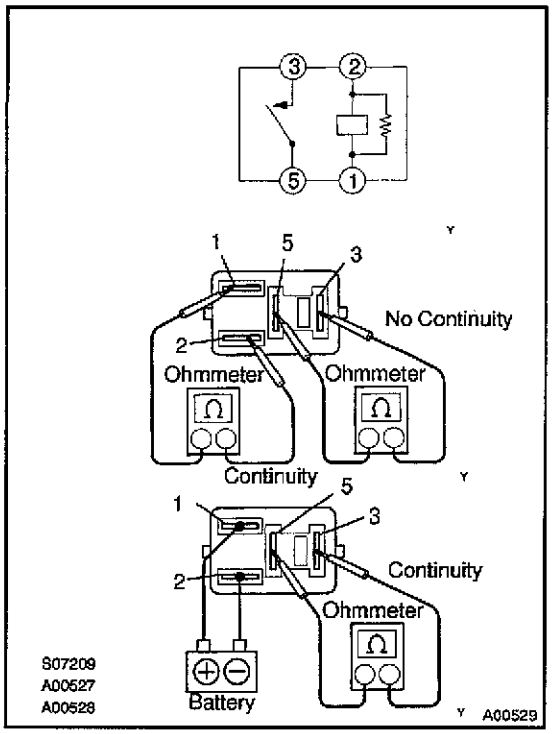
NG

2	**Check for open in harness and connector between terminal E1 of engine ECU and body ground (See page IN–21).**

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

OK

3	Check EFI main relay.



PREPARATION:
Remove EFI main relay from engine room J/B.
CHECK:
Check continuity between terminals EFI main relay shown below.
OK:

Terminals 3 and 5	Open
Terminals 1 and 2	Continuity

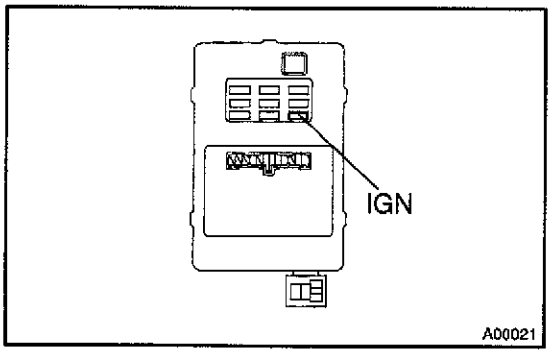
CHECK:
(a) Apply battery positive voltage between terminals 1 and 2.
(b) Check continuity between terminals 3 and 5.
OK:

Terminals 3 and 5	Continuity

NG → **Replace EFI main relay.**

OK

4	Check IGN fuse.

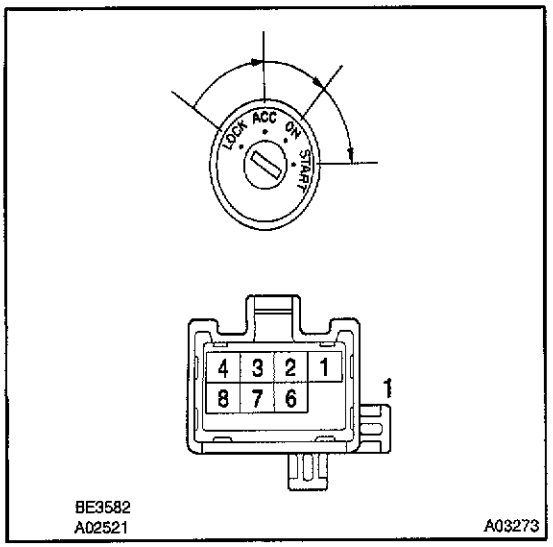


PREPARATION:
Remove IGN fuse from drive side J/B.
CHECK:
Check continuity of IGN fuse.
OK:
Continuity

NG → **Check for short in all the harness and components connected to IGN fuse (See attached wiring diagram)**

OK

5	Check ignition switch.



PREPARATION:

(a) Remove lower finish panel.

(b) Disconnect the ignition switch connector.

CHECK:

Check continuity between terminals shown below.

OK:

Switch Position	Terminal No. to continuity	
Lock	–	–
ACC	2–3	–
ON	2–3–4	6–7
START	1–2–4	6–7–8

NG → **Replace ignition switch.**

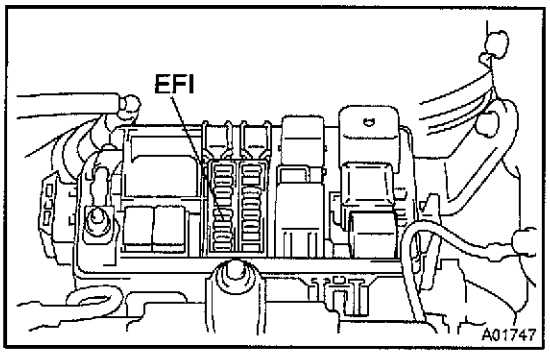
OK

6	Check for open in harness and connector between IG switch and EFI main relay, EFI main relay and body ground (See page IN–21).

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

OK

7	Check EFI fuse.



PREPARATION:
Remove EFI fuse from engine room J/B.
CHECK:
Check continuity of EFI fuse.
OK:
Continuity

NG → **Check for short in all the harness and components connected to EFI fuse (See attached wiring diagram).**

OK

Check for open in harness and connector between main relay and battery, main relay and ECU.

