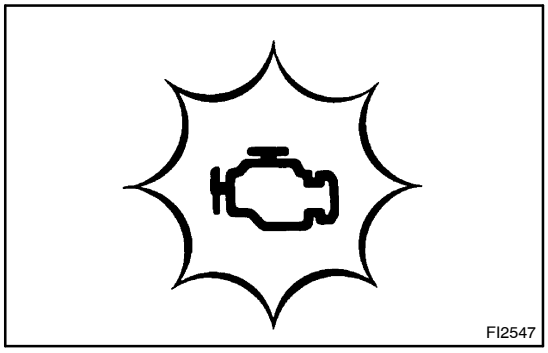
DICT8–02


FI2547

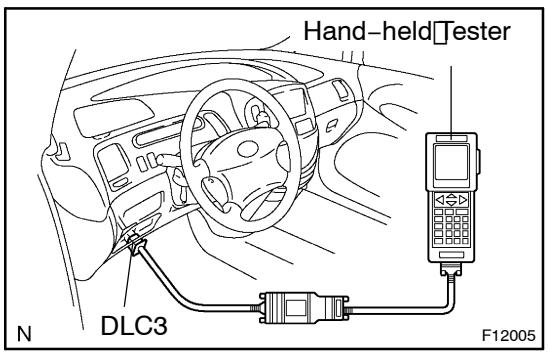
PRE–CHECK

1. DIAGNOSIS SYSTEM

(a) Description for Euro–OBD (European spec.)

- When troubleshooting Euro–OBD vehicles, you should connect a hand–held tester to the vehicle, and read various data output from the vehicle's engine control ECU.
- Euro–OBD regulations require that the vehicle's on–board computer illuminates the Check Engine Warning Light (CHK ENG) on the instrument panel when: (1) the computer detects a malfunction in the emission control system or components, (2) the power train control components (which affect vehicle emissions), or a computer malfunction occurs. In addition to the illumination of the CHK ENG when a malfunction is detected, the applicable Diagnostic Trouble Codes (DTCs) prescribed by ISO 15031–4 are recorded in the engine ECU memory (See page DI–19).

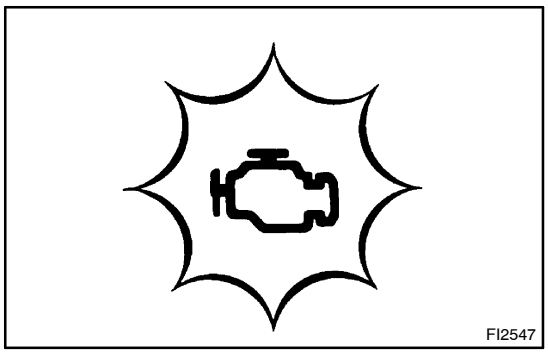
If the malfunction does not reoccur in 3 consecutive trips, the CHK ENG goes off automatically but the DTCs remain recorded in the engine ECU memory.



- To check the DTCs, connect the hand–held tester to Data Link Connector 3 (DLC3) on the vehicle. The hand–held tester also enables you to erase the DTCs and check freeze frame data and various forms of engine data.
  DTCs include ISO controlled codes and manufacturer defined codes. ISO controlled codes must be set as prescribed by the ISO, while manufacturer defined codes can be set freely by the manufacturer within the prescribed limits (See DTC Chart on page DI–19).

- The diagnosis system operates in normal mode during normal vehicle use. It also has check (test) mode for technicians to simulate malfunction symptoms and troubleshoot. Most DTCs use 2 trip detection logic* to prevent erroneous detection, and to ensure a thorough malfunction detection. By switching the engine ECU to check (test) mode using the hand–held tester when troubleshooting, a technician can cause the CHK ENG to illuminate for a malfunction that is only detected once or momentarily.
- *2 trip detection logic:
  When a malfunction is first detected, the pending fault code is stored in the engine ECU memory (1st trip). If the same malfunction is detected again during the second drive test, this second detection causes the CHK ENG to illuminate (2nd trip). However, the ignition switch must be turned OFF between the 1st trip and 2nd trip.
- Freeze frame data:
  Freeze frame data records the engine condition (fuel system, calculated load, engine coolant temperature, fuel trim, engine speed, vehicle speed, etc.) when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air–fuel ratio was lean or rich, and other data from the time the malfunction occurred.

(b) Description for M–OBD (Except European specification)
When troubleshooting Multiplex On–Board Diagnostic (M–OBD) vehicles, the vehicle must be connected to the hand–held tester. Various data output from the engine ECU can then be read.


