DIAGNOSIS SYSTEM

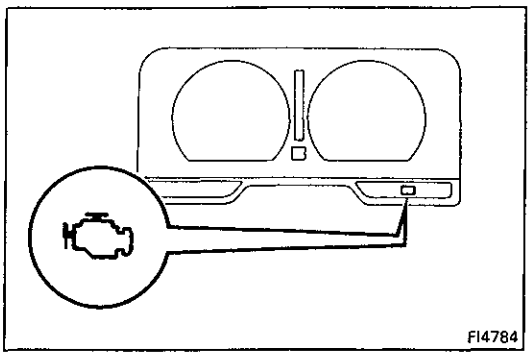
DESCRIPTION

The ECU contains a built-in self-diagnosis system by which troubles with the engine signal network are detected and a "CHECK ENGINE" warning light on the instrument panel flashes.

By analyzing various signals as shown in the later table (See pages FI-24, 25) the Electronic Control Unit (ECU) detects system malfunctions which are related to the various operating parameter sensors or to actuator.

The ECU stores the failure until the diagnostic system is cleared by removing the fuse EFI with ignition switch off.

A "CHECK ENGINE" warning light on the instrument panel informs the driver that a malfunction has been detected. The light goes out automatically when the malfunction has been cleared.



"CHECK ENGINE" WARNING LIGHT CHECK

1. The "CHECK ENGINE" warning light will comes on when the ignition switch is placed at ON and the engine not running.
2. When the engine is started, the "CHECK ENGINE" warning light should go out.

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

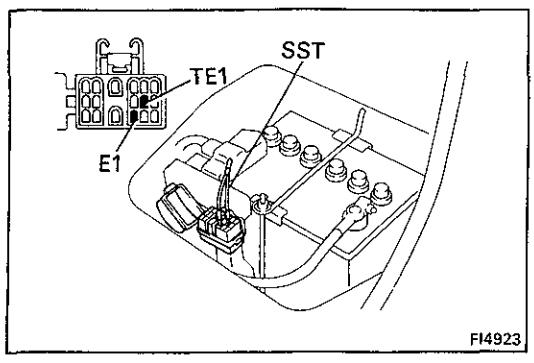
OUTPUT OF DIAGNOSIS CODES

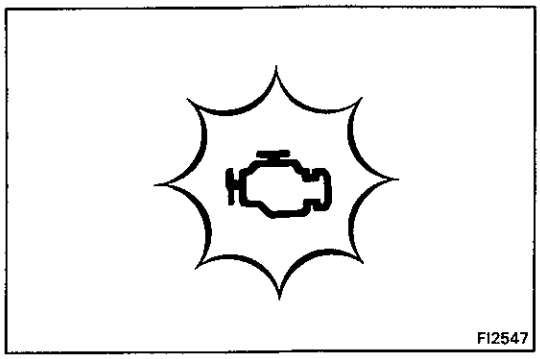
To obtain an output of diagnostic codes, proceed as follows:

1. Initial conditions
   (a) Battery voltage above 11 volts
   (b) Throttle valve fully closed (throttle position sensor IDL points closed)
   (c) Transmission in neutral position
   (d) Accessory switches OFF
2. Turn the ignition switch to ON. Do not start the engine.
3. Using SST, connect terminals TE1 and E1 of the check connector.

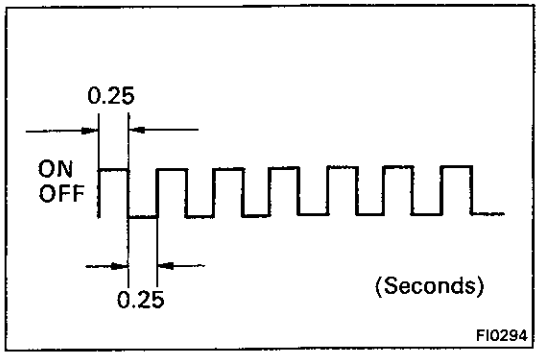
   SST 09843-18020

   HINT: The check connector is located near the battery.



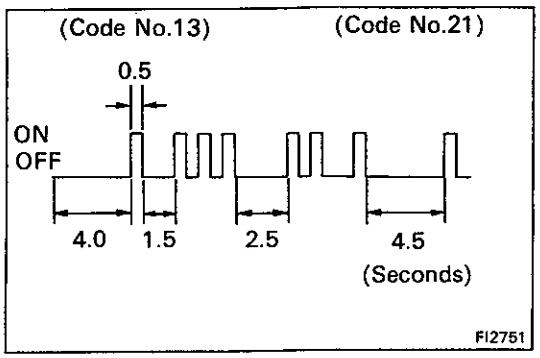


4. Read the diagnosis code as indicated by the number of flashes of the "CHECK ENGINE" warning light.



Diagnosis code (See pages FI-24, 25)

(a) Normal System Operation
The light will blink once every 0.25 seconds.