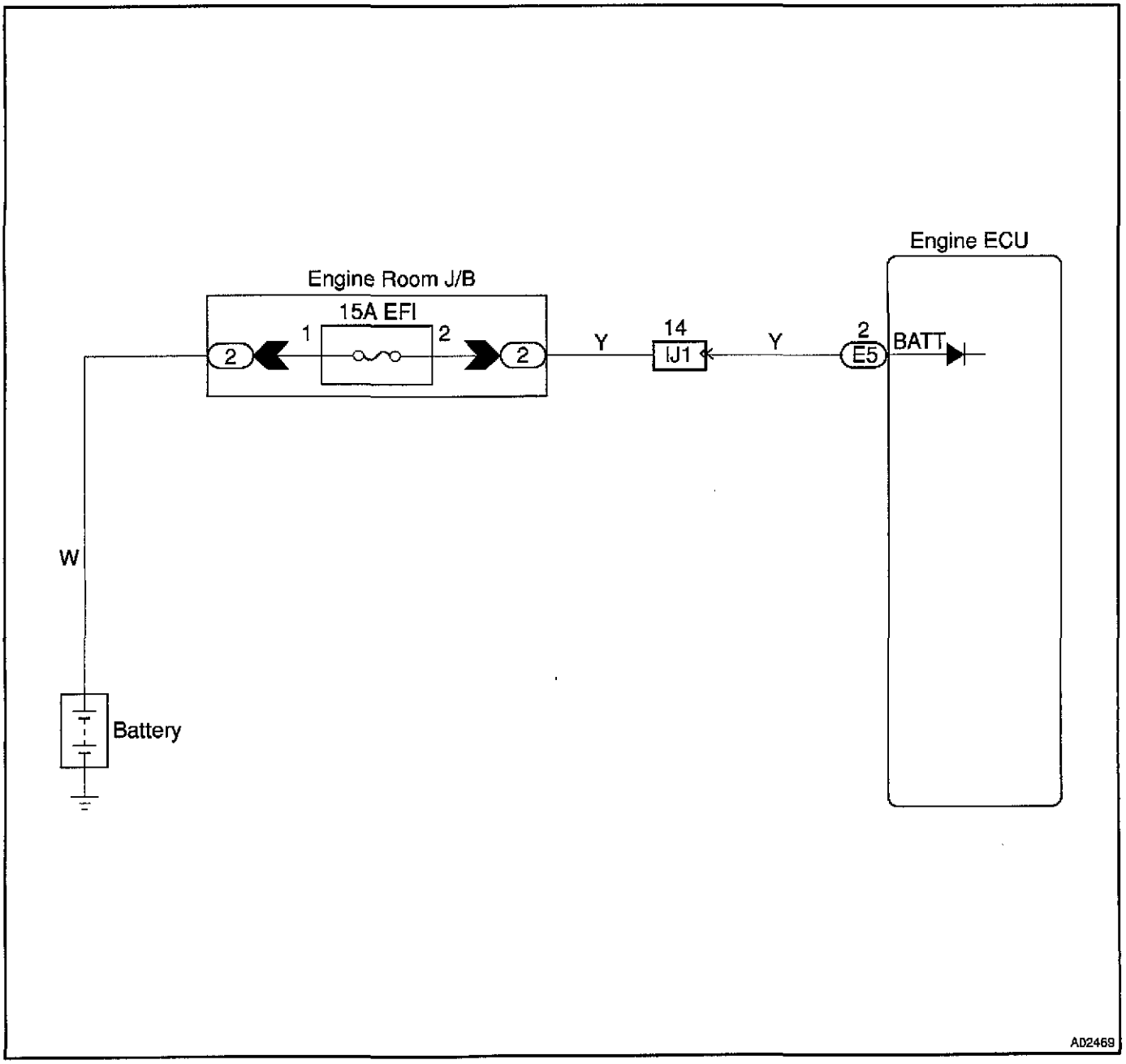
D1HZ-01

Back Up Power Source Circuit

CIRCUIT DESCRIPTION

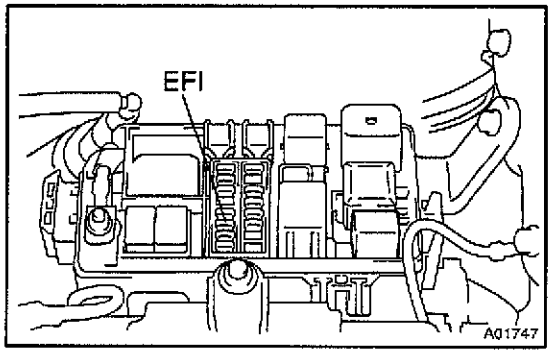
Battery positive voltage is supplied to terminal BATT of the ECU even when the ignition switch is OFF for use by the diagnostic trouble code memory, air–fuel ratio adaptive control value memory, etc.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check EFI fuse.

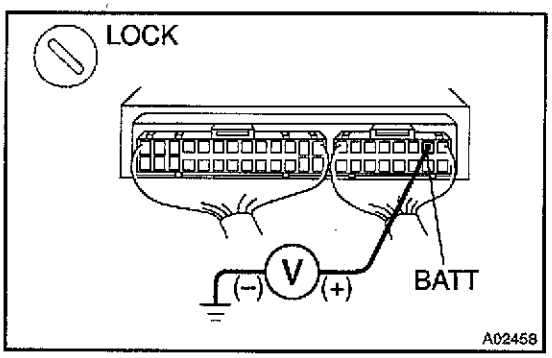


PREPARATION:
Remove EFI fuse from engine room J/B.
CHECK:
Check continuity of EFI fuse.
OK:
Continuity

NG → **Check for short in all the harness and components connected to EFI fuse (See attached wiring diagram).**

OK

2	Check voltage between terminal BATT of engine ECU connector and body ground.



PREPARATION:
Remove the glove compartment.(See page FI–60)
CHECK:
Measure voltage between terminal BATT of engine ECU connector and body ground.
OK:
Voltage: 9 – 14 V

NG → **Check and repair harness or connector between engine ECU and EFI fuse, EFI fuse and battery.**

OK

3	Are the diagnostic trouble codes still in the memory when the ignition switch is turned OFF?

NO → Check and replace engine ECU.

YES

Proceed to next circuit inspection shown on problem symptoms table (See page DI–18).

Injector Circuit

CIRCUIT DESCRIPTION

The injectors are situated in the intake manifold. They inject fuel into the cylinders based on the signals from the engine ECU.