FI2547

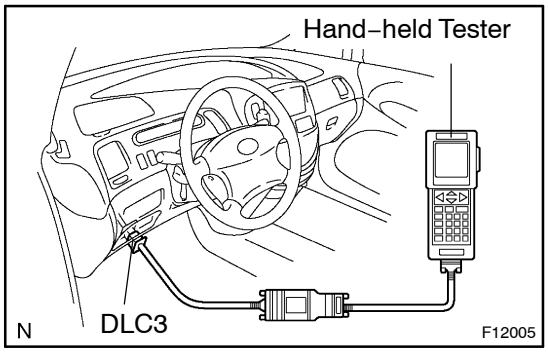
2UZ–FE ENGINE SUP (RM1113E)

OBD regulations require that the vehicle's on–board computer illuminates the MIL on the instrument panel when the computer detects a malfunction in:

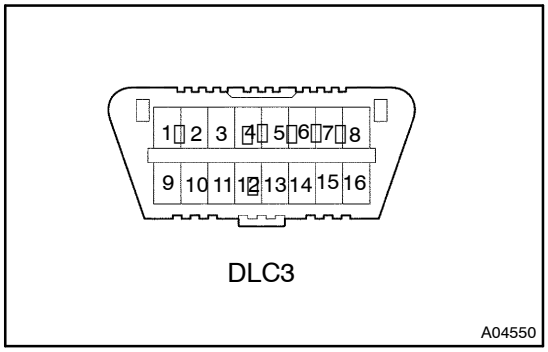
- The emission control system ./ components
- The powertrain control components (Which affect vehicle emissions)
- The computer

In addition to, the applicable Diagnostic Trouble Codes (DTCs) are recorded in the ECU memory (See page DI–19).

If the malfunction does not recur in 3 consecutive trips, the MIL turns off automatically but the DTCs remain recorded in the ECU memory.



- To check the DTCs, connect the hand–held tester to the Data Link Connector 3 (DLC3) on the vehicle. Or, connect TC and CG terminals on the DLC3 and read the DTC on the multi information display. The hand–held tester also enables you to erase the DTCs and check the freeze frame data and various forms of engine data. (For operating instructions, see the instruction book.)
- The diagnosis system operates in normal mode during normal vehicle use. It also has check (test) mode for technicians to simulate malfunction symptoms and troubleshoot. Most DTCs use 2 trip detection logic* to prevent erroneous detection and to ensure thorough malfunction detection. By switching the engine ECU to check (test) mode using the hand–held tester when troubleshooting, a technician can cause the CHK ENG to illuminate for a malfunction that is only detected once or momentarily (hand–held tester only) (See step 3).
- * 2 trip detection logic:
  When a malfunction is first detected, the pending fault code is stored in the engine ECU memory (1st trip). If the same malfunction is detected again during the second drive test, this second detection causes the CHK ENG to illuminate (2nd trip). However, the ignition switch must be turned OFF between the 1st trip and 2nd trip.
- Freeze frame data:
  Freeze frame data records the engine conditions (fuel system, calculator load, water temperature, fuel trim, engine speed, vehicle speed, etc.) when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air–fuel ratio was lean or rich, and other data from the time the malfunction occurred.



(c) Check the DLC3.
The vehicle's engine ECU uses the ISO 9141–2 (Euro–OBD)/ISO 14230 (Euro–OBD) communication protocol. The terminal arrangement of the DLC3 complies with ISO 15031–3 and matches the ISO 9141–2/ISO 14230 format.

Tester Connection	Condition	Specified Condition
7 (Bus + line) – 5 (Signal ground)	During communication	pulse generation
4 (Chassis ground) – Body ground	Constant	Below 1 Ω
5 (Signal ground) – Body ground	Constant	
16 (B+) – Body ground	Constant	9 to 14 V

HINT:
Connect the cable of the hand–held tester to the DLC3, turn the ignition switch ON and attempt to use the hand–held tester. If the screen displays UNABLE TO CONNECT TO VEHICLE, a problem exists in the vehicle side or the tester side.

- If communication is normal when the tester is connected to another vehicle, inspect the DLC3 on the original vehicle.
- If communication is still not possible when the tester is connected to another vehicle, the problem is probably in the tester itself. Consult the Service Department listed in the tester instruction manual.

(d) Inspect the battery voltage.
Battery voltage: 11 to 14 V
If voltage is below 11 V, recharge the battery before proceeding.

(e) Check the CHK ENG.
(1) The CHK ENG comes on when the ignition switch is turned ON and the engine is not running.

HINT:
If the CHK ENG is not illuminated, at this time troubleshoot the combination meter (See page DI–247).

