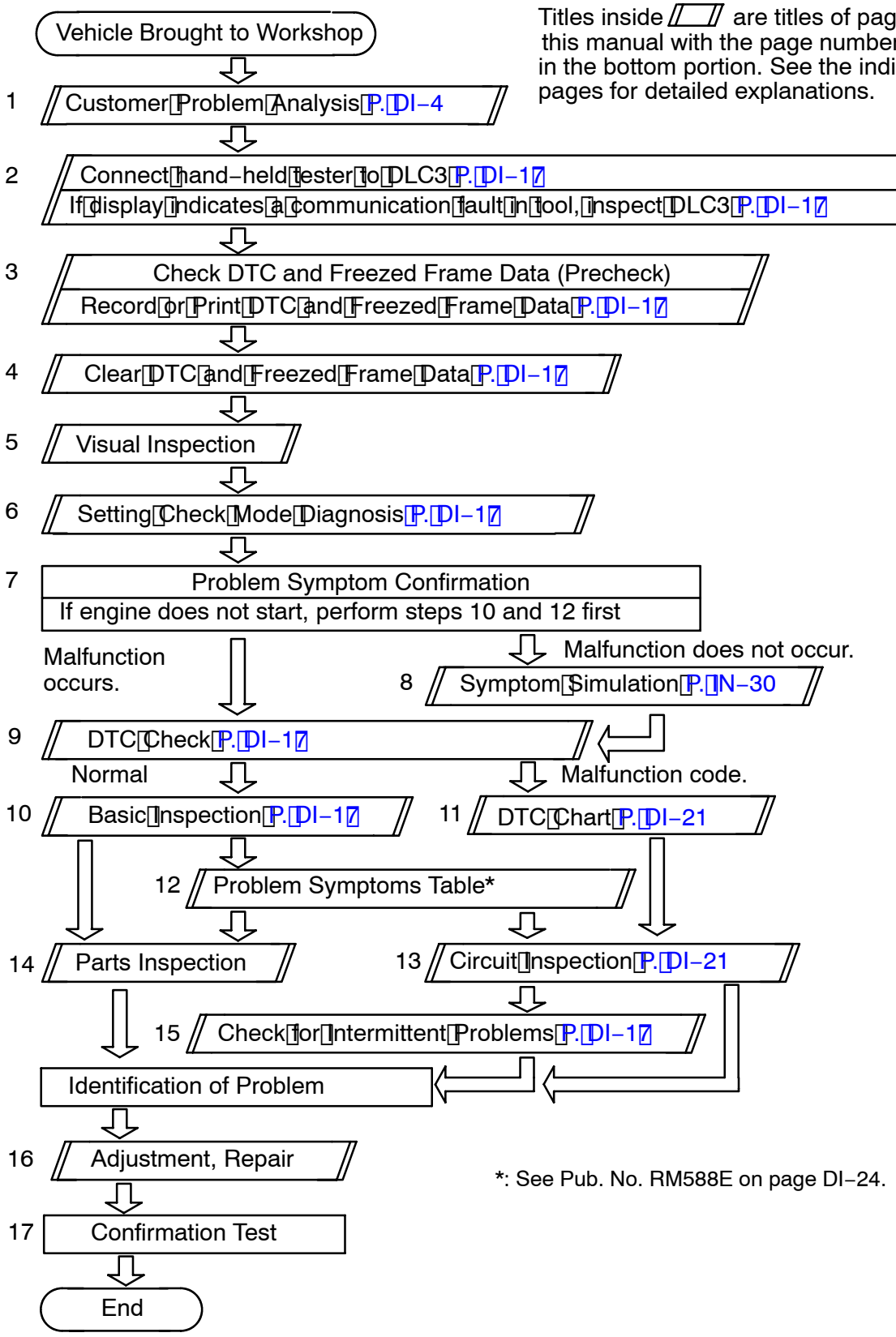
ENGINE (2JZ–GE)

DI63H–06

HOW TO PROCEED WITH TROUBLESHOOTING

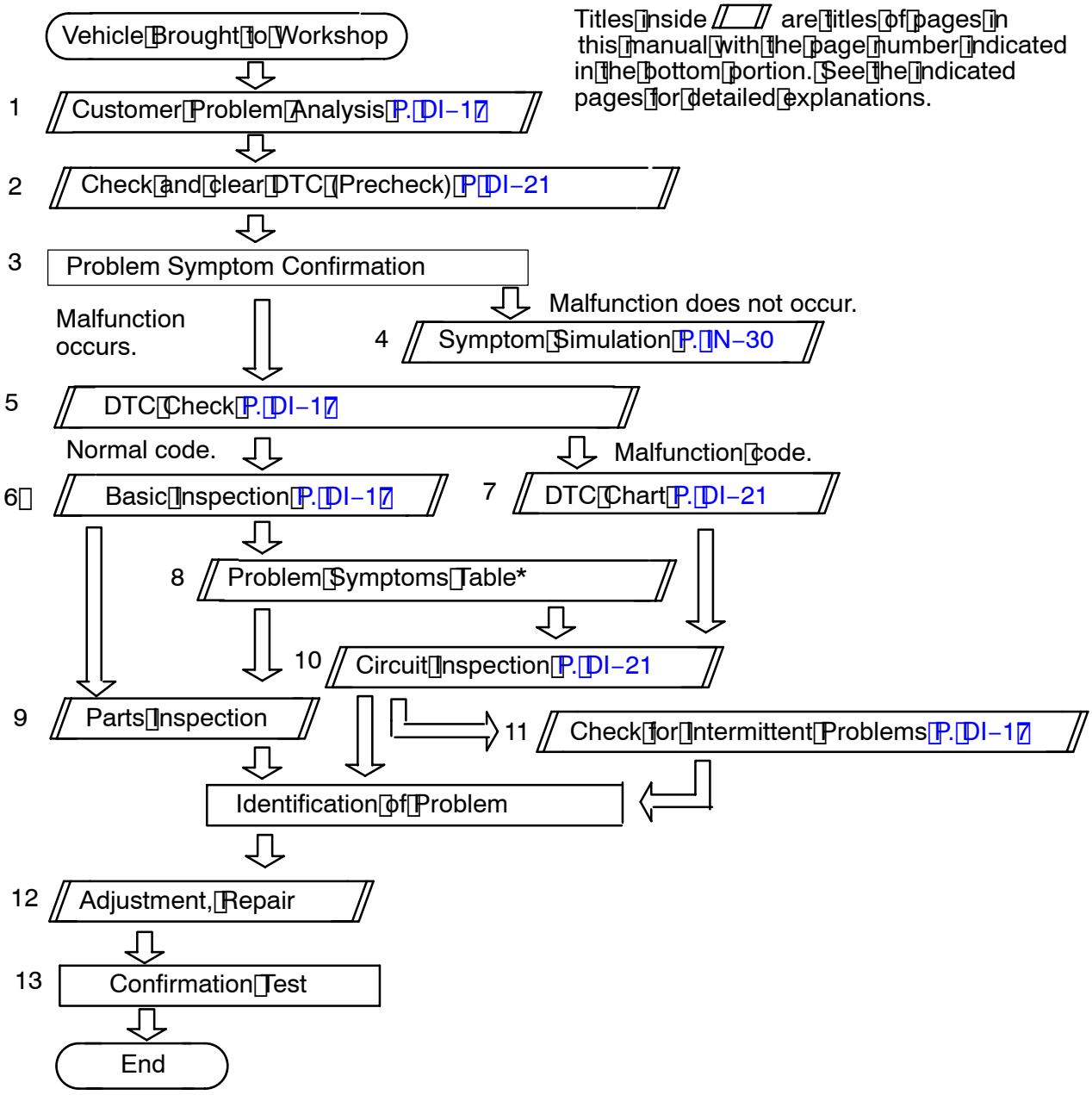
When using hand–held tester, troubleshoot in accordance with the procedure on the following page.



Titles inside ▱ are titles of pages in this manual with the page number indicated in the bottom portion. See the indicated pages for detailed explanations.

*: See Pub. No. RM588E on page DI–24.

When not using hand–held tester, troubleshoot in accordance with the procedure on the following page.



*: See Pub. No. RM588E on page DI–24

DI63I–01

CUSTOMER PROBLEM ANALYSIS CHECK

ENGINE CONTROL SYSTEM Check Sheet

Inspector's Name _____

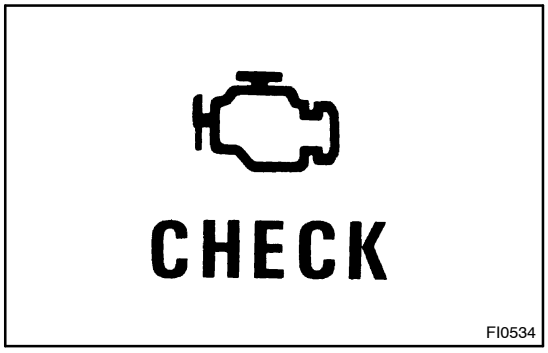
Customer's Name		Model and Model Year	
Driver's Name		Frame No.	
Date Vehicle Brought in		Engine Model	
License No.		Odometer Reading	km miles

Problem Symptoms	☐ Engine does not Start	☐ Engine does not crank ☐ No initial combustion ☐ No complete combustion
	☐ Difficult to Start	☐ Engine cranks slowly ☐ Other _____
	☐ Poor Idling	☐ Incorrect first idle ☐ Idling rpm is abnormal ☐ High (rpm) ☐ Low (rpm) ☐ Rough idling ☐ Other _____
	☐ Poor Driveability	☐ Hesitation ☐ Back fire ☐ Muffler explosion (after–fire) ☐ Surging ☐ Knocking ☐ Other _____
	☐ Engine Stall	☐ Soon after starting ☐ After accelerator pedal depressed ☐ After accelerator pedal released ☐ During A/C operation ☐ Shifting from N to D ☐ Other _____
	☐ Others	

Dates Problem Occurred		
Problem Frequency		☐ Constant ☐ Sometimes (times per day/month) ☐ Once only ☐ Other _____
Condition When Problem Occurs	Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Other _____
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (approx. ____ °F/____ °C)
	Place	☐ Highway ☐ Suburbs ☐ Inner city ☐ Uphill ☐ Downhill ☐ Rough road ☐ Other _____
	Engine Temp.	☐ Cold ☐ Warming up ☐ After warming up ☐ Any temp. ☐ Other _____
	Engine Operation	☐ Starting ☐ Just after starting (min.) ☐ Idling ☐ Racing ☐ Driving ☐ Constant speed ☐ Acceleration ☐ Deceleration ☐ A/C switch ON/OFF ☐ Other _____

DTC Inspection	Normal Mode (Precheck)	☐ Normal ☐ Malfunction code(s) (code) ☐ Freezed frame data ( )
	Check (Test) Mode	☐ Normal ☐ Malfunction code(s) (code) ☐ Freezed frame data ( )

DI85I–01

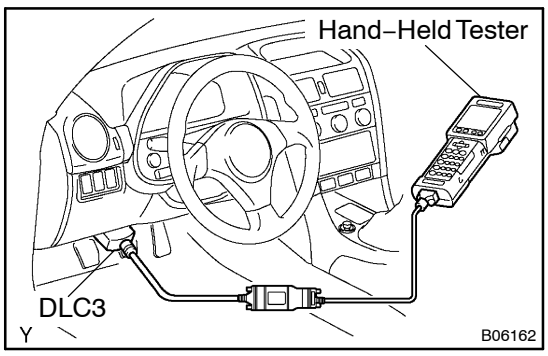


PRE–CHECK

1. DIAGNOSIS SYSTEM

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

- When troubleshooting Euro–OBD vehicles, the only difference from the usual troubleshooting procedure is that you connect to the vehicle the OBD scan tool complying with ISO 15031–4 or hand–held tester, and read off various data output from the vehicle's engine ECU.
  Euro–OBD regulations require that the vehicle's on–board computer lights up the check engine warning ignition the instrument panel when the computer detects a malfunction in the emission control system/components or in the powertrain control components which affect vehicle emissions, or a malfunction in the computer. In addition to the check engine warning light (CHK ENG) lighting up when a malfunction is detected, the applicable Diagnostic Trouble Codes (DTCs) prescribed by ISO15031–6 are recorded in the engine ECU memory (See page DI–21). If the malfunction does not repaired in 3 consecutive trips, the (CHK ENG) goes off automatically but the DTCs remain recorded in the engine ECU memory.



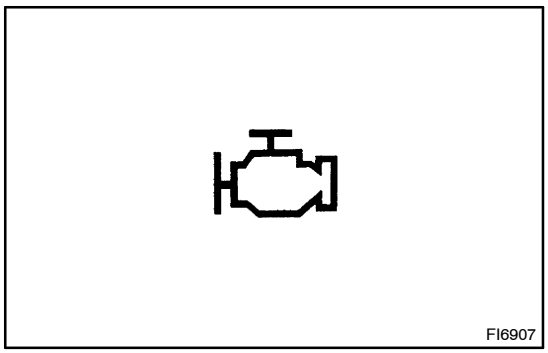
- To check the DTCs, connect the OBD scan tool or hand–held tester to the Data Link Connector 3 (DLC3) on the vehicle. The OBD scan tool or hand–held tester also enables you to erase the DTCs and check freezed frame data and various forms of engine data (For operating instructions, see the OBD scan tool's instruction book.).
  DTCs include ISO controlled codes and manufacturer controlled codes. ISO controlled codes must be set as prescribed by the ISO, while manufacturer controlled codes can be set freely by the manufacturer within the prescribed limits (See DTC chart on page DI–21).
- The diagnosis system operates in normal mode during normal vehicle use. It also has a check mode for technicians to simulate malfunction symptoms and troubleshoot. Most DTCs use 2 trip detection logic* to prevent erroneous detection, and ensure thorough malfunction detection. By switching the engine ECU to check mode when troubleshooting,

the technician can cause the check engine warning light to light up for a malfunction that is only detected once or momentarily (Hand–held tester only) (See step 2).

- *2 trip detection logic:
  When a malfunction is first detected, the malfunction is temporarily 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 light up. (2nd trip) (However, the ignition switch must be turned OFF between the 1st trip and the 2nd trip.).
- Freeze frame data:
  Freeze frame data records the engine condition when a misfire (DTCs P0300 – P0306) or fuel trim malfunction (DTCs P0171, P0172, P0174 and P0175) or other malfunction (first malfunction only), is detected.
  Because freeze frame data records the engine conditions (fuel system, calculated load, engine coolant temperature, fuel trim, engine speed, vehicle speed, etc.) when the malfunction is detected, when troubleshooting, it is useful to determine whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

Priorities for troubleshooting:
If troubleshooting priorities for multiple DTCs are given in the applicable DTC chart, these should be followed.
If no instructions are given, troubleshoot DTCs according to the following priorities.

(1) DTCs other than fuel trim malfunction (DTCs P0171, P0172, P0174 and P0175) and misfire (DTCs P0300 – P0306).
(2) Fuel trim malfunction (DTCs P0171, P0172, P0174 and P0175).
(3) Misfire (DTCs P0300 – P0306).

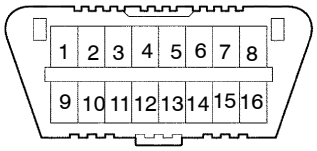

FI6907

(b) Description for M–OBD (Except European spec.)

- When troubleshooting Multiplex OBD (M–OBD) vehicles, the only difference from the usual troubleshooting procedure is that you connect the vehicle to the hand–held tester, and read off various data output from the vehicle's engine ECU.
- The vehicle's on–board computer indicates the check engine light (CHK ENG) on the instrument panel when the computer detects a malfunction in the computer itself or in drive system components.

In addition to an indication of the CHK ENG when a malfunction is detected, the applicable Diagnostic Trouble Codes (DTCs) recorded in the engine ECU memory (See page DI–21). When the malfunction does not reoccur, the CHK ENG is indicated until the ignition switch is turned off, and then the CHK ENG is not indicated when the ignition switch is turned on 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 or read the DTC which is indicated on the multi information display when TC and CG terminals on the DLC3 are connected. The hand–held tester also enables you to erase the DTCs and check freezed 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 a check (test) mode for technicians to simulate malfunction symptoms and troubleshoot. Most DTCs use 2 trip detection logic* to prevent erroneous detection, and ensure thorough malfunction detection. By switching the engine ECU to check (test) mode using hand–held tester when troubleshooting, the technician can cause the CHK ENG on the light up for a malfunction that is only detected once or momentarily (Hand–held tester only) (See step 2).
- * 2 trip detection logic:
  When a logic malfunction is fist detected, the malfunction is temporally stored in the engine ECU memory. If the same malfunction is detected again during the second drive test, this second detection cases the CHK ENG to light up.
  The 2 trip repeats the same mode for 2 times. (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 when malfunction is detected.
  Because freeze frame data records the engine conditions (fuel system, calculator load, water temperature, fuel trim, engine speed, vehicle speed, etc.) when the malfunction is detected, when troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.



DLC3

A04550

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

Terminal No.	Connection/Voltage or Resistance	Condition
7	Bus ⊕ Line/Pulse generation	During transmission
4	Chassis Ground ↔ Body Ground/1 Ω or less	Always
16	Battery Positive ↔ Body Ground/9 – 14 V	Always

HINT:
Only for Euro–OBD:
If your display shows UNABLE TO CONNECT TO VEHICLE when you have connected the cable of the OBD scan tool or hand–held tester to the DLC3, turned the ignition switch ON and operated the scan tool, there is a problem on the vehicle side or tool side.

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

2. INSPECT DIAGNOSIS (Normal Mode)

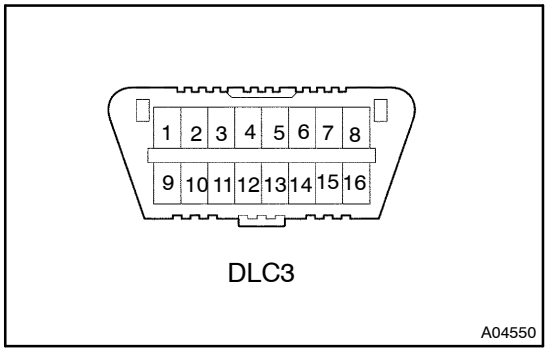
(a) Check the DTC using hand–held tester.

NOTICE:

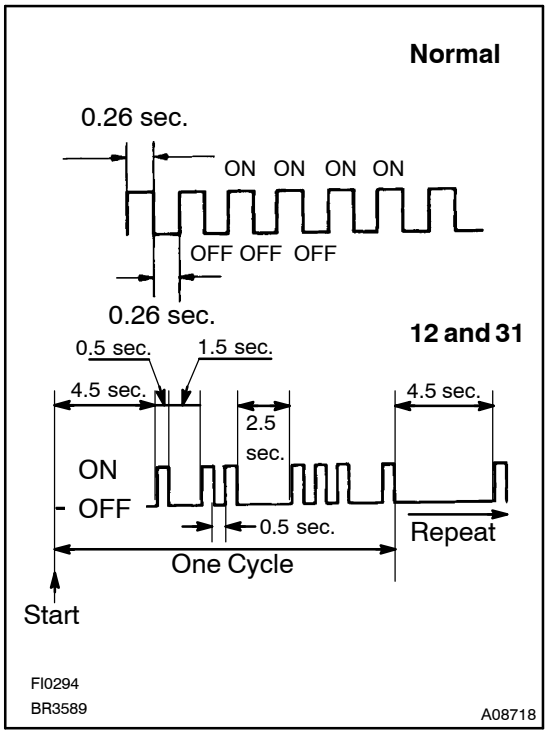
Hand–held tester only:

When the diagnosis system is switched from normal mode to check mode, it erases all DTCs and freezed frame data recorded in normal mode. So before switching modes, always check the DTCs and freezed frame data, and note them down.

(1) Prepare the hand–held tester.
(2) Connect the hand–held tester to DLC3.
(3) Turn the ignition switch ON and push the hand–held tester main switch ON.
(4) Use the hand–held tester to check the DTCs and freezed frame data, note them down. (For operating instructions, see the hand–held tester instruction book.)
(5) See page DI–21 to confirm the details of the DTCs.



(b) Except European spec.:
Check the DTC when not using hand–held tester.
(1) Turn the ignition switch ON.
(2) Using SST, connect between terminals 13 (TC) and 4 (CG) of the DLC3.
SST 09843–18040



(3) Read the DTC from the check engine warning light (CHK ENG).
As an example, the blinking patterns for codes, normal, 12 and 31 are as shown in the illustration.
(4) Check the details of the malfunction using the DTC chart on page.
(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 cords, the indication will begin from the smaller numbered cord and continue in order to the larger.

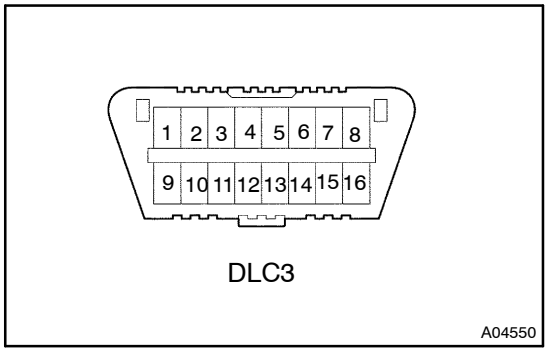
(6) Push the function key of the steering switch until EFI will be displayed on the instrument panel.
(7) Read the DTC on the instrument panel.

HINT:
- If a DTC is not indicated, check the TC terminal circuit.
- If a code No.89 is indicated, read the number of blinks of the ECT SNOW indication to get the DTC for the electric throttle control system (ETCS).

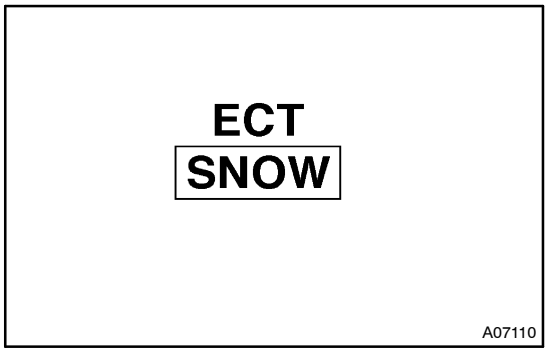
NOTICE:
- **When simulating symptoms with out a hand–held tester to check the DTCs, use normal mode. For code on the DTC chart subject to ”2 trip detection logic”, turn the ignition switch OFF after the symptom is simulated the first time. Then repeat the simulation process again. When the problem has been simulated twice, the CHECK ENG is indicated on the instrument panel and the DTCs are recorded in the engine ECU.**
- **Check the 1st trip DTC using Mode 7 for ISO 15031 (Continuous Test Results of Euro–OBD function in hand–held tester).**

(c) Check the DTC for ETCS
(1) Turn the ignition switch ON.

HINT:
If the ECT SNOW indicator does not light up, troubleshoot the combination meter (See page BE–4).



(2) Using SST, connect between terminals 13 (TC) and 4 (CG) of the DLC3.
SST 09843–18040

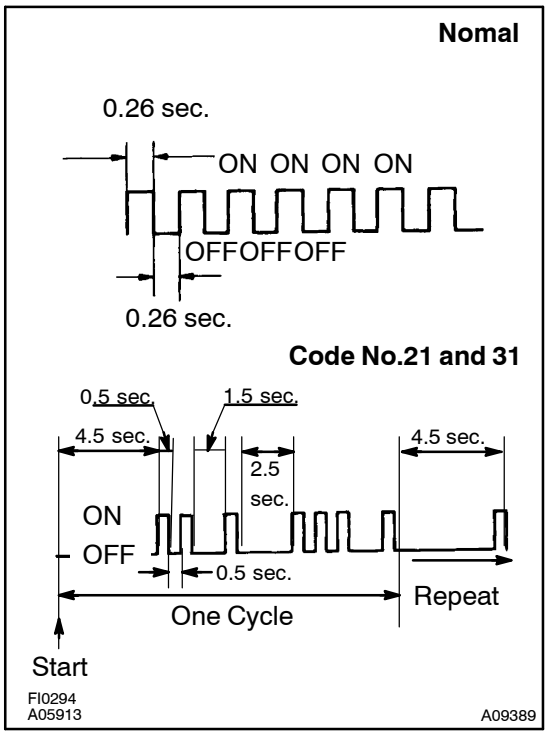


(3) Read the DTC from the ECT snow indicator the combination meter.

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–21.

(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 ECTS fuses.

NOTICE:
If the hand–held tester switches the engine ECU from 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 freezed frame data will be erased.

3. INSPECT DIAGNOSIS (Check (Test) Mode)

HINT:
Hand–held tester only:
Compared to the normal mode, the check mode has an increased sensitivity to detect malfunctions.
Furthermore, the same diagnostic items which are detected in the normal mode can also be detected in the check (test) mode.

(a) Check the DTC.

(1) Initial conditions

- Battery voltage 11 V or more
- Throttle valve fully closed.
- Transmission in P or N position
- A/C switched OFF

(2) Turn the ignition switch OFF.
(3) Prepare the hand–held tester.
(4) Connect the hand–held tester to the DLC3.
(5) Turn the ignition switch ON and push the hand–held tester main switch ON.
(6) Switch the hand–held tester from the normal mode to the check (test) mode.

NOTICE:
If the hand–held tester switches the engine ECU from 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 freezed frame data will be erased.

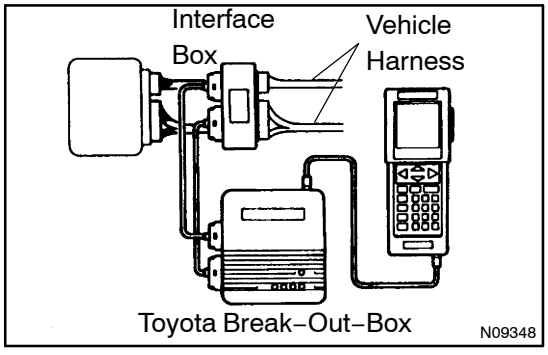
(7) Start the engine.
(8) Simulate the conditions of the malfunction described by the customer.

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

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

HINT:
Take care not to turn the ignition switch OFF. Turning the ignition switch OFF switches the diagnosis system from check (test) mode to normal mode. so all DTCs, etc. are erased.

(10) After checking the DTC, inspect the applicable circuit.



(b) Engine ECU Terminal Values Measurement Using Break–Out–Box and Hand–Held Tester
(1) Hook up the break–out–box and hand–held tester to the vehicle.
(2) Read the engine ECU input/output values by following the prompts on the tester screen.

HINT:
- Hand–held tester has a ”Snapshot” function.
  This records the measured values and is effective in the diagnosis of intermittent problems.
- Please refer to the hand–held tester/break–out–box operator’s manual for further details.

4. FAIL–SAFE CHART

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

DTC No.	Fail–Safe Operation	Fail–Safe Deactivation Conditions
P0100/31	From the amount of throttle valve opening and the engine rpm, estimate the amount of inhaled air.	Returned to normal condition
P0110/24	Intake air temperature is fixed at 20°C (68°F)	Returned to normal condition
P0115/22	Water temperature is fixed at 80°C (176°F)	Returned to normal condition

P0120/41	Saved driving mode	Ignition switch OFF
P0135/21 P0141/21 P0155/28 P0161/28	The heater circuit in which an abnormality is detected is turned off	Ignition switch OFF
P0325/52 P0330/53	Max. timing retardation	Ignition switch OFF
P1300/14 P1305/15 P1310/14 P1315/14 P1320/14 P1325/14 P1330/14 P1340/14	Fuel cut	Returned to normal condition

5. CHECK FOR INTERMITTENT PROBLEMS

HINT:

Hand–held tester only:

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

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

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

(c) Perform a simulation test (See page IN–20).

(d) Check the connector and terminal (See page IN–30).

(e) Handle the connector (See page IN–30).

6. BASIC INSPECTION

When the malfunction code is not confirmed in the DTC check, troubleshooting should be performed 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 troubleshooting.

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

NO → **Charge or replace battery.**

YES

2	**Is engine cranked?**

NO → **Proceed to problems table (See Pub. No. RM588E on page DI–25).**

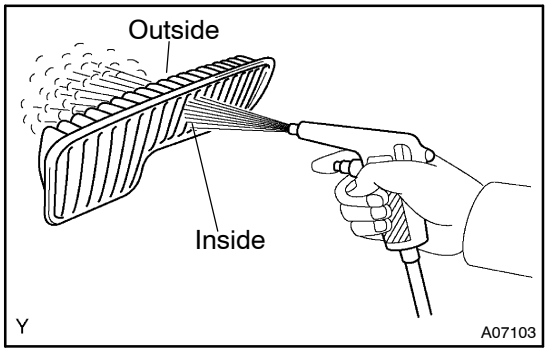
YES

3	**Does engine start?**

NO → **Go to step 7.**

YES

4	**Check air filter.**

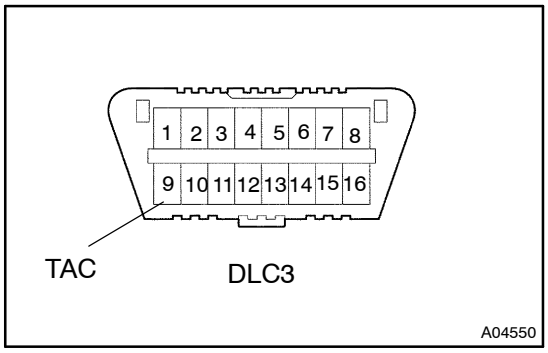


PREPARATION:
Remove the air filter.
CHECK:
Visually check that the air filter is not dirty or excessive oily.
HINT:
If necessary, clean the air filter with compressed air. First blow from inside thoroughly, then blow from outside of the air filter.

NG → **Repair or replace**

OK

5	**Check idle speed.**



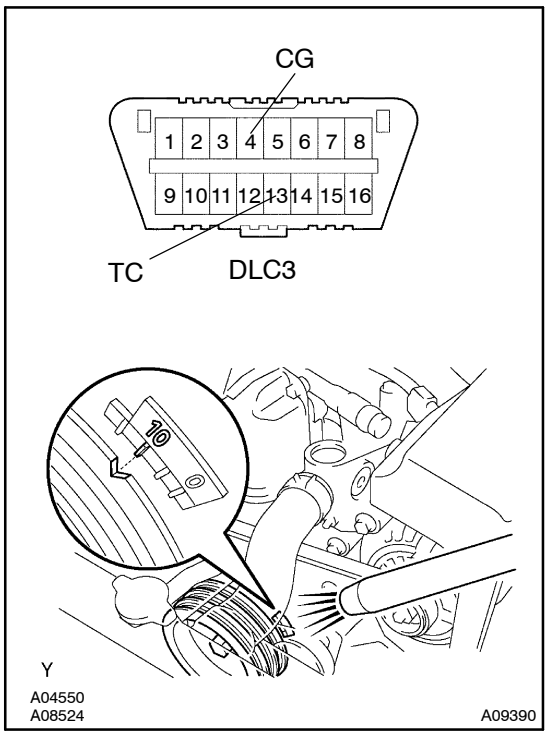
PREPARATION:
(a) Warm up the engine to normal operating temperature.
(b) Switch off all the accessories.
(c) Switch off the A/C.
(d) Shift the transmission into the N position.
(e) Connect the hand–held tester to the DLC3 on the vehicle.
(f) If you have no hand–held tester, connect tachometer test prove to terminal 9 (TAC) of the DLC3.
SST 09843–18030

NOTICE:
As some tachometers are not compatible with this ignition system, we recommend that you confirm the compatibility of your unit before use.
CHECK:
Check the idle speed.
OK:
Idle speed: 600 – 700 rpm

NG → **Proceed to problem symptoms table (See Pub. No. RM588E on page DI–25).**

OK

6	Check ignition timing.



PREPARATION:

(a) Warm up the engine to normal operating temperature.
(b) Shift the transmission into the N position.
(c) Keep the engine speed at idle.
(d) Using SST, connect terminals 13 (TC) and 4 (CG) of the DLC3.
SST 09843–18040
(e) Using a timing light, connect the tester to the ignition coil connector wire (See Pub. No. RM588E on page EM–15).

CHECK:

Check the ignition timing.

OK:

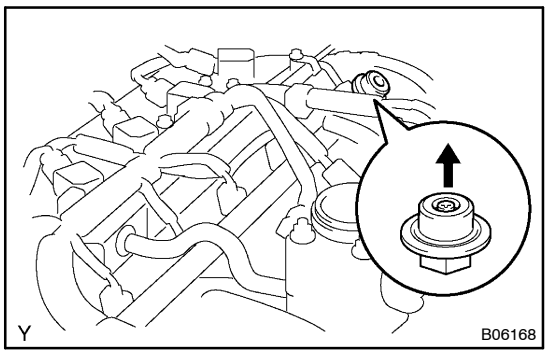
Ignition timing: 10° BTDC at idle

NG → **Proceed to Pub. No. RM588E on page IG–1 and continue to troubleshoot.**

OK

Proceed to problem symptoms table (See Pub. No. RM588E on page DI–25).

7	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 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. RM588E on page FI–6).

CHECK:

Check that pulsation damper screw rises up when fuel pump operates.

HINT:

At this time, you will hear a fuel flowing noise.

NG → **Proceed to Pub. No. RM588E on page FI–6 and continue to troubleshoot.**

OK

8	**Check for spark.**

PREPARATION:

(a) Remove the ignition coil from the spark plug.
(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 engine is being cranked.

NOTICE:

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

NG → **Proceed to Pub. No. RM588E on page IG–1 and continue to troubleshoot.**

OK

Proceed to problem symptoms table (See Pub. No. RM588E on page DI–25).

7. ENGINE OPERATING CONDITION

NOTICE:

The values given below for "Normal Condition" are representative values, so a vehicle may still be normal even if its value varies differ from those listed here. So do not decide whether a part is faulty or not solely according to the "Normal Condition" here.

Hand–held tester display	Measurement Item	Normal Condition*
FUEL SYS #1	Fuel System Bank 1 OPEN: Air–fuel ratio feedback stopped CLOSED: Air–fuel ratio feedback operating	Idling after warming up: CLOSED
FUEL SYS #2	Fuel System Bank 2 OPEN: Air–fuel ratio feedback stopped CLOSED: Air–fuel ratio feedback operating	Idling after warming up: CLOSED

CALC LOAD	Calculator Load: Current intake air volume as a proportion of max. intake air volume	Idling: 19.7 – 50.4 % Racing without load (2,500rpm): 16.8 – 47.4 %
COOLANT TEMP	Water Temp. Sensor Value	After warming up: 80 – 95˚C (176 – 203˚F)
SHORT FT #1	Short–term Fuel Trim Bank 1	0 ± 20 %
LONG FT #1	Long–term Fuel Trim Bank 1	0 ± 20 %
SHORT FT #2	Short–term Fuel Trim Bank 2	0 ± 20 %
LONG FT #2	Long–term Fuel Trim Bank 2	0 ± 20 %
ENGINE SPD	Engine Speed	Idling: 700 – 800 rpm
VEHICLE SPD	Vehicle Speed	Vehicle stopped: 0 km/h (0 mph)
IGN ADVANCE	Ignition Advance: Ignition Timing of Cylinder No.1	Idling: BTDC 5 – 15˚
INTAKE AIR	Intake Air Temp. Sensor Value	Equivalent to ambient temp.
MAF	Air Flow Rate Through Mass Air Flow Meter	Idling: 3.5 – 5.0 gm/ sec. Racing without load (2,500 rpm): 12.5 – 17.9 gm/sec.
THROTTLE POS	Voltage Output of Throttle Position Sensor Calculated as a percentage: 0 V → 0 %, 5 V → 100 %	Throttle fully closed: 8 – 20 % Throttle fully open: 64 – 96 %
O2S B1 S1	Voltage Output of Oxygen Sensor Bank 1 Sensor 1	Idling: 0.1 – 0.9 V
O2S B1 S2	Voltage Output of Oxygen Sensor Bank 1 Sensor 2	Driving (50 km/h, 31 mph): 0.1 – 0.9 V
O2S B2 S1	Voltage Output of Oxygen Sensor Bank 2 Sensor 1	Idling: 0.1 – 0.9 V
O2S B2 S2	Voltage Output of Oxygen Sensor Bank 2 Sensor 2	Driving: (50 km/h, 31 mph): 0.1 – 1.0 V
O2FT B1 S1	Oxygen Sensor Fuel Trim Bank 1, Sensor 1 (Same as SHORT FT #1)	0 ± 20 %
O2FT B2 S1	Oxygen Sensor Fuel Trim Bank 2, Sensor 1 (Same as SHORT FT #2)	0 ± 20 %
MIL ON RUN DIST	Distance since activation of check engine warning light	When there is no DTC: 0 km/h (0 mph)
INJECTOR	Fuel injection time for cylinder No.1	Idling: 1.92 – 3.37 ms
MISFIRE RPM	Engine RPM for first misfire range	Misfire 0: 0 rpm
MISFIRE LOAD	Engine load for first misfire range	Misfire 0: 0 g/r
STARTER SIG	Starter Signal	Cranking: ON
A/C SW	A/C Switch Signal	A/C ON: ON
PNP SW	Park/Neutral Position Switch Signal	P or N position: ON
ELE LOAD SIG	Electrical Load Signal	Defogger switch ON: ON
SW	Closed Throttle Position	Throttle fully closed: ON
STOP LIGHT SW	Stop Light Switch Signal	Stop light switch ON: ON
PS OIL PRESS SW	Power Steering Oil Pressure Switch Signal	Turn steering wheel: ON
FC IDL	Fuel Cut Idle: Fuel cut when throttle valve fully closed, during deceleration	Fuel cut operating: ON
FC TAU	Fuel Cut TAU: Fuel cut during very light load	Fuel cut operating: ON
CYL#1 – CYL#6	Abnormal revolution variation for each cylinder	0 %
IGNITION	Total number of ignition for every 1,000 revolutions	0 – 300
INTAKE CTRL VSV1	Intake Air Control Valve VSV Signal	VSV operating: ON

FUEL PUMP	Fuel Pump Signal	Idling: ON
EVAP VSV	EVAP VSV Signal	VSV operating: ON
THROTTLE POS #2	Throttle position sensor No.2 output voltage	Throttle fully closed: 2.0 – 2.9 V Throttle fully open: 4.6 – 5.0 V
ACCEL POS #1	Accelerator pedal position sensor No.1 output voltage	Accelerator pedal released: 0.25 – 0.9 V Accelerator pedal depressed: 3.2 – 4.8 V
ACCEL POS #2	Accelerator pedal position sensor No.2 output voltage	Accelerator pedal released: 1.8 – 2.7 V Accelerator pedal depressed: 4.7 – 5.0 V
THROTTLE TARGET	Target position of throttle valve	Idling: 0.4 – 1.1 V
DUTY	Throttle motor opening duty ratio	Throttle fully closed: 0 % When accelerator pedal is depressed, duty ratio is increased
THROTL CLS DUTY	Throttle motor closed duty ratio	Throttle fully closed: 0 % When accelerator pedal is quick released, duty ratio is increased
THROTTLE MOT	Whether or not throttle motor control is permitted	Idling: ON
CLUTCH	Whether or not magnetic clutch control is permitted	Idling: ON
+BM	Whether or not electric throttle control system power is inputted	Idling: ON
ACCEL IDL POS	Whether or not accelerator pedal position sensor is detecting idle	Idling: ON
THROTTLE IDL POS	Whether or not throttle position sensor is detecting idle	Idling: ON
FAIL #1	Whether or not fail safe function is executed	ETCS is failed: ON
FAIL #2	Whether or not fail safe function is executed	ETCS is failed: ON
THROTTL INITAL	Throttle fully closed learning value	0.4 – 0.8 V
ACCEL LEARN VAL	Accelerator fully closed learning value	0.4 – 0.8 V
THROTTLE MOT	Throttle motor control current	Idling: 0 – 3.0 A
CLUTCH	Magnetic clutch control current	0.8 – 1.0 A
A/C MAG CLUTCH	A/C switch signal	A/C ON: ON
VVT CTRL	VVT control signal	VVT operation: ON
TOTAL FT B1	Total Fuel Trim Bank 1: Average value for fuel trim system of bank 1	Idling: 0.5 – 1.4
TOTAL FT B2	Total Fuel Trim Bank 2: Average value for fuel trim system of bank 2	Idling: 0.5 – 1.4
O2 LR B1 S1	Oxygen Sensor Lean Rich Bank 1 Sensor 1: Response time for oxygen sensor output to switch from lean to rich	Idling after warming up: 0 – 1,000 msec.
O2 LR B2 S1	Oxygen Sensor Lean Rich Bank 2 Sensor 1: Response time for oxygen sensor output to switch from lean to rich	Idling after warming up: 0 – 1,000 msec.
O2 RL B1 S1	Oxygen Sensor Rich Lean Bank 1 Sensor 1: Response time for oxygen sensor output to switch from rich to lean	Idling after warming up: 0 – 1,000 msec.
O2 RL B2 S1	Oxygen Sensor Rich Lean Bank 1 Sensor 1: Response time for oxygen sensor output to switch from rich to lean	Idling after warming up: 0 – 1,000 msec.

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

DI63K–04

DIAGNOSTIC TROUBLE CODE CHART

HINT:

Parameters listed in the chart may not be exactly the same as your reading due to the type of instrument or other factors.

If a malfunction code is displayed during the DTC check in the check mode, check the circuit for the code listed in the table below. For details of each code, turn to the page referred to under the ”See page” for the respective ”DTC No.” in the DTC chart.

ENGINE TROUBLE CODES

(★: Refer to Pub. No. RM588E)

DTC No. (See page)	Detection Item	Trouble Area	*1 CHK ENG	Memory
P0100/31 (DI–21)	Air Flow Meter Circuit Malfunction	• Open or short in Air Flow Meter circuit • Air Flow Meter • Engine ECU	○	○
P0110/24 (DI–30)	Intake Air Temp. Circuit Malfunction	• Open or short in intake air temp. sensor circuit • Intake air temp. sensor • Engine ECU	○	○
P0115/22 (★)	Water Temp. Circuit Malfunction	• Open or short in water temp. sensor circuit • Water temp. sensor • Engine ECU	○	○
P0116/22*3 (DI–31)	Water Temp. Circuit Range/Performance Problem	• Water temp. sensor • Cooling system	○	○
P0120/41 (★)	Throttle Position Sensor Circuit Malfunction	• Open or short in throttle position sensor circuit • Throttle position sensor • Engine ECU	○	○
P0121/41 (★)	Throttle Position Sensor Circuit Range/Performance Problem	• Throttle position sensor	○	○
P0125/91*3 (DI–38)	Insufficient Coolant Temp. for Closed Loop Fuel Control	• Open or short in oxygen sensor (bank 1, 2 sensor 1) circuit • Oxygen Sensor (bank 1, 2 sensor 1) • Air induction system • Fuel pressure • Injector • Gas leakage on exhaust system • Engine ECU	○	○
P0130/21*4 (★)	Oxygen Sensor Circuit Malfunction (Bank 1 Sensor 1)	• Open or short in oxygen sensor circuit • Oxygen sensor • Air induction system • Fuel pressure • Injector • Engine ECU	○*3	○
P0133/21*3 (DI–42)	Oxygen Sensor Circuit Slow Response (Bank 1 Sensor 1)	• Open or short in oxygen sensor circuit • Oxygen sensor • Air induction system • Fuel pressure • Injector • Engine ECU	○*3	○
P0135/21*4 (★)	Oxygen Sensor Heater Circuit Malfunction (Bank 1 Sensor 1)	• Open or short in heater circuit of oxygen sensor • Oxygen sensor heater • Engine ECU	○*3	○
P0136/27*4 (★)	Oxygen Sensor Circuit Malfunction (Bank 1 Sensor 2)	• Open or short in oxygen sensor circuit • Oxygen sensor	○*3	○

P0141/21*4 (★)	Oxygen Sensor Heater Circuit Malfunction (Bank 1 Sensor 2)	• Same as DTC No. P0135/21	○*3	○
P0150/28*4 (★)	Oxygen Sensor Circuit Malfunction (Bank 2 Sensor 1)	• Same as DTC No. P0130/21	○*3	○
P0153/28*3 (DI–42)	Oxygen Sensor Circuit Slow Response (Bank 2 Sensor 1)	• Same a DTC No. P0130/21	○*3	○
P0155/28*4 (★)	Oxygen Sensor Heater Circuit Malfunction (Bank 2 Sensor 1)	• Same as DTC No. P0135/21	○*3	○
P0156/29*4 (★)	Oxygen Sensor Circuit Malfunction (Bank 2 Sensor 2)	• Same as DTC No. P0136/27	○*3	○
P0161/28*4 (★)	Oxygen Sensor Heater Circuit Malfunction (Bank 2 Sensor 2)	• Same as DTC No. P0135/21	○*3	○
P0171/25 (DI–48)	System too Lean (A/F Lean Malfunction, Bank 1)	• Air induction system • Injector blockage • Vacuum Sensor • Water temp. sensor • Fuel pressure • Gas leakage on exhaust system • Open or short in oxygen sensor (bank1, 2 sensor1) circuit • Oxygen sensor (bank1, 2 sensor1) • Engine ECU	○*3	○
P172/26*3 (DI–48)	System too Rich (A/F Rich Malfunction, Bank 1)	• Injector leak, blockage • Vacuum sensor • Water temp. sensor • Ignition system • Fuel pressure • Gas leakage on exhaust system • Open or short in oxygen sensor (bank1, 2 sensor1) circuit • Oxygen sensor (bank1, 2 sensor1) • Engine ECU	○	○
P0174/25 (DI–48)	System too Lean (A/F Lean Malfunction, Bank 2)	• Same as DTC No. P0171/25	○*3	○
P0175/26*3 (DI–48)	System too Rich (A/F Rich Malfunction, Bank 2)	• Same as DTC No. P0172/26	○	○
P0300/93*3 (DI–53)	Random/Multiple Cylinder Misfire Detected	• Open or short engine wire • Connector connection • Vacuum hose connection • Ignition system • Injector • Fuel pressure • Vacuum sensor • Water temp. sensor • Compression pressure • Valve clearance • Valve timing • Engine ECU	○	○
P0301/93*3 (DI–53)	Cylinder 1 Misfire Detected			
P0302/93*3 (DI–53)	Cylinder 2 Misfire Detected			
P0303/93*3 (DI–53)	Cylinder 3 Misfire Detected			
P0304/93*3 (DI–53)	Cylinder 4 Misfire Detected			
P0305/93*3 (DI–53)	Cylinder 5 Misfire Detected			
P0306/93*3 (DI–53)	Cylinder 6 Misfire Detected			
P0325/52 (★)	Knock Sensor 1 Circuit Malfunction (Bank 1)	• Open or short in knock sensor 1 circuit • Knock sensor 1 (looseness) • Engine ECU	○	○

P0330/55 (★)	Knock Sensor 2 Circuit Malfunction (Bank 2)	• Open or short in knock sensor 2 circuit • Knock sensor 2 (looseness) • Engine ECU	○	○
P0335/12, 13 (★)	Crankshaft Position Sensor Circuit Malfunction (NE Signal)	• Open or short in crankshaft position sensor circuit • Crankshaft position sensor • Crankshaft timing pulley • Engine ECU	○	○
P0340/12 (★)	Camshaft Position Sensor Circuit Malfunction (G Signal)	• Open or short in camshaft position sensor circuit • Camshaft position sensor • Intake camshaft • Engine ECU	○	○
P0420/94*3 (DI–56)	Catalyst System Efficiency Below Threshold (Bank 1)	• Gas leakage on exhaust system • Oxygen sensor • Three–way catalytic converter	○	○
P0430/94*3 (DI–56)	Catalyst System Efficiency Below Threshold (Bank 2)	• Same as DTC P0420/94	○	○
P0443/94*3 (DI–60)	Evaporative Emission Control System Purge Control Vent Control Malfunction	• Open or short in VSV circuit for EVAP • VSV for EVAP • Engine ECU	○	○
P0500/42 (★)	Vehicle Speed Sensor Malfunction	• Open or short in vehicle speed sensor circuit • Transmission output speed sensor • Engine ECU	○	○
P0505/33*3 (DI–61)	Idle Control System Malfunction	• Air induction system • Electric throttle control system	○	○
P0550/75 (DI–63)	Power Steering Pressure Sensor Circuit Malfunction	• PS pressure sensor • Engine ECU	○	○
P1120/19 (★)	Accelerator Pedal Position Sensor Circuit Malfunction	• Open or short in accelerator pedal position sensor circuit • Accelerator pedal position sensor • Engine ECU	○	○
P1121/19 (★)	Accelerator Pedal Position Sensor Range/Performance Problem	• Accelerator pedal position sensor	○	○
P1125/89*2 (★)	Throttle Control Motor Circuit Malfunction	• Open or short in throttle control motor circuit • Throttle control motor • Engine ECU	○	○
P1126/89*2 (★)	Magnetic Clutch Circuit Malfunction	• Open or short in magnetic clutch circuit • Magnetic clutch • Engine ECU	○	○
P1127/89*2 (★)	ETCS Actuator Power Source Circuit Malfunction	• Open in ETCS power source circuit • Engine ECU	○	○
P1128/89*2 (★)	Throttle Control Motor Lock Malfunction	• Throttle control motor • Throttle body	○	○
P1129/89*2 (★)	Electric Throttle Control System Malfunction	• Electric throttle control system • Engine ECU	○	○
P1200/78*5 (★)	Fuel Pump Relay/Engine ECU Circuit Malfunction	• Open or short in fuel pump relay circuit • Fuel pump relay • Engine ECU	○	○
P1300/14 (★)	Igniter Circuit Malfunction (No.1)	• Ignition system • Open or short in IGF or IGT1 circuit from igniter to engine ECU • Igniter • Engine ECU	○	○

P1335/13 (★)	Crankshaft Position Sensor Circuit Malfunction (During engine running)	• Open or short in crankshaft position sensor circuit • Crankshaft position sensor • Crankshaft timing pulley • Engine ECU	–	○
P1346/18 (DI–64)	VVT Sensor/Camshaft Position Sensor Circuit Range/Performance Problem (Bank 1)	• Mechanical system (Jumping teeth of timing belt, belt stretched) • ECM	○	○
P1349/59 (★)	VVT System Malfunction (Bank 1)	• Valve timing • OCV • VVT controller assembly • Engine ECU	○*6	○
P1520 (DI–67)	Stop Light Switch Signal Circuit	• Open or short in stop light switch signal circuit • Stop light switch • Engine ECU	○	○
P1633/89*2 (★)	Engine ECU Malfunction (ETCS Circuit)	• Engine ECU	○	○
P1645/82 (★)	Body ECU Malfunction	• Body ECU • A/C ECU • Communication bus	–	–
P1651/96*3 (DI–67)	VSV for ACIS Circuit Malfunction	• Open or short in VSV circuit for ACIS • VSV for ACIS • Engine ECU	○	○
P1656/39 (★)	OCV Circuit Malfunction (Bank 1)	• Open or short in OCV circuit • OCV • Engine ECU	○	○
P1780/97*2 (DI–261)	Park/Neutral Position Switch Malfunction	• Short in neutral start switch circuit • Neutral start switch • Engine ECU	○	○

*1: ○ ... CHK ENG is indicated. – ... CHK ENG is not indicated.
*2: If the DTC No.89 is indicated on the check engine warning light, read the DTC for ETCS from ECT SNOW indicator to get the detail of the DTC No.89. If using the hand–held tester, the detail DTC for ETCS is displayed on the hand–held tester.
*3: Europe.
*4: Except G.C.C.
*5: Except Europe.
*6: Except Australia.

DI7GR–06

CIRCUIT INSPECTION

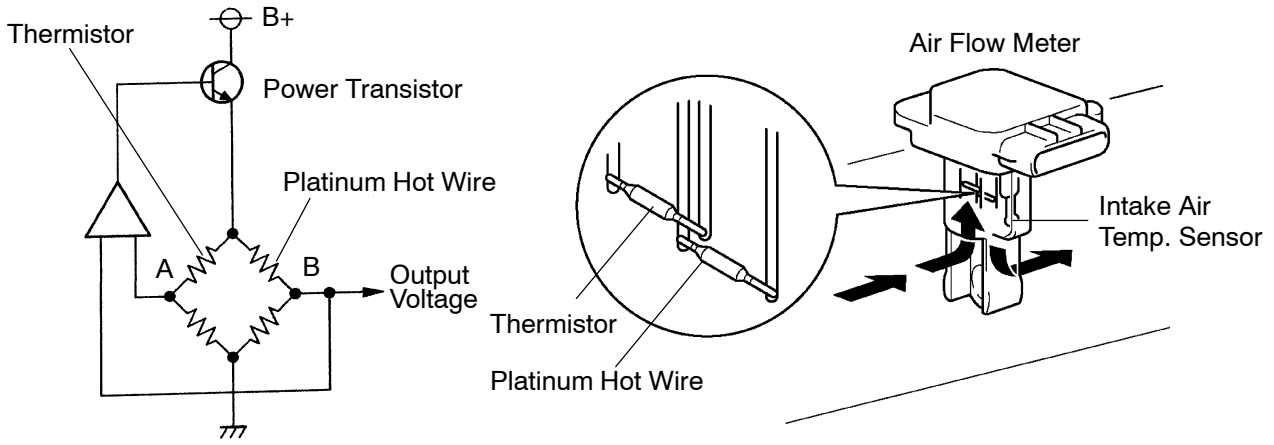
DTC	P0100/31	Air Flow Meter Circuit Malfunction

CIRCUIT DESCRIPTION

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

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

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



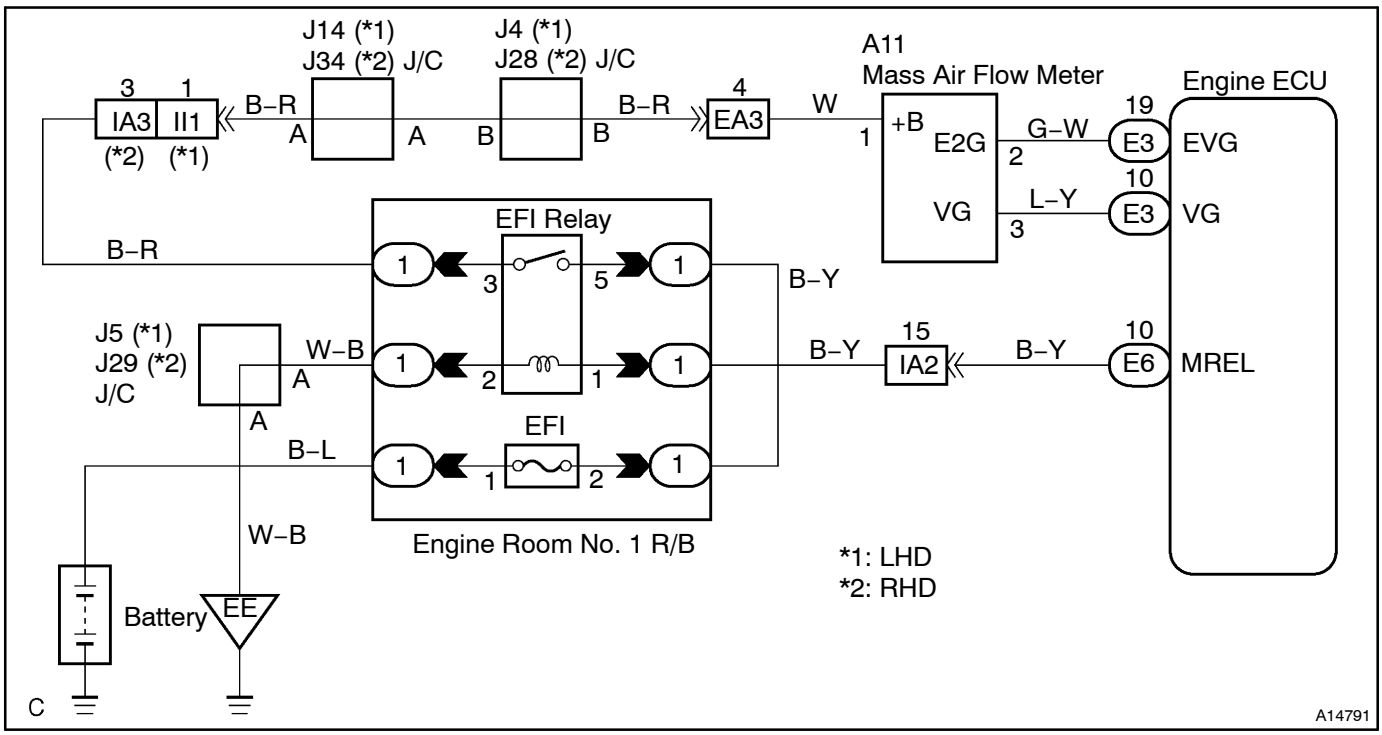
DTC No.	DTC Detection Condition	Trouble Area
P0100/31	Open or short in air flow meter circuit with more than 3 sec. and engine speed is less than 4,000 rpm	• Open or short in air flow meter circuit • Air flow meter • Engine ECU

HINT:

After confirming DTC P0100/31, use the hand–held tester to confirm the air flow ratio from the CURRENT DATA.

Air Flow Value (gm/sec.)	Malfunction
Approx. 0.0	• Air flow meter power source circuit open • VG circuit open or short
271.0 or more	• EVG circuit open

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Connect hand–held tester, and read value of air flow rate.**

PREPARATION:

(a) Connect the hand–held tester to the DLC3.
(b) Turn the ignition switch ON and push the hand–held tester main switch ON.
(c) Start the engine.

CHECK:

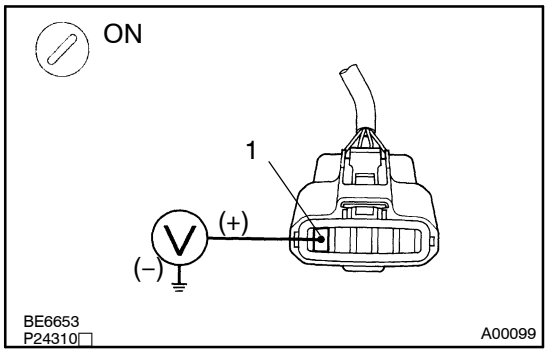
Read the air flow rate on the hand–held tester.

RESULT:

	Type I	Type II
Air Flow Rate (gm/sec.)	0.0	271.0 or more

Type I	**Go to step 2.**
Type II	**Go to step 5.**

2	Check voltage of air flow meter power source.



PREPARATION:

(a) Disconnect the air flow meter connector.

(b) Turn the ignition switch ON.

CHECK:

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

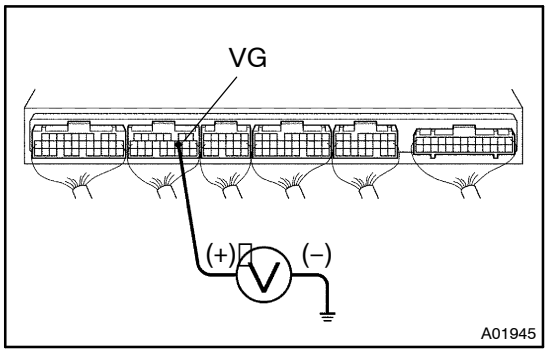
OK:

Voltage: 9 – 14 V

NG	Check for open in harness and connector between EFI main relay (Marking: EFI MAIN) and air flow meter (See page IN–30).

OK

3	Check voltage between terminals VG of engine ECU connector and body ground.



PREPARATION:

(a) Remove the engine ECU hood.

(b) Start the engine.

CHECK:

Measure the voltage between terminal VG of the engine ECU connector and body ground while the engine is idling.

OK:

Voltage:

0.2 – 4.9 V (P or N position and A/C switch OFF)

OK	Check and replace engine ECU (See page IN–30).

NG

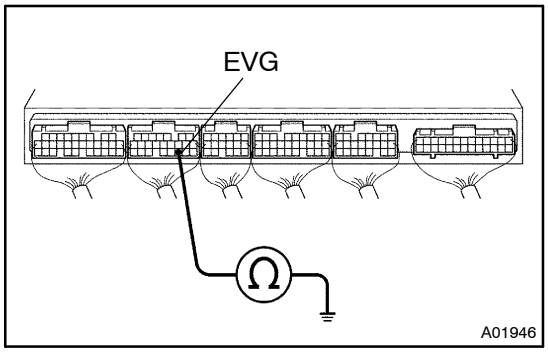
4	Check for open and short in harness and connector between air flow meter and engine ECU (See page IN–30).

NG	Repair or replace harness or connector.

OK

Replace air flow meter.

5	**Check continuity between terminal EVG of engine ECU connector and body ground.**



PREPARATION:
Remove the engine ECU hood.
CHECK:
Check the continuity between terminal EVG of the engine ECU connector and body ground.
OK:
Continuity (1 Ω or less)

NG → **Check and replace engine ECU (See page IN–30).**

OK

6	**Check for open in harness and connector between air flow meter and engine ECU (See page IN–30).**

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

OK

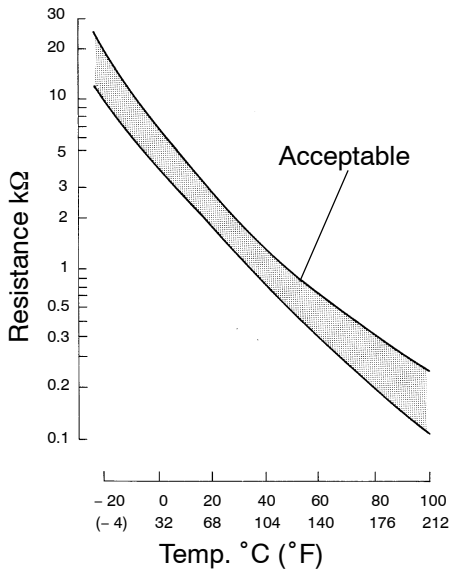
Replace air flow meter.

DI63Q–04

DTC	P0110/24	Intake Air Temp. Circuit Malfunction

CIRCUIT DESCRIPTION

(Fig. 1)



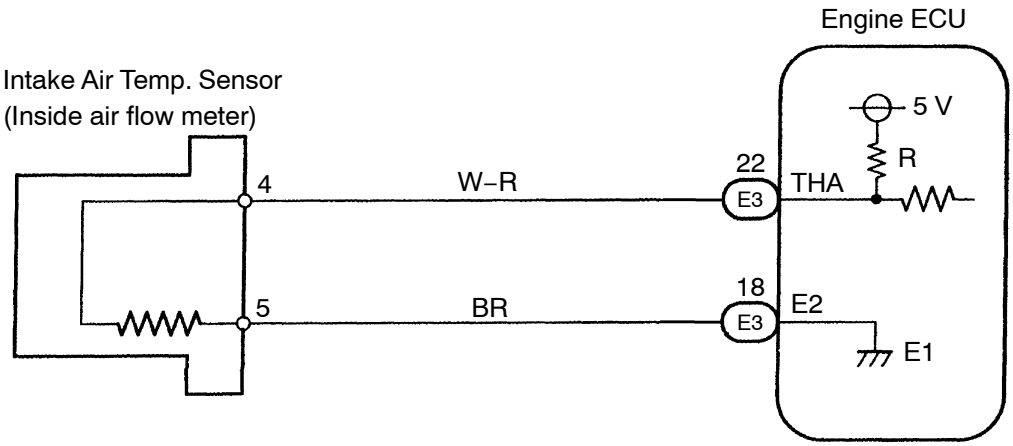
The intake air temperature sensor is built into the air cleaner and senses the intake air temperature.
A thermistor built in the sensor changes the resistance value according to the intake air temperature.
The lower the intake air temperature, the greater the thermistor resistance value, and the higher the intake air temperature, the lower the thermistor resistance value (See Fig. 1).
The intake air temperature sensor is connected to the engine ECU (See below). The 5 V power source voltage in the engine ECU is applied to the intake air temp. sensor from terminal THA via resistor R.
That is, resistor R and the intake air temperature sensor are connected in series. When the resistance value of the intake air temperature sensor changes in accordance with changes in the intake air temperature, the potential at terminal THA also changes. Based on this signal, the engine ECU increases the fuel injection volume to improve driveability during cold engine operation.

DTC No.	DTC Detecting Condition	Trouble Area
P0110/24	Open or short in intake air temp. sensor circuit	• Open or short in intake air temp. sensor circuit • Intake air temp. sensor • Engine ECU

HINT:
After confirming DTC P0110/24, use the hand–held tester to confirm the intake air temperature from the CURRENT DATA.

Temperature Displayed	Malfunction
–40°C (–40°F)	Open circuit
140°C (284°F) or more	Short circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTCs P0100/31, P0101/31, P0110/24, P0115/22, P0120/41, P0121/41, P1120/19 and P1121/19 are output simultaneously, E2 (sensor ground) may be open.
- Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

When using hand–held tester:

1	**Connect hand–held tester, and read value of intake air temperature.**

PREPARATION:

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

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

CHECK:

Read the temperature value on the hand–held tester.

OK:

Same as actual intake air temperature.

HINT:

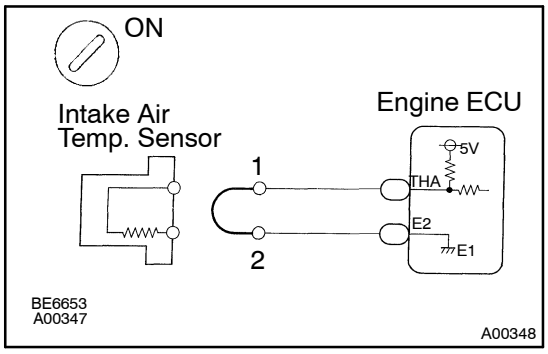
- If there is open circuit, hand–held tester indicates –40°C (–40°F).
- If there is short circuit, hand–held tester indicates 140°C (284°F) or more.

NG → **–40°C (–40°F) ... Go to step 2**
140°C (284°F) or more ... Go to step 4.

OK

Check for intermittent problems
(See page DI–17).

2	Check for open in harness or engine ECU.



PREPARATION:

(a) Disconnect the intake air temperature sensor connector.
(b) Connect the sensor wire harness terminals together.
(c) Turn the ignition switch ON.

CHECK:

Read the temperature value on the hand–held tester.

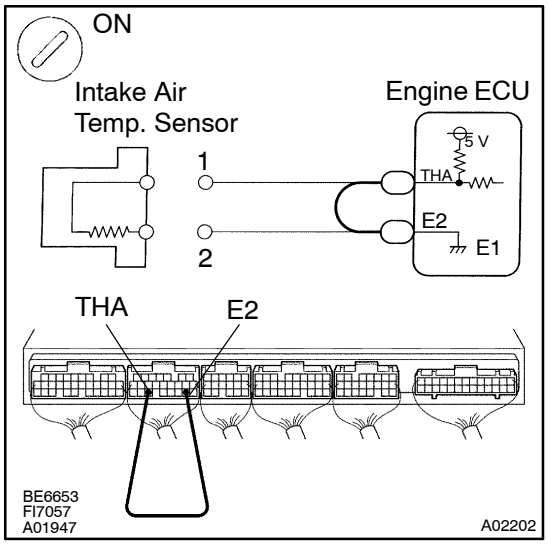
OK:

Temperature value: 140°C (284°F) or more

OK	Confirm good connection at sensor. If OK, replace intake air temperature sensor.

NG

3	Check for open in harness or engine ECU connector.



PREPARATION:

(a) Remove the engine ECU hood.
(b) Connect between terminals THA and E2 of the engine ECU connector.

HINT:

The intake air temperature sensor connector is disconnected. Before checking, do a visual and contact pressure check for the engine ECU connector (See page IN–30).

CHECK:

Read the temperature value on the hand–held tester.

OK:

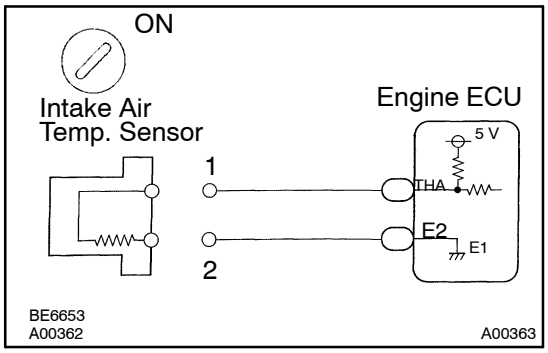
Temperature value: 140°C (284°F) or more

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

NG

Confirm good connection at engine ECU. If OK, check and replace engine ECU (See page IN–30).

4	Check for short in harness and engine ECU.



PREPARATION:

(a) Disconnect the intake air temperature sensor connector.

(b) Turn the ignition switch ON.

CHECK:

Read the temperature value on the hand–held tester.

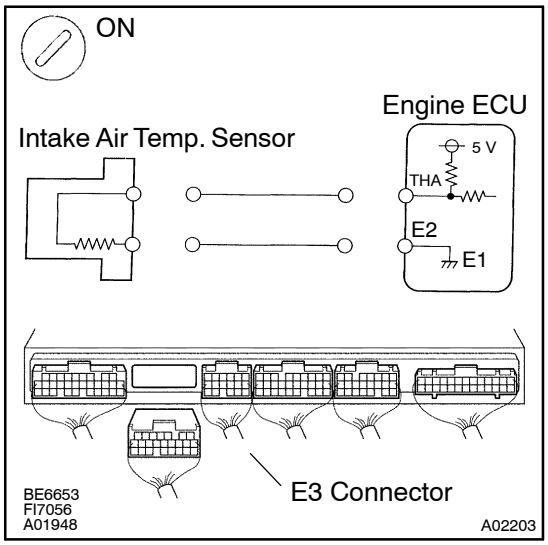
OK:

Temperature value: –40°C (–40°F)

OK	Replace intake air temperature sensor.

NG

5	Check for short in harness or engine ECU.



PREPARATION:

(a) Remove the engine ECU hood.

(b) Disconnect the E3 connector from the engine ECU.

HINT:

The intake air temperature sensor connector is disconnected.

(c) Turn the ignition switch ON.

CHECK:

Read the temperature value on the hand–held tester.

OK:

Temperature value: –40°C (–40°F)

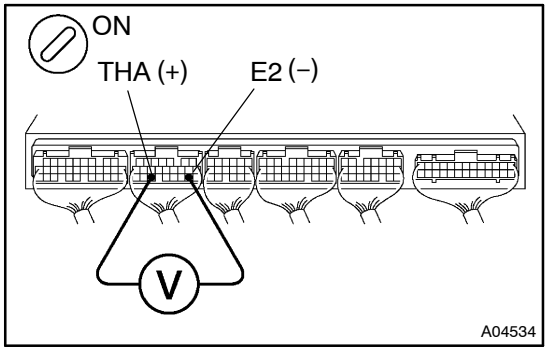
OK	Repair or replace harness or connector.

NG

Check and replace engine ECU (See page IN–30).

When not using hand–held tester:

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



PREPARATION:

(a) Remove the engine ECU hood.

(b) Turn the ignition switch ON.

CHECK:

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

OK:

Intake Air temperature	Voltage
20°C (68°F)	0.5 – 3.4 V
60°C (140°F)	0.2 – 1.0 V

OK → **Check for intermittent problems (See page DI–17).**

NG

2	**Check intake air temperature sensor (See page FI–2).**

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

OK

3	**Check for open and short in harness and connector between engine ECU and intake air temperature sensor (See page IN–30).**

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

OK

Check and replace engine ECU (See page IN–30).

DI07J–11

DTC	P0116/22	Water Temp. Circuit Range/Performance Problem

CIRCUIT DESCRIPTION

Refer to DTC P0115/22 of Pub. No. RM588E on page DI–37.

DTC No.	DTC Detecting Condition	Trouble Area
P0116	When the fluctuations in the engine coolant temperature are within 3 °C (37 °F) before and after the following conditions are met: 19.IDL OFF time ≧ 250 sec. 20.Vehicle speed change of 28 km/h (17 mph) or more occurs 10 times or more. 21.–40 °C (–40 °F) ≦ Engine coolant temperature when the ignition switch is turned ON < 60 °C (140 °F) 22.Intake air temperature after starting the engine ≧ –6.7 °C (20 °F)	• Water temp. sensor • Cooling system

INSPECTION PROCEDURE

HINT:

- If DTC P0115/22 and P0116/22 are output simultaneously, engine coolant temp. sensor circuit may be open. Perform troubleshooting of DTC P0115 first.
- Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Are there any other codes (besides DTC P0116/22) being output?**

YES → **Go to relevant DTC chart.**

NO

2	**Check thermostat (See Pub. No. RM588E on page CO–10).**

NG → **Replace thermostat.**

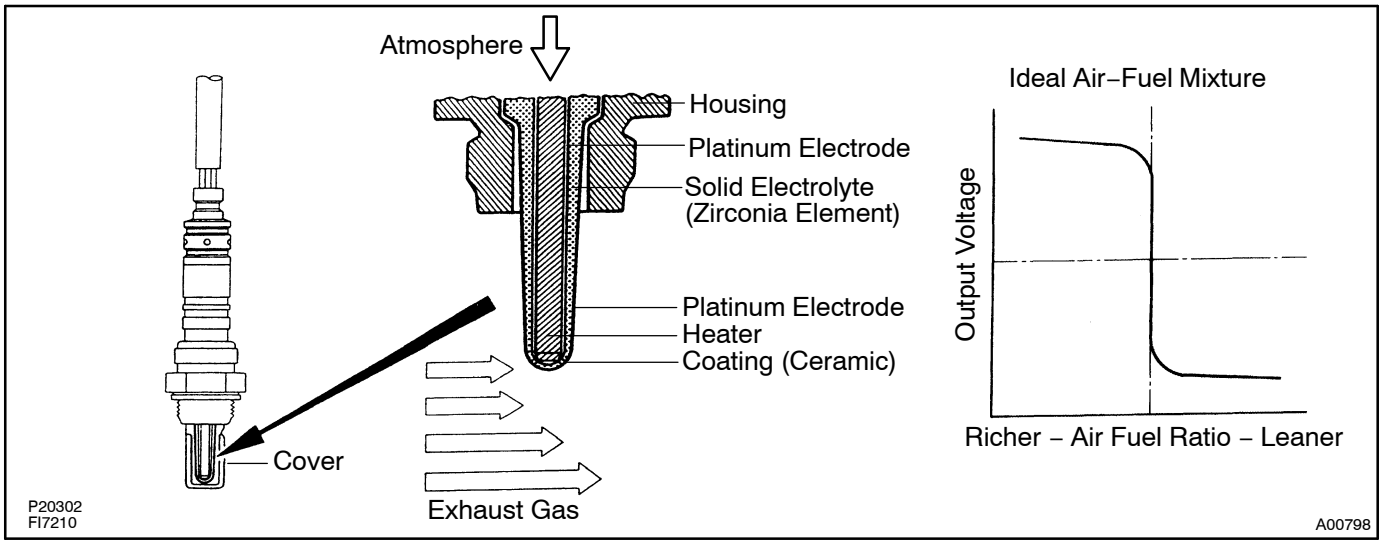
OK

Replace water temp. sensor.

DTC	P0125/91	Insufficient Coolant Temp. for Closed Loop Fuel Control

CIRCUIT DESCRIPTION

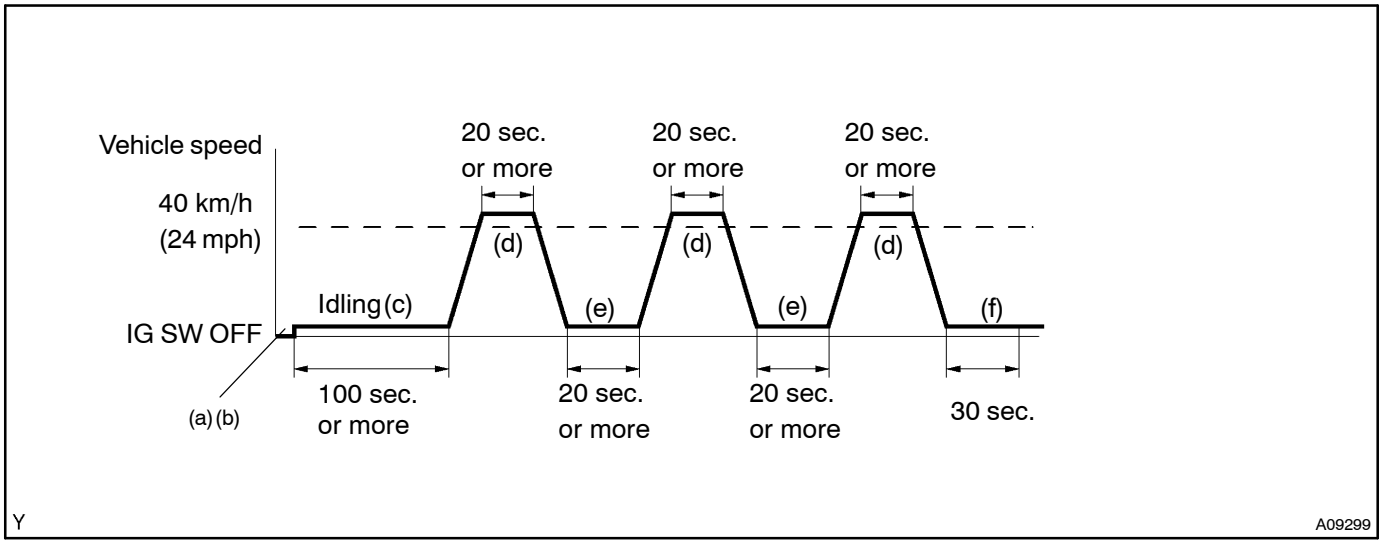
To obtain a high purification rate for the CO, HC and NOx components of the exhaust gas, a three–way catalytic converter is used, but for the most efficient use of the three–way catalytic converter, the air–fuel ratio must be precisely controlled so that it is always close to the stoichiometric air–fuel ratio.
The oxygen sensor (bank 1, 2 sensor 1) has the characteristic which its output voltage changes suddenly in the vicinity of the stoichiometric air–fuel ratio. This characteristic is used to detect the oxygen concentration in the exhaust gas and provide the engine ECU with feedback to control of the air–fuel ratio.
When the air–fuel ratio becomes LEAN, the oxygen concentration in the exhaust increases and the oxygen sensor informs the engine ECU of the LEAN condition (small electromotive force: < 0.45 V).
When the air–fuel ratio is RICHER than the stoichiometric air–fuel ratio the oxygen concentration in the exhaust gas is reduced and the oxygen sensor informs the engine ECU of the RICH condition (large electromotive force: > 0.45 V). The engine ECU judges by the electromotive force from the oxygen sensor whether the air–fuel ratio is RICH or LEAN and controls the injection time accordingly. However, if malfunction of the oxygen sensor causes output of abnormal electromotive force, the engine ECU is unable to perform accurate air–fuel ratio control. The oxygen sensors include a heater which heats the zirconia element. The heater is controlled by the engine ECU. When the intake air volume is low (the temperature of the exhaust gas is low) current flows to the heater to heat the sensor for accurate oxygen concentration detection.



DTC No.	DTC Detecting Condition	Trouble Area
P0125/91	After engine is warmed up, heated oxygen sensors (bank 1, 2 sensor 1) output does not indicate RICH (≧0.45 V) even once when conditions (a), (b), (c) and (d) continue for at least 90 sec.: (a) Engine speed: 1,400 rpm or more (b) Vehicle speed: 40 – 100 km/h (25 – 62 mph) (c) Throttle valve does not fully closed (d) 180 sec. or more after starting engine	• Open or short in oxygen sensor (bank 1, 2 sensor 1) circuit • Oxygen sensor (bank 1, 2 sensor 1) • Air induction system • Fuel pressure • Injector • Gas leakage on exhaust system • Engine ECU

HINT:
After confirming DTC P0125, use the hand–held tester to confirm voltage output of the oxygen sensor (bank 1, 2 sensor 1) from the CURRENT DATA. If voltage output of the oxygen sensor is less than 0.1 V, oxygen sensor circuit may be open or short.

CONFIRMATION DRIVING PATTERN



(a) Connect the hand–held tester to the DLC3.
(b) Switch the hand–held tester from normal mode to check mode (See page DI–4).
(c) Start the engine and let the engine idle for 100 seconds or more.
(d) Drive the vehicle at 40 km/h (24 mph) or more for 20 seconds or more.
(e) Let the engine idle for 20 seconds or more.
(f) Let the engine idle for 30 seconds.

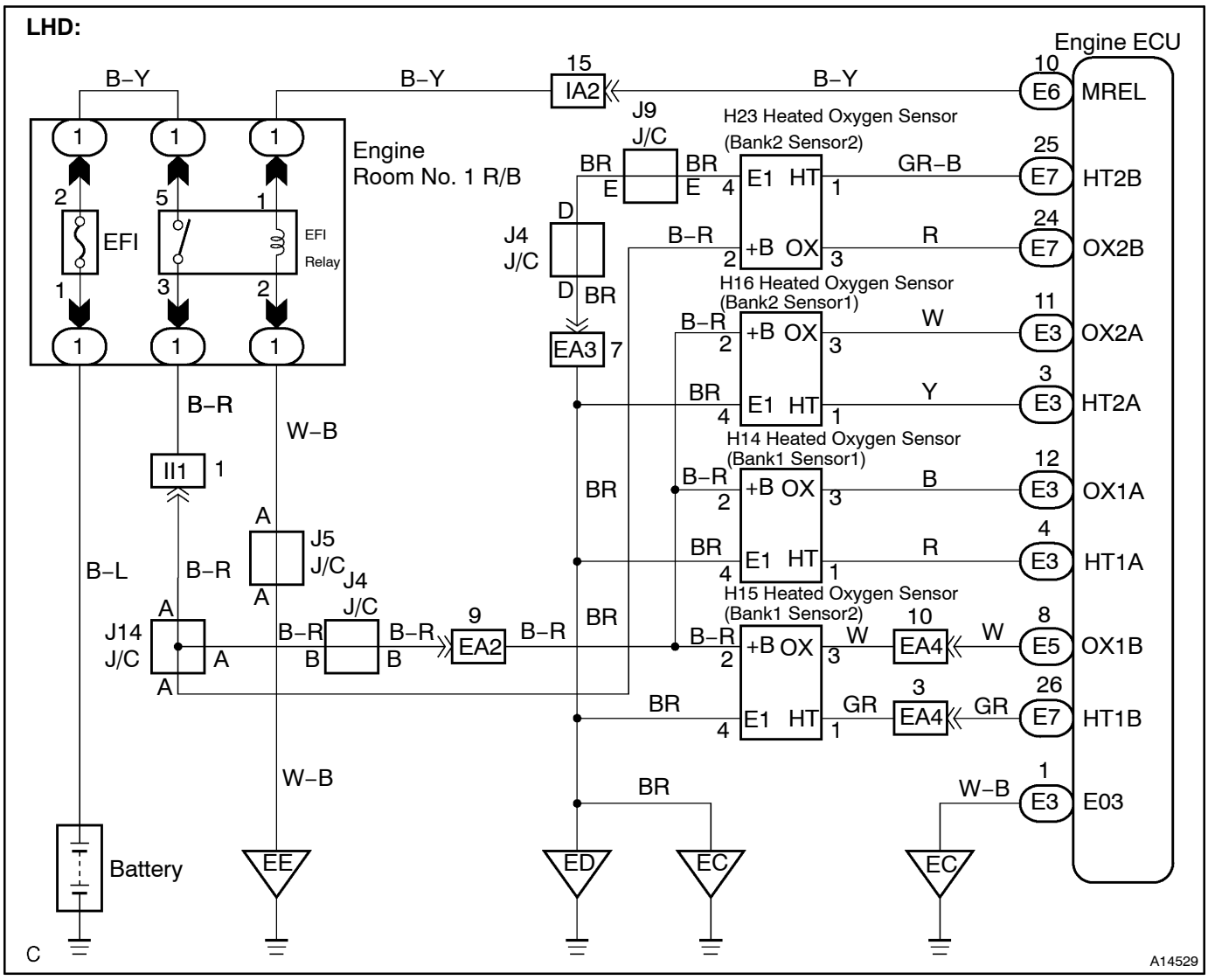
HINT:

If a malfunction exists, the MIL will light up during step (f).

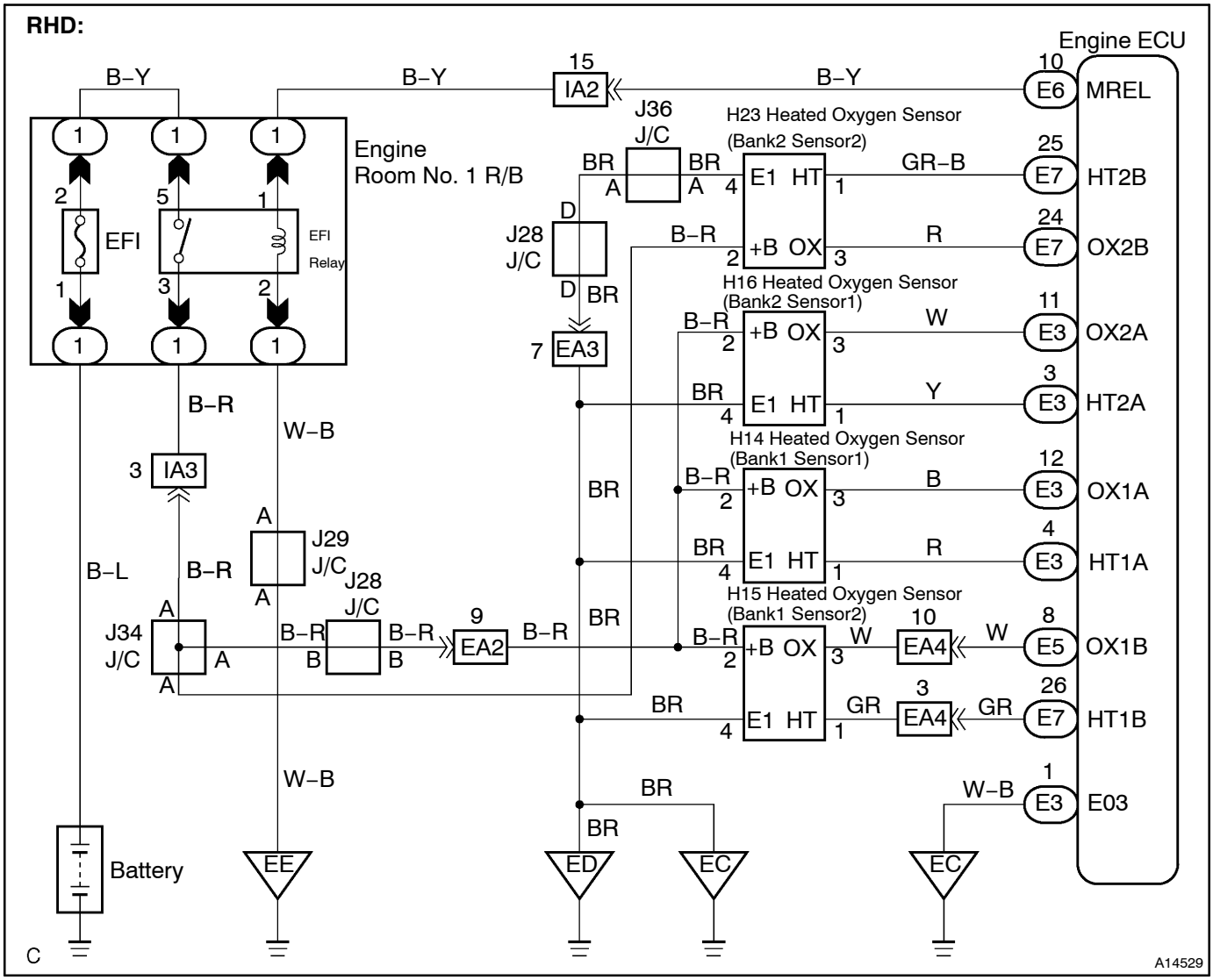
NOTICE:

If the conditions in this test are not strictly followed, detection of the malfunction will not be possible.
If you do not have a hand–held tester, turn the ignition switch OFF after performing steps (c) to (f), then perform steps (c) to (f) again.

WIRING DIAGRAM



RHD:


Engine ECU
B–Y
B–Y
15
IA2
B–Y
10
E6
MREL
J36
J/C
H23 Heated Oxygen Sensor
(Bank2 Sensor2)
Engine
Room No. 1 R/B
BR
A
BR
A
4
E1 HT
1
GR–B
25
E7
HT2B
EFI
EFI
Relay
D
J28
J/C
D
BR
B–R
2
+B OX
3
R
24
E7
OX2B
H16 Heated Oxygen Sensor
(Bank2 Sensor1)
7
EA3
B–R
2
+B OX
3
W
11
E3
OX2A
BR
4
E1 HT
1
Y
3
E3
HT2A
B–R
W–B
H14 Heated Oxygen Sensor
(Bank1 Sensor1)
3
IA3
B–R
2
+B OX
3
B
12
E3
OX1A
BR
A
J29
J/C
B–L
B–R
A
J28
J/C
BR
4
E1 HT
1
R
4
E3
HT1A
H15 Heated Oxygen Sensor
(Bank1 Sensor2)
A
J34
J/C
A
A
B–R
B
B–R
B
9
EA2
B–R
BR
B–R
2
+B OX
3
W
10
EA4
W
8
E5
OX1B
BR
4
E1 HT
1
GR
3
EA4
GR
26
E7
HT1B
W–B
BR
1
W–B
E3
E03
BR
Battery
EE
ED
EC
EC
C
A14529

INSPECTION PROCEDURE

When not using hand–held tester:

HINT:

- Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.
- If the vehicle runs out of fuel, the air–fuel ratio is LEAN and DTC P0125 will be recorded. The CHE ENG (MIL) then comes on.

1	**Are there any other codes (besides DTC P0125) being output?**

YES → **Go to relevant DTC chart (See page DI–21).**

NO

2	**Connect the hand–held tester, and read value for voltage output of oxygen sensors (bank 1, 2 sensor 1).**

PREPARATION:

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

(b) Warm up the engine to normal operating temperature (above 75°C (169°F)).

CHECK:

Read voltage output of the oxygen sensors when the engine is suddenly raced.

HINT:

Perform quick racing to 4,000 rpm 3 times using the accelerator pedal.

OK:

Oxygen sensor output a RICH signal (0.45 V or more) at least once.

OK → **Go to step 9**

NG

3	**Check for open and short in harness and connector between engine ECU and oxygen sensors (bank 1, 2 sensor 1) (See page IN–30).**

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

OK

4	Check whether misfire is occurred or not by monitoring DTC and data list.

NG → Perform troubleshooting for misfire (See Pub. No. RM588E on page DI–24).

OK

5	Check air induction system (See Pub. No. RM588E on page FI–1).

NG → Repair or replace.

OK

6	Check fuel pressure (See Pub. No. RM588E on page FI–6).

NG → Check and repair fuel pump, pressure regulator, fuel pipe line and filter (See Pub. No. RM588E on page FI–1).

OK

7	Check injector injection (See Pub. No. RM588E on page FI–22).

NG → Replace injector.

OK

8	Check gas leakage on exhaust system.

NG → Repair or replace.

OK

Replace oxygen sensor (bank 1, 2 sensor 1).

9	Perform confirmation driving pattern.

GO

10	Is there DTC P0125 being output again?

YES → Check and replace engine ECU (See page IN–30).

NO

11	Did vehicle runs out of fuel in past?

NO → Check for intermittent problems (See page DI–17).

YES

DTC P0125 is caused by running out of fuel.

When not using hand–held tester:

1	Are there any other codes (besides code 91) being output?

YES → Go to relevant DTC chart (See page DI–21).

NO

Replace oxygen sensor (bank 1, 2 sensor 1).

DI563–09

DTC	P0133/21	Oxygen Sensor Circuit Slow Response (Bank 1 Sensor 1)

DTC	P0153/28	Oxygen Sensor Circuit Slow Response (Bank 2 Sensor 1)

CIRCUIT DESCRIPTION

Refer to DTC P0125/91 on page DI–38.

DTC No.	DTC Detecting Condition	Trouble Area
P0133/21 P0153/28	Response time for oxygen sensor's voltage output to change from rich to lean, or from lean to rich, is 1.1 sec. or more during idling after engine is warmed up (2 trip detection logic)	• Open or short in oxygen sensor circuit • Oxygen sensor • Air induction system • Fuel pressure • Injector • Engine ECU

HINT:

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

WIRING DIAGRAM

Refer to DTC P0125/91 on page DI–38.

INSPECTION PROCEDURE

When using hand–held tester:

HINT:

Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Are there any other codes (besides DTC P0133 or P0153) being output?**

YES ⟩ **Go to relevant DTC chart (See page DI–21).**

NO

2	**Check output voltage of oxygen sensor during idling.**

PREPARATION:

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

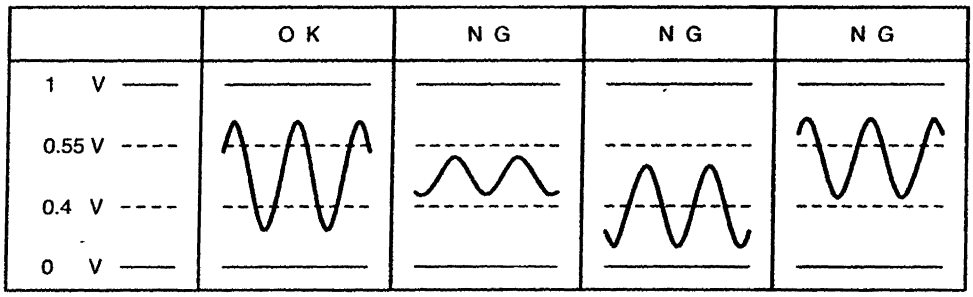
CHECK:

Use the hand–held tester to read the output voltage of the oxygen sensor during idling.

OK:

Oxygen sensor output voltage:

Alternates repeatedly between less than 0.4 V and more than 0.55 V (See the following table).



P18349

OK	Go to step 7.

NG

3	Check for open and short in harness and connector between engine ECU and oxygen sensor (See page IN–30).

NG	Repair or replace harness or connector.

OK

4	Check air induction system (See Pub. No. RM588E on page FI–1).

NG	Repair or replace.

OK

5	Check fuel pressure (See Pub. No. RM588E on page FI–6).

NG	Check and repair fuel pump, pressure regulator, fuel pipe line and filter (See Pub. No. RM588E on page FI–1).

OK

6	Check injector injection (See Pub. No. RM588E on page FI–22).

NG → Replace injector.

OK

Replace oxygen sensor.

7	Perform confirmation driving pattern (See page DI–38).

GO

8	Is there DTC P0133 or P0153 being output again?

NO → Check for intermittent problems (See page DI–17).

YES

Check and replace engine ECU (See page IN–30).

When not using hand–held tester:

1	Are there any other codes (besides code 21 or 28) being output?

YES → Go to relevant DTC chart (See page DI–21).

NO

Replace oxygen sensor.

DI63Y–03

DTC	P0171/25	System too Lean (A/F Lean Malfunction, Bank 1)

DTC	P0172/26	System too Rich (A/F Rich Malfunction, Bank 1) (Europe)

DTC	P0174/25	System too Lean (A/F Lean Malfunction, Bank 2)

DTC	P0175/26	System too Rich (A/F Rich Malfunction, Bank 2) (Europe)

CIRCUIT DESCRIPTION

Fuel trim refers to the feedback compensation value compared to the basic injection time. Fuel trim includes short–term fuel trim and long–term fuel trim.

Short–term fuel trim is the short–term fuel compensation used to maintain the air–fuel ratio at its ideal theoretical value. The signal from the heated oxygen sensor indicates whether the air–fuel ratio is RICH or LEAN compared to the ideal theoretical value, triggering a reduction in fuel volume if the air–fuel ratio is rich, and an increase in fuel volume if it is lean.

Long–term fuel trim is overall fuel compensation carried out long–term to compensate for continual deviation of the short–term fuel trim form the central value due to individual engine differences, wear overtime and changes in the usage environment.

If both the short–term fuel trim and long–term fuel trim are LEAN or RICH beyond a certain value, it is detected as a malfunction and the CHK ENG on the multi information display.

DTC No.	DTC Detecting Condition	Trouble Area
P0171/25 P0174/25	When air–fuel ratio feedback is stable after engine warming up, fuel trim is considerably in error on LEAN side (2 trip detection logic)	• Air induction system • Injector blockage • Vacuum sensor • Water temp. sensor • Fuel pressure • Gas leakage on exhaust system • Open or short in oxygen sensor (bank 1, 2 sensor 1) • Oxygen sensor (bank 1, 2 sensor 1) • Engine ECU
P0172/26 P0175/26	When air–fuel ratio feedback is stable after engine warming up, fuel trim is considerably in error on RICH side (2 trip detection logic)	• Injector leak, blockage • Vacuum sensor • Water temp. sensor • Ignition system • Fuel pressure • Gas leakage on exhaust system • Open or short in oxygen sensor (bank 1, 2 sensor 1) • Oxygen sensor (bank 1, 2 sensor 1) • Engine ECU

HINT:

- When the DTC P0171/25 or P0174/25 is recorded, the actual air–fuel ratio is on the LEAN side. When DTC P0172/26 or P0175/26 is recorded, the actual air–fuel ratio is on the RICH side.
- If the vehicle runs out of fuel, the air–fuel ratio is LEAN and DTC P0171/25 and P0174/25 is recorded. The CHK ENG then comes on.
- If the total of the short–term fuel trim value and long–term fuel trim value is within ± 38 %, the system is functioning normally.
- The oxygen sensor (bank 1 sensor 1) output voltage and the short–term fuel trim value can be read using the hand–held tester.

WIRING DIAGRAM

Refer to DTC P0125 on page DI–38.

INSPECTION PROCEDURE

When using hand–held tester:

HINT:

Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Check air induction system (See Pub. No. RM588E on page FI–1).**

NG → **Repair or replace.**

OK

2	**Check injector injection (See Pub. No. RM588E on page FI–22).**

NG → **Replace injector.**

OK

3	**Check air flow meter (See page FI–2) and water temperature sensor (See Pub. No. RM588E on page FI–56).**

NG → **Repair or replace.**

OK

4	**Check for spark and ignition (See Pub. No. RM588E on page IG–1).**

NG → **Repair or replace.**

OK

5	**Check fuel pressure (See Pub. No. RM588E on page FI–6).**

NG → **Check and repair fuel pump, pressure regulator, fuel pipe line and filter.**

OK

6	**Check gas leakage on exhaust system.**

NG → **Repair or replace.**

OK

7	**Check output voltage of oxygen sensor (bank 1, 2 sensor 1) during idling.**

PREPARATION:

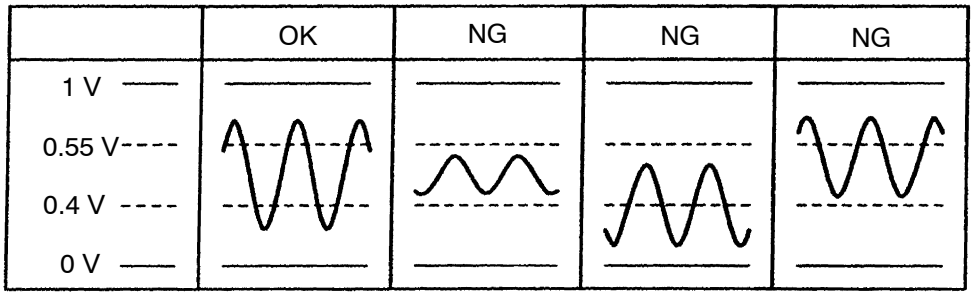
Warm up the oxygen sensor with the engine speed at 2,500 rpm for approx. 90 sec.

CHECK:

Used the hand–held tester to read the output voltage of the oxygen sensor during idling.

OK:

Oxygen sensor output voltage:
Alternates repeatedly between less than 0.4 V and more than 0.5 V (See the following table).



OK → Go to step 9.

NG

8	Check for open and short in harness and connector between engine ECU and oxygen sensor (bank 1, 2 sensor 1) (See page IN–30).

NG → Repair or replace harness or connector.

OK

Replace oxygen sensor.

9	Perform confirmation driving pattern (See page DI–38).

Go

10	Is there DTC P0171, P0172, P0174 or P0175 being output again?

YES → Check and replace engine ECU (See page IN–30).

NO

11	Did vehicle runs out of fuel in past?

NO → Check for intermittent problems (See page DI–17).

YES

DTC P0171, P0172, P0174, or P0175 is caused by running out of fuel.

When not using hand–held tester:

1	Check air induction system (See Pub. No. RM588E on page FI–41).

NG → Repair or replace.

OK

2	Check fuel pressure (See Pub. No. RM588E on page FI–6).

NG → Check and repair fuel pump, fuel pipe line and filter (See Pub. No. RM588E on page FI–1).

OK

3	Check injector injection (See Pub. No. RM588E on page FI–22).

NG → Replace injector.

OK

4	Check air flow meter (See page FI–2) and water temperature sensor (See Pub. No. RM588E on page FI–56).

NG → Repair or replace.

OK

5	Check for spark and ignition (See Pub. No. RM588E on page IG–1).

NG → Repair or replace.

OK

6	**Does malfunction disappear when a good oxygen sensor (bank 1, 2 sensor 1) installed?**

YES → **Repair oxygen sensor.**

NO

Check and replace engine ECU (See page IN–30).

DI63Z–03

DTC	P0300/93	Random/Multiple Cylinder Misfire Detected

DTC	P0301/93	Cylinder 1 Misfire Detected

DTC	P0302/93	Cylinder 2 Misfire Detected

DTC	P0303/93	Cylinder 3 Misfire Detected

DTC	P0304/93	Cylinder 4 Misfire Detected

DTC	P0305/93	Cylinder 5 Misfire Detected

DTC	P0306/93	Cylinder 6 Misfire Detected

CIRCUIT DESCRIPTION

Misfire: The engine ECU uses the crankshaft position sensor and camshaft position sensor to monitor changes in the crankshaft rotation for each cylinder.

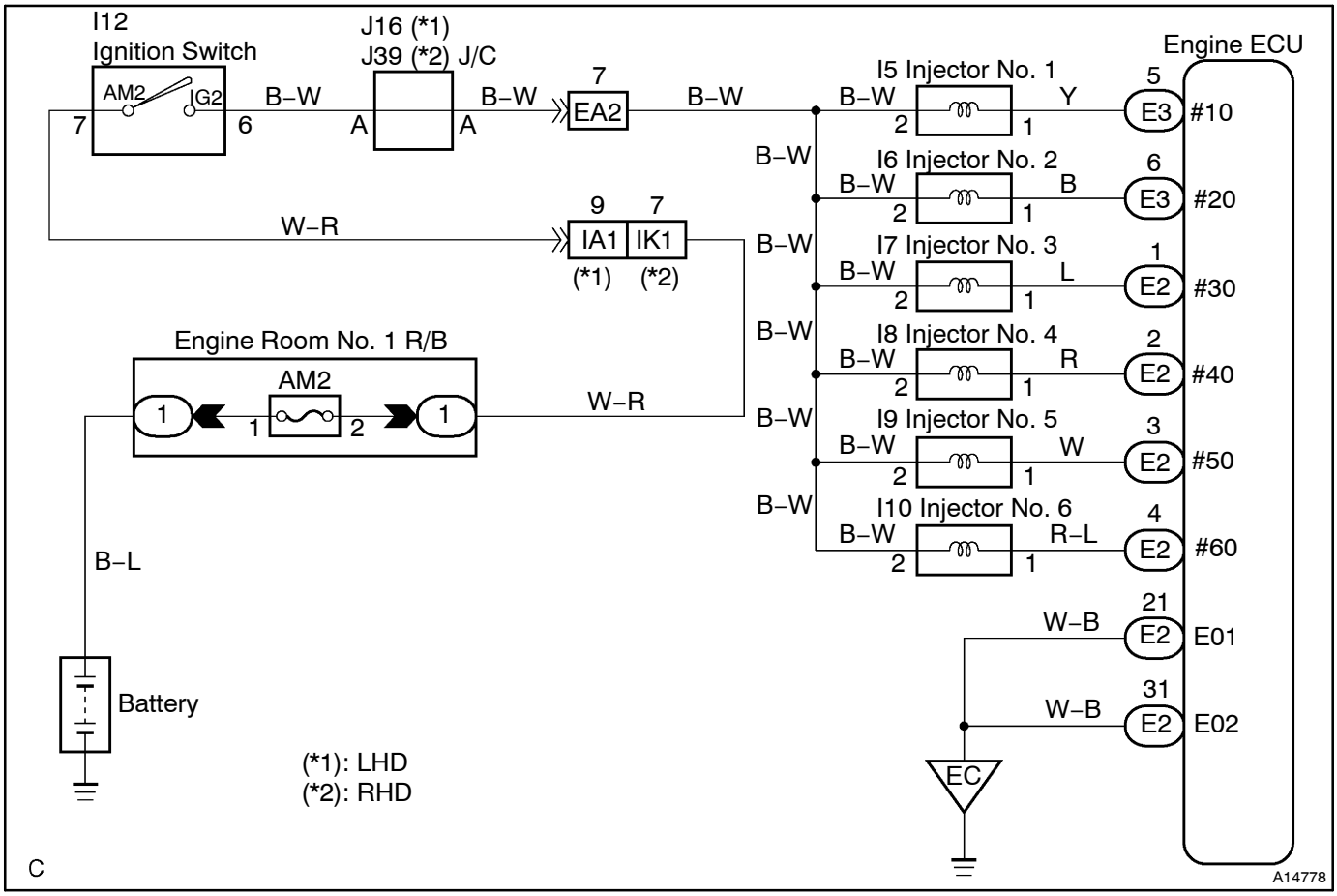
The engine ECU counts the number of times the engine speed change rate indicates that misfire has occurred. And when the misfire rate equals or exceeds the count indicating that the engine condition has deteriorated, the CHK ENG lights up.

If the misfire rate is high enough and the driving conditions will cause catalyst overheating, the CHK ENG blinks when misfiring occurs.

DTC No.	DTC Detecting Condition	Trouble Area
P0300/93	Misfiring of random cylinders is detected during any particular 200 or 1,000 revolutions 1 trip detection logic: CHK ENG to brink 2 trip detection logic: CHK ENG to light up	• Open or short in engine wire • Connector connection • Vacuum hose connection • Ignition system • Injector • Fuel pressure • Vacuum sensor • Water temp. sensor • Compression pressure • Valve clearance • Valve timing • Engine ECU
P0301/93 P0302/93 P0303/93 P0304/93 P0305/93 P0306/93	For any particular 200 revolutions of engine, misfiring is detected which can cause catalyst overheating (This causes CHK ENG to blink)	
	For any particular 1,000 revolutions of engine, misfiring is detected which causes a deterioration in emissions (2 trip detection logic)	

HINT:
When codes for a misfiring cylinder is recorded repeatedly but no random misfire code is recorded, it indicates that the misfires were detected and recorded at different times.

WIRING DIAGRAM



CONFIRMATION DRIVING PATTERN

(a) Connect the hand–held tester to the DLC3.
(b) Record DTC and the freeze frame data.
(c) Use the hand–held tester to set to the Check (Test) Mode (See page DI–17).
(d) Drive the vehicle several times with the engine speed, load and its surrounding range shown with ENGINE SPD, CALC LOAD in the freeze frame data or MISFIRE RPM, MISFIRE LOAD in the data list.

If you have no hand–held tester, turn the ignition switch OFF after the symptom is simulated the first time. Then repeat the simulation process again.

HINT:
In order to memorize DTC of misfire, it is necessary to drive around MISFIRE RPM, MISFIRE LOAD in the data list for the following period of time.

Engine Speed	Time
Idling	3 minutes 30 seconds or more
1,000 rpm	3 minutes or more
2,000 rpm	1 minute 30 seconds or more
3,000 rpm	1 minute or more

(e) Check whether there is misfire or not by monitoring DTC and the freeze frame data. After that, record them.
(f) Turn the ignition switch OFF and wait at least 5 seconds.

INSPECTION PROCEDURE

HINT:

- If it is the case that DTC besides misfire is memorized simultaneously, first perform the troubleshooting for them.
- Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.
- When the vehicle is brought to the workshop and the misfire is not occurred, misfire can be confirmed by reproducing the condition of freeze frame data. Also, after finishing the repair, confirm that there is no misfire (See confirmation driving pattern).
- When either of SHORT FT #1, LONG FT #1, SHORT FT #2 or LONG FT #2 in the freeze frame data is besides the range of ± 20 %, there is a possibility that the air–fuel ratio is inclining either to RICH (–20 % or less) or LEAN (+20 % or more).
- When COOLANT TEMP in the freeze frame data is less than 80°C (176°F), there is a possibility of misfire only during warmed up.
- In the case that misfire cannot be reproduced, the reason may be because of the driving with lack of fuel, the use of improper fuel, a stain of the ignition plug, and etc.

1	**Check wire harness, connector and vacuum hose in engine room.**

CHECK:

(a) Check the connection conditions of wire harness and connector.

(b) Check the disconnection, piping and break of vacuum hose.

NG → **Repair or replace, then confirm that there is no misfire (See confirmation driving pattern).**

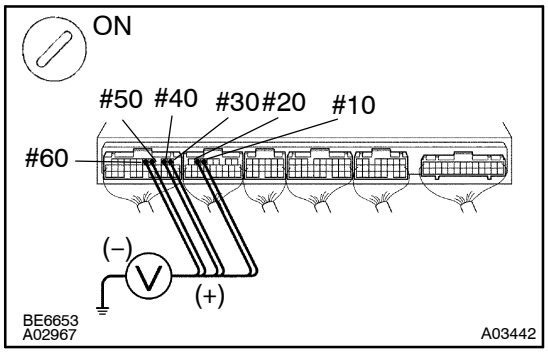
OK

2	**Check spark plug and spark of misfiring cylinder (See Pub. No. RM588E on page IG–1).**

NG → **Replace or check ignition system (See Pub No. RM588E on page IG–1).**

OK

3	Check voltage of engine ECU terminals for injector of failed cylinder.



PREPARATION:

(a) Remove the engine ECU hood.

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between applicable terminals #10 – #60 of the engine ECU connectors and body ground.

OK:

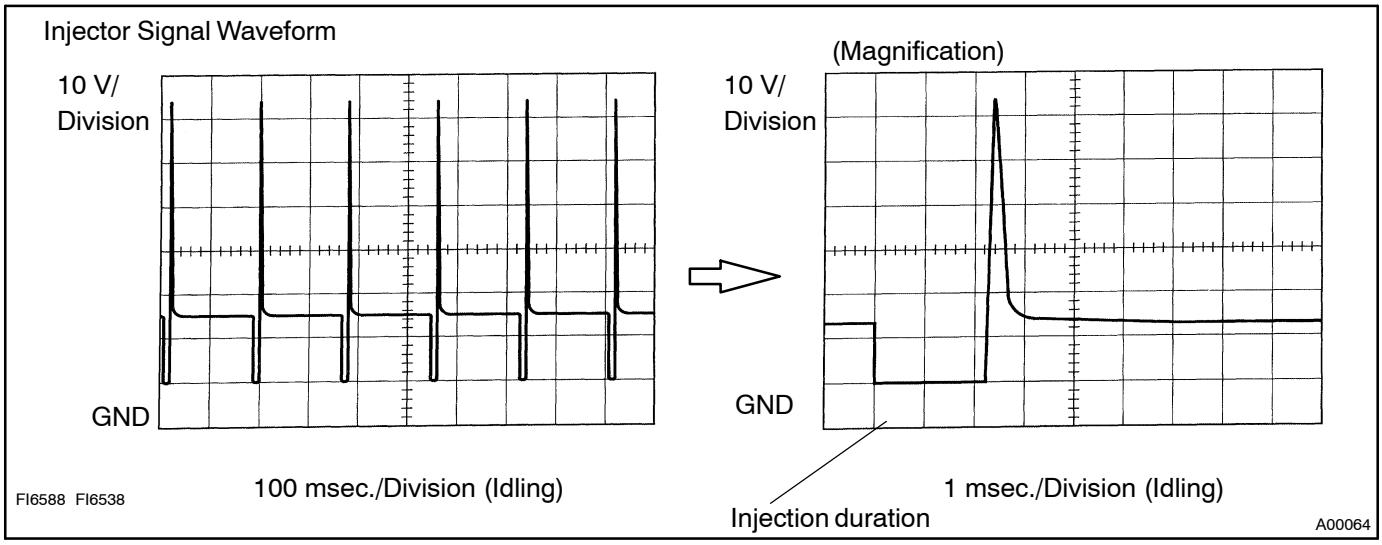
Voltage: 9 – 14 V

Reference: INSPECTION USING OSCILLOSCOPE

With the engine idling, check the waveform between terminals #10 – #60 and E01 of the engine ECU connectors.

HINT:

The correct waveform is as shown.



OK	Go to step 5.

NG

4	Check resistance of injector of misfiring cylinder (See Pub. No. EM588E on page FI–1).

NG → Replace injector.

OK →

Check for open and short in harness and connector between injector and engine ECU (See page IN–30).

5	Check fuel pressure (See Pub. No. EM588E on page FI–6).

NG → Check and repair fuel pump, pressure regulator, fuel pipe line and filter (See Pub. No. RM588E on page FI–1).

OK →

6	Check injector injection (See Pub. No. EM588E on page FI–22).

NG → Replace injector.

OK →

7	Check air flow meter (See page FI–2) and water temperature sensor (See Pub. No. EM588E on page FI–56).

NG → Repair or replace.

OK →

Check compression pressure (See Pub. No. RM588E on page EM–5), valve clearance (See Pub. No. RM588E on page EM–6) and valve timing (See Pub. No. RM588E on page EM–23).

DI643–04

DTC	P0420/94	Catalyst System Efficiency Below Threshold (Bank 1) (European spec. (Except Taiwan))

DTC	P0430/94	Catalyst System Efficiency Below Threshold (Bank 2)

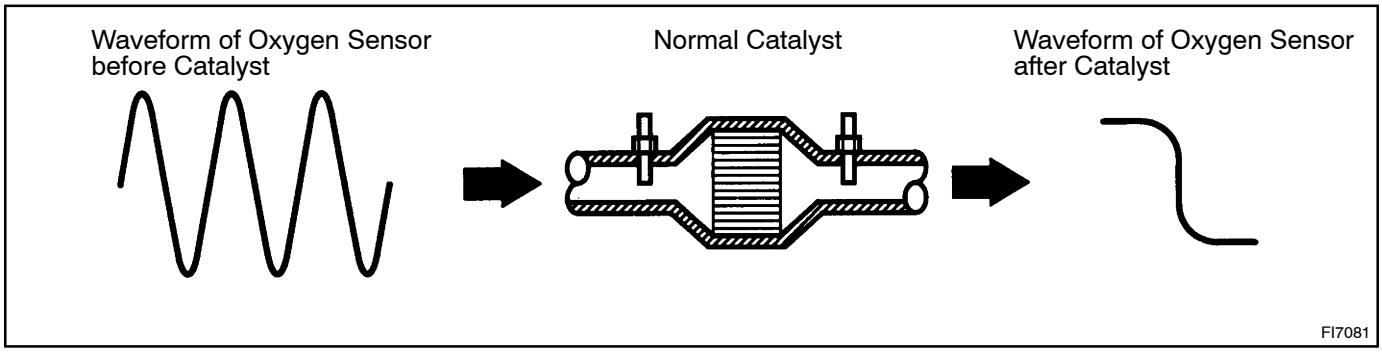
CIRCUIT DESCRIPTION

The engine ECU compares the waveform of the oxygen sensor located before the catalyst with the waveform of the oxygen sensor located after the catalyst to determine whether or not catalyst performance has deteriorated.

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

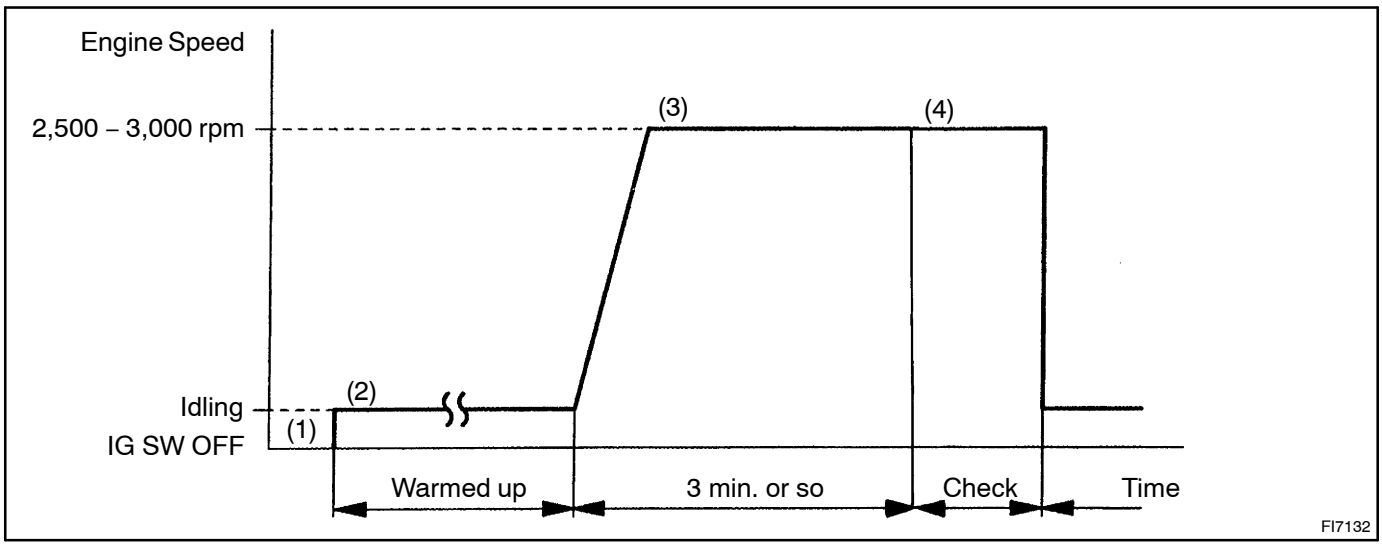
If the catalyst is functioning normally, the waveform of the oxygen sensor after the catalyst switches back and forth between rich and lean much more slowly than the waveform of the oxygen sensor before the catalyst.

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

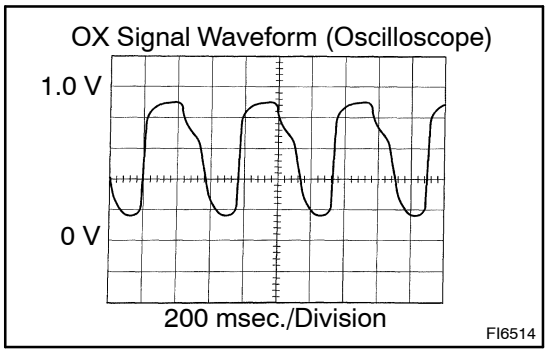


DTC No.	DTC Detecting Condition	Trouble Area
P0420/94 P0430/94	After engine and catalyst are warmed up, and while vehicle is driven within set vehicle and engine speed range, waveform of oxygen sensors have same amplitude (2 trip detection logic)	• Gas leakage on exhaust system • Oxygen sensor • Three–way catalytic converter

CONFIRMATION ENGINE RACING PATTERN



(1) Connect the hand–held tester to the DLC3, or connect the probe of the oscilloscope between terminals OX1A, OX1B, OX2A, and E1 of the engine ECU connectors.
(2) Start the engine and warm it up with all the accessories switched OFF until engine coolant temperature is stable.
(3) Race the engine at 2,500 – 3,000 rpm for about 3 min.
(4) After confirming that the waveform of the oxygen sensor (bank 1, 2 sensor 1) (OX1A, OX2A), oscillate around 0.5 V during feedback to the engine ECU, check the waveform of the oxygen sensor (bank 1 sensor 2) (OX1B).



HINT:
If there is a malfunction in the system, the waveform of the oxygen sensor (bank 1 sensor 2) (OX1B) is almost the same as that of the oxygen sensor (bank 1, 2 sensor 1) (OX1A, OX2A) on the left.
There are some cases where, even though a malfunction exists, the CHK ENG may either light up or not light up.

INSPECTION PROCEDURE

HINT:
Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Are there any other codes (besides P0420/94 or P0430/94) being output?**

YES ⇨ **Go to relevant DTC chart (See page DI–21).**

NO

2	Check gas leakage on exhaust system.

NG → Repair or replace.

OK

3	Check oxygen sensor (bank 1, 2 sensor 1) (See Pub. No. RM588E on page FI–63).

NG → Repair or replace.

OK

4	Check oxygen sensor (bank 1 sensor 2) (See Pub. No. RM588E on page FI–63).

NG → Repair or replace.

OK

Replace three–way catalytic converter.

DI85K–01

DTC	P0443/94	Evaporative Emission Control System Purge Control Vent Control Malfunction

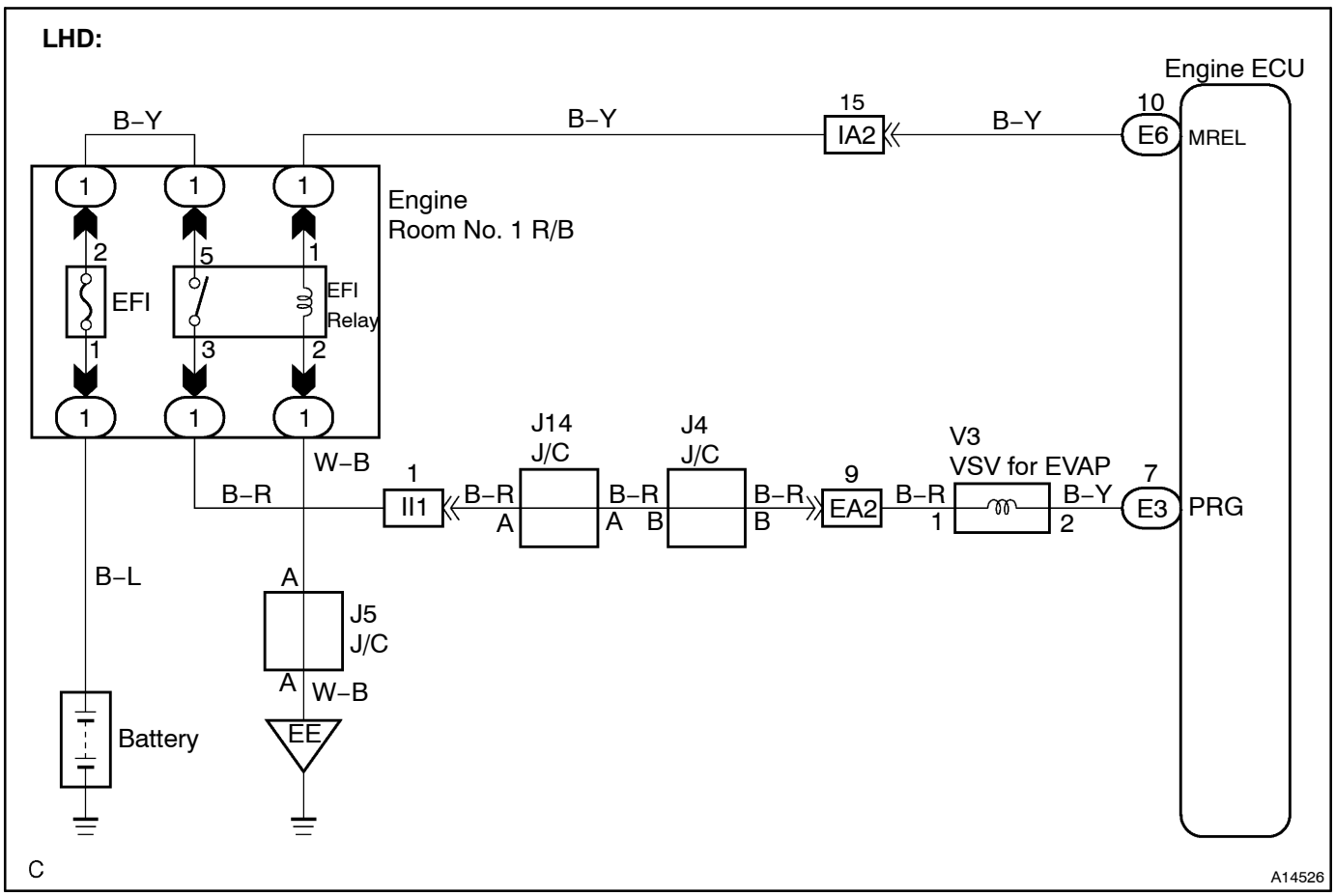
CIRCUIT DESCRIPTION

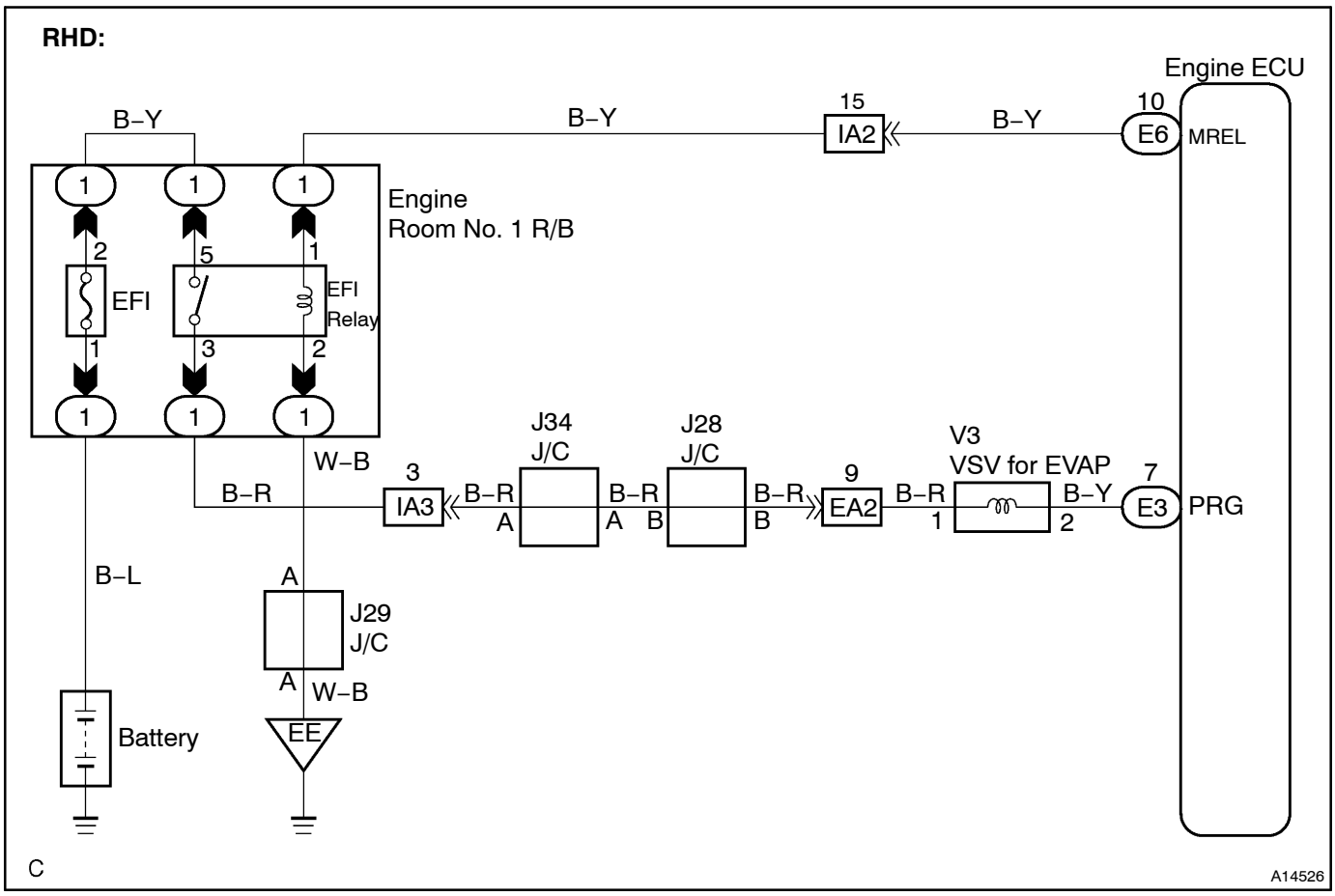
To reduce HC emissions, evaporated fuel from the fuel tank is routed through the charcoal canister to the intake manifold for combustion in the cylinders.

The engine ECU changes the duty signal to the VSV for the EVAP so that the intake quantity of HC emissions is appropriate for the driving conditions (engine load, engine speed, vehicle speed, etc.) after the engine is wamed up.

DTC No.	DTC Detecting Condition	Trouble Area
P0443/94	Proper response to engine ECU command does not occur	• Open or short in VSV circuit for EVAP • VSV for EVAP • Engine ECU

WIRING DIAGRAM





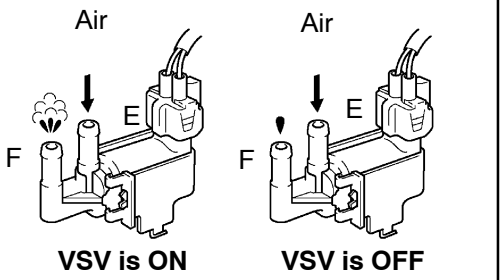
INSPECTION PROCEDURE

When using hand–held tester:

HINT:

Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	Connect hand–held tester and check operation of VSV for EVAP.



PREPARATION:

(a) Connect the hand–held tester to the DLC3.
(b) Turn the ignition switch ON and push the hand–held tester main switch ON.
(c) Select the ACTIVE TEST mode on the hand–held tester.

CHECK:

Check the operation of the VSV when the VSV is operated by the hand–held tester.

OK:

VSV is ON:
Air from port E flows out through port F.
VSV is OFF:
Air from port E does not flows out through port F filter.

OK	Check for intermittent problems (See page DI–17).

NG

2	Check VSV for EVAP (See Pub. No. RM588E on page FI–51).

NG	Replace VSV for EVAP.

OK

3	Check for open and short in harness and connector between EFI main relay and engine ECU (See page IN–30).

NG	Repair or replace harness or connector.

OK

Check and replace engine ECU (See page IN–30).

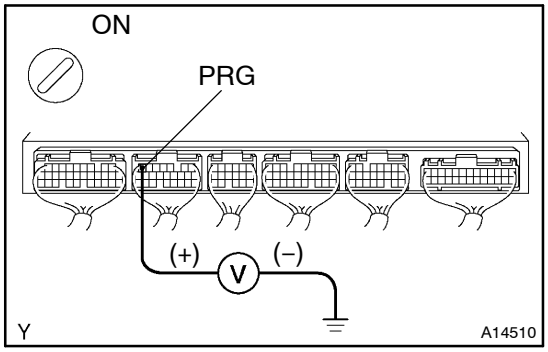
When not using hand–held tester:

1	**Check VSV for EVAP (See Pub. No. RM588E on page FI–51).**

NG → **Replace VSV for EVAP.**

OK

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



PREPARATION:

(a) Remove the engine ECU hood.

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminal PRG of the engine ECU connector and body ground.

OK:

Voltage: 9 – 14 V

NG → **Check for open and short in harness and connector between EFI main relay and engine ECU (See page IN–30).**

OK

Check and replace engine ECU (See page IN–30).

DI2P2–05

DTC	P0505/33	Idle Control System Malfunction (European spec.)

CIRCUIT DESCRIPTION

The idle speed is controlled by the Electric Throttle Control System (ETCS).
ETCS is composed of the throttle motor to operate the throttle valve, the magnetic clutch to connect the throttle motor with the throttle valve, the throttle position sensor to detect the opening angle of the throttle valve, the accelerator pedal position sensor to detect the accelerator pedal position, the engine ECU to control the ETCS and the one valve type throttle body.
The engine ECU controls the throttle motor to make the throttle valve opening angle properly for the target idle speed.

DTC No.	DTC Detecting Condition	Trouble Area
P0505	Idle speed continues to vary greatly from target speed (2 trip detection logic)	• Air induction system • Electric throttle control system

INSPECTION PROCEDURE

HINT:
Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel was ratio lean or rich, etc. at the time of the malfunction.

1	**Are there any other codes (besides P0505/33) being output?**

YES ⇒ **Go to relevant DTC chart (See page DI–21).**

NO

2	**Check air induction system (See Pub. No. RM588E on page FI–1).**

NG ⇒ **Repair or replace.**

OK

Check electric throttle control system (See Pub. No. RM588E on page FI–32).

DI6ZR–02

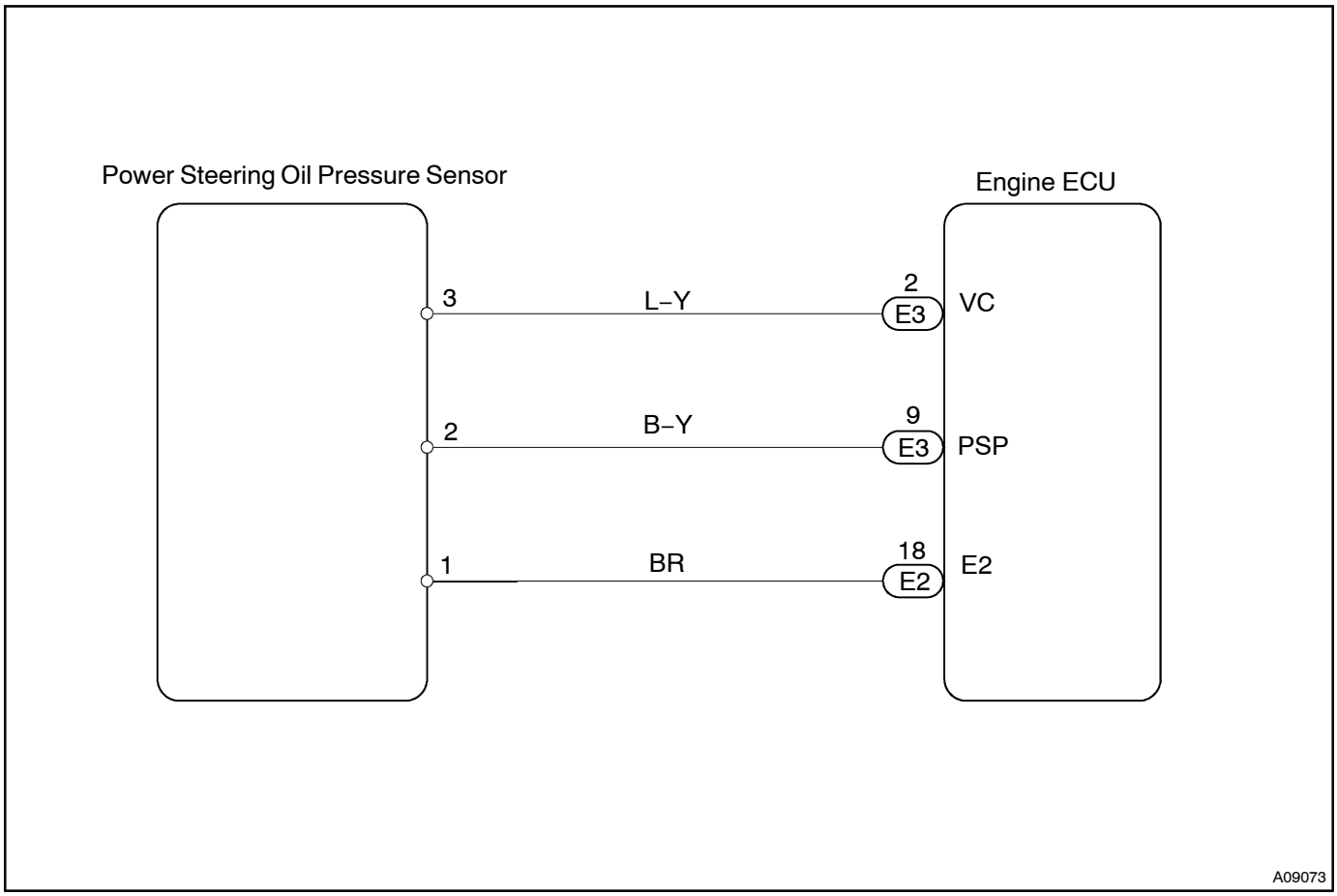
DTC	P0550/75	Power Steering Pressure Sensor Circuit Malfunction

CIRCUIT DESCRIPTION

Engine ECU controls the idle speed the most appropriate according to the signal from the power steering pressure sensor.

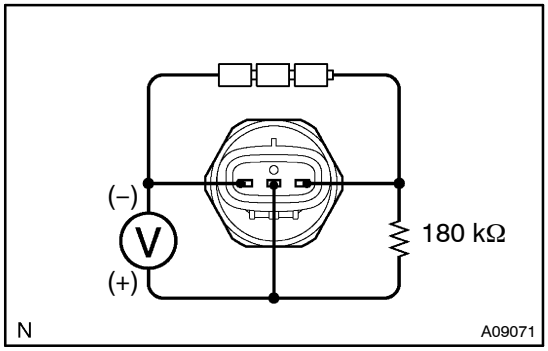
DTC No.	DTC Detecting Condition	Trouble Area
P0550/75	Condition (a) or (b) continues with more than 0.5 secs.: (a) PNP < 0.28 V (b) PNP > 4.9 V	• Open in power steering pressure sensor circuit • Power steering oil pressure sensor • Engine ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check power steering oil pressure sensor.**



PREPARATION:

(a) Connect the 3 dry batteries of 1.5 V in series.

(b) Connect the wire harness as shown in the illustration.

CHECK:

Measure voltage between terminals Vout and GND.

OK:

Power steering fluid pressure	Voltage (V)
0 kPa (0 kgf/cm^2, 0 psi)	Approx. 0.45
3,500 kPa (36 kgf/cm^2, 512 psi)	Approx. 2.25
7,000 kPa (71 kgf/cm^2, 1,010 psi)	Approx. 4.05

NG → **Replace power steering oil pressure sensor.**

OK

2	**Check for open in harness and connector between engine ECU and power steering oil pressure sensor (See page IN–30).**

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

OK

Check and replace engine ECU.

DI64F–03

DTC	P1346/18	VVT Sensor/Camshaft Position Sensor Circuit Range/Performance Problem (Bank 1)

CIRCUIT DESCRIPTION

Refer to DTC P0335/12, 13 of Pub. No. RM588E on page DI–68.

DTC No.	DTC Detecting Condition	Trouble Area
P1346	Deviation in crankshaft position sensor signal and camshaft position sensor signal (2 trip detection logic)	• Mechanical system (Jumping teeth of timing belt, belt stretched) • Engine ECU

WIRING DIAGRAM

Refer to DTC P0335/12, 13 of Pub. No. RM588E on page DI–68.

INSPECTION PROCEDURE

HINT:

- Perform troubleshooting of DTC P0335/12, 13 first. If no trouble is found, troubleshoot the following mechanical systems.
- Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Check valve timing (Check for loose and jumping teeth of timing belt) (See Pub. No. RM588E on page EM–23).**

NG → **Adjust valve timing (Repair or replace timing belt).**

OK

Check and replace engine ECU (See page IN–30).

DI088–13

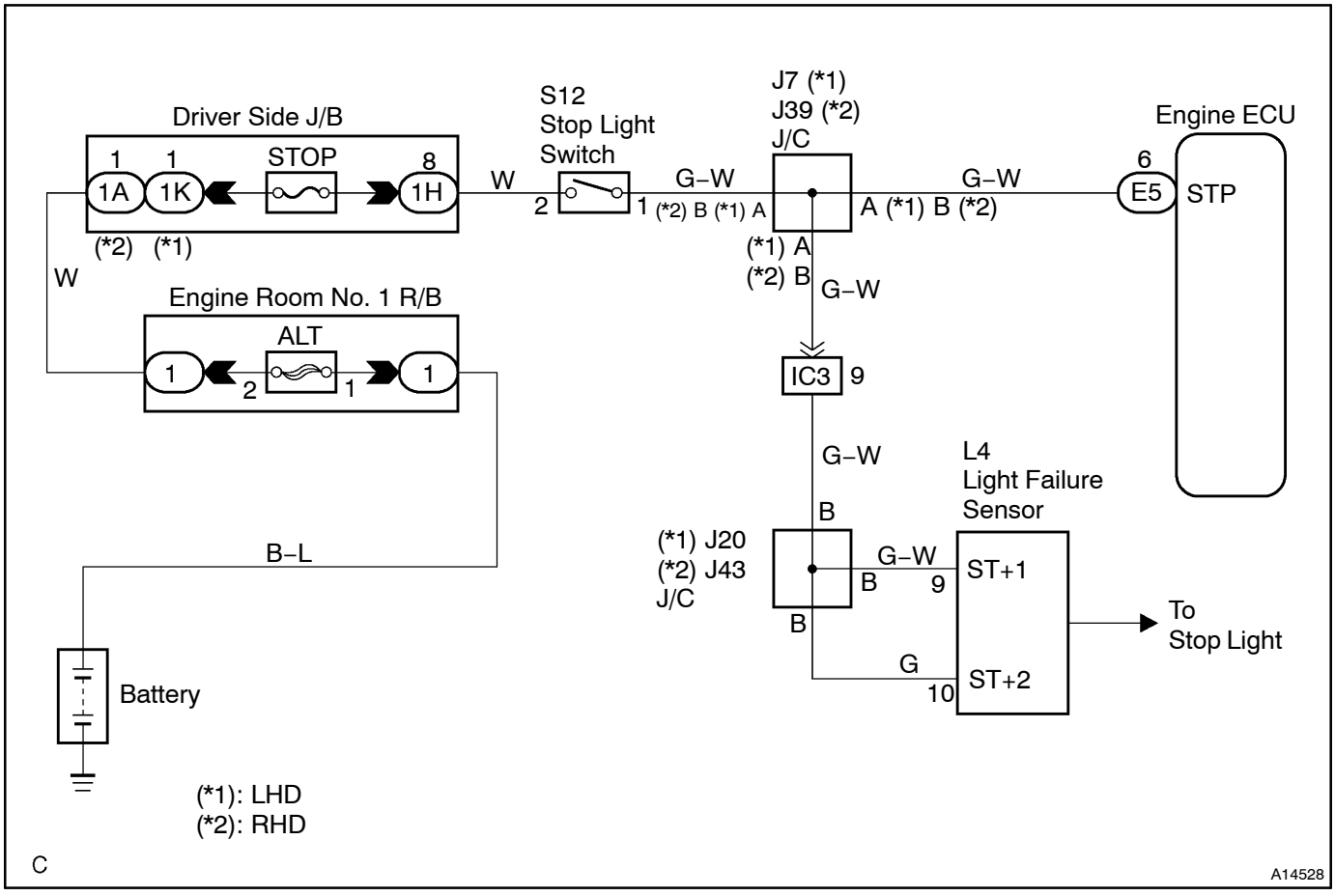
DTC	P1520/52	Stop Light Switch Signal Malfunction

CIRCUIT DESCRIPTION

This signal is used to detect when the brakes have been applied. The STP signal voltage is the same as the voltage supplied to the stop lights.
The STP signal is used mainly to control the fuel cut–off engine speed (The fuel cut–off engine speed is reduced slightly when the vehicle is braking.).

DTC No.	DTC Detecting Condition	Trouble Area
P1520/52	The stop light switch does not turn off even once the vehicle is driven (2 trip detection logic)	• Short in stop light switch signal circuit • Stop light switch • Engine ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Check operation of stop light.**

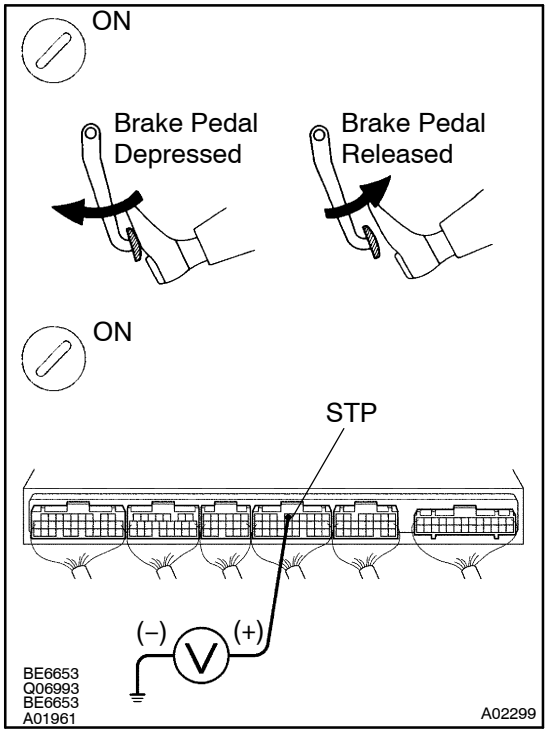
CHECK:

Check if the stop lights go on and off normally when the brake pedal is operated and released.

NG → **Check and repair stop light circuit.**

OK ↓

2	**Check STP signal.**



When using hand–held tester:

PREPARATION:

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

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

CHECK:

Read the STP signal on the hand–held tester.

OK:

Brake pedal is depressed: STP ... ON

Brake pedal is released: STP ... OFF

When not using TOYOTA hand–held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Check voltage between terminal STP of the engine ECU and body ground.

OK:

Brake pedal	Voltage
Depressed	7.5 – 14 V
Released	Below 1.5 V

OK → **Check for intermittent problems (See page DI–17).**

NG ↓

3	Check harness and connector between engine ECU and stop light switch (See page IN–30).

NG → Repair or replace harness or connector.

OK →

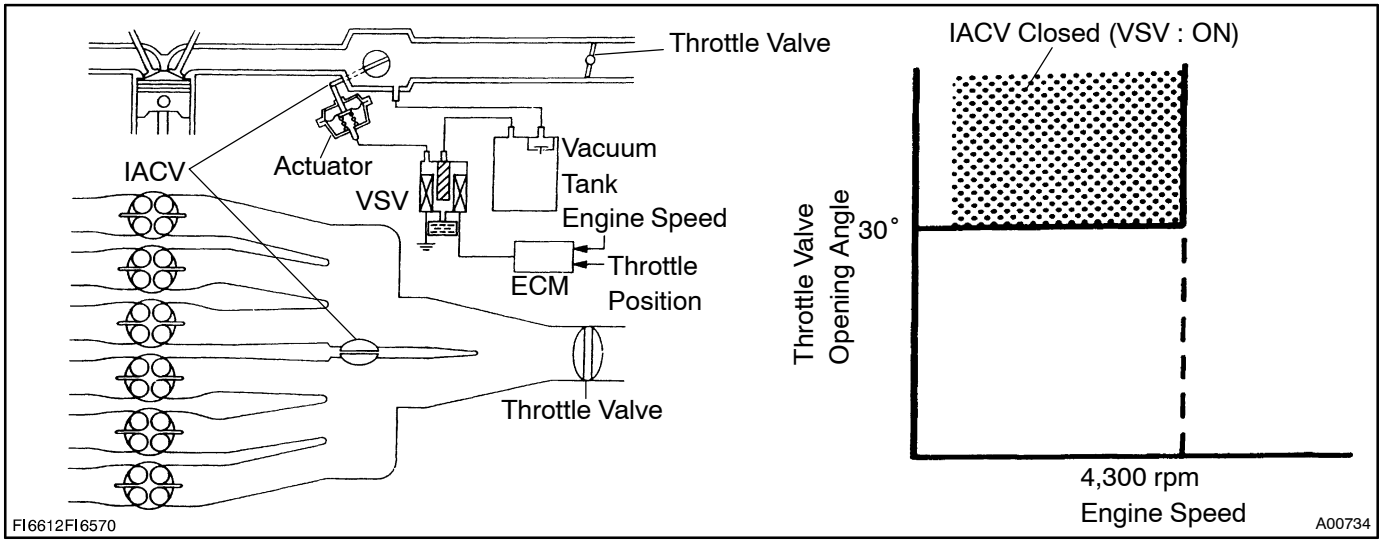
Check and replace engine ECU (See page IN–30).

DI64K–04

DTC	P1651/96	VSV for ACIS Circuit Malfunction

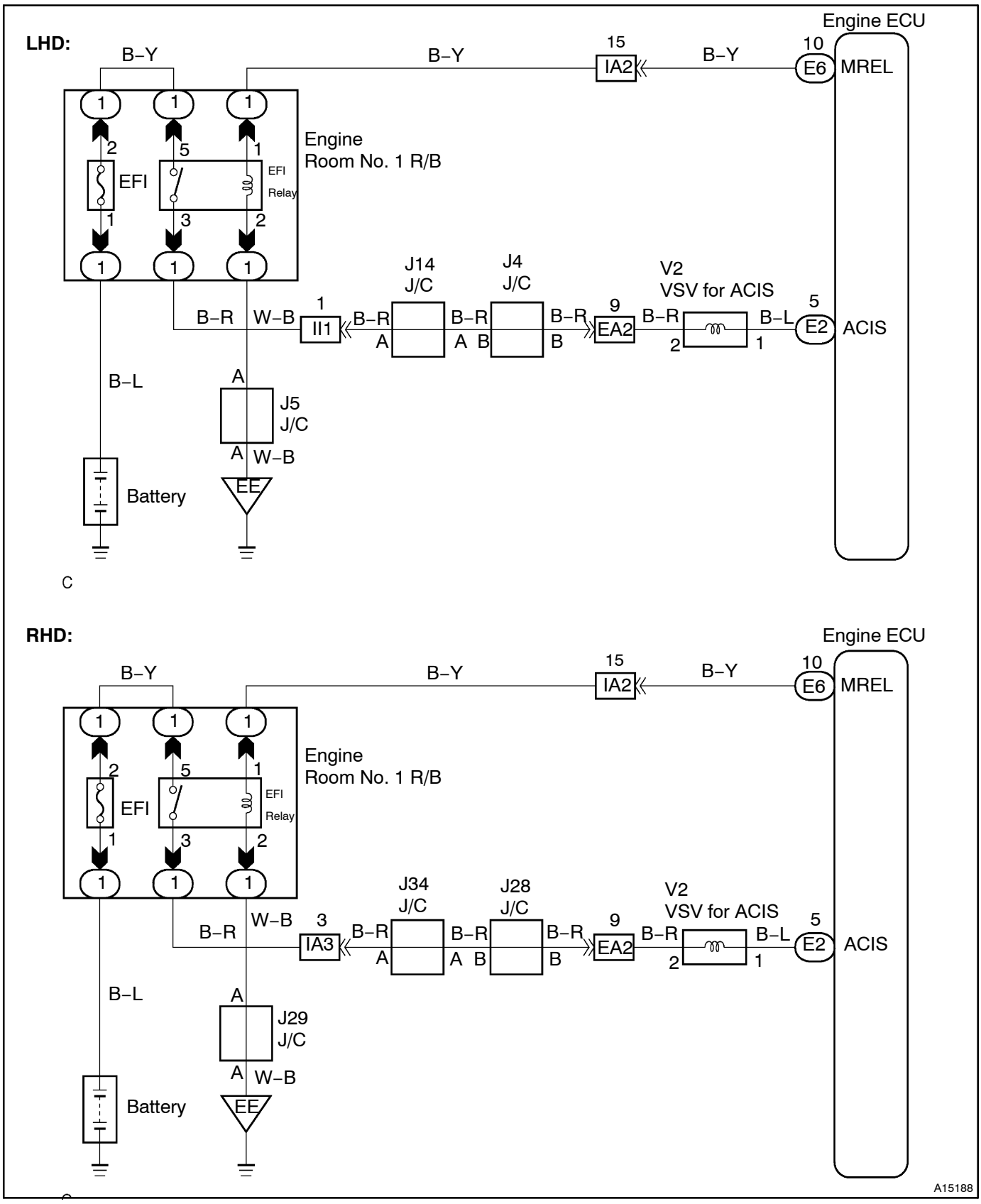
CIRCUIT DESCRIPTION

This circuit opens and closes the Intake Air Control Valve (IACV) in response to the engine load in order to increase the intake efficiency (ACIS: Acoustic Control Induction System).
When the engine speed is 4,300 rpm or less and the throttle valve opening angle is 30° or more, the ECM turns the VSV ON and closes the IACV. At all other times, the VSV is OFF, so the IACV is open.



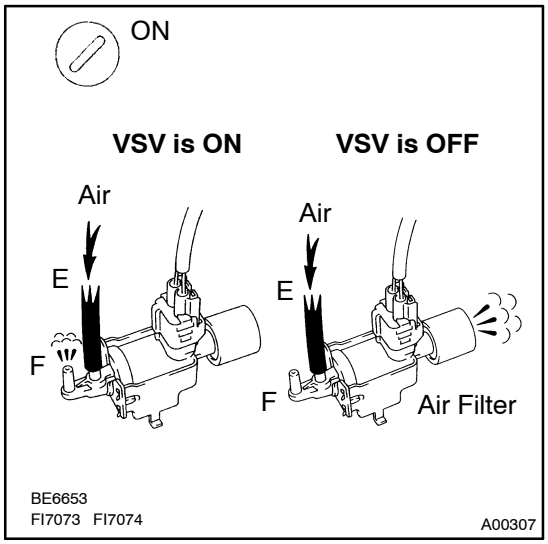
DTC No.	DTC Detecting Condition	Trouble Area
P1651/96	Proper response to engine ECU command does not occur (2 trip detection logic)	• Open or short in VSV circuit for ACIS • VSV for ACIS • Engine ECU

WIRING DIAGRAM



INSPECTION PROCEDURE
LEXUS hand–held tester:

1	**Connect LEXUS hand–held tester, and check operation of VSV for ACIS.**



PREPARATION:

(a) Connect the LEXUS hand–held tester to the DLC3.
(b) Turn the ignition switch ON and push the LEXUS hand–held tester main switch ON.
(c) Select the ACTIVE TEST mode on the LEXUS hand–held tester.

CHECK:

Check the operation of the the VSV when the VSV is operated by the LEXUS hand–held tester.

OK:

VSV is ON:
Air from port E flows out through port F.
VSV is OFF:
Air from port E flows out through air filter.

OK	**Check for vacuum tank.**

NG

2	**Check VSV for ACIS (See Pub. No. RM588E on page FI–53).**

NG	**Replace VSV for ACIS.**

OK

3	**Check for open and short in harness and connector between EFI main relay (Marking: EFI) and ECM (See page IN–30).**

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

OK

Check and replace ECM (See page IN–30).

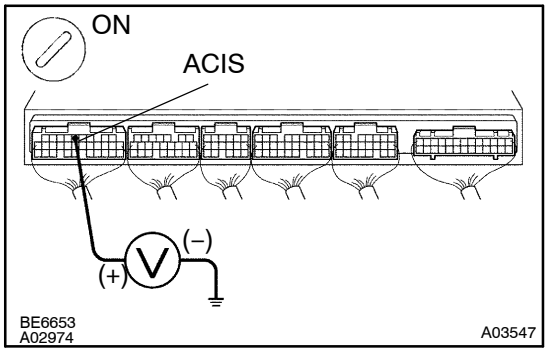
OBD II scan tool (excluding LEXUS hand–held tester):

1	Check VSV for ACIS (See Pub. No. RM588E on page FI–53).

NG → Replace VSV for ACIS.

OK

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



PREPARATION:

(a) Remove the engine room ECM cover and hood.
(b) Turn the ignition switch ON.

CHECK:

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

OK:

Voltage: 9 – 14 V

NG → Check for open and short in harness and connector between EFI main relay (Marking: EFI) and ECM (See page IN–30).

OK

3	Check for vacuum tank.

NG → Repair or replace.

OK

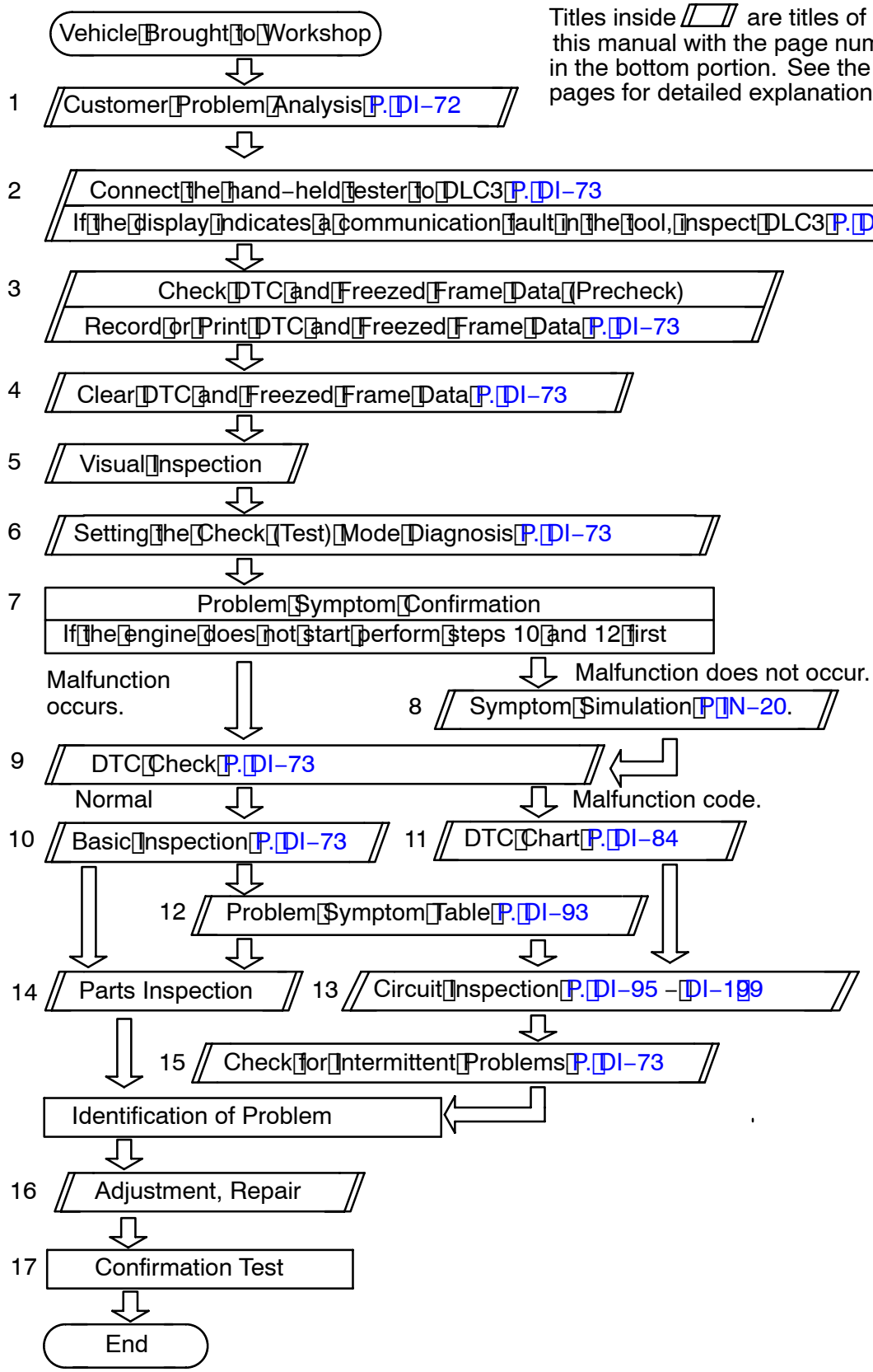
Check and replace ECM (See page IN–30).

ENGINE (3UZ–FE)

HOW TO PROCEED WITH TROUBLESHOOTING

DI4DW–16

When using hand–held tester, troubleshooting in accordance with the procedure on the following page.



Titles inside // // are titles of pages in this manual with the page number indicated in the bottom portion. See the indicated pages for detailed explanations.

DI4DX–02

CUSTOMER PROBLEM ANALYSIS CHECK

ENGINE CONTROL SYSTEM Check Sheet

Inspector's Name _____

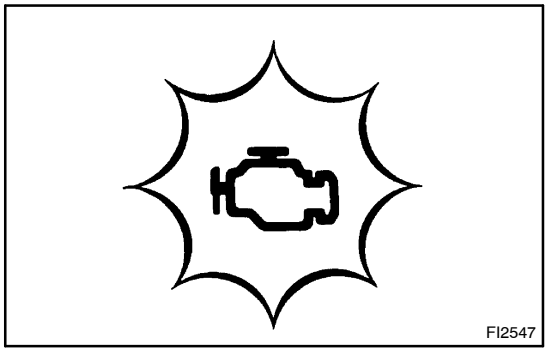
Customer's Name		Model and Model Year	
Driver's Name		Frame No.	
Data Vehicle Brought in		Engine Model	
License No.		Odometer Reading	km miles

Problem Symptoms	☐ Engine does not Start	☐ Engine does not crank ☐ No initial combustion ☐ No complete combustion
	☐ Difficult to Start	☐ Engine cranks slowly ☐ Other _____
	☐ Poor Idling	☐ Incorrect first idle ☐ Idling rpm is abnormal ☐ High (rpm) ☐ Low (rpm) ☐ Rough idling ☐ Other _____
	☐ Poor Drivability	☐ Hesitation ☐ Back fire ☐ Muffler explosion (after–fire) ☐ Surging ☐ Knocking ☐ Other _____
	☐ Engine Stall	☐ Soon after starting ☐ After accelerator pedal depressed ☐ After accelerator pedal released ☐ During A/C operation ☐ Shifting from N to D ☐ Other _____
	☐ Others	

Datas Problem Occurred		
Problem Frequency		☐ Constant ☐ Sometimes (times per day/month) ☐ Once only ☐ Other _____
Condition When Problem Occurs	Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Other _____
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (approx. ____ ˚F/____ ˚C)
	Place	☐ Highway ☐ Suburbs ☐ Inner City ☐ Uphill ☐ Downhill ☐ Rough road ☐ Other _____
	Engine Temp.	☐ Cold ☐ Warming up ☐ After Warming up ☐ Any temp. ☐ Other _____
	Engine Operation	☐ Starting ☐ Just after starting (min.) ☐ Idling ☐ Racing ☐ Driving ☐ Constant speed ☐ Acceleration ☐ Deceleration ☐ A/C switch ON/OFF ☐ Other _____

Condition of check engine warning light (CHK ENG)		☐ Remains on ☐ Sometimes light up ☐ Does not light up
DTC Inspection	Normal mode (Precheck)	☐ Normal ☐ Malfunction code(s) (code) ☐ Freezed frame data ( )
	Check Mode	☐ Normal ☐ Malfunction code(s) (code) ☐ Freezed frame data ( )

DI7O5–03

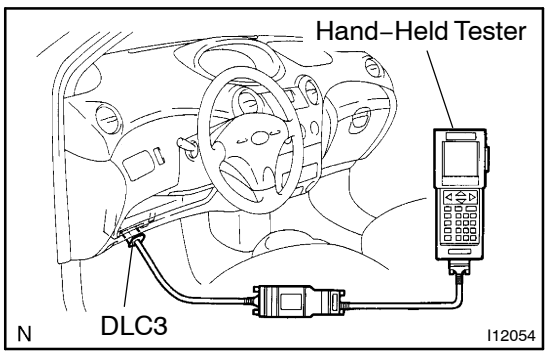


PRE–CHECK

1. DIAGNOSIS SYSTEM

(a) Description

- When troubleshooting Euro–OBD vehicles, the only difference from the usual troubleshooting procedure is that you connect to the vehicle the OBD scan tool complying with ISO 15031–4 or hand–held tester, and read off various data output from the vehicle's engine ECU.
- Euro–OBD regulations require that the vehicle's on–board computer lights up the check engine warning light on the instrument panel when the computer detects a malfunction in the emission control system / components or in the power train control components which affect vehicle emissions, or a malfunction in the computer. In addition to the check engine warning light lighting up when a malfunction is detected, the applicable Diagnostic Trouble Codes (DTC) prescribed by ISO 15031–4 are recorded in the engine ECU memory. (See page DI–84). If the malfunction does not reoccur in 3 consecutive trips, the check engine warning light goes off automatically but the DTCs remain recorded in the engine ECU memory.

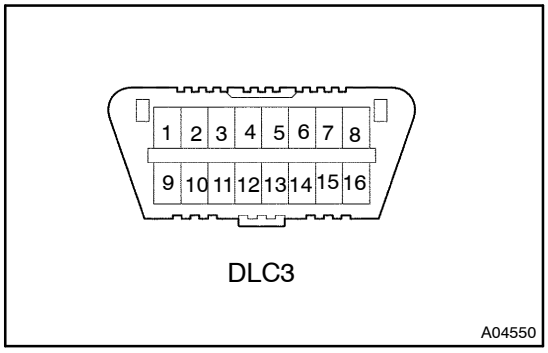


- To check the DTCs, connect the OBD scan tool or hand–held tester to Data Link Connector 3 (DLC3) on the vehicle. The OBD scan tool or hand–held tester also enables you to erase the DTCs and check freezed frame data and various forms of engine data. (For operating instructions, see the OBD scan tool's instruction book.)
  DTCs include ISO controlled codes and manufacturer controlled codes. ISO controlled codes must be set as prescribed by the ISO, while manufacturer controlled codes can be set freely by the manufacturer within the prescribed limits. (See DTC chart on page DI–84)

- The diagnosis system operates in normal mode during normal vehicle use. It also has a check mode for technicians to simulate malfunction symptoms and troubleshoot. Most DTCs use 2 trip detection logic* to prevent erroneous detection, and ensure thorough malfunction detection. By switching the engine ECU to check mode when troubleshooting, the technician can cause the check engine warning light to light up for a malfunction that is only detected once or momentarily. (hand–held tester only) (See step 2)
- *2 trip detection logic: When a malfunction is 1st detected, the malfunction is temporarily stored in the engine ECU memory. (1st trip) If the same malfunction is detected again during the second drive test, this 2nd detection causes the check engine warning light to light up. (2nd trip)
  (However, the IG switch must be turned OFF between the 1st trip and the 2nd trip.)
- Freeze frame data:
  Freeze frame data records the engine condition when a misfire (DTCs P0300 – P0308) or fuel trim malfunction (DTCs P0171, P0172, P0174, P0175) or other malfunction (first malfunction only), is detected.
  Because freeze frame data records the engine conditions (fuel system, calculated load, engine coolant temperature, fuel trim, engine speed, vehicle speed, etc.) when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

Priorities for troubleshooting:
If troubleshooting priorities for multiple DTCs are given in the applicable DTC chart, these should be followed.
If no instructions are given troubleshoot DTCs according to the following priorities.

(1) DTCs other than fuel trim malfunction (DTCs P0171, P0172, P0174, P0175) and misfire (DTCs P0300 – P0308).
(2) Fuel trim malfunction (DTCs P0171, P0172, P0174, P0175).
(3) Misfire (DTCs P0300 – P0308).

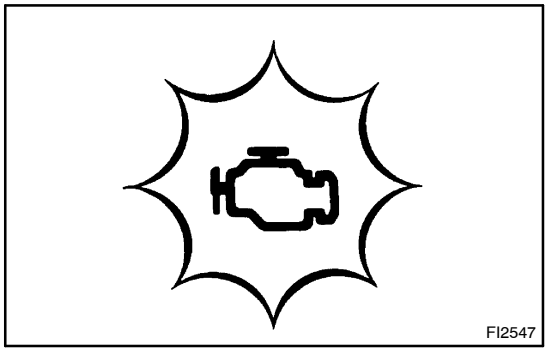


(b) Check the DLC3.
The vehicle's engine ECU uses the ISO 9141–2 communication protocol. The terminal arrangement of DLC3 complies with ISO 15031–03 and matches the ISO 9141–2 format.

Terminal No.	Connection / Voltage or Resistance	Condition
7	Bus ⊕ Line / Pulse generation	During transmission
4	Chassis Ground / ↔ Body Ground 1 Ω or less	Always
16	Battery Positive / ↔ Body Ground 9 – 14 V	Always

HINT:
If your display shows "UNABLE TO CONNECT TO VEHICLE" when you have connected the cable of the OBD scan tool or hand–held tester to DLC3, turned the ignition switch ON and operated the hand–held tester, there is a problem on the vehicle side or tool side.

- If communication is normal when the tool is connected to another vehicle, inspect DLC3 on the original vehicle.
- If communication is still not possible is when the tool is connected to another vehicle, the problem is probably in the tool itself, so consult the Service Debarment listed in the tool,s instruction manual.



2. INSPECT DIAGNOSIS (Normal Mode)

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

HINT:
If the check engine warning light (CHK ENG) does not light up, troubleshoot the combination meter.

(2) When the engine is started, the check engine warning light should go off. If the lamp remains on, the diagnosis system has detected a malfunction or abnormality in the system

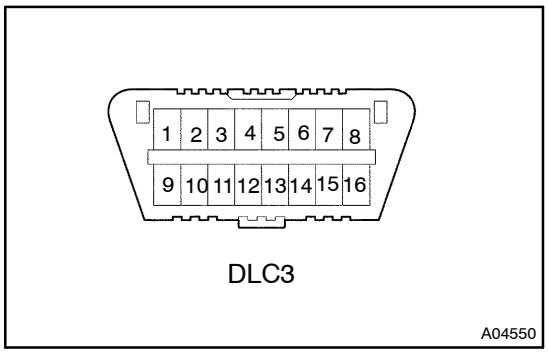
(b) Check the DTC, using hand–held tester.

NOTICE:
Hand–held tester only:
When the diagnosis system is switched from normal mode to check (test) mode, it erases all DTCs and freezed frame data recorded in normal mode. So before switching modes, always check the DTCs and freezed frame data, and note them down.

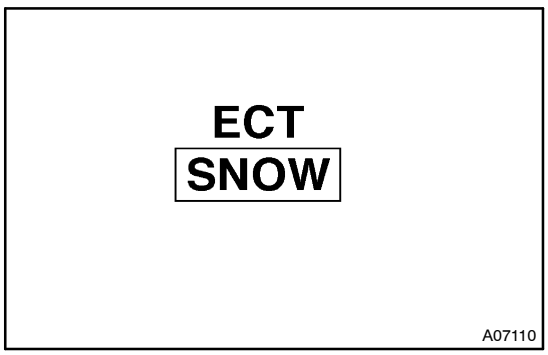
(1) Prepare the hand–held tester.
(2) Connect the hand–held tester to DLC3.
(3) Turn the ignition switch ON and switch the hand–held tester main switch ON.
(4) Use the hand–held tester to check the DTCs and freezed frame data; note them down. (For operating instructions, see the hand–held tester,s instruction book.)
(5) See page DI–84 to confirm the details of the DTCs.

(c) Check the DTC for ETCS
(1) Turn the ignition switch ON.

HINT:
If the ECT SNOW indicator does not light up, troubleshoot the combination meter (See page BE–4).



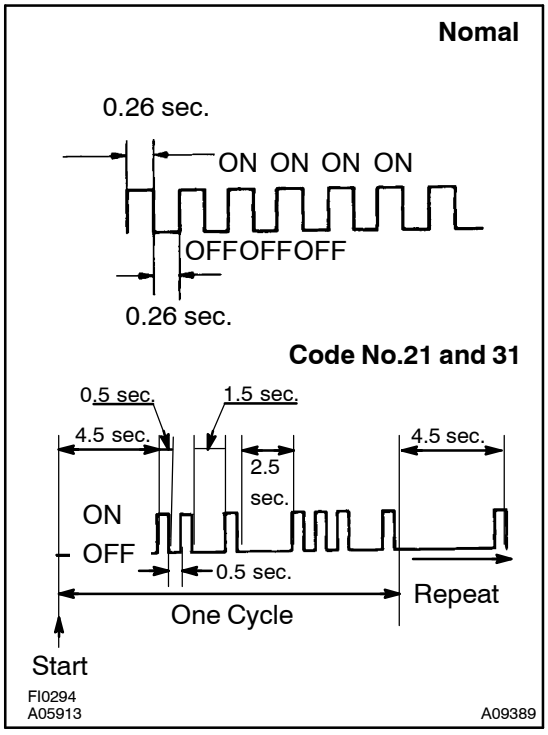
(2) Using SST, connect between terminals 13 (TC) and 4 (CG) of the DLC3.
SST 09843–18040



(3) Read the DTC from the ECT snow indicator the combination meter.

HINT:
If a DTC is not output, check the TC terminal circuit (See page DI–216).

(4) Check details of the malfunction using the DTC chart on page DI–84.
(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 ECTS fuses.

NOTICE:
If the hand–held tester switches the engine ECU from 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 freezed frame data will be erased.

(e) Clear the DTC.
The following actions will erase the DTCs and freezed frame data.
- Operating the hand–held tester to erase the codes. (See the hand–held tester's instruction book for operating instructions.)
- Disconnecting the battery terminals or EFI fuse.

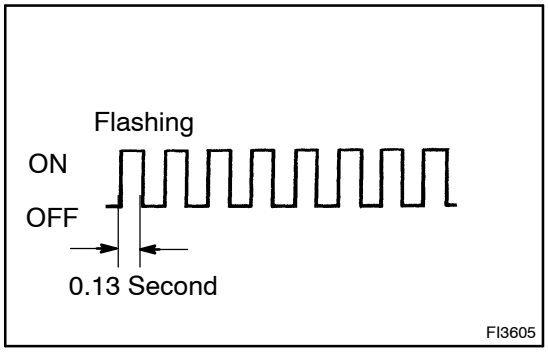
NOTICE:
If the hand–held tester switches the engine ECU from normal mode to check mode or vice–versa, or if the ignition switch is turned from ON to ACC or OFF during check mode, the DTCs and freezed frame data will be erased.

3. INSPECT DIAGNOSIS (Check (Test) Mode)

HINT:
Hand–held tester only:
Compared to the normal mode, the check mode has an increased sensitivity to detect malfunctions.
Furthermore, the same diagnostic items which are detected in the normal mode can also be detected in the check (test) mode.

(a) Check the DTC.
(1) Initial conditions
- Battery positive voltage 11V or more.
- Throttle valve fully closed.
- Transmission in "P" or "N" position.
- Air conditioning switched OFF.

(2) Turn ignition switch OFF.
(3) Prepare the hand–held tester.
(4) Connect the hand–held tester to DLC3 on the at the lower left of the instrument panel.
(5) Turn the ignition switch ON and switch the push the hand–held tester ON.



(6) Switch the hand–held tester normal mode to check (test) mode. (Check that the check engine warning light (CHK ENG) flashes.)

(7) Start the engine. (The check engine warning (CHK ENG) light goes out after the engine start.)

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

NOTICE:

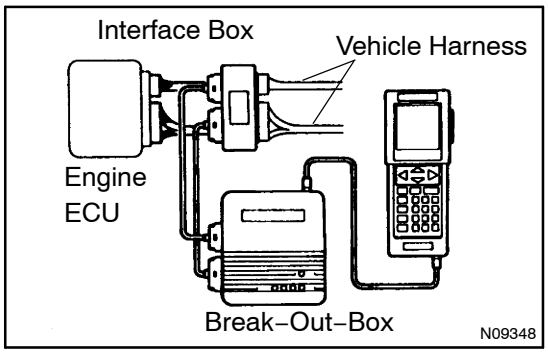
Leave the ignition switch ON until you have checked the DTC, etc.

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

HINT:

Take care not to turn the ignition switch OFF. Turning the ignition switch OFF switches the diagnosis system from check (test) mode to normal mode. so all DTCs, etc. are erased.

(10) After checking the DTCs, inspect the applicable circuit.



(b) Using break–out–box and hand–held tester

(1) Hook up the break–out–box and hand–held tester to the vehicle.

(2) Read the engine ECU input/output values following the prompts on the tester screen.

HINT:

Hand–held tester has a ”Snapshot” function. This records the measured values and is effective in the diagnosis of intermittent problems. Please refer to the hand–held tester/break–out–box operator,s manual for further details.

4. FAIL–SAFE CHART

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

DTC No.	Fail–Safe Operation	Fail–Safe Deactivation Conditions
P0100	• Ignition timing fixed at 5° BTDC	Returned to normal condition
P0110	Intake air temp. is fixed at 20°C (68°F)	Returned to normal condition
P0115	Water temp. is fixed at 80°(176°F)	Returned to normal condition
P0120	VTA is fixed at 0°	The following condition must be repeated at least 2 times consecutively When closed throttle position switch is ON: 0.1 V ≦ VTA and 0.95 V
P0325	Max. timing retardation	IG switch OFF

P0500	High RPM for cut is prohibited ISC control prohibited	Returned to normal condition
P1300 P1305 P1310 P1315 P1320 P1325 P1330 P1340	Fuel cut	Feturned to normal condition

5. CHECK FOR INTERMITTENT PROBLEMS

HAND–HELD TESTER only:

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

(1) Clear the DTC (See step 3.).
(2) Set the check (test) mode (See step 3.).
(3) Perform a simulation test (See page IN–20).
(4) Check the connector and terminal (See page IN–30).
(5) Check the visual check and contact pressure (See page IN–30).
(6) Handle the connector (See page IN–30).

6. 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 troubleshooting.

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

NO → **Charge or replace battery.**

YES

2	**Is engine cranked ?**

NO → **Proceed to problem table on page DI–93.**

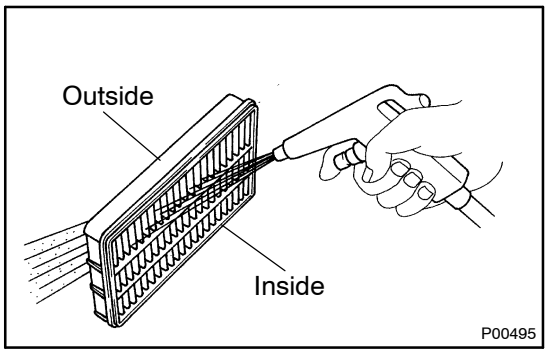
YES

3	**Does engine start ?**

NO → **Go to step 7.**

YES

4	**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 filter with compressed air. First blow from inside thoroughly, then blow from outside of filter.

NG → **Repair or replace.**

OK

5	**Check engine idle speed (See page EM–11).**

NG → **Proceed to problem symptoms table on page DI–93.**

OK

6	**Check ignition timing (See page EM–9).**

NG → **Proceed to page IG–1 and continue to trouble-shoot.**

OK

Proceed to problem symptoms table on page DI–93.

7	Check fuel pressure (See page FI–6).

NG → Proceed to page FI–6, and continue to trouble-shoot.

OK

8	Check for spark (See page IG–1).

NG → Proceed to page IG–1 and continue to trouble-shoot.

OK

Proceed to problem symptoms table on page DI–93.

7. ENGINE OPERATING CONDITION

NOTICE:

The values given below for "Normal Condition" are representative values, so a vehicle may still be normal even if its value from those listed here. So do not decide whether a part is faulty or not solely according to the "Normal Condition" here.

Hand–held tester display	Measurement Item	Normal Condition*
FUEL SYS #1	Fuel System Bank 1 OPEN: Air–fuel ratio feedback stopped CLOSED: Air–fuel ratio feedback operating	Idling after warming up: CLOSED
FUEL SYS #2	Fuel System Bank 2 OPEN: Air–fuel ratio feedback stopped CLOSED: Air–fuel ratio feedback operating	Idling after warming up: CLOSED
CALC LOAD	Calculator Load: Current intake air volume as a proportion of max. intake air volume	Idling: 13.9 – 19.7 % Racing without load (2,500rpm): 13.9 – 19.7 %
COOLANT TEMP.	Water Temp. Sensor Value	After warming up: 80 – 95°C (176 – 203°F)
SHORT FT #1	Short–term Fuel Trim Bank 1	0 ± 20 %
LONG FT #1	Long–term Fuel Trim Bank 1	0 ± 20 %
SHORT FT #2	Short–term Fuel Trim Bank 2	0 ± 20 %
LONG FT #2	Long–term Fuel Trim Bank 2	0 ± 20 %
ENGINE SPD	Engine Speed	Idling: 700 – 800 rpm

VEHICLE SPD	Vehicle Speed	Vehicle stopped: 0 km/h (0 mph)
IGN ADVANCE	Ignition Advance: Ignition Timing of Cylinder No. 1	Idling: BTDC 5 – 15°
INTAKE AIR	Intake Air Temp. Sensor Value	Equivalent to ambient temp.
MAF	Air Flow Rate Through Air Flow Meter	Idling: 4.5 – 6.3 gm/sec. Racing without load (2,500 rpm): 14.8 – 21.1 gm/sec.
THROTTLE POS	Voltage Output of Throttle Position Sensor Calculated as a percentage: 0 V → 0 %, 5 V → 100 %	Throttle fully closed: 8 – 20 % Throttle fully open: 64 – 96 %
O2S B1, S1	Voltage Output of Oxygen Sensor Bank 1, Sensor 1	Idling: 0.1 – 0.9 V
O2S B1, S2	Voltage Output of Oxygen Sensor Bank 1, Sensor 2	Driving (50 km/h, 31 mph): 0.1 – 0.9 V
O2S B2, S1	Voltage Output of Oxygen Sensor Bank 2, Sensor 1	Idling: 0.1 – 0.9 V
O2S B2, S2	Voltage Output of Oxygen Sensor Bank 2, Sensor 2	Driving (50 km/h, 31 mph): 0.1 – 0.9 V
O2FT B1, S1	Oxygen Sensor Fuel Trim Bank 1, Sensor 1 (Same as SHORT FT #1)	0 ± 20 %
O2FT B2, S1	Oxygen Sensor Fuel Trim Bank 2, Sensor 1 (Same as SHORT FT #2)	0 ± 20 %
MIL ON RUN DIST	Distance since activation of check engine warning light	When there is no DTC: 0 km (0 mile)
IGNITION	Total number of ignition for every 1,000 revolutions	0 – 2,000
CYL#1 – #8	Abnormal revolution variation for each cylinder	0 %
MISFIRE RPM	Engine RPM for first misfire range	Misfire 0: 0 rpm
MISFIRE LOAD	Engine load for first misfire range	Misfire 0: 0 g/r
INJECTOR	Fuel injection time for cylinder No.1	Idling: 1.8 – 3.2 ms
STARTER SIG	Starter Signal	Cranking: ON
A/C SIG	A/C Switch Signal	A/C ON: ON
PNP SW	Park/Neutral Position Switch Signal	P or N position: ON
CTP SW	Closed Throttle Position	Throttle fully closed: ON
STOP LIGHT SW	Stop Light Switch Signal	Stop light switch ON: ON
FC IDL	Fuel Cut Idle: Fuel cut when throttle valve fully closed, during deceleration	Fuel cut operating: ON
FC TAU	Fuel Cut TAU: Fuel cut during very light load	Fuel cut operating: ON
FUEL PUMP	Fuel Pump Signal	Idling: ON
EVAP VSV	EVAP VSV Signal	VSV operating: ON
THROTTLE POS #2	Throttle position sensor No.2 output voltage	Throttle fully closed: 2.0 – 2.9 V Throttle fully open: 4.6 – 5.0 V
ACCEL POS #1	Accelerator pedal position sensor No.1 output voltage	Accelerator pedal released: 0.25 – 0.9 V Accelerator pedal depressed: 3.2 – 4.8 V
ACCEL POS #2	Accelerator pedal position sensor No.2 output voltage	Accelerator pedal released: 1.8 – 2.7 V Accelerator pedal depressed: 4.7 – 5.0 V
THROTTLE TARGET	Target position of throttle valve	Idling: 0.4 – 1.1 V

DUTY	Throttle motor opening duty ratio	Throttle fully closed: 0 % When accelerator pedal is depressed, duty ratio is increased
THROTL CLS DUTY	Throttle motor closed duty ratio	Throttle fully closed: 0 % When accelerator pedal is quick released, duty ratio is increased
THROTTLE MOT	Whether or not throttle motor control is permitted	Idling: ON
+BM	Whether or not electric throttle control system power is inputted	Idling: ON
ACCEL IDL POS	Whether or not accelerator pedal position sensor is detecting idle	Idling: ON
THROTTLE IDL POS	Whether or not throttle position sensor is detecting idle	Idling: ON
FAIL #1	Whether or not fail safe function is executed	ETCS is failed: ON
FAIL #2	Whether or not fail safe function is executed	ETCS is failed: ON
THROTTLE INITIAL	Throttle fully closed learning value	0.4 – 0.8 V
ACCEL LEARN VALUE	Accelerator fully closed learning value	0.4 – 0.8 V
THROTTLE MOT	Throttle motor control current	Idling: 0 – 3.0 A
TOTAL FT B1	Total Fuel Trim Bank 1: Average value for fuel trim system of bank 1	Idling: 0.5 – 1.4
TOTAL FT B2	Total Fuel Trim Bank 2: Average value for fuel trim system of bank 2	Idling: 0.5 – 1.4
O2 LR B1, S1	Oxygen Sensor Lean Rich Bank 1, Sensor 1 Response time for oxygen sensor output to switch from lean to rich	Idling after warming up: 0 – 1,000 msec.
O2 LR B2, S1	Oxygen Sensor Lean Rich Bank 2, Sensor 1 Response time for oxygen sensor output to switch from lean to rich	Idling after warming up: 0 – 1,000 msec.
O2 RL B1, S1	Oxygen Sensor Rich Lean Bank 1, Sensor 1 Response time for oxygen sensor output to switch from rich to lean	Idling after warming up: 0 – 1,000 msec.
O2 RL B2, S1	Oxygen Sensor Rich Lean Bank 1, Sensor 1 Response time for oxygen sensor output to switch from rich to lean	Idling after warming up: 0 – 1,000 msec.

*: If no conditions are specifically stated for ”Idling”, it means the shift lever is at P position, the A/C switch is OFF and all accessory switches are OFF.

DI1L4–10

DIAGNOSTIC TROUBLE CODE CHART

HINT:

Parameters listed in the chart may not be exactly the same as your reading due to the type of instrument or other factors.

If a malfunction code is displayed during the DTC check in the check mode, check the circuit for the code listed in the table below. For details of each code, turn to the page referred to under the "See page" for the respective "DTC No." in the DTC chart.

ENGINE TROUBLE CODES

DTC No. (See page)	Detection Item	Trouble Area	* CHK ENG (MIL)	Memory
P0100 (DI–95)	Mass Air Flow Circuit Malfunction	• Open or short in air flow meter circuit • Air flow meter • Engine ECU	○	○
P0110 (DI–99)	Intake Air Temp. Circuit Malfunction	• Open or short in intake air temp. sensor circuit • Intake air temp. sensor • Engine ECU	○	○
P0115 (DI–103)	Water Temp. Circuit Malfunction	• Open or short in water temp. sensor circuit • Water temp. sensor • Engine ECU	○	○
P0116 (DI–107)	Engine Coolant Temp. Circuit Range/Performance Probrem	• Engine coolant temp. sensor • Cooling system	○	○
P0120 (DI–108)	Throttle Position Sensor Circuit Malfunction	• Open or short in throttle position sensor circuit • Throttle position sensor • Engine ECU	○	○
P0121 (DI–112)	Throttle Position Sensor Circuit Range/Performance Problem	• Throttle position sensor	○	○
P0125 (DI–113)	Insufficient Coolant Temp. for Closed Loop Fuel Control	• Open or short in oxygen sensor (bank 1, 2 sensor 1) circuit • Oxygen Sensor (bank 1, 2 sensor 1) • Air induction system • Fuel pressure • Injector • Gas leakage on exhaust system • Engine ECU	○	○
P0130 (DI–118)	Oxygen Sensor Circuit Malfunction (Bank 1 Sensor 1)	• Open or short in oxygen sensor circuit • Oxygen sensor • Air induction system • Fuel pressure • Injector • Engine ECU	○	○
P0133 (DI–122)	Oxygen Sensor Circuit Slow Response (Bank 1 Sensor 1)	• Open or short in oxygen sensor circuit • Oxygen sensor • Air induction system • Fuel pressure • Injector • Engine ECU	○	○
P0135 (DI–125)	Oxygen Sensor Heater Circuit Malfunction (Bank 1 Sensor 1)	• Open or short in heater circuit of oxygen sensor • Oxygen sensor heater • Engine ECU	○	○
P0136 (DI–127)	Oxygen Sensor Circuit Malfunction (Bank 1 Sensor 2)	• Open or short in oxygen sensor circuit • Oxygen sensor	○	○
P0141 (DI–125)	Oxygen Sensor Heater Circuit Malfunction (Bank 1 Sensor 2)	• Same as DTC No. P0135	○	○

P0150 (DI–118)	Oxygen Sensor Circuit Malfunction (Bank 2 Sensor 1)	• Same as DTC No. P0130	○	○
P0153 (DI–122)	Oxygen Sensor Circuit Slow Response (Bank 2 Sensor 1)	• Same as DTC No. P0130	○	○
P0155 (DI–125)	Oxygen Sensor Heater Circuit Malfunction (Bank 2 Sensor 1)	• Same as DTC No. P0135	○	○
P0156 (DI–127)	Oxygen Sensor Circuit Malfunction (Bank 2 Sensor 2)	• Same as DTC No. P0136	○	○
P0161 (DI–125)	Oxygen Sensor Heater Circuit Malfunction (Bank 2 Sensor 2)	• Same as DTC No. P0135	○	○
P0171 (DI–130)	System too Lean (A/F Lean Malfunction, Bank 1)	• Air induction system • Injector blockage • Vacuum Sensor • Water temp. sensor • Fuel pressure • Gas leakage on exhaust system • Open or short in oxygen sensor (bank1, 2 sensor1) circuit • Oxygen sensor (bank1, 2 sensor1) • Engine ECU	○	○
P172 (DI–130)	System too Rich (A/F Rich Malfunction, Bank 1)	• Injector leak, blockage • Vacuum sensor • Water temp. sensor • Ignition system • Fuel pressure • Gas leakage on exhaust system • Open or short in oxygen sensor (bank1, 2 sensor1) circuit • Oxygen sensor (bank1, 2 sensor1) • Engine ECU	○	○
P0174 (DI–130)	System too Lean (A/F Lean Malfunction, Bank 2)	• Same as DTC No. P0171	○	○
P0175 (DI–130)	System too Rich (A/F Rich Malfunction, Bank 2)	• Same as DTC No. P0172	○	○
P0300 (DI–134)	Random/Multiple Cylinder Misfire Detected	• Open or short engine wire • Connector connection • Vacuum hose connection • Ignition system • Injector • Fuel pressure • Vacuum sensor • Water temp. sensor • Compression pressure • Valve clearance • Valve timing • Engine ECU	○	○
P0301 (DI–134)	Cylinder 1 Misfire Detected			
P0302 (DI–134)	Cylinder 2 Misfire Detected			
P0303 (DI–134)	Cylinder 3 Misfire Detected			
P0304 (DI–134)	Cylinder 4 Misfire Detected			
P0305 (DI–134)	Cylinder 5 Misfire Detected			
P0306 (DI–134)	Cylinder 6 Misfire Detected			
P0307 (DI–134)	Cylinder 7 Misfire Detected			
P0308 (DI–134)	Cylinder 8 Misfire Detected			
P0325/52 (DI–140)	Knock Sensor 1 Circuit Malfunction (Bank 1)	• Open or short in knock sensor 1 circuit • Knock sensor 1 (looseness) • Engine ECU	○	○

P0330/55 (DI–140)	Knock Sensor 2 Circuit Malfunction (Bank 2)	• Open or short in knock sensor 2 circuit • Knock sensor 2 (looseness) • Engine ECU	○	○
P0335 (DI–144)	Crankshaft Position Sensor Circuit Malfunction (NE Signal)	• Open or short in crankshaft position sensor circuit • Crankshaft position sensor • Crankshaft timing pulley • Engine ECU	○	○
P0340 (DI–146)	Camshaft Position Sensor Circuit Malfunction (G Signal)	• Open or short in camshaft position sensor circuit • Camshaft position sensor • Intake camshaft • Engine ECU	○	○
P0420 (DI–148)	Catalyst System Efficiency Below Threshold (Bank 1)	• Gas leakage on exhaust system • Oxygen sensor • Three–way catalytic converter	○	○
P0430 (DI–148)	Catalyst System Efficiency Below Threshold (Bank 2)	• Same as DTC No. P0420	○	○
P0443 (DI–151)	Evaporative Emission Control System Purge Control Vent Control Malfunction	• Open or short in VSV circuit for EVAP • VSV for EVAP • Engine ECU	○	○
P0500 (DI–154)	Vehicle Speed Sensor Malfunction	• Open or short in vehicle speed sensor circuit • Transmission output speed sensor • Engine ECU	○	○
P0505 (DI–157)	Idle Control System Malfunction	• Air induction system • Electric throttle control system	○	○
P1120 (DI–108)	Accelerator Pedal Position Sensor Circuit Malfunction	• Open or short in accelerator pedal position sensor circuit • Accelerator pedal position sensor • Engine ECU	○	○
P1121 (DI–112)	Accelerator Pedal Position Sensor Range/Performance Problem	• Accelerator pedal position sensor	○	○
P1125 (DI–164)	Throttle Control Motor Circuit Malfunction	• Open or short in throttle control motor circuit • Throttle control motor • Engine ECU	○	○
P1127 (DI–166)	ETCS Actuator Power Source Circuit Malfunction	• Open in ETCS power source circuit • Engine ECU	○	○
P1128 (DI–168)	Throttle Control Motor Lock Malfunction	• Throttle control motor • Throttle body	○	○
P1129 (DI–170)	Electric Throttle Control System Malfunction	• Electric throttle control system • Engine ECU	○	○
P1300 (DI–171)	Igniter Circuit Malfunction (No.1)	• Ignition system • Open or short in IGF or IGT1 circuit from igniter to engine ECU • Igniter • Engine ECU	○	○
P1305 (DI–171)	Igniter Circuit Malfunction (No.2)	• Ignition system • Open or short in IGF or IGT2 circuit from igniter to engine ECU • Igniter • Engine ECU	○	○
P1310 (DI–171)	Igniter Circuit Malfunction (No.3)	• Ignition system • Open or short in IGF or IGT3 circuit from igniter to engine ECU • Igniter • Engine ECU	○	○

P1315 (DI–171)	Igniter Circuit Malfunction (No.4)	• Ignition system • Open or short in IGF or IGT4 circuit from igniter to engine ECU • Igniter • Engine ECU	○	○
P1320 (DI–171)	Igniter Circuit Malfunction (No.5)	• Ignition system • Open or short in IGF or IGT5 circuit from igniter to engine ECU • Igniter • Engine ECU	○	○
P1325 (DI–171)	Igniter Circuit Malfunction (No.6)	• Ignition system • Open or short in IGF or IGT6 circuit from igniter to engine ECU • Igniter • Engine ECU	○	○
P1330 (DI–171)	Igniter Circuit Malfunction (No.7)	• Ignition system • Open or short in IGF1 and IGT7 circuit from No.7 ignition coil with igniter to Engine ECU • No.7 ignition coil with igniter • Engine ECU	○	○
P1340 (DI–171)	Igniter Circuit Malfunction (No.8)	• Ignition system • Open or short in IGF2 and IGT8 circuit from No.8 ignition coil with igniter to Engine ECU • No.8 ignition coil with igniter • Engine ECU	○	○
P1335 (DI–178)	Crankshaft Position Sensor Circuit Malfunction (During engine running)	• Open or short in crankshaft position sensor circuit • Crankshaft position sensor • Crankshaft timing pulley • Engine ECU	–	○
P1345 (DI–179)	VVT Sensor Circuit Malfunction (Bank 1)	• Open or short in VVT sensor circuit • VVT sensor • Engine ECU	○	○
P1346 (DI–181)	VVT Sensor/Camshaft Position Sensor Circuit Range/Performance Problem (Bank 1)	• Mechanical system (Jumping teeth of timing belt, belt stretched) • Engine ECU	○	○
P1349 (DI–182)	VVT System Malfunction (Bank 1)	• Valve timing • OCV • VVT controller assembly • Engine ECU	○	○
P1350 (DI–179)	VVT Sensor/Camshaft Position Sensor Circuit Malfunction (Bank 2)	• Same as DTC No. P1345	○	○
P1351 (DI–181)	VVT Sensor/Camshaft Position Sensor Circuit Range/Performance Problem (Bank 2)	• Same as DTC No. P1346	○	○
P1354 (DI–182)	VVT System Malfunction (Bank 2)	• Same as DTC No. P1349	○	○
P1520 (DI–189)	Stop Light Switch Signal Malfunction	• Short in stop light switch signal circuit • Stop light switch • Engine ECU	○	○
P1600 (DI–192)	Engine ECU BATT Malfunction	• Open in back up power source circuit • Engine ECU	○	○
P1633 (DI–194)	Engine ECU Malfunction (ETCS Circuit)	• Engine ECU	○	○
P1645 (DI–195)	Body ECU Malfunction	• Body ECU • A/C ECU • Communication bus	–	–

P1651 (DI–196)	VSV for ACIS Circuit Malfunction	• Open or short in VSV circuit for ACIS • VSV for ACIS • Engine ECU	○	○
P1656 (DI–199)	OCV Circuit Malfunction (Bank 1)	• Open or short in OCV circuit • OCV • Engine ECU	○	○
P1663 (DI–194)	OCV Circuit Malfunction (Bank 2)	• Open or short in OCV circuit (bank 2) • OCV (bank 2) • Engine ECU	○	○
P1780 (DI–333)	Park/Neutral Position Switch Malfunction	• Short in neutral start switch circuit • Neutral start switch • Engine ECU	○	○
B2795/99	Unmatch Key Code	• Key • Unregistered key inserted before?	–	○
B2796/99	No Communication in Immobilizer System	• Key • Transponder key coil • Amplifier • Wireharness • Engine ECU	–	○
B2797/99	Communication Malfunction No.1	• Communication contests • Unregistered key inserted before?	–	○
B2798/99	Communication Malfunction No.2	• Key • Transponder key coil • Amplifier • Wireharness • Engine ECU	–	○

*: ○ ... CHK ENG is indicated. – ... CHK ENG is not indicated.