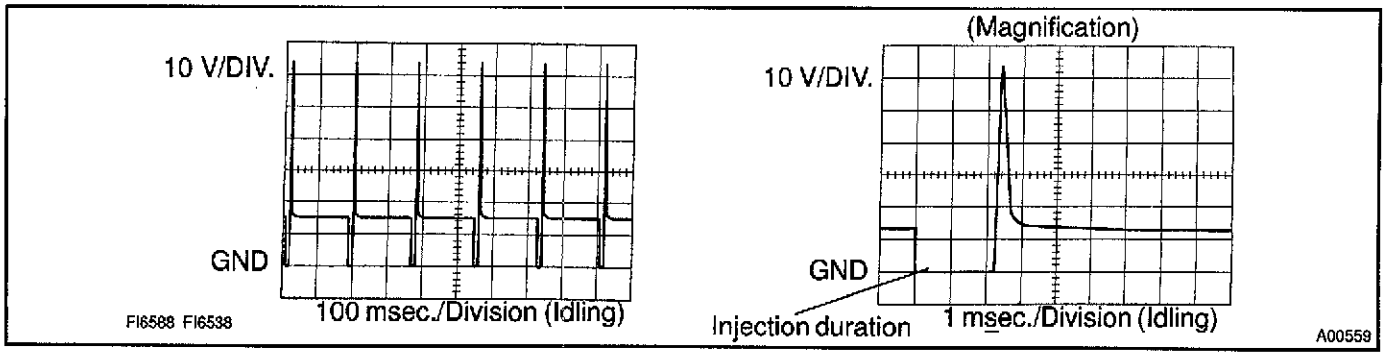
Reference: INSPECTION USING OSCILLOSCOPE

INJECTOR SIGNAL WAVEFORM

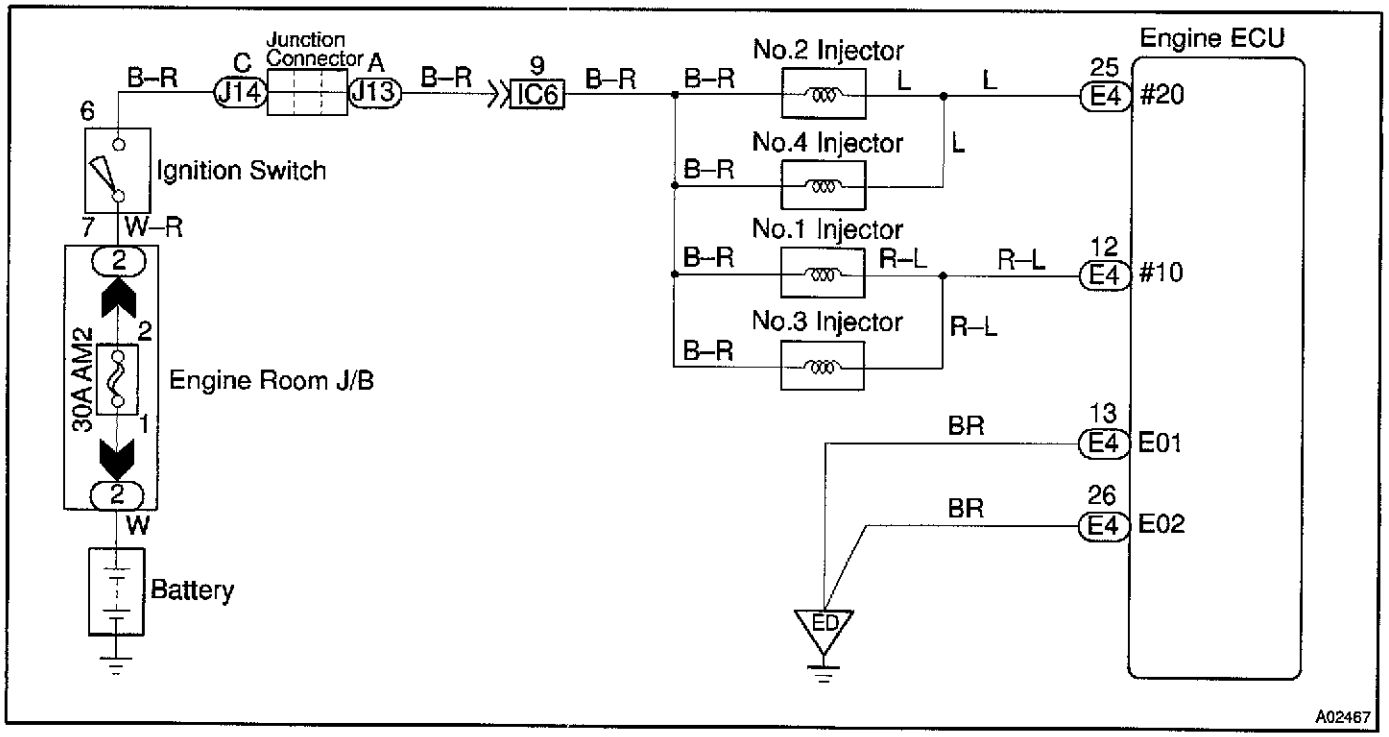
With the engine idling measure waveform between terminals #10, #20 and E01 of engine ECU.

HINT:

The correct waveforms are as shown.

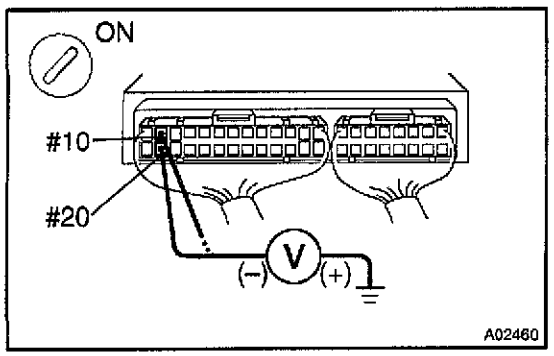


WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check voltage between terminals #10, #20 of engine ECU and body ground.



PREPARATION:
(a) Remove the glove compartment.(See page FI–60)
(b) Turn ignition switch ON.

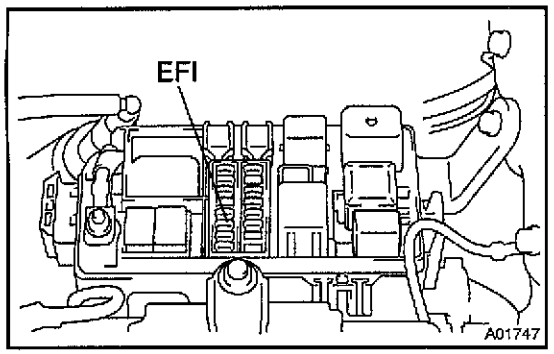
CHECK:
Measure voltage between terminals #10, #20 of engine ECU and body ground.