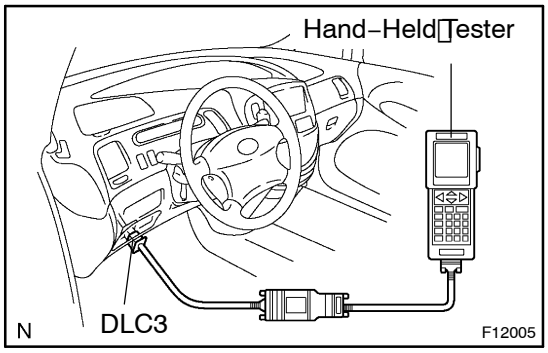
(2) When the engine is started, the CHK ENG should turn off. If the CHK ENG remains on, the diagnosis system has detected a malfunction or abnormality in the system.

2. Normal Mode: CHECK DTC

NOTICE:

Hand–held tester only:

When the diagnosis system is switched from normal mode to check mode, all DTCs and freeze frame data recorded in the normal mode are erased. Before switching modes, always make check the DTCs and freeze frame data and note them down.



(a) Check DTCs.

(1) Connect the hand–held tester to the DLC3.

(2) Turn the ignition switch ON and push the hand–held tester main switch ON.

(3) Use the hand–held tester to check the DTCs and freeze frame data and then write them down. If you need help with the hand–held tester, refer to the hand–held tester's instruction book.

(4) See page DI–19 to confirm the details of the DTCs.

(b) Clear the DTC.

The DTCs and freeze frame data will be erased by either actions.

(1) Operating the hand–held tester to erase the codes. (See the hand–held tester's instruction book for operating instructions.)

(2) Disconnecting the battery terminals or EFI and ECD and ETCS fuses.

NOTICE:

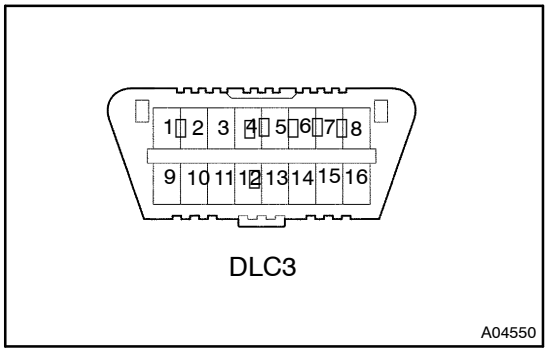
If the hand–held tester switches the engine ECU from the normal mode to the check mode or vice–versa, or if the ignition switch is turned from ON to ACC or OFF during the check mode, the DTCs and freeze frame data will be erased.

(c) Check the DTC for ETCS

(1) Turn ignition switch ON.

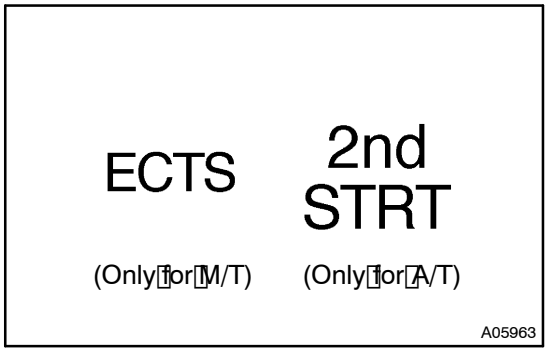
HINT:

If the 2nd STRT indicator (only for A/T)/ETCS indicator (only for M/T) does not light up, troubleshoot the combination meter.



(2) Using SST, connect between terminals 13 (TC) and 4 (CG) of DLC3.

SST 09843–18040

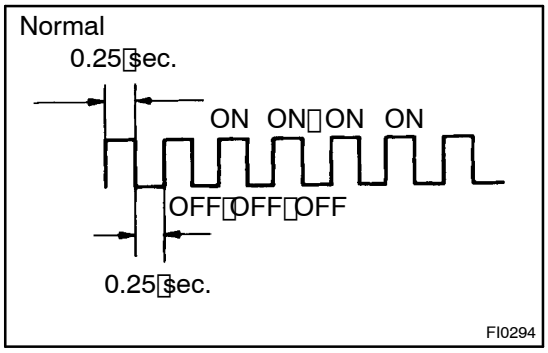


(3) Read the diagnostic trouble code from 2nd STRT indicator (only for A/T)/ETCS indicator (only for M/T) on the combination meter.

HINT:
If a DTC is not output, check the TC terminal circuit.

(4) Check details of the malfunction using the DTC chart on page DI–19.