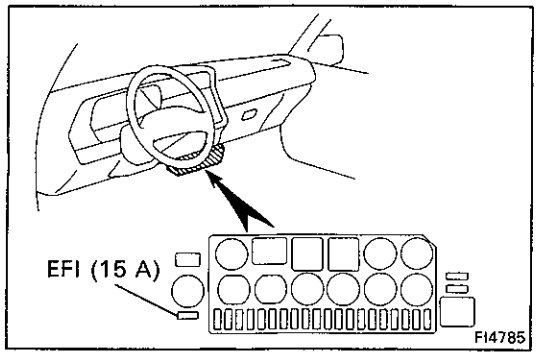
(b) Malfunction Code Indication

- The light will blink a number of times equal to the malfunction code indication as follows:
  1. Between the first digit and second digit, 1.5 seconds.
  2. Between code and code 2.5 seconds.
  3. Between all malfunction codes 4.5 seconds.

The diagnostic code series will be repeated as long as the check connector terminals TE1 and E1 are connected.

HINT: In event of a number of trouble codes, indication will begin from the small value and continue to the larger in order.

5. After the diagnosis check, remove SST from the check connector.



Cancelling out Diagnostic Code

(a) After repair of the trouble area, the diagnostic code retained in memory by the ECU must be cancelled out by removing the fuse EFI 15A for 30 seconds or more, depending on ambient temperature (the lower the temperature, the longer the fuse must be left out) with the ignition switch off.

HINT:

- Cancellation can also be achieved by removing the battery negative (–) terminal, but in this case other memory systems (radio ETR, clock etc.) will also be cancelled out.
- If the diagnostic code is not cancelled out, it will be retained by the ECU and appear along with a new code in event of future trouble.
- If it is necessary to work engine components requiring removal of battery terminal, a check must first be made to see if a diagnostic code has been recorded.

(b) After cancellation, perform a road test to, confirm that a "normal" code is now read on the "CHECK ENGINE" warning light.

If the same diagnostic code is still indicated, it means that the trouble area has not been repaired thoroughly.

DIAGNOSIS INDICATION

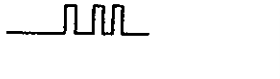
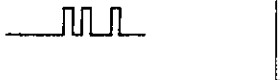
(1) Including "normal", the ECU is programmed with the following 14 diagnostic codes.

(2) When 2 or more codes are indicated, the lowest number (code) will appear first.

(3) All detected diagnostic codes, except 51, will be retained in memory by the ECU from the time of detection until cancelled out.

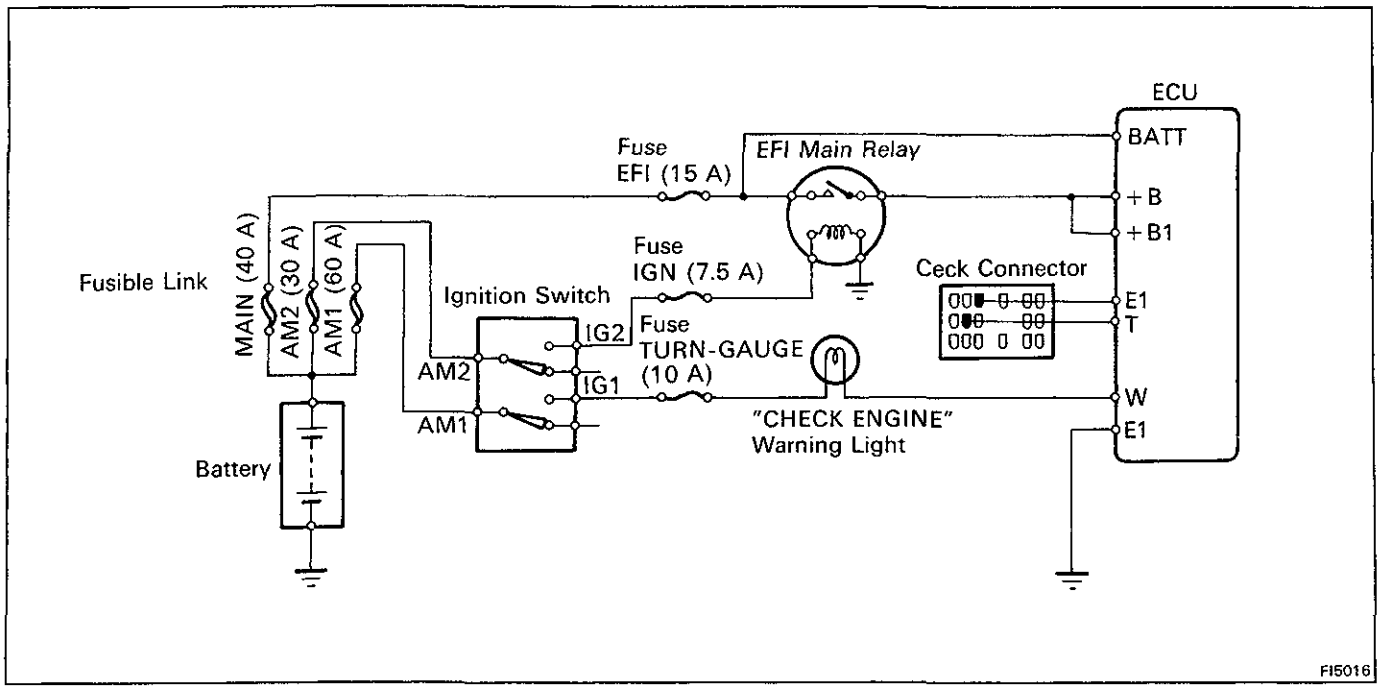
(4) Once the malfunction is cleared, the "CHECK ENGINE" warning light on the instrument panel will go out but the diagnostic code(s) remain stored in ECU memory (except for code 51).