OK:
Voltage: 9 – 14 V

OK	Go to step 3.

NG

2	Check EFI fuse.



PREPARATION:
Remove EFI fuse from engine room J/B.

CHECK:
Check continuity of EFI fuse.

OK:
Continuity

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

OK

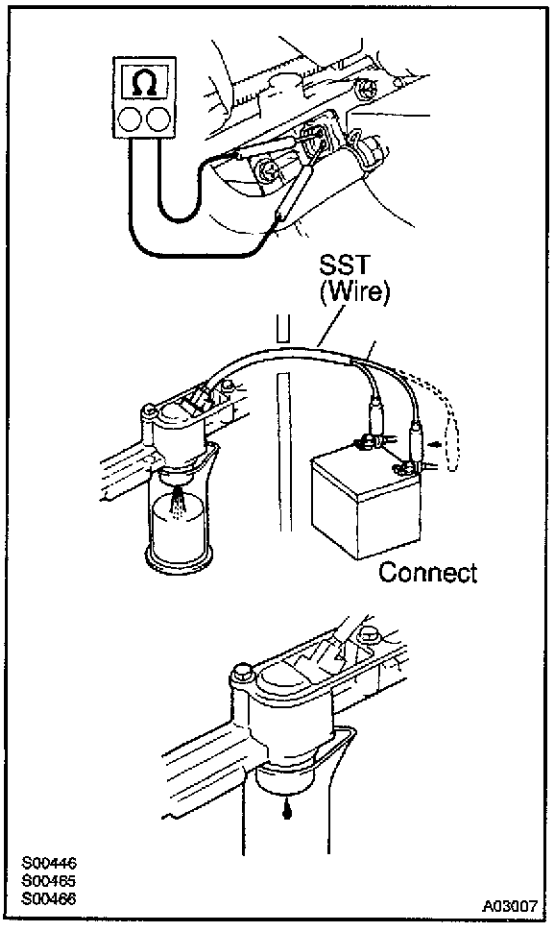
Check for open in harness and connector between engine ECU and battery.

3	Check for open in harness and connector between terminals E01, E02 of engine ECU connector and body ground (See page IN–21).

NG	Repair or replace harness or connector.

OK

4	Check injectors.



PREPARATION:
Disconnect injector connectors.

CHECK:
Measure resistance of injectors.

OK:

Resistance: At 20°C (68°F): 13.4 – 14.2 Ω

CHECK:
Check injection volume of injectors.

OK:

Injection volume:
44 – 54 cm^3 (3.3 – 3.4 cu in.)/15 sec.
Difference between each injector:
Less than 10 cm^3 (0.3 cu in.)
Leakage: 1 drop or less per 3 minutes

NG → **Replace injector(s).**

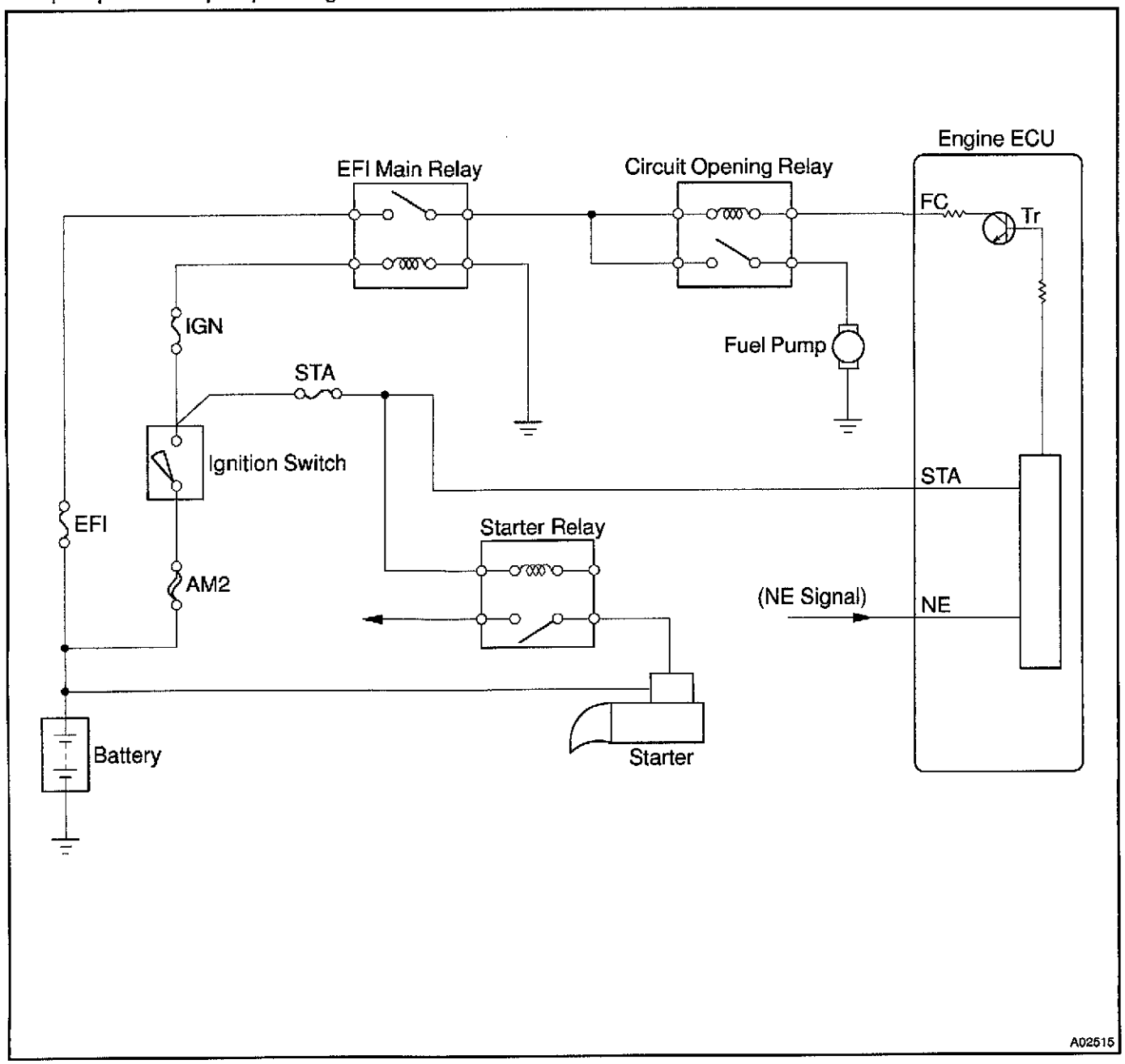
OK

Check and replace engine ECU.