(5) After completing the check, disconnect terminals 13 (TC) and 4 (CG) and turn off the display.



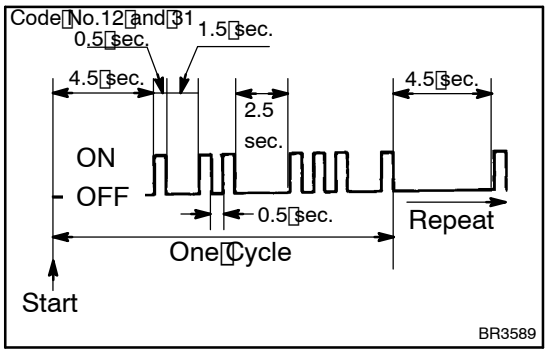
HINT:
In the event of 2 or more malfunction codes, indication will begin from the smaller numbered code and continue in order to the lager.

(d) Clear the DTC.
The DTCs and freezed frame data will be erased by either actions.

(1) Operating the hand–held tester to erase the codes. (See the hand–held tester's instruction book for operating instructions.)

(2) Disconnecting the battery terminals of EFI and ECD and ETCS fuses.

NOTICE:
If the hand–held tester switches the engine ECU from normal mode to check (test) mode or vice–versa, or if the ignition switch is turned from ON to ACC or OFF during check (test) mode, the DTCs and freezed frame data will be erased.



3. Check Mode: CHECK DTC

HINT:
Hand–held tester only:
Compared to the normal mode, the check mode is more sensitive to malfunctions. Furthermore, the same diagnostic items which are detected in the normal mode can also be detected in the check (test) mode.

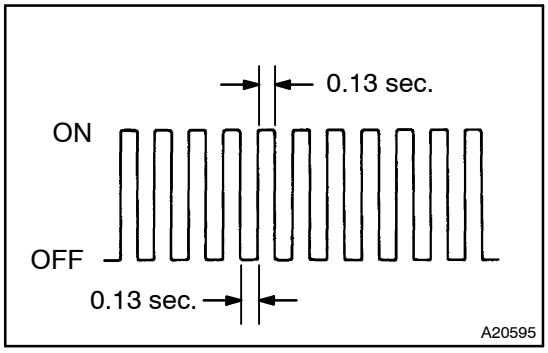
(a) Procedure for check mode using the hand–held tester.

(1) Check the initial conditions.
- Battery positive voltage 11 V or more.
- Throttle valve fully closed.
- Transmission in the P or N position.
- A/C switched OFF.

(2) Turn the ignition switch OFF.

(3) Connect the hand–held tester to the DLC3.

(4) Turn the ignition switch ON and push the hand–held tester main switch ON.



(5) Switch the hand–held tester from normal mode to check (test) mode. The CHK ENG blinks at 0.13 second intervals as shown in the illustration.

NOTICE:

If the hand–held tester switches the engine ECU from the normal mode to check mode or vice–versa, or if the ignition switch is turned from ON to ACC or OFF during check mode, the DTCs and freeze frame data will be erased.

(6) Start the engine (The CHK ENG goes off after the engine start.).

(7) Simulate the conditions of the malfunction described by the customer.

NOTICE:

Leave the ignition switch ON until you have checked the DTCs, etc.

(8) After simulating the malfunction conditions, use the hand–held tester diagnosis selector to check the DTCs and freeze frame data, etc.

HINT:

Be sure not to turn the ignition switch OFF. Doing so would change the engine control ECU from check mode to normal mode,resulting in all of the DTCs and freeze frame data being erased.

(9) After checking the DTCs, inspect the applicable circuits.

4. FAIL–SAFE CHART

If any of the following code is recorded, the engine control ECU enters fail–safe mode.

DTC No.	Fail–Safe Operation	Fail–Safe Deactivation Conditions
P0031 P0032 P0037 P0038 P0051 P0052 P0057 P0058	Turn off heater of HO2S heater	Ignition switch OFF
P0100 P0102 P0103	Ignition timing is calculated from engine speed and throttle angle	”Pass” condition detected
P0110 P0112 P0113	Intake air temperature is fixed at 20°C (68°F)	”Pass” condition detected
P0115 P0117 P0118	Engine coolant temperature is fixed at 80°C (176°F)	”Pass” condition detected