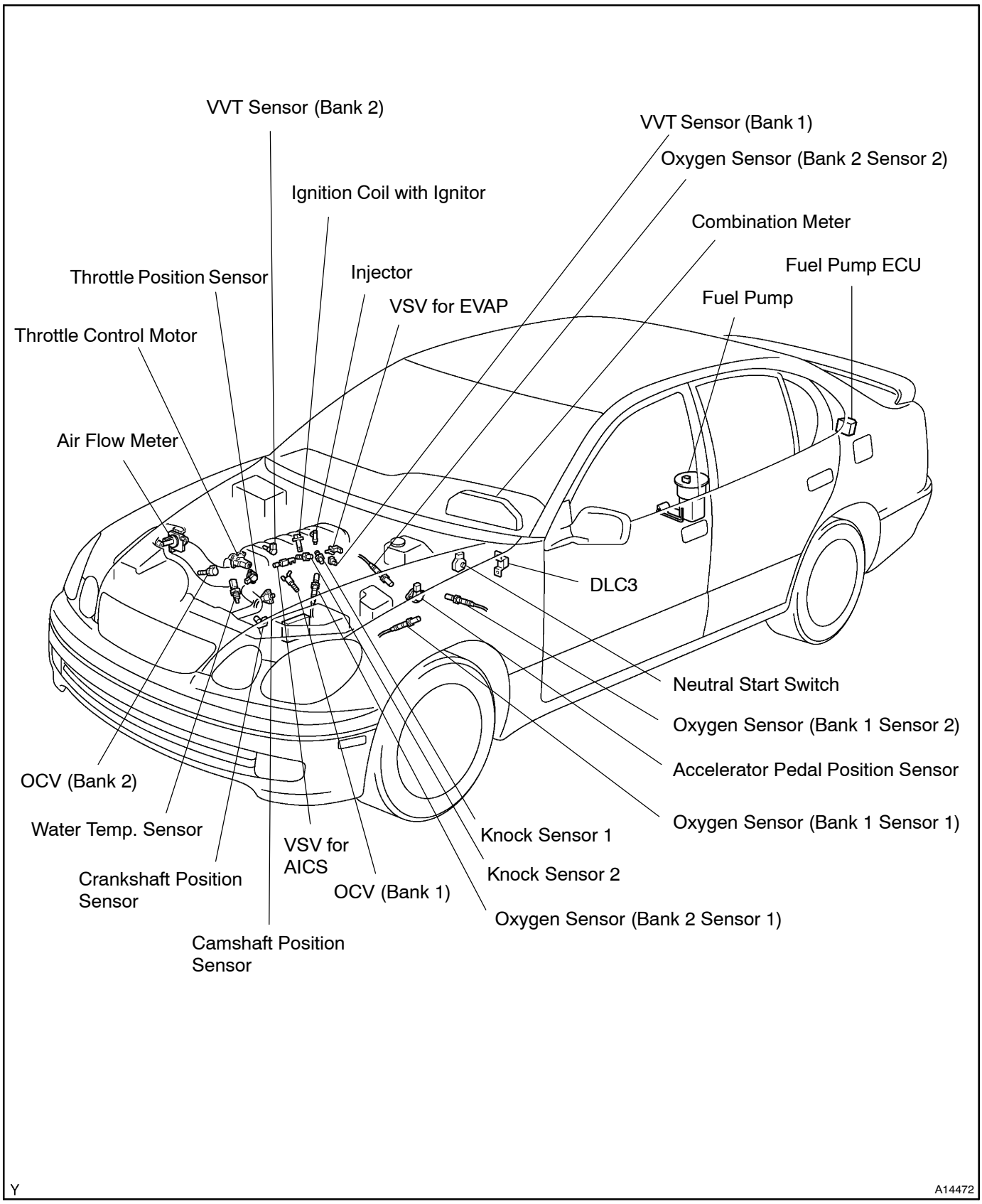
ETCS TROUBLE CODES (When not use hand–held tester)

DTC No. (See page)	Detection Item	Trouble Area	* CHK ENG (MIL)	Memory
21 (DI–164)	Throttle Control Motor Circuit Malfunction	• Same as DTC No. P1125	○	○
23 (DI–166)	ETCS Actuator Power Source Circuit Malfunction	• Same as DTC No. P1127	○	○
31 (DI–168)	Throttle Control Motor Lock Malfunction	• Same as DTC No. P1128	○	○
32 (DI–170)	Electric Throttle Control System Malfunction	• Same as DTC No. P1129	○	○
33 (DI–194)	ECU Malfunction (ETCS)	• Same as DTC No. P1633	○	○

*: ○ ... CHK ENG is indicated.

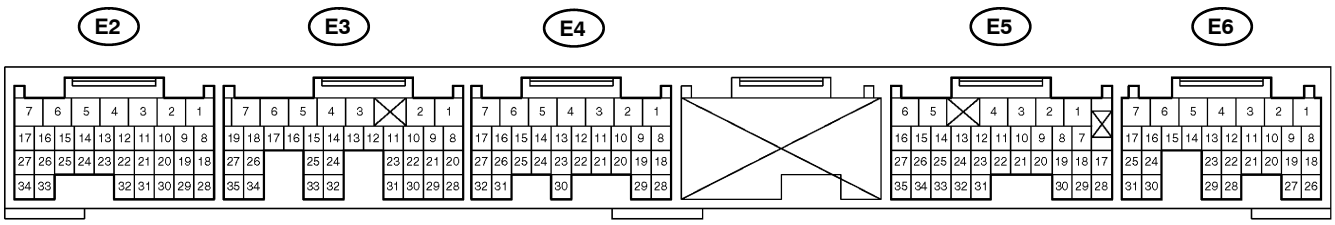
DI2C2–04

PARTS LOCATION



DI63M–02

TERMINALS OF ECU



Y

A14471

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
BATT (E6–4) – E1 (E3–7)	B–Y ↔ BR	Always	9 – 14
+BM (E6–7) – E1 (E3–7)	V–Y ↔ BR		
IGSW (E6–17) – E1 (E3–7)	B–O ↔ BR	IG switch ON	9 – 14
+B (E6–6) – E1 (E3–7)	B–R ↔ BR		
+B1 (E6–5) – E1 (E3–7)	B–R ↔ BR		
VC (E2–23) – ETA (E2–22)	L–R ↔ BR	IG switch ON	4.5 – 5.5
VTA (E2–25) – ETA (E2–22)	Y ↔ BR	IG switch ON, Accelerator pedal fully closed	0.4 – 1.0
		IG switch ON, Accelerator pedal fully open	3.2 – 4.8
VTA2 (E2–24) – ETA (E2–22)	B ↔ BR	IG switch ON, Accelerator pedal fully closed	2.0 – 2.9
		IG switch ON, Accelerator pedal fully open	4.6 – 5.1
VCPA (E5–35) – EPA (E5–34)	B ↔ BR	IG switch ON	4.5 – 5.5
VPTK (E5–27) – EPTK (E5–26)	L–R ↔ BR	IG switch ON	4.5 – 5.5
VPA (E5–33) – EPTK (E5–26)	L ↔ BR	IG switch ON Accelerator pedal fully closed	0.3 – 0.9
		IG switch ON Accelerator pedal fully open	3.2 – 4.8
VPA2 (E5–32) – EPA (E5–34)	B ↔ BR	IG switch ON Accelerator pedal fully closed	1.8 – 2.7
		IG switch ON Accelerator pedal fully open	4.7 – 5.1
VG (E4–27) – EVG (E4–26)	L–Y ↔ G–W	Idling, P or N position, A/C switch OFF	0.5 – 3.0
THA (E4–32) – ETHA (E4–31)	P–L ↔ BR	Idling, Intake air temp. 20°C (68°F)	0.5 – 3.4
THW (E4–24) – ETHW (E4–25)	R–L ↔ BR	Idling, water temp. 80°C (176°F)	0.2 –1.0
STA (E6–12) – E1 (E3–7)	B ↔ BR	Shift lever position P or N position, ignition switch START	6.0 or more
#1 (E2–15) – E01 (E4–2)	L ↔ W–B	IG switch ON	9 – 14
#2 (E4–17) – E01 (E4–2)	W ↔ W–B		
#3 (E2–14) – E01 (E4–2)	W ↔ W–B		
#4 (E4–16) – E01 (E4–2)	G ↔ W–B	Idling	Pulse generation (See page DI–134)
#5 (E2–13) – E01 (E4–2)	G ↔ W–B		
#6 (E4–15) – E01 (E4–2)	BR ↔ W–B		
#7 (E2–12) – E01 (E4–2)	BR ↔ W–B		
#8 (E4–14) – E01 (E4–2)	L ↔ W–B		

IGT1 (E2–17) – E1 (E3–7) IGT2 (E4–13) – E1 (E3–7) IGT3 (E2–16) – E1 (E3–7) IGT4 (E4–12) – E1 (E3–7) IGT5 (E2–27) – E1 (E3–7) IGT6 (E4–11) – E1 (E3–7) IGT7 (E2–26) – E1 (E3–7) IGT8 (E4–10) – E1 (E3–7)	G–W ↔ BR L–R ↔ BR L ↔ BR R ↔ BR G ↔ BR R–L ↔ BR P–L ↔ BR B–W ↔ BR	Idling	Pulse generation (See page DI–171)
IF1L (E4–6) – E1 (E3–7) IF2L (E4–4) – E1 (E3–7) IF1R (E4–7) – E1 (E3–7) IF2R (E4–5) – E1 (E3–7)	LG ↔ BR G–B ↔ BR G ↔ BR L–B ↔ BR	IG switch ON	4.5 – 5.5
		Idling	Pulse generation (See page DI–171)
G2 (E2–29) – G2 – (E2–28)	L ↔ Y	Idling	Pulse generation (See page DI–144)
NE+ (E2–31) – NE– (E2–32)	R ↔ G		
MREL (E6–13) – E1 (E3–7)	B–Y ↔ BR	IG switch ON	9 – 14
DI (E6–15) – E1 (E3–7)	B–R ↔ BR	IG switch ON	0 – 3.0
FPC (E6–14) – E1 (E3–7)	B–L ↔ BR	IG switch ON	9 – 14
STP (E5–4) – E1 (E3–7)	G–W ↔ BR	Brake pedal is depressed	7.5 – 14
		Brake pedal is released	Below 1.5
PRG (E2–11) – E1 (E3–7)	G–B ↔ BR	IG switch ON	9 – 14
OXL1 (E3–28) – E1 (E3–7) OXL2 (E5–28) – E1 (E3–7) OXR1 (E4–28) – E1 (E3–7) OXR2 (E5–17) – E1 (E3–7)	B ↔ BR W ↔ BR W ↔ BR R ↔ BR	Maintain engine speed at 2,500 rpm for 2 minutes after warming up	Pulse generation (See page DI–148)
HTL (E3–9) – E1 (E3–7) HTL2 (E5–7) – E1 (E3–7) HTR (E4–30) – E1 (E3–7) HTR2 (E5–8) – E1 (E3–7)	L–Y ↔ BR GR ↔ BR G–Y ↔BR GR–B↔BR	Idling	Below 3.0
		IG switch ON	9 – 14
KNKL (E3–1) – E1 (E3–7)	B ↔ BR	Maintain engine speed at 4,000 rpm after warming up	Pulse generation (See page DI–140)
KNKR (E3–2) – E1 (E3–7)	W ↔ BR		
TC (E5–3) – E1 (E3–7)	P–B ↔ BR	IG switch ON	9 – 14
W (E5–2) – E1 (E3–7)	GR–R ↔ BR	Idling	9 – 14
		IG switch ON	Below 3.0
ACMG (E6–16) – E1 (E3–7)	L–O ↔ BR	A/C switch ON (At Idling)	Below 3.0
		A/C switch OFF	9 – 14
ENG+ (E5–19) – ENG– (E5–30) TRC+ (E5–18) – TRC– (E5–29)	LG ↔ L P ↔ V	Idling	Pulse generation
VVL+ (E2–18) – VVL– (E2–19)	R ↔ G	Idling	Pulse generation (See page DI–178)
VVR+ (E4–19) – VVR– (E4–18)	Y ↔ L		
OCV+ (E2–6) – OCV– (E2–5)	L–Y ↔ G–W	IG switch ON	Pulse generation (See page DI–182)
OCR+ (E4–9) – OCR– (E4–8)	L–W ↔ L–B		
ACIS (E4–21) – E01 (E3–2)	L–W ↔ W–B	IG switch ON	9 – 14
		Engine speed between 2,500 rpm and 4,000 rpm	Below 3.0

M+ (E2–3) – E1 (E3–7) M– (E2–2) – E1 (E3–7)	L ↔ BR Y ↔ BR	Idling	Pulse generation (See page DI–154)
ST1– (E6–8) – E1 (E3–7)	B–L ↔ BR	IG switch ON, Brake pedal is depressed	Below 1.5
		IG switch ON, Brake pedal is released	7.5 – 14
SIL (E6–26) – E1 (E3–7)	W–G ↔ BR	During transmission	Pulse generation
SP2+ (E3–23) – SP2– (E3–22)	G ↔ R	Vehicle is driving	Pulse generation (See page DI–154)

DI2T1–04

PROBLEM SYMPTOMS TABLE

When the malfunction is not confirmed in the diagnostic trouble code check and the problem still can not be confirmed in the basic inspection, proceed to this matrix chart and troubleshoot according to the numbered order given below.

Symptom	Suspect Area	See page
Engine does not crank (Does not start)	1. Starter and starter relay 2. Neutral start switch circuit	ST–2 DI–333
No initial combustion (Does not start)	1. Engine ECU power source circuit 2. Ignition coil with igniter 3. Fuel pump control circuit 4. Injector circuit	DI–205 DI–171 DI–210 DI–134
No complete combustion (Does not start)	1. Fuel pump control circuit 2. Ignition coil with igniter 3. Injector circuit	DI–210 DI–171 DI–134
Engine cranks normally (Difficult to start)	1. Starter signal circuit 2. Fuel pump control circuit 3. Ignition coil with igniter 4. Spark plug 5. Compression 6. Injector circuit	DI–202 DI–210 DI–171 IG–1 EM–3 DI–134
Cold engine (Difficult to start)	1. Starter signal circuit 2. Fuel pump control circuit 3. Injector circuit 4. Ignition coil with igniter 5. Spark plug	DI–202 DI–210 DI–134 DI–171 IG–1
Hot engine (Difficult to start)	1. Starter signal circuit 2. Fuel pump control circuit 3. Injector circuit 4. Ignition coil 5. Spark plug	DI–202 DI–210 DI–134 IG–1 IG–1
High engine idle speed (Poor idling)	1. A/C signal circuit (Compressor circuit) 2. Engine ECU power source circuit 3. Neutral start switch circuit 4. Back up power source circuit	– DI–205 DI–333 DI–192
Low engine idle speed (Poor idling)	1. A/C signal circuit (Compressor circuit) 2. Neutral start switch circuit 3. Fuel pump control circuit 4. Injector circuit 5. Air flow meter circuit 6. Back up power source circuit	– DI–333 DI–210 DI–134 DI–95 DI–192
Rough idling (Poor idling)	1. Air flow meter circuit 2. Injector circuit 3. Ignition coil with igniter 4. Compression 5. Fuel pump control circuit 6. Back up power source circuit	DI–95 DI–134 DI–171 EM–3 DI–210 DI–192
Hunting (Poor idling)	1. Air flow meter circuit 2. Engine ECU power source circuit 3. Fuel pump control circuit	DI–95 DI–205 DI–210
Hesitation/Poor acceleration (Poor driveability)	1. Air flow meter circuit 2. Injector circuit 3. Fuel pump control circuit 4. Ignition coil with igniter 5. A/T faulty	DI–95 DI–134 DI–210 DI–171 –

Muffler explosion, afterfire (Poor driveability)	1. Ignition coil 2. Spark plug 3. Injection circuit	IG–1 IG–1 DI–134
Surging (Poor driveability)	1. Fuel pump control circuit 2. Spark plug 3. Injection circuit	DI–210 IG–1 DI–134
Engine stall (Soon after starting)	1. Fuel pump control circuit 2. Air flow meter circuit	DI–210 DI–95
Engine stall (After accelerator pedal depressed)	1. Air flow meter circuit	DI–95
Engine stall (After accelerator pedal released)	1. Air flow meter circuit 2. Engine ECU	DI–95 IN–30
Engine stall (During A/C operation)	1. A/C signal circuit (Compressor circuit) 2. Engine ECU	– IN–30
Engine stall (When shifting N to D)	1. Neutral start switch circuit	DI–333

DI85L–01

CIRCUIT INSPECTION

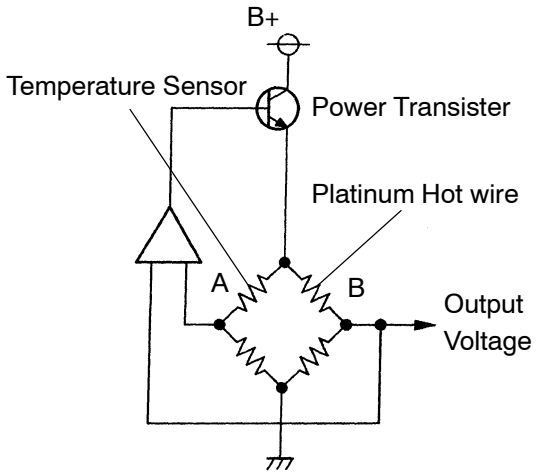
DTC	P0100	Mass Air Flow Circuit Malfunction

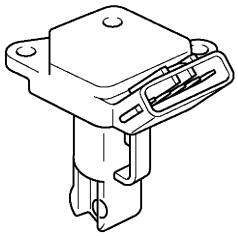
CIRCUIT DESCRIPTION

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

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

The circuit is constructed so that the platinum hot wire and temperature sensor provide a bridge circuit, with the power transistor controlled so that the potential of A and B remains equal to maintain the set temperature.





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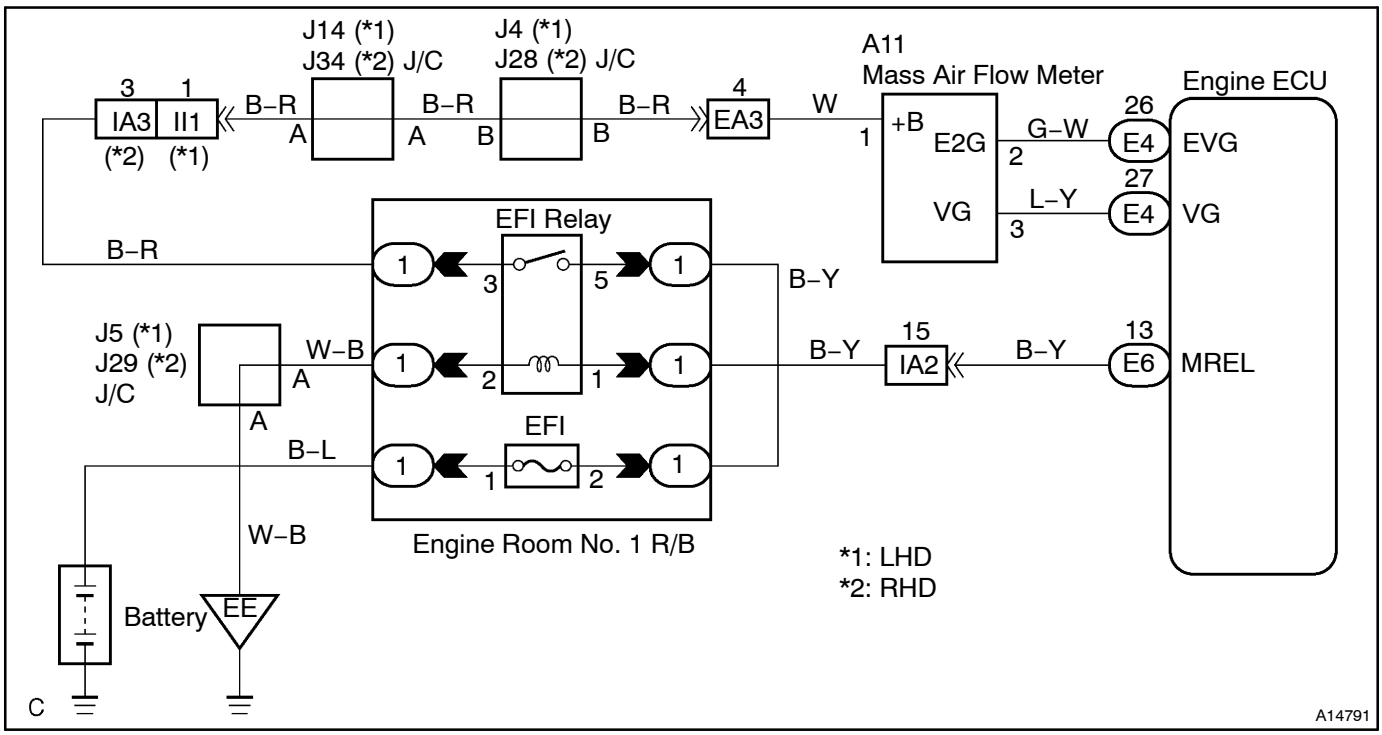
DTC No.	DTC Detecting Condition	Trouble Area
P0100	Open or short in air flow meter circuit with more than 3 sec. engine speed less than 4,000 rpm	• Open or short in air flow meter circuit • Air flow meter • Engine ECU

HINT:

After confirming DTC P0100 use the hand–held tester to confirm the air flow ratio from CURRENT DATA.

Air Flow Value (gm/sec.)	Malfunction
Approx. 0.0	• Air flow meter power source circuit open • VG circuit open or short
271.0 or more	• EVG circuit open

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freeze frame data using OBD scan tool or hand–held tester. Because freeze data frame records the engine conditions when malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

1	**Connect OBD scan tool or hand–held tester, and read value of air flow rate.**

PREPARATION:

(a) Connect the hand–held tester to the DLC3.
(b) Turn the ignition switch ON and push the OBD scan tool or hand–held tester main switch ON.
(c) Start the engine.

CHECK:

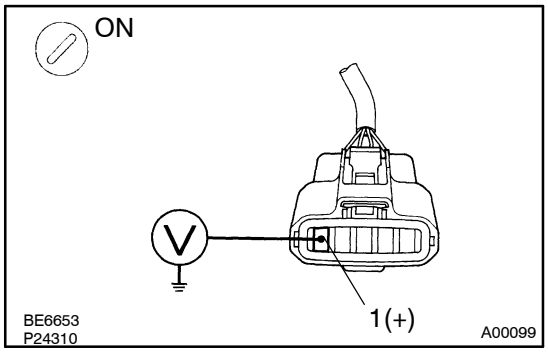
Read air flow rate on the OBD scan tool or hand–held tester.

RESULT:

	Type I	Type II
Air flow rate (gm/sec.)	0.0	271.0 or more

Type I	Go to step 2.
Type II	Go to step 5.

2	Check voltage of air flow meter power source.



PREPARATION:

(a) Disconnect the air flow meter connector.

(b) Turn the ignition switch ON.

CHECK:

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

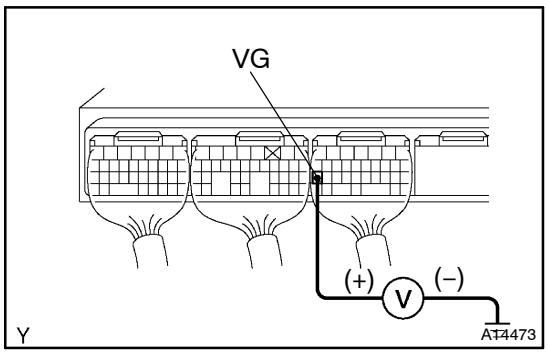
OK:

Voltage: 9 – 14 V

NG	Check for open in harness and connector between EFI main relay (Marking: EFI) and air flow meter (See page IN–30).

OK

3	Check voltage between terminals VG of engine ECU connector and body ground.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Start the engine.

CHECK:

Measure the voltage between terminal VG of the engine ECU connector and body ground while engine is idling.

OK:

Voltage:

0.5 – 3.0 V (P or N position and A/C switch OFF)

OK	Check and replace engine ECU (See page IN–30).

NG

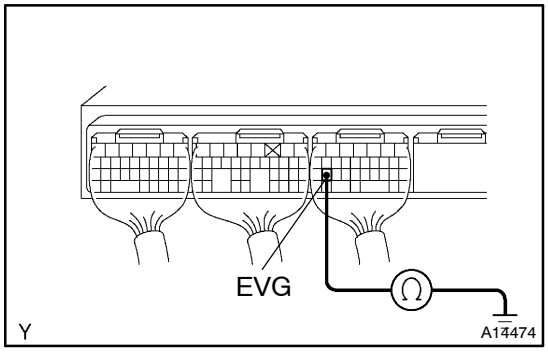
4	**Check for open and short in harness and connector between air flow meter and engine ECU (See page IN–30).**

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

OK

Replace air flow meter.

5	**Check continuity between terminal EVG of engine ECU connector and body ground.**



PREPARATION:
Remove the engine ECU hood and cover (See page FI–74).
CHECK:
Check continuity between terminal EVG of the engine ECU connector and body ground.
OK:
Continuity (1 Ω or less)

OK → **Check and replace engine ECU (See page IN–30).**

NG

6	**Check for open in harness and connector between air flow meter and engine ECU (See page IN–30).**

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

OK

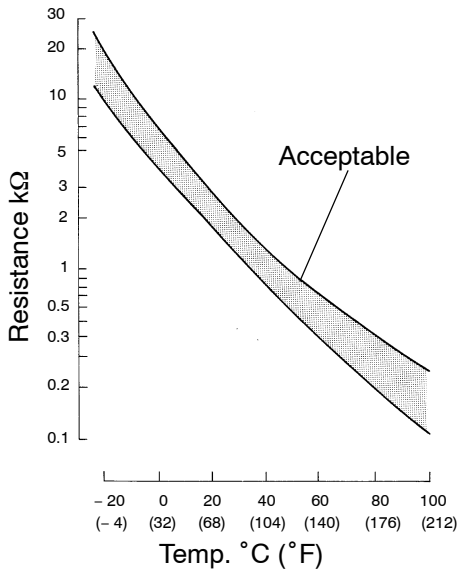
Replace air flow meter.

DI85M–01

DTC	P0110	Intake Air Temp. Circuit Malfunction

CIRCUIT DESCRIPTION

(fig. 1)



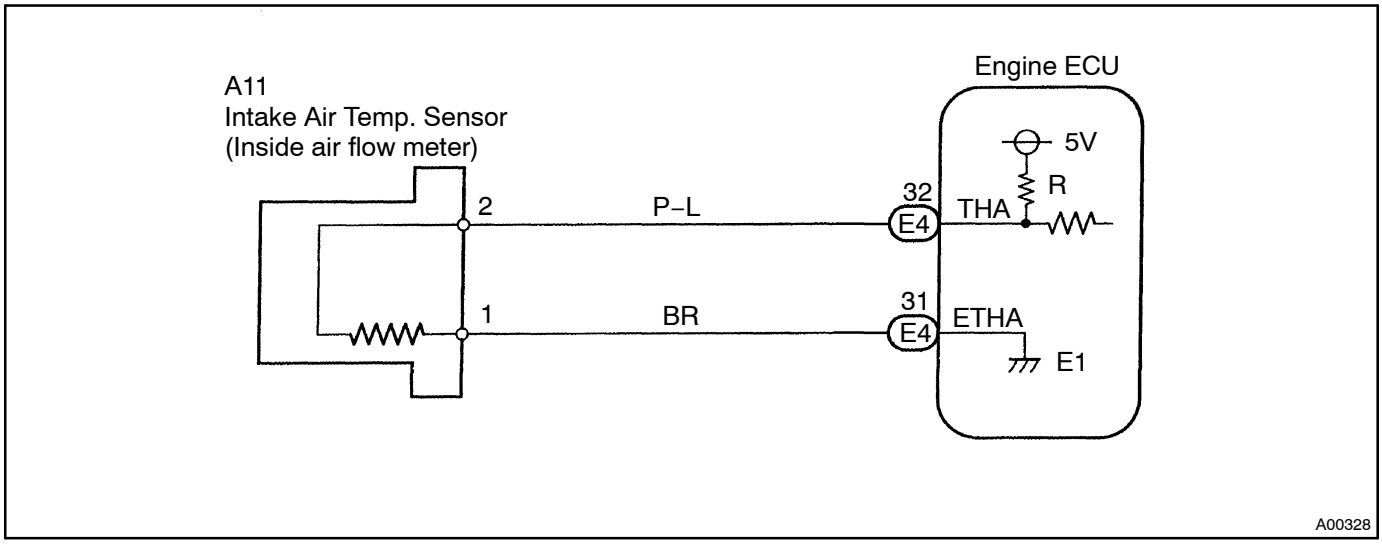
The intake air temp. sensor is built into the air flow meter and senses the intake air temperature.
A thermistor built in the sensor changes the resistance value according to the intake air temperature.
The lower the intake air temperature, the greater the thermistor resistance value, and the higher the intake air temperature, the lower the thermistor resistance value (See fig. 1).
The intake air temp. sensor is connected to the engine ECU (See below). The 5 V power source voltage in the engine ECU is applied to the intake air temp. sensor from the terminal THA via resistor R.
That is, the resistor R and the intake air temp. sensor are connected in series. When the resistance value of the intake air temp. sensor changes in accordance with changes in the intake air temperature, the potential at terminal THA also changes. Based on this signal, the engine ECU increases the fuel injection volume to improve driveability during cold engine operation.

DTC No.	DTC Detecting Condition	Trouble Area
P0110	Open or short in intake air temp. sensor circuit	• Open or short in intake air temp. sensor circuit • Intake air temp. sensor (inside air flow meter) • Engine ECU

HINT:
After confirming DTC P0110, use the OBD scan tool or hand–held tester to confirm the intake air temperature from CURRENT DATA.

Temperature Displayed	Malfunction
–40°C (–40°F)	Open circuit
140°C (284°F) or more	Short circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freeze frame data using a OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

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

PREPARATION:

(a) Connect the OBD scan tool or hand–held tester to the DLC3.

(b) Turn the ignition switch ON and push the OBD scan tool or hand–held tester main switch ON.

CHECK:

Read temperature value on the OBD scan tool or hand–held tester.

OK:

Same as actual intake air temperature

HINT:

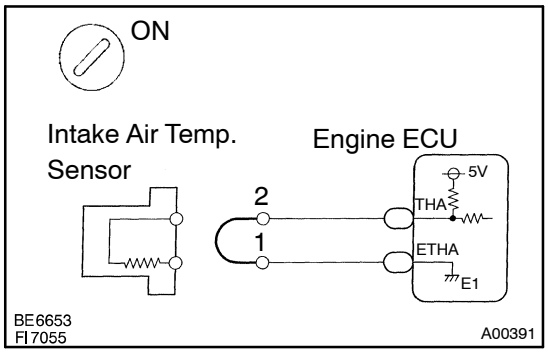
- If there is open circuit, OBD scan tool or hand–held tester indicates –40°C (–40°F).
- If there is short circuit, OBD scan tool or hand–held tester indicates 140°C (284°F) or more.

NG → **–40°C (–40°F)...Go to step 2**
140°C (284°F) or more...Go to step 4.

OK

Check for intermittent problems (See page DI–73).

2	Check for open in harness or engine ECU.



PREPARATION:

(a) Disconnect the air flow meter connector.

(b) Connect the sensor wire harness terminals together.

(c) Turn the ignition switch ON.

CHECK:

Read temperature value on the OBD scan tool or hand–held tester.

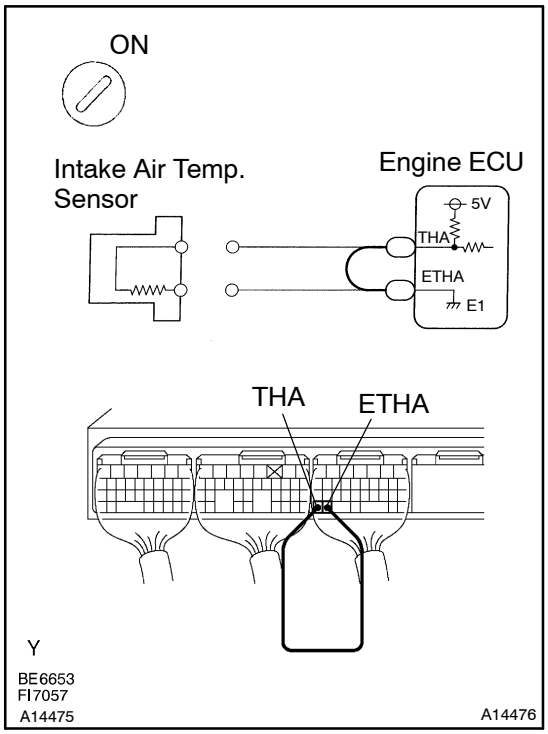
OK:

Temperature value: 140°C (284°F) or more

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

NG

3	Check for open in harness or engine ECU.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Connect between terminals THA and ETHA of the engine ECU connector.

HINT:

Air flow meter connector is disconnected.

Before checking, do a visual and contact pressure check for the engine ECU connector (See page IN–30).

CHECK:

Read temperature value on the OBD scan tool or hand–held tester.

OK:

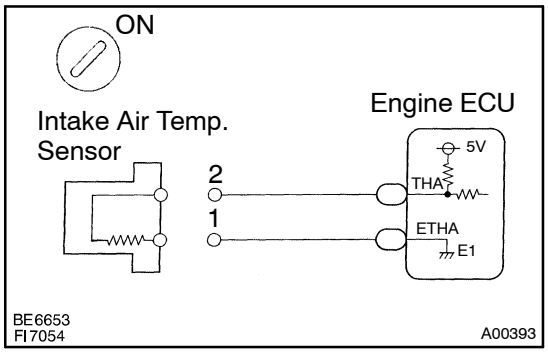
Temperature value: 140°C (284°F) or more

OK	Open in harness between terminals ETHA or THA, repair or replace harness.

NG

**Confirm good connection at engine ECU.
If OK, check and replace engine ECU.
(See page IN–30)**

4	Check for short in harness and engine ECU.



PREPARATION:

(a) Disconnect the air flow meter connector.

(b) Turn the ignition switch ON.

CHECK:

Read temperature value on the hand–held tester.

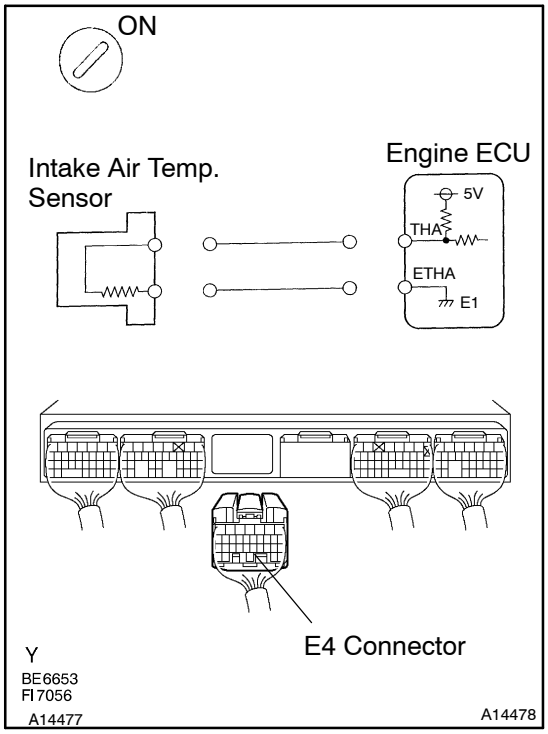
OK:

Temperature value: –40°C (–40°F)

OK	Replace air flow meter.

NG

5	Check for short in harness or engine ECU.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Disconnect the E4 connector of the engine ECU.

HINT:

Air flow meter connector is disconnected.

(c) Turn the ignition switch ON.

CHECK:

Read temperature value on the OBD scan tool or hand–held tester.

OK:

Temperature value: –40°C (–40°F)

OK	Repair or replace harness or connector.

NG

Check and replace engine ECU (See page IN–30).

DI85N–01

DTC	P0115	Water Temp. Circuit Malfunction

CIRCUIT DESCRIPTION

A thermistor built into the water temp. sensor changes the resistance value according to the water temperature.

The structure of the sensor and connection to the engine ECU is the same as in the DTC P0110 (shown on page DI–99).

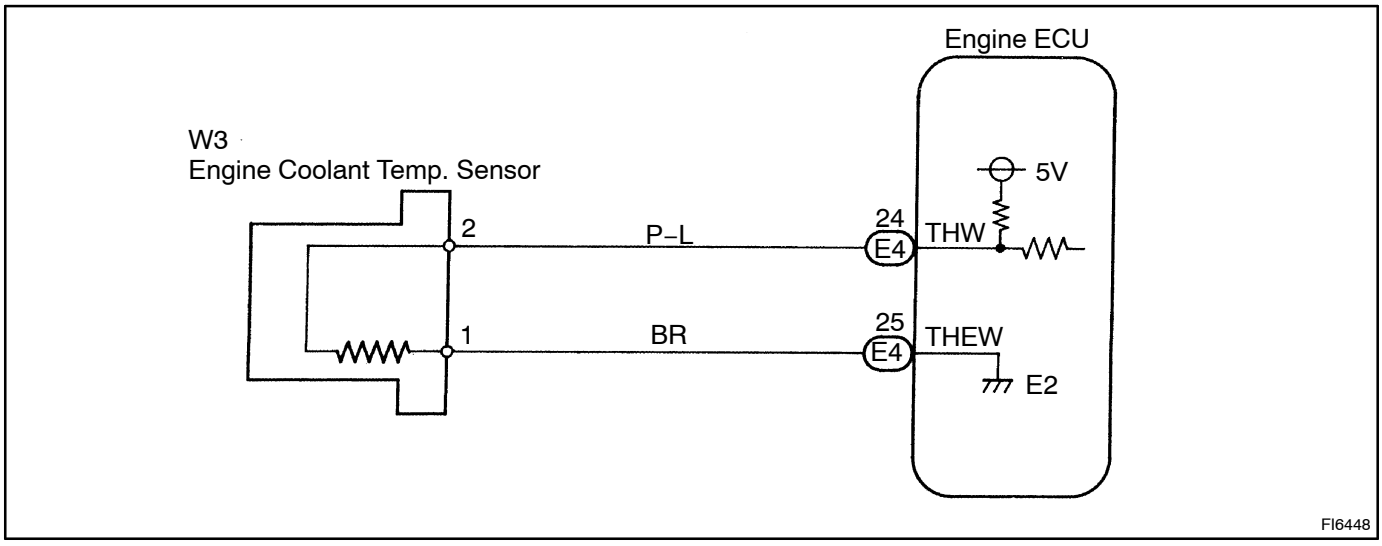
DTC No.	DTC Detecting Condition	Trouble Area
P0115	Open or short in water temp. sensor circuit	• Open or short in water temp. sensor circuit • Water temp. sensor • Engine ECU

HINT:

After confirming DTC P0115, use the OBD scan tool hand–held tester to confirm the water temperature from CURRENT DATA.

Temperature Displayed	Malfunction
–40°C (–40°F)	Open circuit
140C° (284°F) or more	Short circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using a OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

1	**Connect OBD scan tool or hand–held tester, and read value of water temperature.**

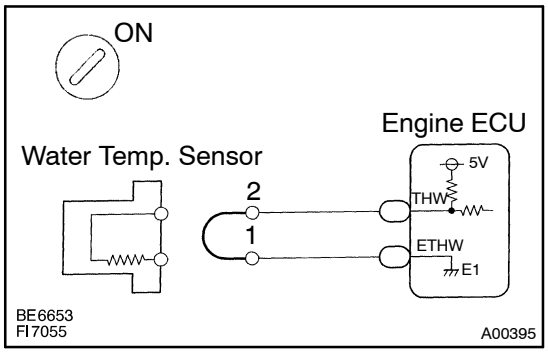
PREPARATION:
(a) Connect the OBD scan tool or hand–held tester to the DLC3.
(b) Turn the ignition switch ON and switch the hand–held tester main switch ON.
CHECK:
Read temperature value on the OBD scan tool or hand–held tester.
OK:
Same as actual water temperature
HINT:
- If there is open circuit, Hand–held tester indicates –40°C (–40°F).
- If there is short circuit, Hand–held tester indicates 140°C (284°F) or more.

NG → **–40°C (–40°F)...Go to step 2.**
140°C (284°F) or more...Go to step 4.

OK

Check for intermittent problems (See page DI–73).

2	Check for open in harness or engine ECU.



PREPARATION:

(a) Disconnect the water temp. sensor connector.
(b) Connect sensor wire harness terminals together.
(c) Turn the ignition switch ON.

CHECK:

Read temperature value on the OBD scan tool or hand–held tester.

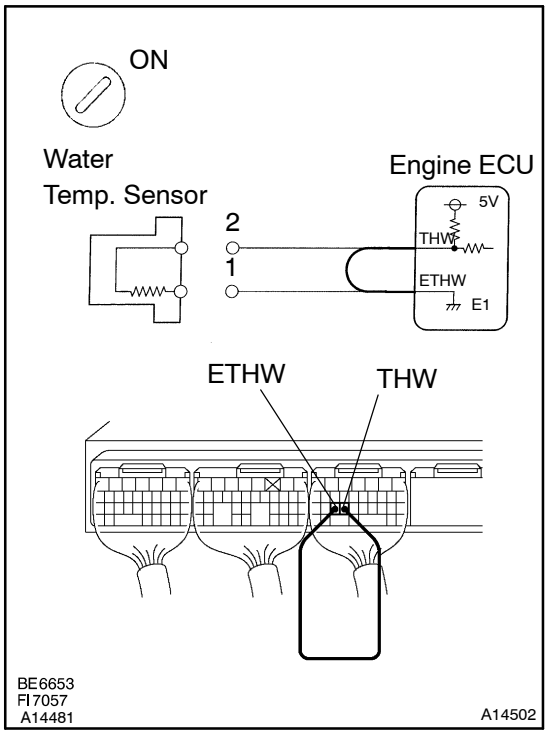
OK:

Temperature value: 140°C (284°F) or more

OK	Confirm good connection at sensor. If OK, replace water temp. sensor.

NG

3	Check for open in harness or engine ECU.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).
(b) Connect between terminals THW and ETHW of the engine ECU connector.

HINT:

Water temp. sensor connector is disconnected.

Before checking, do a visual and contact pressure check for the engine ECU connector (See page IN–30).

(c) Turn the ignition switch ON.

CHECK:

Read temperature value on the OBD scan tool or hand–held tester.

OK:

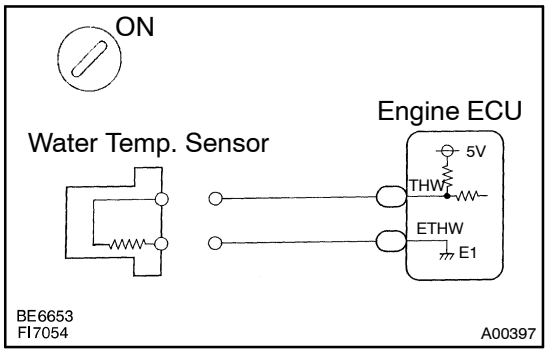
Temperature value: 140°C (284°F) or more

OK	Open in harness between terminals ETHW or THW, repair or replace harness.

NG

Confirm good connection at engine ECU.If OK, check and replace engine ECU (See page IN–30).

4	Check for short in harness and engine ECU.



PREPARATION:

(a) Disconnect the water temp. sensor connector.

(b) Turn the ignition switch ON.

CHECK:

Read temperature value on the OBD scan tool or hand–held tester.

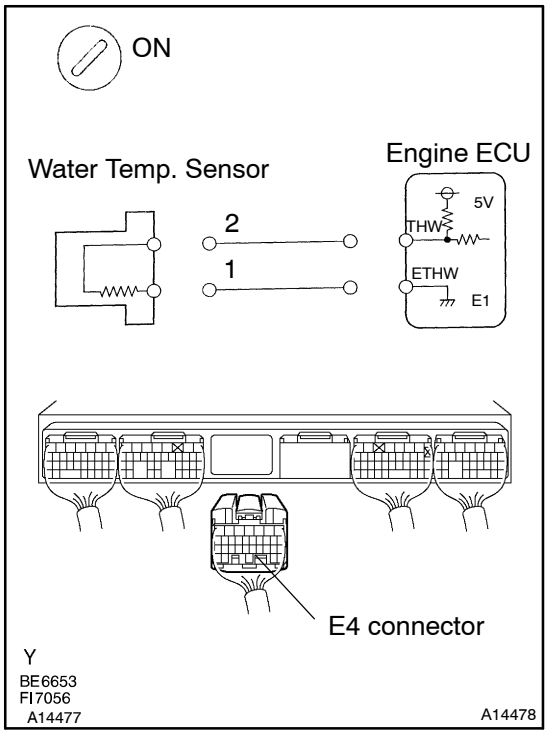
OK:

Temperature value: –40°C (–40°F)

OK	Replace water temp. sensor.

NG

5	Check for short in harness or engine ECU.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Disconnect the E4 connector of the engine ECU.

HINT:

Water temp. sensor connector is disconnected.

(c) Turn the ignition switch ON.

CHECK:

Read temperature value on the OBD scan tool or hand–held tester.

OK:

Temperature value: –40°C (–40°F)

OK	Repair or replace harness or connector.

NG

Check and replace engine ECU (See page IN–30).

DTC	P0116	Engine Coolant Temp. Circuit Range/ Performance Problem

CIRCUIT DESCRIPTION

Refer to DTC P0115 on page DI–103.

DTC No.	DTC Detecting Condition	Trouble Area
P0116	When the engine starts, the water temp. is –7°C (20°F) or less. And, 20 min. or more after the engine starts, the water temp. sensor value is 20°C (68°F) or less (2 trip detection logic)	• Water temp. sensor • Cooling system
	When the engine starts, the water temp. is between –7°C (20°F) and 10°C (50°F) And, 5 min. or more after the engine starts, the water temp. sensor value is 20°C (68°F) or less (2 trip detection logic)	

INSPECTION PROCEDURE

HINT:

Read freeze frame data using a OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

1	**Are there any other codes (besides DTC P0116) being output?**

YES → **Go to relevant DTC chart.**

NO

2	**Check thermostat (See page CO–12).**

NG → **Replace thermostat.**

OK

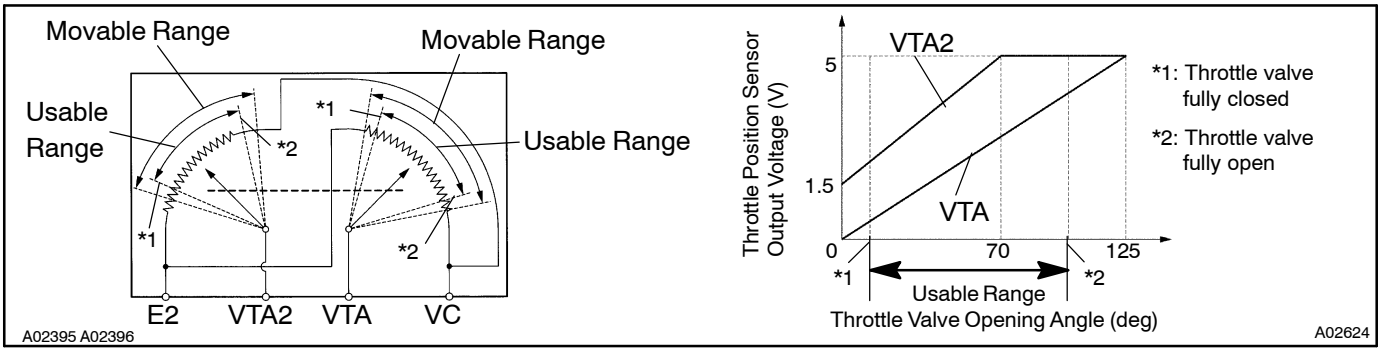
Replace engine coolant temp. sensor.

DI85O–01

DTC	P0120	Throttle/Pedal Position Sensor/Switch "A" Circuit Malfunction

CIRCUIT DESCRIPTION

Throttle position sensor is mounted on the throttle body and it have the 2 sensors to detect the throttle opening angle and the malfunction of the throttle position sensor's own.
The voltage applied to the terminals VTA and VTA2 of the engine ECU changes between 0 V and 5 V in proportion to the opening angle of the throttle valve.
The engine ECU judges the current opening angle of the throttle valve from these signals input from terminals VTA and VTA2, and the engine ECU controls the throttle motor to make the throttle valve angle properly in response to driving condition.
If this DTC is stored, the engine ECU shuts down the power for the throttle motor, and the throttle valve is fully closed by the return spring.

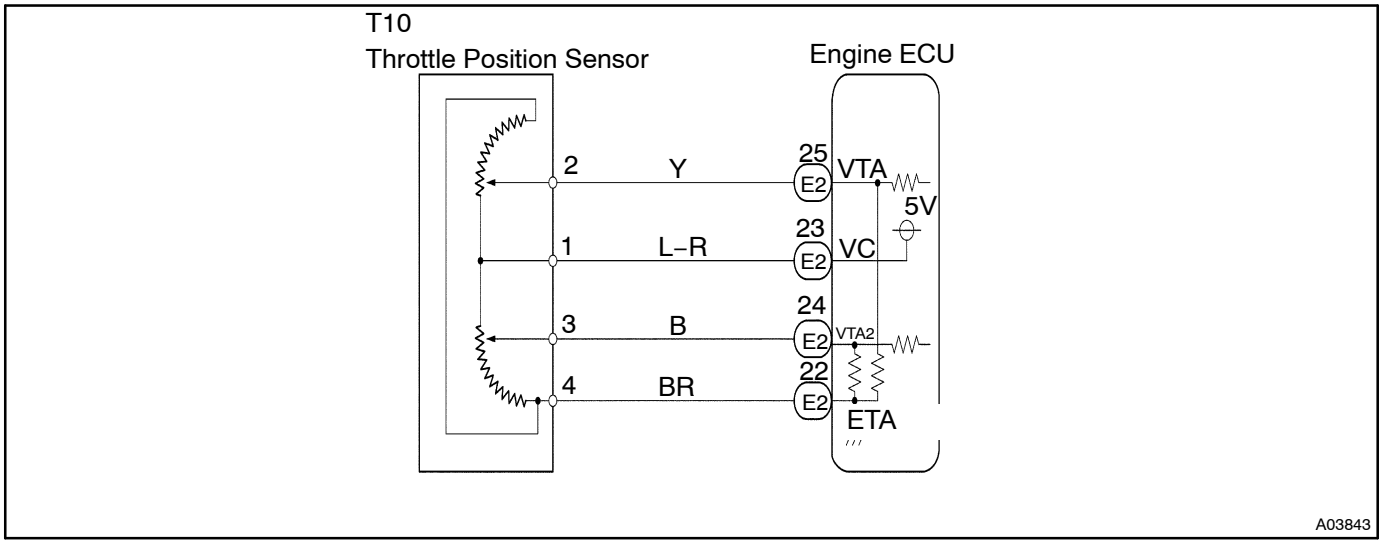


DTC No.	DTC Detecting Condition	Trouble Area
P0120	Condition (a), (b), (c), (d) or (e) continues for 2.0 seconds: (a) VTA ≦ 0.2 V (b) VTA2 ≦ 0.5 V (c) VTA ≧ 4.8 V (d) When VTA ≧ 0.2 V and ≦ 2.0 V, and VTA2 ≧ 4.97 V (e) VTA–VTA2 ≦ 0.02 V	• Open or short in throttle position sensor circuit • Throttle position sensor • Engine ECU
	Condition (a) or (b) continues for 0.4 seconds: (a) VTA ≦ 0.2 V and VTA2 ≦ 0.5 V (b) VTA–VTA2 ≦ 0.02 V	

HINT:
After confirming DTC P0120 use the OBD scan tool or hand–held tester to confirm the throttle valve opening percentage .

Accelerator pedal position expressed as percentage and voltage				Trouble area
Accelerator pedal released		Accelerator pedal depressed		
THROTTLE POS	THROTTLE POS #2	THROTTLE POS	THROTTLE POS #2	
0 %	0 V	0 %	0 V	VC line open
0 %	2.0 – 2.9 V	0 %	4.6 – 5.1 V	VTA line open or grand short
8 – 20 %	0 V	64 – 96 %	0 V	VTA2 line open or grand short
100 %	5 V	100 %	5 V	E2 line open

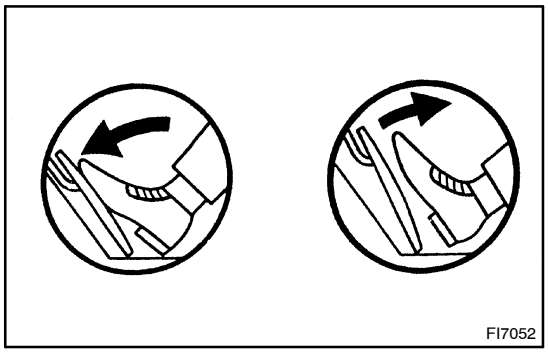
WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

1	**Connect OBD scan tool or hand–held tester, read throttle valve opening percentage.**



PREPARATION:

(a) Connect the OBD scan tool or hand–held tester to DLC3.
(b) Turn the ignition switch ON and switch the OBD scan tool or hand–held tester main switch ON.

CHECK:

Read the throttle valve opening percentage for VTA circuit and read the voltage for VTA2 circuit.

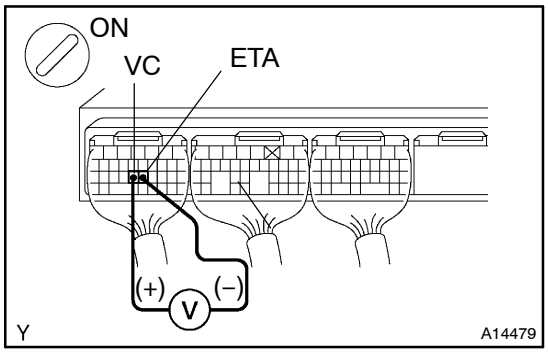
OK:

Accelerator pedal	Throttle valve opening position expressed as percentage (VTA)	Voltage (VTA2)
Released	8 – 20 %	2.0 – 2.9 V
Depressed	64 – 96 %	4.6 – 5.1 V

OK	**Check and replace engine ECU (See page IN–30).**

NG

2	Check voltage between terminals VC and ETA of engine ECU connector.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

Measure voltage between terminals VC and ETA of the engine ECU connector.

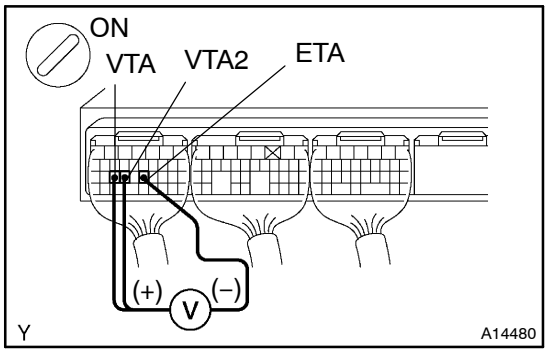
OK:

Voltage: 4.5 – 5.5 V

NG	Check and replace engine ECU (See page IN–30).

OK

3	Check voltage between terminals VTA, VTA2 and ETA of engine ECU connector.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

Measure voltage between terminals VTA, VTA2 and ETA of the engine ECU connector.

OK:

Accelerator pedal	Voltage	
	VTA	VTA2
Released	0.4 – 1.0 V	2.0 – 2.9 V
Depressed	3.2 – 4.8 V	4.6 – 5.1 V

NG	Check and replace engine ECU (See page IN–30).

NG

4	Check throttle position sensor (See page FI–35).

NG → Replace throttle position sensor (See page FI–38).

OK →

Check for open and short in harness and connector between engine ECU and throttle position sensor (VC, VTA, VTA2, ETA line) (See page IN–30).

DI1LI–14

DTC	P0121	Throttle/Pedal Position Sensor/Switch ”A” Circuit Range/Performance Problem

CIRCUIT DESCRIPTION

Refer to DTC P0120 on page DI–108.

DTC No.	DTC Detecting Condition	Trouble Area
P0121	While vehicle speed drops from 30 km/h (19 mph) or more to 0 km/h (0 mph), output value of throttle position sensor is out of applicable range. (2 trip detection logic)	• Throttle position sensor • Engine ECU

INSPECTION PROCEDURE

HINT:

Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

Replace throttle body (See page FI–38).

DI7J3–04

DTC	P0125	Insufficient Coolant Temp. for Closed Loop Fuel Control

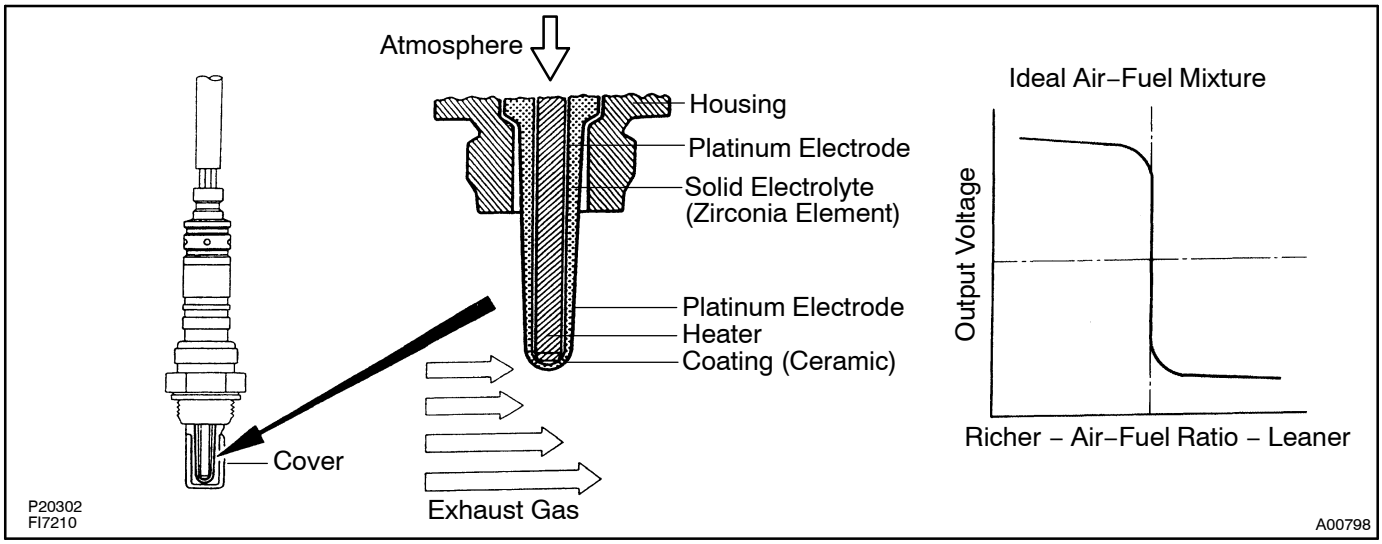
CIRCUIT DESCRIPTION

To obtain a high purification rate for the CO, HC and NOx components of the exhaust gas, a three–way catalytic converter is used, but for the most efficient use of the three–way catalytic converter, the air–fuel ratio must be precisely controlled so that it is always close to the stoichiometric air–fuel ratio.

The oxygen sensor (bank 1 sensor 1) has the characteristic which its output voltage changes suddenly in the vicinity of the stoichiometric air–fuel ratio. This characteristic is used to detect the oxygen concentration in the exhaust gas and provide the engine ECU with feedback to control the air–fuel ratio.

When the air–fuel ratio becomes LEAN, the oxygen concentration in the exhaust increases and the oxygen sensor informs the engine ECU of the LEAN condition (small electromotive force: < 0.45 V).

When the air–fuel ratio is RICHER than the stoichiometric air–fuel ratio the oxygen concentration in the exhaust gas is reduced and the oxygen sensor informs the engine ECU of the RICH condition (large electromotive force: > 0.45 V). The engine ECU judges by the electromotive force from the oxygen sensor whether the air–fuel ratio is RICH or LEAN and controls the injection time accordingly. However, if malfunction of the oxygen sensor causes output of abnormal electromotive force, the engine ECU is unable to perform accurate air–fuel ratio control. The oxygen sensors include a heater which heats the zirconia element. The heater is controlled by the engine ECU. When the intake air volume is low (the temperature of the exhaust gas is low) current flows to the heater to heat the sensor for accurate oxygen concentration detection.

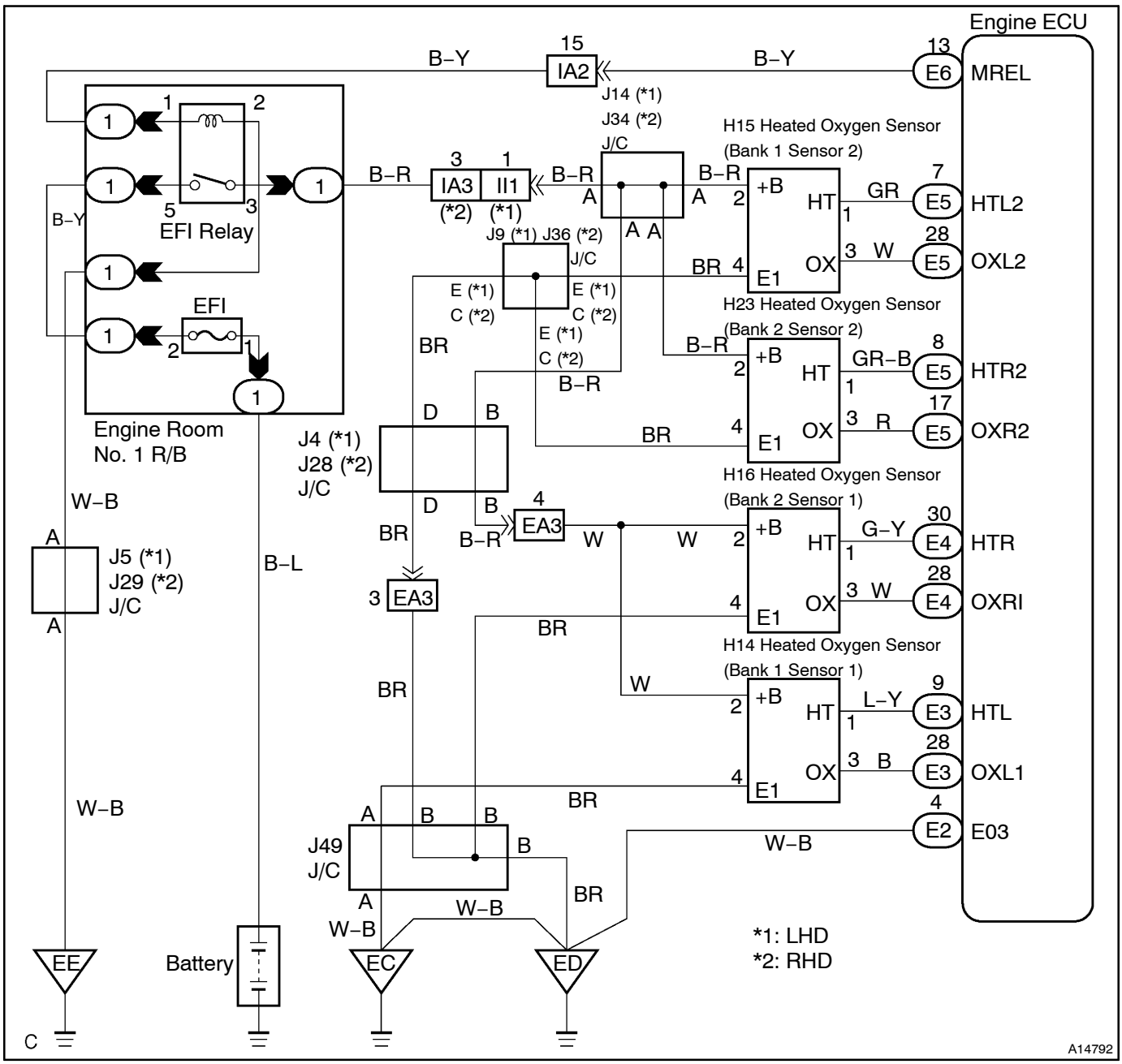


DTC No.	DTC Detection Condition	Trouble Area
P0125	After engine is warmed up, oxygen sensors (bank 1, 2 sensor 1) output does not indicate RICH (≧0.45 V) even once when conditions (a), (b) and (c) continue for at least 65 sec.: (a) Engine speed: 1,400 rpm or more (b) Vehicle speed: 40 – 100 km/h (25 – 62 mph) (c) 180 sec. or more after starting engine	• Open or short in oxygen sensor (bank 1 sensor 1) circuit • Oxygen sensor (bank 1 sensor 1) • Air induction system • Fuel pressure • Injector • Gas leakage on exhaust system • Engine ECU

HINT:

After confirming DTC P0125, use the OBD scan tool or hand–held tester to confirm voltage output of the oxygen sensor (bank 1, 2 sensor 1) from the CURRENT DATA. If voltage output of the oxygen sensor is less than 0.1 V, oxygen sensor circuit may be open or short.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If the vehicle runs out of fuel, the air–fuel ratio is LEAN and DTC P0125 will be recorded. The CHK ENG warning light then comes on.
- Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Are there any other codes (besides DTC P0125) being output?**

YES ⟩ **Go to relevant DTC chart (See page DI–84).**

NO

2	**Connect OBD scan tool or hand–held tester, and read value for voltage output of oxygen sensor (bank 1, 2 sensor 1).**

PREPARATION:

(a) Connect the OBD scan tool or hand–held tester to the DLC3.

(b) Warm up the engine to normal operating temperature (above 75°C (169°F)).

CHECK:

Read the voltage output of the oxygen sensors when the engine is suddenly raced.

HINT:

Perform quick racing to 4,000 rpm 3 times using the accelerator pedal.

OK:

Oxygen sensor output a RICH signal (0.45 V or more) at least once.

OK ⟩ **Go to step 9.**

NG

3	**Check for open and short in harness and connector between engine ECU and oxygen sensor (bank 1, 2 sensor 1) (See page IN–30).**

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

OK

4	**Check whether misfire has occurred or not by monitoring DTC and data list.**

NG ⟩ **Perform troubleshooting for misfire (See page DI–134).**

OK

5	Check air induction system (See page FI–1).

NG → Repair or replace.

OK

6	Check fuel pressure (See page FI–6).

NG → Check and repair fuel pump, pressure regulator, fuel pipe line and filter.

OK

7	Check injector injection (See page FI–24).

NG → Replace injector.

OK

8	Check gas leakage on exhaust system.

NG → Repair or replace.

OK

Replace oxygen sensor (bank 1, 2 sensor 1).

9	Perform confirmation driving pattern (See page DI–118).

GO

10	Is there DTC P0125 being output again?

YES → Check and replace engine ECU (See page IN–30).

NO

11	Did vehicle runs out of fuel in past?

NO → Check for intermittent problems (See page DI–73).

YES

DTC P0125 is caused by shortage of fuel.

DI85P–01

DTC	P0130	Oxygen Sensor Circuit Malfunction (Bank 1 Sensor 1)

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

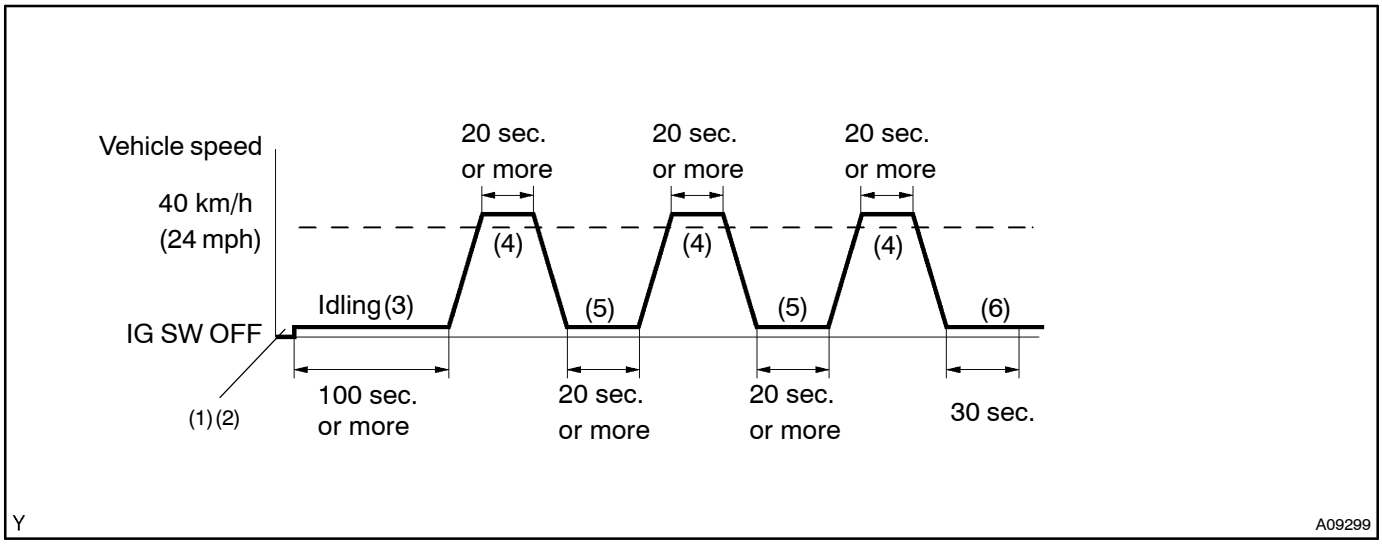
CIRCUIT DESCRIPTION

Refer to DTC P0125 on page DI–113.

DTC No..	DTC Detecting Condition	Trouble Area
P0130 P0150	Condition (a) and (b) continues for 60 secs. or more: (a) Voltage output of oxygen sensor remains at 0.35 V or more, or 0.70 V or less, during idling after engine is warmed up. (b) Oxygen sensor output voltage amplitude is less than 0.3 V.	• Oxygen sensor • Fuel trim malfunction

HINT:
Sensor 1 refers to the sensor closer to the engine body. The oxygen sensor's output voltage and the short–term fuel trim value can be read using the OBD scan tool or hand–held tester.

CONFIRMATION DRIVING PATTERN



(1) Connect the hand–held tester to the DLC3.
(2) Switch the hand–held tester from normal mode to check mode (See page DI–73).
(3) Start the engine and let the engine idle for 100 seconds or more.
(4) Drive the vehicle at 40 km/h (24 mph) or more for 20 seconds or more.
(5) Let the engine idle for 20 seconds or more.
(6) Let the engine idle for 30 seconds.
HINT:
If a malfunction exists, the check engine warning light will light up during step (6).
NOTICE:
If the conditions in this test are not strictly followed, detection of the malfunction will not be possible. If you do not have a hand–held tester, turn the ignition switch OFF after performing steps (3) to (6), then perform steps (3) to (6) again.

WIRING DIAGRAM

Refer to DTC P0125 on page DI–113.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

1	**Are there any other codes (besides DTC P0130 or P0150) being output?**

YES → **Go to relevant DTC chart.**

NO

2	**Check the output voltage of oxygen sensor during idling.**

PREPARATION:

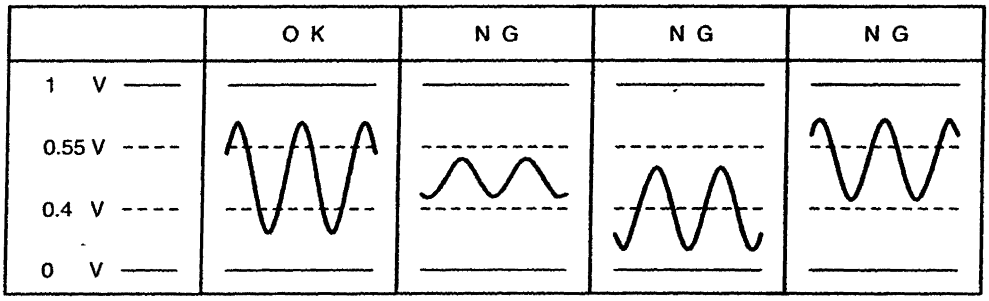
Warm up the oxygen sensor with the engine at 2,500 rpm for approx. 90 sec.

CHECK:

Use the OBD scan tool or hand–held tester to read the output voltage of the oxygen sensor during idling.

OK:

Oxygen sensor output voltage:
Alternates repeatedly between less than 0.4 V and more than 0.55 V (See the following table).



OK → **Go to step 7.**

NG

3	Check for open and short in harness and connector between engine ECU and oxygen sensor (bank 1, 2 sensor 1) (See page IN–30).

NG → Repair or replace harness or connector.

OK

4	Check air induction system (See page FI–1).

NG → Repair or replace induction system.

OK

5	Check fuel pressure (See page FI–6).

NG → Check and repair fuel pump, fuel pipe line and filter (See page FI–6).

OK

6	Check injector injection (See page FI–24).

NG → Replace injector.

OK

Replace oxygen sensor (bank 1, 2 sensor 1).

7	**Perform confirmation driving pattern.**

Go

8	**Are there DTC P0130 or P0150 being output again?**

YES → **Check for intermittent problems (See page DI–73).**

No

Check and replace engine ECU.

DI563–10

DTC	P0133	Oxygen Sensor Circuit Slow Response (Bank 1 Sensor 1)

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

CIRCUIT DESCRIPTION

Refer to DTC P0125 on page DI–113.

DTC No.	DTC Detecting Condition	Trouble Area
P0133 P0153	Response time for oxygen sensor's voltage output to change from rich to lean, or from lean to rich, is 1.1 sec. or more during idling after engine is warmed up (2 trip detection logic)	• Open or short in oxygen sensor circuit • Oxygen sensor • Air induction system • Fuel pressure • Injector • Engine ECU

HINT:

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

WIRING DIAGRAM

Refer to DTC P0125 on page DI–113.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Are there any other codes (besides DTC P0133 or P0153) being output?**

YES → **Go to relevant DTC chart (See page DI–84).**

NO

2	**Check output voltage of oxygen sensor during idling.**

PREPARATION:

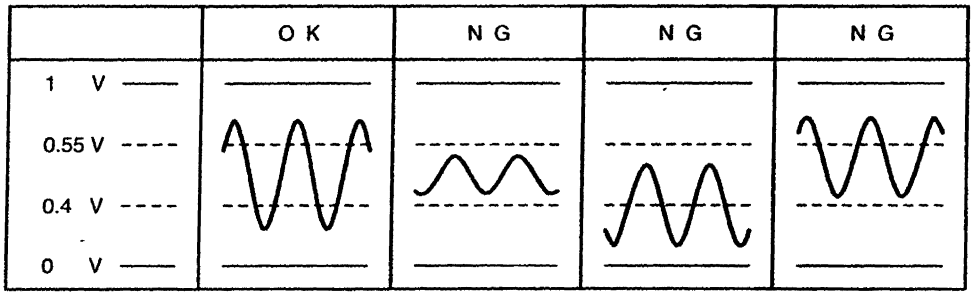
Warm up the oxygen sensor with the engine speed at 2,500 rpm for approx. 90 sec.

CHECK:

Use the OBD scan tool or hand–held tester to read the output voltage of the oxygen sensor during idling.

OK:

Oxygen sensor output voltage:
Alternates repeatedly between less than 0.4 V and more than 0.55 V (See the following table).



P18349

OK	Go to step 7

NG

3	Check for open and short in harness and connector between engine ECU and oxygen sensor (See page IN–30).

NG	Repair or replace harness or connector.

OK

4	Check air induction system (See page FI–1).

NG	Repair or replace.

OK

5	Check fuel pressure (See page FI–6).

NG	Check and repair fuel pump, pressure regulator, fuel pipe line and filter (See page FI–1).

OK

6	Check injector injection (See page FI–24).

NG → Replace injector.

OK →

Replace oxygen sensor.

7	Perform confirmation driving pattern (See page DI–118).

GO →

8	Is there DTC P0133 or P0153 being output again?

NO → Check for intermittent problems (See page DI–73).

YES →

Check and replace engine ECU (See page IN–30).

DI2S8–16

DTC	P0135	Oxygen Sensor Heater Circuit Malfunction (Bank 1 Sensor 1)

DTC	P0141	Oxygen Sensor Heater Circuit Malfunction (Bank 1 Sensor 2)

DTC	P0155	Oxygen Sensor Heater Circuit Malfunction (Bank 2 Sensor 1)

DTC	P0161	Oxygen Sensor Heater Circuit Malfunction (Bank 2 Sensor 2)

CIRCUIT DESCRIPTION

Refer to DTC P0125 on page DI–113.

DTC No.	DTC Detecting Condition	Trouble Area
P0135 P0141 P0155 P0161	When the heater operates, heater current exceeds 2 A (2 trip detection logic)	• Open or short in heater circuit of oxygen sensor • Oxygen sensor heater • Engine ECU
	Heater current of 0.2 A or less when the heater operates (2 trip detection logic)	

WIRING DIAGRAM

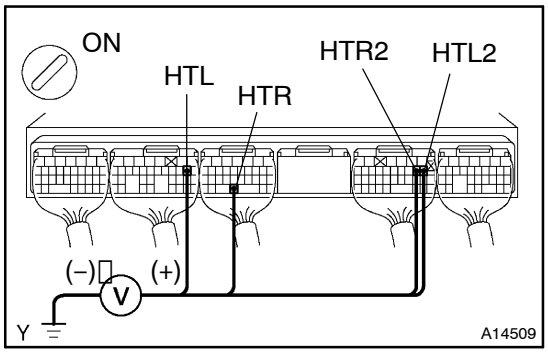
Refer to DTC P0125 on page DI–113.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

1	**Check voltage between terminals HTR, HTR2, HTL, HTL2 of engine ECU connector and body ground.**



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals HTR, HTR2, HTL, HTL2 of the engine ECU connector and body ground.

HINT:

- Connect terminal HTL to bank 1 sensor 1.
- Connect terminal HTR to bank 2 sensor 1.
- Connect terminal HTL1 to bank 1 sensor 2.
- Connect terminal HTR2 to bank 2 sensor 2.

OK:

Voltage: 9 – 14 V

OK	**Check and replace engine ECU (See page IN–30).**

NG

2	**Check resistance of oxygen sensor heater (See page FI–67).**

NG	**Replace oxygen sensor.**

OK

Check and repair harness or connector between main relay and oxygen sensor and engine ECU (See page IN–30).

DI7J5–02

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

DTC	P0156	Oxygen Sensor Circuit Malfunction (Bank 2 Sensor 2)

CIRCUIT DESCRIPTION

Refer to DTC P0125 on page DI–113.

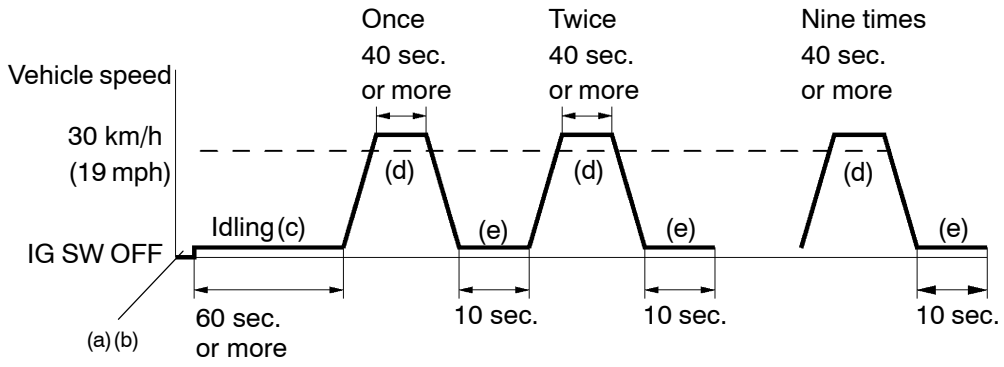
DTC No.	DTC Detecting Condition	Trouble Area
P0136 P0156	Voltage output of heated oxygen sensor remains at 0.4 V or more or 0.5 V or less when vehicle is driven at 30 km/h (19 mph) or more after engine is warmed up (2 trip detection logic)	• Open or short in heated oxygen sensor circuit • Oxygen sensor

HINT:
Sensor 2 refers to the sensor farther away from the engine body.

WIRING DIAGRAM

Refer to DTC P0125 on page DI–113.

CONFIRMATION DRIVING PATTERN



(a) Connect the hand–held tester to the DLC3.
(b) Switch the hand–held tester from the Normal Mode to the Check (Test) Mode (See page DI–73).
(c) Start the engine and let the engine idle for 60 seconds or more.
(d) Drive the vehicle at 30 km/h (18 mph) or more for 40 seconds or more.
(e) Let the engine idle for 10 seconds or more.
(f) Preform steps (d) to (e) 9 times.

HINT:
If a malfunction exists, the MIL will be indicated on the multi information display during step (f).

NOTICE:
If the conditions in this test are not strictly followed, detection of the malfunction will not be possible. If you do not have a hand–held tester, turn the ignition switch OFF after performing steps (3) to (6), then perform steps (3) to (6) again.

INSPECTION PROCEDURE

HINT:
Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

1	**Are there any other codes (besides DTC P0136 or P0156) being output?**

YES → **Go to relevant DTC chart (See page DI–84).**

NO

2	**Check for open and short in harness and connector between engine ECU and oxygen sensor (See page IN–30).**

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

OK

3	**Check output voltage of heated oxygen sensor.**

PREPARATION:
(a) Connect the OBD scan tool or hand–held tester to the DLC3.
(b) Warm up the engine to normal operating temperature.
CHECK:
Read voltage output of the heated sensor when the engine suddenly raced.
HINT:
Perform quick racing to 4,000 rpm for 3 min. using the accelerator pedal.
OK:
Oxygen sensor output voltage: Alternates from 0.4 V or less to 0.5 V or more.

OK → **Check that each connector is properly connected.**

NG

Replace oxygen sensor.

DI63Y–04

DTC	P0171	System too Lean (A/F Lean Malfunction, Bank 1)

DTC	P0172	System too Rich (A/F Rich Malfunction, Bank 1)

DTC	P0174	System too Lean (A/F Lean Malfunction, Bank 2)

DTC	P0175	System too Rich (A/F Rich Malfunction, Bank 2)

CIRCUIT DESCRIPTION

Fuel trim refers to the feedback compensation value compared to the basic injection time. Fuel trim includes short–term fuel trim and long–term fuel trim.

Short–term fuel trim is the short–term fuel compensation used to maintain the air–fuel ratio at its ideal theoretical value. The signal from the heated oxygen sensor indicates whether the air–fuel ratio is RICH or LEAN compared to the ideal theoretical value, triggering a reduction in fuel volume if the air–fuel ratio is rich, and an increase in fuel volume if it is lean.

Long–term fuel trim is overall fuel compensation carried out long–term to compensate for continual deviation of the short–term fuel trim form the central value due to individual engine differences, wear overtime and changes in the usage environment.

If both the short–term fuel trim and long–term fuel trim are LEAN or RICH beyond a certain value, it is detected as a malfunction and the check engine warning light on the multi information display.

DTC No.	DTC Detecting Condition	Trouble Area
P0171 P0174	When air–fuel ratio feedback is stable after engine warming up, fuel trim is considerably in error on LEAN side (2 trip detection logic)	• Air induction system • Injector blockage • Vacuum sensor • Water temp. sensor • Fuel pressure • Gas leakage on exhaust system • Open or short in oxygen sensor (bank 1, 2 sensor 1) • Oxygen sensor (bank 1, 2 sensor 1) • Engine ECU
P0172 P0175	When air–fuel ratio feedback is stable after engine warming up, fuel trim is considerably in error on RICH side (2 trip detection logic)	• Injector leak, blockage • Vacuum sensor • Water temp. sensor • Ignition system • Fuel pressure • Gas leakage on exhaust system • Open or short in oxygen sensor (bank 1, 2 sensor 1) • Oxygen sensor (bank 1, 2 sensor 1) • Engine ECU

HINT:

- When the DTC P0171 or P0174 is recorded, the actual air–fuel ratio is on the LEAN side. When DTC P0172 or P0175 is recorded, the actual air–fuel ratio is on the RICH side.
- If the vehicle runs out of fuel, the air–fuel ratio is LEAN and DTC P0171 and P0174 is recorded. The check engine warning light then comes on.
- If the total of the short–term fuel trim value and long–term fuel trim value is within –35 to +40 %, the system is functioning normally.

WIRING DIAGRAM

Refer to DTC P0125 on page DI–113.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Check air induction system (See page FI–1).**

NG → **Repair or replace.**

OK

2	**Check injector injection (See page FI–24).**

NG → **Replace injector.**

OK

3	**Check air flow meter (See page FI–34) and water temperature sensor (See page FI–61).**

NG → **Repair or replace.**

OK

4	**Check for spark and ignition (See page IG–1).**

NG	Repair or replace.

OK

5	Check fuel pressure (See page FI–6).

NG	Check and repair fuel pump, pressure regulator, fuel pipe line and filter (See page FI–6).

OK

6	Check gas leakage on exhaust system.

NG	Repair or replace.

OK

7	Check output voltage of oxygen sensor (bank 1, 2 sensor 1) during idling.

PREPARATION:

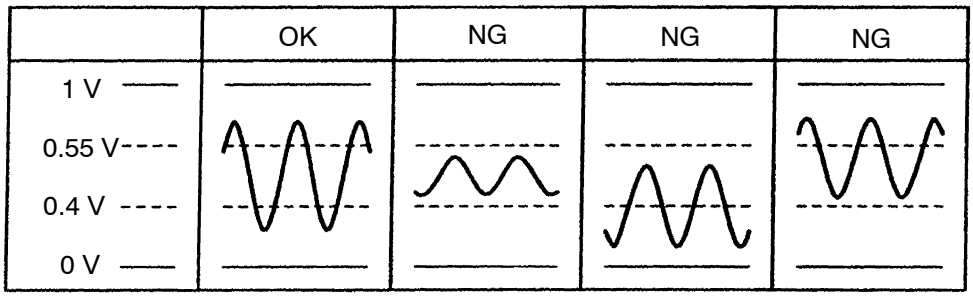
Warm up the oxygen sensor with the engine speed at 2,500 rpm for approx. 90 sec.

CHECK:

Used the OBD scan tool or hand–held tester to read the output voltage of the oxygen sensor during idling.

OK:

Oxygen sensor output voltage:
Alternates repeatedly between less than 0.4 V and more than 0.55 V (See the following table).



OK → Go to step 9.

NG

8	Check for open and short in harness and connector between engine ECU and oxygen sensor (bank 1, 2 sensor 1) (See page IN-30).

NG → Repair or replace harness or connector.

OK

Replace oxygen sensor.

9	Perform confirmation driving pattern (See page DI-118).

Go

10	Is there DTC P0171, P0172, P0174 or P0175 being output again?

YES → Check and replace engine ECU (See page DI-73).

NO

11	Did vehicle runs out of fuel in past?

NO → Check for intermittent problems (See page DI-93).

YES

DTC P0171, P0172, P0174, or P0175 is caused by running out of fuel.

DI63Z–04

DTC	P0300	Random/Multiple Cylinder Misfire Detected
DTC	P0301	Cylinder 1 Misfire Detected
DTC	P0302	Cylinder 2 Misfire Detected
DTC	P0303	Cylinder 3 Misfire Detected
DTC	P0304	Cylinder 4 Misfire Detected
DTC	P0305	Cylinder 5 Misfire Detected
DTC	P0306	Cylinder 6 Misfire Detected
DTC	P0307	Cylinder 7 Misfire Detected
DTC	P0308	Cylinder 8 Misfire Detected

CIRCUIT DESCRIPTION

Misfire: The engine ECU uses the crankshaft position sensor and camshaft position sensor to monitor changes in the crankshaft rotation for each cylinder.

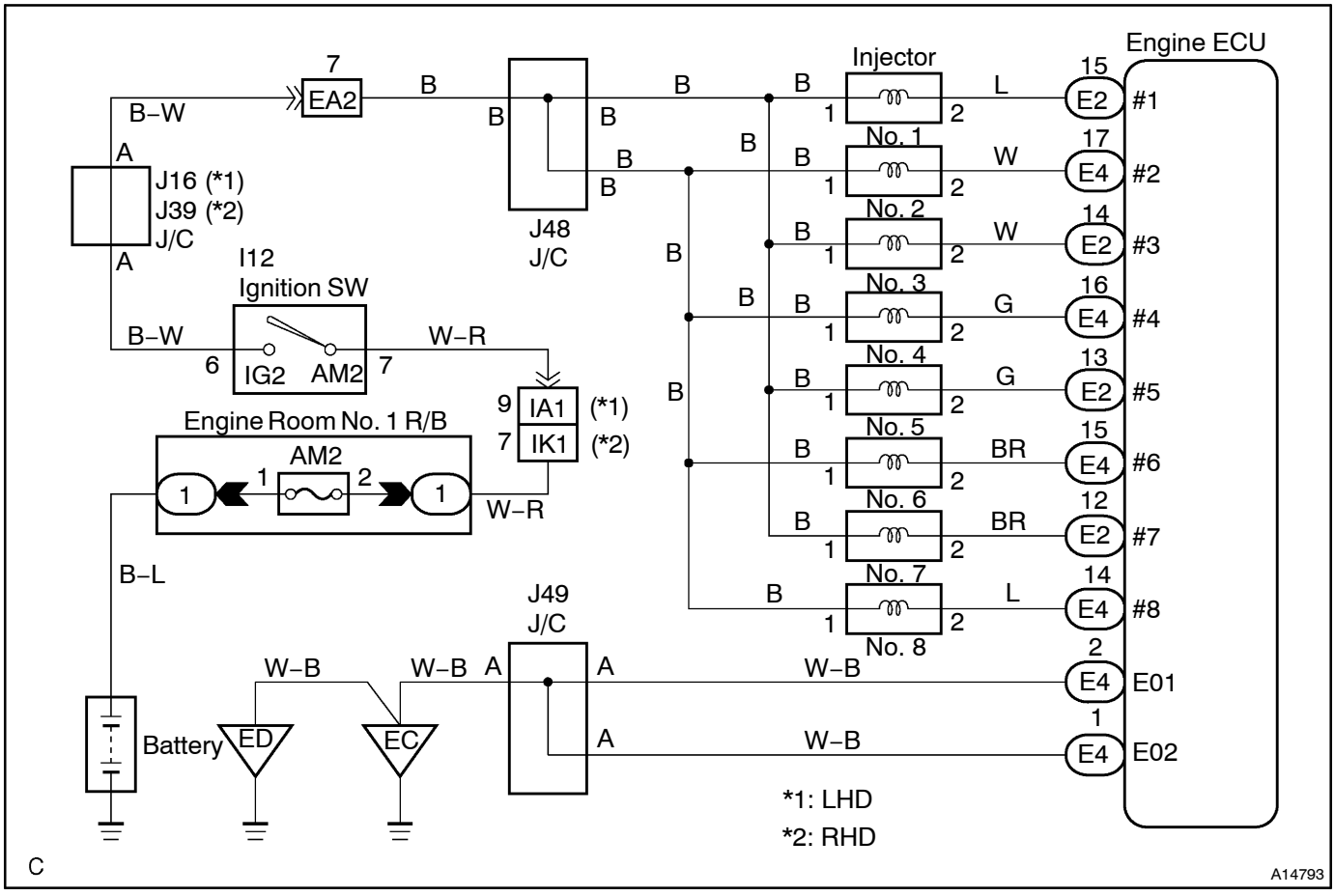
The engine ECU counts the number of times the engine speed change rate indicates that misfire has occurred. And when the misfire rate equals or exceeds the count indicating that the engine condition has deteriorated, the check engine warning light lights up.

If the misfire rate is high enough and the driving conditions will cause catalyst overheating, the check engine warning light blinks when misfiring occurs.

DTC No.	DTC Detecting Condition	Trouble Area
P0300	Misfiring of random cylinders is detected during any particular 200 or 1,000 revolutions 1 trip detection logic: check engine warning light to brink 2 trip detection logic: check engine warning light to light up	• Open or short in engine wire • Connector connection • Vacuum hose connection • Ignition system • Injector • Fuel pressure • Vacuum sensor • Water temp. sensor • Compression pressure • Valve clearance • Valve timing • Engine ECU
P0301 P0302 P0303 P0304	For any particular 200 revolutions of engine, misfiring is detected which can cause catalyst overheating (This causes check engine warning light to blink)	
P0305 P0306 P0307 P0308	For any particular 1,000 revolutions of engine, misfiring is detected which causes a deterioration in emissions (2 trip detection logic)	

HINT:
When codes for a misfiring cylinder is recorded repeatedly but no random misfire code is recorded, it indicates that the misfires were detected and recorded at different times.

WIRING DIAGRAM



CONFIRMATION DRIVING PATTERN

(a) Connect the OBD scan tool or hand–held tester to the DLC3.
(b) Record DTC and the freeze frame data.
(c) Use the OBD scan tool or hand–held tester to set to the Check (Test) Mode (See page DI–73).
(d) Drive the vehicle several times with the engine speed, load and its surrounding range shown with ENGINE SPD, CALC LOAD in the freeze frame data or MISFIRE RPM, MISFIRE LOAD in the data list.

If you have no OBD scan tool or hand–held tester, turn the ignition switch OFF after the symptom is simulated the first time. Then repeat the simulation process again.

HINT:

In order to memorize DTC of misfire, it is necessary to drive around MISFIRE RPM, MISFIRE LOAD in the data list for the following period of time.

Engine Speed	Time
Idling	3 minutes 30 seconds or more
1,000 rpm	3 minutes or more
2,000 rpm	1 minute 30 seconds or more
3,000 rpm	1 minute or more

(e) Check whether there is misfire or not by monitoring DTC and the freeze frame data. After that, record them.
(f) Turn the ignition switch OFF and wait at least 5 seconds.

INSPECTION PROCEDURE

HINT:

- If it is the case that DTC besides misfire is memorized simultaneously, first perform the troubleshooting for them.
- Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.
- When the vehicle is brought to the workshop and the misfire is not occurred, misfire can be confirmed by reproducing the condition of freeze frame data. Also, after finishing the repair, confirm that there is no misfire (See confirmation driving pattern).
- When either of SHORT FT #1, LONG FT #1, SHORT FT #2 or LONG FT #2 in the freeze frame data is besides the range of ± 20 %, there is a possibility that the air–fuel ratio is inclining either to RICH (–20 % or less) or LEAN (+20 % or more).
- When COOLANT TEMP in the freeze frame data is less than 80°C (176°F), there is a possibility of misfire only during warmed up.
- In the case that misfire cannot be reproduced, the reason may be because of the driving with lack of fuel, the use of improper fuel, a stain of the ignition plug, and etc.

1	**Check wire harness, connector and vacuum hose in engine room.**

CHECK:

(a) Check the connection conditions of wire harness and connector.
(b) Check the disconnection, piping and break of vacuum hose.

NG	**Repair or replace, then confirm that there is no misfire (See confirmation driving pattern).**

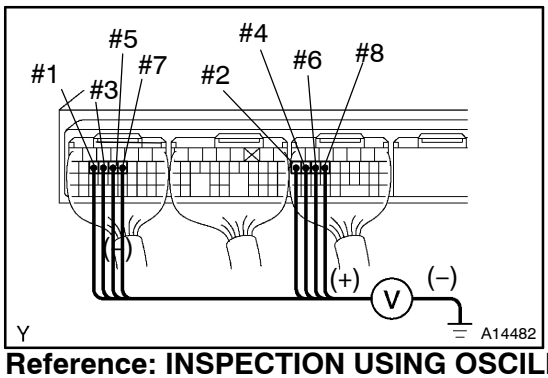
OK

2	Check spark plug and spark of misfiring cylinder (See page IG–1).

NG → Replace or check ignition system (See page IG–1).

OK

3	Check voltage of engine ECU terminals for injector of failed cylinder.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between applicable terminals #1 – #8 of the engine ECU connectors and body ground.

OK:

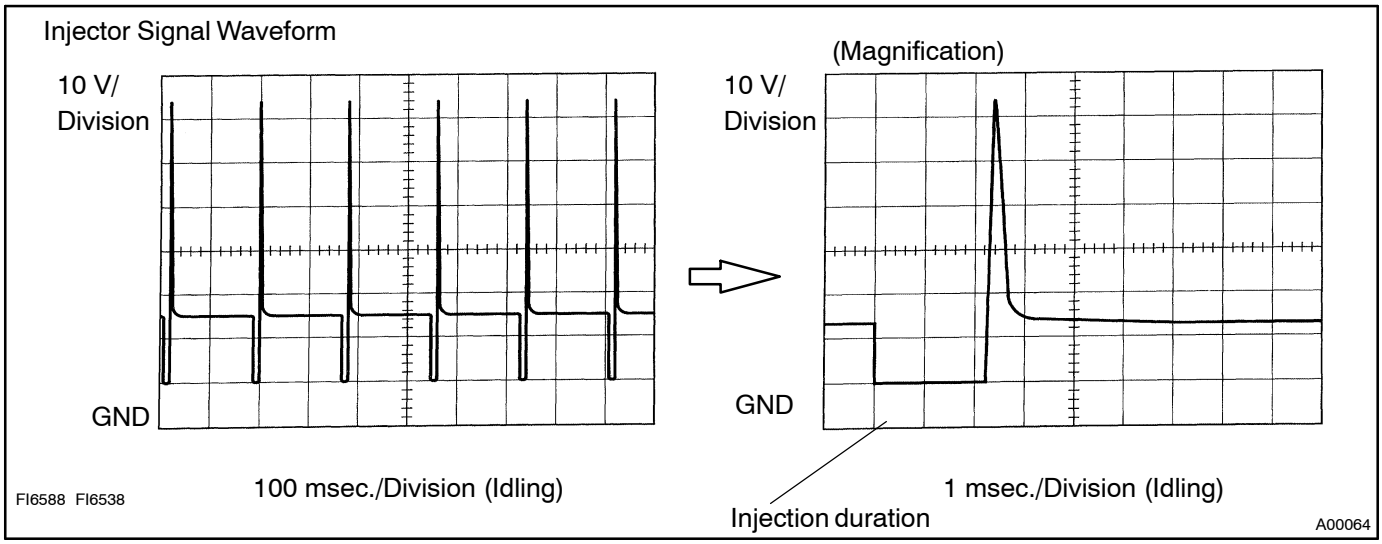
Voltage: 9 – 14 V

Reference: INSPECTION USING OSCILLOSCOPE

With the engine idling, check the waveform between terminals #1 – #8 and E01 of the engine ECU connectors.

HINT:

The correct waveform is as shown.



OK → Go to step 5.

NG

4 Check resistance of injector of misfiring cylinder (See page FI–19).

NG → Replace injector.

OK

Check for open and short in harness and connector between injector and engine ECU (See page IN–30).

5 Check fuel pressure (See page FI–6).

NG → Check and repair fuel pump, pressure regulator, fuel pipeline and filter (See page FI–1).

OK

6 Check injector injection (See page FI–24).

NG → Replace injector.

OK

7 Check air flow meter (See page FI–34) and water temperature sensor (See page FI–61).

NG → Repair or replace.

OK

Check compression pressure (See page EM–3), valve clearance (See page EM–4) and valve timing (See page EM–22).

DI85Q–01

DTC	P0325	Knock Sensor 1 Circuit Malfunction

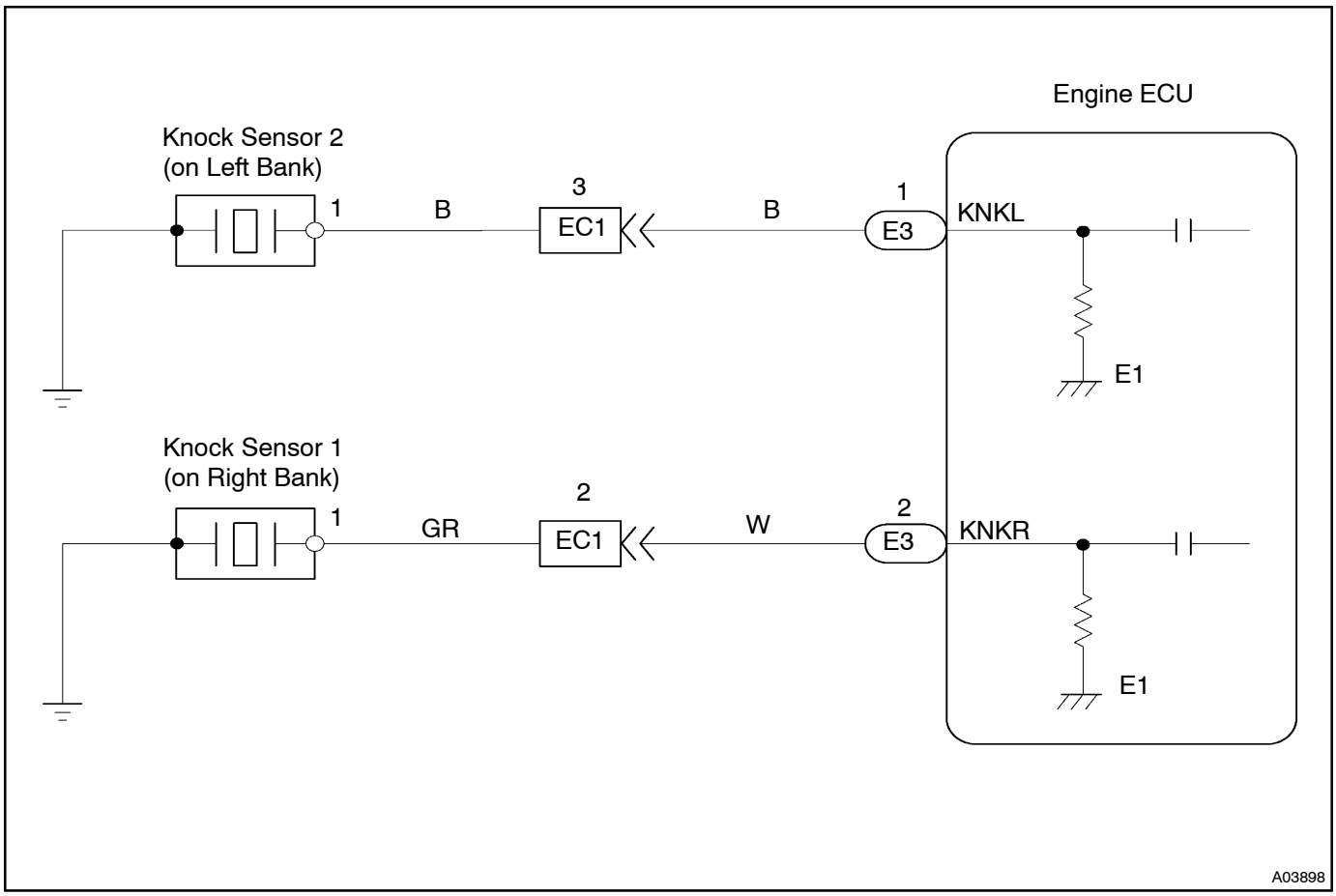
DTC	P0330	Knock Sensor 2 Circuit Malfunction

CIRCUIT DESCRIPTION

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

DTC No.	DTC Detecting Condition	Trouble Area
P0325	No knock sensor 1 signal to engine ECU with engine speed between 1,700 rpm and 5,400 rpm	• Open or short in knock sensor 1 circuit • Knock sensor 1 (looseness) • Engine ECU
P0330	No knock sensor 2 signal to engine ECU with engine speed between 1,700 rpm and 5,400 rpm	• Open or short in knock sensor 2 circuit • Knock sensor 2 (looseness) • Engine ECU

WIRING DIAGRAM

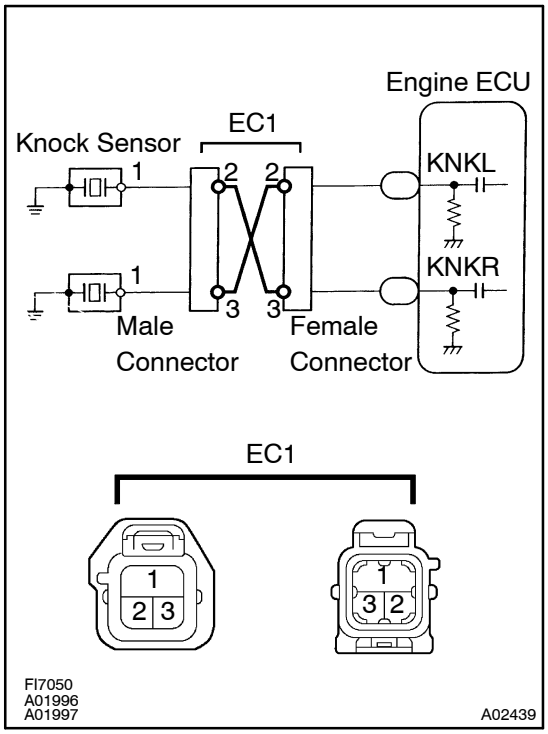


INSPECTION PROCEDURE

HINT:

- DTC P0325 is for the left bank knock sensor circuit.
- DTC P0330 is for the right bank knock sensor circuit.
- Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

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



PREPARATION:

(a) Connect the OBD scan tool or hand–held tester to the DLC3.

(b) Disconnect the wire to wire connector EC1.

(c) Connect the terminals of the disconnected EC1 male connector and EC1 female as follows.

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

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

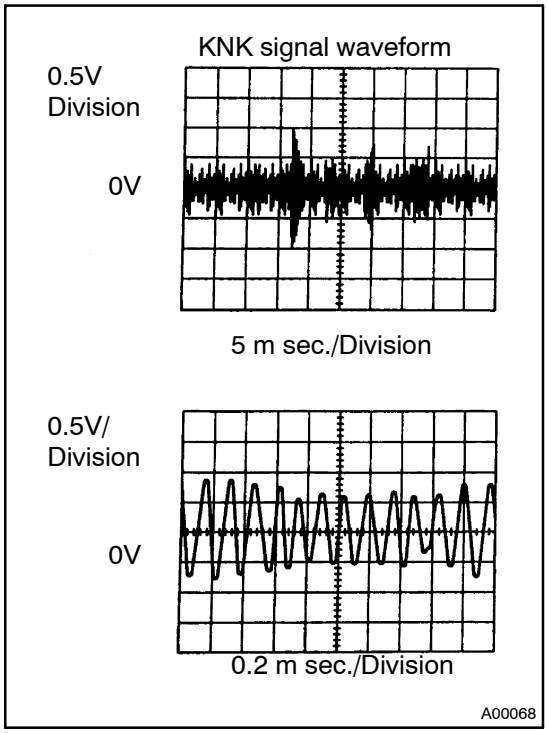
(e) After the engine is warmed up, perform quick racing to 4,000 rpm three times.

CHECK:

Check the DTC.

RESULT:

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



Reference: INSPECTION USING OSCILLOSCOPE

- With the engine racing (4,000 rpm) measure between terminal KNK1, KNK2 of the engine ECU connector and body ground.

HINT:
The correct waveforms are as shown.

- Spread the time on the horizontal axis, and confirm that period of the wave is 0.13 m sec.
  (Normal mode vibration frequency of knock sensor: 7.6 kHz)

HINT:
If normal mode vibration frequency is not 7.6 kHz, the sensor is malfunctioning.

Type II	**Go to step 3.**

Type I

2	**Check for open and short in harness and connector between EC1 connector and engine ECU (See page IN–30).**

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

OK

Check and replace engine ECU (See page IN–30).

3	**Check for open and short in harness and connector between EC1 connector and knock sensor (See page IN–30).**

HINT:

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

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

OK

Replace knock sensor.

DI641–03

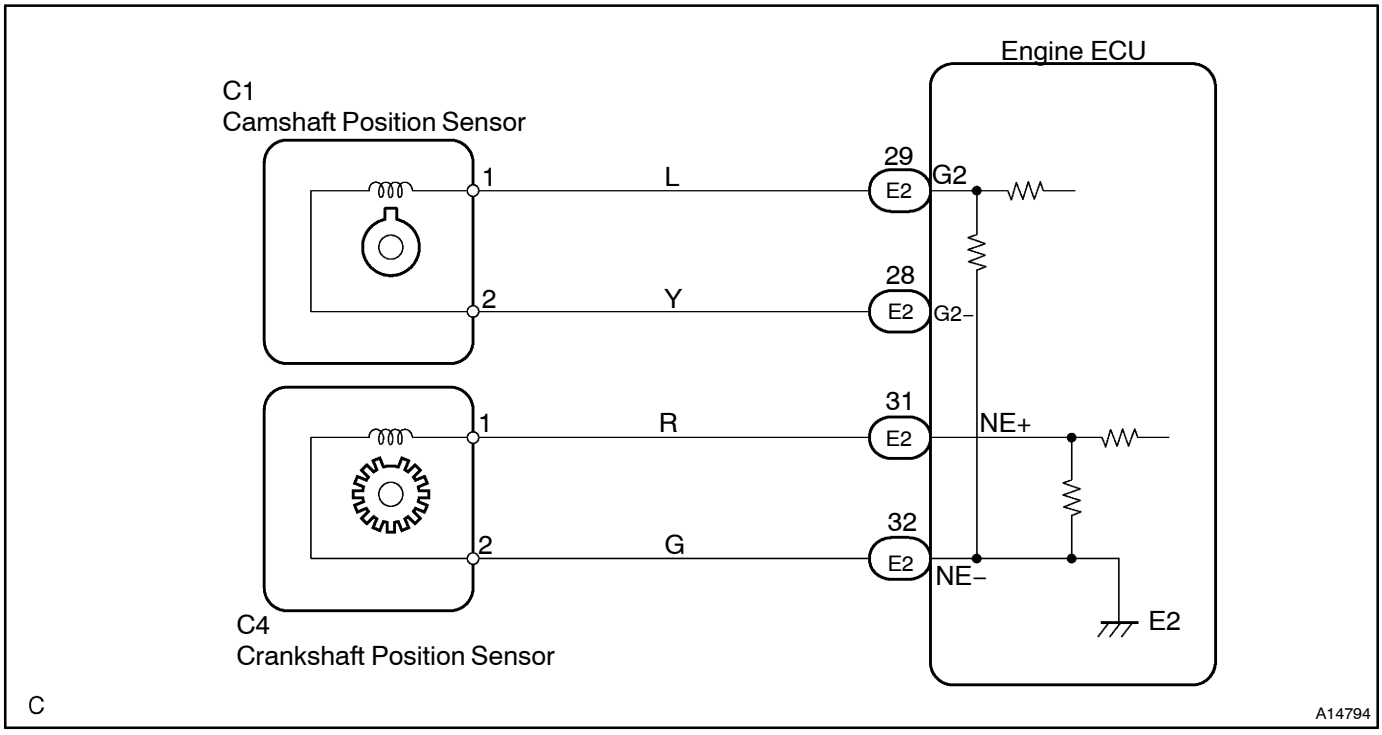
DTC	P0335	Crankshaft Position Sensor Circuit Malfunction (NE Signal)

CIRCUIT DESCRIPTION

The crankshaft position sensor, which detects the engine speed and crankshaft angle signal (NE signal), has been installed on the oil pump body.
The NE signal plate of the crankshaft timing pulley has 34 teeth. The NE signal sensor generates 34 signals of every engine revolution. The engine ECU detects the standard crankshaft angle based on the G signal, and the actual crankshaft angle and the engine speed by the NE signal.

DTC No.	DTC Detecting Condition	Trouble Area
P0335	No crankshaft position sensor signal to engine ECU during cranking (2 trip detection logic)	• Open or short in crankshaft position sensor circuit • Crankshaft position sensor • Crankshaft timing pulley • Engine ECU
	No crankshaft position sensor signal to engine ECU with engine speed 600 rpm or more (2 trip detection logic)	

WIRING DIAGRAM

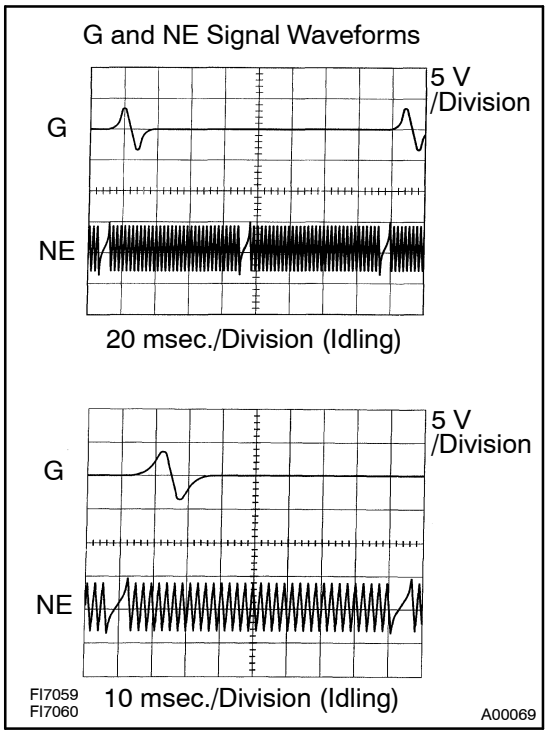


INSPECTION PROCEDURE

HINT:

- Perform troubleshooting of DTC P0335 first. If no trouble is found, troubleshoot the following mechanical systems.
- Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	Check resistance of crankshaft position sensor (See page IG–1).



Reference: INSPECTION USING OSCILLOSCOPE
During cranking or idling, check the waveform between terminals G2 and G2–, and NE and NE– of the engine ECU connector.
HINT:
The correct waveforms are as shown.

NG → Replace crankshaft position sensor.

OK

2	Check for open and short in harness and connector between engine ECU and crankshaft position sensor (See page IN–30).

NG → Repair or replace harness or connector.

OK

3	Inspect sensor installation and signal plate teeth of crankshaft timing pulley.

NG → Tighten sensor.
Replace crankshaft timing pulley.

OK

Check and replace engine ECU (See page IN–30).

DI642–03

DTC	P0340	Camshaft Position Sensor Circuit Malfunction (G Signal)

CIRCUIT DESCRIPTION

Camshaft position sensor (G signal) consists of an iron core and pickup coil.
The G signal rotor has 3 teeth, and is installed on the intake camshaft.
When the camshafts rotate, the protrusion on the signal rotor and the air gap on the pickup coil change, causing fluctuations in the magnetic field and generating an electromotive force in the pickup coil.
The NE signal plate has 34 teeth and is installed on the crankshaft timing pulley. The NE signal sensor generates 34 signals for every engine revolution. The engine ECU detects the standard crankshaft angle based on the G2 signal and the actual crankshaft angle and the engine speed by the NE signals.

DTC No.	DTC Detecting Condition	Trouble Area
P0340	No camshaft position sensor signal to engine ECU during cranking (2 trip detection logic)	• Open or short in camshaft position sensor circuit • Camshaft position sensor • Intake camshaft • Engine ECU
	No camshaft position sensor signal to engine ECU with engine speed 600 rpm or more	

WIRING DIAGRAM

Refer to DTC P0335 on page DI–144.

INSPECTION PROCEDURE

HINT:
Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Check resistance of camshaft position sensor (See page IG–1).**

Reference: INSPECTION USING OSCILLOSCOPE
Refer to DTC P0335 on page DI–144.

NG → **Replace camshaft position sensor.**

OK

2	**Check for open and short in harness and connector between engine ECU and camshaft position sensor (See page IN–30).**

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

OK

3	**Inspect sensor installation and signal rotor of the intake camshaft.**

NG → **Tighten sensor. Replace intake camshaft.**

OK

Check and replace engine ECU (See page IN–30).

DI1EE–16

DTC	P0420	Catalyst System Efficiency Below Threshold (Bank 1)

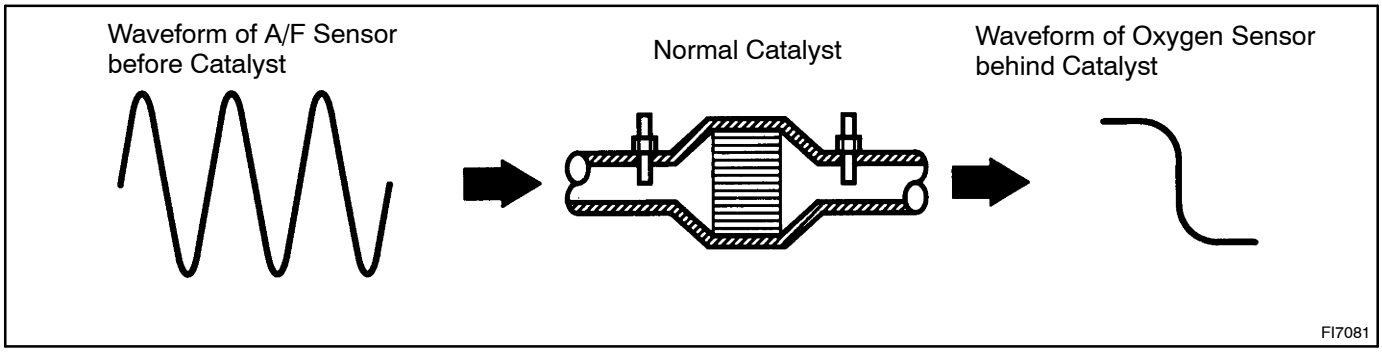
DTC	P0430	Catalyst System Efficiency Below Threshold (Bank 2)

CIRCUIT DESCRIPTION

The engine ECU compares the waveform of the A/F sensor located before the catalyst with the waveform of the oxygen sensor located behind the catalyst to determine whether or not catalyst performance has deteriorated.

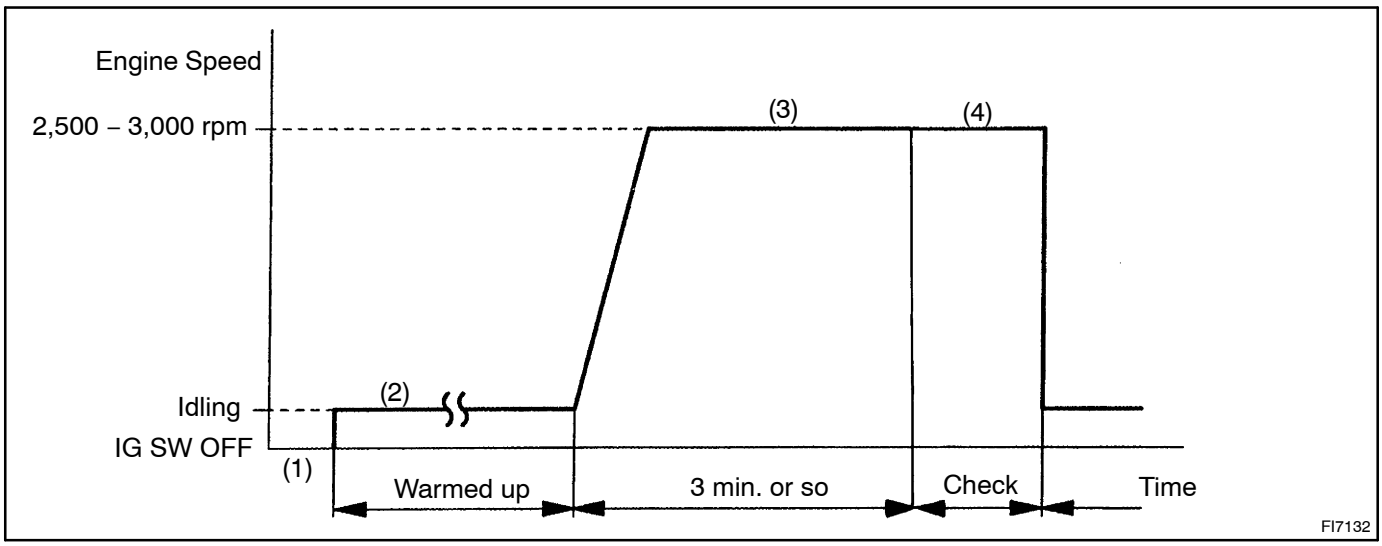
Air–fuel ratio feedback compensation keeps the waveform of the A/F sensor before the catalyst repeatedly changing back and forth from rich to lean.

If the catalyst is functioning normally, the waveform of the oxygen sensor behind the catalyst switches back and forth between rich and lean much more slowly than the waveform of the A/F sensor before the catalyst. But when both waveforms change at a similar rate, it indicates that catalyst performance has deteriorated.

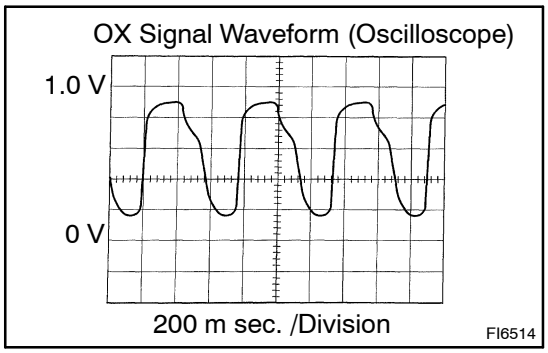


DTC No.	DTC Detecting Condition	Trouble Area
P0420 P0430	After the engine and the catalyst are warmed up, and while the vehicle is driven within the set vehicle and engine speed range, the waveforms of the A/F sensors (bank1, 2 sensor 1) and oxygen sensors (bank 1, 2 sensor 2) have the same amplitude (2 trip detection logic)	• Three–way catalytic converter • Open or short in oxygen sensor (bank1, 2 sensor2) circuit • Oxygen sensor (bank1, 2 sensor2)

CONFIRMATION ENGINE RACING PATTERN



(1) Connect the hand–held tester to the DLC3, or connect the probe of the oscilloscope between terminals OXL1, OXL2, OXR1, OXR2 and E1 of the engine ECU.
(2) Start engine and warm it up with all accessories switched OFF until water temp. is stable.
(3) Race the engine at 2,500 – 3,000 rpm for about 3 min.
(4) After confirming that the waveforms of the oxygen sensor (bank 1, 2 sensor 1 (OXL1, OXR1)), oscillate around
0.5 V during feedback to the engine ECU, check the waveform of the oxygen sensor (bank 1, 2 sensor 2 (OXL2, OXR2)).



HINT:
If there is a malfunction in the system, the waveform of the oxygen sensor (bank 1, 2 sensor 2 (OXL1, OXR1)), is almost the same as that of the oxygen sensor (bank 1, 2 sensor 1 (OXL1+, OXR1)), on the left.
There are some cases where, even though a malfunction exists, the check engine warning light may either light up or not light up.

INSPECTION PROCEDURE

HINT:
Read freeze frame data using a OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

1	**Are there any other codes (besides DTC P0420, P0430) being output?**

YES → **Go to relevant DTC chart (See page DI–84).**

NO

2	**Check gas leakage on exhaust system.**

NG → **Repair or replace.**

OK

3	**Check oxygen sensor (bank 1, 2 sensor 1) (See page FI–67).**

NG → **Repair or replace.**

OK

4	**Check oxygen sensor (bank 1, 2 sensor 2) (See page FI–67).**

NG → **Repair or replace.**

OK

Replace three–way catalytic converter.

DI644–07

DTC	P0443	Evaporative Emission Control System Purge Control Vent Control Malfunction

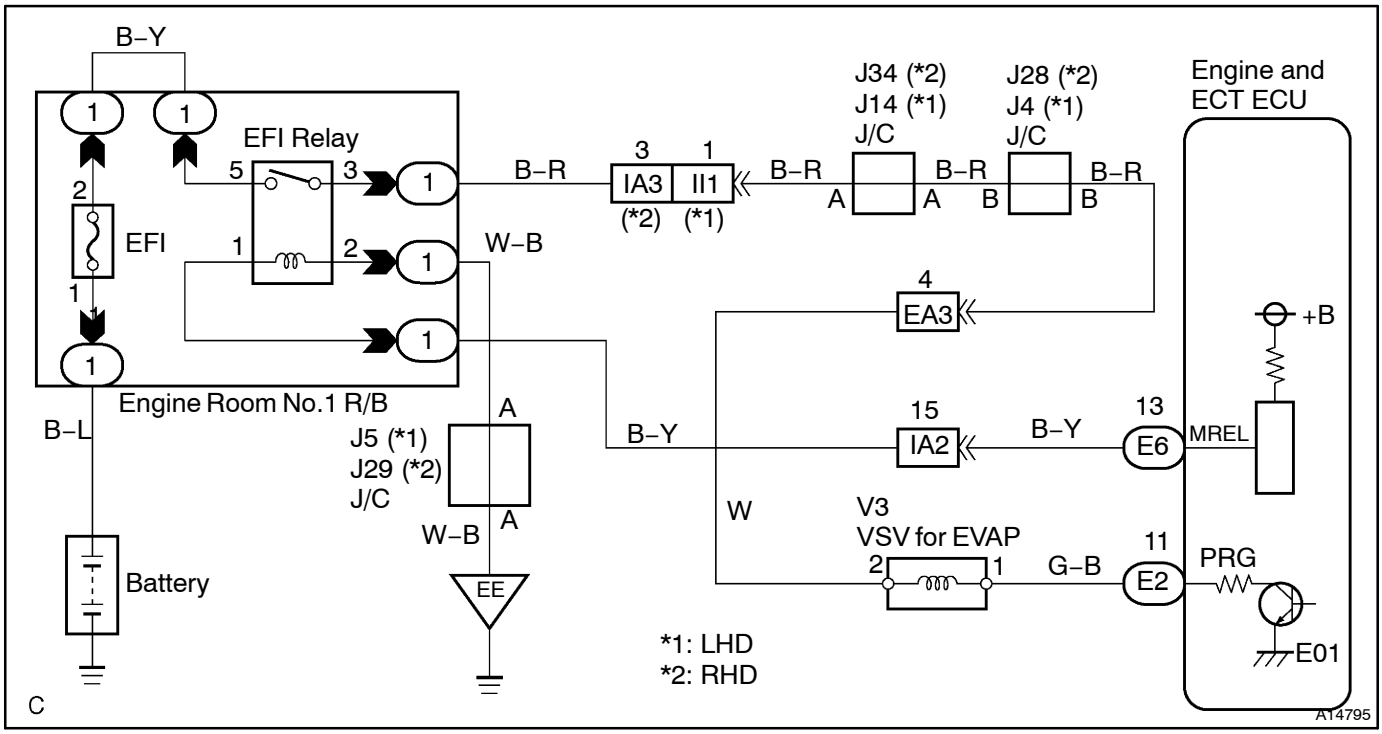
CIRCUIT DESCRIPTION

To reduce HC emissions, evaporated fuel from the fuel tank is routed through the charcoal canister to the intake manifold for combustion in the cylinders.

The engine ECU changes the duty signal to the VSV for the EVAP so that the intake quantity of HC emissions is appropriate for the driving conditions (engine load, engine speed, vehicle speed, etc.) after the engine is wamed up.

DTC No.	DTC Detection Condition	Trouble Area
P0443	Proper response to engine ECU command does not occur	• Open or short in VSV circuit for EVAP • VSV for EVAP • Engine ECU

WIRING DIAGRAM



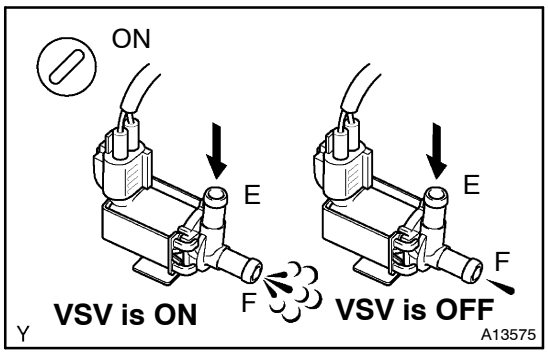
INSPECTION PROCEDURE

When using hand–held tester:

HINT:

Read freeze frame data using a hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Connect hand–held tester and check operation of VSV for EVAP.**



PREPARATION:

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

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

(c) Select the ACTIVE TEST mode on the hand–held tester.

CHECK:

Check the operation of the VSV when the VSV is operated by the hand–held tester.

OK:

VSV is ON:
Air from port E flows out through port F.
VSV is OFF:
Air from port E flows out with hardly through port F.

OK	**Check for intermittent problems (See page DI–73).**

NG

2	**Check VSV for EVAP (See page FI–55).**

NG	**Replace VSV for EVAP.**

OK

3	**Check for open and short in harness and connector between EFI main relay (Marking: EFI) and engine ECU (See page IN–30).**

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

OK

Check and replace engine ECU (See page IN–30).

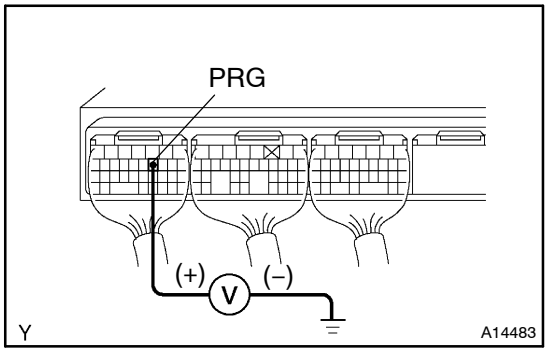
When using OBD scan tool:

1	**Check VSV for EVAP (See page FI–55).**

NG → **Replace VSV for EVAP.**

OK

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



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminal PRG of the engine ECU connector and body ground.

OK:

Voltage: 9 – 14 V

NG → **Check for open and short in harness and connector between EFI main relay (Marking: EFI) and engine ECU (See page IN–30).**

OK

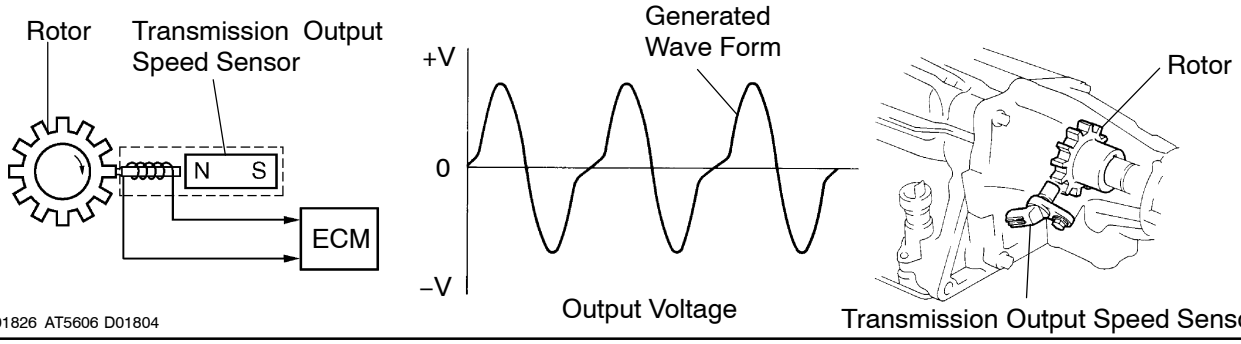
Check and replace engine ECU (See page IN–30).

DI85R–01

DTC	P0500	Vehicle Speed Sensor Malfunction

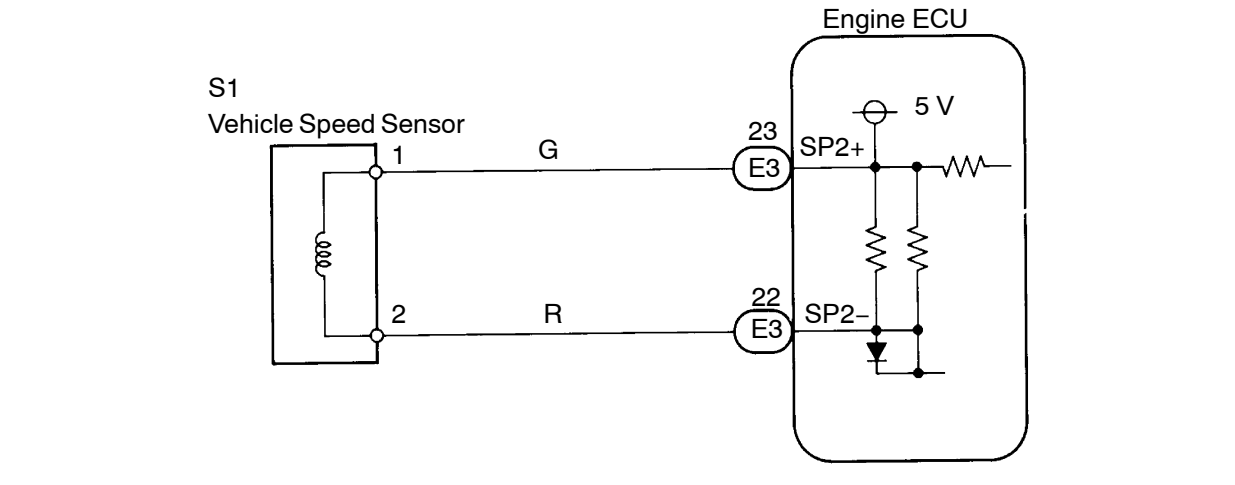
CIRCUIT DESCRIPTION

The vehicle speed sensor detects the rotation speed of the transmission output shaft and sends signals to the engine ECU. The engine ECU determines the vehicle speed based on these signals. An AC voltage is generated in the vehicle speed sensor coil as the rotor mounted on the output shaft rotates, and this voltage is sent to the engine ECU.



DTC No.	DTC Detecting Condition	Trouble Area
P0500	No vehicle speed sensor signal to engine ECU under conditions (a) and (b): (a) Park/neutral position switch is OFF (b) Vehicle is being driven	• Open or short in vehicle speed sensor circuit • Transmission output speed sensor • Engine ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Connect OBD scan tool or hand–held tester and read value of vehicle speed value.**

PREPARATION:
(a) Connect the OBD scan tool or hand–held tester to the DLC3.
(b) Start the engine and push the the hand–held tester main switch ON.
CHECK:
Drive the vehicle and read vehicle speed value.
OK:
Vehicle speed matches tester speed value.

OK	**Check and replace engine ECU (See page IN–30).**

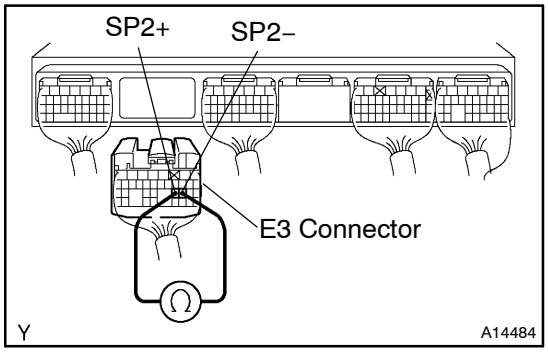
NG

2	**Check speedometer circuit (See page BE–6).**

NG	**Repair or replace speedometer circuit.**

OK

3	**Check resistance between terminals SP2+ and SP2– of engine ECU connector.**

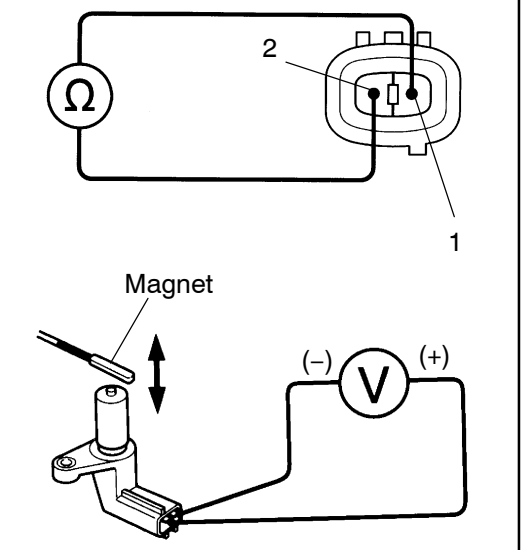


PREPARATION:
(a) Remove the engine ECU hood and cover (See page FI–74).
(b) Disconnect the E3 connector from the engine ECU.
CHECK:
Check the resistance between terminals SP2+ and SP2– of the engine ECU connector.
OK:
Resistance: 560 – 680 Ω

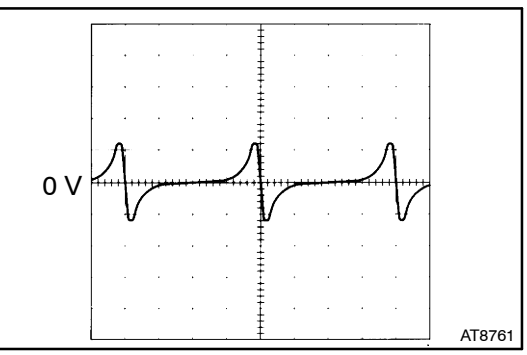
OK	**Check and replace engine ECU (See page IN–30).**

NG

4	Check vehicle speed sensor.



PREPARATION:
Remove the vehicle speed sensor from the transmission.
CHECK:
Measure the resistance between terminals 1 and 2 of the speed sensor.
OK:
Resistance: 560 – 680 Ω
Reference: CHECK VEHICLE SPEED SENSOR'S FUNCTION
CHECK:
Check the voltage between terminals 1 and 2 of the vehicle speed sensor when a magnet is put close to the front end of the vehicle speed sensor then taken away quickly.
OK:
Voltage is generated intermittently.
HINT:
Voltage generated is extremely low.



Reference: INSPECTION USING OSCILLOSCOPE
Check the waveform between terminals SP2+ and SP2– when the vehicle speed is approx. 60 km/h (37 mph).

NG → **Replace vehicle speed sensor.**

OK

Check and repair harness and connector between engine ECU and vehicle speed sensor (See page IN–30).

DI2P2–06

DTC	P0505	Idle Control System Malfunction

CIRCUIT DESCRIPTION

The idle speed is controlled by the Electric Throttle Control System (ETCS).
ETCS is composed of the throttle motor to operate the throttle valve, the magnetic clutch to connect the throttle motor with the throttle valve, the throttle position sensor to detect the opening angle of the throttle valve, the accelerator pedal position sensor to detect the accelerator pedal position, the engine ECU to control the ETCS and the one valve type throttle body.
The engine ECU controls the throttle motor to make the throttle valve opening angle properly for the target idle speed.

DTC No.	DTC Detecting Condition	Trouble Area
P0505	Idle speed continues to vary greatly from target speed (2 trip detection logic)	• Air induction system • Electric throttle control system

INSPECTION PROCEDURE

HINT:
Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel was ratio lean or rich, etc. at the time of the malfunction.

1	**Are there any other codes (besides P0505) being output?**

YES ⇒ **Go to relevant DTC chart (See page DI–84).**

NO

2	**Check air induction system (See page FI–1).**

NG ⇒ **Repair or replace.**

OK

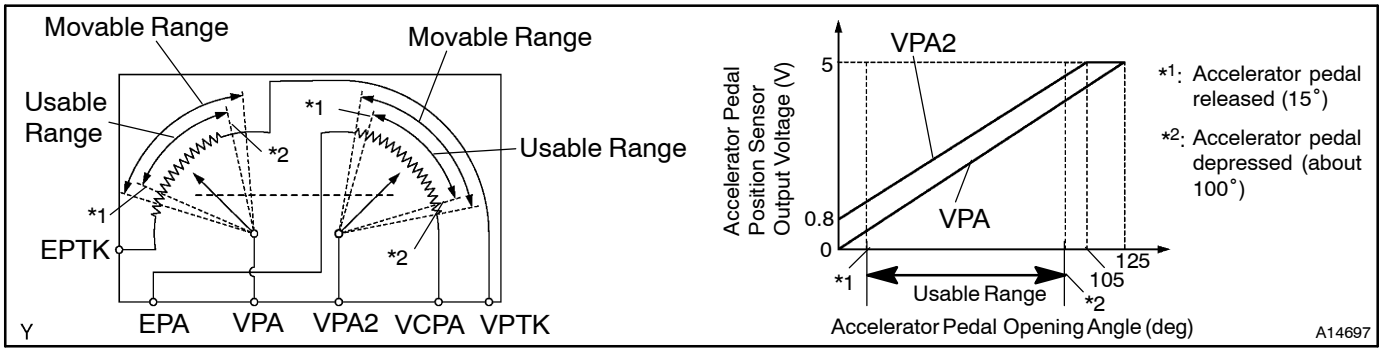
Check electric throttle control system (See page FI–35).

DI646–02

DTC	P1120	Accelerator Pedal Position Sensor Circuit Malfunction

CIRCUIT DESCRIPTION

Accelerator pedal position sensor is mounted on the accelerator pedal bracket and it have the 2 sensors to detects the accelerator position and a malfunction of the accelerator position's own.
The accelerator pedal position sensor is the voltage applied to the terminals VPA and VPA2 of the ECU changes between 0 V and 5 V in proportion to the opening angle of the accelerator pedal.
The engine ECU judges the current opening angle of the accelerator pedal from these signals input from terminals VPA and VPA2 and the engine ECU controls the throttle motor based on these signals.
If this DTC is stored, the engine ECU shuts down the power for the throttle motor, and the throttle valve is fully closed by the return spring.

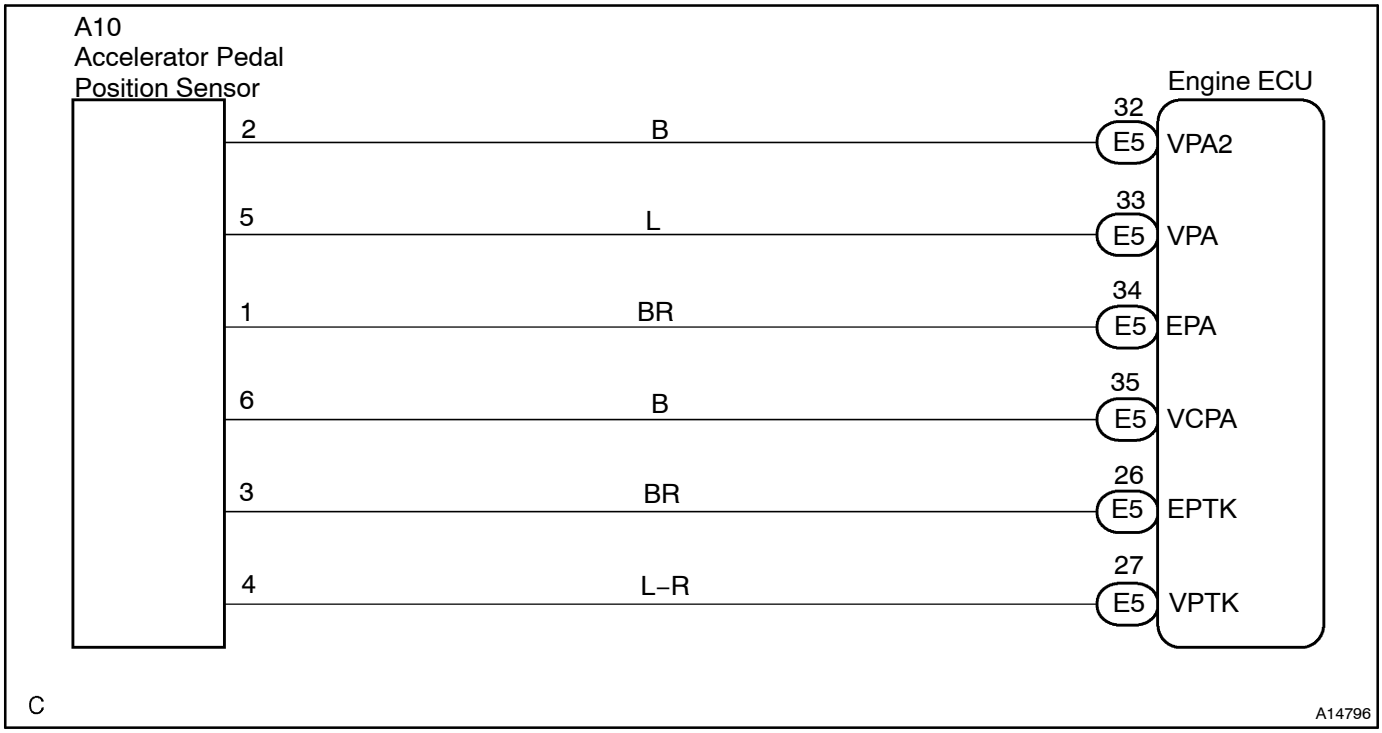


DTC No.	DTC Detecting Condition	Trouble Area
P1120	Condition (a), (b), (c) or (d) continues for 2.0 seconds: (a) VPA ≦ 0.2 V (b) VPA2 ≦ 0.5 V (c) VPA ≧ 4.8 V (d) When VPA ≧ 0.2 V and ≦ 3.4 V, and VPA2 ≧ 4.8 V (e) VPA–VPA2 ≦ 0.02 V	• Open or short in accelerator pedal position sensor circuit • Accelerator pedal position sensor • Engine ECU
	Condition (a) or (b) continues for 0.4 seconds: (a) VPA ≦ 0.2 V and VPA2 ≦ 0.5 V	

HINT:
After confirming DTC P1120, use the OBD scan tool or hand–held tester to confirm the accelerator pedal opening percentage.

Throttle valve position expressed as voltage				Trouble area
Accelerator pedal released		Accelerator pedal depressed		
ACCEL POS #1	ACCEL POS #2	ACCEL POS #1	ACCEL POS #2	
0 V	0 V	0 V	0 V	VC line open
0 V	0.9 – 2.3 V	0 V	3.3 – 5.0 V	VPA line open or grand short
0.5 – 1.1 V	0 V	3.0 – 4.6 V	0 V	VPA2 line open or grand short
5 V	5 V	5 V	5 V	E2 line open

WIRING DIAGRAM



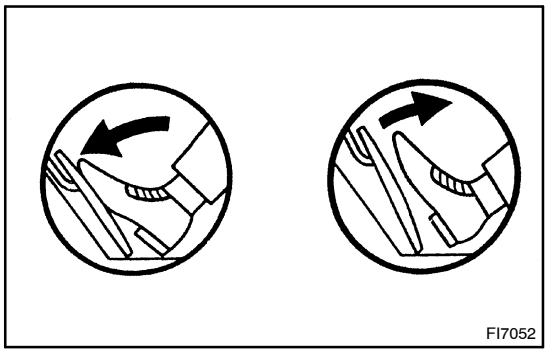
INSPECTION PROCEDURE

HINT:

Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

When using hand–held tester:

1	**Connect hand–held tester, read voltage for accelerator pedal position sensor data.**



PREPARATION:

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

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

CHECK:

Read the voltage for the accelerator pedal position sensor data.

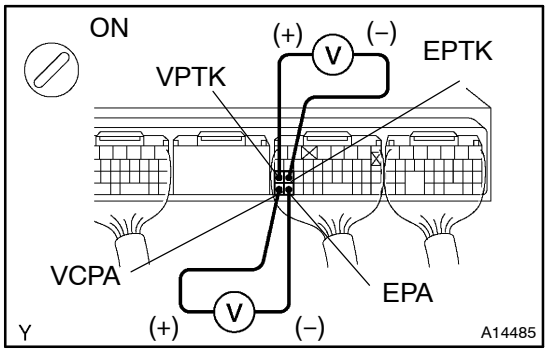
OK:

Accelerator Pedal	VPA	VPA2
Released	0.5 – 1.1 V	0.9 – 2.3 V
Depressed	3.0 – 4.6 V	3.3 – 5.0 V

OK	**Check and replace engine ECU (See page IN–30).**

NG

2	Check voltage between terminals VCPA and EPA, VPTK and EPTK of engine ECU connector.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals VCPA and EPA, VPTK and EPTK of the engine ECU connector.

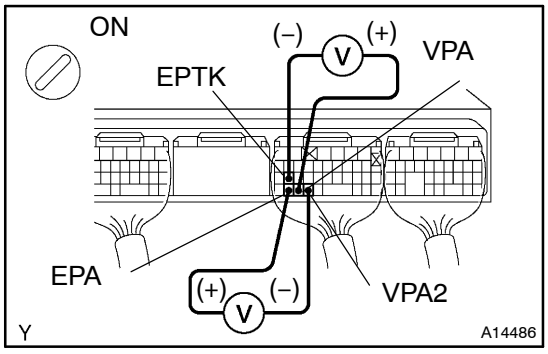
OK:

Voltage: 4.5 – 5.5 V

NG	Check and replace engine ECU (See page IN–30).

OK

3	Check voltage between terminals VPA and EPTK, VPA2 and EPA of engine ECU connector.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals VPA and EPTK, VPA2 and EPA of the engine ECU connector.

OK:

Accelerator pedal	Voltage	
	VPA – EPTK	VPA2 – EPA
Released	0.5 – 1.1 V	0.9 – 2.3 V
Depressed	3.0 – 4.6 V	3.3 – 5.0 V

OK	Check and replace engine ECU (See page IN–30).

NG

4	Check accelerator pedal position sensor (See page FI–35).

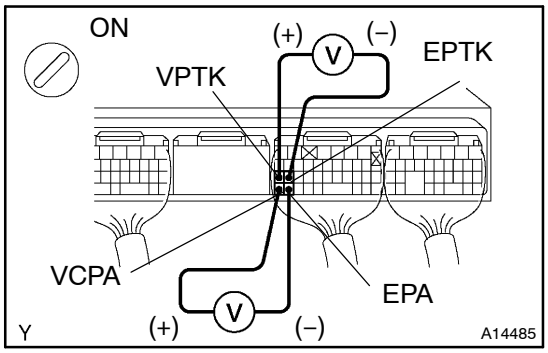
NG → Replace accelerator pedal assembly.

OK →

Check for open and short in harness and connector in VCPA, VPTK, VPA, VPA2, EPTK and EPA circuits between engine ECU and accelerator pedal position sensor (See page IN–30).

When using OBD scan tool:

1	Check voltage between terminals VCPA and EPA, VPTK and EPTK of engine ECU connector.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals VCPA and EPA, VPTK and EPTK of the engine ECU connector.

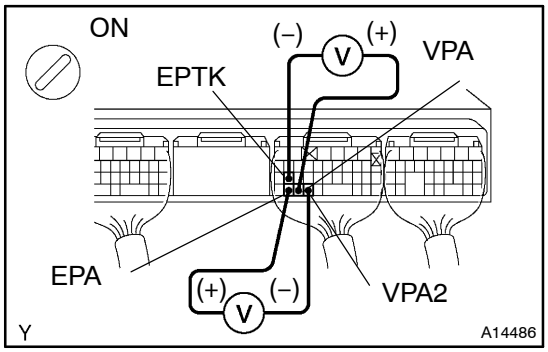
OK:

Voltage: 4.5 – 5.5 V

NG → Check and replace engine ECU (See page IN–30).

OK →

2	**Check voltage between terminals VPA and EPTK, VP2 and EPA of engine ECU connector.**



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals VPA and EPTK, VPA2 and EPA of the engine ECU connector.

OK:

Accelerator pedal	Voltage	
	VPA – EPTK	VPA2 – EPA
Released	0.5 – 1.1 V	0.9 – 2.3 V
Depressed	3.0 – 4.6 V	3.3 – 5.0 V

OK → **Check and replace engine ECU (See page IN–30).**

NG

3	**Check accelerator pedal position sensor (See page FI–35).**

NG → **Replace accelerator pedal assembly.**

OK

Check for open and short in harness and connector in VCPA, VPTK, VPA, VPA2, EPA and EPTK circuits between engine ECU and accelerator pedal position sensor (See page IN–30).

DI647–02

DTC	P1121	Accelerator Pedal Position Sensor Range/ Performance Problem

CIRCUIT DESCRIPTION

Refer to DTC P1120 on page DI–158.

DTC No.	DTC Detecting Condition	Trouble Area
P1121	Condition (a) continue for 2.0 seconds: (a) Difference between VPA and VPA2 is out of threshold	• Accelerator pedal position sensor

INSPECTION PROCEDURE

HINT:

Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

Replace accelerator pedal assembly.

DI85S–01

DTC	P1125	Throttle Control Motor Circuit Malfunction

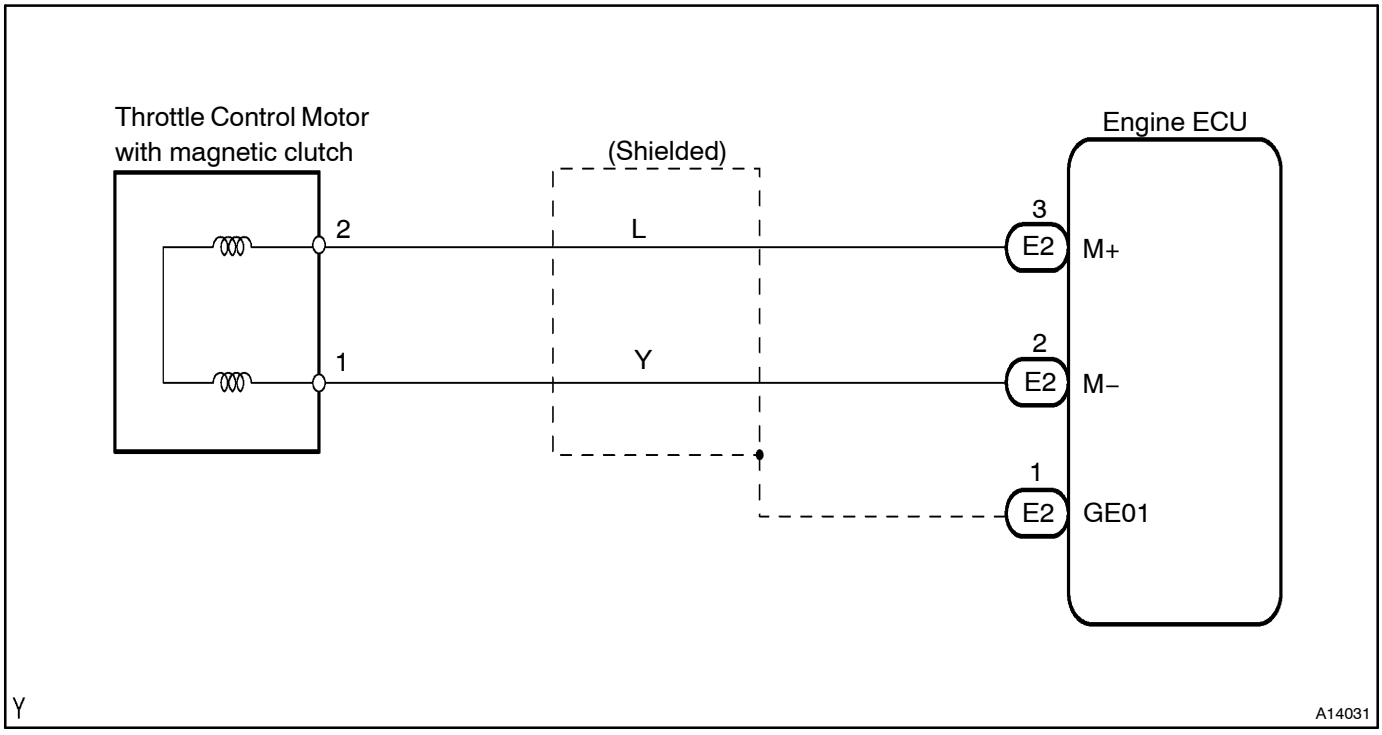
***: ETCS trouble code No. is 21.**

CIRCUIT DESCRIPTION

Throttle motor is operated by the engine ECU and it opens and closes the throttle valve.
The opening angle of the throttle valve is detected by the throttle position sensor which is mounted on the throttle body and it provides feedback to the engine ECU to control the throttle motor in order to the throttle valve opening angle properly in response to driving condition.
If this DTC is stored, the engine ECU shuts down the power for the throttle motor, and the throttle valve is fully closed by the return spring.

DTC No.	DTC Detecting Condition	Trouble Area
P1125	Condition (a) and (b) continues for 0.5 seconds: (a) Throttle control motor output duty ≧ 80 % (b) Throttle control motor current < 0.5 A	• Open or short in throttle control motor circuit • Throttle control motor • Engine ECU
	Throttle control motor current ≧ 16 A	
	Under condition continue for 0.6 seconds: Throttle control motor current ≧ 7 A	

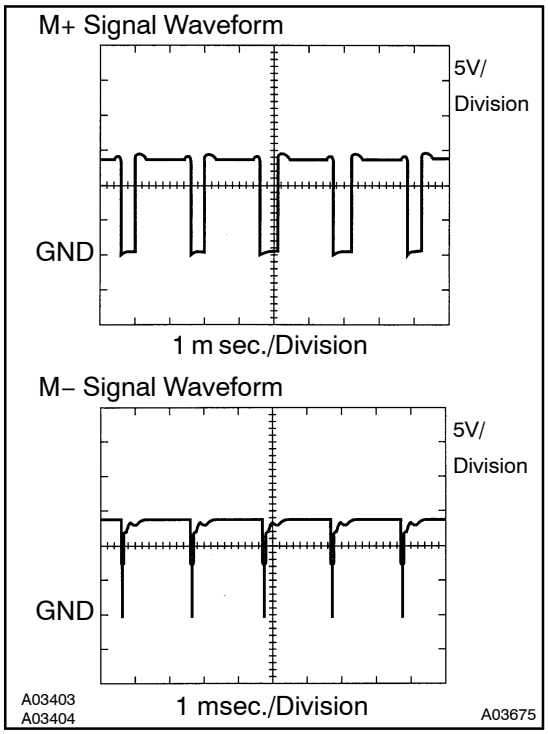
WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	Check throttle control motor circuit.



PREPARATION:

(a) Connect the oscilloscope between terminals M+ or M– and E1 of the engine ECU connector.

(b) Start the engine.

CHECK:

Check the waveform between terminals M+ or M– and E1 of the engine ECU when the engine is idling.

OK:

The correct waveforms are as shown.

HINT:

The waveform frequency varies depending on the throttle opening.

OK → **Check and replace engine ECU (See page IN–30).**

NG

2	Check throttle control motor (See page FI–35).

NG → **Replace throttle body (See page FI–38).**

OK

3	Check for open and short in harness and connector between throttle control motor and engine ECU (See page IN–30).

NG → **Repair or replace.**

OK

Check and replace engine ECU (See page IN–30).

DI64A–04

DTC	P1127	ETCS Actuator Power Source Circuit Malfunction

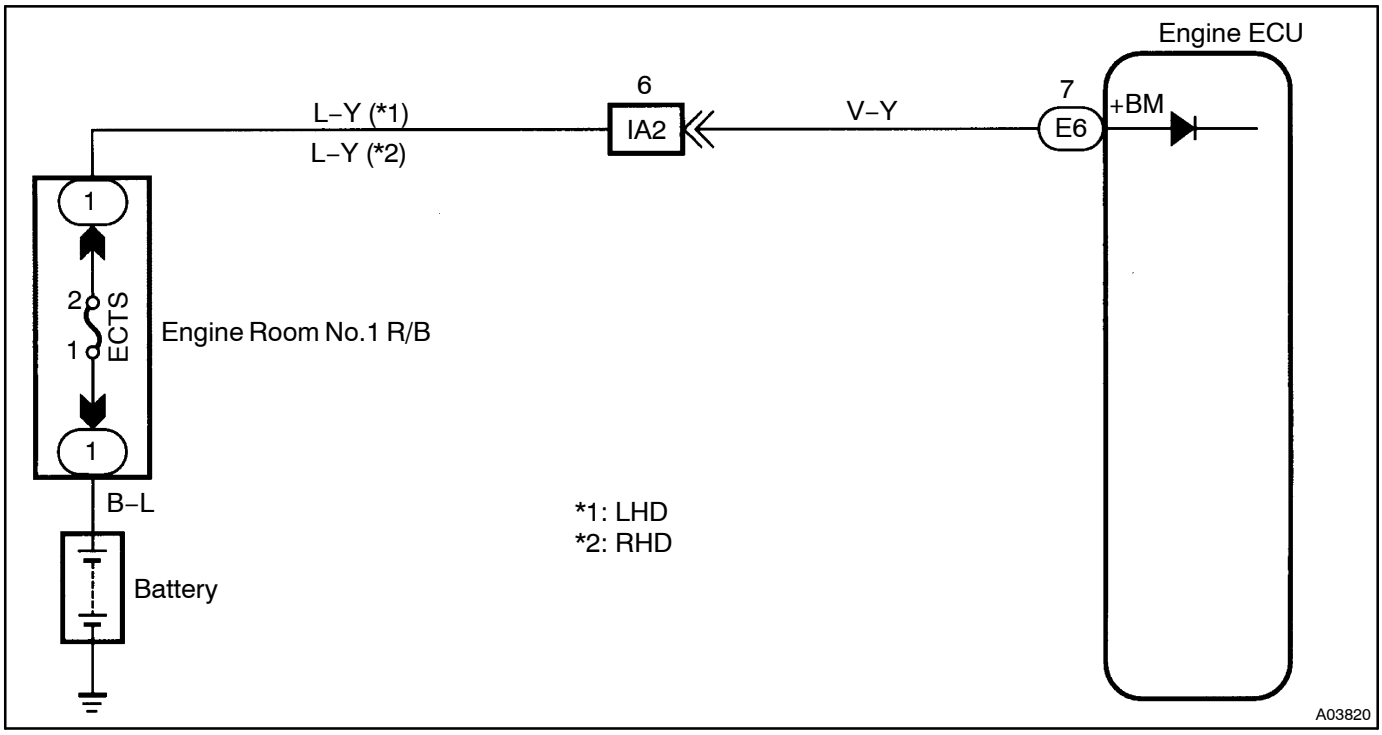
***: ETCS trouble code No. is 23.**

CIRCUIT DESCRIPTION

Battery positive voltage is supplied to terminal BM of the engine ECU even once when the ignition switch is OFF for the electric throttle control system.
If this DTC is stored, the engine ECU shuts down the power for the throttle motor, and the throttle valve is fully closed by the return spring.

DTC No.	DTC Detecting Condition	Trouble Area
P1127	Open in ETCS power source circuit	• Open in ETCS power source circuit • Engine ECU

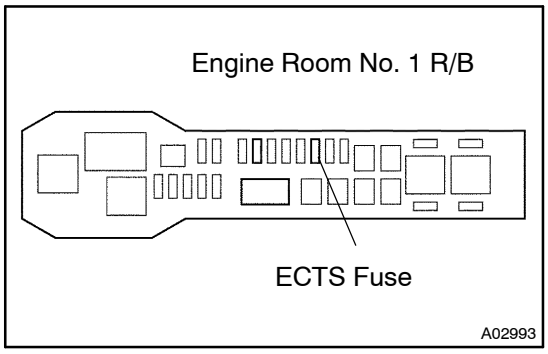
WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	Check ETCS fuse.

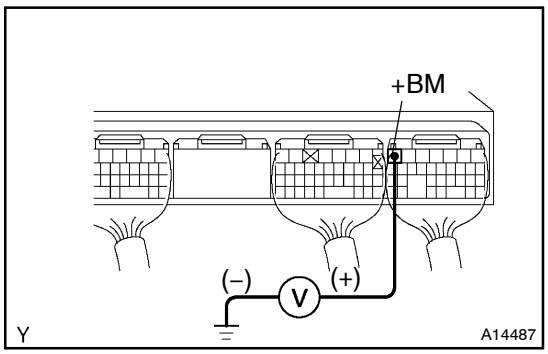


PREPARATION:
Remove the ETCS fuse from the engine room No.1 R/B.
CHECK:
Check the continuity of the ETCS fuse.
OK:
Continuity

NG → **Check for short in all harness and components connected to ETCS fuse.**

OK

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



PREPARATION:
Remove the engine ECU hood and cover (See page FI–74).
CHECK:
Measure the voltage between terminal +BM of the engine ECU connector and body ground.
OK:
Voltage: 9 – 14 V

OK → **Check and replace engine ECU (See page IN–30).**

NG

Check and repair harness or connector between battery and ETCS fuse, and ETCS fuse and engine ECU (See page IN–30).

DI85T–01

DTC	P1128	Throttle Control Motor Lock Malfunction

***: ETCS trouble code No. is 31.**

CIRCUIT DESCRIPTION

Throttle motor is operated by the ECU and it opens and closes the throttle valve.
The opening angle of the throttle valve is detected by the throttle position sensor which is mounted on the throttle body and it provides feedback to the engine ECU to control the throttle motor in order the throttle valve opening angle properly in response to driving condition.
If this DTC is stored, the engine ECU shuts down the power for the throttle motor, and the throttle valve is fully closed by the return spring.

DTC No.	DTC Detecting Condition	Trouble Area
P1128	Lock throttle control motor during control throttle control motor	• Throttle control motor • Throttle body

INSPECTION PROCEDURE

HINT:
Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Check throttle control motor (See page FI–35).**

NG → **Replace throttle body (See page FI–38).**

OK

2	**Visually check throttle valve.**

PREPARATION:
Remove the air cleaner.
CHECK:
Check whether or not a foreign body is caught between the throttle valve and the housing.

NG → **Remove a foreign body and clean throttle body.**

OK

Replace throttle body.

DI64C–04

DTC	P1129	Electric Throttle Control System Malfunction

***: ETCS trouble code No. is 32.**

CIRCUIT DESCRIPTION

Electric Throttle Control System (ETCS) is composed of the throttle motor to operate the throttle valve, the throttle position sensor to detect the opening angle of the throttle valve, the accelerator pedal position sensor to detect the accelerator pedal position, the engine ECU to control the ETCS and the one valve type throttle body.
The engine ECU controls the throttle motor to make the throttle valve opening angle properly in response driving condition.
The throttle position sensor which is mounted on the throttle body detects the opening angle of the throttle valve, and it provides feedback to the engine ECU to control the throttle motor.
If the ETCS has a malfunction, the engine ECU shuts down the power for the throttle motor, and the throttle valve is fully closed by the return spring.

DTC No.	DTC Detecting Condition	Trouble Area
P1129	Throttle opening angle continues to vary great from target throttle opening angle	• Electric throttle control system • Engine ECU

WIRING DIAGRAM

Refer to DTC P1125 on page DI–164.

INSPECTION PROCEDURE

HINT:
Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Are there any other codes (besides DTC P1129) being output?**

YES ⇒ **Go to relevant DTC chart (See page DI–84).**

NO

Replace engine ECU, and clear DTC. If DTC P1129 is memorized again, and then replace throttle body.

DI2UP–03

DTC	P1300	Igniter Circuit Malfunction (No.1)

DTC	P1305	Igniter Circuit Malfunction (No.2)

DTC	P1310	Igniter Circuit Malfunction (No.3)

DTC	P1315	Igniter Circuit Malfunction (No.4)

DTC	P1320	Igniter Circuit Malfunction (No.5)

DTC	P1325	Igniter Circuit Malfunction (No.6)

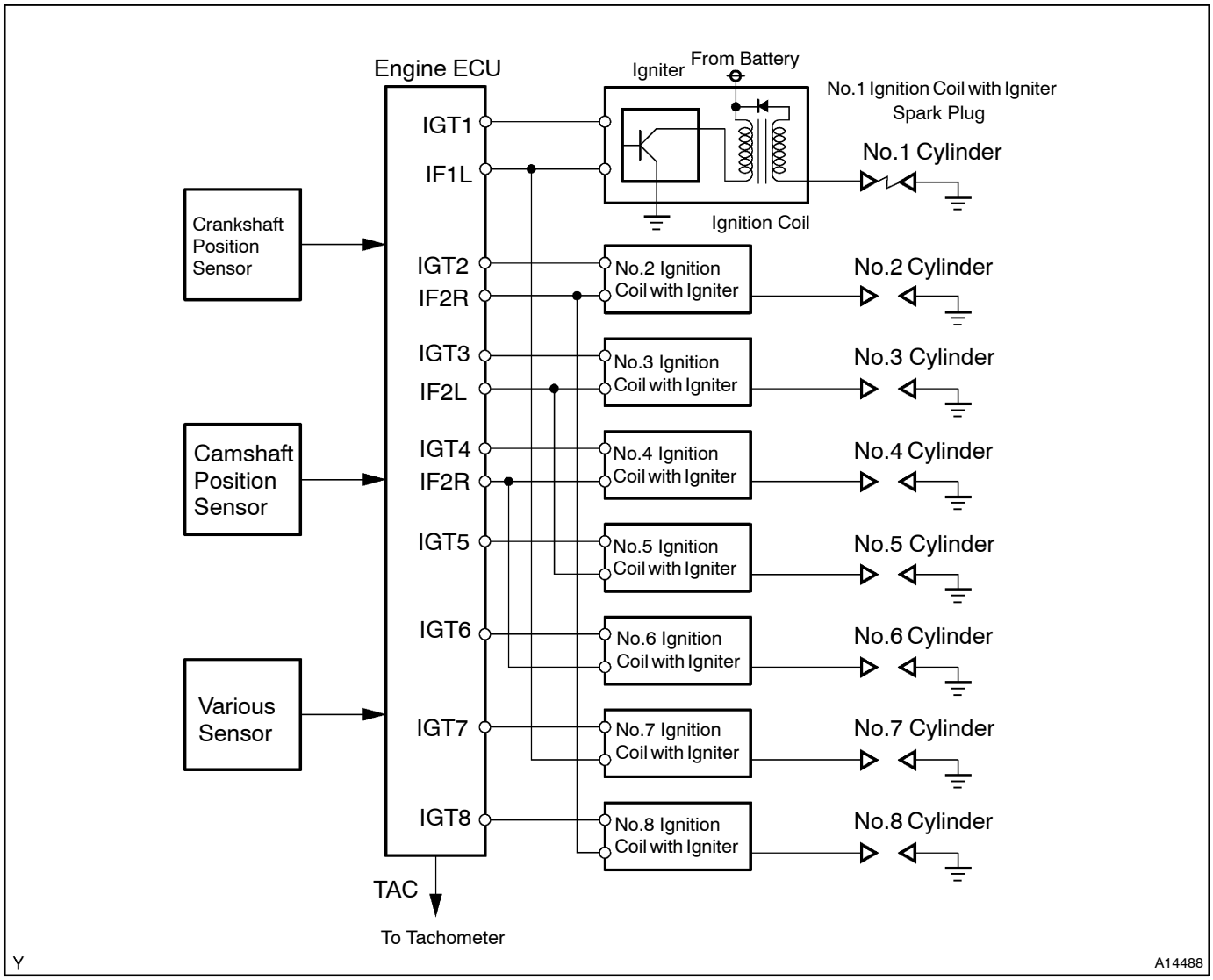
DTC	P1330	Igniter Circuit Malfunction (No.7)

DTC	P1340	Igniter Circuit Malfunction (No.8)

CIRCUIT DESCRIPTION

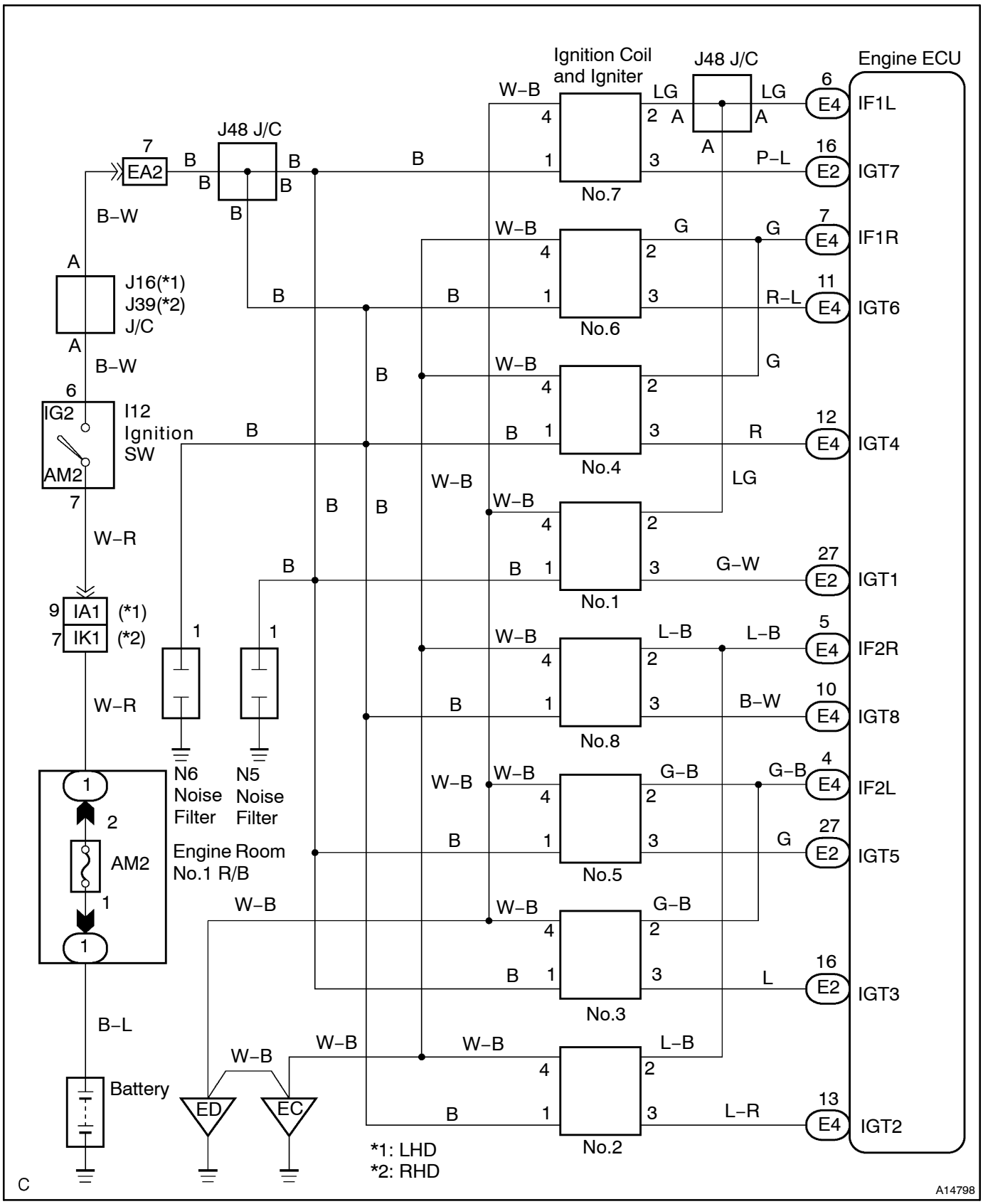
A DIS (Direct Ignition System) has been adopted. The DIS improves the ignition timing accuracy, reduces high–voltage loss, and enhances the the overall reliability of the ignition system by eliminating the distributor. The DIS is a 1–cylinder ignition system which ignites one cylinder with one ignition coil. In the 1–cylinder ignition system, the one spark plug is connected to the end of the secondary winding. High voltage generated in the secondary winding is applied directly to the spark plug. The spark of the spark plug pass from the center elecrtode to the ground electrode.

The engine ECU determines ignition timing and outputs the ignition signals (IGT) for each cylinder. Based on IGT signals, the power transistors in the igniter cuts off the current to the primary coil in the ignition coil is supplied to the spark plug that are connected to the end of the secondary coil. At the same time, the igniter also sends an ignition confirmation signal (IGF) as a fail–safe measure to the engine ECU.



DTC No.	DTC Detecting Condition	Trouble Area
P1300 P1305 P1310 P1315 P1320 P1325 P1330 P1340	No IF signal to engine ECU while engine is running	• Open or short in IF1L, IF2L, IF1R or IF2R and IGT1 – 8 circuit from ignition coil with igniter • No.1 – No.8 ignition coil with igniter • Engine ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTC P1300 is displayed, check No.1 ignition coil with igniter circuit.
- If DTC P1305 is displayed, check No.2 ignition coil with igniter circuit.
- If DTC P1310 is displayed, check No.3 ignition coil with igniter circuit.
- If DTC P1315 is displayed, check No.4 ignition coil with igniter circuit.
- If DTC P1320 is displayed, check No.5 ignition coil with igniter circuit.
- If DTC P1325 is displayed, check No.6 ignition coil with igniter circuit.
- If DTC P1330 is displayed, check No.7 ignition coil with igniter circuit.
- If DTC P1340 is displayed, check No.8 ignition coil with igniter circuit.
- If DTC P1300 and P1330 are output simultaneously, IF1L circuit may be open or short.
- If DTC P1315 and P1325 are output simultaneously, IF1R circuit may be open or short.
- If DTC P1310 and P1320 are output simultaneously, IF2L circuit may be open or short.
- If DTC P1305 and P1340 are output simultaneously, IF2R circuit may be open or short.
- Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

1	**Check spark plug and spark (See page IG–1).**

NG → **Go to step 4.**

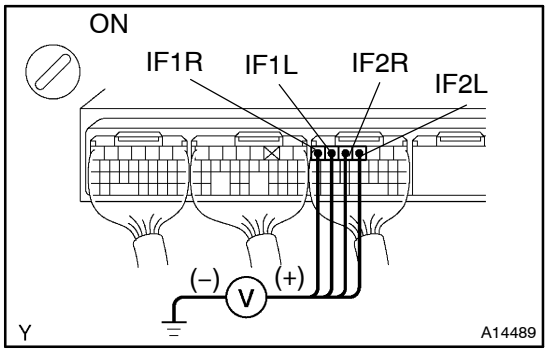
OK

2	**Check for open and short in harness and connector in IF and IGT signal circuit between engine ECU and ignition coil with igniter (See page IN–30).**

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

OK

3	Disconnect ignition coil with igniter connector and check voltage between terminals IF1L, IF2L, IF1R, IF2R of engine ECU connector and body ground.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Disconnect the ignition coil with igniter connector.

(c) Turn the ignition switch ON.

CHECK:

Measure voltage between terminals IF1L, IF2L, IF1R, IF2R of the engine ECU connector and body ground.

OK:

Voltage: 4.5 – 5.5 V

OK	Replace ignition coil with igniter.

NG

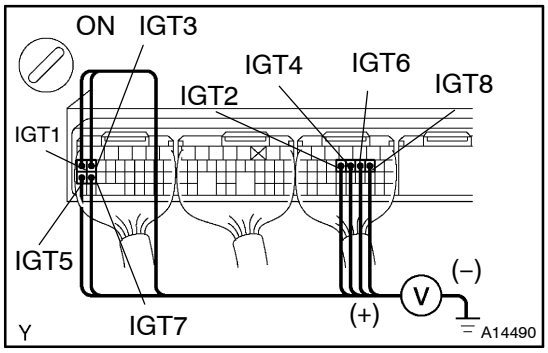
Check and replace engine ECU (See page IN–30).

4	Check for open and short in harness and connector in IGT signal circuit between engine ECU and ignition coil with igniter (See page IN–30).

NG	Repair or replace harness or connector.

OK

5	Check voltage between terminals IGT1 – 8 of engine ECU connector and body ground.



PREPARATION:

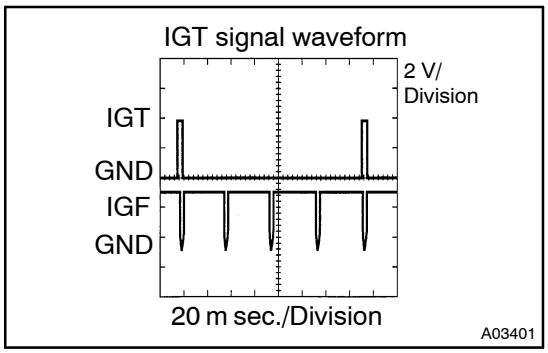
Remove the engine ECU hood and cover (See page FI–74).

CHECK:

Measure voltage between terminals IGT1 – 8 of the engine 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 cranking or idling, check waveform between terminals IGT1 – 8 and E1 of the engine ECU connector.

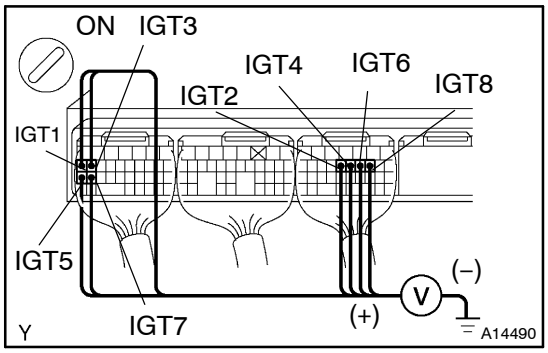
HINT:

Correct waveform appears as sohwn, with rectangle waves.

NG	Check and replace engine ECU (See page IN–30).

OK

6	Disconnect ignition coil with igniter connector and check voltage between terminals IGT1 – 8 of engine ECU connector and body ground.



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Disconnect the ignition coil with igniter connector.

CHECK:

Measure voltage between terminals IGT1 – 8 of the engine ECU connector and body ground when engine is cranked.

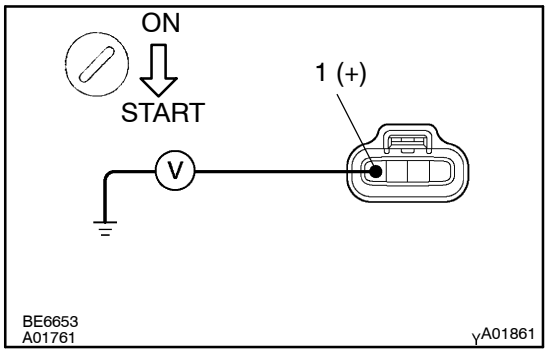
OK:

Voltage: More than 0.1 V and less than 4.5 V

NG	Check and replace engine ECU (See page IN–30).

OK

7	Check ignition coil with igniter power source circuit.



PREPARATION:

Disconnect the ignition coil with igniter connector.

CHECK:

Measure voltage between terminal 1 of ignition coil with igniter connector and body ground, when ignition switch is turned to "ON" and "START" position.

OK:

Voltage: 9 – 14 V

OK	Repair ignition coil with igniter power source circuit.

NG

8	Check for open and short in harness and connector between ignition switch and ignition coil with igniter (See page IN–30).

NG	Repair or replace harness or connector.

OK

Replace ignition coil with igniter.

DI64E–05

DTC	P1335	Crankshaft Position Sensor Circuit Malfunction (During engine running)

CIRCUIT DESCRIPTION

Refer to DTC P0335 on page DI–144.

DTC No.	DTC Detecting Condition	Trouble Area
P1335	No crankshaft position sensor signal to engine ECU with engine speed 1,000 rpm or more	• Open or short in crankshaft position sensor circuit • Crankshaft position sensor • Crankshaft timing pulley • Engine ECU

WIRING DIAGRAM

Refer to DTC P0335 on page DI–144.

INSPECTION PROCEDURE

HINT:

Refer to DTC P0335 on page DI–144.

DI2UR–02

DTC	P1345	VVT Sensor Circuit Malfunction (Bank 1)

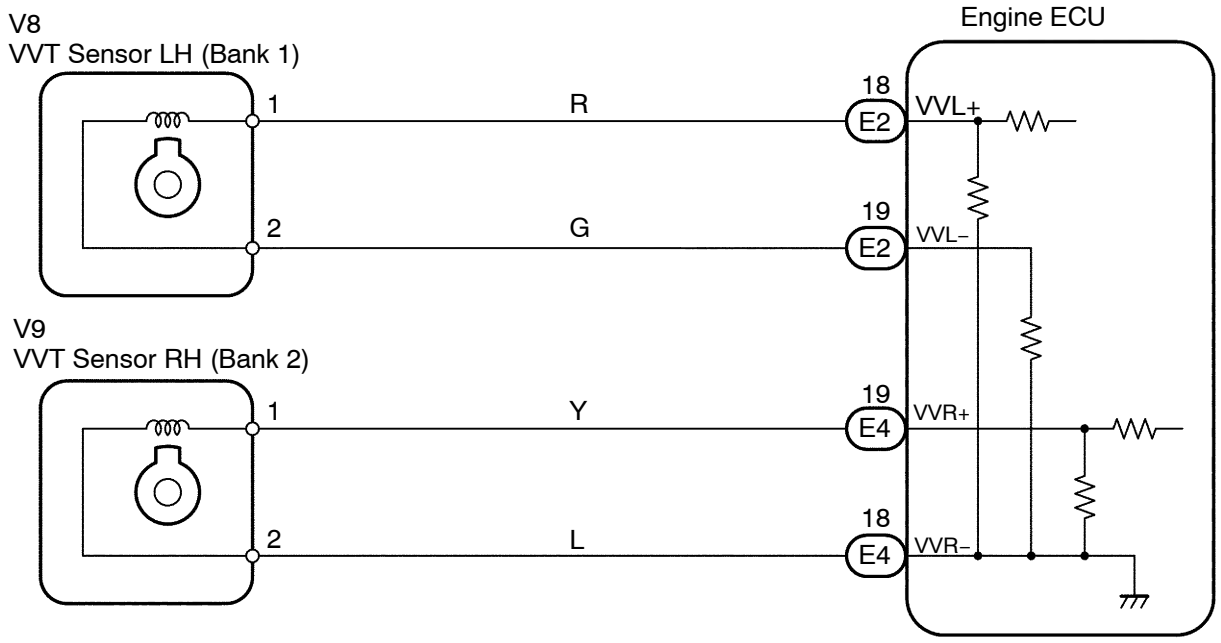
DTC	P1350	VVT Sensor Circuit Malfunction (Bank 2)

CIRCUIT DESCRIPTION

VVT sensor (VVL or VVR signal) consist of a signal plate and pickup coil.
The VVL or VVR signal plate has 1 tooth on its outer circumference and is mounted on the intake camshafts. When the camshafts rotate, the protrusion on the signal plate and the air gap on the pickup coil change, causing fluctuations in the magnetic field and generating an electromotive force in the pickup coil.
The actual camshaft angle is detected by the VVT sensor and it provides feedback to the engine ECU to control the intake valve timing in response to during condition.

DTC No.	DTC Detecting Condition	Trouble Area
P1345 P1350	No VVT sensor signal to engine ECU during cranking at 4 sec. or more	• Open or short in VVT sensor circuit • VVT sensor • Engine ECU
	No VVT sensor signal to engine ECU with 5 sec. or more engine speed 600 rpm or more	
	While the crankshaft rotates twice, VVT sensor signal will be input to engine ECU 5 times.	

WIRING DIAGRAM



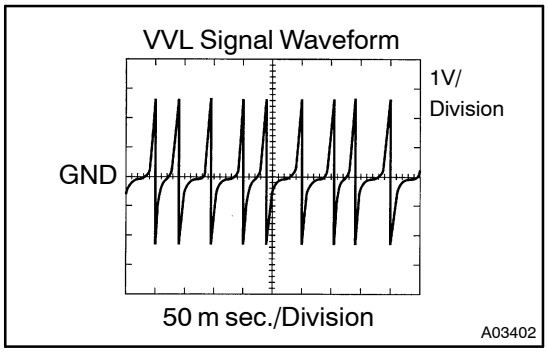
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INSPECTION PROCEDURE

HINT:

- If DTC P1345 is dysplayed, check left bank VVT sensor.
- If DTC P1350 is dysplayed, check right bank VVT sensor.
- Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

1	**Check resistance of VVT sensor (See page FI–70).**



Reference: INSPECTION USING OSCILLOSCOPE

During idling, check between terminals VVL+ and VVL–, VVR+ and VVR– of the engine ECU connector.

HINT:

- The correct waveform is as shown.
- The waveform frequency is shortened as the engine speed becomes higher.

NG → **Replace VVT sensor.**

OK

2	**Check for open and short in harness and connector between engine ECU and VVT sensor (See page IN–30).**

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

OK

3	**Inspect sensor installation.**

NG → **Tighten sensor.**

OK

Check and replace engine ECU (See page IN–30).

DI1MB–12

DTC	P1346	VVT Sensor/Camshaft Position Sensor Circuit Range/Performance Problem (Bank 1)

DTC	P1351	VVT Sensor/Camshaft Position Sensor Circuit Range/Performance Problem (Bank 2)

CIRCUIT DESCRIPTION

Refer to DTCs P1345 and P1350 on page DI–179.

DTC No.	Detection Item	Trouble Area
P1346	Deviation in crankshaft position sensor signal and VVT sensor 1 signal (2 trip detection logic)	• Mechanical system (Jumping teeth of timing belt, belt stretched) • Engine ECU
P1351	Deviation in crankshaft position sensor signal and VVT sensor 2 signal (2 trip detection logic)	

WIRING DIAGRAM

Refer to DTCs P1345 and P1350 on page DI–179.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand–held tester or OBD scan tool. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Check valve timing (Check for loose and jumping teeth of timing belt) (See page EM–22).**

NG → **Adjust valve timing (Repair or replace timing belt).**

OK

Check and replace engine ECU (See page IN–30).

DI2US–02

DTC	P1349	VVT System Malfunction (Bank 1)

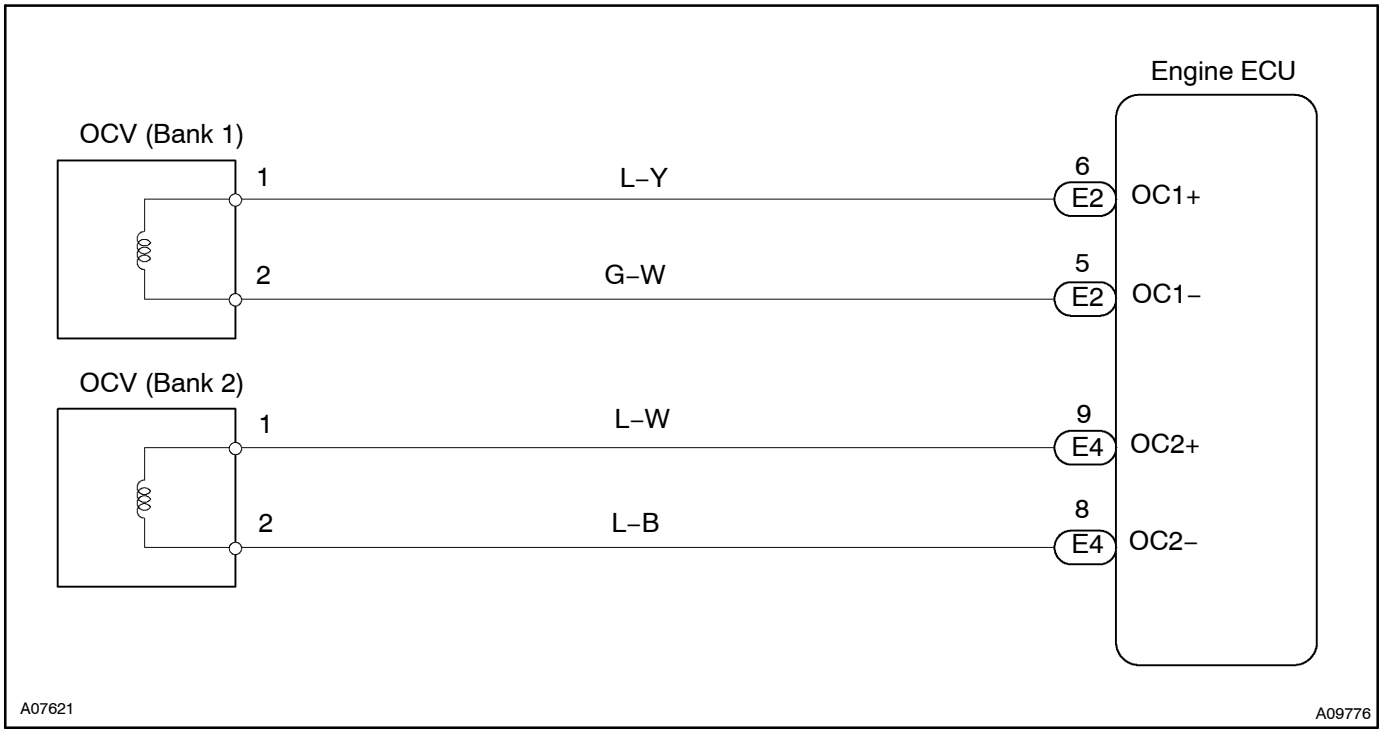
DTC	P1354	VVT System Malfunction (Bank 2)

CIRCUIT DESCRIPTION

VVT system controls the intake valve timing to proper timing in response to driving condition.
engine ECU controls OCV (Oil Control Valve) to make the intake valve timing properly, and, oil pressure controlled with OCV is supplied to the VVT controller, and then, VVT controller changes relative position between the camshaft and the crankshaft.

DTC No.	DTC Detecting Condition	Trouble Area
P1349 P1354	Condition (a) or (b) continues for after the engine is warmed up and engine speed at 400 ~ 4,000 rpm : (a) Valve timing does not change from of current valve timing (b) Current valve timing is fixed.	• Valve timing • Oil control valve • VVT controller assembly • Engine ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTC P1349 is displayed, check left bank VVT system circuit.
- If DTC P1354 is displayed, check right bank VVT system circuit.
- Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

When using hand–held tester:

1	**Check valve timing (See page EM–22).**

NG → **Repair valve timing.**

OK

2	**Check operation of OCV.**

PREPARATION:

(a) Start the engine and warmed it up.

(b) Connect the hand–held tester and select VVT from ACTIVE TEST menu.

CHECK:

Check the engine speed when operate the OCV by the hand–held tester.

OK:

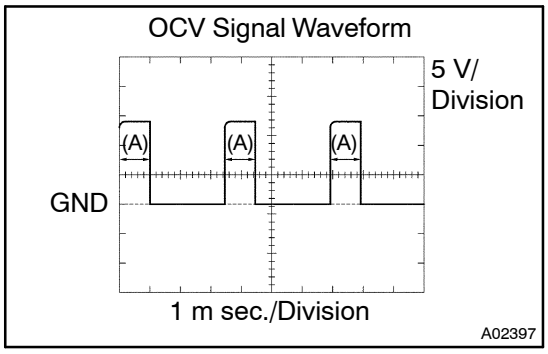
OCV is OFF:
Normal engine speed
OCV is ON:
Rough idle or engine stall

OK → **VVT system is OK.***

*: DTC P1349 and P1354 are also output after the foreign object is caught in some part of the system in the engine oil and the system returns to normal in a short time. As engine ECU controls so that foreign objects are ejected, there is no problem about VVT. There is also no problem since the oil filter should get the foreign object in the engine oil.

NG

3	Check voltage between terminals OCV+ and OCV– of engine ECU connector.

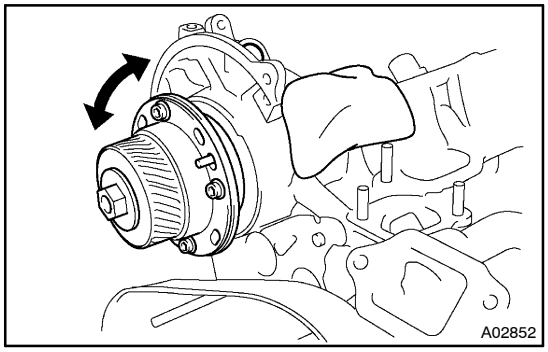


Reference: INSPECTION USING OSCILLOSCOPE
Turn the ignition switch ON, check waveform between terminals OCV+ and OCV– of the engine ECU connector.
HINT:
- The correct waveform is as shown.
- The waveform frequency (A) is lengthened as the engine speed becomes higher.

NG	Check and replace engine ECU (See page IN–30).

OK

4	Check VVT controller assembly.



PREPARATION:
(a) Remove the timing belt (See page EM–15).
(b) Remove the cylinder head cover.
(c) Remove the oil control valve (See page EM–36).
(d) Drain oil into the VVT controller assembly (See page EM–36).

CHECK:
Check whether the oil into VVT controller assembly is drained or not.

OK:
The oil into VVT controller assembly is drained.

NG	Replace VVT controller assembly, and then go to step 5.

OK

5	Check oil control valve (See page FI–43).

NG	Replace oil control valve, and then go to step 6.

OK

6	**Check blockage of oil control valve, oil check valve and oil pipe No.1.**

NG → **Repair or replace.**

OK

7	**Check whether or not DTC P1349/P1354 is stored.**

PREPARATION:

(a) Clear the DTC (See page DI–73).

(b) Perform simulation test.

CHECK:

Check whether or not DTC P1349/P1354 is stored (See page DI–73).

OK:

DTC P1349/P1354 is not stored

OK → **VVT system is OK.***

*: DTC P1349 and P1354 are also output after the foreign object is caught in some part of the system in the engine oil and the system returns to normal in a short time. As engine ECU controls so that foreign objects are ejected, there is no problem about VVT. There is also no problem since the oil filter should get the foreign object in the engine oil.

NG

Replace engine ECU

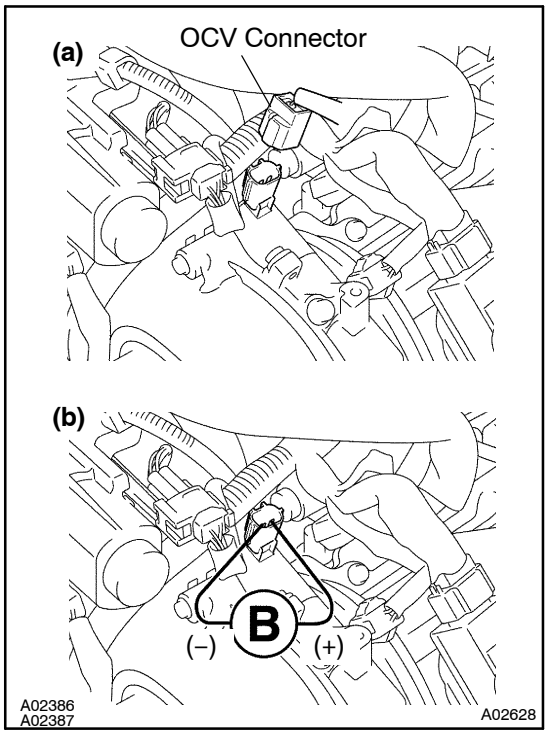
When using OBD scan tool:

1	**Check valve timing (See page EM–22).**

NG → **Repair valve timing.**

OK

2	Check operation of OCV.



PREPARATION:

Start the engine.

CHECK:

(a) Check the engine speed when disconnect the OCV connector.

(b) Check the engine speed when apply battery positive voltage between terminals of OCV.