DIAGNOSTIC CODES

Code No.	Number of blinks "CHECK ENGINE"	System	Diagnosis	Trouble area
–	 ON OFF FI1401	Normal	This appears when none of the other codes are identified.	———
12	 FI1389	RPM Signal	No "NE" signal to ECU within 2 seconds after engine has been cranked.	• Distributor circuit • Distributor • Igniter circuit • Igniter • Starter signal circuit • ECU
13	 FI1390	RPM Signal	No "NE" signal to ECU when engine speed is above 1,500 rpm.	• Distributor circuit • Distributor • Igniter circuit • Igniter • ECU
14	 FI1391	Ignition Signal	*No "IGF" signal to ECU 4 - 5 times* in succession.	• Igniter and ignition coil circuit • Igniter and ignition coil • ECU
21	 FI1400	Oxygen Sensor Signal	During air-fuel ratio feedback correction, voltage output from the oxygen sensor does not exceed a set valve on the lean side and the rich side continuously for a certain period.	• Oxygen sensor circuit • Oxygen sensor • ECU
		Oxygen Sensor Heater Signal	• Open or short circuit in oxygen sensor heater (HT1).	• Oxygen sensor heater circuit • Oxygen sensor heater • ECU
22	 FI1392	Water Temp. Sensor Signal	• Open or short circuit in water temp. sensor signal (THW).	• Water temp. sensor circuit • Water temp. sensor • ECU
24	 FI1611	Intake Air Temp. Sensor Signal	• Open or short circuit in intake air temp. sensor signal (THA).	• Intake air temp. sensor circuit • Intake air temp. sensor • ECU
25	 FI2562	• Air-fuel Ratio Lean Malfunction	• When oxygen sensor signal continues at the upper (rich) or lower (lean) limit for a certain period of time during feedback condition. • When air-fuel ratio feedback compensation value or adaptive control value continues at the upper (lean) or lower (rich) limit renewed for a certain period of time. • Open circuit in oxygen sensor (Ox).	• Injector circuit • Injector • Fuel line pressure • Oxygen sensor circuit • Oxygen sensor • Vacuum sensor • Air induction system • ECU
26	 FI2563	• Air-fuel Ratio Rich Malfunction		• Injector circuit • Injector • Fuel line pressure • Vacuum sensor • Cold start injector • ECU

Code No.	Number of blinks "CHECK ENGINE"	System	Diagnosis	Trouble area
31	 FI1394	Vacuum Sensor Signal	Open or short circuit intake manifold pressure signal (PIM)	• Vacuum sensor circuit • Vacuum sensor • ECU
41	 FI1396	Throttle Position Sensor Signal	• Open or short circuit in throttle position sensor signal (PSW).	• Throttle position sensor circuit • Throttle position sensor
42	 FI1397	Vehicle Speed Sensor Signal	• No "SPD" signal to ECU for 8 seconds when engine speed is between 2,100 rpm and 5,000 rpm and coolant temp. is above 80°C except when racing the engine.	• Vehicle speed sensor circuit • Vehicle speed sensor • ECU
43	 FI1398	Starter Signal	• No "STA" signal to ECU until engine speed reaches 800 rpm with vehicle not moving.	• IG switch circuit • IG switch • ECU
51	 FI1399	Switch condition Signal	• No "IDL" signal to ECU, with the check connector E1 and TE1 connected.	• Throttle position sensor circuit • Throttle position sensor • ECU

INSPECTION OF DIAGNOSIS CIRCUIT



1.

Does CHECK ENG. light come on when ignition switch is at ON?
- YES → System Normal
- NO → Does CHECK ENG. light come on when ECU terminal W is grounded to the body?
  - YES → Check wiring between ECU terminal E1 and body ground.
    - OK → Try another ECU.
    - BAD → Repair or replace.
  - NO → Check bulb, fuse and wiring between ECU and ignition switch.
    - BAD → Repair or replace.

2.

Does CHECK ENG. light go OFF when engine is started?
- YES → System Normal
- NO → Check wiring between ECU and CHECK ENG. light.
  - BAD → Repair
  - OK → Is there diagnosis code output when check connector TE1 and E1 is connect circuited?
    - NO → Try another ECU.
    - YES → Does CHECK ENG. light go out after repair according to malfunction code?
      - NO → Further repair required.
      - YES → System OK
        - NO → Cancel out diagnostic code.