P0120 P0121 P0122 P0123 P0220 P0222 P0223 P0604 P0607 P0657 P2102 P2103 P2111 P2112 P2118 P2119 P2135	If the Electronic Throttle Control System (ETCS) has a malfunction, the engine control ECU cuts off current to the throttle control motor. The throttle control valve returns to a predetermined opening angle (approximately 16°) by the force of the return spring. The engine control ECU then adjusts the engine output by controlling the fuel injection (intermittent fuel–cut) and ignition timing in accordance with the accelerator pedal opening angle to enable the vehicle to continue at a minimal speed.	"Pass" condition is detected and then the ignition switch is turned OFF.
P0325 P0330	Max. timing retardation	Ignition switch OFF
P0351 P0352 P0353 P0354 P0355 P0356 P0357 P0358	Fuel cut	"Pass" condition detected
P2120 P2121 P2122 P2123 P2125 P2127 P2128 P2138	The accelerator pedal position sensor has two (main and sub) sensor circuits. If a malfunction occurs in either of the sensor circuits, the engine control ECU switches to limp mode. In limp mode, the remaining circuit is used to calculate the accelerator pedal opening to allow the vehicle to continue driving. If both circuits malfunction, the engine control ECU regards the opening angle of the accelerator pedal to be fully closed. In this case, the throttle valve will remain closed as if the engine is idling.	"Pass" condition is detected and the ignition switch is turned OFF.

5. CHECK FOR INTERMITTENT PROBLEMS

Hand–held tester only:

By putting the vehicle's engine ECU in check mode, the 1 trip detection logic is possible instead of the 2 trip detection logic, and the sensitivity to detect faults is increased. This makes it easier to detect intermittent problems.

(a) Clear the DTC (See step 2).

(b) Set the check mode (See step 3).

(c) Perform a simulation test (See page IN–10).

(d) Check the connector and terminal (See page IN–20).

(e) Wiggle the harness and the connector (See page IN–10).

6. DATA LIST

HINT:

Using the DATA LIST displayed by the hand–held tester, you can read the value of the switches, sensors, actuators and other parts without parts removal. Reading the DATA LIST as the first step of troubleshooting is one way to shorten the diagnostic time.

NOTICE:

The values given below for "Normal Condition" are representative values. A vehicle may still be normal even if its value differs from those listed here. Do not solely depend on the "Normal Condition" here when deciding whether a part is faulty or not.

(a) Warm up the engine.
(b) Turn the ignition switch OFF.
(c) Connect the hand–held tester to the DLC3.
(d) Turn the ignition switch ON.
(e) Push the "ON" button of the hand–held tester.
(f) Select the item "DIAGNOSIS / OBD/MOBD / DATA LIST".
(g) According to the display on the tester, read the "DATA LIST".

HINT:

If no conditions are specifically stated for "Idling", it means the shift lever is in the N or P position, the A/C switch is OFF and all accessory switches are OFF.

Item	Measurement Item/Range (Display)	Normal Condition*	Diagnostic Note
INJECTOR	Injection period of the No. 1 cylinder/ Min.: 0 ms, Max.: 32.64 ms	Idling: 2.1 to 3.9 ms	–
IGN ADVANCE	Ignition timing advance for No.1 cylinder/ Min.: –64 deg., Max.: 63.5 deg.	Idling: BTDC 5 to 25˚	–
CALC LOAD	Calculated load by engine control ECU/ Min.: 0%, Max.: 100%	• Idling: 12.5 to 19.7% • Racing without load (2,500 rpm): 10.7 to 17.9%	–
MAF	Air flow rate from MAF sensor/ Min.: 0 gm/s, Max.: 655 gm/s	• Idling: 4.1 to 6.4 gm/sec. • Racing without load (2,500 rpm): 12.5 to 20.8 gm/sec.	If value is approximately 0.0 gm/s: • Mass air flow meter power source circuit open • VG circuit open or short If value is 160.0 gm/s or more: • E2G circuit open
ENGINE SPD	Engine Speed/ Min.: 0 rpm, Max.: 16,383 rpm	Idling: 650 to 750 rpm	–
COOLANT TEMP	Coolant temperature/ Min.: –40˚C, Max.: 140˚C	After warming up: 80 to 95˚C (176 to 203˚F)	• If value is –40°C (–40°F): sensor circuit is open. • If value is 140°C (284°F) or more: sensor circuit is shorted.
INTAKE AIR	Intake air temperature/ Min.: –40 ˚C, Max.: 140 ˚C	Equivalent to ambient temp. (After cold soak)	
THROTTLE POS	Absolute throttle position sensor/ Min.: 0%, Max.: 100%	• Throttle fully closed: 10 to 24% • Throttle fully open: 66 to 98%	Read value with the ignition switch ON (Do not start engine).
THROTTLE INITIAL	Throttle fully closed rearing value	0.5 to 0.9 V	–
CTP SW	Closed throttle position switch/ ON or OFF	• Throttle fully closed: ON • Throttle open: OFF	–
VEHICLE SPD	Vehicle speed/ Min.: 0 km/h, Max.: 255 km/h	Vehicle stopped: 0 km/h (0 mph)	Speed indicated on speedometer