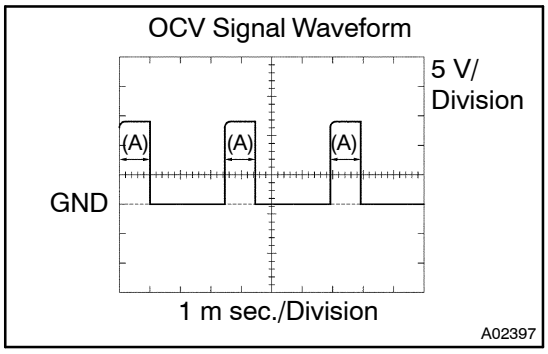
RESULT:

Result	Check (a)	Check (b)
1	Normal engine speed	Rough idle or engine stall
2	Except 1	

2	Go to step 4.

1

3	Check voltage between terminals OCV+ and OCV– of engine ECU connector.



Reference: INSPECTION USING OSCILLOSCOPE
Turn the ignition switch ON, check waveform between terminals OCV+ and OCV– of the engine ECU connector.
HINT:

- The correct waveform is as shown.
- The waveform frequency (A) is lengthened as the engine speed becomes higher.

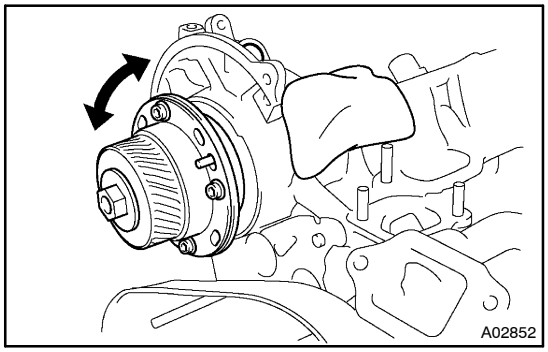
OK	VVT system is OK.*

*: DTC P1349 and P1354 are also output after the foreign object is caught in some part of the system in the engine oil and the system returns to normal in a short time. As engine ECU controls so that foreign objects are ejected, there is no problem about VVT. There is also no problem since the oil filter should get the foreign object in the engine oil.

NG

Check and replace engine ECU (See page IN–30).

4	Check VVT controller assembly.



PREPARATION:
(a) Remove the timing belt (See page EM–15).
(b) Remove the cylinder head cover.
(c) Remove the oil control valve (See page EM–36).
(d) Drain oil into the VVT controller assembly (See page EM–36).

CHECK:
Check whether the oil into VVT controller assembly is drained or not.

OK:
The oil into VVT controller assembly is drained.

NG	Replace VVT controller assembly, and then go to step 5.

OK

5	Check oil control valve (See page FI–43).

NG → Replace oil control valve, and then go to step 6.

OK

6	Check blockage of oil control valve, oil check valve and oil pipe No.1.

NG → Repair or replace.

OK

7	Check whether or not DTC P1349/P1354 is stored.

PREPARATION:

(a) Clear the DTC (See page DI–73).

(b) Perform simulation test.

CHECK:

Check whether or not DTC P1349/P1354 is stored (See page DI–73).

OK:

DTC 59 is not stored

OK → **VVT system is OK.***

*: DTC P1349 and P1354 are also output after the foreign object is caught in some part of the system in the engine oil and the system returns to normal in a short time. As engine ECU controls so that foreign objects are ejected, there is no problem about VVT. There is also no problem since the oil filter should get the foreign object in the engine oil.

NG

Replace engine ECU

DI088–14

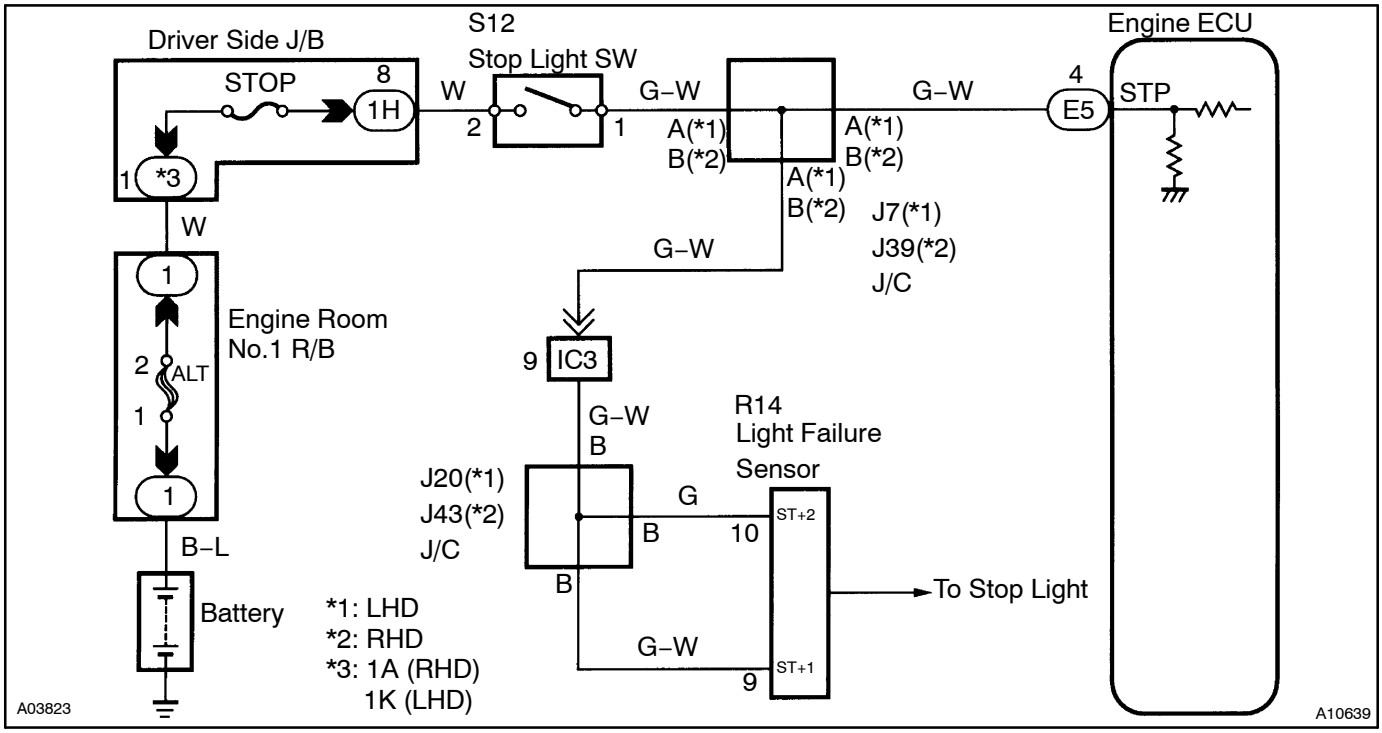
DTC	P1520	Stop Light Switch Signal Malfunction

CIRCUIT DESCRIPTION

This signal is used to detect when the brakes have been applied. The STP signal voltage is the same as the voltage supplied to the stop lights.
The STP signal is used mainly to control the fuel cut–off engine speed (The fuel cut–off engine speed is reduced slightly when the vehicle is braking.).

DTC No.	DTC Detecting Condition	Trouble Area
P1520	The stop light switch does not turn off even once the vehicle is driven (2 trip detection logic)	• Short in stop light switch signal circuit • Stop light switch • Engine ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using a OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

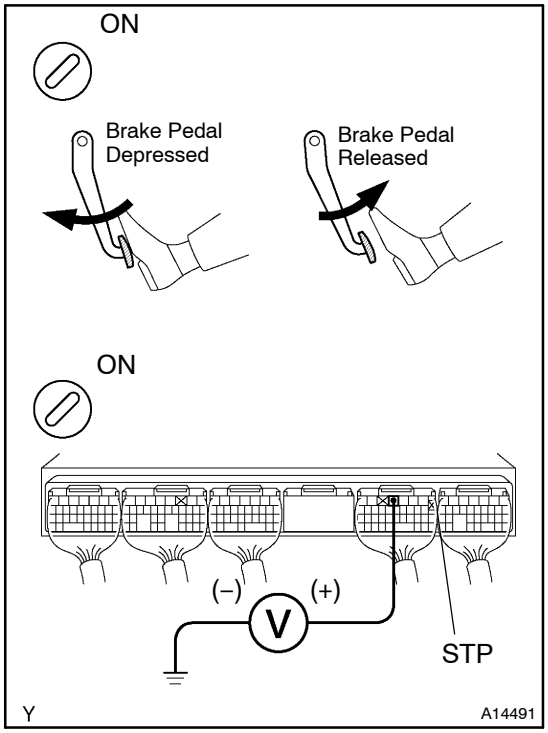
1	**Check operation of stop light.**

CHECK:
Check if the stop lights go on and off normally when the brake pedal is operated and released.

NG → **Check and repair stop light circuit.**

OK

2	**Check STP signal.**



When using hand–held tester:

PREPARATION:

(a) Connect the hand–held tester to the DLC3.
(b) Turn the ignition switch ON and push the hand–held tester main switch ON.

CHECK:

Read the STP signal on the hand–held tester.

OK:

Brake Pedal	STP Signal
Depressed	ON
Released	OFF

When using OBD scan tool:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Check the voltage between terminal STP of the engine ECU connector and body ground.

OK:

Brake Pedal	Voltage
Depressed	7.5 – 14 V
Released	Below 1.5 V

OK → **Check for intermittent problems (See page DI–73).**

NG

3	Check harness and connector between engine ECU and stop light switch (See page IN–30).

NG → Repair or replace harness or connector.

OK →

Check and replace engine ECU (See page IN–30).

DI7JD–03

DTC	P1600	ECM BATT Malfunction

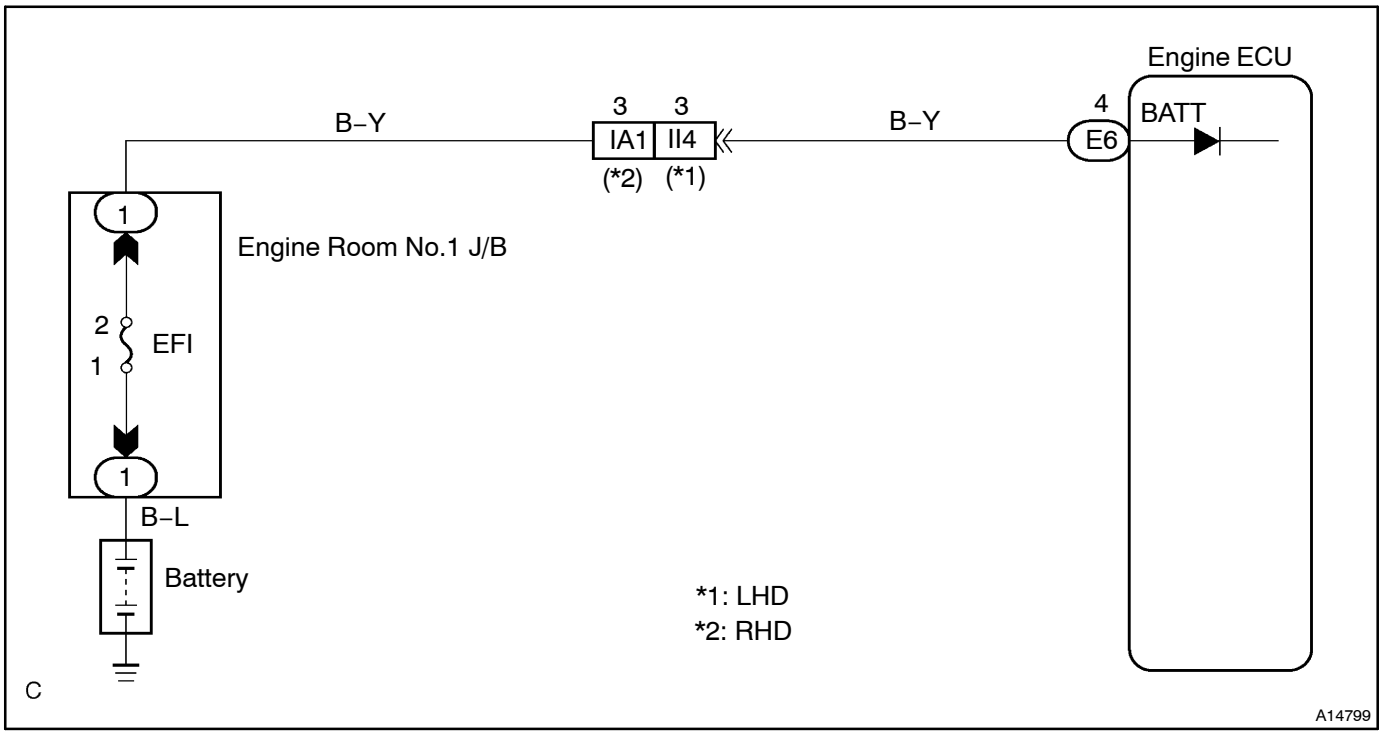
CIRCUIT DESCRIPTION

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

DTC No.	DTC Detecting Condition	Trouble Area
P1600	Open in back up power source circuit	• Open in back up power source circuit • Engine ECU

HINT:
If DTC P1600 appear, the engine ECU does not store another DTC.

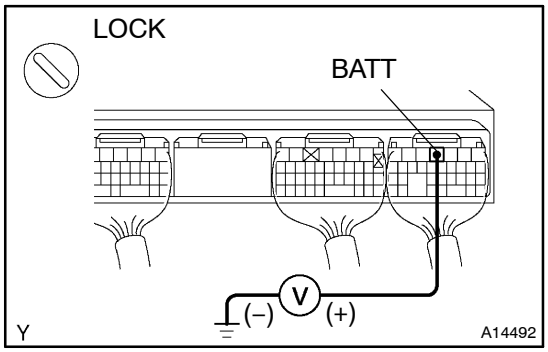
WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using OBD scan tool or hand–held tester. Because free frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

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

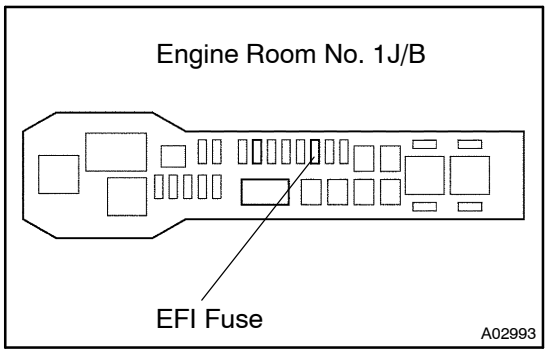


PREPARATION:
Remove the engine ECU hood and cover (See page FI–74).
CHECK:
Measure voltage between terminal BATT of the engine ECU connector and body ground.
OK:
Voltage: 9 – 14 V

OK	Check and replace engine ECU (See page IN–30).

NG

2	Check EFI fuse.



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

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

OK

Check and repair harness or connector between battery, EFI fuse and engine ECU (See page IN–30).

DI2UT–03

DTC	P1633	ECU Malfunction (ETCS Circuit)

*: ETCS trouble code No. is 33.

CIRCUIT DESCRIPTION

Refer to DTC P1129 on page DI–170.

DTC No.	DTC Detecting Condition	Trouble Area
P1633	ECU malfunction	• Engine ECU

INSPECTION PROCEDURE

HINT:

Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

Replace engine ECU.

DI64J–04

DTC	P1645	Body ECU Malfunction

CIRCUIT DESCRIPTION

ECU receives the operating condition (ON/OFF) of A/C from A/C ECU and it also receives the electrical load information from the body ECU.
ECU uses these information to control the engine (idle up, etc.).

DTC No.	DTC Detecting Condition	Trouble Area
P1645	Condition (a) or (b) continues for 5.0 seconds or more: (a) No communication from body ECU (b) No communication from A/C ECU	• Body ECU • A/C ECU • Communication bus

INSPECTION PROCEDURE

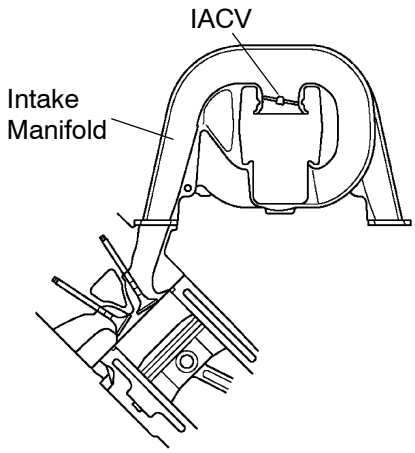
Perform troubleshooting the Multiplex Communication System (See page DI–739).

DI64K–05

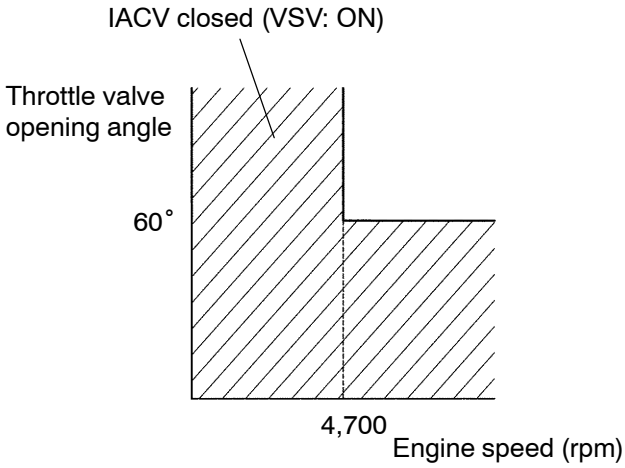
DTC	P1651	VSV for ACIS Circuit Malfunction

CIRCUIT DESCRIPTION

This circuit opens and closes the Intake Air Control Valve (IACV) in response to the engine load in order to increase the intake efficiency (ACIS: Acoustic Control Induction System).
When the engine speed is 4,700 rpm or more and the throttle valve opening angle is 60° or more, the VSV is OFF, so the is IACV open. All the other times, the ECM turns the VSV ON and closes the IACV.



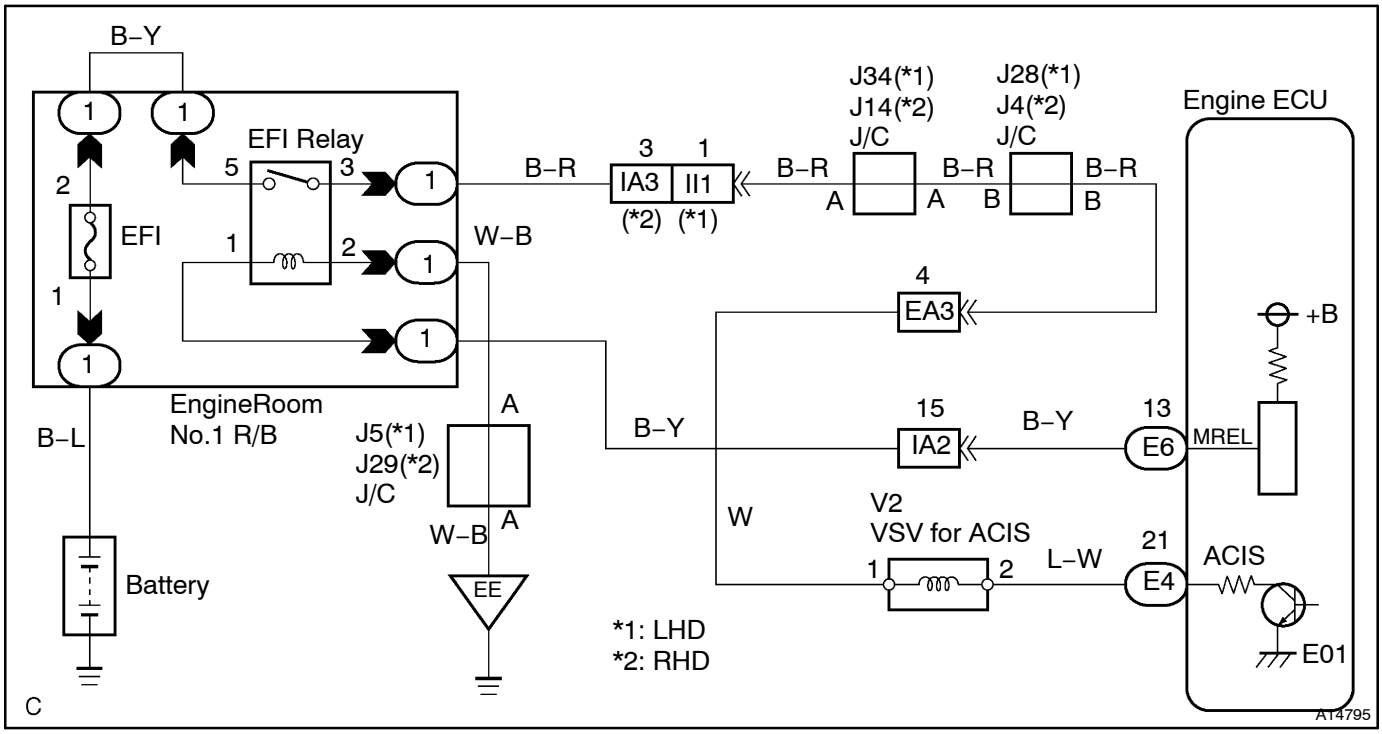
A01995 A15196



A15197

DTC No.	DTC Detecting Condition	Trouble Area
P1651	Proper response to engine ECU command does not occur (2 trip detection logic)	• Open or short in VSV circuit for ACIS • VSV for ACIS • Engine ECU

WIRING DIAGRAM



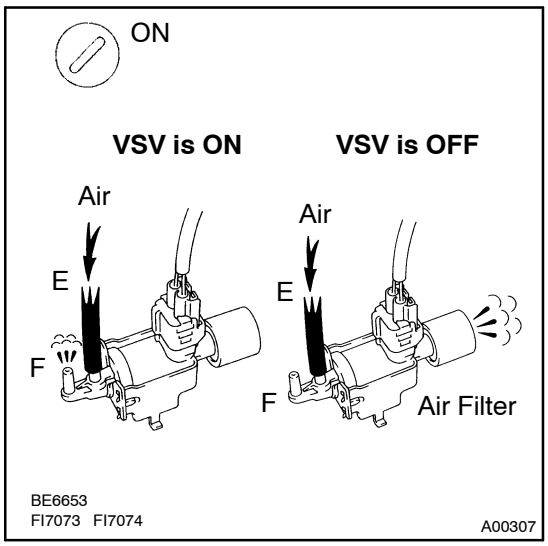
INSPECTION PROCEDURE

HINT:

Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

When using hand–held tester:

1	**Connect hand–held tester and check operation of VSV for ACIS.**



PREPARATION:

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

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

(c) Select the ACTIVE TEST mode on the hand–held tester.

CHECK:

Check operation of the VSV when VSV is operated by the hand–held tester.

OK:

VSV is ON:
Air from port E flows out through port F.
VSV is OFF:
Air from port E flows out through the air filter.

OK	**Check for vacuum tank (See page FI–59).**

NG

2	**Check VSV for ACIS (See page FI–59).**

NG	**Replace VSV for ACIS.**

OK

3	**Check for open and short in harness and connector between EFI main relay and (Marking: EFI) engine ECU (See page IN–30).**

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

OK

Check and replace engine ECU (See page IN–30).

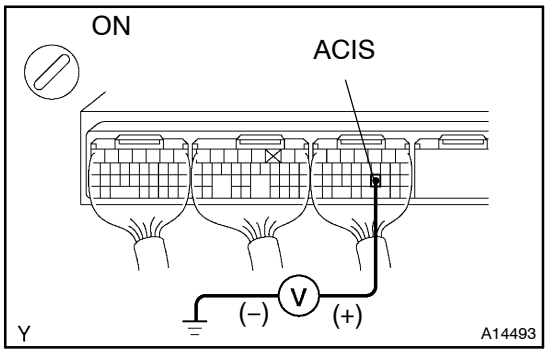
When using OBD scan tool:

1	**Check VSV for ACIS (See page FI–59).**

NG → **Replace VSV for ACIS.**

OK

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



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminal ACIS of the engine ECU connector and body ground.

OK:

Voltage: 9 – 14 V

NG → **Check for open and short in harness and connector between EFI main relay (Marking: EFI) and engine ECU (See page IN–30).**

OK

Check and replace engine ECU (See page IN–30).

DI2UV–02

DTC	P1656	OCV Circuit Malfunction (bank 1)

DTC	P1663	OCV Circuit Malfunction (bank 2)

CIRCUIT DESCRIPTION

Refer to DTC P1349, P1354 on page DI–182.

DTC No.	DTC Detecting Condition	Trouble Area
P1656 P1663	Open or short in oil control valve circuit	• Open or short in oil control valve circuit • Oil control valve • Engine ECU

WIRING DIAGRAM

Refer to DTC P1349, P1354 on page DI–182.

INSPECTION PROCEDURE

HINT:

- If DTC P1656 dysplayed, check left bank OCV circuit.
- If DTC P1663 dysplayed, check right bank OCV circuit.
- Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

When using hand–held tester:

1	Check OCV circuit.

PREPARATION:

(a) Start the engine and warmed it up.

(b) Connect the hand–held tester and select VVT from ACTIVE TEST menu.

CHECK:

Check the engine speed when operate the OCV by the hand–held tester.

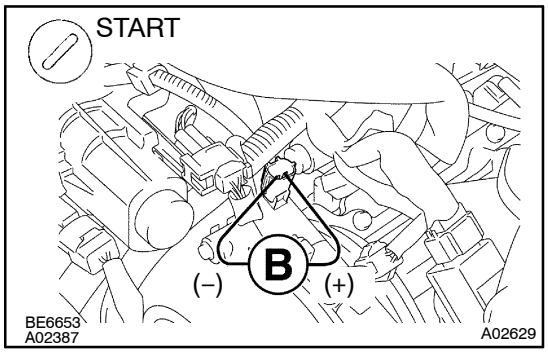
OK:

VVT system is OFF (OCV is OFF):
Normal engine speed
VVT system is ON (OCV is ON):
Rough idle or engine stalled

OK → **Check for intermittent problems (See page DI–73).**

NG

2	**Check operation of OCV.**



PREPARATION:

(a) Start the engine and warmed it up.
(b) Disconnect the OCV connector.
(c) Apply battery positive voltage between terminals of the OCV.

CHECK:

Check the engine speed.

OK:

Rough idle or engine stalled.

NG → **Replace OCV.**

OK

3	**Check voltage between terminals OCV+ and OCV– of engine ECU connector (See page DI–181).**

NG → **Check and replace engine ECU (See page IN–30).**

OK

4	**Check for open and short in harness and connector between OCV and engine ECU (See page IN–30).**

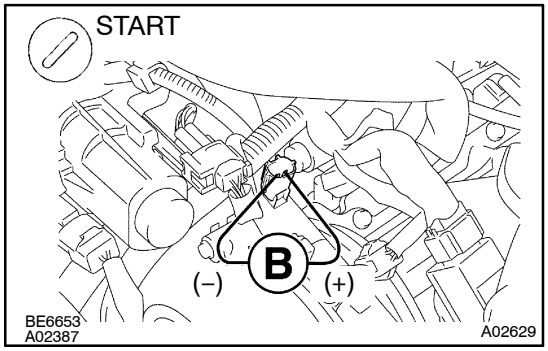
NG → **Repair or replace.**

OK

Check for intermitent problems (See page DI–73).

When using OBD scan tool:

1	**Check operation of OCV.**



PREPARATION:

(a) Start the engine and warmed it up.
(b) Disconnect the OCV connector.
(c) Apply battery positive voltage between terminals of the OCV.

CHECK:

Check the engine speed.

OK:

Rough idle or engine stalled

NG → **Replace OCV.**

OK

2	**Check voltage between terminals OCV+ and OCV– of engine ECU connector (See page DI–181).**

NG → **Check and replace engine ECU (See page IN–30).**

OK

3	**Check for open and short in harness and connector between OCV and engine ECU (See page IN–30).**

NG → **Repair or replace.**

OK

Check for intermitent problems (See page DI–73).

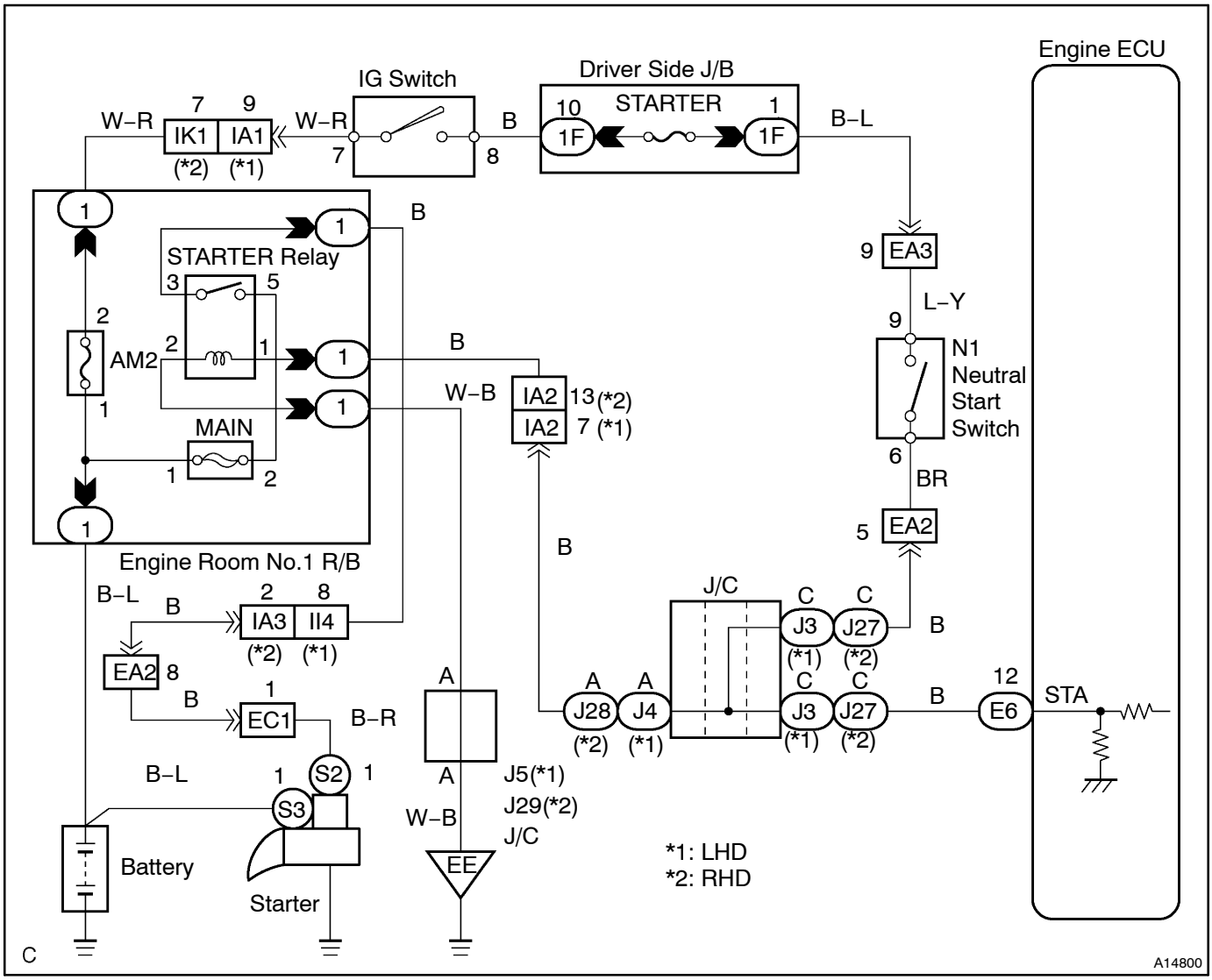
DI85U–01

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 engine ECU. The starter signal id mainly used to increase the fuel injection volume for the starting injection control and after–start injection control.

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–93.

When using hand–held tester:

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

PREPARATION:

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

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

CHECK:

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

OK:

Ignition Switch Position	ON	START
STA signal	OFF	ON

OK → **Proceed to next circuit inspection shown on problem symptoms table (See page DI–93).**

NG

2	**Check for open in harness and connector between engine ECU and starter relay (Marking: STARTER) (See page IN–30).**

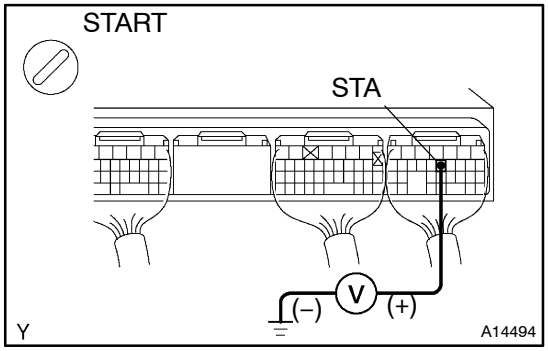
NG → **Repair or replace harness or connector.**

OK

Check and replace engine ECU (See page IN–30).

When using OBD scan tool:

1	**Check voltage between terminal STA of engine ECU connector and body ground.**



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

Measure voltage between terminal STA of the engine ECU connector and body ground, during engine cranking.

OK:

Voltage: 6 V or more

OK	**Proceed to next circuit inspection shown on problem symptoms table (See page DI–93).**

NG

2	**Check for open in harness and connector between engine ECU and starter relay (Marking: STARTER) (See page IN–30).**

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

OK

Check and replace engine ECU (See page IN–30).

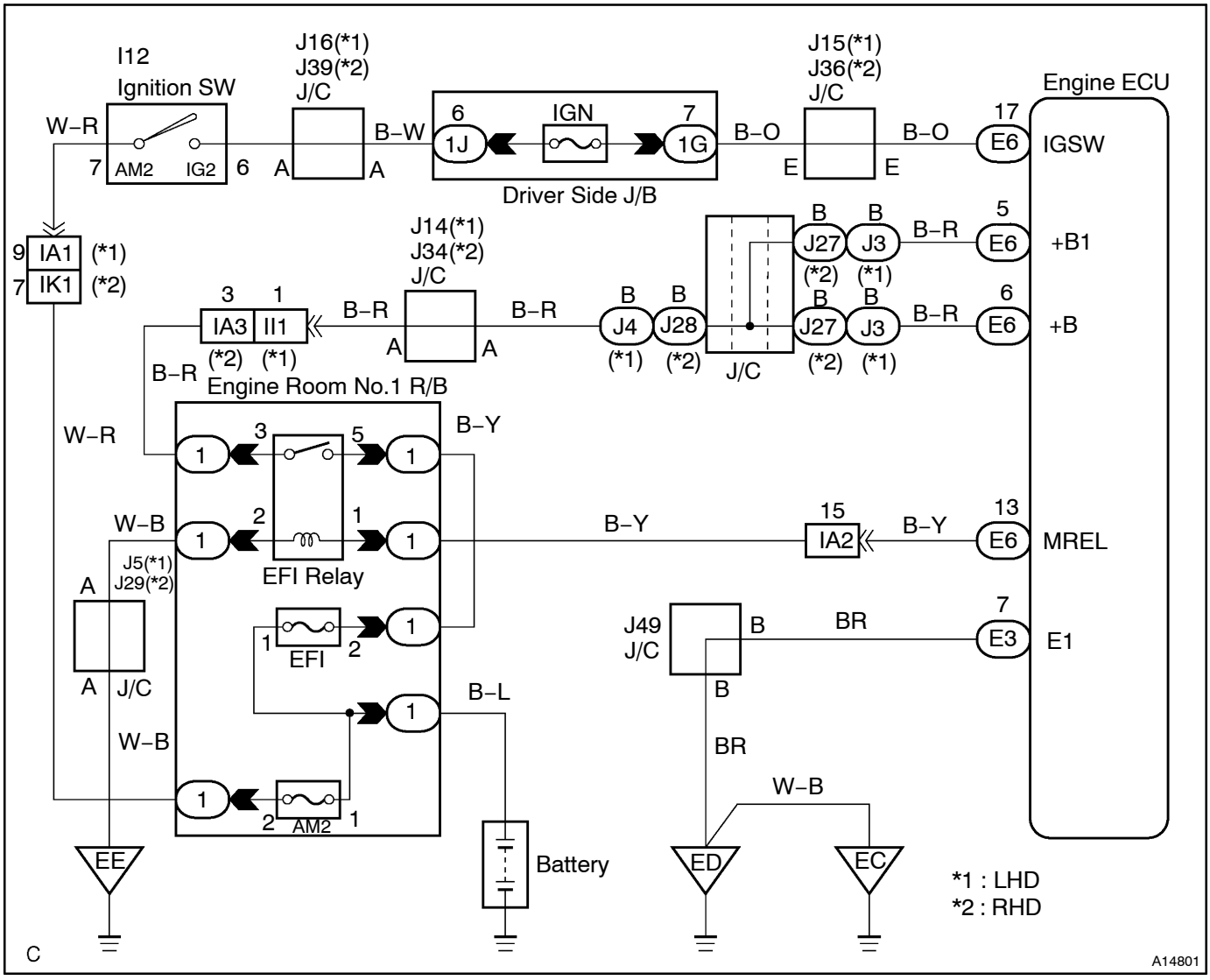
DI2UX–04

ECU Power Source Circuit

CIRCUIT DESCRIPTION

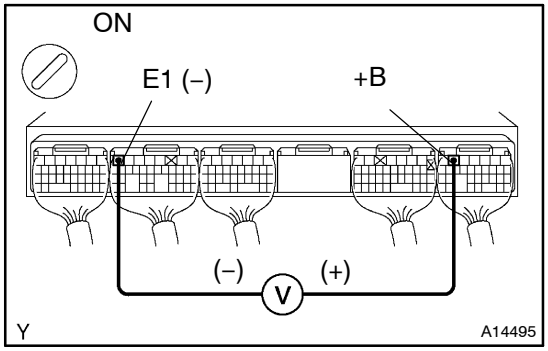
When the ignition switch is turned ON, battery positive voltage is applied to the terminal IGSW of the engine ECU and the EFI main relay (Making: EFI) control circuit in the engine ECU sends a signal to the terminal MREL of the engine ECU switching on the EFI main relay.
This signal causes current to flow to the coil, closing the contacts of the EFI main relay and supplying power to the terminals +B of the engine ECU.
If the ignition switch is turned off, the engine ECU continues to switch on the EFI main relay for a maximum of 2 seconds for the initial setting of the ISC valve.

WIRING DIAGRAM



INSPECTION PROCEDURE

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



PREPARATION:

(a) Remove the engine ECU hood and cover (See page FI–74).

(b) Turn the ignition switch ON.

CHECK:

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

OK:

Voltage: 9 – 14 V

OK	**Proceed to next circuit inspection shown on Problem symptoms table (See page DI–93).**

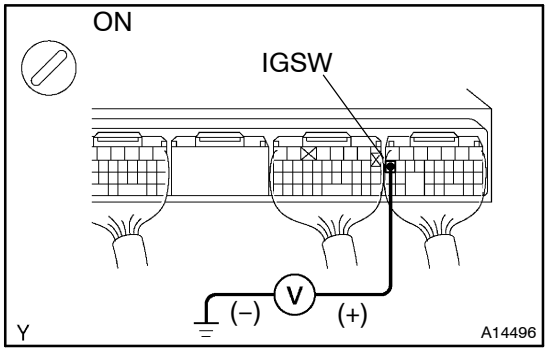
NG

2	**Check for open in harness and connector between terminal E1 of engine ECU and body ground (See page IN–30).**

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

OK

3	**Check voltage between terminal IGSW of engine ECU connector and body ground.**



PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between terminal IGSW of the engine ECU and body ground.

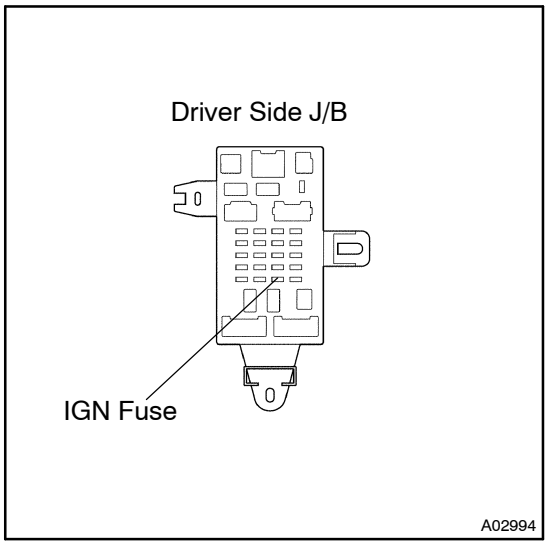
OK:

Voltage: 9 – 14 V

OK	**Go to step 6.**

NG

4	**Check IGN fuse.**



PREPARATION:
Remove the IGN fuse from the instrument panel J/B.
CHECK:
Check continuity of the IGN fuse.
OK:
Continuity

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

OK

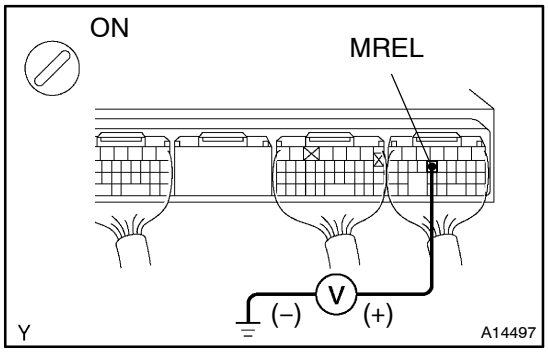
5	**Check ignition switch (See Pub. No. RM588E on page BE–31).**

NG → **Replace ignition switch.**

OK

Check and repair harness and connector between battery and ignition switch, ignition switch and engine ECU.

6	**Check voltage between terminal MREL of engine ECU connector and body ground.**



PREPARATION:
Turn the ignition switch ON.
CHECK:
Measure voltage between terminal MREL of the engine ECU connector and body ground.
OK:
Voltage: 9 – 14 V

NG → **Check and replace engine ECU (See page IN–30).**

OK

7	**Check EFI No.1 fuse of engine room J/B (See page DI–192).**

NG → **Check for short in all harness and components connected to EFI No.1 fuse.**

OK

8	**Check EFI main relay (Marking: EFI) (See page FI–53).**

NG → **Replace EFI main relay (Marking: EFI).**

OK

9	Check for open and short in harness and connector between terminal MREL of engine ECU and body ground (See page IN–30).

NG → Repair and replace harness or connector.

OK →

Check and repair harness or connector between EFI No.1 fuse and battery.

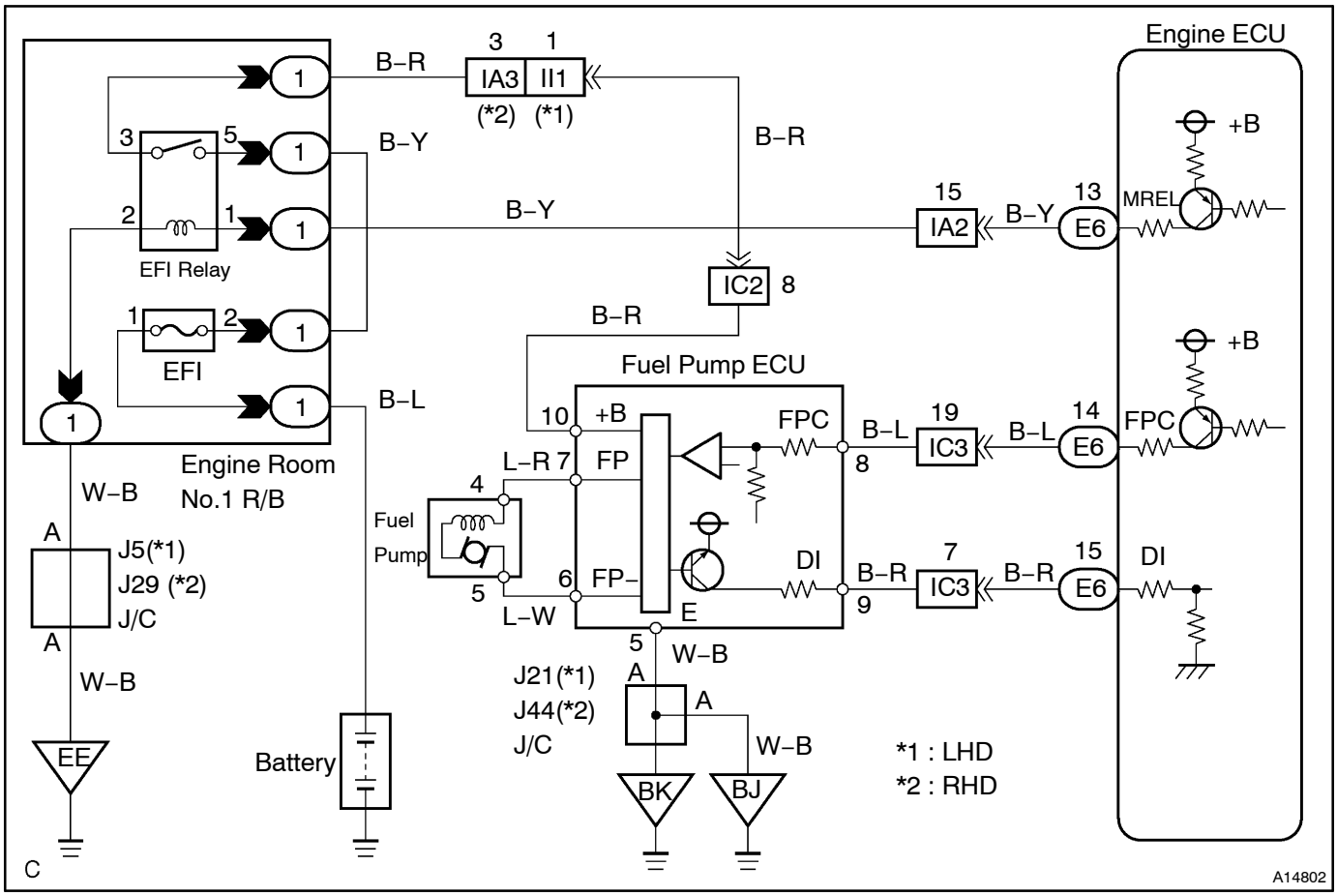
DI2SK–04

Fuel Pump Relay/ECU Circuit Malfunction

CIRCUIT DESCRIPTION

The fuel pump speed is controlled at 3 steps (high speed, medium speed, low speed) by the condition of the engine (starting, idling, light load, heavy load), when the engine starts (STA ON) or heavy loads with engine high speed, the engine ECU sends a Hi signal (about 3.8 V) to the fuel pump ECU (FPC terminal). The fuel pump ECU then outputs Hi voltage (battery positive voltage) to the fuel pump so that the fuel pump operates at high speed. When the heavy loads with engine low spped, the engine ECU sends a Mid signal (about 2.5 V) to the fuel pump ECU (FPC terminal). The fuel pump ECU then outputs Mid voltage (about 10 V) to the fuel pump so that the fuel pump operates at medium speed.
When the idling or light loads, the engine ECU sends a Low signal (about 1.3 V) to the fuel pump ECU (FPC terminal). The fuel pump ECU then outputs Low voltage (about 8.5 V) to the fuel pump so that the fuel pump operates at low speed.

WIRING DIAGRAM



INSPECTION PROCEDURE

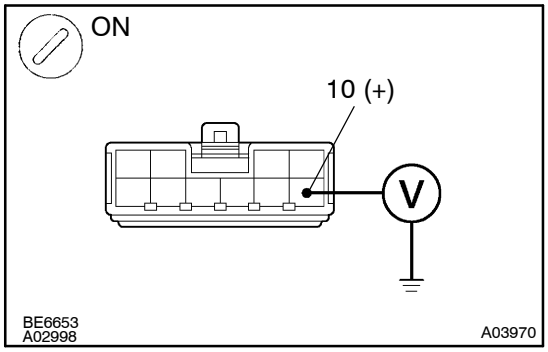
HINT:
Read freeze frame data using OBD scan tool or hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

1	**Connect OBD scan tool or hand–held tester and check operation of fuel pump (See page FI–6).**

OK → **Go to step 7.**

NG

2	**Check voltage of fuel pump ECU power source.**



PREPARATION:
(a) Remove the fuel pump ECU (See page FI–72).
(b) Disconnect the fuel pump ECU connector.
(c) Turn the ignition switch ON.

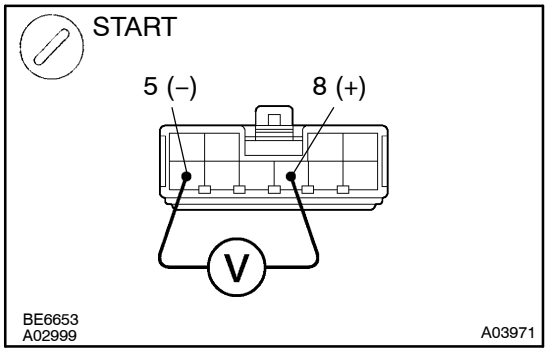
CHECK:
Measure voltage between terminal 10 of fuel pump ECU connector and body ground.

OK:
Voltage: 9 – 14 V

NG → **Check for open and short in harness and connector between EFI main relay and fuel pump engine ECU (See page IN–30).**

OK

3	**Check voltage between terminals 5 and 8 of fuel pump ECU connector.**



PREPARATION:
(a) Remove the fuel pump ECU (See page FI–72).
(b) Disconnect the fuel pump ECU connector.

CHECK:
Measure voltage between terminals 5 and 8 of fuel pump ECU connector when ignition switch is turned to start.

OK:
Voltage: 3.3 – 4.3 V

OK → **Go to step 5.**

NG

4	Check for open and short in harness and connector between terminals FPC of engine ECU and 8 of fuel pump ECU, terminal 5 of fuel pump ECU and body ground (See page IN–30).

NG → Repair or replace harness or connector.

OK →

Check and replace engine ECU (See page IN–30).

5	Check fuel pump (See page FI–6).

NG → Repair or replace fuel pump.

OK →

6	Check for open and short in harness and connector between terminal 7 of fuel pump ECU and fuel pump and terminal 6 of fuel pump ECU and fuel pump (See page IN–30).

NG → Repair or replace harness or connector.

OK →

7	Check for open and short in harness and connector between terminals DI of engine ECU and 9 of fuel pump ECU (See page IN–30).

NG → Repair or replace harness or connector.

OK →

Check and replace engine ECU (See page IN–30).

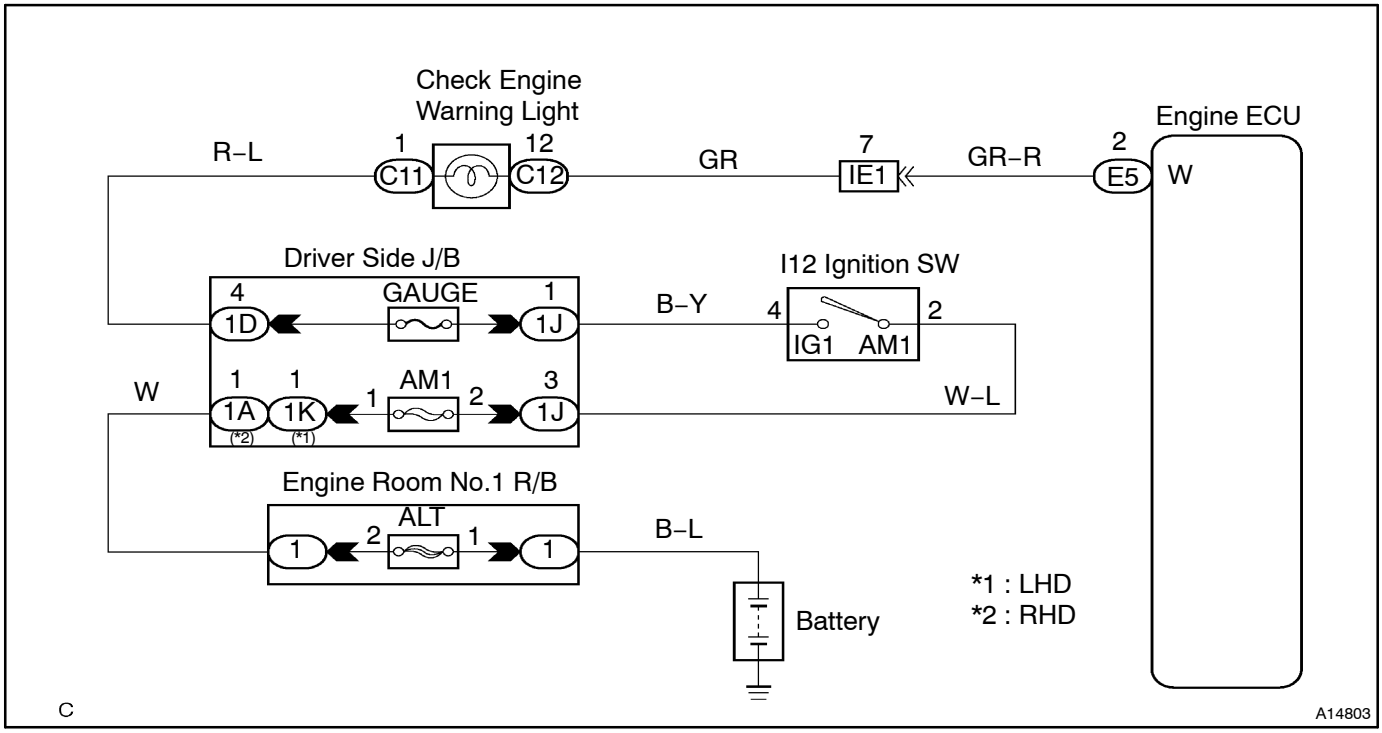
DI6QO–08

Check Engine Warning Light Circuit Malfunction

CIRCUIT DESCRIPTION

If the engine ECU detects trouble, the check engine warning lights up. At this time, the engine ECU records a DTC in memory.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Troubleshoot in accordance with the chart below for each trouble symptom.

Check engine warning light does not light up	Start inspection from step 1 in case of using hand–held tester and start from step 2 in case of not using hand–held tester
Check engine warning light remains on	After inspection of step 3, start inspection from step 4 in case of using hand–held tester and start from step 5 in case of not using hand–held tester

1	**Check operation of check engine warning light.**

PREPARATION:

(a) Connect the hand–held tester to the DLC3.
(b) Turn the ignition switch ON and push the hand–held tester main switch ON.
(c) Switch the hand–held tester from the normal mode to the check mode.

CHECK:

Check if the check engine warning light blinks.

OK:

The check engine warning light blinks.

OK → **Check and replace engine ECU (See page IN–30).**

NG

2	**Check check engine warning light.**

See combination meter troubleshooting (See Pub. No. RM588E on page BE–2).

NG → **Repair or replace bulb or combination meter assembly.**

OK

3	**Check that engine ECU connectors are securely connected to engine ECU.**

NO → **Connect connector to engine ECU.**

YES

Check for open circuit in harness and connector between combination meter and engine ECU (See page IN–30).

4	**Check operation of check engine warning light (See step 1).**

OK → **Check and replace engine ECU (See page IN–30).**

NG

5	**Is DTC output?**

Check DTC on page DI–73.

YES → **Repair circuit indicated by output code.**

NO

Check for short circuit in harness and connector between DLC3 and engine ECU (See page IN–30).

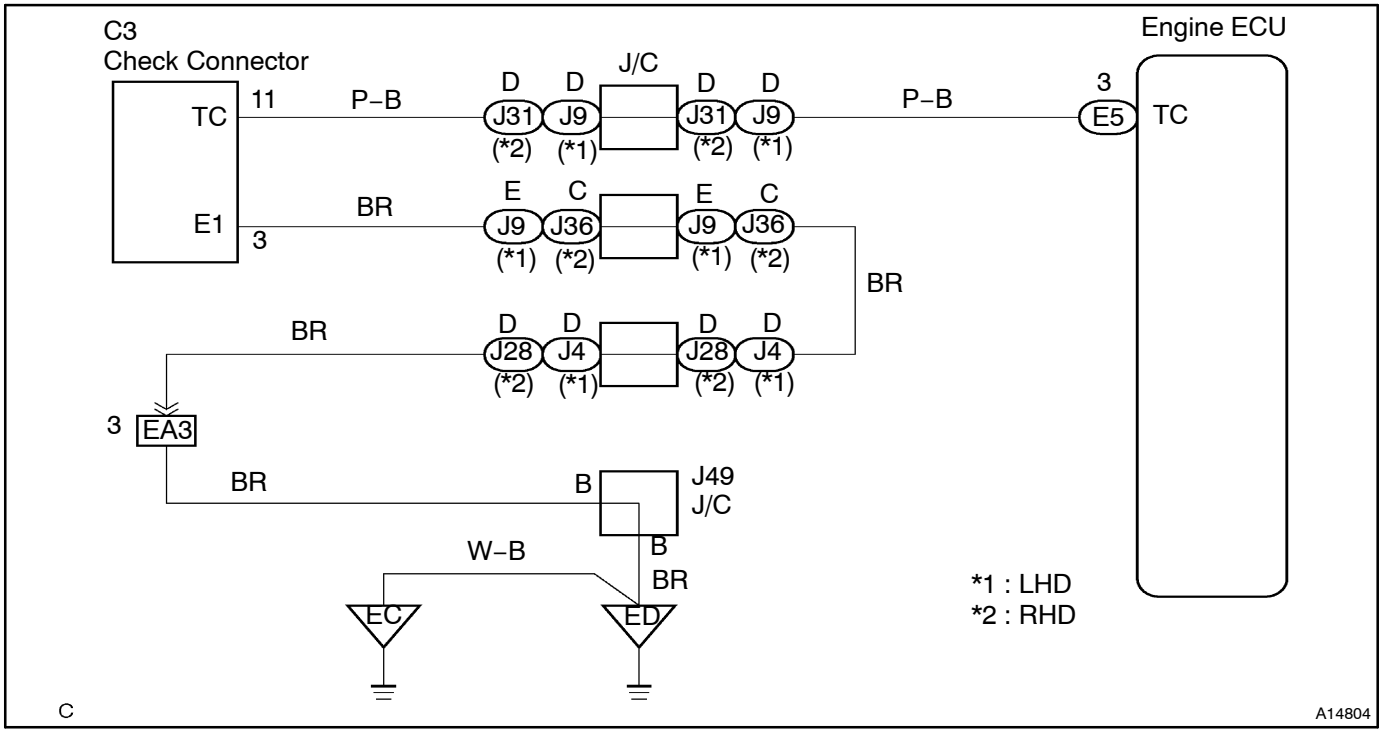
DI6SV–10

TC Terminal Circuit

CIRCUIT DESCRIPTION

Terminal TC and CG are located in the DLC3. When connecting these terminals, DTCs in normal mode or test mode can be read through the check engine warning light in combination meter by flashing it.

WIRING DIAGRAM

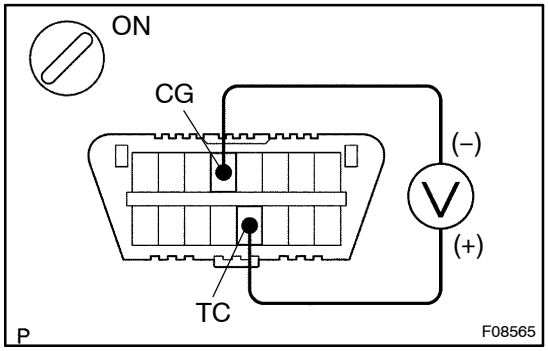


INSPECTION PROCEDURE

HINT:

- Even though terminal TC is not connected with terminal CG, the check engine warning light blinks.
- For the above phenomenon, an open or short in the wire harness, or malfunction inside the engine ECU is the likely cause.

1	**Check voltage between terminals TC and CG of DLC3.**



PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals TC and CG of the DLC3.

OK:

Voltage: 9 – 14 V

OK	**Check and replace engine ECU (See page IN–30).**

NG

2	**Check continuity between terminal CG of DLC3 and body ground.**

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

OK

3	**Check for open and short circuit in harness and connector between engine ECU and DLC3, and DLC3 and body ground (See page IN–30).**

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

OK

Check and replace engine ECU (See page IN–30).

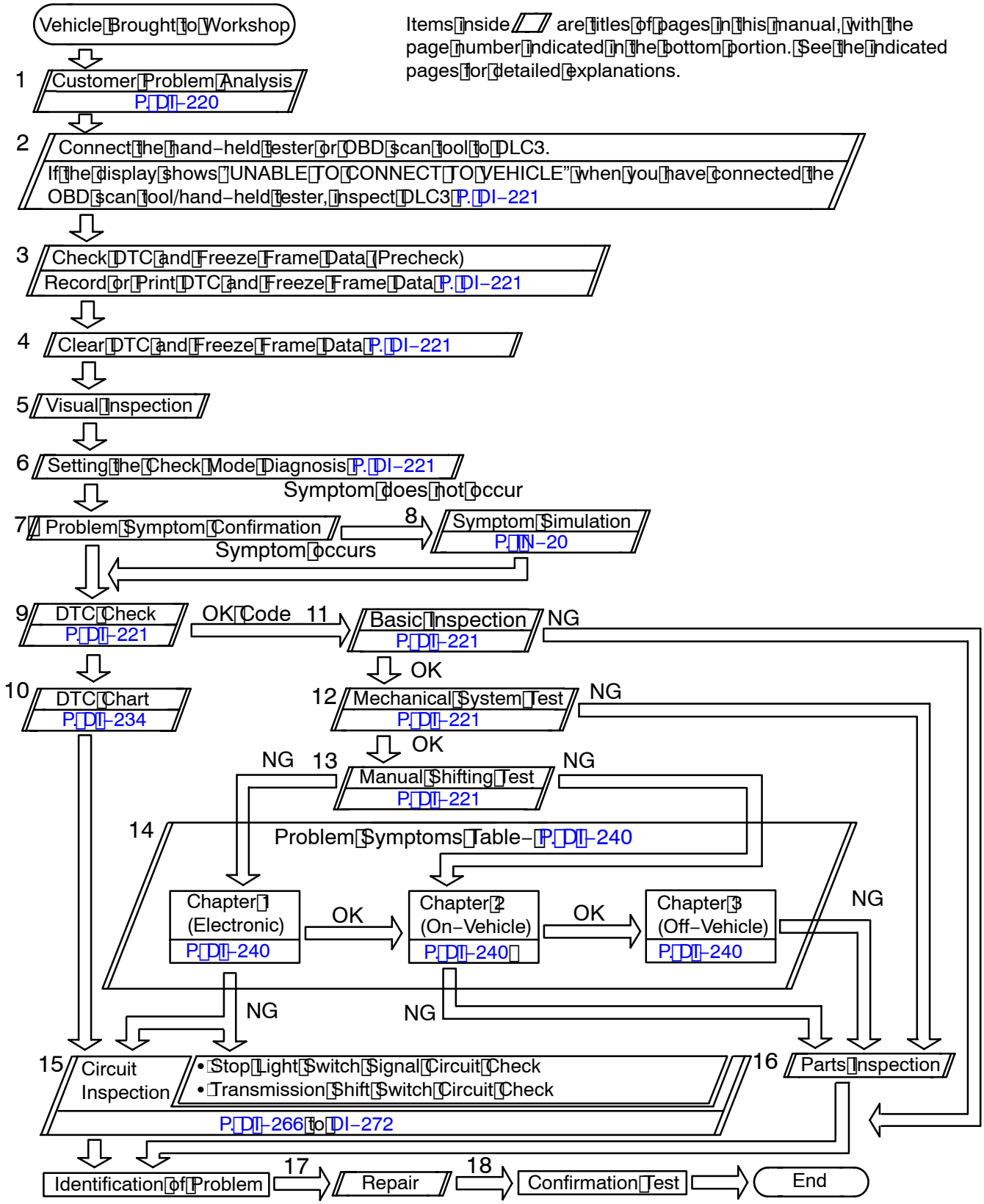
AUTOMATIC TRANSMISSION (2JZ–GE)

HOW TO PROCEED WITH TROUBLESHOOTING

DI61K–03

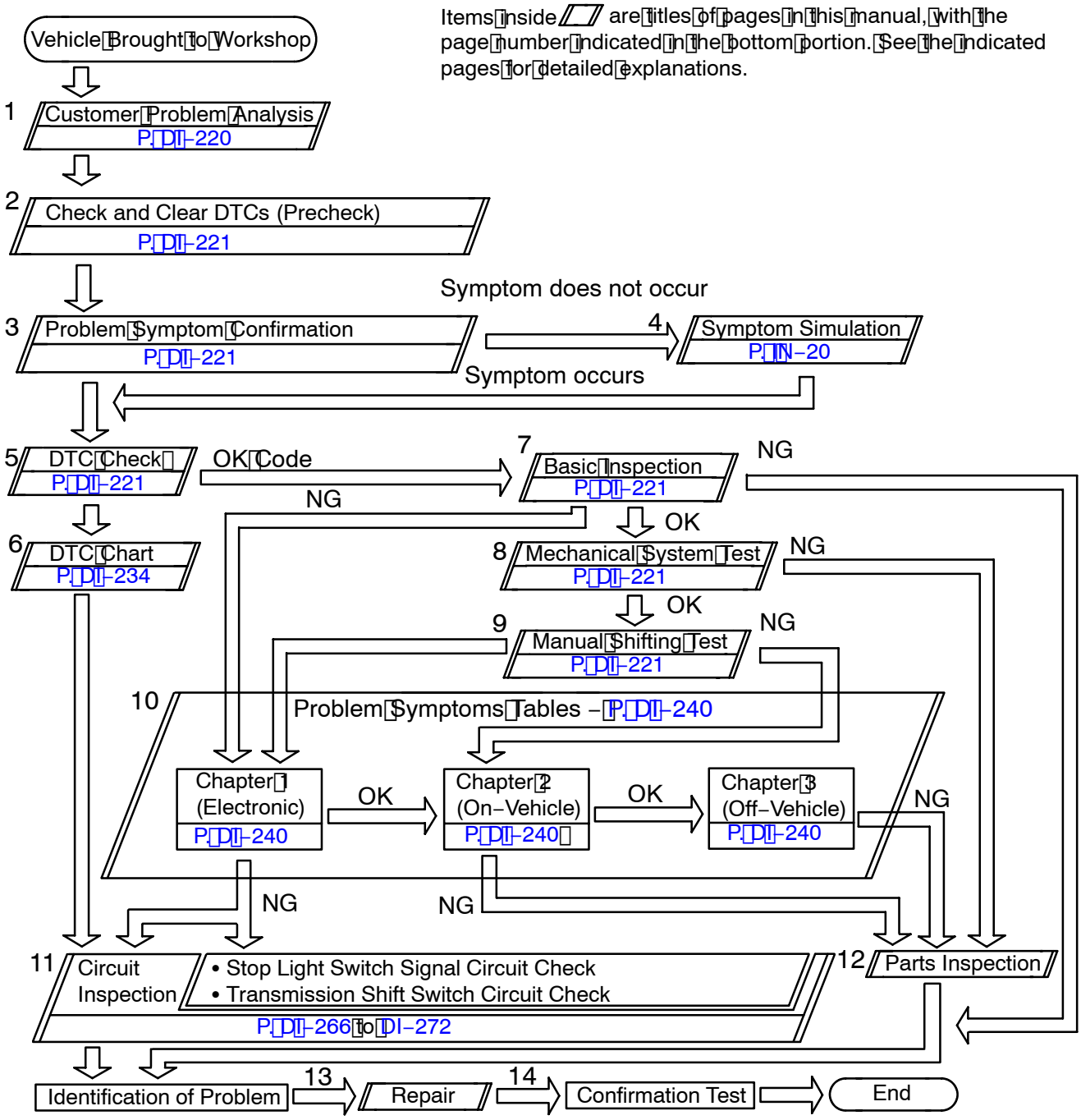
When using hand–held tester, troubleshoot in accordance with the procedure on the following pages.

Items inside // are titles of pages in this manual, with the page number indicated in the bottom portion. See the indicated pages for detailed explanations.



When not using hand–held tester, troubleshoot in accordance with the procedure on the following pages.

Items inside // are titles of pages in this manual, with the page number indicated in the bottom portion. See the indicated pages for detailed explanations.



DI61L–02

CUSTOMER PROBLEM ANALYSIS CHECK

Transmission Control System Check Sheet

Inspector's Name :

Customer's Name		Registration No.	
		Registration Year	/ /
		Frame No.	
Date Vehicle Brought In	/ /	Odometer Reading	km mile

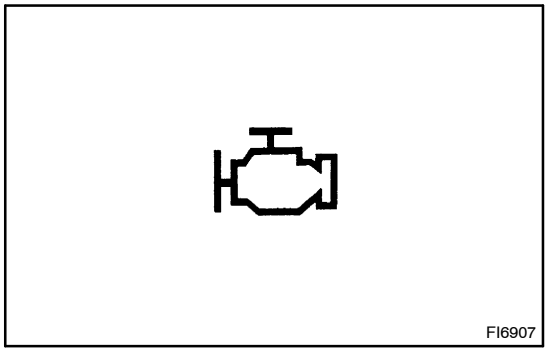
Date Problem Occurred	/ /
How Often Does Problem Occur?	☐ Continuous ☐ Intermittent (times a day)

Symptoms	☐ Vehicle does not move (☐ Any range ☐ Particular range)
	☐ No up–shift (☐ 1st → 2nd ☐ 2nd → 3rd ☐ 3rd → 4th)
	☐ No down–shift (☐ 4th → 3rd ☐ 3rd → 2nd ☐ 2nd → 1st)
	☐ Lock–up malfunction
	☐ Shift point too high or too low
	☐ Harsh engagement (☐ N → D ☐ Lock–up ☐ Any drive range)
	☐ Slip or shudder
	☐ No kick–down
	☐ Others ( )

Check Item	Check Engine Warning Light (CHK ENG)	☐ Normal ☐ Remains ON

DTC Check	1st Time	☐ Normal code ☐ Malfunction code (DTC)
	2nd Time	☐ Normal code ☐ Malfunction code (DTC)

DI87P–01

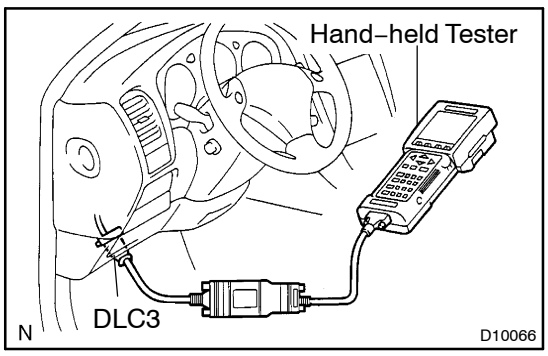

FI6907

PRE–CHECK

1. DIAGNOSIS SYSTEM

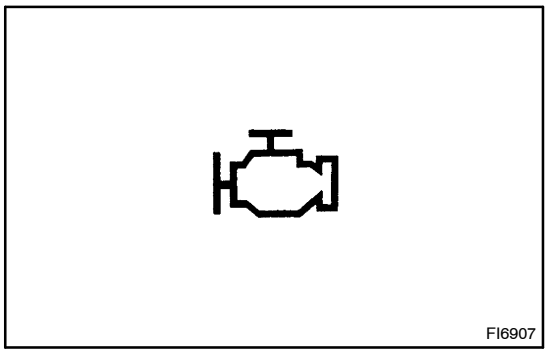
(a) Description for EURO–OBD

- When troubleshooting Euro–OBD vehicles, the only difference from the usual troubleshooting procedure is that you connect to the vehicle the OBD scan tool complying with ISO 15031–4 or hand–held tester, and read off various data output from the vehicle's engine ECU.
  Euro–OBD regulations require that the vehicle's on–board computer lights up the check engine warning light on the instrument panel when the computer detects a malfunction in the emission control system/components or in the power–train control components which affect vehicle emissions, or a malfunction in the computer. In addition to the check engine warning light (CHK ENG) lighting up when a malfunction is detected, the applicable Diagnostic Trouble Codes (DTCs) prescribed by ISO15031–6 are recorded in the engine ECU memory (See page DI–17). 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.



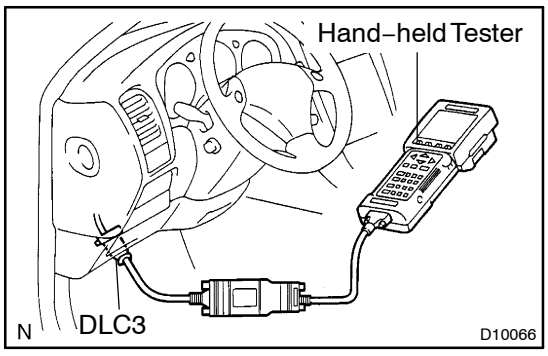
- To check the DTCs, connect the OBD scan tool or hand–held tester to the Data Link Connector 3 (DLC3) on the vehicle. The OBD scan tool or hand–held tester also enables you to erase the DTCs and check freezed frame data and various forms of engine data. (For operating instructions, see the OBD scan tool's instruction book.)
  DTCs include ISO controlled codes and manufacturer controlled codes. ISO controlled codes must be set as prescribed by the ISO, while manufacturer controlled codes can be set freely by the manufacturer within the prescribed limits (See DTC chart on page DI–17).

- The diagnosis system operates in normal mode during normal vehicle use. It also has a check mode for technicians to simulate malfunction symptoms and troubleshoot. Most DTCs use 2 trip detection logic* to prevent erroneous detection, and ensure thorough malfunction detection. By switching the engine ECU to check mode when troubleshooting, the technician can cause the check engine warning light to light up for a malfunction that is only detected once or momentarily (Hand–held tester only) (See step 2).
- *2 trip detection logic:
  When a malfunction is first detected, the malfunction is temporarily 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 light up (2nd trip).
  (However, the ignition switch must be turned OFF between the 1st trip and the 2nd trip.)


FI6907

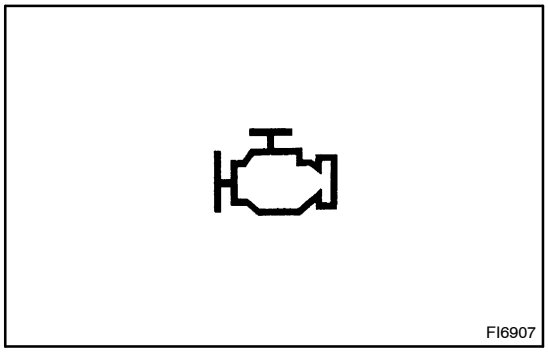
(b) Description for M–OBD

- When troubleshooting Multiplex (M–OBD) vehicles, the only difference from the usual troubleshooting procedure is that you connect the hand–held tester to the vehicle, and read off various data output from the vehicle's Engine & ECT ECU.
  The vehicle's on–board computer lights up the check engine warning light (CHK ENG) on the instrument panel when the computer detects a malfunction in the computer itself or in drive system components. In addition to the CHK ENG lighting up when a malfunction is detected, the applicable DTCs are recorded in the Engine & ECT ECU memory (See page DI–17).
  If the malfunction only occurs in 3 trips, the CHK ENG goes off but the DTCs remain recorded in the Engine & ECT ECU memory.



- To check the DTCs, connect a hand–held tester to DLC3 on the vehicle or read the number of blinks of the CHK ENG when Tc and CG terminals on the DLC3 are connected. The hand–held tester also enables you to erase the DTCs and activate the several actuators and check freeze frame data and various forms of engine data (For instruction book).

- The diagnosis system operates in normal mode during normal vehicle use, and also has a check (test) mode for technicians to simulate malfunction symptoms and perform troubleshooting. Most DTCs use 2–trip detection logic (*) to prevent erroneous detection and ensure thorough malfunction detection. By switching the Engine & ECT ECU to check (test) mode using hand–held tester when troubleshooting, the technician can cause the CHK ENG to light up for a malfunction that is only detected once or momentarily.
- *2 trip detection logic:
  When a logic malfunction is first detected, the malfunction is temporarily stored in the Engine & ECT ECU memory.
  If the same malfunction is detected again during the 2nd test drive, this 2nd detection causes the CHK ENG to light up.


FI6907

2. INSPECT DIAGNOSIS (NORMAL MODE)

(a) Check the CHK ENG.

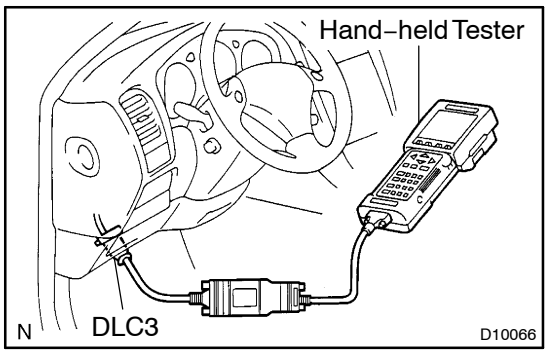
(1) The CHK ENG comes on when the ignition switch is turned ON and the engine is not running.

HINT:
If the CHK ENG does not light up, troubleshoot the combination meter (See page BE–11).

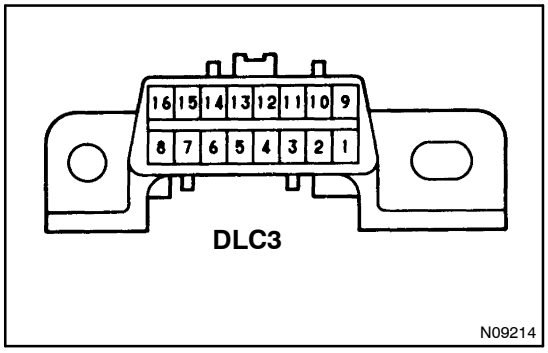
(2) When the engine is started, the CHK ENG should go off. If the light remains on, the diagnosis system has detected a malfunction or abnormality in the system.

(b) Check the DTC (Using hand–held tester).

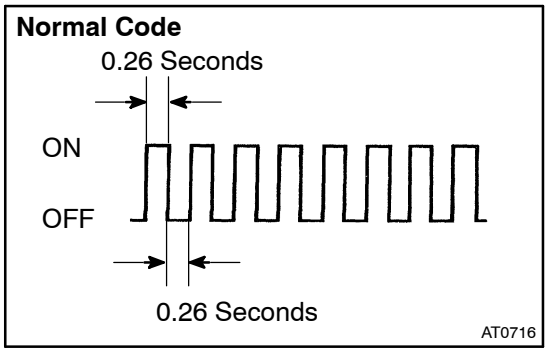
NOTICE:
When the diagnostic system is switched from normal mode to check (test) mode, it erases all DTCs and freeze frame data recorded in normal mode. So before switching modes, always check the DTCs and freeze frame data, and note them down.



(1) Prepare hand–held tester.
(2) Connect the hand–held tester to DLC3 at the lower part of the instrument panel.
(3) Turn the ignition switch ON and turn the hand–held tester switch ON.
(4) Use the hand–held tester to check the DTCs and instructions, see the hand–held tester instruction book.
(5) See page DI–221 to confirm the details of the DTCs.

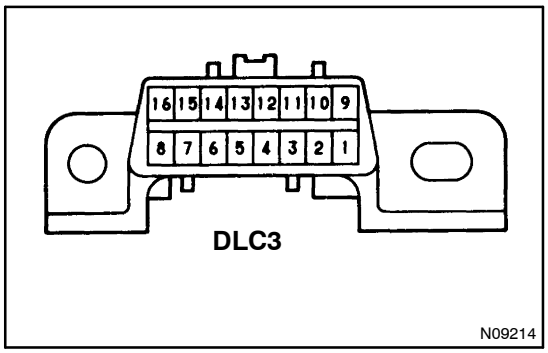


(c) M–OBD only:
Check the DTC (Not using hand–held tester).
(1) Turn the ignition switch ON, but do not start the engine.
(2) Using SST, connect terminals 13 (Tc) and 4 (CG) of DLC3.
SST 09843–18040



(3) Read the DTC indicated by the number of times the CHK ENG blinks.

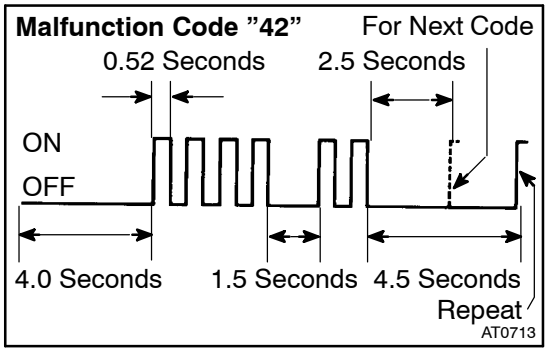
HINT:
If the system is operating normally, the light will blink 2 times per second.



(d) Inspect the DLC3.
(1) The vehicle's Engine and ECT ECU uses ISO 9141–2 (Euro–OBD)/ISO 14230 (M–OBD) for communication. The terminal arrangement of DLC3 complies with SAE J1962 and matches the ISO 9141–2/ISO 14230 format.

Terminal No.	Connection	Voltage or Resistance	Condition
7	Bus ⊕ Line	Pulse generation	During transmission
4	Chassis Ground	↔ Body Ground / 1 Ω or less	Always
16	Battery Positive	↔ Body Ground / 9 – 14 V	Always

HINT:
Only for Euro–OBD:
If your display shows "UNABLE TO CONNECT TO VEHICLE" when you have connected the cable of the OBD scan tool or hand–held tester to DLC3, turned the ignition switch ON and operated the scan tool, there is a problem on the vehicle side or tool side.
- If communication is normal when the tool is connected to another vehicle, inspect DLC3 on the original vehicle.
- If communication is still not possible when the tool is connected to another vehicle, the problem is probably in the tool itself, so consult the Service Department listed in the tool's instruction manual.



(2) The malfunction code is indicated, as shown in the chart on the left (DTC "42" is shown as an example).

HINT:

When 2 or more malfunction codes are stored in memory, the lower–numbered code is displayed first.

3. INSPECT DIAGNOSIS (CHECK MODE)

HINT:

Hand–held tester only: Compared to the Normal mode, the Check mode has high sensing ability to detect malfunctions. Furthermore, the same diagnostic items which are detected in normal mode can also be detected in Check mode.

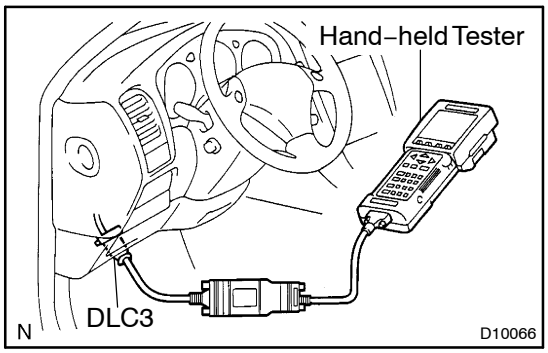
(a) Check the DTC.

(1) Check the initial conditions.

- Battery positive voltage 11 V or more
- Throttle valve fully closed
- Transmission in P range
- Air conditioning switched off

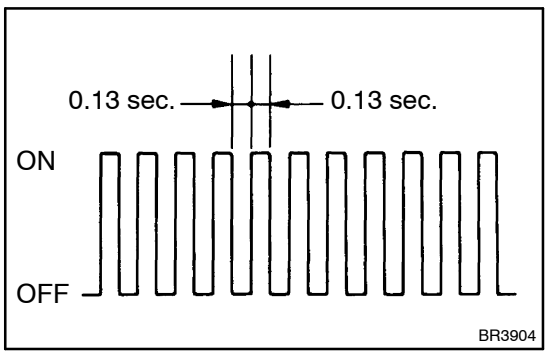
(2) Turn the ignition switch OFF.

(3) Prepare a hand–held tester.



(4) Connect the hand–held tester to DLC3 at the lower part of the instrument panel.

(5) Turn the ignition switch ON and switch the hand–held tester ON.



(6) Switch the hand–held tester from Normal mode to Check mode (Check that the CHK ENG flashes).

(7) Start the engine (CHK ENG goes out after the engine starts).

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

NOTICE:

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

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

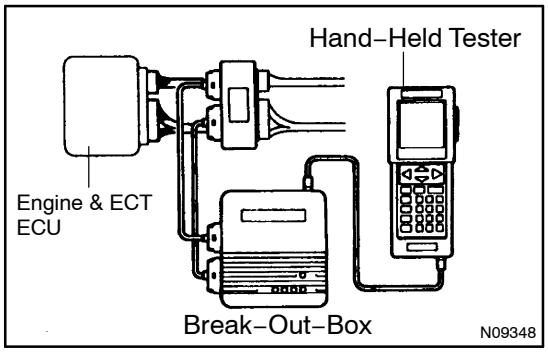
HINT:

Take care not to turn the ignition switch OFF, as turning it off switches the diagnosis system from Check mode to Normal mode, all DTCs etc. are erased.

(10) After checking the DTC, inspect the applicable circuit.

(b) When using hand–held tester:
Clear the DTC.
The following actions will erase the DTC and freeze frame data. Operate a hand–held tester to erase the codes.

(c) When not using hand–held tester:
Clear the DTC.
Disconnecting the battery terminals or EFI fuse for 10 seconds or more.



4. ENGINE & ECT ECU OR ECT ECU STANDARD VALUES MEASUREMENT USING BREAK–OUT–BOX AND HAND–HELD TESTER

(a) Hook up the break–out–box and hand–held tester to the vehicle.

(b) Read the Engine & ECT ECU input/output values by following the prompts on the tester screen.

HINT:
Hand–held tester has "Snapshot" function. This records the measured values and is effective in the diagnosis of intermittent problems. Please refer to the hand–held tester/break–out–box operator's manual for further details.

5. PROBLEM SYMPTOM CONFIRMATION

Taking into consideration the results of the customer problem analysis, try to reproduce the symptoms of the trouble. If the problem is that the transmission does not shift up, shift down, or the shift point is too high or too low conduct the following road test referring to the automatic shift schedule and simulate the problem symptoms.

6. ROAD TEST

NOTICE:

Conduct the test at normal operating ATF temperature 50 – 80 °C (122 – 176 °F).

(a) D range test (NORM and PWR pattern):
Shift into the D range and fully depress the accelerator pedal and check the following points.

(1) Check up–shift operation.
Check to see that 1 → 2, 2 → 3, 3 → 4 and 4 → 5 up–shift take place, at that the shift point conform to the automatic shift schedule (See page SS–29).

HINT:

- 5th Gear Up–shift Prohibition Control (Coolant temp. is 60 °C (140 °F) or less.)
- 5th Gear Lock–up Prohibition Control (1. Brake pedal is depressed. 2. Coolant temp. is 60 °C (140 °F) or less)

(2) Check for shift shock and slip.
Check for shock and slip at the 1 → 2, 2 → 3, 3 → 4 and 4 → 5 up–shifts.

(3) Check for abnormal noises and vibration.
Run at the D range lock–up or 5th gear and check for abnormal noises and vibration.

HINT:
The check for the cause of abnormal noises and vibration must be done very thoroughly as it could also be due to loss of balance in the differential, torque converter, etc.

(4) Check kick–down operation.
While running in the D range, 2nd, 3rd and 5th gears, check to see that the possible kick–down vehicle speed limits for 2 → 1, 3 → 2, 4 → 3 and 5 → 4 kick–downs conform to those indicated in the automatic shift schedule (See page SS–29).

(5) Check abnormal shock and slip at kick–down.

(6) Check the lock–up mechanism.
- Drive in D range, 5th gear, at a steady speed (lock–up ON) of about 70 km/h (43 mph).
- Lightly depress the accelerator pedal and check that the engine speed does not change abruptly.

If there is a big jump in engine speed, there is no lock–up.

(b) 4 range test:
Shift into the 4 range and fully depress the accelerator pedal and check the following points.

(1) Check up–shift operation.
Check to see that the 1 → 4 up–shift takes place and that the shift point conforms to the automatic shift schedule (See page SS–29).

HINT:
There is no 5th up–shift in the 4 range.

(2) Check engine braking.
While running in the 4 range and 4th gear, release the accelerator pedal and check the engine braking effect.

(3) Check for abnormal noises during acceleration and deceleration, and for shock at up–shift and down–shift.

(c) 3 range test:
Shift into the 3 range and fully depress the accelerator pedal and check the following points.

(1) Check up–shift operation.
Check to see that the 1 → 3 up–shift takes place and that the shift point conforms to the automatic

(2) Check engine braking.
While running in the 3 range and 3rd gear, release the accelerator pedal and check the engine braking effect.

(3) Check for abnormal noises during acceleration and deceleration, and for shock at up–shift and down–shift.

(d) 2 range test:
Shift into the 2 range and fully depress the accelerator pedal and check the following points.

(1) Check up–shift operation.
Check to see that the 1 → 2 up–shift takes place and that the shift point conforms to the automatic

(2) Check engine braking.
While running in the 2 range and 2nd gear, release the accelerator pedal and check the engine braking effect.

(3) Check for abnormal noises during acceleration and deceleration, and for shock at up–shift and down–shift.

(e) L range test:
Shift into the L range and fully depress the accelerator pedal and check the following points.

(1) Check no up–shift.
While running in the L range, check that there is no up–shift to 2nd gear.

(2) Check engine braking.
While running in the L range, release the accelerator pedal and check the engine braking effect.

(3) Check for abnormal noises during acceleration and deceleration.

(f) R range test:
Shift into the R range and fully depress the accelerator pedal and check for slipping.

CAUTION:
Before conducting this test ensure that the test area is free from people and obstruction.

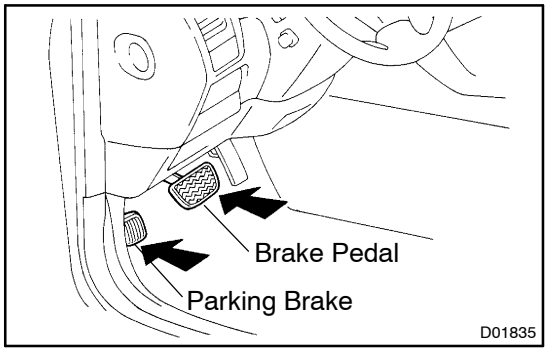
(g) P range test:
Stop the vehicle on a grade (more than 5°) and after shifting into the P range, release the parking brake. Then, check to see that the parking lock pawl holds the vehicle in place.

7. ACTIVE TEST

You are able to set the A/T gear position as you like by operating each solenoid value forcibly using hand–held tester.

However, the condition that you can set the gear position differs in the setting gear position, so conduct the ACTIVE TEST following the table below.

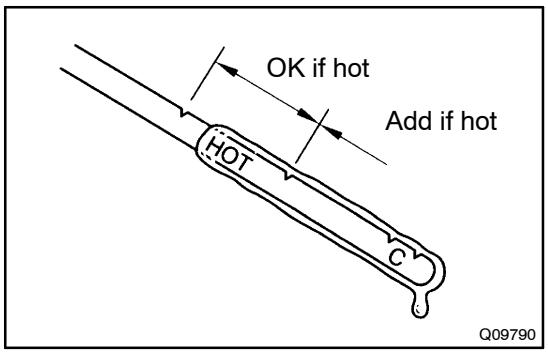
No.	Indication Gear Condition	Starting Condition	Canceling Condition
1	1st, 2nd	Vehicle speed: 0 km/h (0 mph)	Vehicle speed: 0 km/h (0 mph)
2	3rd	Vehicle speed: 0 km/h (0 mph) or vehicle running at 4th or 5th gear	Vehicle speed: less than 50 km/h (31 mph)
3	4th	• Vehicle running at 3rd or 5th gear • Vehicle speed: 50 km/h (31 mph)	Vehicle speed: less than 50 km/h (31 mph)
4	5th	• Vehicle speed: more than 60 km/h (37 mph) • Vehicle running at 4th gear • Throttle value opening angle: less than 50 %	• Vehicle speed: less than 60 km/h (37 mph) • Throttle value opening angle: more than 50 %



8. BASIC INSPECTION

(a) Check the fluid level.

HINT:
Drive the vehicle so that the engine and transmission are at normal operating temperature.
Fluid temperature: 70 – 80 °C (158 – 176 °F)



(1) Park the vehicle on a level surface and set the parking brake.
(2) With the engine idling and the brake pedal depressed, shift the shift lever into all ranges from P to L range and return to P range.
(3) Pull out the dipstick and wipe it clean.
(4) Push it back fully into the pipe.

(5) Pull it out and check that the fluid level is in the HOT range.

If the level is not within the range, add new fluid.

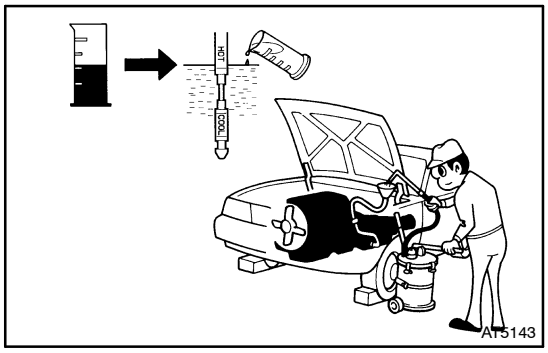
Fluid type: ATF TYPE T–IV

NOTICE:

Do not overfill.

(b) Check the fluid condition.

If the fluid smells burnt or is black, replace it.



(c) Replace the ATF.

(1) Remove the drain plug and drain the fluid.

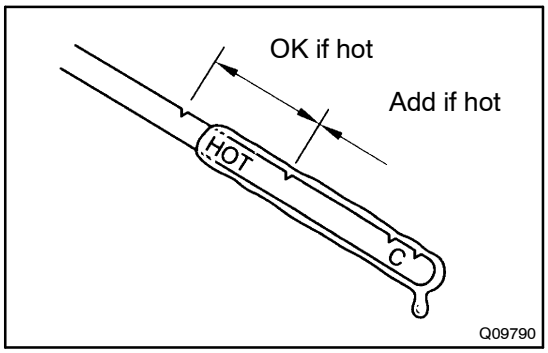
(2) Reinstall the drain plug securely.

(3) With the engine OFF add new fluid through the oil filler pipe.

Fluid type: ATF TYPE T–IV

Capacity: 2.0 liters (2.1 US qts, 1.8 Imp.qts)

(4) Start the engine and shift the shift lever into all ranges from P to L range and then shift into P range.



(5) With the engine idling, check the fluid level. Add fluid up to the COOL level on the dipstick.

(6) Check the fluid level at the normal operating temperature, 70 – 80 °C (158 – 176 °F), and add as necessary.

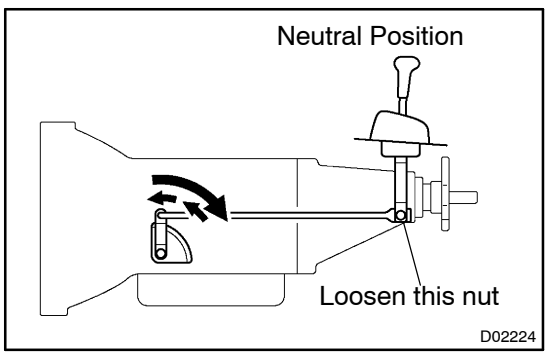
NOTICE:

Do not overfill.

(d) Check the fluid leaks.

Check for leaks in the transmission.

If there are leaks, it is necessary to repair or replace O–rings, FIPGs, oil seals, plugs or other parts.



(e) Inspect and adjust the shift lever position.

- When shifting the shift lever from the N range to other ranges, check that the lever can be shifted smoothly and accurately to each range and that the position indicator is not aligned with the correct position.

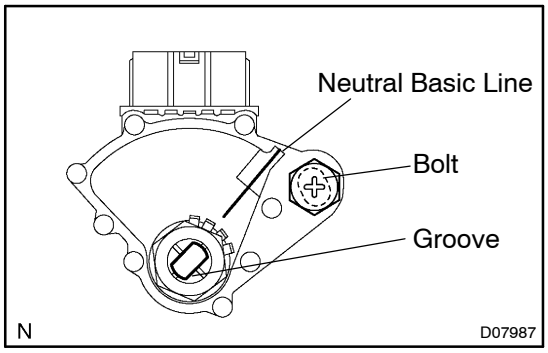
If the indicator is not aligned with the correct position, carry out the following adjustment procedures.

- Loosen the nut on the shift lever.

- Push the control shaft fully rearward.
- Return the control shaft lever 2 notches to N range.
- Set the shift lever to N range.
- While holding the shift lever lightly toward the R range side, tighten the shift lever nut.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

- Start the engine and make sure that the vehicle moves forward when shifting the lever from the N to D range and reverses when shifting it to the R range.



(f) Inspect and adjust the neutral start switch.

Check that the engine can be started with the shift lever only in the N or P range, but not in other ranges.

If it is not as stated above, carry out the following adjustment procedures.

- Loosen the neutral start switch bolt and set the shift lever to the N range.
- Align the groove and neutral basic line.
- Hold the switch in position and tighten the bolt.

Torque: 13 N·m (130 kgf·cm, 10 ft·lbf)

- For continuity inspection of the neutral start switch, see page DI–261.

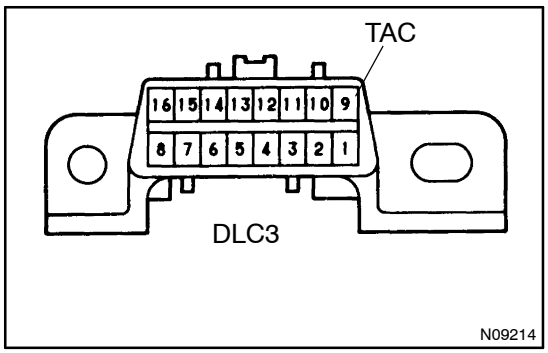
9. MECHANICAL SYSTEM TESTS

(a) Measure the stall speed.

The object of this test is to check the overall performance of the transmission and engine by measuring the stall speeds in the D ranges.

NOTICE:

- **Do the test at normal operating ATF temperature 50 – 80 °C (122 – 176 °F).**
- **Do not continuously run this test for longer than 5 seconds.**
- **To ensure safety, do this test in a wide, clear level area which provides good traction.**
- **The stall test should always be carried out in pairs. One technician should observe the conditions of wheels or wheel stoppers outside the vehicle while the other is doing the test.**



- Chock the 2 wheels.
- Connect a hand–held tester to DLC3 or tachometer to terminal TAC of DLC3 with SST.

SST 09843–18030

- Fully apply the parking brake.
- Keep your left foot pressing firmly on the brake pedal.
- Start the engine.

- Shift into the D range. Press all the way down on the accelerator pedal with your right foot. Quickly read the stall speed at this time.

Stall speed: 2,700 ± 150 rpm

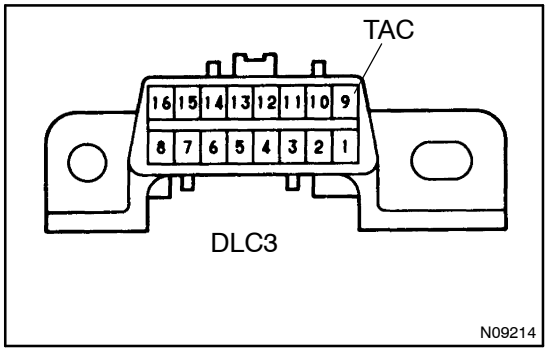
Evaluation:

Problem	Possible cause
(a) Stall speed low in D ranges	• Engine output may be insufficient • Stator one–way clutch is operating properly HINT: If more than 600 rpm below the specified value, the torque converter could be faulty.
(b) Stall speed high in D range	• Line pressure too low • Forward clutch slipping • No. 2 one–way clutch not operating properly • O/D one–way clutch not operating properly

(b) Measure the time lag.
when the shift lever is shifted while the engine is idling, there will be a certain time lapse or lag before the shock can be felt. This is used for checking the condition of the O/D direct clutch, forward clutch, and 1st & reverse brake.

NOTICE:

- **Do the test at normal operating ATF temperature 50 – 80 °C (122 – 176 °F).**
- **Be sure to allow 1 minute interval between tests.**
- **Take 3 measurements and take the average value.**



- Chock the 4 wheels.
- Connect a hand–held tester to DLC3 or tachometer to terminal TAC of DLC3 with SST.

SST 09843–18030

- Start engine and check idle speed.

Idle speed: 700 ± 50 rpm (In N range and A/C OFF)

- Shift the lever from N to D range. Using a stop watch, measure the time from when the lever is shifted until the shock is felt.

Time lag: N → D less than 1.2 seconds

- In the same way, measure the time lag for N → R.

Time lag: N → R less than 1.5 seconds

Evaluation (If N → D time or N → R time lag is longer than the specified):

Problem	Possible cause
N → D time lag is longer	• Line pressure too low • Forward clutch worn • O/D one–way clutch not operating properly
N → R time lag is longer	• Line pressure too low • Direct clutch worn • 1st & reverse brake worn • O/D one–way clutch not operating properly

10. HYDRAULIC TEST

Measure the line pressure.

NOTICE:

- **Do the test at normal operation ATF temperature 50 – 80 °C (122 – 176 °F).**
- **The line pressure test should always be carried out in pairs. One technician should observe the conditions of wheels or wheel stopper outside the vehicle while the other is doing the test.**
- **Be careful to prevent SST's hose from interfering with the exhaust pipe.**

(1) Warm up the ATF.

(2) Remove the test plug on the right side of the transmission case and connect SST.
(See page AT–251 for the location to connect SST)

SST 09992–00095 (09992–00231, 09992–00271)

(3) Fully apply the parking brake and chock the 4 wheels.

(4) Connect a hand–held tester to DLC3.

(5) Start the engine and check idling speed.

(6) Keep your left foot pressing firmly on the brake pedal and shift into D range.

(7) Measure the line pressure when the engine is idling.

(8) Depress the accelerator pedal all the way down. Quickly read the highest line pressure when engine speed reaches stall speed.

(9) In the same way, do the test in R range.

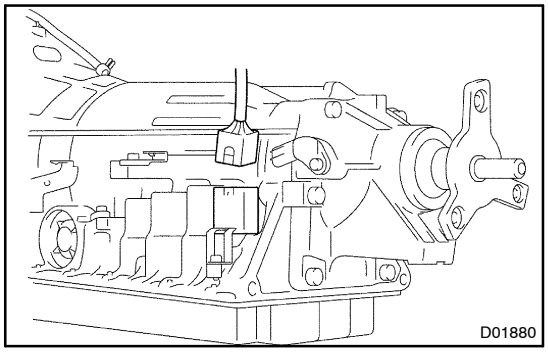
Specified line pressure:

Condition	D range kPa (kgf / cm^2, psi)	R range kPa (kgf / cm^2, psi)
Idling	395 – 455 (4.0 – 4.6, 57 – 65)	0
Stall	1,200 – 1,360 (12.2 – 13.8, 174 – 196)	1,655 – 1,960 (16.9 – 20.0, 240 – 282)

If the measured pressure is not up to the specified value, recheck the throttle cable adjustment and retest.

Evaluation:

Problem	Possible cause
If the measured values at all ranges are higher	• SLT solenoid value defective • Regulator valve detective
If the measured values at all ranges are lower	• SLT solenoid value defective • Regulator valve defect • Oil pump defect • O/D direct clutch defect
If pressure is low in the D range only	• D range circuit fluid leakage • Forward clutch defect
If pressure is low in the R range only	• R range circuit fluid leakage • Direct clutch defect • 1st & reverse brake defect



11. MANUAL SHIFTING TEST

HINT:

By this test, it can be determined whether the trouble is within the electrical circuit or is a mechanical problem in the transmission.

(a) Disconnect the solenoid wire.

(b) Inspect the manual driving operation.

Check that the shift and gear positions correspond to the table below.

While driving, shift through the L, 2, 3, 4 and D ranges.

Check that the gear change corresponds to the shift range.

Shift range	Gear position
D	5th
4	5th
3	4th
2	3rd
L	3rd
R	Reverse
P	Pawl Lock

HINT:

If the L, 2, 3, 4 and D range gear positions are difficult to distinguish, do the following read test.

If any abnormality is found in the above test, the problem is in the transmission itself.

(c) Connect the solenoid wire.

(d) Cancel out DTC.

DI1G9–03

DIAGNOSTIC TROUBLE CODE CHART

If a DTC is displayed during the DTC check, check the circuit listed in the table below and proceed to the page given.

Euro OBD:

DTC No. (See Page)	Detection Item	Trouble Area	*1 CHK ENG	*2 Memory
P0500 (★)	Vehicle Speed Sensor Malfunction	• Open or short in vehicle speed sensor circuit • Vehicle speed sensor • Combination meter • Engine & ECT ECU • Automatic transmission assembly	●	○
P0710 (★)	Transmission Fluid Temperature Sensor Circuit Malfunction (ATF Temperature Sensor)	• Open or short in ATF temperature sensor circuit • ATF temperature sensor circuit • Engine & ECT ECU	●	○
P0711 (DI–245)	Transmission Fluid Temperature Sensor Circuit Range/Performance problem	• Open in ATF temperature sensor circuit • ATF temperature sensor • Engine & ECT ECU	●	○
P0715 (★)	Input/Turbine Speed Sensor Circuit Malfunction (O/D Direct Clutch Speed Sensor)	• Open or short in O/D direct clutch speed sensor circuit • O/D direct clutch speed sensor • Engine & ECT ECU • Automatic transmission assembly	●	○
P0750 (DI–246)	Shift Solenoid "A" Malfunction (No. 1 Solenoid Valve)	• No. 1 solenoid valve is stuck open or closed • Valve body is blocked up or stuck • Automatic transmission assembly	●	○
P0753 (DI–249)	Shift Solenoid "A" Electrical Malfunction (No. 1 Solenoid Valve)	• Open or short in No. 1 solenoid valve circuit • No. 1 solenoid valve • Engine & ECT ECU	●	○
P0755 (DI–246)	Shift Solenoid "B" Malfunction (No. 2 Solenoid Valve)	• No. 2 solenoid valve is stuck open or closed • Valve body is blocked up or stuck • Automatic transmission assembly	●	○
P0758 (DI–249)	Shift Solenoid "B" Electrical Malfunction (No. 2 Solenoid Valve)	• Open or short in No. 2 solenoid valve circuit • No. 2 solenoid valve • Engine & ECT ECU	●	○
P0760 (DI–246)	Shift Solenoid "C" Malfunction (No. 3 Solenoid Valve)	• No. 3 solenoid valve is stuck open or closed • Valve body is blocked up or stuck • Automatic transmission assembly	●	○
P0763 (DI–249)	Shift Solenoid "C" Electrical Malfunction (No. 3 Solenoid Valve)	• Open or short in No. 3 solenoid valve circuit • No. 3 solenoid valve • Engine & ECT ECU	●	○
P0768 (DI–255)	Shift Solenoid "D" Electrical Malfunction (No. 4 Solenoid Valve)	• Open or short in No. 4 solenoid valve circuit • No. 4 solenoid valve • Engine & ECT ECU	●	○
P0770 (DI–258)	Shift Solenoid "E" Malfunction (SLU Solenoid Valve)	• SLU solenoid valve is stuck open or closed • Valve body is blocked up or stuck • Lock–up clutch • Automatic transmission assembly	●	○
P1755 (★)	Linear Solenoid for Lock–up Control Circuit Malfunction (SLU Solenoid Valve)	• Open or short in SLU solenoid valve circuit • SLU solenoid valve • Engine & ECT ECU • Automatic transmission assembly	●	○
P1760 (★)	Linear Solenoid for Line Pressure Control Circuit Malfunction (SLT Solenoid Valve)	• Open or short in SLT solenoid valve circuit • SLT solenoid valve • Engine & ECT ECU	●	○

P1765 (★)	Linear Solenoid for Accumulator Pressure Control Circuit Malfunction (SLN Solenoid Valve SLN)	• Open or short in SLN solenoid valve circuit • SLN solenoid valve • Engine & ECT ECU	●	○
P1780 (DI–261)	Park/Neutral Position Switch Malfunction (Neutral Start Switch)	• Short in neutral start switch circuit • Neutral start switch • Engine & ECT ECU	●	○

★: See Pub. No. RM588E

*1: "●" mark means check engine waning light (CHK ENG) blinks once every 2 seconds.

*2: "○" mark means Engine & ECT ECU memorizes the malfunction code if the Engine & ECT ECU detects the DTC detection condition.

HINT:

This DTC may be output when the clutch, brake and gear components etc. inside the automatic transmission are damaged.

M–OBD (Except European spec.):

DTC No. (See Page)	Detection Item	Trouble Area	*CHK ENG	*2 Memory
P0500/42 (★)	Vehicle Speed Sensor Malfunction	• Open or short in vehicle speed sensor circuit • Vehicle speed sensor • Combination meter • Engine & ECT ECU • Automatic Transmission Assembly	●	○
P0710/38 (★)	Transmission Fluid Temperature Sensor Circuit Malfunction (ATF Temperature Sensor)	• Open or short in ATF temperature sensor circuit • ATF temperature sensor circuit • Engine & ECT ECU	●	○
P0715/67 (★)	Input/Turbine Speed Sensor Circuit Malfunction (O/D Direct Clutch Speed Sensor)	• Open or short in O/D direct clutch speed sensor circuit • O/D direct clutch speed sensor • Engine & ECT ECU • Automatic Transmission Assembly	●	○
P0753/62 (DI–249)	Shift Solenoid "A" Electrical Malfunction (No. 1 Solenoid Valve)	• Open or short in No. 1 solenoid value circuit • No. 1 solenoid valve • Engine & ECT ECU	●	○
P0758/63 (DI–249)	Shift Solenoid "B" Electrical Malfunction (No. 2 Solenoid Valve)	• Open or short in No. 2 solenoid valve circuit • No. 2 solenoid valve • Engine & ECT ECU	●	○
P0763/76 (DI–249)	Shift Solenoid "C" Electrical Malfunction (No. 3 Solenoid Valve)	• Open or short in No. 3 solenoid valve circuit • No. 3 solenoid valve • Engine & ECT ECU	●	○
P0768/65 (DI–255)	Shift Solenoid "D" Electrical Malfunction (No. 4 Solenoid Valve)	• Open or short in No. 4 solenoid valve circuit • No. 4 solenoid valve • Engine & ECT ECU	●	○
P1755/68 (★)	Linear Solenoid for Line Pressure Control Circuit Malfunction (SLU Solenoid Valve)	• Open or short in SLU solenoid valve circuit • SLU solenoid valve • Engine & ECT ECU	X	○
P1760/77 (★)	Linear Solenoid for Line Pressure Control Circuit Malfunction (SLT Solenoid Valve)	• Open or short in SLT solenoid valve circuit • SLT solenoid valve • Engine & ECT ECU	X	○

P1765/46 (★)	Linear Solenoid for Accumulator Pressure Control Circuit Malfunction (SLN Solenoid Valve)	• Open or short in SLN solenoid valve circuit • SLN solenoid valve • Engine & ECT ECU	X	○
P1780/97 (DI–261)	Park/Neutral Position Switch Malfunction (Neutral Start Switch)	• Short in neutral start switch circuit • Neutral start switch • Engine & ECT ECU	●	○

★: See Pub. No. RM588E

*1: "●" mark means check engine warning light (CHK ENG) blinks once every 2 seconds.
"X" mark means CHK ENG never blinks.

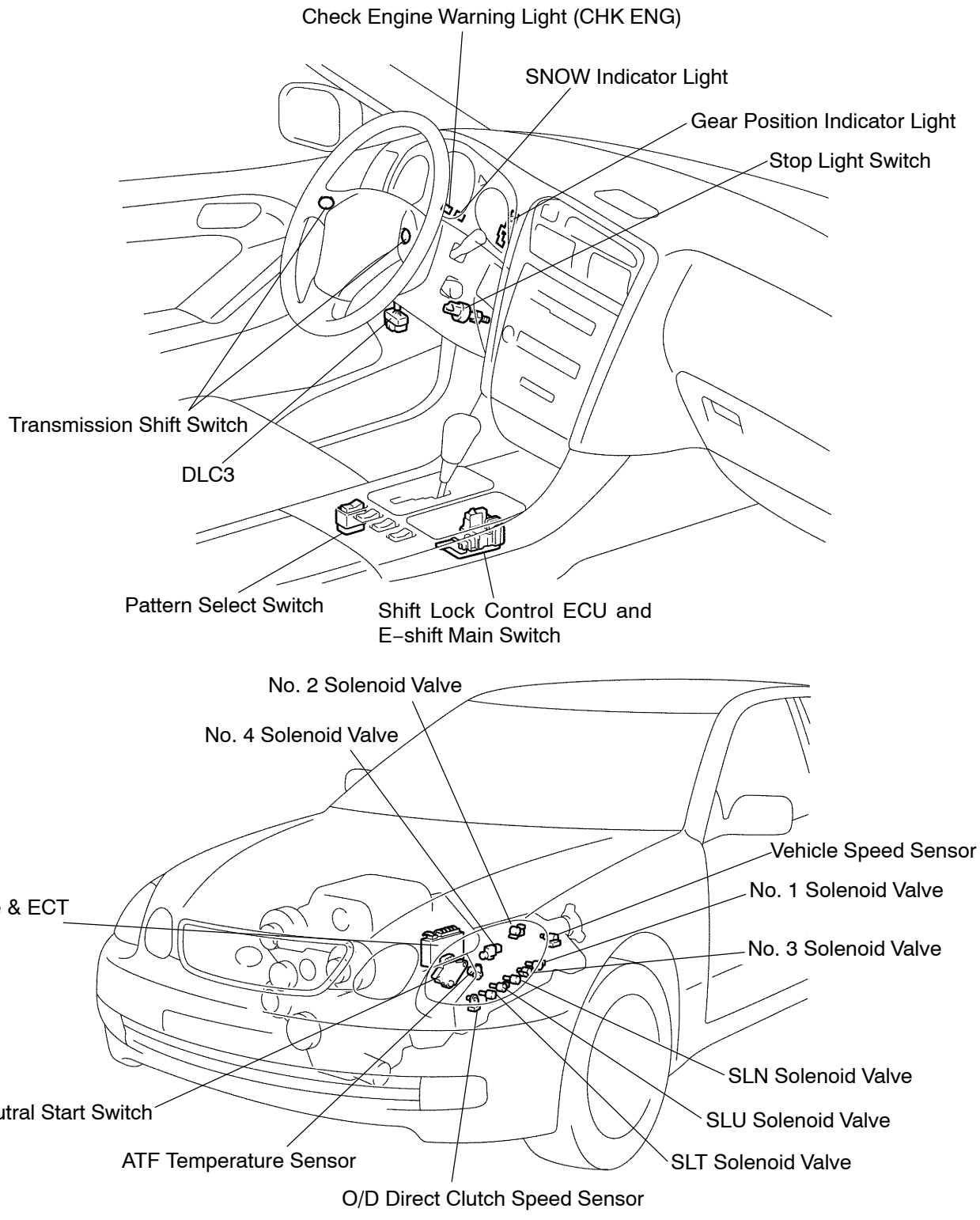
*2: "○" mark means Engine & ECT ECU memorizes the malfunction code if the Engine & ECT ECU detects the DTC detection condition.

HINT:

This DTC may be output when the clutch, brake and gear components etc. inside the automatic transmission are damaged.

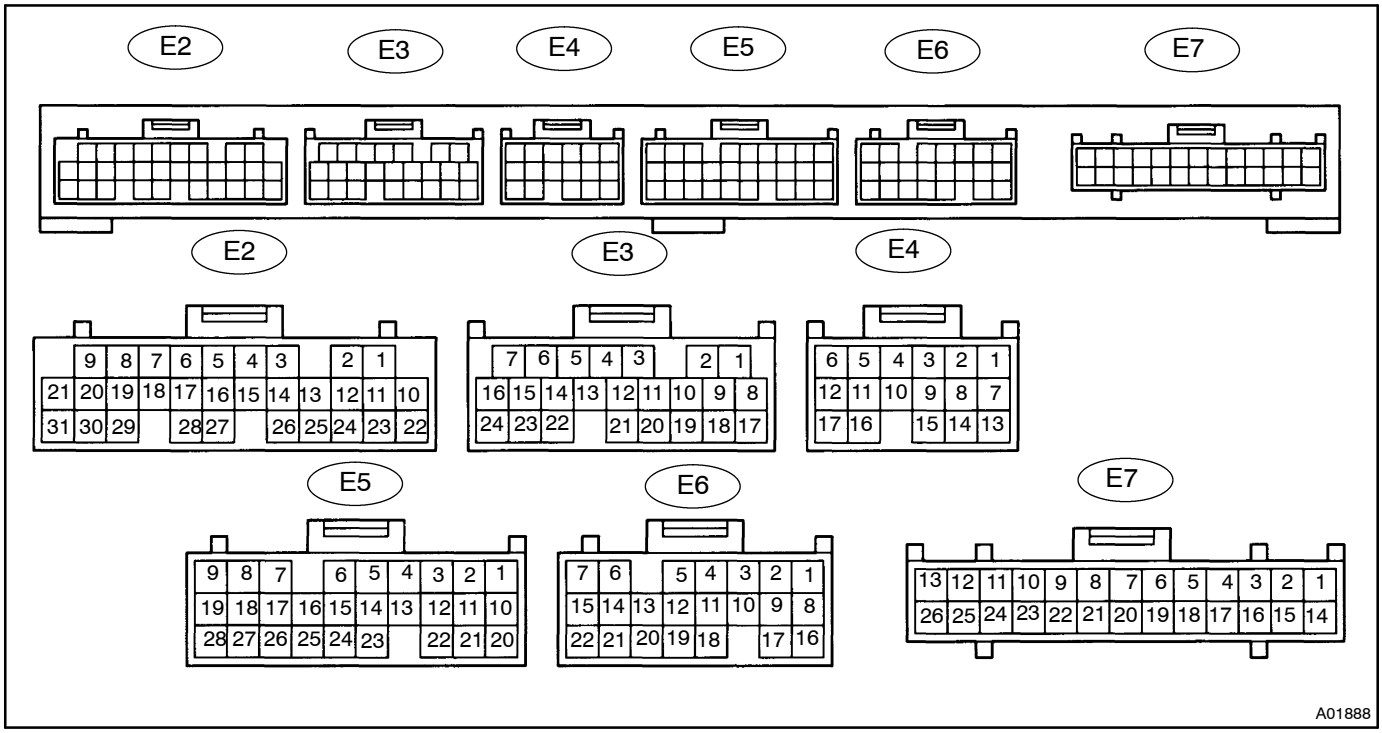
DI1GA–02

PARTS LOCATION



DI1GB–10

TERMINALS OF ECU



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
S1 ↔ E1 (E4–1 ↔ E3–17)	L ↔ BR	IG ON	Below 1.5
		3rd, 4th or 5th gear	Below 1.5
		1st or 2nd gear	9 – 14
S2 ↔ E1 (E4–2 ↔ E3–17)	G–Y ↔ BR	IG ON	Below 1.5
		1st, 4th or 5th gear	Below 1.5
		2nd or 3rd gear	9 – 14
S3 ↔ E1 (E4–3 ↔ E3–17)	Y–G ↔ BR	IG ON	Below 1.5
		1st, 2nd, 3rd or 5th gear	Below 1.5
		4th gear	9 – 14
S4 ↔ E1 (E4–6 ↔ E3–17)	Y ↔ BR	IG ON	Below 1.5
		1st, 2nd, 3rd or 4th gear	Below 1.5
		5th gear	9 – 14
SLU^+ ↔ SLU^- (E4–7 ↔ E4–13)	G–W ↔ L–R	IG ON	Below 3
		Engine is idling	Pulse signal is output below 1.5 ↔ 9 – 14
SLN^+ ↔ SLN^- (E4–8 ↔ E4–14)	P ↔ L–B	IG ON	Below 3
		Engine is idling	Pulse signal is output below 1.5 ↔ 9 – 14
SLT^+ ↔ SLT^- (E4–9 ↔ E4–15)	G–B ↔ R–B	IG ON	Below 3
		Engine is idling	Pulse signal is output below 1.5 ↔ 9 – 14
$SP2^+$ ↔ $SP2^-$ (E4–5 ↔ E4–11)	L–Y ↔ R–L	Engine is idling	Pulse signal is output below 1.5 ↔ 4 – 6
NCO^+ ↔ NCO^- (E4–4 ↔ E4–10)	R ↔ G	Engine is idling	Pulse signal is output below 1.5 ↔ 4 – 6

OIL ↔ E2 (E4–17 ↔ E3–18)	G–R ↔ BR	IG ON and ATF temperature 110 °C (176 °F)	Below 1
P ↔ E1 (E5–26 ↔ E3–17)	R–W ↔ BR	IG ON and shift lever P range	7.5 – 14
		IG ON and shift lever other than P range	Below 1.5
R ↔ E1 (E5–16 ↔ E3–17)	R–B ↔ BR	IG ON and shift lever R range	7.5 – 14
		IG ON and shift lever other than R range	Below 1.5
N ↔ E1 (E3–13 ↔ E3–17)	G–R ↔ BR	IG ON and shift lever N range	7.5 – 14
		IG ON and shift lever other than N range	Below 1.5
D ↔ E1 (E5–17 ↔ E3–17)	Y–B ↔ BR	IG ON and shift lever D or M range	7.5 – 14
		IG ON and shift lever other than D and M range	Below 1.5
4 ↔ E1 (E5–7 ↔ E3–17)	Y–G ↔ BR	IG ON and shift lever M range	7.5 – 14
		IG ON and shift lever other than M range	Below 1.5
3 ↔ E1 (E3–20 ↔ E3–17)	*1G ↔ BR *2G–R ↔ BR	IG ON and shift lever 3 range	7.5 – 14
		IG ON and shift lever other than 3 range	Below 1.5
2 ↔ E1 (E3–21 ↔ E3–17)	G–B ↔ BR	IG ON and shift lever 2 or L range	7.5 – 14
		IG ON and shift lever other than 2 and L range	Below 1.5
L ↔ E1 (E2–14 ↔ E3–17)	R–Y ↔ BR	IG ON and shift lever L range	7.5 – 14
		IG ON and shift lever other than L range	Below 1.5
STP ↔ E1 (E5–6 ↔ E3–17)	G–W ↔ BR	IG ON and brake pedal depressed	7.5 – 14
		IG ON and brake pedal released	Below 1.5
*3KD ↔ E1 (E5–15 ↔ E3–17)	Y–R ↔ BR	IG ON and accelerator pedal depressed	9 – 14
		IG ON and accelerator pedal released	Below 1.5
SFTU ↔ E1 (E5–4 ↔ E3–17)	L–Y ↔ BR	IG ON and "Up" transmission shift switch pressed	Below 3
		IG ON and "Up" transmission shift switch released	7 – 12
SFTD ↔ E1 (E5–14 ↔ E3–17)	R–G ↔ BR	IG ON and "Down" transmission shift switch pressed	Below 3
		IG ON and "Down" transmission shift switch released	7 – 12

*1: LHD
*2: RHD
*3: Except G.C.C.

DI1GC–12

PROBLEM SYMPTOMS TABLE

HINT:

If a normal code is displayed during the DTC check but the trouble still occurs, check the circuits for each symptom in the order given in the charts on the following pages and proceed to the page given for trouble-shooting.

The Matrix Chart is divided into 3 chapters.

- If the instruction ”Proceed to next circuit inspection shown on matrix chart” is given in the flow chart for each circuit, proceed to the circuit with the next highest number in the table to continue the check.
- If the trouble still occurs even though there are no abnormalities in any of the other circuits, then check and replace the Engine & ECT ECU.

1. CHAPTER 1: ELECTRONIC CIRCUIT MATRIX CHART

Symptom	Suspect Area	See page
No up–shift (A particular gear, from 1st to 4th gear, is not up–shifted)	Engine & ECT ECU	IN–30
No up–shift (4th → 5th)	1. E–shift main switch circuit 2. Engine & ECT ECU	DI–269 IN–30
No down–shift (5th → 4th)	1. E–shift main switch circuit 2. Engine & ECT ECU	DI–269 IN–30
No down–shift (A particular gear, from 1st to 4th gear, is not up–shifted)	Engine & ECT ECU	IN–30
No lock–up	1. Stop light switch signal circuit 2. Engine & ECT ECU	DI–266 IN–30
No lock–up off	Engine & ECT ECU	IN–30
Shift point too high or too low	1. Pattern select switch circuit 2. Engine & ECT ECU	★ IN–30
Up–shift to 5th from 4th while shift lever is M position	1. E–shift main switch circuit 2. Engine & ECT ECU	DI–269 IN–30
Up–shift to 5th from 4th while engine is cold	Engine & ECT ECU	IN–30
No kick–down	1. Kick–down switch circuit 2. Engine & ECT ECU	★ IN–30
No pattern select	1. Pattern select switch circuit 2. Engine & ECT ECU	★ IN–30
Engine stalls when starting off or stopping	1. Stop light switch signal circuit 2. Engine & ECT ECU	DI–266 IN–30
No 2nd start	1. Pattern select switch circuit 2. Engine & ECT ECU	★ IN–30
No E–shift system	1. E–shift main switch circuit 2. Transmission shift switch circuit 3. Pattern select switch circuit 4. Engine & ECT ECU	DI–269 DI–272 ★ IN–30

★: See Pub. No. RM588E

2. CHAPTER 2: ON–VEHICLE REPAIR (★: A650E AUTOMATIC TRANSMISSION Repair Manual Pub. No. RM579U)

Symptom	Suspect Area	See page
Vehicle does not move in any forward range and reverse range	1. Transmission control rod 2. Manual valve 3. Parking lock pawl 4. Off–vehicle repair matrix chart	DI–221 ★ ★ –
Vehicle does not move in R range	1. Reverse control valve 2. Off–vehicle repair matrix chart	★ –
Vehicle does not move in particular range or ranges (Except R range)	Off–vehicle repair matrix chart	–
No up–shift (1st → 2nd)	1. 1–2 shift valve 2. Off–vehicle repair matrix chart	★ –
No up–shift (2nd → 3rd)	1. 2–3 shift valve 2. Off–vehicle repair matrix chart	★ –
No up–shift (3rd → 4th)	1. 3–4 shift valve 2. Off–vehicle repair matrix chart	★ –
No up–shift (4th → 5th)	1. 4–5 shift valve 2. Off–vehicle repair matrix chart	★ –
No down–shift (5th → 4th)	1. 4–5 shift valve 2. Off–vehicle repair matrix chart	★ –
No down–shift (4th → 3rd)	1. 3–4 shift valve 2. Off–vehicle repair matrix chart	★ –
No down–shift (3rd → 2nd)	1. 2–3 shift valve 2. Off–vehicle repair matrix chart	★ –
No down–shift (2nd → 1st)	1. 1–2 shift valve 2. Off–vehicle repair matrix chart	★ –
No lock–up or No lock–up off	1. Lock–up control valve 2. Lock–up relay valve 3. Off–vehicle repair matrix chart	★ ★ –
Harsh engagement (N → D)	1. Accumulator control valve 2. Solenoid modulator valve 3. C_1 accumulator 4. Orifice control valve 5. Off–vehicle repair matrix chart	★ ★ ★ ★ –
Harsh engagement (Lock–up)	1. Lock–up control valve 2. Lock–up relay valve 3. Solenoid relay valve 4. Off–vehicle repair matrix chart	★ ★ ★ –
Harsh engagement (N → R)	1. Accumulator control valve 2. C_2 accumulator 3. Solenoid modulator valve 4. Off–vehicle repair matrix chart	★ ★ ★ –
Harsh engagement (2 → L)	Coast brake control valve	★
Harsh engagement (2nd → 3rd → 4th → 5th)	1. Accumulator control valve 2. Solenoid modulator valve	★ ★
Harsh engagement (1st → 2nd)	1. Solenoid modulator valve 2. B_3 control valve 3. B_2 release control valve 4. Solenoid relay valve 5. Off–vehicle repair matrix chart	★ ★ ★ ★ –

Harsh engagement (2nd → 3rd)	1. Accumulator control valve 2. Solenoid modulator valve 3. B_2 accumulator 4. B_3 control valve 5. B_2 release control valve 6. Solenoid relay valve 7. Off–vehicle repair matrix chart	★ ★ ★ ★ ★ ★ –
Harsh engagement (3rd → 4th)	1. Accumulator control valve 2. Solenoid modulator valve 3. C_2 accumulator 4. Off–vehicle repair matrix chart	★ ★ ★ –
Harsh engagement (4th → 5th)	1. Accumulator control valve 2. Solenoid modulator valve 3. B_0 accumulator 4. Off–vehicle repair matrix chart	★ ★ ★ –
Harsh engagement (5th → 4th)	1. Accumulator control valve 2. Solenoid modulator valve 3. C_0 accumulator 4. Off–vehicle repair matrix chart	★ ★ ★ –
Slip or shudder (Forward and reverse)	1. Transmission control rod 2. Oil strainer 3. Pressure relief valve 4. Off–vehicle repair matrix chart	DI–221 ★ ★ –
Slip or shudder (Particular range)	1. Transmission control rod 2. Off–vehicle repair matrix chart	DI–221 –
No engine braking (1st: L range)	1. Coast brake control valve 2. B–4 relay valve 3. Off–vehicle repair matrix chart	★ ★ –
No engine braking (2nd: 2 range)	1. Coast brake control valve 2. Off–vehicle repair matrix chart	★ –
No kick–down	1. 1–2 shift valve 2. 2–3 shift valve 3. 3–4 shift valve	★ ★ ★

3. CHAPTER 3: OFF–VEHICLE REPAIR (★: A650E AUTOMATIC TRANSMISSION Repair Manual Pub. No. RM579U)

Symptom	Suspect Area	See page
Vehicle does not move in any forward range and reverse range	1. O/D one–way clutch (F_0) 2. O/D direct clutch (C_0) 3. O/D planetary gear unit 4. Torque converter	★ ★ ★ *
Vehicle does not move in R range	1. Center and rear planetary gear unit 2. Direct clutch (C_2) 3. 1st & reverse brake (B_4) 4. O/D brake (B_0)	★ ★ ★ ★
No up–shift (1st → 2nd)	2nd brake (B_3)	★
No up–shift (2nd → 3rd)	1. 3rd brake (B_2) 2. One–way clutch No. 1 (F_1)	★ ★
No up–shift (3rd → 4th)	Direct clutch	★
No up–shift (4th → 5th)	O/D brake (B_0)	★
No lock–up or No lock–up off	Torque converter	*
Harsh engagement (N → D)	1. Forward clutch (C_1) 2. O/D one–way clutch (F_0) 3. One–way clutch No. 2 (F_2)	★ ★ ★
Harsh engagement (N → R)	1. Direct clutch (C_2) 2. O/D brake (B_0) 3. 1st & reverse brake (B_4)	★ ★ ★
Harsh engagement (1st → 2nd)	2nd brake (B_3)	★
Harsh engagement (2nd → 3rd)	1. 3rd brake (B_2) 2. 2nd brake (B_3) 3. One–way clutch No. 1 (F_1)	★ ★ ★
Harsh engagement (3rd → 4th)	Direct clutch (C_2)	★
Harsh engagement (4th → 5th)	1. O/D brake (B_0) 2. O/D direct clutch (C_0)	★ ★
Harsh engagement (Lock–up)	Torque converter	*
Slip or shudder (Forward and reverse: After warm–up)	1. Torque converter 2. O/D one–way clutch (F_0) 3. O/D direct clutch (C_0)	* ★ ★
Slip or shudder (Particular range: Just after engine starts)	Torque converter	*
Slip or shudder (R range)	1. Direct clutch (C_2) 2. O/D brake (B_0) 3. 1st & reverse brake (B_4)	★ ★ ★
Slip or shudder (1st)	1. Forward clutch (C_1) 2. No. 2 one–way clutch (F_2)	★ ★
Slip or shudder (2nd)	2nd brake (B_3)	★
Slip or shudder (3rd)	1. 3rd coast brake (B_1) 2. 3rd brake (B_2) 3. One–way clutch No. 1 (F_1)	★ ★ ★
Slip or shudder (4th)	Direct clutch	★
Slip or shudder (5th)	O/D brake (B_0)	★
No engine braking (1st – 4th: D range)	O/C direct clutch (C_0)	★
No engine braking (1st: L range)	1st & reverse brake (B_4)	★
No engine braking (2nd: 2 range)	2nd brake (B_3)	★
No engine braking (3rd: 3 range)	3rd coast brake (B_1)	★

Poor acceleration (All ranges)	Torque converter	*
Poor acceleration (5th)	1. O/D brake (B_0) 2. O/D planetary gear unit	★ ★
Engine stalls when starting off or stopping	Torque converter	*

*: See Pub. No. RM588E

DI87Q–01

CIRCUIT INSPECTION

DTC	P0711	Transmission Fluid Temperature sensor Circuit Range / Performance

CIRCUIT DESCRIPTION

Refer to DTC P0710 on Pub. No. RM588E.

DTC No.	DTC Detecting Condition	Trouble Area
P0711	Both (a) and (b) detected. (a) After 12 seconds of the engine start, the temp. of the atmosphere and that of the engine coolant is more than –10 °C. (b) After a normal driving for over 20 minutes and 6.2 miles (10 km), the ATF temp. is less than 10 °C.	• Open in ATF temperature sensor circuit • ATF temperature sensor • Engine & ECT ECU

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand–held tester or OBD scan tool. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	Are there any other codes (besides DTC P0711) being output?

YES → Go to relevant DTC chart (See page DI–234).

NO →

Replace ATF temperature sensor.

DI87R–01

DTC	P0750	Shift Solenoid ”A” Malfunction (No. 1 Solenoid Valve)

DTC	P0755	Shift Solenoid ”B” Malfunction (No. 2 Solenoid Valve)

DTC	P0760	Shift Solenoid ”C” Malfunction (No. 3 Solenoid Valve)

SYSTEM DESCRIPTION

The Engine & ECT ECU uses signals from the vehicle speed sensor and input/turbine speed sensor to detect the actual gear position (1st, 2nd, 3rd, 4th or 5th gear). The Engine & ECT ECU then compares the actual gear with the shift schedule in the Engine & ECT ECU memory to detect mechanical trouble of the solenoid valves, valve body and automatic transmission (clutch, brake or gear etc.).

DTC No.	DTC Detecting Condition	Trouble Area
P0750 P0755 P0760	During normal driving, the gear required by the Engine & ECT ECU does not match the actual gear (2–trip detection logic)	• No. 1/No. 2/No. 3 solenoid valve is stuck open or closed • Valve body is blocked up or stuck • Automatic transmission assembly

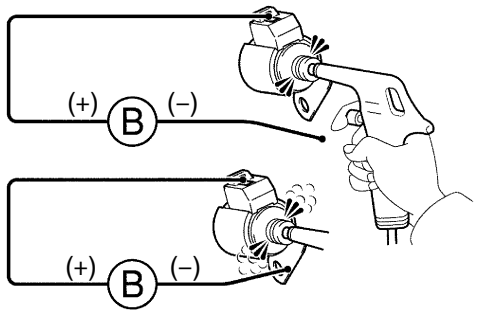
HINT:

Check the No. 1 solenoid valve when DTC P0750 is output, check No. 2 solenoid valve when DTC P0755 is output and check the No. 3 solenoid valve when DTC P0760 is output.

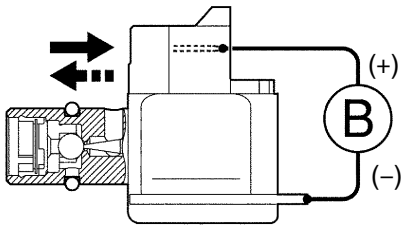
INSPECTION PROCEDURE

1	**Check No. 1, No. 2 , or No. 3 solenoid valve operation.**

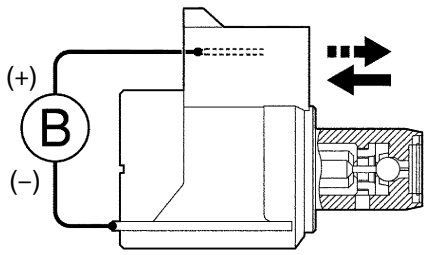
No. 2 Solenoid Valve



No. 1 Solenoid Valve



No. 3 Solenoid Valve



P D10482

PREPARATION:

(a) Remove the oil pan.
(b) Remove the No. 1, No. 2 or No. 3 solenoid valve.

CHECK:

No. 2 solenoid valve:

(a) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valves do not leak air.
(b) When battery positive voltage is supplied to the shift solenoid valves, check that the solenoid valves are open.

No. 1 and No. 3 solenoid valve:

Connect the positive (+) lead with 8 – 10 W bulb to terminal 2 and the negative (–) lead to terminal 1, then check the movement of the valve.

OK:

When B^+ is applied.	Valve moves in ◄ direction in illustration on the left.
When B^+ is cut off.	Valve moves in ■■► direction in illustration on the left.

OK

NG → **Replace the No. 1, No. 2 or No. 3 solenoid valve.**

2	Check valve body (See page DI–240).

NG → Repair or replace the valve body.

OK

Replace the transmission
(See Pub. No. RM588E on page AT–28).

DI2LB–02

DTC	P0753/62	Shift Solenoid A Electrical Malfunction (No. 1 Solenoid Valve)

DTC	P0758/63	Shift Solenoid B Electrical Malfunction (No. 2 Solenoid Valve)

DTC	P0763/76	Shift Solenoid C Electrical Malfunction (No. 3 Solenoid Valve)

CIRCUIT DESCRIPTION

Shifting from 1st to 5th is performed in combination with ON and OFF of the No. 1, No. 2 and No. 3 solenoid valves controlled by Engine & ECT ECU. If an open or short circuit occurs in either of the solenoid valves, the Engine & ECT ECU controls the remaining normal solenoid valve to allow the vehicle to be operated smoothly (Fail safe function).

HINT:

Check the No. 1 solenoid valve when DTC P0753/62 is output, check the No. 2 solenoid valve when DTC P0758/63 is output and check the No. 3 solenoid valve when DTC P0763/76 is output.

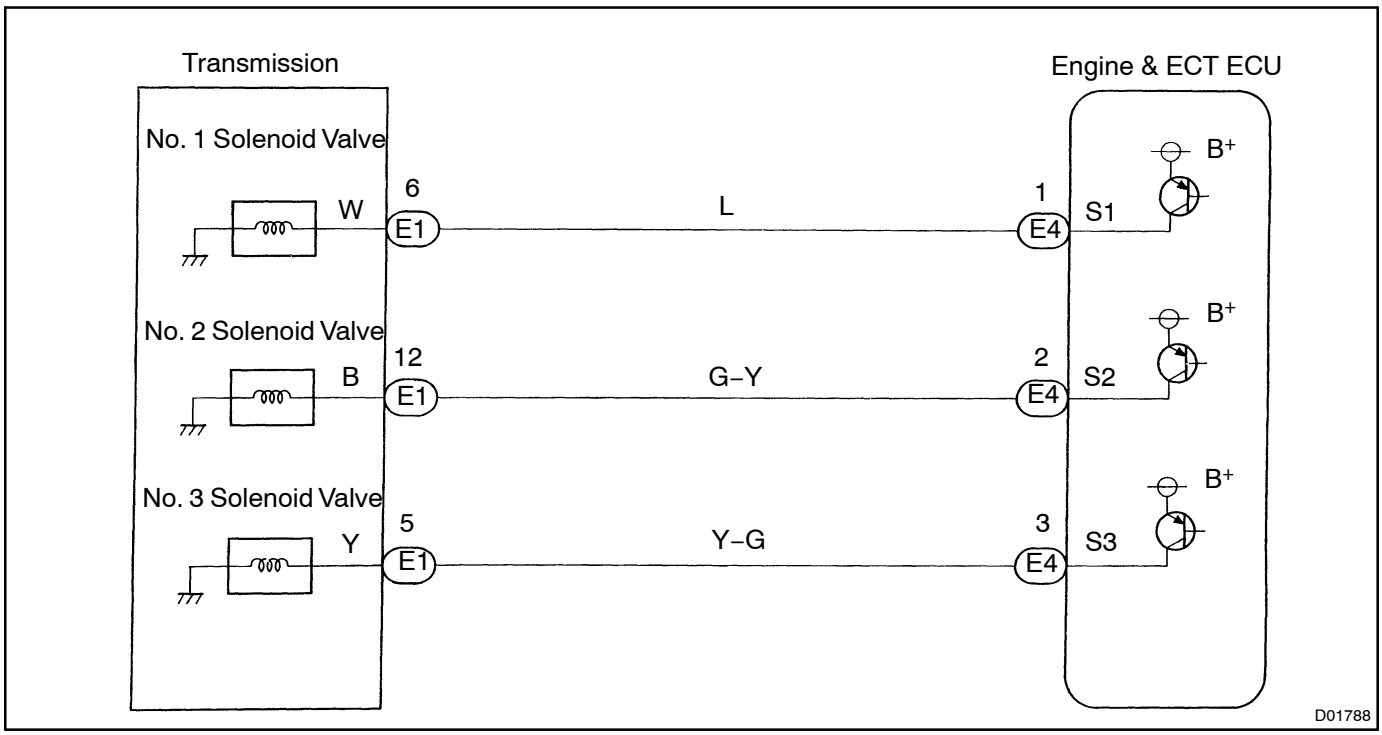
DTC No.	DTC Detecting Condition	Trouble Area
P0753/62 P0758/63 P0763/76	The Engine & ECT ECU checks for an open or short circuit in the No. 1, No. 2 or No. 3 solenoid valve circuit when it changes. The Engine & ECT ECU records DTC P0753/62, P0758/63 or P0763/76 if condition (a) or (b) is detected once, but it does not light up CHK ENG. After Engine & ECT ECU detects condition (a) or (b) continuously 8 times or more in 1 trip, it causes the CHK ENG lights up until condition (a) or (b) disappears. After that, if the Engine & ECT ECU detects condition (a) or (b) once, it starts lighting up CHK ENG again. (a) Solenoid resistance is 8 Ω or less (short circuit) when the solenoid is energized. (b) Solenoid resistance is 100 kΩ or more (open circuit) when the solenoid is not energized.	• Open or short in No. 1/No. 2/No. 3 solenoid valve circuit • No. 1/No. 2/No. 3 solenoid valve • Engine & ECT ECU

Fail Safe Function:
If either of the shift solenoid valve circuits develops an open or short, the Engine & ECT ECU turns the other solenoid valve ON and OFF to shift to the gear positions shown in the table below. The Engine & ECT ECU also turns the SLU solenoid valve OFF at the same time. If both solenoids are malfunctioning, hydraulic control cannot be performed electronically and must be done manually.
Manual shifting as shown in the following table must be done (In the case of a short circuit, the Engine & ECT ECU stops sending current to the short circuited solenoid).

Range	Normal				No. 1 Solenoid Valve Malfunction				No. 2 Solenoid Valve Malfunction				No. 3 Solenoid Valve Malfunction			
	Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear
	No. 1	No. 2	No. 3		No. 1	No. 2	No. 3		No. 1	No. 2	No. 3		No. 1	No. 2	No. 3	
D	ON	OFF	OFF	1	X	OFF→ON	OFF	5→3	ON	X	OFF	1	ON	OFF	X	1
	OFF	ON	OFF	3	X	ON	OFF	3	OFF	X	OFF→ON	5→4	OFF	ON	X	3
	OFF	OFF	ON	4	X	OFF	ON	4	OFF	X	ON	4	OFF	OFF	X	5
	OFF	OFF	OFF	5	X	OFF	OFF	5	OFF	X	OFF	5	OFF	OFF	X	5
4	ON	OFF	OFF	1	X	OFF→ON	OFF	5→3	ON	X	OFF	1	ON	OFF	X	1
	OFF	ON	OFF	3	X	ON	OFF	3	OFF	X	OFF→ON	5→4	OFF	ON	X	3
	OFF	OFF	ON	4	X	OFF	ON	4	OFF	X	ON	4	OFF	OFF	X	5
3	ON	OFF	OFF	1	X	OFF→ON	OFF→ON	4→3	ON	X	OFF	1	ON	OFF	X	1
	OFF	ON	ON	3	X	ON	ON	3	OFF	X	ON	4	OFF	ON	X	3
	OFF	OFF	ON	4	X	OFF	ON	4	OFF	X	ON	4	OFF	OFF	X	4
2	ON	OFF	ON	1	X	OFF	ON	3	ON	X	ON	1	ON	OFF	X	1
	OFF	ON	ON	3	X	ON	ON	3	OFF	X	ON	3	OFF	ON	X	3
L	ON	OFF	OFF	1	X	OFF	OFF	3	ON	X	OFF	1	ON	OFF	X	1

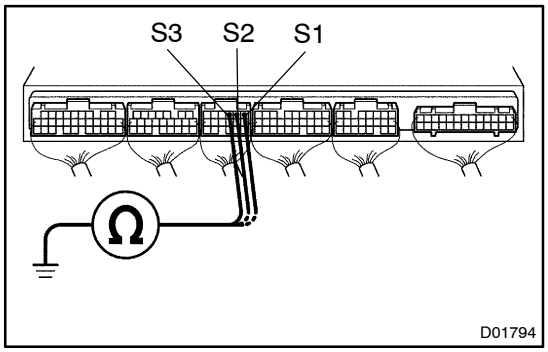
Range	No. 1 and No. 2 Solenoid Valve Malfunction				No. 1 and No. 3 Solenoid Valve Malfunction				No. 2 and No. 3 Solenoid Valve Malfunction				No. 1, No. 2 and No. 3 Solenoid Valve Malfunction			
	Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear
	No. 1	No. 2	No. 3		No. 1	No. 2	No. 3		No. 1	No. 2	No. 3		No. 1	No. 2	No. 3	
D	X	X	OFF→ON	5→4	X	OFF→ON	X	5→3	ON	X	X	1	X	X	X	5
	X	X	OFF→ON	5→4	X	ON	X	3	OFF	X	X	5	X	X	X	5
	X	X	ON	4	X	OFF	X	5	OFF	X	X	5	X	X	X	5
	X	X	OFF	5	X	OFF	X	5	OFF	X	X	5	X	X	X	5
4	X	X	OFF→ON	5→4	X	OFF→ON	X	5→3	ON	X	X	1	X	X	X	5
	X	X	OFF→ON	5→4	X	ON	X	3	OFF	X	X	5	X	X	X	5
	X	X	ON	4	X	OFF	X	5	OFF	X	X	5	X	X	X	5
3	X	X	OFF	4	X	OFF→ON	X	4→3	ON	X	X	1	X	X	X	4
	X	X	ON	4	X	ON	X	3	OFF	X	X	4	X	X	X	4
	X	X	ON	4	X	OFF	X	4	OFF	X	X	4	X	X	X	4
2	X	X	OFF	3	X	OFF	X	3	ON	X	X	1	X	X	X	3
	X	X	ON	3	X	ON	X	3	OFF	X	X	3	X	X	X	3
L	X	X	OFF	3	X	OFF	X	3	ON	X	X	1	X	X	X	3

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Measure resistance between terminal S1, S2 or S3 of Engine & ECT ECU and body ground.**



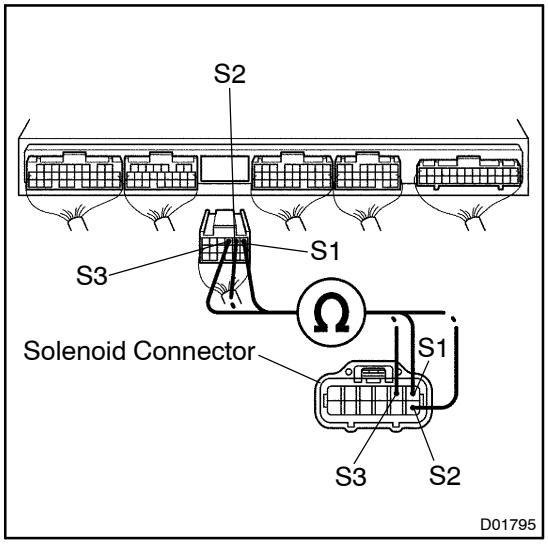
PREPARATION:
Disconnect the connector from Engine & ECT ECU.
CHECK:
Measure resistance between terminal S1, S2 or S3 of Engine & ECT ECU and body ground.
OK:

Resistance: 11 – 15 Ω at 20 °C (68 °F)

OK	**Check and replace the Engine & ECT ECU (See page IN–30).**

NG

2	**Check harness and connector between Engine & ECT ECU and automatic transmission solenoid connector.**



PREPARATION:
Disconnect the solenoid connector from the automatic transmission.
CHECK:
Check the harness and connector between terminal S1, S2 or S3 of Engine & ECT ECU and terminal S1, S2 or S3 of solenoid connector.
OK:

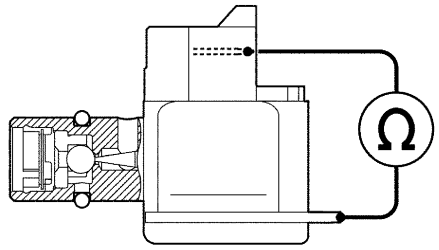
There is no open and no short circuit.

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

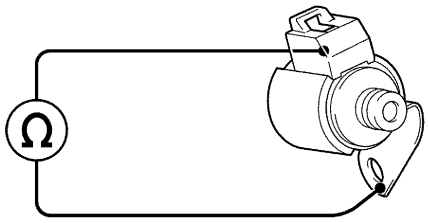
OK

3	Check No. 1, No. 2 or No. 3 solenoid valve.

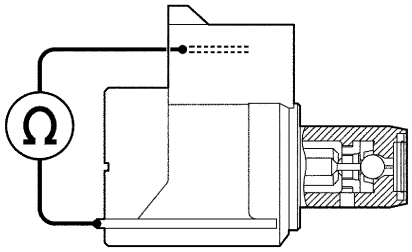
No. 1 Solenoid Valve



No. 2 Solenoid Valve



No. 3 Solenoid Valve



P D10483

Electrical Check:

PREPARATION:

(a) Remove the oil pan.

(b) Remove the No. 1, No. 2 or No. 3 solenoid valve.

CHECK:

(a) Measure resistance between solenoid connector and body ground.

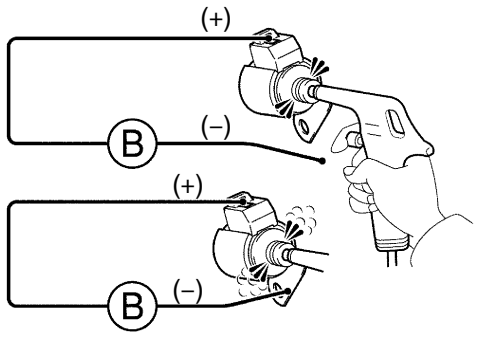
(b) Connect positive ⊕ lead to terminal of solenoid connector, negative ⊖ lead to solenoid body.

OK:

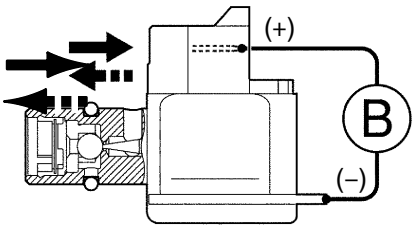
(a) Resistance: 11 – 15 Ω at 20 °C (68 °F)

(b) The solenoid makes an operating noise.

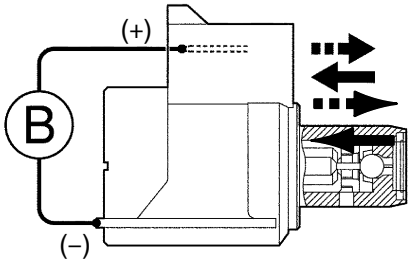
No. 2 Solenoid Valve



No. 1 Solenoid Valve



No. 3 Solenoid Valve



P D10482

Mechanical Check:

PREPARATION:

(a) Remove the oil pan.

(b) Remove the No. 1, No. 2 or No. 3 solenoid valve.

CHECK:

No. 2 solenoid valve:

(a) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valves do not leak air.

(b) When battery positive voltage is supplied to the shift solenoid valves, check that the solenoid valves open.

No. 1 and No. 3 solenoid valves:

Connect the positive (+) lead with 8 – 10 W bulb to terminal 2 and the negative (–) lead to terminal 1, then check the movement of the valve.

OK:

When B^+ is applied.	Valve moves in ◀ direction in the illustration on the left.
When B^+ is cut off.	Valve moves in ■■■▶ direction in the illustration on the left.

NG → **Replace the solenoid valve.**

OK

Repair or replace the solenoid wire.

DI2LC–02

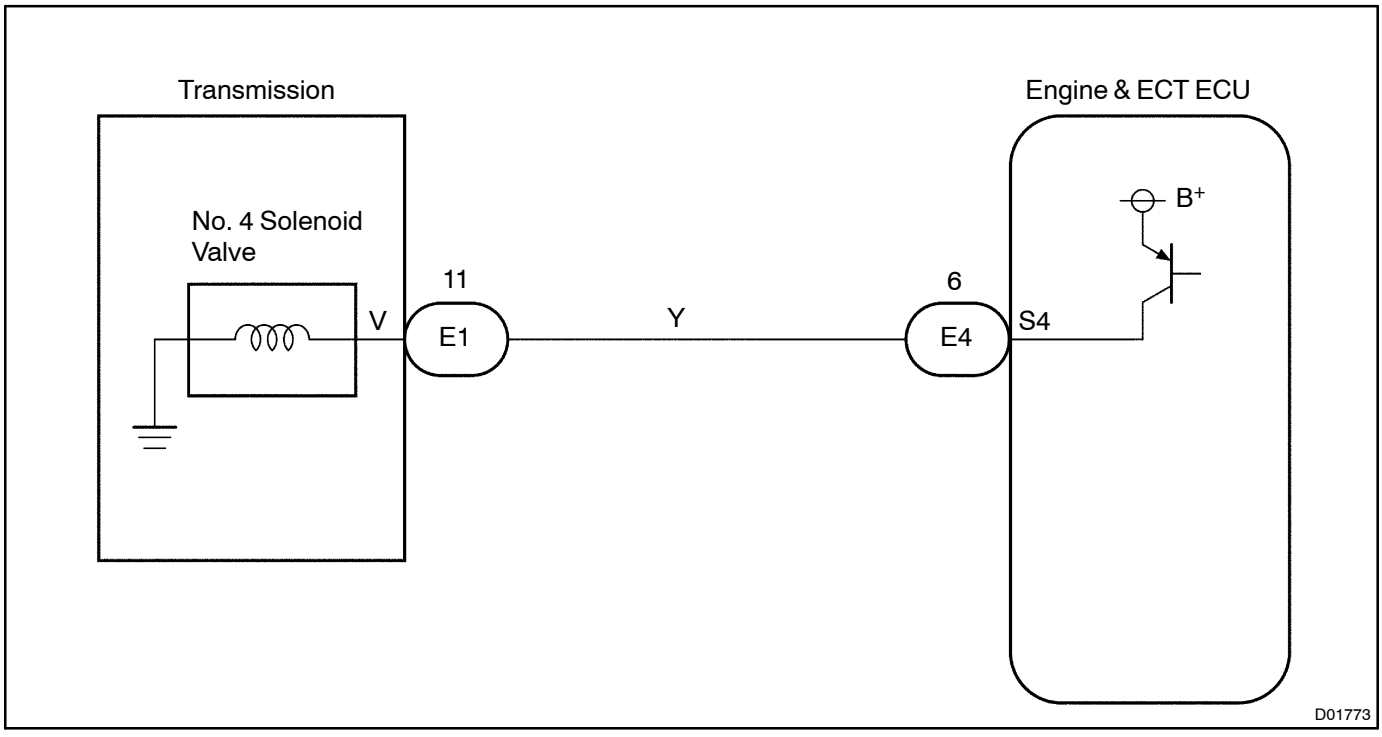
DTC	P0768/65	Shift Solenoid D Electrical Malfunction (No. 4 Solenoid Valve)

CIRCUIT DESCRIPTION

No. 4 solenoid valve is controlled by Engine & ECT ECU and it switches ON and OFF of the O/D direct switch.

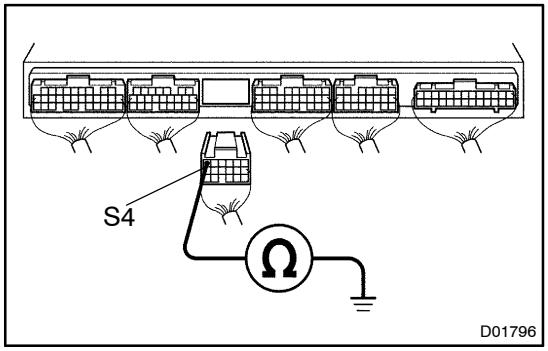
DTC No.	DTC Detecting Condition	Trouble Area
P0768/65	The Engine & ECT ECU checks for an open or short circuit in the No. 4 solenoid valve circuit when it changes. The Engine & ECT ECU records DTC P0768/65 if condition (a) or (b) is detected once, but it does not light up CHK ENG. After Engine & ECT ECU detects condition (a) or (b) continuously 8 times or more in 1 trip, it causes the CHK ENG lights up until condition (a) or (b) disappears. After that, if the Engine & ECT ECU detects condition (a) or (b) once, it starts lighting up CHK ENG again. (a) Solenoid resistance is 8 Ω or less (short circuit) when the solenoid is energized. (b) Solenoid resistance is 100 kΩ or more (open circuit) when the solenoid is not energized.	• Open or short in No. 4 solenoid valve circuit • No. 4 solenoid valve • Engine & ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check resistance between terminals S4 of Engine & ECT ECU and body ground.**

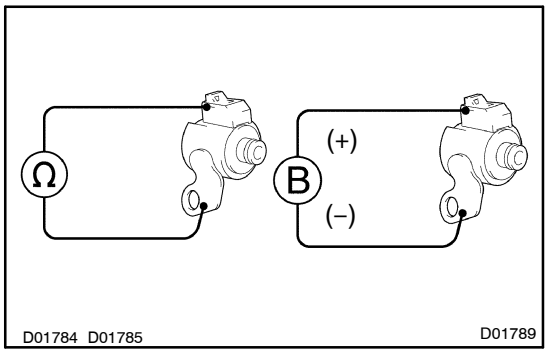


PREPARATION:
Disconnect the connector from Engine & ECT ECU.
CHECK:
Measure resistance between terminals S4 and body ground.
OK:
Resistance: 11 – 15 Ω at 20 °C (68 °F)

OK	**Check and replace the Engine & ECT ECU (See page IN–30).**

NG

2	**Check No. 4 solenoid valve.**

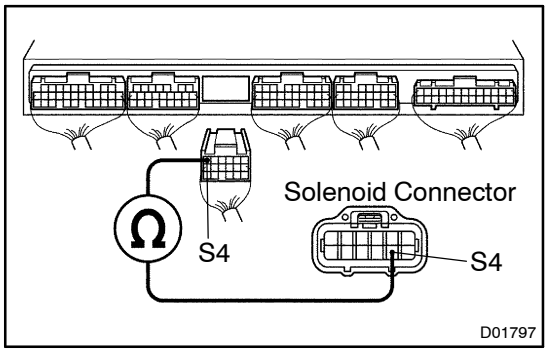


PREPARATION:
(a) Remove the oil pan.
(b) Remove the No. 4 solenoid valve.
CHECK:
(a) Measure resistance between terminal and solenoid body.
(b) Connect positive (+) lead to terminal of solenoid connector and negative (–) lead to solenoid body.
OK:
(a) Resistance: 11 – 15 Ω at 20 °C (68 °F)
(b) The solenoid makes an operating noise.

NG	**Replace No. 4 solenoid valve.**

OK

3	**Check harness and connector between Engine & ECT ECU and automatic transmission solenoid connector.**



PREPARATION:

Disconnect the solenoid connector from the automatic transmission.

CHECK:

Check the harness and connector between terminal S4 of Engine & ECT ECU and terminal S4 solenoid connector.

OK:

There is open and no short circuit.

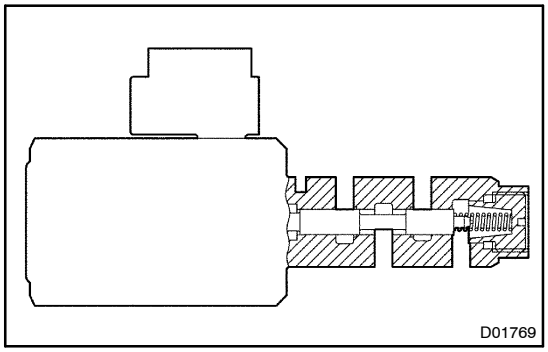
NG → **Repair or replace harness or connector.**

OK

Proceed to next circuit inspection shown in problem symptoms table (See page DI–240). However, when DTC P0768/65 is displayed, check and replace Engine & ECT ECU (See page IN–20).

DI87S–01

DTC	P0770	Shift Solenoid ”E” Malfunction (SLU Shift SOlenoid Valve)



SYSTEM DESCRIPTION

The Engine & ECT ECU uses the signals from the Throttle Position Sensor and Air–flow Meter to monitor the engagement condition of the lock–up clutch.

Then the Engine & ECT ECU compares the engagement condition of the lock–up clutch with the lock–up schedule in the Engine & ECT ECU memory to detect mechanical trouble of the SLU solenoid valve SLU, valve body, torque converter and automatic transmission assembly (clutch, brake or gear etc.).

DTC No.	DTC Detecting Condition	Trouble Area
P0770	Lock–up does not occur when driving in the lock–up range (normal driving at 80 km/h [50 mph]), or lock–up remains ON in the lock–up OFF range. (2–trip detection logic)	• SLU solenoid valve is stuck open or closed • Valve body blocked up or stuck • Lock–up clutch • Automatic transmission assembly

INSPECTION PROCEDURE

HINT:

In case of using hand–held tester, start the inspection from step 1 and in case of not using the hand–held tester, start from step 2.

1	**Active test.**

PREPARATION:

(a) Remove the DLC3 cover.
(b) Connect a hand–held tester.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Using active test, check the lock–shift operation.

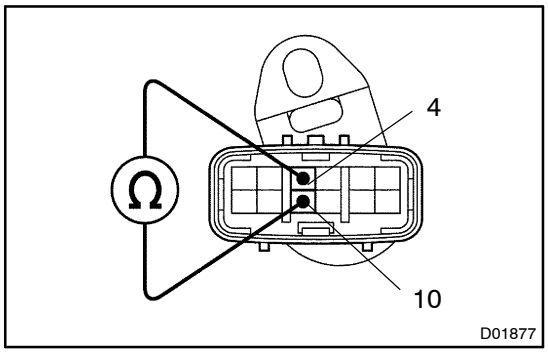
OK:

Lock–up ON

NG → **Replace the torque converter.**

OK

2	Check SLU solenoid valve resistance.

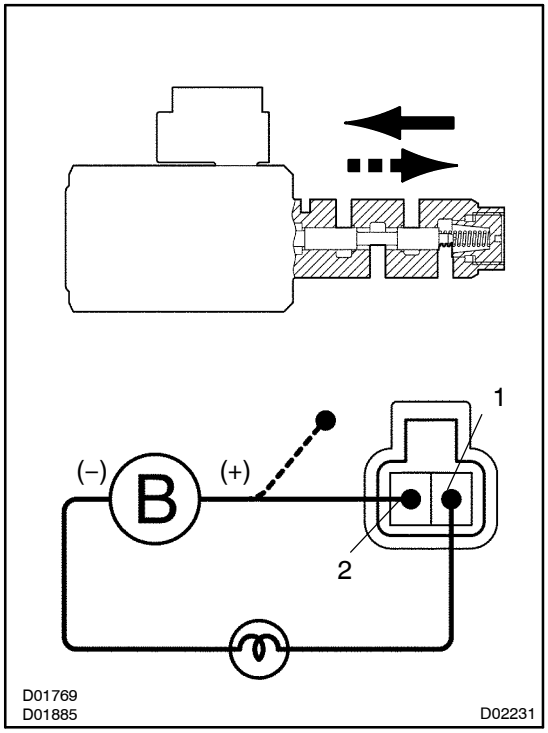


PREPARATION:
Disconnect the solenoid wire connector.
CHECK:
Measure the resistance between terminals 4 and 10 of solenoid connector.
OK:
Resistance: 5.0 – 5.6 Ω at 20 °C (68 °F)

NG → **Replace the SLU solenoid valve.**

OK

3	Check SLU solenoid valve operation.



PREPARATION:
(a) Remove the oil pan.
(b) Remove the SLU solenoid valve.
CHECK:
Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 1.
OK:

When B^+ is applied.	Valve moves in ➡ direction in illustration on the left.
When B^+ is cut off.	Valve moves in ⬅ direction in illustration on the left.

NG → **Replace the SLU solenoid valve.**

OK

4	Check valve body (See page DI–240).

NG → Repair or replace the valve body.

OK →

Replace the torque converter
(See Pub. No. RM588E on page AT–28).

DI87T–01

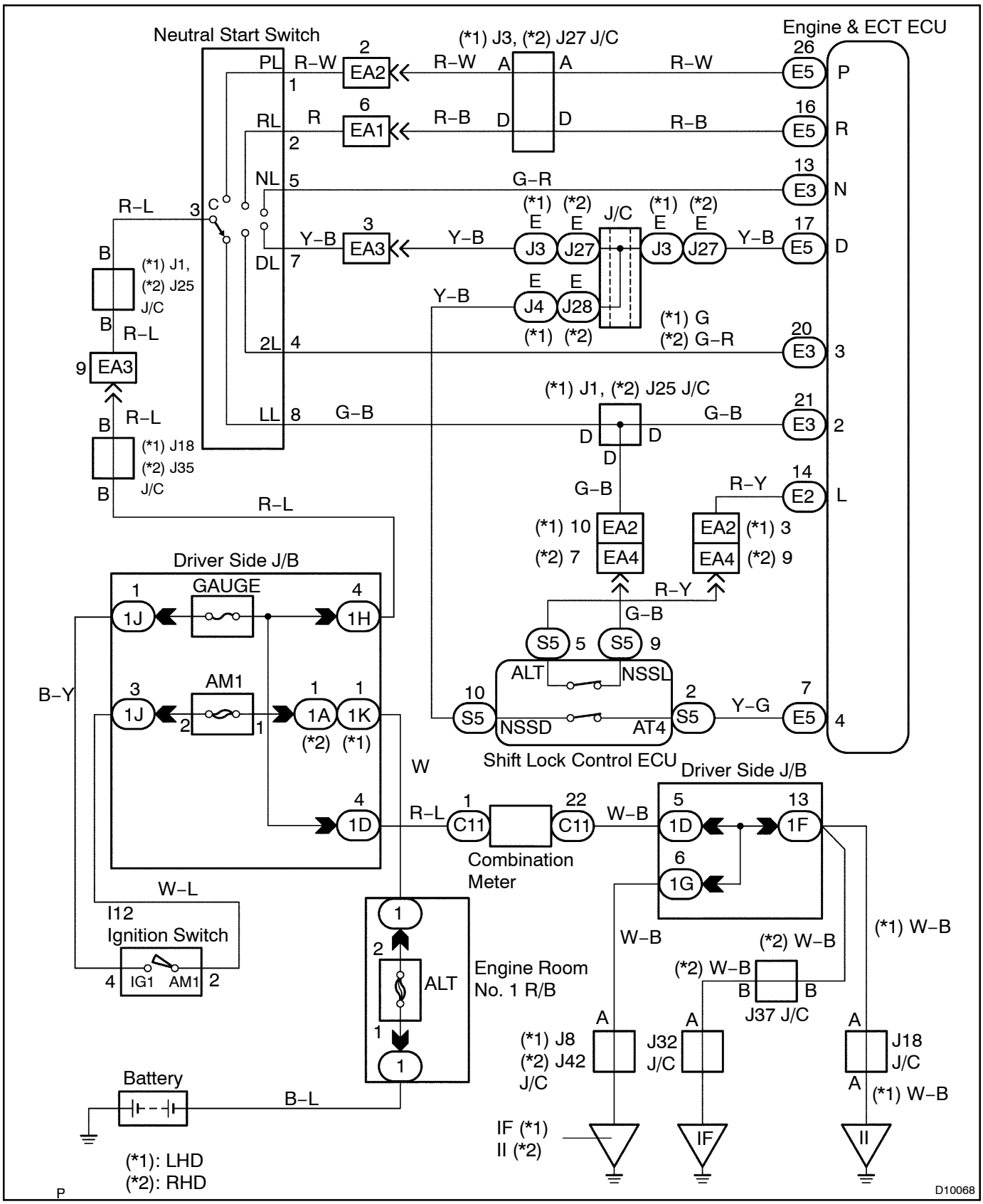
DTC	P1780/97	Park/Neutral Position Switch Circuit (Neutral Start Switch)

CIRCUIT DESCRIPTION

The neutral start switch detects the shift lever range and sends signals to the Engine & ECT ECU.
The Engine & ECT ECU receives signals (P, R, N, D, 4, 3, 2 and L) from the neutral start switch. When the signal is not sent to the Engine & ECT ECU from the neutral start switch, the Engine & ECT ECU judges that the shift lever is in D range.

DTC No.	DTC Detection Condition	Trouble Area
P1780/97	2 or more switches are ON simultaneously for P, R, N, D, 4, 3, 2 and L ranges. (2–trip detection logic)	• Short in neutral start switch circuit • Neutral start switch • Engine & ECT ECU
	When driving under conditions (a) and (b) for 30 seconds or more, the neutral start switch is ON (N position). (2–trip detection logic) (a) Vehicle speed: 70 km/h (44 mph) or more (b) Engine speed: 1,500 – 2,500 rpm	

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
In case of using the hand–held tester, start the inspection from step 1 and in case of not using the hand–held tester, start from step 2.

1	**Read PNP, REVERSE, DRIVE, 4TH, 3RD, 2ND and LOW signals.**

PREPARATION:

(a) Remove the DLC3 cover.
(b) Connect a hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Shift lever into the P, R, N, D, M, 3, 2 and L ranges, and read the PNP, REVERSE, DRIVE, 4TH, 3RD, 2ND and LOW signals on the hand–held tester.

OK:

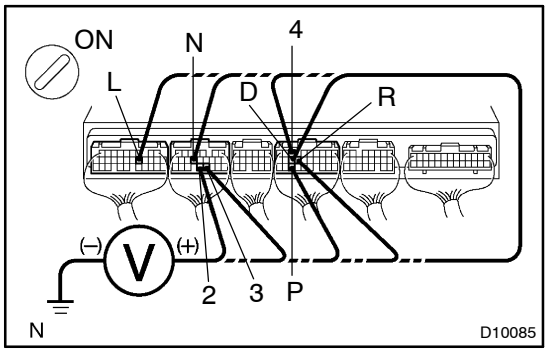
Shift range	Signal
P, N	PNP: OFF → ON
R	REVERSE: OFF → ON
D	DRIVE: OFF → ON
M	4TH: OFF → ON
3	3RD: OFF → ON
2	2ND: OFF → ON
L	LOW: OFF → ON

OK → **Check and replace the Engine & ECT ECU (See page 1N–30).**

NG

Go to step 3.

2	**Measure voltage between each terminals of P, R, N, D, 4, 3, 2, and L of Engine & ECT ECU and body ground.**



PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between each terminals P, R, N, D, 4, 3, 2 and L of Engine & ECT ECU and body ground when the shift lever is shifted to the following positions.

OK:

Tester connection	Condition	Specified condition
P– Body ground	Shift lever range: P	Battery voltage
R – Body ground	Shift lever range: R	Battery voltage*
N – Body ground	Shift lever range: N	Battery voltage
D – Body ground	Shift lever range: D Transmission control SW (for D and 4) : OFF	Battery voltage
4 – Body ground	Shift lever range: M Transmission control SW (for D and 4) : ON	Battery voltage
3 – Body ground	Shift lever range: 3	Battery voltage
2 – Body ground	Shift lever range: 2 Transmission control SW (for 2 and L) : OFF	Battery voltage
L – Body ground	Shift lever range: L Transmission control SW (for 2 and L) : ON	Battery voltage

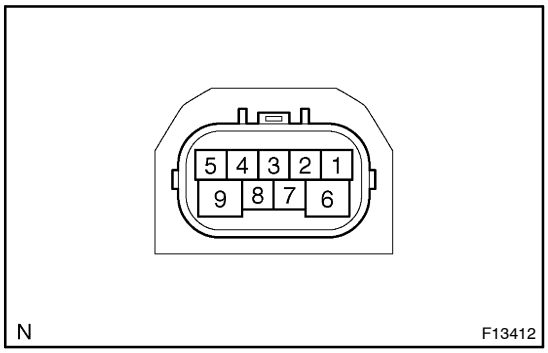
HINT:

*: The voltage will drop slightly due to lighting up of the back up light.

OK → **Check and replace the Engine & ECT ECU (See page N–30).**

NG

3	Check neutral start switch.



PREPARATION:

(a) Jack up the vehicle.

(b) Remove the neutral start switch connector.

CHECK:

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

OK:

Shift range	Terminal No. to continuity	Terminal No. to continuity
P	1 – 3	6 – 9
R	2 – 3	–
N	3 – 5	6 – 9
D, M	3 – 7	–
3	3 – 4	–
2, L	3 – 8	–

NG → **Replace the neutral start switch.**

OK

Repair or replace harness and connector between battery and neutral start switch, neutral start switch and Engine & ECT ECU (See page IN–30).

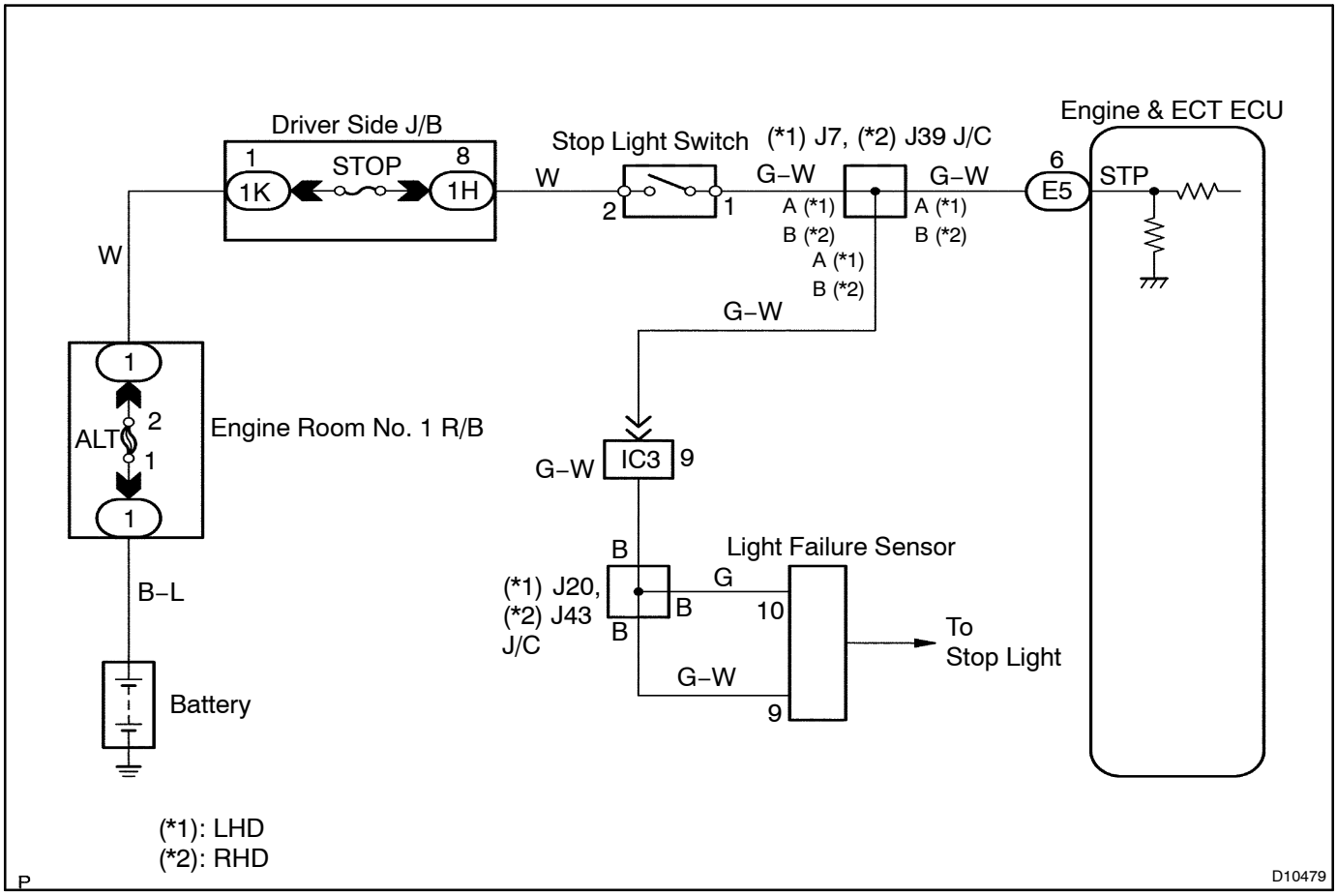
DI0I7–15

Stop Light Switch Signal Malfunction

CIRCUIT DESCRIPTION

The object of this circuit is to prevent the engine from stalling, while driving in lock–up condition, when brakes are suddenly applied.
When the brake pedal is operated, this switch sends a signal to Engine & ECT ECU. Then the Engine & ECT ECU cancels operation of the lock–up clutch while braking is in progress.

WIRING DIAGRAM



INSPECTION PROCEDURE

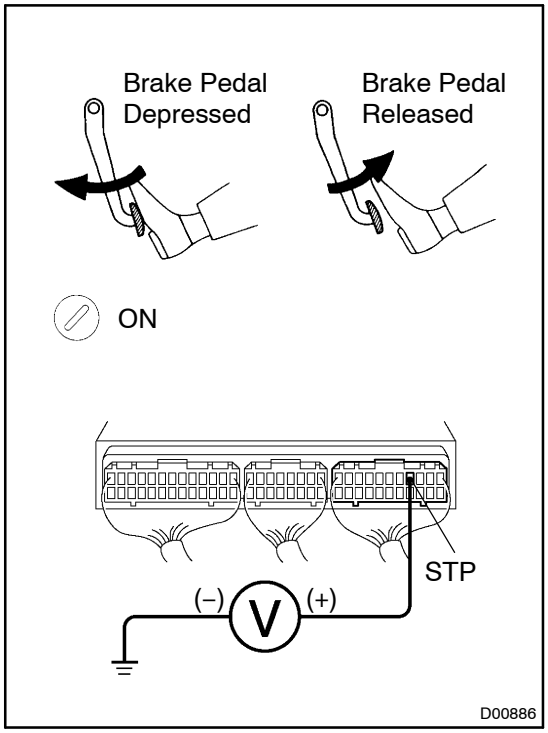
1	**Check operation of stop light.**

CHECK:
Check if the stop lights go on and off normally when the brake pedal is operated and released.

NG → **Check and repair stop light circuit.**

OK

2	**Check STP signal.**



When using hand–held tester:

PREPARATION:

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

(b) Turn the ignition switch ON and turn the hand–held tester main switch ON.

CHECK:

Read the STP signal on the hand–held tester.

OK:

Brake pedal is depressed: STP....ON
Brake pedal is released: STP....OFF

When not using hand –held tester:

PREPARATION:

Turn the ignition switch ON.

CHECK:

Check voltage between terminal STP of Engine & ECT ECU and body ground.

OK:

Brake pedal	Voltage
Depressed	7.5 – 14 V
Released	Below 1.5 V

OK → **Proceed to next circuit inspection shown on problem symptoms table (See page DI–240).**

NG

3	**Check harness and connector between Engine & ECT ECU and stop light switch (See page IN–30).**

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

OK

Check and replace Engine & ECT ECU (See page IN–30).

DI7W2–02

E–shift Main Switch Circuit

CIRCUIT DESCRIPTION

When the shift lever is in the M range (with E–shift main switch for D and M pressed), ”M” in the shift position indicator light will come on and when the shift lever is in the D position (with E–shift main switch for D and M released), ”D” in the shift position indicator light will come on.
When the shift lever is in the L position (with E–shift main switch for 2 and L pressed), ”L” in the shift position indicator light will come on and when the shift lever is in the 2 position (with E–shift main switch for 2 and L released), ”2” in the shift position indicator light will come on.
When the shift lever is in M range, the Engine & ECT ECU prohibits shifting to 5th.

WIRING DIAGRAM

See page DI–261.

INSPECTION PROCEDURE

1	**Check operation of E–shift main switch.**

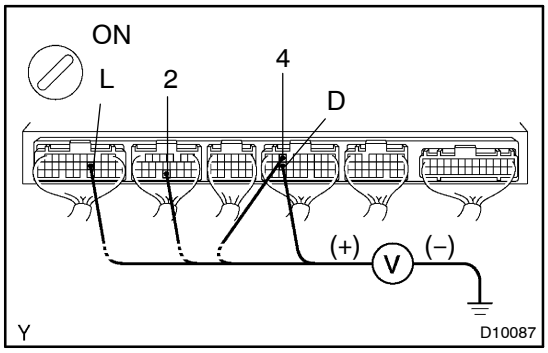
PREPARATION:
Turn the ignition switch ON.
CHECK:
Check the shift indicator light when the shift lever is in the each position.
OK:

Shift Lever Position	Specified Condition
D	”D” indicator light comes on
Except D	”D” indicator light goes off
M	”M” indicator light comes on
Except M	”M” indicator light goes off
2	”2” indicator light comes on
Except 2	”2” indicator light goes off
L	”L” indicator light comes on
Except L	”L” indicator light goes off

NG → **Go to step 4.**

OK

2	Check voltage between each terminals of D, 4, 2 and L of Engine & ECT ECU and body ground.



PREPARATION:

Remove the Engine & ECT ECU with connectors still connected.

CHECK:

(a) Turn ignition switch ON.

(b) Check voltage between each of terminals of D, 4, 2,and L of Engine & ECT ECU and body ground.

OK:

Tester connection	Shift lever position	Specified condition
D – Body ground	D or M	7.5 – 14 V
	Except D and M	Below 1.5 V
4 – Body ground	M	7.5 – 14 V
	Except M	Below 1.5 V
2 – Body ground	2 or L	7.5 – 14 V
	Except 2 and L	Below 1.5 V
L – Body ground	L	7.5 – 14 V
	Except L	Below 1.5 V

OK → **Proceed to next circuit inspection shown in problem symptom table (See page DI–240).**

NG

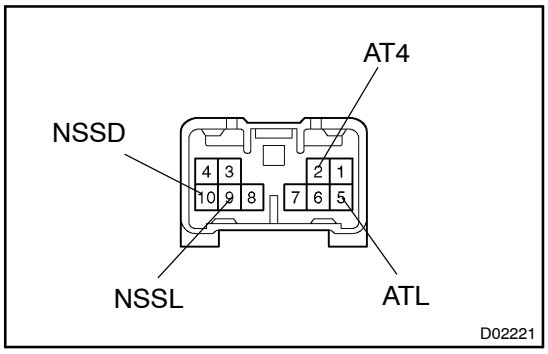
3	Check harness and connector between battery and Engine & ECT ECU, Engine & ECT ECU and shift indicator light (See page IN–30).

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

OK

Check and replace Engine & ECT ECU (See page IN–30).

4	Check E–shift main switch.



CHECK:

(a) Disconnect the transmission control switch connector.

(b) Check continuity between each terminal of transmission control switch connector.

OK:

Shift position	Tester connection	Specified value
D	2 – 10 (AT4 – NSSD)	No continuity
M		Continuity
2	5 – 9 (ATL – NSSL)	No continuity
L		Continuity

NG → **Replace E–shift main switch.**

OK

Check and replace combination meter (See combination meter troubleshooting section on page BE–11).

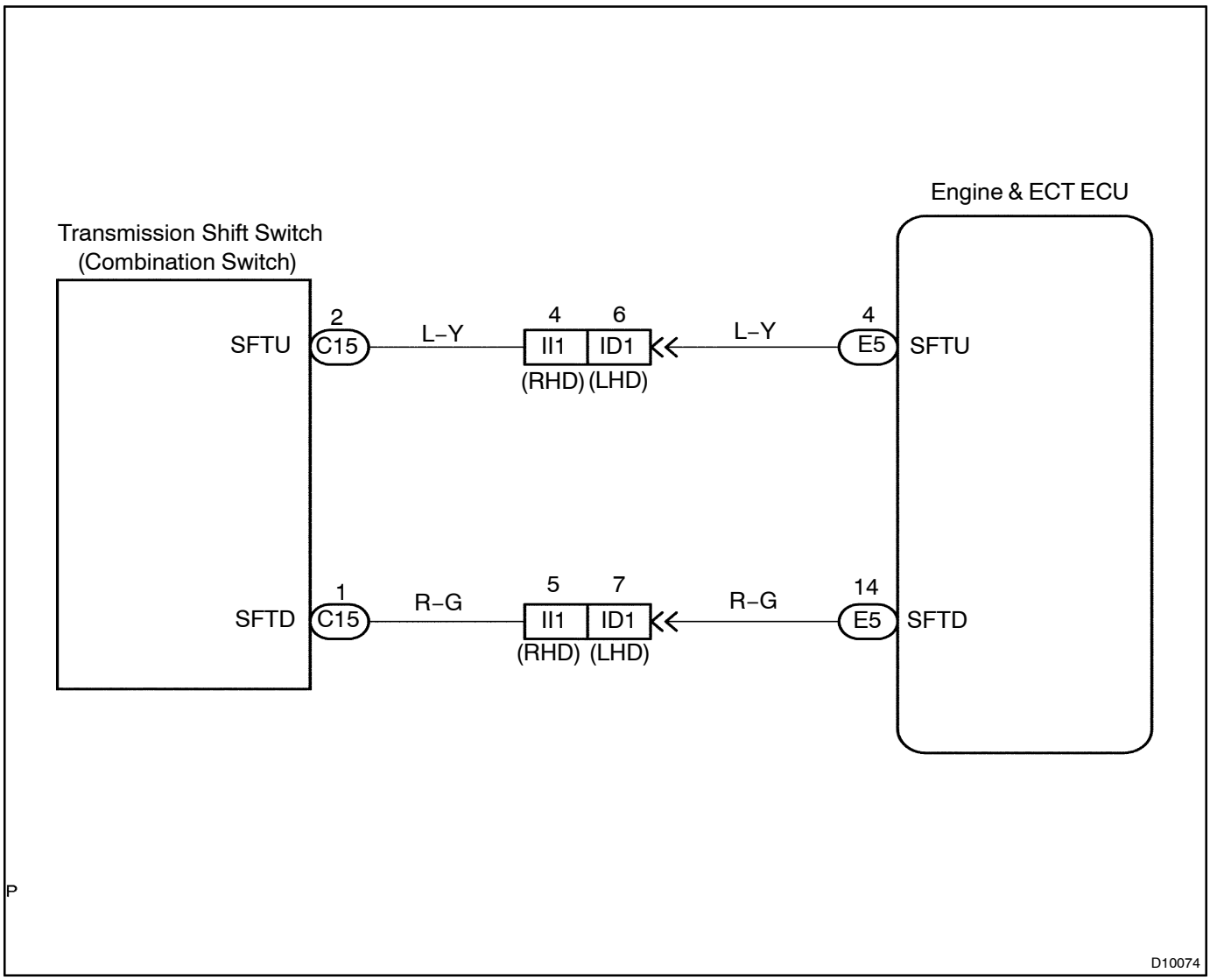
DI25Z–05

Transmission Shift Switch Circuit

CIRCUIT DESCRIPTION

When shifting the shift lever in M range, using the transmission shift switch, it is possible to shift in 2 – 5 ranges.
Pressing ”Up switch” once shifts up 1 range, ”Down switch” once shifts down 1 range respectively.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check the shift lock control unit assembly (See page AT–9).

NG → Replace the shift lock control unit assembly.

OK ↓

2	Check operation of transmission shift switch.

PREPARATION:

(a) Turn the ignition switch ON.

(b) Shift the shift lever into the M range.

CHECK:

Check the odo trip display panel when the transmission shift switch is pressed.

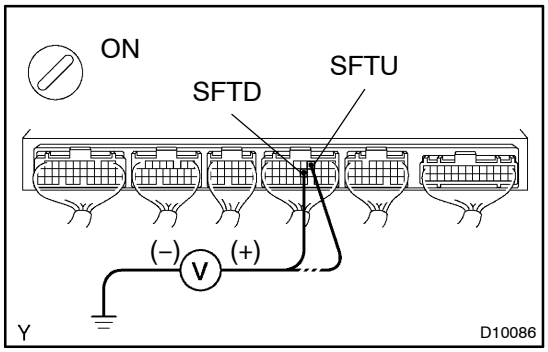
OK:

Switch condition	Odo trip display panel
”Up” switch press	Shift up
”Down” switch press	Shift down

NG → Go to step 5.

OK ↓

3	Check voltage between each of terminals SFTU and SFTD of Engine & ECT ECU and body ground.



PREPARATION:

(a) Turn ignition switch ON.

(b) Remove the Engine & ECT ECU with connectors still connected.

CHECK:

Check voltage between each terminals of SFTU and SFTD of ECM and body ground.

OK:

Switch condition	Tester connection	Specified condition
"Up" switch held pressing	SFTU – Body ground	7 – 12 V
"Up" switch released		Below 3 V
"Down" switch held pressing	SFTD – Body ground	7 – 12 V
"Down" switch released		Below 3 V

OK → **Proceed to next circuit inspection shown in problem symptoms table (See page DI–240).**

NG

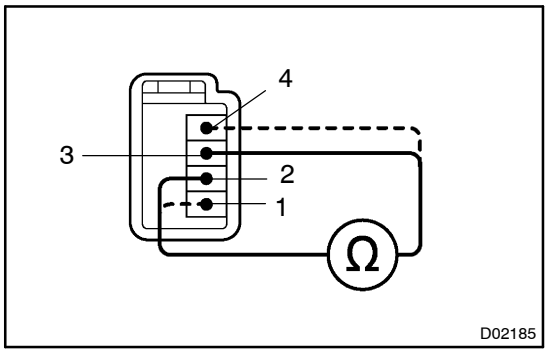
4	Check harness and connector between battery and Engine & ECT ECU, Engine & ECT ECU and odo/trip display panel (See page IN–30).

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

OK

Check and replace Engine & ECT ECU (See page IN–30).

5	Check transmission shift switch.



PREPARATION:

(a) Remove the steering wheel pad.

(b) Disconnect the transmission shift switch connector.

CHECK:

Check continuity between each terminal of transmission shift switch connector.

OK:

Switch condition	Tester connection	Specified value
"Up" switch pressed	1 – 4	No continuity
"Up" switch released		Continuity
"Down" switch pressed	2 – 3	No continuity
"Down" switch released		Continuity

NG → **Replace the steering wheel.**

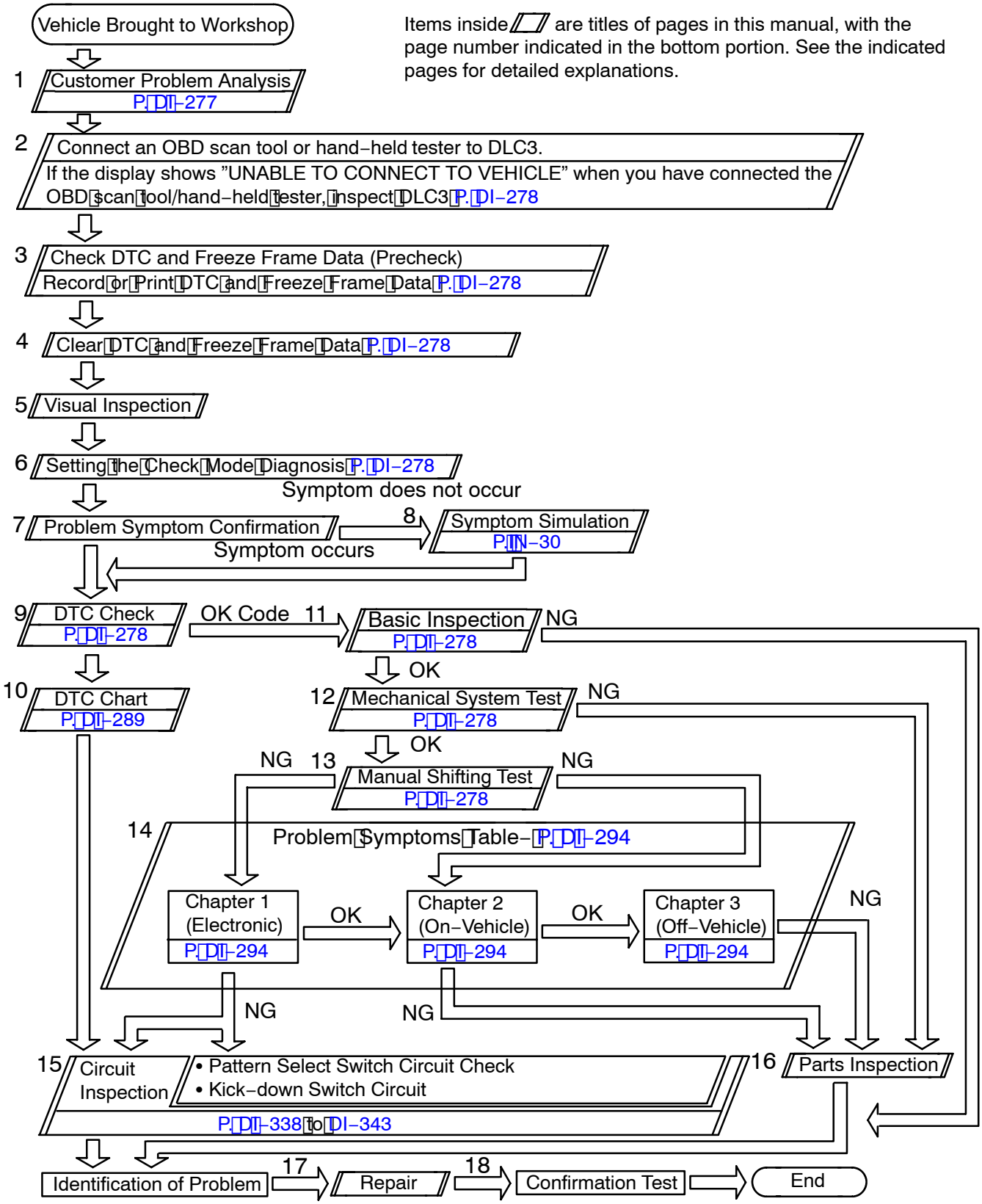
OK →

Check and replace combination meter (See combination meter troubleshooting section on page BE–11).

AUTOMATIC TRANSMISSION (3UZ–FE)

HOW TO PROCEED WITH TROUBLESHOOTING

DI87U–01



DI87V–01

CUSTOMER PROBLEM ANALYSIS CHECK

Transmission Control System Check Sheet

Inspector's Name :

Customer's Name		Registration No.	
		Registration Year	/ /
		Frame No.	
Date Vehicle Brought In	/ /	Odometer Reading	km mile

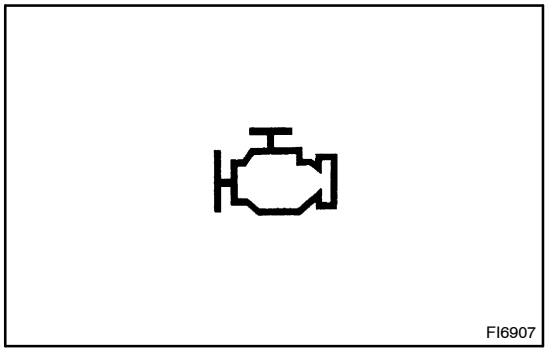
Date Problem Occurred	/ /
How Often Does Problem Occur?	☐ Continuous ☐ Intermittent (times a day)

Symptoms	☐ Vehicle does not move (☐ Any range ☐ Particular range)
	☐ No up–shift (☐ 1st → 2nd ☐ 2nd → 3rd ☐ 3rd → 4th ☐ 4th → O/D)
	☐ No down–shift (☐ O/D → 4th ☐ 4th → 3rd ☐ 3rd → 2nd ☐ 2nd → 1st)
	☐ Lock–up malfunction
	☐ Shift point too high or too low
	☐ Harsh engagement (☐ N → D ☐ Lock–up ☐ Any drive range)
	☐ Slip or shudder
	☐ No kick–down
	☐ Others ( )

Check Item	Check Engine Warning Light (CHK ENG)	☐ Normal ☐ Remains ON

DTC Check	1st Time	☐ Normal code ☐ Malfunction code (DTC)
	2nd Time	☐ Normal code ☐ Malfunction code (DTC)

DI87W–01


FI6907

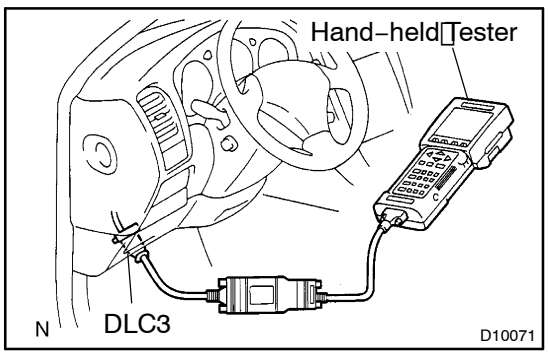
PRE–CHECK

1. DIAGNOSIS SYSTEM

(a) Description

• When troubleshooting Euro–OBD vehicles, the only difference from the usual troubleshooting procedure is that you connect to the vehicle the OBD scan tool complying with ISO 15031–4 or hand–held tester, and read off various data output from the vehicle's engine ECU.

Euro–OBD regulations require that the vehicle's on–board computer lights up the check engine warning ignition on the instrument panel when the computer detects a malfunction in the emission control system/components or in the power–train control components which affect vehicle emissions, or a malfunction in the computer. In addition to the check engine warning light (CHK ENG) lighting up when a malfunction is detected, the applicable Diagnostic Trouble Codes (DTCs) prescribed by ISO15031–6 are recorded in the engine ECU memory (See page DI–84). If the malfunction does not repaired in 3 consecutive trips, the (CHK ENG) goes off automatically but the DTCs remain recorded in the engine ECU memory.