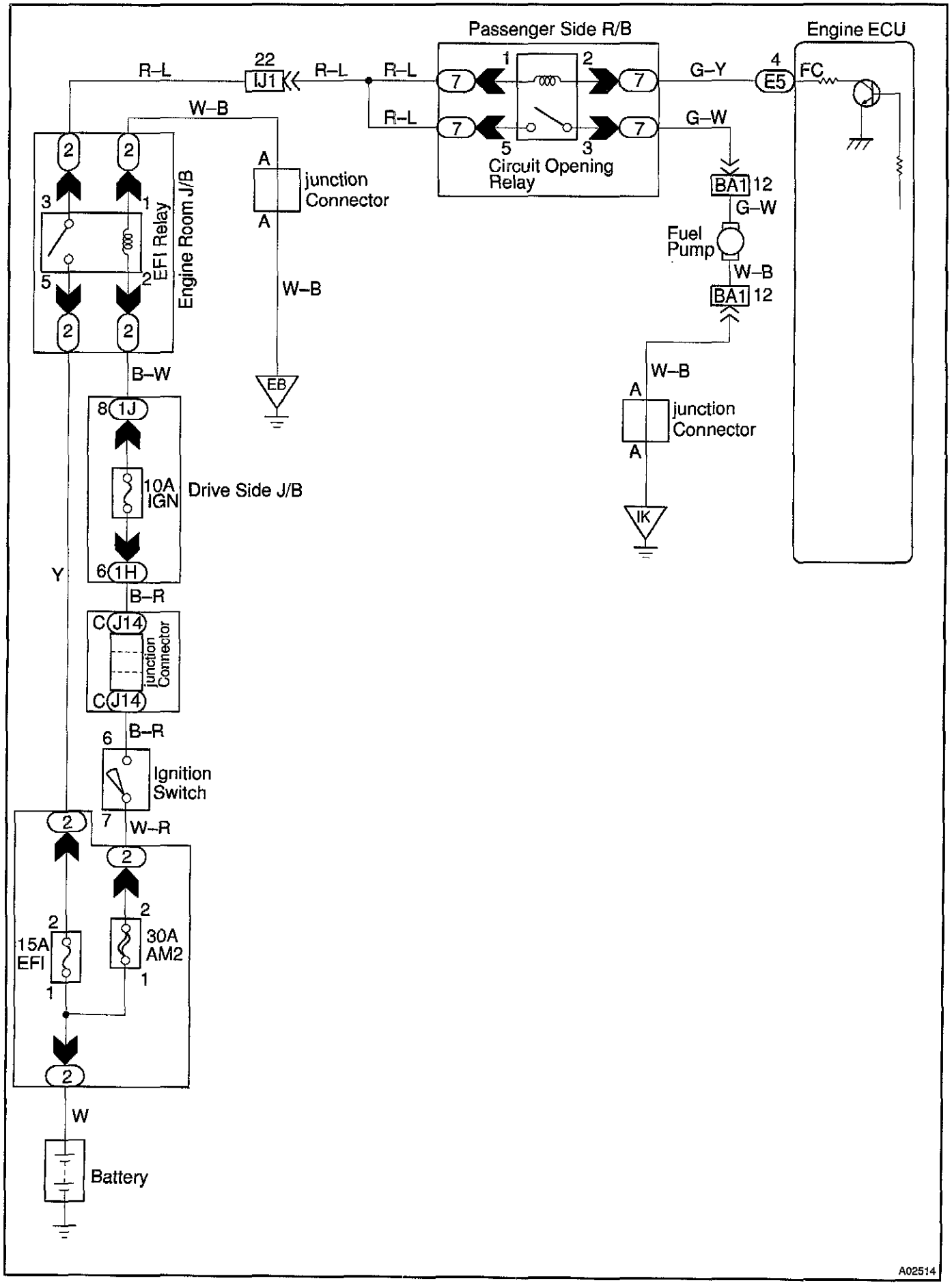
Fuel System Circuit

CIRCUIT DESCRIPTION

In the diagram below, when the engine is cranked, current flows from terminal ST of the ignition switch to the starter relay coil and also current flows to terminal STA of ECU (STA signal).
When the STA signal and NE signal are input to the ECU, Tr is turned ON, current flows to coil of the circuit opening relay, the relay switches on, power is supplied to the fuel pump and the fuel pump operates.
While the NE signal is generated (engine running), the ECU keeps Tr ON (circuit opening relay ON) and the fuel pump also keeps operating.

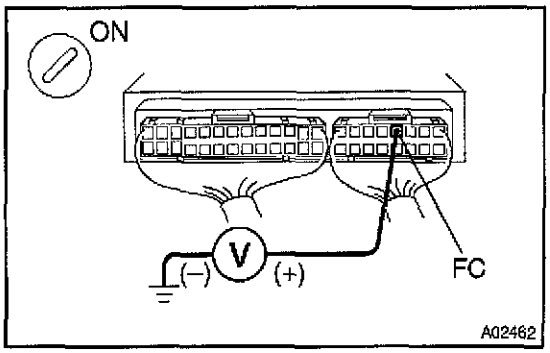


WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check voltage terminal FC.



PREPARATION:
(a) Remove the glove compartment.(See page FI–60)
(b) Turn ignition switch ON.

CHECK:
Measure voltage between terminal FC of engine ECU connector and body ground.

OK:
Voltage: 9 – 14 V

OK	Check and replace engine ECU.

