DI3U8–01

PRE–CHECK

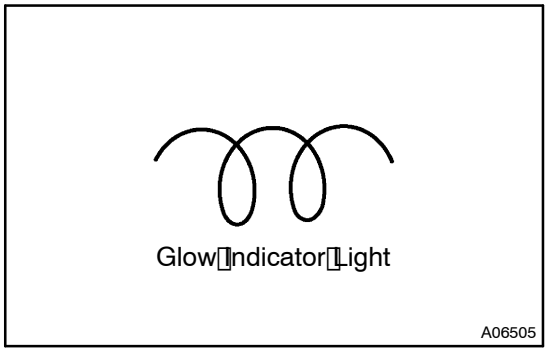
1. DIAGNOSIS SYSTEM

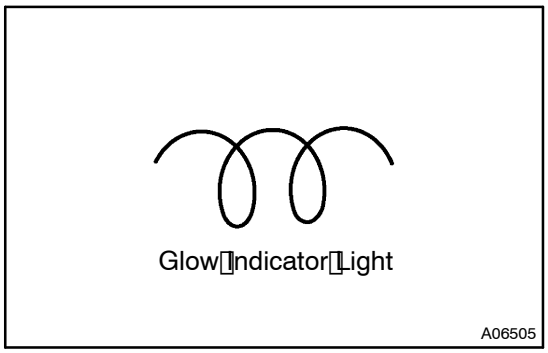
Description

The emission ECU contains a built–in self–diagnosis system by which troubles with the engine signal network and then flashes the glow indicator light on the combination meter.

By analyzing various signals as shown in the later table (See page DI–9), the emission ECU detects system malfunctions which are related to the various operating parameter sensors.

The DTC (diagnostic trouble code) can be read by the number of blinks of the glow indicator light when TE1 and E1 terminals on the check connector are connected. When 2 or more codes are indicated, the lowest number (code) will appear first.





2. DIAGNOSIS INSPECTION

(a) Glow Indicator Light Check

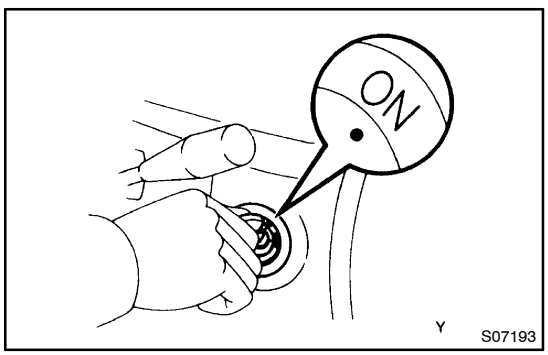
(1) The glow indicator light will light up when the ignition switch is turned ON and the engine is not running.

HINT:

If the glow indicator light does not light up, proceed to trouble-shooting of the combination meter.

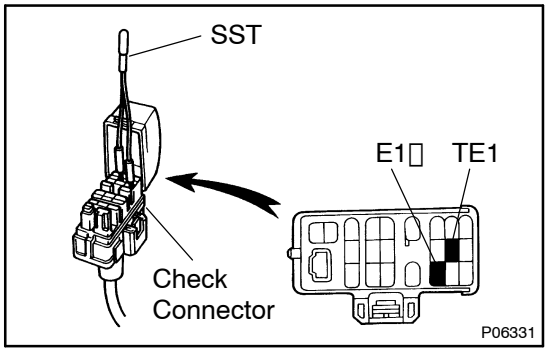
(2) When the engine is started, the glow indicator light should go off.

If the light remains on, the diagnosis system has detected a malfunction or abnormality in the system.

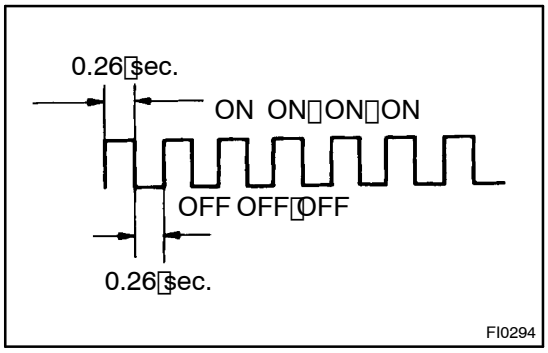


(b) DTC Check

(1) Turn the ignition switch ON.



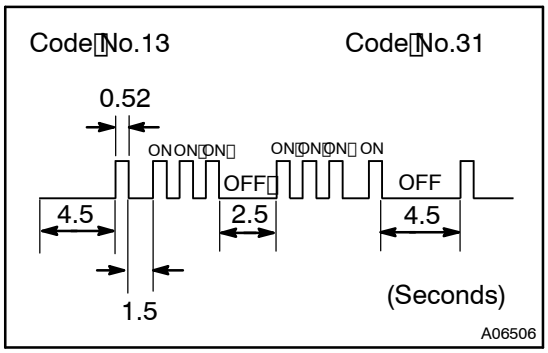
(2) Using SST, connect terminals between TE1 and E1 of check connector.
SST 09843–18020



(3) Read the DTC from glow indicator light.
As an example, the blinking patterns for codes; normal, 12 and 31 are as shown on the illustration.