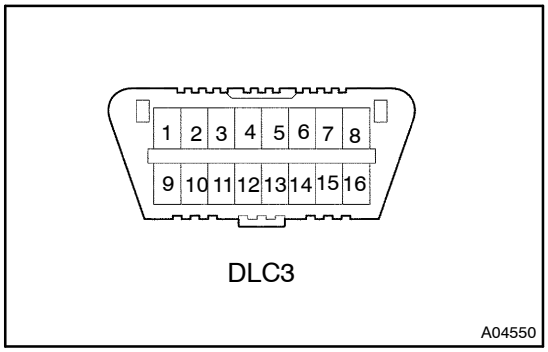


• To check the DTCs, connect the OBD scan tool or hand–held tester to the Data Link Connector 3 (DLC3) on the vehicle. The OBD scan tool or hand–held tester also enables you to erase the DTCs and check freezed frame data and various forms of engine data (For operating instructions, see the OBD scan tool's instruction book.).

DTCs include ISO controlled codes and manufacturer controlled codes. ISO controlled codes must be set as prescribed by the ISO, while manufacturer controlled codes can be set freely by the manufacturer within the prescribed limits (See DTC chart on page DI–84).

- The diagnosis system operates in normal mode during normal vehicle use. It also has a check mode for technicians to simulate malfunction symptoms and troubleshoot. Most DTCs use 2 trip detection logic* to prevent erroneous detection, and ensure thorough malfunction detection. By switching the engine ECU to check mode when troubleshooting, the technician can cause the check engine warning light to light up for a malfunction that is only detected once or momentarily (Hand–held tester only) (See step 2).
- *2 trip detection logic:
  When a malfunction is first detected, the malfunction is temporarily 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 light up (2nd trip).
  (However, the ignition switch must be turned OFF between the 1st trip and the 2nd trip.)

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



DLC3

Terminal No.	Connection/Voltage or Resistance	Condition
7	Bus ⊕ Line/Pulse generation	During transmission
4	Chassis Ground ↔ Body Ground/1 Ω or less	Always
16	Battery Positive ↔ Body Ground/9 – 14 V	Always

HINT:
If your display shows UNABLE TO CONNECT TO VEHICLE when you have connected the cable of the OBD scan tool or hand–held tester to the DLC3, turned the ignition switch ON and operated the scan tool, there is a problem on the vehicle side or tool side.

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

2. INSPECT DIAGNOSIS (Normal Mode)

(a) Check the DTC using hand–held tester.

NOTICE:

Hand–held tester only:

When the diagnosis system is switched from normal mode to check mode, it erases all DTCs and freezed frame data recorded in normal mode. So before switching modes, always check the DTCs and freezed frame data, and note them down.

(1) Prepare the hand–held tester.

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

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

(4) Use the hand–held tester to check the DTCs and freezed frame data, note them down. (For operating instructions, see the hand–held tester instruction book.)

(5) See page BE–11 to confirm the details of the DTCs.

NOTICE:

- **When simulating symptoms with out a hand–held tester to check the DTCs, use normal mode. For code on the DTC chart subject to ”2 trip detection logic”, turn the ignition switch OFF after the symptom is simulated the first time. Then repeat the simulation process again. When the problem has been simulated twice, the CHK ENG is indicated on the instrument panel and the DTCs are recorded in the engine ECU.**
- **Check the 1st trip DTC using Mode 7 for ISO 15031 (Continuous Test Results of Euro–OBD function in hand–held tester).**

3. INSPECT DIAGNOSIS (Check (Test) Mode)

HINT:

Hand–held tester only:

Compared to the normal mode, the check mode has an increased sensitivity to detect malfunctions.

Furthermore, the same diagnostic items which are detected in the normal mode can also be detected in the check (test) mode.

(a) Check the DTC.

(1) Initial conditions

- Battery voltage 11 V or more
- Throttle valve fully closed.
- Transmission in P or N range
- A/C switched OFF

(2) Turn the ignition switch OFF.

(3) Prepare the hand–held tester.

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

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

(6) Switch the hand–held tester from the normal mode to the check (test) mode.

NOTICE:

If the hand–held tester switches the engine ECU from 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 freezed frame data will be erased.

(7) Start the engine.

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

NOTICE:

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

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

HINT:

Take care not to turn the ignition switch OFF. Turning the ignition switch OFF switches the diagnosis system from check (test) mode to normal mode. so all DTCs, etc. are erased.

(10) After checking the DTC, inspect the applicable circuit.

(b) Clear the DTC.

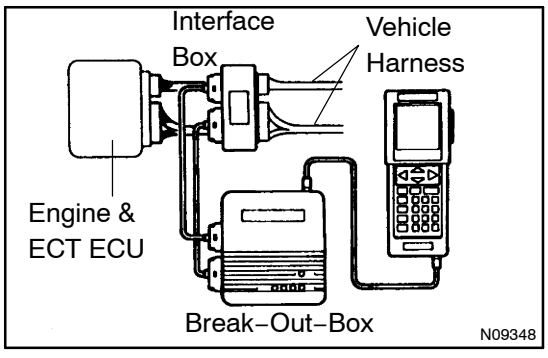
The DTCs and freezed frame data will be erased by either actions.

(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 fuse for 10 seconds or more.

NOTICE:

If the hand–held tester switches the engine ECU from 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 freezed frame data will be erased.



(c) Engine ECU Terminal Values Measurement Using Break–Out–Box and Hand–Held Tester

(1) Hook up the break–out–box and hand–held tester to the vehicle.

(2) Read the engine ECU input/output values by following the prompts on the tester screen.

HINT:

- Hand–held tester has a "Snapshot" function.
  This records the measured values and is effective in the diagnosis of intermittent problems.

- Please refer to the hand–held tester/break–out–box operator's manual for further details.

4. PROBLEM SYMPTOM CONFIRMATION

Taking into consideration the results of the customer problem analysis, try to reproduce the symptoms of the trouble. If the problem is that the transmission does not shift up, shift down, or the shift point is too high or too low conduct the following road test referring to the automatic shift schedule and simulate the problem symptoms.

5. ROAD TEST

NOTICE:

Conduct the test at normal operating ATF temperature 50 – 80 °C (122 – 176 °F).

(a) D range test (NORM and PWR pattern):

Shift into the D range and fully depress the accelerator pedal and check the following points.

(1) Check up–shift operation.

Check to see that 1 → 2, 2 → 3, 3 → 4 and 4 → 5 up–shift takes place, and that the shift points conform to the automatic shift schedule (See page SS–29).

HINT:

- 5th Gear Up–shift Prohibition Control (1. Coolant temp. is 55 °C (128 °F) or less. 2. Vehicle speed is 51 km/h (32 mph) or less.)
- 5th Gear Lock–up Prohibition Control (1. Brake pedal is depressed. 2. Coolant temp. is 55 °C (128 °F) or less.)

(2) Check for shift shock and slip.

Check for shock and slip at the 1 → 2, 2 → 3, 3 → 4 and 4 → 5 up–shifts.

(3) Check for abnormal noises and vibration.

Run at the D range lock–up or 5th gear and check for abnormal noises and vibration.

HINT:

The check for the cause of abnormal noises and vibration must be done very thoroughly as it could also be due to loss of balance in the differential, torque converter, etc.

(4) Check kick–down operation.

While running in the D range, 2nd, 3rd and 5th gears, check to see that the possible kick–down vehicle speed limits for 2 → 1, 3 → 2, 4 → 3 and 5 → 4 kick–downs conform to those indicated in the automatic shift schedule (See page SS–29).

(5) Check abnormal shock and slip at kick–down.

(6) Check the lock–up mechanism.

- Drive in D range, 5th gear, at a steady speed (lock–up ON) of about 70 km/h (43 mph).
- Lightly depress the accelerator pedal and check that the engine speed does not change abruptly.

If there is a big jump in engine speed, there is no lock–up.

(b) 4 range test:

Shift into the 4 range and fully depress the accelerator pedal and check the following points.

(1) Check up–shift operation.

Check to see that the 1 → 2, 2 → 3 and 3 → 4 up–shift takes place and that the shift point conforms to the automatic shift schedule (See page SS–29).

HINT:

There is no 5th up–shift in the 4 range.

(2) Check engine braking.

While running in the 4 range and 4th gear, release the accelerator pedal and check the engine braking effect.

(3) Check for abnormal noises during acceleration and deceleration, and for shock at up–shift and down–shift.

(c) 3 range test:
Shift into the 3 range and fully depress the accelerator pedal and check the following points.
(1) Check up–shift operation.
Check to see that the 1 → 2 and 2 → 3up–shift takes place and that the shift point conforms to the automatic shift schedule (See page SS–29).
(2) Check engine braking.
While running in the 3 range and 3rd gear, release the accelerator pedal and check the engine braking effect.
(3) Check for abnormal noises during acceleration and deceleration, and for shock at up–shift and down–shift.

(d) 2 range test:
Shift into the 2 range and fully depress the accelerator pedal and check the following points.
(1) Check up–shift operation.
Check to see that the 1 → 2 up–shift takes place and that the shift point conforms to the automatic shift schedule (See page SS–29).
(2) Check engine braking.
While running in the 2 range and 2nd gear, release the accelerator pedal and check the engine braking effect.
(3) Check for abnormal noises during acceleration and deceleration, and for shock at up–shift and down–shift.

(e) L range test:
Shift into the L range and fully depress the accelerator pedal and check the following points.
(1) Check no up–shift.
While running in the L range, check that there is no up–shift to 2nd gear.
(2) Check engine braking.
While running in the L range, release the accelerator pedal and check the engine braking effect.
(3) Check for abnormal noises during acceleration and deceleration.

(f) R range test:
Shift into the R range and fully depress the accelerator pedal and check for slipping.

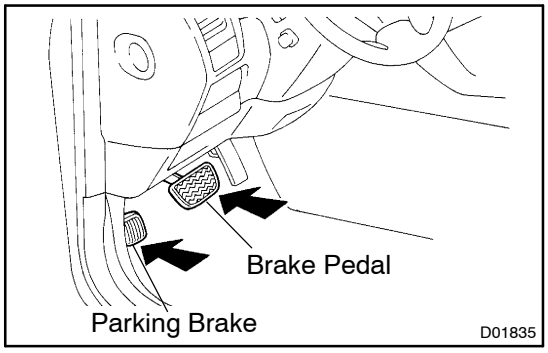
CAUTION:
Before conducting this test ensure that the test area is free from people and obstruction.

(g) P range test:
Stop the vehicle on a grade (more than 5°) and after shifting into the P range, release the parking brake. Then, check to see that the parking lock pawl holds the vehicle in place.

6. ACTIVE TEST

You are able to set the A/T gear position as you like by operating each solenoid valve forcibly using hand–held tester.
However, the condition that you can set the gear position differs in the setting gear position, so conduct the ACTIVE TEST following the table below.

No.	Indication Gear Condition	Starting Condition	Canceling Condition
1	1st, 2nd	Vehicle speed: 0 km/h (0 mph)	Vehicle speed: 0 km/h (0 mph)
2	3rd	Vehicle speed: 0 km/h (0 mph) or vehicle running at 4th or 5th gear	Vehicle speed: less than 50 km/h (31 mph)
3	4th	• Vehicle running at 3rd or 5th gear • Vehicle speed: 50 km/h (31 mph)	Vehicle speed: less than 50 km/h (31 mph)
4	5th	• Vehicle speed: more than 60 km/h (37 mph) • Vehicle running at 4th gear • Throttle valve opening angle: less than 50 %	• Vehicle speed: less than 60 km/h (37 mph) • Throttle valve opening angle: more than 50 %



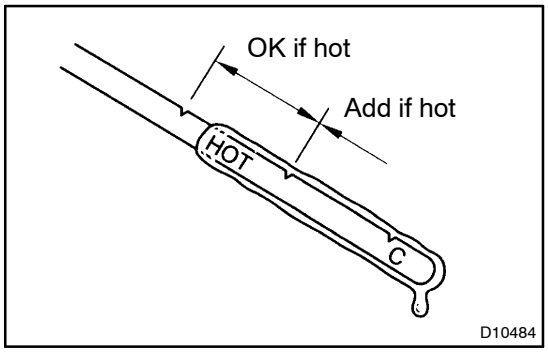
7. BASIC INSPECTION

(a) Check the fluid level.

HINT:

Drive the vehicle so that the engine and transmission are at normal operating temperature.

Fluid temperature: 70 – 80 °C (158 – 176 °F)



(1) Park the vehicle on a level surface and set the parking brake.
(2) With the engine idling and the brake pedal depressed, shift the shift lever into all ranges from P to L range and return to P range.
(3) Pull out the dipstick and wipe it clean.
(4) Push it back fully into the pipe.
(5) Pull it out and check that the fluid level is in the HOT range.

If the level is not within the range, add new fluid.

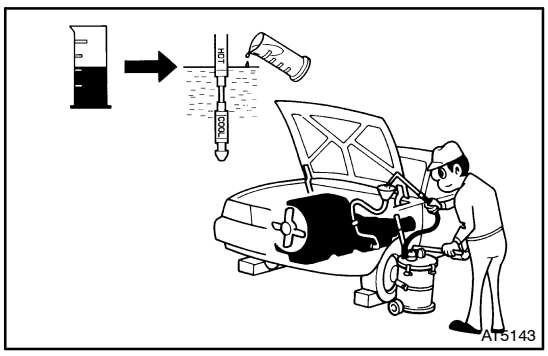
Fluid type: ATF TYPE T–IV

NOTICE:

Do not overfill.

(b) Check the fluid condition.

If the fluid smells burnt or is black, replace it.

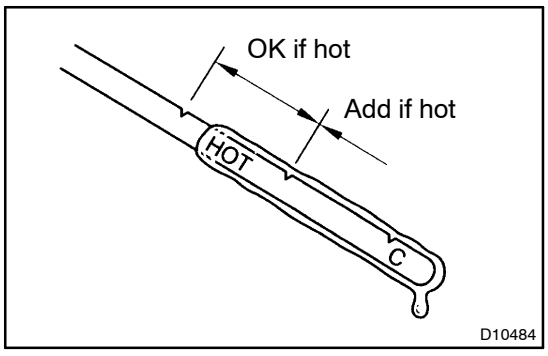


(c) Replace the ATF.
(1) Remove the drain plug and drain the fluid.
(2) Reinstall the drain plug securely.
(3) With the engine OFF add new fluid through the oil filler pipe.

Fluid type: ATF TYPE T–IV

Capacity: 1.8 liters (1.9 US qts, 1.6 Imp.qts)

(4) Start the engine and shift the shift lever into all ranges from P to L range and then shift into P range.



(5) With the engine idling, check the fluid level. Add fluid up to the COOL level on the dipstick.
(6) Check the fluid level at the normal operating temperature, 70 – 80 °C (158 – 176 °F), and add as necessary.

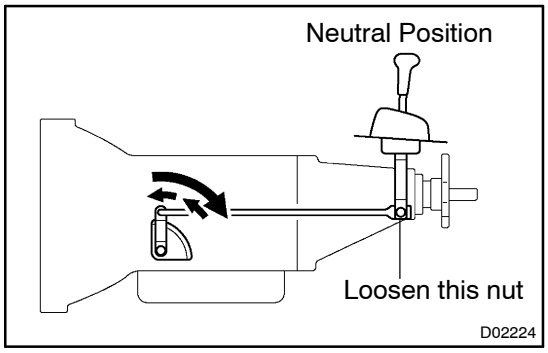
NOTICE:

Do not overfill.

(d) Check the fluid leaks.

Check for leaks in the transmission.

If there are leaks, it is necessary to repair or replace O–rings, FIPGs, oil seals, plugs or other parts.



(e) Inspect and adjust the shift lever position.

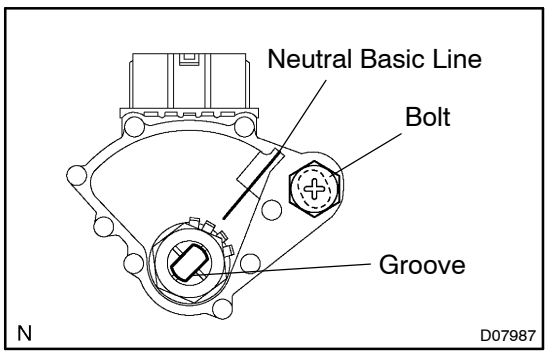
- When shifting the shift lever from the N range to other ranges, check that the lever can be shifted smoothly and accurately to each range and that the position indicator is not aligned with the correct position.

If the indicator is not aligned with the correct position, carry out the following adjustment procedures.

- Loosen the nut on the shift lever.
- Push the control shaft fully rearward.
- Return the control shaft lever 2 notches to N range.
- Set the shift lever to N range.
- While holding the shift lever lightly toward the R range side, tighten the shift lever nut.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

- Start the engine and make sure that the vehicle moves forward when shifting the lever from the N to D range and reverses when shifting it to the R range.



(f) Inspect and adjust the neutral start switch.

Check that the engine can be started with the shift lever only in the N or P range, but not in other ranges.

If it is not as stated above, carry out the following adjustment procedures.

- Loosen the neutral start switch bolt and set the shift lever to the N range.
- Align the groove and neutral basic line.
- Hold the switch in position and tighten the bolt.

Torque: 13 N·m (130 kgf·cm, 10 ft·lbf)

- For continuity inspection of the neutral start switch, see page DI–333.

8. MECHANICAL SYSTEM TESTS

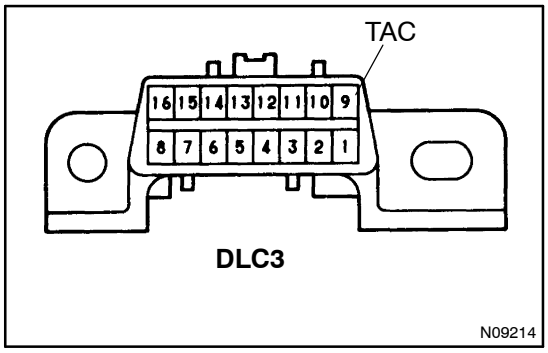
(a) Measure the stall speed.

The object of this test is to check the overall performance of the transmission and engine by measuring the stall speeds in the D range.

NOTICE:

- **Do the test at normal operating ATF temperature 50 – 80 °C (122 – 176 °F).**
- **Do not continuously run this test for longer than 5 seconds.**
- **To ensure safety, do this test in a wide, clear level area which provides good traction.**

- **The stall test should always be carried out in pairs. One technician should observe the conditions of wheels or wheel stoppers outside the vehicle while the other is doing the test.**



- Chock the 2 wheels.
- Connect a hand–held tester to DLC3 or tachometer to terminal TAC of DLC3 with SST.

SST 09843–18030

- Fully apply the parking brake.
- Keep your left foot pressing firmly on the brake pedal.
- Start the engine.
- Shift into the D range. Press all the way down on the accelerator pedal with your right foot. Quickly read the stall speed at this time.

Stall speed: 2,450 ± 150 rpm (In D range)

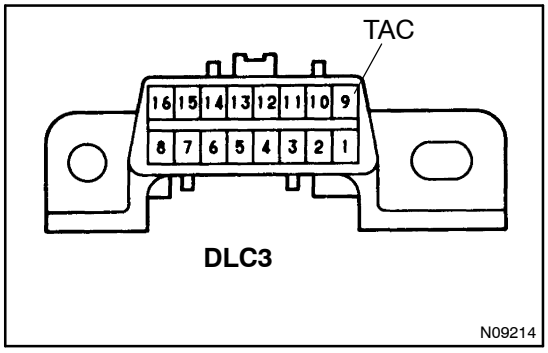
Evaluation:

Problem	Possible cause
(a) Stall speed low in D range	• Engine output may be insufficient • Stator one–way clutch is operating properly HINT: If more than 600 rpm below the specified value, the torque converter could be faulty.
(b) Stall speed high in D range	• Line pressure too low • Forward clutch slipping • No.2 one–way clutch not operating properly • O/D one–way clutch not operating properly

(b) Measure the time lag.
When the shift lever is shifted while the engine is idling, there will be a certain time lapse or lag before the shock can be felt. This is used for checking the condition of the O/D direct clutch, forward clutch, and 1st & reverse brake.

NOTICE:

- **Do the test at normal operating ATF temperature 50 – 80 °C (122 – 176 °F).**
- **Be sure to allow 1 minute interval between tests.**
- **Take 3 measurements and take the average value.**



- Chock the 4 wheels.
- Connect a hand–held tester to DLC3 or tachometer to terminal TAC of DLC3 with SST.

SST 09843–18030

- Start engine and check idle speed.

Idle speed: 750 ± 50 rpm (In N range and A/C OFF)

- Shift the lever from N to D range. Using a stop watch, measure the time from when the lever is shifted until the shock is felt.

Time lag: N → D less than 1.2 seconds

- In the same way, measure the time lag for N → R.

Time lag: N → R less than 1.5 seconds

Evaluation (If N → D or N → R time lag is longer than the specified):

Problem	Possible cause
N → D time lag is longer	• Line pressure too low • Forward clutch worn • O/D one–way clutch not operating properly
N → R time lag is longer	• Line pressure too low • Direct clutch worn • 1st & reverse brake worn • O/D one–way clutch not operating properly

9. HYDRAULIC TEST

Measure the line pressure.

NOTICE:

- **Do the test at normal operation ATF temperature 50 – 80 °C (122 – 176 °F).**
- **The line pressure test should always be carried out in pairs. One technician should observe the conditions of wheels or wheel stopper outside the vehicle while the other is doing the test.**
- **Be careful to prevent SST's hose from interfering with the exhaust pipe.**

(1) Warm up the ATF.
(2) Remove the test plug on the right side of the transmission case and connect SST.
(See page AT–25 for the location to connect SST)
SST 09992–00095 (09992–00231, 09992–00271)
(3) Fully apply the parking brake and chock the 4 wheels.
(4) Connect a hand–held tester to DLC3.
(5) Start the engine and check idling speed.
(6) Keep your left foot pressing firmly on the brake pedal and shift into D range.
(7) Measure the line pressure when the engine is idling.
(8) Depress the accelerator pedal all the way down. Quickly read the highest line pressure when engine speed reaches stall speed.
(9) In the same way, do the test in R range.

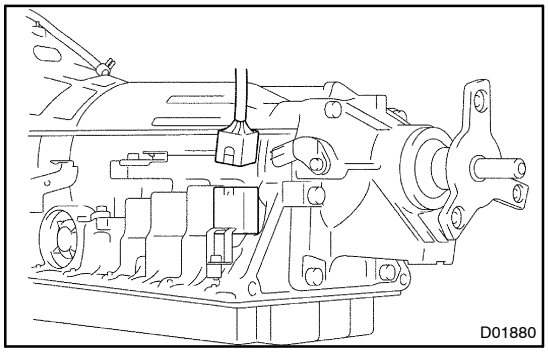
Specified line pressure:

Condition	D range kPa (kgf / cm^2, psi)	R range kPa (kgf / cm^2, psi)
Idling	395 – 455 (4.0 – 4.6, 57 – 65)	0
Stall	1,200 – 1,360 (12.2 – 13.8, 174 – 196)	1,655 – 1,960 (16.9 – 20.0, 240 – 282)

If the measured pressure is not up to the specified value, recheck the throttle cable adjustment and retest.

Evaluation

Problem	Possible cause
If the measured values at all ranges are higher	• SLT solenoid valve defective • Regulator valve detective
If the measured values at all ranges are lower	• SLT solenoid valve defective • Regulator valve defect • Oil pump defect • O/D direct clutch defect
If pressure is low in the D range only	• D range circuit fluid leakage • Forward clutch defect
If pressure is low in the R range only	• R range circuit fluid leakage • Direct clutch defect • 1st & reverse brake defect



10. MANUAL SHIFTING TEST

HINT:

By this test, it can be determined whether the trouble is within the electrical circuit or is a mechanical problem in the transmission.

(a) Disconnect the solenoid wire.

(b) Inspect the manual driving operation.

Check that the shift and gear positions correspond to the table below.

While driving, shift through the L, 2, 3, 4 and D ranges.

Check that the gear change corresponds to the shift range.

Shift range	Gear position
D	5th
4	5th
3	4th
2	3rd
L	3rd
R	Reverse
P	Pawl Lock

HINT:

If the L, 2, 3, 4 and D range gear positions are difficult to distinguish, do the following read test.

If any abnormality is found in the above test, the problem is in the transmission itself.

(c) Connect the solenoid wire.

(d) Cancel out DTC.

DI25J–04

DIAGNOSTIC TROUBLE CODE CHART

If a DTC is displayed during the DTC check, check the circuit listed in the table below and proceed to the page given.

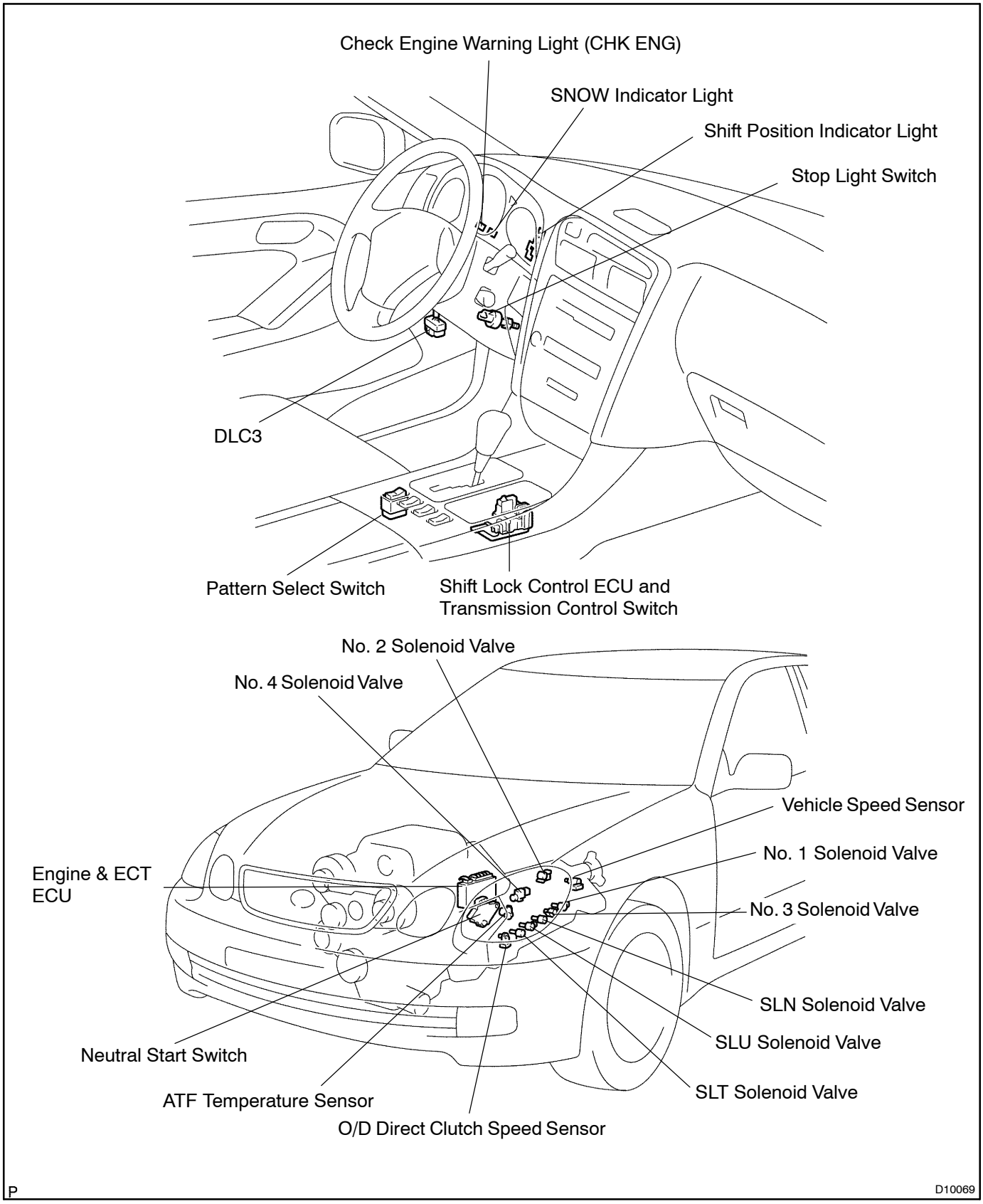
DTC No. (See Page)	Detection Item	Trouble Area	*1CHK ENG	*2Memory
P0500 (DI–299)	Vehicle Speed Sensor Malfunction	• Open or short in vehicle speed sensor circuit • Vehicle speed sensor • Combination meter • Engine & ECT ECU • Automatic transmission assembly	●	○
P0710 (DI–303)	Transmission Fluid Temperature Sensor Circuit Malfunction (ATF Temperature Sensor)	• Open or short in ATF temperature sensor circuit • ATF temperature sensor • Engine & ECT ECU	●	○
P0711 (DI–305)	Transmission Fluid Temperature Sensor Circuit Range/Performance problem	• Open in ATF temperature sensor • ATF temperature sensor circuit • Engine & ECT ECU	●	○
P0715 (DI–306)	Input/Turbine Speed Sensor Circuit Malfunction (O/D Direct Clutch Speed Sensor)	• Open or short in O/D direct clutch speed sensor circuit • O/D direct clutch speed sensor • Engine & ECT ECU • Automatic transmission assembly	●	○
P0750 (DI–309)	Shift Solenoid ”A” Malfunction (No. 1 Solenoid Valve)	• No. 1 solenoid valve is stuck open or closed • Valve body is blocked up or stuck • Automatic transmission assembly	●	○
P0753 (DI–312)	Shift Solenoid ”A” Electrical Malfunction (No. 1 Solenoid Valve)	• Open or short in No. 1 solenoid valve circuit • No. 1 solenoid valve • Engine & ECT ECU	●	○
P0755 (DI–309)	Shift Solenoid ”B” Malfunction (No. 2 Solenoid Valve)	• No. 2 solenoid valve is stuck open or closed • Valve body is blocked up or stuck • Automatic transmission assembly	●	○
P0758 (DI–312)	Shift Solenoid ”B” Electrical Malfunction (No. 2 Solenoid Valve)	• Open or short in No. 2 solenoid valve circuit • No. 2 solenoid valve • Engine & ECT ECU	●	○
P0760 (DI–309)	Shift Solenoid ”C” Malfunction (No. 3 Solenoid Valve)	• No. 3 solenoid valve is stuck open or closed • Valve body is blocked up or stuck • Automatic transmission assembly	●	○
P0763 (DI–312)	Shift Solenoid ”C” Electrical Malfunction (No. 3 Solenoid Valve)	• Open or short in No. 3 solenoid valve circuit • No. 3 solenoid valve • Engine & ECT ECU	●	○
P0768 (DI–318)	Shift Solenoid ”D” Electrical Malfunction (No. 4 Solenoid Valve)	• Open or short in No. 4 solenoid valve circuit • No. 4 solenoid valve • Engine & ECT ECU	●	○
P0770 (DI–321)	Shift Solenoid ”E” Malfunction (SLU Solenoid Valve)	• SLU solenoid valve is stuck open or closed • Valve body is blocked up or stuck • Lock–up clutch • Automatic transmission assembly	●	○
P1520 (DI–324)	Stop Light Switch Malfunction	• Open or short in stop light switch signal circuit • Stop light switch • Engine & ECT ECU	●	○
P1755 (DI–325)	Linear Solenoid for Lock–up Control Circuit Malfunction (SLU Solenoid Valve)	• Open or short in SLU solenoid valve circuit • SLU solenoid valve • Engine & ECT ECU • Automatic transmission assembly	●	○

P1760 (DI–327)	Linear Solenoid for Line Pressure Control Circuit Malfunction (SLT Solenoid Valve)	• Open or short in SLT solenoid valve circuit • SLT solenoid valve • Engine & ECT ECU	●	○
P1765 (DI–330)	Linear Solenoid for Accumulator Pressure Control Circuit Malfunction (SLN Solenoid Valve)	• Open or short in SLN solenoid valve circuit • SLN solenoid valve • Engine & ECT ECU	●	○
P1780 (DI–333)	Park/Neutral Position Switch Malfunction	• Short in neutral start switch circuit • Neutral start switch • Engine & ECT ECU	●	○

*1: "●" mark means check engine waning light (CHK ENG) blinks once every 2 seconds.
*2: "○" mark means Engine & ECT ECU memorizes the malfunction code if the Engine & ECT ECU detects the DTC detection condition.
HINT:
This DTC may be output when the clutch, brake and gear components etc. inside the automatic transmission are damaged.

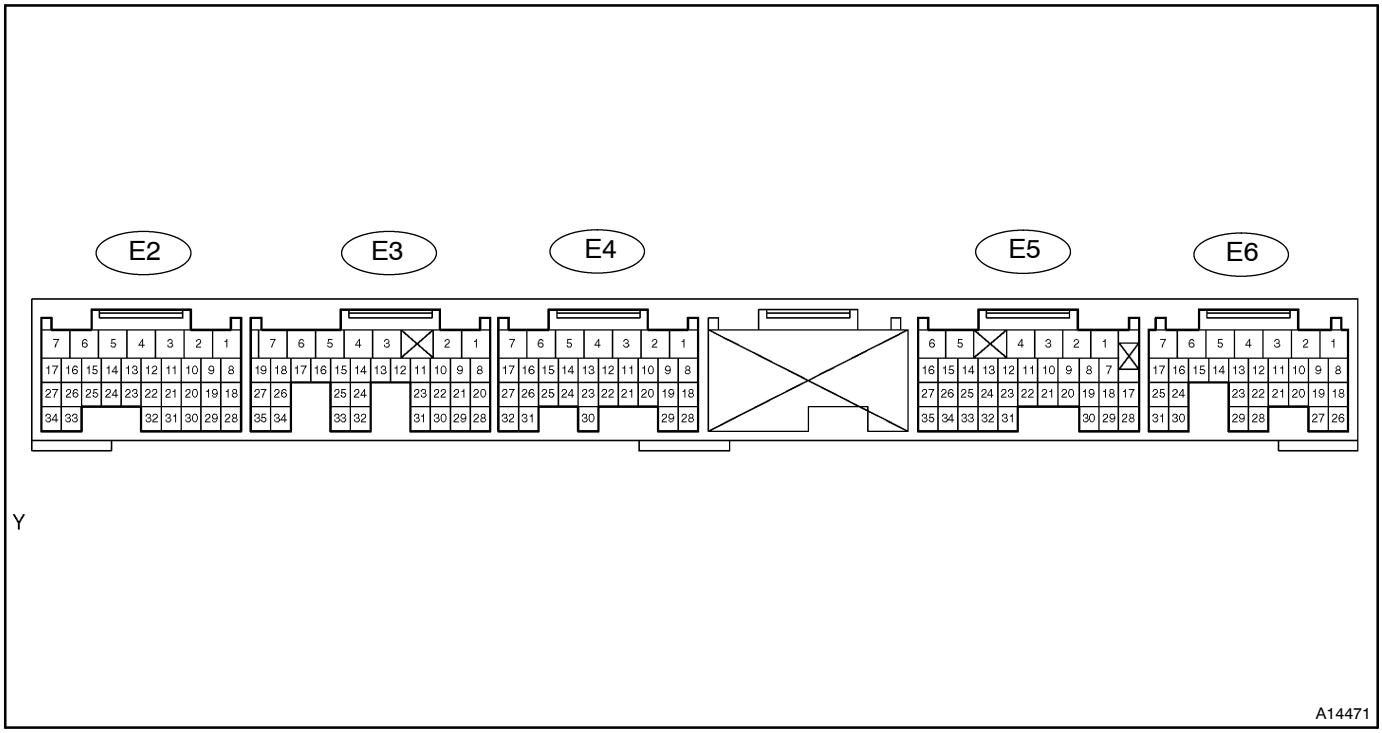
DI2LK–02

PARTS LOCATION



DI2LL–03

TERMINALS OF ECU



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
S1 ↔ E1 (E3–19 ↔ E3–7)	R ↔ BR	IG ON	Below 1.5
		3rd, 4th or 5th gear	Below 1.5
		1st or 2nd gear	9 – 14
S2 ↔ E1 (E3–18 ↔ E3–7)	W ↔ BR	IG ON	Below 1.5
		1st, 4th or 5th gear	Below 1.5
		2nd or 3rd gear	9 – 14
S3 ↔ E1 (E3–17 ↔ E3–7)	G ↔ BR	IG ON	Below 1.5
		1st, 2nd, 3rd or 5th gear	Below 1.5
		4th gear	9 – 14
S4 ↔ E1 (E3–16 ↔ E3–7)	G–R ↔ BR	IG ON	Below 1.5
		1st, 2nd, 3rd or 4th gear	Below 1.5
		5th gear	9 – 14
SLU^+ ↔ SLU^- (E3–11 ↔ E3–10)	L–Y ↔ L–R	IG ON	Below 3
		Engine is idling	Pulse signal is output below 1.5 ↔ 9 – 14
SLN^+ ↔ SLN^- (E3–13 ↔ E3–12)	Y ↔ L	IG ON	Below 3
		Engine is idling	Pulse signal is output below 1.5 ↔ 9 – 14
SLT^+ ↔ SLT^- (E3–35 ↔ E3–34)	B ↔ G–B	IG ON	Below 3
		Engine is idling	Pulse signal is output below 1.5 ↔ 9 – 14
$SP2^+$ ↔ $SP2^-$ (E3–23 ↔ E3–22)	G ↔ R	Engine is idling	Pulse signal is output below 1.5 ↔ 4 – 6
NCO^+ ↔ NCO^- (E3–21 ↔ E3–20)	Y ↔ L	Engine is idling	Pulse signal is output below 1.5 ↔ 4 – 6

OIL ↔ EOIL (E3–27 ↔ E3–26)	G–Y ↔ BR	IG ON and ATF temperature 110 °C (176 °F)	Below 1
P ↔ E1 (E3–6 ↔ E3–7)	W ↔ BR	IG ON and shift lever P range	7.5 – 14
		IG ON and shift lever other than P range	Below 1.5
R ↔ E1 (E3–5 ↔ E3–7)	G ↔ BR	IG ON and shift lever R range	7.5 – 14
		IG ON and shift lever other than R range	Below 1.5
N ↔ E1 (E3–3 ↔ E3–7)	G–R ↔ BR	IG ON and shift lever N range	7.5 – 14
		IG ON and shift lever other than N range	Below 1.5
D ↔ E1 (E5–13 ↔ E3–7)	Y–B ↔ BR	IG ON and shift lever D or 4 range	7.5 – 14
		IG ON and shift lever other than D or 4 range	Below 1.5
4 ↔ E1 (E5–14 ↔ E3–7)	Y–G ↔ BR	IG ON and shift lever 4 range	7.5 – 14
		IG ON and shift lever other than 4 range	Below 1.5
3 ↔ E1 (E3–4 ↔ E3–7)	G ↔ BR	IG ON and shift lever 3 range	7.5 – 14
		IG ON and shift lever other than 3 range	Below 1.5
2 ↔ E1 (E5–12 ↔ E3–7)	*1G–B ↔ BR *2W–B ↔ BR	IG ON and shift lever 2 or L range	7.5 – 14
		IG ON and shift lever other than 2 or L range	Below 1.5
L ↔ E1 (E5–15 ↔ E3–7)	R–Y ↔ BR	IG ON and shift lever L range	7.5 – 14
		IG ON and shift lever other than L range	Below 1.5
STP ↔ E1 (E5–4 ↔ E3–7)	G–W ↔ BR	IG ON and brake pedal depressed	9 – 14
		IG ON and brake pedal released	Below 1.5
KD ↔ E1 (E6–9 ↔ E3–7)	Y–R ↔ BR	IG ON and accelerator pedal depressed	9 – 14
		IG ON and accelerator pedal released	Below 1.5

*1: LHD
*2: RHD

DI2L7–03

PROBLEM SYMPTOMS TABLE

HINT:

If a normal code is displayed during the DTC check but the trouble still occurs, check the circuits for each symptom in the order given in the charts on the following pages and proceed to the page given for trouble-shooting.

The Matrix Chart is divided into 3 chapters.

- If the instruction ”Proceed to next circuit inspection shown on matrix chart” is given in the flow chart for each circuit, proceed to the circuit with the next highest number in the table to continue the check.
- If the trouble still occurs even though there are no abnormalities in any of the other circuits, then check and replace the Engine & ECT ECU.

1. CHAPTER 1: ELECTRONIC CIRCUIT MATRIX CHART

Symptom	Suspect Area	See page
No up–shift (A particular gear, from 1st to 4th gear, is not up–shifted)	Engine & ECT ECU	IN–30
No up–shift (4th → 5th)	1. Transmission control switch circuit 2. Engine & ECT ECU	DI–340 IN–30
No down–shift (5th → 4th)	1. Transmission control switch circuit 2. Engine & ECT ECU	DI–340 IN–30
No down–shift (A particular gear, from 1st to 4th gear, is not up–shifted)	Engine & ECT ECU	IN–30
No lock–up	Engine & ECT ECU	IN–30
No lock–up off	Engine & ECT ECU	IN–30
Shift point too high or too low	1. Pattern select switch circuit 2. Engine & ECT ECU	DI–338 IN–30
Up–shift to 5th from 4th while engine is cold	Engine & ECT ECU	IN–30
No kick–down	1. Kick–down switch circuit 2. Engine & ECT ECU	DI–343 IN–30
No pattern select	1. Pattern select switch circuit 2. Engine & ECT ECU	DI–338 IN–30
Engine stalls when starting off or stopping	Engine & ECT ECU	IN–30
No 2nd start	1. Pattern select switch circuit 2. Engine & ECT ECU	DI–338 IN–30
No steering shift system	1. Transmission control switch circuit 2. Pattern select switch circuit 3. Engine & ECT ECU	DI–340 DI–338 IN–30

2. CHAPTER 2: ON–VEHICLE REPAIR (★: A650E AUTOMATIC TRANSMISSION Repair Manual Pub. No. RM794U)

Symptom	Suspect Area	See page
Vehicle does not move in any forward range and reverse range	1. Transmission control rod 2. Manual valve 3. Parking lock pawl 4. Off–vehicle repair matrix chart	DI–278 ★ ★ –
Vehicle does not move in R range	1. Reverse control valve 2. Off–vehicle repair matrix chart	★ –
Vehicle does not move in particular range or ranges (Except R range)	Off–vehicle repair matrix chart	–
No up–shift (1st → 2nd)	1. 1–2 shift valve 2. Off–vehicle repair matrix chart	★ –
No up–shift (2nd → 3rd)	1. 2–3 shift valve 2. Off–vehicle repair matrix chart	★ –
No up–shift (3rd → 4th)	1. 3–4 shift valve 2. Off–vehicle repair matrix chart	★ –
No up–shift (4th → 5th)	1. 4–5 shift valve 2. Off–vehicle repair matrix chart	★ –
No down–shift (5th → 4th)	1. 4–5 shift valve 2. Off–vehicle repair matrix chart	★ –
No down–shift (4th → 3rd)	1. 3–4 shift valve 2. Off–vehicle repair matrix chart	★ –
No down–shift (3rd → 2nd)	1. 2–3 shift valve 2. Off–vehicle repair matrix chart	★ –
No down–shift (2nd → 1st)	1. 1–2 shift valve 2. Off–vehicle repair matrix chart	★ –
No lock–up or No lock–up off	1. Lock–up control valve 2. Lock–up relay valve 3. Off–vehicle repair matrix chart	★ ★ –
Harsh engagement (N → D)	1. Accumulator control valve 2. Solenoid modulator valve 3. C_1 accumulator 4. Orifice control valve 5. Off–vehicle repair matrix chart	★ ★ ★ ★ –
Harsh engagement (Lock–up)	1. Lock–up control valve 2. Lock–up relay valve 3. Solenoid relay valve 4. Off–vehicle repair matrix chart	★ ★ ★ –
Harsh engagement (N → R)	1. Accumulator control valve 2. C_2 accumulator 3. Solenoid modulator valve 4. Off–vehicle repair matrix chart	★ ★ ★ –
Harsh engagement (2 → L)	Coast brake control valve	★
Harsh engagement (2nd → 3rd → 4th → 5th)	1. Accumulator control valve 2. Solenoid modulator valve	★ ★
Harsh engagement (1st → 2nd)	1. Solenoid modulator valve 2. B_3 control valve 3. B_2 release control valve 4. Solenoid relay valve 5. Off–vehicle repair matrix chart	★ ★ ★ ★ –

Harsh engagement (2nd → 3rd)	1. Accumulator control valve 2. Solenoid modulator valve 3. B_2 accumulator 4. B_3 control valve 5. B_2 release control valve 6. Solenoid relay valve 7. Off–vehicle repair matrix chart	★ ★ ★ ★ ★ ★ –
Harsh engagement (3rd → 4th)	1. Accumulator control valve 2. Solenoid modulator valve 3. C_2 accumulator 4. Off–vehicle repair matrix chart	★ ★ ★ –
Harsh engagement (4th → 5th)	1. Accumulator control valve 2. Solenoid modulator valve 3. B_0 accumulator 4. Off–vehicle repair matrix chart	★ ★ ★ –
Harsh engagement (5th → 4th)	1. Accumulator control valve 2. Solenoid modulator valve 3. C_0 accumulator 4. Off–vehicle repair matrix chart	★ ★ ★ –
Slip or shudder (Forward and reverse)	1. Transmission control rod 2. Oil strainer 3. Pressure relief valve 4. Off–vehicle repair matrix chart	DI–278 ★ ★ –
Slip or shudder (Particular range)	1. Transmission control rod 2. Off–vehicle repair matrix chart	DI–278 –
No engine braking (1st: L range)	1. Coast brake control valve 2. B–4 relay valve 3. Off–vehicle repair matrix chart	★ ★ –
No engine braking (2nd: 2 range)	1. Coast brake control valve 2. Off–vehicle repair matrix chart	★ –
No kick–down	1. 1–2 shift valve 2. 2–3 shift valve 3. 3–4 shift valve	★ ★ ★

3. CHAPTER 3: OFF–VEHICLE REPAIR (★: A650E AUTOMATIC TRANSMISSION Repair Manual Pub. No. RM794U)

Symptom	Suspect Area	See page
Vehicle does not move in any forward range and reverse range	1. O/D one–way clutch (F_0) 2. O/D direct clutch (C_0) 3. O/D planetary gear unit 4. Torque converter	★ ★ ★ *
Vehicle does not move in R range	1. Center and rear planetary gear unit 2. Direct clutch (C_2) 3. 1st & reverse brake (B_4) 4. O/D brake (B_0)	★ ★ ★ ★
No up–shift (1st → 2nd)	2nd brake (B_3)	★
No up–shift (2nd → 3rd)	1. 3rd brake (B_2) 2. One–way clutch No.1 (F_1)	★ ★
No up–shift (3rd → 4th)	Direct clutch	★
No up–shift (4th → 5th)	O/D brake (B_0)	★
No lock–up or No lock–up off	Torque converter	*
Harsh engagement (N → D)	1. Forward clutch (C_1) 2. O/D one–way clutch (F_0) 3. One–way clutch No.2 (F_2)	★ ★ ★
Harsh engagement (N → R)	1. Direct clutch (C_2) 2. O/D brake (B_0) 3. 1st & reverse brake (B_4)	★ ★ ★
Harsh engagement (1st → 2nd)	2nd brake (B_3)	★
Harsh engagement (2nd → 3rd)	1. 3rd brake (B_2) 2. 2nd brake (B_3) 3. One–way clutch No.1 (F_1)	★ ★ ★
Harsh engagement (3rd → 4th)	Direct clutch (C_2)	★
Harsh engagement (4th → 5th)	1. O/D brake (B_0) 2. O/D direct clutch (C_0)	★ ★
Harsh engagement (Lock–up)	Torque converter	*
Slip or shudder (Forward and reverse: After warm–up)	1. Torque converter 2. O/D one–way clutch (F_0) 3. O/D direct clutch (C_0)	* ★ ★
Slip or shudder (Particular range: Just after engine starts)	Torque converter	*
Slip or shudder (R range)	1. Direct clutch (C_2) 2. O/D brake (B_0) 3. 1st & reverse brake (B_4)	★ ★ ★
Slip or shudder (1st)	1. Forward clutch (C_1) 2. No. 2 one–way clutch (F_2)	★ ★
Slip or shudder (2nd)	2nd brake (B_3)	★
Slip or shudder (3rd)	1. 3rd coast brake (B_1) 2. 3rd brake (B_2) 3. One–way clutch No.1 (F_1)	★ ★ ★
Slip or shudder (4th)	Direct clutch	★
Slip or shudder (5th)	O/D brake (B_0)	★
No engine braking (1st – 4th: D range)	O/C direct clutch (C_0)	★
No engine braking (1st: L range)	1st & reverse brake (B_4)	★
No engine braking (2nd: 2 range)	2nd brake (B_3)	★
No engine braking (3rd: 3 range)	3rd coast brake (B_1)	★

Poor acceleration (All ranges)	Torque converter	*
Poor acceleration (5th)	1. O/D brake (B_0) 2. O/D planetary gear unit	★ ★
Engine stalls when starting off or stopping	Torque converter	*

*: See Pub. No. RM588E

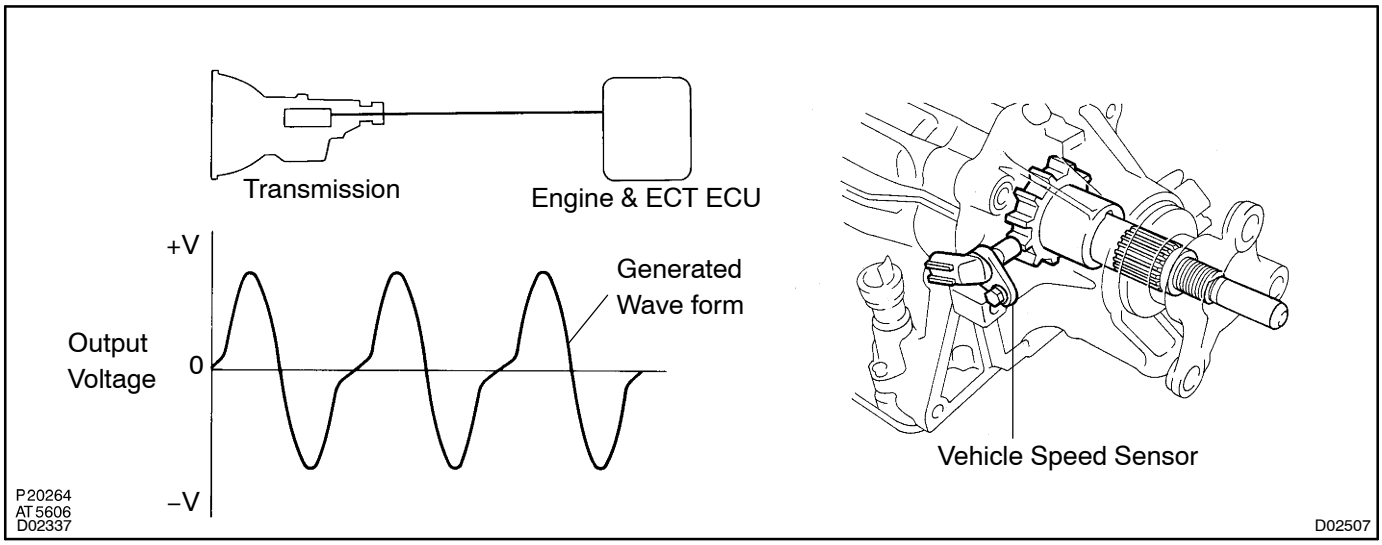
DI2L8–03

CIRCUIT INSPECTION

DTC	P0500	Vehicle Speed Sensor Malfunction

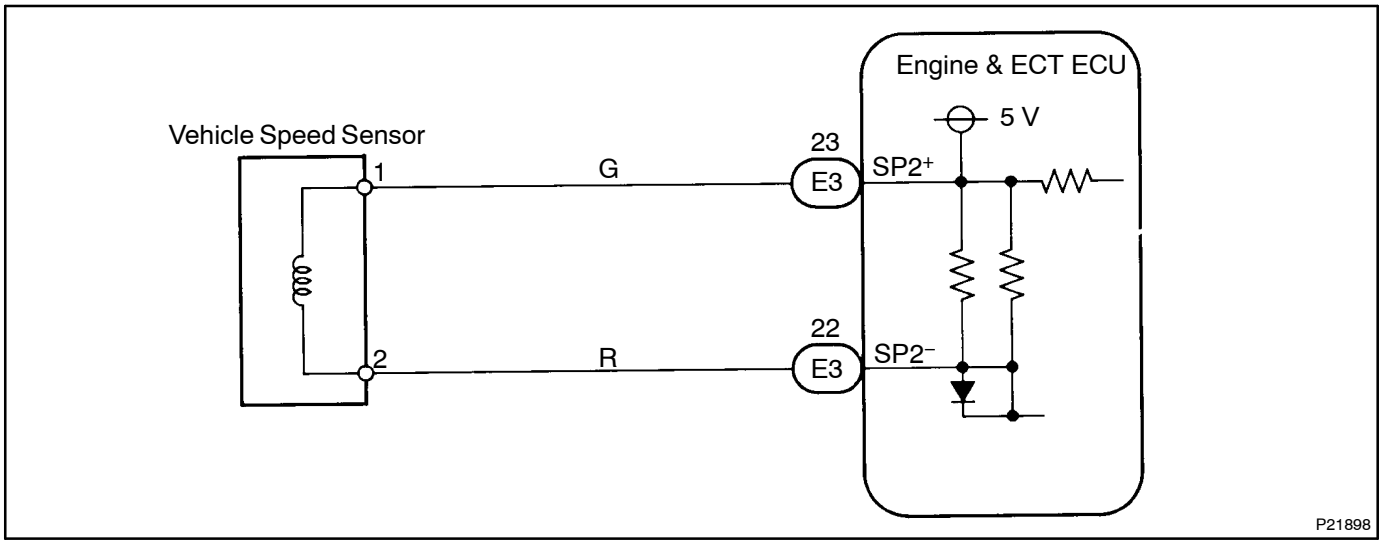
CIRCUIT DESCRIPTION

The vehicle speed sensor detects the rotation speed of the transmission output shaft and sends signals to the Engine & ECT ECU. The Engine & ECT ECU determines the vehicle speed based on these signals. An AC voltage is generated in the vehicle speed sensor coil as the rotor mounted on the output shaft rotates, and this voltage is sent to the Engine & ECT ECU.



DTC No.	DTC Detecting Condition	Trouble Area
P0500	No vehicle speed sensor signal to Engine & ECT ECU under conditions (a) and (b): (a) Neutral start switch is OFF (b) Vehicle is being driven	• Open or short in vehicle speed sensor circuit • Vehicle speed sensor • Engine & ECT ECU • Automatic transmission assembly
	Clutch or brake slips or gear broken	

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand–held tester. Because freeze frame records the engine conditions when the malfunction is detected, when troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.

1	**Connect hand–held tester and read value of vehicle speed value.**

PREPARATION:

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

(b) Start the engine and the hand–held tester main switch ON.

CHECK:

Drive the vehicle and read vehicle speed value.

OK:

Vehicle speed matches tester speed value

NG → **Check and replace Engine & ECT ECU (See page IN–30).**

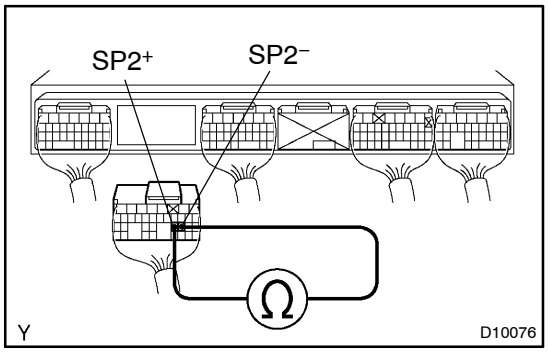
OK

2	**Check speedometer circuit (See page BE–6).**

NG → **Repair or replace speedometer circuit.**

OK

3	Check resistance between terminals SP2+ and SP2– of Engine & ECT ECU connector.



PREPARATION:

(a) Remove the instrument panel under cover.

(b) Disconnect the connector of the Engine & ECT ECU.

CHECK:

Check resistance between terminals $SP2^+$ and $SP2^-$ of the Engine & ECT ECU connector.

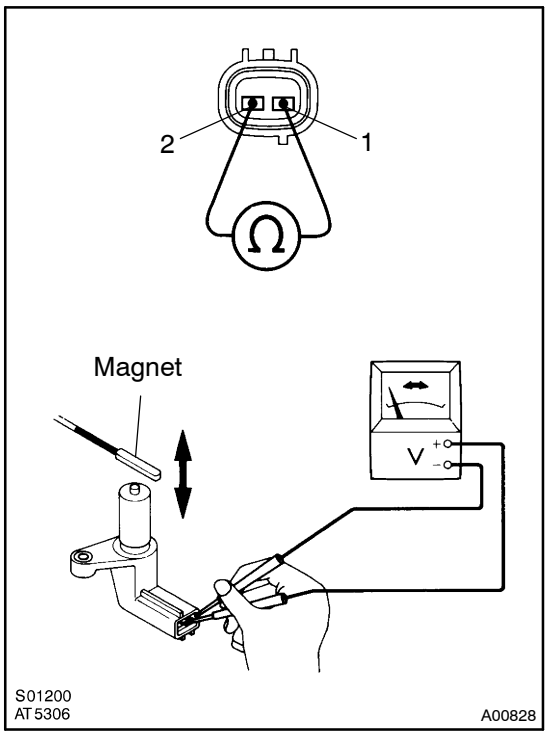
OK:

Resistance: 560 – 680 Ω at 20 °C (68 °F)

OK	Check and replace Engine & ECT ECU (See page N–30).

NG

4	Check vehicle speed sensor.



PREPARATION:

Remove the vehicle speed sensor from the transmission.

CHECK:

Measure resistance between terminals 1 and 2 of the speed sensor.

OK:

Resistance: 560 – 680 Ω at 20 °C (68 °F)

Reference:

Check vehicle speed sensor's function

CHECK:

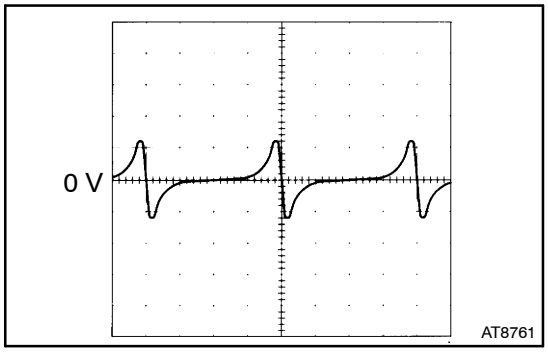
Check voltage between terminals 1 and 2 of the vehicle speed sensor when a magnet is put close to front end of the vehicle speed sensor then taken away quickly.

OK:

Voltage is generated intermittently

HINT:

The generated voltage is extremely low.



Reference: INSPECTION USING OSCILLOSCOPE
Refer to the chart for wave form between terminals $SP2^+$ and $SP2^-$ When the vehicle speed is approx. 60 km/h (37 mph).

NG → **Replace vehicle speed sensor.**

OK

5	**Check and repair harness and connector between Engine & ECT ECU and vehicle speed sensor (See page IN–30).**

NG → **Replace or repair wire harness or connector.**

OK

Check and repair the transmission (clutch, brake or gear etc.).

DI2L9–02

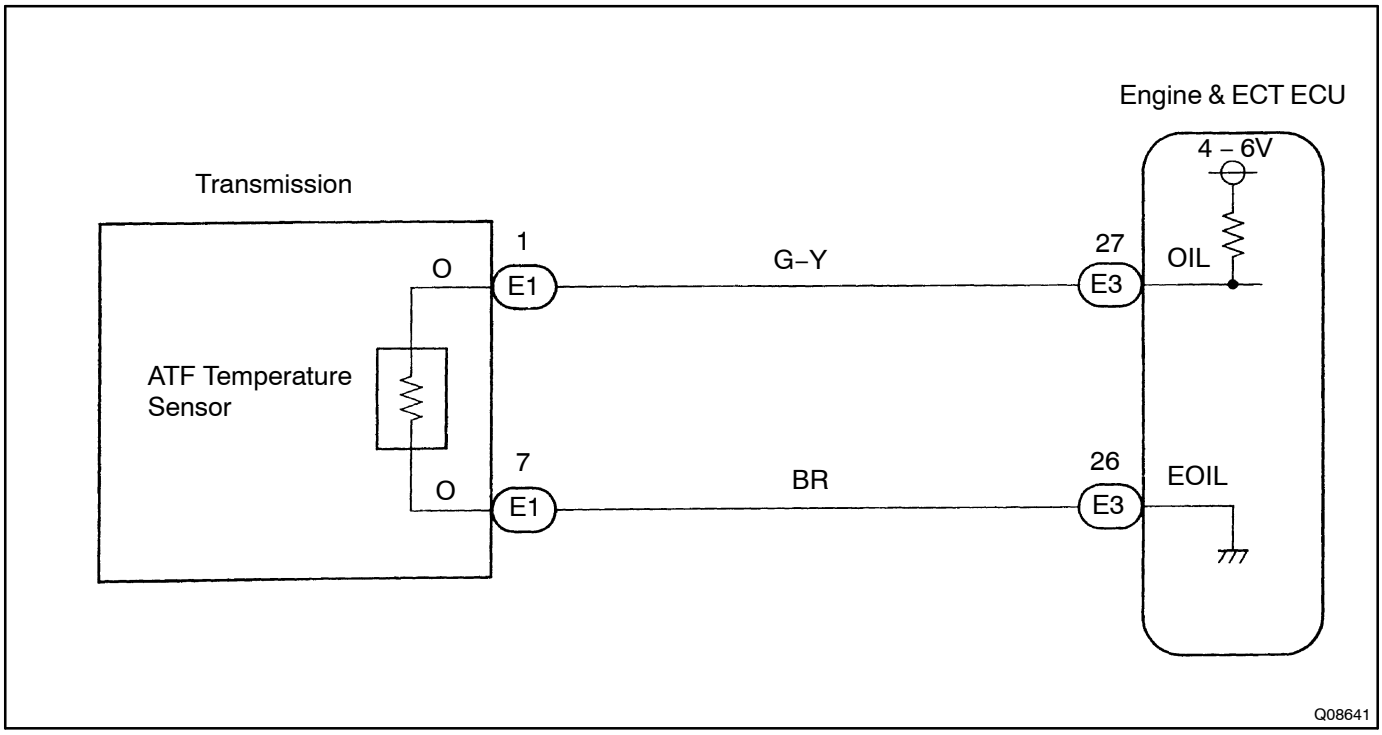
DTC	P0710	Transmission Fluid Temperature Sensor Malfunction (ATF Temperature Sensor)

CIRCUIT DESCRIPTION

The ATF temperature sensor converts fluid temperature into a resistance value which is input into the Engine & ECT ECU.

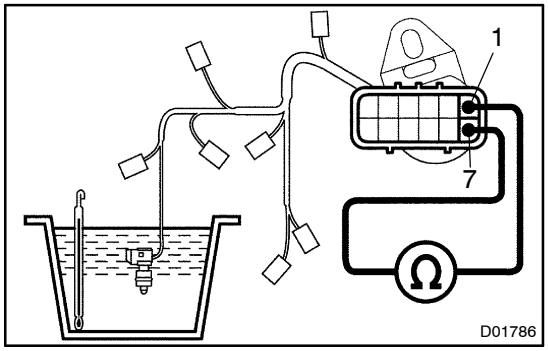
DTC No.	DTC Detecting Condition	Trouble Area
P0710	Either (a) or (b) is detected for 0.5 sec. or more. (2–trip detection logic) (a) Temperature sensor resistance is less than 79 Ω (b) After the engine has been operating for 15 minutes or more, the resistance at the temp. sensor is more than 156 kΩ	• Open or short in ATF temperature sensor • ATF temperature sensor • Engine & ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check ATF temperature sensor.**



PREPARATION:

(a) Disconnect the solenoid wire connector.
(b) Remove the oil pan.
(c) Disconnect all solenoid valve connectors.
(d) Remove transmission wire harness.

CHECK:

Measure resistance between terminals 1 and 7 of solenoid connector at 25 °C (77 °F) and 110 °C (230 °F).

OK:

Resistance (Approx.):
25 °C (77 °F): 3.5 kΩ
110 °C (230 °F): 231 – 263 Ω

NG → **Replace the ATF temperature sensor (transmission wire).**

OK

2	**Check harness and connector between ATF temperature sensor and Engine & ECT ECU (See page IN–30).**

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

OK

Check and replace the Engine & ECT ECU (See page IN–30).

DI2C9–07

DTC	P0711	Transmission Fluid Temperature Sensor Circuit Range / Performance

CIRCUIT DESCRIPTION

Refer to DTC P0710 on page DI–303.

DTC No.	DTC Detecting Condition	Trouble Area
P0711	Both (a) and (b) is detected. (a) After 12 seconds of the engine start, the temp., of the atmosphere and that of the engine coolant is more than –10 °C. (b) After a normal driving for over 20 minutes and 6.2 miles (10km), the ATF temp. is less than 10 °C.	• Open in ATF temperature sensor circuit • ATF temperature sensor • Engine & ECT ECU

INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand–held tester or OBD scan tool. Because freeze frame records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

1	**Are there any other codes (besides DTC P0711) being output?**

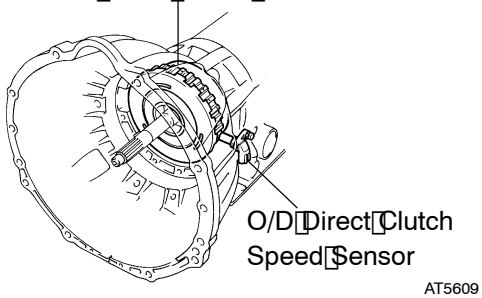
YES → **Go to relevant DTC chart (See page DI–289).**

NO

Replace ATF temperature sensor.

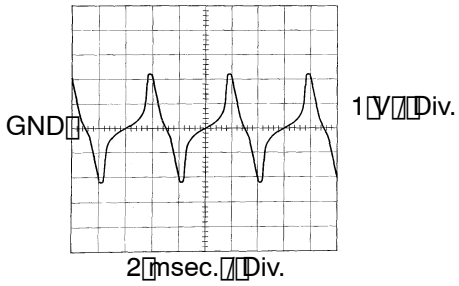
DTC	P0715	Input/Turbine Speed Sensor Circuit Malfunction (O/D Direct Clutch Speed Sensor)

CIRCUIT DESCRIPTION



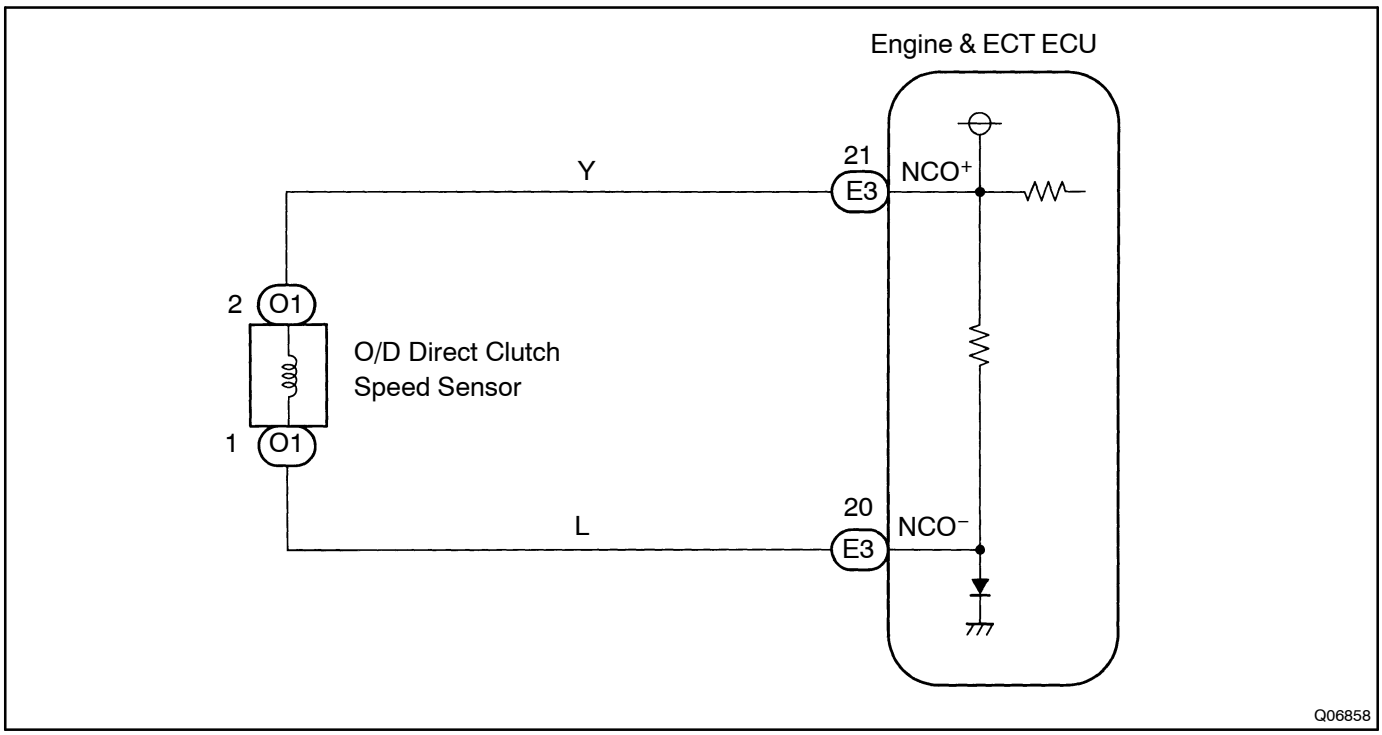
This sensor detects the rotation speed of the O/D input shaft from the rotation of the O/D direct clutch drum.
Its construction is the same as that of the vehicle speed sensor (See page DI–299).
By comparing the O/D direct clutch speed signal and vehicle speed sensor signal, the Engine & ECT ECU detects the shift timing of the gears and appropriately controls the engine torque and hydraulic pressure in response to various conditions, thus doing smooth gear shift.

DTC No.	DTC Detection Condition	Trouble Area
P0715	All conditions below are detected for 5 secs. or more (2–trip detection logic) (a) Gear change not being performed (b) Gear position: 1st, 2nd, 3rd or 4th (c) T/M input shaft rpm: 300 rpm or less (d) T/M output shaft rpm: 1,000 rpm or more (e) Neutral start switch: OFF (f) No. 1, No. 2, No. 3, No. 4, SLU solenoid valves and vehicle speed sensor are in normal operation	• Open or short in O/D direct clutch speed sensor circuit • O/D direct clutch speed sensor • Engine & ECT ECU • Automatic transmission assembly



Refer to the chart for the wave form between terminals NCO^{+} and NCO^{-} during engine idling.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
In case of using the hand–held tester, start the inspection from step 1 and in case of not using the hand–held tester, start from step 2.

1	**Using hand–held tester, check O/D direct clutch speed signal.**

PREPARATION:
(a) Remove the DLC3 cover.
(b) Connect a hand–held tester to the DLC3.
(c) Start the engine (Shift range: P).
(d) Turn the hand–held tester main switch ON.

CHECK:
Read O/D direct clutch speed at engine idling.

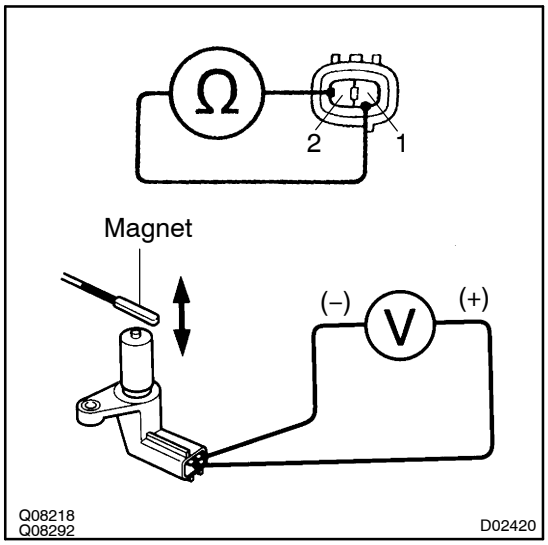
OK:
750 ± 50 rpm at engine idling

NG → **Go to step 2.**

OK

Proceed to next circuit inspection shown in problem symptoms table (See page DI–294). However, when DTC P0715/67 is displayed, check and replace Engine & ECT ECU (See page IN–30).

2	Check O/D direct clutch speed sensor.



PREPARATION:

Remove the O/D direct clutch speed sensor from the transmission.

CHECK:

(a) Measure resistance between terminals 1 and 2 of O/D direct clutch speed sensor.

(b) Check voltage between terminals 1 and 2 of the speed sensor when a magnet is put close to the front end of the speed sensor then kept away quickly.

OK:

(a): Voltage is generated intermittently

(b): Resistance: 560 – 680 Ω 20 °C (68 °F)

HINT:

The generated voltage is extremely low.

NG → **Replace the O/D direct clutch speed sensor.**

OK

Check and repair harness and connector between Engine & ECT ECU and O/D direct clutch speed sensor (See page IN–30).

DI25O–03

DTC	P0750	Shift Solenoid ”A” Malfunction (No. 1 Solenoid Valve)

DTC	P0755	Shift Solenoid ”B” Malfunction (No. 2 Solenoid Valve)

DTC	P0760	Shift Solenoid ”C” Malfunction (No. 3 Solenoid Valve)

SYSTEM DESCRIPTION

The Engine & ECT ECU uses signals from the vehicle speed sensor and input/turbine speed sensor to detect the actual gear position (1st, 2nd, 3rd, 4th or 5th gear). The Engine & ECT ECU then compares the actual gear with the shift schedule in the Engine & ECT ECU memory to detect mechanical trouble of the solenoid valves, valve body and automatic transmission (clutch, brake or gear etc.).

DTC No.	DTC Detecting Condition	Trouble Area
P0750 P0755 P0760	During normal driving, the gear required by the Engine & ECT ECU does not match the actual gear (2–trip detection logic)	• No. 1/No. 2/No. 3 solenoid valve is stuck open or closed • Valve body is blocked up or stuck • Automatic transmission assembly

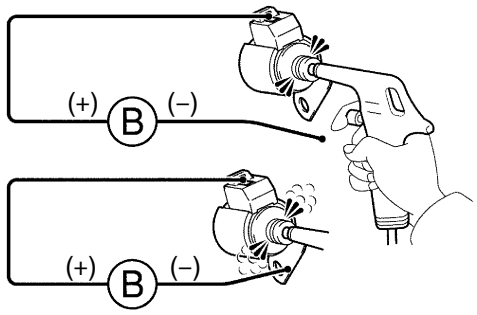
HINT:

Check the No. 1 solenoid valve when DTC P0750 is output, check No. 2 solenoid valve when DTC P0755 is output and check the No. 3 solenoid valve when DTC P0760 is output.

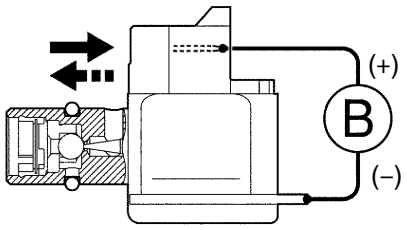
INSPECTION PROCEDURE

1	**Check No. 1, No. 2 or No. 3 solenoid valve operation.**

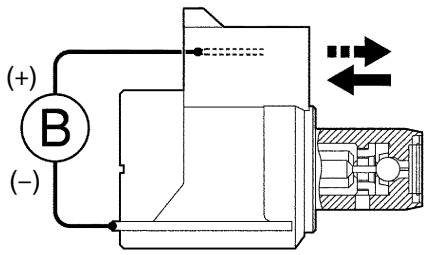
No. 2 Solenoid Valve



No. 1 Solenoid Valve



No. 3 Solenoid Valve



P D10482

PREPARATION:

(a) Remove the oil pan.
(b) Remove the No. 1, No. 2 or No. 3 solenoid valve.

CHECK:

No. 2 solenoid valve:

(a) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valves do not leak air.
(b) When battery positive voltage is supplied to the shift solenoid valves, check that the solenoid valves are open.

No. 1 and No. 3 solenoid valve:

Connect the positive (+) lead with 8 – 10 W bulb to terminal 2 and the negative (–) lead to terminal 1, then check the movement of the valve.

OK:

When B$^+$ is applied.	Valve moves in ◄ direction in illustration on the left.
When B$^+$ is cut off.	Valve moves in ■■► direction in illustration on the left.

OK

NG → **Replace the No. 1, No. 2 or No. 3 solenoid valve.**

2	Check valve body (See page DI–294).

NG → Repair or replace the valve body.

OK →

Replace the transmission (See page AT–26).

DI2LB–03

DTC	P0753	Shift Solenoid A Electrical Malfunction (No. 1 Solenoid Valve)

DTC	P0758	Shift Solenoid B Electrical Malfunction (No. 2 Solenoid Valve)

DTC	P0763	Shift Solenoid C Electrical Malfunction (No. 3 Solenoid Valve)

CIRCUIT DESCRIPTION

Shifting from 1st to 5th is performed in combination with ON and OFF of the No. 1, No. 2 and No. 3 solenoid valves controlled by Engine & ECT ECU. If an open or short circuit occurs in either of the solenoid valves, the Engine & ECT ECU controls the remaining normal solenoid valve to allow the vehicle to be operated smoothly (Fail safe function).

HINT:

Check the No. 1 solenoid valve when DTC P0753 is output, check the No. 2 solenoid valve when DTC P0758 is output and check the No. 3 solenoid valve when DTC P0763 is output.

DTC No.	DTC Detecting Condition	Trouble Area
P0753 P0758 P0763	The Engine & ECT ECU checks for an open or short circuit in the No. 1, No. 2 or No. 3 solenoid valve circuit when it changes. The Engine & ECT ECU records DTC P0753, P0758 or P0763 if condition (a) or (b) is detected once, but it does not light up CHK ENG. After Engine & ECT ECU detects condition (a) or (b) continuously 8 times or more in 1 trip, it causes the CHK ENG lights up until condition (a) or (b) disappears. After that, if the Engine & ECT ECU detects condition (a) or (b) once, it starts lighting up CHK ENG again. (a) Solenoid resistance is 8 Ω or less (short circuit) when the solenoid is energized. (b) Solenoid resistance is 100 kΩ or more (open circuit) when the solenoid is not energized.	• Open or short in No. 1/No. 2/No. 3 solenoid valve circuit • No. 1/No. 2/No. 3 solenoid valve • Engine & ECT ECU

Fail Safe Function:

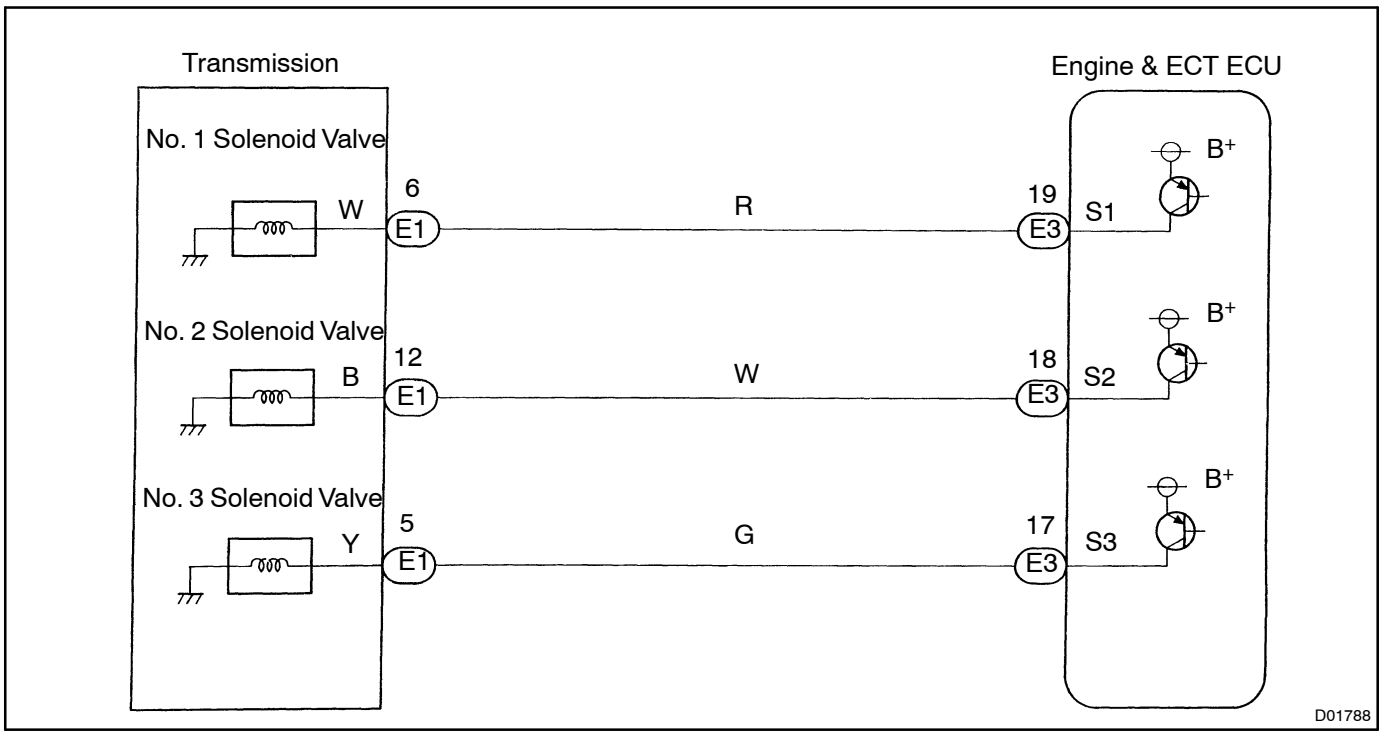
If either of the shift solenoid valve circuits develops an open or short, the Engine & ECT ECU turns the other solenoid valve ON and OFF to shift to the gear positions shown in the table below. The Engine & ECT ECU also turns the SLU solenoid valve OFF at the same time. If both solenoids are malfunctioning, hydraulic control cannot be performed electronically and must be done manually.

Manual shifting as shown in the following table must be done (In the case of a short circuit, the Engine & ECT ECU stops sending current to the short circuited solenoid).

Range	Normal				No. 1 Solenoid Valve Malfunction				No. 2 Solenoid Valve Malfunction				No. 3 Solenoid Valve Malfunction			
	Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear
	No. 1	No. 2	No. 3		No. 1	No. 2	No. 3		No. 1	No. 2	No. 3		No. 1	No. 2	No. 3	
D	ON	OFF	ON	1	X	OFF→ON	ON→OFF	4→3	ON	X	OFF	1	ON	OFF	X	1
	OFF	ON	OFF	3	X	ON	OFF	3	OFF	X	OFF→ON	5→4	OFF	ON	X	3
	OFF	OFF	ON	4	X	OFF	ON	4	OFF	X	ON	4	OFF	OFF	X	5
	OFF	OFF	OFF	5	X	OFF	OFF	5	OFF	X	OFF	5	OFF	OFF	X	5
4	ON	OFF	ON	1	X	OFF→ON	ON→OFF	4→3	ON	X	OFF	1	ON	OFF	X	1
	OFF	ON	OFF	3	X	ON	OFF	3	OFF	X	OFF→ON	5→4	OFF	ON	X	3
	OFF	OFF	ON	4	X	OFF	ON	4	OFF	X	ON	4	OFF	OFF	X	5
3	ON	OFF	ON	1	X	OFF→ON	ON	4→3	ON	X	OFF	1	ON	OFF	X	1
	OFF	ON	ON	3	X	ON	ON	3	OFF	X	ON	4	OFF	ON	X	3
	OFF	OFF	ON	4	X	OFF	ON	4	OFF	X	ON	4	OFF	OFF	X	4
2	ON	OFF	ON	1	X	OFF→ON	ON	3	ON	X	ON	1	ON	OFF	X	1
	OFF	ON	ON	3	X	ON	ON	3	OFF	X	ON	3	OFF	ON	X	3
L	ON	OFF	OFF	1	X	OFF→ON	OFF→ON	3	ON	X	OFF	1	ON	OFF	X	1

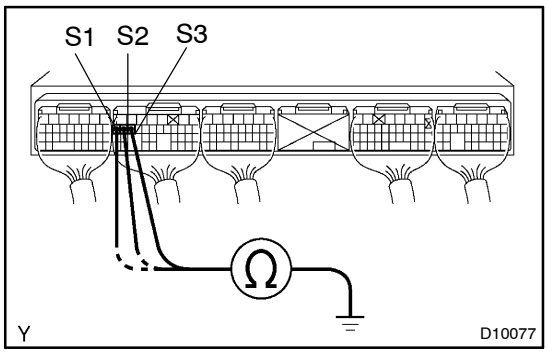
Range	No. 1 and No. 2 Solenoid Valve Malfunction				No. 1 and No. 3 Solenoid Valve Malfunction				No. 2 and No. 3 Solenoid Valve Malfunction				No. 1, No. 2, No. 3 Solenoid Valve Malfunction			
	Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear	Solenoid Valve			Gear
	No. 1	No. 2	No. 3		No. 1	No. 2	No. 3		No. 1	No. 2	No. 3		No. 1	No. 2	No. 3	
D	X	X	ON	4	X	OFF→ON	X	5→3	ON	X	X	1	X	X	X	5
	X	X	OFF→ON	5→4	X	ON	X	3	OFF	X	X	5	X	X	X	5
	X	X	ON	4	X	OFF	X	5	OFF	X	X	5	X	X	X	5
	X	X	OFF	5	X	OFF	X	5	OFF	X	X	5	X	X	X	5
4	X	X	ON	4	X	OFF→ON	X	5→3	ON	X	X	1	X	X	X	5
	X	X	OFF→ON	5→4	X	ON	X	3	OFF	X	X	5	X	X	X	5
	X	X	ON	4	X	OFF	X	5	OFF	X	X	5	X	X	X	5
3	X	X	ON	4	X	OFF→ON	X	4→3	ON	X	X	1	X	X	X	4
	X	X	ON	4	X	ON	X	3	OFF	X	X	4	X	X	X	4
	X	X	ON	4	X	OFF	X	4	OFF	X	X	4	X	X	X	4
2	X	X	ON	3	X	OFF→ON	X	3	ON	X	X	1	X	X	X	3
	X	X	ON	3	X	ON	X	3	OFF	X	X	3	X	X	X	3
L	X	X	OFF→ON	3	X	OFF→ON	X	3	ON	X	X	1	X	X	X	3

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Measure resistance between terminal S1, S2 or S3 of Engine & ECT ECU and body ground.**

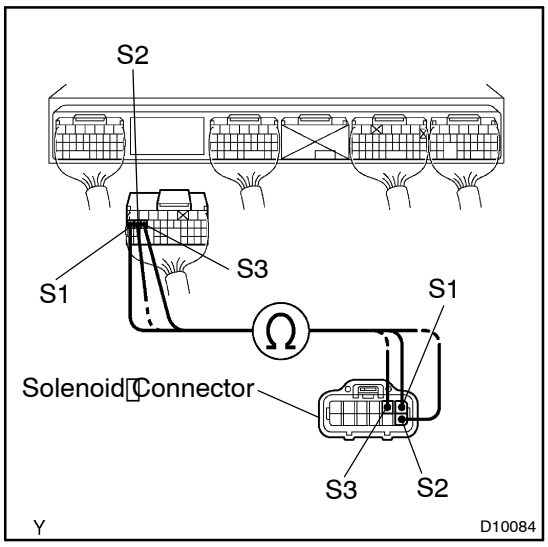


PREPARATION:
Disconnect the connector from Engine & ECT ECU.
CHECK:
Measure resistance between terminal S1, S2 or S3 of Engine & ECT ECU and body ground.
OK:
Resistance: 11 – 15 Ω at 20°C (68°F)

OK	**Check and replace the Engine & ECT ECU (See page IN–30).**

NG

2	**Check harness and connector between Engine & ECT ECU and automatic transmission solenoid connector.**



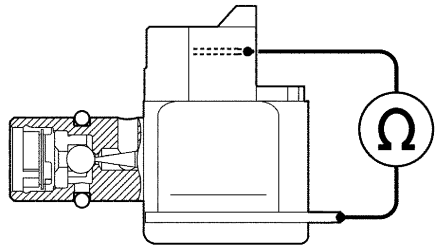
PREPARATION:
Disconnect the solenoid connector from the automatic transmission.
CHECK:
Check the harness and connector between terminal S1, S2 or S3 of Engine & ECT ECU and terminal S1, S2 or S3 of solenoid connector.
OK:
There is no open and no short circuit.

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

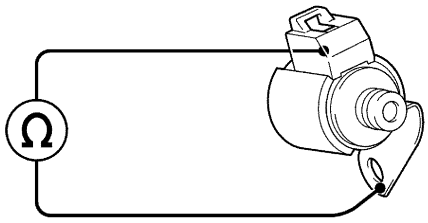
OK

3	Check No. 1, No. 2 or No. 3 solenoid valve.

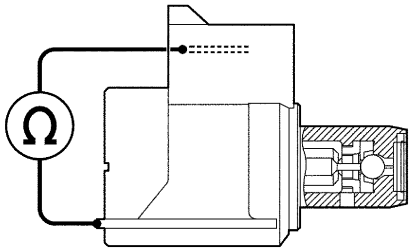
No. 1 Solenoid Valve



No. 2 Solenoid Valve



No. 3 Solenoid Valve



P D10483

Electrical Check:

PREPARATION:

(a) Remove the oil pan.

(b) Remove the No. 1, No. 2 or No. 3 solenoid valve.

CHECK:

(a) Measure resistance between solenoid connector and body ground.

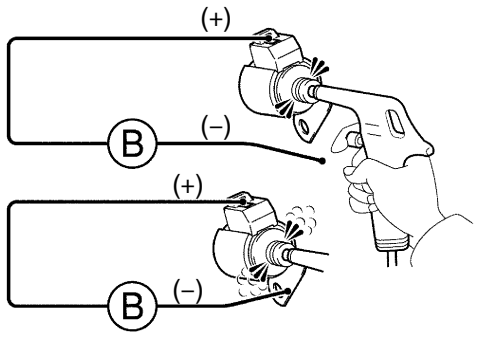
(b) Connect positive ⊕ lead to terminal of solenoid connector, negative ⊖ lead to solenoid body.

OK:

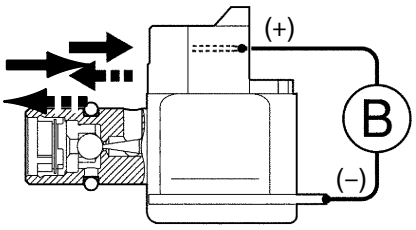
(a) Resistance: 11 – 15 Ω at 20 °C (68 °F)

(b) The solenoid makes an operating noise.

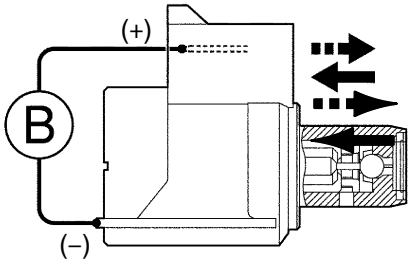
No. 2 Solenoid Valve



No. 1 Solenoid Valve



No. 3 Solenoid Valve



P D10482

Mechanical Check:

PREPARATION:

(a) Remove the oil pan.

(b) Remove the No. 1, No. 2 or No. 3 solenoid valve.

CHECK:

No. 2 solenoid valve:

(a) Applying 490 kPa (5 kgf/cm^2, 71 psi) of compressed air, check that the solenoid valves do not leak air.

(b) When battery positive voltage is supplied to the shift solenoid valves, check that the solenoid valves open.

No. 1 and No. 3 solenoid valves:

Connect the positive (+) lead with 8 – 10 W bulb to terminal 2 and the negative (–) lead to terminal 1, then check the movement of the valve.

OK:

When B^+ is applied.	Valve moves in ◀ direction in the illustration on the left.
When B^+ is cut off.	Valve moves in ■■■▶ direction in the illustration on the left.

NG → **Replace the solenoid valve.**

OK

Repair or replace the solenoid wire.

DI2LC–03

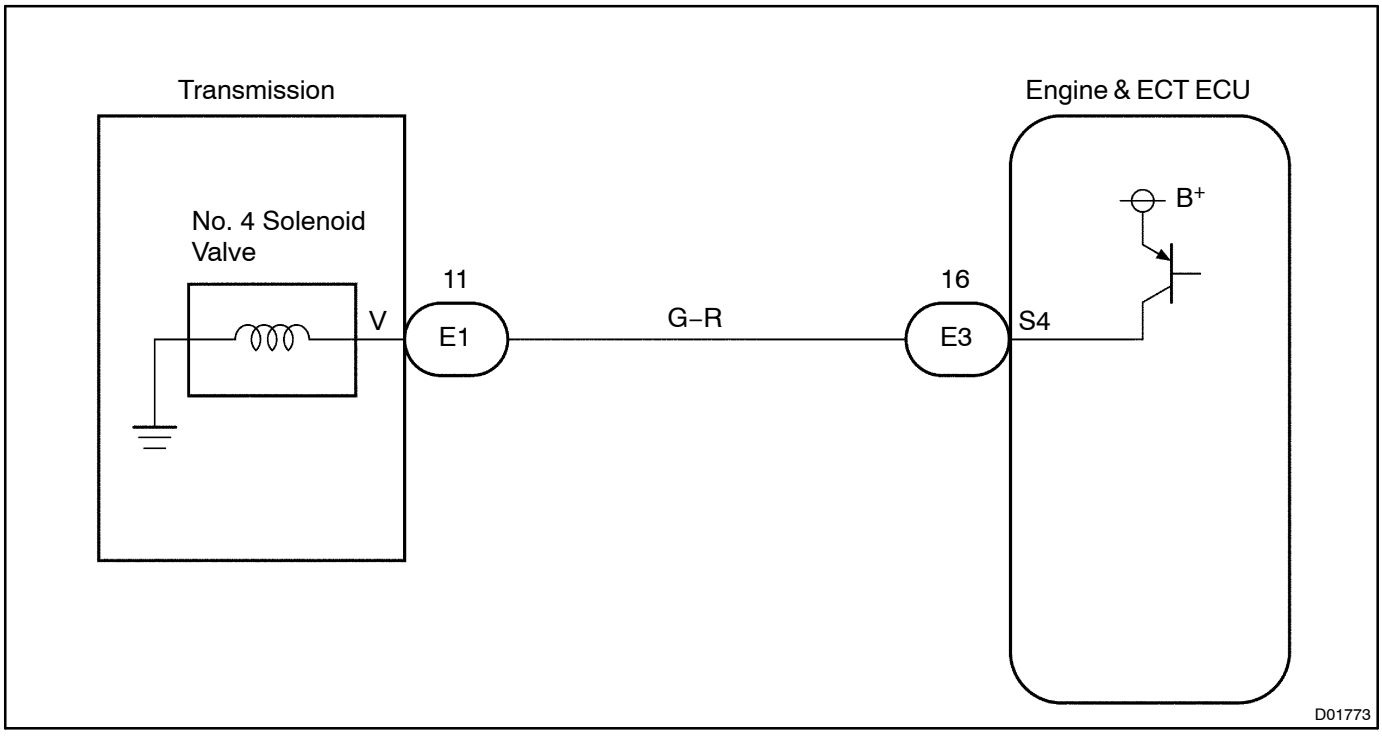
DTC	P0768	Shift Solenoid D Electrical Malfunction (No. 4 Solenoid Valve)

CIRCUIT DESCRIPTION

No. 4 solenoid valve is controlled by Engine & ECT ECU and it switches ON and OFF of the O/D direct switch.

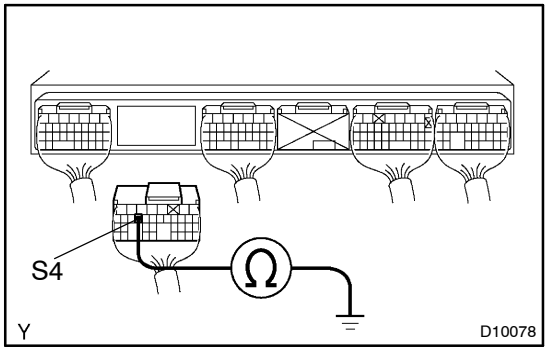
DTC No.	DTC Detecting Condition	Trouble Area
P0768	The Engine & ECT ECU checks for an open or short circuit in the No. 4 solenoid valve circuit when it changes. The Engine & ECT ECU records DTC P0768 if condition (a) or (b) is detected once, but it does not light up CHK ENG. After Engine & ECT ECU detects condition (a) or (b) continuously 8 times or more in 1 trip, it causes the CHK ENG lights up until condition (a) or (b) disappears. After that, if the Engine & ECT ECU detects condition (a) or (b) once, it starts lighting up CHK ENG again. (a) Solenoid resistance is 8 Ω or less (short circuit) when the solenoid is energized. (b) Solenoid resistance is 100 kΩ or more (open circuit) when the solenoid is not energized.	• Open or short in No. 4 solenoid valve circuit • No. 4 solenoid valve • Engine & ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check resistance between terminals S4 of Engine & ECT ECU and body ground.

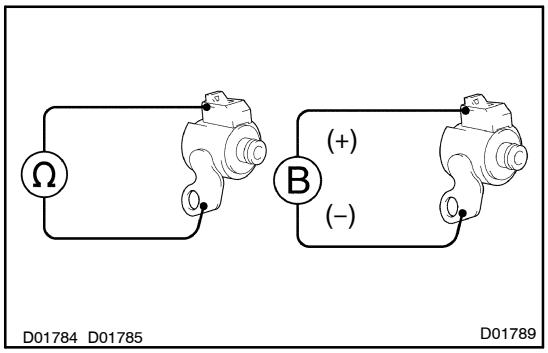


PREPARATION:
Disconnect the connector from Engine & ECT ECU.
CHECK:
Measure resistance between terminals S4 and body ground.
OK:
Resistance: 11 – 15 Ω at 20 °C (68 °F)

OK	Check and replace the Engine & ECT ECU (See page IN–30).

NG

2	Check No. 4 solenoid valve.

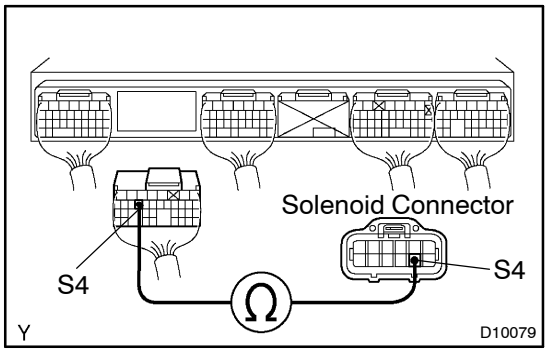


PREPARATION:
(a) Remove the oil pan.
(b) Remove the No. 4 solenoid valve.
CHECK:
(a) Measure resistance between terminal and solenoid body.
(b) Connect positive (+) lead to terminal of solenoid connector and negative (–) lead to solenoid body.
OK:
(a) Resistance: 11 – 15 Ω at 20 °C (68 °F)
(b) The solenoid makes an operating noise.

NG	Replace No. 4 solenoid valve.

OK

3	Check harness and connector between Engine & ECT ECU and automatic transmission solenoid connector.



PREPARATION:

Disconnect the solenoid connector from the automatic transmission.

CHECK:

Check the harness and connector between terminal S4 of Engine & ECT ECU and terminal S4 solenoid connector.

OK:

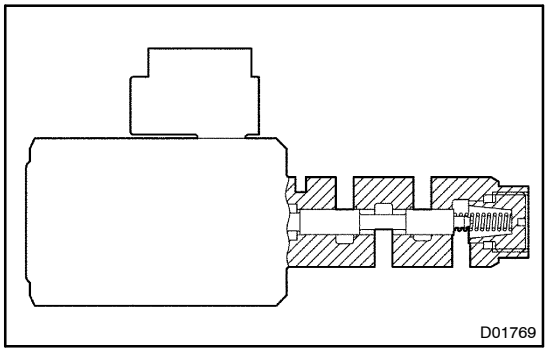
There is open and no short circuit.

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

OK

Proceed to next circuit inspection shown in problem symptoms table (See page DI–294). However, when DTC P0768 is displayed, check and replace Engine & ECT ECU (See page IN–30).

DTC	P0770	Shift Solenoid "E" Malfunction (SLU Shift Solenoid Valve)



SYSTEM DESCRIPTION

The Engine & ECT ECU uses the signals from the Throttle Position Sensor and Air–flow Meter to monitor the engagement condition of the lock–up clutch.

Then the Engine & ECT ECU compares the engagement condition of the lock–up clutch with the lock–up schedule in the Engine & ECT ECU memory to detect mechanical trouble of the SLU solenoid valve SLU, valve body, torque converter and automatic transmission assembly (clutch, brake or gear etc.).

DTC No.	DTC Detecting Condition	Trouble Area
P0770	Lock–up does not occur when driving in the lock–up range (normal driving at 80 km/h [50 mph]), or lock–up remains ON in the lock–up OFF range. (2–trip detection logic)	• SLU solenoid valve is stuck open or closed • Valve body blocked up or stuck • Lock–up clutch • Automatic transmission assembly

INSPECTION PROCEDURE

HINT:

In case of using hand–held tester, start the inspection from step 1 and in case of not using the hand–held tester, start from step 2.

1	**Active test.**

PREPARATION:

(a) Remove the DLC3 cover.
(b) Connect a hand–held tester.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Using active test, check the lock–shift operation.

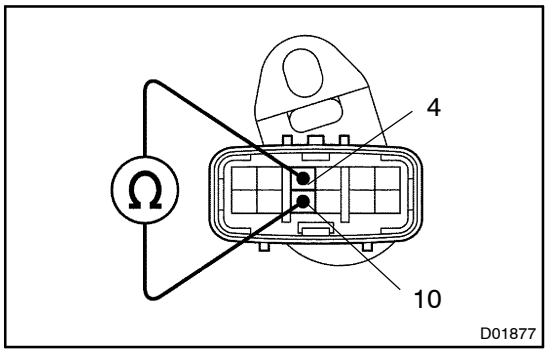
OK:

Lock–up ON

NG → **Replace the torque converter.**

OK

2	Check SLU solenoid valve resistance.

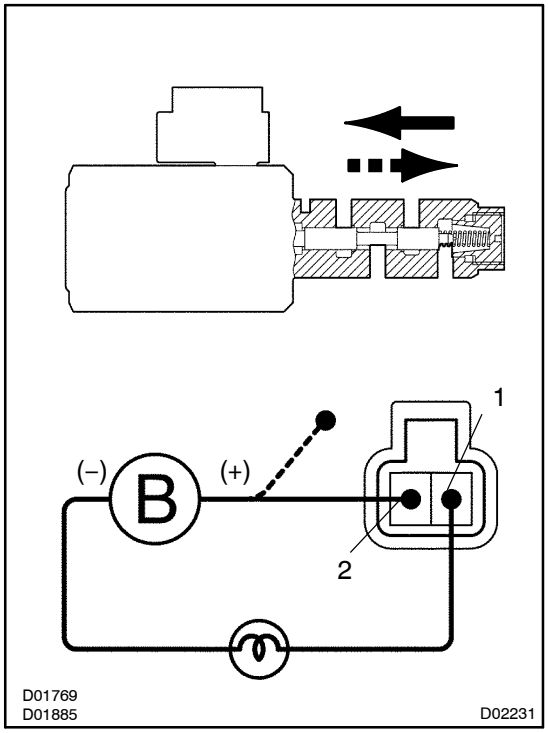


PREPARATION:
Disconnect the solenoid wire connector.
CHECK:
Measure the resistance between terminals 4 and 10 of solenoid connector.
OK:
Resistance: 5.0 – 5.6 Ω at 20 °C (68 °F)

NG → **Replace the SLU solenoid valve.**

OK

3	Check SLU solenoid valve operation.



PREPARATION:
(a) Remove the oil pan.
(b) Remove the SLU solenoid valve.
CHECK:
Connect the positive (+) lead from the battery to terminal 2 and the negative (–) lead to terminal 1.
OK:

When B^+ is applied.	Valve moves in ➡ direction in illustration on the left.
When B^+ is cut off.	Valve moves in ⬅ direction in illustration on the left.

NG → **Replace the SLU solenoid valve.**

OK

4	Check valve body (See page DI–294).

NG → Repair or replace the valve body.

OK

Replace the torque converter (See page AT–26).

DI25S–03

DTC	P1520	Stop Light Switch Signal Malfunction

CIRCUIT DESCRIPTION

The purpose of this circuit is to prevent the engine from stalling, while driving in lock–up condition, when brakes are suddenly applied.
When the brake pedal is depressed, this switch sends a signal to Engine & ECT ECU. Then the Engine & ECT ECU cancels operation of the lock–up clutch while braking is in progress.

DTC No.	DTC Detecting Condition	Trouble Area
P1520	The stop light switch does not turn off even once the vehicle is driven. (2–trip detection logic)	• Short in stop light switch signal circuit • Stop light switch • Engine & ECT ECU

WIRING DIAGRAM

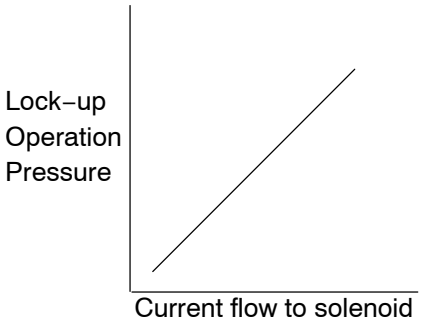
See page DI–1389.

INSPECTION PROCEDURE

See page DI–1389.

DI2LD–02

DTC	P1755	Linear Solenoid for Lock–up Control Circuit Malfunction (SLU Solenoid Valve)

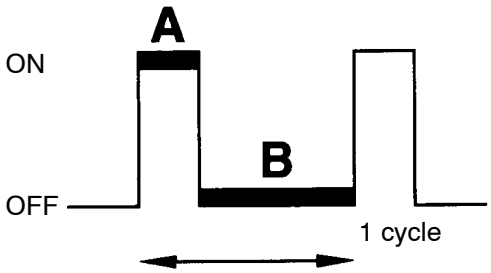


CIRCUIT DESCRIPTION

The amount of current flow to the solenoid is controlled by the (*) duty ratio of the Engine & ECT ECU output signal. The higher the duty ratio becomes, the higher the lock–up hydraulic pressure becomes during the lock–up operation.

(*) Duty Ratio

The duty ratio is the ratio of the period of continuity in one cycle. For example, if A is the period of continuity in one cycle, and B is the period of non–continuity, then



BE4056

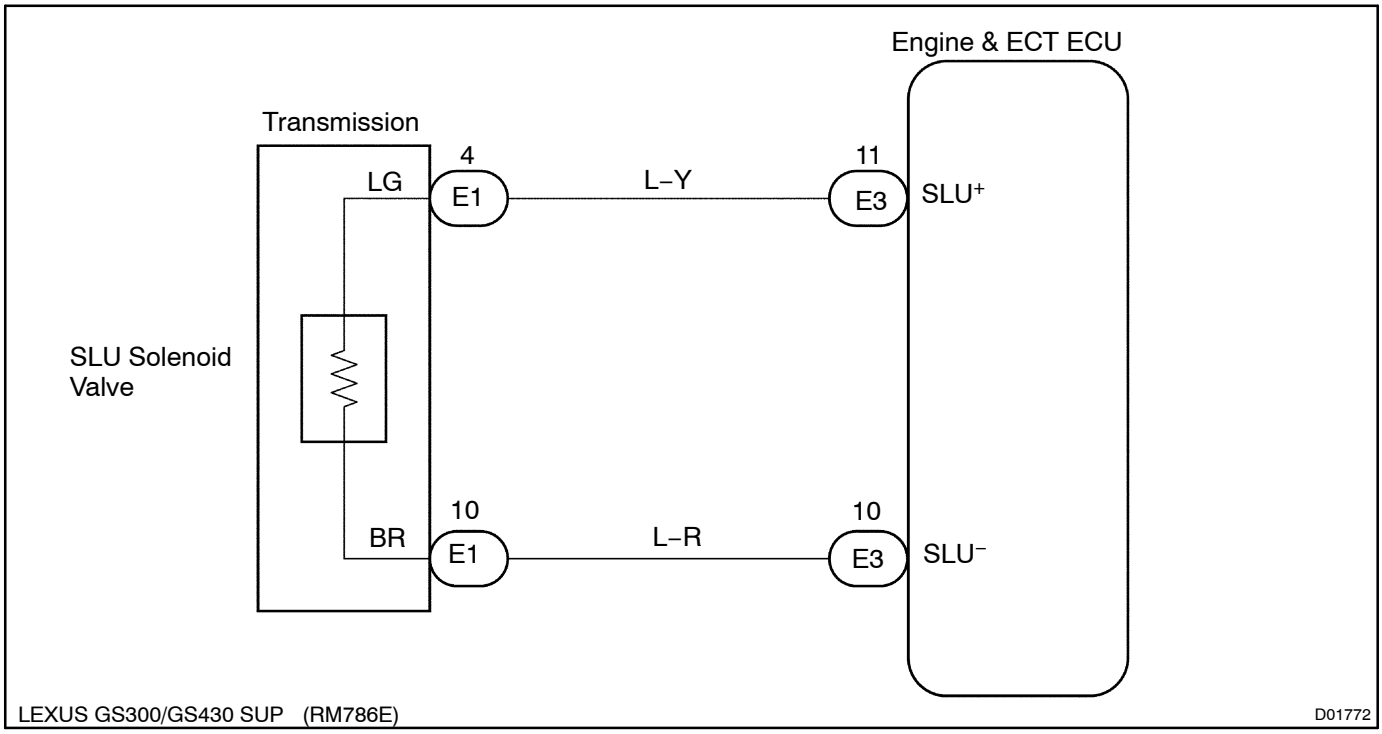
(*)

$$\text{Duty Ratio} = \frac{A}{A + B} \times 100\ (\%)$$

D00160

DTC No.	DTC detection condition	Trouble Area
P1755	The following condition is detected. (2–trip detection logic) Signal output from SLU is ON for 3.3 msecs. or more and duty ratio is at least 95 % for 1 second.	• Open or short in SLU solenoid valve circuit • SLU solenoid valve • Engine & ECT ECU • Automatic transmission assembly

WIRING DIAGRAM

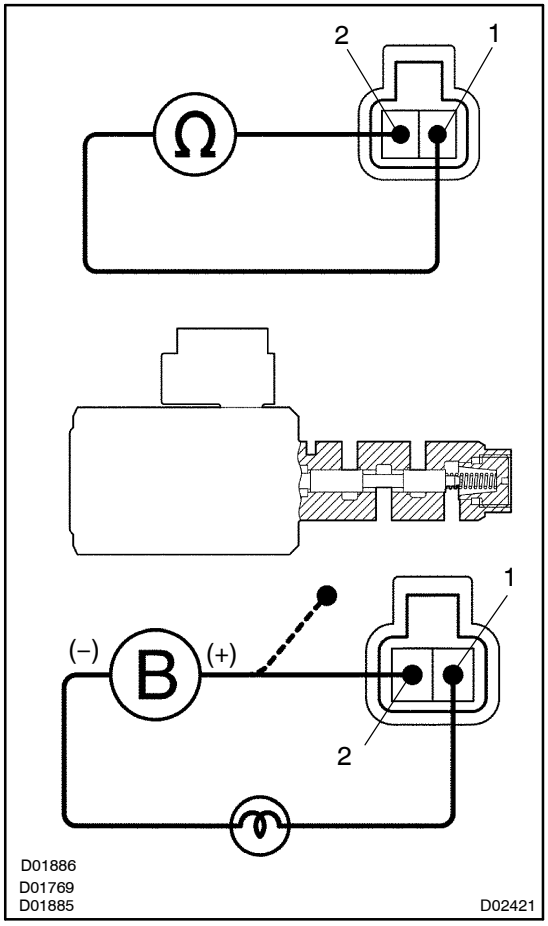


LEXUS GS300/GS430 SUP (RM786E)

D01772

INSPECTION PROCEDURE

1	Check SLU solenoid valve.



PREPARATION:
(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.

CHECK:
Measure the resistance between terminals 1 and 2.

OK:
5.0 – 5.6 Ω at 20 °C (68 °F)

Check solenoid operation:

PREPARATION:
(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Remove the SLU solenoid valve.

CHECK:
Connect the positive (+) lead from the battery to terminal 2 and negative (–) lead to terminal 1.

OK:

When B^+ is applied.	Valve moves in ➡ direction in the illustration on the left.
When B^+ is cut off.	Valve moves in ⬅ direction in the illustration on the left.

NG → **Replace SLU solenoid valve.**

OK

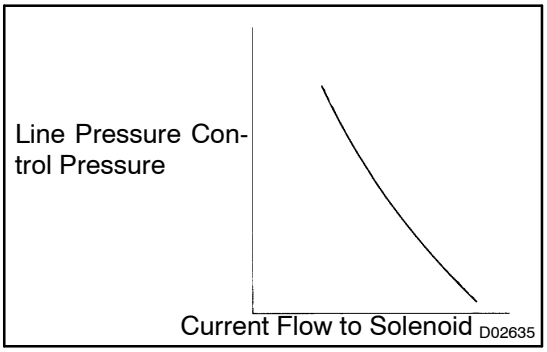
2	Check harness and connector between SLU solenoid valve and Engine & ECT ECU (See page IN–30).

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

OK

Check and replace the Engine & ECT ECU (See page IN–30).

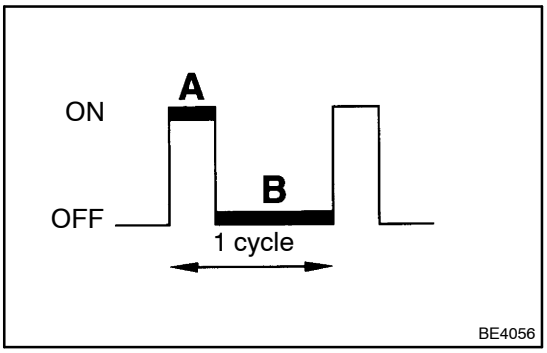
DTC	P1760	Linear Solenoid for Line Pressure Control Circuit Malfunction (SLT Solenoid Valve)



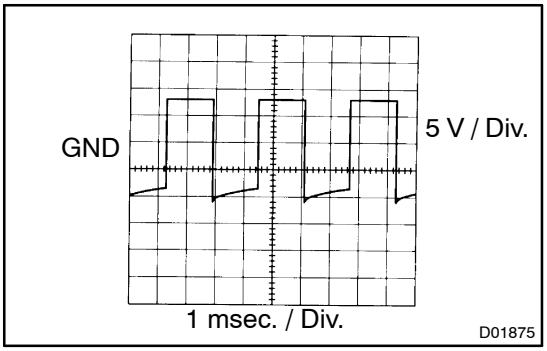
CIRCUIT DESCRIPTION

The throttle pressure that is applied to the primary regulator valve (which modulates line pressure) causes the SLT solenoid valve, under electronic control, to precisely and minutely modulates and generates line pressure according to the accelerator pedal effort, or engine power output detected.
This reduces the function of line pressure and provides smooth shifting characteristics.
Upon receiving the throttle valve opening angle signal, Engine & ECT ECU controls the line pressure by sending a predetermined (*) duty ratio to the solenoid valve, modulating the line pressure, generating throttle pressure.
(*) Duty Ratio
The duty ratio is the ratio of the period of continuity in one cycle.
For example, if A is the period of continuity in one cycle, and B is the period of non–continuity, then

$$\text{Duty Ratio} = \frac{A}{A + B} \times 100\ (\%)$$

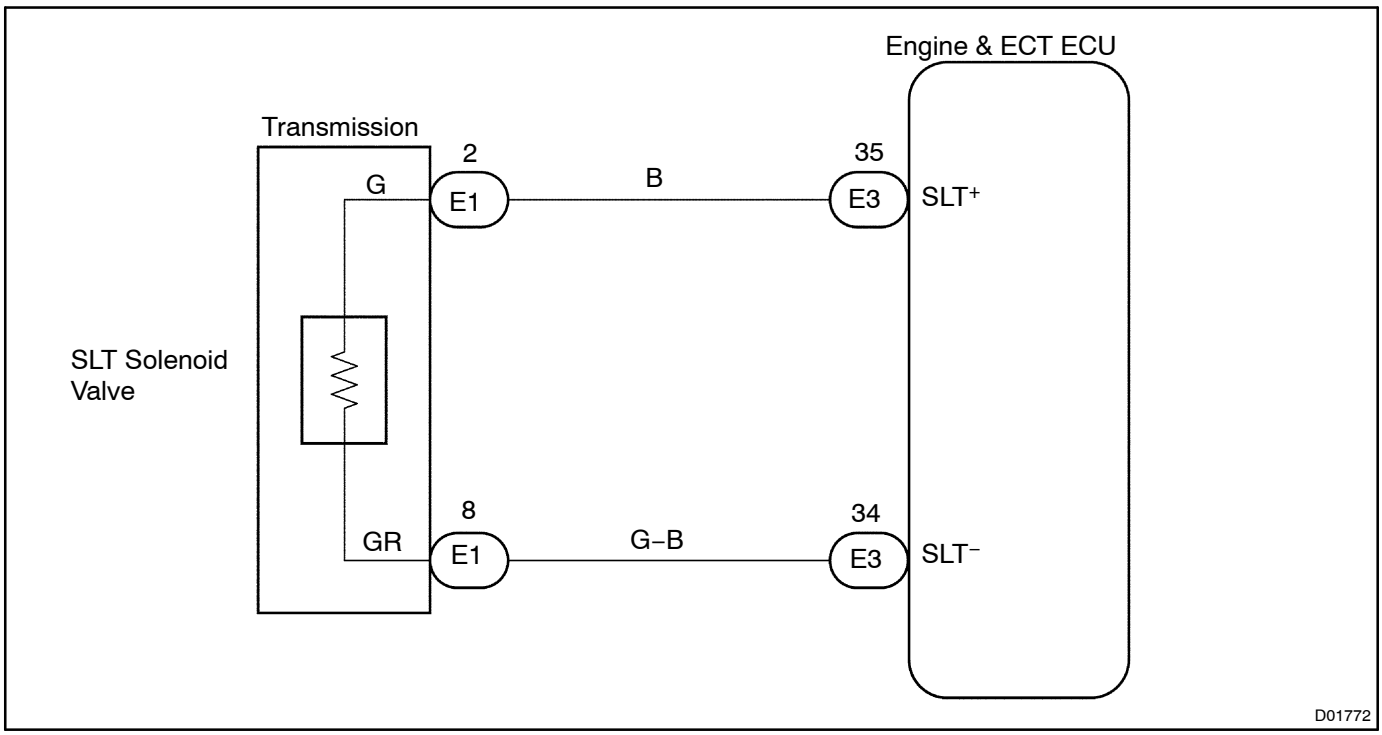


DTC No.	DTC Detecting Condition	Trouble Area
P1760	(a) or (b) condition below is detected for 1 second or more. (a) SLT⁻ terminal: 0 V (b) SLT⁻ terminal: 12 V	• Open or short in SLT solenoid valve circuit • SLT solenoid valve • Engine & ECT ECU



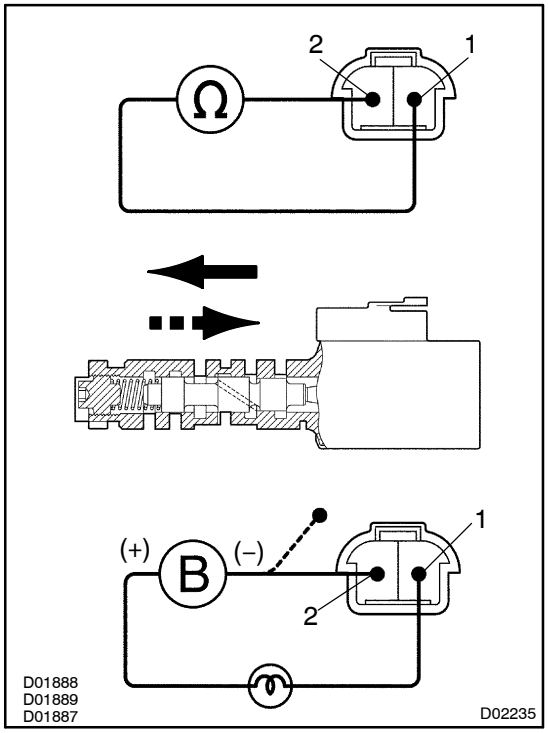
Reference:
Refer to the chart for the wave form between terminals SLT+ and SLT–during engine idling.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check SLT solenoid valve.**



PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.

Check solenoid resistance:

CHECK:

Measure resistance between terminals 1 and 2 of solenoid connector.

OK:

Resistance: 5.0 – 5.6 Ω at 20 °C (68°F)

Check solenoid operation:

CHECK:

Connect positive (+) lead with an 8 – 10 W bulb to terminal 1 of solenoid connector and negative (–) lead to terminal 2, then check the movement of the valve.

OK:

When battery positive voltage is applied.	Valve moves in ← direction in the illustration on the left.
When battery positive voltage is cut off.	Valve moves in → direction in the illustration on the left.

NG → **Replace SLT solenoid valve.**

OK ↓

2	**Check harness and connector between SLT solenoid valve and Engine & ECT ECU (See page IN–30).**

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

OK ↓

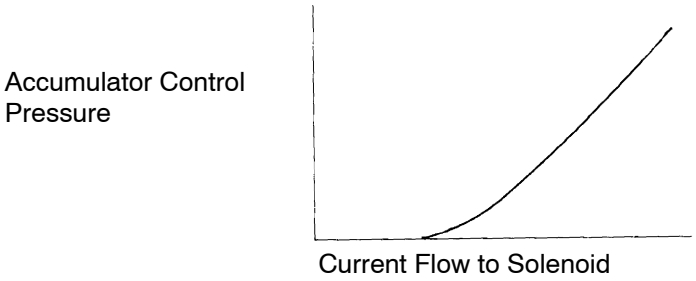
Check and replace Engine & ECT ECU (See page IN–30).

DI2LF–02

DTC	P1765	Linear Solenoid for Accumulator Pressure Control Circuit Malfunction (SLN Solenoid)

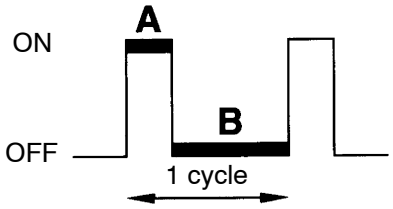
CIRCUIT DESCRIPTION

The SLN solenoid valve controls the hydraulic pressure acting on the accumulator control valve when gears are shifted and performs smooth gear shifting. The Engine & ECT ECU determines optimum operating pressure according to the signals from the throttle position sensor, vehicle speed sensor and O/D direct clutch speed sensor and controls the volume of current flow to the solenoid valve. The amount of current to the solenoid is controlled by the (*) duty ratio of Engine & ECT ECU output signals, causing a momentary charge to the hydraulic pressure acting on the clutches during gear shifting.
When the duty ratio is high, the hydraulic pressure acting on the clutches is low.



D02636

(*) Duty Ratio
The duty ratio is the ratio of the period of continuity in one cycle.
For example, if A is the period of continuity in one cycle, and B is the period of non–continuity, then

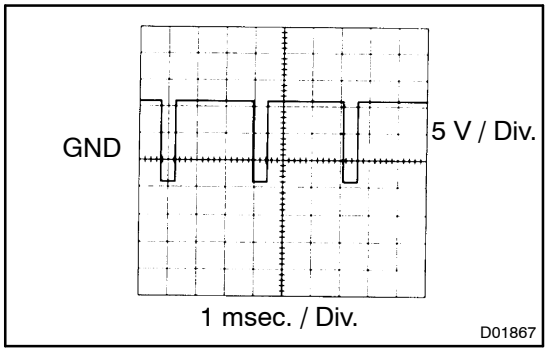


$$\text{Duty Ratio} = \frac{A}{A + B} \times 100\ (\%)$$

BE4056

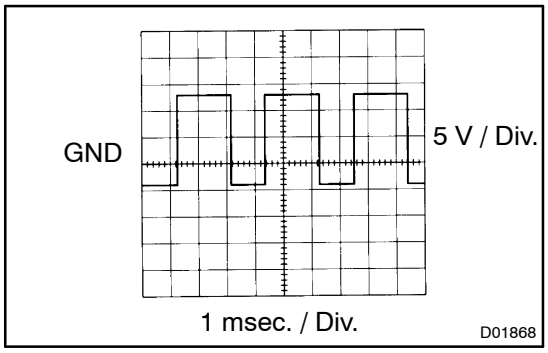
D02292

DTC No	DTC Detecting Condition	Trouble Area
P1765	All conditions below are detected for 1 second or more. (2–trip detection logic) (a) Engine & ECT ECU outputs duty signal to SLN solenoid valve at 90 % or higher duty ratio (b) Current to SLN solenoid valve: 230 – 430 mA or less	• Open or short in SLN solenoid valve circuit • SLN solenoid valve • Engine & ECT ECU



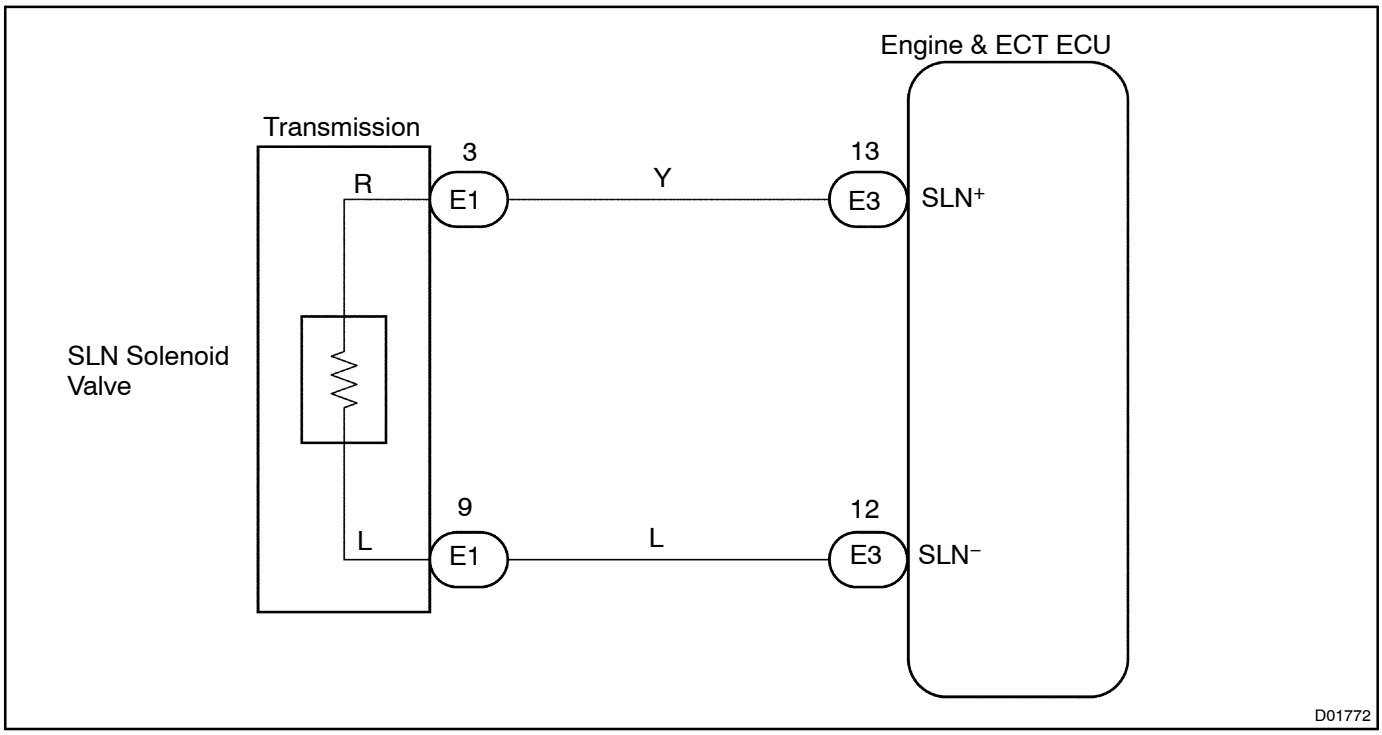
Reference:

- Refer to the chart for the wave form between terminals SLN⁻ and E1 when engine is idling.



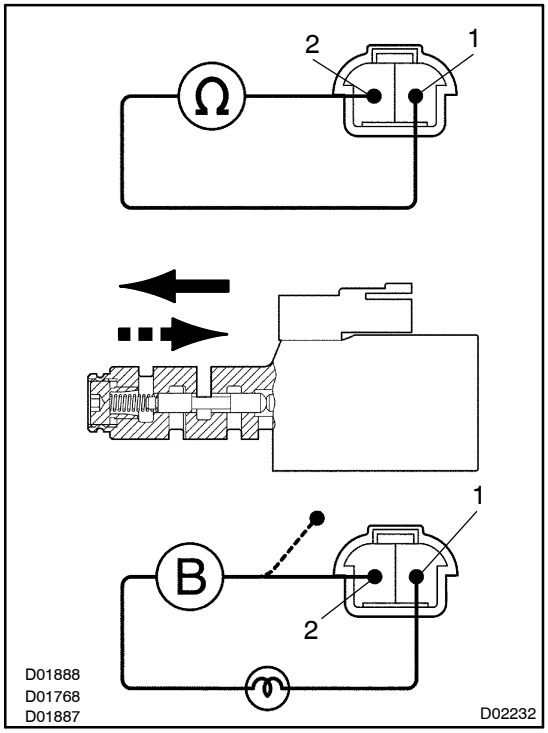
- Refer to the chart for the wave form between terminals SLN⁻ and E1 during shift change.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check SLN solenoid valve.**



PREPARATION:

(a) Jack up the vehicle.
(b) Remove the oil pan.
(c) Disconnect the solenoid connector.

Check solenoid resistance:

CHECK:

Measure resistance between terminals 1 and 2 of solenoid connector.

OK:

Resistance: 5.0 – 5.6 Ω at 20 °C (68 °F)

Check solenoid operation:

CHECK:

Connect positive (+) lead with an 8 – 10 W bulb to terminal 1 of solenoid connector and negative (–) lead to terminal 2, then check the movement of the valve.

OK:

When battery voltage is applied.	Valve moves in ◀ direction in the illustration on the left.
When battery voltage is cut off.	Valve moves in ■■▶ direction in the illustration on the left.

NG → **Replace SLN solenoid valve.**

OK ↓

2	**Check harness and connector between SLN solenoid valve and Engine & ECT ECU (See page IN–30).**

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

OK ↓

Check and replace Engine & ECT ECU (See page IN–30).

DI87X–01

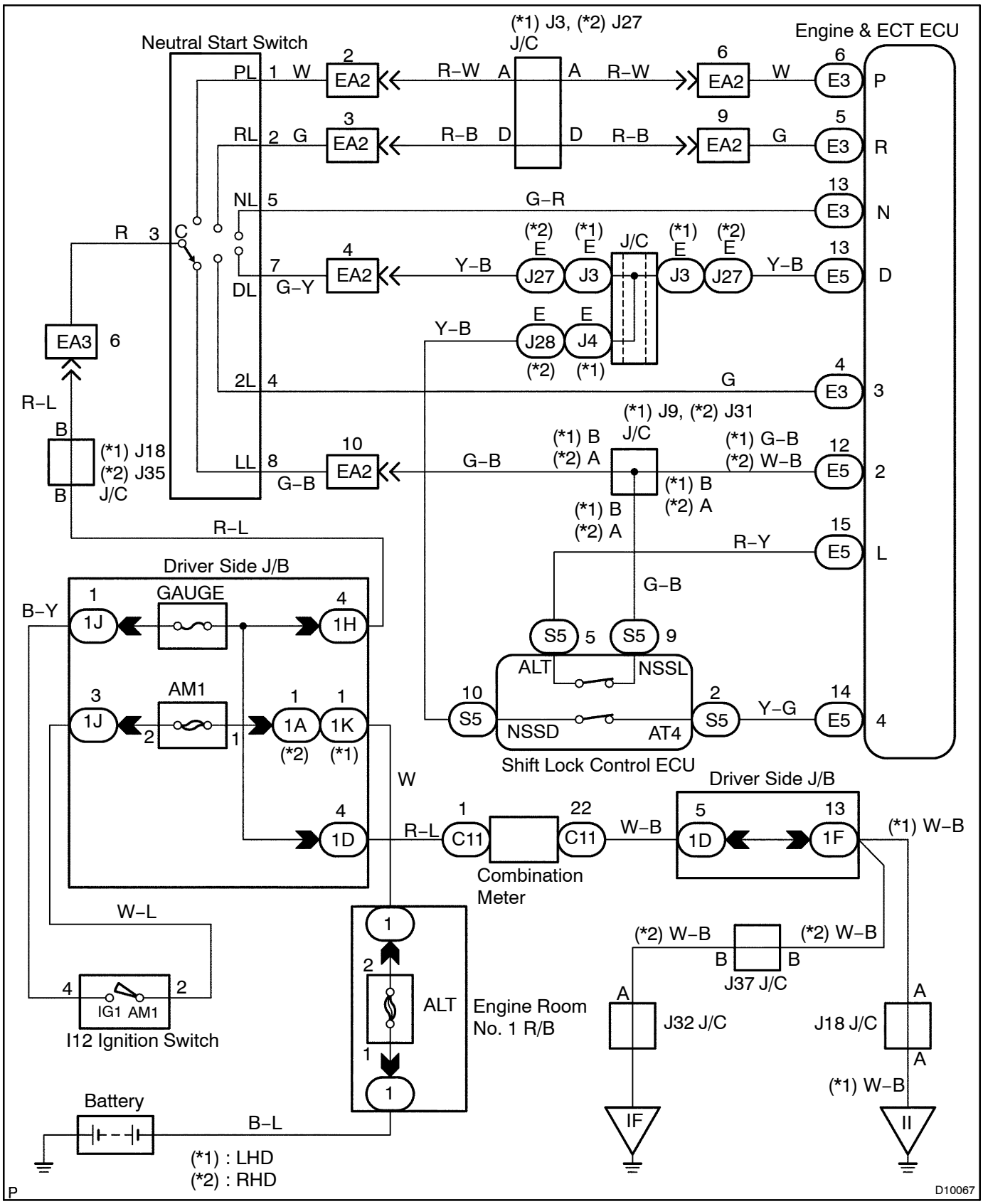
DTC	P1780	Park/Neutral Position Switch Circuit (Neutral Start Switch)

CIRCUIT DESCRIPTION

The neutral start switch detects the shift lever range and sends signals to the Engine & ECT ECU.
The Engine & ECT ECU receives signals (P, R, N, D, 4, 3, 2 and L) from the neutral start switch. When the signal is not sent to the Engine & ECT ECU from the neutral start switch, the Engine & ECT ECU judges that the shift lever is in D range.

DTC No.	DTC Detection Condition	Trouble Area
P1780	2 or more switches are ON simultaneously for P, R, N, D, 4, 3, 2 and L ranges. (2–trip detection logic)	• Short in neutral start switch circuit • Neutral start switch • Engine & ECT ECU
	When driving under conditions (a) and (b) for 30 seconds or more, the neutral start switch is ON (N position). (2–trip detection logic) (a) Vehicle speed: 70 km/h (44 mph) or more (b) Engine speed: 1,500 – 2,500 rpm	

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
In case of using the hand–held tester, start the inspection from step 1 and in case of not using the hand–held tester, start from step 2.

1	**Read PNP, REVERSE, DRIVE, 4TH, 3RD, 2ND and LOW signals.**

PREPARATION:

(a) Remove the DLC3 cover.
(b) Connect a hand–held tester to the DLC3.
(c) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Shift lever into the P, R, N, D, 4, 3, 2 and L ranges, and read the PNP, REVERSE, DRIVE, 4TH, 3RD, 2ND and LOW signals on the hand–held tester.

OK:

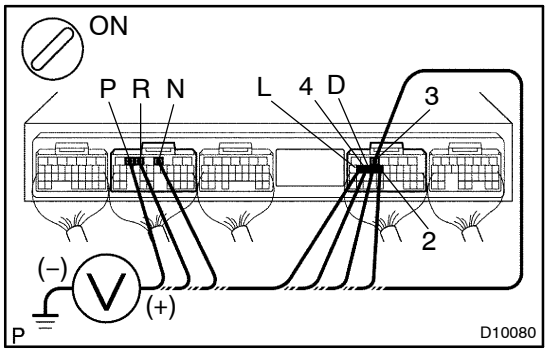
Shift range	Signal
P, N	PNP: OFF → ON
R	REVERSE: OFF → ON
D	DRIVE: OFF → ON
4	4TH: OFF → ON
3	3RD: OFF → ON
2	2ND: OFF → ON
L	LOW: OFF → ON

OK → **Check and replace the Engine & ECT ECU (See page IN–30).**

NG

Go to step 3.

2	**Measure voltage between each terminals of P, R, N, D, 4, 3, 2, and L of Engine & ECT ECU and body ground.**



PREPARATION:

Turn the ignition switch ON.

CHECK:

Measure voltage between each terminals P, R, N, D, 4, 3, 2 and L of Engine & ECT ECU and body ground when the shift lever is shifted to the following positions.

OK:

Tester connection	Condition	Specified condition
P– Body ground	Shift lever range: P	Battery voltage
R – Body ground	Shift lever range: R	Battery voltage*
N – Body ground	Shift lever range: N	Battery voltage
D – Body ground	Shift lever range : D Transmission control SW (for D and 4) : OFF	Battery voltage
4 – Body ground	Shift lever range: 4 Transmission control SW (for D and 4) : ON	Battery voltage
3 – Body ground	Shift lever range: 3	Battery voltage
2 – Body ground	Shift lever range: 2 Transmission control SW (for 2 and L) : OFF	Battery voltage
L – Body ground	Shift lever range: L Transmission control SW (for 2 and L) : ON	Battery voltage

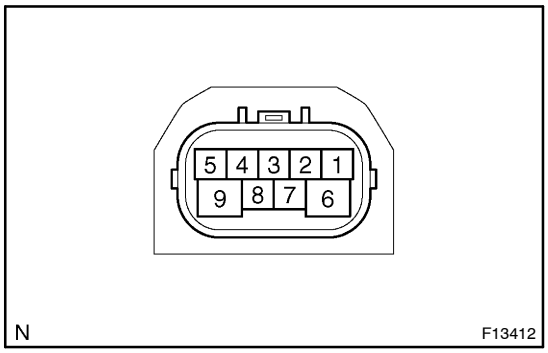
HINT:

*: The voltage will drop slightly due to lighting up of the back up light.

OK → **Check and replace the Engine & ECT ECU (See page IN–30).**

NG

3	Check neutral start switch.



PREPARATION:

(a) Jack up the vehicle.

(b) Remove the neutral start switch connector.

CHECK:

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

OK:

Shift range	Terminal No. to continuity	Terminal No. to continuity
P	1 – 3	6 – 9
R	2 – 3	–
N	3 – 5	6 – 9
D, 4	3 – 7	–
3	3 – 4	–
2, L	3 – 8	–

NG → **Replace the neutral start switch.**

OK →

Repair or replace harness and connector between battery and neutral start switch, neutral start switch and Engine & ECT ECU (See page IN–30).

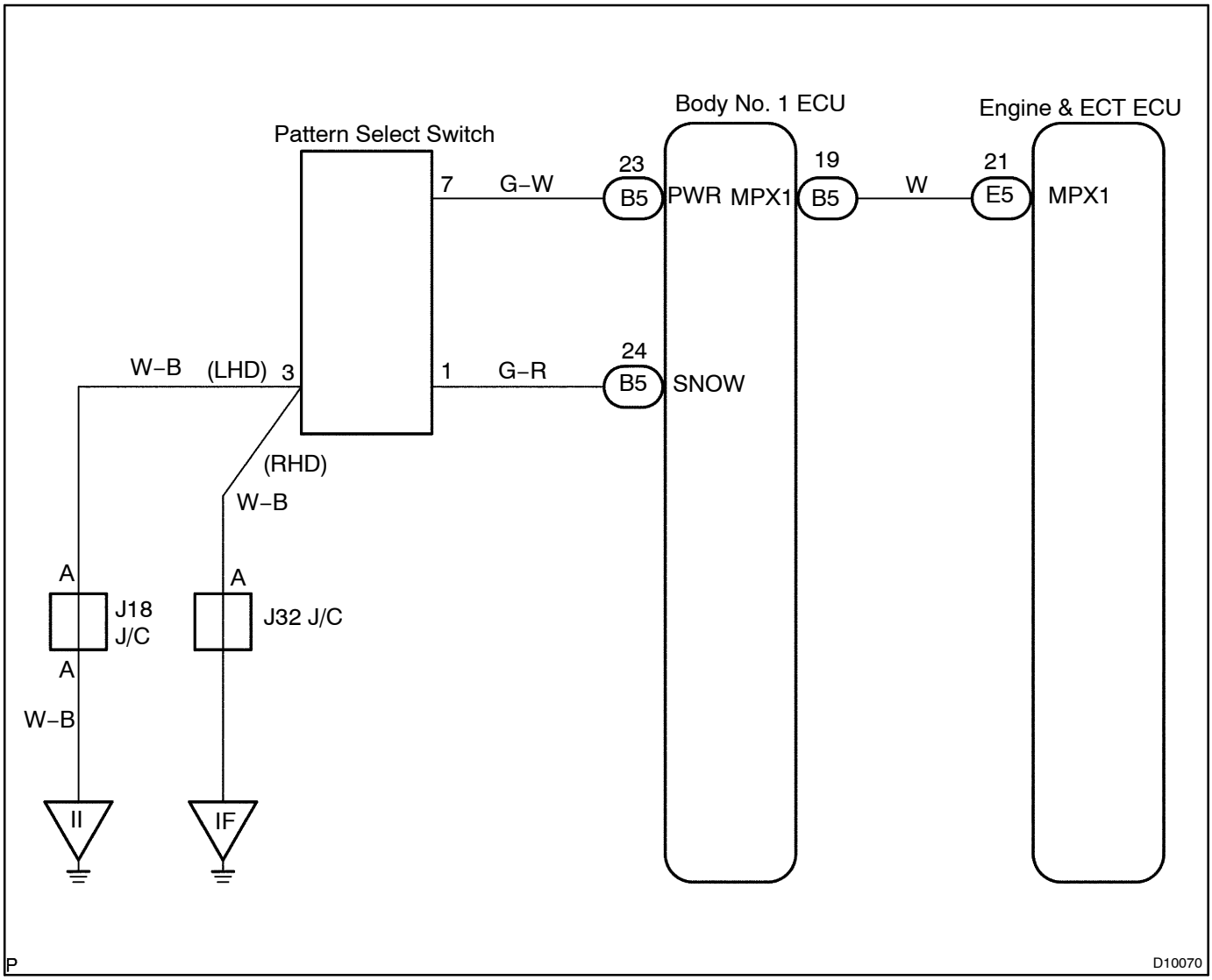
DI87Y–01

Pattern Select Switch Circuit

CIRCUIT DESCRIPTION

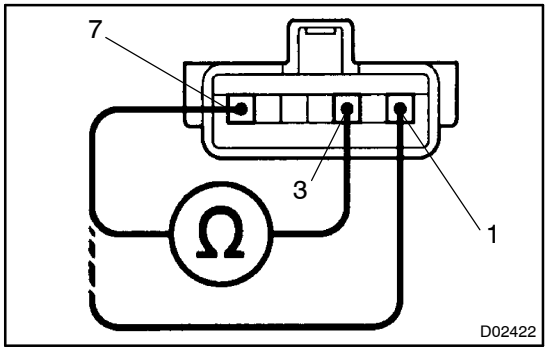
The Engine & ECT ECU memory contains the shift programs for the NORMAL, POWER and SNOW patterns, 2 range, L range and the lock–up patterns. By following the programs corresponding to the signals from the pattern select switch, the neutral start and other various sensors, the Engine & ECT ECU switches the solenoid valves ON and OFF, and controls the transmission gear change and the lock–up clutch operation.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check pattern select switch.**



PREPARATION:

Disconnect the pattern select switch connector.

CHECK:

Check continuity between each terminal of pattern select switch connector when the select switch is set to PWR, NORM or SNOW positions.

OK:

Switch condition	Tester connection	Specified condition
PWR	3 – 7	Continuity
NORM	1 – 3, 3 – 7	No continuity
SNOW	1 – 3	Continuity

If the continuity is not as specified, replace the switch.

DI2LG–02

Transmission Control Switch Circuit

CIRCUIT DESCRIPTION

When the shift lever is in the 4 range (with transmission control switch for D and 4 pressed), "4" in the shift position indicator light will come on and when the shift lever is in the D range (with transmission control switch for D and 4 released), "D" in the shift position indicator light will come on.
When the shift lever is in the L range (with transmission control switch for 2 and L pressed), "L" in the shift position indicator light will come on and when the shift lever is in the 2 range (with transmission control switch for 2 and L released), "2" in the shift position indicator light will come on.

WIRING DIAGRAM

See page DI–333.

INSPECTION PROCEDURE

1	**Check operation of transmission control switch.**

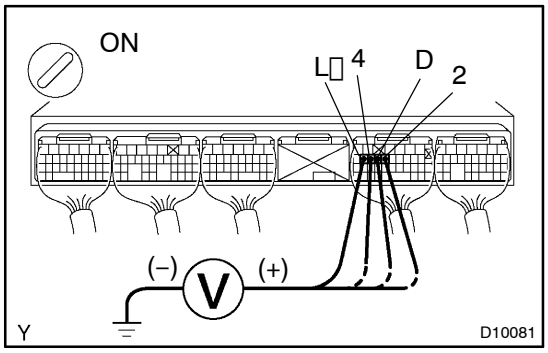
PREPARATION:
Turn ignition switch ON.
CHECK:
Check shift indicator light when the shift lever is in the each range.
OK:

Shift lever range	Specified condition
D	"D" indicator light comes on
Except D	"D" indicator light goes off
4	"4" indicator light comes on
Except 4	"4" indicator light goes off
2	"2" indicator light comes on
Except 2	"2" indicator light goes off
L	"L" indicator light comes on
Except L	"L" indicator light goes off

OK → **Go to step 4.**

NG

2	**Check voltage between each terminals of D, 4, 2 and L of Engine & ECT ECU and body ground.**



PREPARATION:

Remove the Engine & ECT ECU with connectors still connected.

CHECK:

(a) Turn ignition switch ON.

(b) Check voltage between each terminals of D, 4, 2 and L of Engine & ECT ECU and body ground.

OK:

Tester connection	Shift lever range	Specified condition
D – Body ground	D or 4	9 – 14 V
	Except D and 4	Below 1.5 V
4 – Body ground	4	9 – 14 V
	Except 4	Below 1.5 V
2 – Body ground	2 or L	9 – 14 V
	Except 2 and L	Below 1.5 V
L – Body ground	L	9 – 14 V
	Except L	Below 1.5 V

OK	**Proceed to next circuit inspection shown in problem symptoms table (See page DI–294).**

NG

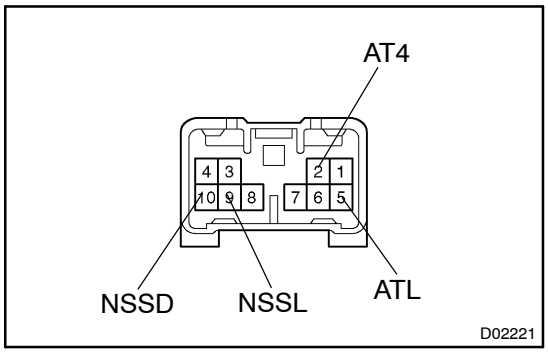
3	**Check harness and connector between battery and Engine & ECT ECU, Engine & ECT ECU and shift indicator light (See page IN–30).**

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

OK

Check and replace Engine & ECT ECU (See page IN–30).

4	Check transmission control switch.



CHECK:

(a) Disconnect the shift lock control unit assembly.

(b) Check continuity between each terminal of shift lock control unit connector.

OK:

Shift position	Tester connection	Specified value
D	2 – 10 (AT4 – NSSD)	No continuity
4		Continuity
2	5 – 9 (ATL – NSSL)	No continuity
L		Continuity

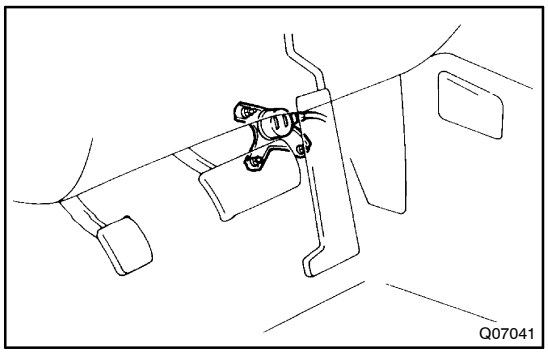
NG → **Replace shift lock control unit assembly.**

OK →

Check and replace combination meter (See combination meter troubleshooting section on page IN–30).

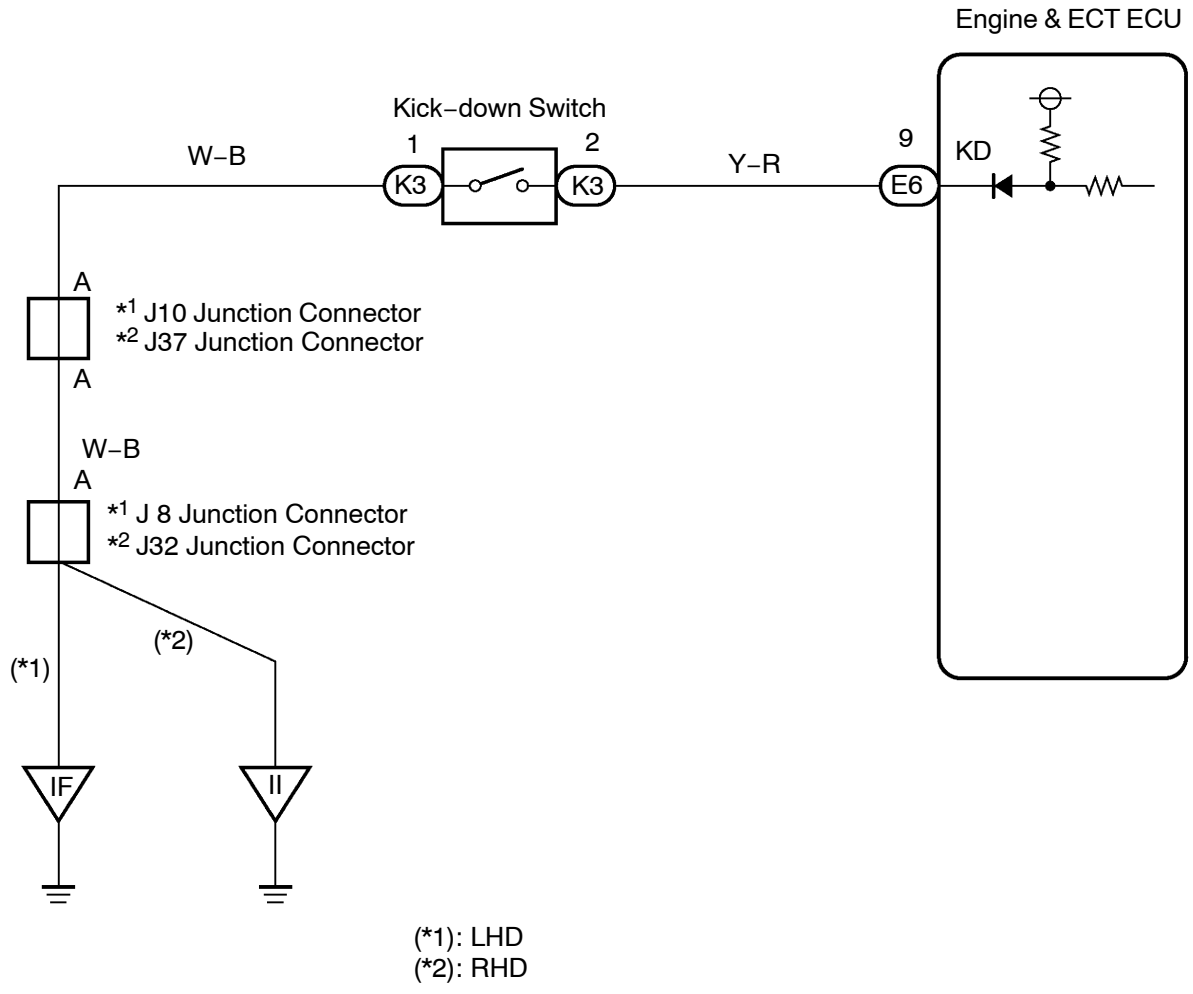
Kick–down Switch Circuit

CIRCUIT DESCRIPTION



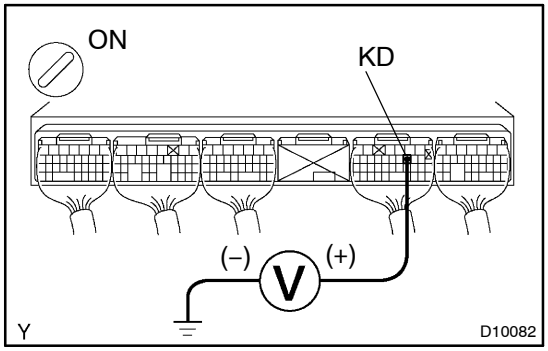
The kick–down switch is turned ON when the accelerator pedal is depressed to the full throttle and sends signals to Engine & ECT ECU.
When the kick–down switch is turned ON, the Engine & ECT ECU controls gear shifting according to the programmed shift diagrams.
If a short circuit develops in the kick–down switch, the Engine & ECT ECU disregards the kick–down signals and controls shifting at the normal shift points.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check voltage between terminal KD of Engine & ECT ECU and body ground.



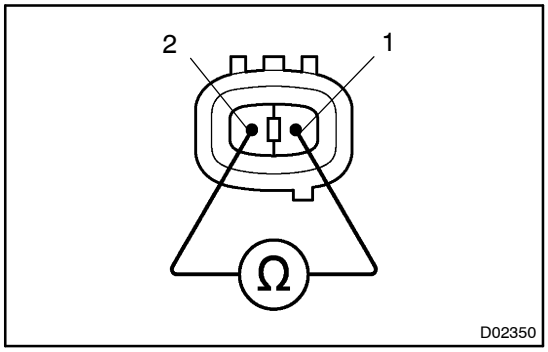
PREPARATION:
Turn the ignition switch ON.
CHECK:
Measure voltage between terminal KD of Engine & ECT ECU and body ground when accelerator pedal is fully depressed or not.
OK:

Accelerator pedal	Voltage
Fully depressed (Kick–down switch is ON)	Below 1 V
Released (Kick–down switch is OFF)	10 – 14 V

OK	Proceed to next circuit inspection shown in problem symptoms table (See page DI–294).

NG

2	Check kick–down switch.



PREPARATION:
Disconnect the kick–down switch connector.
CHECK:
Measure continuity between terminals 1 and 2 of the kick–down switch connector when kick–down switch is ON and OFF.
OK:

Kick–down switch	Continuity
ON	Continuity
OFF	No continuity

NG	Replace the kick–down switch.

OK

3	Check harness and connector between Engine & ECT ECU and kick–down switch, kick–down switch and body ground (See page IN–30).

NG → Repair or replace harness or connector.

OK →

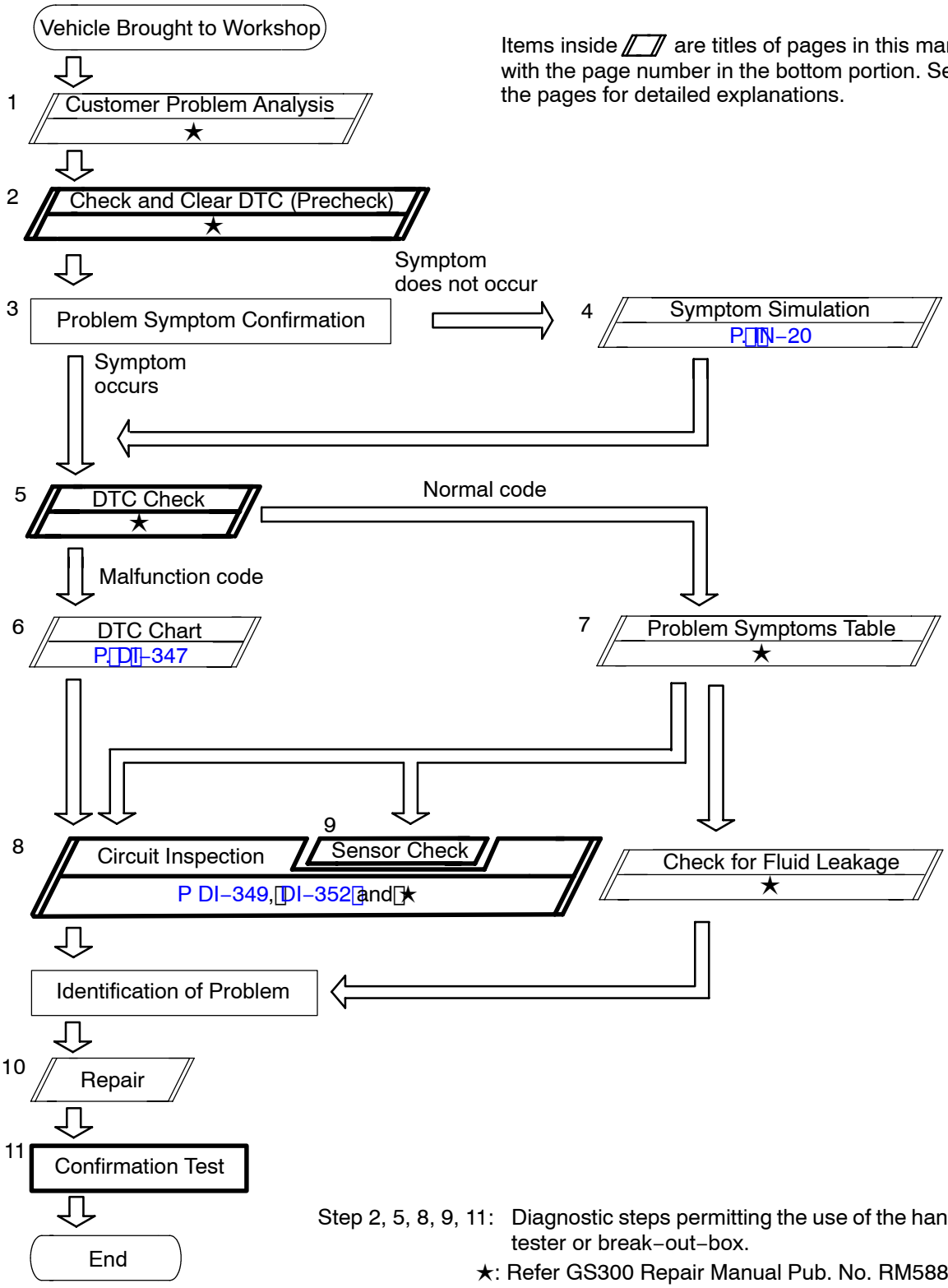
Check and replace Engine & ECT ECU (See page IN–30).

ABS & HYDRAULIC BRAKE BOOSTER POWER SUPPLY SYSTEM

DI284–13

HOW TO PROCEED WITH TROUBLESHOOTING

Troubleshooting in accordance with the procedure on the following pages.



Items inside ▱ are titles of pages in this manual, with the page number in the bottom portion. See the pages for detailed explanations.

Step 2, 5, 8, 9, 11: Diagnostic steps permitting the use of the hand–held tester or break–out–box.

★: Refer GS300 Repair Manual Pub. No. RM588E.

DI28U–12

DIAGNOSTIC TROUBLE CODE CHART

NOTICE:

When removing the part, turn the ignition switch OFF.

HINT:

- Using SST 09843–18020, connect the terminals Tc and E_1 of check connector and remove the short pin.
- If any abnormality is not found when inspecting parts, inspect the ECU.
- If a malfunction code is displayed during the DTC check, check the circuit listed that code. For details of each code, turn to the page referred to under the ”See page” for respective ”DTC No.” in the DTC chart.

DTC No. (See Page)	Detection Item	Trouble Area
C0278 / 11*1 (★)	Open or short circuit in ABS solenoid relay circuit	• ABS solenoid relay • ABS solenoid relay circuit
C0279 / 12*1 (★)	B+ short circuit in ABS solenoid relay circuit	
C0226 / 21*1 (★)	Open or short circuit in hydraulic brake booster solenoid circuit (SFR circuit)	• Hydraulic brake booster • SFRR or SFRH circuit
C0236 / 22*1 (★)	Open or short circuit in hydraulic brake booster solenoid circuit (SFL circuit)	• Hydraulic brake booster • SFLR or SFLH circuit
C0246 / 23*1 (★)	Open or short circuit in hydraulic brake booster solenoid circuit (SRR circuit)	• Hydraulic brake booster • SRRR or SRRH circuit
C0256 / 24*1 (★)	Open or short circuit in hydraulic brake booster solenoid circuit (SRL circuit)	• Hydraulic brake booster • SRLR or SRLH circuit
C1225 / 25*1 (★)	Open or short circuit in hydraulic brake booster solenoid circuit (SA1 circuit)	• Hydraulic brake booster • SA1 circuit
C1226 / 26*1 (★)	Open or short circuit in hydraulic brake booster solenoid circuit (SA2 circuit)	• Hydraulic brake booster • SA2 circuit
C1227 / 27*1 (★)	Open or short circuit in hydraulic brake booster solenoid circuit (SA3 circuit)	• Hydraulic brake booster • SA3 circuit
C1228 / 28*1 (★)	Open or short circuit in hydraulic brake booster solenoid circuit (STR circuit)	• Hydraulic brake booster • STR circuit
C0200 / 31*1 (★)	Right front wheel speed sensor signal malfunction	• Right front, left front, right rear and left rear speed sensor • Each speed sensor circuit • Sensor rotor
C0205 / 32*1 (★)	Left front wheel speed sensor signal malfunction	
C0210 / 33*1 (★)	Right rear wheel speed sensor signal malfunction	
C0215 / 34*1 (★)	Left rear wheel speed sensor signal malfunction	
C1241 / 41 (★)	Low battery voltage or abnormally high battery voltage	• Battery • IC regulator • Power source circuit
C1242 / 42*1 (★)	Open circuit in IG2 circuit	• Battery • IC regulator • Power source circuit
C1243 / 43*1 (★)	Malfunction in deceleration sensor (constant output)	• Deceleration sensor • Wire harness for deceleration sensor system
C1244 / 44*1 (★)	Open or short circuit in deceleration sensor circuit	• Deceleration sensor • Deceleration sensor circuit

C1245 / 45*1 (★)	Malfunction in deceleration sensor	• Deceleration sensor • Wire harness for deceleration sensor sytem
C1246 / 46*1 (DI–349)	Malfunction in master cylinder pressure sensor	• Master cylinder pressure sensor • Master cylinder pressure sensor circuit
C1249 / 49*1 (★)	Open circuit in stop light switch circuit	Stop light switch circuit
C1251 / 51*2 (★)	Pump motor is locked Open circuit in pump motor ground	Hydraulic brake booster pump motor
C1252 / 52*2 (★)	Hydraulic brake booster pump motor malfunction	• Hydraulic brake booster pump motor • Hydraulic brake booster pump motor circuit • Pressure switch (PH or PL)
C1253 / 53*2 (★)	Hydraulic brake booster pump motor relay malfunction	• ABS or TRC motor relay • ABS or TRC motor relay circuit • Hydraulic brake booster pump motor circuit
C1254 / 54*2 (★)	Pressure switch malfunction	• Pressure switch (PH or PL) • Pressure switch circuit
C1256 / 56*2 (★)	Accumulator low pressure malfunction	• Accumulator • Pressure switch (PH or PL) • Hydraulic brake booster pump motor
C1257 / 57*2 (★)	Power supply drive circuit malfunction	• Battery • Power Source circuit • ABS & TRC & VSC ECU
Always ON (★)	Malfunction in ABS & TRC & VSC ECU	• Battery • IC regulator • Power source circuit • ABS & TRC & VSC ECU

★: Refer GS300 Repair Manual Pub. No. RM588E.

*1: As the DTC cannot be erased by replacing parts alone, clear DTC (See Pub. No. RM588E on page DI–210).

*2: Using the following table, troubled parts can be specified. When replacing parts, clear DTCs.

DTC		C1242/42		C1251/51		C1252/52		C1253/53		C1254/54		C1256/56		C1257/57	
BRAKE warning light and buzzer		Light	Buzzer	Light	Buzzer	Light	Buzzer	Light	Buzzer	Light	Buzzer	Light	Buzzer	Light	Buzzer
Pressure switch	PH					○	○			○		○	○		
	PL					○	○			○		○	○		
Pump motor circuit	Pump motor			○	○	○	○					○	○		
	MTT wire harness					○	○	○							
	MT+ wire harness			○											
	MT– wire harness			○											
Accumulator malfanction												○	○		
Motor relay circuit	MR1 open circuit							○							
	MR2 open circuit							○							
	MR1 welded contact					○	○	○							
	MR2 welded contact					○	○	○							
Hydraulic brake booster	Pressure leaks					○	○					○	○		
Power souce*	IG2 open circuit	○													
ECU	Power supply circuit													○	

*: When IG1 circuit is open, ABS warning light and BRAKE warning light come on.

DI296–07

CIRCUIT INSPECTION

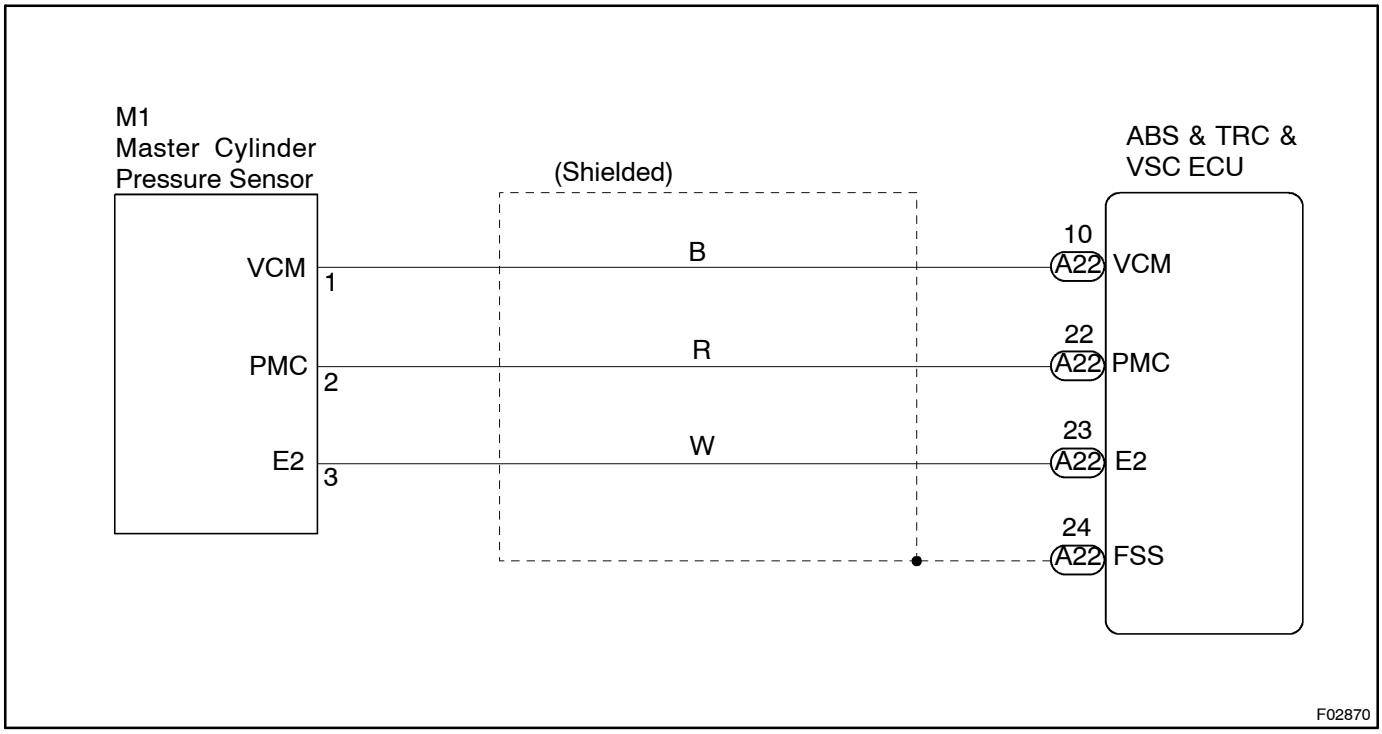
DTC	C1246 / 46	Master Cylinder Pressure Sensor Circuit

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1246 / 46	Either of the following 1., 2., 3., 4. or 5. is detected: 23.At the vehicle speed of 7 km/h (4 mph) or more, ECU terminal PMC voltage becomes more than 0.86 V and the condition that 0.01 V or less does not change continues for 30 secs. 24.Interference occurs to ECU terminal PMC 7 times or more for 5 sec. 25.ECU terminal STP is OFF, and the condition that terminal PMC voltage becomes more than 0.86 V or less than 0.3 V continues for 5 secs. or more. 26.The condition that ECU terminal IG1 voltage is 9.5 V to 17.0 V, and terminal VCM voltage other than the range from 4.4 V to 5.6 V continues for 1.2 secs. or more. 27.The condition that ECU terminal VCM voltage is 4.4 V to 5.6 V, and terminal PMC voltage other than the range from 0.14 V to 4.85 V continues for 1.2 secs. or more.	• Master cylinder pressure sensor • Master cylinder pressure sensor circuit

Fail safe function:
If trouble occurs in the master cylinder pressure sensor circuit, the ECU cuts off current to the ABS solenoid relay and prohibits ABS & TRC & VSC controls and the brake system becomes normal.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Start the inspection from step 1 in case of using the hand–held tester and start from step 2 in case of not using the hand–held tester.

1	**Check output value of the master cylinder pressure sensor.**

PREPARATION:
(a) Connect the hand–held tester to the DLC3.
(b) Turn the ignition switch ON and push the hand–held tester main switch ON.
(c) Select the DATALIST mode on the hand–held tester.

CHECK:
Check that the brake fluid pressure value of the master cylinder pressure sensor displayed on the hand–held tester is changing when depressing the brake pedal.

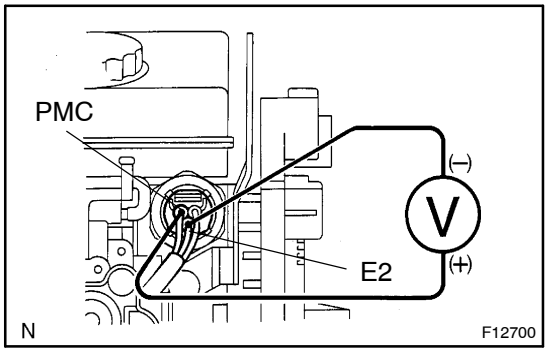
OK:

Brake fluid pressure value must be changing.

OK → **Go to step 4.**

NG

2	**Check master cylinder pressure sensor.**



PREPARATION:
(a) Install LSPV gauge to the front caliper bleeder plug portion, and bleed LSPV gauge.
SST 09709–29018
(b) Remove air cleaner inlet and battery clamp cover.

CHECK:
Start the engine and depress the brake pedal, then check the relation between the fluid pressure and voltage of PMC and E2 terminals of the master cylinder pressure sensor with connector still connected.

OK:

Front brake caliper fluid pressure	Voltage
0 kPa (0 Kgf/cm^2, 0 psi)	0.37 – 0.63 V
5,883 kPa (60 kgf/cm^2, 853 psi)	1.57 – 1.83 V
11,768 kPa (120 kgf/cm^2, 1,706 psi)	2.77 – 3.03 V

HINT:
Voltage of between terminals VCM and E2: 4.7 – 5.3 V.

NG → **Replace master cylinder pressure sensor.**

OK

3	Check for open and short circuit in harness and connector between master cylinder pressure sensor and ABS & TRC & VSC ECU (See page IN–30).

NG → Repair or replace harness or connector.

OK

4	Check whether or not the ECU terminal STP input voltage is changed when the stop light switch is turned on and off.

NO → Check the stop light switch circuit (See Pub. No. RM588E on page BE–3).

YES

Check and replace ABS & TRC & VSC ECU.

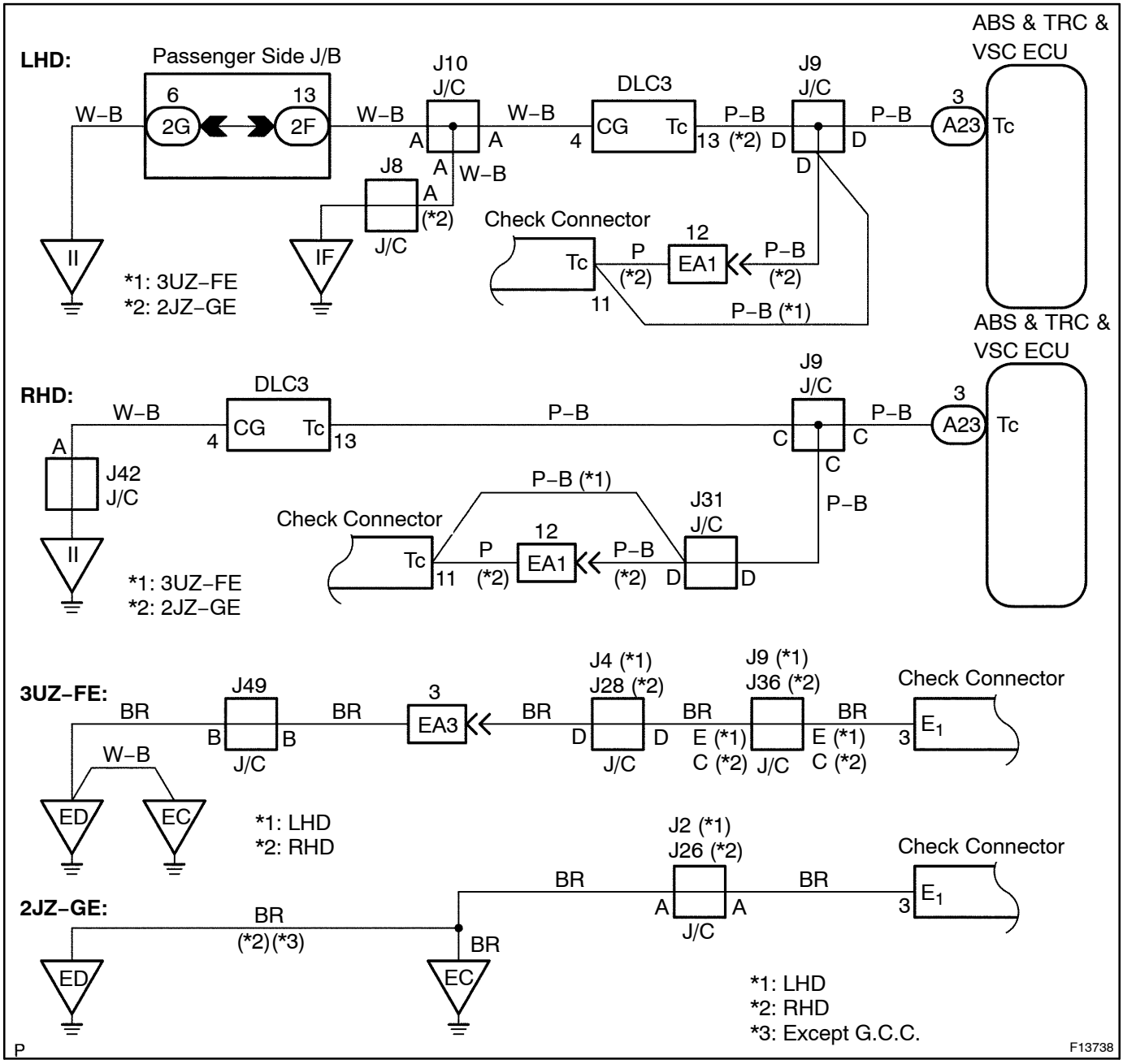
DI29I–15

Tc Terminal Circuit

CIRCUIT DESCRIPTION

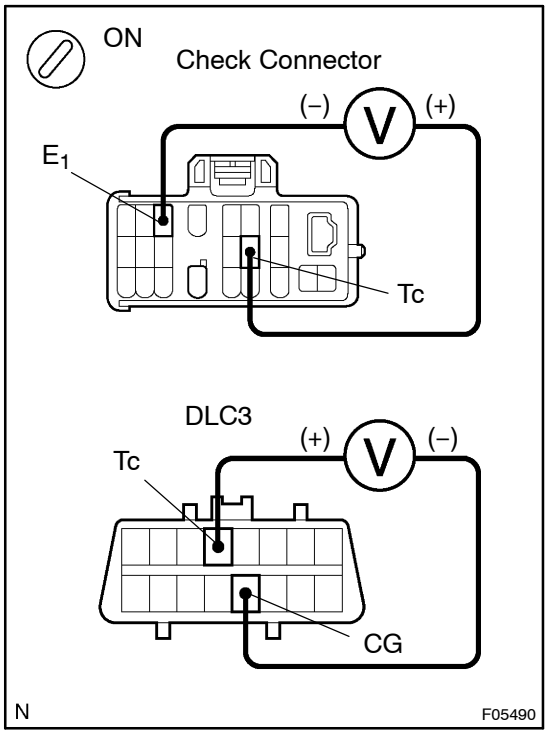
Connecting terminals Tc and E_1 of the check connector or (Tc and CG of DLC3) causes the ECU to display the DTC by flashing the ABS warning light.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals Tc and E_1 of check connector (or Tc and CG of DLC3).**



PREPARATION:
Turn ignition switch ON.
CHECK:
Measure voltage between terminal Tc and E1 of check connector (or Tc and CG of DLC3).
OK:
Voltage: 10 – 14 V

OK	**If ABS warning light does not blink even after Tc and E_1 (or Tc and CG) are connected, the ECU may be defective.**

NG

2	**Turn the IG switch OFF, and check for open and short circuit in harness and connector between ABS & TRC & VSC ECU and check connector (or DLC3), check connector (or DLC3) and body ground (See page IN–30).**

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

OK

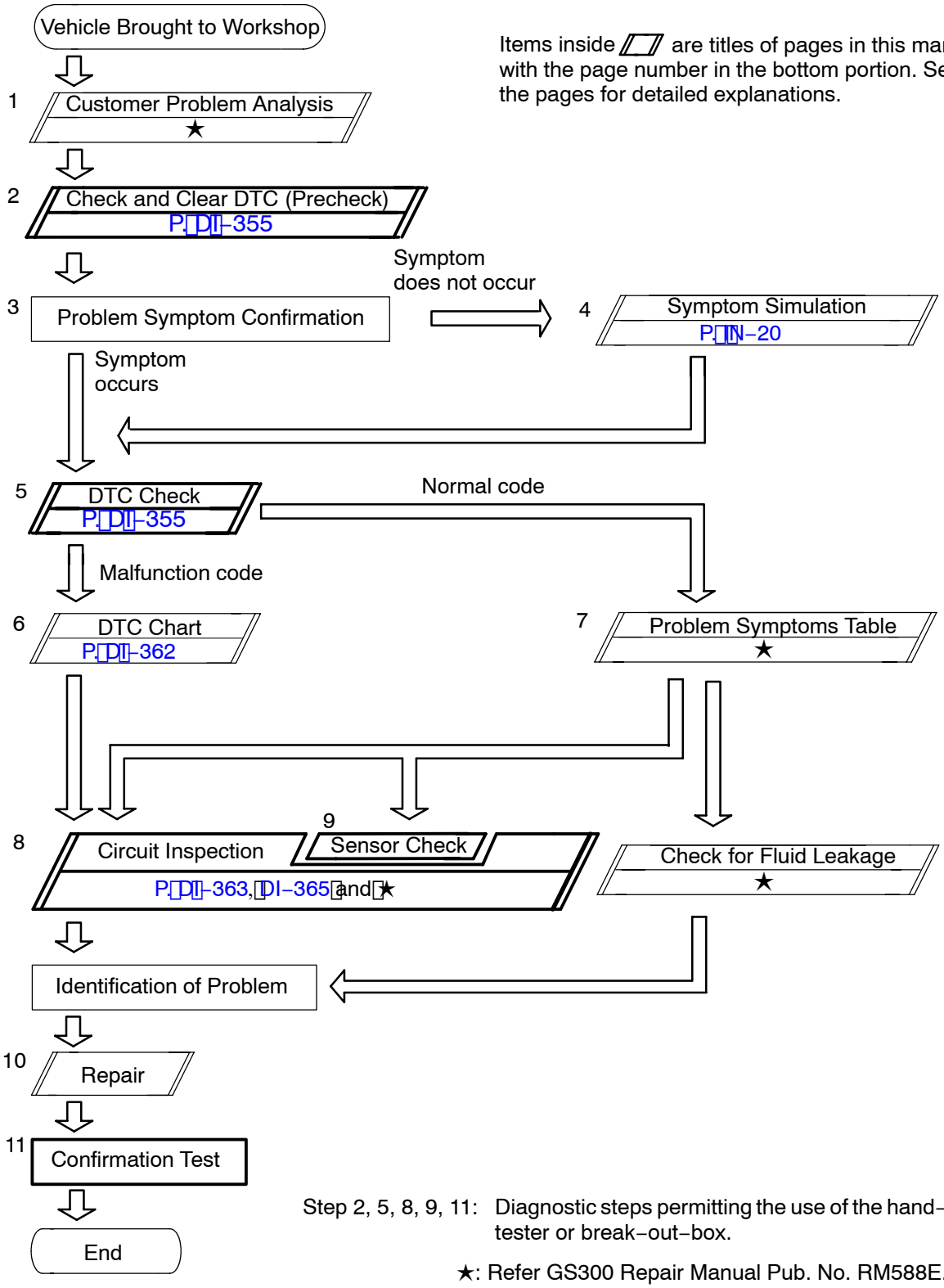
Check and replace ABS & TRC & VSC ECU.

VEHICLE STABILITY CONTROL (VSC) SYSTEM

DI285–05

HOW TO PROCEED WITH TROUBLESHOOTING

Troubleshooot in accordance with the procedure on the following pages.



Items inside ▱ are titles of pages in this manual, with the page number in the bottom portion. See the pages for detailed explanations.

Step 2, 5, 8, 9, 11: Diagnostic steps permitting the use of the hand–held tester or break–out–box.

★: Refer GS300 Repair Manual Pub. No. RM588E.

DI87N–01

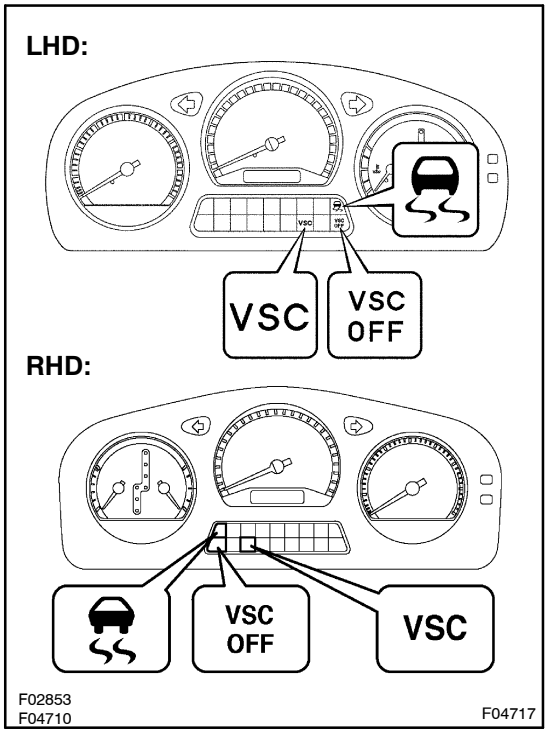
PRE–CHECK

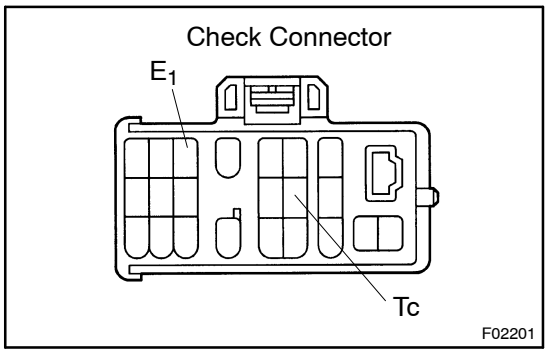
1. DIAGNOSIS SYSTEM

(a) Check the indicator.
When the ignition switch is turned ON, check that the VSC warning light, VSC OFF indicator light and SLIP indicator light goes ON for 3 seconds.

HINT:

- If the ECU stores DTC, VSC warning light and VSC OFF indicator light is ON.
- If the indicator check result is not normal, proceed to troubleshooting for the VSC warning light circuit, VSC OFF indicator light circuit, and SLIP indicator light circuit (See Pub. No. RM588E on page DI–342, DI–344 and DI–347).

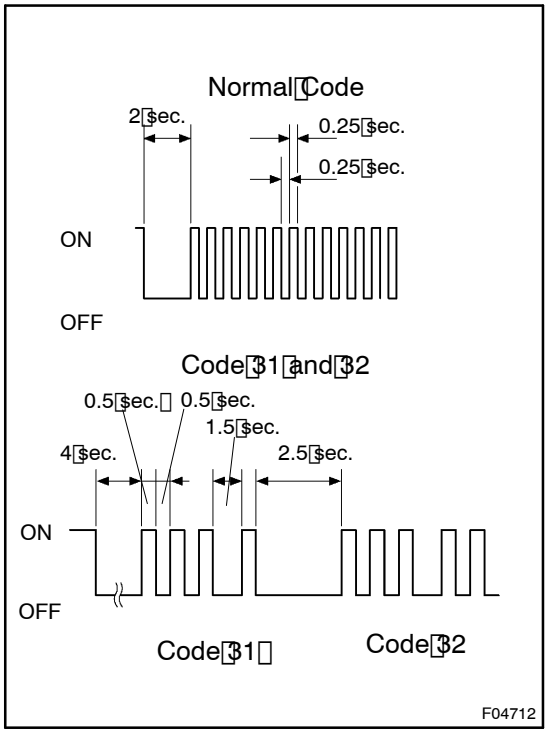




(b) In case of not using hand–held tester:
Check the DTC.
(1) Using SST, connect terminals Tc and E_1 of check connector.
SST 09843–18020
(2) Turn the ignition switch ON.
(3) Read the DTC from the VSC warning light on the combination meter.

HINT:

- If no code appears, inspect the diagnostic circuit or VSC warning light circuit (See page DI–352 or See Pub. No. RM588E on page DI–342).

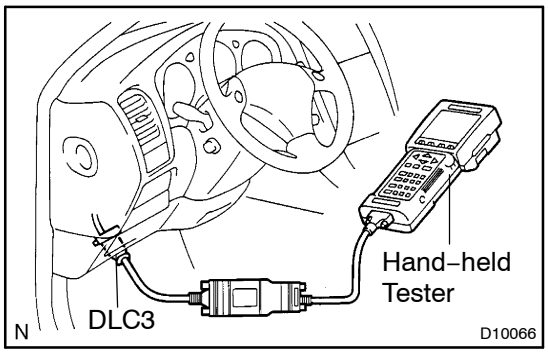


• As an example, the blinking patterns for normal code and code 31 and 32 are shown on the left.

(4) Codes are explained in the code table on page DI–362.

(5) After completing the check, disconnect terminals Tc and E_1 of check connector, and turn OFF the display.

If 2 or more malfunctions are indicated at the same time, the lowest numbered DTC will be displayed 1st.



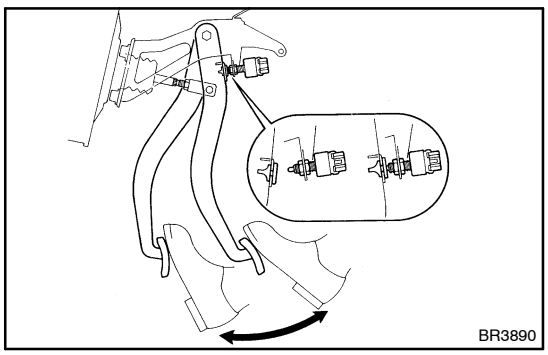
(c) In case of using hand–held tester:
Check the DTC.

(1) Hook up the hand–held tester to the DLC3.

(2) Turn the ignition switch ON.

(3) Read the DTC by following the prompts on the tester screen.

HINT:
Please refer to the hand–held tester operator's manual for further details.



(d) In case of not using hand–held tester:
Clear the DTC.

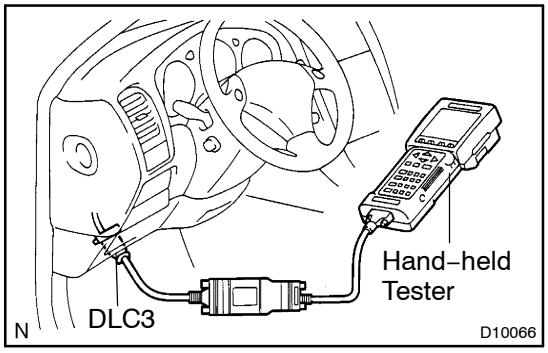
(1) Using SST, connect terminals Tc and E_1 of check connector.
SST 09843–18020

(2) Turn the ignition switch ON.

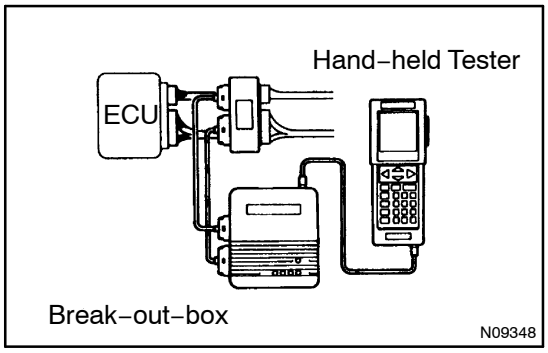
(3) Clear the DTC stored in ECU by depressing the brake pedal 8 or more times within 5 seconds.

(4) Check that the warning light shows the normal code.

(5) Remove the SST from the terminals of check connector.
SST 09843–18020



(e) In case of using hand–held tester:
Clear the DTC.
(1) Hook up the hand–held tester to the DLC3.
(2) Turn the ignition switch ON.
(3) Operate the hand–held tester to erase the codes (See hand–held tester operator's manual.).



(f) Reference:
Using break–out–box and hand–held tester, measure the ECU terminal values.
(1) Turn the ignition switch OFF.
(2) Hook up the break–out–box and hand–held tester to the vehicle.
(3) Turn the ignition switch ON.
(4) Read the ECU input/output values by following the prompts on the tester screen.

HINT:
- Hand–held tester has a "Snapshot" function. This records the measured values and is effective in the diagnosis of intermittent problems.
- Please refer to the hand–held tester/break–out–box operator's manual for further details.

2. VSC SENSOR CHECK (TEST MODE)

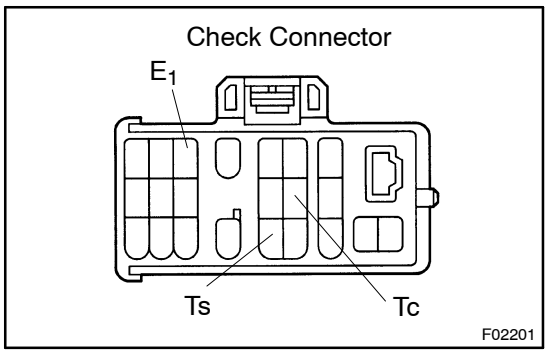
NOTICE:

When having replaced the yaw rate sensor, deceleration sensor and/or ECU, perform zero point calibration of the yaw rate and deceleration sensors (See step 3.).

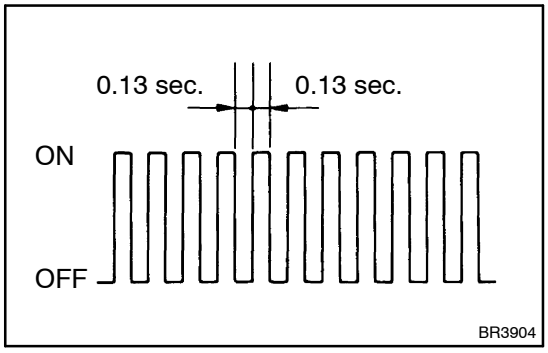
HINT:

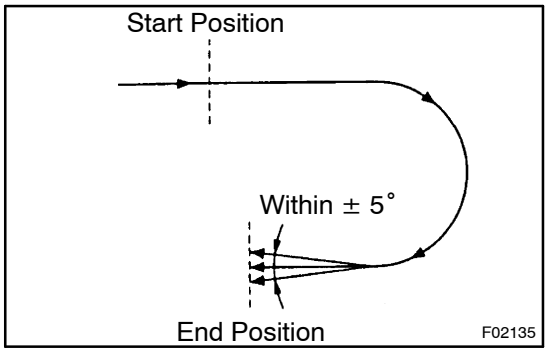
If the ignition switch is turned from ON to ACC or LOCK during test mode, DTC will be erased.

(a) In case of not using hand–held tester:
Check the VSC sensor signal.
(1) Turn the ignition switch OFF.
(2) Check that the shift lever position is at P range, turn the steering wheel to the neutral position.



(3) Using SST, connect terminals Ts and E_1 of check connector.
SST 09843–18020
(4) Start the engine.





(5) Check that the VSC warning light blinks.

HINT:

If the VSC warning light does not blink, inspect the VSC warning light circuit and Ts terminal circuit (See Pub. No. RM588E on page DI–303 and DI–342).

(6) Check the steering angle sensor.
Turn the steering wheel either to left or right for 450° or more from the vehicle stationary condition, and turn back the steering wheel to the straight ahead position.

(7) Check the yaw rate sensor.
Shift the shift lever to the D range and drive the vehicle at the vehicle speed of approx. 5 km/h (3 mph), turn the steering wheel either to left or right for 90° or more, and maintain 180° circular drive for the vehicle.
Stop the vehicle and shift the shift lever to the P range, check that the VSC buzzer sounds for 3 sec.

If the VSC buzzer sounded, the sensor check is in normal completion.

If the VSC buzzer does not sound, do the sensor check again.

If the VSC buzzer still won't sound, there is malfunction in the VSC sensor, so check the DTC.

HINT:

- Drive the vehicle circularly by 180°. At the end of the turn, the direction of the vehicle should be within 180° ± 5° of its start position.
- Do not spin the rear wheels.

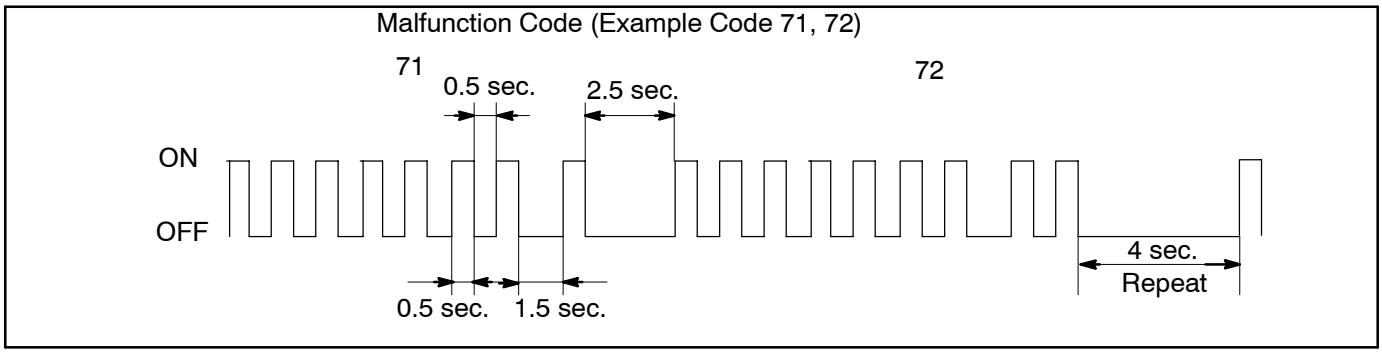
(8) Using SST, connect terminals Tc and E_1 of check connector.

SST 09843–18020

(9) Read the number of blinks of the VSC warning light.

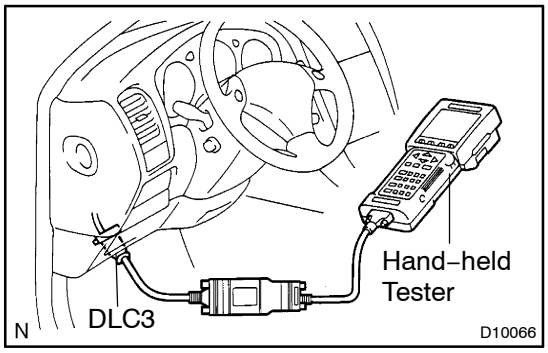
HINT:

- See the list of DTC shown on step the next page.
- If every sensor is normal, a normal code is output. (A cycle of 0.25 sec. ON and 0.25 sec. OFF is repeated.)
- If 2 or more malfunctions are indicated at the same time, the lowest numbered code will be displayed 1st.



(10) After doing the check, disconnect the SST from terminals of check connector, and turn ignition switch OFF.

SST 09843–18020



(b) In case of using hand–held tester:
Check the VSC sensor signal.
(1) Hook up the hand–held tester to the DLC3.
(2) Do steps (a)–(2) and (4) – (7) (See 2 pages before).
(3) Read the DTC by following the prompts on the tester screen.

HINT:
Please refer to the hand–held tester operator's manual for further details.