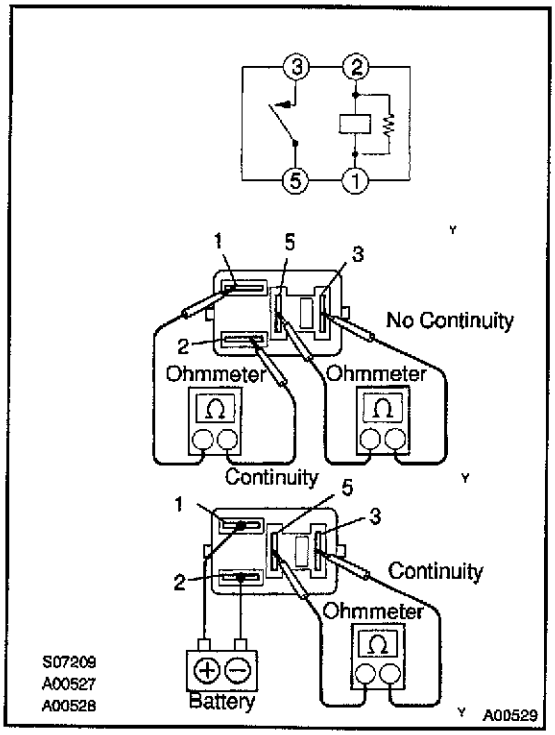
NG

2	Check for ECU power source circuit (See page DI–49).

NG	Repair or replace.

OK

3	Check circuit opening relay.



PREPARATION:

(a) Remove the driver's cowl side trim.
(b) Remove circuit opening relay.

CHECK:

Check continuity between terminals of circuit opening relay shown below.

OK:

Terminals 3 and 5	Open
Terminals 1 and 2	Continuity

CHECK:

(a) Apply battery positive voltage between terminals 1 and 2.
(b) Check continuity between terminals 3 and 5.

OK:

Terminals 3 and 5	Continuity

NG → **Replace circuit opening relay.**

OK

4	Check for open in harness and connector between EFI main relay and circuit opening relay, circuit opening relay and engine ECU (See page IN–21).

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

OK

5	Check fuel pump (See page FI–11)

NG → **Replace fuel pump.**

OK

Check for open in harness and connector between circuit opening relay and fuel pump, fuel pump and body ground.

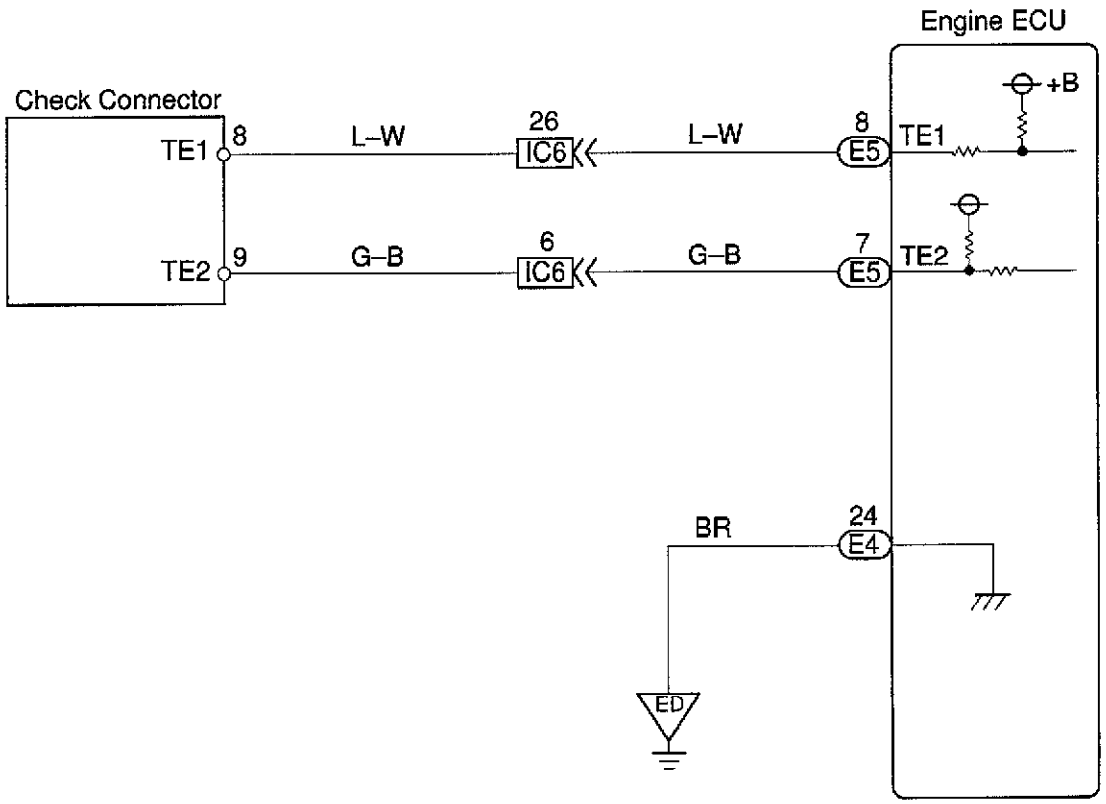
DI1I2-01

TE1, TE2 Terminal Circuit

CIRCUIT DESCRIPTION

Terminals TE1 and TE2 are located in the check connector.
The check connector is located in the engine compartment. When these terminals are connected with the E1 terminal, diagnostic trouble codes in normal mode or test mode can be read from the check engine warning light in the combination meter.

WIRING DIAGRAM



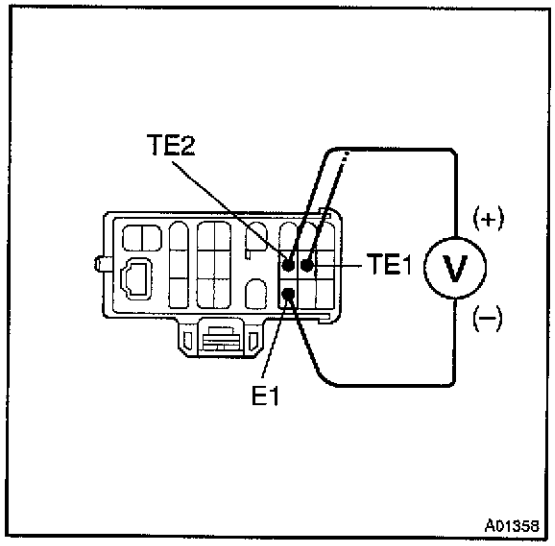
A02513

INSPECTION PROCEDURE

HINT:

- If terminals TE1 and TE2 are connected with terminal E1, diagnostic trouble code is not output or test mode is not activated.
- Even though terminal TE1 is not connected with terminal E1, the check engine warning light blinks.
- For the above phenomenon, the likely cause is an open or short in the wire harness, or malfunction inside the ECU.