HINT:
If a DTC is not output, check the TE1 terminal circuit. (See page DI–9)

(4) Check the details of the malfunction using the DTC chart on page DI–9.



(5) After completing the check, disconnect the SST from terminals TE1 and E1, and turn off the display.

HINT:
If the event of 2 or more malfunction codes, indication will begin from the smallest numbered code and continue in order to the largest.

3. FAIL–SAFE CHART

If any of the following codes is recorded, the emission ECU enters fail–safe mode.

Trouble Code No.	Fail–Safe Operation	Fail–Safe Deactivation Conditions
13	• Engine speed 0 rpm • EGR OFF • EGR cut VSV and VSV for BACS OFF	Returned to normal condition
22	• Water temp. is fixed at –20°C (–4°F) • EGR OFF • EGR cut VSV and VSV for BACS OFF	Returned to normal condition
31	• Intake air pressure 101.3 kPa (760 mmHg, 30 in.Hg) • EGR OFF • EGR cut VSV and VSV for BACS OFF	Returned to normal condition
41	• Accelerator pedal position is fixed at 0% • EGR OFF • EGR cut VSV and VSV for BACS OFF	The following condition must be repeated at least 2 times consecutively When closed throttle position switch is ON: 0.1 V ≦ VA ≦ 4.85 V
42	Do not operation A/C cut	Returned to normal condition
43	Starter OFF	Returned to normal condition
71	• EGR OFF • EGR cut VSV and VSV for BACS OFF	• +B 23.0 V • E–VRV OFF. (Cut the EGR)

DTC	Circuit
13	NE signal circuit
22	Water temp. sensor circuit
31	Vacuum sensor circuit
41	Throttle position sensor circuit

4. CHECK FOR INTERMITTENT PROBLEMS

As previously described so that when intermittent problems occur in the emission ECU signal circuits (NE, THW, PIM, VA) shown in the table opposite, the appropriate DTC is output. Accordingly, when the DTCs shown in the table opposite (13, 22, 31, 41) are output during the DTC check, and inspection of the appropriate circuits reveals no abnormality, check for intermittent problems as described below.

By check for intermittent problems, the place where intermittent problems are occurring due to poor contacts can be isolated.

(1) Clear DTC (See page DI–3)

(2) Perform a Simulation Test

Using the symptom simulation (See page IN–9), apply vibration to and pull lightly on the wire harness, connector or terminals in the circuit indicated by the malfunction code.

In this test, if the glow indicator light lights up, it indicates that the place where the wire harness, connector or terminals being pulled or vibrated has faulty contact. Check that point for loose connections, dirt on the terminals, poor fit or other problems and repair as necessary.

HINT:

After cancelling out the DTC in memory and set the test mode, if the glow indicator light does not go off after the engine is started, check thoroughly for faulty contact, etc., then try the check again. If the glow indicator light still does not go off, check and replace emission ECU.

5. BASIC INSPECTION

When the malfunction code is not confirmed in the DTC check, troubleshooting should be carried out in the order for all possible circuits to be considered as the causes of the problems.
In many cases, by carrying out the basic engine check shown in the following flow chart, the location causing the problem can be found quickly and efficiently. Therefore, use of this check is essential in engine trouble-shooting.

1	Is battery positive voltage 12.3 V or more when engine is stopped?

NO → Charge or replace battery.

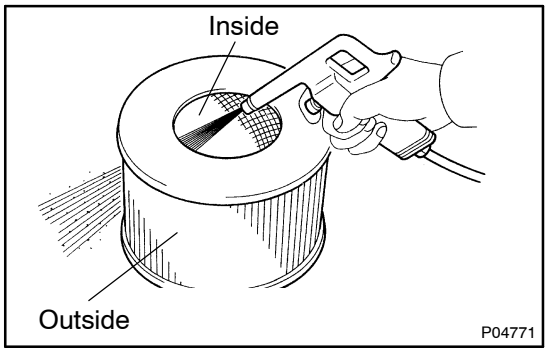
YES

2	Is engine cranked?

NO → Proceed to problem symptoms table on page DI–12.

YES

3	Check air filter.



PREPARATION:
Remove the air filter.
CHECK:
Visually check that the air filter is not excessively dirty or oily.
HINT:
If necessary, clean the air filter with compressed air. First blow from inside thoroughly, then blow from outside of the air filter.

NG → Repair or replace.

OK

4	Check fuel quality.

CHECK:

- Check that use only diesel fuel.
- Check that the fuel does not contain any impurity.

NG → Replace fuel.

OK

5	Check engine oil. (See page PP–12)

NG → Repair or replace.

OK

6	Check coolant. (See page PP–11)

NG → Replace coolant.

OK

7	Check injection timing. (See Pub. No. RM172E)

NG → Adjusting injection timing.

OK

8	Check idle speed and maximum speed. (See Pub. No.172E)

NG → Repair or replace injection pump.

OK

Proceed to problem symptoms table on page DI–12.