DTC of the VSC sensor check function:

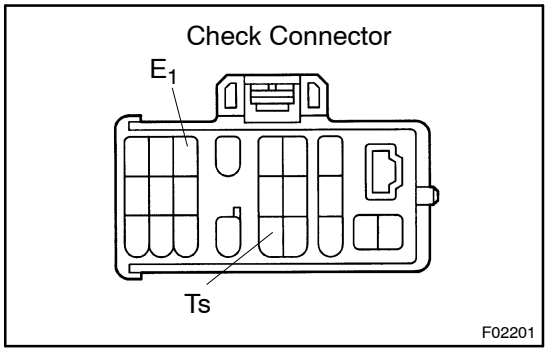
Code No.	Diagnosis	Trouble Area
C0371 / 71	Yaw rate sensor output signal malfunction	• Yaw rate sensor • Yaw rate sensor circuit
C1208 / 72	Steering position sensor output signal malfunction	• Steering position sensor • Steering position sensor circuit

3. IF NECESSARY, PERFORM ZERO POINT CALIBRATION OF YAW RATE AND DECELERATION SENSORS

HINT:
- When having replaced the yaw rate sensor, deceleration sensor or the ECU, make sure to perform yaw rate and deceleration sensors' zero point calibration. Be sure to complete this step 3. once it is started.
- During step 3., a not–replaced sensor also requires zero point calibration.

NOTICE:
- **While obtaining the zero point, do not give any vibration to the vehicle by tilting, moving or shaking it and keep it in a stationary condition. (Do not start the engine.)**
- **Be sure to do this on a level surface (within an inclination of 1 %).**

(a) Clear the zero points of the yaw rate and deceleration sensors.
(1) Shift the shift lever to P range.
(2) Turn the ignition switch ON in a stationary condition.



(3) With the lit switch ON, using SST, repeat a cycle of short and open between terminals Ts and E_1 of check connector 4 times or more within 8 sec. Check that the VSC warning light is lit indicating the recorded zero point is erased.

SST 09843–18020

(4) Turn the ignition switch OFF.

(b) Obtain zero point of the yaw rate sensor.

(1) Make the terminals Ts and E_1 of check connector disconnected.

(2) Turn the ignition switch ON.

HINT:

The vehicle should be in a stationary condition with the shift lever in P range.

(3) Check that the lit VSC warning light goes off about 15 sec. after the ignition switch is turned ON.

HINT:

Even if the ignition is not turned OFF in step (a)–(4) and remains ON, the yaw rate sensor zero point calibration can be completed. In this case, the VSC warning light is lit for about 15 sec. and then starts blinking. (Normal code)

(4) After ensuring that the VSC warning light remains OFF for 2 sec., turn the ignition switch OFF.

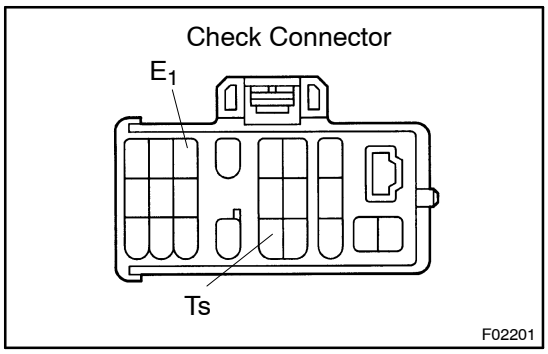
HINT:

If the ignition switch is not turned OFF in step (a)–(4), make sure that the VSC warning light blinks for 2 sec. Then turn the ignition switch OFF.

(c) Perform deceleration sensor zero point calibration.

NOTICE:

After step (b) (the yaw rate sensor zero point calibration), the VSC warning light goes off. At this time, if the vehicle is driven without performing step (c) (deceleration sensor zero point calibration), deceleration sensor zero point calibration malfunction will be detected and the VSC warning light will light up. Therefore, perform step (c) right after step (b).



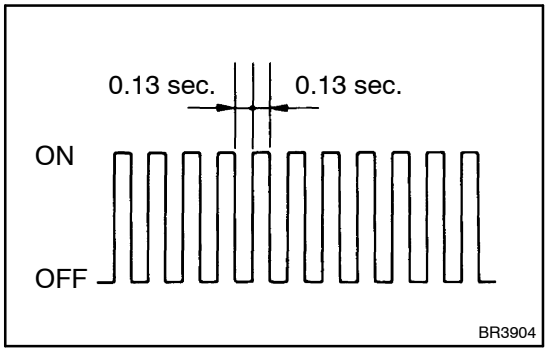
(1) Using SST, connect the terminals Ts and E_1 of check connector.

SST 09843–18020

(2) Turn the ignition switch ON.

HINT:

Place the vehicle in a stationary condition with the shift lever in P range.



(3) After turning the ignition switch ON, check that the VSC warning light is lit for about 4 sec. and then starts quick blinking at 0.13 sec. intervals.

(4) After ensuring the blinking of the VSC warning light for 2 sec., turn the ignition switch OFF.

(5) Remove the SST and make the terminals Ts and E_1 of check connector disconnected.

SST 09843–18020

DI288–05

DIAGNOSTIC TROUBLE CODE CHART

NOTICE:

When removing the part, turn the ignition switch OFF.

HINT:

- Using SST 09843–18020, connect the terminals TC and E_1 of check connector.
- If any abnormality is not found when inspecting parts, inspect the ECU.
- If a malfunction code is displayed during the DTC check, check the circuit listed for that code. For details of each code, turn to the page referred to under the "See page" for the respective "DTC No." in the DTC chart.

DTC No. (See Page)	Detection Item	Trouble Area
C1201 / 51 (★)	ECM system malfunction	Engine control system
C1203 / 53 (★)	ECM communication circuit malfunction	• TRC+ or TRC– circuit • ENG+ or ENG– circuit • Engine and ECT ECU
C1207 / 37 (DI–363)	Malfunction in P/R range switch	• P/R range switch • P/R range switch circuit
C1210 / 36 (★)	Zero point calibration of yaw rate sensor undone	• Yaw rate sensor • Yaw rate sensor circuit • P range switch circuit
C1223 / 43 (★)	Malfunction in ABS control system	ABS control system
C1224 / 44 (★)	Open or short circuit in NE signal circuit	• NEO circuit • Engine and ECT ECU • ABS & BA & TRC & VSC ECU
C1231 / 31 (★)	Malfunction in steering angle sensor	• Steering angle sensor • Steering angle sensor circuit
C1232 / 32 (★)	Malfunction in deceleration sensor	• Deceleration sensor • Deceleration sensor circuit
C1233 / 33 (★)	Open or short circuit in yaw rate sensor circuit	• Yaw rate sensor • Yaw rate sensor circuit
C1234 / 34 (★)	Malfunction in yaw rate sensor	• Yaw rate sensor • Yaw rate sensor circuit
C1336 / 39 (DI–365)	Zero point calibration of deceleration sensor	• Deceleration sensor • Deceleration sensor circuit • Zero point calibration not done
Always ON (★)	Malfunction in ABS & BA & TRC & VSC ECU Open circuit in VSC warning indicator circuit	• Power source circuit • VSC warning light circuit

★: Refer GS300 Repair Manual Pub. No. RM588E.

HINT:

There is a case that hand–held tester cannot be used when VSC warning light is always on.

DI28E–06

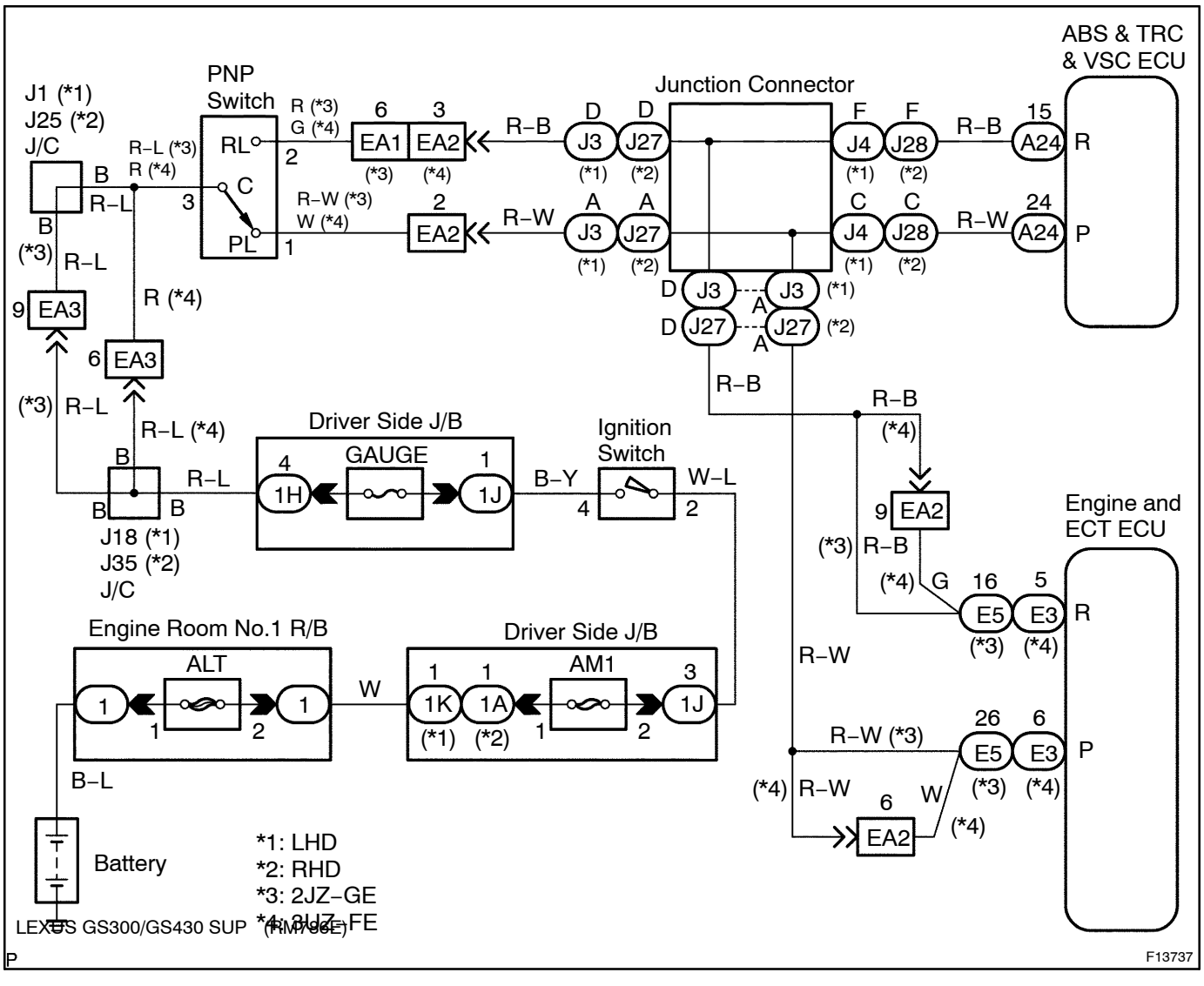
CIRCUIT INSPECTION

DTC	C1207 / 37	P/R Range Switch Circuit

CIRCUIT DESCRIPTION

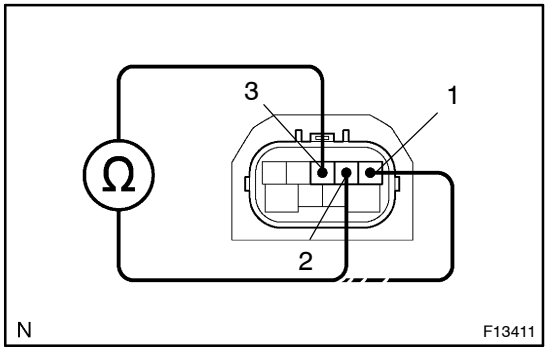
DTC No.	DTC Detection Condition	Trouble Area
C1207 / 37	When any of the following 1. through 3. is detected: 1. At vehicle speed of 15 km/h (9 mph) or less and the conditions that open circuit signal of P signal circuit of park/neutral position switch is ON and the voltage of IG1 terminal is 9.5 to17 V continue for 5 sec. or more. 2. At vehicle speed of 15 km/h (9 mph) or more, and when the condition that P signal from park/neutral position switch is ON, and the the shift lever position information from the ECM is other than in P or N range continues for 60 sec. or more. 3. At vehicle speed of 15 km/h (9 mph) or less and the conditions that open circuit signal of R signal circuit of park/neutral position switch is ON and the voltage of IG1 terminal is 9.5 to 17 V continue for 2 sec. or more.	• P/R range switch • P/R range switch circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check park/neutral position switch (P/R range switch).**



PREPARATION:

(a) Jack up the vehicle.

(b) Disconnect the park/neutral position switch connector.

CHECK:

Check continuity between each terminal shown below when the shift lever is moved to each position.

OK:

P range switch	Terminals 3 – 1	Continuity
R range switch	Terminals 3 – 2	Continuity

NG → **Replace park/neutral position switch (P/R range switch).**

OK ↓

2	**Check for open and short circuit in harness and connector between terminals P and R of ABS & TRC & VSC ECU and battery (See page IN–30).**

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

OK ↓

Check and replace ABS & TRC & VSC ECU or engine and ECT ECU.

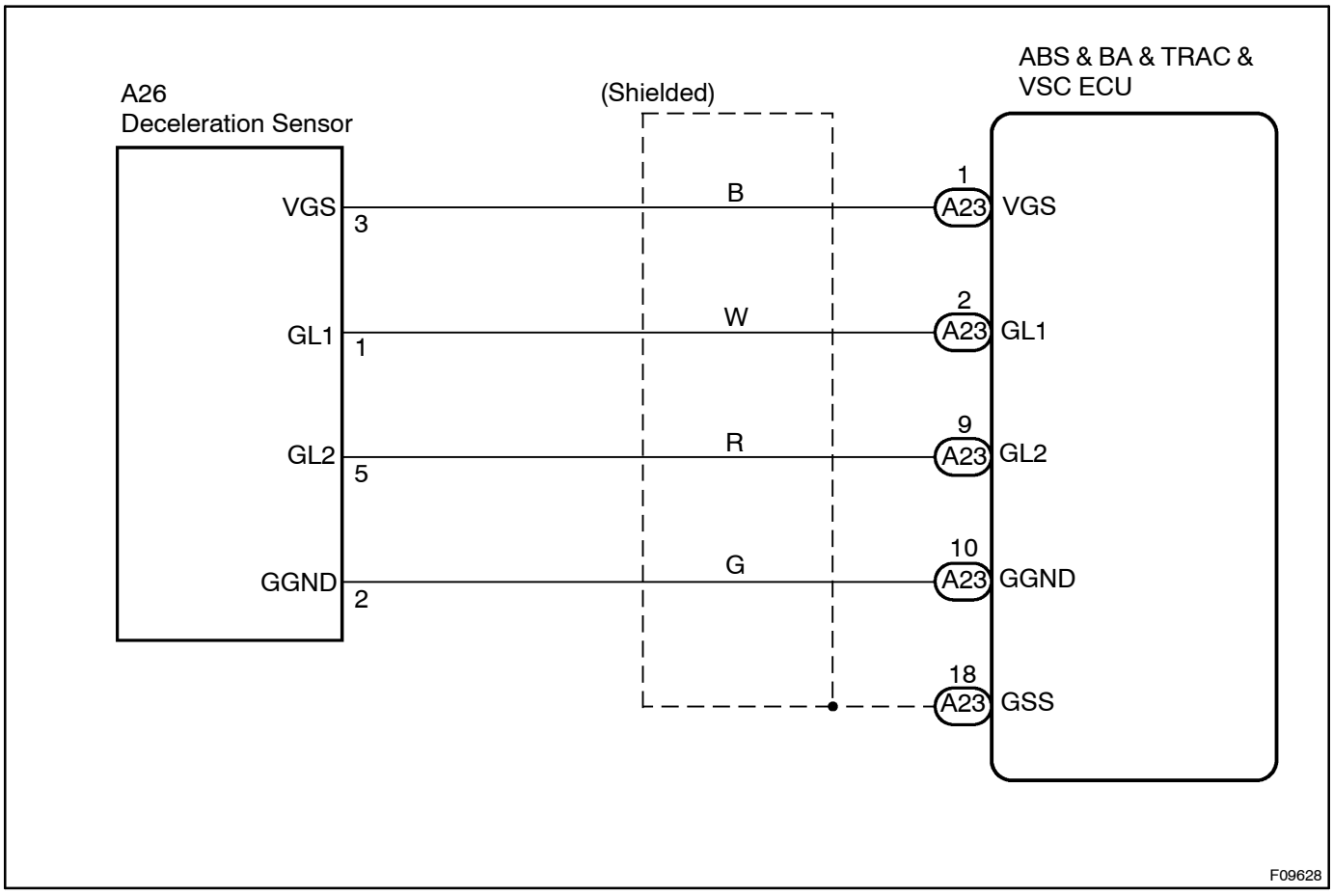
DI87O–01

DTC	C1336 / 39	Zero Point Calibration of Deceleration Sensor Undone

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
C1336 / 39	At the initial time after replacing the computer, or after erasing the deceleration sensor memory by operating the terminals Ts and E_1 of check connector, the ignition is turned ON and the vehicle is driven in any mode except for the test mode.	• Deceleration sensor • Deceleration sensor circuit • Zero point calibration not done

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Carry out deceleration sensor zero point calibration and confirm it by VSC warning light (See page DI–355).

OK:

VSC warning light blinks

OK → No problem.

NG

2	Check DTC for the VSC (See page DI–355).

*1: Other than DTC C1336 / 39 is output.
*2: DTC C1336 / 39 only is output.

*1 → Repair ABS control system according to the code output.

*2

3	Check for open and short circuit in harness and connector between deceleration sensor and ABS & BA & TRC & VSC ECU (See page IN–30).

NG → Repair or replace harness or connector.

OK

4	Check deceleration sensor (See Pub. No. RM588E on page DI–215).

NG → Replace deceleration sensor.

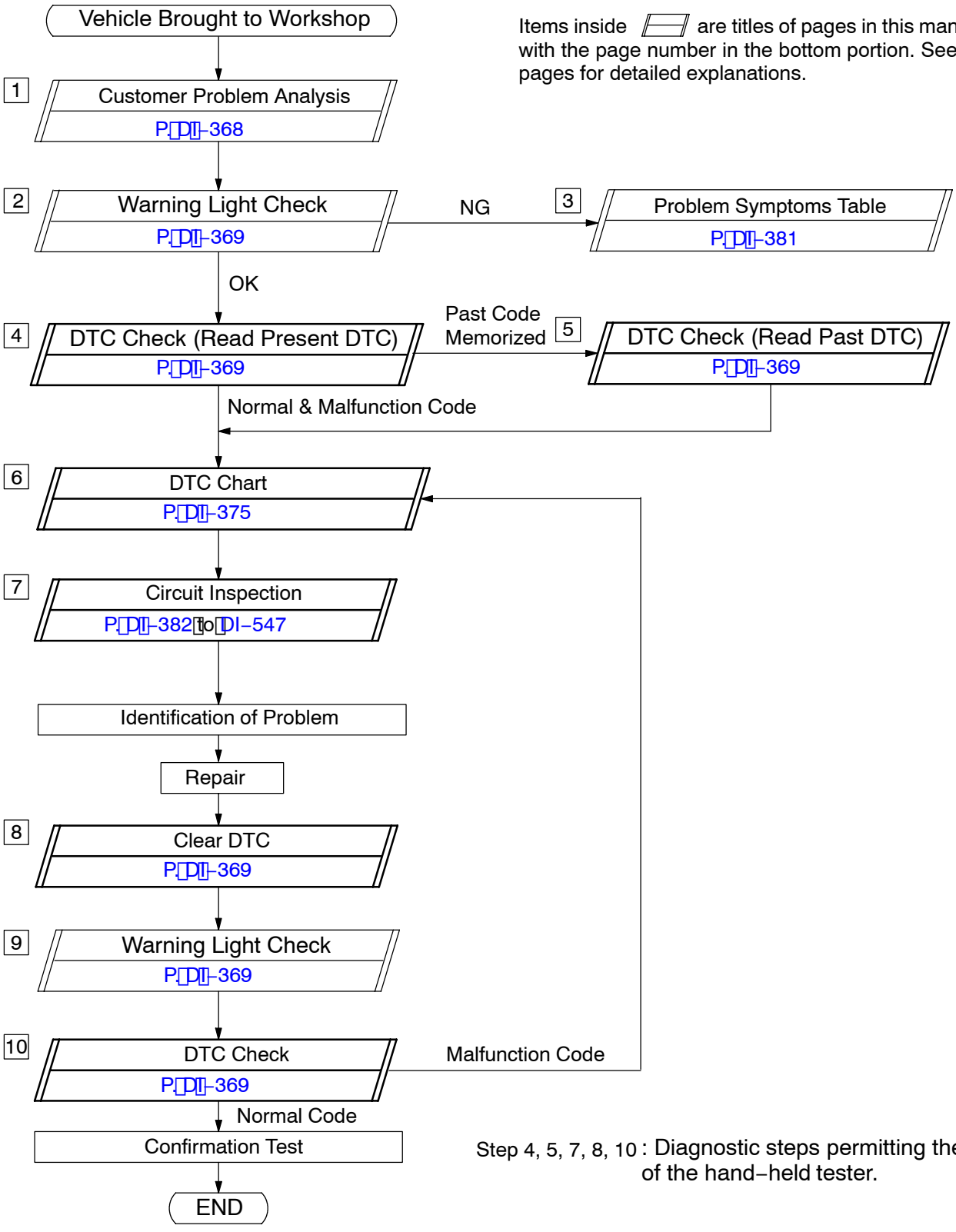
OK

Check and replace ABS & BA & TRC & VSC ECU.

SUPPLEMENTAL RESTRAINT SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

DI6OW–09



Items inside ▱ are titles of pages in this manual, with the page number in the bottom portion. See the pages for detailed explanations.

Step 4, 5, 7, 8, 10 : Diagnostic steps permitting the use of the hand–held tester.

DI6OX–01

CUSTOMER PROBLEM ANALYSIS CHECK

Supplemental Restraint System Check Sheet

Inspector's Name _____

Customer's Name		**Registration No.**	
		Registration Year	/ /
		Frame No.	
Date Vehicle Brought In	/ /	**Odometer Reading**	**km Miles**

Date Problem Occurred	/ /
Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Other
Temperature	**Approx.**

Vehicle Operation	☐ Starting ☐ Idling ☐ Driving [☐ Constant speed ☐ Acceleration ☐ Deceleration ☐ Other]
Road Conditions	
Details Of Problem	

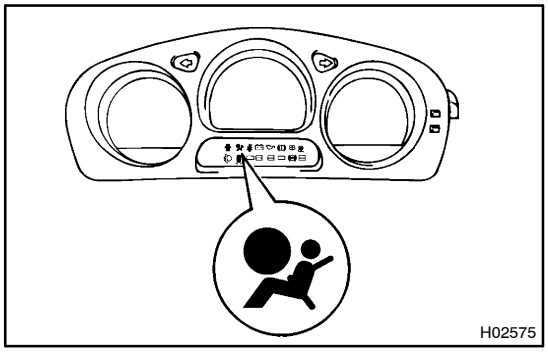
Vehicle Inspection, Repair History Prior to Occurrence of Malfunction (Including Supplemental Restraint System)	

Diagnosis System Inspection

SRS Warning Light Inspection	**1st Time**	☐ Remains ON ☐ Sometimes Lights Up ☐ Does Not Light Up
	2nd Time	☐ Remains ON ☐ Sometimes Lights Up ☐ Does Not Light Up
DTC Inspection	**1st Time**	☐ Normal Code ☐ Malfunction Code [Code.]
	2nd Time	☐ Normal Code ☐ Malfunction Code [Code.]

DI6OY–09

PRE–CHECK



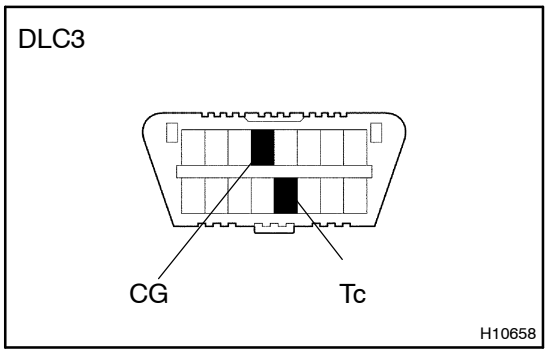
1. SRS WARNING LIGHT CHECK

(a) Turn the ignition switch to the ON position and check that the SRS warning light lights up.

(b) Check that the SRS warning light goes out after approx. 6 seconds.

HINT:

- When the ignition switch is at ON and the SRS warning light remains on or flashes, the airbag sensor assembly has detected a malfunction code.
- If, after approx. 6 seconds have elapsed, the SRS warning light sometimes lights up or the SRS warning light lights up even when the ignition switch is OFF, a short in the SRS warning light circuit can be considered likely. Proceed to "SRS warning light circuit malfunction" on page DI–543.



2. DTC CHECK (Using diagnosis check wire)

(a) Present troubles codes:

Output the DTC.

(1) Turn the ignition switch to the ON position and wait for approx. 20 seconds.

(2) Using SST, connect terminals Tc and CG of the DLC3.

SST 09843–18040

NOTICE:

Pay due attention to the terminal connecting position to avoid a malfunction.

(b) Past troubles codes:

Output the DTC.

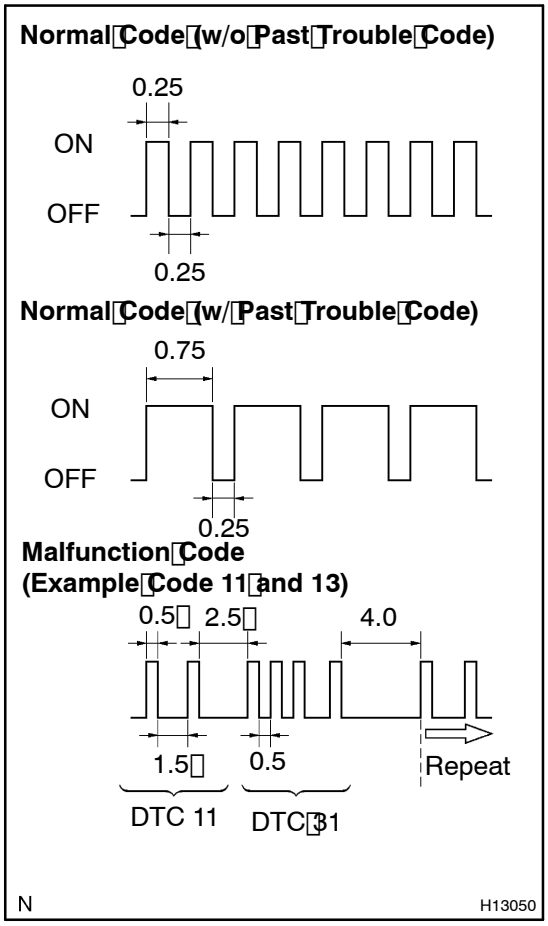
(1) Using service wire, connect terminals Tc and CG of the DLC3.

SST 09843–18040

(2) Turn the ignition switch to the ON position and wait for approx. 20 seconds.

NOTICE:

Pay due attention to the terminal connecting position to avoid a malfunction.



(c) Read the DTC.

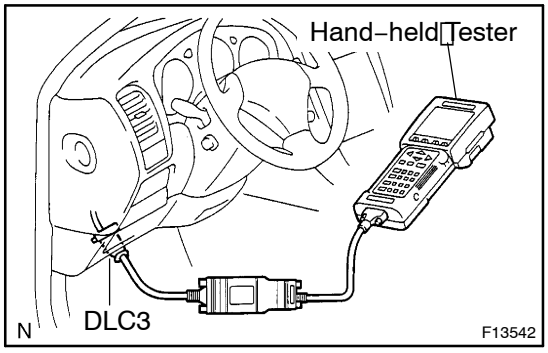
Read the 2–digit DTC as indicated by the number of times the SRS warning light blinks. As an example, the blinking patterns, normal, 11 and 31 are shown in the illustration.

- Normal code indication (w/o past trouble code)
  The light will blink 2 times per second.
- Normal code indication (w/ past trouble code)
  When the past troubles code is stored in the airbag sensor assembly, the light blinks only ones a second.
- Malfunction code indication
  The first blinking output indicates the first digit of a 2–digit DTC. After a 1.5–second pause, the second blinking output will indicate the second digit.

If there are 2 or more codes, there will be a 2.5–second pause between each code. After all the codes have been output, there will be a 4.0–second pause and they will all be repeated.

HINT:

- In the event of a number of trouble codes, indication will start from the smallest numbered code.
- If a DTC is not output or a DTC is output without terminal connection, proceed to the Tc terminal circuit inspection on page DI–547.



3. DTC CHECK (Using hand–held tester)

(a) Hook up the hand–held tester to the DLC3.

(b) Read the DTCs by following the prompts on the tester screen.

HINT:

Please refer to the hand–held tester operator's manual for further details.

4. DTC CLEARANCE (Not using service wire)

When the ignition switch is turned off, the diagnostic trouble code is cleared.

HINT:

DTC might not be cleared by turning the ignition switch OFF. In this case, proceed to the next step.

5. DTC CLEARANCE (Using service wire)

(a) Connect the service wire to terminals Tc of the DLC3.

(b) Ground terminal Tc of the DLC3.

(c) Turn the ignition switch to the ON position.

(d) Within 3 to 10 sec. after DTC is started to be output, release ground from terminal Tc of the DLC3.

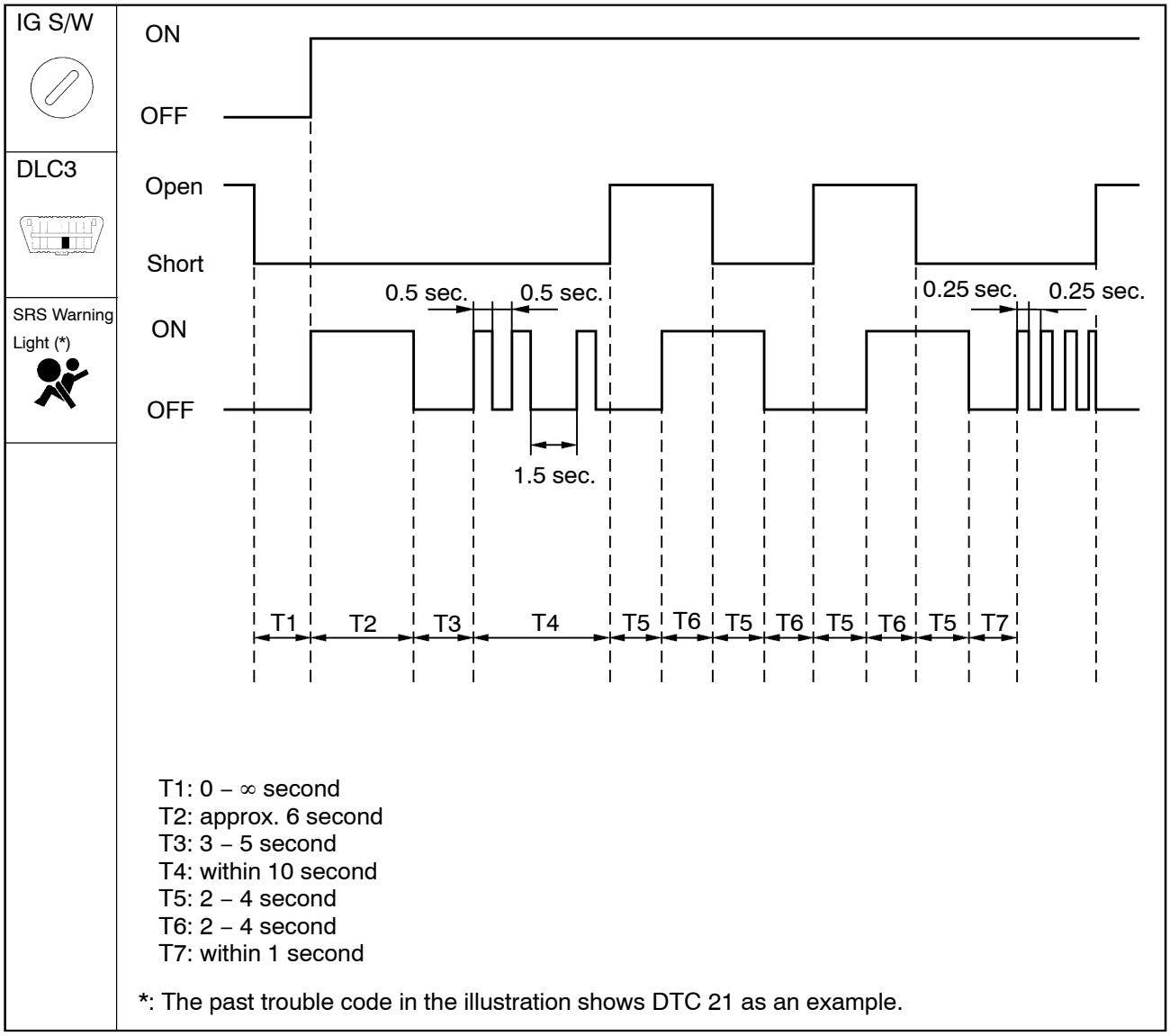
(e) The SRS warning light lights up 2 to 4 sec. later. Within 1 to 5 sec. after that, ground terminal Tc of the DLC3.

(f) The SRS warning light goes off 2 to 4 sec. after grounding terminal Tc. Within 1 to 5 sec. after that, release ground from terminal Tc again.

(g) The SRS warning light lights up again 2 to 4 sec. later. Within 1 to 5 sec. after that, ground terminal Tc of the DLC3 again.

(h) The SRS warning light goes off 2 to 4 sec. later. Within 1 sec. after that, normal code is output indicating that DTC deletion is completed.

If DTCs are not cleared, repeat the above procedure until the codes are cleared.

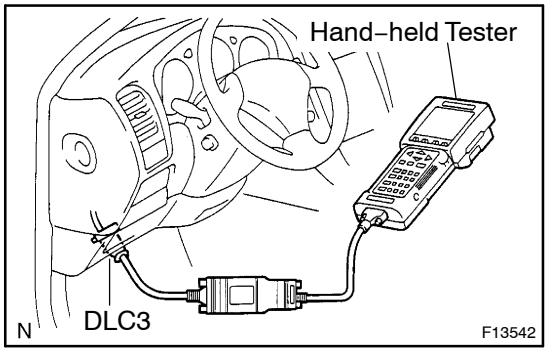


T1: 0 – ∞ second
T2: approx. 6 second
T3: 3 – 5 second
T4: within 10 second
T5: 2 – 4 second
T6: 2 – 4 second
T7: within 1 second

*: The past trouble code in the illustration shows DTC 21 as an example.

N

H13049



6. DTC CLEARANCE (Using hand–held tester)

(a) Hook up the hand–held tester to the DLC3.

(b) Clear the DTCs by following the prompts on the tester screen.

HINT:

Please refer to the hand–held tester operation's manual for further details.

7. RELEASE METHOD OF AIRBAG ACTIVATION PREVENTION MECHANISM

An airbag activation prevention mechanism is built into the connector for the squib circuit of the SRS.

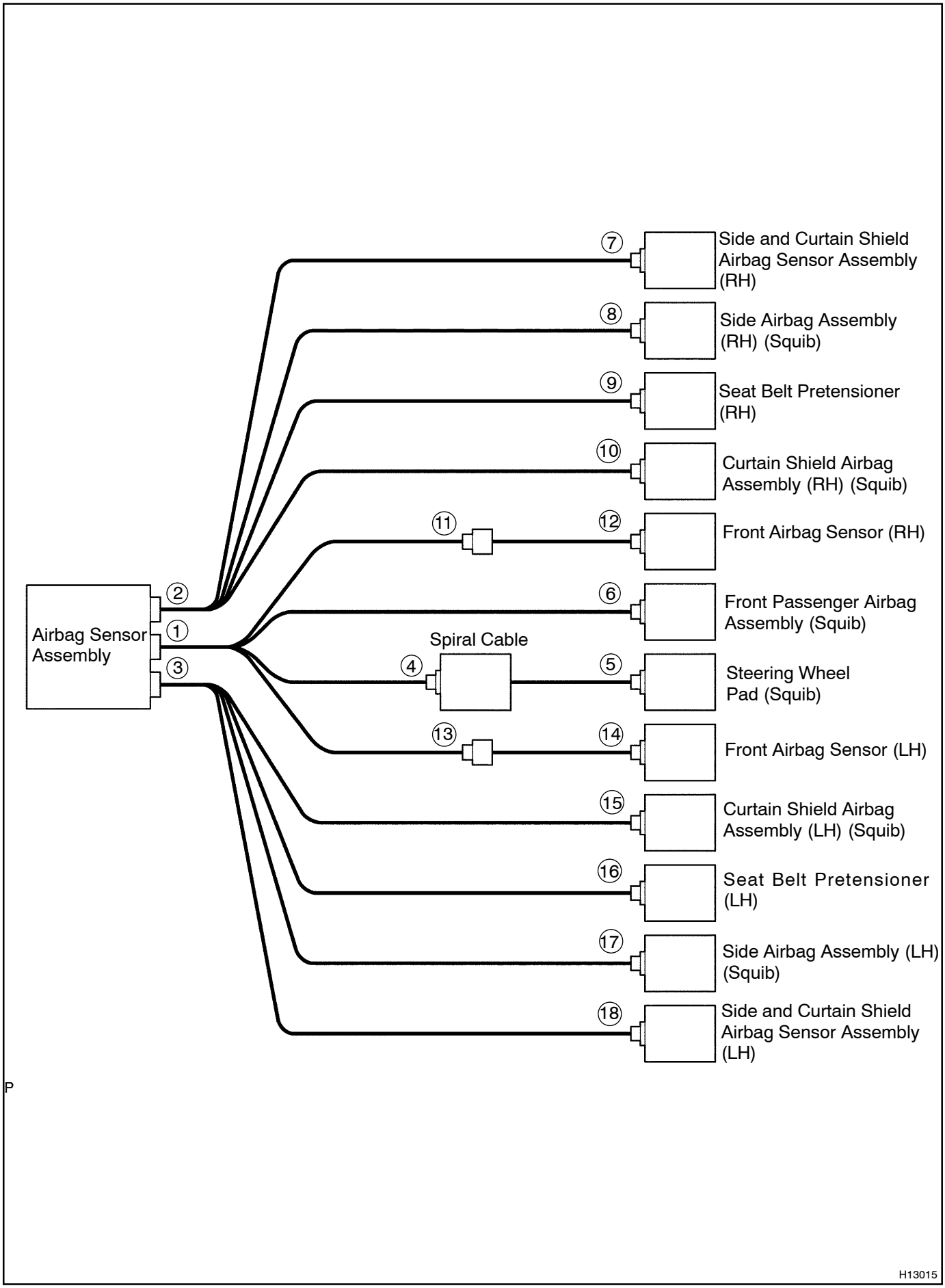
When release of the airbag activation prevention mechanism is directed in the troubleshooting procedure, as shown in the illustration of the connectors on the next pages, insert paper which has the same thickness as the male terminal between the terminal and the short spring.

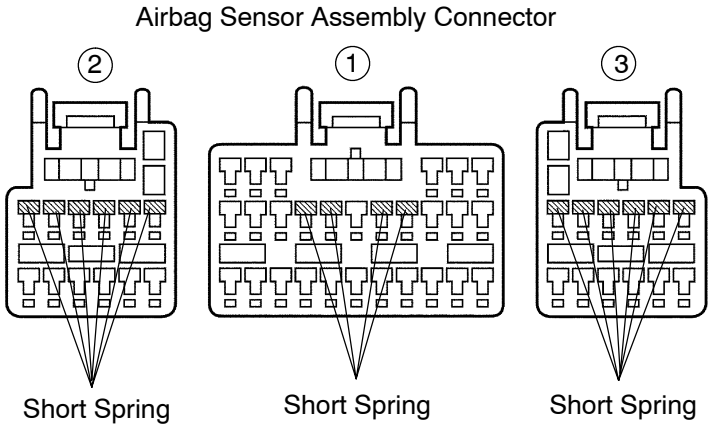
CAUTION:

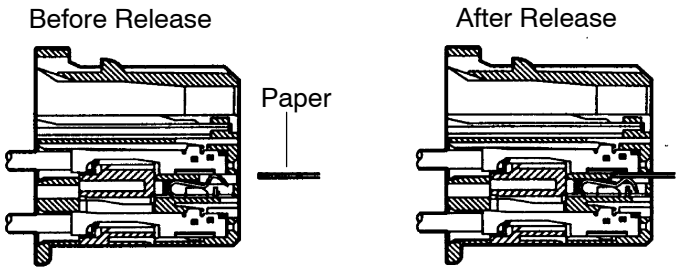
Never release the airbag activation prevention mechanism on the squib connector.

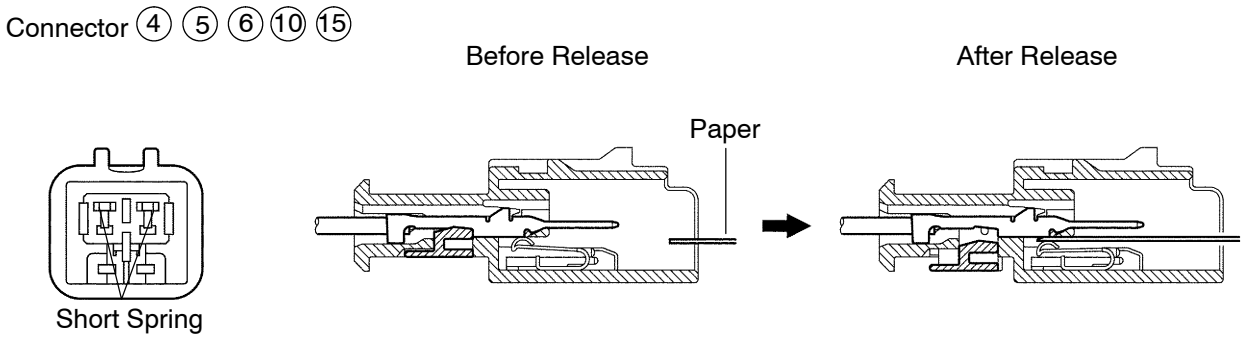
NOTICE:

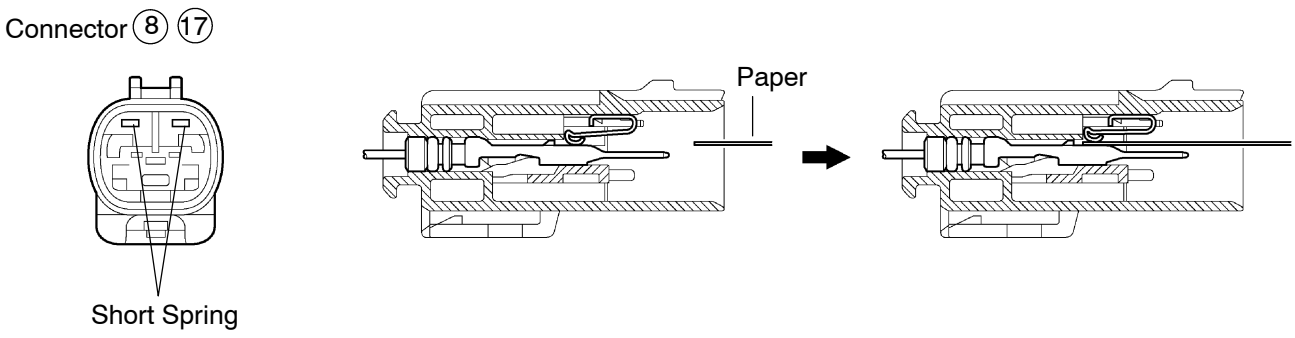
- **Do not release the airbag activation prevention mechanism unless specifically directed by the troubleshooting procedure.**
- **If the inserted paper is too thick the terminal and short spring may be damaged, so always use paper with the same thickness as the male terminal.**


Airbag Sensor Assembly
2
1
3
Spiral Cable
4
5
Steering Wheel Pad (Squib)
7
Side and Curtain Shield Airbag Sensor Assembly (RH)
8
Side Airbag Assembly (RH) (Squib)
9
Seat Belt Pretensioner (RH)
10
Curtain Shield Airbag Assembly (RH) (Squib)
11
12
Front Airbag Sensor (RH)
6
Front Passenger Airbag Assembly (Squib)
13
14
Front Airbag Sensor (LH)
15
Curtain Shield Airbag Assembly (LH) (Squib)
16
Seat Belt Pretensioner (LH)
17
Side Airbag Assembly (LH) (Squib)
18
Side and Curtain Shield Airbag Sensor Assembly (LH)
P
H13015









H09607
H01233
H02248 H02249
H09672 H09658

H13716

DI6OZ–19

DIAGNOSTIC TROUBLE CODE CHART

If a malfunction code is displayed during the DTC check, check the circuit listed for that code in the table below (Proceed to the page given for that circuit.).

DTC No. (See Page)	Detection Item	Trouble Area	SRS Warning Light
B0100/13 (DI–382)	• Short in D squib circuit	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
B0101/14 (DI–387)	• Open in D squib circuit	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
B0102/11 (DI–391)	• Short in D squib circuit (to ground)	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
B0103/12 (DI–395)	• Short in D squib circuit (to B+)	• Steering wheel pad (squib) • Spiral cable • Airbag sensor assembly • Wire harness	ON
B0105/53 (DI–399)	• Short in P squib circuit	• Front passenger airbag assembly (squib) • Airbag sensor assembly • Wire harness	ON
B0106/54 (DI–403)	• Open in P squib circuit	• Front passenger airbag assembly (squib) • Airbag sensor assembly • Wire harness	ON
B0107/51 (DI–406)	• Short in P squib circuit (to ground)	• Front passenger airbag assembly (squib) • Airbag sensor assembly • Wire harness	ON
B0108/52 (DI–409)	• Short in P squib circuit (to B+)	• Front passenger airbag assembly (squib) • Airbag sensor assembly • Wire harness	ON
B0110/43 (DI–412)	• Short in side squib (RH) circuit	• Side airbag assembly RH (squib) • Airbag sensor assembly • Wire harness	Blink
B0111/44 (DI–416)	• Open in side squib (RH) circuit	• Side airbag assembly RH (squib) • Airbag sensor assembly • Wire harness	Blink
B0112/41 (DI–419)	• Short in side squib (RH) circuit (to ground)	• Side airbag assembly RH (squib) • Airbag sensor assembly • Wire harness	Blink
B0113/42 (DI–422)	• Short in side squib (RH) circuit (to B+)	• Side airbag assembly RH (squib) • Airbag sensor assembly • Wire harness	Blink
B0115/47 (DI–425)	• Short in side squib (LH) circuit	• Side airbag assembly LH (squib) • Airbag sensor assembly • Wire harness	Blink
B0116/48 (DI–429)	• Open in side squib (LH) circuit	• Side airbag assembly LH (squib) • Airbag sensor assembly • Wire harness	Blink

DTC No. (See Page)	Detection Item	Trouble Area	SRS Warning Light
B0117/45 (DI–432)	• Short in side squib (LH) circuit (to ground)	• Side airbag assembly LH (squib) • Airbag sensor assembly • Wire harness	Blink
B0118/46 (DI–435)	• Short in side squib (LH) circuit (to B+)	• Side airbag assembly LH (squib) • Airbag sensor assembly • Wire harness	Blink
B0121/B0122/26 (DI–438)	• Seat belt buckle switch (RH) malfunction	• Seat belt buckle switch (RH) • Airbag sensor assembly • Wire harness	ON
B0126/B0127/27 (DI–442)	• Seat belt buckle switch (LH) malfunction	• Seat belt buckle switch (LH) • Airbag sensor assembly • Wire harness	ON
B0130/63 (DI–446)	• Short in P/T squib (RH) circuit	• Seat belt pretensioner RH (squib) • Airbag sensor assembly • Wire harness	Blink
B0131/64 (DI–450)	• Open in P/T squib (RH) circuit	• Seat belt pretensioner RH (squib) • Airbag sensor assembly • Wire harness	Blink
B0132/61 (DI–453)	• Short in P/T squib (RH) circuit (to ground)	• Seat belt pretensioner RH (squib) • Airbag sensor assembly • Wire harness	Blink
B0133/62 (DI–456)	• Short in P/T squib (RH) circuit (to B+)	• Seat belt pretensioner RH (squib) • Airbag sensor assembly • Wire harness	Blink
B0135/73 (DI–459)	• Short in P/T squib (LH) circuit	• Seat belt pretensioner LH (squib) • Airbag sensor assembly • Wire harness	Blink
B0136/74 (DI–463)	• Open in P/T squib (LH) circuit	• Seat belt pretensioner LH (squib) • Airbag sensor assembly • Wire harness	Blink
B0137/71 (DI–466)	• Short in P/T squib (LH) circuit (to ground)	• Seat belt pretensioner LH (squib) • Airbag sensor assembly • Wire harness	Blink
B0138/72 (DI–469)	• Short in P/T squib (LH) circuit (to B+)	• Seat belt pretensioner LH (squib) • Airbag sensor assembly • Wire harness	Blink
B1100/31 (DI–472)	• Airbag sensor assembly malfunction	• Airbag sensor assembly	ON
B1135/24 (DI–474)	• Half connection in airbag sensor assembly malfunction	• Airbag sensor assembly • Wire harness	Blink
B1140/32 (DI–478)	• Side airbag sensor assembly (RH) malfunction	• Side airbag sensor assembly (RH) • Airbag sensor assembly • Wire harness	Blink
B1141/33 (DI–486)	• Side airbag sensor assembly (LH) malfunction	• Side airbag sensor assembly (LH) • Airbag sensor assembly • Wire harness	Blink
B1150/23 (DI–494)	• Occupant detection malfunction	• Occupant detection sensor • Airbag sensor assembly • Wire harness	ON

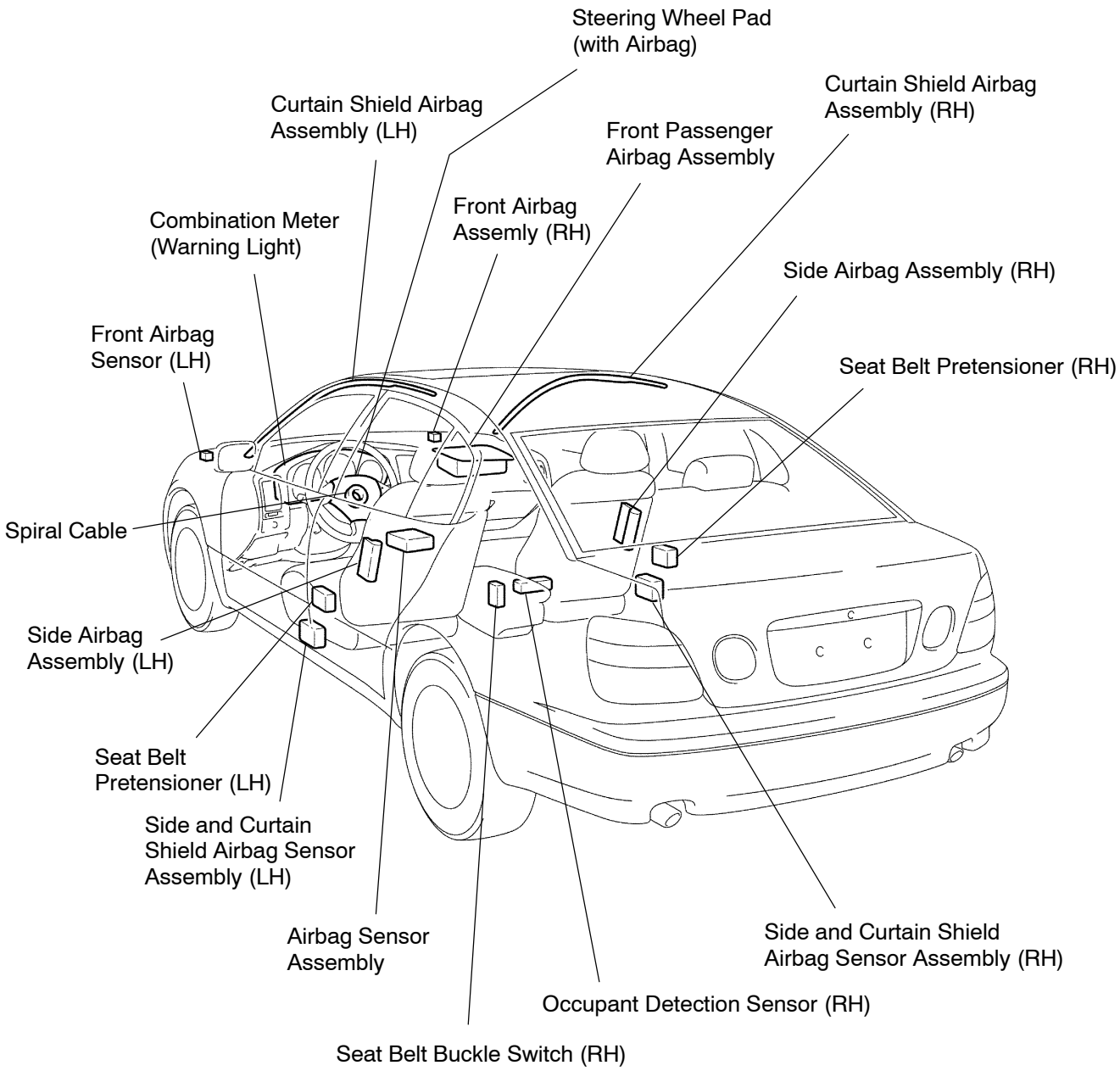
DTC No. (See Page)	Detection Item	Trouble Area	SRS Warning Light
B1156/B1157/15 (DI–498)	• Front airbag sensor (RH) malfunction	• Front airbag sensor (RH) • Airbag sensor assembly • Instrument panel wire harness • Engine room main wire harness	ON
B1158/B1159/16 (DI–506)	• Front airbag sensor (LH) malfunction	• Front airbag sensor (LH) • Airbag sensor assembly • Instrument panel wire harness • Engine room main wire harness	ON
B1160/83 (DI–514)	• Short in curtain shield airbag (RH) squib circuit	• Curtain shield airbag (RH) (squib) • Airbag sensor assembly • Wire harness	Blink
B1161/84 (DI–518)	• Open in curtain shield airbag (RH) squib circuit	• Curtain shield airbag (RH) (squib) • Airbag sensor assembly • Wire harness	Blink
B1162/81 (DI–521)	• Short in curtain shield airbag (RH) circuit (to ground)	• Curtain shield airbag (RH) (squib) • Airbag sensor assembly • Wire harness	Blink
B1163/82 (DI–524)	• Short in curtain shield airbag (RH) circuit circuit (to B+)	• Curtain shield airbag (RH) (squib) • Airbag sensor assembly • Wire harness	Blink
B1165/87 (DI–527)	• Short in curtain shield airbag (LH) squib circuit	• Curtain shield airbag (LH) (squib) • Airbag sensor assembly • Wire harness	Blink
B1166/88 (DI–531)	• Open in curtain shield airbag (LH) squib circuit	• Curtain shield airbag (LH) (squib) • Airbag sensor assembly • Wire harness	Blink
B1167/85 (DI–534)	• Short in curtain shield airbag (LH) circuit (to ground)	• Curtain shield airbag (LH) (squib) • Airbag sensor assembly • Wire harness	Blink
B1168/86 (DI–537)	• Short in curtain shield airbag (LH) circuit circuit (to B+)	• Curtain shield airbag (LH) (squib) • Airbag sensor assembly • Wire harness	Blink
Normal (DI–540)	• System normal	–	OFF
	• Voltage source drop	• Battery • Airbag sensor assembly	ON

HINT:

- When the SRS warning light remains lit up and the DTC is the normal code, this means a voltage source drops.
  This malfunction is not stored in memory by the airbag sensor assembly and if the power source voltage returns to normal, the SRS warning light will automatically go out.
- When 2 or more codes are indicated, the codes will be displayed in numeral order starting from the lowest numbered code.
- If a code not listed on the chart is displayed, the airbag sensor assembly is faulty.

DI6P0–08

PARTS LOCATION



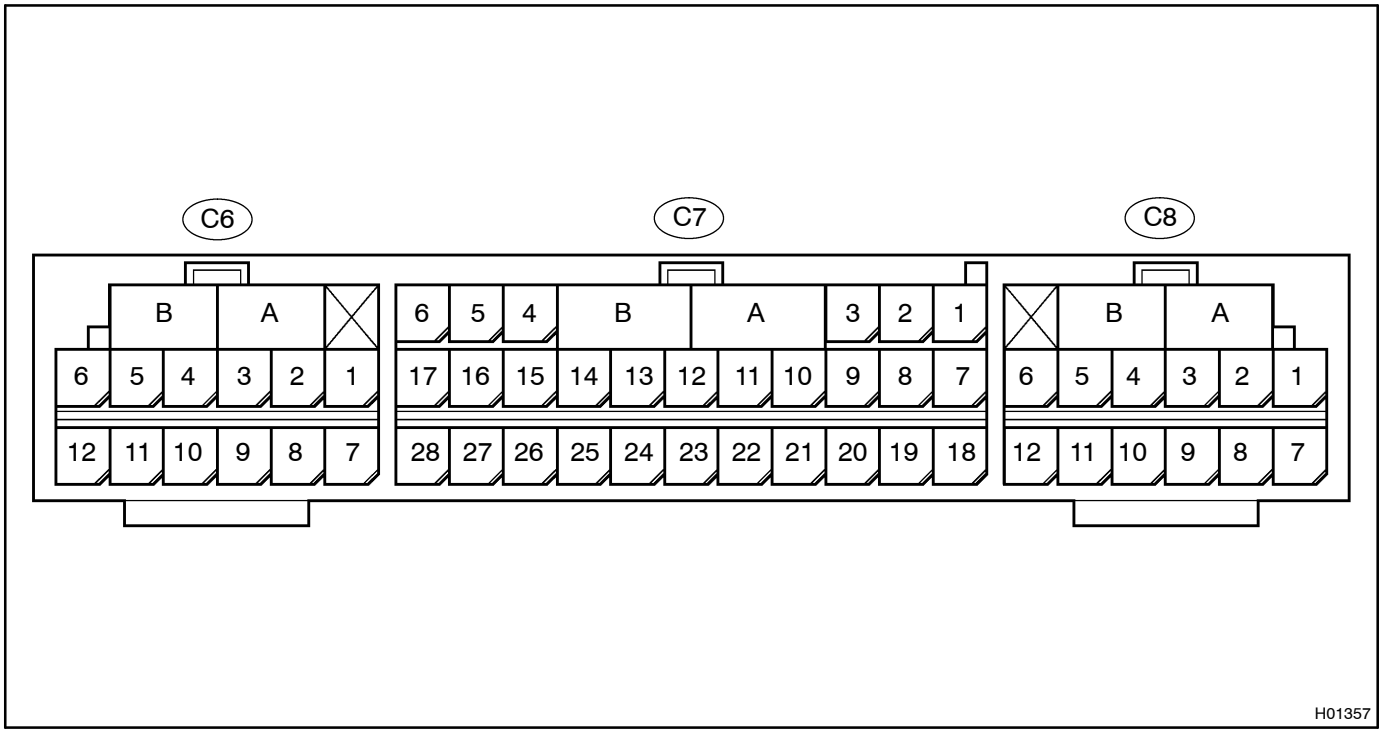
*All components for RHD vehicle are minor image of LHD vehicle.

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DI6P1–09

TERMINALS OF ECU



No.	Symbol	Terminal Name
A	–	Electrical Connector Check Mechanism
B	–	Electrical Connector Check Mechanism
C7 – 5	IG2	Power Source
C7 – 6	IG1	Power Source
C7 – 9	+SR	Front Airbag Sensor (RH)
C7 – 10	P+	Squib (Passenger)
C7 – 11	P–	Squib (Passenger)
C7 – 12	SIL	Diagnosis
C7 – 13	D–	Squib (Driver)
C7 – 14	D+	Squib (Driver)
C7 – 15	+SL	Front Airbag Sensor (LH)
C7 – 20	–SR	Front Airbag Sensor (RH)
C7 – 21	FSR– (LHD), FSL– (RHD)	Occupant Detection Sensor
C7 – 22	MPX2	Instrument Panel Integration ECU
C7 – 24	MPX1	Engine ECU
C7 – 25	FSR+ (LHD), FSL+ (RHD)	Occupant Detection Sensor
C7 – 26	–SL	Front Airbag Sensor (LH)
C7 – 27	E1	Ground
C7 – 28	E2	Ground
C6 – 1	PL–	Squib (Seat Belt Pretensioner, LH)
C6 – 2	PL+	Squib (Seat Belt Pretensioner, LH)
C6 – 3	ICL–	Squib (Curtain Shield Airbag Assembly (LH))
C6 – 4	ICL+	Squib (Curtain Shield Airbag Assembly (LH))
C6 – 5	SFL–	Squib (Side, LH)
C6 – 6	SFL+	Squib (Side, LH)

No.	Symbol	Terminal Name
C6 – 7	VUPL	Side Airbag Sensor (LH)
C6 – 9	ESL	Side Airbag Sensor (LH)
C6 – 10	SSL+	Side Airbag Sensor (LH)
C6 – 11	LBE+	Seat Belt Buckle Switch (LH)
C6 – 12	SSL–	Side Airbag Sensor (LH)
C8 – 1	SFR+	Squib (Side, RH)
C8 – 2	SFR–	Squib (Side, RH)
C8 – 3	ICR+	Squib (Curtain Shield Airbag Assembly (RH))
C8 – 4	ICR–	Squib (Curtain Shield Airbag Assembly (RH))
C8 – 5	PR+	Squib (Pretensioner, RH)
C8 – 6	PR–	Squib (Pretensioner, RH)
C8 – 7	SSR–	Side Airbag Sensor (RH)
C8 – 8	RBE+	Seat Belt Buckle Switch (RH)
C8 – 9	SSR+	Side Airbag Sensor (RH)
C8 – 10	ESR	Side Airbag Sensor (RH)
C8 – 12	VUPR	Side Airbag Sensor (RH)

DI6P2-02

PROBLEM SYMPTOMS TABLE

Proceed with troubleshooting of each circuit in the table below.

Symptom	Suspect Area	See page
• With the ignition switch in ON position, the SRS warning light sometimes lights up after approx. 6 seconds have elapsed.	• SRS warning light circuit	DI–543
• SRS warning light is always lit up even when ignition switch is in the LOCK position.		
• With the ignition switch in ON position, the SRS warning light does not light up.		
• DTC is not displayed.	• Tc terminal circuit	DI–547
• SRS warning light is always lit up at the time of DTC check procedure.		
• DTC is displayed without Tc and CG terminal connection.		

DI6P3–08

CIRCUIT INSPECTION

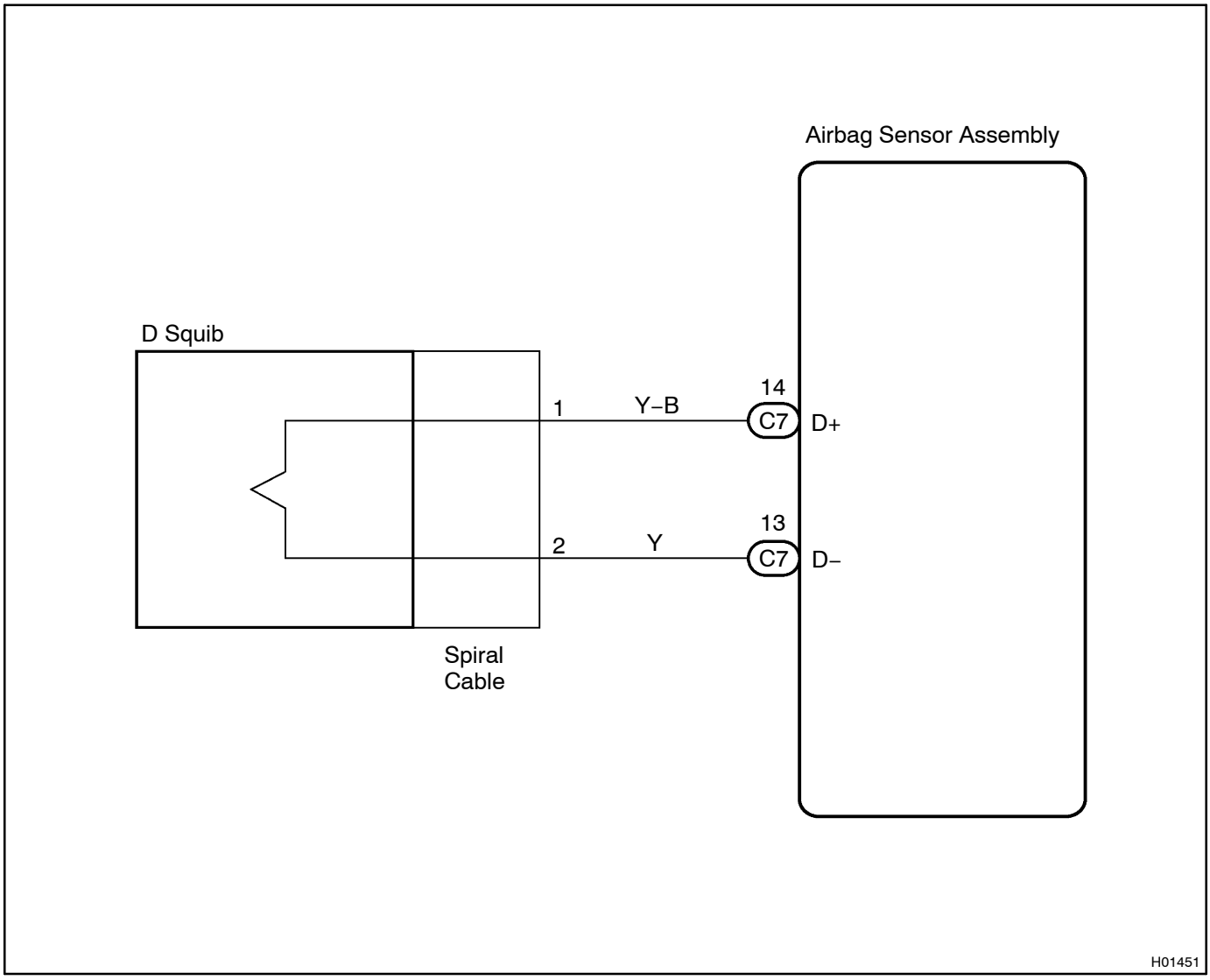
DTC	B0100/13	Short in D Squib Circuit

CIRCUIT DESCRIPTION

The D squib circuit consists of the airbag sensor assembly, spiral cable and steering wheel pad.
It causes the airbag to deploy when the airbag deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0100/13 is recorded when a short is detected in the D squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0100/13	• Short circuit between D+ wire harness and D– wire harness of squib • D squib malfunction • Spiral cable malfunction • Airbag sensor assembly malfunction	• Steering wheel pad (D squib) • Spiral cable • Airbag sensor assembly • Wire harness

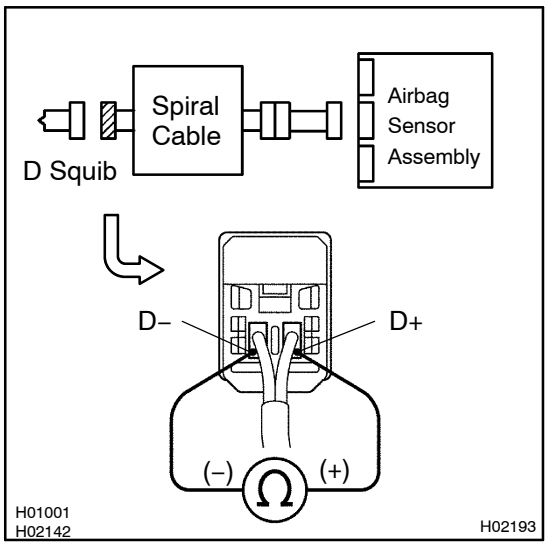
WIRING DIAGRAM



INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check D squib circuit.



PREPARATION:

Release the airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the spiral cable (See page DI–369).

CHECK:

For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the resistance between D+ and D–.

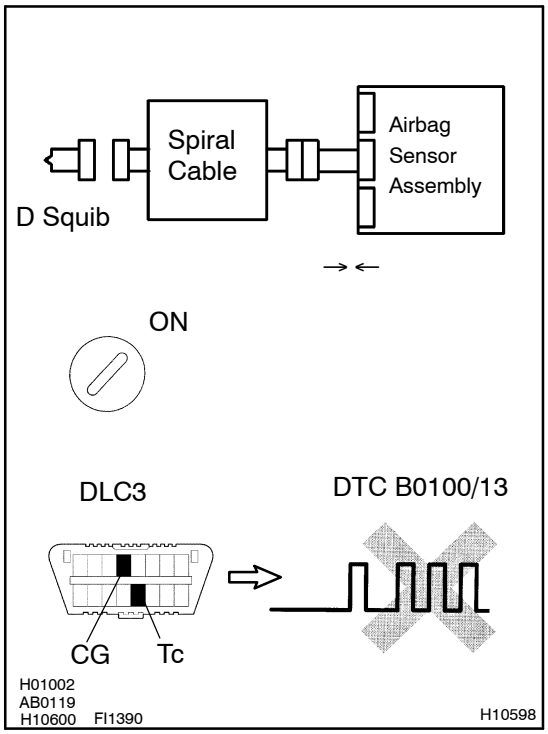
OK:

Resistance: 1 MΩ or Higher

NG → **Go to step 5.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0100/13 is not output.

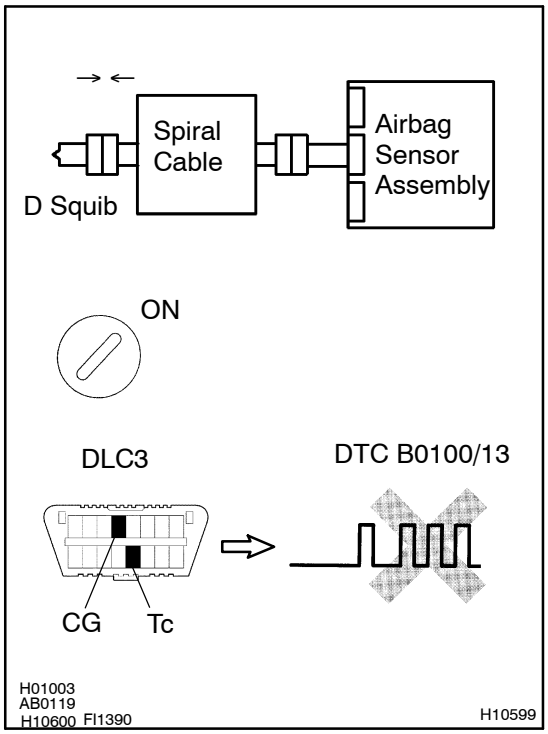
HINT:

Codes other than code B0100/13 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	**Check D squib.**



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the steering wheel pad connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Clear the DTC stored in memory (See page DI–369).
(d) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check the DTC (See page DI–369).

OK:

DTC B0100/13 is not output.

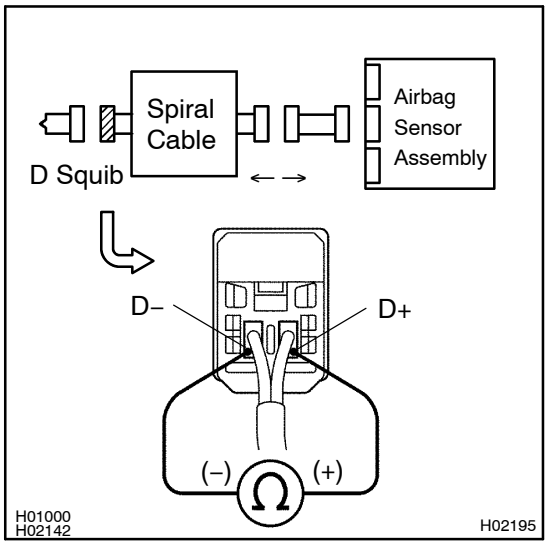
HINT:
Codes other than code B0100/13 may be output at this time, but they are not relevant to this check.

NG → **Replace steering wheel pad.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

5	Check spiral cable.



PREPARATION:

(a) Disconnect the connector between the airbag sensor assembly and the spiral cable.

(b) Release the airbag activation prevention mechanism of the spiral cable connector on the airbag sensor assembly side (See page DI–369).

CHECK:

For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the resistance between D+ and D–.

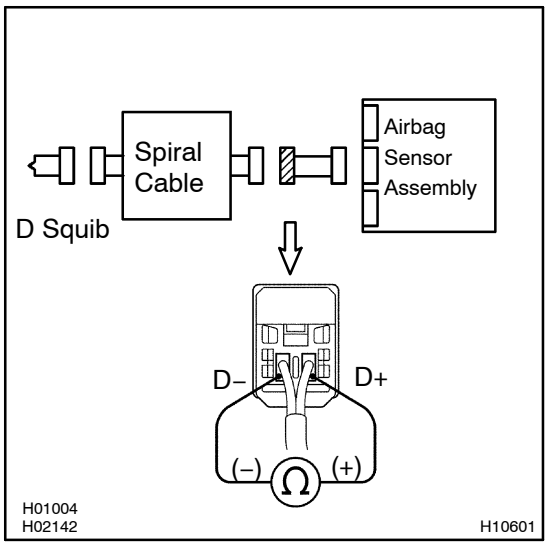
OK:

Resistance: 1 MΩ or Higher

NG	Repair or replace spiral cable.

OK

6	Check harness between airbag sensor assembly and spiral cable.



PREPARATION:

Release the airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the spiral cable (See page DI–369).

CHECK:

For the connector (on the spiral cable side) between the airbag sensor assembly and the spiral cable, measure the resistance between D+ and D–.

OK:

Resistance: 1 MΩ or Higher

NG	Repair or replace harness or connector between airbag sensor assembly and spiral cable.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6P4–01

DTC	B0101/14	Open in D Squib Circuit

CIRCUIT DESCRIPTION

The D squib circuit consists of the airbag sensor assembly, spiral cable and steering wheel pad.
It causes the airbag to deploy when the airbag deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0101/14 is recorded when an open is detected in the D squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0101/14	• Open circuit in D+ wire harness or D– wire harness of squib • D squib malfunction • Spiral cable malfunction • Airbag sensor assembly malfunction	• Steering wheel pad (D squib) • Spiral cable • Airbag sensor assembly • Wire harness

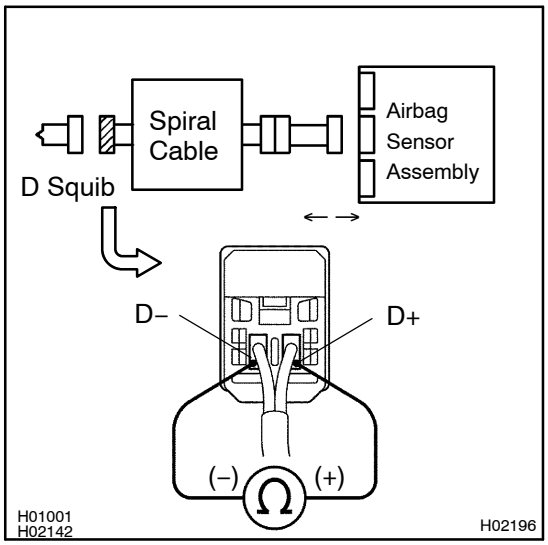
WIRING DIAGRAM

See page DI–382.

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check D squib circuit.

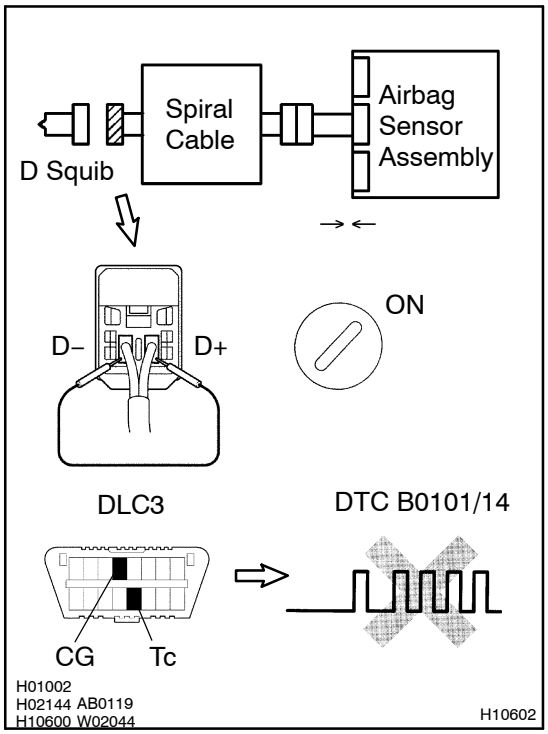


CHECK:
For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the resistance between D+ and D–.
OK:
Resistance: Below 1 Ω

NG → **Go to step 5.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect D+ and D– of the connector (on the spiral cable side) between the spiral cable and the steering wheel pad.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0101/14 is not output.

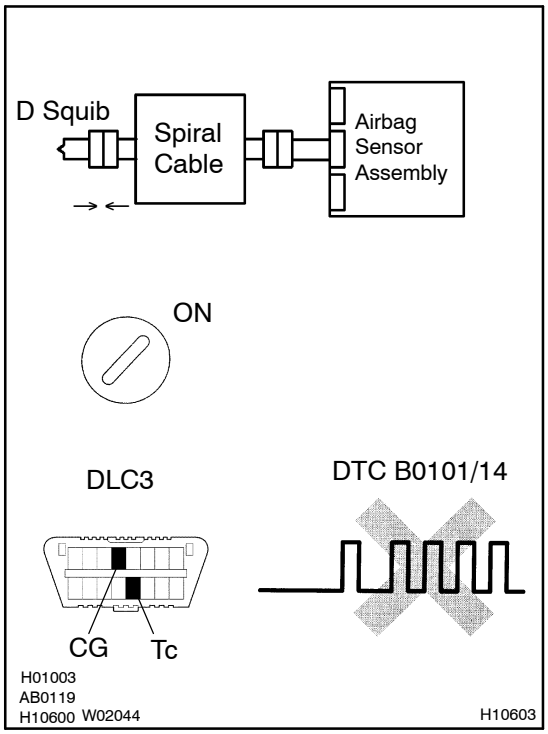
HINT:

Codes other than code B0101/14 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check D squib.



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the steering wheel pad connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0101/14 is not output.

HINT:

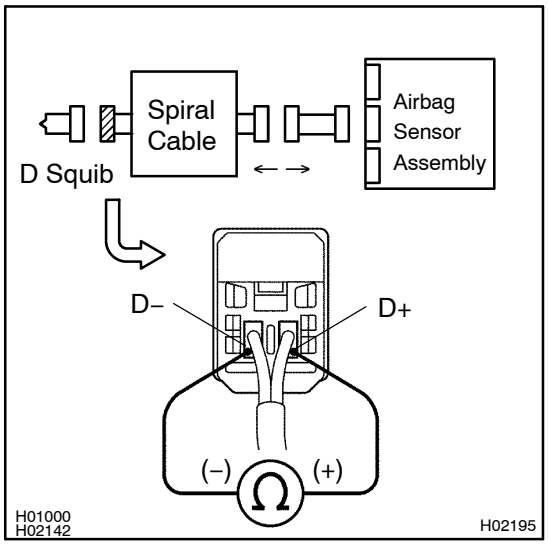
Codes other than code B0101/14 may be output at this time, but they are not relevant to this check.

NG	Replace steering wheel pad.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

5	Check spiral cable.



PREPARATION:

Disconnect the connector between the airbag sensor assembly and the spiral cable.

CHECK:

For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the resistance between D+ and D–.

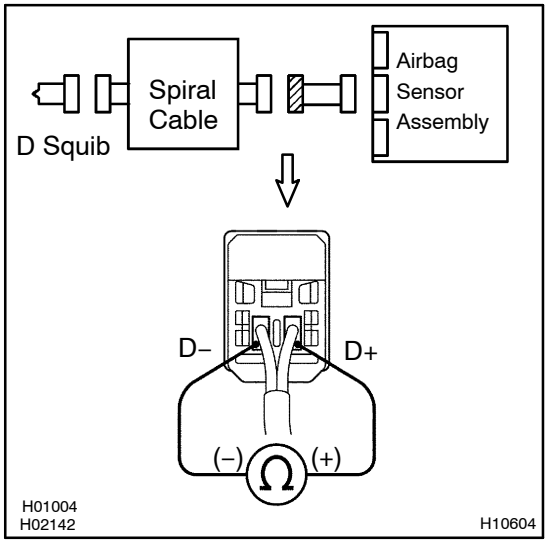
OK:

Resistance: Below 1 Ω

NG → **Repair or replace spiral cable.**

OK

6	Check harness between airbag sensor assembly and spiral cable.



CHECK:

For the connector (on the spiral cable side) between the airbag sensor assembly and the spiral cable, measure the resistance between D+ and D–.

OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between airbag sensor assembly and spiral cable.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6P5–01

DTC	B0102/11	Short in D Squib Circuit (to Ground)

CIRCUIT DESCRIPTION

The D squib circuit consists of the airbag sensor assembly, spiral cable and steering wheel pad.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0102/11 is recorded when a ground short is detected in the D squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0102/11	• Short circuit in D squib wire harness (to ground) • D squib malfunction • Spiral cable malfunction • Airbag sensor assembly malfunction	• Steering wheel pad (D squib) • Spiral cable • Airbag sensor assembly • Wire harness

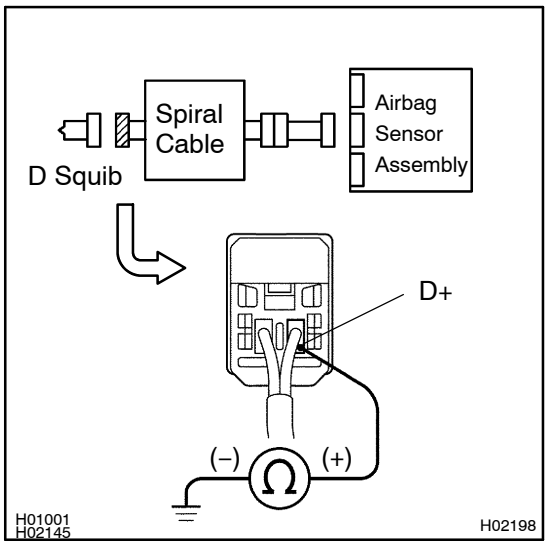
WIRING DIAGRAM

See page DI–382.

INSPECTION PROCEDURE

1	**Prepare for inspection (See step 1 on page DI–540).**

2	**Check D squib circuit.**

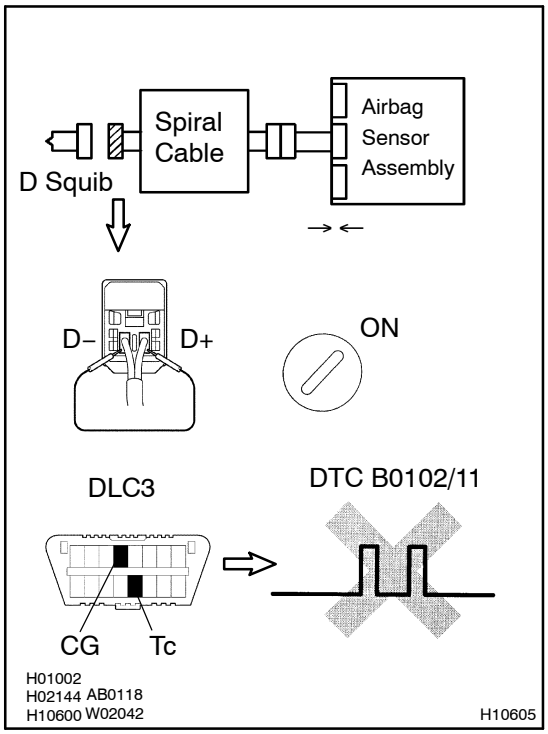


CHECK:
For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the resistance between D+ and body ground.
OK:
Resistance: 1 MΩ or Higher

NG	**Go to step 5.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect D+ and D– of the connector (on the spiral cable side) between the spiral cable and the steering wheel pad.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0102/11 is not output.

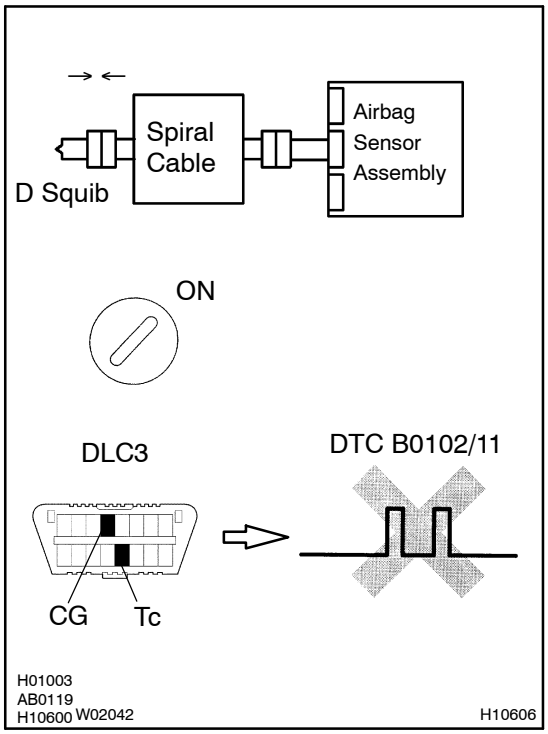
HINT:

Codes other than code B0102/11 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check D squib.



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the steering wheel pad connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0102/11 is not output.

HINT:

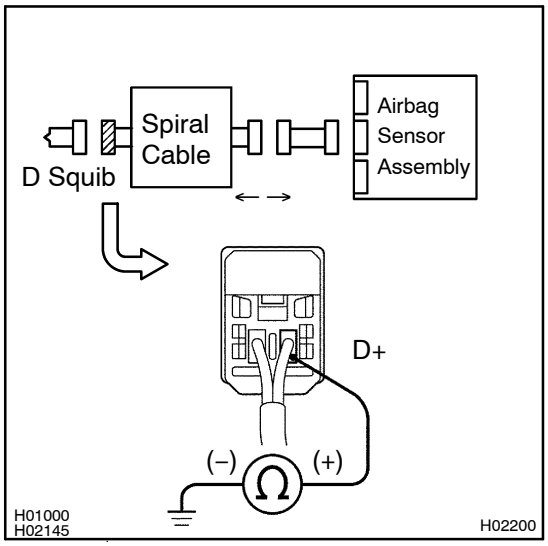
Codes other than code B0102/11 may be output at this time, but they are not relevant to this check.

NG	Replace steering wheel pad.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

5	Check spiral cable.



PREPARATION:
Disconnect the connector between the airbag sensor assembly and the spiral cable.

CHECK:
For the connector (on the spiral cable side) between the steering wheel pad and the spiral cable, measure the resistance between D+ and body ground.

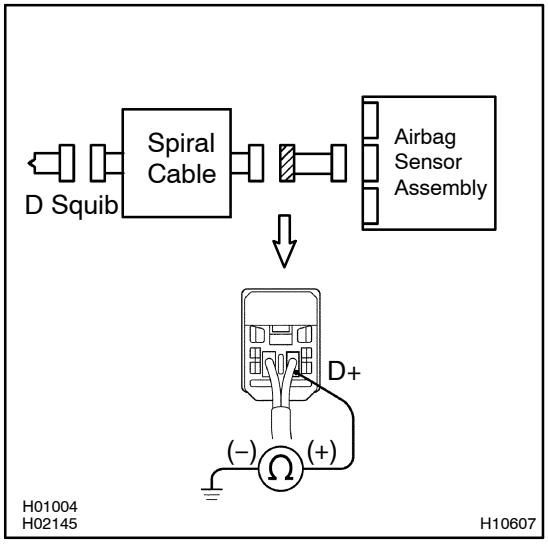
OK:

Resistance: 1 MΩ or Higher

NG	Repair or replace spiral cable.

OK

6	Check harness between airbag sensor assembly and spiral cable.



CHECK:
For the connector (on the spiral cable side) between the spiral cable and the airbag sensor assembly, measure the resistance between D+ and body ground.

OK:

Resistance: 1 MΩ or Higher

NG	Repair or replace harness between airbag sensor assembly and spiral cable.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI6P6-07

DTC	B0103/12	Short in D Squib Circuit (to B+)

CIRCUIT DESCRIPTION

The D squib circuit consists of the airbag sensor assembly, spiral cable and steering wheel pad.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0103/12 is recorded when a B+ short is detected in the D squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0103/12	• Short circuit in D squib wire harness (to B+) • D squib malfunction • Spiral cable malfunction • Airbag sensor assembly malfunction	• Steering wheel pad (D squib) • Spiral cable • Airbag sensor assembly • Wire harness

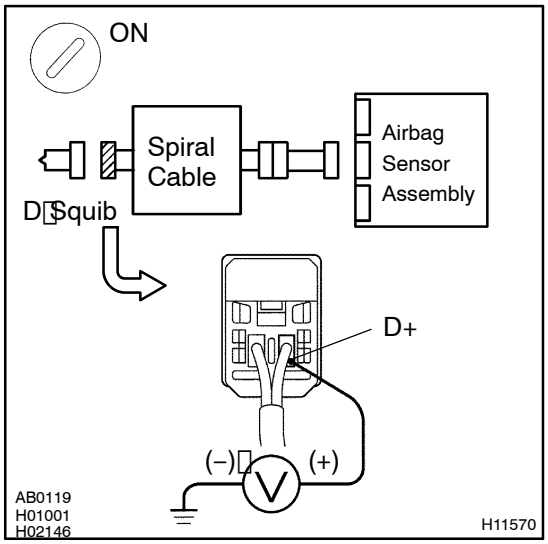
WIRING DIAGRAM

See page DI–382.

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check D squib circuit.



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the voltage between D+ and body ground.

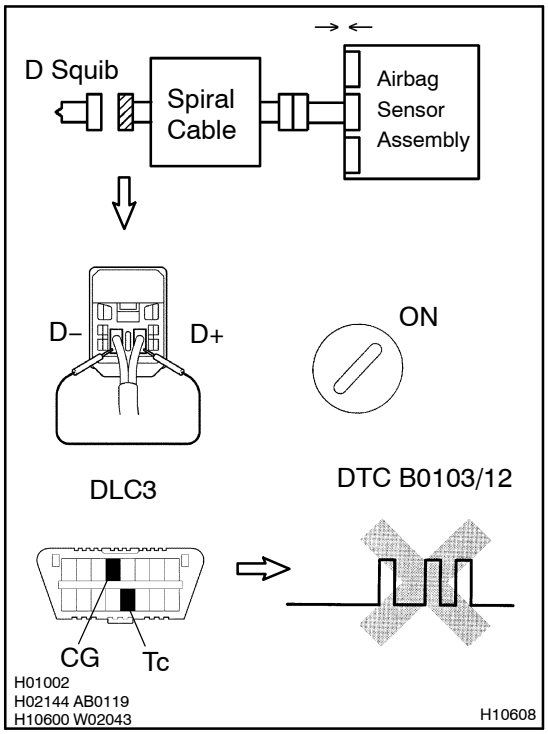
OK:

Voltage: 0 V

NG	Go to step 5.

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect D+ and D– of the connector (on the spiral cable side) between the spiral cable and the steering wheel pad.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0103/12 is not output.

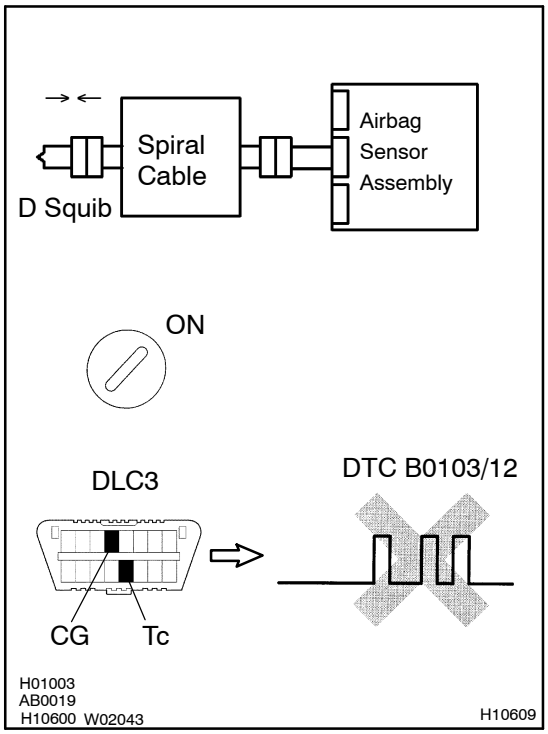
HINT:

Codes other than code B0103/12 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check D squib.



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the steering wheel pad connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0103/12 is not output.

HINT:

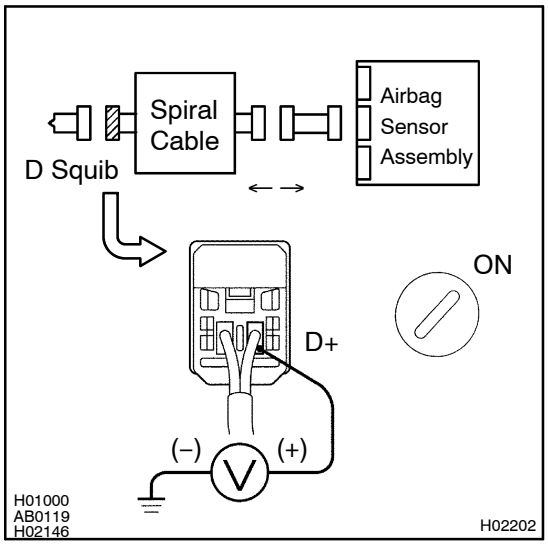
Codes other than code B0103/12 may be output at this time, but they are not relevant to this check.

NG	Replace steering wheel pad.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

5	Check spiral cable.



PREPARATION:

(a) Turn the ignition switch to LOCK.

(b) Disconnect the connector between the airbag sensor assembly and the spiral cable.

CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the spiral cable side) between the spiral cable and the steering wheel pad, measure the voltage between D+ and body ground.

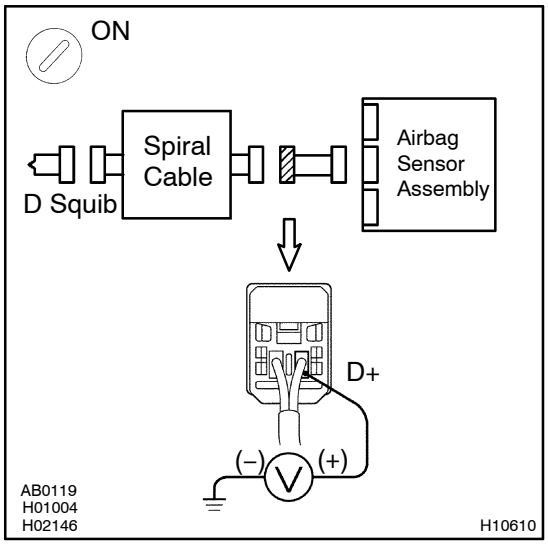
OK:

Voltage: 0 V

NG	Repair or replace spiral cable.

OK

6	Check harness between airbag sensor assembly and spiral cable.



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the spiral cable side) between the spiral cable and airbag sensor assembly, measure the voltage between D+ and body ground.

OK:

Voltage: 0 V

NG	Repair or replace harness between airbag sensor assembly and spiral cable.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI6P7–08

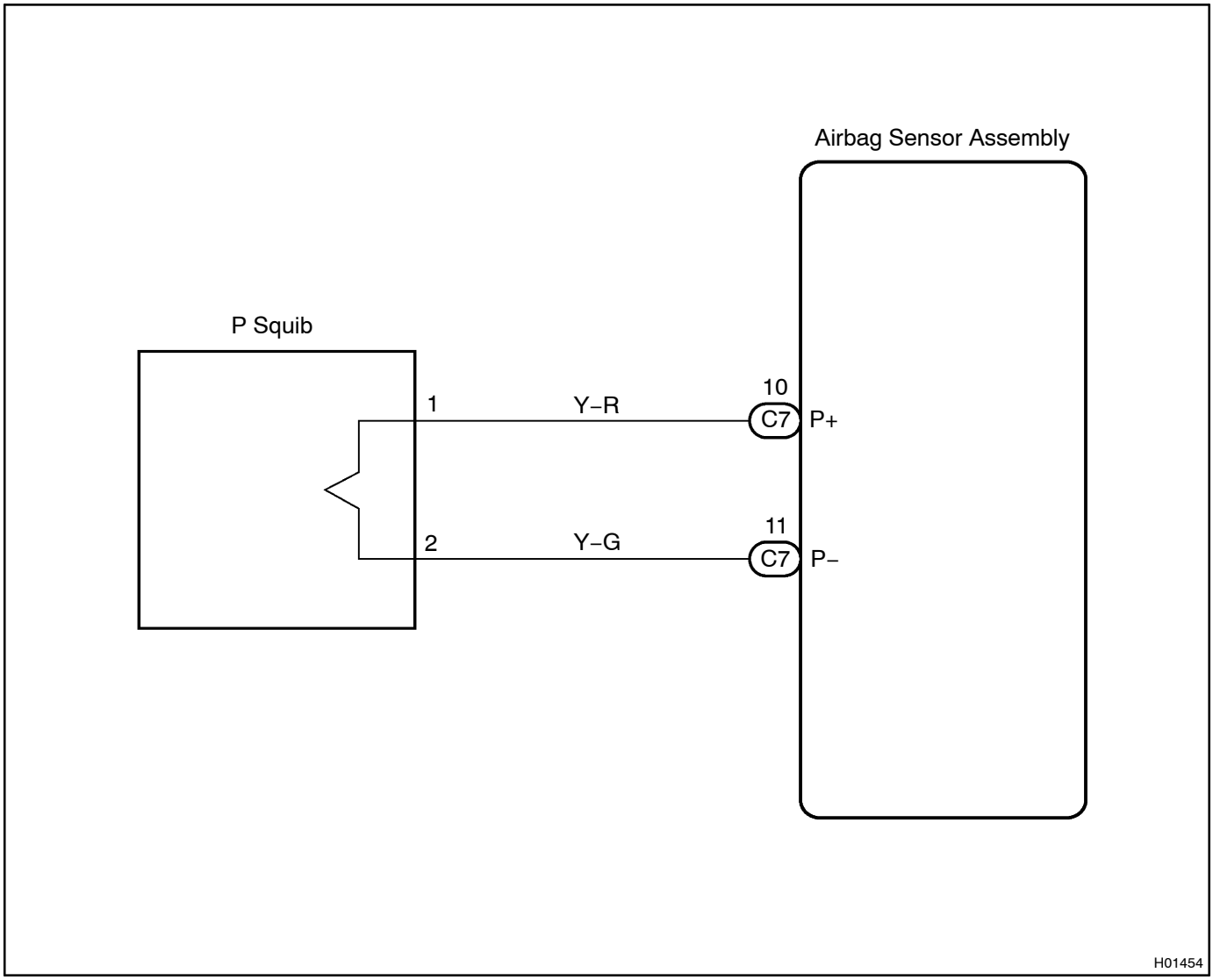
DTC	B0105/53	Short in P Squib Circuit

CIRCUIT DESCRIPTION

The P squib circuit consists of the airbag sensor assembly and front passenger airbag assembly.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0105/53 is recorded when a short is detected in the P squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0105/53	• Short circuit in P squib wire harness • P squib malfunction • Airbag sensor assembly malfunction	• Front passenger airbag assembly (P squib) • Airbag sensor assembly • Wire harness

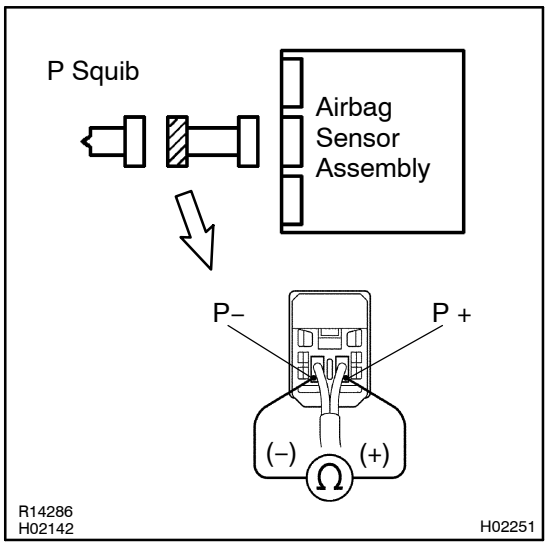
WIRING DIAGRAM



INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check P squib circuit.



PREPARATION:

Release the airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the front passenger airbag assembly and the airbag sensor assembly (See page DI–369).

CHECK:

For the connector (on the front passenger airbag assembly side) between the front passenger airbag assembly and the airbag sensor assembly, measure the resistance between P+ and P–.

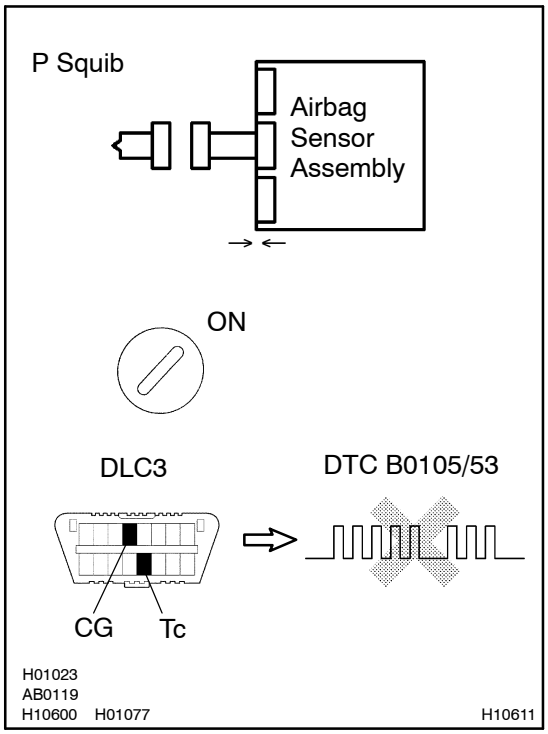
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between front passenger airbag assembly and airbag sensor assembly.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0105/53 is not output.

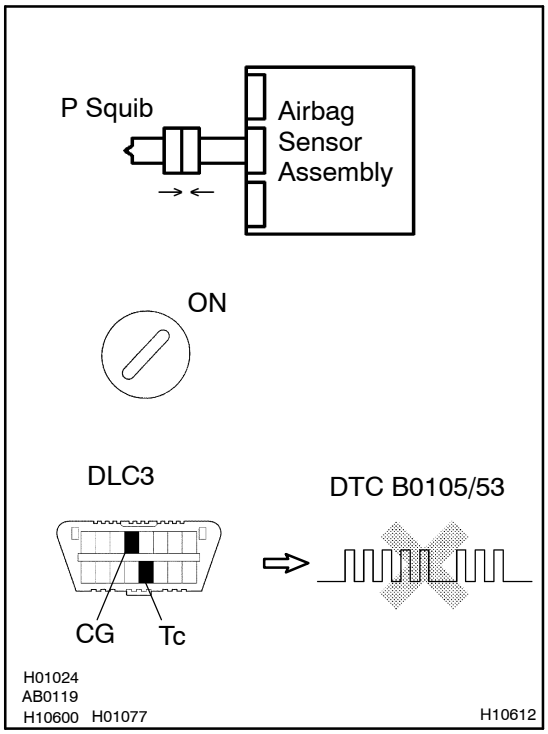
HINT:

Codes other than code B0105/53 may be output at this time, but they are not relevant to this check.

NG	**Replace airbag sensor assembly.**

OK

4	**Check P squib.**



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front passenger airbag assembly connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to LOOK, and wait at least for 20 seconds.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Clear the DTC stored in memory (See page DI–369).
(d) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check the DTC (See page DI–369).

OK:

DTC B0105/53 is not output.

HINT:
Codes other than code B0105/53 may be output at this time, but they are not relevant to this check.

NG → **Replace front passenger airbag assembly.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6P8–04

DTC	B0106/54	Open in P Squib Circuit

CIRCUIT DESCRIPTION

The P squib circuit consists of the airbag sensor assembly and front passenger airbag assembly.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0106/54 is recorded when an open is detected in the P squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0106/54	• Open circuit in P+ wire harness or P– wire harness of squib • P squib malfunction • Airbag sensor assembly malfunction	• Front passenger airbag assembly (P squib) • Airbag sensor assembly • Wire harness

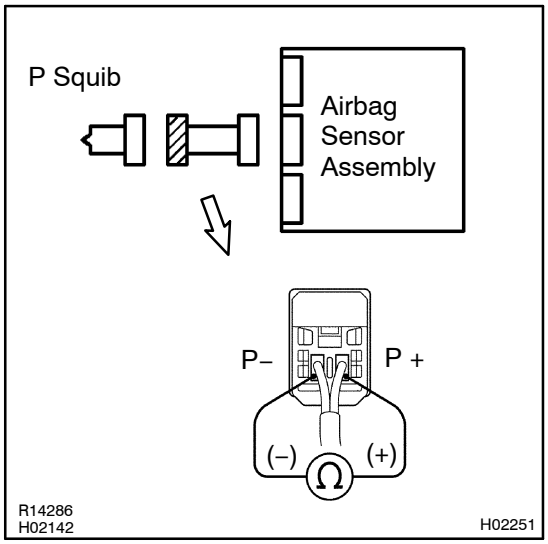
WIRING DIAGRAM

See page DI–399.

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check P squib circuit.



CHECK:

For the connector (on the front passenger airbag assembly side) between the front passenger airbag assembly and the airbag sensor assembly, measure the resistance between P+ and P–.

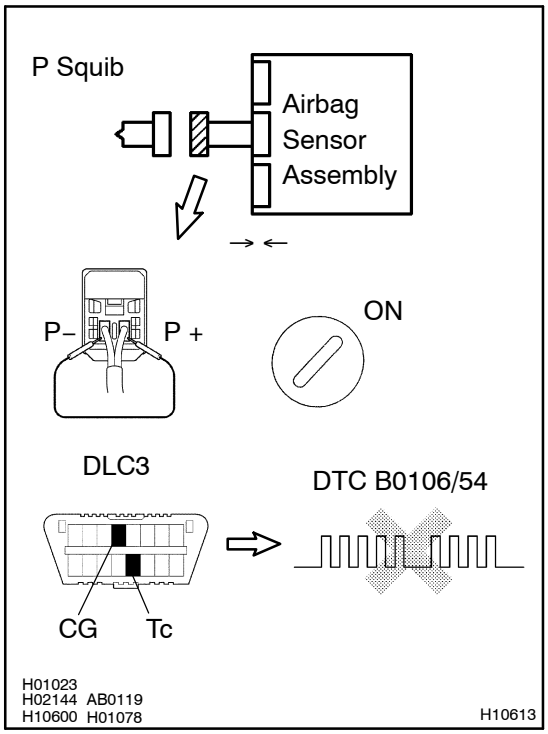
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between front passenger airbag assembly and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect P+ and P– of the connector (on the front passenger airbag assembly side) between the front passenger airbag assembly and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0106/54 is not output.

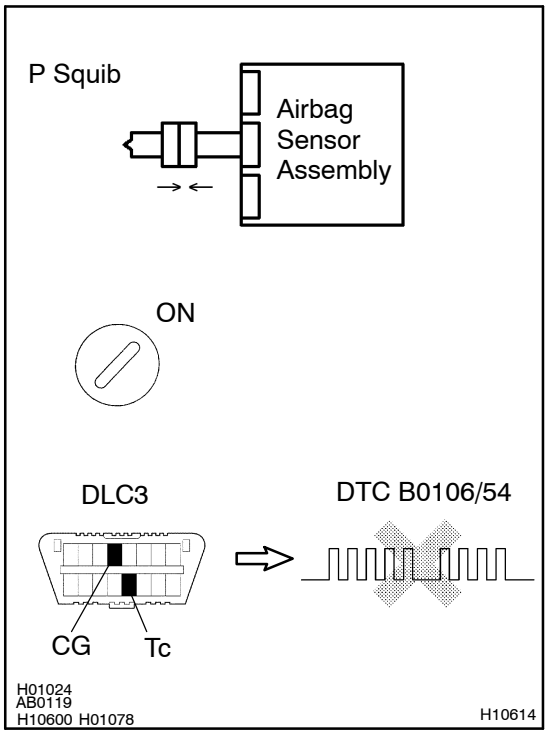
HINT:

Codes other than code B0106/54 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	**Check P squib.**



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front passenger airbag assembly connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0106/54 is not output.

HINT:

Codes other than code B0106/54 may be output at this time, but they are not relevant to this check.

NG → **Replace front passenger airbag assembly.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6P9–04

DTC	B0107/51	Short in P Squib Circuit (to Ground)

CIRCUIT DESCRIPTION

The P squib circuit consists of the airbag sensor assembly and front passenger airbag assembly.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0107/51 is recorded when ground short is detected in the P squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0107/51	• Short circuit in P squib wire harness (to ground) • P squib malfunction • Airbag sensor assembly malfunction	• Front passenger airbag assembly (P squib) • Airbag sensor assembly • Wire harness

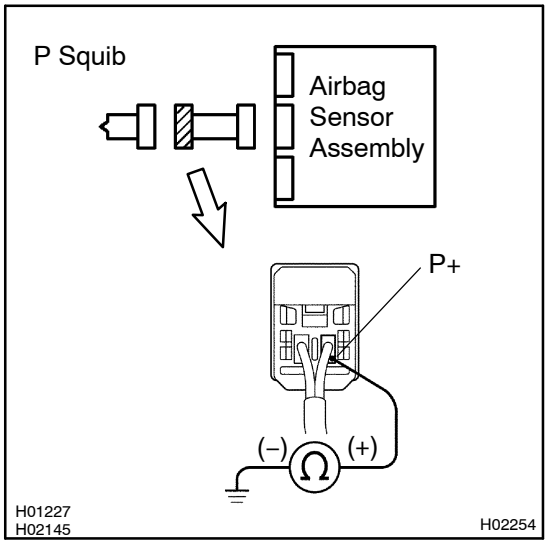
WIRING DIAGRAM

See page DI–399.

INSPECTION PROCEDURE

1	**Prepare for inspection (See step 1 on page DI–540).**

2	**Check P squib circuit.**



CHECK:

For the connector (on the front passenger airbag assembly side) between the front passenger airbag assembly and the airbag sensor assembly, measure the resistance between P+ and body ground.

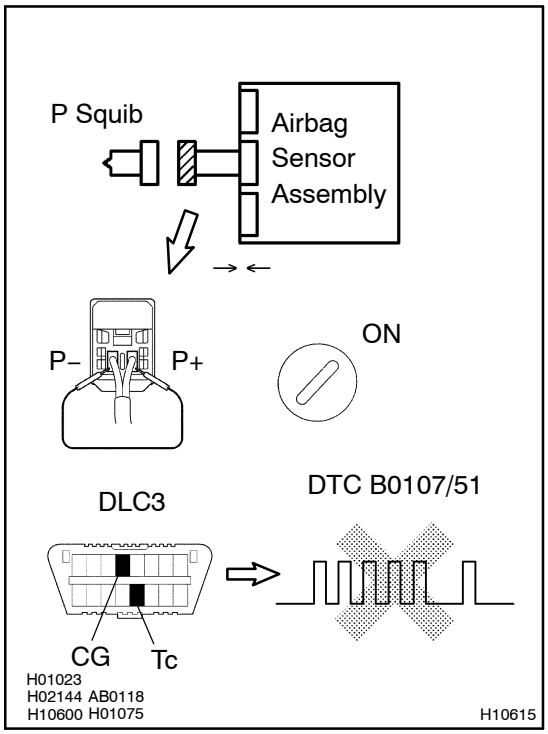
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between front passenger airbag assembly and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect P+ and P– of the connector (on the front passenger airbag assembly side) between the front passenger airbag assembly and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0107/51 is not output.

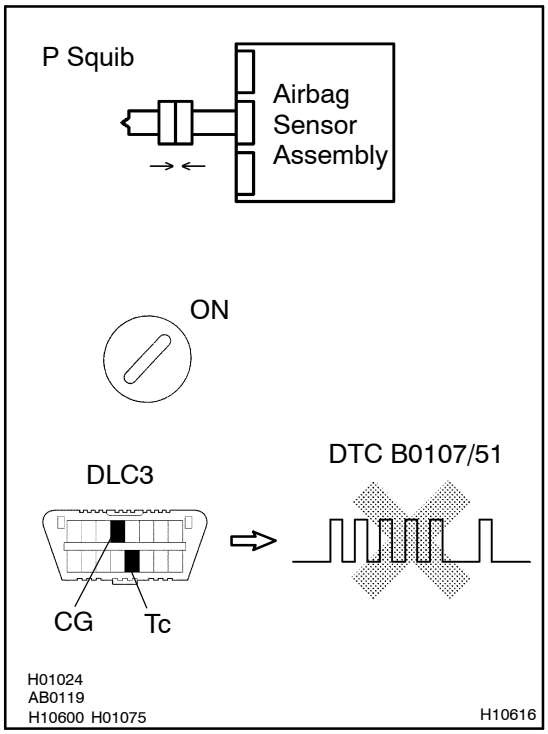
HINT:

Codes other than code B0107/51 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check P squib.



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front passenger airbag assembly connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0107/51 is not output.

HINT:

Codes other than code B0107/51 may be output at this time, but they are not relevant to this check.

NG	Replace front passenger airbag assembly.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI6PA–01

DTC	B0108/52	Short in P Squib Circuit (to B+)

CIRCUIT DESCRIPTION

The P squib circuit consists of the airbag sensor assembly and front passenger airbag assembly.
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0108/52 is recorded when a B+ short is detected in the P squib circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0108/52	• Short circuit in P squib wire harness (to B+) • P squib malfunction • Airbag sensor assembly malfunction	• Front passenger airbag assembly (P squib) • Airbag sensor assembly • Wire harness

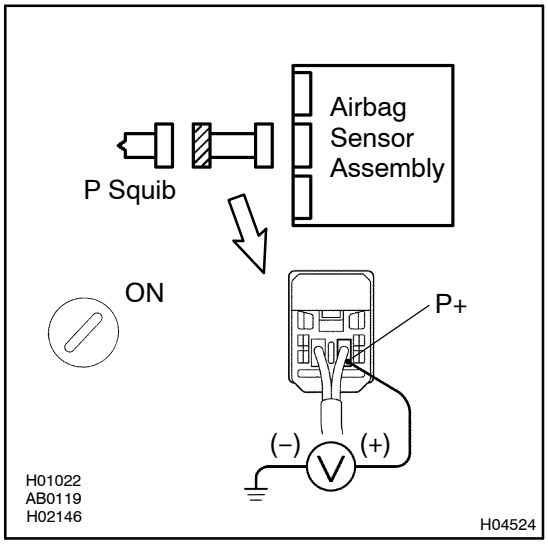
WIRING DIAGRAM

See page DI–399.

INSPECTION PROCEDURE

1	**Prepare for inspection (See step 1 on page DI–540).**

2	**Check P squib circuit.**



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the front passenger airbag assembly side) between the front passenger airbag assembly and the airbag sensor assembly, measure the voltage between the P+ and body ground.

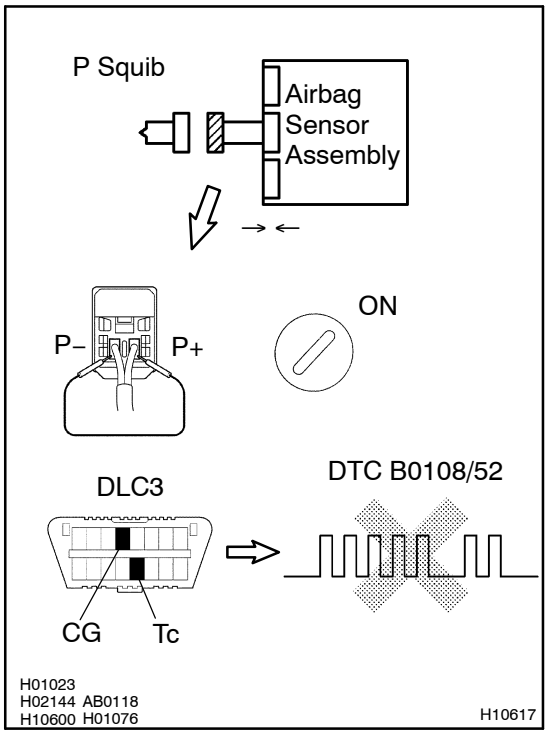
OK:

Voltage: 0 V

NG → **Repair or replace harness or connector between front passenger airbag assembly and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect P+ and P– of the connector (on the front passenger airbag assembly side) between the front passenger airbag assembly and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0108/52 is not output.

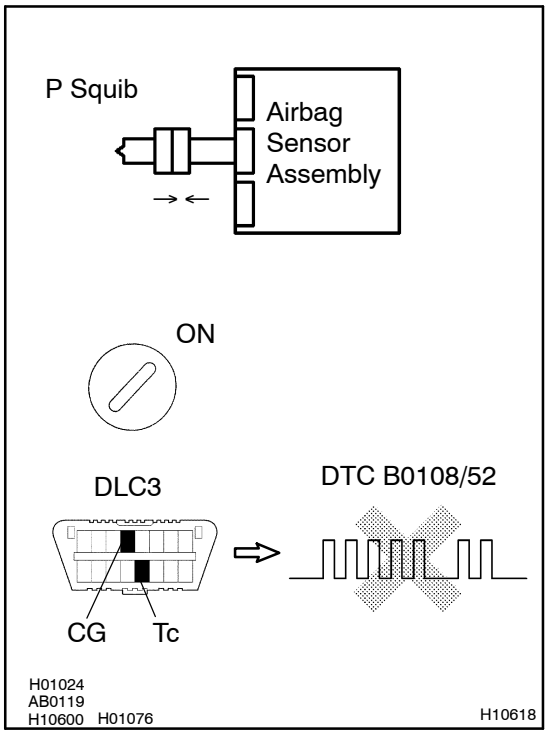
HINT:

Codes other than code B0108/52 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check P squib.



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front passenger airbag assembly connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0108/52 is not output.

HINT:

Codes other than code B0108/52 may be output at this time, but they are not relevant to this check.

NG	Replace front passenger airbag assembly.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI6PB-06

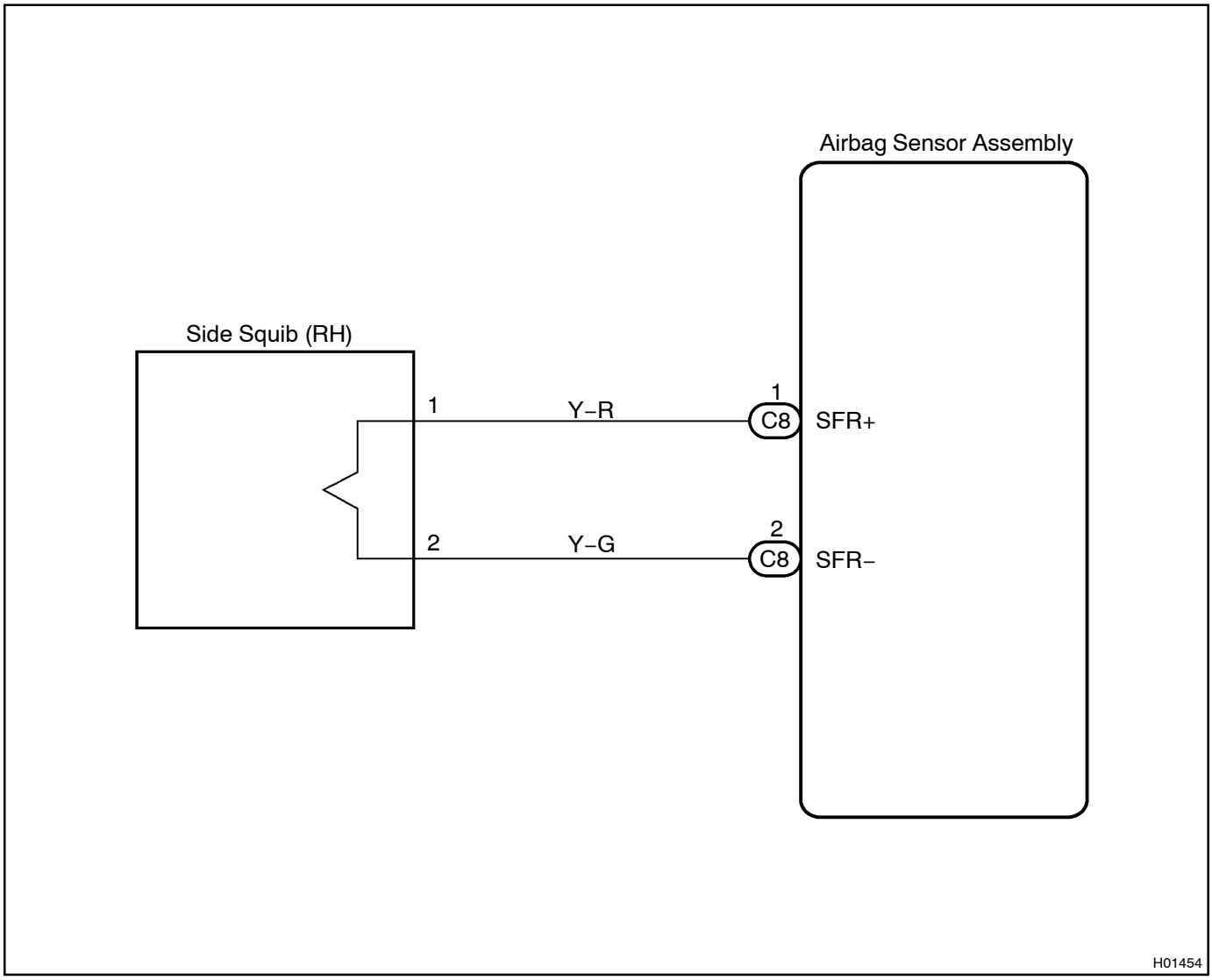
DTC	B0110/43	Short in Side Squib (RH) Circuit

CIRCUIT DESCRIPTION

The side squib (RH) circuit consists of the airbag sensor assembly and side airbag assembly (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0110/43 is recorded when a short is detected in the side squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0110/43	• Short circuit between SFR+ wire harness and SFR– wire harness of squib • Side squib (RH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (RH) • Airbag sensor assembly • Wire harness

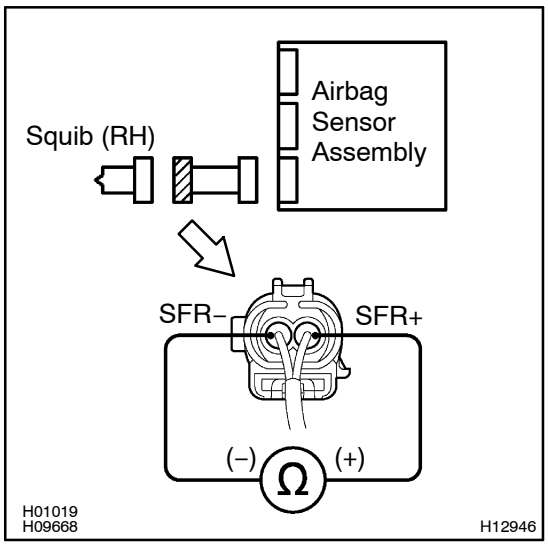
WIRING DIAGRAM



INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check side squib (RH) circuit.



PREPARATION:

Release the airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the side airbag assembly (RH) (See page DI–369).

CHECK:

For the connector (on the side airbag assembly side) between the side airbag assembly (RH) and the airbag sensor assembly, measure the resistance between SFR+ and SFR–.

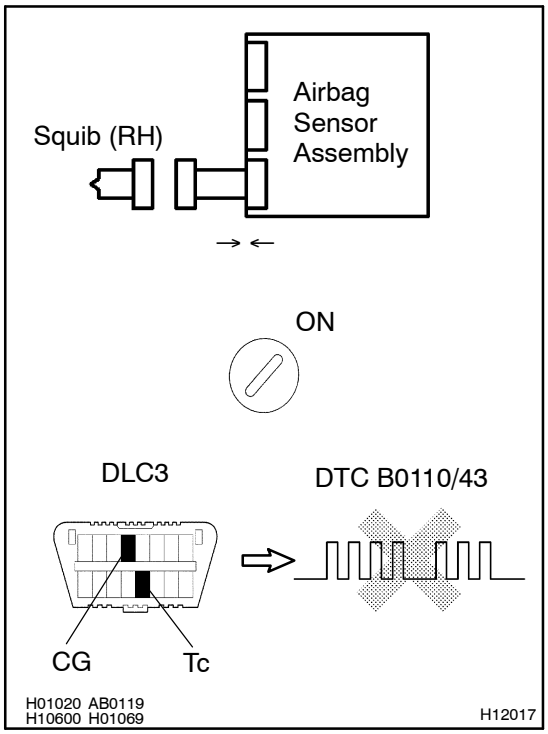
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between side airbag assembly (RH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch or ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0110/43 is not output.

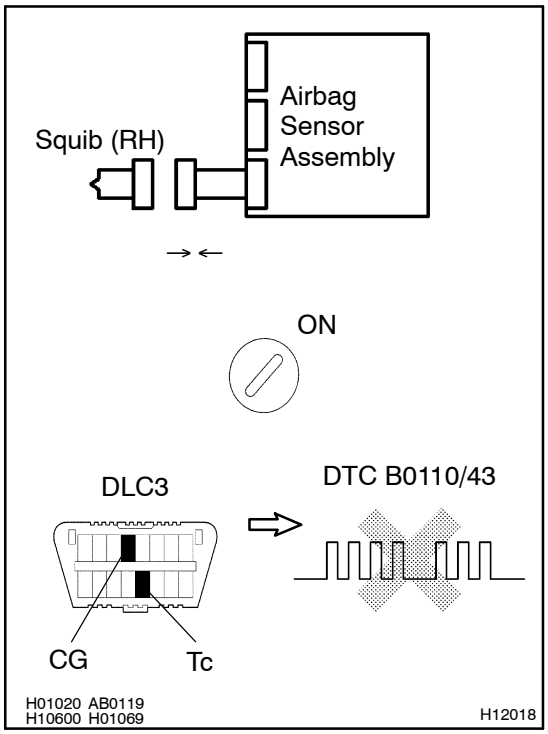
HINT:

Codes other than code B0110/43 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check side squib (RH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to LOOK, and wait at least for 20 second.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Clear the DTC stored in memory (See page DI–369).
(d) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check the DTC (See page DI–369).

OK:

DTC B0110/43 is not output.

HINT:
Codes other than code B0110/43 may be output at this time, but they are not relevant to this check.

NG → **Replace side airbag assembly (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6PC–04

DTC	B0111/44	Open in Side Squib (RH) Circuit

CIRCUIT DESCRIPTION

The side squib (RH) circuit consists of the airbag sensor assembly and side airbag assembly (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0111/44 is recorded when an open is detected in the side squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0111/44	• Open circuit in SFR+ wire harness or SFR– wire harness of squib • Side squib (RH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (RH) • Airbag sensor assembly • Wire harness

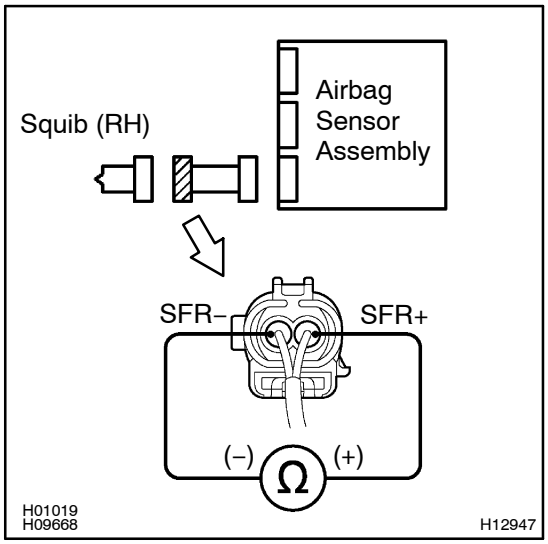
WIRING DIAGRAM

See page DI–412.

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check front side squib (RH) circuit.



CHECK:

For the connector (on the front side airbag assembly side) between the front side airbag assembly (RH) and the airbag sensor assembly, measure the resistance between SFR+ and SFR–.

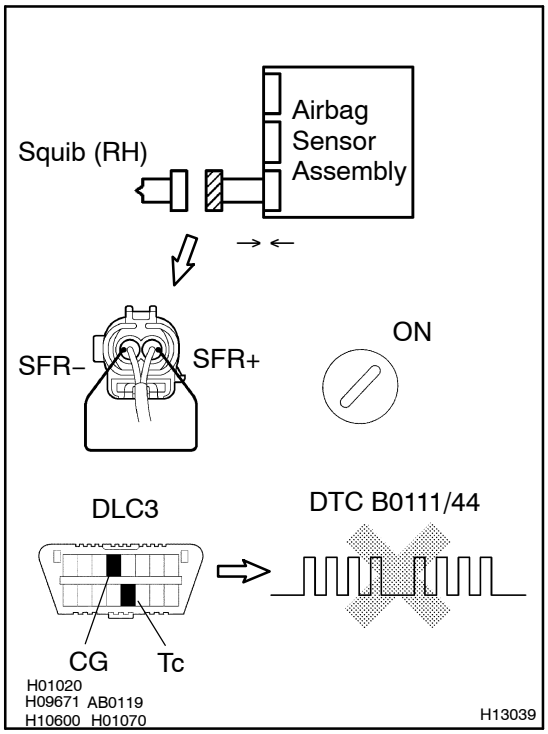
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between side airbag assembly (RH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect SFR+ and SFR– of the connector (on the side airbag assembly side) between the side airbag assembly (RH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0111/44 is not output.

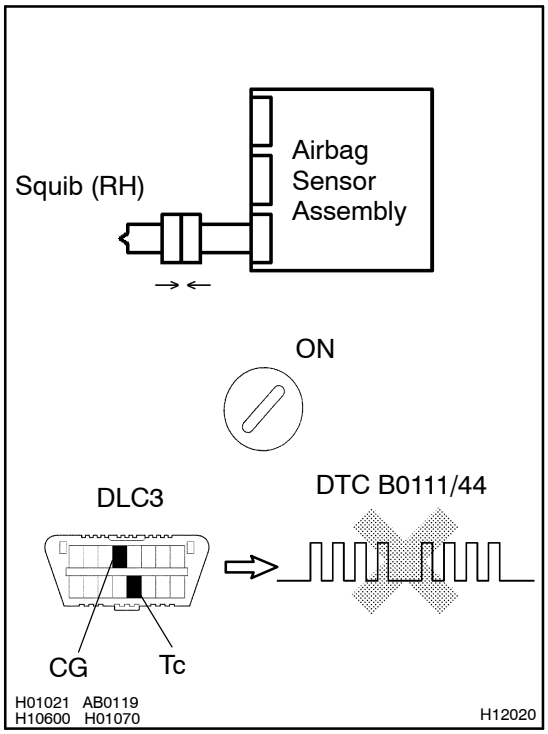
HINT:

Codes other than code B0111/44 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check side squib (RH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front side airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to or ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0111/44 is not output.

HINT:

Codes other than code B0111/44 may be output at this time, but they are not relevant to this check.

NG	Replace side airbag assembly (RH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6PD–04

DTC	B0112/41	Short in Side Squib (RH) Circuit (to Ground)

CIRCUIT DESCRIPTION

The side squib (RH) circuit consists of the airbag sensor assembly and side airbag assembly (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0112/41 is recorded when ground short is detected in the side squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0112/41	• Short circuit in side squib (RH) wire harness (to ground) • Side squib (RH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (RH) • Airbag sensor assembly • Wire harness

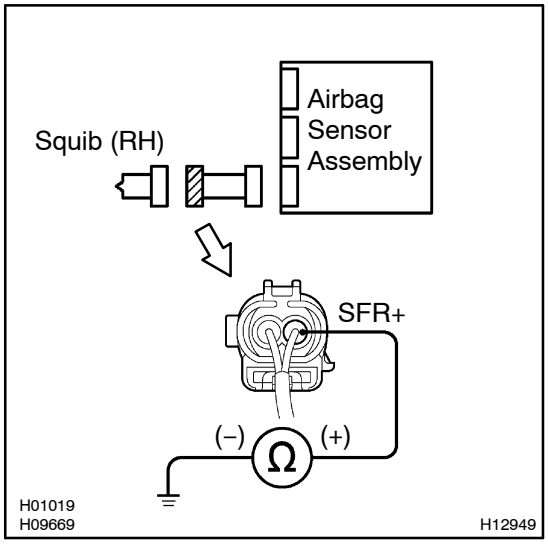
WIRING DIAGRAM

See page DI–412.

INSPECTION PROCEDURE

1	**Prepare for inspection (See step 1 on page DI–540).**

2	**Check side squib (RH) circuit.**



CHECK:

For the connector (on the side airbag assembly side) between the side airbag assembly (RH) and the airbag sensor assembly, measure the resistance between SFR+ and body ground.

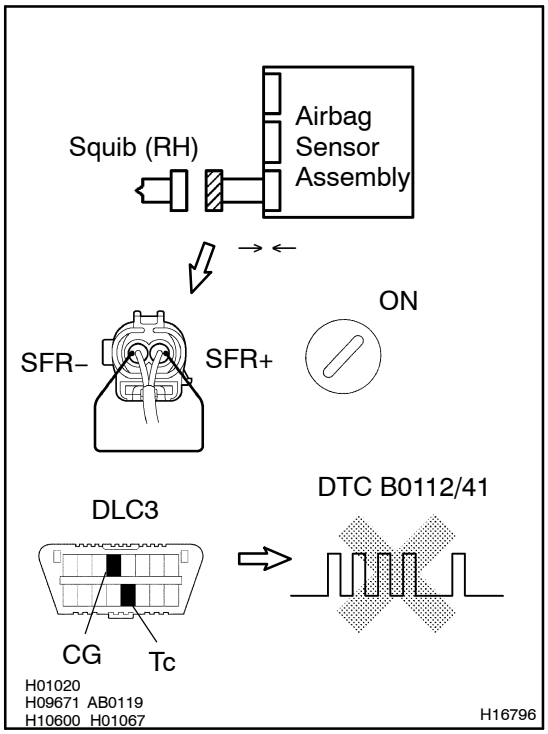
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between side airbag assembly (RH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect SFR+ and SFR– of the connector (on the side airbag assembly side) between the side airbag assembly (RH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0112/41 is not output.

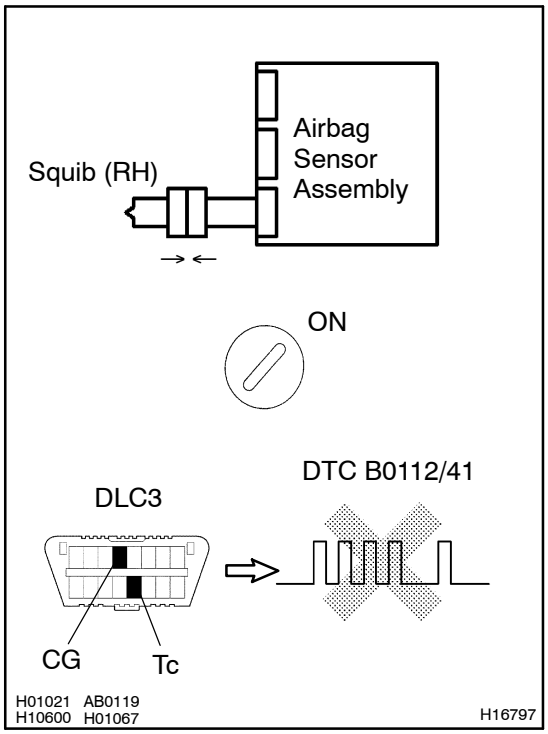
HINT:

Codes other than code B0112/41 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check side squib (RH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0112/41 is not output.

HINT:

Codes other than code B0112/41 may be output at this time, but they are not relevant to this check.

NG	Replace side airbag assembly (RH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI6PE-04

DTC	B0113/42	Short in Side Squib (RH) Circuit (to B+)

CIRCUIT DESCRIPTION

The side squib (RH) circuit consists of the airbag sensor assembly and side airbag assembly (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0113/42 is recorded when a B+ short is detected in the side squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0113/42	• Short circuit in side squib (RH) wire harness (to B+) • Side squib (RH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (RH) • Airbag sensor assembly • Wire harness

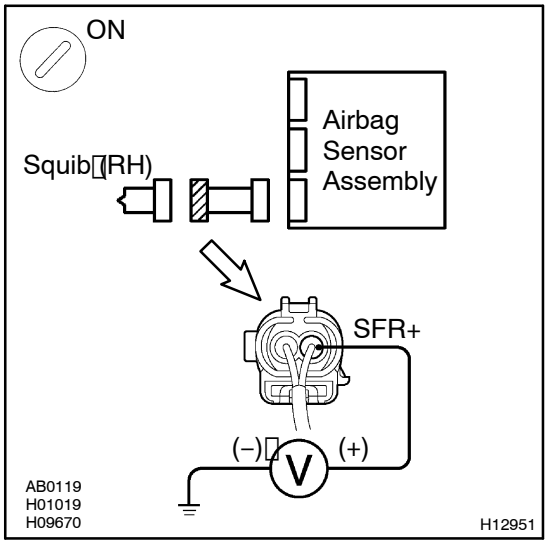
WIRING DIAGRAM

See page DI–412.

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–369).

2	Check side squib (RH) circuit.



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the airbag sensor assembly side) between the side airbag assembly (RH) and the airbag sensor assembly, measure the voltage between SFR+ and body ground.

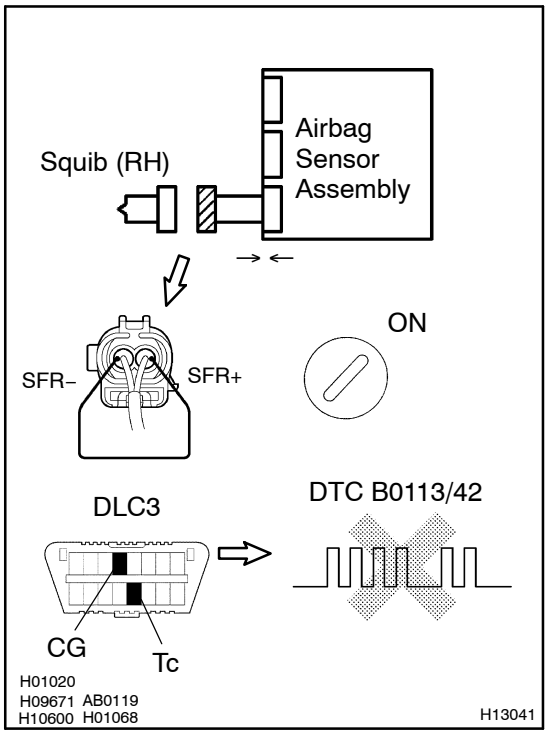
OK:

Voltage: 0 V

NG	Repair or replace harness or connector between side airbag assembly (RH) and airbag sensor assembly.

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect SFR+ and SFR– of the connector (on the front side airbag assembly side) between the front side airbag assembly (RH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0113/42 is not output.

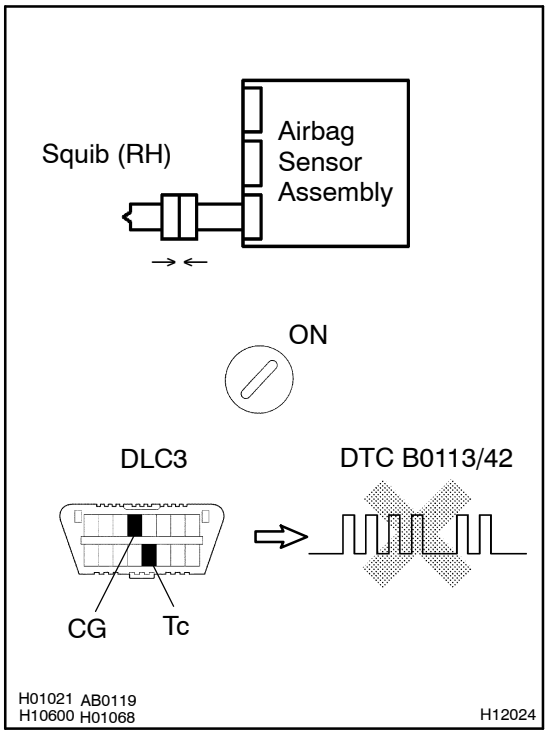
HINT:

Codes other than code B0113/42 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check side squib (RH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front side airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0113/42 is not output.

HINT:

Codes other than code B0113/42 may be output at this time, but they are not relevant to this check.

NG	Replace side airbag assembly (RH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI6PF–06

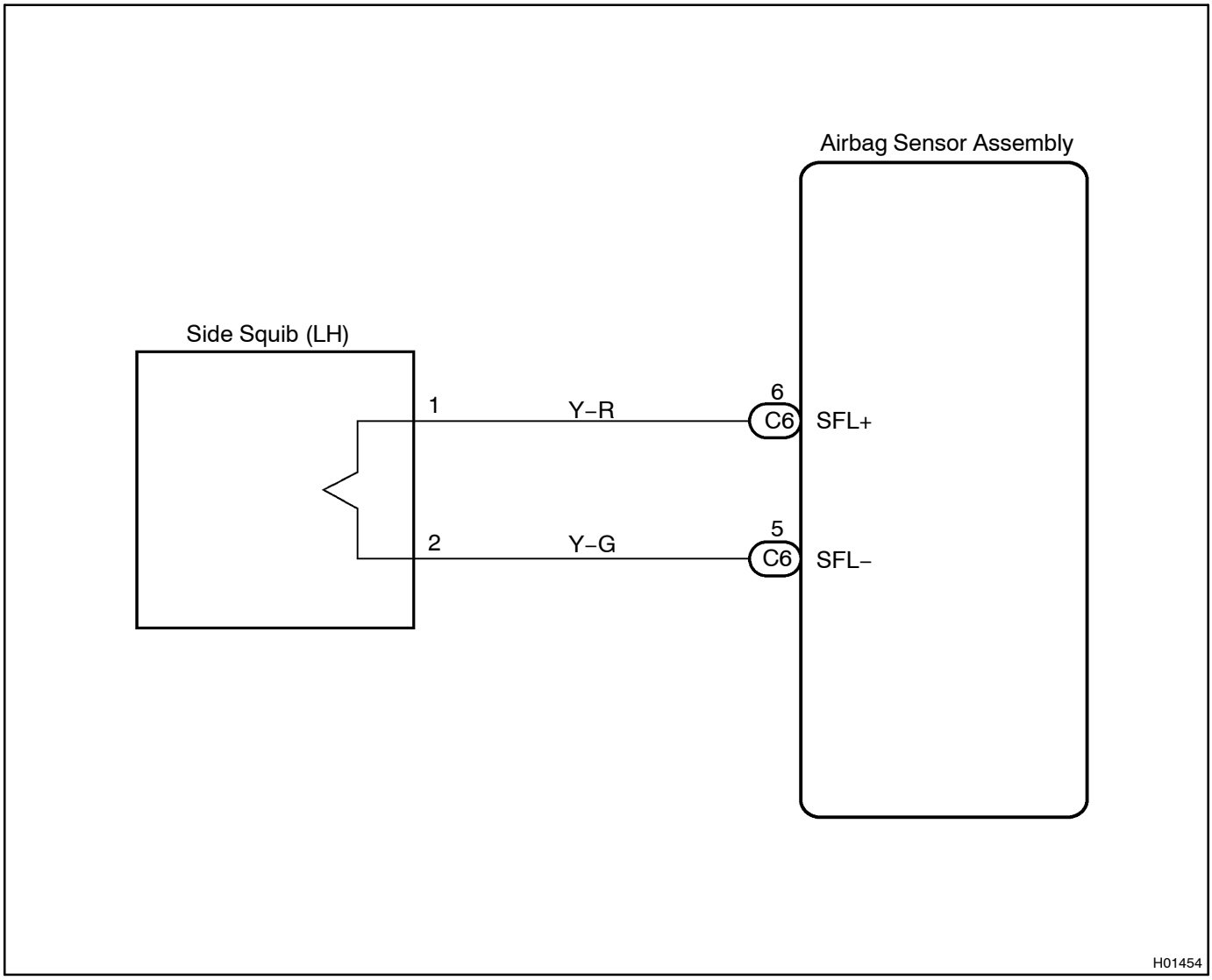
DTC	B0115/47	Short in Side Squib (LH) Circuit

CIRCUIT DESCRIPTION

The side squib (LH) circuit consists of the airbag sensor assembly and side airbag assembly (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0115/47 is recorded when a short is detected in the side squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0115/47	• Short circuit between SFL+ wire harness and SFL– wire harness of squib • Side squib (LH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (LH) • Airbag sensor assembly • Wire harness

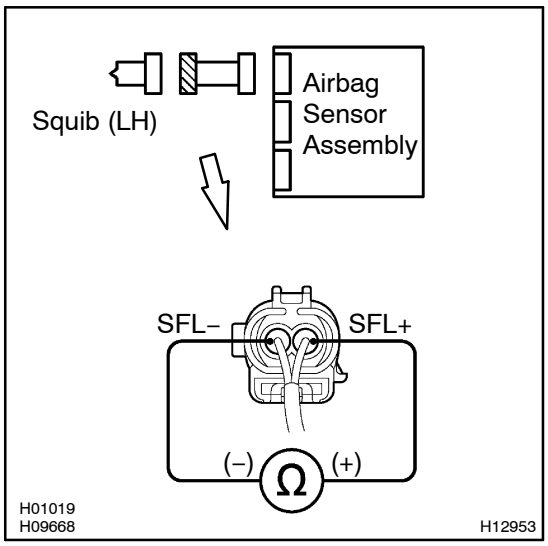
WIRING DIAGRAM



INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check side squib (LH) circuit.



PREPARATION:

Release the airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the side airbag assembly (LH) (See page DI–369).

CHECK:

For the connector (on the side airbag assembly side) between the side airbag assembly (LH) and the airbag sensor assembly, measure the resistance between SFL+ and SFL–.

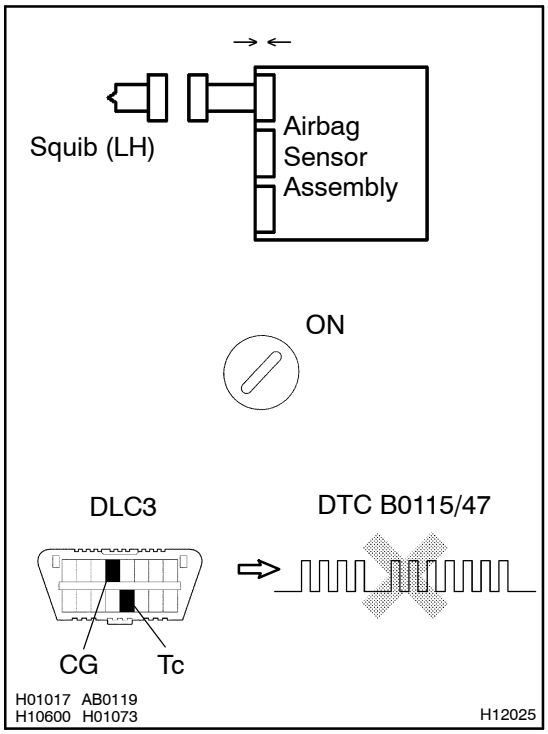
OK:

Resistance: 1 MΩ or Higher

NG	**Repair or replace harness or connector between side airbag assembly (LH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch or ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0115/47 is not output.

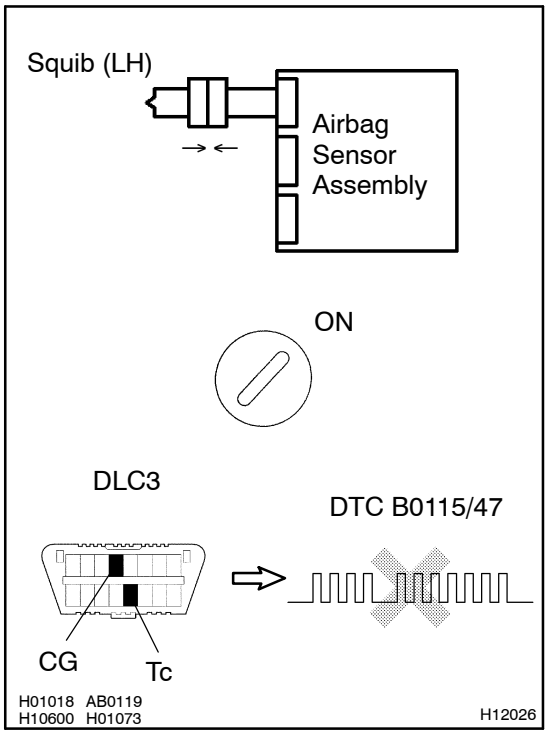
HINT:

Codes other than code B0115/47 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check side squib (LH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front side airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to LOOK, and wait at least for 20 second.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Clear the DTC stored in memory (See page DI–369).
(d) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check the DTC (See page DI–369).

OK:

DTC B0115/47 is not output.

HINT:
Codes other than code B0115/47 may be output at this time, but they are not relevant to this check.

NG	Replace side airbag assembly (LH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6PG–04

DTC	B0116/48	Open in Side Squib (LH) Circuit

CIRCUIT DESCRIPTION

The side squib (LH) circuit consists of the airbag sensor assembly and side airbag assembly (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0116/48 is recorded when an open is detected in the side squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0116/48	• Open circuit in SFL+ wire harness or SFL– wire harness of squib • Side squib (LH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (LH) • Airbag sensor assembly • Wire harness

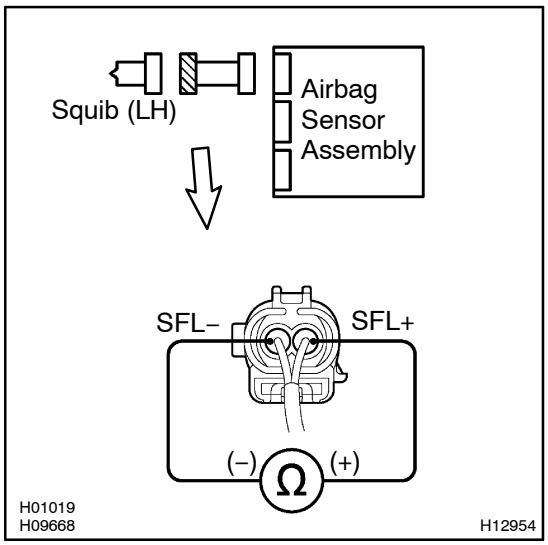
WIRING DIAGRAM

See page DI–425.

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check side squib (LH) circuit.



CHECK:

For the connector (on the front side airbag assembly side) between the front side airbag assembly (LH) and the airbag sensor assembly, measure the resistance between SFL+ and SFL–.

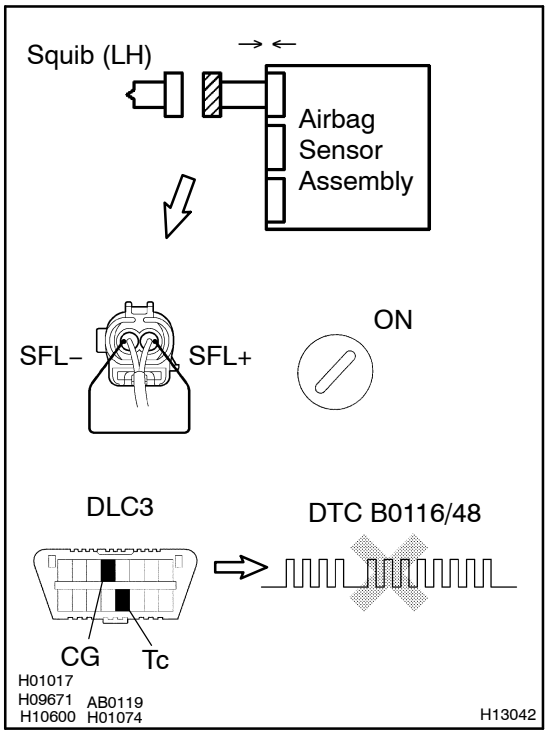
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between side airbag assembly (LH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect SFL+ and SFL– of the connector (on the side airbag assembly side) between the side airbag assembly (LH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0116/48 is not output.

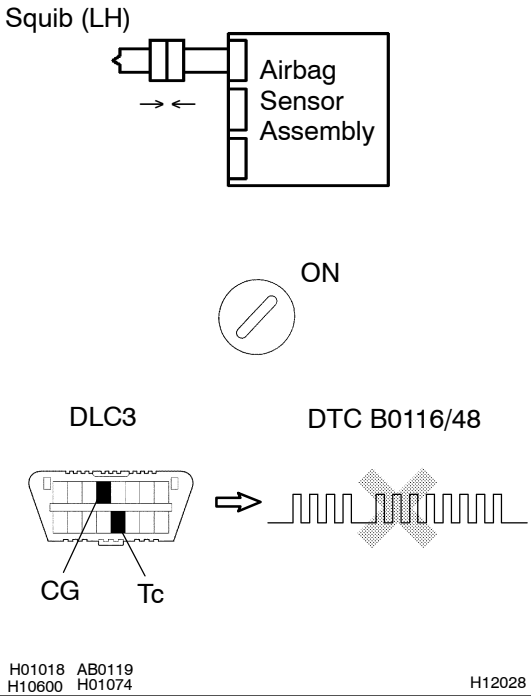
HINT:

Codes other than code B0116/48 may be output at this time, but they are not relevant to this check.

NG	Replace side airbag sensor assembly.

OK

4	Check side squib (LH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0116/48 is not output.

HINT:

Codes other than code B0116/48 may be output at this time, but they are not relevant to this check.

NG	Replace side airbag assembly (LH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6PH–04

DTC	B0117/45	Short in Side Squib (LH) Circuit (to Ground)

CIRCUIT DESCRIPTION

The side squib (LH) circuit consists of the airbag sensor assembly and side airbag assembly (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0117/45 is recorded when ground short is detected in the side squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0117/45	• Short circuit in side squib (LH) wire harness (to ground) • Side squib (LH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (LH) • Airbag sensor assembly • Wire harness

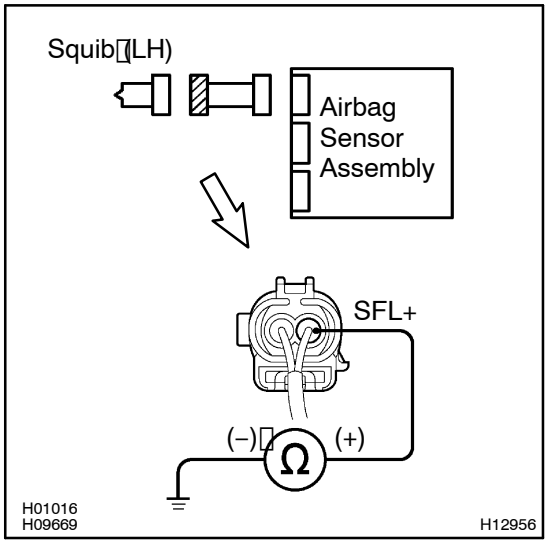
WIRING DIAGRAM

See page DI–425.

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check side squib (LH) circuit.



CHECK:

For the connector (on the side airbag assembly side) between the side airbag assembly (LH) and the airbag sensor assembly, measure the resistance between SFL+ and body ground.

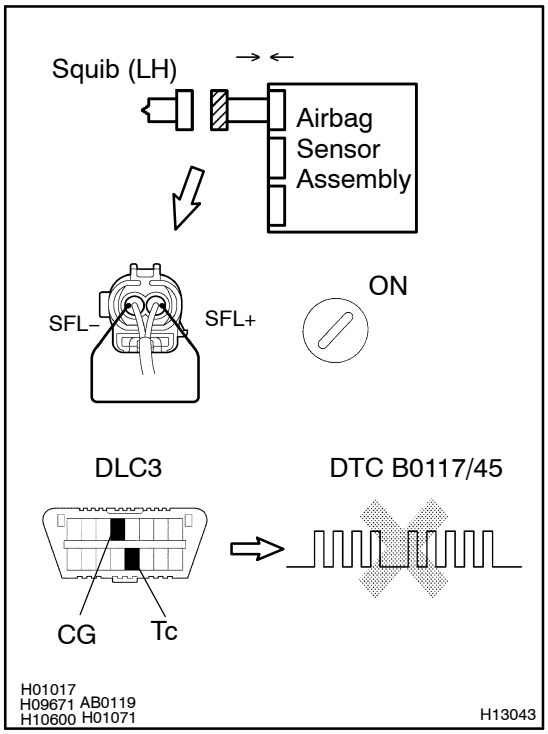
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between side airbag assembly (LH) and airbag sensor assembly.**

OK

3	**Check airbag sensor assembly.**



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect SFL+ and SFL– of the connector (on the side airbag assembly side) between the side airbag assembly (LH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0117/45 is not output.

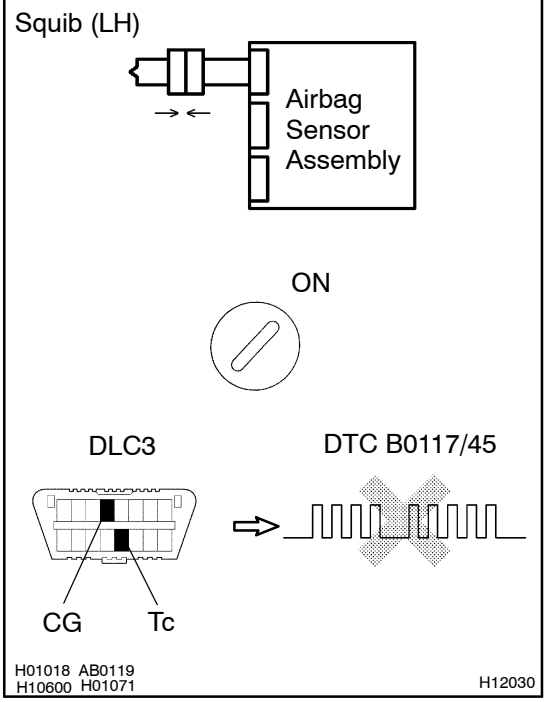
HINT:

Codes other than code B0117/45 may be output at this time, but they are not relevant to this check.

NG	**Replace airbag sensor assembly.**

OK

4	Check side squib (LH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front side airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0117/45 is not output.

HINT:

Codes other than code B0117/45 may be output at this time, but they are not relevant to this check.

NG	Replace front side airbag assembly (LH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI6PI–04

DTC	B0118/46	Short in Side Squib (LH) Circuit (to B+)

CIRCUIT DESCRIPTION

The side squib (LH) circuit consists of the airbag sensor assembly and side airbag assembly (LH). It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0118/46 is recorded when a B+ short is detected in the side squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0118/46	• Short circuit in side squib (LH) wire harness (to B+) • Side squib (LH) malfunction • Airbag sensor assembly malfunction	• Side airbag assembly (LH) • Airbag sensor assembly • Wire harness

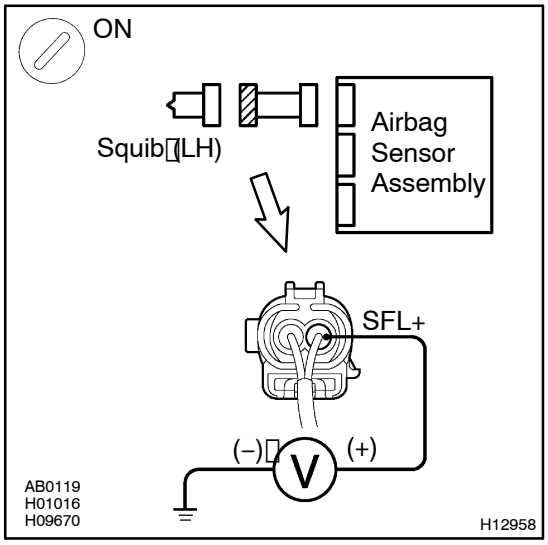
WIRING DIAGRAM

See page DI–425.

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check side squib (LH) circuit.



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the side airbag assembly side) between the side airbag assembly (LH) and the airbag sensor assembly, measure the voltage between SFL+ and body ground.

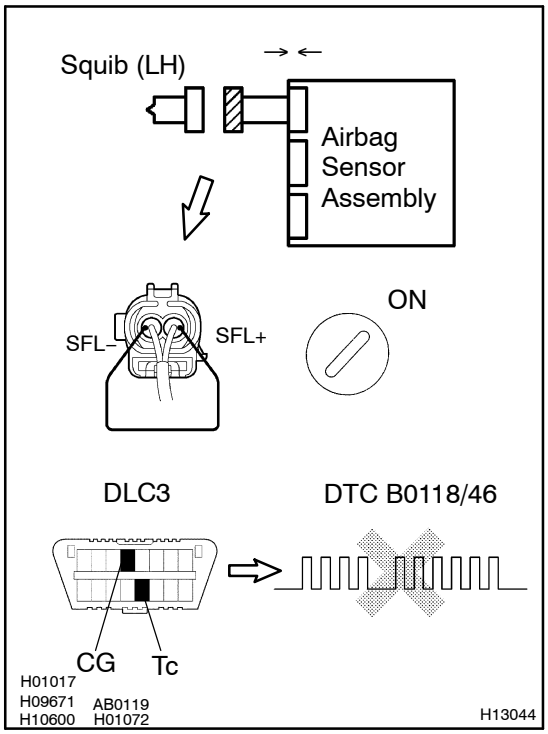
OK:

Voltage: 0 V

NG → **Repair or replace harness or connector between side airbag assembly (LH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect SFL+ and SFL– of the connector (on the side airbag assembly side) between the side airbag assembly (LH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0118/46 is not output.

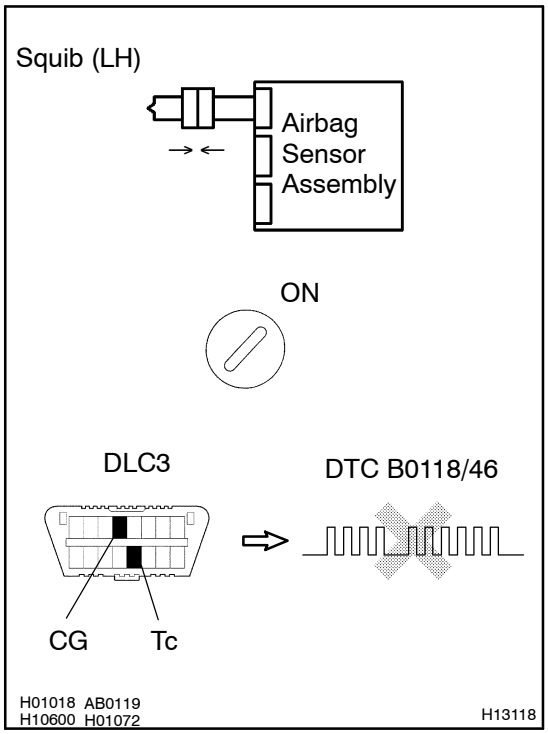
HINT:

Codes other than code B0118/46 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check side squib (LH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0118/46 is not output.

HINT:

Codes other than code B0118/46 may be output at this time, but they are not relevant to this check.

NG	Replace side airbag assembly (LH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI85V–01

DTC	B0121/B0122/26	Seat Belt Buckle Switch (RH) Malfunction (LHD Only)

CIRCUIT DESCRIPTION

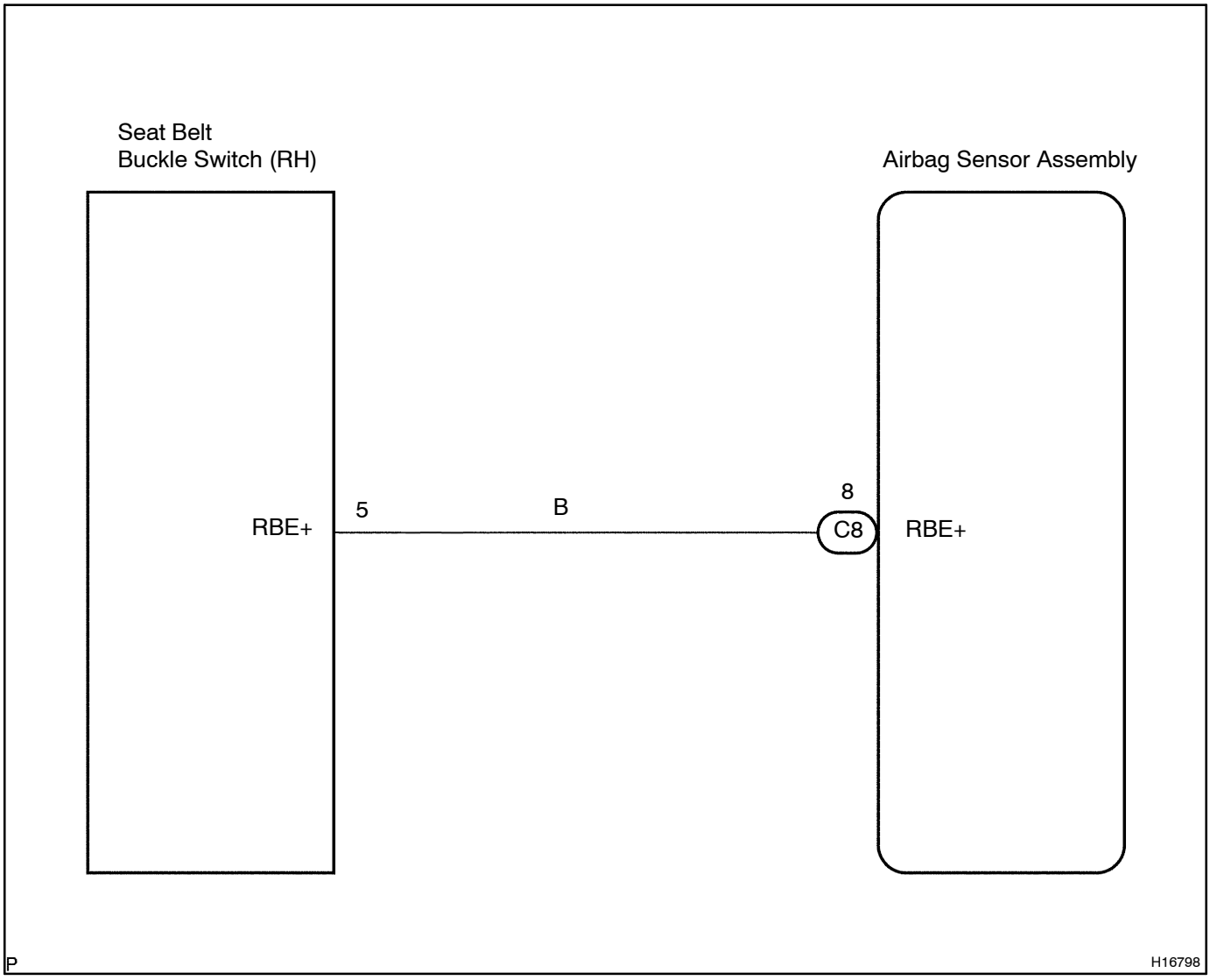
The seat belt buckle switch (RH) circuit consists of the airbag sensor assembly and seat belt buckle switch (RH).

For details of the function of each component, see OPERATION on page RS–2.

DTC B0121/B0122/26 is recorded when a malfunction is detected in the seat belt buckle switch (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0121/B0122/26	• Seat belt buckle switch (RH) circuit	• Seat belt buckle switch (RH) • Airbag sensor assembly • Wire harness

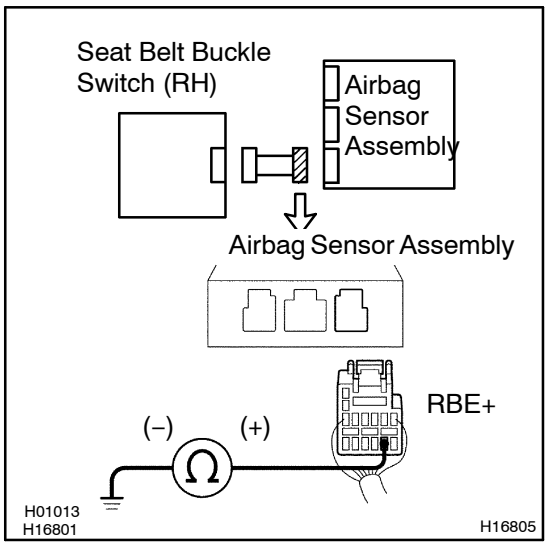
WIRING DIAGRAM



INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–369).

2	Check wire harness (to ground).



CHECK:

For the connector (on the airbag sensor assembly side) between the seat belt buckle switch (RH) and the airbag sensor assembly, measure the resistance between RBE+ and body ground.

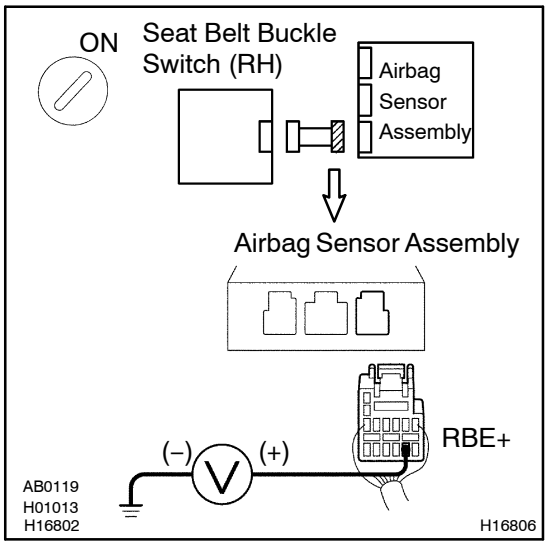
OK:

Resistance: 1 MΩ or Higher

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

OK

3	Check wire harness (to B+).



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the airbag sensor assembly side) between the seat belt, buckle switch (RH) and the airbag sensor assembly, measure the voltage between RBE+ and body ground.

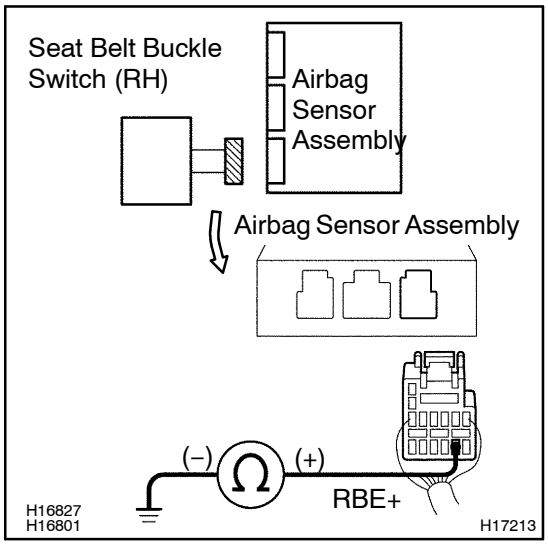
OK:

Resistance: Below 1 V

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

OK

4	Check seat belt buckle switch (RH).



PREPARATION:

(a) Connect the connector of the seat belt buckle switch (RH).

(b) Unlock the seat belt for the front passenger's seat.

CHECK:

For the connector (on the airbag sensor assembly side), measure the resistance between RBE+ and body ground.

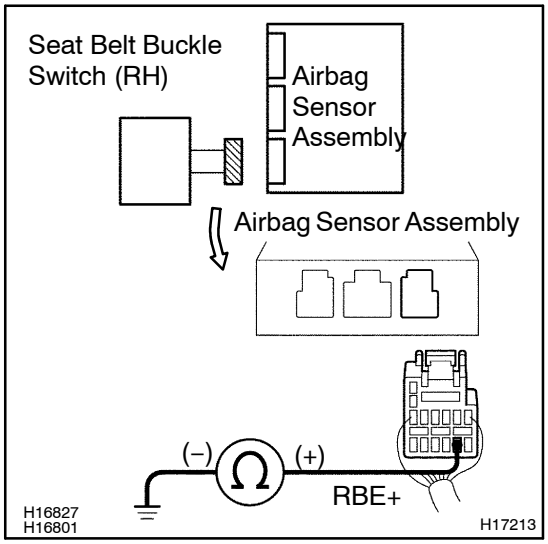
OK:

Resistance: 1.0 kΩ – 1.6 kΩ

NG → **Replace front seat inner belt (RH).**

OK

5	Check seat belt buckle switch (RH).



PREPARATION:

Lock the seat belt for the front passenger's seat.

CHECK:

For the connector (on the airbag sensor assembly side), measure the resistance between RBE+ and body ground.

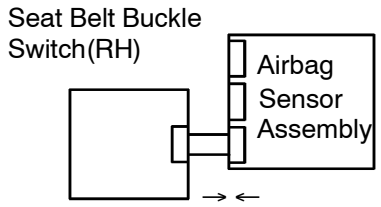
OK:

Resistance: 100 Ω – 500 Ω

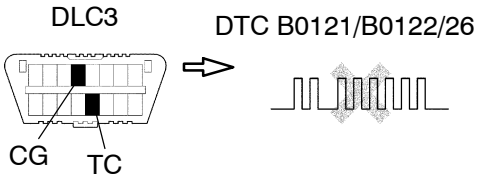
NG → **Replace front seat inner belt (RH).**

OK

6	Check airbag sensor assembly.







H01012
AB0119
H10600 H16822
H16807

PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the connector to the airbag assembly.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0121/B0122/26 is not output.

HINT:

Codes other than code B0121/B0122/26 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI85W–01

DTC	B0126/B0127/27	Seat Belt Buckle Switch (LH) Malfunction (RHD Only)

CIRCUIT DESCRIPTION

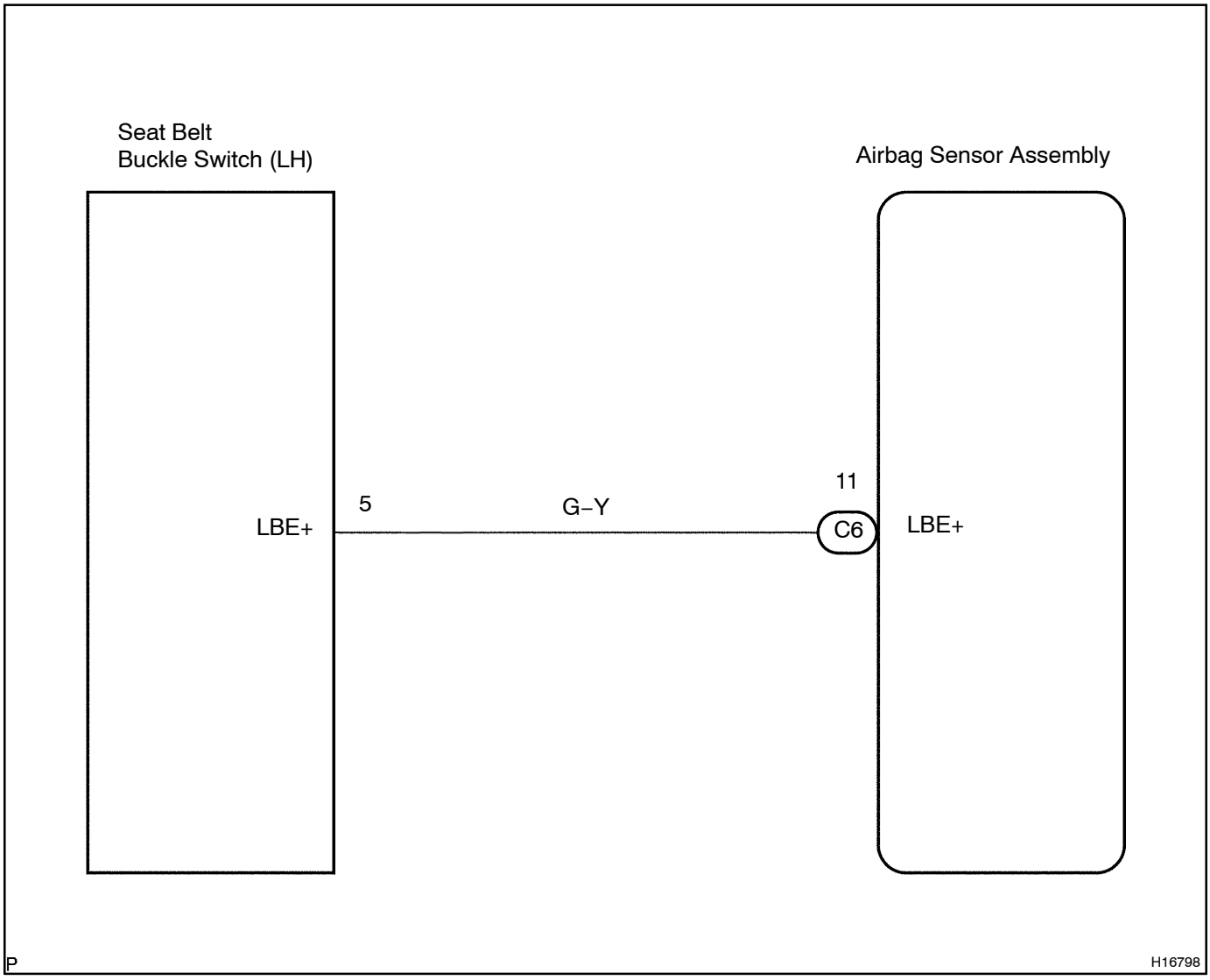
The seat belt buckle switch (LH) circuit consists of the airbag sensor assembly and seat belt buckle switch (LH).

For details of the function of each component, see OPERATION on page RS–2.

DTC B0126/B0127/27 is recorded when a malfunction is detected in the seat belt buckle switch (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0126/B0127/27	• Seat belt buckle switch (LH) circuit	• Seat belt buckle switch (LH) • Airbag sensor assembly • Wire harness

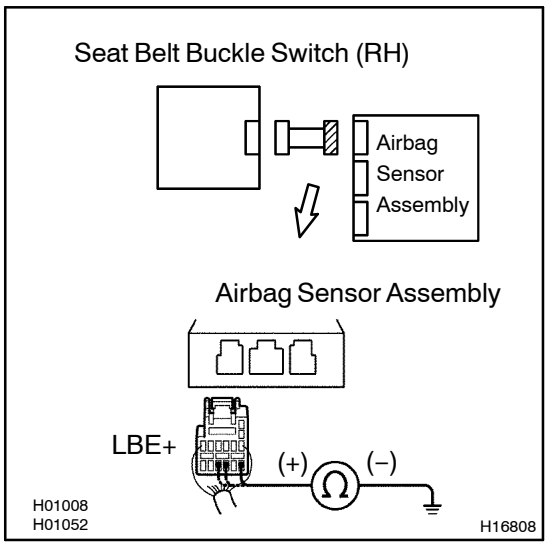
WIRING DIAGRAM



INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–369).

2	Check wire harness (to ground).



CHECK:

For the connector (on the airbag sensor assembly side) between the seat belt buckle switch (LH) and the airbag sensor assembly, measure the resistance between LBE+ and body ground.

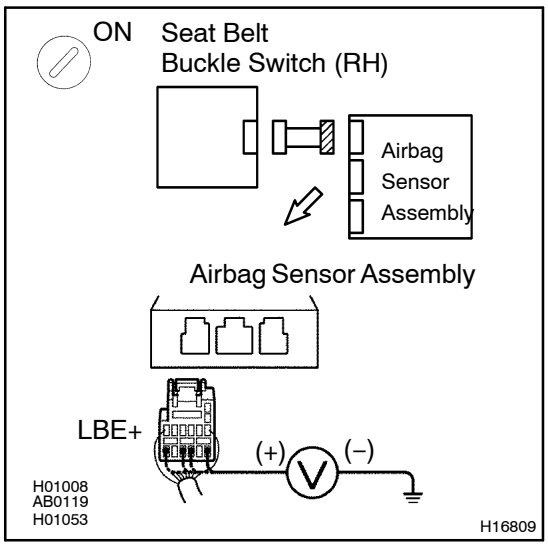
OK:

Resistance: 1 MΩ or Higher

NG	Repair or replace wire harness.

OK

3	Check wire harness (to B+).



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the airbag sensor assembly side) between the seat belt, buckle switch (LH) and the airbag sensor assembly, measure the voltage between LBE+ and body ground.

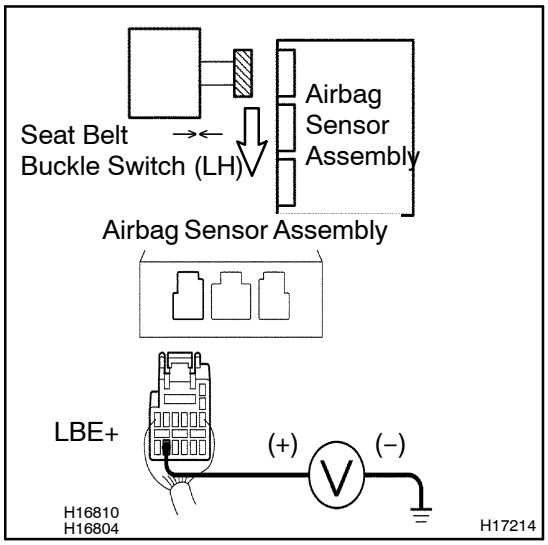
OK:

Resistance: Below 1 V

NG	Repair or replace wire harness.

OK

4	Check seat belt buckle switch (LH).



PREPARATION:

(a) Connect the connector of the seat belt buckle switch (LH).

(b) Unlock the seat belt for the front passenger's seat.

CHECK:

For the connector (on the airbag sensor assembly side), measure the resistance between LBE+ and body ground.

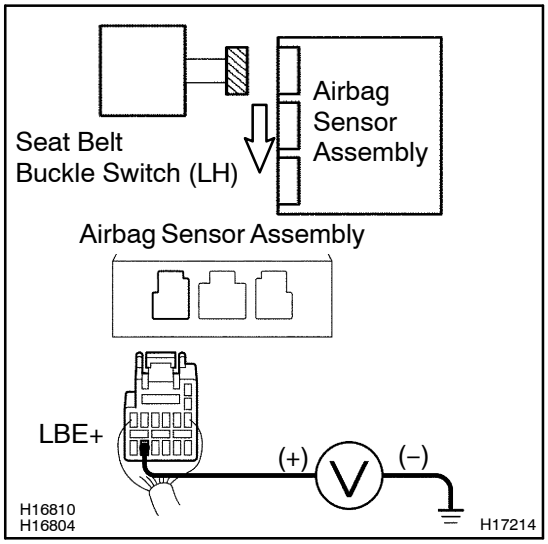
OK:

Resistance: 1.0 kΩ – 1.6 kΩ

NG → **Replace front seat inner belt (LH).**

OK

5	Check seat belt buckle switch (LH).



PREPARATION:

Lock the seat belt for the front passenger's seat.

CHECK:

For the connector (on the airbag sensor assembly side), measure the resistance between LBE+ and body ground.

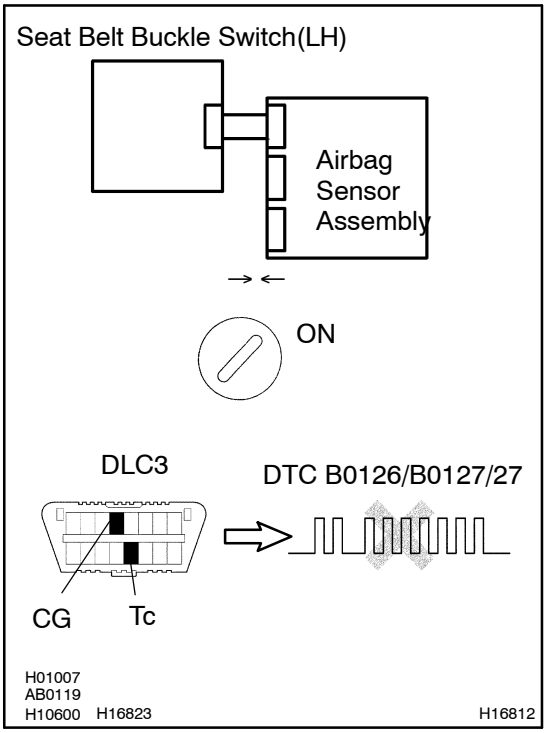
OK:

Resistance: 100 Ω – 500 Ω

NG → **Replace front seat inner belt (LH).**

OK

6	**Check airbag sensor assembly.**



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the connector to the airbag assembly.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0126/B0127/27 is not output.

HINT:

Codes other than code B0126/B0127/27 may be output at this time, but they are not relevant to this check.

NG	**Replace airbag sensor assembly.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6PJ–08

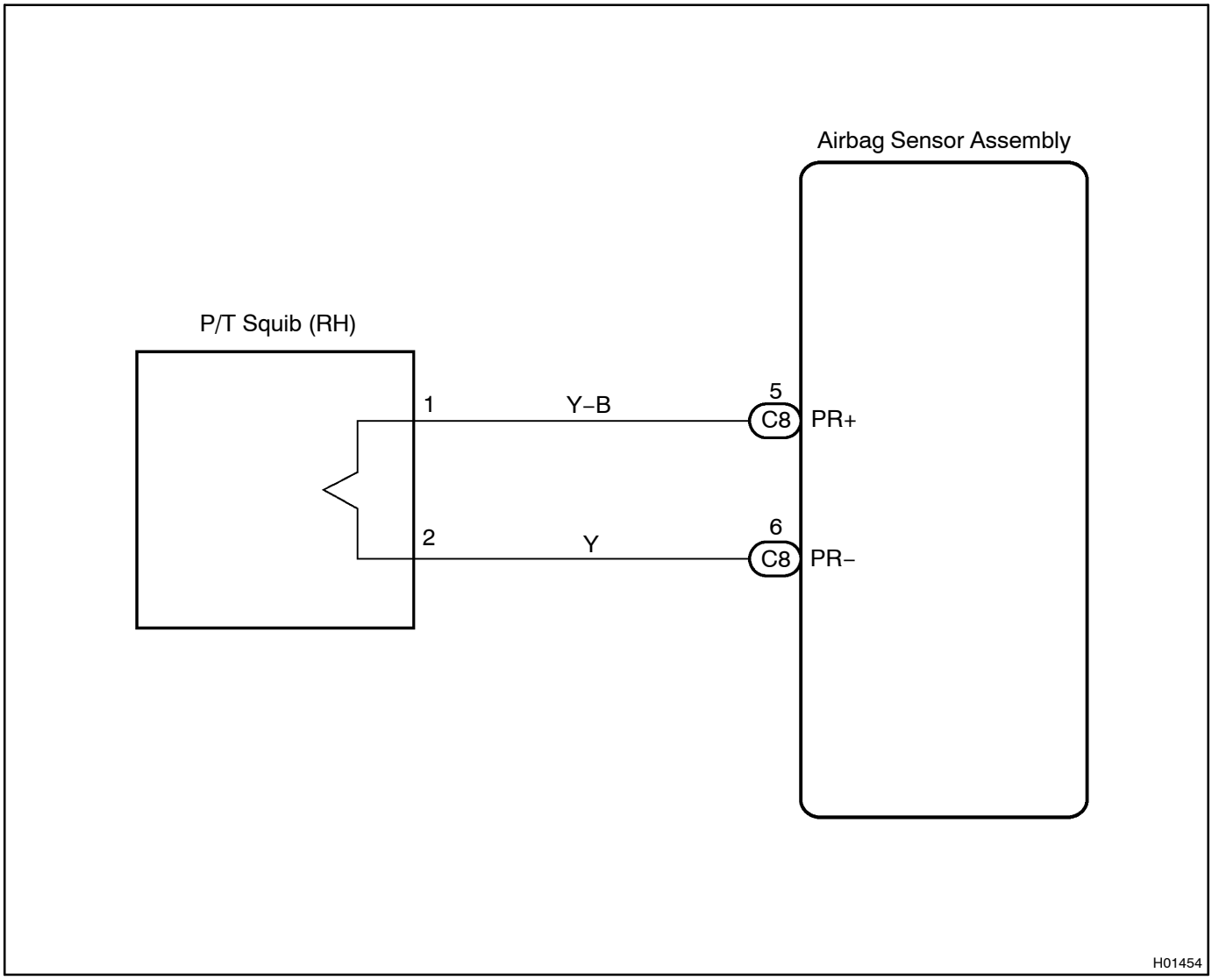
DTC	B0130/63	Short in P/T Squib (RH) Circuit

CIRCUIT DESCRIPTION

The P/T squib (RH) circuit consists of the airbag sensor assembly and seat belt pretensioner (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0130/63 is recorded when a short is detected in the P/T squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0130/63	• Short circuit between PR+ wire harness and PR– wire harness of squib • P/T squib (RH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (RH) • Airbag sensor assembly • Wire harness

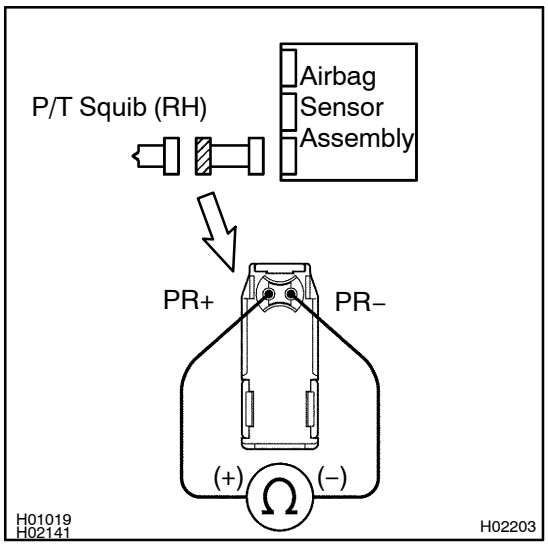
WIRING DIAGRAM



INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check P/T squib (RH) circuit.



PREPARATION:

Release the airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the seat belt pretensioner (RH) (See page DI–369).

CHECK:

For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assembly, measure the resistance between PR+ and PR–.

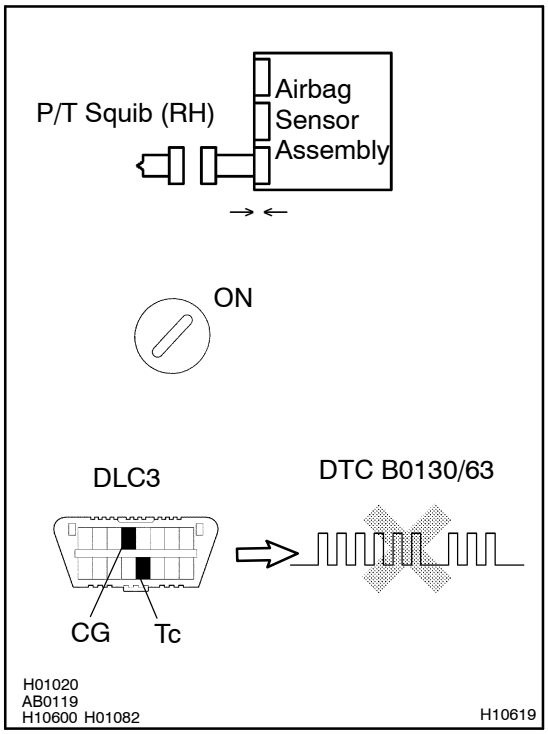
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between seat belt pretensioner (RH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0130/63 is not output.

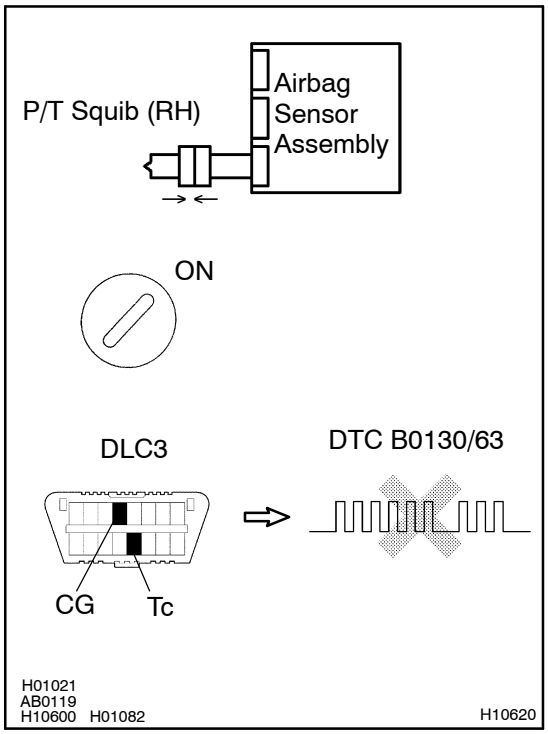
HINT:

Codes other than code B0130/63 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check P/T squib (RH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to LOOK, and wait at least for 20 second.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Clear the DTC stored in memory (See page DI–369).
(d) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check the DTC (See page DI–369).

OK:

DTC B0130/63 is not output.

HINT:
Codes other than code B0130/63 may be output at this time, but they are not relevant to this check.

NG	Replace seat belt pretensioner (RH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6PK–01

DTC	B0131/64	Open in P/T Squib (RH) Circuit

CIRCUIT DESCRIPTION

The P/T squib circuit (RH) consists of the airbag sensor assembly and seat belt pretensioner (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0131/64 is recorded when an open is detected in the P/T squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0131/64	• Open circuit in PR+ wire harness or PR– wire harness of squib • P/T squib (RH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (RH) • Airbag sensor assembly • Wire harness

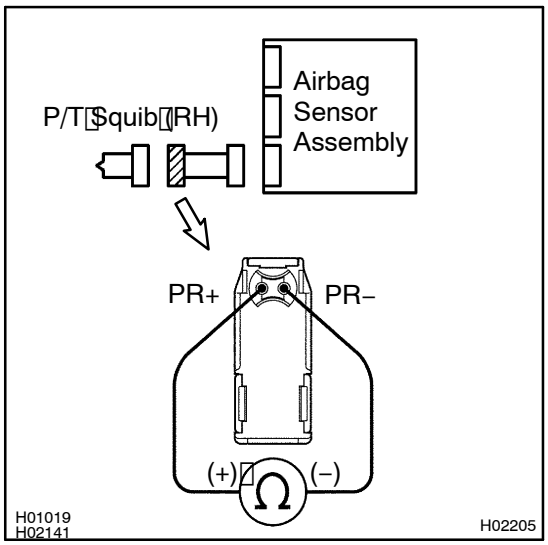
WIRING DIAGRAM

See page DI–446.

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check P/T squib (RH) circuit.



CHECK:

For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assembly, measure the resistance between PR+ and PR–.

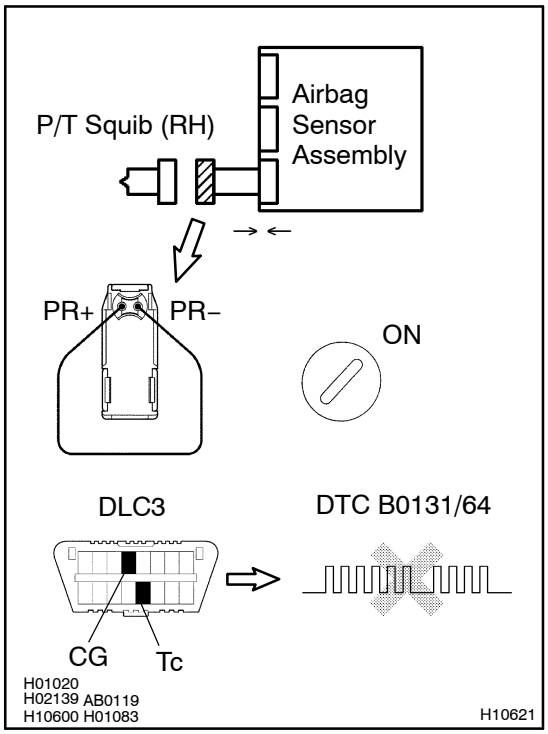
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between seat belt pretensioner (RH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect PR+ and PR– of the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0131/64 is not output.

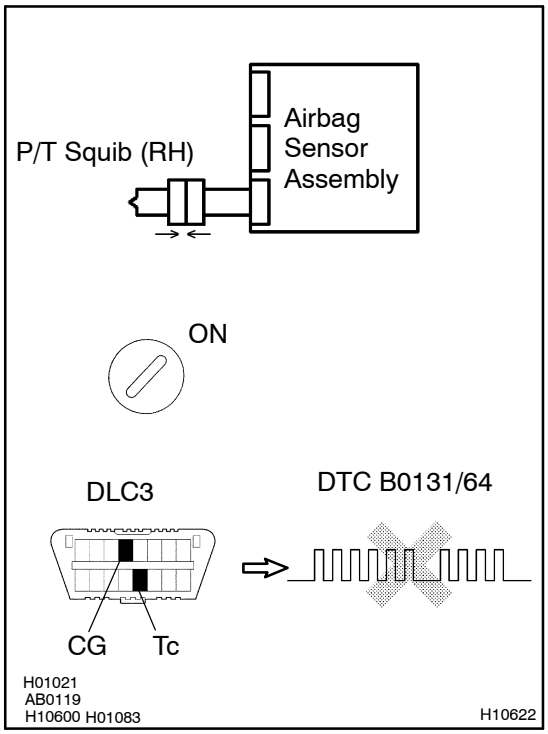
HINT:

Codes other than code B0131/64 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check P/T squib (RH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0131/64 is not output.

HINT:

Codes other than code B0131/64 may be output at this time, but they are not relevant to this check.