1	**Check voltage between terminals TE1, TE2 and E1 of check connector.**



PREPARATION:
Turn ignition switch ON.
CHECK:
Measure voltage between terminal TE1, TE2 and E1 of check connector.
OK:
Voltage: 9 – 14 V

OK → **Check and replace engine ECU.**

NG

2	**Check continuity between terminal E1 of check connector and body ground.**

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

OK

3	Check for open and short in harness and connector between terminal TE1, TE2 of engine ECU and check connector (See page IN–21).

NG → Repair or replace harness or connector.

OK →

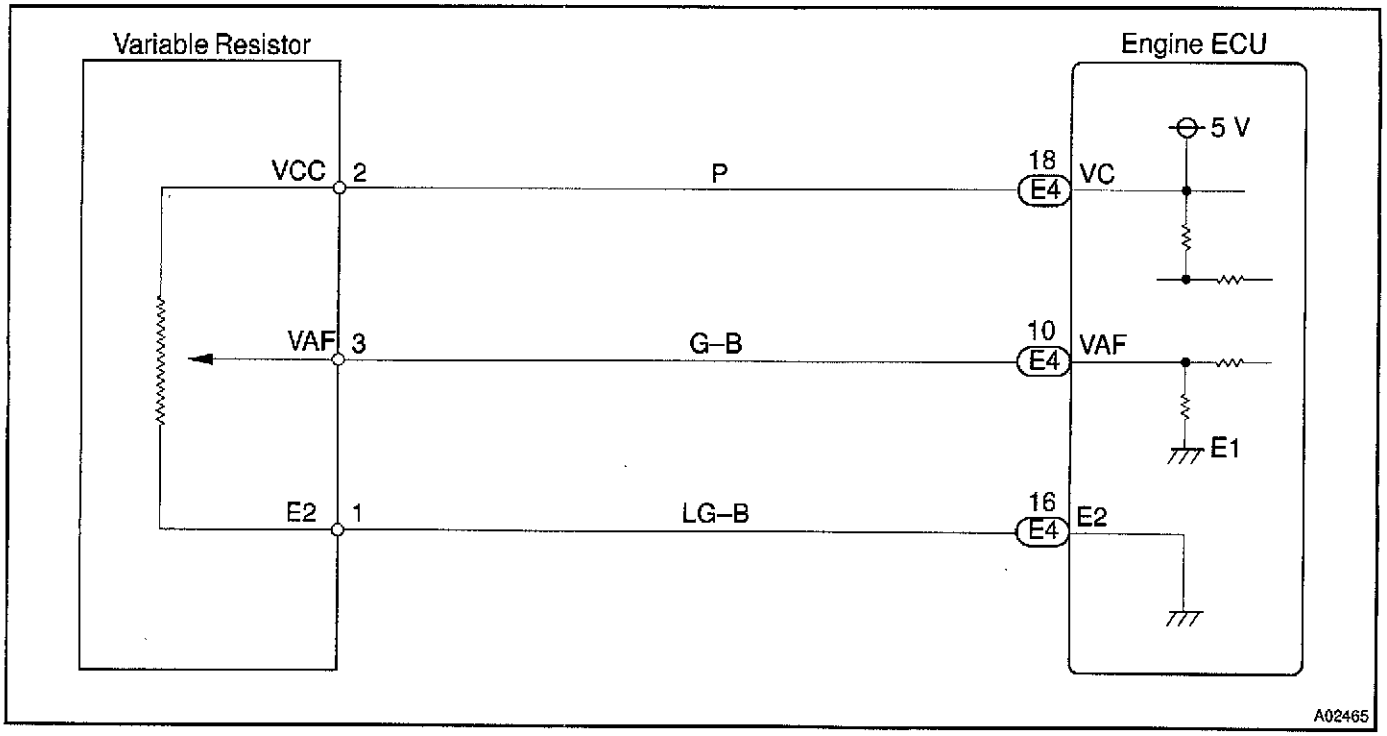
Check and replace engine ECU.

Variable Resistor Circuit.

CIRCUIT DESCRIPTION

This resistor is used to change the air–fuel ratio of the air–fuel mixture.
The idle mixture is adjusted using this resistor.
Turning the idle mixture adjusting screw clockwise moves the contacts inside the resistor, raising terminal VAF voltage. Conversely, turning the screw counterclockwise lowers the terminal VAF voltage.
When the terminal VAF voltage rises, the ECU increases the injection volume slightly, making the air–fuel mixture a little richer.

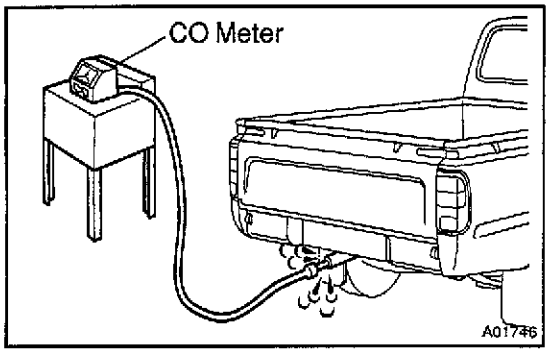
WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:
Always use a CO meter when adjusting the idle mixture. If a CO meter is not available, DO NOT ATTEMPT TO ADJUST IDLE MIXTURE.

1	**Check CO concentration.**



PREPARATION:
(a) Warm up engine to normal operating temperature.
(b) All accessories switched OFF.
(c) All vacuum lines properly connected.
(d) Transmission in "N" position.
(e) Connect the tachometer.
(f) Ignition timing check correctly.
(g) Idle speed check correctly.
(h) Check that the CO meter is properly calibrated.
(i) Race the engine at 2,500 rpm about 2 minutes.