O2S B1 S1 (*1)	Oxygen sensor output voltage of the bank 1 sensor 1/ Min.: 0 V, Max.: 1.275 V	0.1 to 0.9 V	Performing INJ VOL or A/F CONTROL function of ACTIVE TEST enables the technician to check the voltage output of each sensor.
O2S B2 S1 (*1)	Oxygen sensor output voltage of the bank 2 sensor 1/ Min.: 0 V, Max.: 1.275 V		Performing INJ VOL or A/F CONTROL function of ACTIVE TEST enables the technician to check the voltage output of each sensor.
O2S B1 S2 (*1)	Oxygen sensor output voltage of the bank 1 sensor 2/ Min.: 0 V, Max.: 1.275 V	0.1 to 0.9 V	Performing INJ VOL or A/F CONTROL function of ACTIVE TEST enables the technician to check the voltage output of each sensor.
O2S B2 S2 (*1)	Oxygen sensor output voltage of the bank 2 sensor 2/ Min.: 0 V, Max.: 1.275 V		Performing INJ VOL or A/F CONTROL function of ACTIVE TEST enables the technician to check the voltage output of each sensor.
SHORT FT #1 (*1)	Short term fuel trim of bank 1/ Min.: –100%, Max.: 100%	0 ± 20%	This item is short–term fuel compensation used to maintain air–fuel ratio at stoichiometric air–fuel ratio
LONG FT #1 (*1)	Long term fuel trim of bank 1/ Min.: –100%, Max.: 100%	0 ± 20%	This item is overall, long–term fuel compensation that helps to maintain air–fuel ratio at stoichiometric air–fuel ratio (steadies long term deviations of short–term fuel trim from central value)
TOTAL FT #1 (*1)	Total fuel trim of bank 1/ (SHORT FT #1 + LONG FT #1) Min.: 0.5, Max.: 1.496	0.6 to 1.4	–
SHORT FT #2 (*1)	Short term fuel trim of bank 2/ Min.: –100%, Max.: 100%	0 ± 20%	Same as SHORT FT #1
LONG FT #2 (*1)	Long term fuel trim of bank 2/ Min.: –100%, Max.: 100%	0 ± 20%	Same as LONG FT #1
TOTAL FT #2 (*1)	Total fuel trim of bank 2/ (SHORT FT #2 + LONG FT #2) Min.: 0.5, Max.: 1.496	0.6 to 1.4	–
O2FT B1 S1 (*1)	Short term fuel trim associated with the bank 1, sensor 1/ Min.: –100%, Max.: 100%	0 ± 20%	Same as SHORT FT #1
O2FT B1 S2 (*1)	Short term fuel trim associated with the bank 1, sensor 2/ Min.: –100%, Max.: 100%	0 ± 20%	Same as SHORT FT #2
O2FT B2 S1 (*1)	Short term fuel trim associated with the bank 2, sensor 1/ Min.: –100%, Max.: 100%	0 ± 20%	Same as SHORT FT #1
O2FT B2 S2 (*1)	Short term fuel trim associated with the bank 2, sensor 2/ Min.: –100%, Max.: 100%	0 ± 20%	Same as SHORT FT #2
O2 LR B1 S1 (*1)	Response time of the O2 sensor lean to rich (bank 1, sensor 1)/ Min.: 0 ms, Max.: 16,711 ms	Idling after warming up: 0 to 1,000 ms	–
O2 LR B2 S1 (*1)	Response time of the O2 sensor lean to rich (bank 2, sensor 1)/ Min.: 0 ms, Max.: 16,711 ms	Idling after warming up: 0 to 1,000 ms	–