NG	Replace seat belt pretensioner (RH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6PL–01

DTC	B0132/61	Short in P/T Squib (RH) Circuit (to Ground)

CIRCUIT DESCRIPTION

The P/T squib (RH) circuit consists of the airbag sensor assembly and seat belt pretensioner (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0132/61 is recorded when a ground short is detected in the P/T squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0132/61	• Short circuit in P/T squib (RH) wire harness (to ground) • P/T squib (RH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (RH) • Airbag sensor assembly • Wire harness

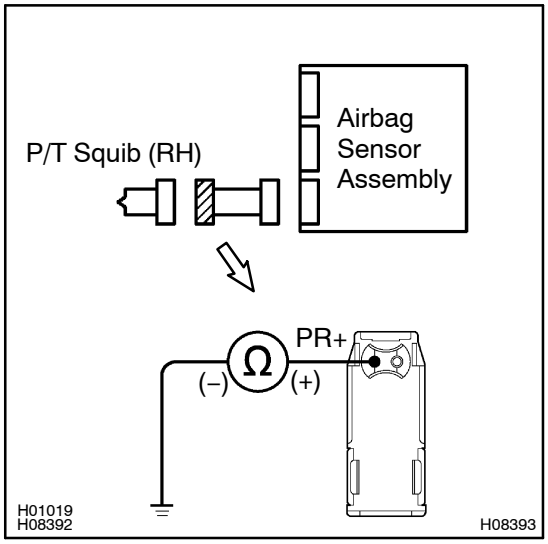
WIRING DIAGRAM

See page DI–446.

INSPECTION PROCEDURE

1	**Prepare for inspection (See step 1 on page DI–540).**

2	**Check P/T squib (RH) circuit.**



CHECK:

For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assembly, measure the resistance between PR+ and body ground.

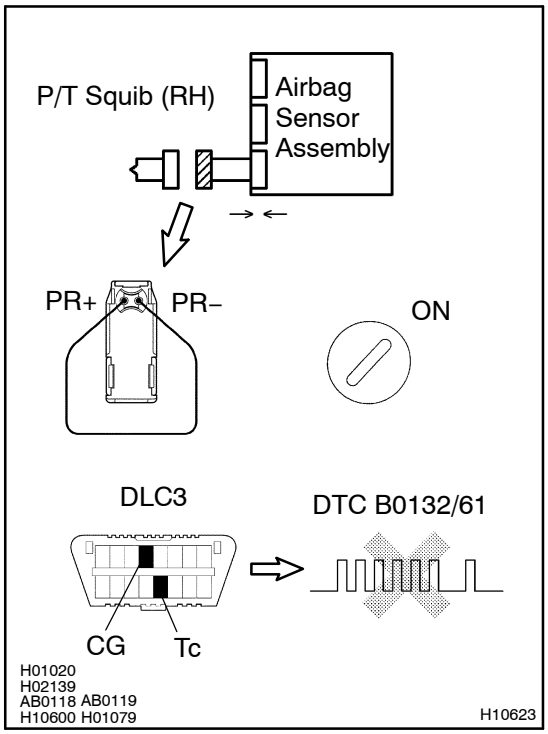
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between seat belt pretensioner (RH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect PR+ and PR– of the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0132/61 is not output.

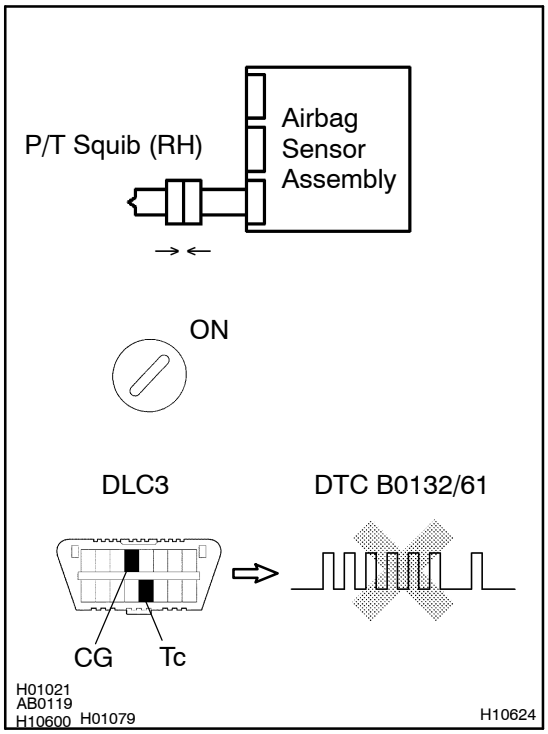
HINT:

Codes other than code B0132/61 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check P/T squib (RH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0132/61 is not output.

HINT:

Codes other than code B0132/61 may be output at this time, but they are not relevant to this check.

NG	Replace seat belt pretensioner (RH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI6PM–01

DTC	B0133/62	Short in P/T Squib (RH) Circuit (to B+)

CIRCUIT DESCRIPTION

The P/T squib (RH) circuit consists of the airbag sensor assembly and seat belt pretensioner (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0133/62 is recorded when a B+ short is detected in the P/T squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0133/62	• Short circuit in seat belt pretensioner (RH) wire harness (to B+) • P/T squib (RH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (RH) • Airbag sensor assembly • Wire harness

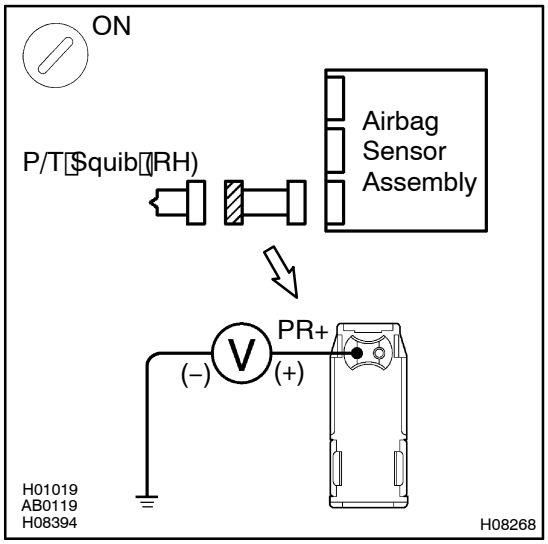
WIRING DIAGRAM

See page DI–446.

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check P/T squib (RH) circuit.



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assembly, measure the voltage between PR+ and body ground.

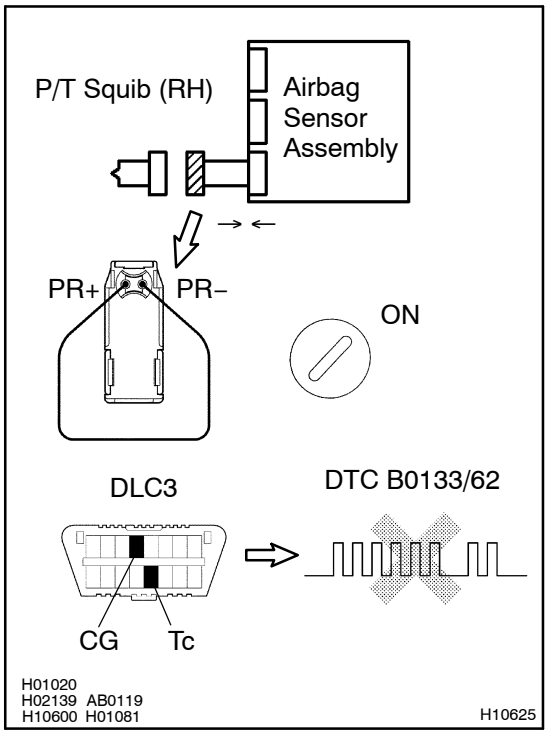
OK:

Voltage: 0 V

NG	Repair or replace harness or connector between seat belt pretensioner (RH) and airbag sensor assembly.

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect PR+ and PR– of the connector (on the seat belt pretensioner side) between the seat belt pretensioner (RH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0133/62 is not output.

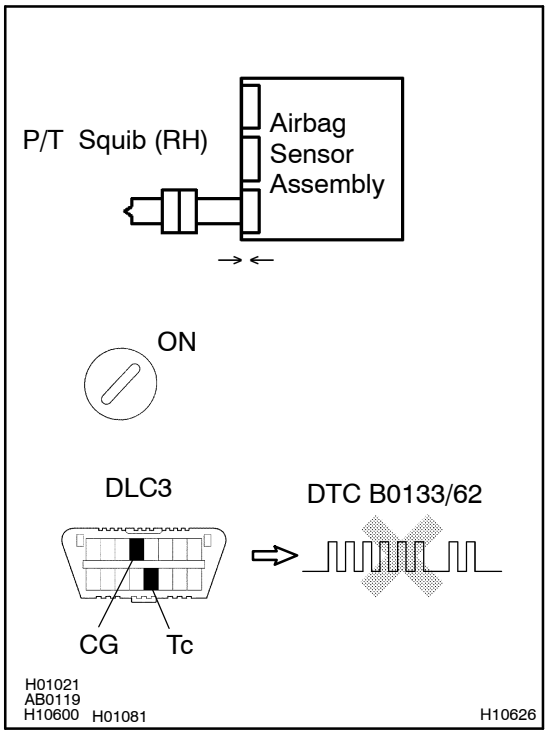
HINT:

Codes other than code B0133/62 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check P/T squib (RH).



PREPARATION:

(a) Turn ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0133/62 is not output.

HINT:

Codes other than code B0133/62 may be output at this time, but they are not relevant to this check.

NG	Replace seat belt pretensioner (RH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI6PN–08

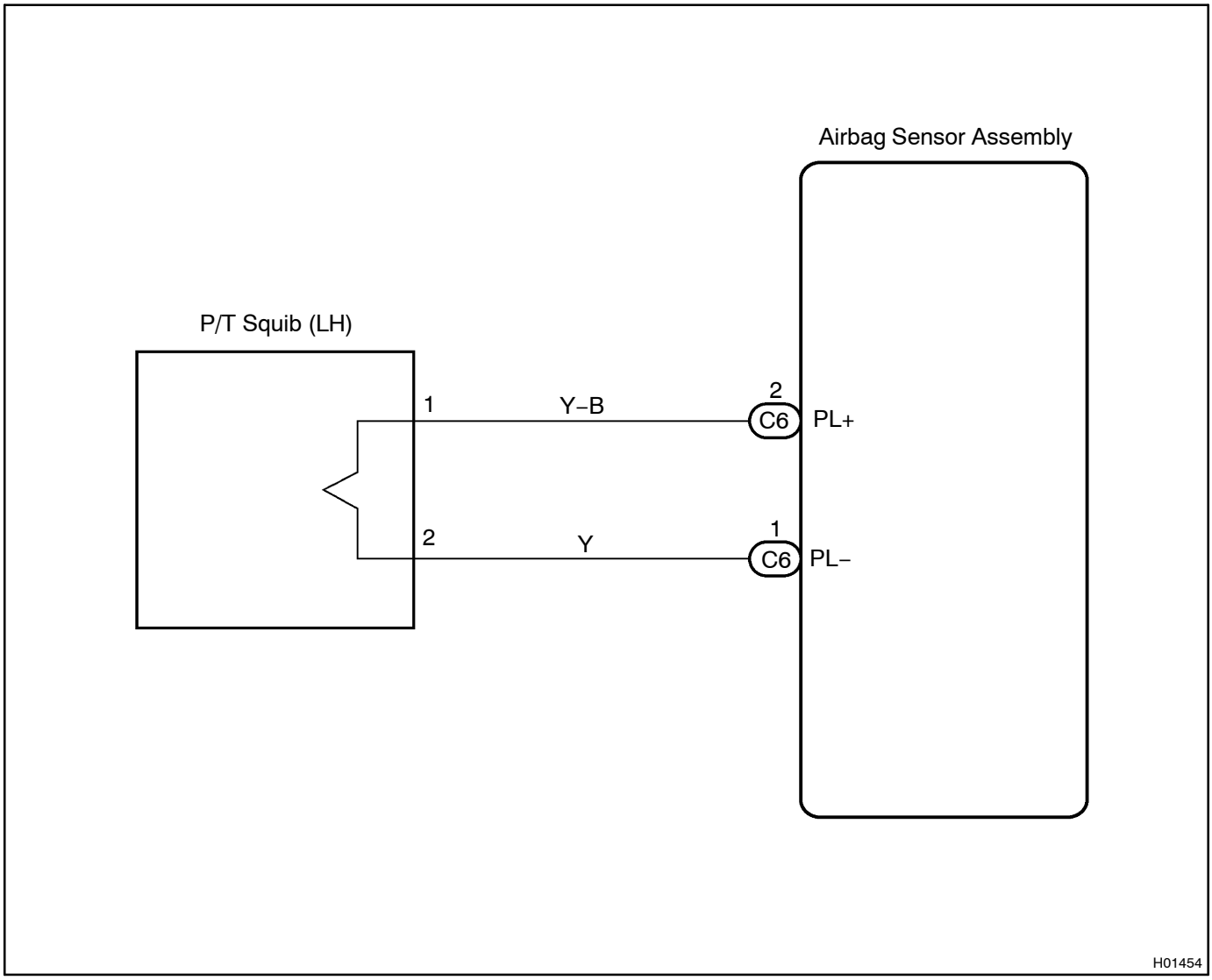
DTC	B0135/73	Short in P/T Squib (LH) Circuit

CIRCUIT DESCRIPTION

The P/T squib (LH) circuit consists of the airbag sensor assembly and seat belt pretensioner (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0135/73 is recorded when a short is detected in the P/T squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0135/73	• Short circuit between PL+ wire harness and PL– wire harness of squib • P/T squib (LH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (LH) • Airbag sensor assembly • Wire harness

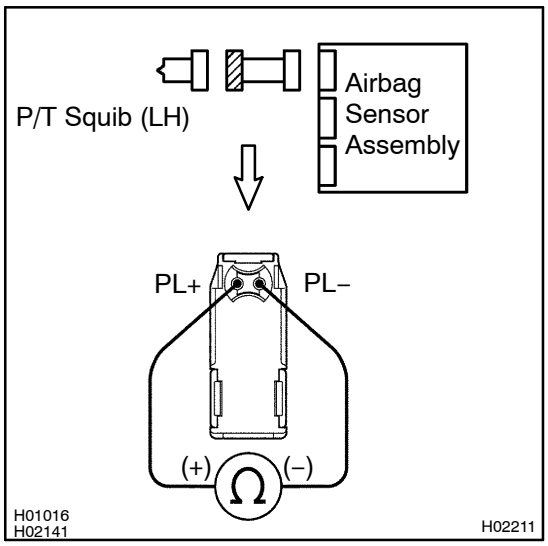
WIRING DIAGRAM



INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check P/T squib (LH) circuit.



PREPARATION:

Release the airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the seat belt pretensioner (LH) (See page DI–369).

CHECK:

For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assembly, measure the resistance between PL+ and PL–.

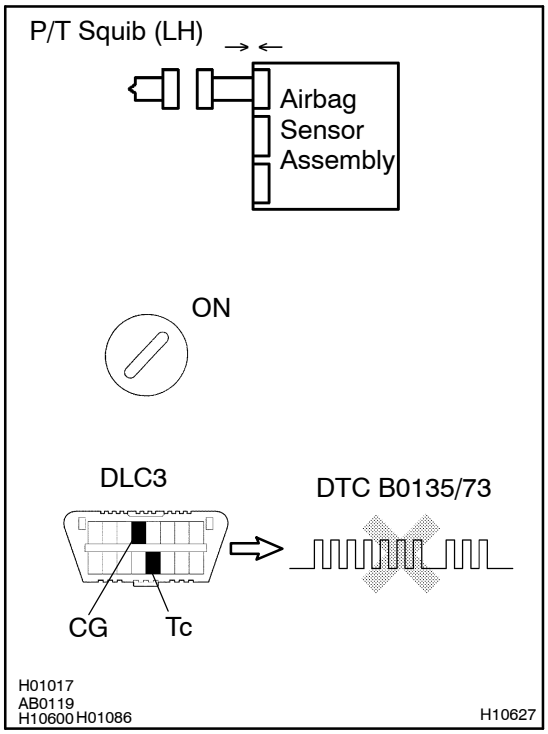
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between seat belt pretensioner (LH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0135/73 is not output.

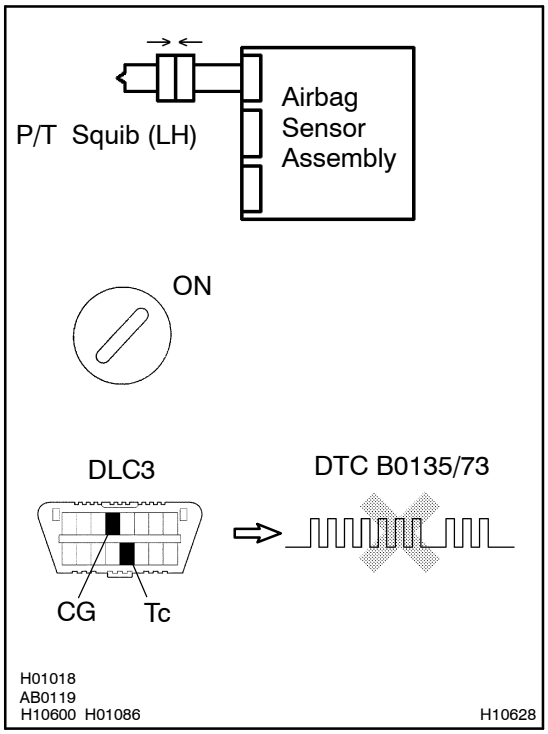
HINT:

Codes other than code B0135/73 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check P/T squib (LH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to LOOK, and wait at least for 20 second.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Clear the DTC stored in memory (See page DI–369).
(d) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check the DTC (See page DI–369).

OK:

DTC B0135/73 is not output.

HINT:
Codes other than code B0135/73 may be output at this time, but they are not relevant to this check.

NG	Replace seat belt pretensioner (LH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6PO–01

DTC	B0136/74	Open in P/T Squib (LH) Circuit

CIRCUIT DESCRIPTION

The P/T squib circuit (LH) consists of the airbag sensor assembly and seat belt pretensioner (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0136/74 is recorded when an open is detected in the P/T squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0136/74	• Open circuit in PL+ wire harness or PL– wire harness of squib • P/T squib (LH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (LH) • Airbag sensor assembly • Wire harness

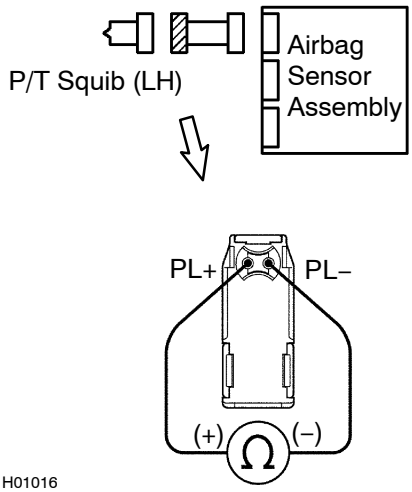
WIRING DIAGRAM

See page DI–459.

INSPECTION PROCEDURE

1	**Prepare for inspection (See step 1 on page DI–540).**

2	**Check P/T squib (LH) circuit.**



CHECK:

For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assembly, measure the resistance between PL+ and PL–.

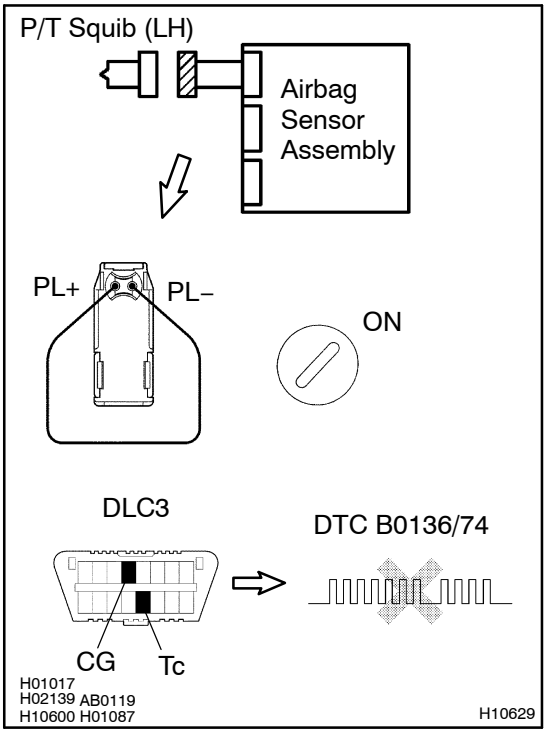
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between seat belt pretensioner (LH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect PL+ and PL– of the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0136/74 is not output.

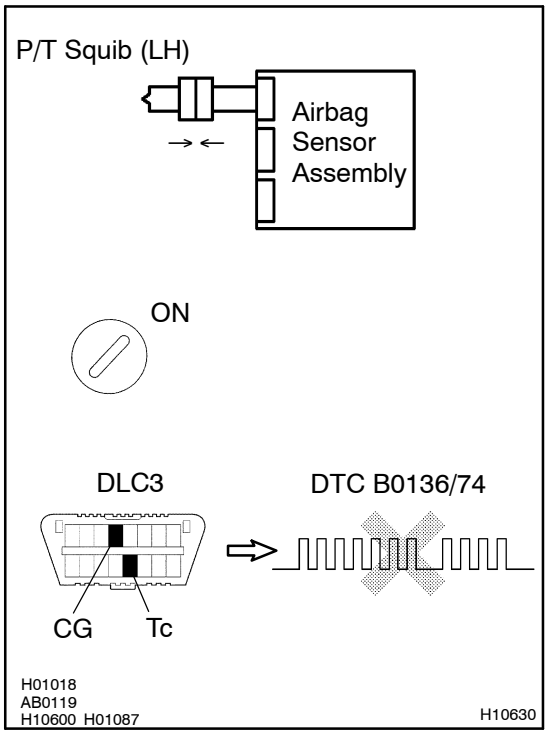
HINT:

Codes other than code B0136/74 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check P/T squib (LH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0136/74 is not output.

HINT:

Codes other than code B0136/74 may be output at this time, but they are not relevant to this check.

NG → **Replace seat belt pretensioner (LH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6PP–01

DTC	B0137/71	Short in P/T Squib (LH) Circuit (to Ground)

CIRCUIT DESCRIPTION

The P/T squib (LH) circuit consists of the airbag sensor assembly and seat belt pretensioner (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0137/71 is recorded when a ground short is detected in the P/T squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0137/71	• Short circuit in P/T squib (LH) wire harness (to ground) • P/T squib (LH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (LH) • Airbag sensor assembly • Wire harness

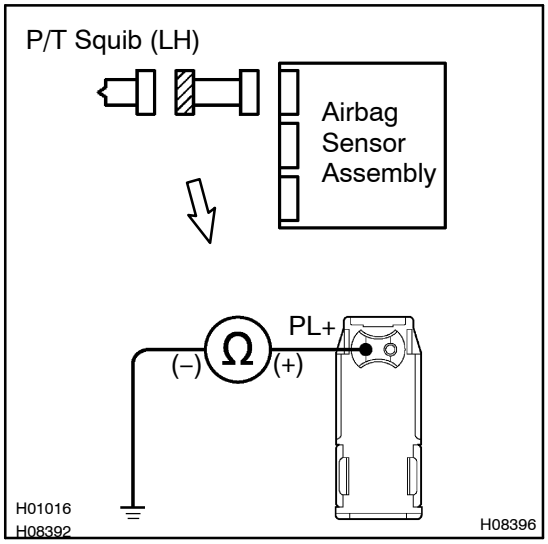
WIRING DIAGRAM

See page DI–459.

INSPECTION PROCEDURE

1	**Prepare for inspection (See step 1 on page DI–540).**

2	**Check P/T squib (LH) circuit.**

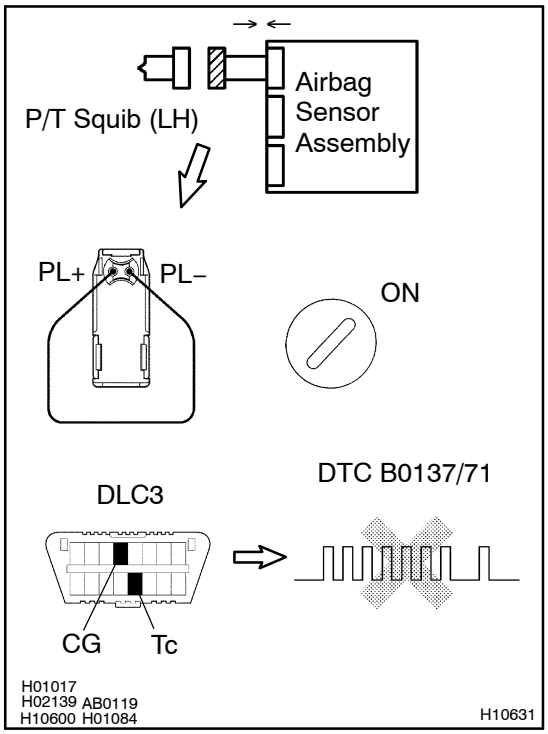


CHECK:
For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assembly, measure the resistance between PL+ and body ground.
OK:
Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between seat belt pretensioner (LH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect PL+ and PL– of the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B0137/71 is not output.

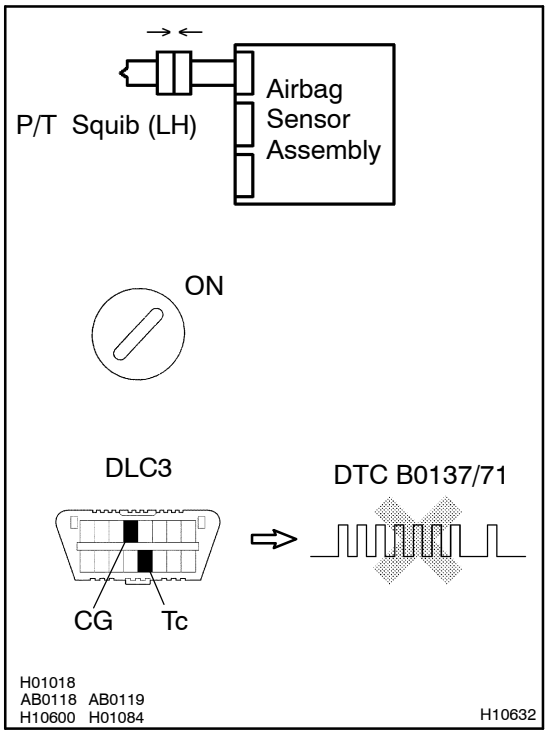
HINT:

Codes other than code B0137/71 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check P/T squib (LH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0137/71 is not output.

HINT:

Codes other than code B0137/71 may be output at this time, but they are not relevant to this check.

NG	Replace seat belt pretensioner (LH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI6PQ–01

DTC	B0138/72	Short in P/T Squib (LH) Circuit (to B+)

CIRCUIT DESCRIPTION

The P/T squib (LH) circuit consists of the airbag sensor assembly and seat belt pretensioner (LH). It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B0138/72 is recorded when a B+ short is detected in the P/T squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B0138/72	• Short circuit in seat belt pretensioner (LH) wire harness (to B+) • P/T squib (LH) malfunction • Airbag sensor assembly malfunction	• Seat belt pretensioner (LH) • Airbag sensor assembly • Wire harness

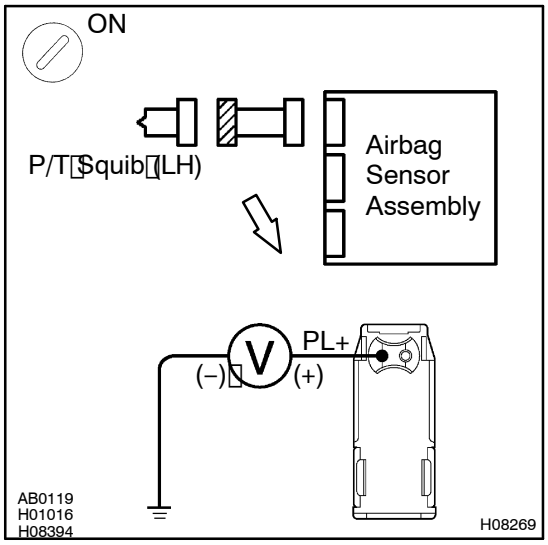
WIRING DIAGRAM

See page DI–459.

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check P/T squib (LH) circuit.



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assembly, measure the voltage between PL+ and body ground.

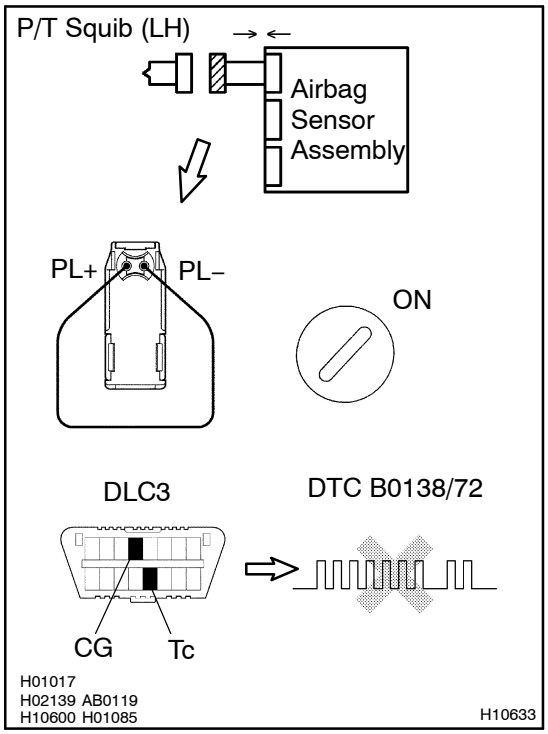
OK:

Voltage: 0 V

NG	Repair or replace harness or connector between seat belt pretensioner (LH) and airbag sensor assembly.

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.
(b) Using a service wire, connect PL+ and PL– of the connector (on the seat belt pretensioner side) between the seat belt pretensioner (LH) and the airbag sensor assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0138/72 is not output.

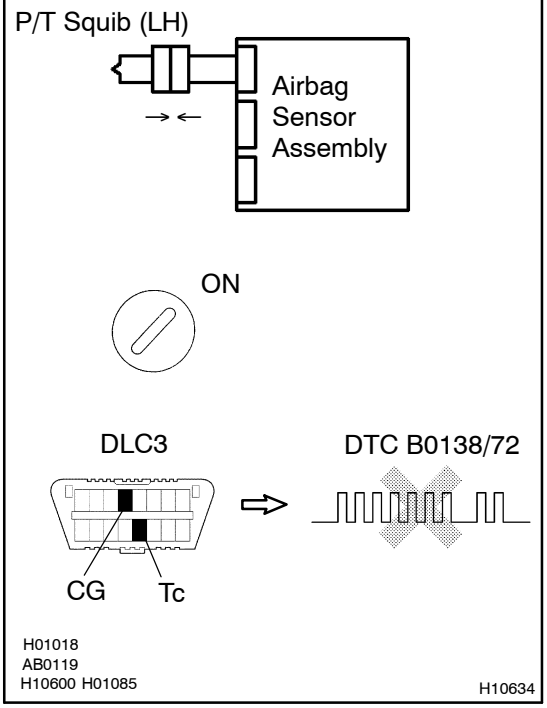
HINT:

Codes other than code B0138/72 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check P/T squib (LH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the seat belt pretensioner (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B0138/72 is not output.

HINT:

Codes other than code B0138/72 may be output at this time, but they are not relevant to this check.

NG	Replace seat belt pretensioner (LH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI6PR–01

DTC	B1100/31	Airbag Sensor Assembly Malfunction

CIRCUIT DESCRIPTION

The airbag sensor assembly consists of a airbag sensor, safing sensor, drive circuit, diagnosis circuit and ignition control, etc.
It receives signals from the airbag sensor, judges whether or not the SRS must be activated, and detects diagnosis system malfunction.
DTC B1100/31 is recorded when occurrence of a malfunction in the airbag sensor assembly is detected.

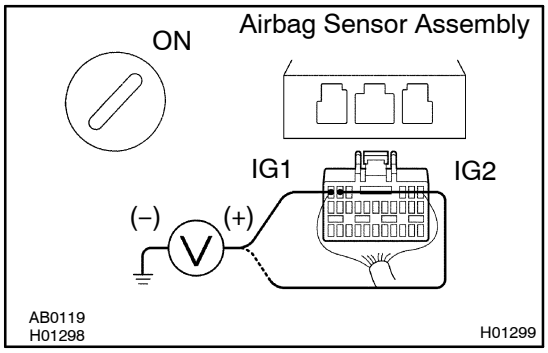
DTC No.	DTC Detecting Condition	Trouble Area
B1100/31	• Airbag sensor assembly malfunction	• Airbag sensor assembly

INSPECTION PROCEDURE

HINT:
When a malfunction code other than code B1100/31 is displayed at the same time, first repair the malfunction indicated by the malfunction code other than code B1100/31.

1	**Prepare for inspection (See step 1 on page DI–540).**

2	**Check voltage at IG1 and IG2 of airbag sensor assembly.**



CHECK:

(a) Turn the ignition switch to ON.
(b) Measure the voltage between body ground and each of terminals IG1 and IG2 of the airbag sensor assembly connector.

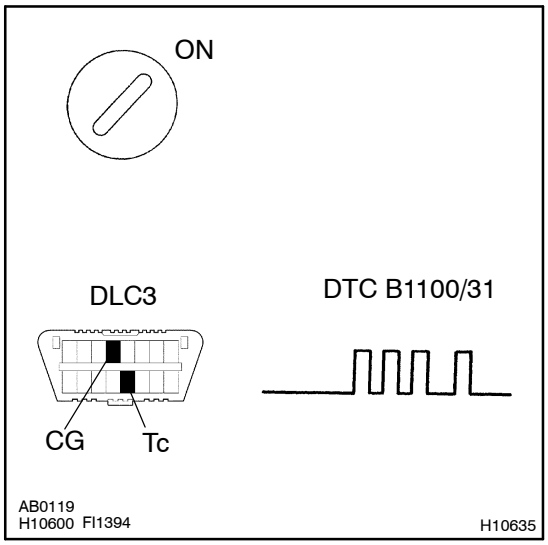
OK:

Voltage: 10 – 14 V

NG	**Check that an abnormality occurs on the battery and charging system.**

OK

3	Is DTC B1100/31 output again?



PREPARATION:

Clear the DTC (See step 5 on page DI–369).

CHECK:

(a) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(b) Turn the ignition switch to ON, and wait at least for 20 seconds.

(c) Repeat operation in step (a) and (b) at least 5 times.

(d) Check the DTC (See page DI–369).

HINT:

Codes other than code B1100/31 may be output at this time, but they are not relevant to this check.

NO → **Using simulation method, reproduce malfunction symptoms (See page IN–20).**

YES

Replace airbag sensor assembly.

DI7IA–02

DTC	B1135/24	Harf Connection in Airbag Sensor Assembly Connector

CIRCUIT DESCRIPTION

The airbag sensor assembly detects partial connection of connector.
For details of the function of each component, see OPERATION on page RS–2.
DTC B1135/24 is recorded when the airbag sensor assembly detects an open in the electrical connection chech mechanism of the airbag sensor connector or in the airbag sensor assembly circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B1135/24	• Malfunction of electrical connection check mechanism of airbag sensor assembly connector • Airbag sensor assembly malfunction	• Electrical connection check mechanism • Airbag sensor assembly

INSPECTION PROCEDURE

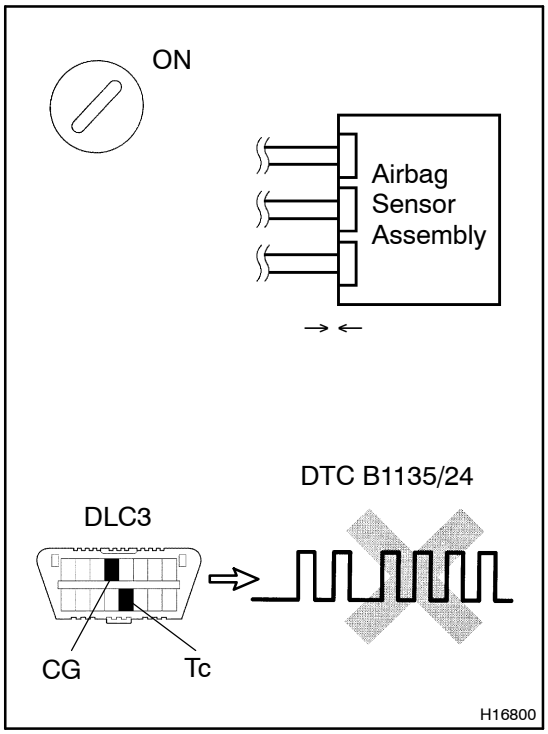
1	**Are connector of the airbag sensor assembly properly connected?**

NG → **Connect connectors.**

OK ↓

2	**Prepare for inspection (See step 1 on page DI–540).**

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connectors to the airbag sensor assembly.
(b) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Clear the DTC stored in memory (See page DI–369).
(d) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check the DTC (See page DI–369).

OK:

DTC B1135/24 is not output.

HINT:

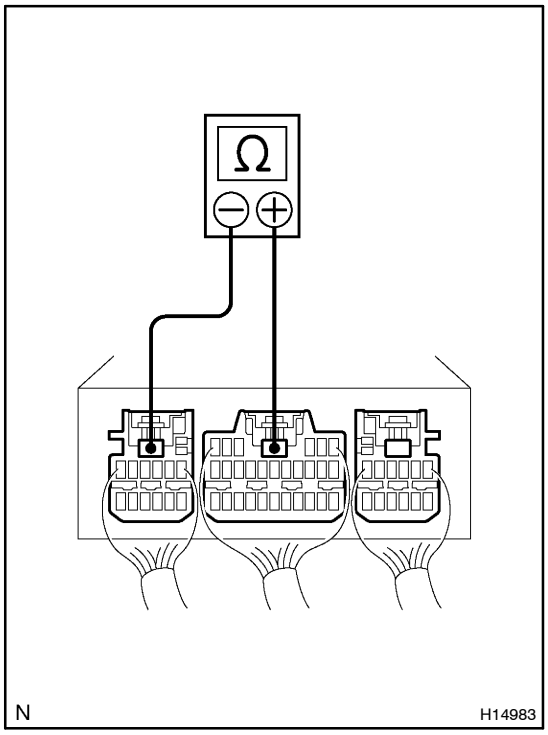
Codes other than code B1135/24 may be output at this time, but they are not relevant to this check.

NG	Go to the next step.

OK

From the results of the inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

4	**Check disconnection detection pin in the airbag sensor assembly connector.**



CHECK:

With 3 connectors connected to the airbag sensor assembly, place tester leads onto any 2 of 3 disconnection detection pins and check for continuity.

OK:

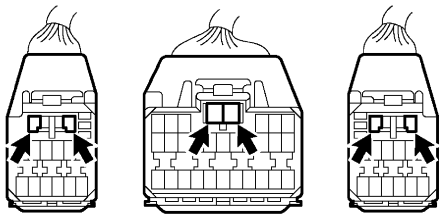
Continuity

NG → **Go to the next step.**

OK

From the results of the inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

5	**Perform a visual check of the disconnection detection pin.**


H15243

OK:
No deformation is identified.
HINT:
Compare it with the other 2 connector pins.

NG → **Repair or replace airbag sensor assembly connector.**

OK

Replace airbag sensor assembly.

DI6PS–05

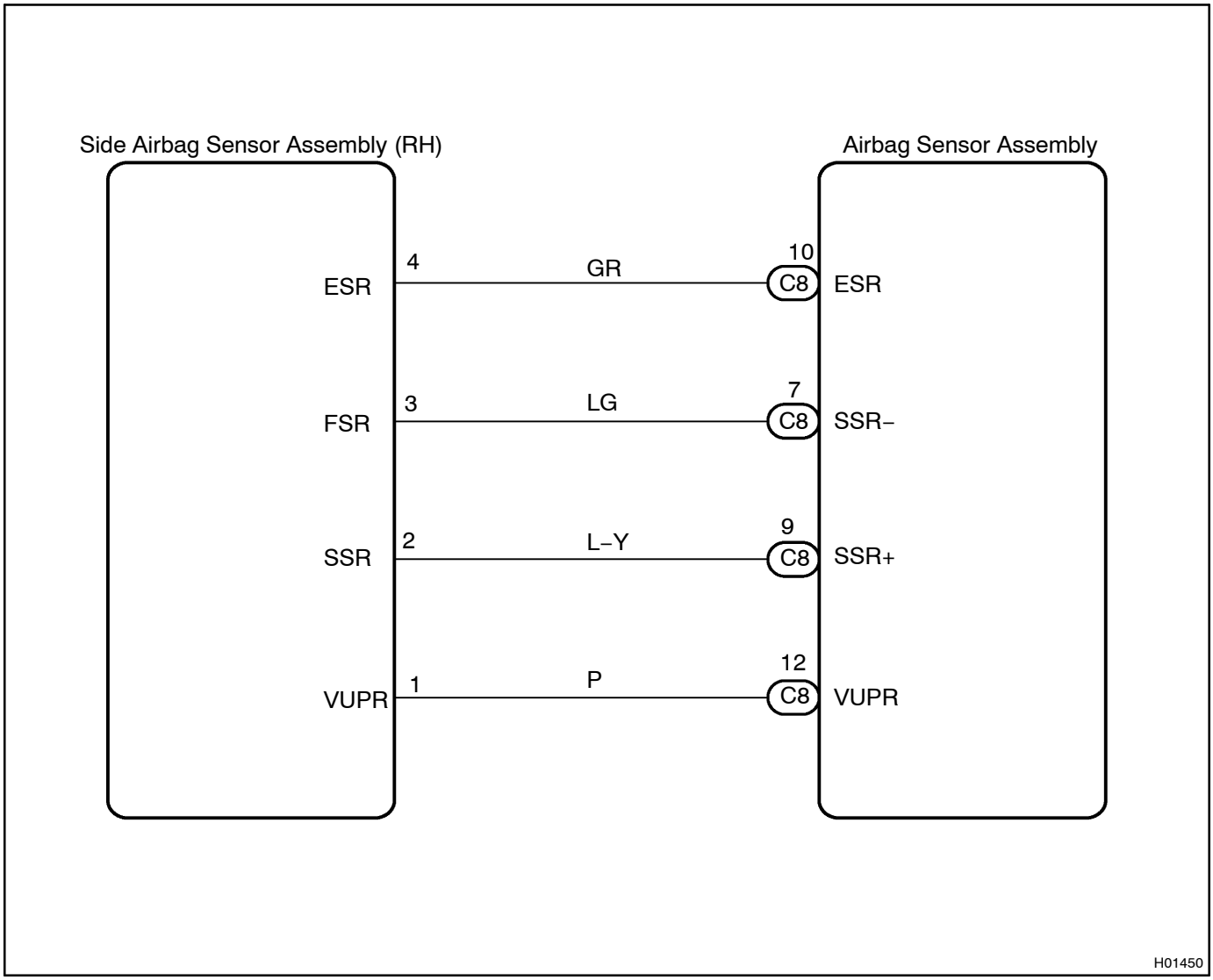
DTC	B1140/32	Side Airbag Sensor Assembly (RH) Malfunction

CIRCUIT DESCRIPTION

The side airbag sensor assembly (RH) consists of the safing sensor, diagnosis circuit and lateral deceleration sensor, etc.
It receives signals from the lateral deceleration sensor, judges whether or not the SRS must be activated, and detects diagnosis system malfunction.
DTC B1140/32 is recorded when occurrence of a malfunction in the side airbag sensor assembly (RH) is detected.

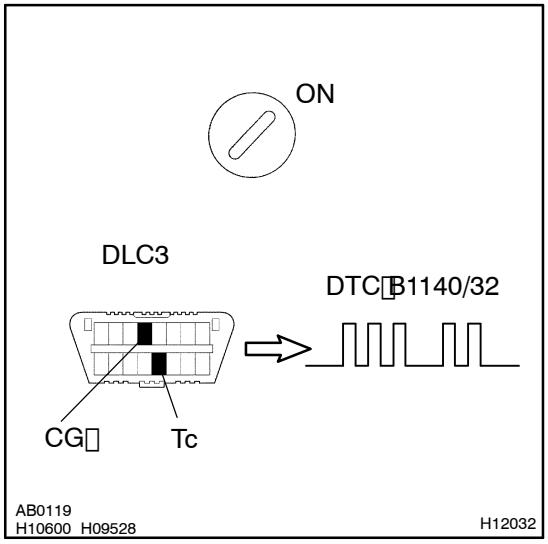
DTC No.	DTC Detecting Condition	Trouble Area
B1140/32	• Side airbag sensor assembly (RH) malfunction	• Side airbag sensor assembly (RH) • Wire harness • Airbag sensor assembly

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Is DTC B1140/32 output?



CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

HINT:

Codes other than code B1140/32 may be output at this time, but they are not relevant to this check.

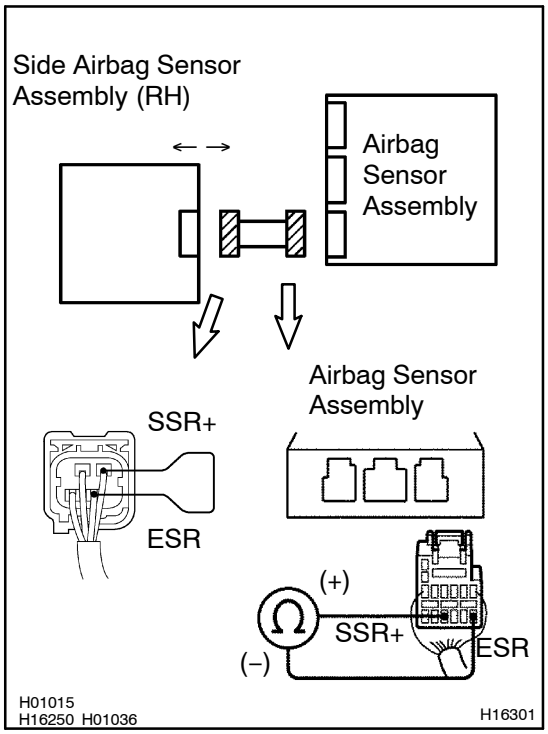
YES	The malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

NO

2	Is connector of side airbag sensor assembly (RH) properly connected?

3	Prepare for inspection (See step 1 on DI–540).

4	**Check wire harness.**



PREPARATION:

(a) Disconnect the side airbag sensor assembly (RH) connector.

(b) Using a service wire, connect SSR+ and ESR of the connector (on the side airbag sensor assembly side) between the side airbag sensor assembly (RH) and airbag sensor assembly.

CHECK:

For the connector (on the airbag sensor assembly side) between the side airbag sensor assembly (RH) and the airbag sensor assembly, measure the resistance between SSR+ and ESR.

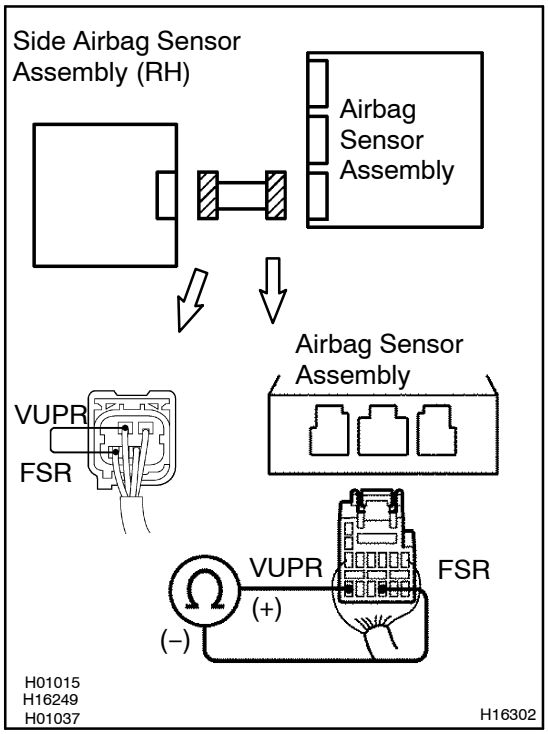
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between side airbag sensor assembly (RH) and airbag sensor assembly.**

OK

5	**Check wire harness.**



PREPARATION:

Using a service wire, connect VUPR and FSR of the connector (on the side airbag sensor assembly side) between the side airbag sensor assembly (RH) and airbag sensor assembly.

CHECK:

For the connector (on the airbag sensor assembly side) between the side airbag sensor assembly (RH) and the airbag sensor assembly, measure the resistance between VUPR and FSR.

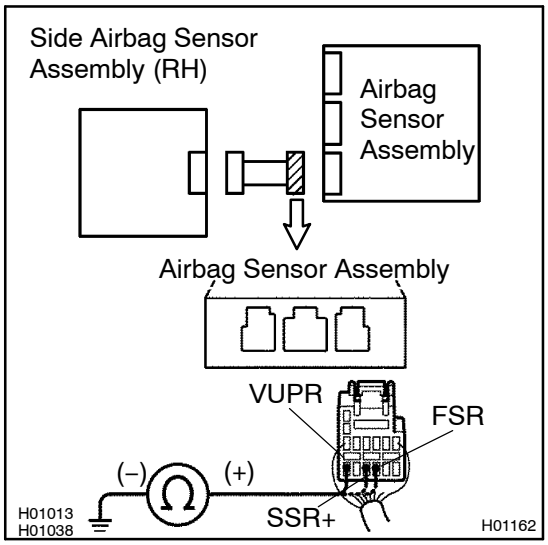
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between side airbag sensor assembly (RH) and airbag sensor assembly.**

OK

6	Check wire harness (to ground).



CHECK:

For the connector (on the airbag sensor assembly side) between the side airbag sensor assembly (RH) and the airbag sensor assembly, measure the resistance between body ground and each of SSR+, VUPR and FSR.

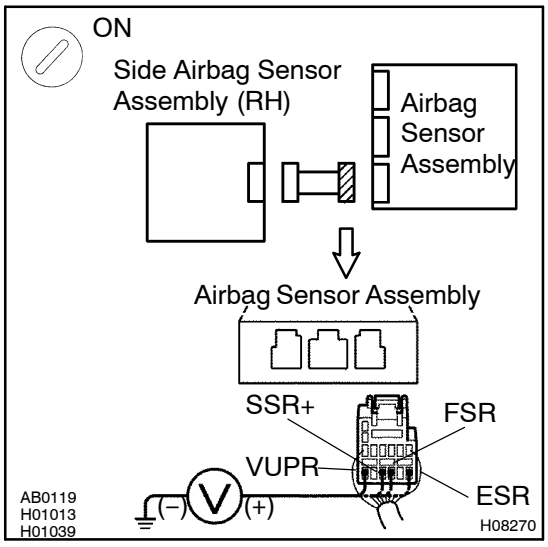
OK:

Resistance: Below 1 Ω

NG	Repair or replace harness or connector between side airbag sensor assembly (RH) and airbag sensor assembly.

OK

7	Check wire harness (to B+).



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the airbag sensor assembly side) between the side airbag sensor assembly (RH) and the airbag sensor assembly, measure the voltage between the body ground and each of SSR+, VUPR, ESR and FSR.

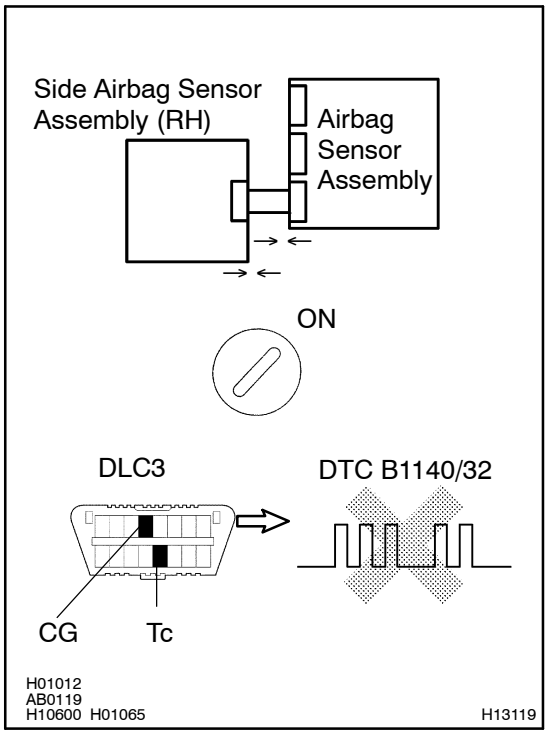
OK:

Voltage: 0 V

NG	Repair or replace harness or connector between side airbag sensor assembly (RH) and airbag sensor assembly.

OK

8	Is DTC B1140/32 out put again?



PREPARATION:

(a) Connect the connector to the side airbag sensor assembly (RH).
(b) Connect the connector to the airbag sensor assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B1140/32 is not output.

HINT:

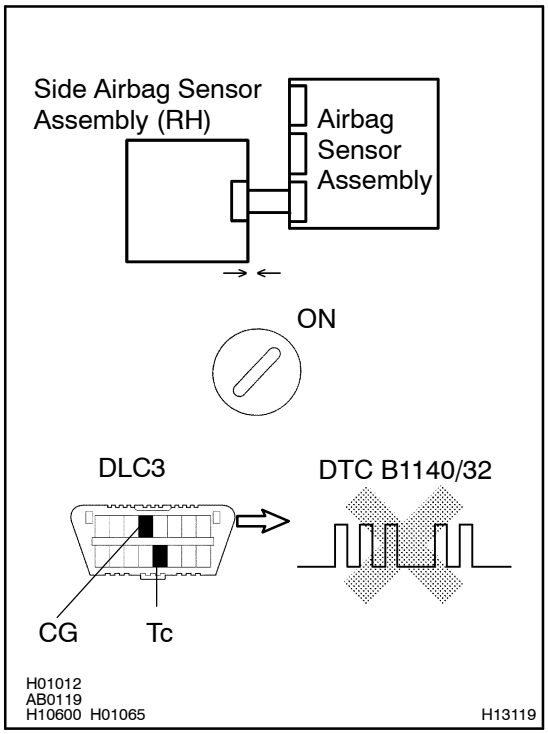
Codes other than code B1140/32 may be output at this time, but they are not relevant to this check.

NG	Go to step 9.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

9	Check airbag sensor assembly.



PREPARATION:

(a) Turn the ignition switch to LOCK.

(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.

(c) Disconnect the side airbag sensor (RH) from the connector and connect the side airbag sensor (LH) to the connector.

(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B1140/32 is not output.

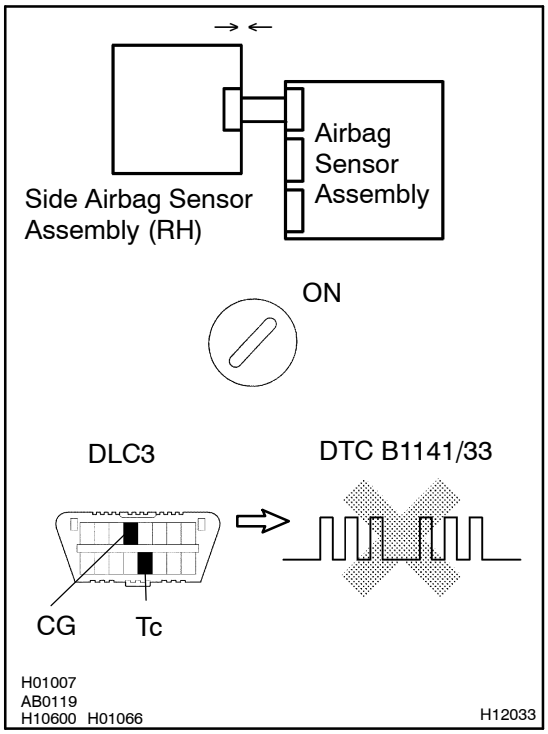
HINT:

Codes other than code B1140/32 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

10	Check side airbag sensor assembly (RH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag sensor (RH) to the connector that the side airbag sensor (LH) was connected to.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B1141/33 is not output.

HINT:
Codes other than code B1141/33 may be output at this time, but they are not relevant to this check.

NG	Replace side airbag sensor assembly (RH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6PT–05

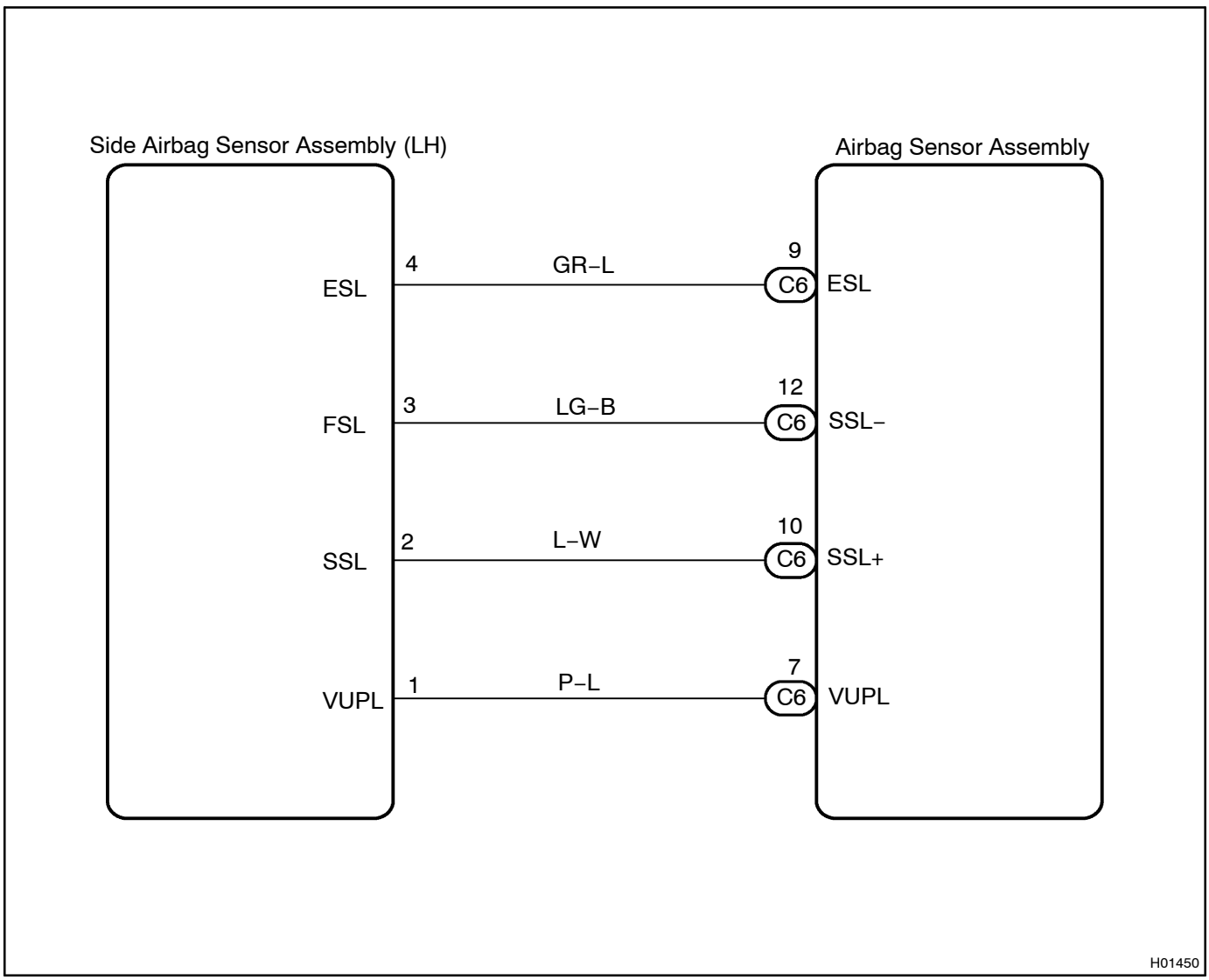
DTC	B1141/33	Side Airbag Sensor Assembly (LH) Malfunction

CIRCUIT DESCRIPTION

The side airbag sensor assembly (LH) consists of the safing sensor, diagnosis circuit and lateral deceleration sensor, etc.
It receives signals from the lateral deceleration sensor, judges whether or not the SRS must be activated, and detects diagnosis system malfunction.
DTC B1141/33 is recorded when occurrence of a malfunction in the side airbag sensor assembly (LH) is detected.

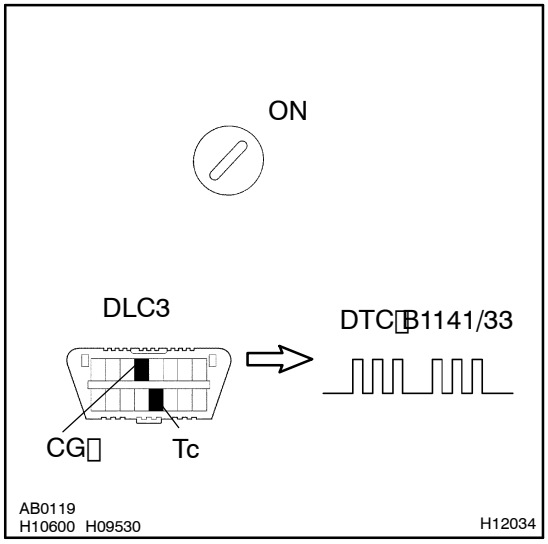
DTC No.	DTC Detecting Condition	Trouble Area
B1141/33	• Side airbag sensor assembly (LH) malfunction	• Side airbag sensor assembly (LH) • Wire harness • Airbag sensor assembly

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Is DTC B1141/33 output?



CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

HINT:

Codes other than code B1141/33 may be output at this time, but they are not relevant to this check.

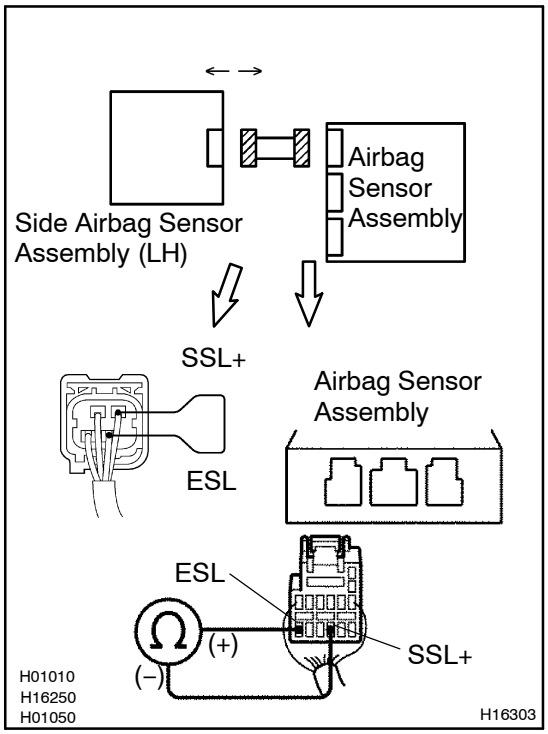
YES → **The malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.**

NO

2	Is connector of side airbag sensor assembly (LH) properly connected?

3	Prepare for inspection (See step 1 on page DI–540).

4	**Check wire harness.**



PREPARATION:

(a) Disconnect the side airbag sensor assembly (LH).

(b) Using a service wire, connect SSL+ and ESL of the connector (on the side airbag sensor assembly side) between the side airbag sensor assembly (LH) and the airbag sensor assembly.

CHECK:

For the connector (on the airbag sensor assembly side) between the side airbag sensor assembly (LH) and the airbag sensor assembly, measure the resistance between SSL+ and ESL.

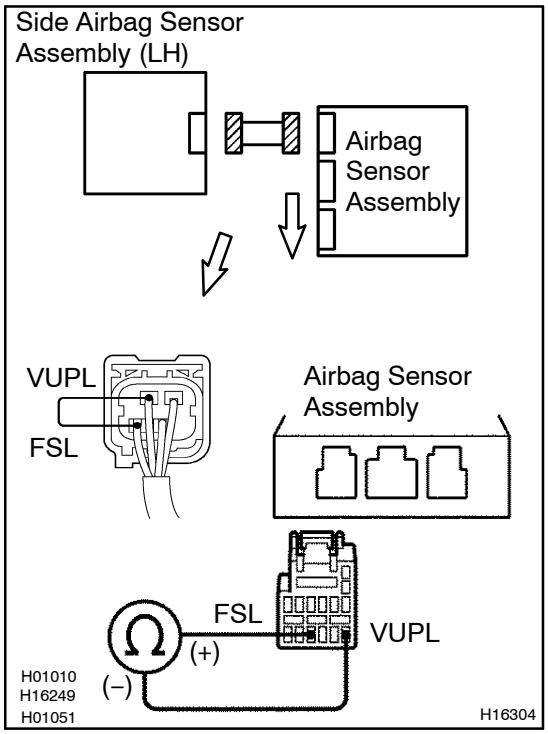
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between side airbag sensor assembly (LH) and airbag sensor assembly.**

OK

5	**Check wire harness.**



PREPARATION:

Using a service wire, connect VUPL and FSL of the connector (on the side airbag sensor assembly side) between the side airbag sensor assembly (LH) and the airbag sensor assembly.

CHECK:

For the connector (on the airbag sensor assembly side) between the side airbag sensor assembly (LH) and the airbag sensor assembly, measure the resistance between VUPL and FSL.

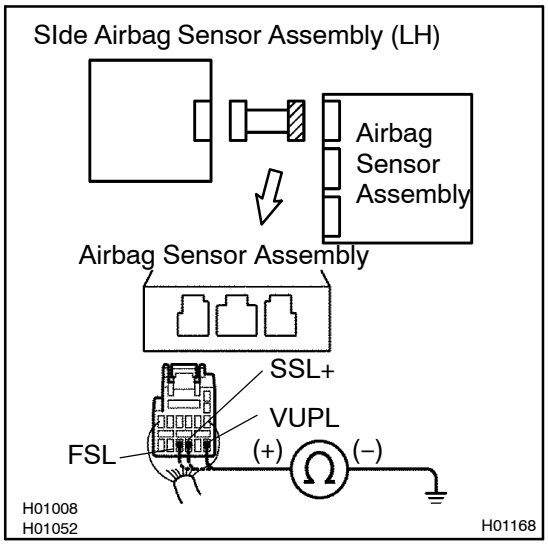
OK:

Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between side airbag sensor assembly (LH) and airbag sensor assembly.**

OK

6	Check wire harness (to ground).



CHECK:

For the connector (on the airbag sensor assembly side) between the side airbag sensor assembly (LH) and the airbag sensor assembly, measure the resistance between body ground and each of SSL+, VUPL and FSL.

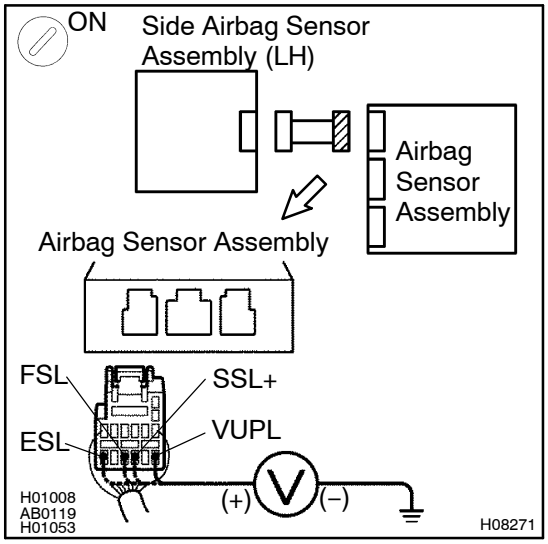
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between side airbag sensor assembly (LH) and airbag sensor assembly.**

OK

7	Check wire harness (to B+).



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the airbag sensor assembly side) between the side airbag sensor assembly (LH) and the airbag sensor assembly, measure the voltage between body ground and each of SSL+, ESL, VUPL and FSL.

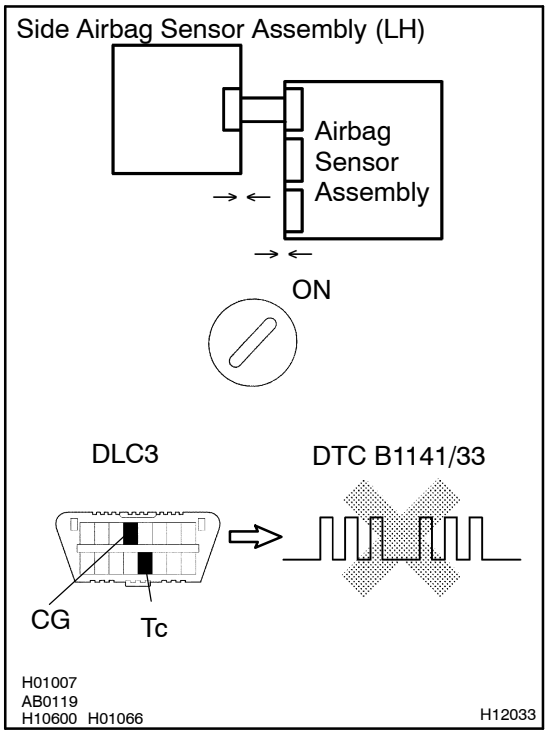
OK:

Voltage: 0 V

NG → **Repair or replace harness or connector between side airbag sensor assembly (LH) and airbag sensor assembly.**

OK

8	**Is DTC B1141/33 out put again?**



PREPARATION:

(a) Connect the connector to the side airbag sensor assembly (LH).
(b) Connect the connector to the airbag sensor assembly.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B1141/33 is not output.

HINT:

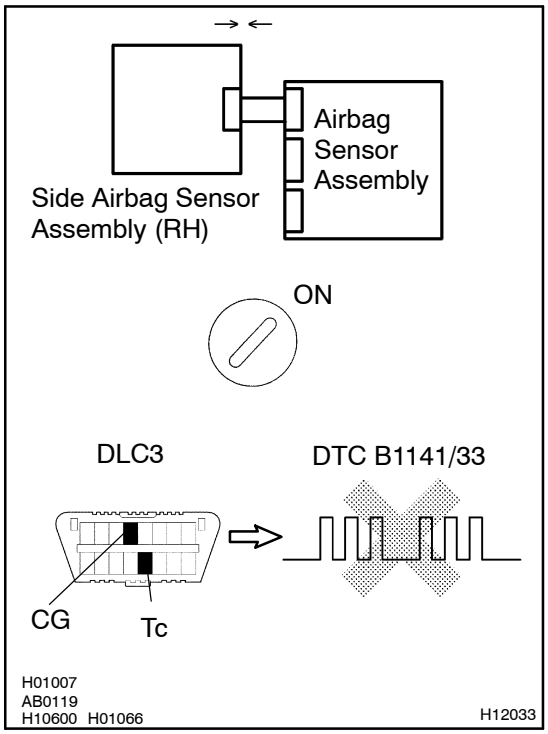
Codes other than code B1141/33 may be output at this time, but they are not relevant to this check.

NO	**Go to step 9.**

YES

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

9	Check airbag sensor assembly.



PREPARATION:

(a) Turn the ignition switch to LOCK.

(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.

(c) Disconnect the side airbag sensor (LH) from the connector and connect the side airbag sensor (RH) to the connector.

(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B1141/33 is not output.

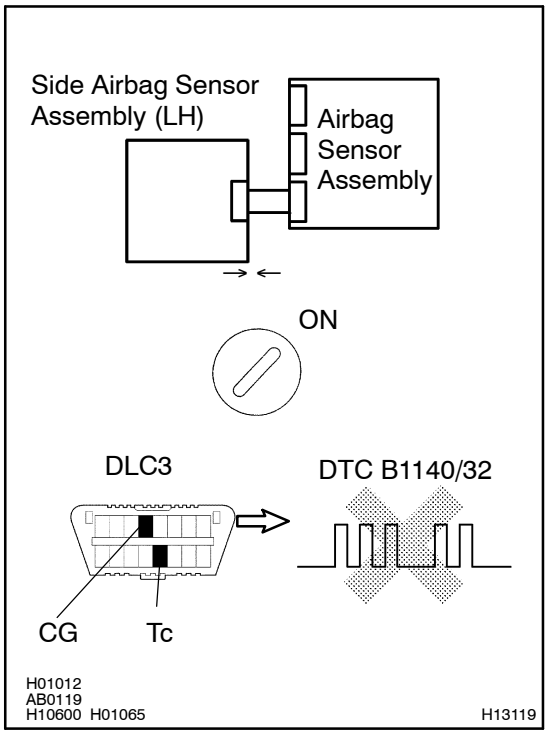
HINT:

Codes other than code B1141/33 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

10	Check side airbag sensor assembly (LH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the side airbag sensor (LH) to the connector that the side airbag sensor (RH) was connected to.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B1140/32 is not output.

HINT:
Codes other than code B1140/32 may be output at this time, but they are not relevant to this check.

NG	Replace side airbag sensor assembly (LH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI85X–01

DTC	B1150/23	Occupant Detection Sensor Malfunction

CIRCUIT DESCRIPTION

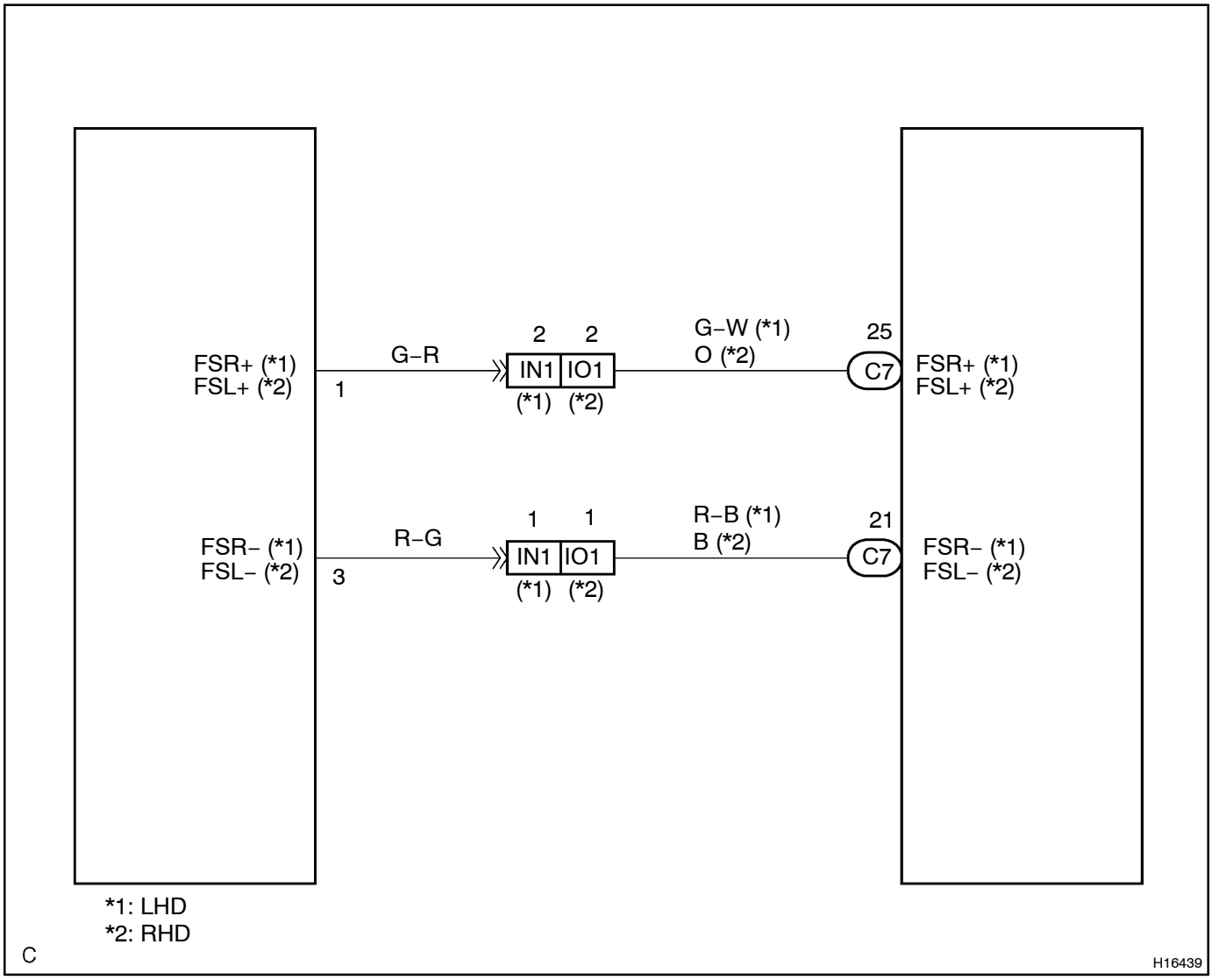
The occupant detection sensor circuit consists of the airbag sensor assembly and occupant detection sensor.

For details of the function of each components, see OPERATION on page RS–2.

DTC B1150/23 is recorded when a malfunction is detected in the occupant detection sensor circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B1150/23	• Occupant detection sensor malfunction	• Occupant detection sensor • Airbag sensor assembly • Wire harness

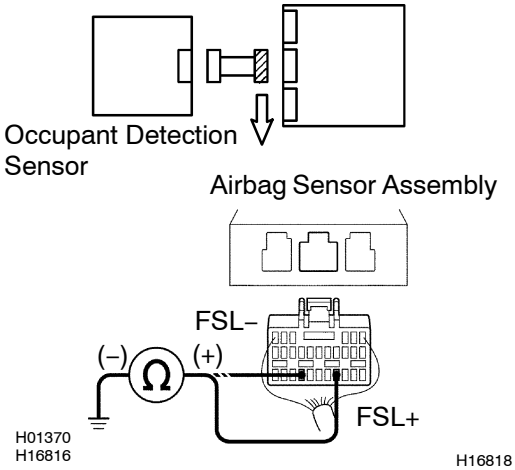
WIRING DIAGRAM



INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–369).

2	Check wire harness (to ground).



CHECK:

For the connector (on the airbag sensor assembly side) between the occupant detection sensor and the airbag sensor assembly, measure the resistance between body ground and each of FSL+ and FSL–.

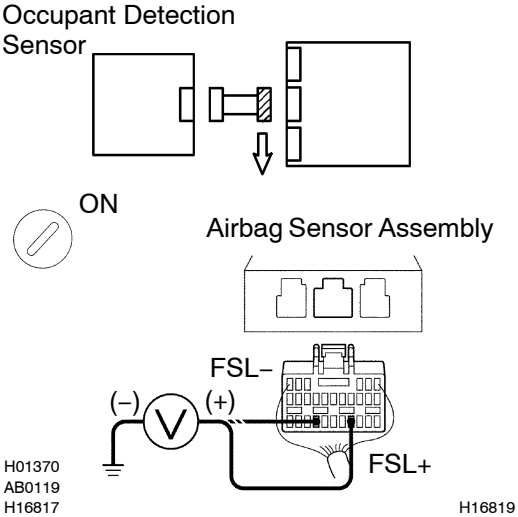
OK:

Resistance: 0 MΩ or Higher

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

OK

3	Check wire harness (to B+).



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the airbag sensor assembly side) between the occupant detection sensor and the airbag sensor assembly, measure the voltage between body ground and each of FSL+ and FSL–.

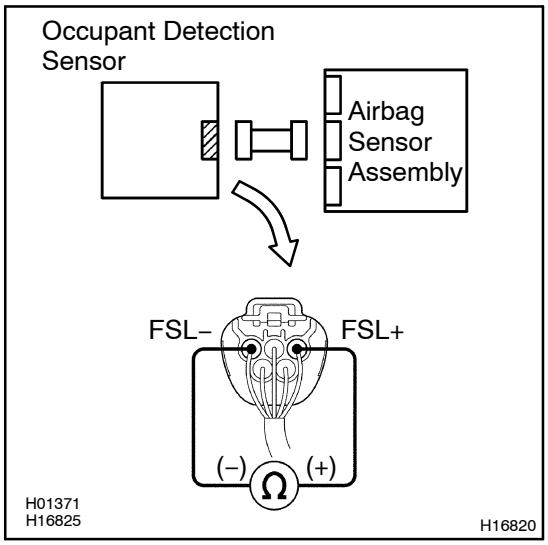
OK:

Voltage: Below 1 V

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

OK

4	Check occupant detection sensor.



CHECK:

Without passenger on a passenger seat:

For the connector of the occupant detection sensor, connect the positive (+) lead from the ohmmeter to terminal FSL+ and the negative (–) lead to terminal FSL–, measure the resistance between FSL+ and FSL–.

OK:

Resistance: 50 kΩ or Higher

CHECK:

With passenger on a passenger seat:

For the connector of the occupant detection sensor, connect the positive (+) lead from the ohmmeter to terminal FSL+ and the negative (–) lead to terminal FSL–, measure the resistance between FSL+ and FSL–.

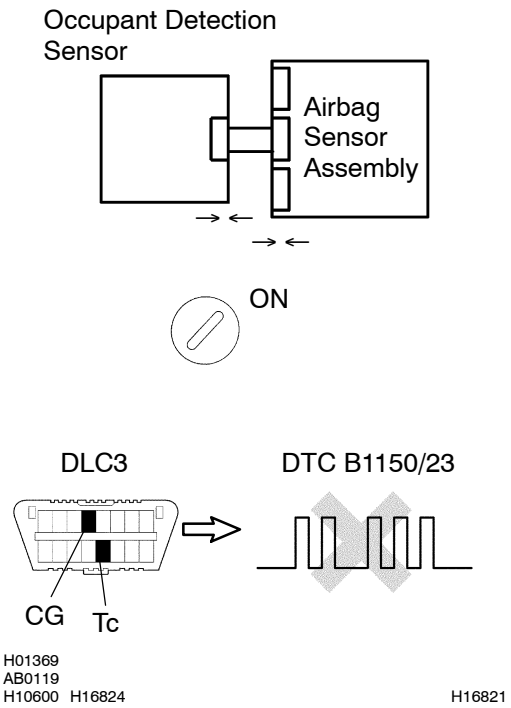
OK:

Resistance: Below 50 kΩ

NG → **Replace seat cushion cover.**

OK

5	Check airbag sensor assembly.



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the occupant detection sensor connector and airbag sensor assembly connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B1150/23 is not output.

HINT:

Codes other than code B1150/23 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6PW–08

DTC	B1156/B1157/15	Front Airbag Sensor (RH) Malfunction

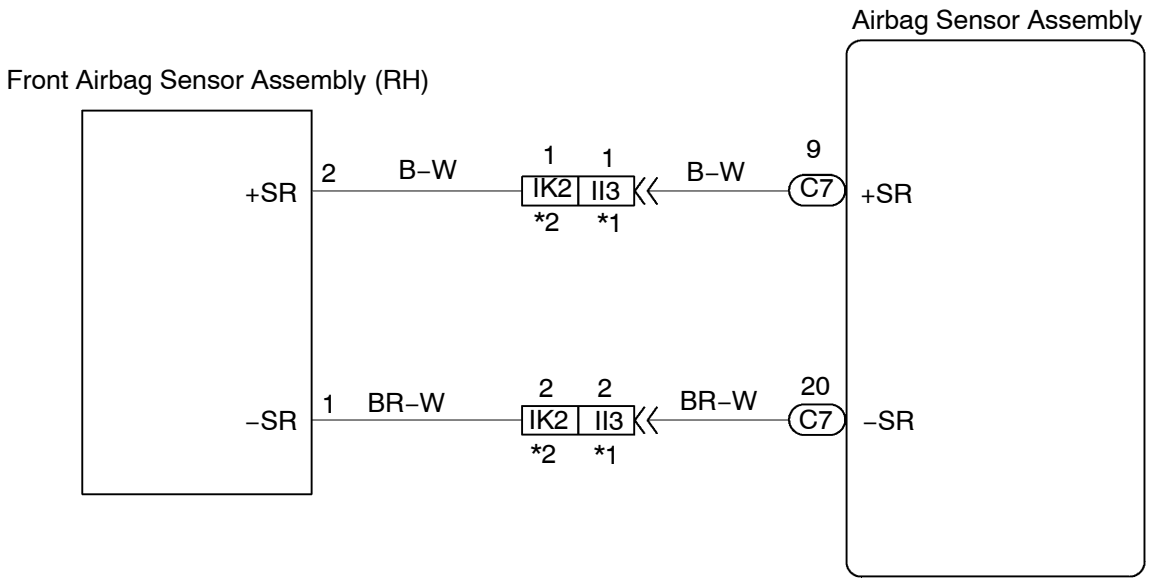
CIRCUIT DESCRIPTION

The front airbag sensor (RH) circuit consists of the airbag sensor assembly and front airbag sensor (RH). For details of the function of each component, see OPERATION on page RS–2.

DTC B1156/B1157/15 is recorded when a malfunction is detected in the front airbag sensor (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B1156/B1157/15	• Front airbag sensor (RH) malfunction	• Front airbag sensor (RH) • Airbag sensor assembly • Wire harness • Engine room main wire harness

WIRING DIAGRAM



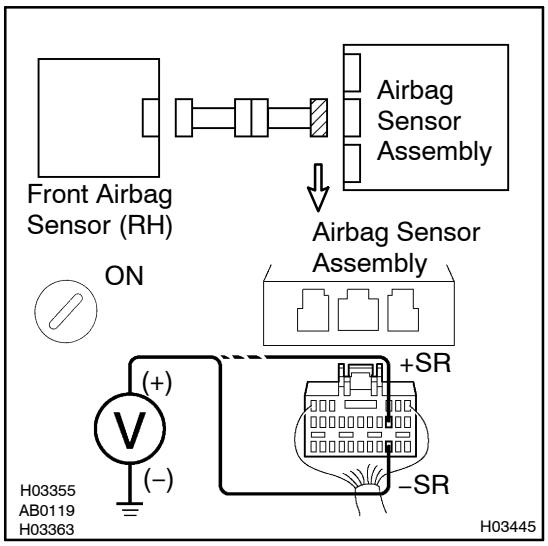
*1: LHD
*2: RHD

H04708

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check wire harness (to B+).



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the airbag sensor assembly side) between the front airbag sensor (RH) and the airbag sensor assembly, measure the voltage between body ground and each of +SR and –SR.

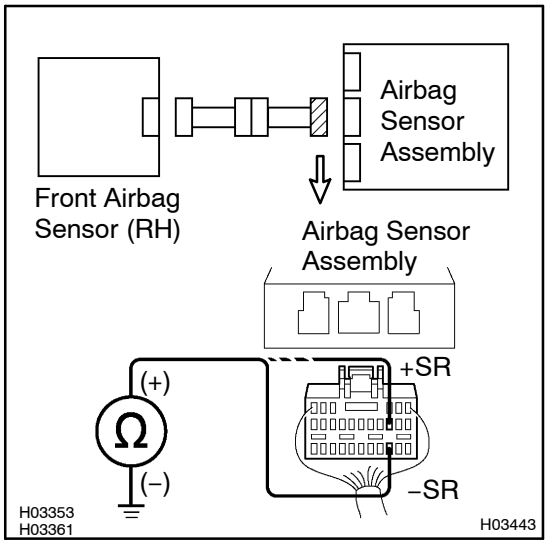
OK:

Voltage: Below 1 V

NG → **Go to step 8.**

OK

3	Check wire harness (to ground).



CHECK:

For the connector (on the airbag sensor assembly side) between the front airbag sensor (RH) and the airbag sensor assembly, measure the resistance between body ground and each of +SR and –SR.

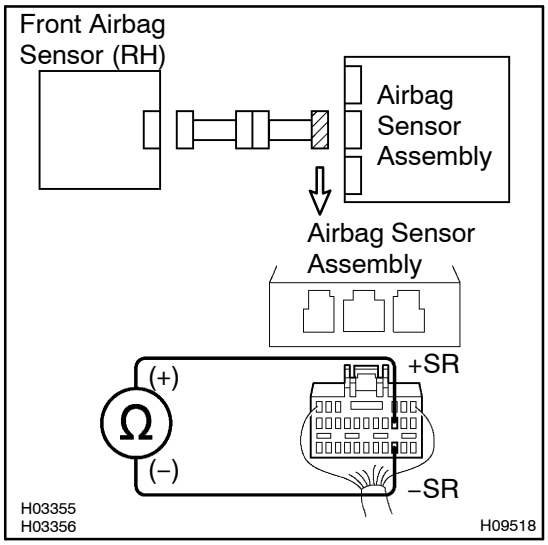
OK:

Resistance: 1 MΩ or Higher

NG → **Go to step 9.**

OK

4	Check wire harness.



CHECK:

For the connector (on the airbag sensor assembly side) between the front airbag sensor (RH) and the airbag sensor assembly, measure the resistance between +SR and –SR.

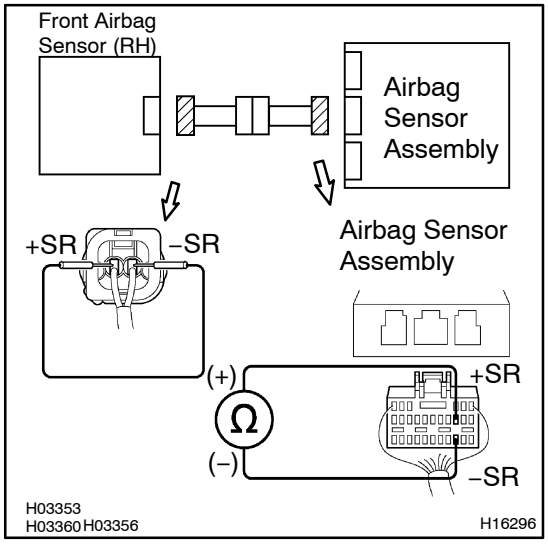
OK:

Resistance: 1 MΩ or Higher

NG	Go to step 10.

OK

5	Check wire harness.



PREPARATION:

Using a service wire, connect +SR and –SR of the connector (on the front airbag sensor (RH) side) between the airbag sensor assembly and the front airbag sensor (RH).

CHECK:

For the connector (on the airbag sensor assembly side) between the front airbag sensor (RH) and the airbag sensor assembly, measure the resistance between +SR and –SR.

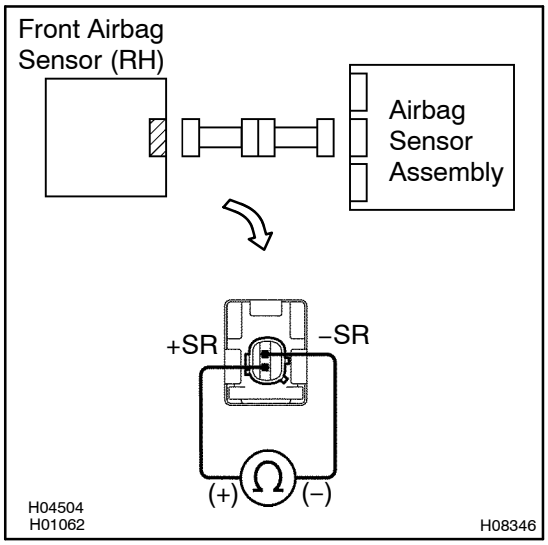
OK:

Resistance: Below 1 Ω

NG	Go to step 11.

OK

6	**Check front airbag sensor (RH).**



CHECK:

For the connector of the front airbag sensor (RH), measure the resistance between +SR and –SR.

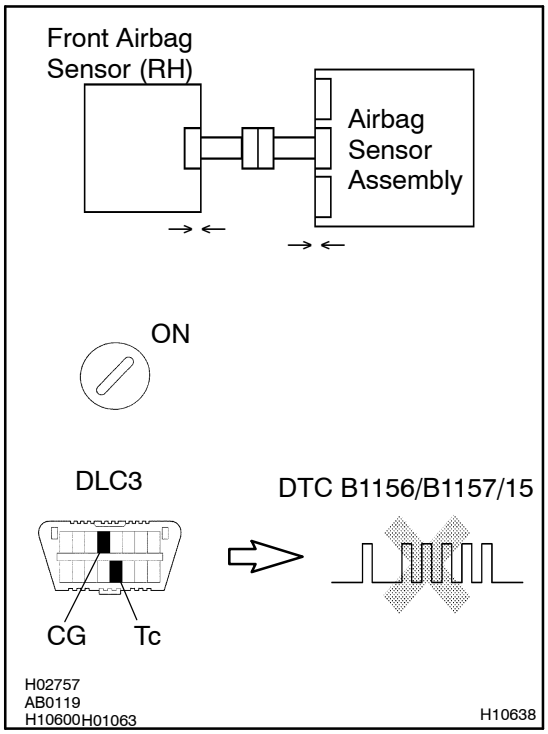
OK:

Resistance: 300 – 1500 Ω

NG → **Replace front airbag sensor (RH).**

OK

7	Check airbag sensor assembly.



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front airbag sensor (RH) connector and airbag sensor assembly connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B1156/B1157/15 is not output.

HINT:

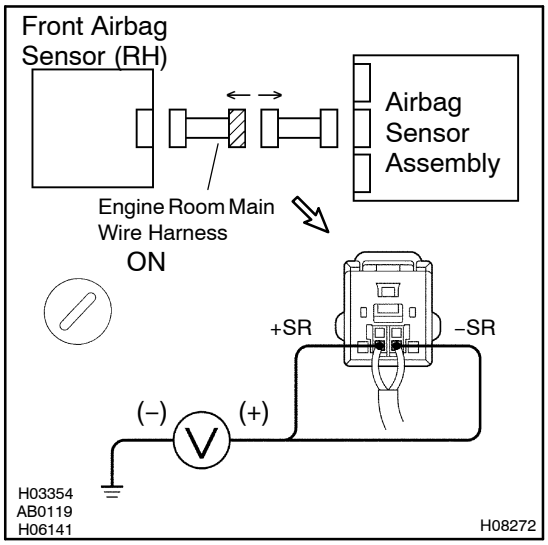
Codes other than code B1156/B1157/15 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

8	Check engine room main wire harness (to B+).



PREPARATION:

Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the RH front door wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the voltage between body ground and each of +SR and –SR.

OK:

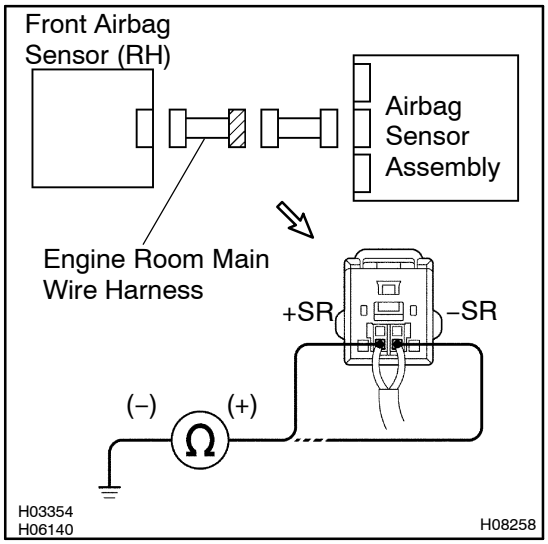
Voltage: Below 1 V

NG	Repair or replace engine room main wire harness.

OK

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

9	Check engine room main wire harness (to ground).



PREPARATION:

Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

CHECK:

For the connector (on the engine room main wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the resistance between body ground and each of +SR and –SR.

OK:

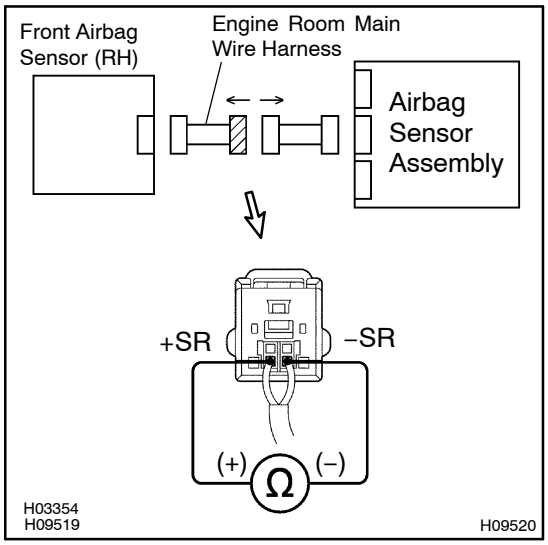
Resistance: 1 MΩ or Higher

NG	Repair or replace engine room main wire harness.

OK

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

10	Check engine room main wire harness.



PREPARATION:

Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

CHECK:

For the connector (on the engine room main wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the resistance between +SR and –SR.

OK:

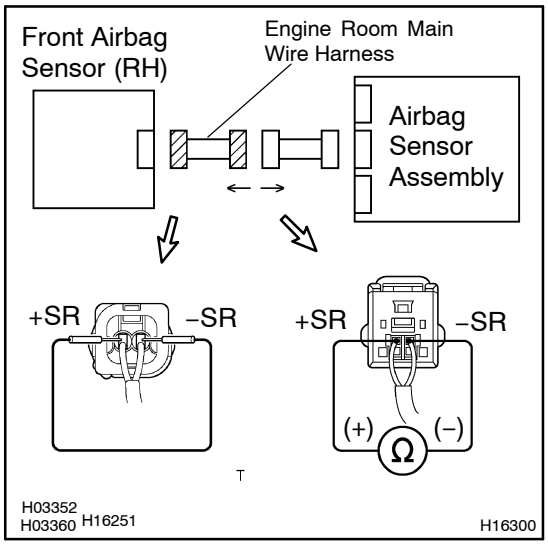
Resistance: 1 MΩ or Higher

NG → **Repair or replace engine room main wire harness.**

OK

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

11	Check engine room main wire harness.



PREPARATION:

(a) Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

(b) Using a service wire, connect +SR and –SR of the connector (on the engine room main wire harness side) between the engine room main wire harness and the front airbag sensor (RH).

CHECK:

For the connector (on the engine room main wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the resistance between +SR and –SR.

OK:

Resistance: Below 1 Ω

NG → **Repair or replace engine room main wire harness.**

OK

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

DI6PX–07

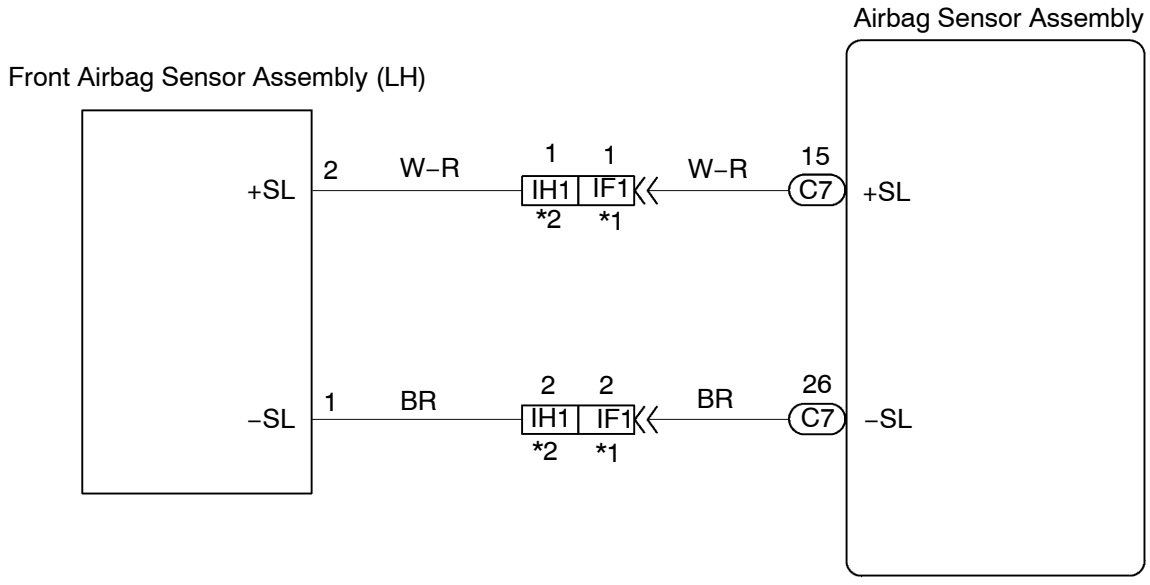
DTC	B1158/B1159/16	Front Airbag Sensor (LH) Malfunction

CIRCUIT DESCRIPTION

The front airbag sensor (LH) circuit consists of the airbag sensor assembly and front airbag sensor (LH).
For details of the function of each component, see OPERATION on page RS–2.
DTC B1158/B1159/16 is recorded when malfunction is detected in the front airbag sensor (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B1158/B1159/16	• Front airbag sensor (LH) malfunction	• Front airbag sensor (LH) • Airbag sensor assembly • Wire harness • Engine room main wire harness

WIRING DIAGRAM



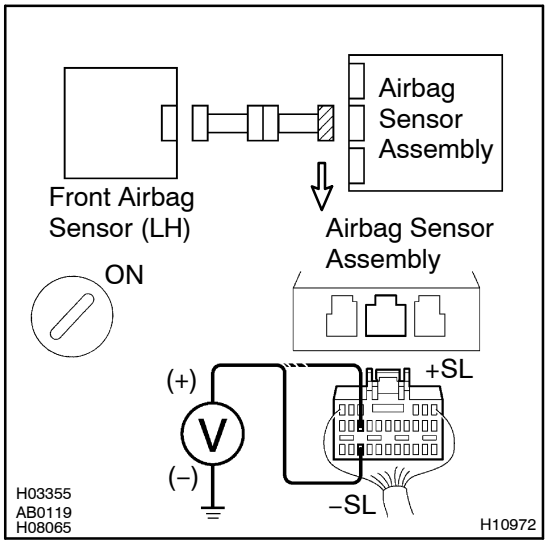
*1: LHD
*2: RHD

H04708

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check wire harness (to B+).



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the airbag sensor assembly side) between the front airbag sensor (LH) and the airbag sensor assembly, measure the voltage between body ground and each of +SL and –SL.

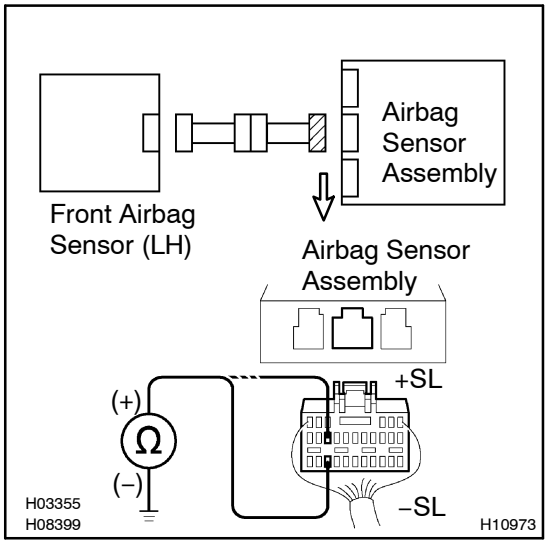
OK:

Voltage: Below 1 V

NG	Go to step 8.

OK

3	Check wire harness (to ground).



CHECK:

For the connector (on the airbag sensor assembly side) between the front airbag sensor (LH) and the airbag sensor assembly, measure the resistance between body ground and each of +SL and –SL.

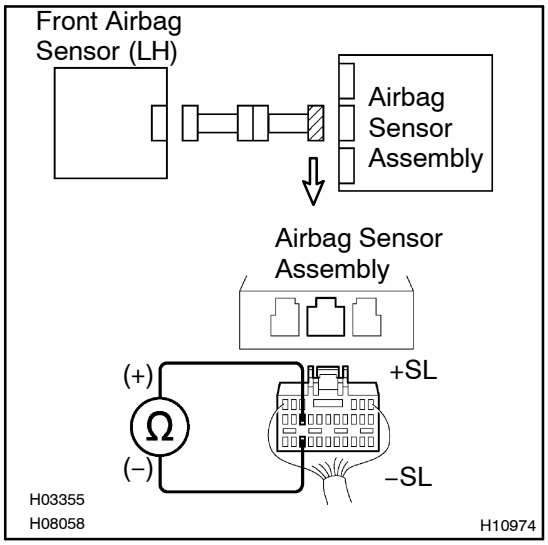
OK:

Resistance: 1 MΩ or Higher

NG	Go to step 9.

OK

4	Check wire harness.



CHECK:

For the connector (on the airbag sensor assembly side) between the front airbag sensor (LH) and the airbag sensor assembly, measure the resistance between +SL and –SL.

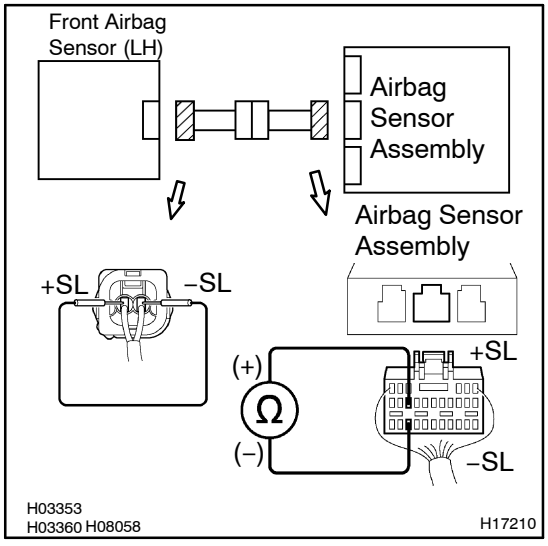
OK:

Resistance: 1 MΩ or Higher

NG → **Go to step 10.**

OK

5	Check wire harness.



PREPARATION:

Using a service wire, connect +SL and –SL of the connector (on the front airbag sensor (LH) side) between the airbag sensor assembly and the front airbag sensor (LH).

CHECK:

For the connector (on the airbag sensor assembly side) between the front airbag sensor (LH) and the airbag sensor assembly, measure the resistance between +SL and –SL.

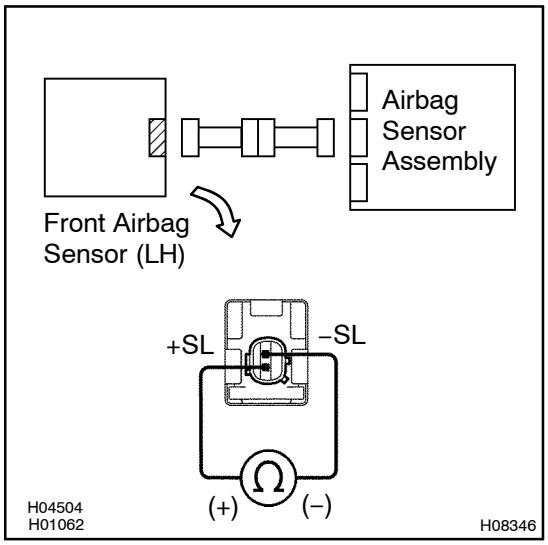
OK:

Resistance: Below 1 Ω

NG → **Go to step 11.**

OK

6	Check front airbag sensor (LH).



CHECK:

For the connector (on the front airbag sensor (LH)), measure the resistance between +SL and –SL.

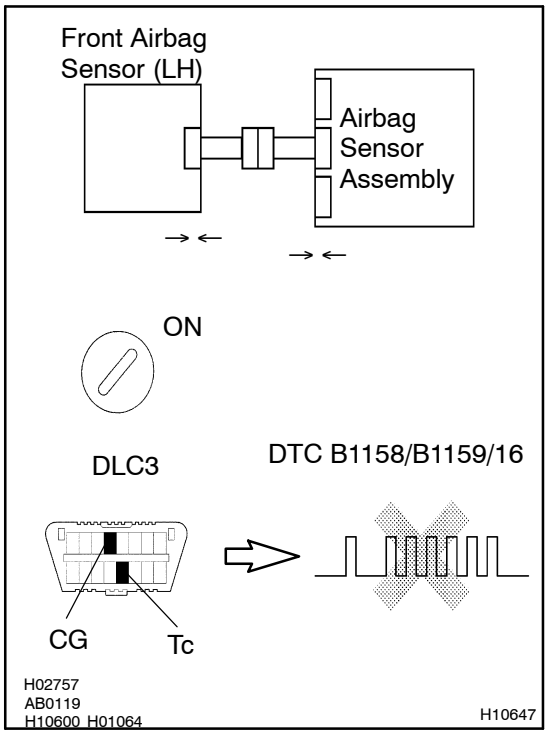
OK:

Resistance: 300 – 1500 Ω

NG → **Replace front airbag sensor (LH).**

OK

7	Check airbag sensor assembly.



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the front airbag sensor (LH) connector and airbag sensor assembly connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B1158/B1159/16 is not output.

HINT:

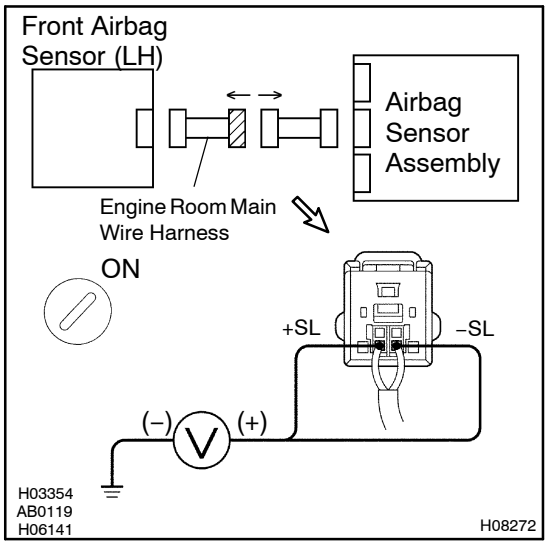
Codes other than code B1158/B1159/16 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

8	Check engine room main wire harness (to B+).



PREPARATION:

Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the LH front door wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the voltage between body ground and each of +SL and –SL.

OK:

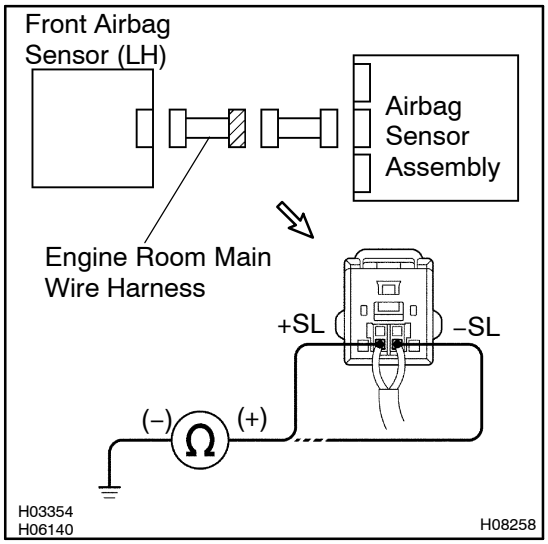
Voltage: Below 1 V

NG	Repair or replace engine room main wire harness.

OK

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

9	Check engine room main wire harness (to ground).



PREPARATION:

Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

CHECK:

For the connector (on the engine room main wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the resistance between body ground and each of +SL and –SL.

OK:

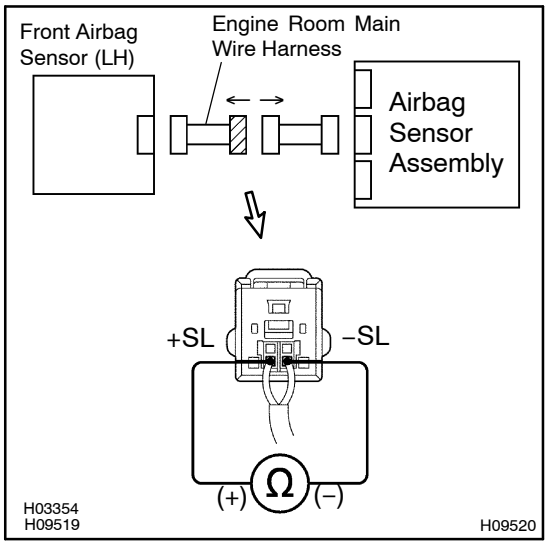
Resistance: 1 MΩ or Higher

NG	Repair or replace engine room main wire harness.

OK

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

10	Check engine room main wire harness.



PREPARATION:

Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

CHECK:

For the connector (on the engine room main wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the resistance between +SL and –SL.

OK:

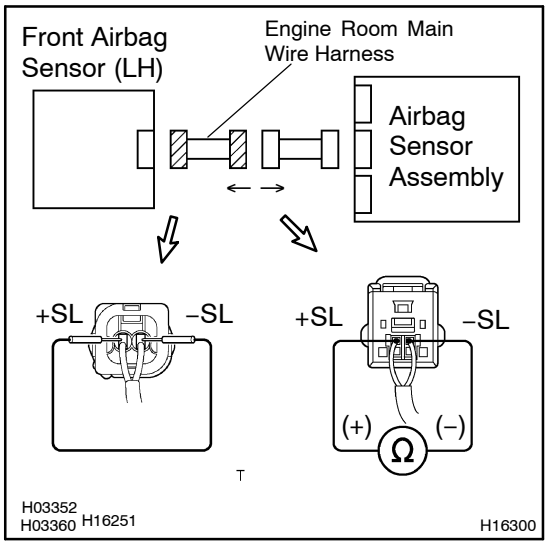
Resistance: 1 MΩ or Higher

NG → **Repair or replace engine room main wire harness.**

OK

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

11	Check engine room main wire harness.



PREPARATION:

(a) Disconnect the engine room main wire harness connector on the airbag sensor assembly side.

(b) Using a service wire, connect +SL and –SL of the connector (on the engine room main wire harness side) between the engine room main wire harness and the front airbag sensor (LH).

CHECK:

For the connector (on the engine room main wire harness side) between the airbag sensor assembly and the engine room main wire harness, measure the resistance between +SL and –SL.

OK:

Resistance: Below 1 Ω

NG → **Repair or replace engine room main wire harness.**

OK

Repair or replace harness or connector between airbag sensor assembly and engine room main wire harness.

DI6PB–07

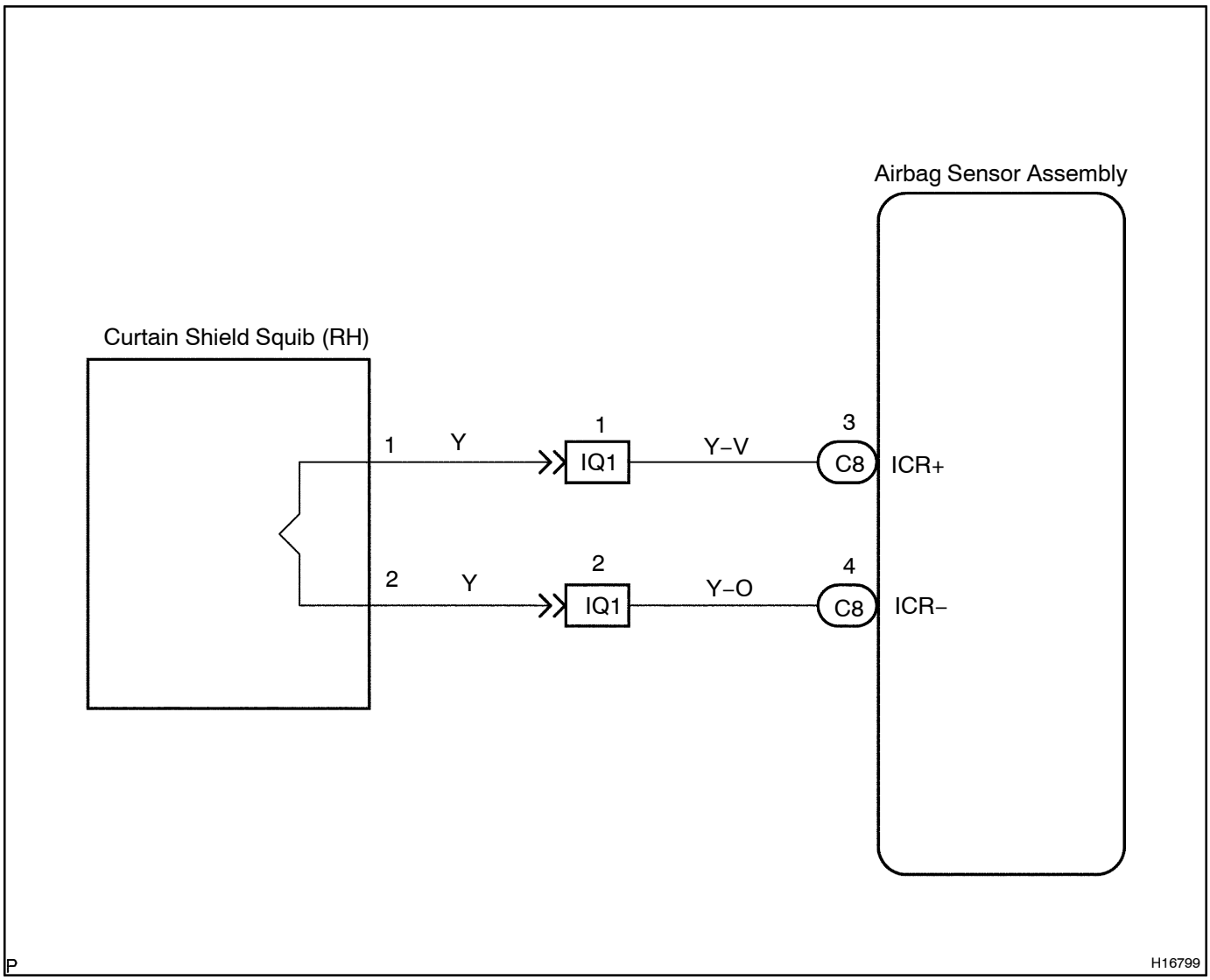
DTC	B1160/83	Short in Curtain Shield Squib (RH) Circuit

CIRCUIT DESCRIPTION

The curtain shield squib (RH) circuit consists of the airbag sensor assembly and curtain shield airbag assembly (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B1160/83 is recorded when a short is detected in the curtain shield squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B1160/83	• Short circuit between ICR+ wire harness and ICR– wire harness of squib • Curtain shield squib (RH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag assembly (RH) • Airbag sensor assembly • Wire harness

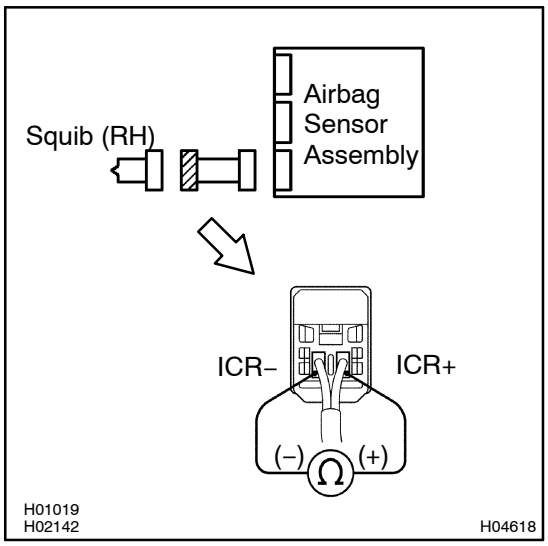
WIRING DIAGRAM



INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check curtain shield squib (RH) circuit.



PREPARATION:

Release the airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the curtain shield airbag assembly (RH) (See page DI–369).

CHECK:

For the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (RH) and the airbag sensor assembly, measure the resistance between ICR+ and ICR–.

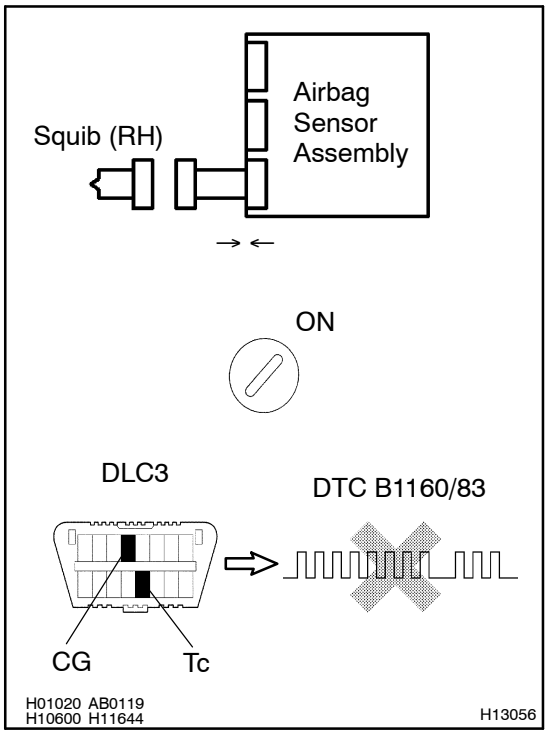
OK:

Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between curtain shield airbag assembly (RH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch or ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B1160/83 is not output.

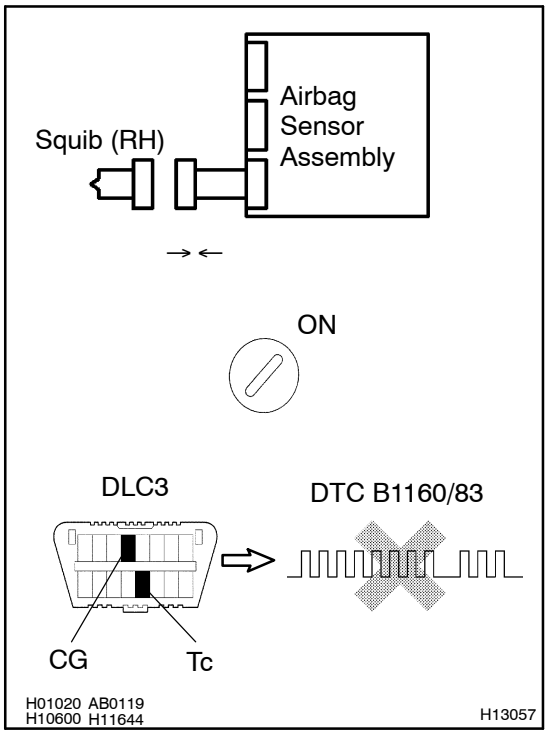
HINT:

Codes other than code B1160/83 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check curtain shield squib (RH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the curtain shield airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to LOOK, and wait at least for 20 second.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Clear the DTC stored in memory (See page DI–369).
(d) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check the DTC (See page DI–369).

OK:

DTC B1160/83 is not output.

HINT:
Codes other than code B1160/83 may be output at this time, but they are not relevant to this check.

NG → **Replace curtain shield airbag assembly (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DTC	B1161/84	Open in Curtain Shield Squib (RH) Circuit

CIRCUIT DESCRIPTION

The curtain shield squib (RH) circuit consists of the airbag sensor assembly and curtain shield airbag assembly (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B1161/84 is recorded when an open is detected in the curtain shield squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B1161/84	• Open circuit in ICR+ wire harness or ICR– wire harness of squib • Curtain shield squib (RH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag assembly (RH) • Airbag sensor assembly • Wire harness

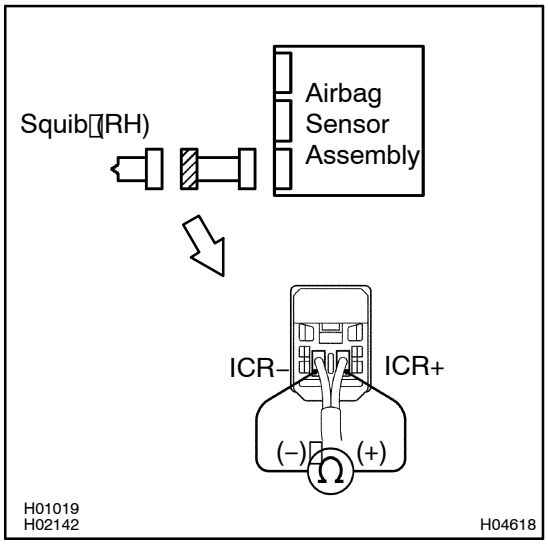
WIRING DIAGRAM

See page DI–514.

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check curtain shield squib (RH) circuit.

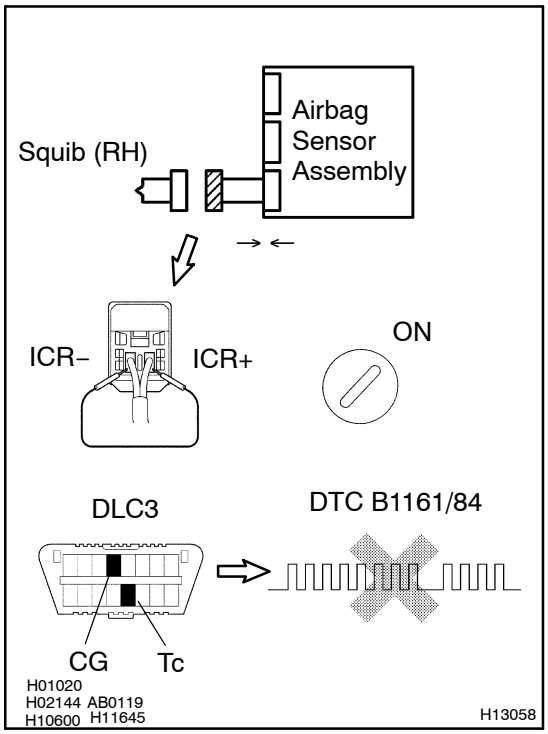


CHECK:
For the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (RH) and the airbag sensor assembly, measure the resistance between ICR+ and ICR–.
OK:
Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between curtain shield airbag assembly (RH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect ICR+ and ICR– of the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (RH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B1161/84 is not output.

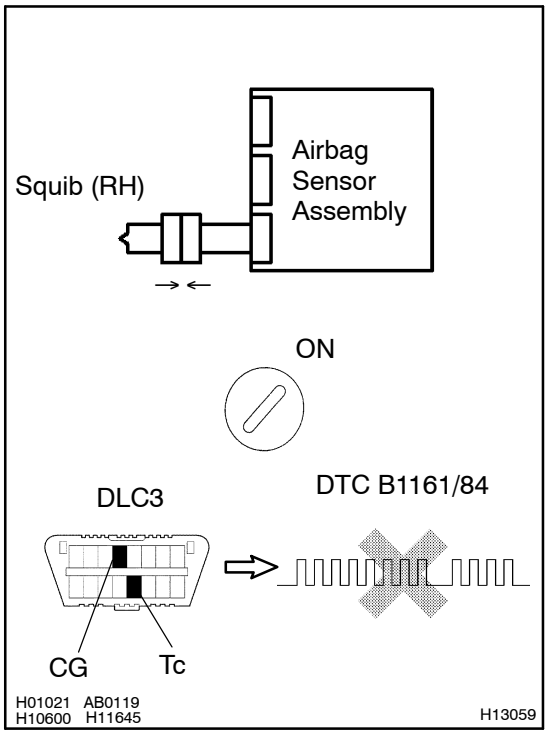
HINT:

Codes other than code B1161/84 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check curtain shield squib (RH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the curtain shield airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to or ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B1161/84 is not output.

HINT:

Codes other than code B1161/84 may be output at this time, but they are not relevant to this check.

NG	Replace curtain shield airbag assembly (RH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DI6PD–02

DTC	B1162/81	Short in Curtain Shield Squib (RH) Circuit (to Ground)

CIRCUIT DESCRIPTION

The curtain shield squib (RH) circuit consists of the airbag sensor assembly and curtain shield airbag assembly (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B1162/81 is recorded when ground short is detected in the curtain shield squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B1162/81	• Short circuit in curtain shield squib (RH) wire harness (to ground) • Curtain shield squib (RH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag assembly (RH) • Airbag sensor assembly • Wire harness

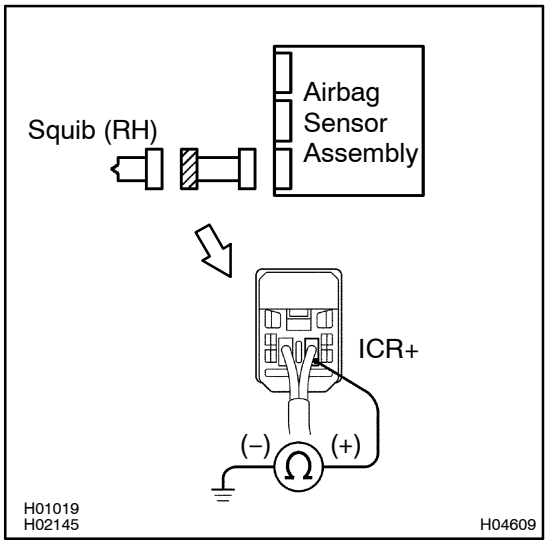
WIRING DIAGRAM

See page DI–514.

INSPECTION PROCEDURE

1	**Prepare for inspection (See step 1 on page DI–540).**

2	**Check curtain shield squib (RH) circuit.**

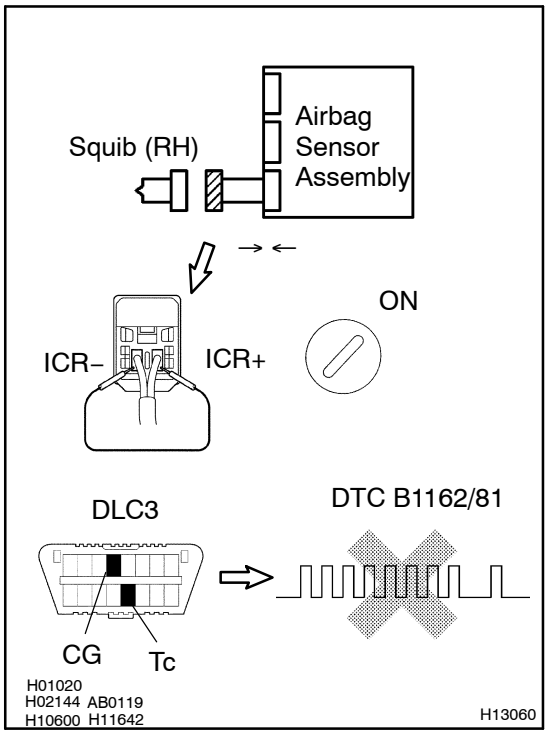


CHECK:
For the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (RH) and the airbag sensor assembly, measure the resistance between ICR+ and body ground.
OK:
Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between curtain shield airbag assembly (RH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect ICR+ and ICR– of the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (RH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B1162/81 is not output.

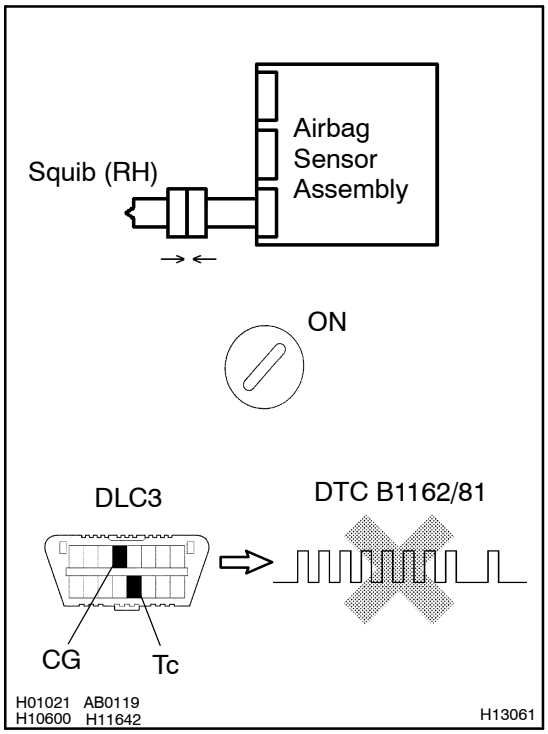
HINT:

Codes other than code B1162/81 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check curtain shield squib (RH).



PREPARATION:

(a) Turn the ignition switch to LOCK.

(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.

(c) Connect the curtain shield airbag assembly (RH) connector.

(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B1162/81 is not output.

HINT:

Codes other than code B1162/81 may be output at this time, but they are not relevant to this check.

NG → **Replace curtain shield airbag assembly (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DTC	B1163/82	Short in curtain shield Squib (RH) Circuit (to B+)

CIRCUIT DESCRIPTION

The curtain shield squib (RH) circuit consists of the airbag sensor assembly and curtain shield airbag assembly (RH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B1163/82 is recorded when a B+ short is detected in the curtain shield squib (RH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B1163/82	• Short circuit in curtain shield squib (RH) wire harness (to B+) • Curtain shield squib (RH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag assembly (RH) • Airbag sensor assembly • Wire harness

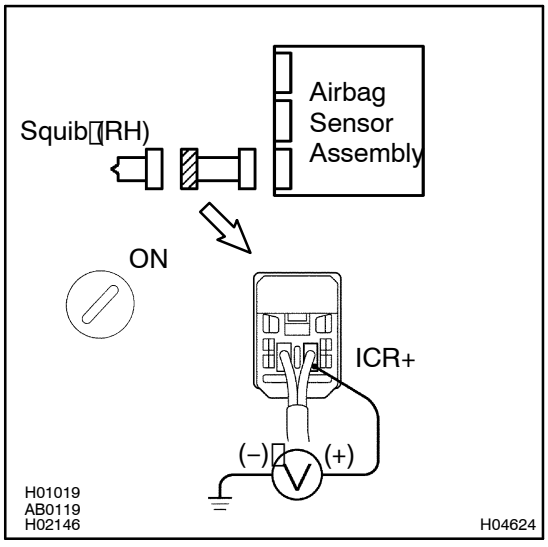
WIRING DIAGRAM

See page DI–514.

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–369).

2	Check curtain shield squib (RH) circuit.



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the airbag sensor assembly side) between the curtain shield airbag assembly (RH) and the airbag sensor assembly, measure the voltage between ICR+ and body ground.

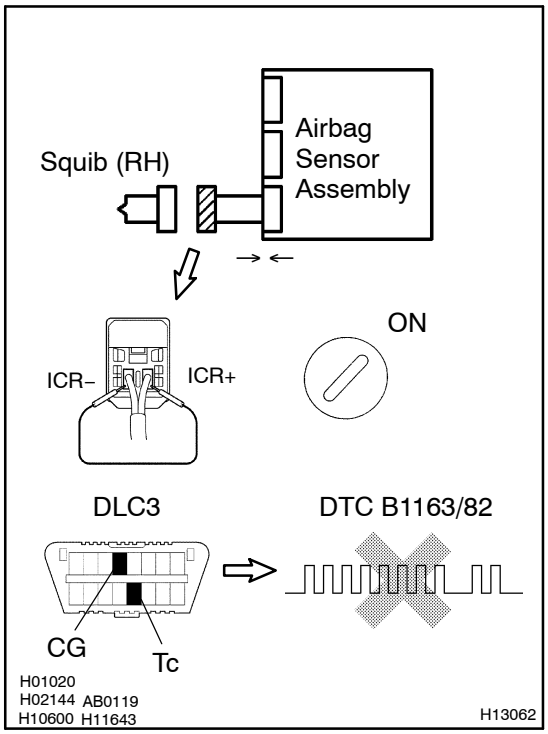
OK:

Voltage: 0 V

NG → **Repair or replace harness or connector between curtain shield airbag assembly (RH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect ICR+ and ICR– of the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (RH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B1163/82 is not output.

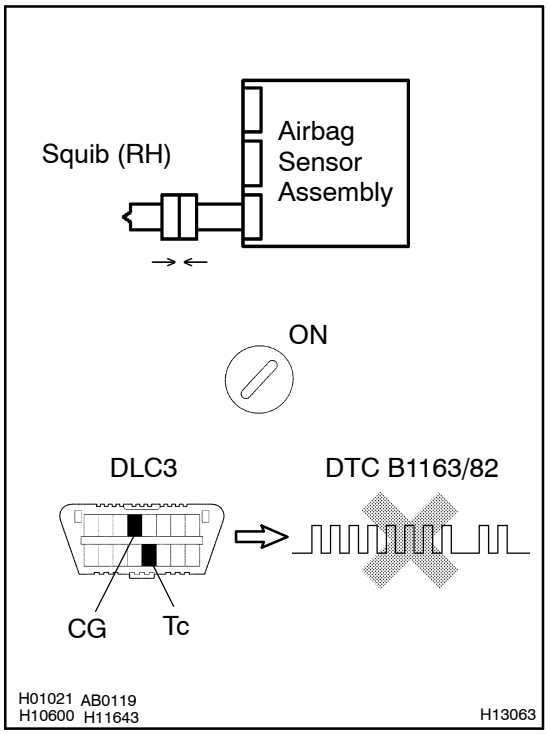
HINT:

Codes other than code B1163/82 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check curtain shield squib (RH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the curtain shield airbag assembly (RH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B1163/82 is not output.

HINT:
Codes other than code B1163/82 may be output at this time, but they are not relevant to this check.

NG → **Replace curtain shield airbag assembly (RH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI6PF–07

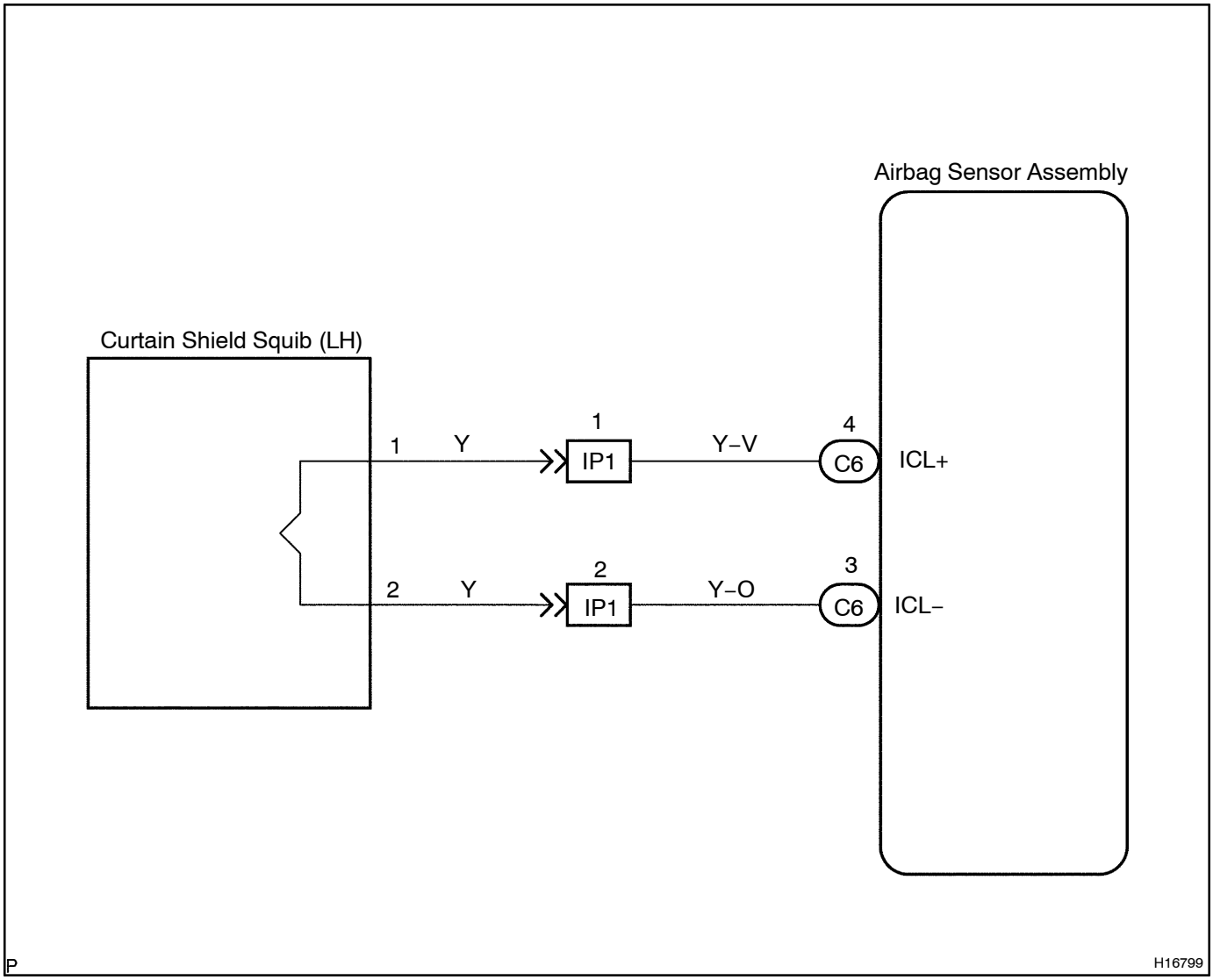
DTC	B1165/87	Short in Curtain Shield Squib (LH) Circuit

CIRCUIT DESCRIPTION

The curtain shield squib (LH) circuit consists of the airbag sensor assembly and curtain shield airbag assembly (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B1165/87 is recorded when a short is detected in the curtain shield squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B1165/87	• Short circuit between ICL+ wire harness and ICL– wire harness of squib • Curtain shield squib (LH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag assembly (LH) • Airbag sensor assembly • Wire harness

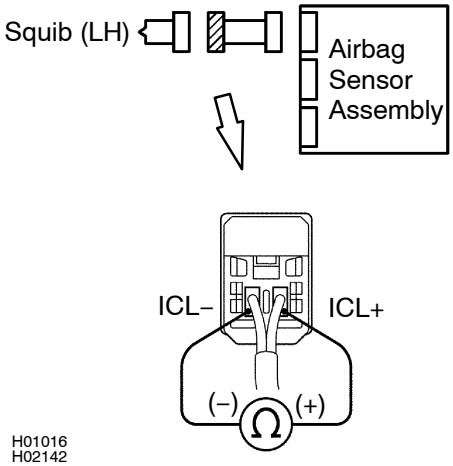
WIRING DIAGRAM



INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check curtain shield squib (LH) circuit.



PREPARATION:

Release the airbag activation prevention mechanism of the connector (on the airbag sensor assembly side) between the airbag sensor assembly and the curtain shield airbag assembly (LH) (See page DI–369).

CHECK:

For the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (LH) and the airbag sensor assembly, measure the resistance between ICL+ and ICL–.

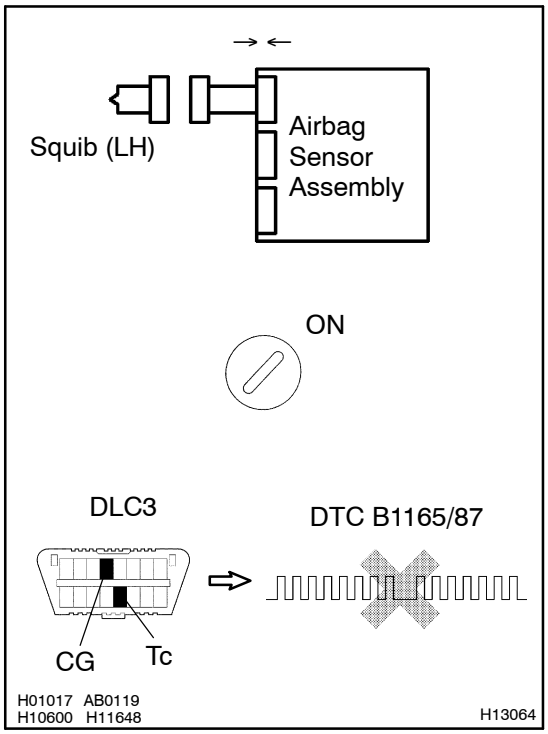
OK:

Resistance: 1 MΩ or Higher

NG	**Repair or replace harness or connector between curtain shield airbag assembly (LH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch or ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B1165/87 is not output.

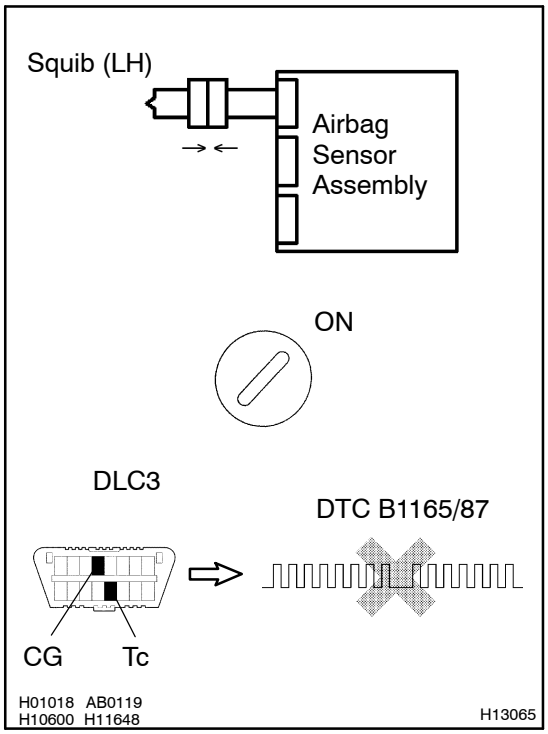
HINT:

Codes other than code B1165/87 may be output at this time, but they are not relevant to this check.

NG → **Replace airbag sensor assembly.**

OK

4	Check curtain shield squib (LH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the curtain shield airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to LOOK, and wait at least for 20 second.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Clear the DTC stored in memory (See page DI–369).
(d) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(e) Turn the ignition switch to ON, and wait at least for 20 seconds.
(f) Check the DTC (See page DI–369).

OK:

DTC B1165/87 is not output.

HINT:
Codes other than code B1165/87 may be output at this time, but they are not relevant to this check.

NG → **Replace curtain shield airbag assembly (LH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DTC	B1166/88	Open in Curtain Shield Squib (LH) Circuit

CIRCUIT DESCRIPTION

The curtain shield squib (LH) circuit consists of the airbag sensor assembly and curtain shield airbag assembly (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B1166/88 is recorded when an open is detected in the curtain shield squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B1166/88	• Open circuit in ICL+ wire harness or ICL– wire harness of squib • Curtain shield squib (LH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag assembly (LH) • Airbag sensor assembly • Wire harness

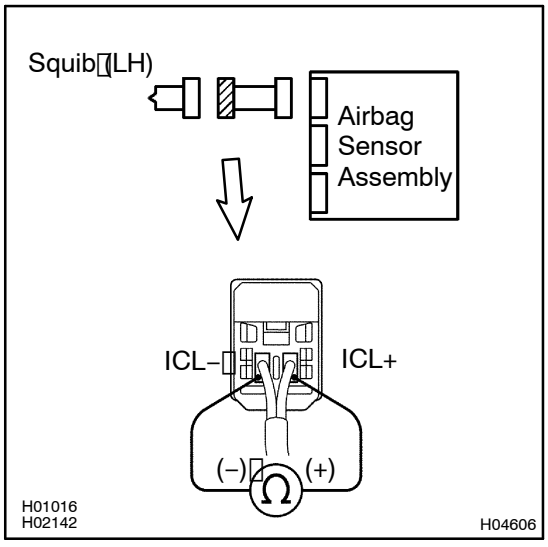
WIRING DIAGRAM

See page DI–527.

INSPECTION PROCEDURE

1	Prepare for inspection. (See step 1 on page DI–540)

2	Check curtain shield squib (LH) circuit.

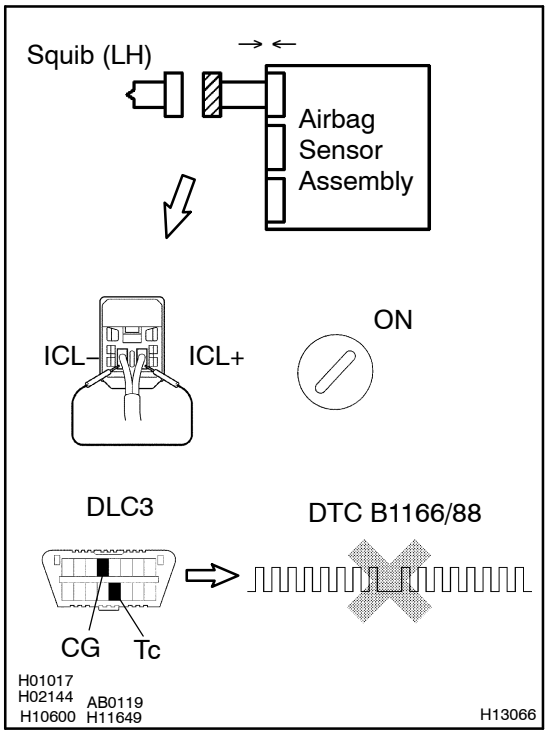


CHECK:
For the connector (on the front curtain shield airbag assembly side) between the front curtain shield airbag assembly (LH) and the airbag sensor assembly, measure the resistance between ICL+ and ICL–.
OK:
Resistance: Below 1 Ω

NG → **Repair or replace harness or connector between curtain shield airbag assembly (LH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect ICL+ and ICL– of the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (LH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B1166/88 is not output.

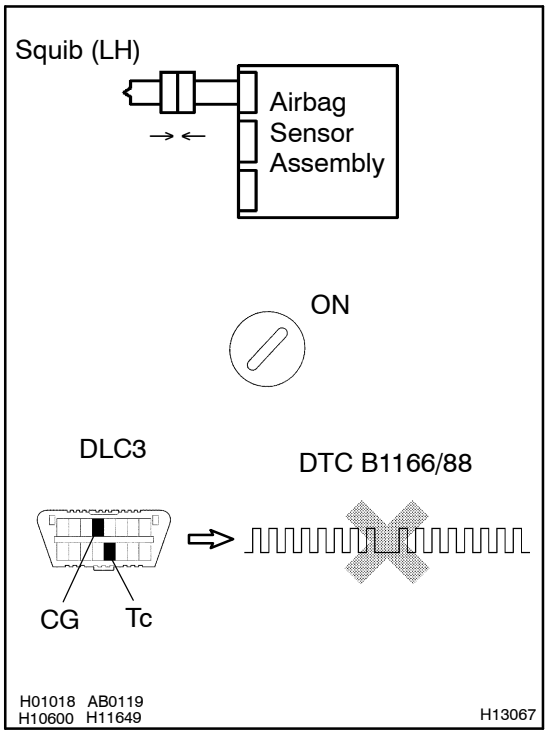
HINT:

Codes other than code B1166/88 may be output at this time, but they are not relevant to this check.

NG	Replace curtain shield airbag sensor assembly.

OK

4	Check curtain shield squib (LH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the curtain shield airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B1166/88 is not output.

HINT:

Codes other than code B1166/88 may be output at this time, but they are not relevant to this check.

NG	Replace curtain shield airbag assembly (LH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

DTC	B1167/85	Short in Curtain Shield Squib (LH) Circuit (to Ground)

CIRCUIT DESCRIPTION

The curtain shield squib (LH) circuit consists of the airbag sensor assembly and curtain shield airbag assembly (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B1167/85 is recorded when ground short is detected in the curtain shield squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B1167/85	• Short circuit in curtain shield squib (LH) wire harness (to ground) • Curtain shield squib (LH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag assembly (LH) • Airbag sensor assembly • Wire harness

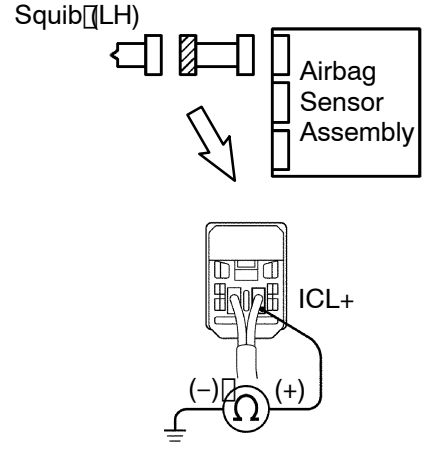
WIRING DIAGRAM

See page DI–527.

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check curtain shield squib (LH) circuit.

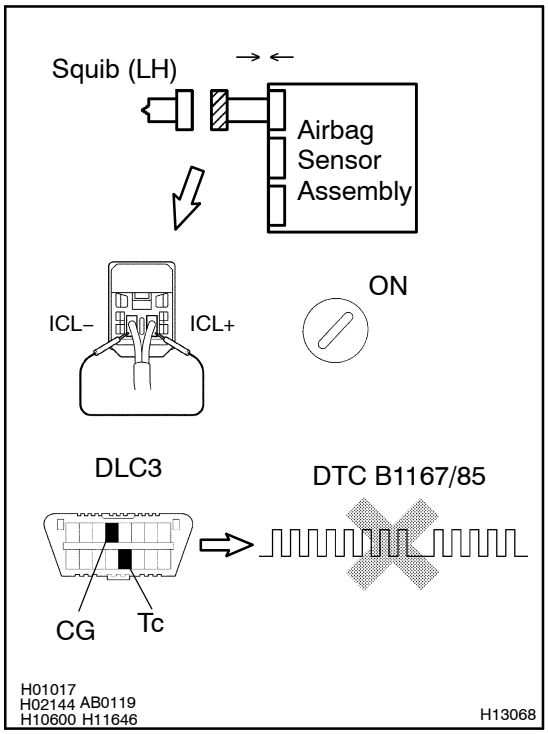


CHECK:
For the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (LH) and the airbag sensor assembly, measure the resistance between ICL+ and body ground.
OK:
Resistance: 1 MΩ or Higher

NG → **Repair or replace harness or connector between curtain shield airbag assembly (LH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect ICL+ and ICL– of the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (LH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B1167/85 is not output.

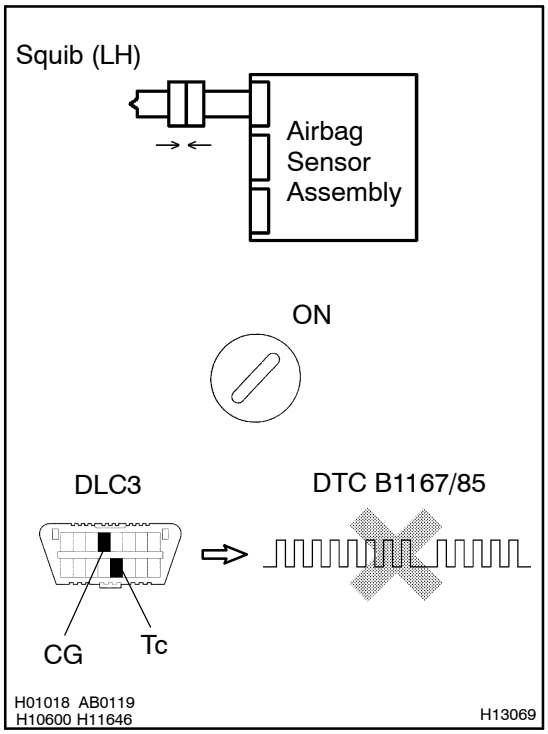
HINT:

Codes other than code B1167/85 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check curtain shield squib (LH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the curtain shield airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B1167/85 is not output.

HINT:
Codes other than code B1167/85 may be output at this time, but they are not relevant to this check.

NG → **Replace curtain shield airbag assembly (LH).**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DTC	B1168/86	Short in Curtain Shield Squib (LH) Circuit (to B+)

CIRCUIT DESCRIPTION

The curtain shield squib (LH) circuit consists of the airbag sensor assembly and curtain shield airbag assembly (LH).
It causes the SRS to deploy when the SRS deployment conditions are satisfied.
For details of the function of each component, see OPERATION on page RS–2.
DTC B1168/86 is recorded when a B+ short is detected in the curtain shield squib (LH) circuit.

DTC No.	DTC Detecting Condition	Trouble Area
B1168/86	• Short circuit in curtain shield squib (LH) wire harness (to B+) • Curtain shield squib (LH) malfunction • Airbag sensor assembly malfunction	• Curtain shield airbag assembly (LH) • Airbag sensor assembly • Wire harness

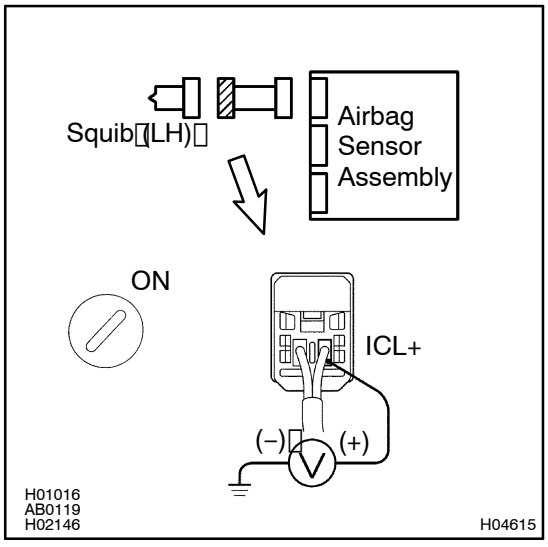
WIRING DIAGRAM

See page DI–527.

INSPECTION PROCEDURE

1	Prepare for inspection (See step 1 on page DI–540).

2	Check curtain shield squib (LH) circuit.



CHECK:

(a) Turn the ignition switch to ON.

(b) For the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (LH) and the airbag sensor assembly, measure the voltage between ICL+ and body ground.

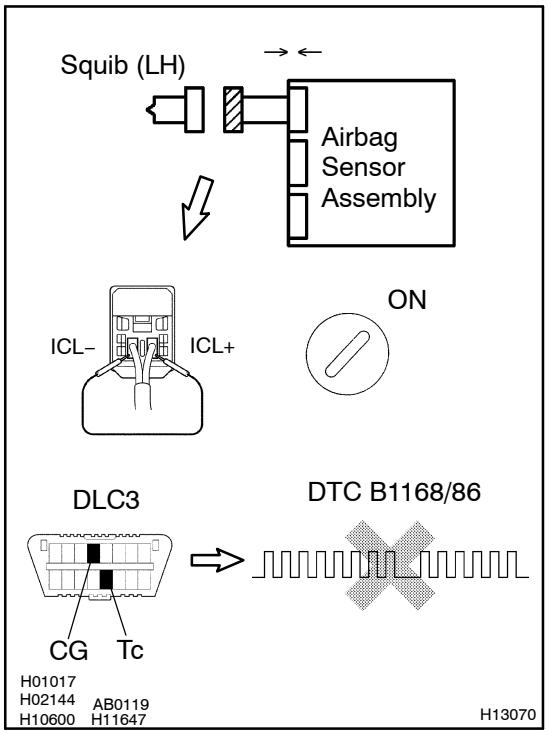
OK:

Voltage: 0 V

NG → **Repair or replace harness or connector between curtain shield airbag assembly (LH) and airbag sensor assembly.**

OK

3	Check airbag sensor assembly.



PREPARATION:

(a) Connect the connector to the airbag sensor assembly.

(b) Using a service wire, connect ICL+ and ICL– of the connector (on the curtain shield airbag assembly side) between the curtain shield airbag assembly (LH) and the airbag sensor assembly.

(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON and wait at least for 20 seconds.

(b) Clear the DTC stored in memory (See step 5 on page DI–369).

(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.

(d) Turn the ignition switch to ON, and wait at least for 20 seconds.

(e) Check the DTC (See page DI–369).

OK:

DTC B1168/86 is not output.

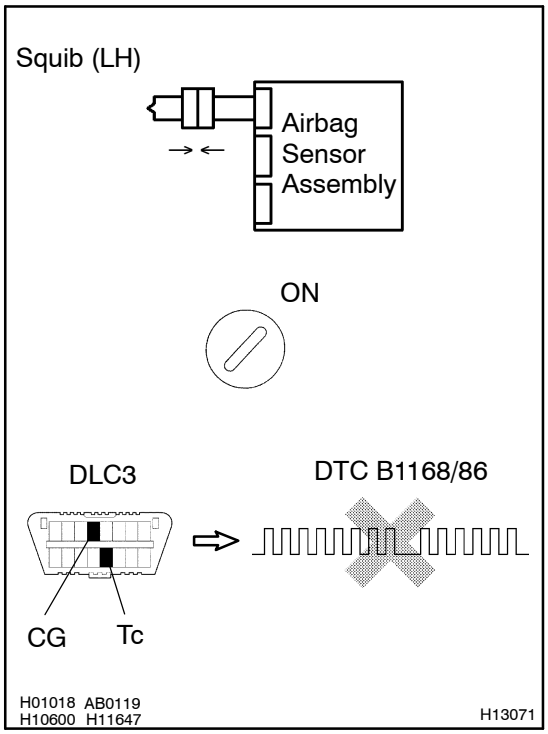
HINT:

Codes other than code B1168/86 may be output at this time, but they are not relevant to this check.

NG	Replace airbag sensor assembly.

OK

4	Check curtain shield squib (LH).



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Connect the curtain shield airbag assembly (LH) connector.
(d) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.

CHECK:

(a) Turn the ignition switch to ON, and wait at least for 20 seconds.
(b) Clear the DTC stored in memory (See step 5 on page DI–369).
(c) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(d) Turn the ignition switch to ON, and wait at least for 20 seconds.
(e) Check the DTC (See page DI–369).

OK:

DTC B1168/86 is not output.

HINT:
Codes other than code B1168/86 may be output at this time, but they are not relevant to this check.

NG	Replace curtain shield airbag assembly (LH).

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check. If the malfunctioning part can not be detected by the simulation method, replace all SRS components including the wire harness.

DI6PY–10

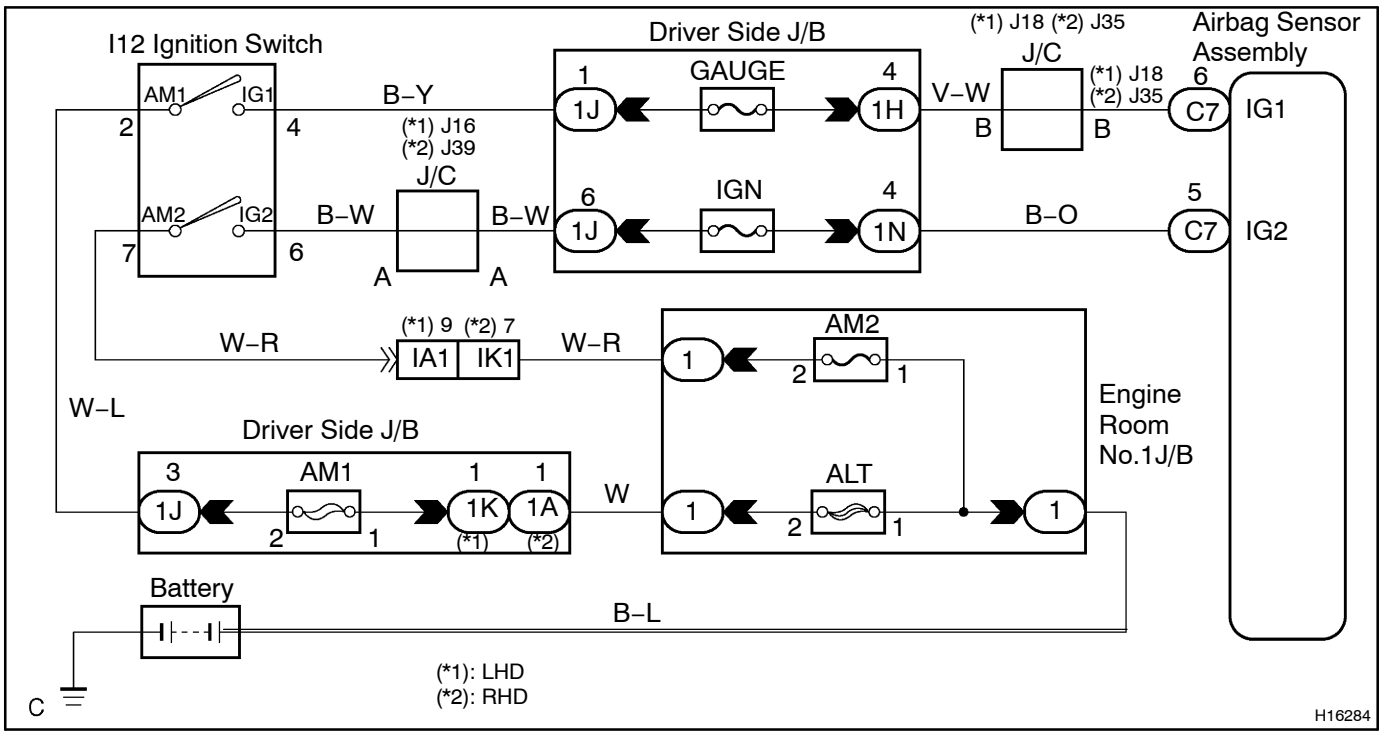
DTC	Normal	Source Voltage Drop

CIRCUIT DESCRIPTION

The SRS is equipped with a voltage–increase circuit (DC–DC converter) in the airbag sensor assembly in case the source voltage drops.
When the battery voltage drops, the voltage–increase circuit (DC–DC converter) functions to increase the voltage of the SRS to normal voltage.
The diagnosis system malfunction display for this circuit is different from other circuits that is when the SRS warning light remains lit up and the DTC is a normal code, source voltage drop is indicated.
Malfunction in this circuit is not recorded in the airbag sensor assembly, and the source voltage returns to normal, the SRS warning light automatically goes off.

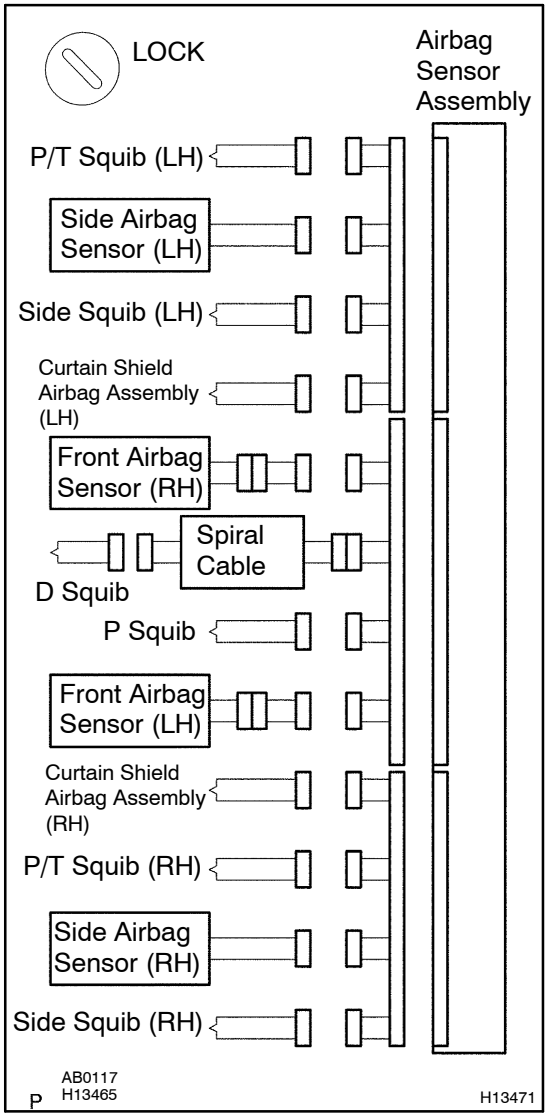
DTC No.	Diagnosis
(Normal)	Source voltage drop

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Prepare for inspection.**



PREPARATION:

(a) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.

(b) Remove the steering wheel pad (See page SR–9).

(c) Disconnect the connector of the front passenger airbag assembly (See Pub.No. RM588E on page RS–28).

(d) Disconnect the connector of the side airbag assembly RH and LH (See Pub. No. RM588E on page RS–40).

(e) Disconnect the connector of the curtain shield airbag assembly RH and LH (See page RS–13).

(f) Disconnect the connector of the seat belt pretensioner RH and LH (See Pub. No. RM588E on page BO–124).

(g) Disconnect the connectors of the airbag sensor assembly (See Pub. No. RM588E on page RS–53).

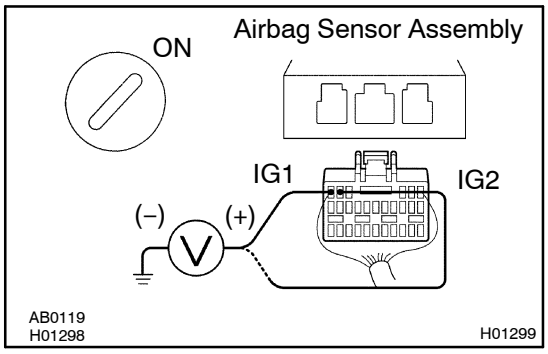
(h) Disconnect the connector of the front airbag sensor RH and LH (See Pub. No. RM588E on page RS–58).

(i) Disconnect the connector of the side and curtain shield airbag sensor assembly RH and LH (See page RS–13).

CAUTION:

Store the steering wheel pad, front passenger airbag assembly, side airbag assembly and curtain shield airbag assembly with the front surface facing upward.

2	Check source voltage.



PREPARATION:

Connect negative (–) terminal cable to the battery.

CHECK:

(a) Turn the ignition switch to ON.

(b) Measure the voltage between body ground and each of IG1 and IG2 on the sensor and operate electric system (defogger, wiper, headlight, heater blower, etc.).

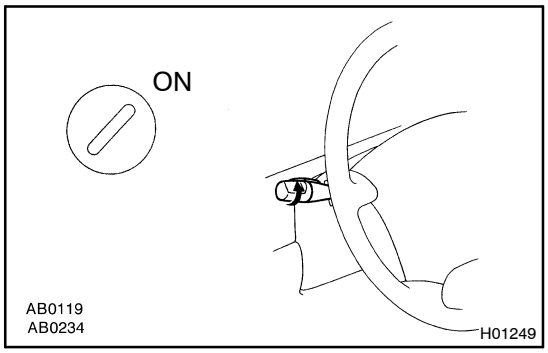
OK:

Voltage: 10 – 14 V

NG → **Check harness between battery and airbag sensor assembly, and check battery and charging system.**

OK

3	Does SRS warning light turn off?



PREPARATION:

(a) Turn the ignition switch to LOCK.

(b) Connect the steering wheel pad connector.

(c) Connect the front passenger airbag assembly connector.

(d) Connect the side airbag assembly connectors.

(e) Connect the seat belt pretensioner connectors.

(f) Connect the airbag sensor assembly connectors.

(g) Connect the front airbag sensor connectors.

(h) Connect the side and curtain shield airbag sensor assembly connectors.

(i) Connect the curtain shield airbag assembly connectors.

(j) Turn the ignition switch to ON.

CHECK:

Operate electric system (defogger, wiper, headlight, heater blower, etc.) and check that SRS warning light goes off.

NO → **Check for DTCs. If a DTC is output, perform troubleshooting for the DTC. If a normal code is output, replace airbag sensor assembly.**

YES

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use the simulation method to check.

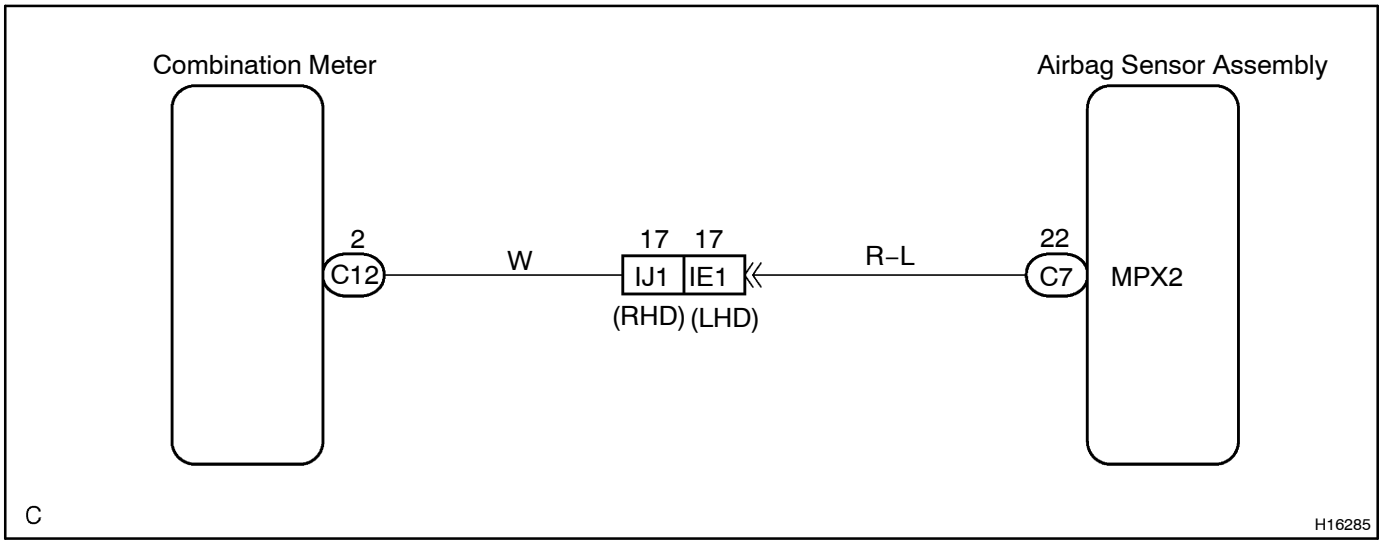
DI71G-02

SRS Warning Light Circuit Malfunction

CIRCUIT DESCRIPTION

The SRS warning light is located on the combination meter.
When the SRS is normal, the SRS warning light lights up for approx. 6 seconds after the ignition switch is turned from the LOCK position to ON position, and then turns off automatically.
If there is a malfunction in the SRS, the SRS warning light lights up to inform the driver of the abnormality. When terminals Tc and CG of the DLC3 are connected, the DTC is displayed by blinking the SRS warning light.
The signal to make the SRS warning light light up is transmitted from the airbag sensor assembly to the combination meter through multiplex communication system.

WIRING DIAGRAM

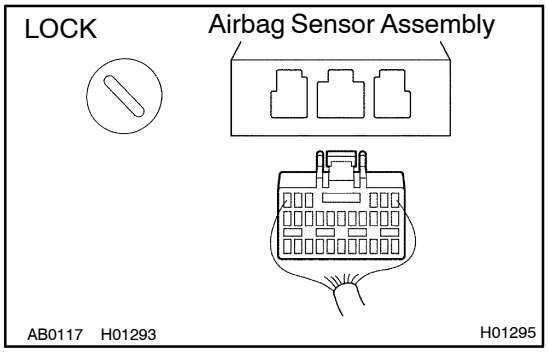


INSPECTION PROCEDURE

Always lights up, when ignition switch is in LOCK position

1	Prepare for inspection (See step 1 on page DI–540).

2	Does SRS warning light turn off?



PREPARATION:

(a) Turn the ignition switch to LOCK.
(b) Disconnect negative (–) terminal cable from the battery, and wait at least for 90 seconds.
(c) Disconnect the airbag sensor assembly connector.
(d) Connect negative (–) terminal cable to the battery.

CHECK:

Check operation of SRS warning light.

NO → Check combination meter (See page BE–1).

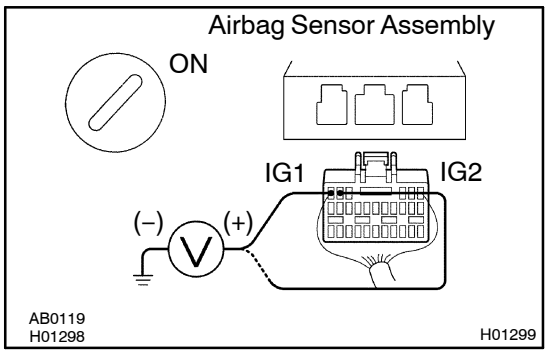
YES

Replace airbag sensor assembly.

Does not light up, when ignition switch is turned to ON

1	Check combination meter (See page BE–1).

2	Check source voltage.



PREPARATION:

Connect negative (–) terminal cable to the battery.

CHECK:

(a) Turn the ignition switch to ON.

(b) Measure the voltage between body ground and each of IG1 and IG2 on the sensor.

OK:

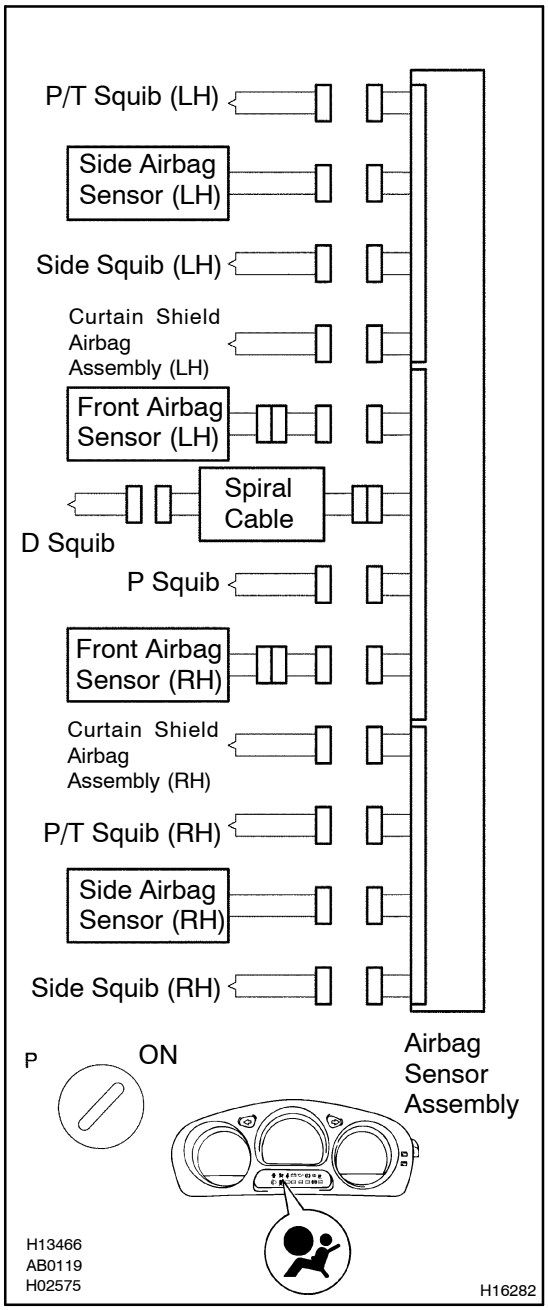
Voltage: 10 – 14 V

NG	Check harness between battery and airbag sensor assembly, and check battery and charging system.

OK

3	Prepare for inspection (See step 1 on page DI–540).

4	Does SRS warning light come on?



PREPARATION:

(a) Disconnect negative (–) terminal cable from the battery.
(b) Connect the airbag sensor assembly connector.
(c) Connect negative (–) terminal cable to the battery, and wait at least for 2 seconds.
(d) Turn the ignition switch to ON.

CHECK:

Check operation of the SRS warning light.

NO → **Replace airbag sensor assembly.**

YES

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use simulation method to check.

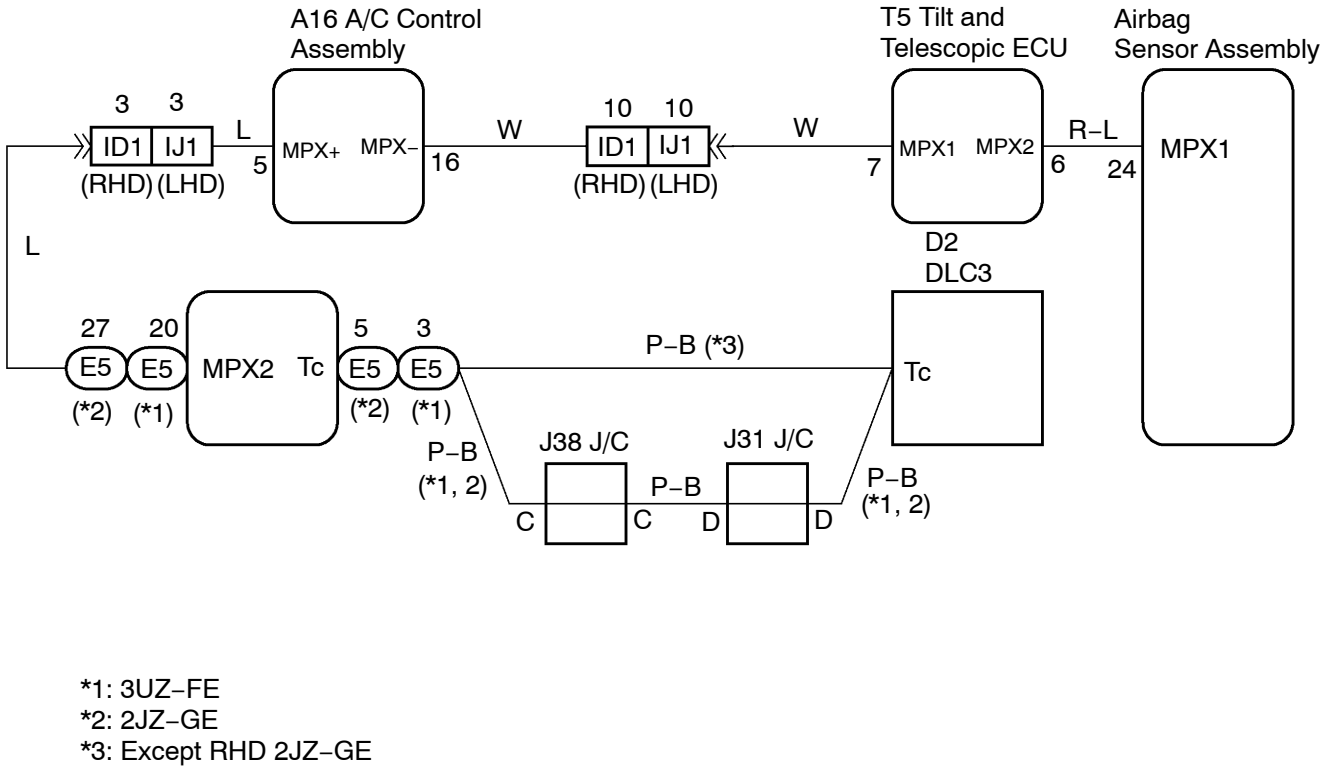
DI71H–02

Tc Terminal Circuit

CIRCUIT DESCRIPTION

By connecting terminals Tc and CG of the DLC3 the airbag sensor assembly is set in the DTC output mode. The DTCs are displayed by blinking the SRS warning light.
The signal passes the engine ECU and is input to the airbag sensor assembly via multiplex communication system.

WIRING DIAGRAM



*1: 3UZ–FE
*2: 2JZ–GE
*3: Except RHD 2JZ–GE

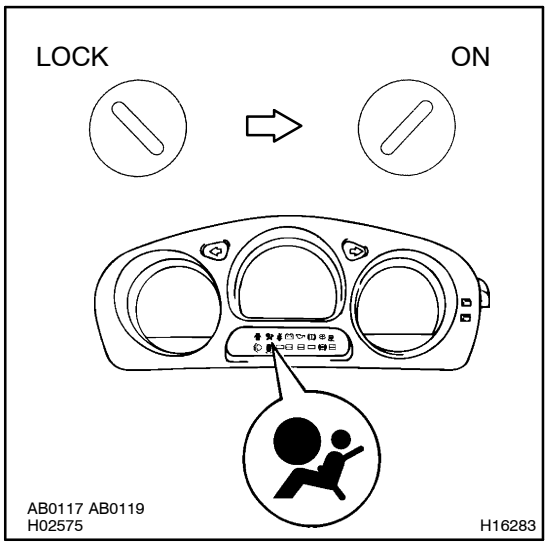
C

H16438

INSPECTION PROCEDURE

If the DTC is not displayed, do the following troubleshooting.

1	**Does SRS warning light light up for approx. 6 seconds?**

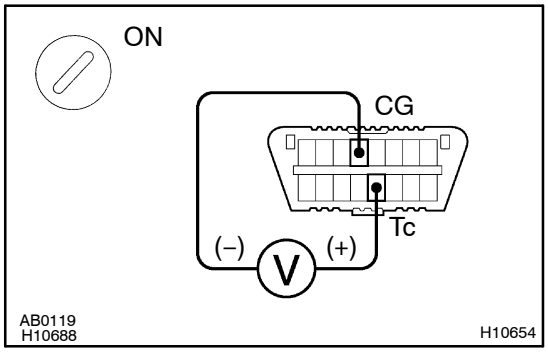


PREPARATION:
Check operation of the SRS warning light after ignition switch is turned from LOCK position to ON position.

NO → **Check SRS warning light system (See page DI–543).**

YES

2	**Check voltage between terminals Tc and CG of DLC3.**

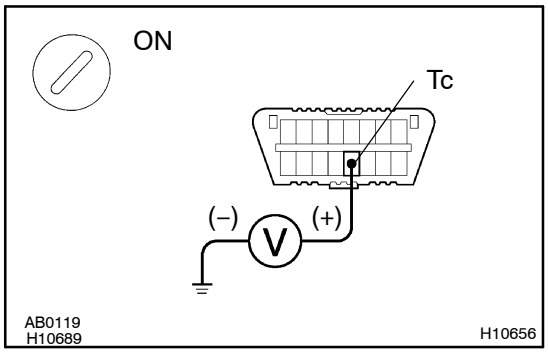


PREPARATION:
Turn the ignition switch to ON.
CHECK:
Measure the voltage between terminals Tc and CG of DLC3.
OK:
Voltage: 10 – 14 V

OK → **Go to step 4.**

NG

3	**Check voltage between terminal Tc of DLC3 and body ground.**



CHECK:

Measure the voltage between terminal Tc of DLC3 and body ground.

OK:

Voltage: 10 – 14 V

OK	**Check or repair harness between terminal CG of DLC3 and body ground.**

NG

4	**Check multiplex communication system (See page BE–1).**

5	**Check airbag sensor assembly.**

CHECK:

Check the DTC (See page DI–369).

OK:

DTC is output.

NG	**Replace airbag sensor assembly.**

OK

From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use simulation method to check.

If the DTC is displayed without a DTC check procedure, perform the following troubleshooting.

1	Check and repair wire harness between the engine ECU and DLC3 (See page DI–90).

2	Is DTC output again?

CHECK:

(a) Turn the ignition switch to LOCK, and wait at least for 20 seconds.
(b) Turn the ignition switch to ON, and wait at least for 20 seconds.
(c) Check SRS warning light.

YES → **Replace airbag sensor assembly.**

NO

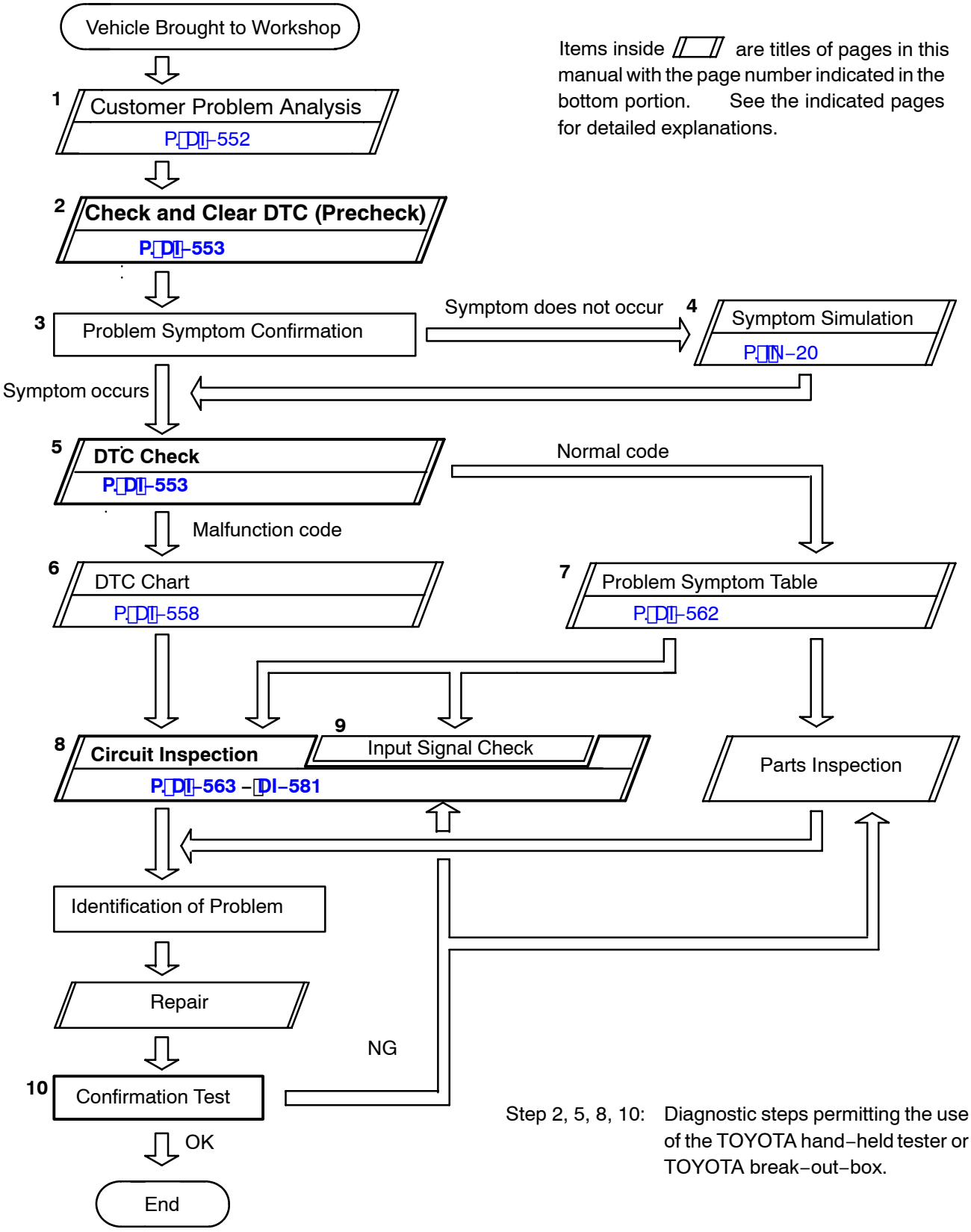
From the results of the above inspection, the malfunctioning part can now be considered normal. To make sure of this, use simulation method to check.

CRUISE CONTROL SYSTEM

DI26R–17

HOW TO PROCEED WITH TROUBLESHOOTING

Troubleshoot in accordance with the procedure on the following page.



Items inside ▱ are titles of pages in this manual with the page number indicated in the bottom portion. See the indicated pages for detailed explanations.

Step 2, 5, 8, 10: Diagnostic steps permitting the use of the TOYOTA hand–held tester or TOYOTA break–out–box.

DI26S–03

CUSTOMER PROBLEM ANALYSIS CHECK

CRUISE CONTROL SYSTEM Check Sheet

Inspector's name: _____

Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date of Vehicle Brought in	/ /	**Odometer Reading**	**km Mile**

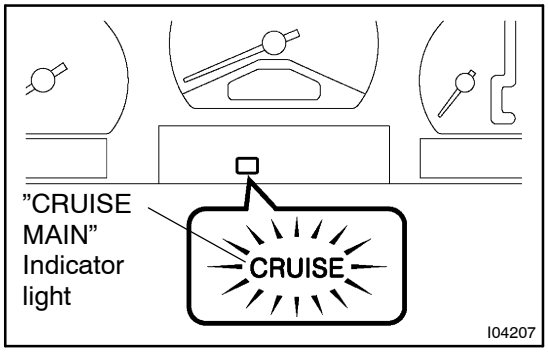
Condition of Problem Occurrence	**Date of Problem Occurrence**	/ /
	Frequency Problem Occurs?	☐ Continuous ☐ Intermittent (Times a day)
	Vehicle Speed when Problem Occurred	**km Mile**

Symptoms	☐ Auto cancel occurs	● Driving condition ☐ City driving ☐ Freeway ☐ Up hill ☐ Down hill ● After cancel occurred, did the driver activate cruise control again? ☐ Yes ☐ No
	☐ Cancel does not occur	☐ With brake ON ☐ Except D position shift ☐ When control SW turns to CANCEL position
	☐ Cruise control malfunction	☐ Slip to acceleration side ☐ Slip to deceleration side ☐ Hunting occurs ☐ O/D cut off does not occur ☐ O/D does not return
	☐ Switch malfunction	☐ SET ☐ ACCEL ☐ COAST ☐ RESUME ☐ CANCEL
	☐	☐ Remains ON ☐ Does not light up ☐ Blinks

DTC Check	**1st Time**	☐ Normal Code ☐ Malfunction Code (Code)
	2nd Time	☐ Normal Code ☐ Malfunction Code (Code)

DI2V2–02

PRE–CHECK



1. DIAGNOSIS SYSTEM

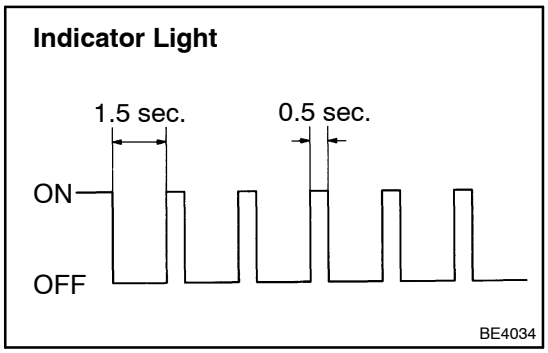
(a) Check the indicator.

(1) Turn the ignition switch to ON.

(2) Check that the CRUISE MAIN indicator light comes on when the cruise control main switch is turned ON, and that the indicator light goes off when the main switch is turned OFF.

HINT:

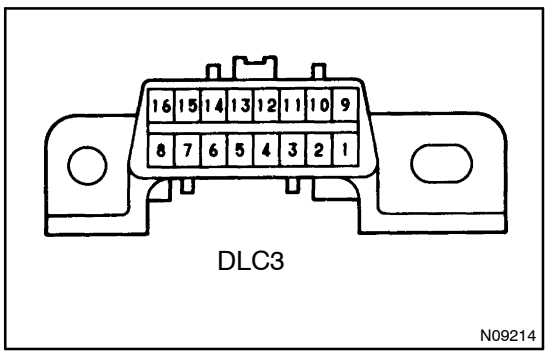
If the indicator check result is not normal, proceed to troubleshooting (See Pub. No. RM588E on page DI–584) for the combination meter section.



(b) Check the DTC.

HINT:

If a malfunction occurs in the speed sensor or actuator, etc. during cruise control driving, the ECU actuates AUTO CANCEL of the cruise control and turns ON and OFF the CRUISE MAIN indicator light to inform the driver of a malfunction. At the same time, the malfunction is stored in memory as a diagnostic trouble code.



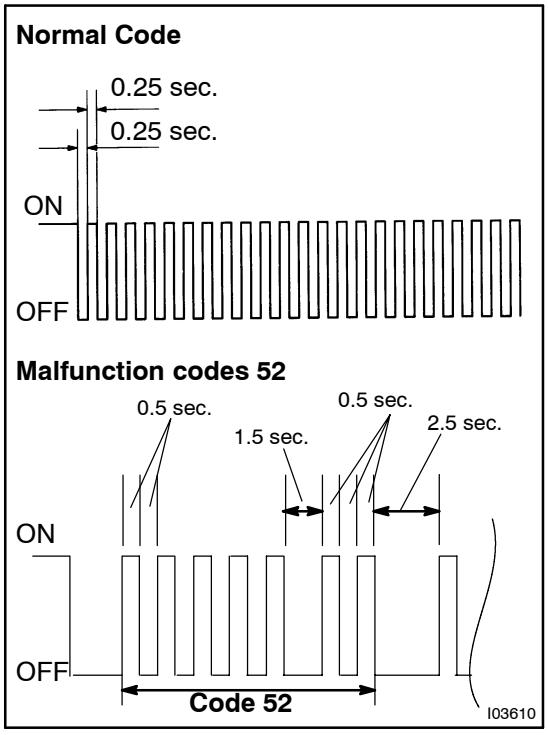
(c) Output DTC using diagnosis check wire.

(1) Turn the ignition switch ON.

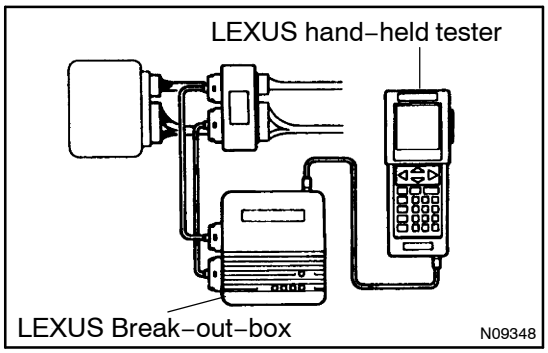
(2) Using SST, connect terminals Tc and E_1 of DLC3.

SST 09843–18020

(3) Read the DTC on the CRUISE MAIN indicator light.

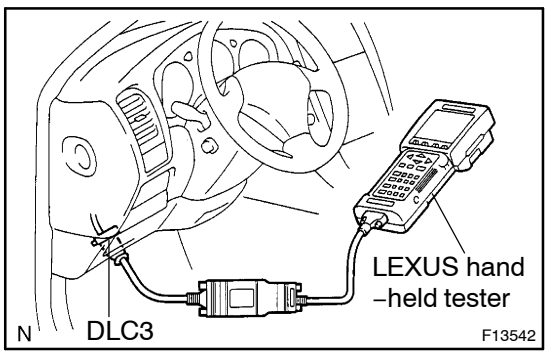


HINT:
If the DTC is not output, inspect the diagnosis circuit.
As an example, the blinking patterns for codes; normal 52 are shown in the illustration.



2. ECU TERMINAL VALUES MEASUREMENT BY USING LEXUS BREAK–OUT–BOX AND LEXUS HAND–HELD TESTER

(a) Hook up the LEXUS break–out–box and LEXUS hand–held tester to the vehicle.
(b) Read the ECU input/output values by following the prompts on the tester screen.
(c) Please refer to the LEXUS hand–held tester has a "Snapshot" function. This records the measured data and is effective in the diagnosis of intermittent problems.



3. USING LEXUS HAND–HELD TESTER

(a) Hook up the LEXUS hand–held tester to the DLC3.
(b) Monitor the ECU data by following the prompts on the tester screen.

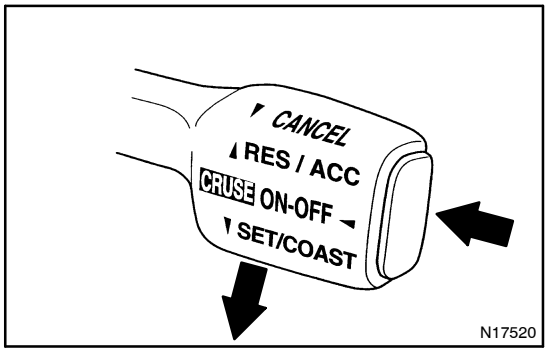
HINT:
LEXUS hand–held tester has a "Snapshot" function which records the monitored data.
Please refer to the LEXUS hand–held tester operator's manual for further details.