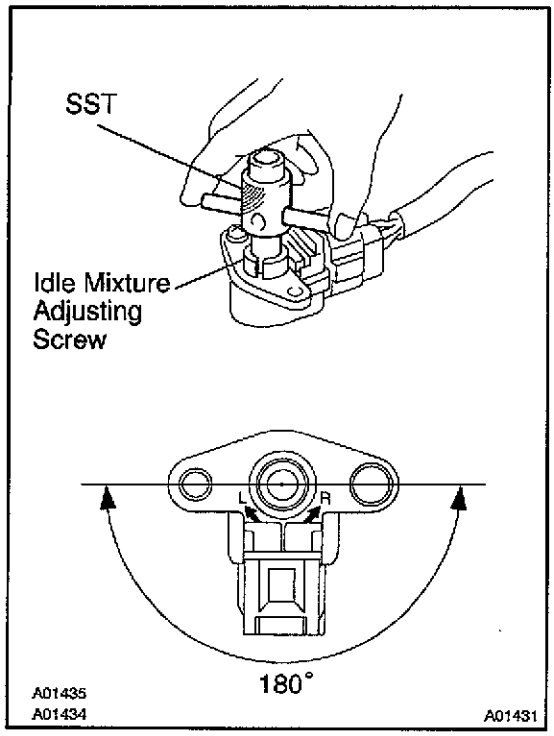
CHECK:
Insert a tester probe at least 40 cm (1.3 ft) into the tailpipe. Measure the concentration with 1 – 3 minutes after racing the engine to allow the the concentration to stabilize.

OK:
Idle CO concentration: 1.5 ± 0.5 %

OK → **CO concentration is normal. Proceed to next circuit inspection shown problem symptom tables (See page DI–18).**

NG

2	**Adjust CO concentration.**



PREPARATION:

Same condition as step 1 of this chart.

CHECK:

Using SST, adjust the mixture by turning the idle mixture adjusting screw in the variable resistor.

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RESULT:

OK	CO concentration: 1.5 ± 0.5 %
NG type I	Change in CO concentration
NG type II	No change in CO concentration

HINT:

Always check idle speed after turning the idle mixture adjusting screw. If it is incorrect, readjust idle speed.

Adjustable range of the idle mixture adjust to turn this screw is 180 degrees. Do not turn this screw more than it.

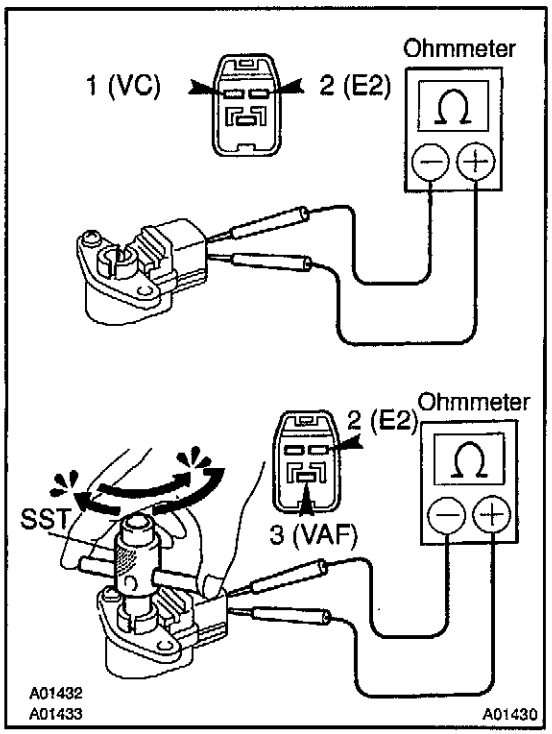
Type I → **See step EM–3 and go on troubleshooting.**

TypeII → **Go to step 3.**

OK

Adjustment is complete.

3	Check resistance of variable resistor.



Check Resistance Between 1 and 2:

PREPARATION:

Disconnect the variable resistor connector.

CHECK:

Measure resistance between terminals 1 and 2 of the variable resistor.

OK:

Resistance: 4 – 6 kΩ

Check Resistance Between 2 and 3:

CHECK:

Measure resistance between terminals 2 and 3 when turning the idle mixture adjusting screw fully clockwise and counter-clockwise using SST.

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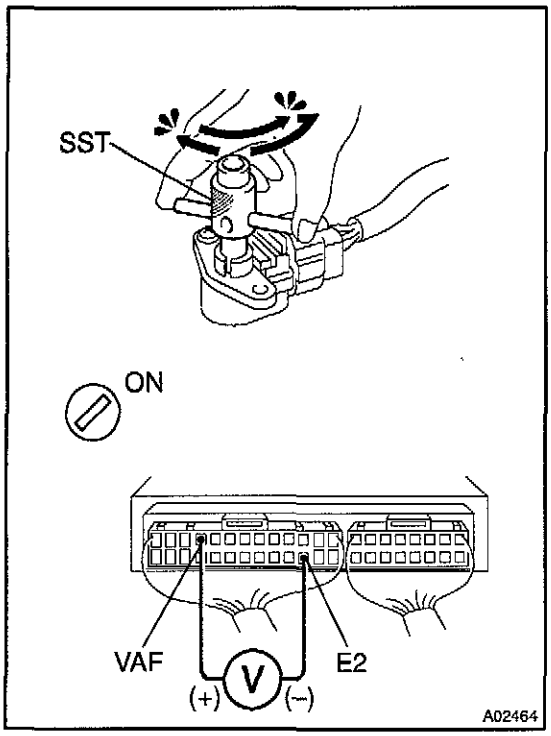
OK:

Resistance: Change from about 5 kΩ to 0 kΩ accordingly

NG → **Replace variable resister.**

OK

4	Check voltage between terminals VAF and E2 of engine ECU connector.



PREPARATION:

(a) Reconnect the variable resistor connector.
(b) Remove the glove compartment.(See page FI–60)
(c) Turn the ignition switch ON.

CHECK:

Measure voltage between terminals VAF and E2 of engine ECU connector while slowly turning the idle mixture adjusting screw first fully counterclockwise, and then fully clockwise, using SST.

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OK:

Voltage changes smoothly from 0 V to about 5 V; i.e., does not suddenly jump up to 5 V or down to 0 V.

OK → **Check and replace engine ECU.**

NG

5	Check for open and short in harness and connector between variable resistor and engine ECU (See page IN–21).

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

OK

Check and replace engine ECU.