O2 RL B1 S1 (*1)	Response time of the O2 sensor rich to lean (bank 1, sensor 1)/ Min.: 0 ms, Max.: 16,711 ms	Idling after warming up: 0 to 1,000 ms	–
O2 RL B2 S1 (*1)	Response time of the O2 sensor rich to lean (bank 2, sensor 1)/ Min.: 0 ms, Max.: 16,711 ms		–
O2 LR B1 S2 (*1)	Response time of the O2 sensor lean to rich (bank 1, sensor 2)/ Min.: 0 ms, Max.: 16,711 ms	–	–
O2 LR B2 S2 (*1)	Response time of the O2 sensor lean to rich (bank 2, sensor 2)/ Min.: 0 ms, Max.: 16,711 ms	–	–
O2 RL B1 S2 (*1)	Response time of the O2 sensor rich to lean (bank 1, sensor 2)/ Min.: 0 ms, Max.: 16,711 ms	–	–
O2 RL B2 S2 (*1)	Response time of the O2 sensor rich to lean (bank 2, sensor 2)/ Min.: 0 ms, Max.: 16,711 ms		–
FUEL SYS #1 (*1)	Fuel system status (Bank1)/ OL or CL or OLDRIVE or OL-FAULT or CLFAULT	Idling after warming up: CL	• Fuel System Status (Bank 1)/ • OL: Open Loop • CL: Closed Loop • OL DRIVE: OL due to driving conditions (ex: when fuel enrichment) • OL FAULT: OL due to detected system fault • CL FAULT: CL is controlled by only one front HO2S (the other front HO2S malfunctions)
FUEL SYS #2 (*1)	Fuel system status (Bank2)/ OL or CL or OLDRIVE or OL-FAULT or CLFAULT		
FC IDL	Idle fuel cut/ ON or OFF	Fuel cut operation: ON	FC IDL = ”ON” when throttle valve fully closed and engine speed is over 1,500 rpm.
MIL	MIL status/ ON or OFF	MIL ON: ON	–
STARTER SIG	Starter signal/ ON or OFF	Cranking: ON	–
A/C SIG	A/C signal/ ON or OFF	A/C ON: ON	–
PNP SW [NSW] (*2)	Park/neutral position switch signal/ ON or OFF	P or N range: ON	–
ELECT LOAD SIG	Electrical load signal/ ON or OFF	Defogger switch ON: ON	–
STOP LIGHT SW	Stop light switch/ ON or OFF	• Brake pedal depressed: ON • Brake pedal released: OFF	–
FUEL PMP SP CTL	Fuel pump speed control status/ ON (Low speed) or OFF (High speed)	Idling: ON	–
FUEL PUMP/SPD	Fuel pump/speed status/ ON or OFF	Idling: ON	–
A/C MAG CLUTCH	A/C magnet clutch status/ ON or OFF	A/C magnet clutch ON: ON	–

EVAP VSV	VSV status for EVAP control/ ON or OFF	VSV operating: ON	VSV for EVAP is controlled by the engine control ECU (ground side duty control)
IGNITION (*1)	Ignition counter/ Min.: 0, Max.: 400	0 to 400	–
CYL #1 – CYL #8 (*1)	Misfire ratio of the cylinder/ Min.: 0%, Max.: 50%	0%	This item is displayed in only idling
MISFIRE LOAD (*1)	Engine load for first misfire range/ Min.: 0 g/rev, Max.: 3.98 g/rev	Misfire 0: 0 g/rev	–
MISFIRE RPM (*1)	Engine RPM for first misfire range/ Min.: 0 rpm, Max.: 6,375 rpm	Misfire 0: 0 rpm	–
MIL ON RUN DIST (*1)	This parameter indicates the distance travelled while CHK ENG is activated/ Min.: 0 km, Max.: 65.535 km	When there is no DTC: 0 km	–

*1: Unleaded gasoline engine only.
*2: A/T only

7. ACTIVE TEST

HINT:
Performing the hand–held tester ACTIVE TEST allows relay, VSV, actuator and other items to be operated without parts removal. Performing the ACTIVE TEST early in troubleshooting is one way to shorten labor time.
The DATA LIST can be displayed during the ACTIVE TEST.

(a) Turn the ignition switch OFF.
(b) Connect the hand–held tester.
(c) Turn the ignition switch ON.
(d) Push the ”ON” button of the hand–held tester.
(e) Select the item ”DIAGNOSIS / OBD/MOBD / ACTIVE TEST”.
(f) According to the display on the tester, perform the ”ACTIVE TEST”.

Hand–held Tester Display	Test Details	Diagnostic Note
INJ VOL	[Test Details] Control injection volume Min.: –12.5 %, Max.: 25 % [Vehicle Condition] Engine speed: 3,000 rpm or less	Injector volume is gradually changed between –12.5 and 25 %
A/F CONTROL	[Test Details] Control injection volume –12.5 or 25 % (Change the injection volume –12.5 % or 25 %) [Vehicle Condition] Engine speed: 3,000 rpm or less	Following procedure of A/F CONTROL enables the technician to check and graph voltage outputs of both the A/F sensor and heated oxygen sensor: (a) Enter ”ACTIVE TEST / A/F CONTROL / USER DATA” (b) Select ”F4”
EVAP (PURGE) VSV	Activate VSV for EVAP (Purge) control ON or OFF	–
A/C MAG CLUTCH	[Test Details] Control A/C magnet clutch ON or OFF	–
FUEL PUMP SP CTL	ON: Low speed OFF: High speed	–