4. DTC CLEARANCE

(a) The following actions will erase the DTCs and freeze frame data.
  (1) Operating the OBD II scan tool (complying with SAEJ1978) or LEXUS hand–held tester to erase the codes. (See the OBD II scan tool's instruction book for operating instructions.)
  (2) Disconnecting the battery terminals or EFI fuse.

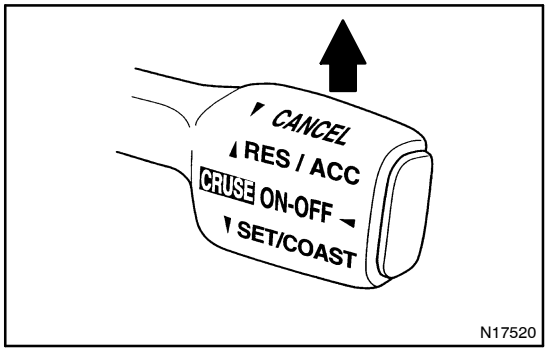
(b) After completing repairs, the DTC retained in memory can be cleared by removing the ECU–B fuse for 10 seconds or more with the ignition switch off.

(c) Check that the normal code is displayed after connecting the fuse.

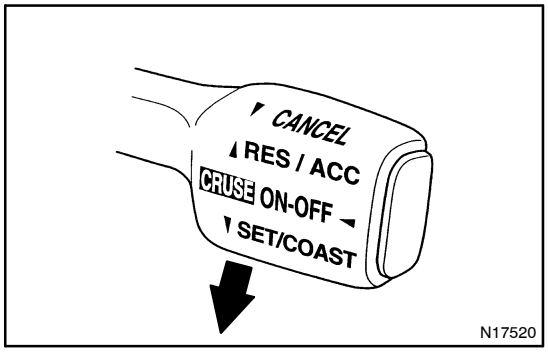


5. PROBLEM SYMPTOM CONFIRMATION (ROAD TEST)

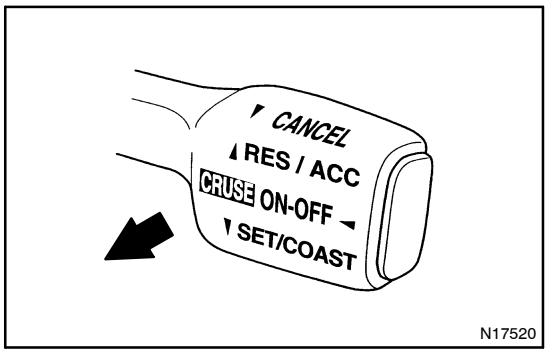
(a) Inspect the SET switch.
  (1) Push the main switch ON.
  (2) Drive at a desired speed (40 km/h (25 mph) or higher).
  (3) Press the control switch to the SET/COAST.
  (4) After releasing the switch, check that the vehicle cruises at the desired speed.



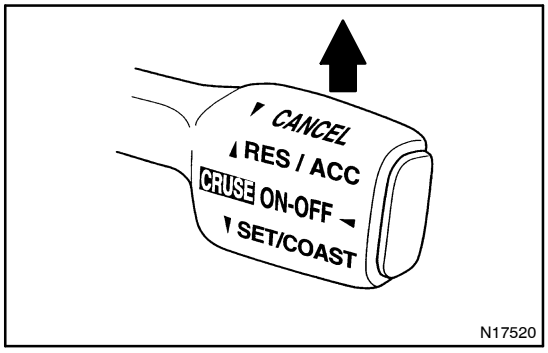
(b) Inspect the ACCEL switch.
  (1) Push the main switch ON.
  (2) Drive at a desired speed (40 km/h (25 mph) or higher).
  (3) Check that the vehicle speed increases while the control switch is turned to RES/ACC, and that the vehicle cruises at the set speed when the switch is released.
  (4) Momentarily press the control switch upward in the RES/ACC and then immediately release it. Check that the vehicle speed increases by about 1.5 km/h (Tap–up function).



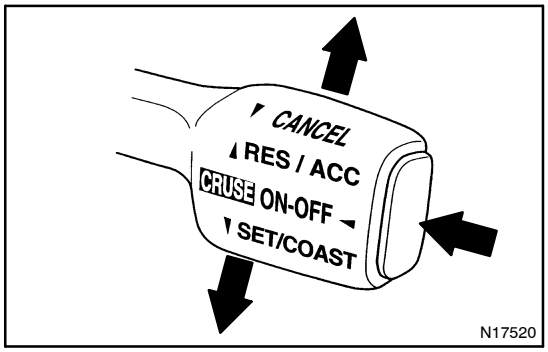
(c) Inspect the COAST switch.
  (1) Push the main switch ON.
  (2) Drive at a desired speed (40 km/h (25 mph) or higher).
  (3) Check that the vehicle speed decreases while the control switch is turned to SET/COAST, and the vehicle cruises at the set speed when the switch is released.
  (4) Momentarily press the control switch is turned to SET/COAST, and then immediately release it. Check that the vehicle speed decreases by about 1.5 km/h (Tap–down function).



(d) Inspect the CANCEL switch.
  (1) Push the main switch ON.
  (2) Drive at a desired speed (40 km/h (25 mph) or higher).
  (3) When operating one of the followings, check that the cruise control system is cancelled and that the normal driving mode is reset.
    - Depress the brake pedal
    - Shift to except D range (A/T)
    - Push the main switch OFF
    - Pull the cruise control switch to CANCEL



(e) Inspect the RESUME switch.
  (1) Push the main switch ON.
  (2) Drive at a desired speed (40 km/h (25 mph) or higher).
  (3) When operating one of the followings, check that the cruise control system is cancelled and that the normal driving mode is reset.
    • Depress the brake pedal
    • Shift to except D range (A/T)
    • Pull the cruise control switch to CANCEL
  (4) After the control switch is turned to RES/ACC at the driving speed of more than 40 km/h (25 mph), check that the vehicle restores the speed prior to the cancellation.



6. INPUT SIGNAL CHECK
(Using LEXUS hand–held tester)

(a) Connect the LEXUS hand–held tester to DLC3
(b) Check the control switch (MAIN, CANCEL, SET/COAST, RES/ACC)

DI26U–17

DIAGNOSTIC TROUBLE CODE CHART

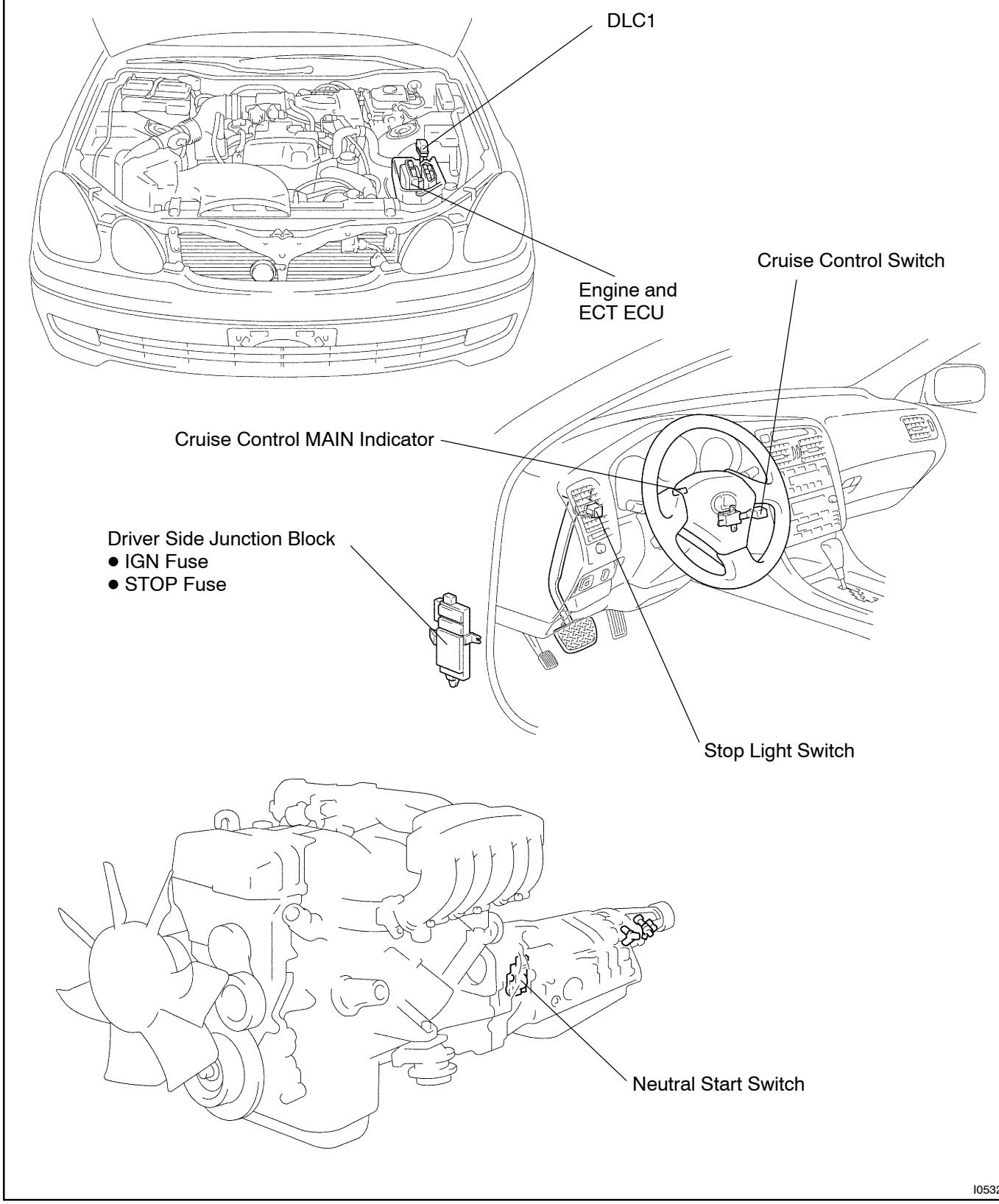
If a malfunction code is displayed during the DTC check, check the circuit listed for that code in the table below and proceed to the appropriate page.

DTC No. (See Page)	Circuit Inspection	Trouble Area
P0500/ 21, 23 (*1) (DI–558)	Vehicle Speed Signal Abnormal	• Harness or connector between engine and ECT ECU and vehicle speed sensor • Vehicle speed sensor • Engine and ECT ECU
P0501/ 21, 23 (*2) (DI–563)	Vehicle Speed Signal Abnormal	• Harness or connector between engine and ECT ECU and vehicle speed sensor • Vehicle speed sensor • Engine and ECT ECU
P1520/ 52 (DI–564)	Short in Stop Light Switch Circuit	• Stop light switch • Harness or connector between engine and ECT ECU and stop light switch circuit • Engine and ECT ECU
P1566/ 54 (DI–569)	Input Signal Circuit	• Engine and ECT ECU

(*1): 2JZ–GE engine
(*2): 3UZ–FE engine

DI26V–05

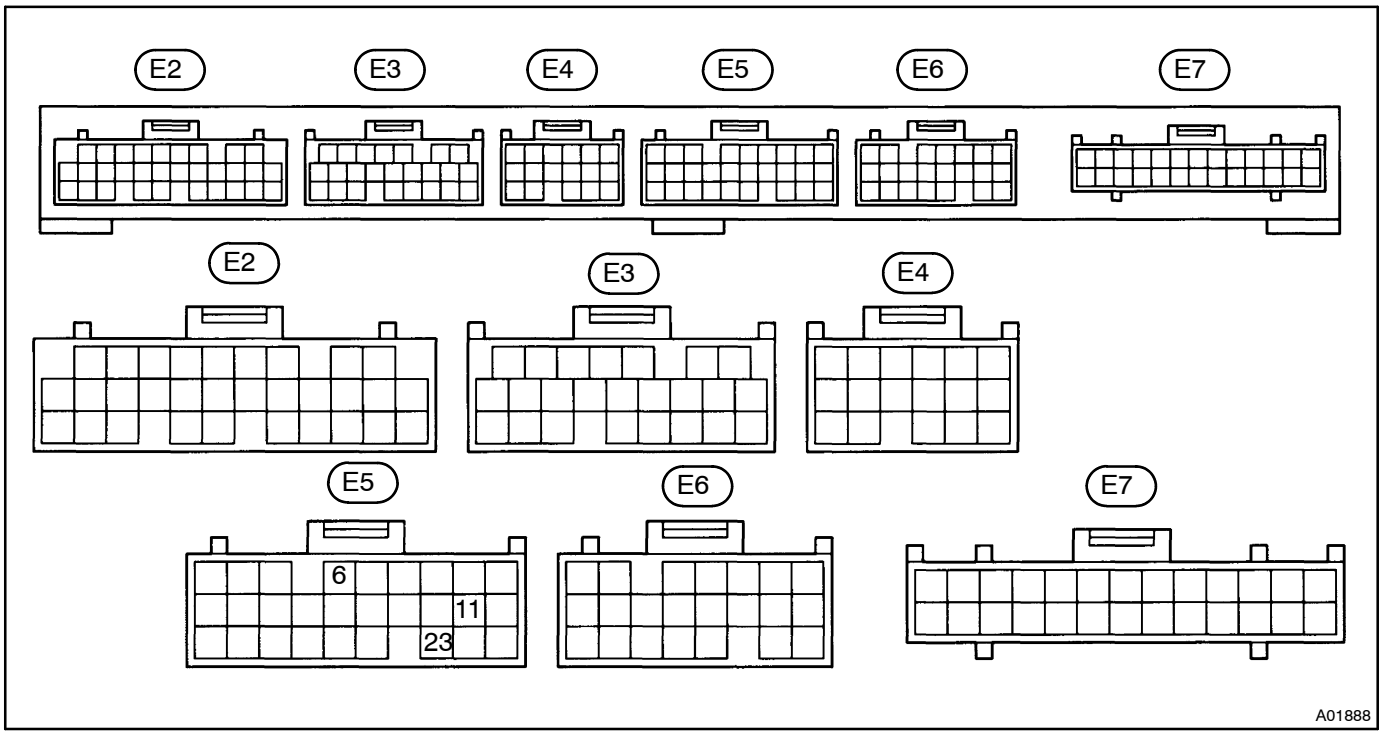
PARTS LOCATION



DI867–01

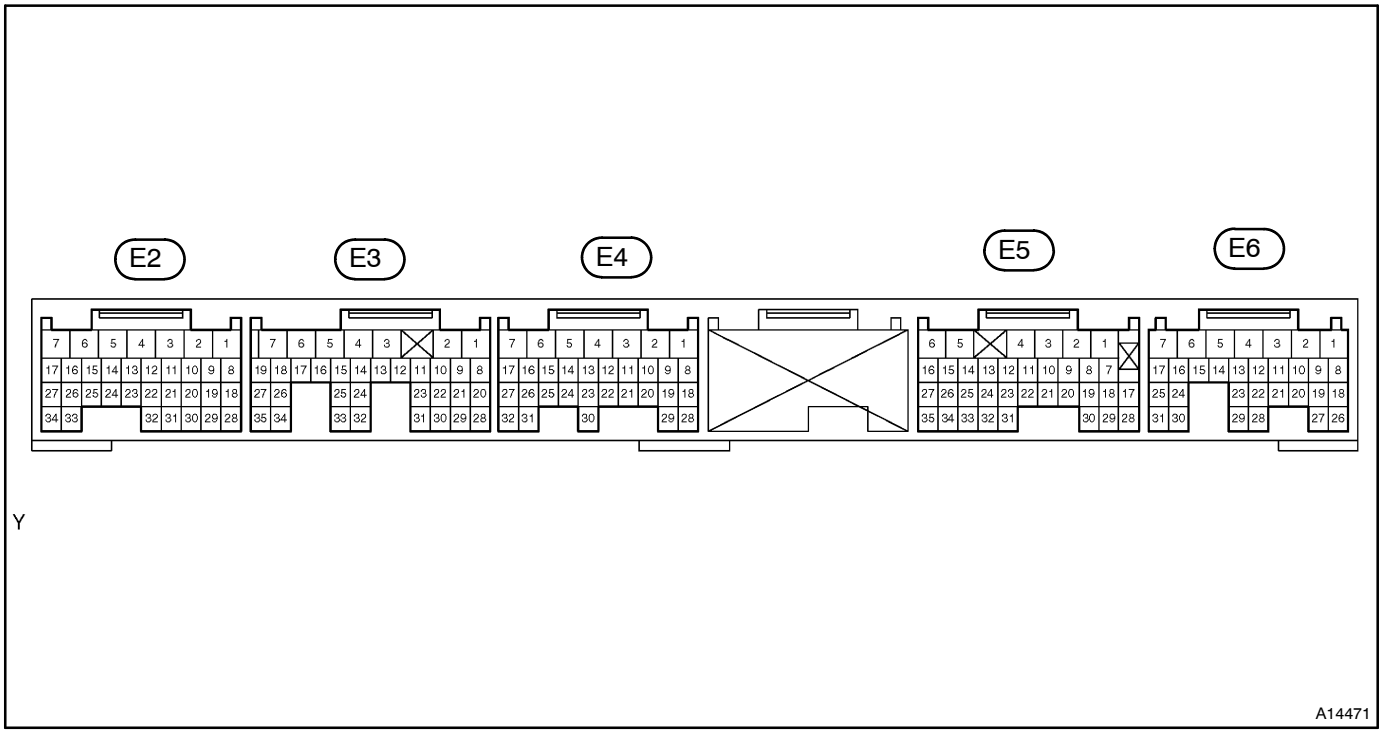
TERMINALS OF ECU

2JZ–GE Engine:



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
STP ↔ E1 (E5 – 6 ↔ E3 – 17)	G–W ↔ BR	Ignition switch ON and Depress brake pedal	10 – 16 V
		Ignition switch OFF or Release brake pedal	Below 1 V
ST1– ↔ E1 (E5 – 11 ↔ E3 – 17)	B–L ↔ BR	Ignition switch ON and release brake pedal	10 – 16 V
		Ignition switch OFF or depress brake pedal	Below 1 V
CCS ↔ E1 (E5 – 23 ↔ E3 – 17)	R–L ↔ BR	Ignition switch ON	10 – 16 V
		Ignition switch ON CANCEL switch held ON	6.9 – 9.8 V
		Ignition switch ON SET/COAST switch held ON	4.7 – 6.9 V
		Ignition switch ON RES/ACC switch held ON	2.4 – 3.8 V

3UZ–FE Engine:



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
STP ↔ E1 (E5 – 4 ↔ E5 – 7)	G–W ↔ BR	Ignition switch ON and Depress brake pedal	10 – 16 V
		Ignition switch OFF or Release brake pedal	Below 1 V
ST1– ↔ E1 (E5 – 8 ↔ E5 – 7)	B–L ↔ BR	Ignition switch ON and release brake pedal	10 – 16 V
		Ignition switch OFF or depress brake pedal	Below 1 V
CCS ↔ E1 (E5 – 31 ↔ E5 – 7)	R–Y ↔ BR	Ignition switch ON	10 – 16 V
		Ignition switch ON CANCEL switch held ON	6.9 – 9.8 V
		Ignition switch ON SET/COAST switch held ON	4.7 – 6.9 V
		Ignition switch ON RES/ACC switch held ON	2.4 – 3.8 V

PROBLEM SYMPTOMS TABLE

DI26X–17

Symptom	Suspect Area	See page
SET not occurring or CANCEL occurring. (DTC is Normal)	1. Input Signal Circuit 2. Vehicle Speed Sensor Circuit 3. Stop Light Switch Circuit 4. Neutral Start Switch Circuit 5. Engine and ECT ECU	DI–569 DI–563 DI–564 DI–261 (*1), DI–333 (*2) IN–30
SET not occurring or CANCEL occurring. (DTC is not output)	1. Engine and ECT ECU	IN–30
Actual vehicle speed deviates above or below the set speed.	1. Input Signal Circuit 2. Engine and ECT ECU	DI–569 IN–30
Gear shifting occurs frequently between 3rd and O/D when driving on uphill road. (Hurting)	1. Engine and ECT ECU	IN–30
Cruise control not cancelled, even when brake pedal is de-pressed.	1. Stop Light Switch Circuit 2. Engine and ECT ECU	DI–564 IN–30
Cruise control not cancelled, even when transmission is shifted to "N" position.	1. Neutral Start Switch Circuit 2. Engine and ECT ECU	DI–261 (*1), DI–333 (*2) IN–30
Cruise control not cancelled, even when clutch pedal is de-pressed.	1. Engine and ECT ECU	IN–30
Control switch does not operate. (SET/COAST, ACC/RES, CANCEL not possible)	1. Input Signal Circuit 2. Engine and ECT ECU	DI–569 IN–30
SET possible at 40 km/h (25 mph) or less, or CANCEL does not operate at 40 km/h (25 mph) or less.	1. Throttle Cable 2. Input Signal Circuit 3. Engine and ECT ECU	 DI–569 IN–30
Poor response in ACCEL and RESUME modes.	1. Engine and ECT ECU	IN–30
O/D does not resume, even though the road is not uphill.	1. Engine and ECT ECU	IN–30
DTC memory is erased.	1. Engine and ECT ECU	IN–30
DTC is not output, or is output when should not be.	1. Diagnosis Circuit 2. Engine and ECT ECU	 IN–30
Cruise MAIN indicator light remains ON or falls to light up.	1. Input Signal Circuit 2. Engine and ECT ECU	DI–569 IN–30

(*1): 2JZ–GE engine
(*2): 3UZ–FE engine

DI26Y–06

CIRCUIT INSPECTION

DTC	P0500/21,23	Vehicle Speed Sensor Circuit (2JZ–GE)

DTC	P0501/21,23	Vehicle Speed Sensor Circuit (3UZ–FE)

CIRCUIT DESCRIPTION

2JZ–GE engine: See Pub. No. RM588E on page DI–72.
3UZ–FE engine: See page DI–157.

DTC No.	Detection Item	Trouble Area
P0500/21, 23 P0501/21, 23	Speed signal is not input to the Engine and ECT ECU while cruise control is set.	• Combination meter • Harness or connector between Engine and ECT ECU and vehicle speed sensor • Vehicle speed sensor • Engine and ECT ECU

WIRING DIAGRAM

2JZ–GE engine: See Pub. No. RM588E on page DI–72.
3UZ–FE engine: See page DI–157.

INSPECTION PROCEDURE

2JZ–GE engine: See Pub. No. RM588E on page DI–72.
3UZ–FE engine: See page DI–157.

DI868–01

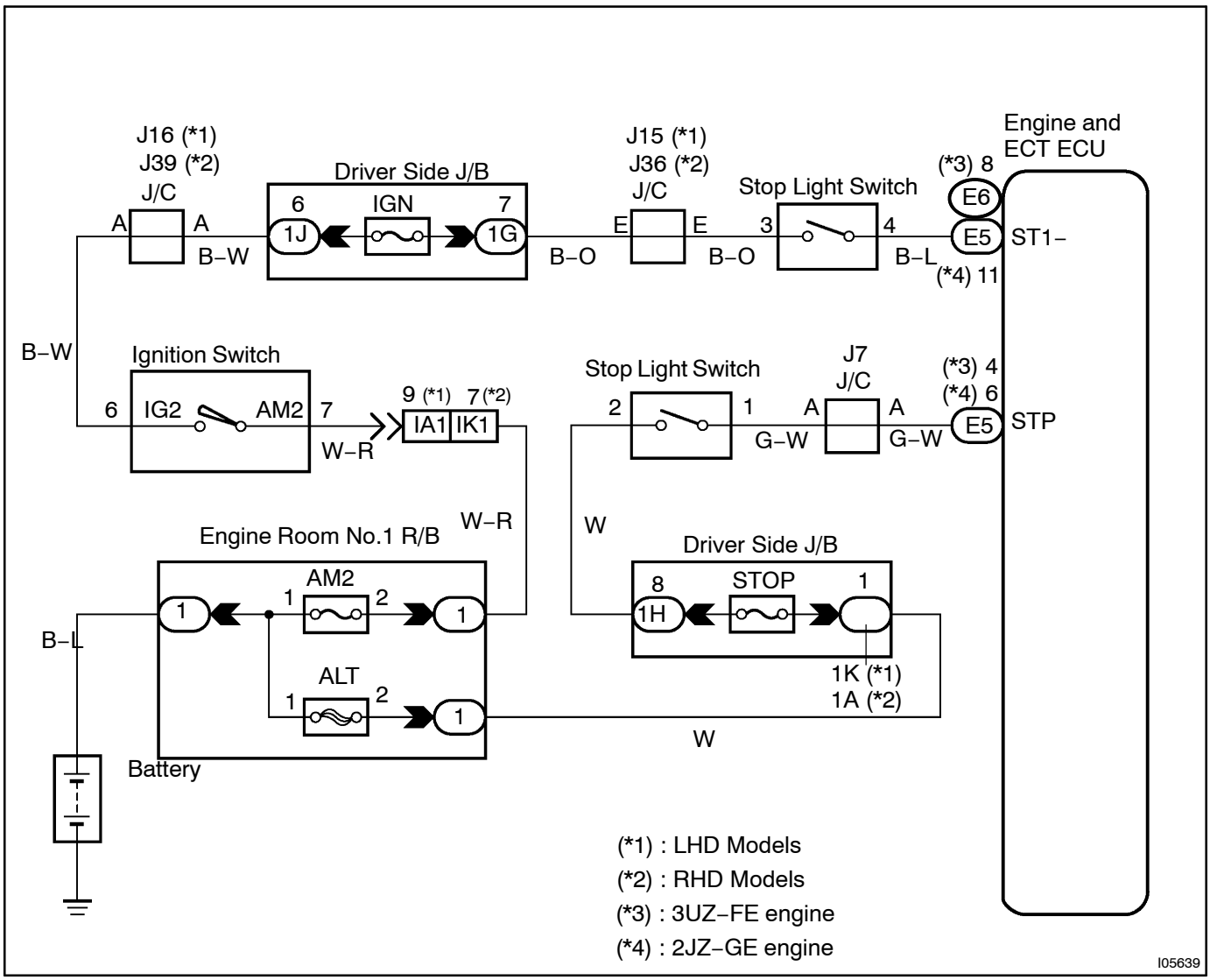
DTC	P1520/52	Stop light switch circuit

CIRCUIT DESCRIPTION

When the brake pedal is depressed, the stop light switch sends a signal to the Engine and ECT ECU. When the Engine and ECT ECU receives this signal, it cancels the cruise control.
A fail–safe function is provided so that the cancel functions normally, even if there is a malfunction in the stop light signal circuit.
The cancel condition is that battery positive voltage is supplied to terminal STP.
When the brake is on, battery positive voltage is normally applied through the STOP fuse and stop light switch to terminal STP of the Engine and ECT ECU, and the Engine and ECT ECU turns the cruise control OFF.
If the harness connected to terminal STP has an open circuit, terminal STP will have battery positive voltage and the cruise control will be turned OFF.

DTC No.	Detection Item	Trouble Area
52	Stop light switch circuit.	• Stop light switch • Harness or connector between Engine and ECT ECU and stop light switch circuit • Engine and ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

In case of using the LEXUS hand–held tester, start the inspection from step 1 and in case of not using the LEXUS hand–held tester, start from step 2.

1	**Check stop light switch using LEXUS hand–held tester.**

PREPARATION:

Connect the LEXUS hand–held tester to the DLC3.

CHECK:

Check the stop light switch using DATALIST.

OK:

Condition	Stop light switch 1 (Sub CPU)	Stop light switch 2 (Sub CPU)	Stop light switch 2 (Main CPU)
Depressed	ON	ON	ON
Released	OFF	OFF	OFF

HINT:

- Stop light SW 1 has a function to disconnect the connection (OFF) when depressing the pedal, however, engine and ECT ECU controls by the logic reverse, so with the LEXUS hand–held tester, it displays ON.
- Stop light SW 1 indicates the input of ST1–terminal and Stop light SW 2 indicates the input of STP terminal.

OK → **Proceed to next circuit inspection shown in problem symptom table (See page DI–562).**

NG

2	**Check operation of stop light.**

CHECK:

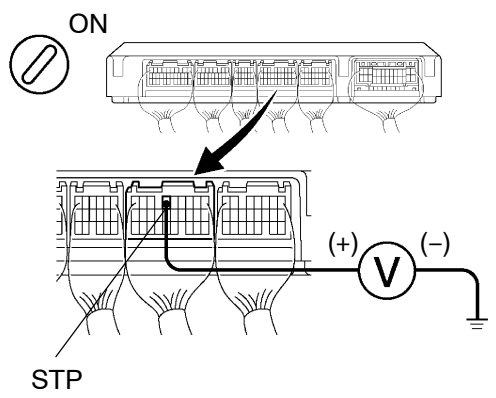
Check that stop light comes on when brake pedal is depressed, and turns off when brake pedal is released.

NG → **Check stop light system (See Pub. No. RM588E on page BE–76).**

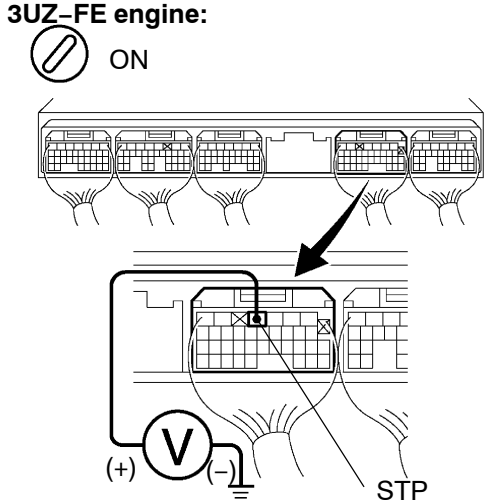
OK

3	Check voltage between terminal STP of engine and ECT ECU connector and body ground.

2JZ–GE engine:



3UZ–FE engine:



PREPARATION:

(a) Remove the engine and ECT ECU with connectors still connected.

(b) Turn ignition switch ON.

CHECK:

Measure voltage between terminal STP of engine and ECT ECU connector and body ground, when the brake pedal is depressed and released.

OK:

Depressed	10 – 14 V
Released	Below 1 V

NG

OK

Proceed to next circuit inspection shown in problem symptom table (See page DI–562).

4	Check wire harness and connector between terminal STP of engine and ECT ECU and stop light switch, and terminal ST1–of engine and ECT ECU and stop light switch (See page IN–30).

NG → Repair or replace harness or connector.

OK →

Check and replace engine and ECT ECU (See page IN–30).

DI869–01

DTC	P1566/ 54	Input signal circuit abnormal

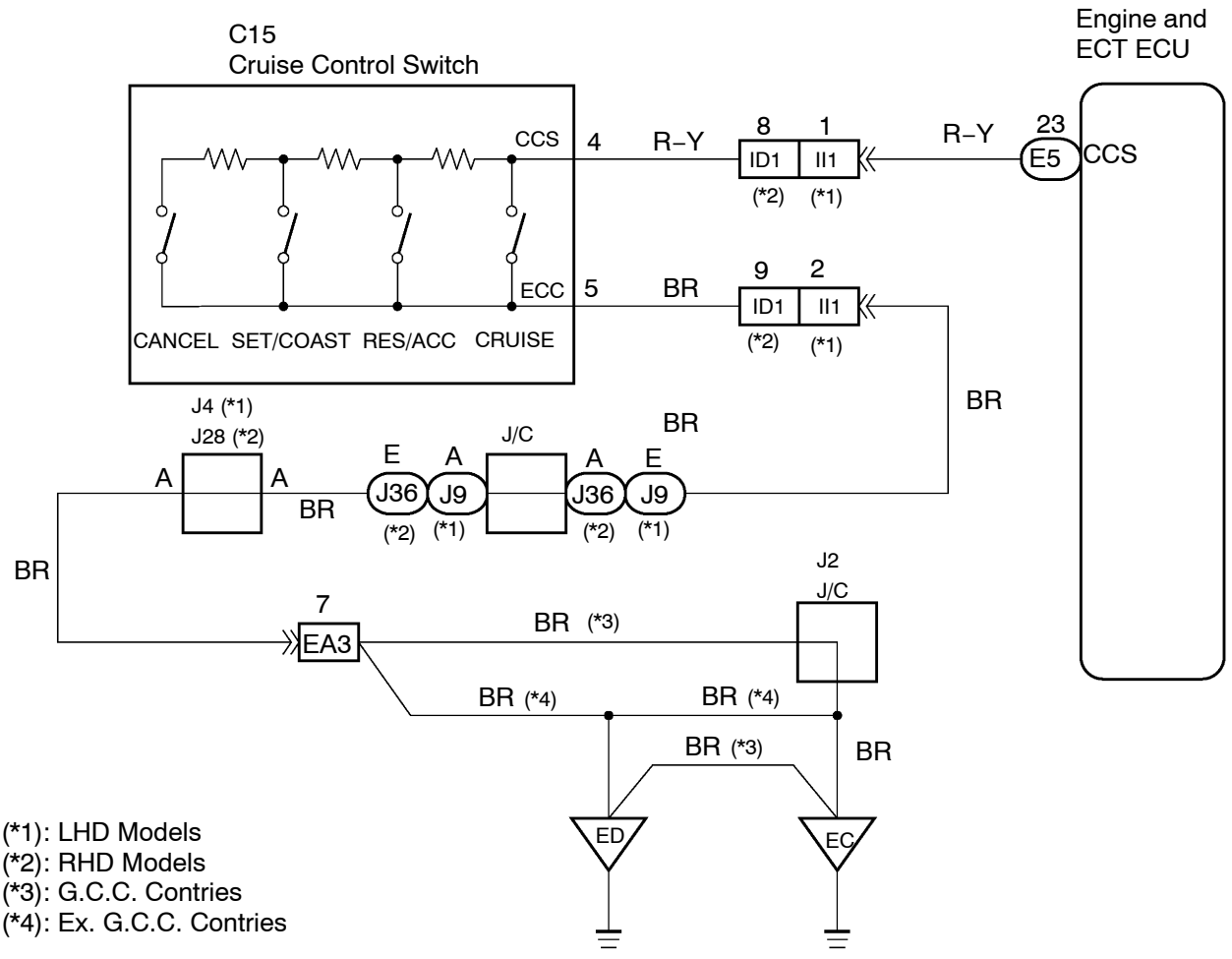
CIRCUIT DESCRIPTION

This circuit carries the SET/COAST, RESUME/ACCEL and CANCEL signals (each voltage) to the engine and ECT ECU.

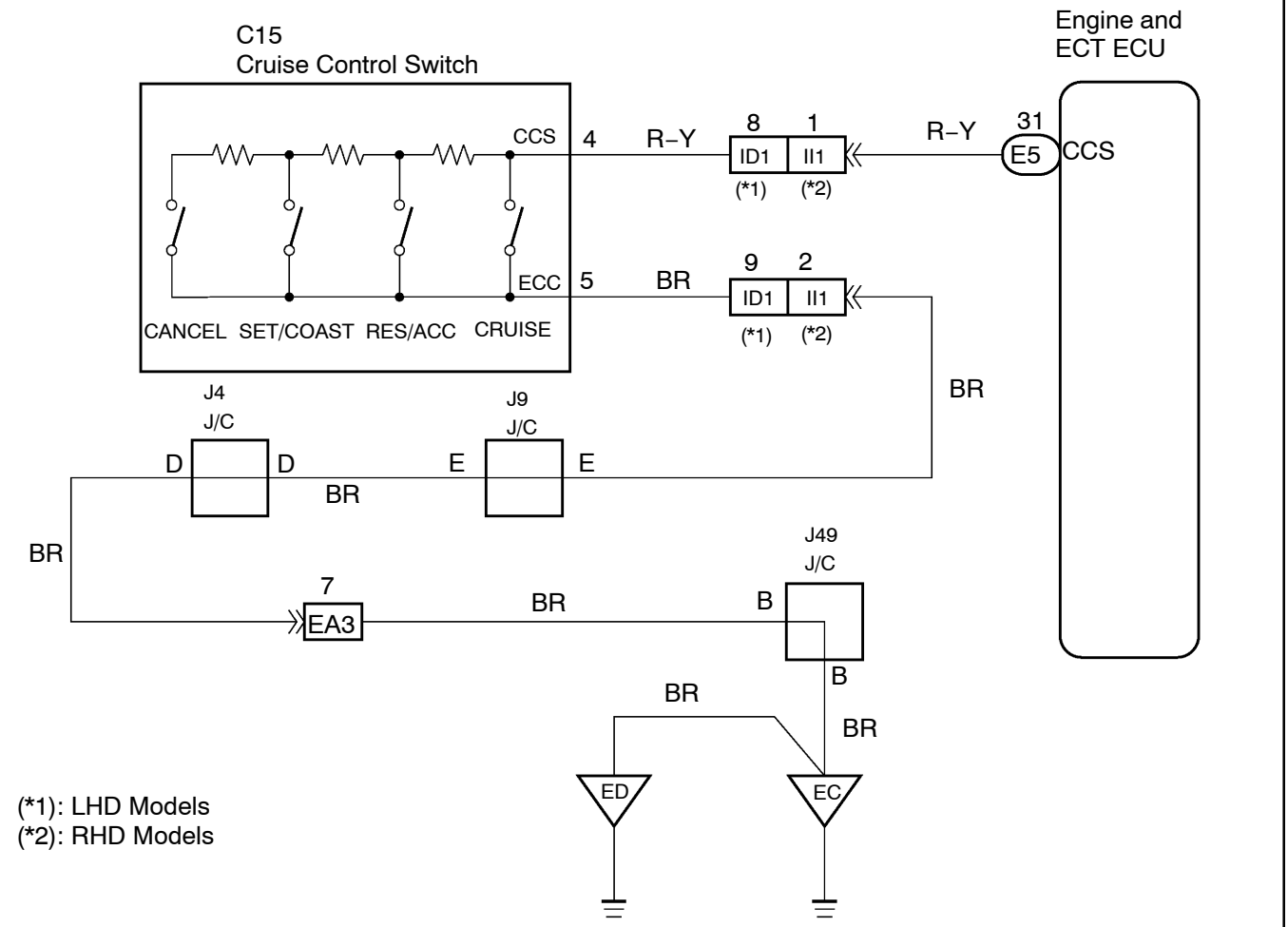
DTC No.	Detection Item	Trouble Area
P1566/ 54	• Stop light switch input signal abnormal. • Cruise control switch input signal abnormal.	• Engine and ECT ECU

WIRING DIAGRAM

2JZ–GE engine:



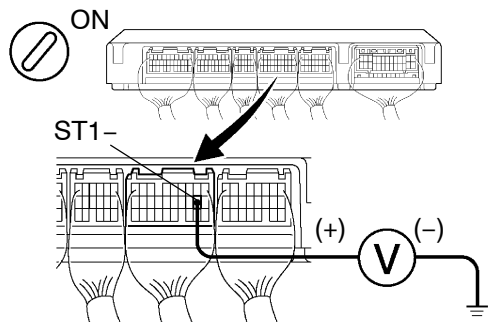
3UZ–FE engine:



INSPECTION PROCEDURE

1	**Check voltage between terminal ST1– of engine and ECT ECU connector and body ground.**

2JZ–GE engine:



I04212

PREPARATION:

(a) Remove the engine and ECT ECU with connectors still connected.

(b) Turn ignition switch ON.

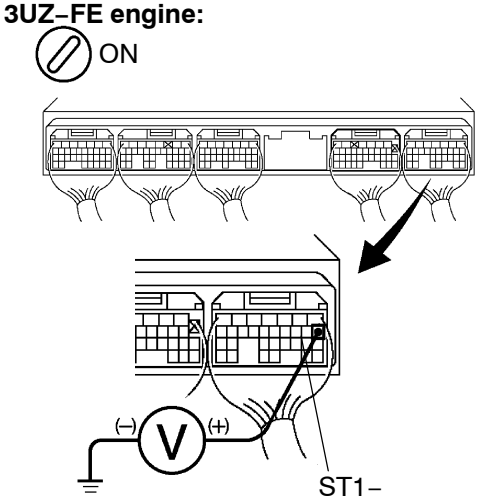
CHECK:

Measure voltage between terminal ST1– of engine and ECT ECU connector and body ground, when the brake pedal is depressed and released.

OK:

Released	10 – 14 V
Depressed	Below 1 V

3UZ–FE engine:



I21631

OK → **Proceed to next circuit inspection shown in problem symptoms table (See page DI–562).**

NG

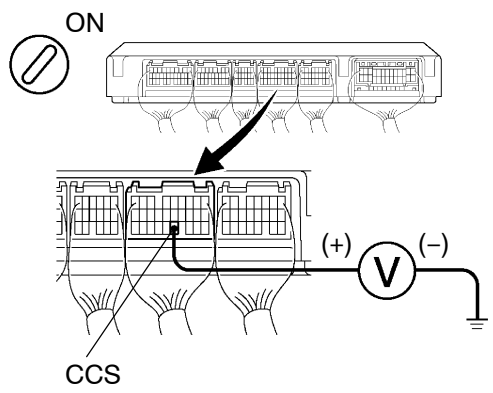
2	**Check for open in harness and connectors between terminal ST1– of engine and ECT ECU and stop light switch (See page IN–30).**

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

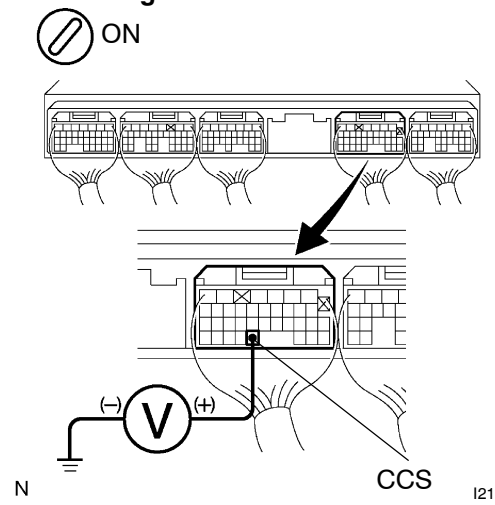
OK

3	**Check voltage between terminals CCS of engine and ECT ECU connector and body ground.**

2JZ–GE engine:



3UZ–FE engine:



PREPARATION:

(a) Remove the engine and ECT ECU with connector still connected.

(b) Turn ignition switch ON.

CHECK:

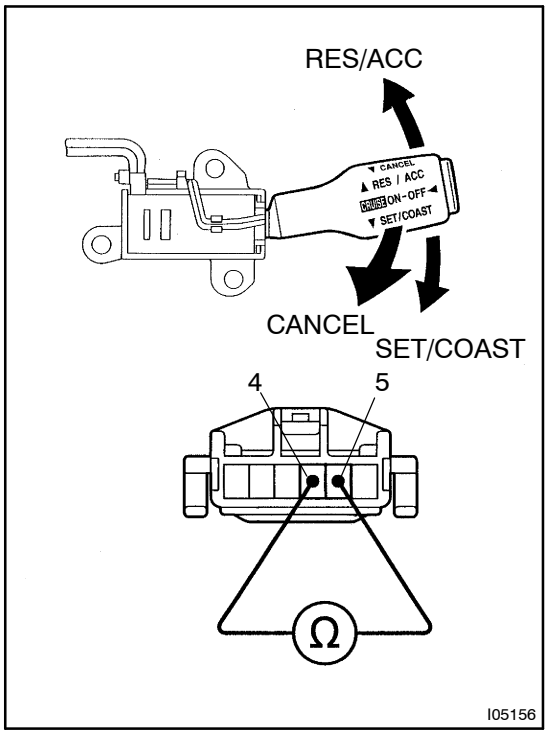
Measure voltage between terminals CCS of ECU connector and body ground, when each of the SET/COAST, RESUME/ACCEL and CANCEL is turned ON.

Switch position	Resistance (V)
Neutral	10 – 16 V
RES/ACC	2.4 – 4.4 V
SET/COAST	4.7 – 7.6 V
CANCEL	6.9 – 11.2 V

NG → **Proceed to next circuit inspection shown in problem symptoms table (See page DI–562)**

OK

4	**Check control switch continuity.**



PREPARATION:

(a) Remove steering wheel pad (See page SR–9).

(b) Disconnect the control switch connector.

CHECK:

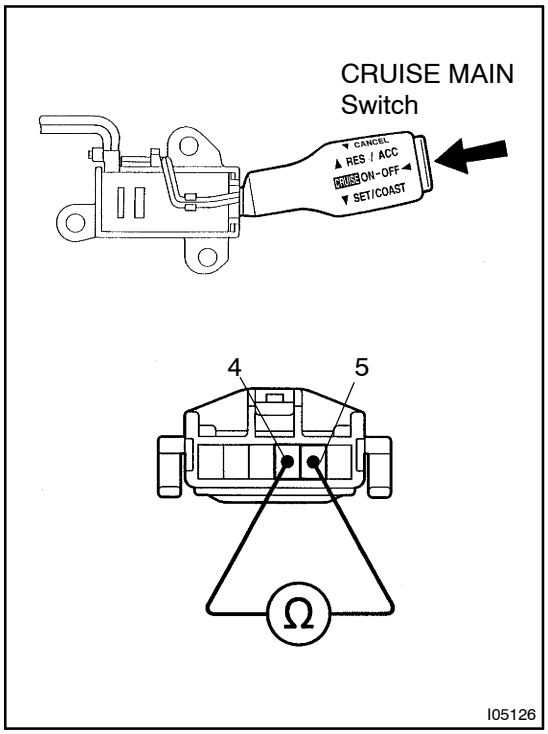
Measure resistance between terminals 4 and 5 of control switch connector when control switch is operated.

Switch position	Resistance (Ω)
Neutral	∞ (No continuity)
RES/ACC	220 – 260
SET/COAST	600 – 660
CANCEL	1,500 – 1,600

NG → **Replace control switch.**

OK

5	Check main switch continuity.



PREPARATION:

(a) Remove steering wheel pad (See page SR–9).

(b) Disconnect the control switch connector.

CHECK:

Check continuity between terminals 4 and 5 of control switch connector when main switch is held ON and OFF.

OK:

Switch position	Tester connection	Specified condition
OFF	–	No continuity
Hold ON	4 – 5	Continuity

NG → **Replace control switch.**

OK

6	Check harness and connector between engine and ECT ECU and cruise control switch, cruise control switch and body ground (See page IN–30).

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

OK

7	**Check cruise control indicator light (See Pub. No. RM588E on page DI–584).**

NG → **Replace combination meter.**

OK

Check and replace engine and ECT ECU (See page IN–30).

DI86A–01

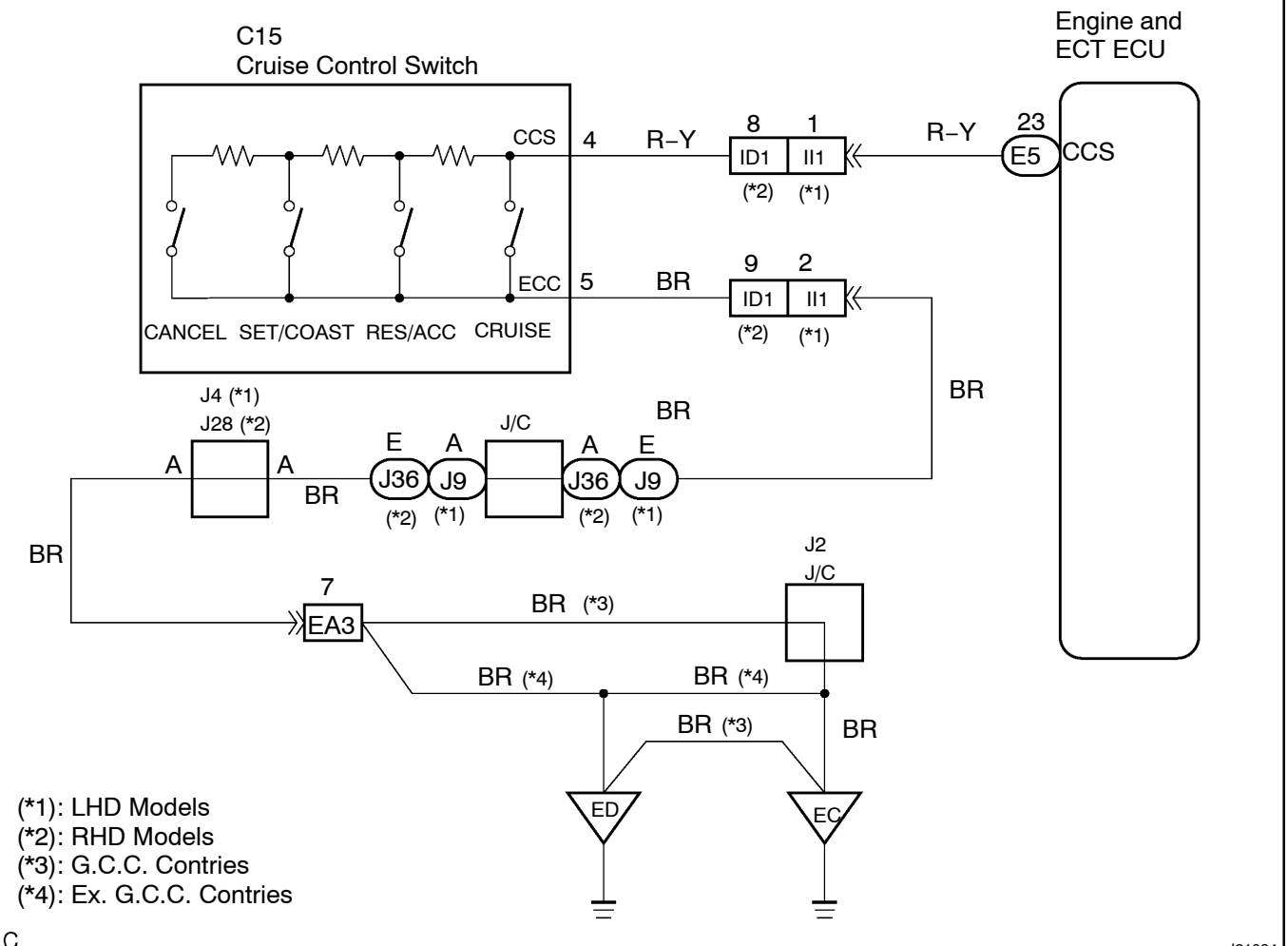
Control switch circuit (Cruise control switch)

CIRCUIT DESCRIPTION

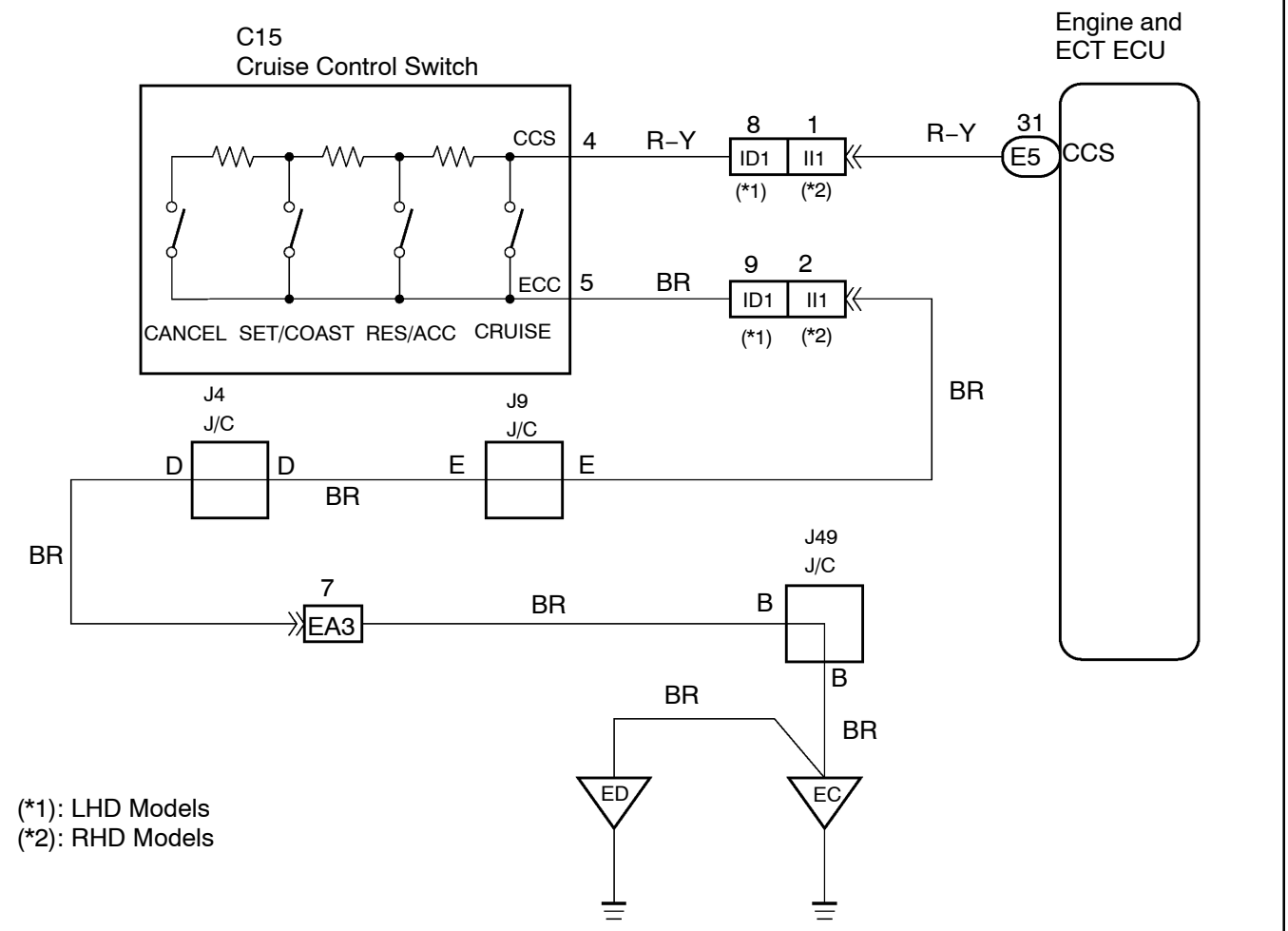
This circuit carries the SET/COAST, RESUME/ACCEL and CANCEL signals (each voltage) to the engine and ECT ECU.

WIRING DIAGRAM

2JZ–GE engine:



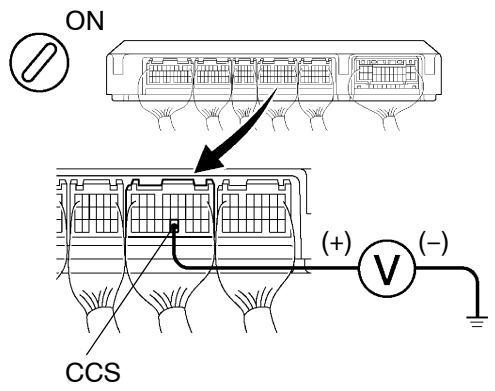
3UZ–FE engine:



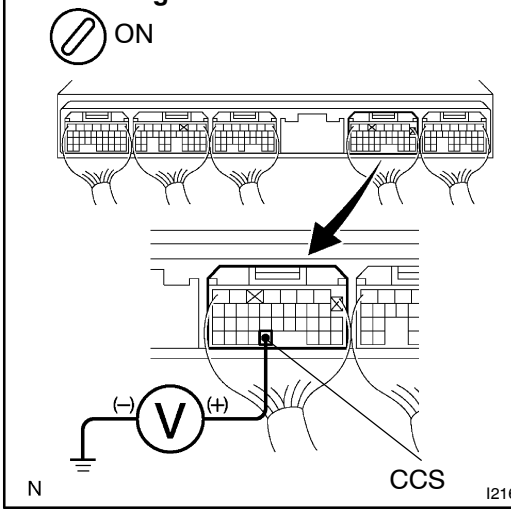
INSPECTION PROCEDURE

1	**Check voltage between terminals CCS of engine and ECT ECU connector and body ground.**

2JZ–GE engine:



3UZ–FE engine:



PREPARATION:

(a) Remove the engine and ECT ECU with connector still connected.

(b) Turn ignition switch ON.

CHECK:

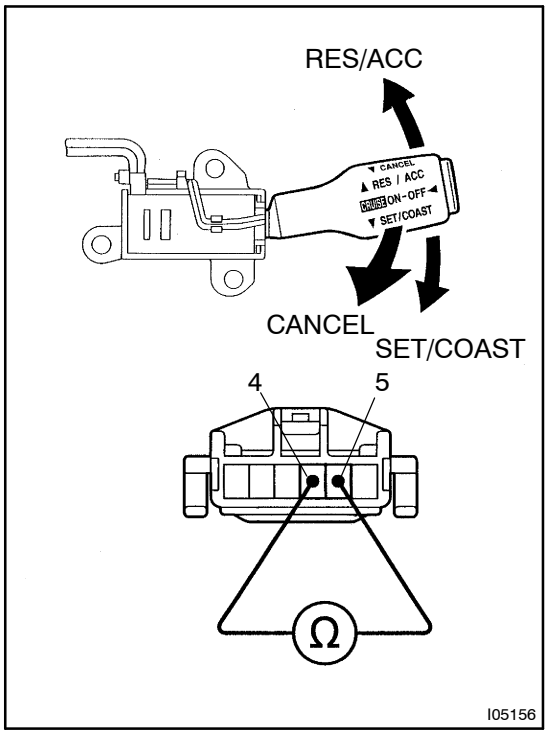
Measure voltage between terminals CCS of Engine and ECT ECU connector and body ground, when each of the SET/COAST, RESUME/ACCEL and CANCEL is turned ON.

Switch position	Resistance (V)
Neutral	10 – 16 V
RES/ACC	0.6 – 2.3 V
SET/COAST	1.9 – 4.7 V
CANCEL	3.4 – 7.2 V

NG → **Proceed to next circuit inspection shown in problem symptoms table (See page DI–562)**

OK

2	**Check control switch continuity.**



PREPARATION:

(a) Remove steering wheel pad (See page SR–9).

(b) Disconnect the control switch connector.

CHECK:

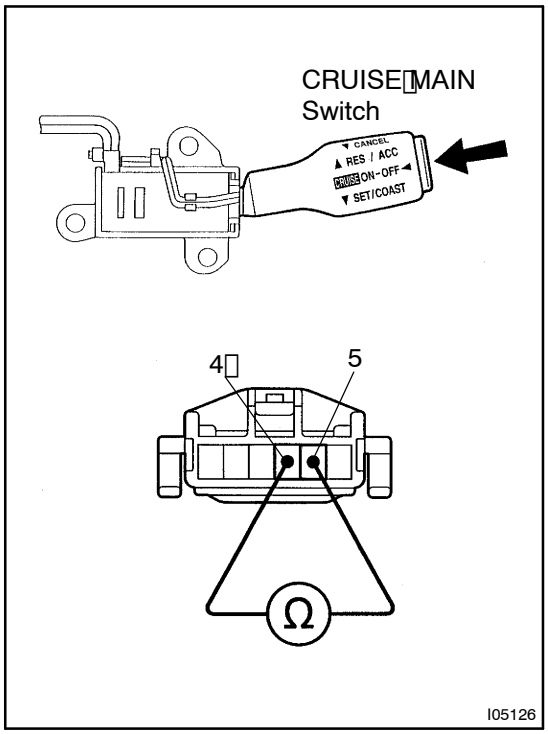
Measure resistance between terminals 4 and 5 of control switch connector when control switch is operated.

Switch position	Resistance (Ω)
Neutral	∞ (No continuity)
RES/ACC	60 – 70
SET/COAST	180 – 220
CANCEL	380 – 460

NG → **Replace control switch.**

OK

3	Check main switch continuity.



PREPARATION:

(a) Remove steering wheel center pad (See page SR–9).

(b) Disconnect the control switch connector.

CHECK:

Check continuity between terminals 4 and 5 of control switch connector when main switch is held ON and OFF.

OK:

Switch position	Tester connection	Specified condition
OFF	–	No continuity
Hold ON	4 – 5	Continuity

NG → Replace control switch.

OK

4	Check harness and connector between engine and ECT ECU and cruise control switch, cruise control switch and body ground (See page IN–30).

NG → Repair or replace harness or connector.

OK

5	Check cruise control indicator light (See Pub. No. RM588E on page DI–584).

NG → Replace combination meter.

OK

Check and replace engine and ECT ECU (See page IN–30).

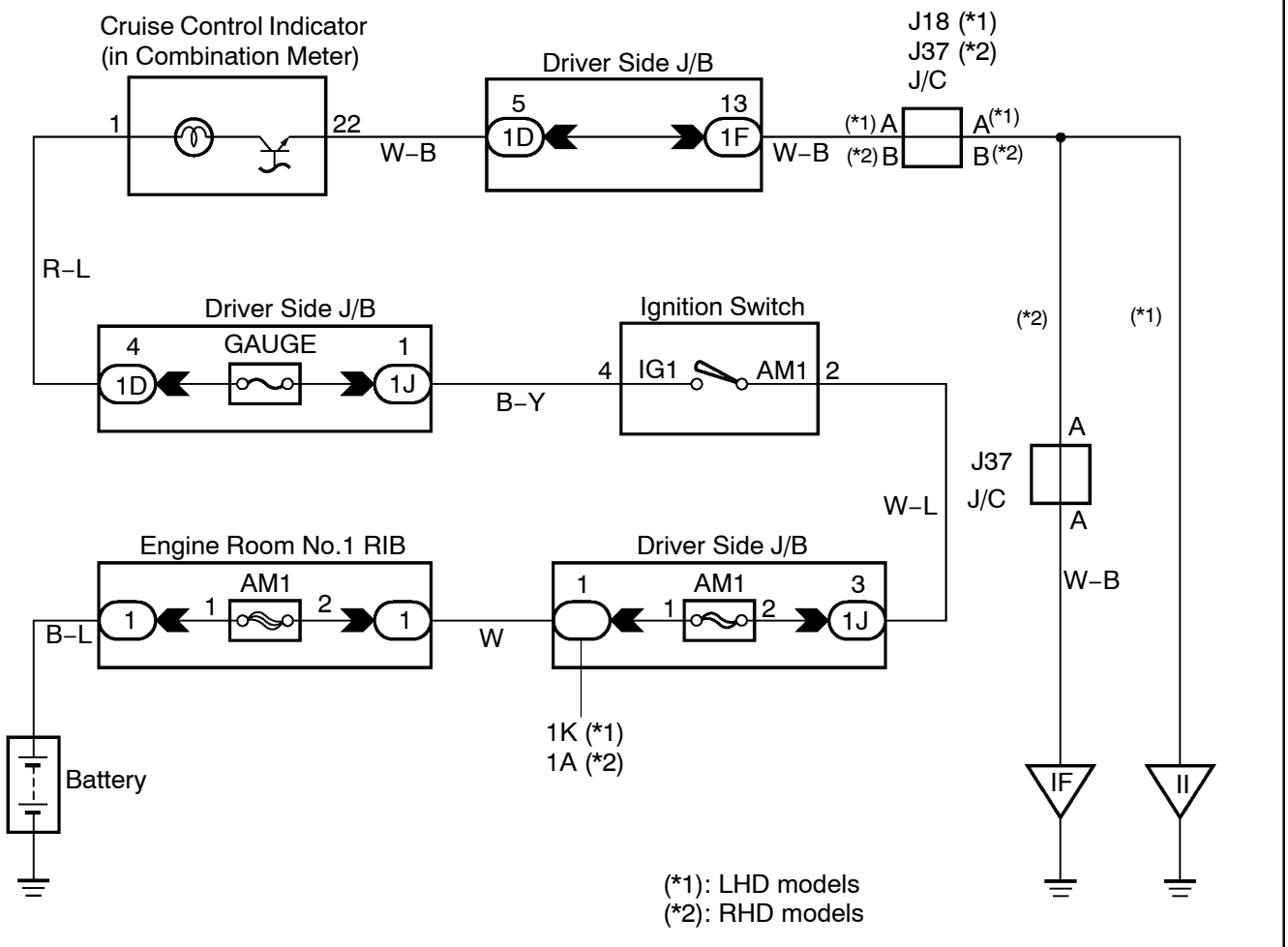
DI271–08

CRUISE MAIN Indicator Light Circuit

CIRCUIT DESCRIPTION

When the cruise control main switch is turned ON, CRUISE MAIN indicator light lights up.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check combination meter (See Pub. No. RM588E on page BE–105).

NG → Replace combination meter.

OK →

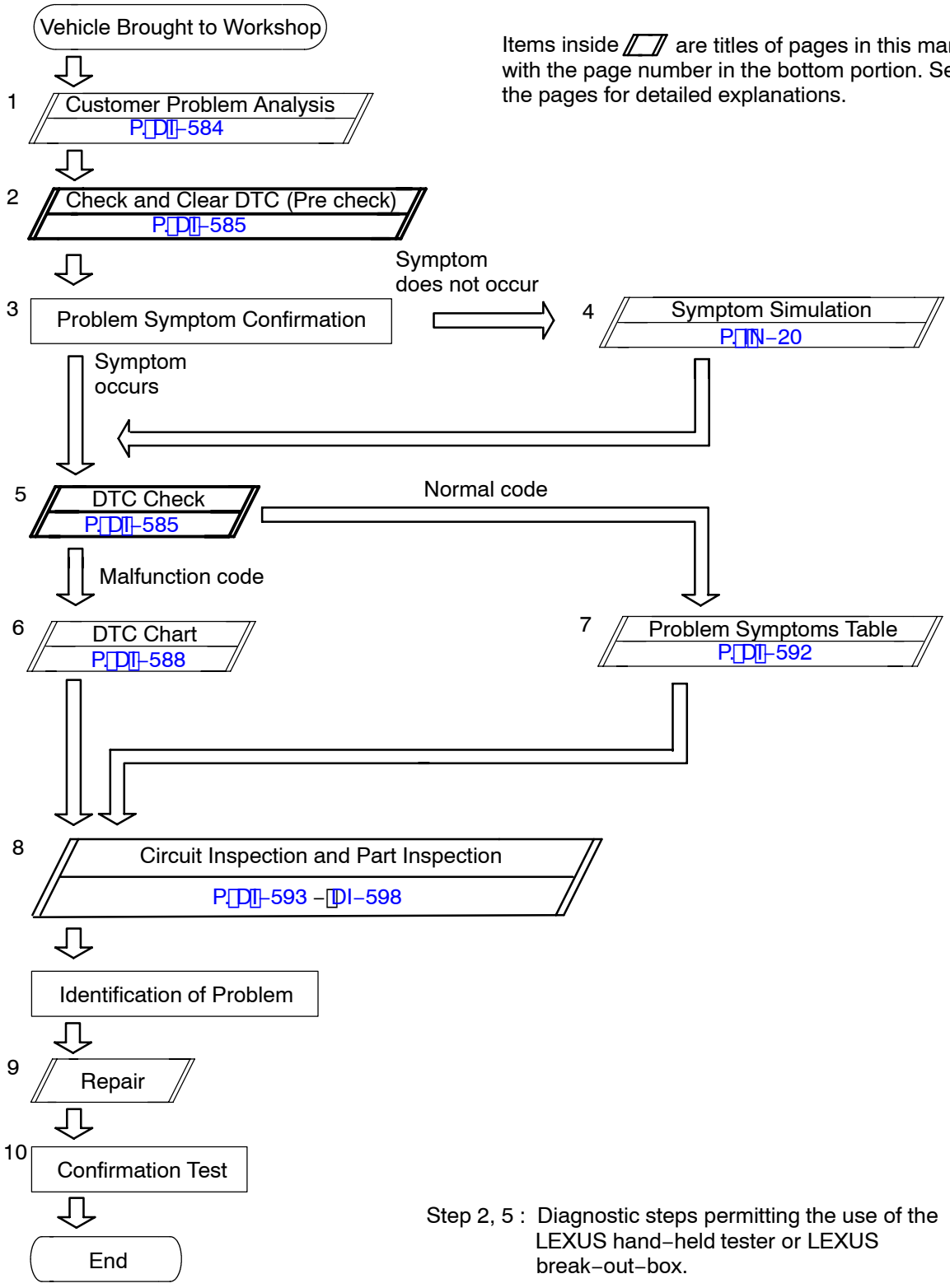
Check and replace engine and ECT ECU (See page IN–30).

ENGINE IMMOBILISER SYSTEM

DI1AJ–24

HOW TO PROCEED WITH TROUBLESHOOTING

Troubleshoot in accordance with the procedure on the following pages.



Items inside ▱ are titles of pages in this manual, with the page number in the bottom portion. See the pages for detailed explanations.

Step 2, 5 : Diagnostic steps permitting the use of the LEXUS hand–held tester or LEXUS break–out–box.

DI1AK–05

CUSTOMER PROBLEM ANALYSIS CHECK

ENGINE IMMOBLISER Check Sheet

Inspector's Name :

Customer's Name		**Registration No.**	
		Registration Year	/ /
		Frame No.	
Date Vehicle Brought In	/ /	**Odometer Reading**	km miles

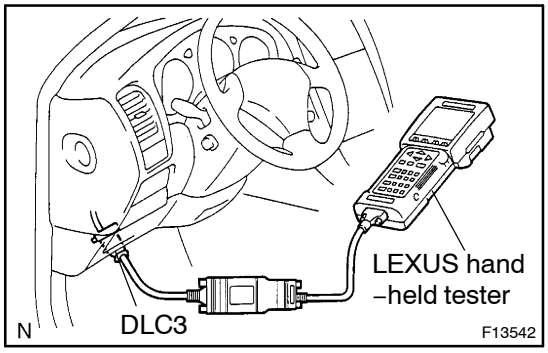
Date Problem First Occurred	/ /
Frequency Problem Occurs	☐ Continuous ☐ Intermittent (times a day)

Symptoms	☐ Immobiliser is not set. (Engine starts with key codes other than the registered key code.)
	☐ Engine does not start.

Check Item	**Malfunction Indicator Lamp**	☐ Normal ☐ Remains ON ☐ Does not Light Up

DTC Check	**1st Time**	☐ Normal Code ☐ Malfunction Code (Code)
	2nd Time	☐ Normal Code ☐ Malfunction Code (Code)

DI2SY–02



PRE–CHECK

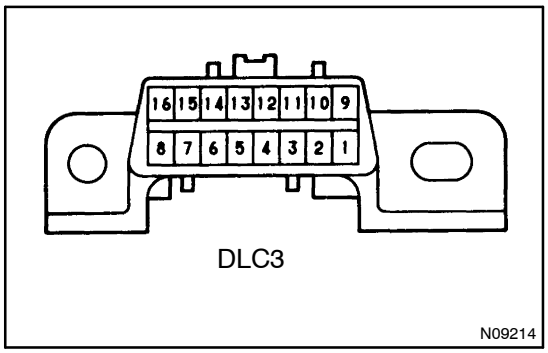
1. DIAGNOSIS SYSTEM

(a) Description

Engine and ECT ECU controls the function of immobiliser on this vehicle.

Data of the immobiliser or DTC can be read form DLC3 of the vehicle. When a trouble occurs on immobiliser, MIL does not light up but DTC inspection is performed.

Therefore when there seems to be a trouble on immobiliser, use LEXUS hand–held tester or SST to check and troubleshoot it.



(b) Inspect the DLC3.

The vehicle's engine and ECT ECU uses ISO 9141–2 for communication.

The terminal arrangement of DLC3 complies with SAEJ1962 and matches the ISO 9141–2 format.

Tester connection	condition	Specified condition
7 (Bus ⊕ Line) – 5 (Signal ground)	During communication	Pulse generation
4 (chassis Ground) – Body	Always	1 Ω or less
5 (Signal Ground) – Body	Always	1 Ω or less
16 (B+) – Body	Always	9 – 14 V

HINT:

If your display shows "UNABLE TO CONNECT TO VEHICLE" when you have connected the cable of OBD II scan tool or LEXUS hand–held tester to DLC3, turned the ignition switch ON and operated the scan tool, there is a problem on the vehicle side or tool side.

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

2. INSPECT DIAGNOSIS

(a) Check the DTC (Using LEXUS hand–held tester).

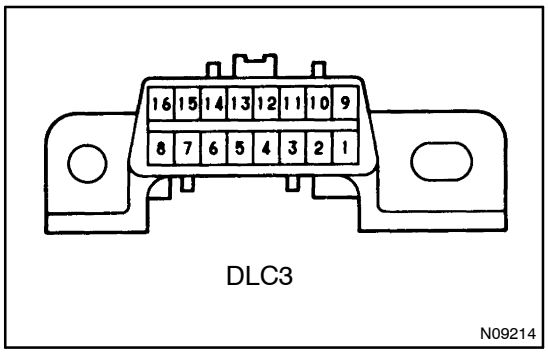
(1) Prepare the OBD II scan tool (complying with SAE J 1978) or LEXUS hand–held tester.

(2) Connect the OBD II scan tool or LEXUS hand–held tester to DLC3 under the instrument panel lower pad.

(3) Turn the ignition switch ON and turn the OBD II scan tool or LEXUS hand–held tester switch ON.

(4) Use the OBD II scan tool or LEXUS hand–held tester to check the DTCs and freeze frame data; note them down. (For operating instructions, see the OBD II scan tool's instruction book.)

(5) See page DI–588 to confirm the details of the DTCs.



(b) Check the DTC (Using diagnosis check wire)

(1) Turn ignition switch ON.

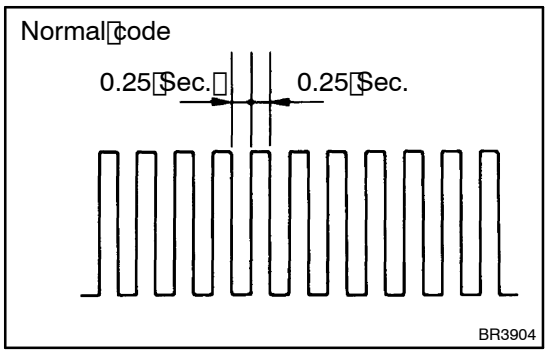
(2) Using SST, connect between terminals 13 (TC) and 4 (CG) of DLC 3.

SST 09843–18040

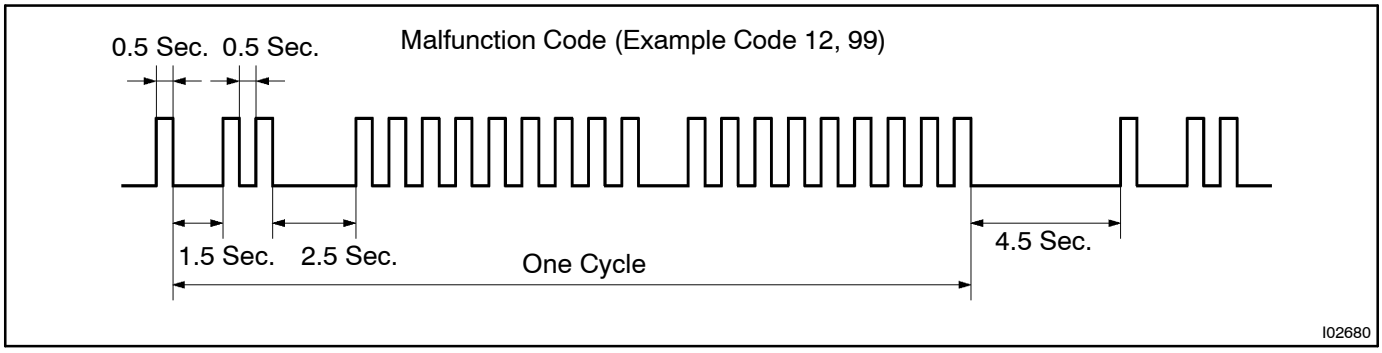
(3) Read the diagnostic trouble code from malfunction indicator lamp.

HINT:

- If a diagnostic trouble code is not output, check the TC terminal circuit.
- Engine and ECT ECU controls the immobiliser function on this vehicle, DTC is out put with engine data.



- As an example, the blinking patterns for codes; normal, 12 and 99 are shown in the charts.



(4) When DTC ”99” is output, there is a trouble of immobiliser. Start troubleshooting referring to PROBLEM SYMPTOMS TABLE.

(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 larger.

(c) Clear the DTC.

The following operations will erase the DTCs and freeze frame data.

- Operating the OBD II scam tool (complying with SAEJ1978) or LEXUS hand–held tester to erase the codes. (See the OBD II scan tool’s instruction book for operating instructions.)
- Disconnecting the battery terminals or EFI fuse.

DI1AM–21

DIAGNOSTIC TROUBLE CODE CHART

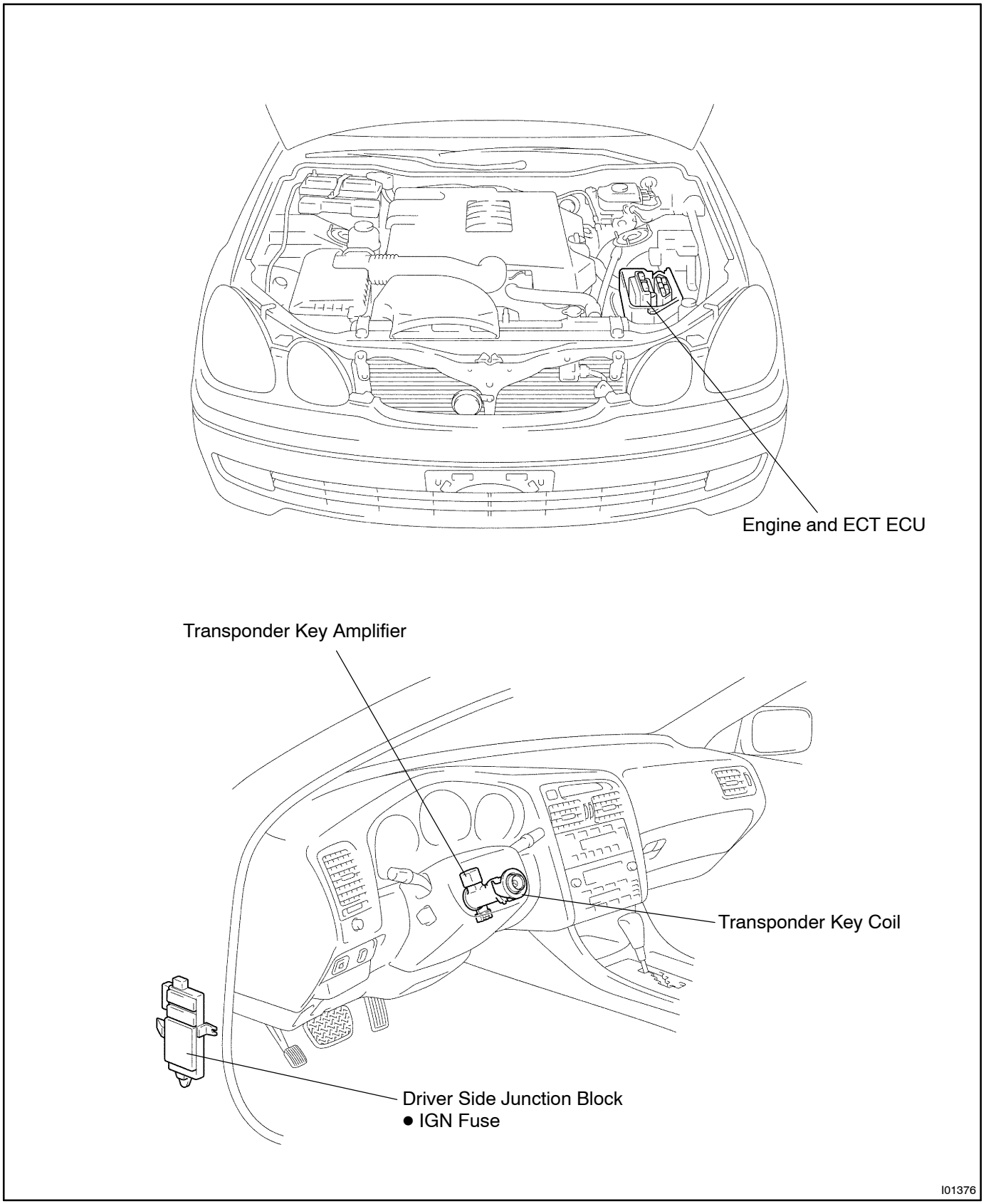
DTC No. (See page)	Detection Item	Trouble Area
B2795 (DI–593)	Unmatched key code	• Key • Unregistered key inserted before
B2796 (DI–594)	No communication in immobiliser system	• Key • Transponder key coil • Amplifier • Wirehaness • Engine and ECT ECU
B2797 (DI–596)	Communication malfunction No.1	• Communication contents • Unregistered key inserted before
B2798 (DI–598)	Communication malfunction No.2	• Key • Transponder key coil • Amplifier • Wire haness • Engine and ECT ECU

HINT:
To reduce the unnecessary exchange of engine and ECT ECU, check that a trouble occurs with the original engine and ECT ECU at the time of exchanging engine and ECT ECU and the trouble will disappear with a new engine and ECT ECU.

DI26P–04

PARTS LOCATION

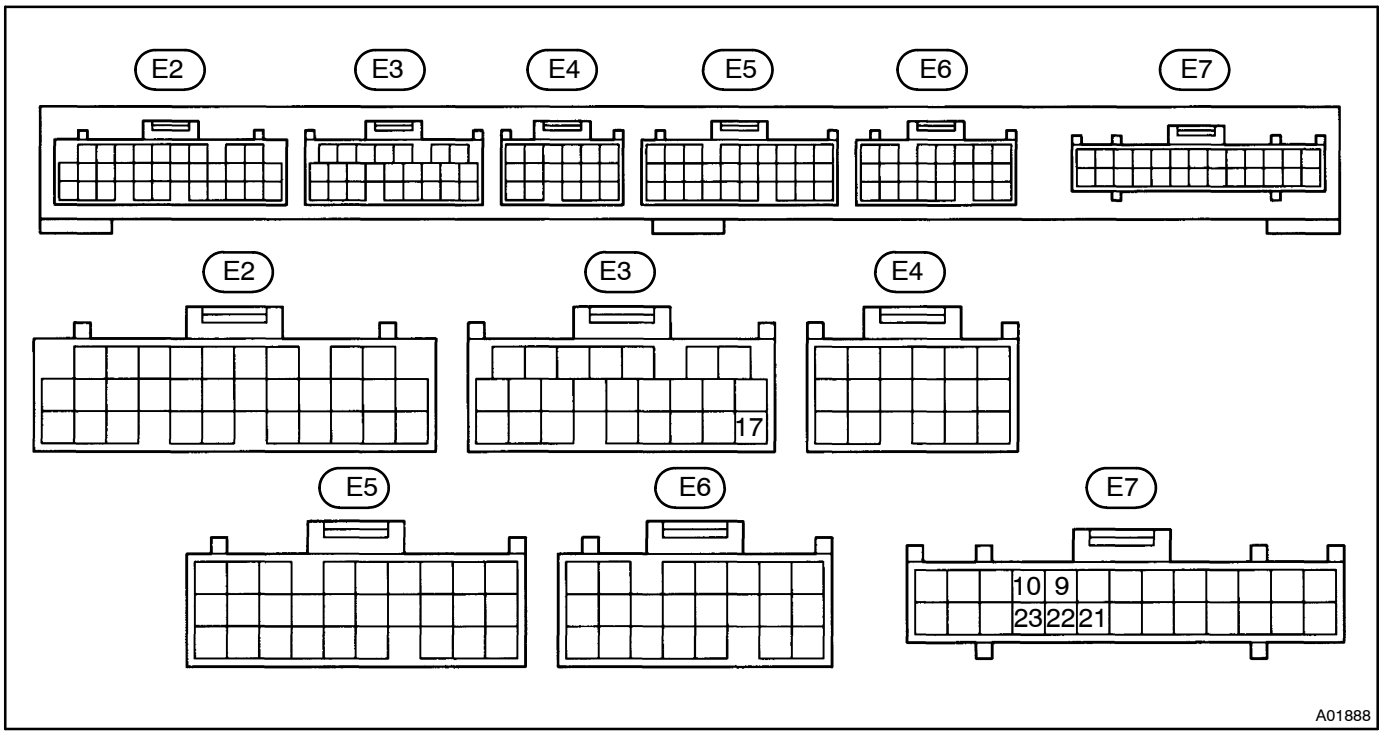
- The vehicle shown in this illustration is ”GS430”.
- All components of ”GS300” other than the ones used for engine are same as ”GS430”.



DI86B–01

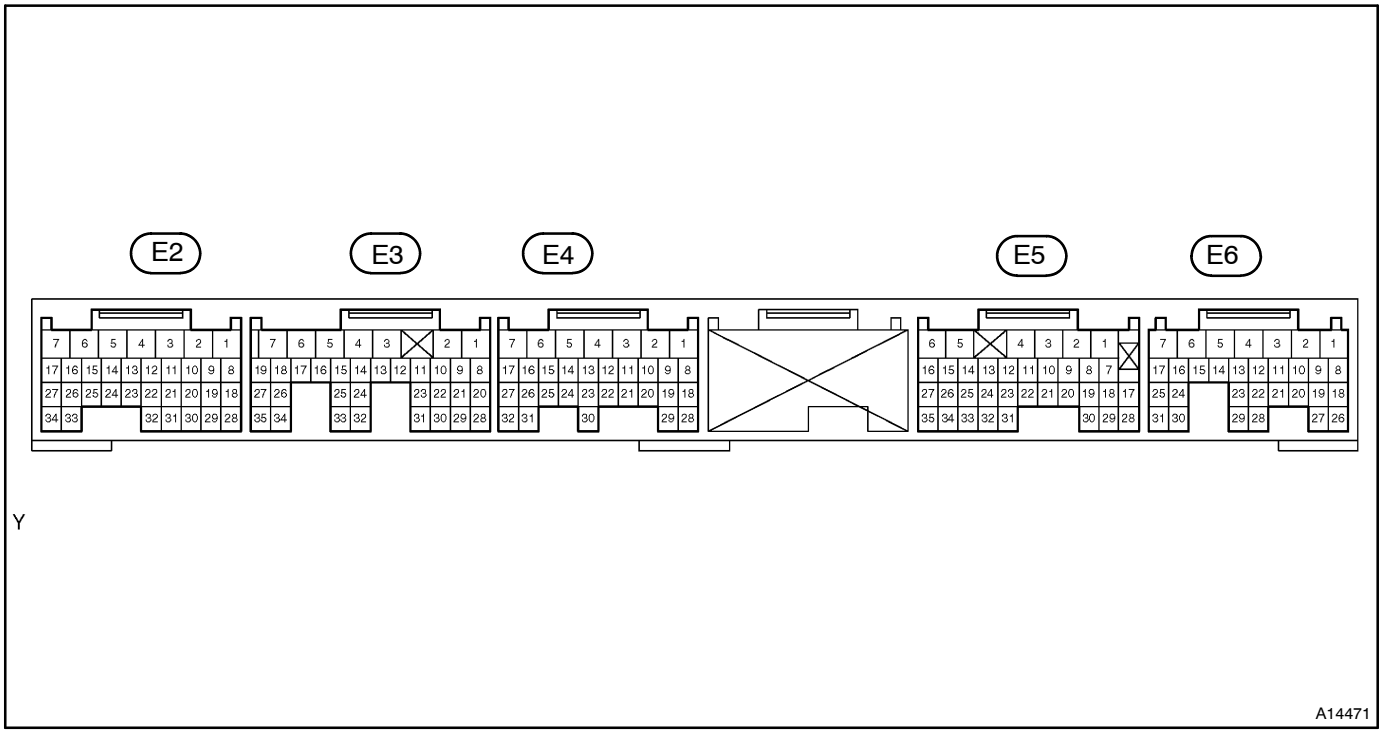
TERMINALS OF ECU

GS300



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
CODE – E1 (E7 – 23 ↔ E3 – 17)	G–B ↔ BR	Ignition Switch ON	10 – 14
TXCT – E1 (E7 – 21 ↔ E3 – 17)	L–R ↔ BR	Ignition Switch ON	10 – 14
RXCK – E1 (E7 – 22 ↔ E3 – 17)	B–W ↔ BR	Ignition Switch ON	10 – 14

GS430



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
CODE – E1 (E6 – 31 ↔ E3 – 7)	G–B ↔ BR	Ignition Switch ON	10 – 14
TXCT – E1 (E5 – 23 ↔ E3 – 7)	L–R ↔ BR	Ignition Switch ON	10 – 14
RXCK – E1 (E5 – 24 ↔ E13 – 7)	B–W ↔ BR	Ignition Switch ON	10 – 14

DI1AP–24

PROBLEM SYMPTOMS TABLE

Symptom	Suspect Area	See page
Immobiliser is not set. (Engine starts with key codes other than the registered key code.)	1. Engine and ECT ECU	IN–30
Engine does not start.	1. Key 2. Wire harness 3. Transponder key coil 4. Amplifier 5. Engine and ECT ECU	*1 IN–30 ★ BE–253 IN–30
Security indicator is always ON.	1. Security indicator 2. Wire harness 3. Engine and ECT ECU	*2 IN–30 IN–30
Security indicator is always ON. (Although code has been registered in the automatic registration mode, indicator is not OFF.)	1. Wire harness 2 Transponder key coil 3. Amplifier 4. Engine and ECT ECU	IN–30 ★ BE–253 IN–30
Security indicator is OFF. (When DTC of immobiliser is output)	1. Wire harness 2 Transponder key coil 3. Amplifier 4. Engine and ECT ECU	IN–30 ★ BE–253 IN–30
Security indicator is OFF. (When DTC of immobiliser is not output)	1. Wire harness 2. Engine and ECT ECU	IN–30 IN–30
Security indicator is abnormally blinking.	1. Wire harness 2. Engine and ECT ECU	IN–30 IN–30

*1 : Check that the key which did not start the engine has been registered and that it is possible to start with other already registered key.

*2 : Finish the automatic registration mode because the mode might still remain.

★: LEXUS GS300 Repair Manual Pub. No. RM588E

DI1AS–23

CIRCUIT INSPECTION

DTC	B2795/99	Unmatched Key Code

This DTC is output when an unregistered key is inserted. When this DTC is output, delete DTC and insert the key that a customer keeps to check that B2795 is output.
When a key that outputs B2795 is found, register this key. when B2795 is not output, there is a possibility that the unregistered key has been inserted before. (Engine and ECT ECU is normal.)
Inquire a customer the condition of using the system to find the cause of the trouble.
(Example: Another key has been inserted, etc..)

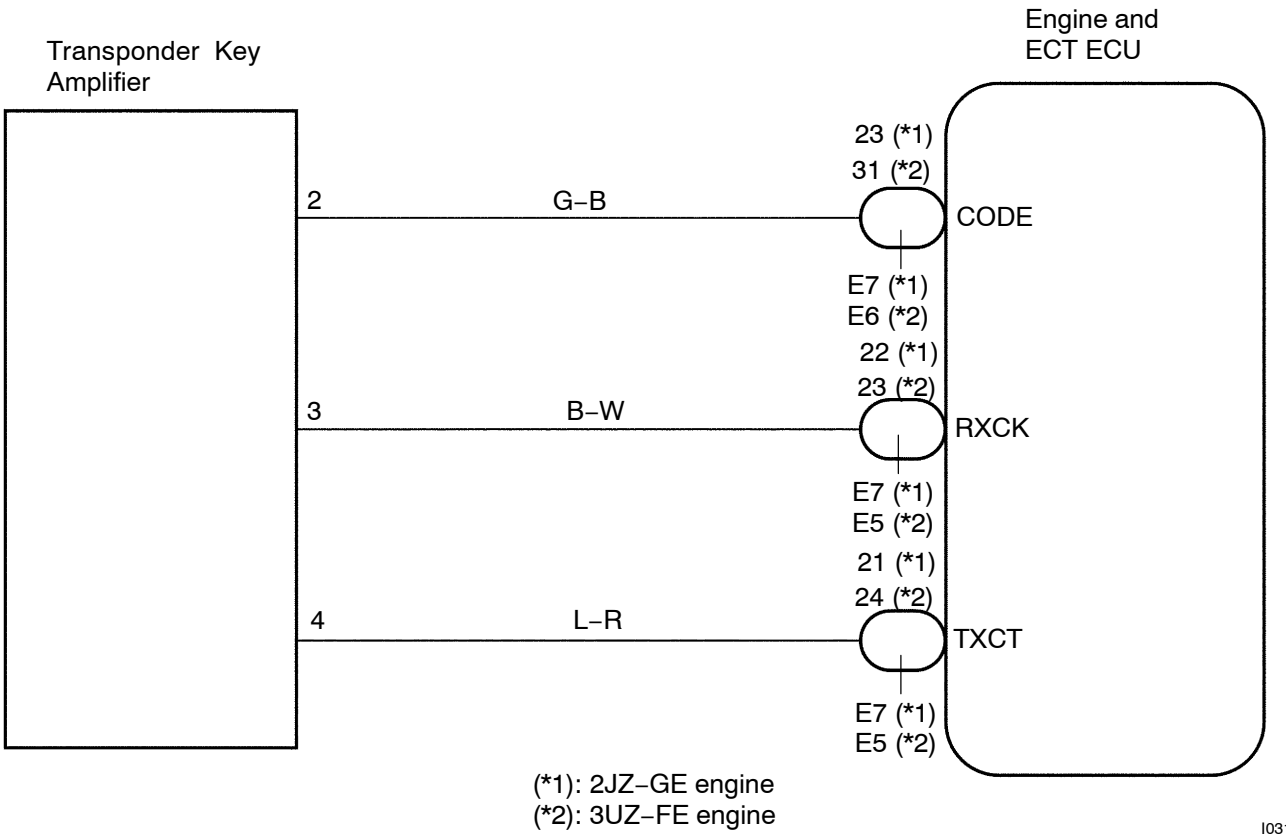
DI1AT–25

DTC	B2796/99	No Communication in Immobiliser system

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
B2796/99	No communication	• Key • Transponder Key Coil • Transponder Key Amplifier • Wire harness • Engine and ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check transponder key coil (See Pub. No. RM588E on page BE–253).

NG → Replace transponder key coil.

OK →

2	Check harness and connector between transponder key amplifier and ECU.

NG → Repair or replace harness and connector.

OK →

3	Does it operate normally after replacement of transponder key amplifier?

Yes → Replace transponder key amplifier.

No →

Replace ECU.

DI1AU–17

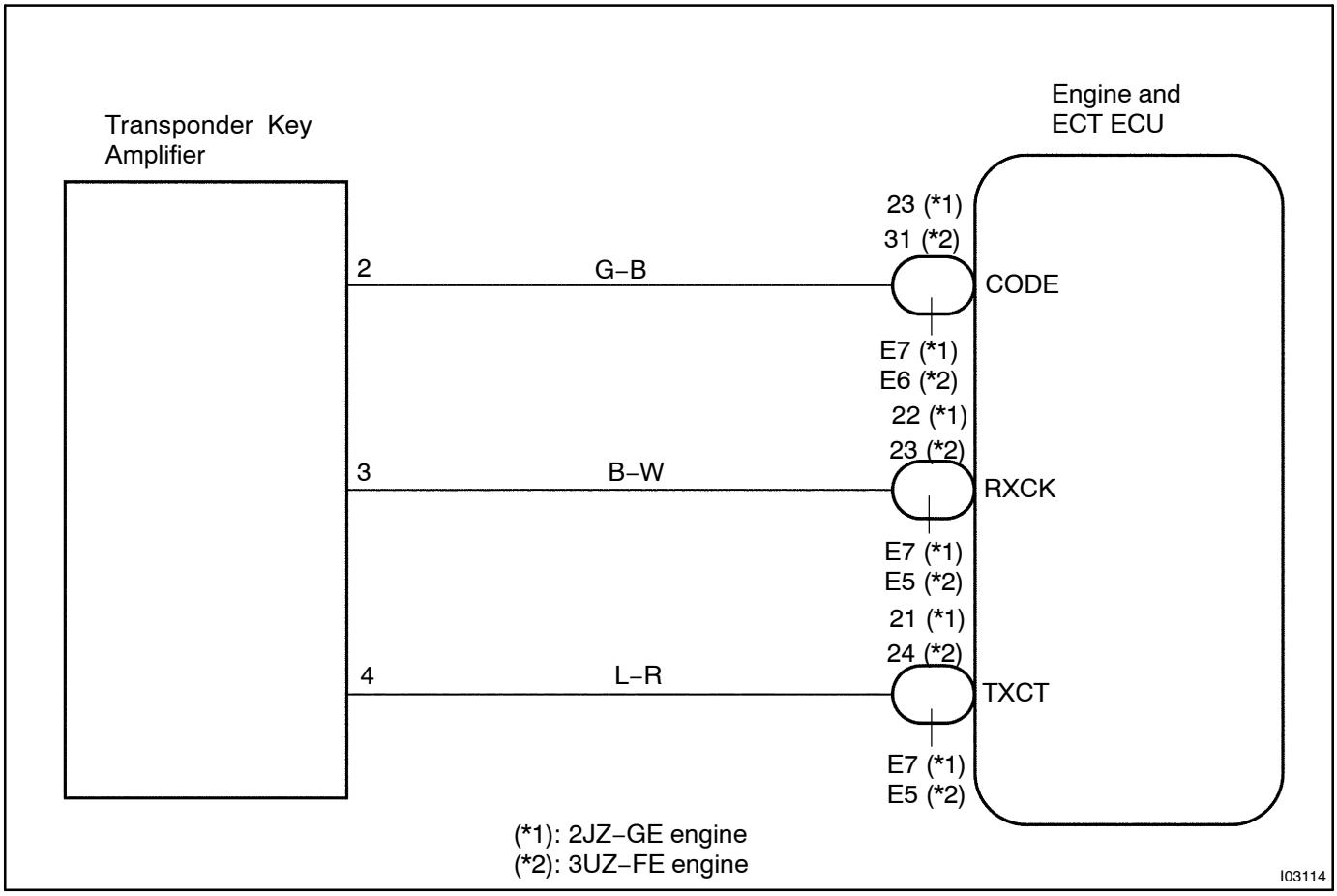
DTC	B2797/99	Communication Malfunction No.1

CIRCUIT DESCRIPTION

This code is detected when although the communication has been performed normally, an error occurs. (Example. Some noise is included in communication line.)

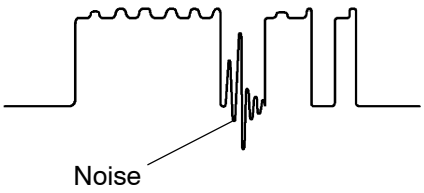
DTC No.	DTC Detecting Condition	Trouble Area
B2797/99	Communication error	• Wire Harness • Transponder Key Amplifier • Engine and ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Noise check**



PREPARATION:
Insert the already registered master key in the key cylinder.
CHECK:
Using an oscilloscope or LEXUS hand–held tester, check that noise is included in the signals sent to the CODE terminal of ECM.
OK:
No noise is detected.

NG → **Try to find the cause of the noise and remove it.**

OK

2	**Does the system operate normally after replacement of transponder key amplifier?**

Yes → **Replace transponder key amplifier.**

No

Replace ECU.

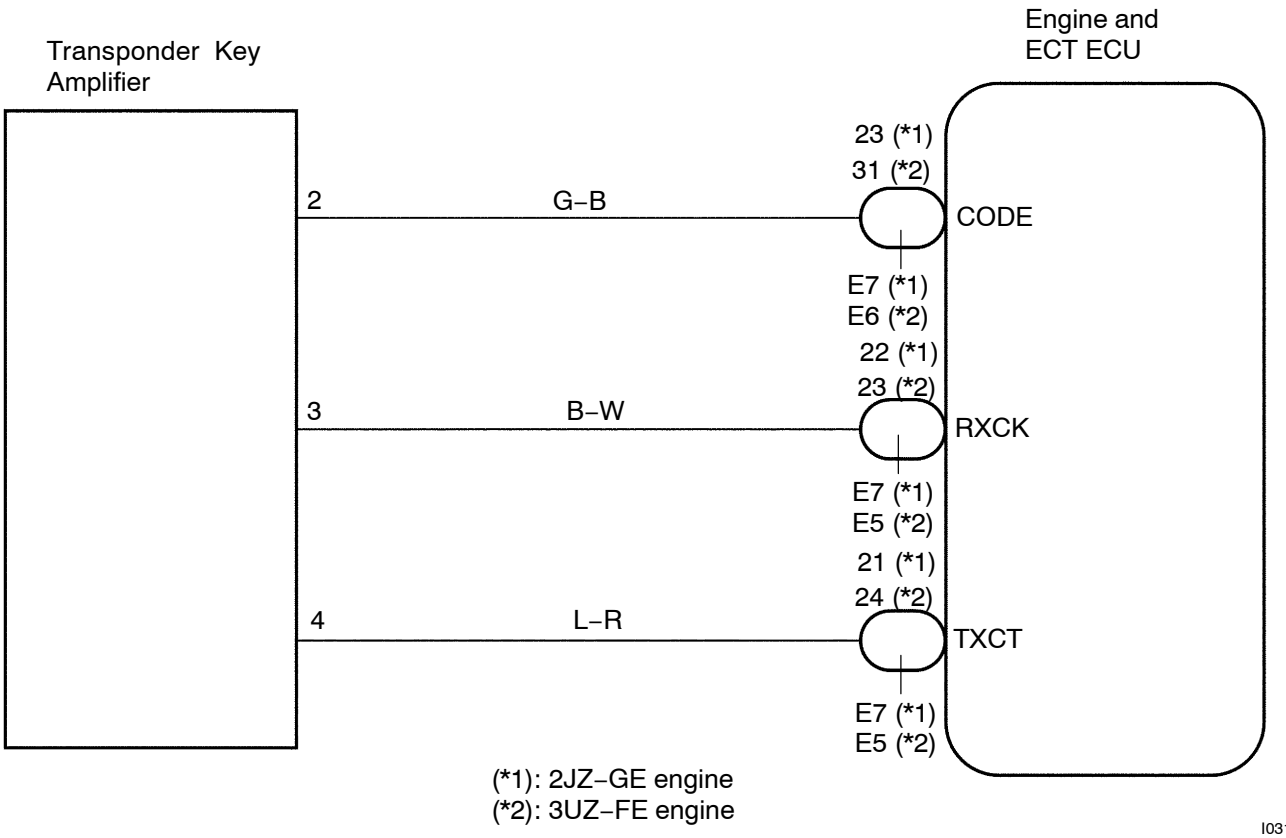
DI1AV–17

DTC	B2798/99	Communication malfunction No.2

CIRCUIT DESCRIPTION

DTC No.	DTC Detecting Condition	Trouble Area
B2798/99	Communication error	• Key • Transponder Key Coil • Transponder Key Amplifier • Wire harness • Engine and ECT ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check transponder key coil (See Pub. No. RM588E on page BE–253).

NG → Replace transponder key coil.

OK

2	Check harness and connector between transponder key amplifier and ECU.

NG → Repair or replace harness and connector.

OK

3	Does the system operate normally after replacement of transponder key amplifier?

Yes → Replace transponder key amplifier.

No

Replace ECU.

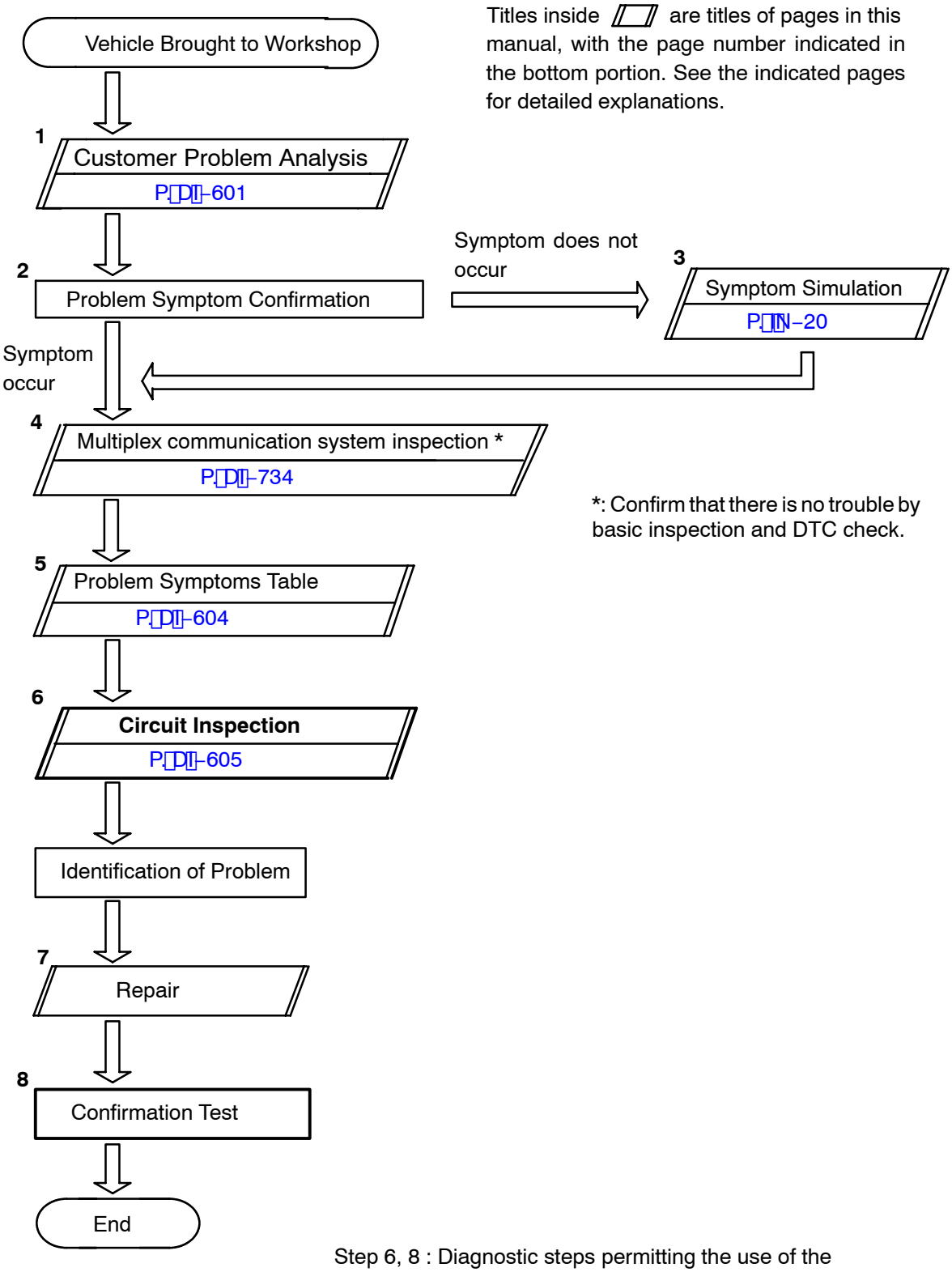
BODY NO.1 CONTROL SYSTEM

DI29N–02

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

This ECU is connected to the multiplex communication system. Therefore, be sure to check that there is no troubles in the multiplex communication system before performing the troubleshooting.



Titles inside ▱ are titles of pages in this manual, with the page number indicated in the bottom portion. See the indicated pages for detailed explanations.

*: Confirm that there is no trouble by basic inspection and DTC check.

Step 6, 8 : Diagnostic steps permitting the use of the LEXUS hand–held tester.

DI29O–04

CUSTOMER PROBLEM ANALYSIS CHECK

BODY NO.1 CONTROL SYSTEM Check Sheet

Inspector's name: _____

Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date Vehicle Brought in	/ /	**Odometer Reading**	**km Mile**

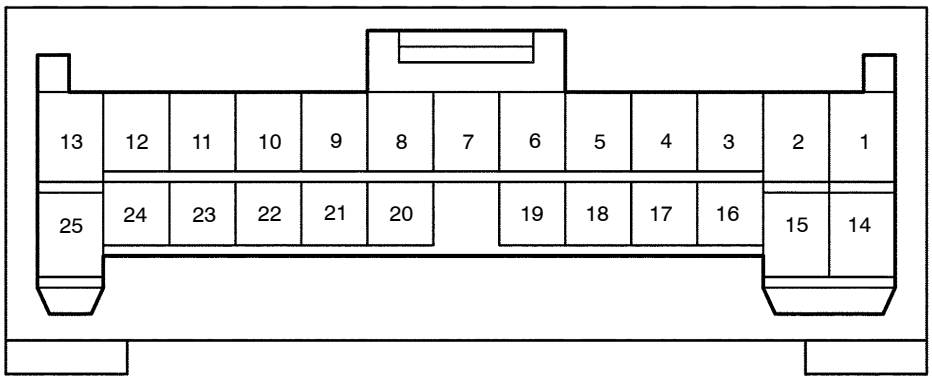
Date Problem First Occurred		/ /
Frequency Problem Occurs		☐ Constant ☐ Sometimes (times per day, month) ☐ Once only
Weather Conditions When Problem Occurred	**Weather**	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/ Others
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (Approx. °F (°C))

Malfunction System	☐ Seat Belt Warning
	☐ Power Window Control System
	☐ Power Door Lock Control System
	☐ Double Locking System (Europe)
	☐ Theft Deterrent System
	☐ Wireless Door Lock Control System
	☐ Luggage compartment door opener system
	☐ Others

DI29Q–05

TERMINALS OF ECU

BODY ECU No. 1



I05039

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
ACC ↔ GND (B5–15 ↔ B5–11)	GR ↔ W–B	Ignition switch position is ACC.	10 – 14 V
TR+ ↔ GND (B5–2 ↔ B5–11)	L ↔ W–B	Luggage compartment door opener switch ON.	10 – 14 V (for 250 ms)
HORN ↔ GND (B5–1 ↔ B5–11)	G–B ↔ W–B	Theft Deterrent System is set, luggage compartment door key lock and unlock switch OFF. Luggage compartment door open.	Voltage change 10 – 14 V ↔ Below 1 V
IND ↔ GND (B5–22 ↔ B5–11)	V ↔ W–B	Security indicator light lights up. (Only for 30 secs. in arming mode. (When the indicator light flashes, engine immobilizer system operates.))	3 – 6 V
		Security indicator light does not light up. (Only for 30 secs. in arming mode. (When the indicator light flashes, engine immobilizer system operates.))	Below 1 V
HDCY ↔ GND (B5–9 ↔ B5–11)	V–G ↔ W–B	Hood is open.	Below 1 V
		Hood is closed.	10 – 14 V
LGCY ↔ GND (B5–10 ↔ B5–11)	R–W ↔ W–B	Luggage door is open.	Below 1 V
		Luggage door is closed.	10 – 14 V
TKUL ↔ GND (B5–16 ↔ B5–11)	LG–B ↔ W–B	Luggage door unlock switch is turned.	Below 1 V
		Luggage door unlock switch is not turned.	10 – 14 V
TSW ↔ GND (B5–17 ↔ B5–11)	V–Y ↔ W–B	Luggage opener S/W is operated.	Below 1 V
		Luggage opener S/W is not operated.	10 – 14 V
B2R ↔ B2R2 (B5–12 ↔ B5–13)	P–B ↔ W–B	When buzzer is not sounded.	Below 1 V
SNOW ↔ GND (B5–24 ↔ B5–11)	G–R ↔ W–B	Snow switch (ECT pattern select switch) is SNOW.	Below 1 V
		Snow switch (ECT pattern select switch) is NORM.	10 – 14 V
PWR ↔ GND (B5–23 ↔ B5–11)	G–W ↔ W–B	PWR switch (ECT pattern select switch) is PWR.	Below 1 V
		PWR switch (ECT pattern select switch) is NORM.	10 – 14 V
RET ↔ GND (*) (B5–7 ↔ B5–11)	P–G ↔ W–B	Retract switch ON	Below 1V
		Retract switch ON	10 – 14 V
RSSI (B5–4)	LG	Wireless door lock ECU communication circuit	–
RCO (B5–5)	LG–R	Wireless door lock ECU communication circuit	–

RDA (B5–6)	P	Wireless door lock ECU communication circuit	–
MPX1 (B5–19)	W	Multiplex communication circuit	–

(*): G.C.C. countries only

DI29R–04

PROBLEM SYMPTOMS TABLE

DOUBLE LOCKING SYSTEM

Symptom	Suspect Area	See page
Double locking system does not operate	1. Double locking switch circuit	DI–660 DI–690 DI–708 DI–728
	2. Double locking motor circuit	DI–658 DI–688 DI–710 DI–730
	3. Double locking system	BE–18
	4. Each door ECU	IN–30
	5. Body ECU No. 1	IN–30

OTHERS

Symptom	Suspect Area	See page
Mirror retract system does not operate	1. Electrical retract switch circuit	DI–605
	2. Retract motor circuit	DI–656 DI–686
	3. Body ECU No. 1	IN–30
DTC is not output, or is output when should not be.	1. Diagnosis circuit	DI–617
	2. Body ECU No. 1	IN–30
Unlock cannot be operated when impact sensing	1. Supplemental restraint system	DI–605
	2. Body No.1 ECU	IN–30

DI86C–01

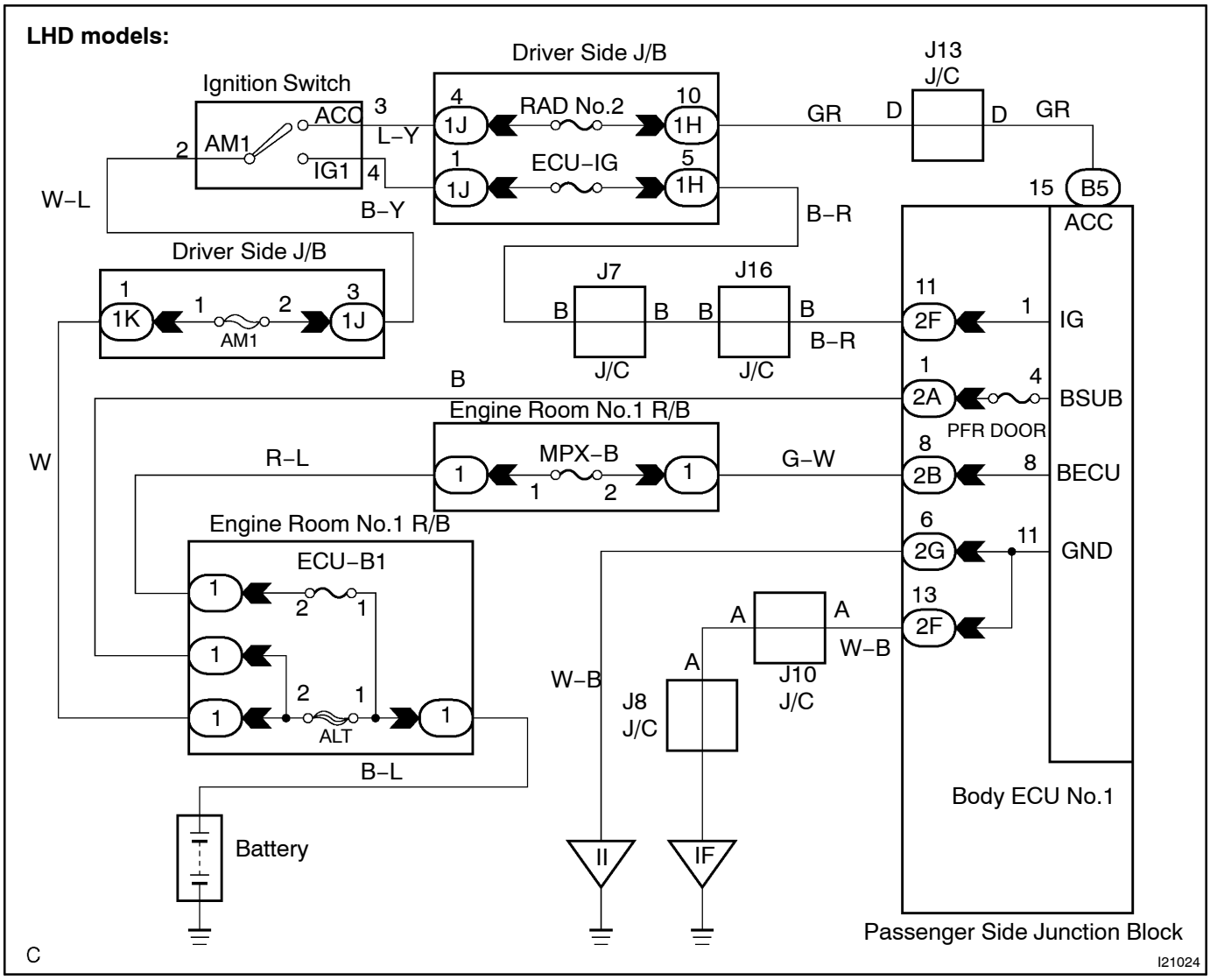
CIRCUIT INSPECTION

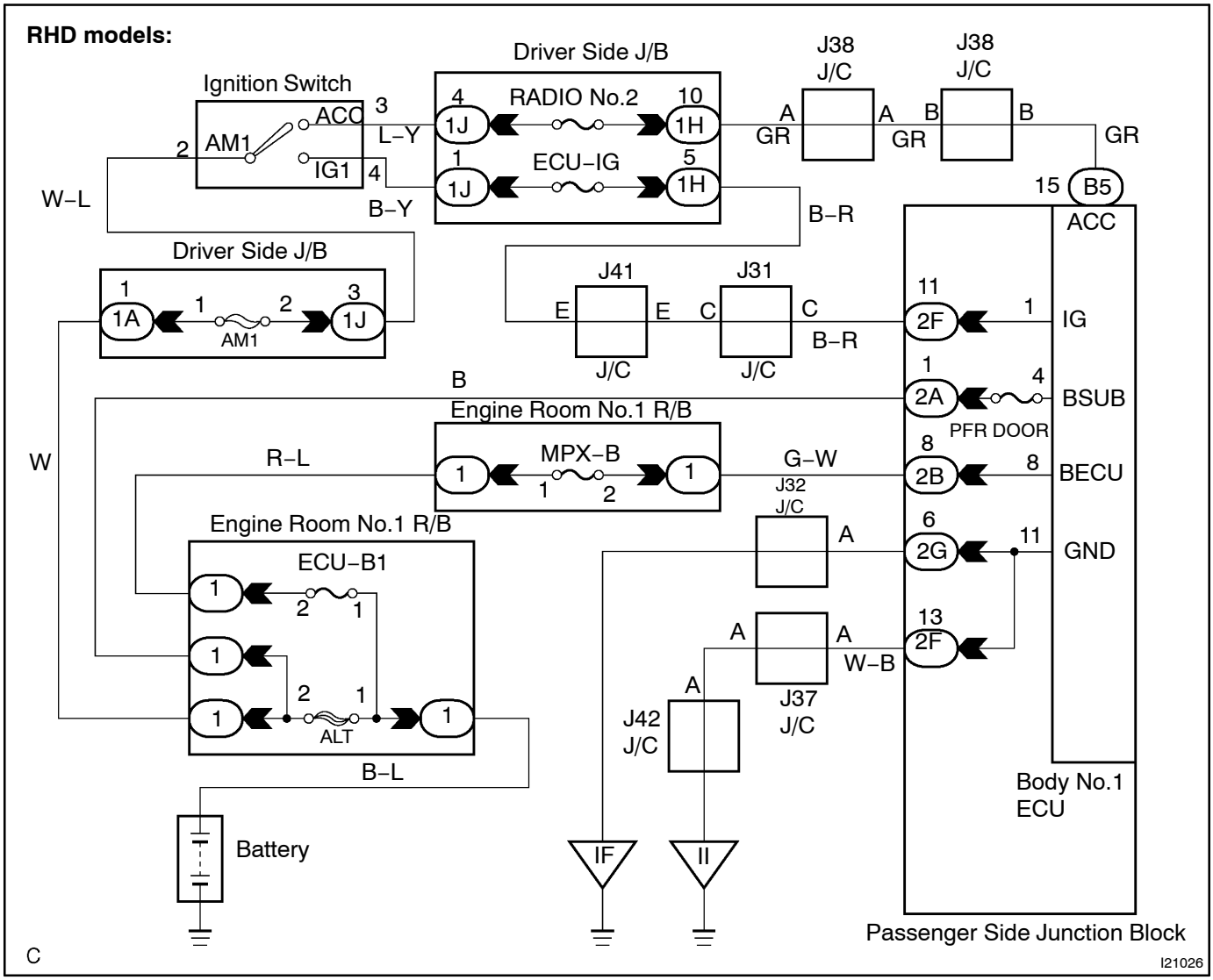
Power source circuit

CIRCUIT DESCRIPTION

This circuit provides power to operate the body ECU No. 1.

WIRING DIAGRAM




RHD models:
Driver Side J/B
Ignition Switch
ACC
AM1
IG1
RADIO No.2
ECU–IG
J38 J/C
J38 J/C
L–Y
B–Y
W–L
B–R
GR
B5
ACC
IG
BSUB
BECU
GND
PFR DOOR
J41
J31
J/C
J/C
Engine Room No.1 R/B
MPX–B
R–L
G–W
J32 J/C
Engine Room No.1 R/B
ECU–B1
ALT
B–L
Battery
J42 J/C
J37 J/C
W–B
IF
II
Body No.1 ECU
Passenger Side Junction Block
I21026

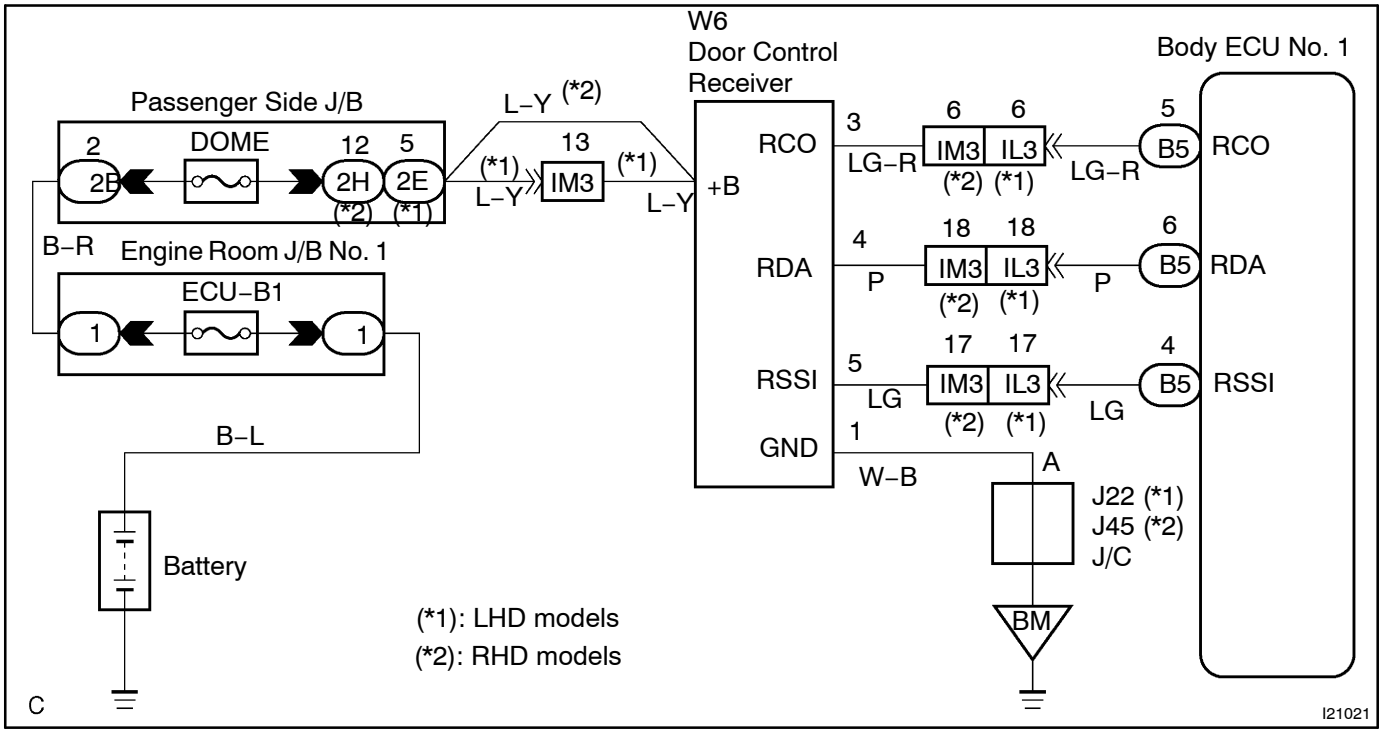
DI29U–04

Wireless door lock tuner circuit

CIRCUIT DESCRIPTION

The pressure of magnetic wave signals witchis sent from the taransmitter is checked in RSSI line.
The RCO line is used to transmit the signals which control power supply of the transmitter.

WIRING DIAGRAM



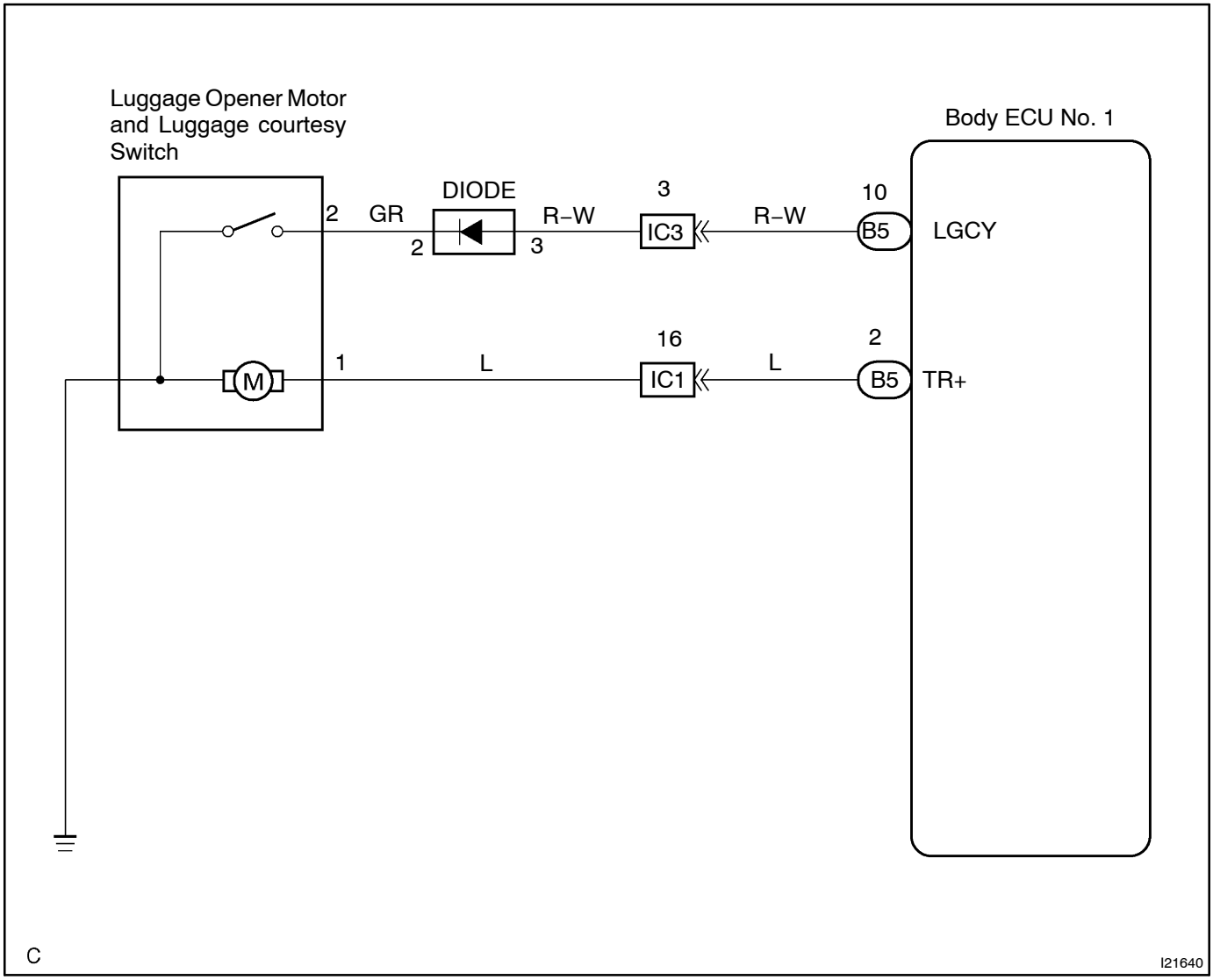
DI29W–04

Luggage courtesy switch circuit

CIRCUIT DESCRIPTION

The luggage courtesy switch goes on when luggage compartment door is opened and goes off when luggage compartment door is closed.

WIRING DIAGRAM



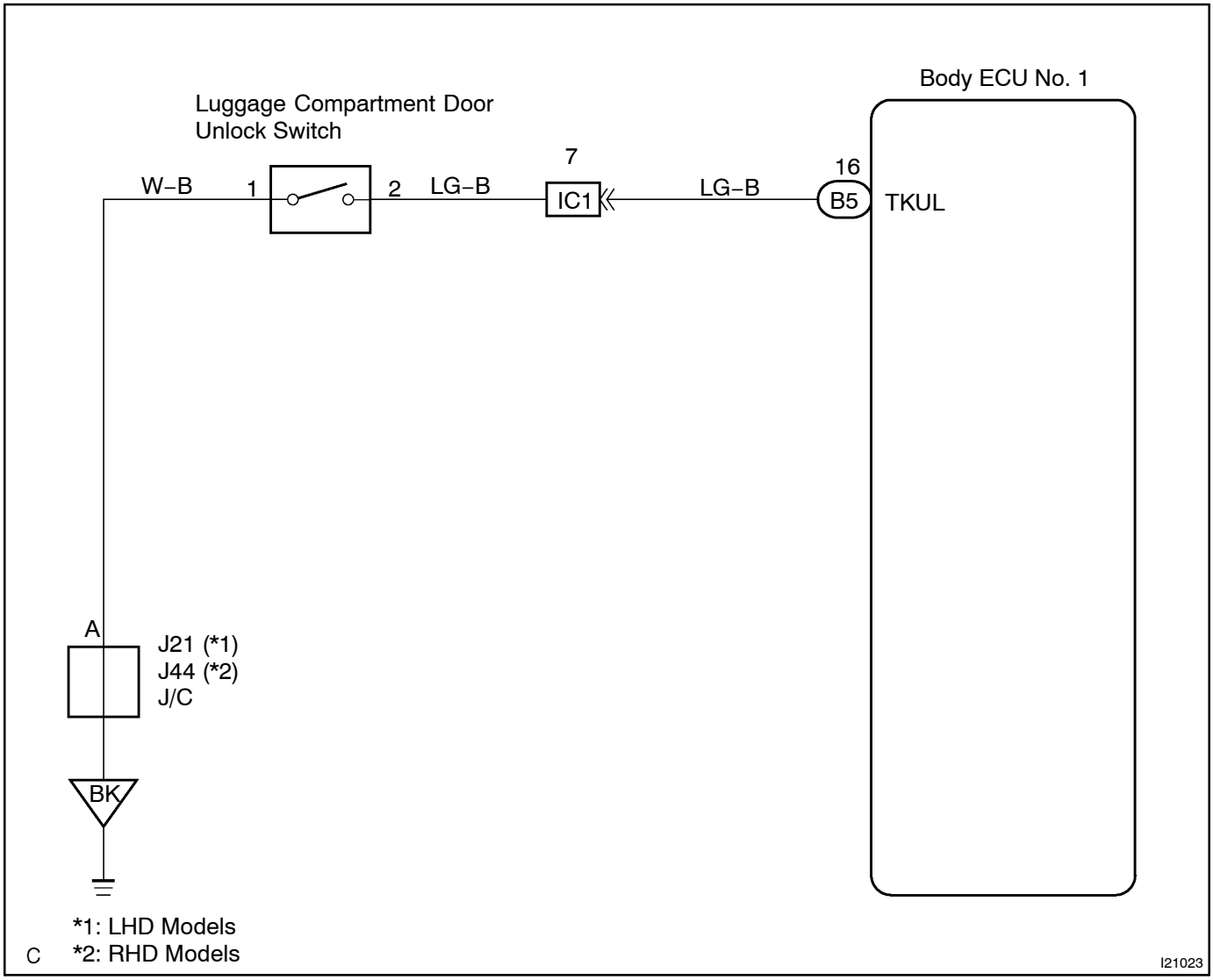
DI29X–05

Luggage compartment door lock and unlock switch circuit

CIRCUIT DESCRIPTION

The luggage compartment door lock and unlock switch goes on when the luggage compartment door key cylinder is turned to the unlock side with the key.

WIRING DIAGRAM

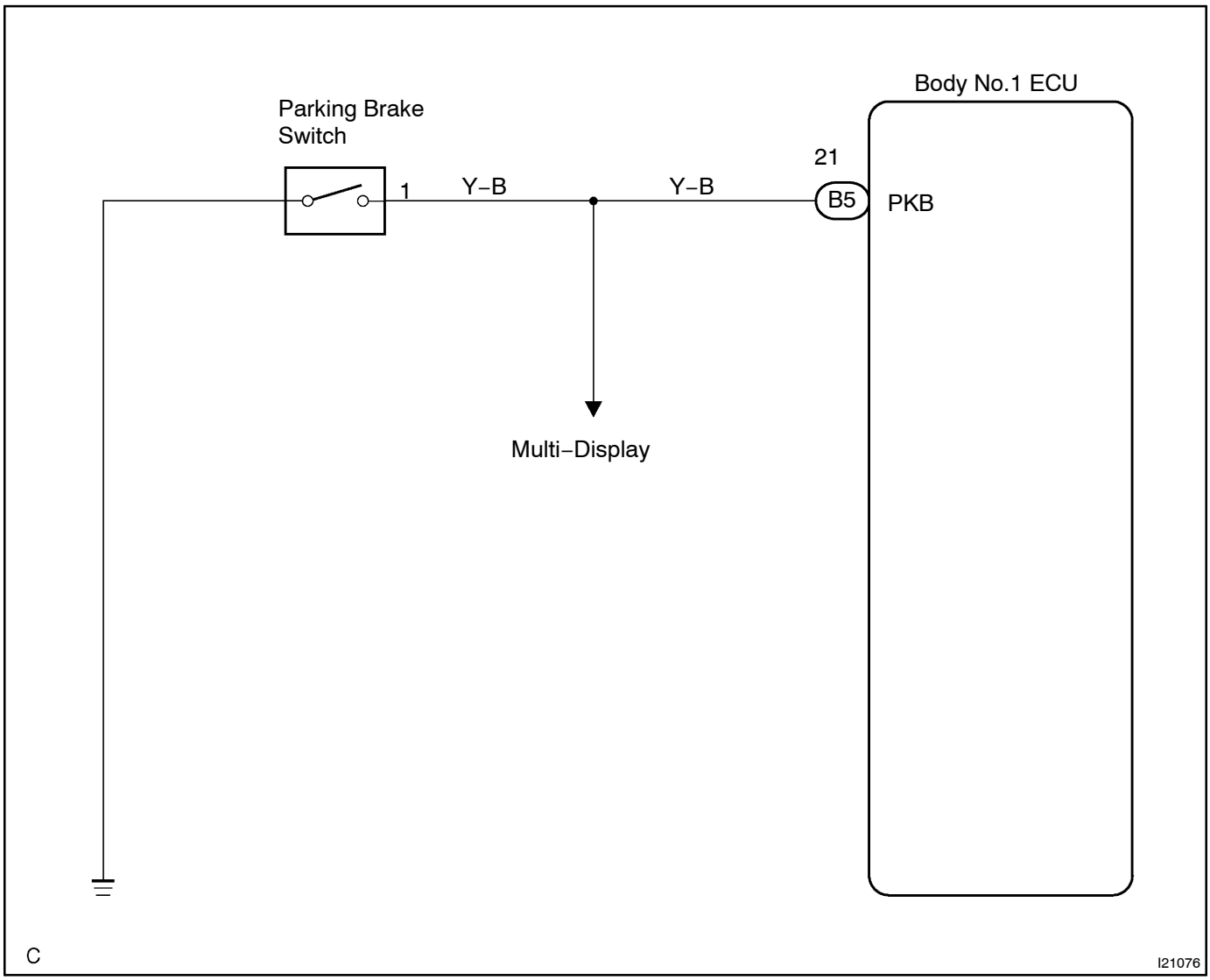


C

DI29Y–07

Parking brake switch circuit

WIRING DIAGRAM



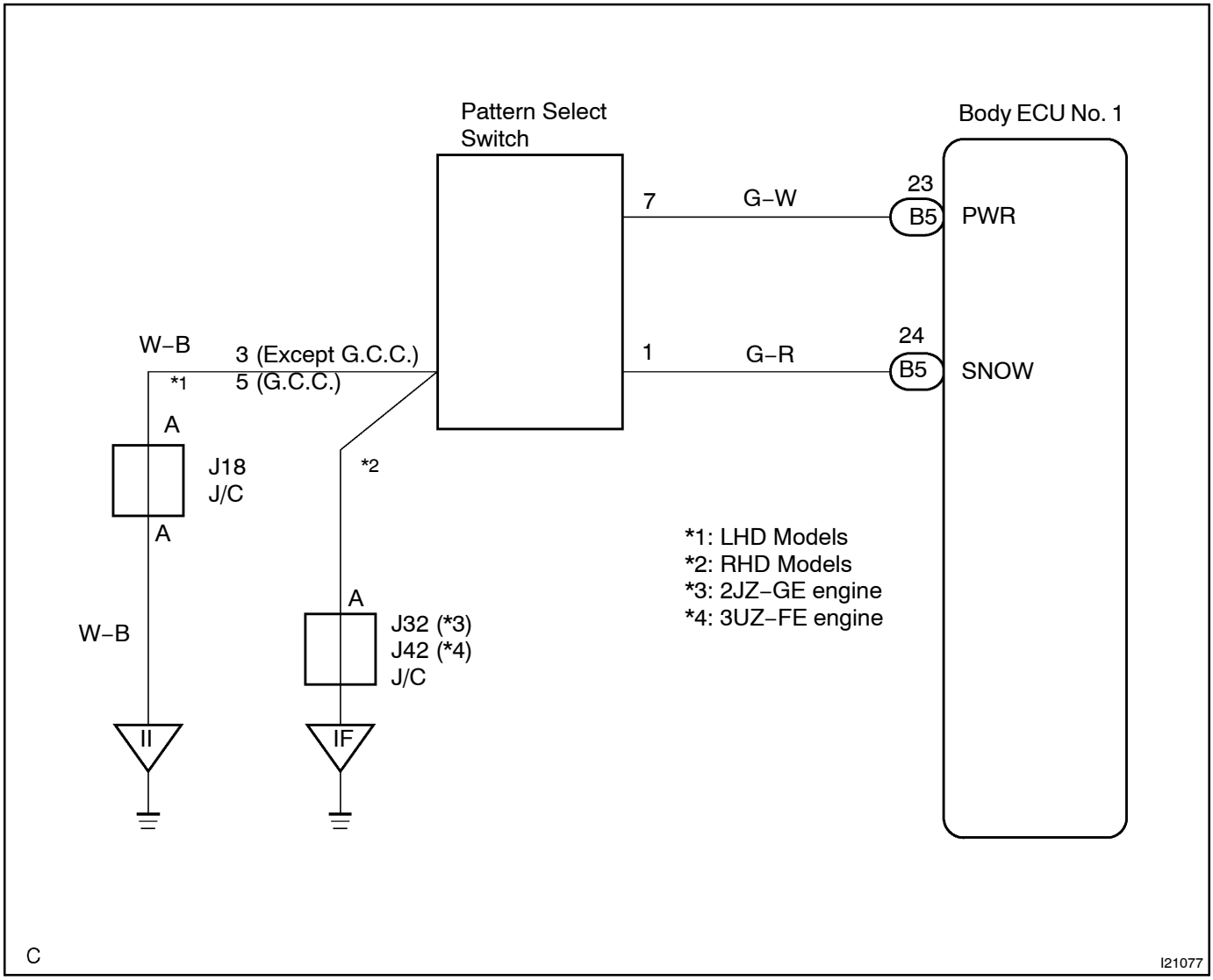
DI29Z–06

Pattern select switch circuit

CIRCUIT DESCRIPTION

Body ECU No.1 detect the state of pattern select switch.

WIRING DIAGRAM



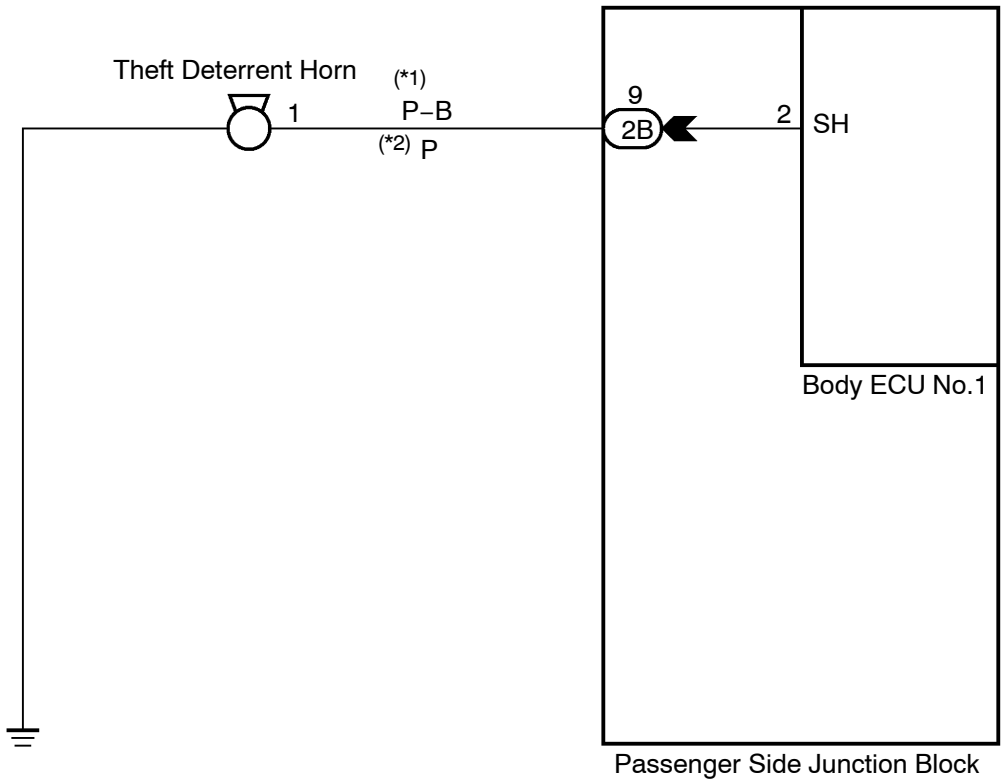
DI2A2–04

Theft deterrent horn circuit

CIRCUIT DESCRIPTION

During warning of the theft deterrent system, the body ECU No.1 activates the theft deterrent horn.

WIRING DIAGRAM



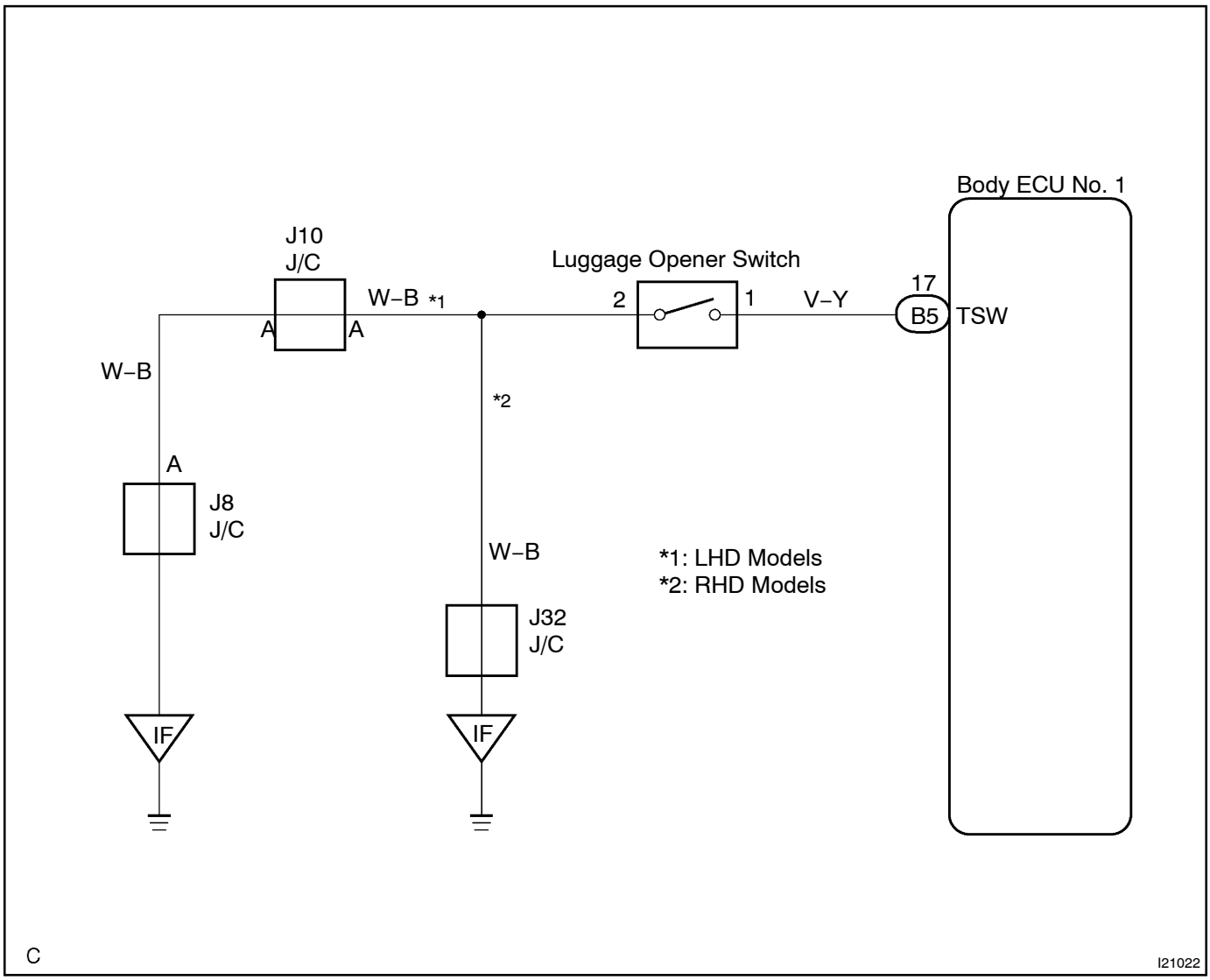
(*1): LHD models
(*2): RHD models

I05654

DI2A8–05

Luggage opener switch circuit

WIRING DIAGRAM



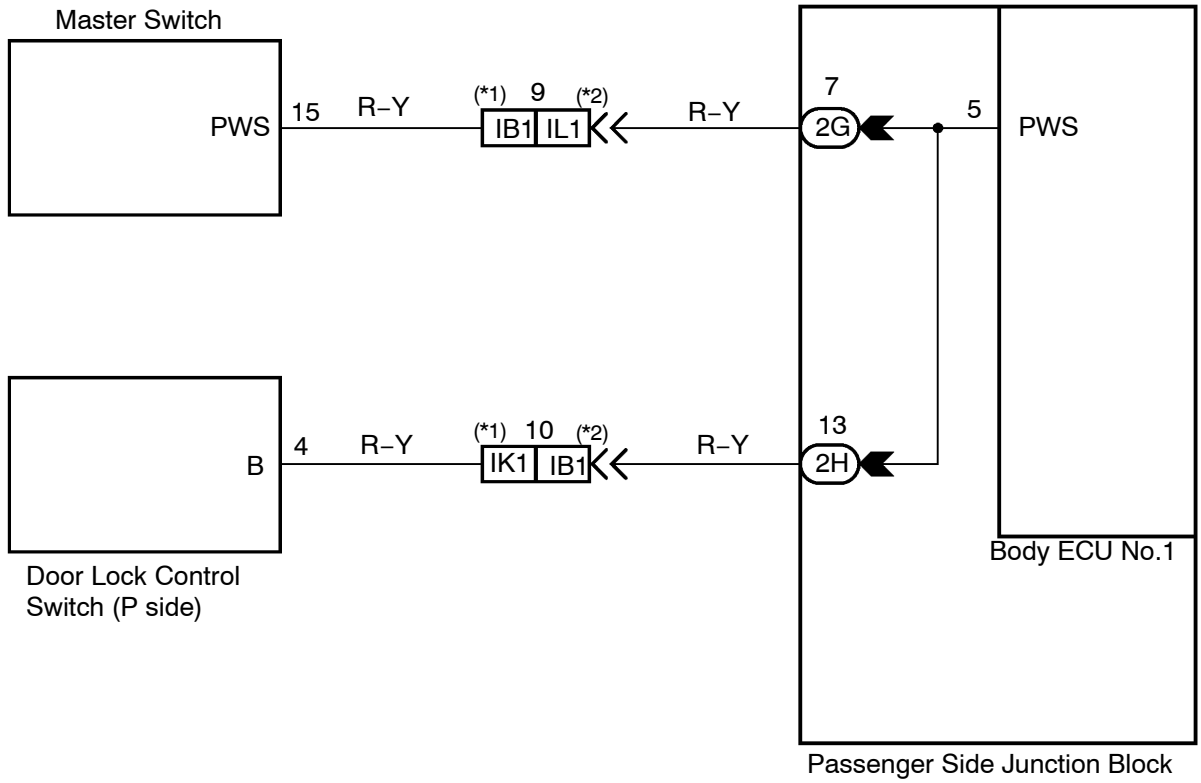
DI2A9–05

PWS circuit

CIRCUIT DESCRIPTION

This circuit is the power source of the master switch for the driver's door and the door lock switch for the passenger's doors.

WIRING DIAGRAM



(*1): LHD models
(*2): RHD models

I05661

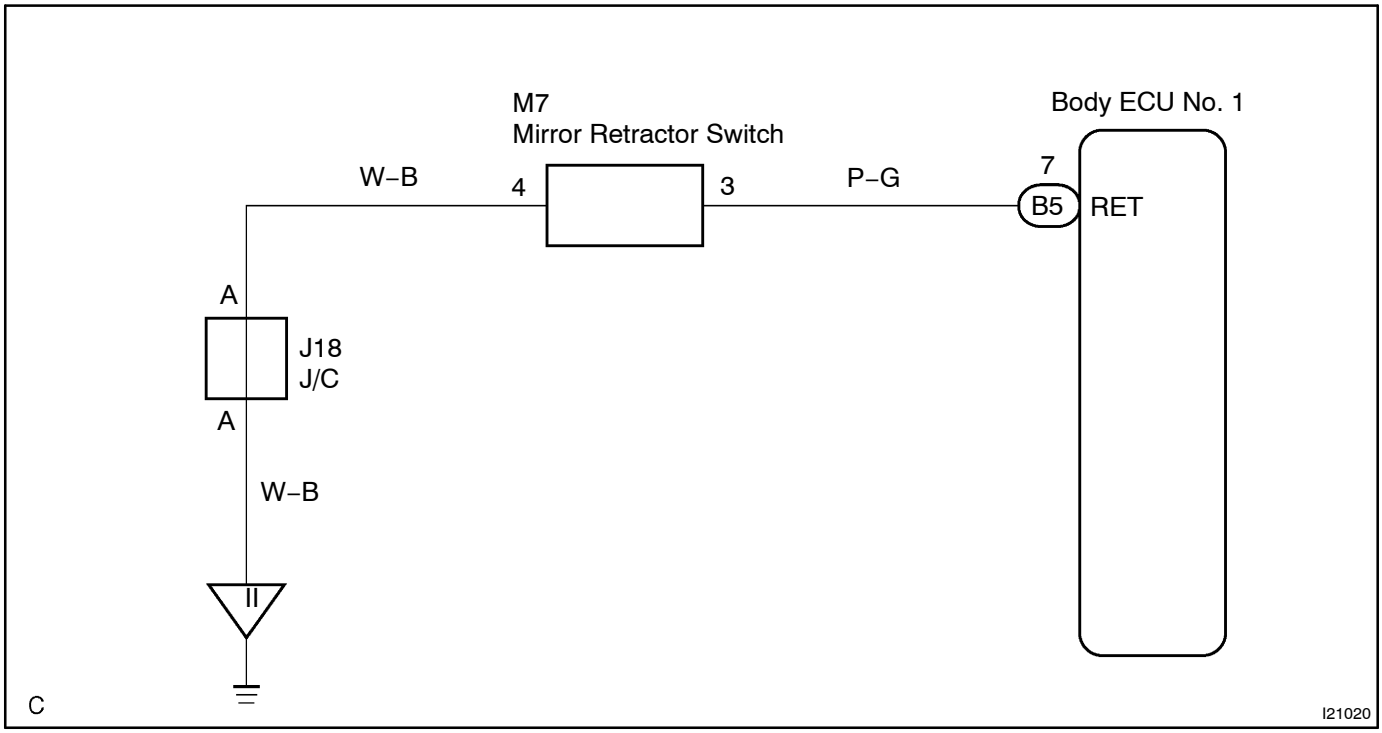
DI726–02

Mirror Retract Switch Circuit (G.C.C. countries only)

CIRCUIT DESCRIPTION

This circuit detects the conditions of the mirror retract switch.
The operating condition of the mirror retract is input by the body ECU No. 1 and the input signals are sent to the driver door ECU or the passenger door ECU.
Mirror retraction is controlled by the driver door ECU or the passenger door ECU.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
In case of using the hand–held tester, start the inspection from step 1 and in case of not using the hand–held tester, start from step 2.

1	**Check the mirror retract switch using hand–held tester.**

PREPARATION:
Connect the hand–held tester to the DLC3.
CHECK:
Check the mirror retract switch using DATA LIST.

OK → **Proceed to next circuit inspection shown on problem symptoms table (See page DI–604).**

NG

2	**Check the mirror retract switch (See page BE–21).**

NG → **Replace the mirror retract switch.**

OK

3	**Check wireharness and connector between body No. 1 ECU and mirror retract switch (See page IN–30).**

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

OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI–604).

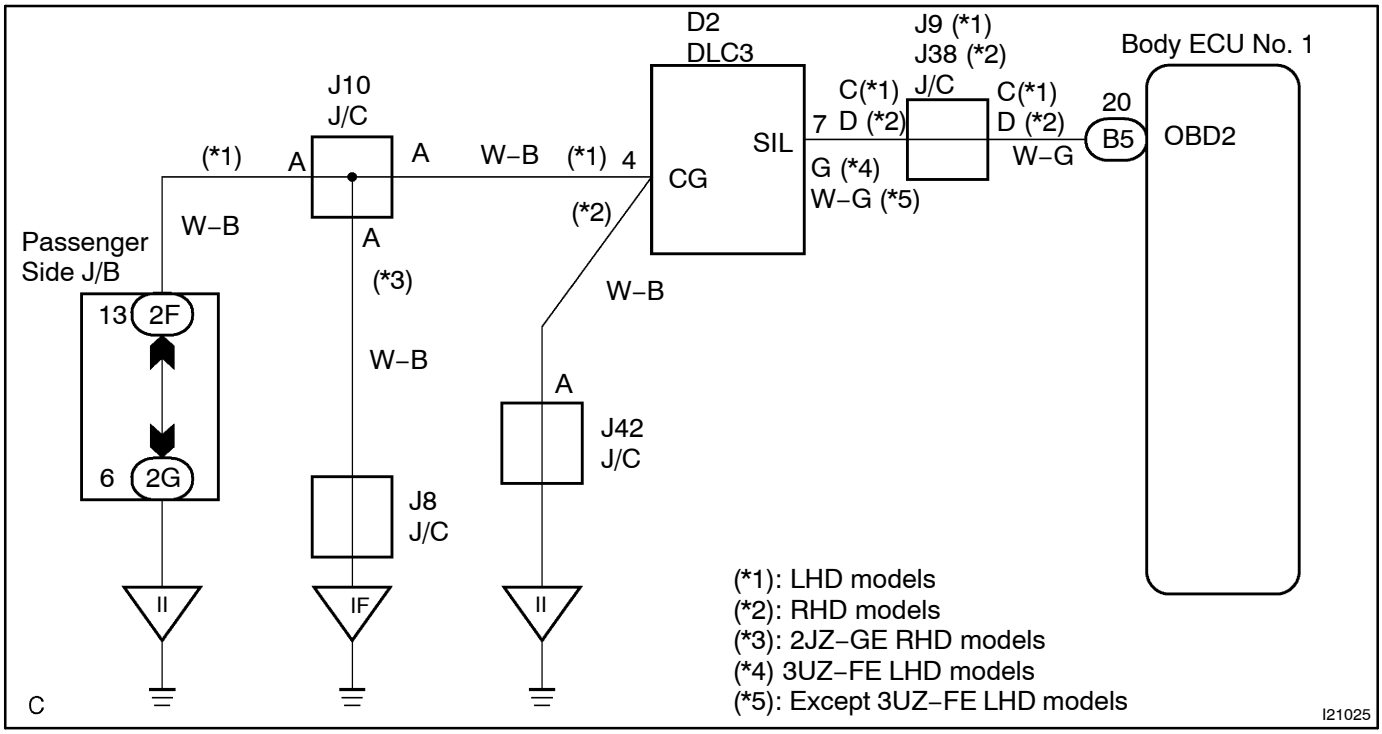
DI72F–02

Diagnosis Circuit

CIRCUIT DESCRIPTION

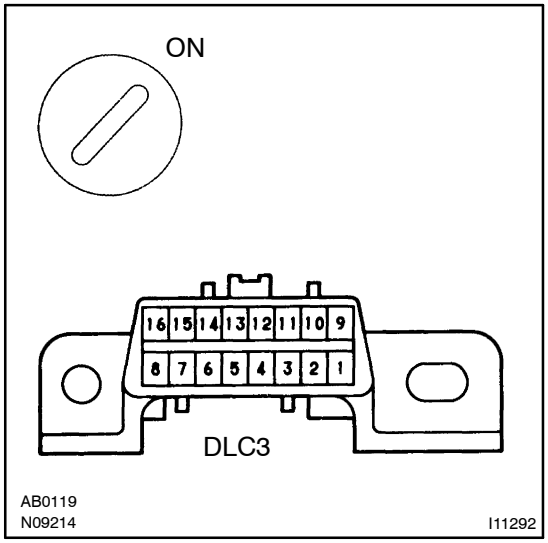
This circuit sends a signal to the ECU that DTC output is required.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals Tc and E1 of DLC3.**



PREPARATION:
Turn ignition switch ON.
CHECK:
Measure voltage between terminals SIL(7) and CG(4) of DLC3.
OK:
Voltage: 10 – 14 V

OK → **Proceed to next circuit inspection shown in problem symptoms table (See page DI–604).**

NG

2	**Check wireharness and connector between DLC3 and body ECU No. 1, DLC3 and body ground (See page IN–30).**

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

OK

Check and replace body ECU No. 1 (See page DI–604).

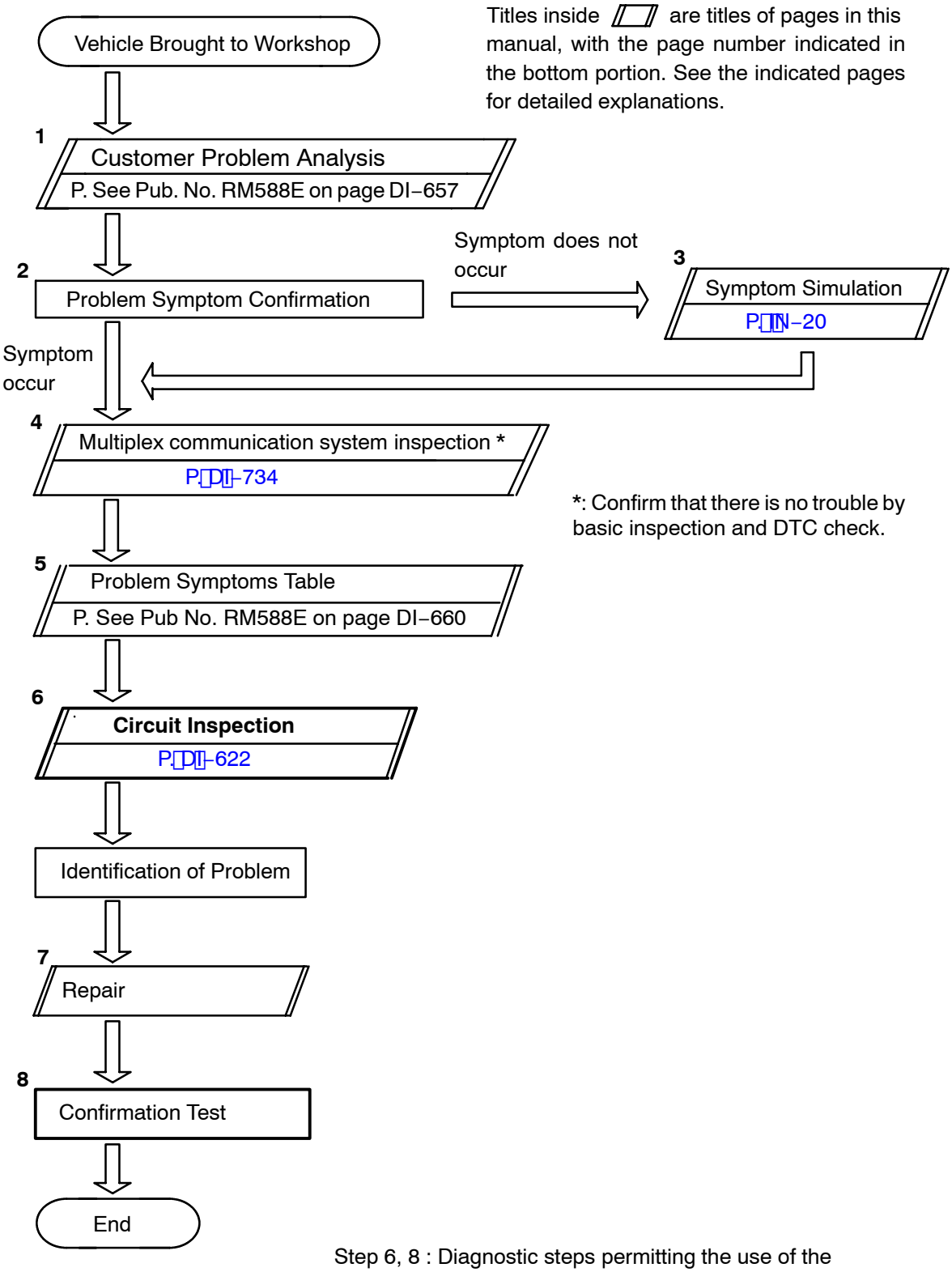
BODY NO.2 CONTROL SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

DI2AA–05

HINT:

This ECU is connected to the multiplex communication system. Therefore, be sure to check that there is no troubles in the multiplex communication system before performing the troubleshooting.

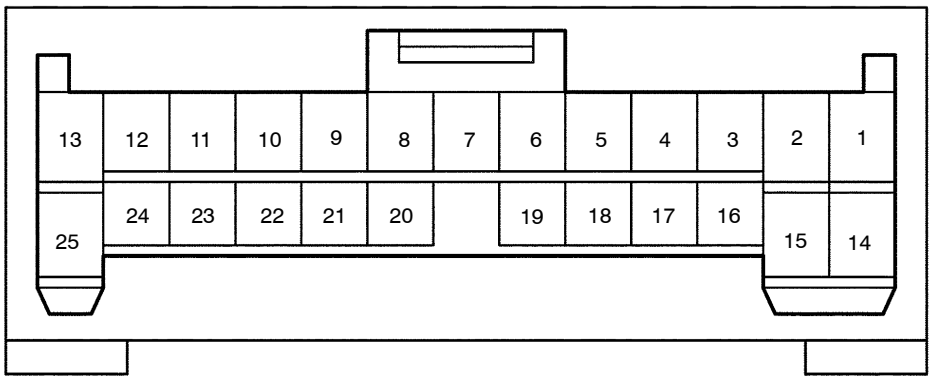


Step 6, 8 : Diagnostic steps permitting the use of the LEXUS hand–held tester.

DI2AD–05

TERMINALS OF ECU

BODY ECU No.2



I05039

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
TAIL ↔ Body ground (B6–2 ↔ Body ground)	R–Y ↔ Body ground	Headlight control switch position is TAIL.	Below 1 V
		Headlight control switch position is except TAIL.	10 – 14 V
AUTO ↔ Body ground (B6–3 ↔ Body ground)	R ↔ Body ground	Headlight control switch position is AUTO.	Below 1 V
		Headlight control switch position is except AUTO.	10 – 14 V
LF ↔ Body ground (B6–4 ↔ Body ground)	V–R ↔ Body ground	Stop light, high mount stop light and taillight is normal.	10 – 14 V
		Stop light, high mount stop light and taillight is wire break.	Below 1 V
KSW ↔ Body ground (B6–5 ↔ Body ground)	Y ↔ Body ground	Key, inserted.	Below 1 V
		Key, not inserted.	10 – 14 V
MIRS ↔ Body ground (B6–7 ↔ Body ground)	V ↔ Body ground	Mirror Left/Right adjusting switch is operating to left	5 V
		Mirror Left/Right adjusting switch is not operating to right	Below 1 V
MIRB ↔ Body ground (B6–8 ↔ Body ground)	BR–B ↔ Body ground	Mirror switch is operating to to UP side	1.4 – 1.9 V
		Mirror switch neutral position.	5 V
HRLY ↔ Body ground (B6–9 ↔ Body ground)	R–G ↔ Body ground	Ignition switch position is ON. Light control switch HEAD position.	Below 2 V
		Ignition switch position is ON. Light control switch OFF position.	10 – 14 V
MIRE ↔ Body ground (B6–6 ↔ Body ground)	W ↔ Body ground	Constant	Below 1 V
ALTL ↔ Body ground (B6–10 ↔ Body ground)	Y–R ↔ Body ground	During engine is running.	10 – 14 V
		Engine is stop	Below 1 V
ACAN ↔ Body ground (B6–11 ↔ Body ground)	LG–B ↔ Body ground	Taillight switch ON. Rheostat light control volume: dark opsition	10 – 14 V
		Taillight switch ON. Rheostat light control volume: except dark opsition	Below 1V
ILE ↔ Body ground (B6–13 ↔ Body ground)	G ↔ Body ground	Each door is opened.	Below 2 V
		All doors are closed.	10 – 14 V
STP1 ↔ Body ground (B6–14 ↔ Body ground)	G–W ↔ Body ground	Brake is ON.	Below 1 V
		Brake is OFF.	10 – 14 V
RFOG ↔ Body ground (*) (B6–16 ↔ Body ground)	R–W ↔ Body ground	Rear fog light switch is ON.	Below 1 V
		Rear fog light switch is OFF	10 – 14 V

FFOG ↔ Body ground (B6–17 ↔ Body ground)	G–W ↔ Body ground	Front fog light switch is ON.	Below 1 V
		Front fog light switch is OFF.	10 – 14
MPX2 (B6–19)	W	Multiplex communication circuit.	–
RFGO ↔ Body ground (*) (B16–25 ↔ Body ground	G–Y ↔ Body ground	Light control switch is TAIL or HEAD and fog light switch ON.	Below 1 V
		Light control switch is TAIL or HEAD and fog light switch OFF.	10 – 14

(*): Europe

DI2AF–05

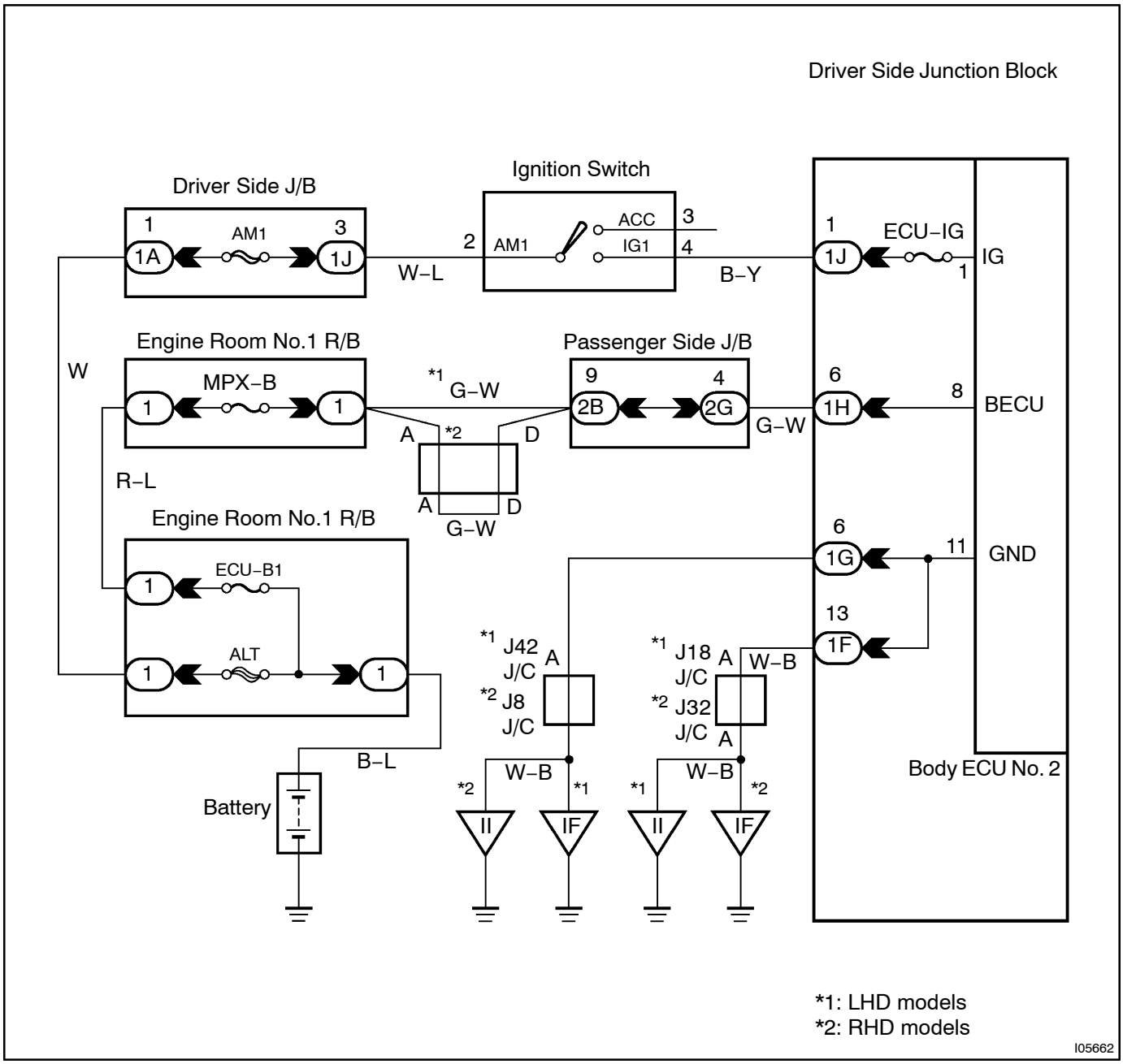
CIRCUIT INSPECTION

Power source circuit

CIRCUIT DESCRIPTION

This circuit provides power to operate the Body ECU No. 2.

WIRING DIAGRAM



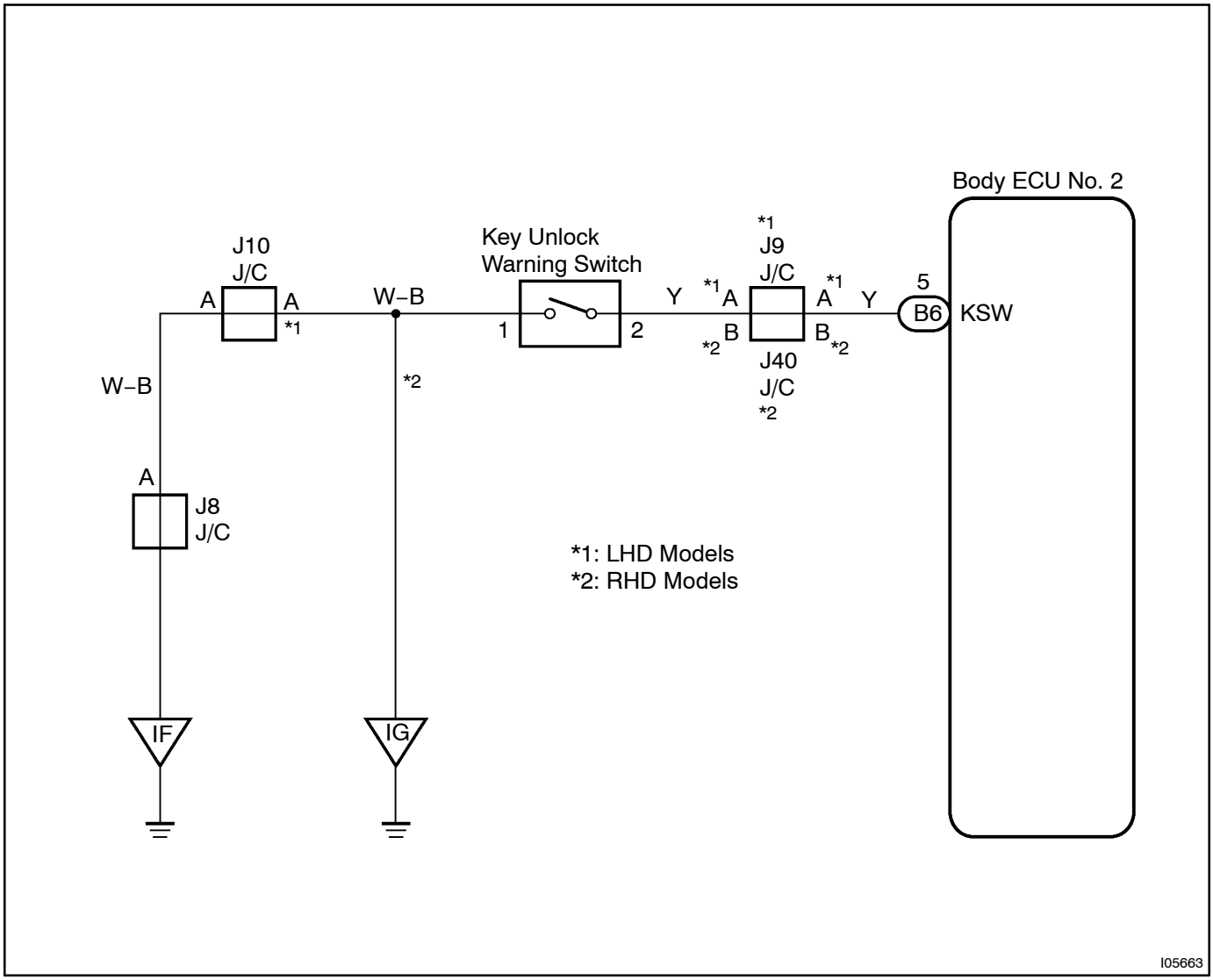
DI2AG–05

Key unlock warning switch circuit

CIRCUIT DESCRIPTION

The key unlock warning switch goes on when the ignition key is inserted in the key cylinder and goes off when the ignition key is removed.
The ECU operates the key confinement prevention function while the key unlock warning switch is on.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

In case of using the LEXUS hand–held tester, start the inspection from step 1 and incase of not using the LEXUS hand–held tester, start from step 2.

1	**Check key unlock warning switch using LEXUS hand–held tester.**

PREPARATION:

Connect the LEXUS hand–held tester to the DLC 3.

CHECK:

Check the key unlock warning switch using DATA LIST.

OK → **Proceed to next circuit inspection shown on problem symptoms table (See Pub. No. RM588E on page DI–616).**

NG

2	**Check key unlock warning switch (See Pub. No. RM588E on page BE–31).**

NG → **Replace the key unlock warning switch.**

OK

3	**Check wireharness and connector between key unlock warning switch and Body ECU No. 2.**

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

OK

Proceed to next circuit inspection shown on problem symptoms table (See Pub. No. RM588E on page DI–616).

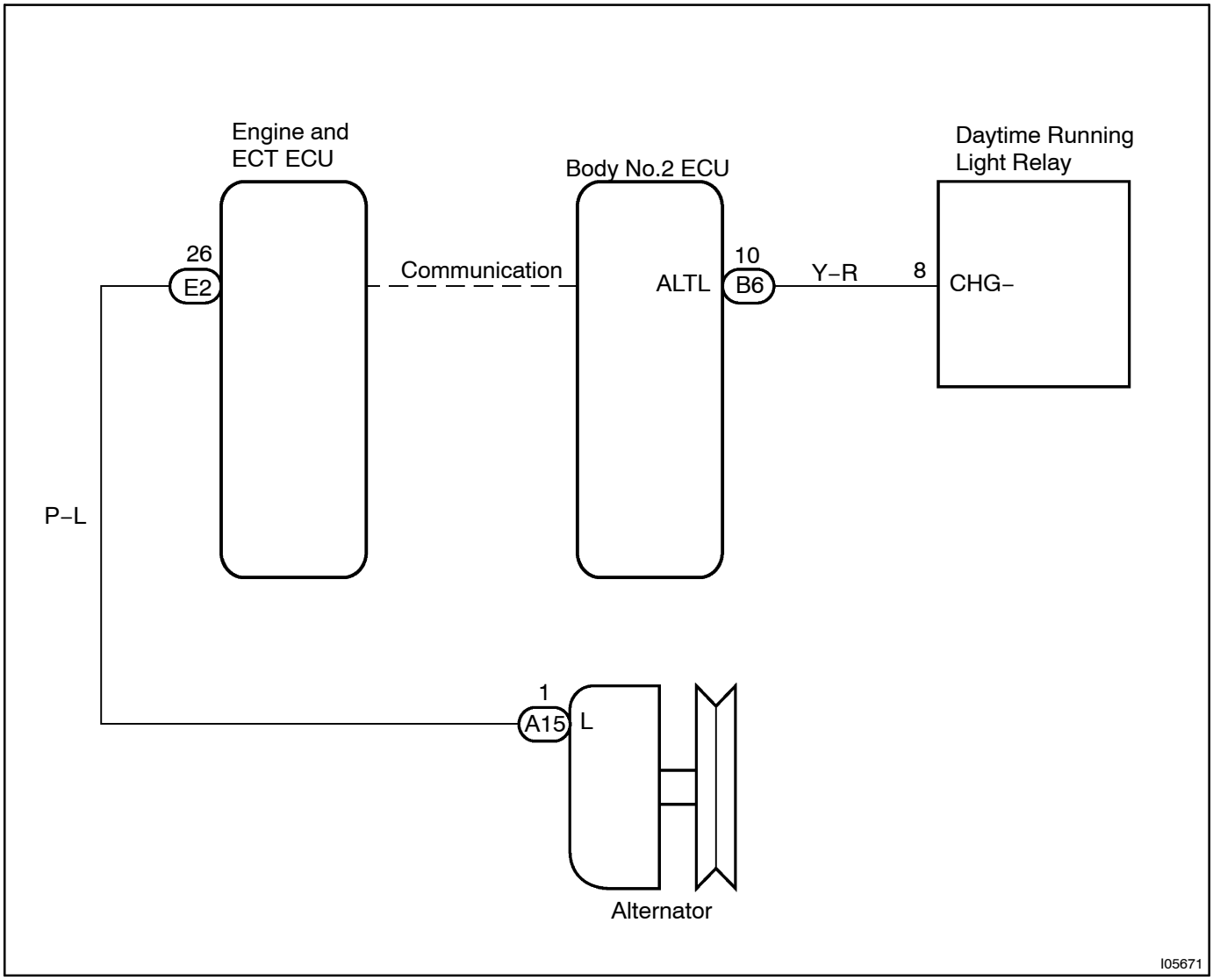
DI87M–01

Alternator L terminal circuit (w/ DRL vehicle LHD models only)

CIRCUIT DESCRIPTION

Body No.2 ECU receives the alternator L signal from ECM through communication and outputs it to the Day time running light relay.
Day time running light relay judjes whether the engine rotates or not with this alternator L signal and makes the Day time running light turn ON and OFF.

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
In case of using the LEXUS hand–held tester, start the inspection from step 1 and incase of not using the LEXUS hand–held tester, start from step 2.

1	**Check generator L terminal output using LEXUS hand–held tester.**

PREPARATION:
Connect the LEXUS hand–held tester to the DLC 3.
CHECK:
Check the generator L terminal output using DATA LIST.

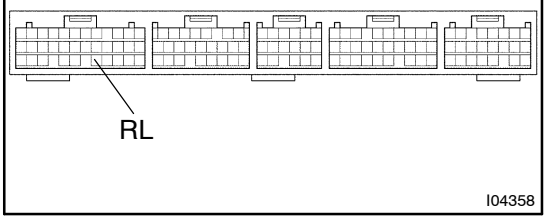
Condition	Generator L termnal
Engine running	ON
Engine not running	OFF

OK → **Proceed to next circuit inspection shown on problem symptoms table (See Pub. No. RM588E on page BE–3).**

NG

2	Check RL terminal of Engine and ECT ECU.

2JZ–GE engine:



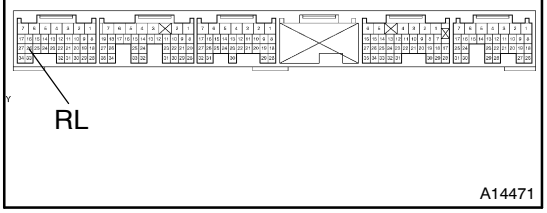
CHECK:

Check the voltage of RL terminal of Engine and ECT ECU.

OK:

Condition	Voltage
Engine running	10 – 14V
Engine not running	0V

3UZ–FE engine:



NG → **Replace the Body ECU No. 2.**

OK

3	Check wireharness and connector between Engine and ECT ECU and generator.

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

OK

Repair or replace the alternator or regulater.

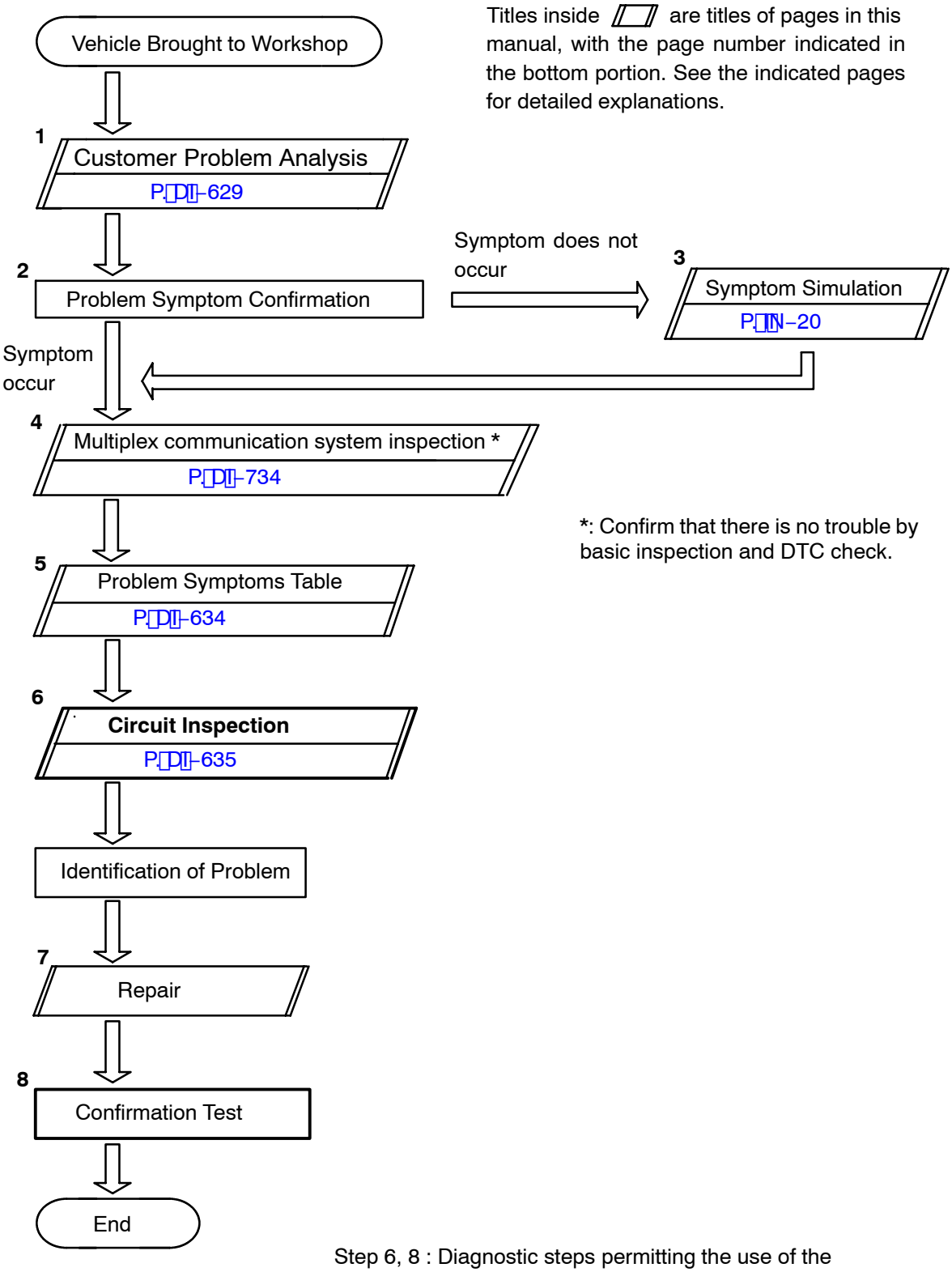
DRIVER DOOR CONTROL SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

DI2BH–02

HINT:

This ECU is connected to the multiplex communication system. Therefore, be sure to check that there is no troubles in the multiplex communication system before performing the troubleshooting.



Step 6, 8 : Diagnostic steps permitting the use of the LEXUS hand–held tester.

DI2BI–10

CUSTOMER PROBLEM ANALYSIS CHECK

DRIVER DOOR CONTROL SYSTEM Check Sheet

Inspector's name: _____

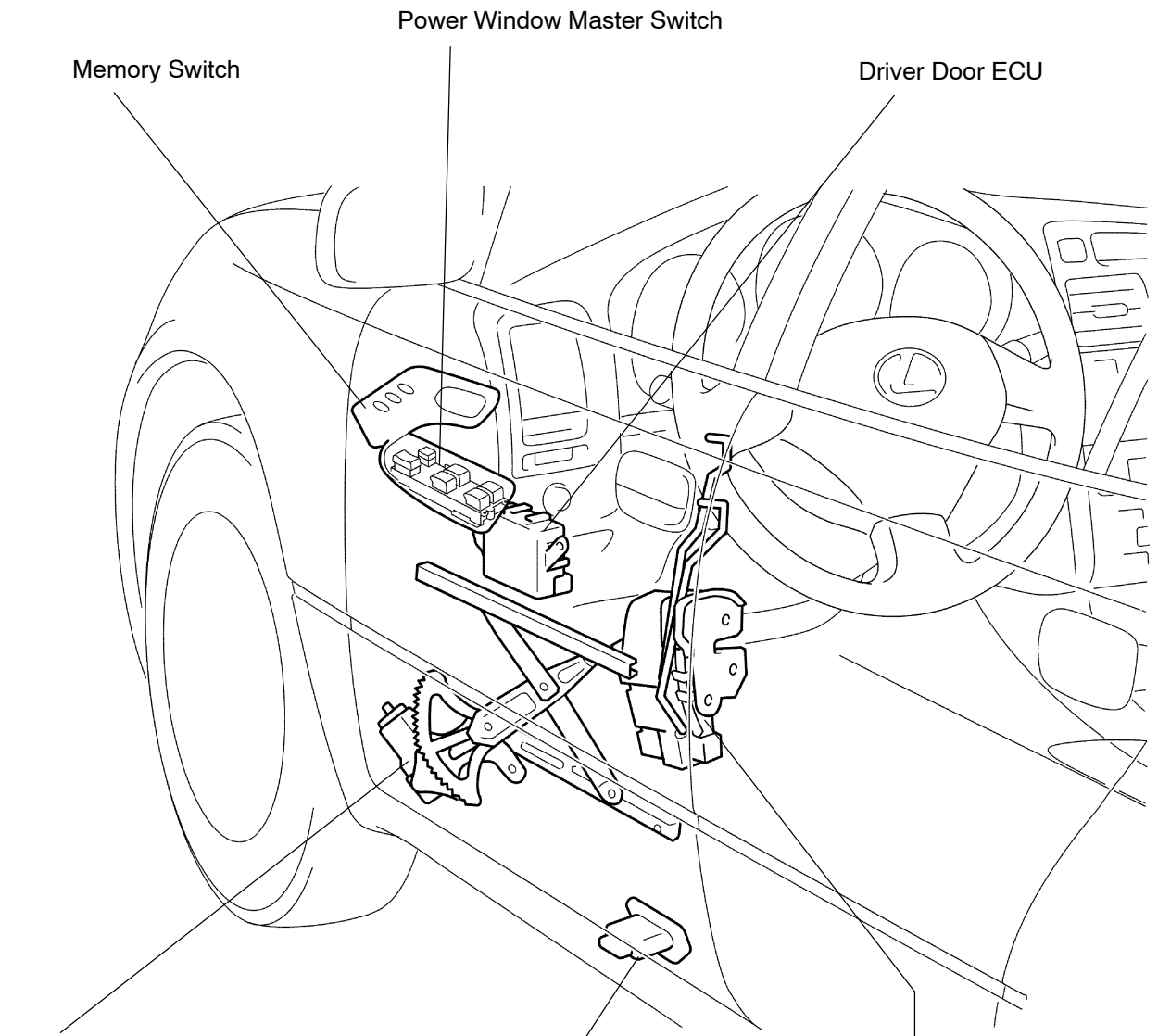
Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date Vehicle Brought in	/ /	**Odometer Reading**	**km Mile**

Date Problem First Occurred		/ /
Frequency Problem Occurs		☐ Constant ☐ Sometimes (times per day, month) ☐ Once only
Weather Conditions When Problem Occurred	**Weather**	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/ Others
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (Approx. °F (°C))

Malfunction System	☐ Power Window Control System
	☐ Power Mirror Control System
	☐ Power Door Lock Control System
	☐ Theft Deterrent System
	☐ Jam Protection System
	☐ Double Locking System (Europe)
	☐ Others

DI2BJ–12

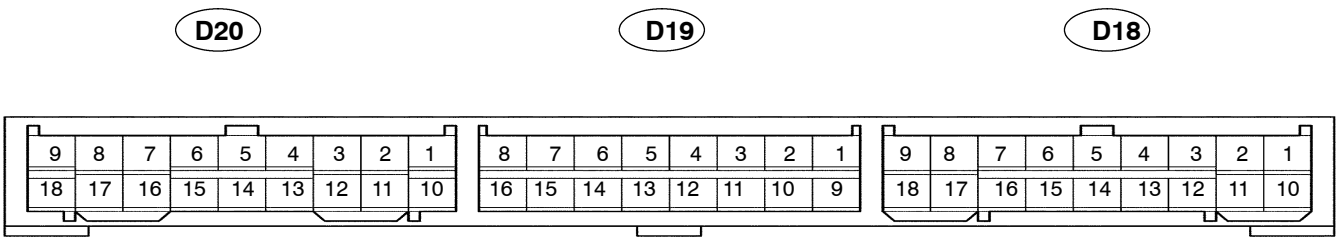
PARTS LOCATION



DI2BK–13

TERMINALS OF ECU

Driver Door ECU



I03225

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
CPUB ↔ GND (D20–11 ↔ D20–17) (*1) (D20–3 ↔ D20–12) (*2)	G–W ↔ W–B	Constant	10 – 14 V
BDR ↔ GND (D18–1 ↔ D20–17(*1), 12(*2))	L–,B ↔ W–B	Constant	10 – 14 V
CTYB ↔ GND (D18–10 ↔ D20–17(*1), 12(*2))	R–Y ↔ W–B	Constant	10 – 14 V
SIG ↔ GND (D20–2 ↔ D20–17(*1), 12(*2))	B–R ↔ W–B	Ignition switch position is ON.	10 – 14 V
GND ↔ Body Ground (D20–17 ↔ Body Ground) (*1) (D20–12 ↔ Body Ground) (*2)	W–B ↔ Body Ground	Constant	Below 1 V
MM ↔ GND (D20–4 ↔ D20–17(*1), 12(*2))	GR ↔ W–B	Set switch position is OFF.	10 – 14 V
		Set switch position is ON.	Below 1 V
M1 ↔ GND (D20–15 ↔ D20–17(*1), 12(*2))	P ↔ W–B	Memory Switch 1 position is OFF.	10 – 14 V
		Memory Switch 1 position is ON.	Below 1 V
M2 ↔ GND (D20–14 ↔ D20–17(*1), 12(*2))	P–B ↔ W–B	Memory Switch 2 position is OFF.	10 – 14 V
		Memory Switch 2 position is ON.	Below 1 V
CTY ↔ GND (D19–15 ↔ D20–17(*1), 12(*2))	R–G ↔ W–B	Driver door closed.	10 – 14 V
		Driver door opened.	Below 1 V
KL ↔ GND (D18–4 ↔ D20–17(*1), 12(*2))	P–B ↔ W–B	Door key lock and unlock switch position is OFF.	Below 1 V
		Door key lock and unlock switch position is LOCK.	10 – 14 V
KUL ↔ GND (D18–5 ↔ D20–17(*1), 12(*2))	P–G ↔ W–B	Door key lock and unlock switch position is OFF.	Below 1 V
		Door key lock and unlock switch position is UNLOCK.	10 – 14 V
CYL ↔ GND (D18–12 ↔ D20–17(*1), 12(*2))	R–W ↔ W–B	Constant	10 – 14 V

Symbols (Terminals No.)	Wiring Color	Condition		STD Voltage (V)
MUP ↔ GND (D19–5 ↔ D20–17(*1), 12(*2))	L–W ↔ W–B	Ignition switch position is ON. Power window switch (Driver side)* position	OFF	Below 1 V
			UP	10 – 14 V
MDN ↔ GND (D19–4 ↔ D20–17(*1), 12(*2))	L–B ↔ W–B	Ignition switch position is ON. Power window switch (Driver side)* position	OFF	Below 1 V
			DOWN	10 – 14 V
ML ↔ GND (D18–6 ↔ D20–17(*1), 12(*2))	LG–B ↔ W–B	Door lock control switch* position	OFF	10 – 14 V
			LOCK	Below 1 V
MUL ↔ GND (D18–7 ↔ D20–17(*1), 12(*2))	LG–R ↔ W–B	Door lock control switch* position	OFF	10 – 14 V
			UNLOCK	Below 1 V
WLSW ↔ GND (D19–7 ↔ D20–17(*1), 12(*2))	Y–G ↔ W–B	Window lock switch* position	UNLOCK	Below 1 V
			LOCK	10 – 14 V
UP ↔ GND (D18–2 ↔ D20–17(*1), 12(*2))	R ↔ W–B	Power window (Driver side)is not operating.		Below 1 V
		Power window (Driver side) is operating upward.		10 – 14 V
DN ↔ GND (D18–11 ↔ D20–17(*1), 12(*2))	G ↔ W–B	Power window (Driver side) is not operating.		Below 1 V
		Power window (Driver side) is operating downward.		10 – 14 V
DMVR ↔ GND (D20–8 ↔ D20–17(*1), 12(*2))	LG–B ↔ W–B	Outside rear view mirror (Driver side) is not operating.		Below 1 V
		Outside rear view mirror (Driver side) is operating to down or right.		
		Outside rear view mirror (Driver side) is operating to up.		10 – 14 V
DM+R ↔ GND (D20–7 ↔ D20–17(*1), 12(*2))	LG–R ↔ W–B	Outside rear view mirror (Driver side) is not operating.		Below 1 V
		Outside rear view mirror (Driver side) is operating to up or left.		
		Outside rear view mirror (Driver side) is operating to down or right.		10 – 14 V
DMHR ↔ GND (D20–16 ↔ D20–17(*1), 12(*2))	LG ↔ W–B	Outside rear view mirror (Driver side) is not operating.		Below 1 V
		Outside rear view mirror (Driver side) is operating to up or left.		
		Outside rear view mirror (Driver side) is operating to left.		10 – 14 V
A+ ↔ GND (D18–8 ↔ D20–17(*1), 12(*2)	G–R ↔ W–B	Power door lock (Driver side) is not operating.		Below 1 V
		Power door lock (Driver side) is operating to unlock.		
		Power door lock (Driver side) is operating to lock.		10 – 14 V
A– ↔ GND (D18–17 ↔ D20–17(*1), 12(*2))	G–B ↔ W–B	Power door lock (Driver side) is not operating.		Below 1 V
		Power door lock (Driver side) is operating to lock.		
		Power door lock (Driver side) is operating to lock.		10 – 14 V
LSW ↔ GND (D18–3 ↔ D20–17(*1), 12(*2))	GR ↔ W–B	Driver door is locked.		10 – 14 V
		Driver door is unlocked.		Below 1 V
DVC ↔ GND (D19–8 ↔ D20–17(*1), 12(*2)	R ↔ W–B	Ignition switch position is OFF. After 30 seconds from door is closed.		Below 1 V
		Ignition switch position is ON.		4 – 6 V
DT1 ↔ GND (D19–3 ↔ D20–17(*1), 12(*2))	GR–G ↔ W–B	Ignition switch position is ON. Power window switch (FrRH) position	OFF	10 – 14 V
			UP	Below 1 V
			DOWN	Below 1 V
			AUTO	Below 1 V

*: Power Window Master Switch

Symbols (Terminals No.)	Wiring Color	Condition		STD Voltage (V)
DT2 ↔ GND (D19–2 ↔ D20–17(*1), 12(*2))	GR–R ↔ W–B	Ignition switch position is ON. Power window switch (RrRH) position	OFF	10 – 14 V
			UP	Below 1 V
			DOWN	Below 1 V
			AUTO	Below 1 V
DT1 ↔ GND (D19–1 ↔ D20–17(*1), 12(*2))	GR–G ↔ W–B	Ignition switch position is ON. Power window switch (RrDriver side) position	OFF	10 – 14 V
			UP	Below 1 V
			DOWN	Below 1 V
			AUTO	Below 1 V
LMT ↔ GND (D19–12 ↔ D20–17(*1), 12(*2))	W–G ↔ W–B	Window full–close position		10 – 14 V
		Except window full–close position		Below 1 V
PLS ↔ GND (D19–13 ↔ D20–17(*1), 12(*2))	W ↔ W–B	During the power window is operation.		Pulse Generation
		Power window is not operated.	SW ON	Below 1 V
			SW OFF	10 – 14 V
AI+ ↔ GND (D18–9 ↔ D20–17) (*1)	G–R ↔ W–B	Dirver side door double lock is not operating.		Below 1 V
		Dirver side door double lock is not operating to set		10 – 14 V
		Dirver side door double lock is not operating to unset		Below 1V
AI– ↔ GND (D18–18 ↔ D20–17) (*1)	G–B ↔ W–B	Dirver side door double lock is not operating		Below 1 V
		Dirver side door double lock is not operating to set		Below 1V
		Dirver side door double lock is not operating to unset		10 – 14 V
VSSR ↔ DE2 (D20–1 ↔ D20–13)	G–O ↔ W–B (*1) Y–R ↔ W–B (*2)	Dirver side mirror moves upper most position		Below 2 V
		Dirver side mirror moves lower most position		4 – 6 V
HSSR ↔ DE2 (D20–10 ↔ D20–13)	Y–R ↔ W–B (*1) G–O ↔ W–B (*2)	Dirver side mirror moves left most position		Below 2 V
		Dirver side mirror moves right most position		4 – 6 V
DBLS ↔ GND (D20–5 ↔ D20–17) (*1)	W ↔ W–B	Driver side door double lock is set		Below 1V
		Driver side door double lock is unset		10 – 14 V
MR– ↔ GND (D18–9 ↔ D20–12) (*3)	GR ↔ W–B	Outer rear view mirror retact switch OFF		Below 1V
		Outer rear view mirror retact switch ON		10 – 14 V
MR+ ↔ GND (D18–18 ↔ D20–12) (*3)	L–R ↔ W–B	Outer rear view mirror retact switch OFF		Below 1V
		Outer rear view mirror retact switch ON		10 – 14 V
MPX1 (D20–9)	O (*1) L–O (*2)	Multiplex communication system		–
MPX2 (D20–18)	L–O (*1) O (*2)	Multiplex communication system		–

(*1): w/ Double locking system
(*2): w/o Double locking system
(*3): G.C.C. countries only

DI2BL–11

PROBLEM SYMPTOMS TABLE

Power Mirror Control System:

Symptom	Suspect Area	See page
Mirror retract system does not operate (G.C.C countries)	1. Mirror retract motor circuit 2. Driver door ECU	DI–656 IN–30

DI878–01

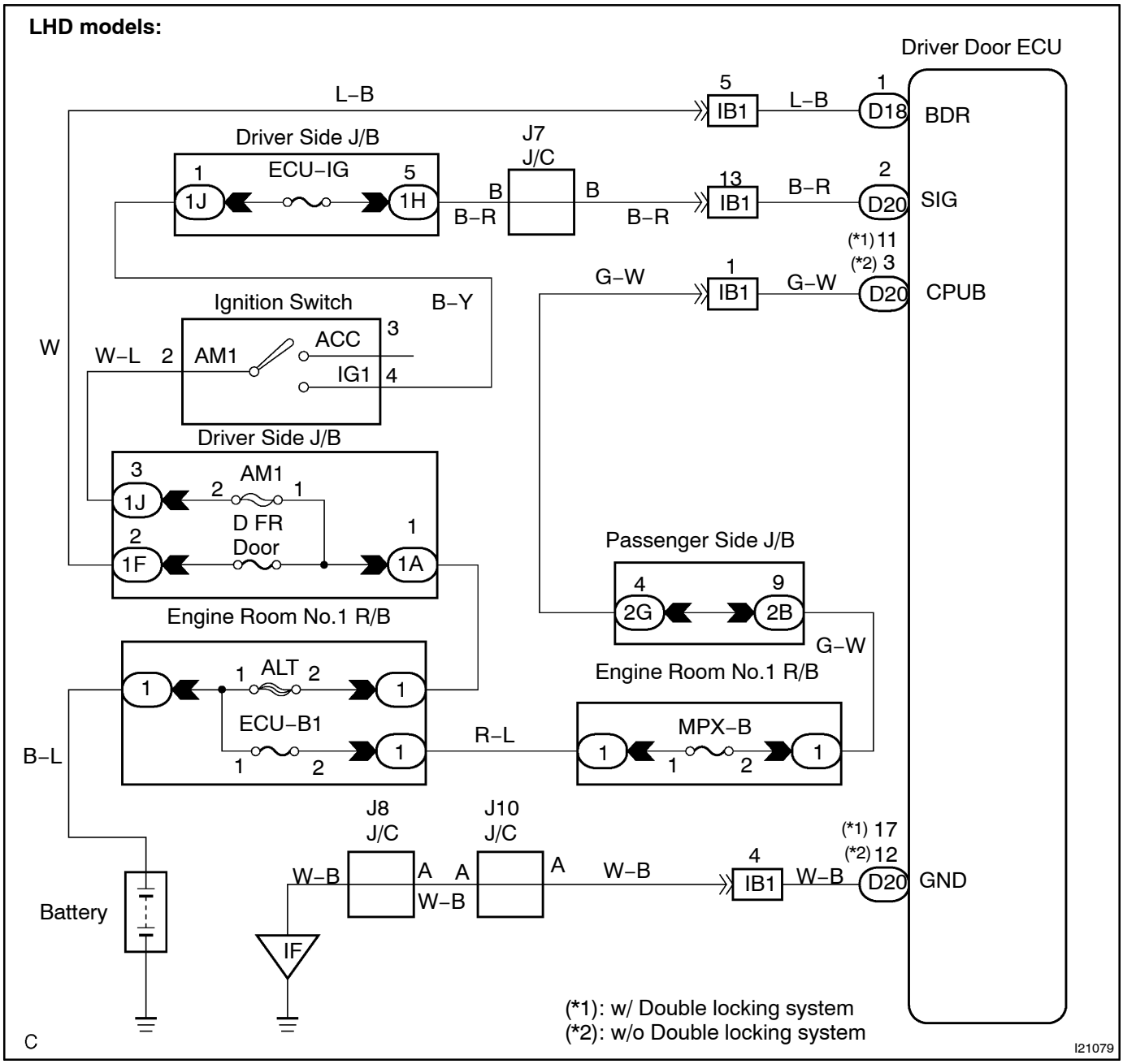
CIRCUIT INSPECTION

Power source circuit

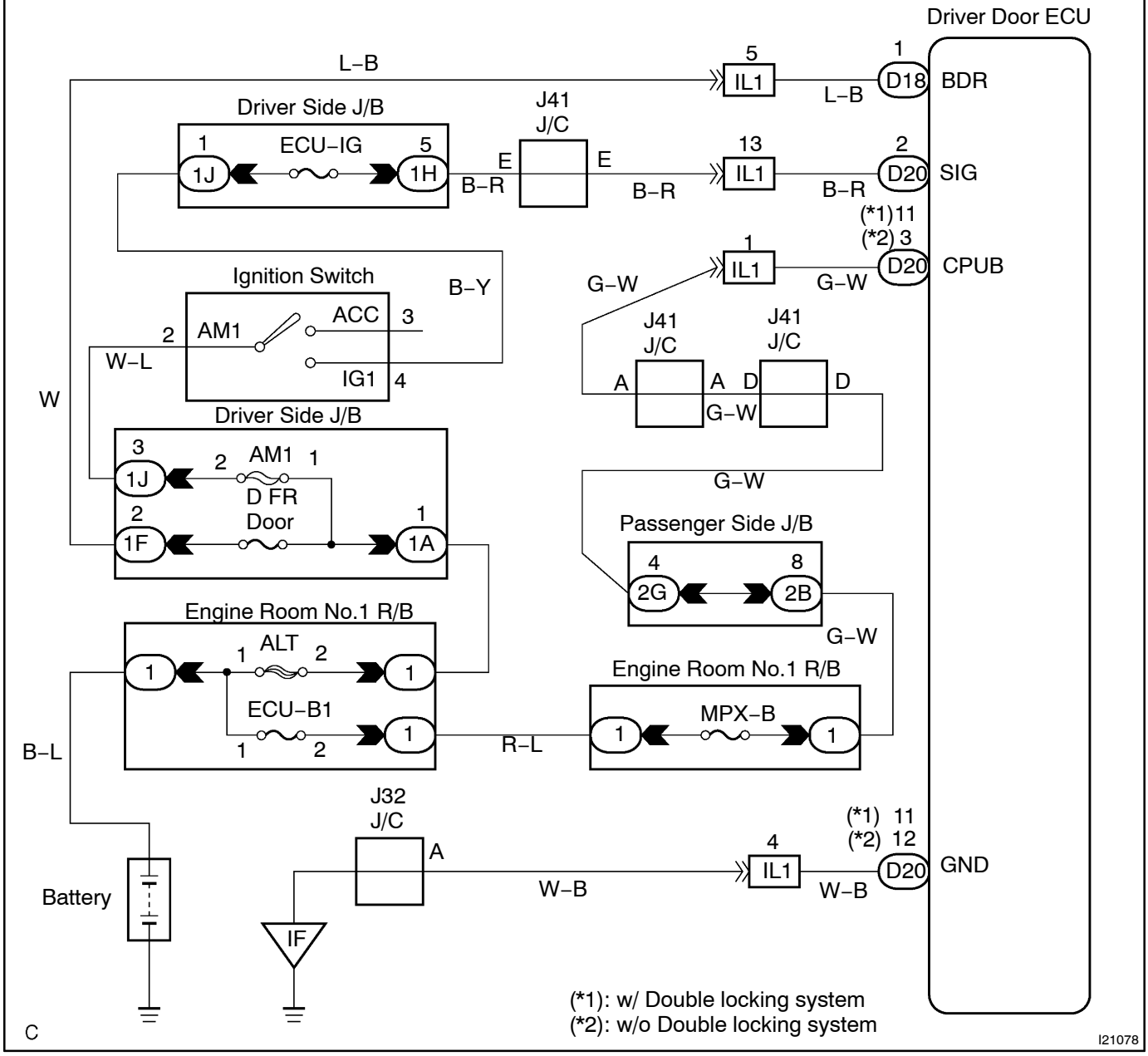
CIRCUIT DESCRIPTION

This circuit provides power to operate the driver door ECU.