FUEL PUMP / SPD	[Test Details] Control fuel pump ON or OFF	–
TC/TE1	[Test Details] Connection TC and TE1 ON: TC and TE1 connected OFF: TC and TE1 disconnected	–
FC IDL PROHBT	[Test Details] Deceleration fuel–cut prohibit ON or OFF	–

8. BASIC INSPECTION

When the malfunction is not confirmed in the DTC check, troubleshooting should be carried out in all the possible circuits considered as causes of the problem. In many cases, by carrying out the basic engine check shown in the following flowchart, the location causing the problem can be found quickly and efficiently. Therefore, using this check is essential in the engine troubleshooting.

1	**Is battery positive voltage 11 V or more when engine stopped?**

NO → **Charge or replace battery.**

YES

2	**Is engine cranked?**

NO → **Proceed to page DI–34, and continue to trouble-shoot.**

YES

3	**Does engine start?**

NO → **Go to step 6.**

YES

4	**Check air filter.**

PREPARATION:
Remove the air filter.
CHECK:
Visually check that the air filter is not excessively dirty or oily.

NG → **Repair or replace air filter.**

OK

5	**Check idle speed.**

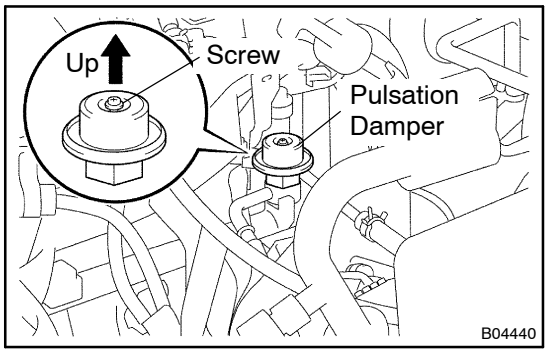
PREPARATION:
(a) Warm up the engine to the normal operating temperature.
(b) Switch off all the accessories.
(c) Switch off the A/C.
(d) Shift the transmission into the N position.
(e) Connect the hand–held tester to the DLC3 of the vehicle.
CHECK:
Use CURRENT DATA to check the idle speed.
OK:

Idle speed: 650 to 750 rpm

NG → **Proceed to problem symptoms table on page DI–34.**

OK

6	**Check fuel pressure.**



PREPARATION:

(a) Be sure that enough fuel is in the tank.
(b) Connect the hand–held tester to the DLC3.
(c) Turn the ignition switch ON and push the hand–held tester main switch ON.
(d) Use the ACTIVE TEST mode to operate the fuel pump.
(e) Please refer to the hand–held tester operator's manual for further details.
(f) If you have no hand–held tester, connect the positive (+) and negative (–) leads from the battery to the fuel pump connector (See Pub. No. RM630E, page FI–7).

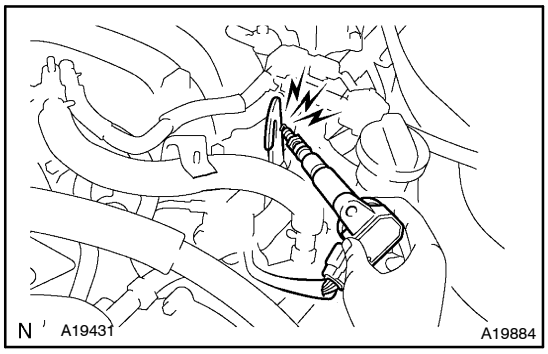
CHECK:

Check that the pulsation damper screw rises up when the fuel pump operation (See Pub. No. RM630E, page FI–7).
HINT:
At this time, you will hear a fuel flowing noise.

NG → **Proceed to Pub. No. RM630E, page FI–7 and continue to troubleshoot.**

OK

7	Check for spark.



PREPARATION:

(a) Disconnect the ignition coil.
(b) Remove the spark plug.
(c) Install the spark plug to the ignition coil.
(d) Disconnect the injector connector.
(e) Ground the spark plug.

CHECK:

Check if spark occurs while the engine is being cranked.

NOTICE:

To prevent excess fuel from being injected from the injectors during this test, don't crank the engine for more than 5 to 10 seconds at a time.

NG → **Proceed to Pub. No. RM630E, page IG–1 and continue to troubleshoot.**

OK

Proceed to problem symptoms table on page DI–34.