WIRING DIAGRAM



RHD models:

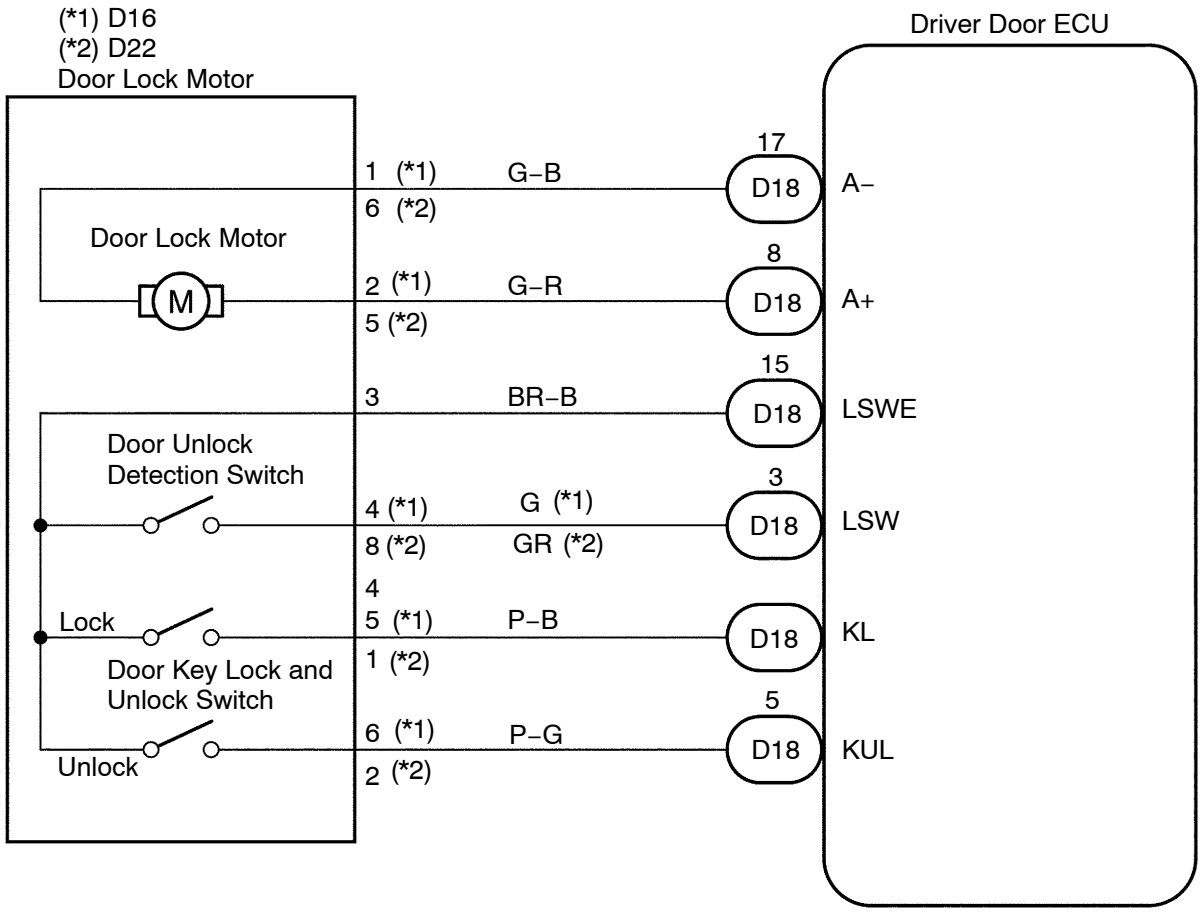

Driver Door ECU
L–B
5
IL1
1
D18
BDR
L–B
Driver Side J/B
J41
J/C
1
ECU–IG
5
1J
1H
E
E
B–R
B–R
13
IL1
2
D20
SIG
B–R
(*1) 11
(*2) 3
1
IL1
D20
CPUB
G–W
G–W
Ignition Switch
B–Y
ACC
3
2
AM1
W–L
IG1
4
J41
J/C
J41
J/C
A
A
D
D
G–W
W
Driver Side J/B
3
1J
2
AM1
1
D FR
Door
2
1F
1
1A
G–W
Passenger Side J/B
4
8
2G
2B
G–W
Engine Room No.1 R/B
1
ALT
2
1
1
ECU–B1
1
2
1
1
Engine Room No.1 R/B
MPX–B
1
1
R–L
B–L
J32
J/C
A
(*1) 11
(*2) 12
4
IL1
D20
GND
W–B
W–B
Battery
IF
(*1): w/ Double locking system
(*2): w/o Double locking system
C
I21078

DI87A–01

Door lock motor circuit

WIRING DIAGRAM

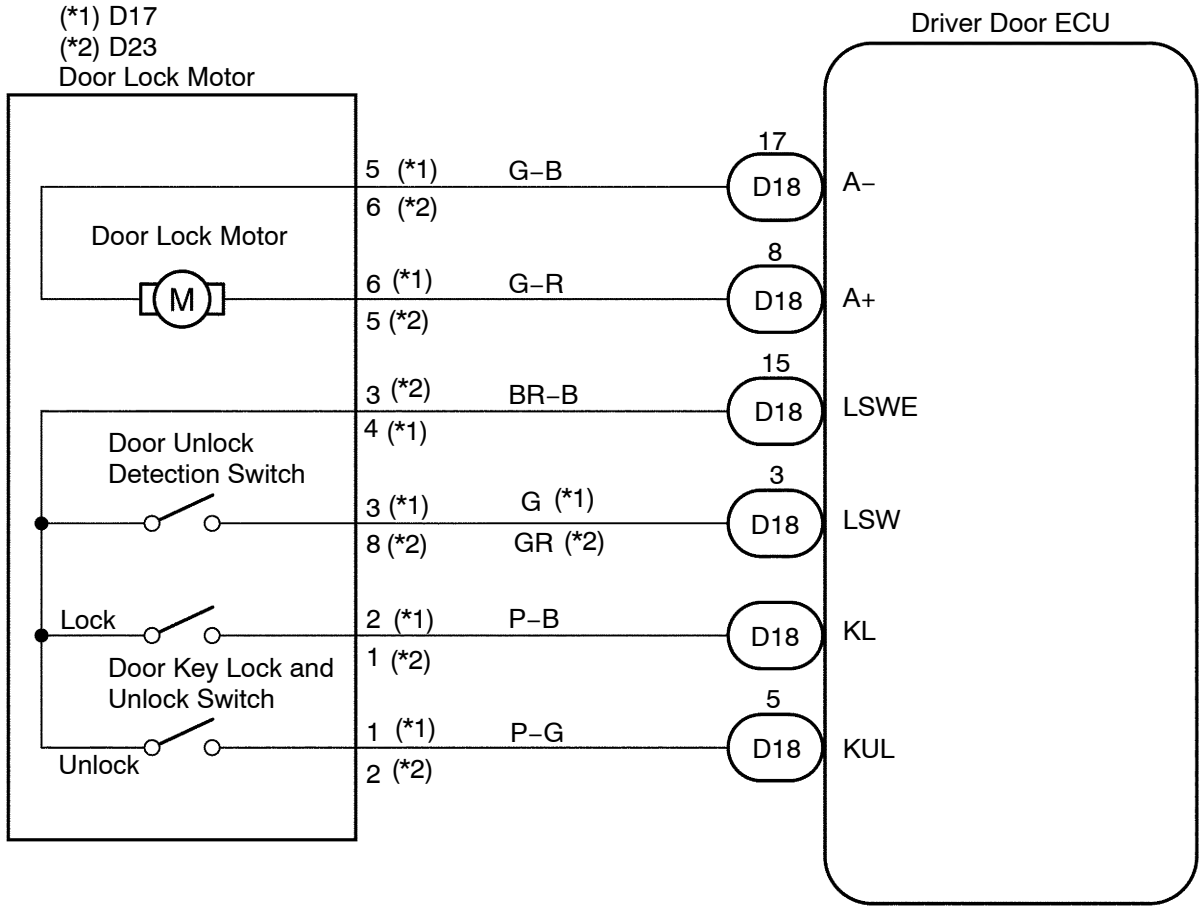
LHD models:



(*1) : w/o Double locking system
(*2): w/ Double locking system

I04890

RHD models:



(*1) : w/o Double locking system
(*2): w/ Double locking system

I04890

INSPECTION PROCEDURE

HINT:
In case of using the LEXUS hand–held tester, start the inspection from step 1 and in case of not using the LEXUS hand–held tester, start from step 2.

1	**Check door lock motor using LEXUS hand–held tester.**

PREPARATION:
Connect the LEXUS hand–held tester to the DLC 3.
CHECK:
Check that the door lock motor can operate in an ACTIVE TEST.

OK

Proceed to next circuit inspection shown on problem symptom table. (See Pub. No. RM588E on page DI–616)

NG

2	Check door lock motor (w/o double locking system: See Pub. No. RM588E on page BE–148 w/ double locking system: See page BE–12).

NG → Replace the door lock motor.

OK

3	Check wireharness and connector between door lock motor and driver door ECU.

NG → Repair or replace wireharness or connector.

OK

Proceed to next circuit inspection shown on problem symptom table. (See Pub. RM588E on page DI–616).

DI879–01

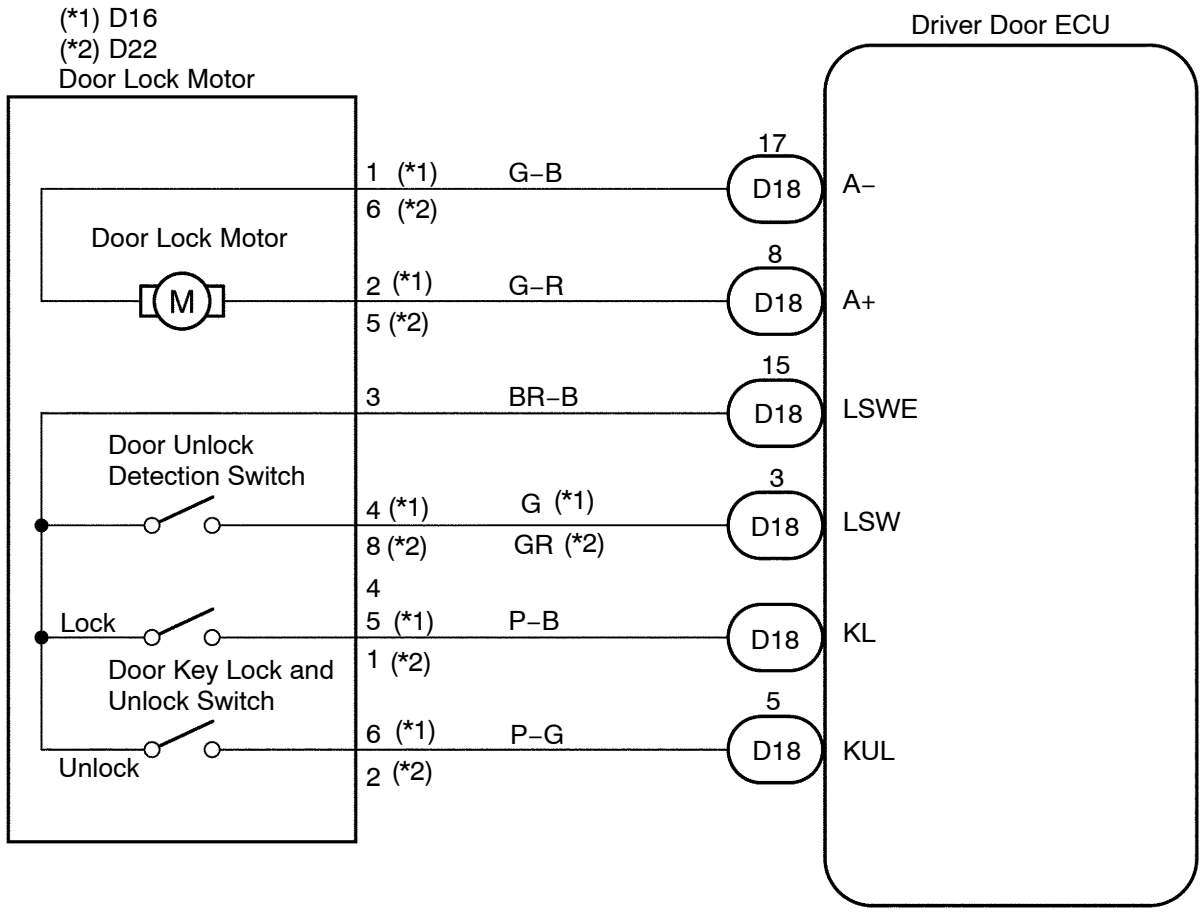
Door unlock detection switch circuit

CIRCUIT DESCRIPTION

The door unlock detection switch is built in the door lock motor assembly. This switch is ON when the door lock knob is in the unlock position and OFF when the lock knob is in the lock position. The ECU detects the door lock knob conditions is this circuit. It is used as one of the operating conditions for the key confinement prevention function.

WIRING DIAGRAM

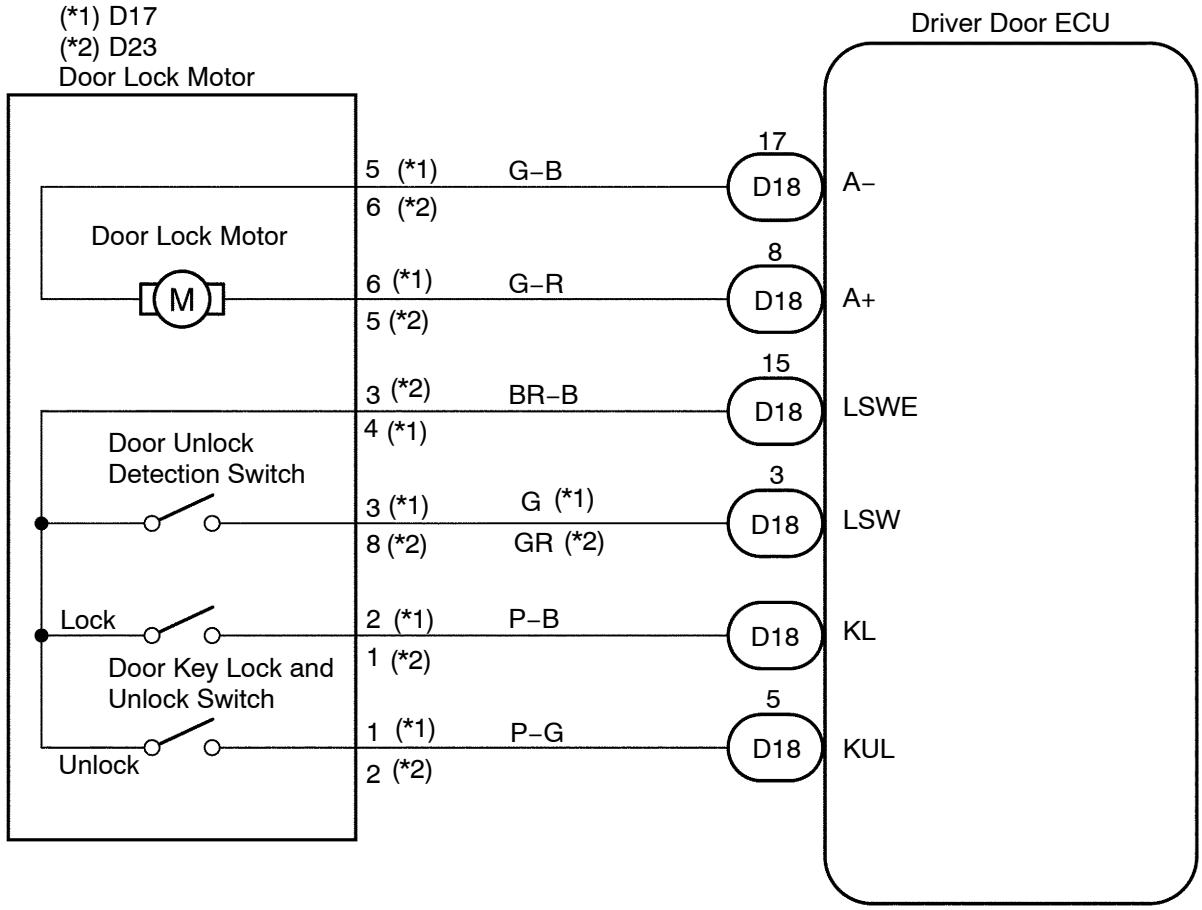
LHD models:



(*1) : w/o Double locking system
(*2): w/ Double locking system

I04890

RHD models:



(*1) : w/o Double locking system
(*2): w/ Double locking system

I04890

INSPECTION PROCEDURE

HINT:
In case of using the LEXUS hand–held tester, start the inspection from step 1 and in case of not using the LEXUS hand–held tester, start from step 2.

1	**Check door unlock detection switch using LEXUS hand–held tester.**

PREPARATION:
Connect the LEXUS hand–held tester to the DLC 3.
CHECK:
Check the door unlock detection switch using DATA LIST.

OK

Proceed to next circuit inspection shown on problem symptom table. (See Pub. No. RM588E on page DI–616)

NG

2	Check door unlock detection switch. (w/o double locking system: See Pub. No. RM588E on page BE–148 w/ double locking system: See page BE–12)

NG → Replace the door lock motor.

OK

3	Check wireharness and connector between door unlock detection switch and driver door ECU.

NG → Repair or replace wireharness or connector.

OK

Proceed to next circuit inspection shown on problem symptom table. (See Pub. RM588E on page DI–616)

DI87B–01

Door key lock and unlock switch circuit

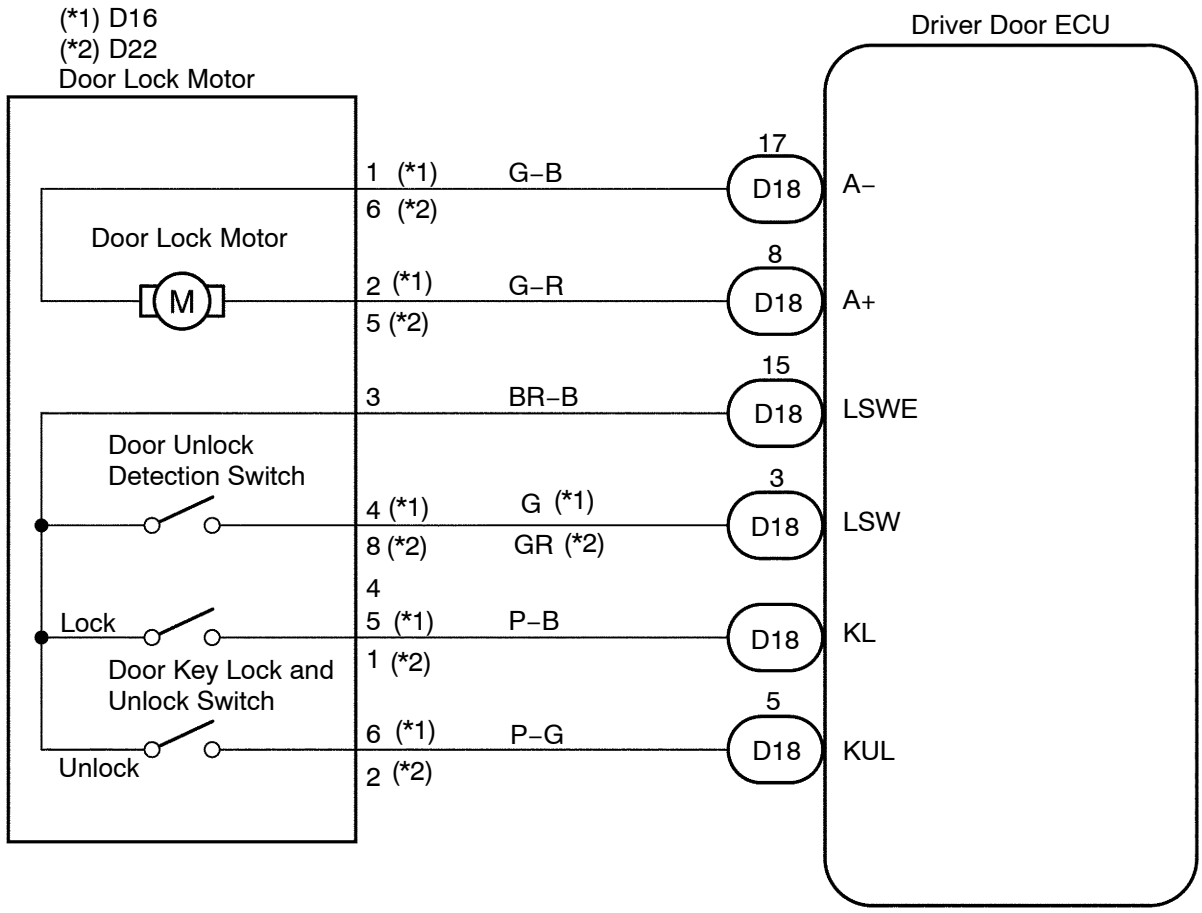
CIRCUIT DESCRIPTION

The door key lock and unlock switch is built in the door key cylinder. When the key is turned to the lock side, terminal 3 of the switch is grounded and when the key is turned to the unlock side, terminal 2 of the switch is grounded.

Door key lock and unlock switch can be checked using DTC check. (Refer to DI–769)

WIRING DIAGRAM

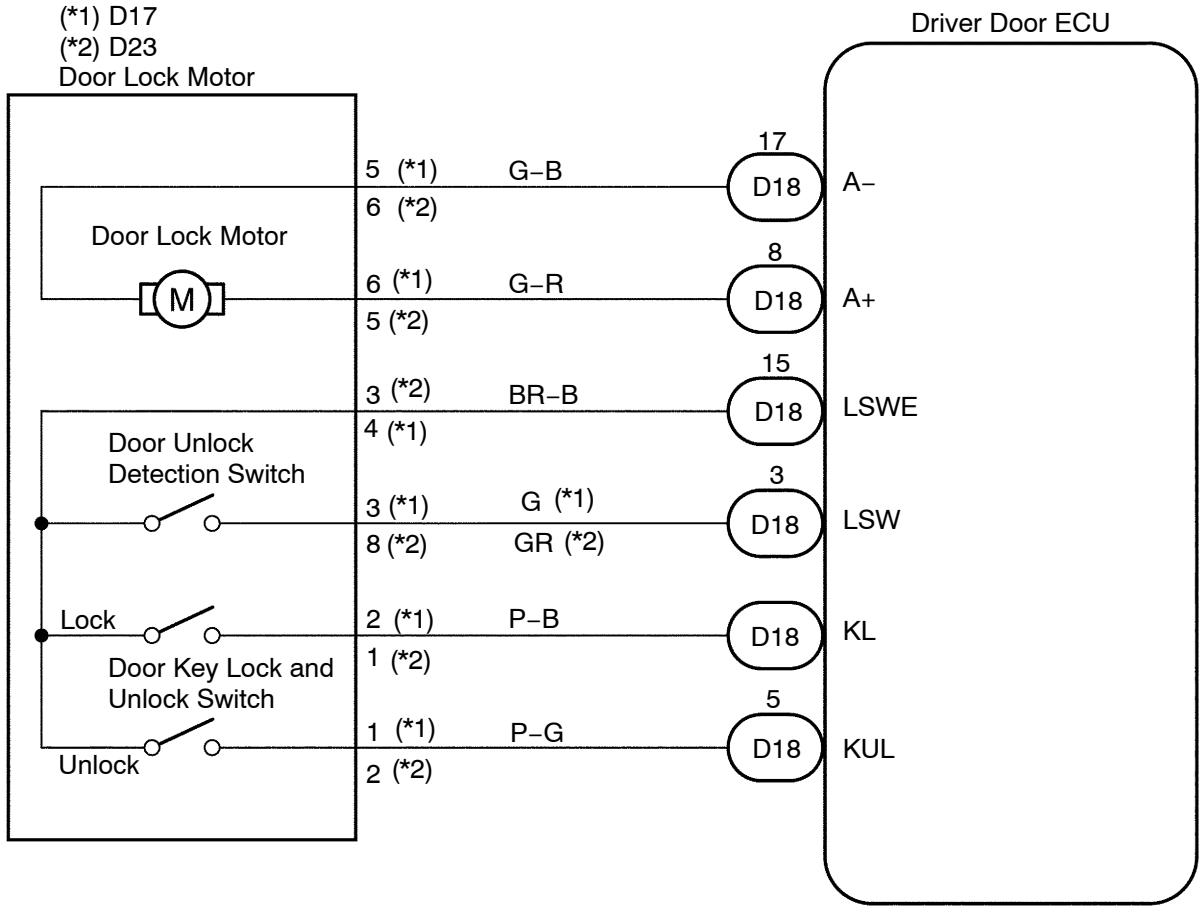
LHD models:



(*1) : w/o Double locking system
(*2): w/ Double locking system

I04890

RHD models:



(*1) : w/o Double locking system
(*2): w/ Double locking system

I04890

INSPECTION PROCEDURE

1	**Check the door key lock and unlock switch using DTC check (See page DI–769).**

OK → **Proceed to next circuit inspection shown on problem symptom table (See Pub. No. RM588E on page DI–616).**

NG

2	Check door key lock and unlock switch. (w/o double locking system: See Pub. No. RM588E on page BE–148 w/ double locking system: See page BE–12)

NG → Replace the door key lock and unlock switch.

NG

3	Check wireharness and connector between door key lock and unlock switch and driver door ECU.

NG → Repair or replace wireharness or connector.

OK

Proceed to next circuit inspection shown on problem symptom table. (See Pub. No. RM588E on page DI–616)

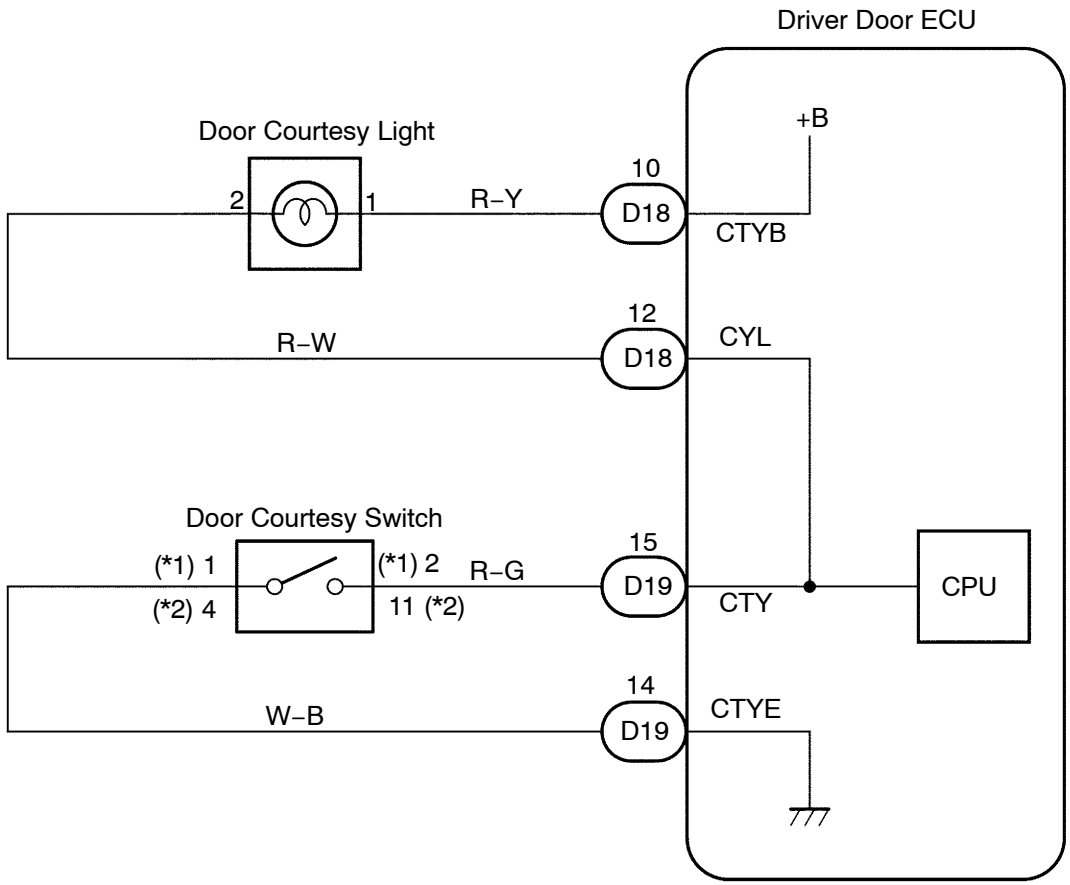
DI2BR–13

Door courtesy light and courtesy switch circuit

CIRCUIT DESCRIPTION

The door courtesy switch goes on when the door is opened and goes off when door is closed.

WIRING DIAGRAM



(*1): w/o Double locking system
(*2) w/ Double locking system

I03216

INSPECTION PROCEDURE

1	**Check operation of door courtesy light.**

CHECK:
Check that door courtesy light comes on when door opened, and goes off when door is closed.
OK:
Must be operated normally.

OK → **Proceed to next circuit inspection shown on problem symptom table (See Pub. No. RM588E on page DI–616).**

NG

2	**Check courtesy light (See Pub. No. RM588E on page BE–66).**

NG → **Replace the courtesy light.**

OK

3	**Check courtesy switch** **(w/o Double locking system: See Pub. No. RM588E on page BE–66** **w/ Double locking system: See page BE–3).**

NG → **Replace the courtesy switch.**

OK

4	**Check wireharness and connector between courtesy light and driver door ECU, courtesy switch and driver door ECU.**

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

OK

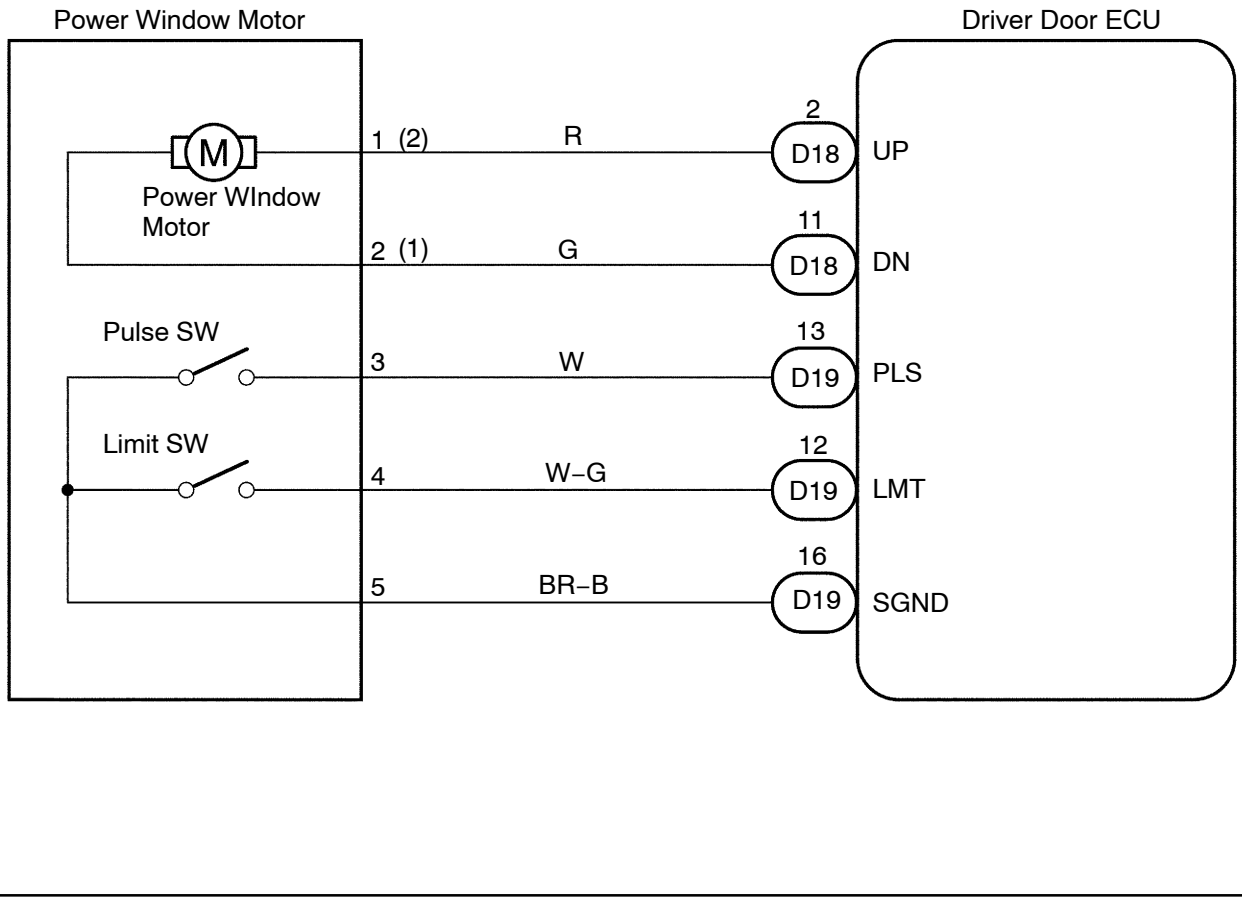
Proceed to next circuit inspection shown on problem symptoms table.
(See Pub. No. RM588E on page DI–616)

DI2BS–13

Power window motor circuit

WIRING DIAGRAM

( ): RHD Models



I03214

DI2BT–12

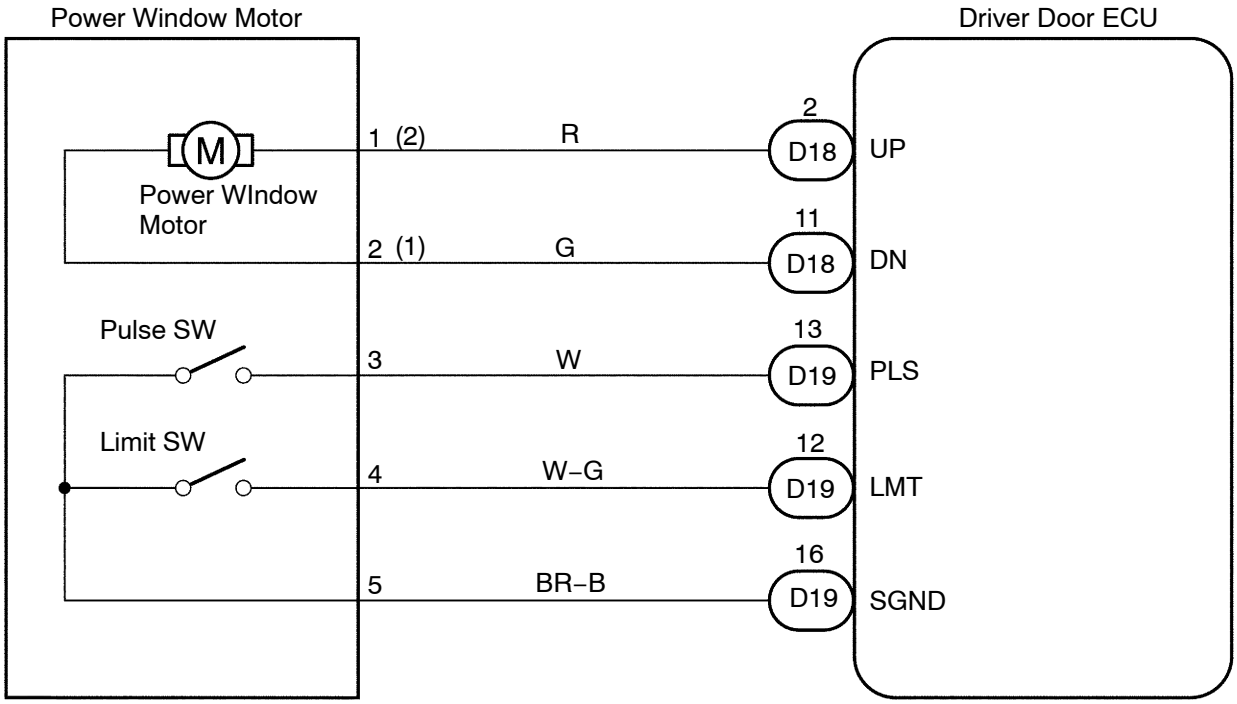
Jam protection limit switch circuit

CIRCUIT DESCRIPTION

Jam protection limit switch is built–in the power window motor. This switch functions to turn ”OFF” before the top dead center, and ECU reads this ”OFF” signal resulting in closing the window fully.

WIRING DIAGRAM

( ): RHD Models



I03214

DI2BU–12

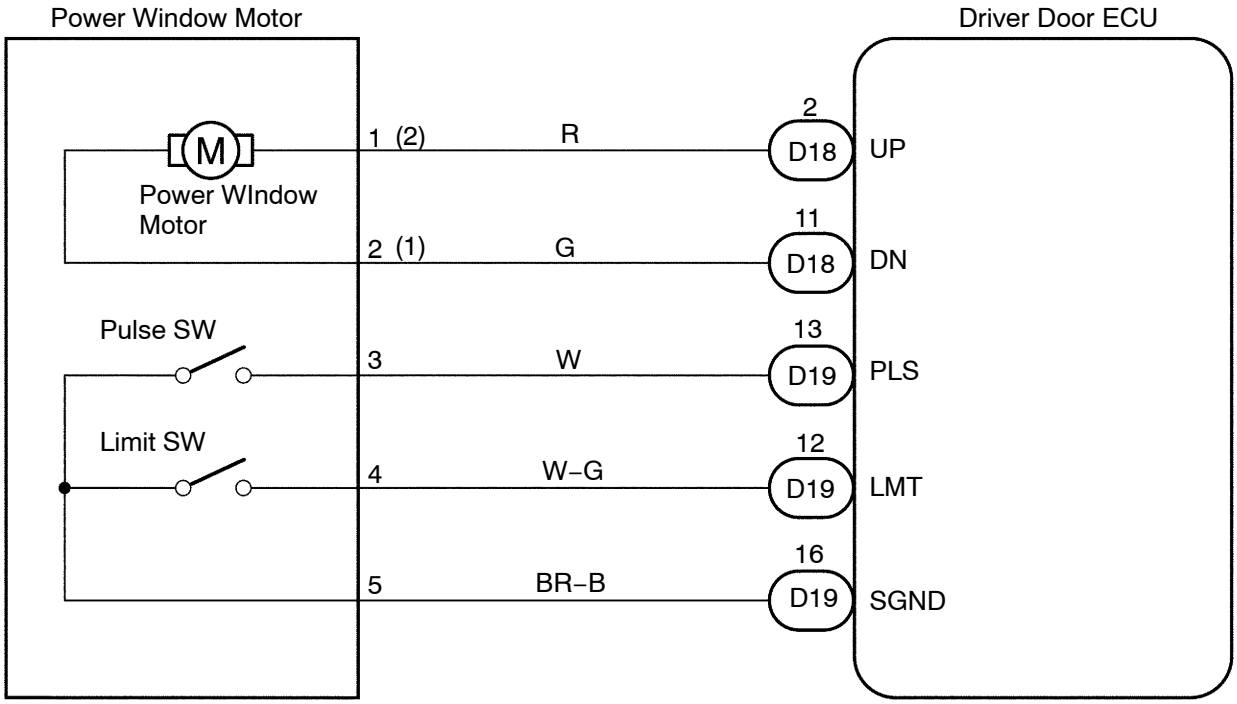
Jam protection pulse switch circuit

CIRCUIT DESCRIPTION

Jam protection pulse switch is built–in the power window motor. Pulse switch outputs ON/OFF pulse when the motor rotates.

WIRING DIAGRAM

( ): RHD Models



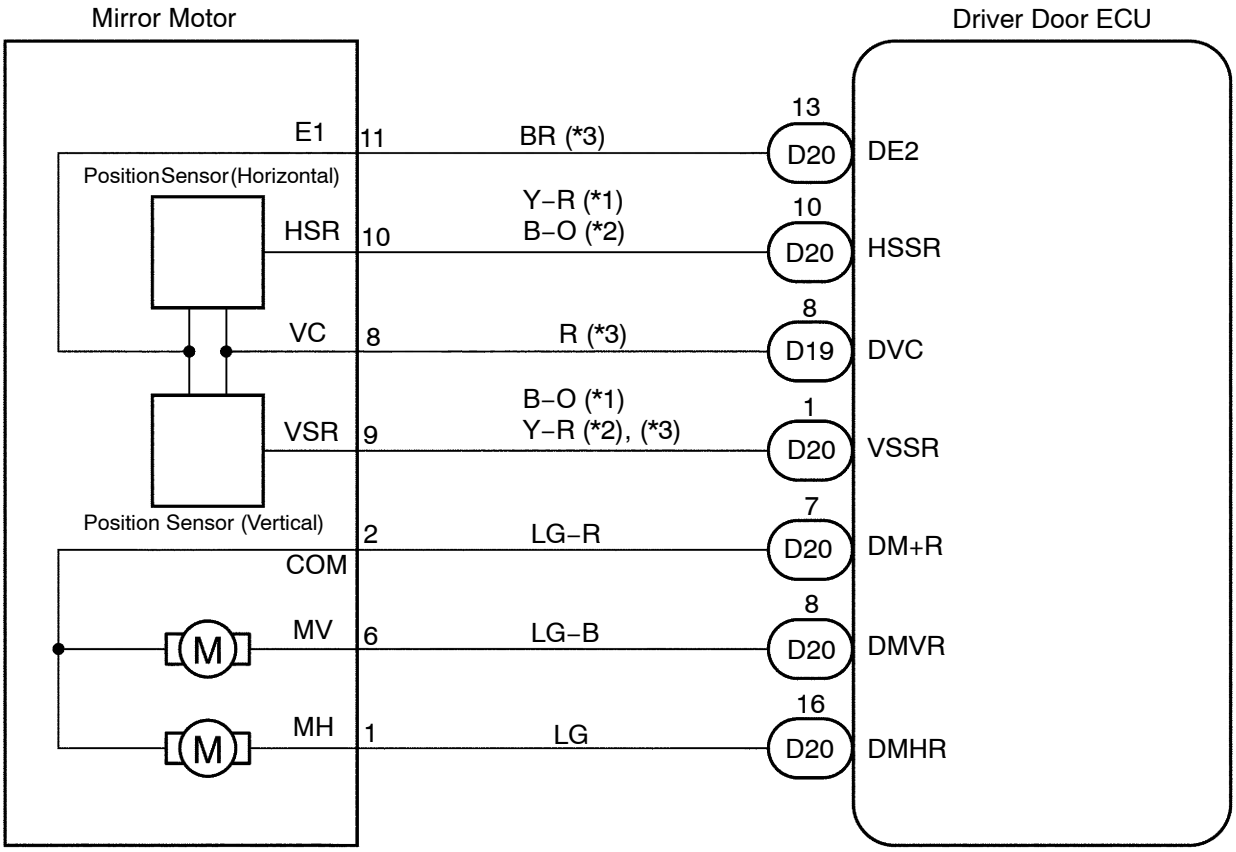
I03214

DI87C–01

Mirror motor circuit

WIRING DIAGRAM

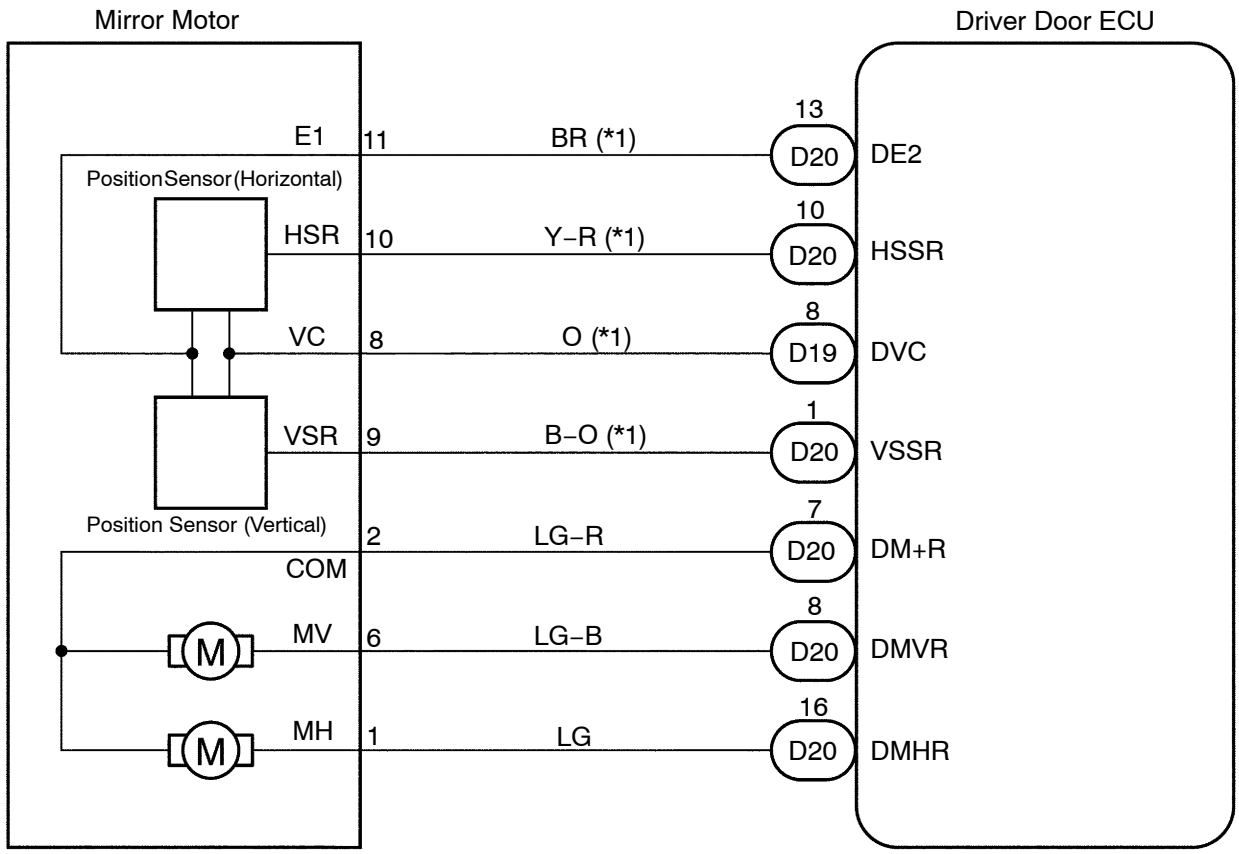
LHD models:



(*1): w/ Double locking system
(*2): w/o Double locking sytem
(*3): w/ Driving position memory

I03219

RHD models:



(*1): w/ Driving position memory

I03219

DI87E–01

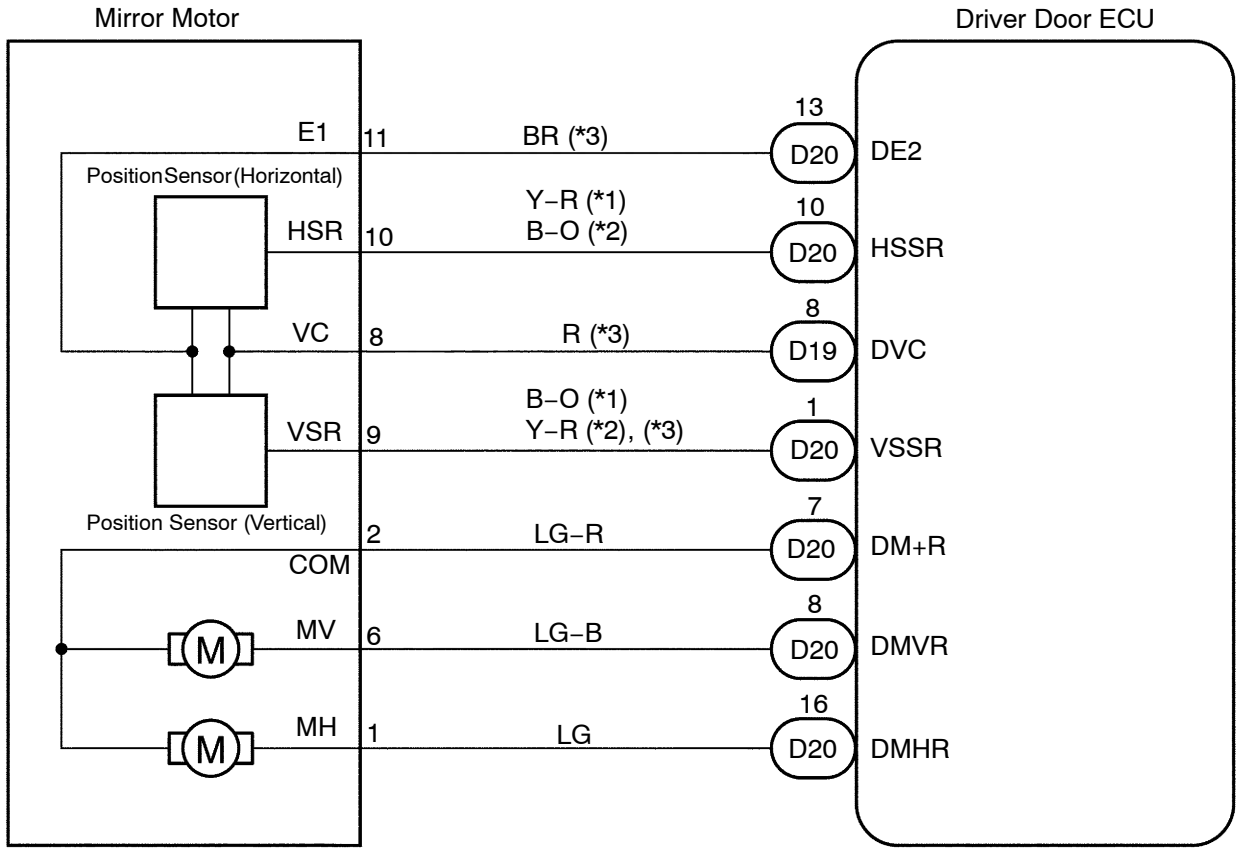
Mirror position sensor circuit (W/ memory)

CIRCUIT DESCRIPTION

This position detected by the mirror position sensor will be memorized in the seat ECU. This sensor is equipped in the mirror in spite of the existence of the memory function.

WIRING DIAGRAM

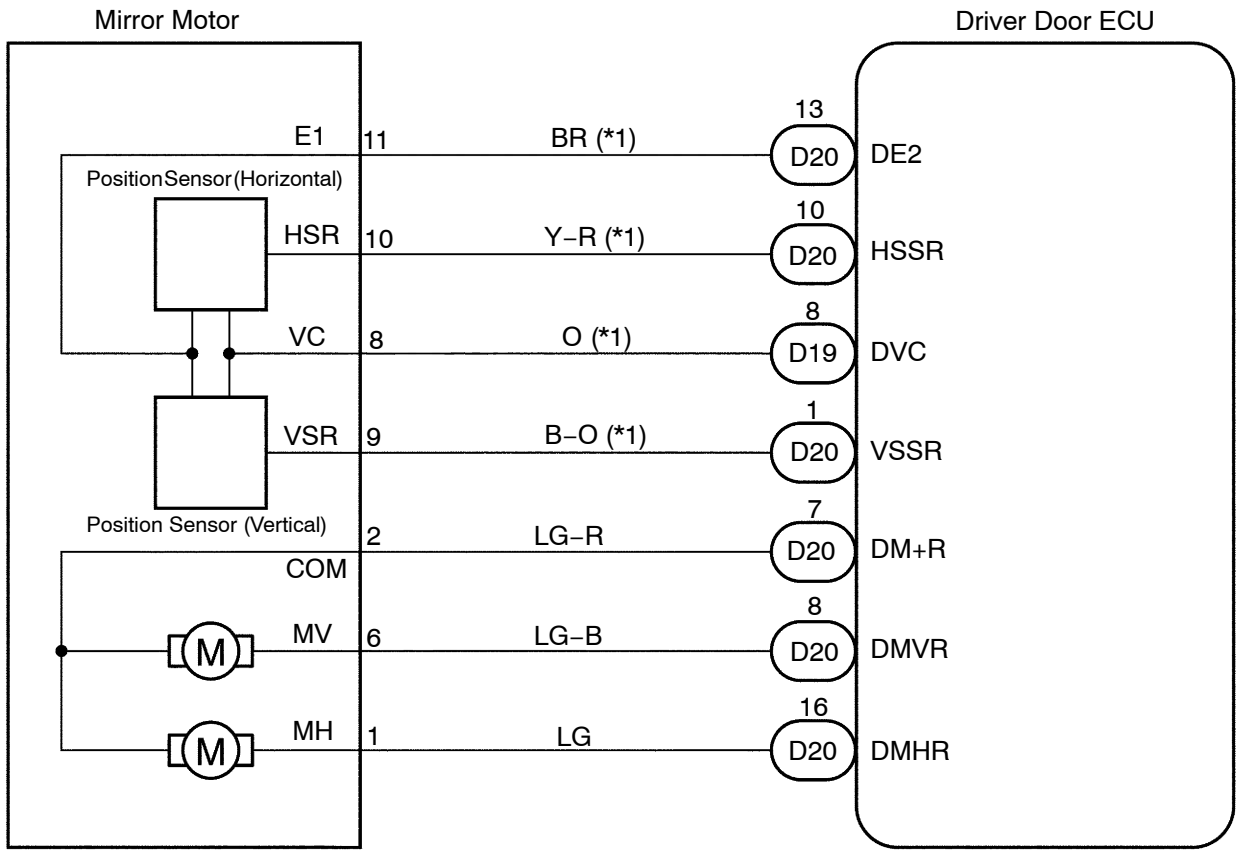
LHD models:



(*1): w/ Double locking system
(*2): w/o Double locking sytem
(*3): w/ Driving position memory

I03219

RHD models:



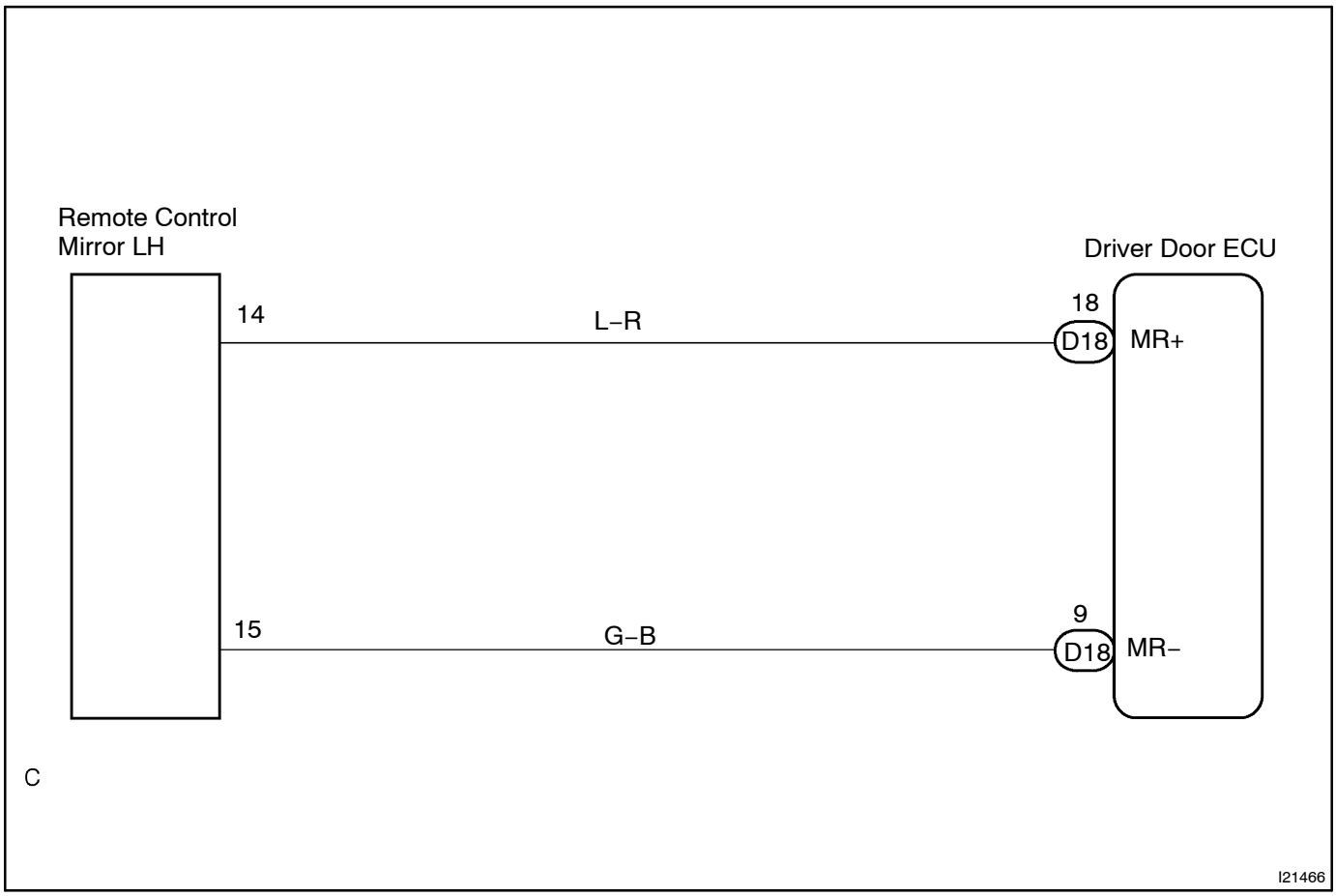
(*1): w/ Driving position memory

I03219

DI87D–01

Mirror retract motor circuit (G.C.C. Countries only)

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
In case of using the hand–held tester, start the inspection from step 1 and in case of not using the hand–held tester, start from step 2.

1	**Check mirror retract motor using hand–held tester.**

PREPARATION:
Connect the mirror retract hand–held tester to the DLC3.
CHECK:
Check the mirror retract motor can operate in an ACTIVE TEST.

OK

Proceed to next circuit inspection shown on problem symptoms table. (See page DI–668)

NG

2	Check mirror retract motor. (See page BE–21)

NG → Replace the mirror retract switch.

OK

3	Check wireharness and connector between mirror retract motor and driver door ECU.

NG → Repair or replace wireharness or connector.

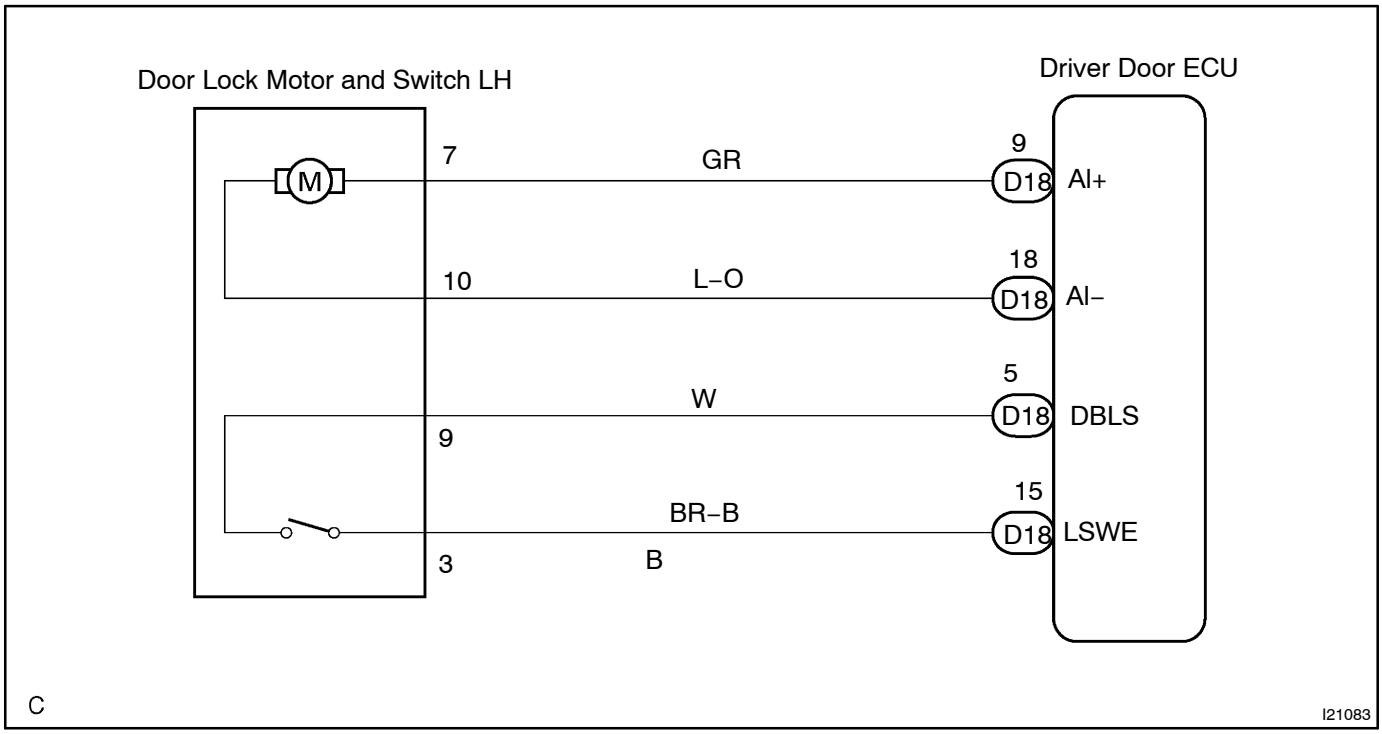
OK

Proceed to next circuit inspection shown on problem symptoms table.
(See page DI–634)

DI6UA–04

Double lock motor circuit (Europe)

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check double lock motor (See page BE–18).

NG → Replace the double lock motor.

OK

2	Check wireharness and connector between double lock motor and driver door ECU.

NG → Repair or replace wireharness or connector.

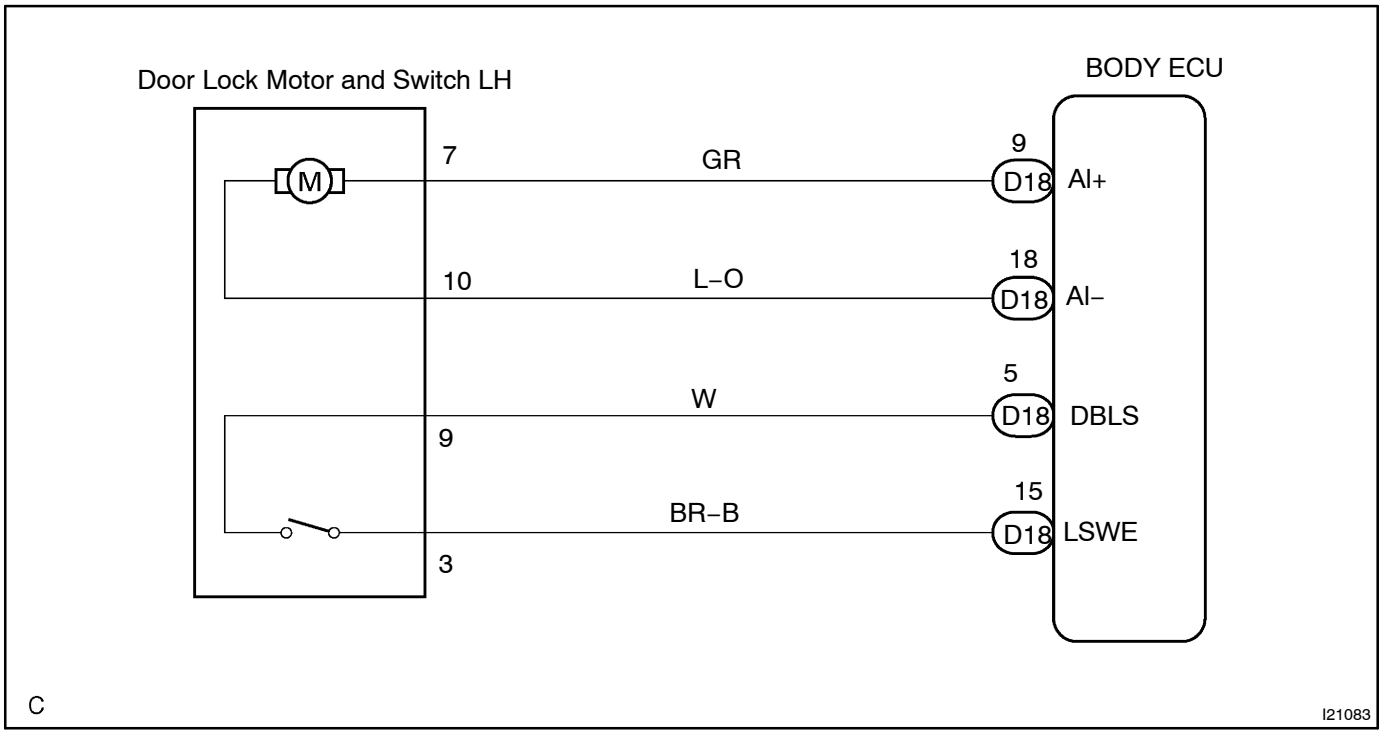
OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI–634).

D16R5–05

Double lock switch circuit (Europe)

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check double lock switch (See page BE–18).

NG → Replace the double lock motor.

OK

2	Check wireharness and connector between double lock switch and driver ECU.

NG → Repair or replace wireharness or connector.

OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI–634).

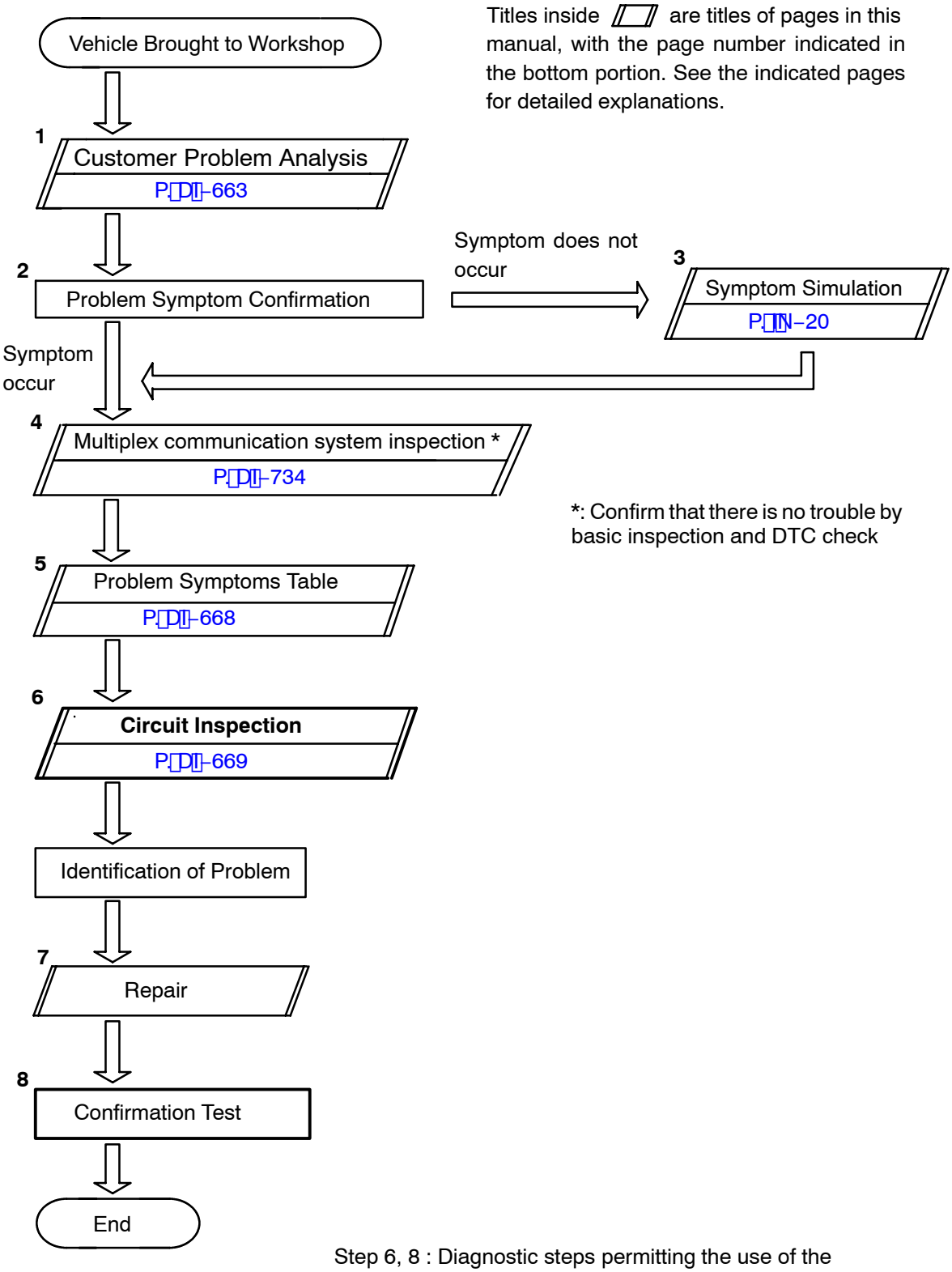
PASSENGER DOOR CONTROL SYSTEM

DI2ES–02

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

This ECU is connected to the multiplex communication system. Therefore, be sure to check that there is no troubles in the multiplex communication system before performing the troubleshooting.



Step 6, 8 : Diagnostic steps permitting the use of the LEXUS hand–held tester.

DI2ET–06

CUSTOMER PROBLEM ANALYSIS CHECK

PASSENGER DOOR CONTROL SYSTEM Check Sheet

Inspector's name: _____

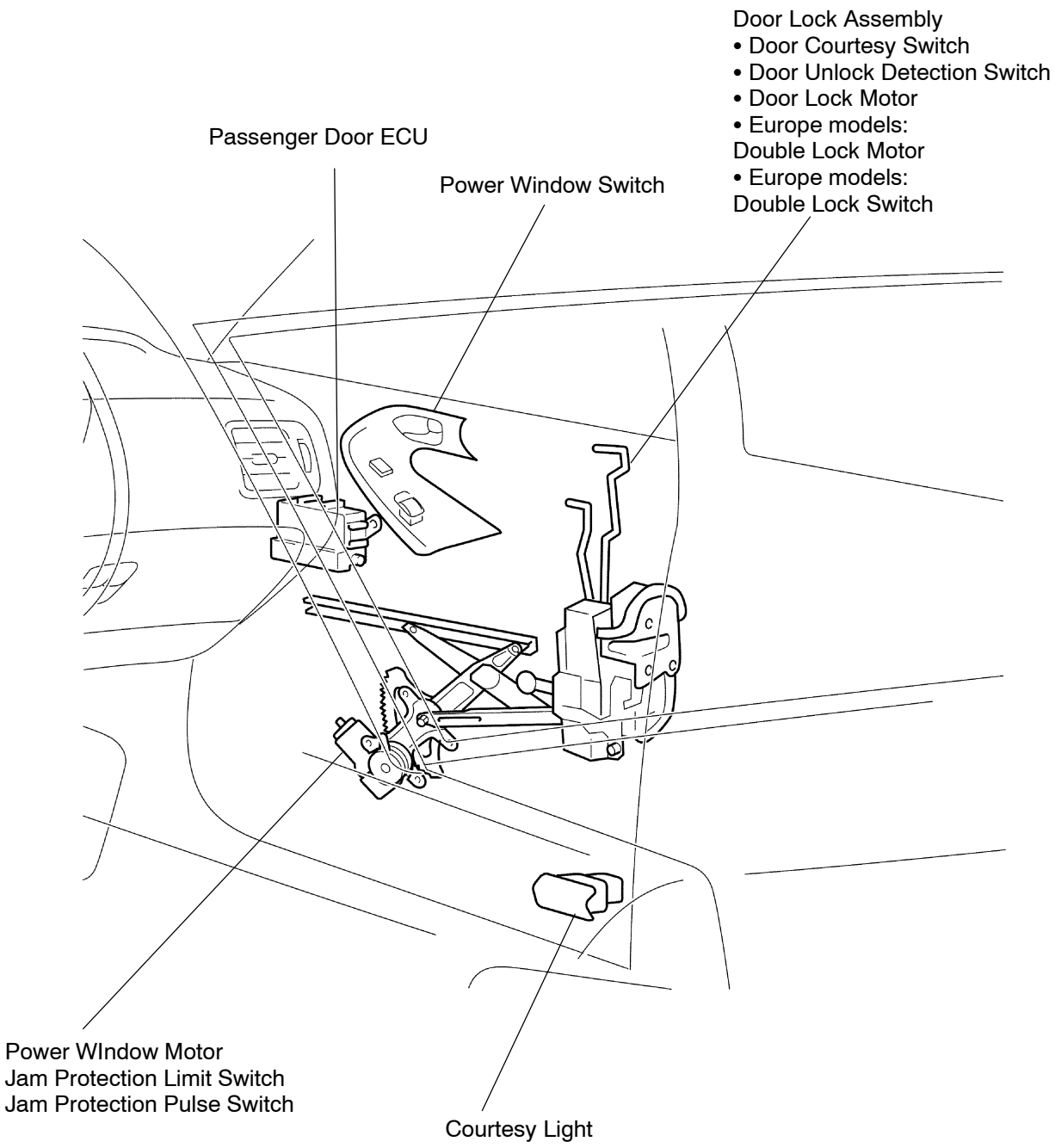
Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date Vehicle Brought in	/ /	**Odometer Reading**	**km Mile**

Date Problem First Occurred		/ /
Frequency Problem Occurs		☐ Constant ☐ Sometimes (times per day, month) ☐ Once only
Weather Conditions When Problem Occurred	**Weather**	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/ Others
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (Approx. °F (°C))

Malfunction System	☐ Power Window Control System
	☐ Power Mirror Control System
	☐ Power Door Lock Control System
	☐ Theft Deterrent System
	☐ Jam Protection System
	☐ Double Locking System
	☐ Others

DI2FS–10

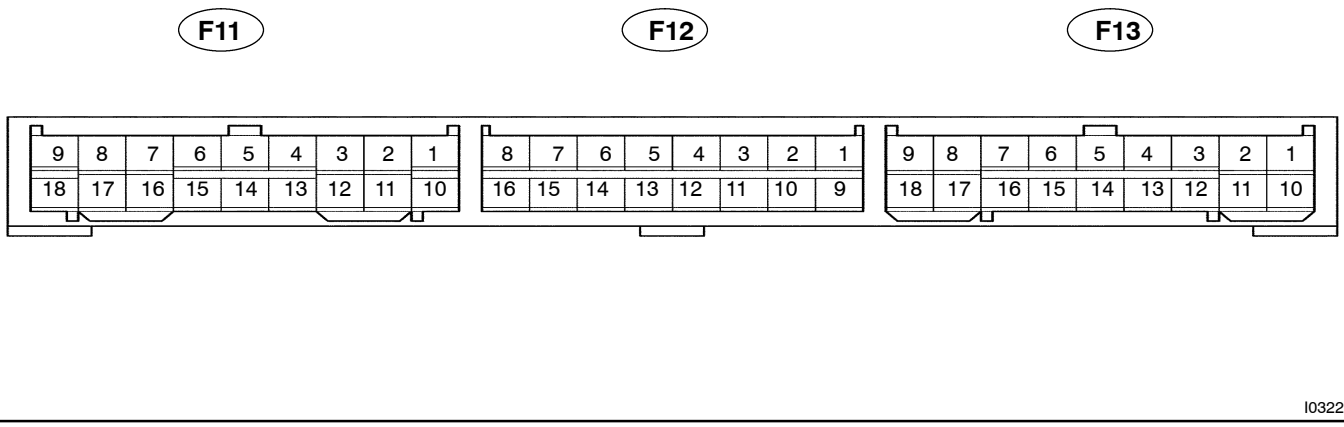
PARTS LOCATION



DI2EV–11

TERMINALS OF ECU

PASSENGER DOOR ECU



I03225

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
CPUB ↔ GND (F13–11 ↔ F13–17) (*1) F13–12 ↔ F13–12) (*2)	G–W ↔ W–B	Constant	10 – 14 V
BDR ↔ GND (F11–1 ↔ F13–17 (*1), 12(*2))	L–,B ↔ W–B	Constant	10 – 14 V
CTYB ↔ GND (F11–10 ↔ F13–17(*1), 12 (*2))	R–Y ↔ W–B	Constant	10 – 14 V
SIG ↔ GND (F13–2 ↔ F13–17(*1), 12(*2))	B–R ↔ W–B	Ignition switch position is ON.	10 – 14 V
GND ↔ Body Ground (F13–17(*1), 12(*2) ↔ Body Ground)	W–B ↔ Body Ground	Constant	Below 1 V
MM ↔ GND (F13–4 ↔ F13–17(*1), 12(*2))	GR ↔ W–B	Set switch position is OFF.	10 – 14 V
		Set switch position is ON.	Below 1 V
M1 ↔ GND (F13–15 ↔ F13–17(*1), 12(*2))	P ↔ W–B	Memory Switch 1 position is OFF.	10 – 14 V
		Memory Switch 1 position is ON.	Below 1 V
M2 ↔ GND (F13–14 ↔ F13–17(*1), 12(*2))	P–B ↔ W–B	Memory Switch 2 position is OFF.	10 – 14 V
		Memory Switch 2 position is ON.	Below 1 V
CTY ↔ GND (F12–15 ↔ F13–17(*1), 12(*2))	R–G ↔ W–B	Driver door closed.	10 – 14 V
		Driver door opened.	Below 1 V
KL ↔ GND (F11–4 ↔ F13–17(*1), 12(*2))	P–B ↔ W–B	Door key lock and unlock switch position is OFF.	Below 1 V
		Door key lock and unlock switch position is LOCK.	10 – 14 V
KUL ↔ GND (F11–5 ↔ F13–17(*1), 12(*2))	P–G ↔ W–B	Door key lock and unlock switch position is OFF.	Below 1 V
		Door key lock and unlock switch position is UNLOCK.	10 – 14 V
CYL ↔ GND (F11–12 ↔ F13–17(*1), 12(*2))	R–W ↔ W–B	Constant	10 – 14 V

Symbols (Terminals No.)	Wiring Color	Condition		STD Voltage (V)
MUP ↔ GND (F12–5 ↔ F13–17(*1), 12(*2))	L–W ↔ W–B	Ignition switch position is ON. Power window switch (Front passenger side)* position	OFF	Below 1 V
			UP	10 – 14 V
MDN ↔ GND (F12–4 ↔ F13–17(*1), 12(*2))	L–B ↔ W–B	Ignition switch position is ON. Power window switch (Front passenger side)* position	OFF	Below 1 V
			DOWN	10 – 14 V
ML ↔ GND (F11–6 ↔ F13–17(*1), 12(*2))	LG–B ↔ W–B	Door lock control switch* position	OFF	10 – 14 V
			LOCK	Below 1 V
MUL ↔ GND (F11–7 ↔ F13–17(*1), 12(*2))	LG–R ↔ W–B	Door lock control switch* position	OFF	10 – 14 V
			UNLOCK	Below 1 V
WLSW ↔ GND (F12–7 ↔ F13–17(*1), 12(*2))	Y–G ↔ W–B	Window lock switch* position	UNLOCK	Below 1 V
			LOCK	10 – 14 V
UP ↔ GND (F11–2 ↔ F13–17(*1), 12(*2))	R ↔ W–B	Power window (Front passenger side) is not operating.		Below 1 V
		Power window (Front passenger side) is operating upward.		10 – 14 V
DN ↔ GND (F11–11 ↔ F13–17(*1), 12(*2))	G ↔ W–B	Power window (Front passenger side) is not operating.		Below 1 V
		Power window (Front passenger side) is operating downward.		10 – 14 V
DMVR ↔ GND (F13–8 ↔ F13–17(*1), 12(*2))	LG–B ↔ W–B	Outside rear view mirror (Front passenger side) is not operating.		Below 1 V
		Outside rear view mirror (Front passenger side) is operating to down or right.		
		Outside rear view mirror (Front passenger side) is operating to up.		10 – 14 V
DM+R ↔ GND (F13–7 ↔ F13–17(*1), 12(*2))	LG–R ↔ W–B	Outside rear view mirror (Front passenger side) is not operating.		Below 1 V
		Outside rear view mirror (Front passenger side) is operating to up or left.		
		Outside rear view mirror (Front passenger side) is operating to down or right.		10 – 14 V
DMHR ↔ GND (F13–16 ↔ F13–17(*1), 12(*2))	LG ↔ W–B	Outside rear view mirror (Front passenger side) is not operating.		Below 1 V
		Outside rear view mirror (Front passenger side) is operating to up or left.		
		Outside rear view mirror (Front passenger side) is operating to left.		10 – 14 V
A+ ↔ GND (F11–8 ↔ F13–17 (*1), 12 (*2)	G–R ↔ W–B	Power door lock (Front passenger side) is not operating.		Below 1 V
		Power door lock (Front passenger side) is operating to unlock.		
		Power door lock (Front passenger side) is operating to lock.		10 – 14 V
A– ↔ GND (F11–17 ↔ F13–17(*1), 12(*2))	G–B ↔ W–B	Power door lock (Front passenger side) is not operating.		Below 1 V
		Power door lock (Front passenger side) is operating to lock.		
		Power door lock (Front passenger side) is operating to lock.		10 – 14 V
LSW ↔ GND (F11–3 ↔ F13–17(*1), 12(*2))	GR ↔ W–B	Driver door is locked.		10 – 14 V
		Driver door is unlocked.		Below 1 V
DVC ↔ GND (F12–8 ↔ F13–17(*1), 12(*2)	R ↔ W–B	Ignition switch position is OFF. After 30 seconds from door is closed.		Below 1 V
		Ignition switch position is ON.		4 – 6 V

*: Power Window Master Switch

Symbols (Terminals No.)	Wiring Color	Condition		STD Voltage (V)
DT1 ↔ GND (F12–3 ↔ F13–17(*1), 12(*2))	GR–G ↔ W–B	Ignition switch position is ON. Power window switch (FrRH) position	OFF	10 – 14 V
			UP	Below 1 V
			DOWN	Below 1 V
			AUTO	Below 1 V
DT2 ↔ GND (F12–2 ↔ F13–17(*1), 12(*2))	GR–R ↔ W–B	Ignition switch position is ON. Power window switch (RrRH) position	OFF	10 – 14 V
			UP	Below 1 V
			DOWN	Below 1 V
			AUTO	Below 1 V
DT1 ↔ GND (F12–1 ↔ F13–17(*1), 12(*2))	GR–G ↔ W–B	Ignition switch position is ON. Power window switch (RrFront passenger side) position	OFF	10 – 14 V
			UP	Below 1 V
			DOWN	Below 1 V
			AUTO	Below 1 V
LMT ↔ GND (F12–12 ↔ F13–17(*1), 12(*2))	W–G ↔ W–B	Window full–close position		10 – 14 V
		Except window full–close position		Below 1 V
PLS ↔ GND (F12–13 ↔ F13–17(*1), 12(*2))	W ↔ W–B	During the power window is operation.		Pulse Generation
		Power window is not operated.	SW ON	Below 1 V
			SW OFF	10 – 14 V
A1+ ↔ GND (F13–9 ↔ F13–12) (*2)	G–R ↔ W–B	Front passenger side double lock is not operating		Below 1 V
		Front passenger side double lock is operating to unset		Below 1 V
		Front passenger side double lock is operating to set		Below 1 V
A1– ↔ GND (F13–18 ↔ F13–12) (*2)	G–B↔ W–B	Front passenger side double lock is not operating		10 – 14 V
		Front passenger side double lock is operating to unset		10 – 14 V
		Front passenger side double lock is operating to set		Below 1 V
VSSR ↔ PE2 (F11–1 ↔ F13–13)	Y–R (*1) ↔ W–B B–O (*2) ↔ W–B	Front passenger side outer rear view mirror moves upper most position		Below 2 V
		Front passenger side outer rear view mirror moves lower most position		4 – 6 V
HSSR ↔ PE2 (F11–10 ↔ F13–13)	B–O (*1) ↔ W–B Y–R (*2) ↔ W–B	Front passenger side outer rear view mirror moves left most position		Below 2 V
		Front passenger side outer rear view mirror moves right most position		4 – 6 V
DBLS ↔ GND (F13–5 ↔ F13–12) (*2)	W ↔ W–B	Front passenger side door double lock is set		10 – 14 V
		Front pasenger side door double lock is not unset		10 – 14 V
WR– ↔ GND (*2) (F13–9 ↔ F13–1)	GR ↔ W–B	Outer rear view mirror retact switch OFF		Below 1V
		Outer rear view mirror retact switch ON		10 – 14 V
WR+ ↔ GND (*2) (F13–18 ↔ F13–17)	Y ↔ W–B	Outer rear view mirror retact switch OFF		Below 1V
		Outer rear view mirror retact switch ON		10 – 14 V
MPX1 (F13–9)	O	Multiplex communication system		–
MPX2 (F13–18)	L	Multiplex communication system		–

(*1): w/o Double locking system
(*2): w/ Double locking system
(*3): G.C.C. countries

DI2EW–08

PROBLEM SYMPTOMS TABLE

POWER MIRROR CONTROL SYSTEM

Symptom	Suspect Area	See page
Mirror retract system does not operate	1. Retract motor circuit 2. Pssenger door ECU	DI–686

DI87F–01

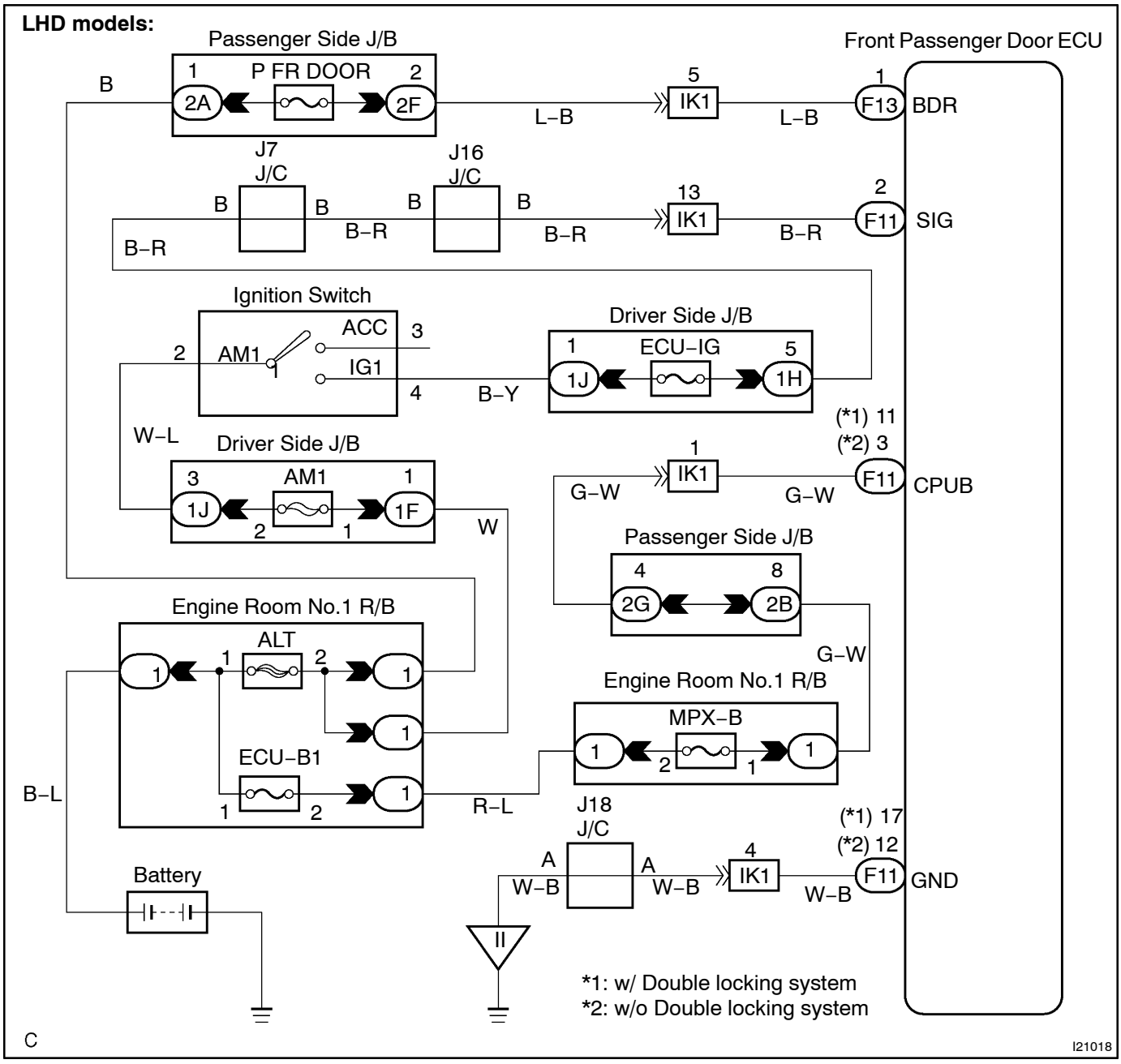
CIRCUIT INSPECTION

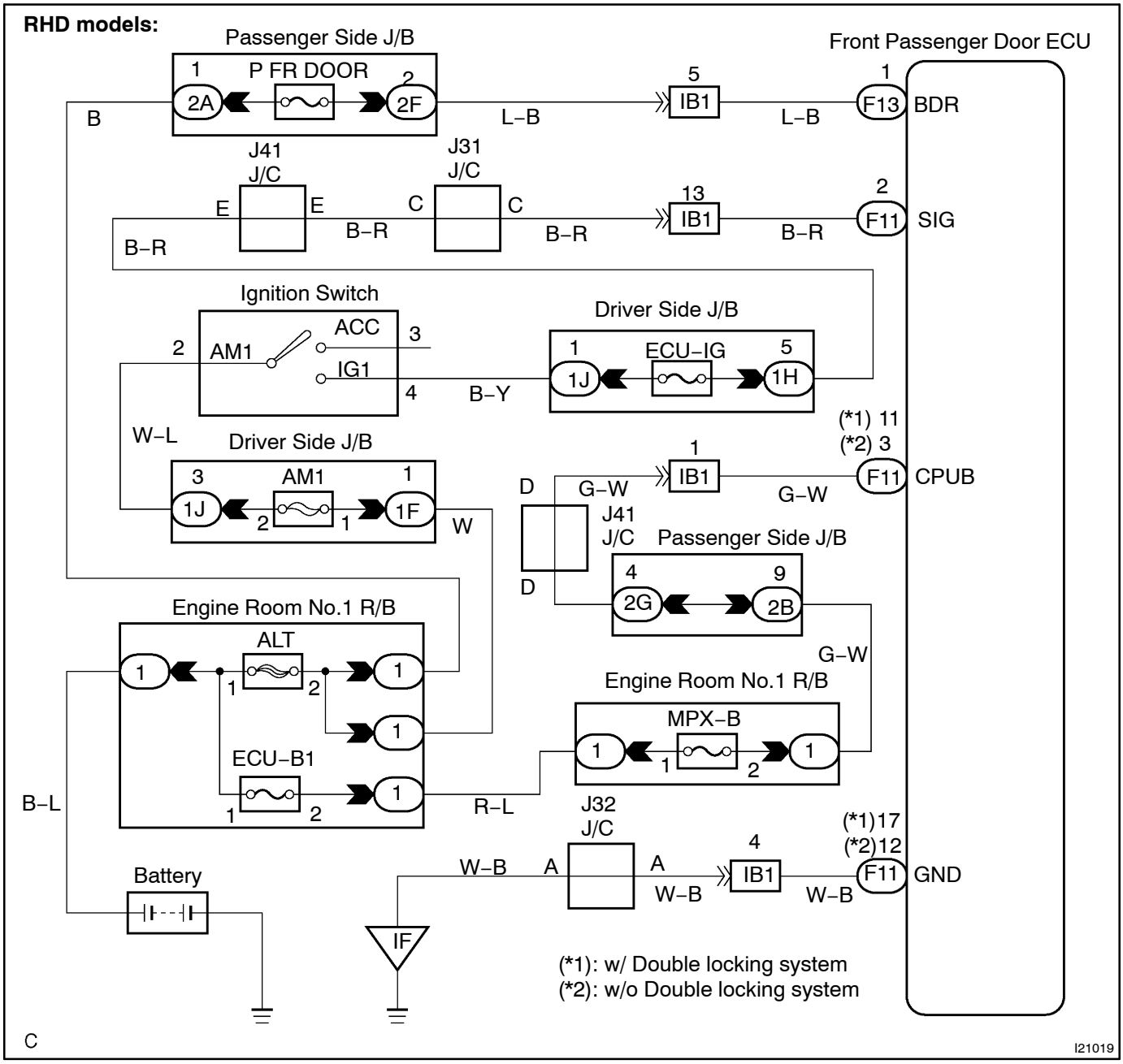
Power source circuit

CIRCUIT DESCRIPTION

This circuit provides power to operate the passenger door ECU.

WIRING DIAGRAM

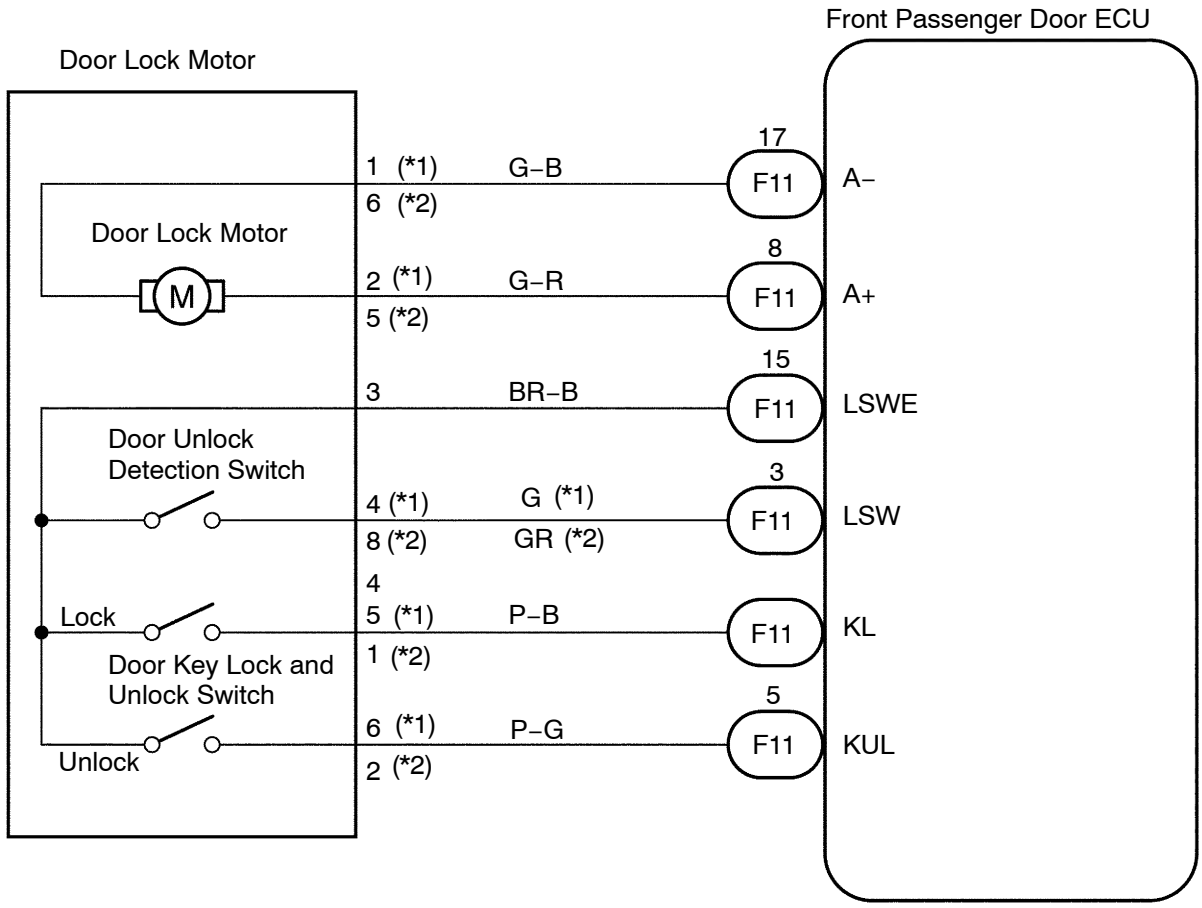



RHD models:
Passenger Side J/B
P FR DOOR
2A
2F
1
2
B
L–B
IB1
5
L–B
Front Passenger Door ECU
F13
1
BDR
J41
J/C
J31
J/C
E
E
C
C
B–R
B–R
B–R
13
IB1
B–R
F11
2
SIG
Ignition Switch
ACC
IG1
AM1
2
3
4
B–Y
Driver Side J/B
1J
ECU–IG
1H
1
5
W–L
Driver Side J/B
3
AM1
1
1J
2
1
1F
W
(*1) 11
(*2) 3
IB1
1
G–W
F11
CPUB
D
G–W
J41
J/C
Passenger Side J/B
D
4
9
2G
2B
G–W
Engine Room No.1 R/B
ALT
1
1
2
1
1
ECU–B1
1
2
1
B–L
R–L
Engine Room No.1 R/B
MPX–B
1
1
2
1
J32
J/C
(*1)17
(*2)12
4
W–B
A
A
W–B
IB1
W–B
F11
GND
Battery
IF
(*1): w/ Double locking system
(*2): w/o Double locking system
C
I21019

DI87G–01

Door lock motor circuit

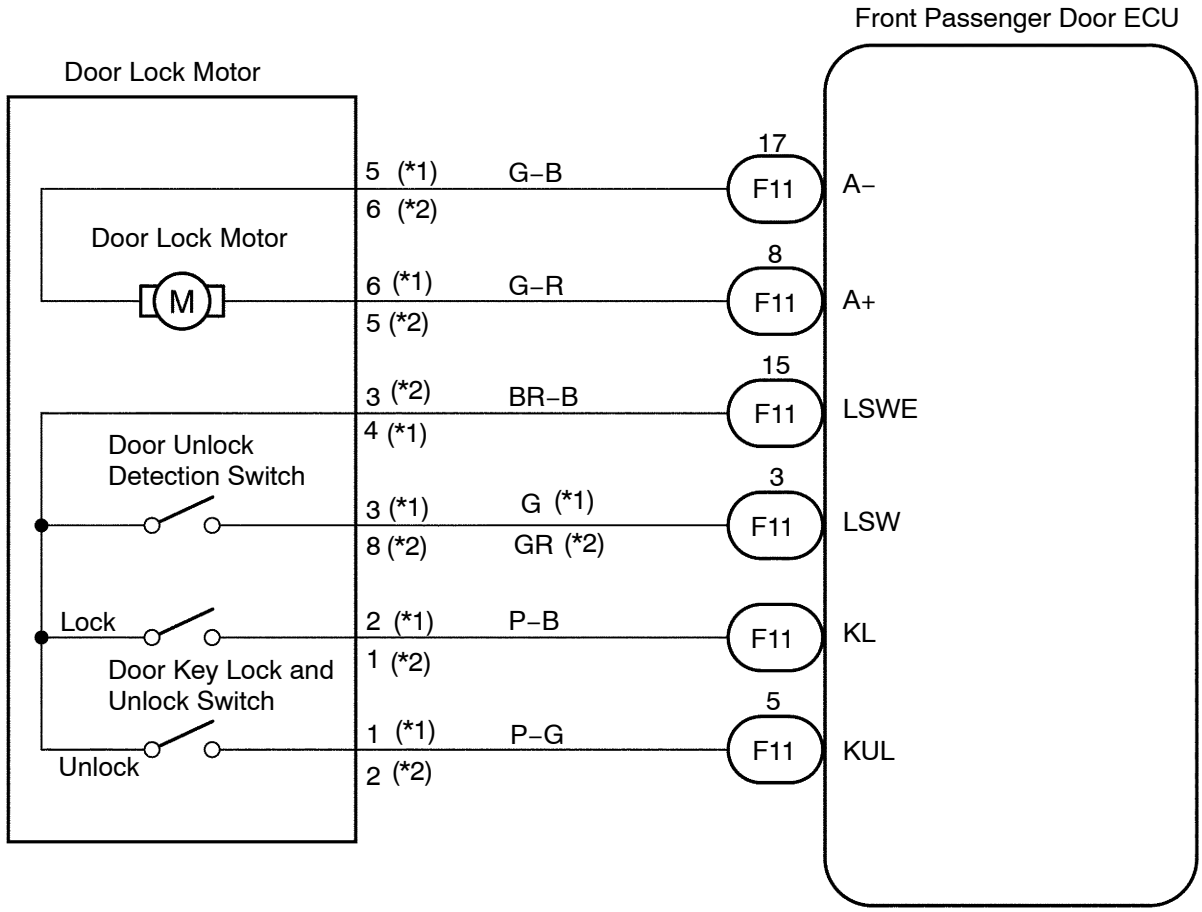
WIRING DIAGRAM



(*1) : w/o Double locking system
(*2): w/ Double locking system

I04890

RHD models:



(*1) : w/o Double locking system
(*2): w/ Double locking system

I04890

INSPECTION PROCEDURE

HINT:

In case of using the LEXUS hand–held tester, start the inspection from step 1 and in case of not using the LEXUS hand–held tester, start from step 2.

1	**Check door lock motor using LEXUS hand–held tester.**

PREPARATION:

Connect the LEXUS hand–held tester to the DLC 3.

CHECK:

Check that the door lock motor can operate in an ACTIVE TEST.

OK → **Proceed to next circuit inspection shown on problem symptom table. (See Pub. No. RM588E on page DI–616)**

NG

2	**Check door lock motor** **(w/o double locking system: See Pub. No. RM588E on page BE–148** **w/ double locking system: See page BE–12).**

NG → **Replace the door lock motor.**

OK

3	**Check wireharness and connector between door lock motor and Front Passenger Door ECU.**

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

OK

Proceed to next circuit inspection shown on problem symptom table (See Pub.No. RM588E on page DI–616).

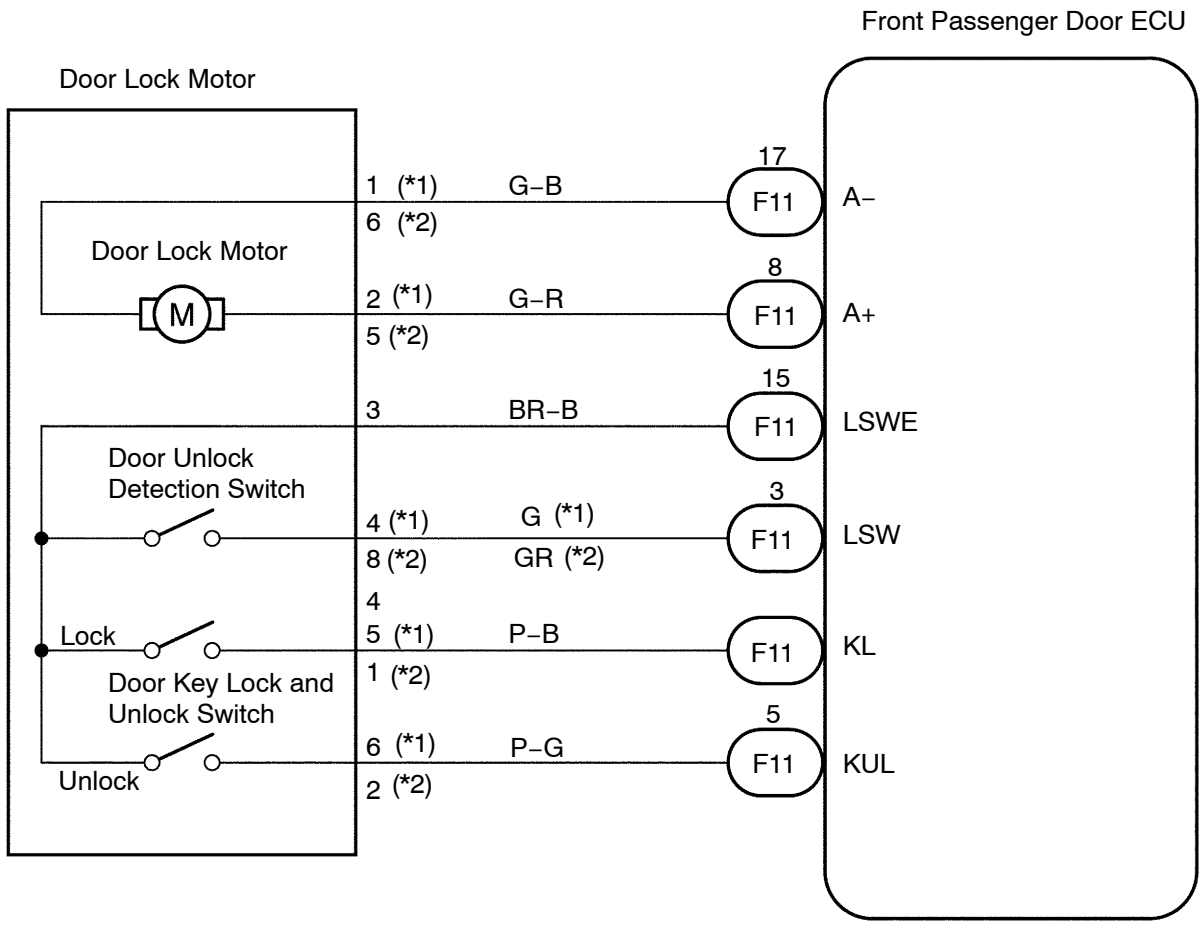
DI87H–01

Door unlock detection switch

CIRCUIT DESCRIPTION

The door unlock detection switch is built in the door lock motor assembly. This switch is ON when the door lock knob is in the unlock position and OFF when the lock knob is in the lock position. The ECU detects the door lock knob conditions is this circuit. It is used as one of the operating conditions for the key confinement prevention function.

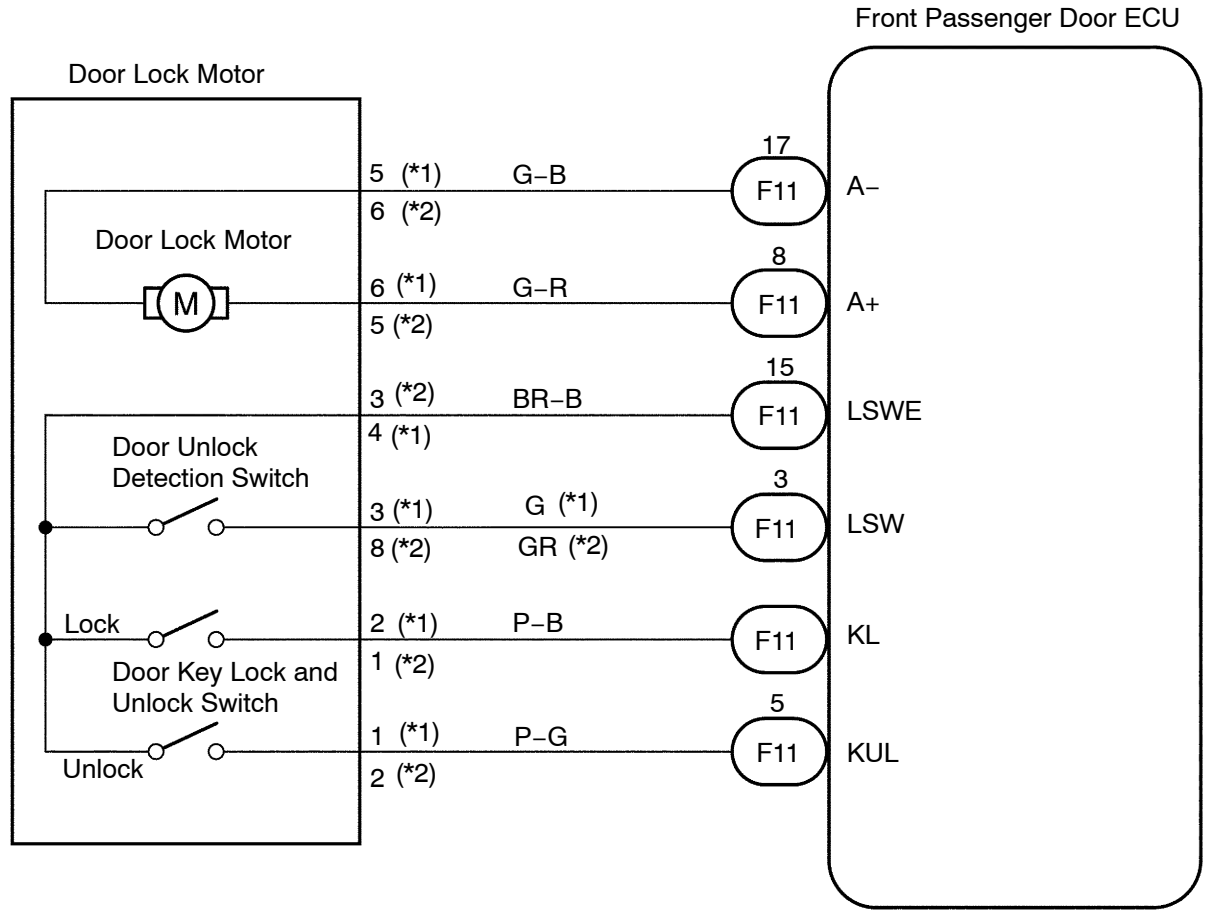
WIRING DIAGRAM



(*1) : w/o Double locking system
(*2): w/ Double locking system

I04890

RHD models:



(*1) : w/o Double locking system
(*2): w/ Double locking system

I04890

INSPECTION PROCEDURE

HINT:
In case of using the LEXUS hand–held tester, start the inspection from step 1 and in case of not using the LEXUS hand–held tester, start from step 2.

1	**Check door unlock detection switch using LEXUS hand–held tester.**

PREPARATION:
Connect the LEXUS hand–held tester to the DLC 3.
CHECK:
Check the door unlock detection switch using DATA LIST.

OK

Proceed to next circuit inspection shown on problem symptom table. (See Pub. No. RM588E on page Di–616)

NG

2	Check door unlock detection switch. (w/o double locking system: See Pub. No. RM588E on page BE–148 w/ double locking system: See page BE–12)

NG → Replace the door lock motor.

OK

3	Check wireharness and connector between door unlock detection switch and passenger door ECU.

NG → Repair or replace wireharness or connector.

OK

Proceed to next circuit inspection shown on problem symptom table. (See Pub. No. RM588E on page DI–616)

DI87I–01

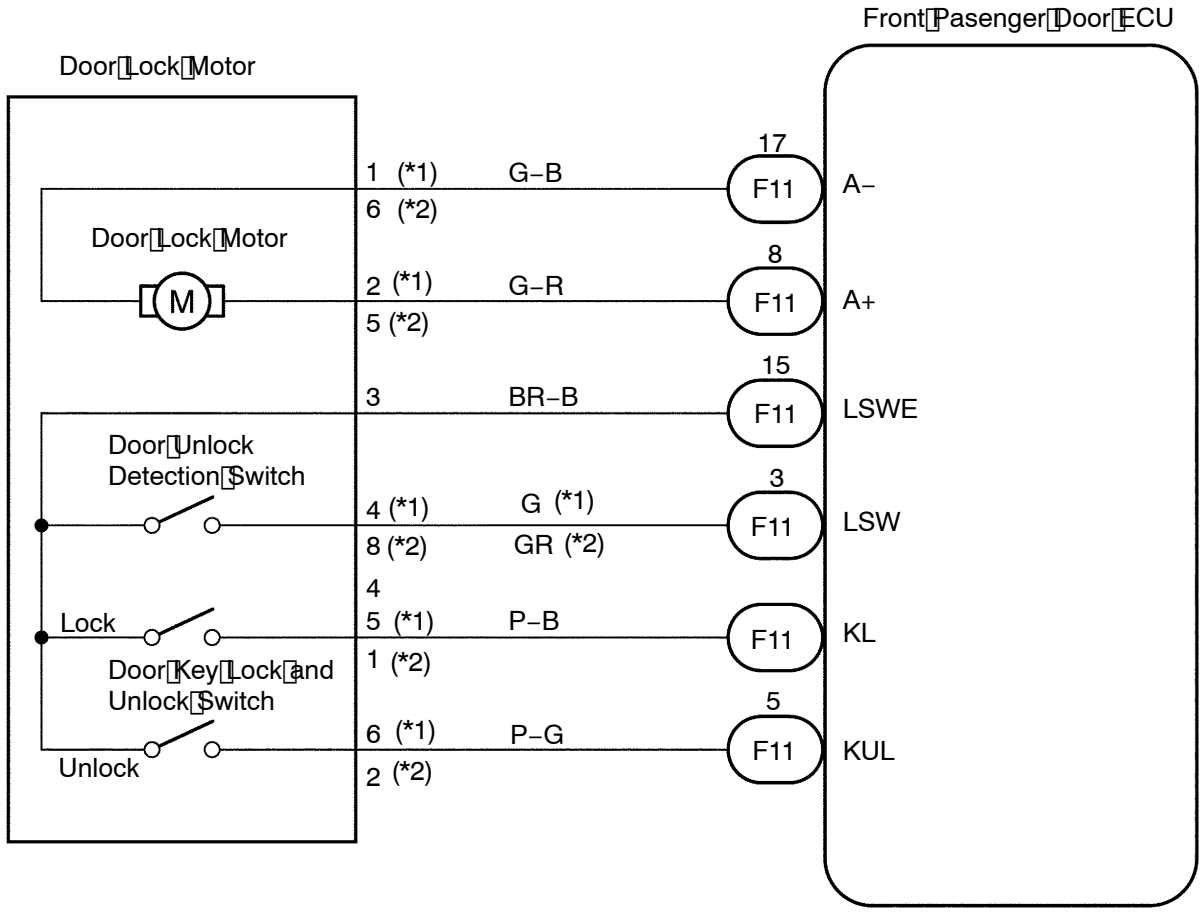
Door key lock and unlock switch circuit

CIRCUIT DESCRIPTION

The door key lock and unlock switch is built in the door key cylinder. When the key is turned to the lock side, terminal 3 of the switch is grounded and when the key is turned to the unlock side, terminal 2 of the switch is grounded.

Door key lock and unlock switch can be checked using DTC check. (Refer to DI–769)

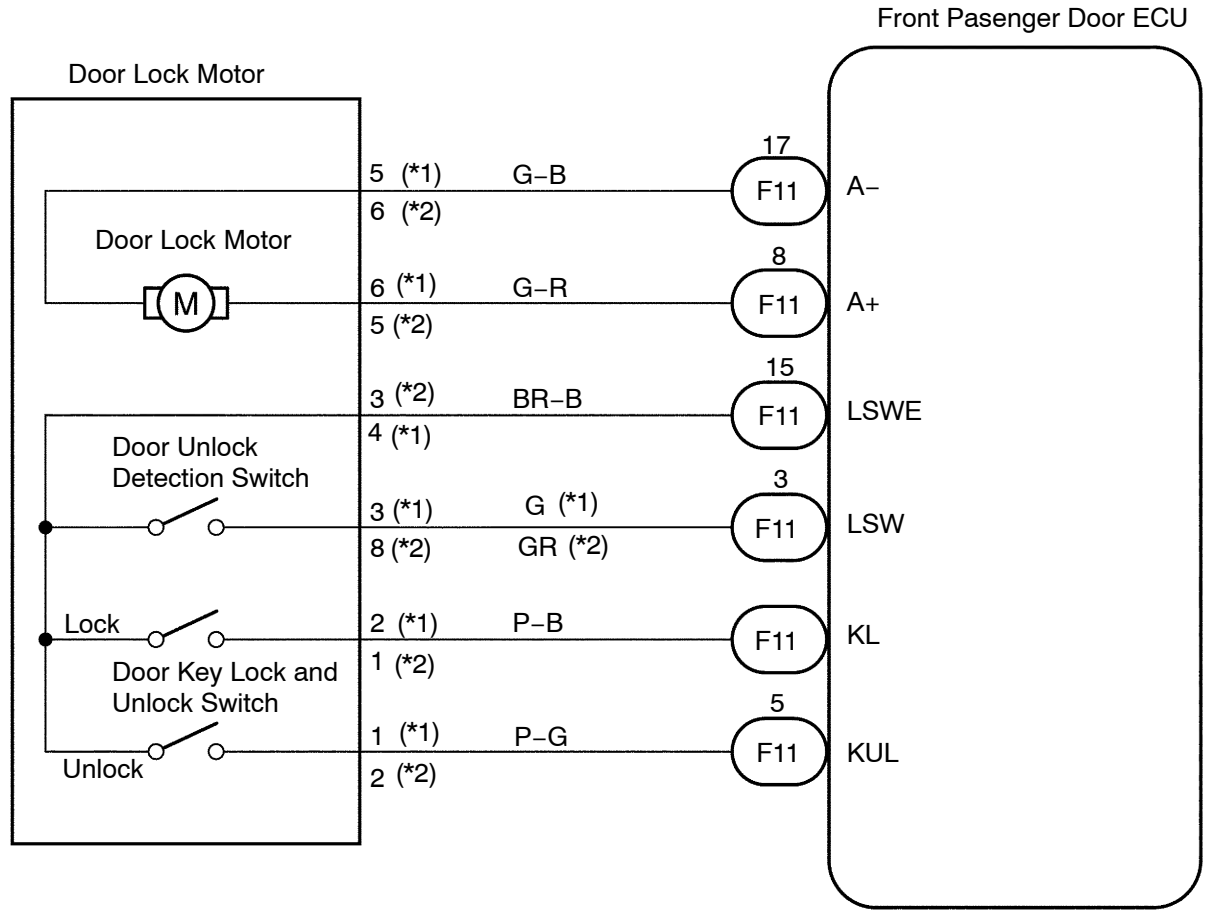
WIRING DIAGRAM



(*1): w/o Double locking system
(*2): w/ Double locking system

I04890

RHD models:



(*1) : w/o Double locking system
(*2): w/ Double locking system

I04890

INSPECTION PROCEDURE

1	**Check the door key lock and unlock switch using DTC check (See page DI–769).**

OK → **Proceed to next circuit inspection shown on problem symptom table (See Pub. No. RM588E on page DI–616).**

NG

2	Check door key lock and unlock switch (w/o double locking system: See Pub. No. RM588E on page BE–148 w/ double locking system: See page BE–12).

NG → Replace the door key lock and unlock switch.

NG

3	Check wireharness and connector between door key lock and unlock switch and Front Pasenger Door ECU.

NG → Repair or replace wireharness or connector.

OK

Proceed to next circuit inspection shown on problem symptom table (See Pub. No. RM588E on page DI–616).

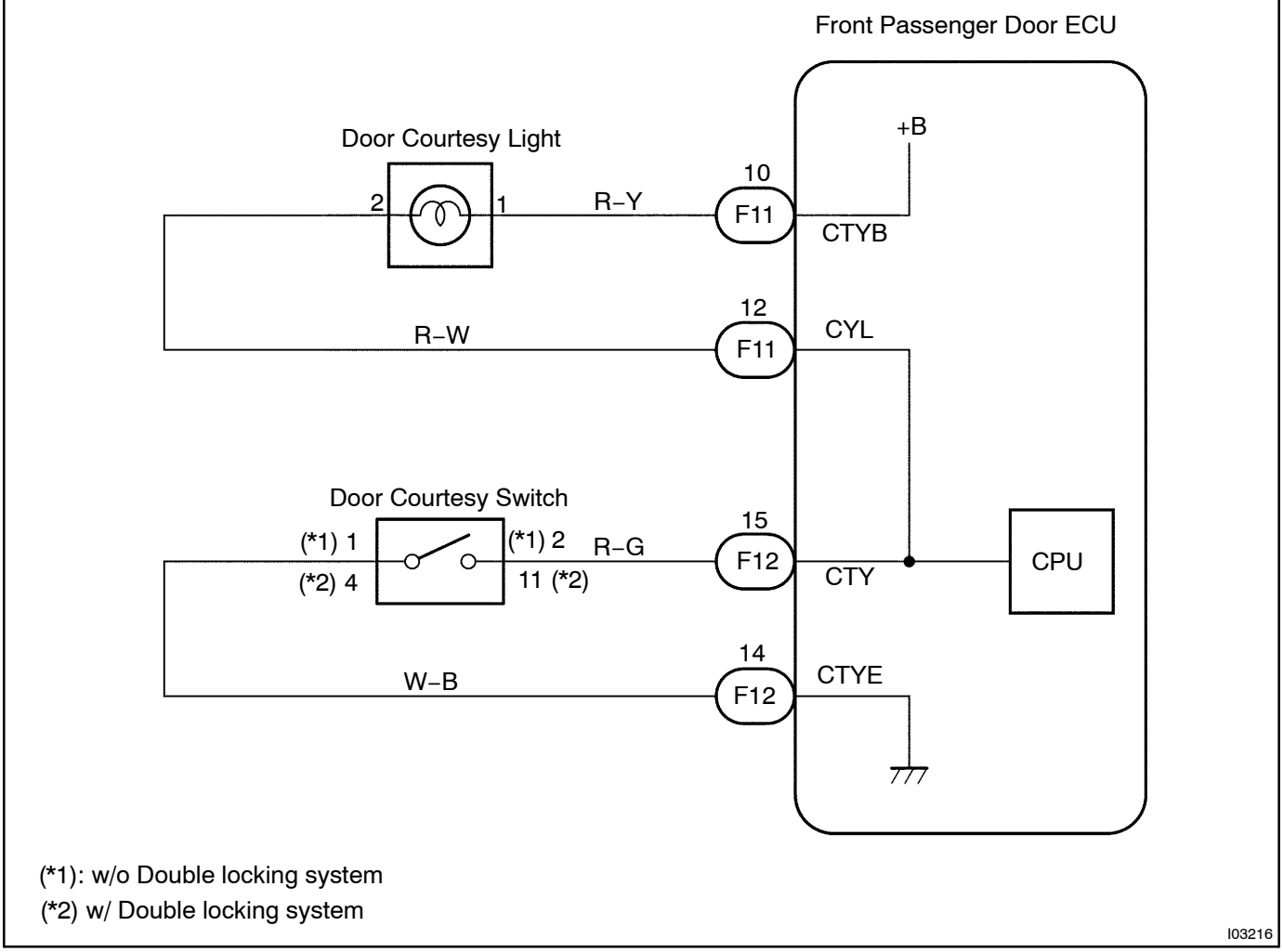
DI2F2–10

Door courtesy light and courtesy switch circuit

CIRCUIT DESCRIPTION

The door courtesy switch goes on when the door is opened and goes off when door is closed.

WIRING DIAGRAM



(*1): w/o Double locking system
(*2) w/ Double locking system

I03216

INSPECTION PROCEDURE

1	**Check operation of door courtesy light.**

CHECK:
Check that door courtesy light comes on when door opened, and goes off when door is closed.
OK:
Must be operated normally.

OK → **Proceed to next circuit inspection shown on problem symptom table (See page Pub. No. RM588E on page DI–616).**

NG

2	**Check courtesy light. (See Pub. No. RM588E on page BE–66)**

NG → **Replace the courtesy light.**

OK

3	**Check courtesy switch** **(w/o Double locking system: See Pub, No. RM588E on page BE–66** **w/ Double locking system: See page BE–3).**

NG → **Replace the courtesy switch.**

OK

4	**Check wireharness and connector between courtesy light and front passenger door ECU, courtesy switch and front passenger door ECU.**

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

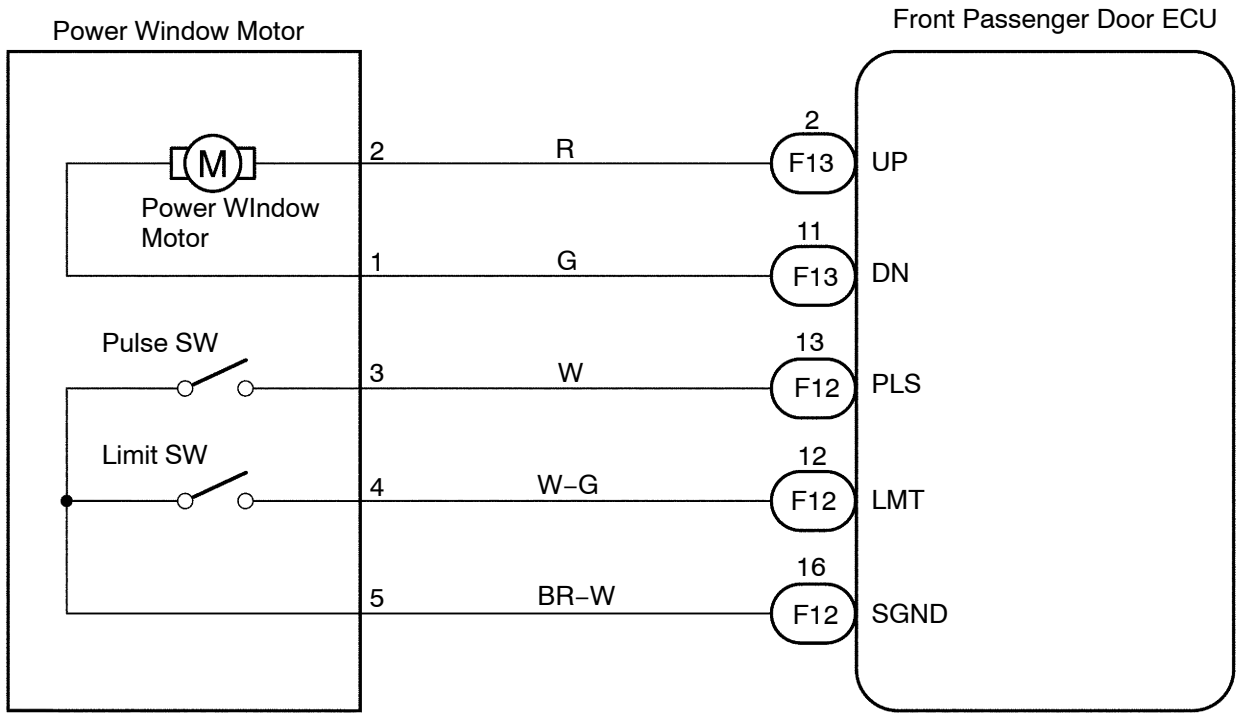
OK

Proceed to next circuit inspection shown on problem symptoms table
(See Pub. No. RM588E on page DI–616.)

DI2F4–10

Power window motor circuit

WIRING DIAGRAM

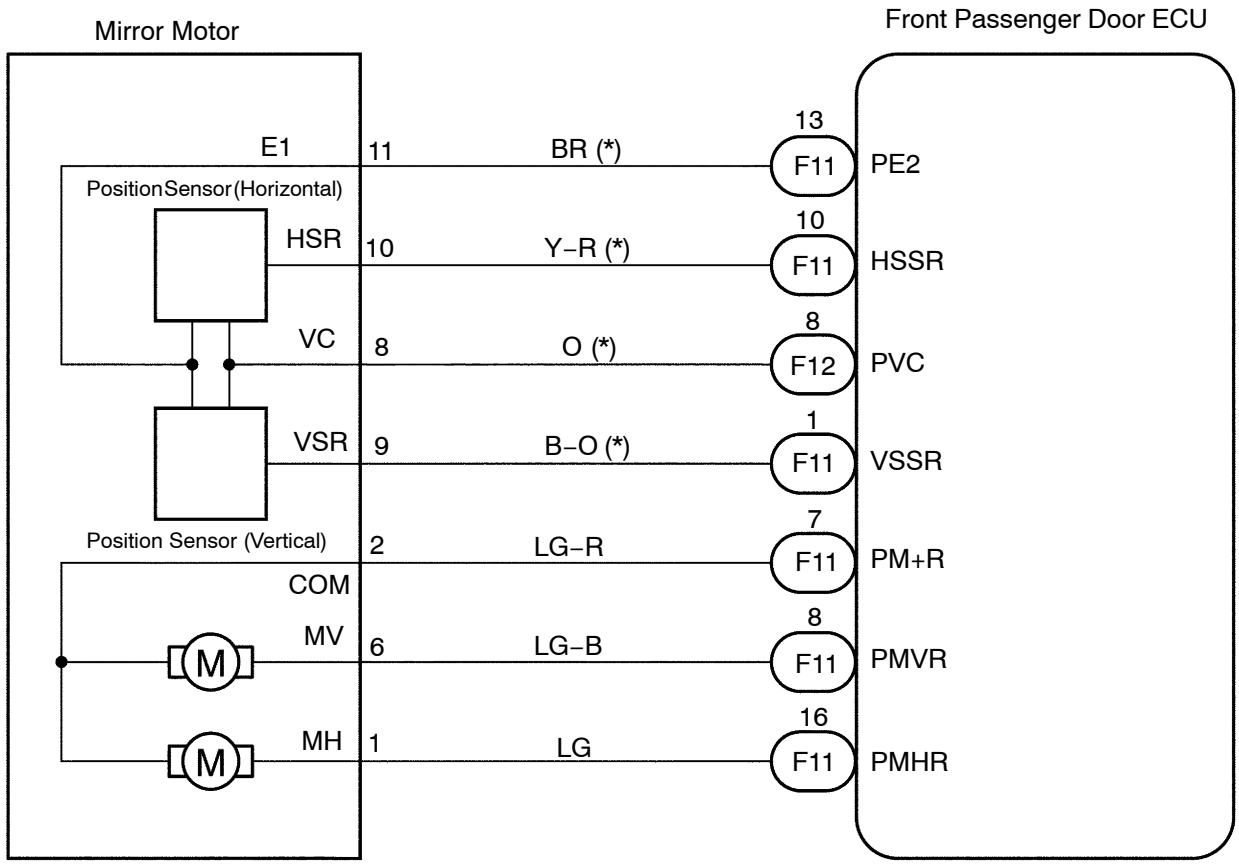


I03214

DI2F7–05

Mirror motor circuit

WIRING DIAGRAM



(*): w/ Driving position memory

I03219

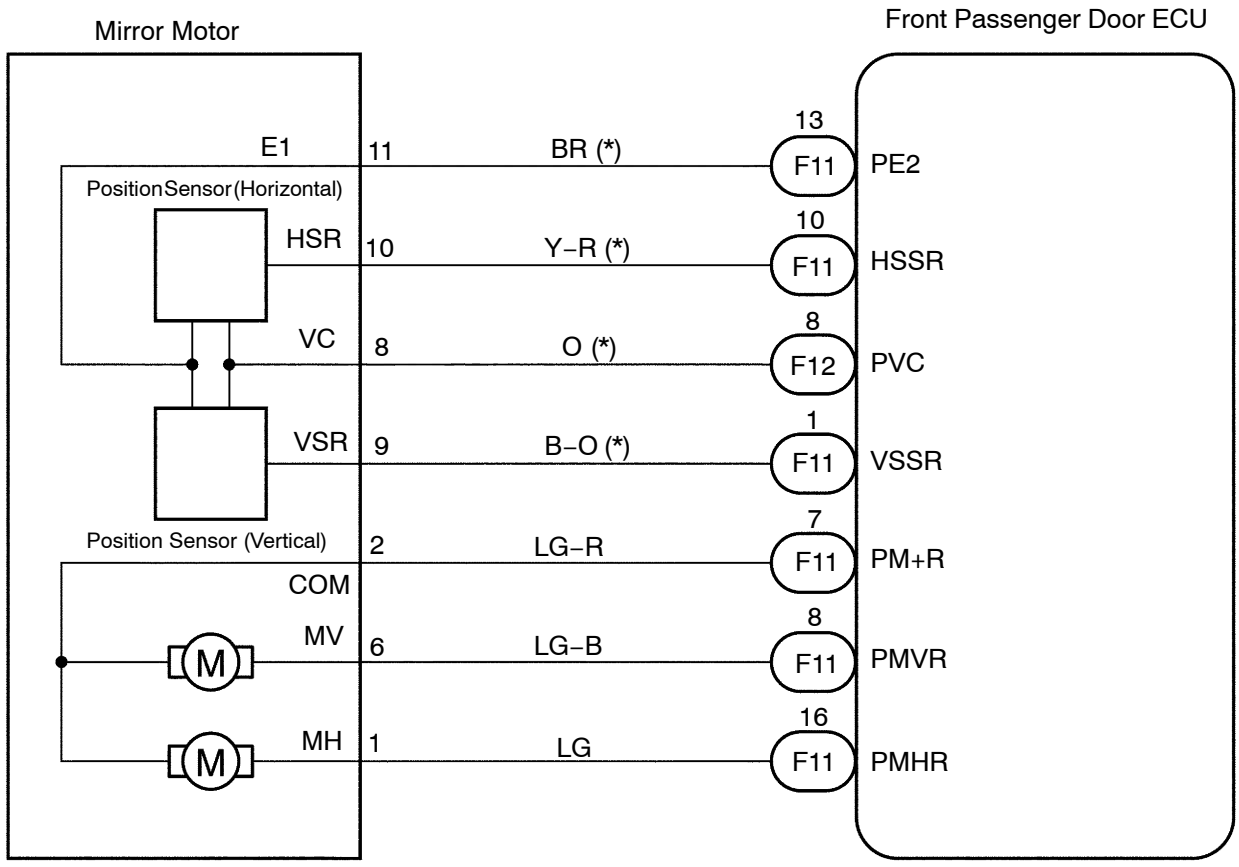
DI2F8–05

Mirror position sensor circuit (W/memory)

CIRCUIT DESCRIPTION

This position detected by the mirror position sensor will be memorized in the seat ECU. This sensor is equipped in the mirror in spite of the existence of the memory function.

WIRING DIAGRAM



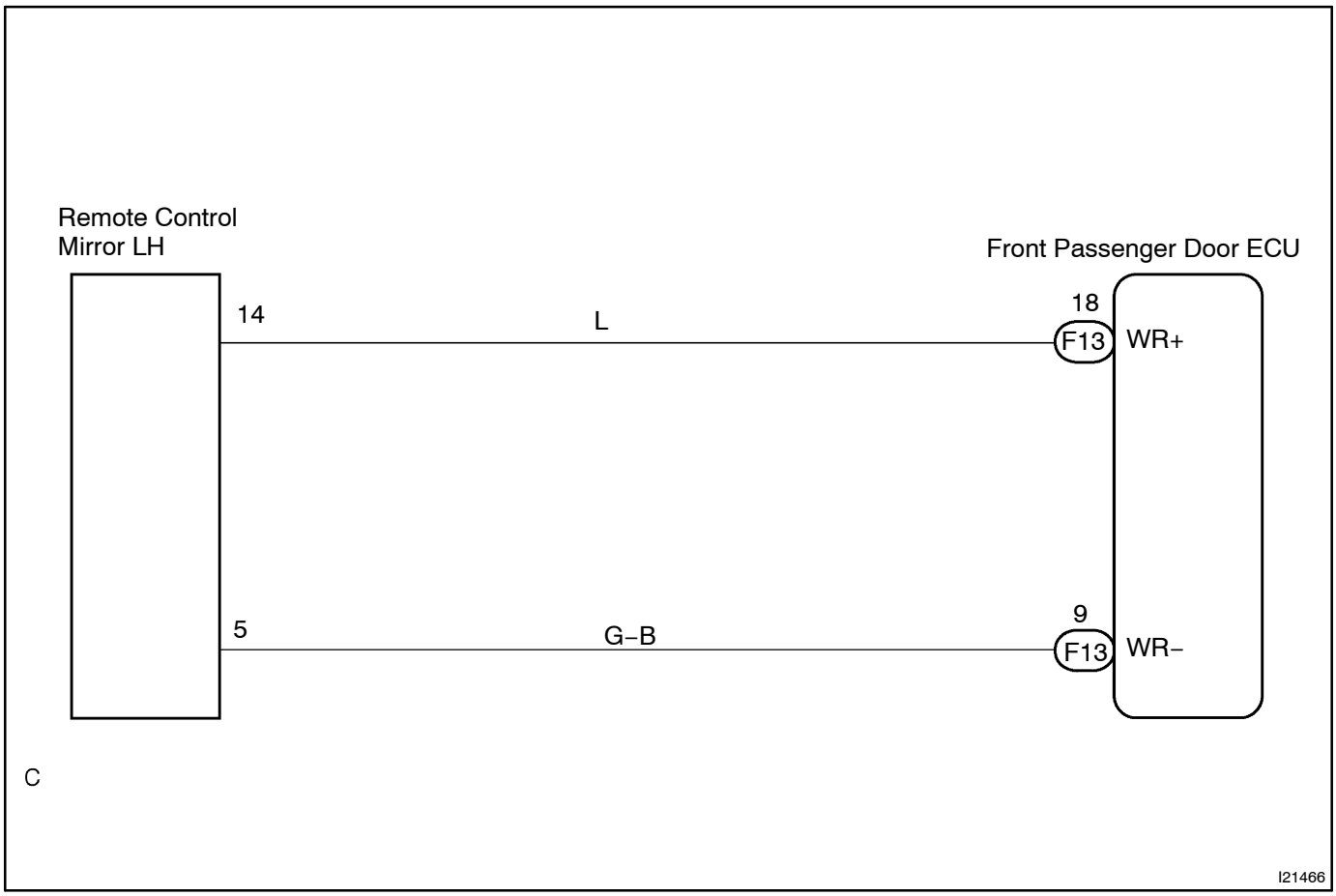
(*): w/ Driving position memory

I03219

DI87J–01

Mirror retract motor circuit (G.C.C. countries only)

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
In case of using the hand–held tester, start the inspection from step 1 and in case of not using the hand–held tester, start from step 2.

1	**Check mirror retract motor using hand–held tester.**

PREPARATION:
Connect the mirror retract hand–held tester to the DLC3.
CHECK:
Check the mirror retract motor can operate in an ACTIVE TEST.

OK	**Proceed to next circuit inspection shown on problem symptoms table. (See page DI–668)**

NG

2	Check mirror retract motor. (See page BE–21)

NG → Replace the mirror retract switch.

OK

3	Check wireharness and connector between mirror retract motor and front passenger door ECU.

NG → Repair or replace wireharness or connector.

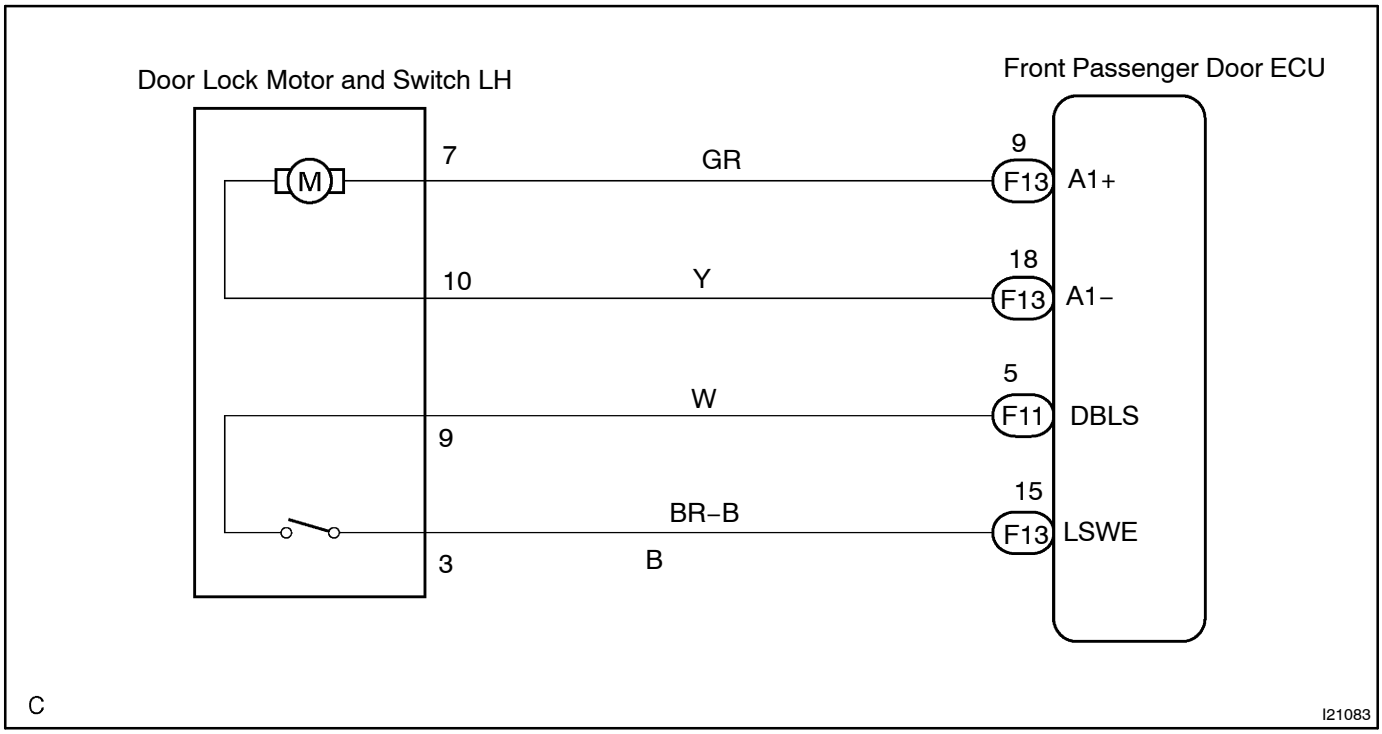
OK

Proceed to next circuit inspection shown on problem symptoms table.
(See page DI–668)

DI87K–01

Double lock motor circuit (Europe)

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check double lock motor (See page BE–18).

NG → Replace the double lock motor.

OK

2	Check wireharness and connector between double lock motor and passenger door ECU.

NG → Repair or replace wireharness or connector.

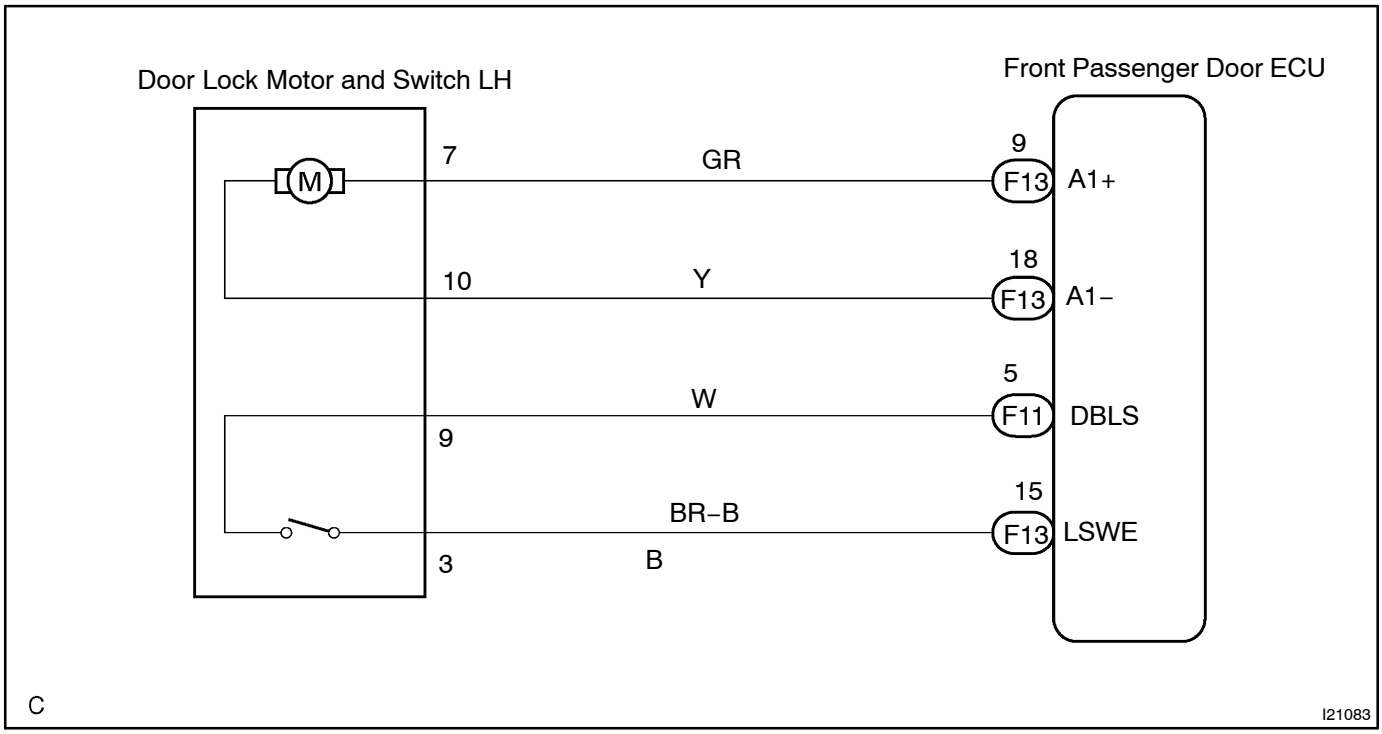
OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI–604).

DI87L–01

Double lock motor circuit (Europe)

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check double lock motor (See page BE–18).

NG → Replace the double lock motor.

OK

2	Check wireharness and connector between double lock motor and front paseng-er door ECU.

NG → Repair or replace wireharness or connector.

OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI–604).

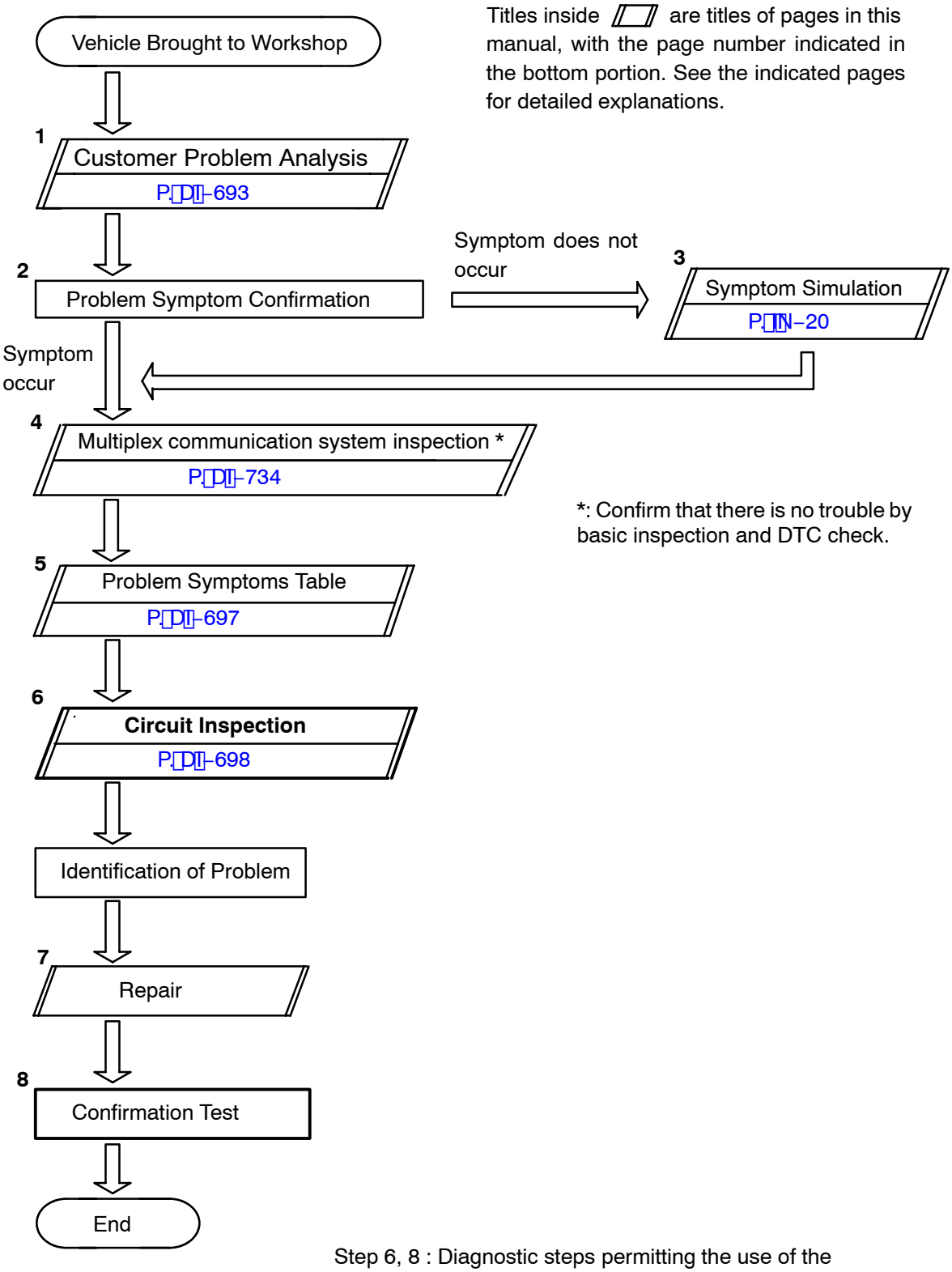
REAR LEFT DOOR CONTROL SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

DI2F9–02

HINT:

This ECU is connected to the multiplex communication system. Therefore, be sure to check that there is no troubles in the multiplex communication system before performing the troubleshooting.



Titles inside ▱ are titles of pages in this manual, with the page number indicated in the bottom portion. See the indicated pages for detailed explanations.

*: Confirm that there is no trouble by basic inspection and DTC check.

Step 6, 8 : Diagnostic steps permitting the use of the LEXUS hand–held tester.

DI2FB–07

CUSTOMER PROBLEM ANALYSIS CHECK

REAR LEFT DOOR CONTROL SYSTEM Check Sheet

Inspector's name: _____

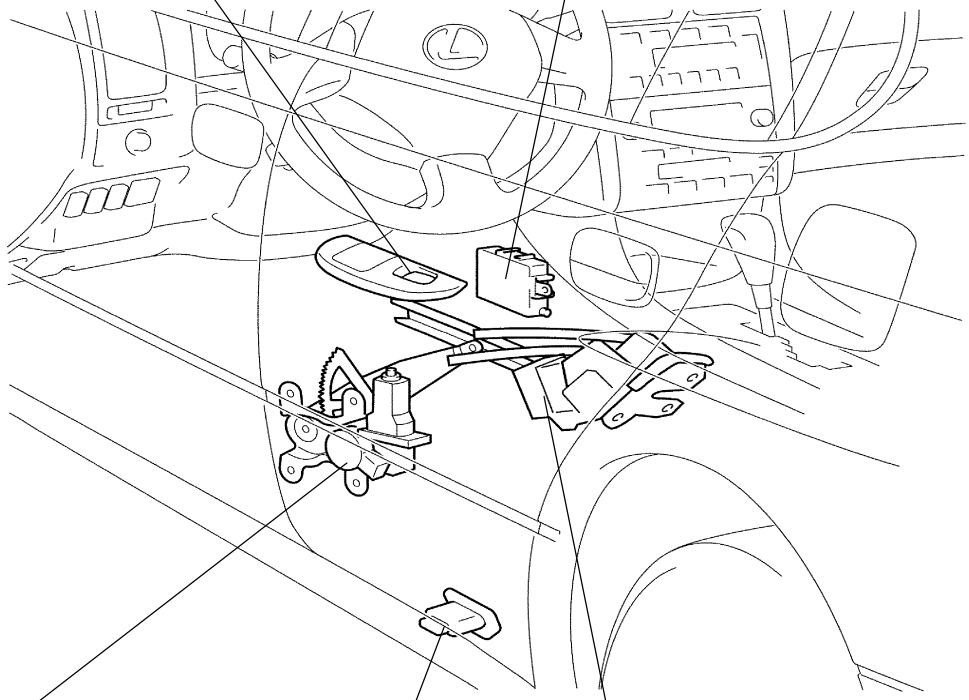
Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date Vehicle Brought in	/ /	**Odometer Reading**	**km Mile**

Date Problem First Occurred		/ /
Frequency Problem Occurs		☐ Constant ☐ Sometimes (times per day, month) ☐ Once only
Weather Conditions When Problem Occurred	**Weather**	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/ Others
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (Approx. °F (°C))

Malfunction System	☐ Power Window Control System
	☐ Power Door Lock Control System
	☐ Theft Deterrent System
	☐ Jam Protection System
	☐ Double Locking System
	☐ Others

DI2FA–07

PARTS LOCATION

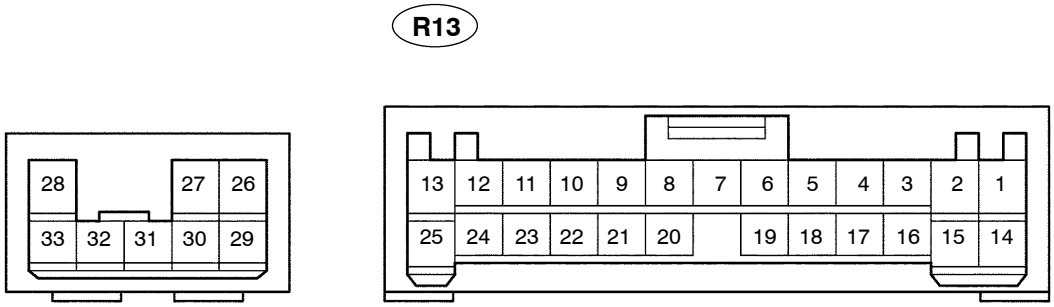


I06103

DI2FH–09

TERMINALS OF ECU

REAR LEFT DOOR ECU



I03226

Symbols (Terminals No.)	Wiring Color	Condition		STD Voltage (V)
CPUB ↔ GND *1(R13–15 ↔ R13–25) *2(R13–4 ↔ R13–15)	G–W ↔ W–B	Constant		10 – 14 V
BDR ↔ GND *1(R13–14 ↔ R13–25) *2(R13–2 ↔ R13–15)	L–R ↔ W–B	Constant		10 – 14 V
SIG ↔ GND *1(R13–9 ↔ R13–25) *2(R13–8 ↔ R13–15)	B–R ↔ W–B	Constant		10 – 14 V
CTYB ↔ GND *1(R13–2 ↔ R13–25) *2(R13–3 ↔ R13–15)	G–W ↔ W–B	Constant		10 – 14 V
GND ↔ Body Ground *1(R13–25 ↔ Body Ground) *2(R13–15 ↔ Body Ground)	W–B ↔ Body Ground	Constant		Below 1 V
CTY ↔ GND *1(R13–8 ↔ R13–25) *2(R13–18 ↔ R13–15)	R–W ↔ W–B	Driver door closed.		10 – 14 V
		Driver door opened.		Below 1 V
CYL ↔ GND *1(R13–7 ↔ R13–25) *2(R13–5 ↔ R13–15)	R ↔ W–B	Constant		10 – 14 V
AUTO ↔ GND *1(R13–22 ↔ R13–25) *2(R13–17 ↔ R13–15)	L–R ↔ W–B	Auto down switch position is OFF.		Below 1 V
		Ignition switch position is ON. Auto down switch position is ON.		10 – 14 V
MUP ↔ GND * *1(R13–24 ↔ R13–25) *2(R13–10 ↔ R13–15)	L–W ↔ W–B	Ignition switch position is ON. Power window switch position	OFF	Below 1 V
			UP	10 – 14 V
MDN ↔ GND * *1(R13–23 ↔ R13–25) *2(R13–23 ↔ R13–15)	L–B ↔ W–B	Ignition switch position is ON. Power window switch position	OFF	Below 1 V
			Down	10 – 14 V
UP ↔ GND *1(R13–28 ↔ R13–25) *2(R13–28 ↔ R13–15)	R ↔ W–B	Power window (RrLH) is not operating.		Below 1 V
		Power window (RrLH) is operating upward.		10 – 14 V

Symbols (Terminals No.)	Wiring Color	Condition		STD Voltage (V)
DN ↔ GND *1(R13–26 ↔ R13–25) *2(R13–26 ↔ R13–15)	G ↔ W–B	Power window (RrLH) is not operating.		Below 1 V
		Power window (RrLH) is operating downward.		10 – 14 V
A+ ↔ GND *1(R13–13 ↔ R13–25) *2(R13–1 ↔ R13–15)	G–R ↔ W–B	Power door lock (RrLH) is not operating.		Below 1 V
		Power door lock (RrLH) is operating to unlock.		
		Power door lock (RrLH) is operating to lock.		10 – 14 V
A– ↔ GND *1(R13–1 ↔ R13–25) *2(R13–14 ↔ R13–15)	G–B ↔ W–B	Power door lock (FrLH) is not operating.		Below 1 V
		Power door lock (FrLH) is operating to lock.		
		Power door lock (FrLH) is operating to unlock.		10 – 14 V
LMT ↔ GND *1(R13–27 ↔ R13–25) *2(R13–27 ↔ R13–15)	B–W ↔ W–B	Window full–close position		10 – 14 V
		Except window full–close position		Below 1 V
PLS ↔ GND *1(R13–32 ↔ R13–25) *2(R13–32 ↔ R13–15)	Y–B ↔ W–B	During the power window is operation.		Pulse Generation
		Power window is not operated.	SW ON	Below 1 V
			SW OFF	10 – 14 V
PCTI ↔ GND *1(R13–11 ↔ R13–25) *2(R13–20 ↔ R13–15)	Y–B ↔ W–B	Window lock switch position*	UNLOCK	Below 1 V
			LOCK	10 –14 V
PCTO ↔ GND *1(R13–10 ↔ R13–25) *2(R13–10 ↔ R13–15)	W–G ↔ W–B	Window lock switch position*	UNLOCK	Below 1 V
			LOCK	10 – 14 V
*2 A1+ ↔ GND (R14–13 ↔ R14–15)	GR ↔ W–B	Rear RH door double lock is not operating.		Below 1 V
		Rear RH door double lock is not operating to set		10 – 14 V
		Rear RH door double lock is not operating to unset		Below 1V
*2 A1– ↔ GND (R14–25 ↔ R14–15)	G–B ↔ W–B	Rear RH door double lock is not operating		Below 1 V
		Rear RH door double lock is not operating to set		Below 1V
		Rear RH door double lock is not operating to unset		10 – 14 V
*2 DBLS ↔ LSWE (R14–9 ↔ R14–24)	W ↔ BR–B	Rear RH door double lock is set		Below 1 V
		Rear RH door double lock is unset		10 – 14 V
MPX1 *1(R13–5) *2(R13–4)		Multiplex communication circuit		–
MPX2 *1(R13–4) *2(R13–7)		Multiplex communication circuit		–

*: Power window master switch
*1: w/o Double locking system
*2: w/ Double locking system

DI2FI–05

PROBLEM SYMPTOMS TABLE

DOUBLE LOCKING SYSTEM

Symptom	Suspect Area	See page
Double locking system does not operate	1. Double locking switch circuit 2. Double locking motor circuit 3. Double locking system 4. Rear left door ECU	DI–708

DI2T4–02

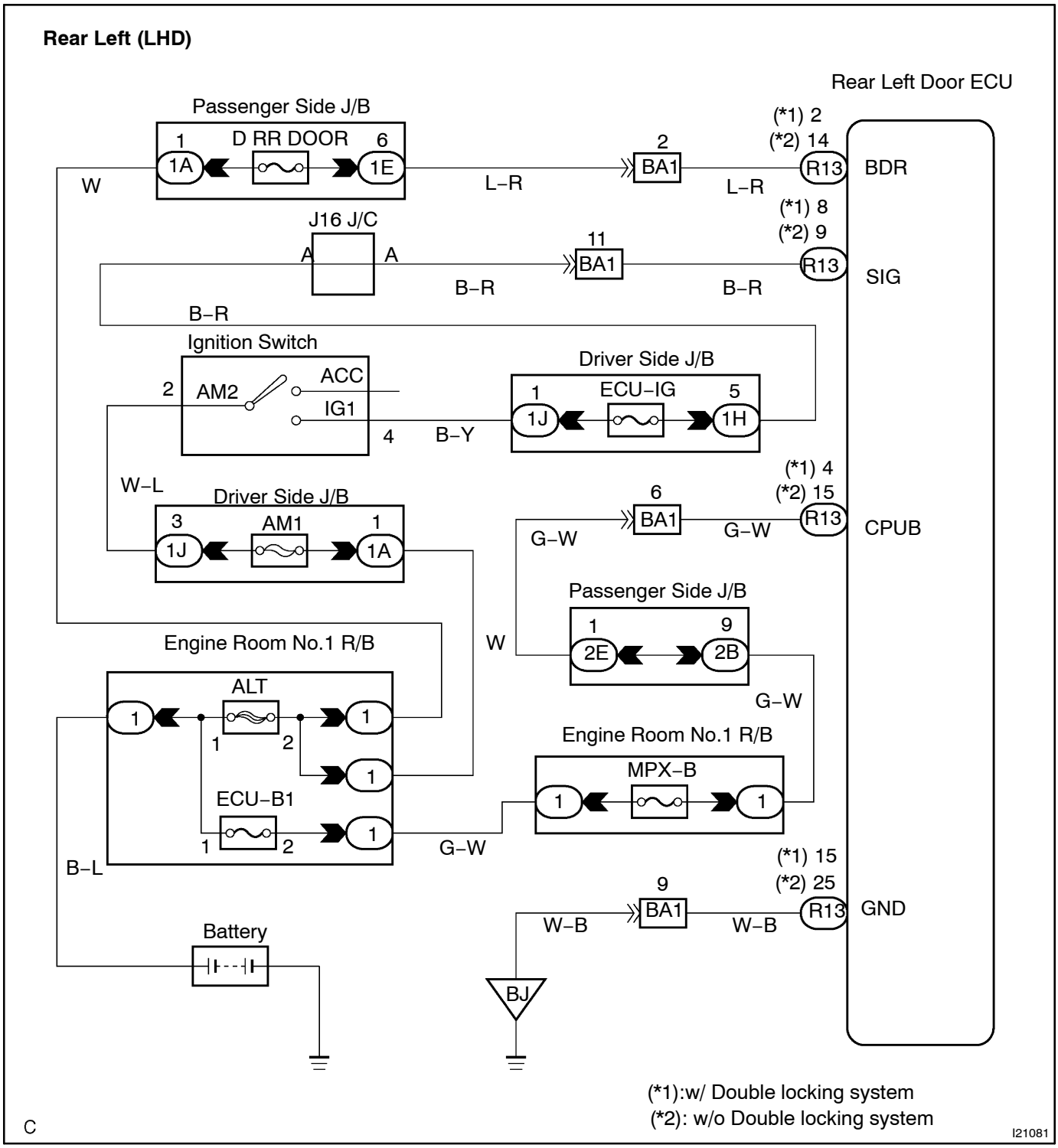
CIRCUIT INSPECTION

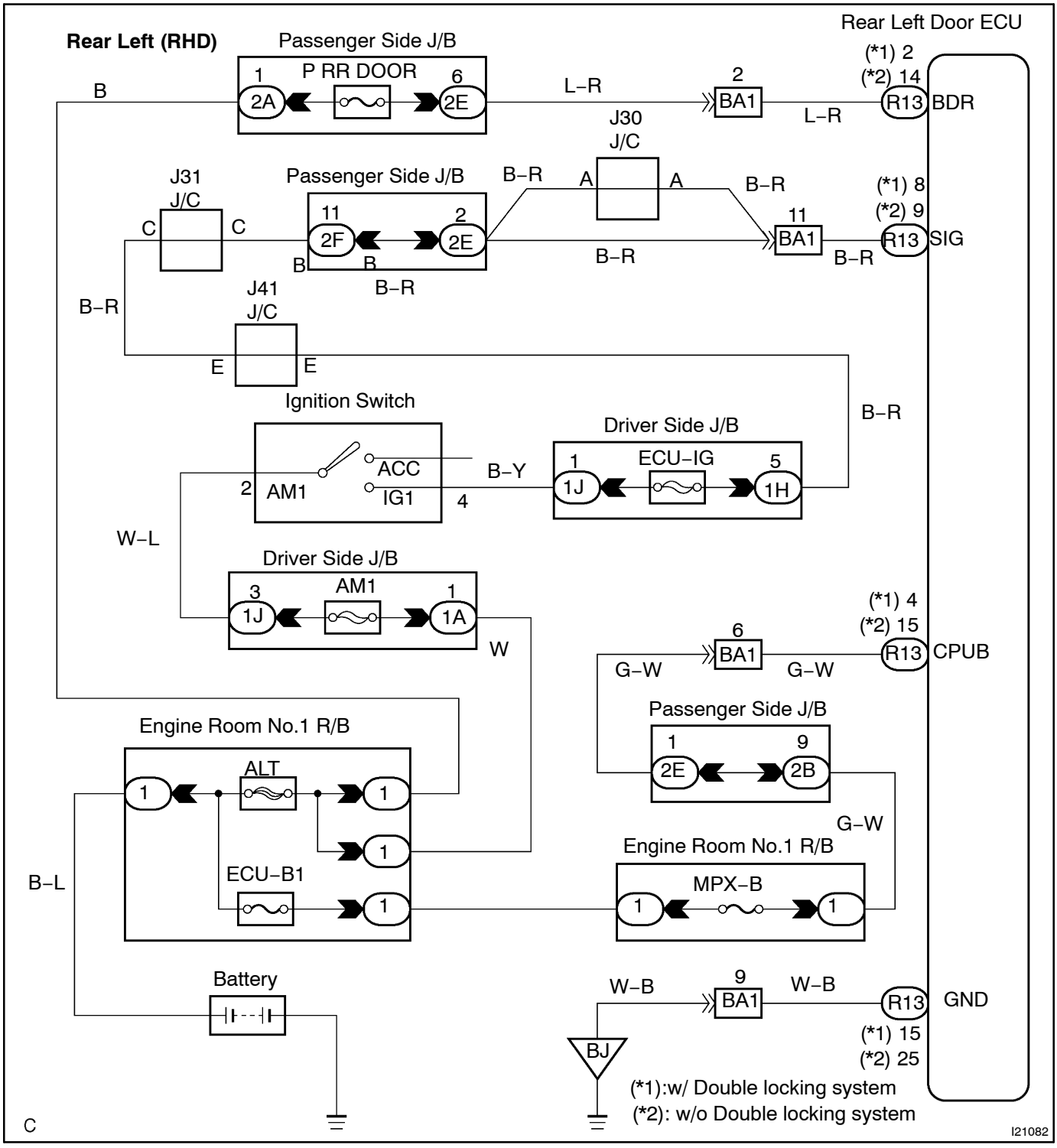
Power source circuit

CIRCUIT DESCRIPTION

This circuit provides power to operate the rear left door ECU.

WIRING DIAGRAM

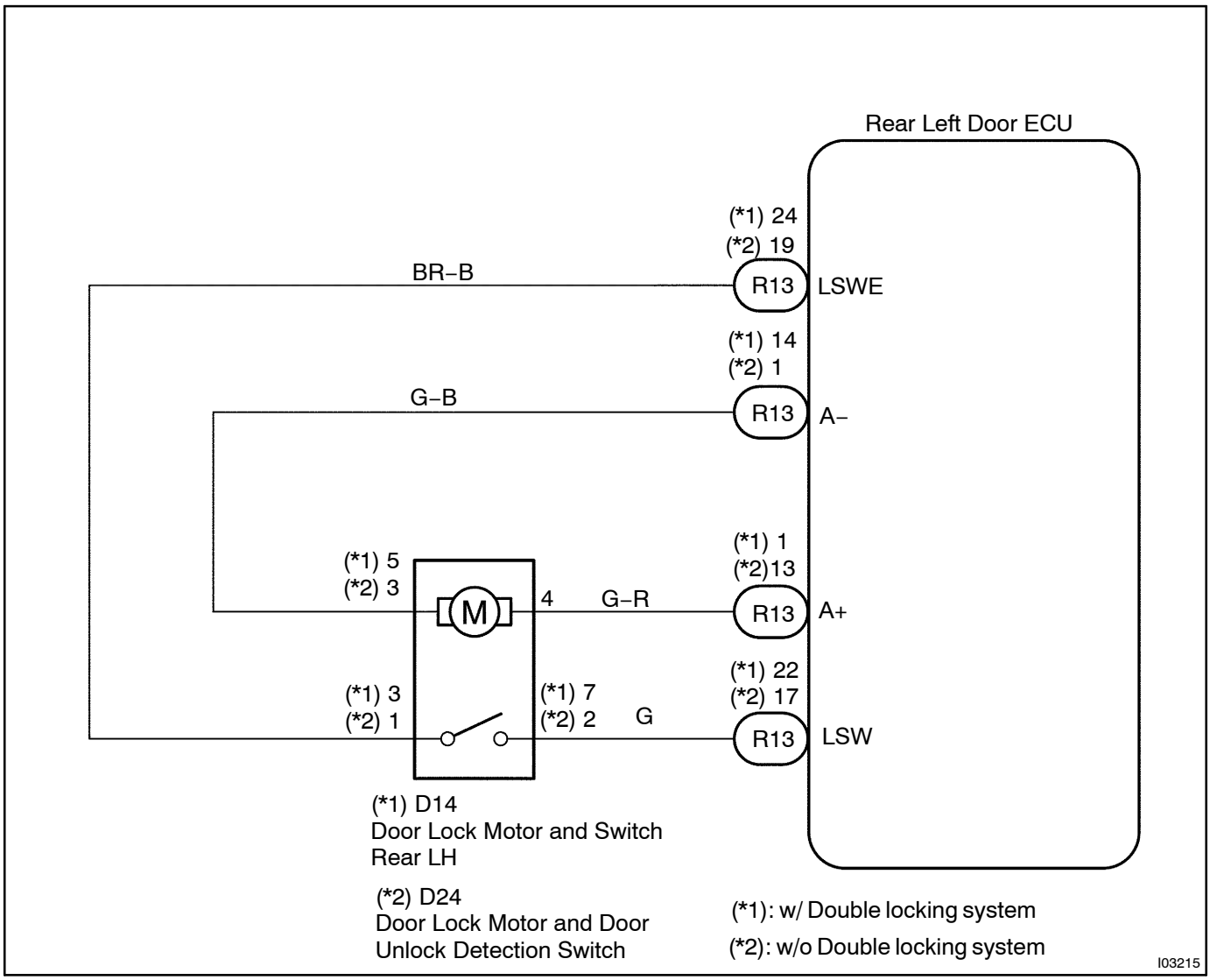



Rear Left (RHD)
Passenger Side J/B
P RR DOOR
Rear Left Door ECU
(*1) 2
(*2) 14
R13
BDR
B
L–R
BA1
J30
J/C
J31
J/C
Passenger Side J/B
B–R
(*1) 8
(*2) 9
SIG
2F
2E
J41
J/C
Ignition Switch
ACC
IG1
AM1
B–Y
Driver Side J/B
ECU–IG
1J
1H
W–L
W
(*1) 4
(*2) 15
CPUB
G–W
Engine Room No.1 R/B
ALT
ECU–B1
2B
MPX–B
B–L
Battery
W–B
GND
(*1) 15
(*2) 25
BJ
(*1):w/ Double locking system
(*2): w/o Double locking system
I21082

DI2FD–07

Door lock motor circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check door lock motor (w/o double locking system: See Pub. No. RM588E on page BE–148 w/ double locking system: See page BE–12).

NG → Replace the door lock motor.

OK

2	Check wireharness and connector between door lock motor and rear left door ECU.

NG → Repair or replace wireharness or connector.

OK

Proceed to next circuit inspection shown on problem symptom table (See Pub. No. RM588E on page DI–616).

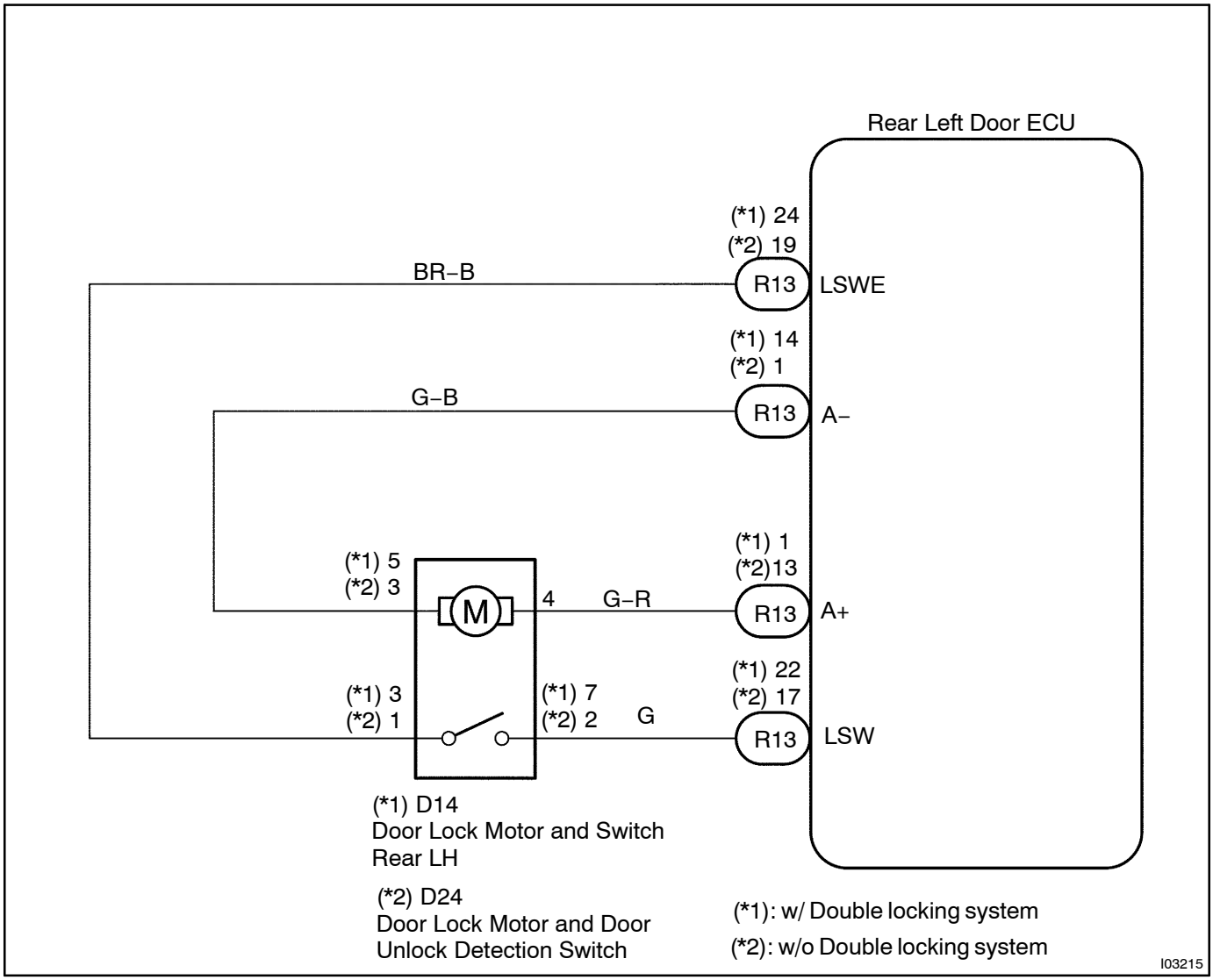
DI2FE–07

Door unlock detection switch

CIRCUIT DESCRIPTION

The door unlock detection switch is built in the door lock motor assembly. This switch is ON when the door lock knob is in the unlock position and OFF when the lock knob is in the lock position. The ECU detects the door lock knob conditions is this circuit. It is used as one of the operating conditions for the key confinement prevention function.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check door unlock detection switch (w/o double locking system: See Pub. No. RM588E on page BE–148 w/ double locking system: See page BE–12).

NG → Replace the door lock motor.

OK

2	Check wireharness and connector between door unlock detection switch and driver door ECU.

NG → Repair or replace wireharness or connector.

OK

Proceed to next circuit inspection shown on problem symptom table (See Pub. No. RM588E on page DI–616).

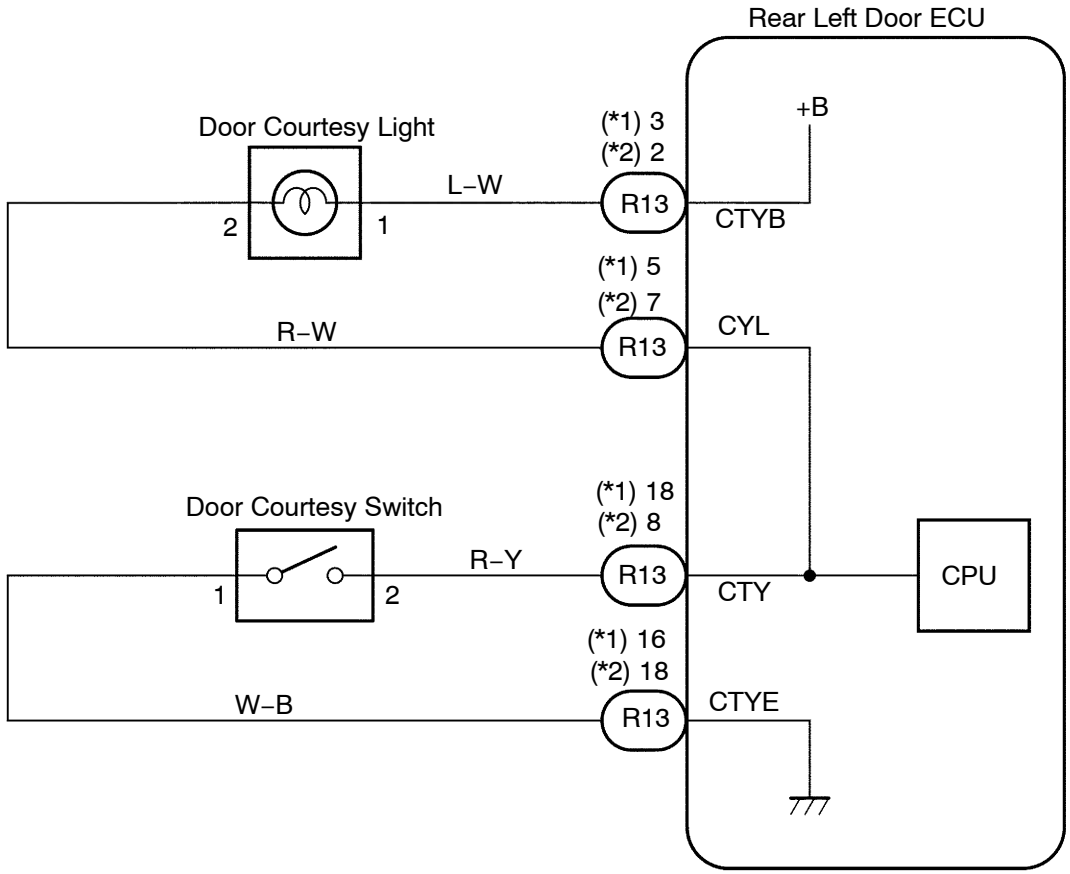
DI2FF–07

Door courtesy light and courtesy switch circuit

CIRCUIT DESCRIPTION

The door courtesy switch goes on when the door is opened and goes off when door is closed.

WIRING DIAGRAM



(*1): w/ Double locking system
(*2): w/o Double locking system

I03216

INSPECTION PROCEDURE

1	**Check operation of door courtesy light.**

CHECK:
Check that door courtesy light comes on when door opened, and goes off when door is closed.
OK:
Must be operated normally.

OK → **Proceed to next circuit inspection shown on problem symptom table (See Pub. No. RM588E on page DI–616).**

NG

2	**Check courtesy light. (See Pub. No. RM588E on page BE–66)**

NG → **Replace the courtesy light.**

OK

3	**Check courtesy switch. (See page BE–3)**

NG → **Replace the courtesy switch.**

OK

4	**Check wireharness and connector between courtesy light and rear left door ECU, courtesy switch and rear left door ECU.**

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

OK

Proceed to next circuit inspection shown on problem symptoms table (See Pub. No. RM588E on page DI–616).

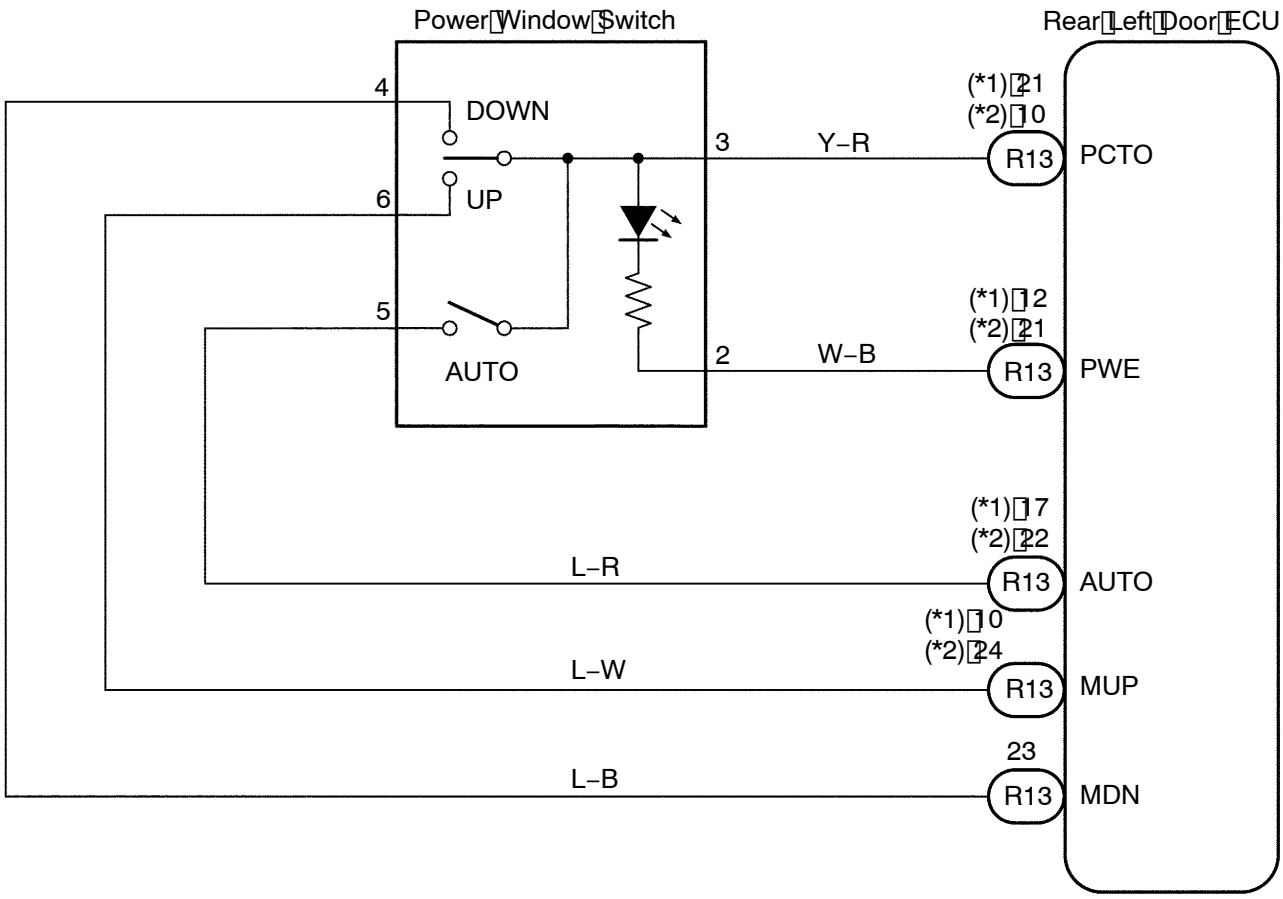
DI2FG–07

Power window switch circuit

CIRCUIT DESCRIPTION

Power window switch circuit can be checked using DTC check. (Refer to DI–769)

WIRING DIAGRAM



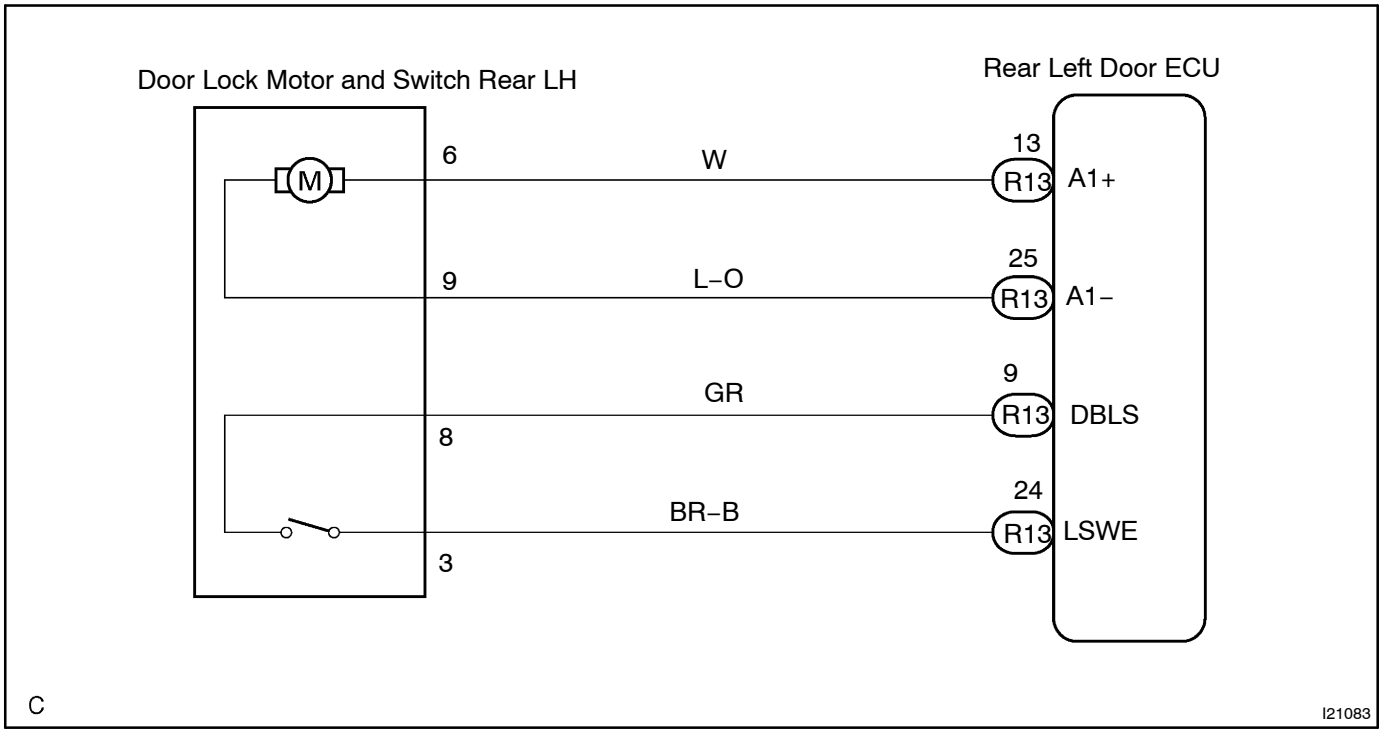
DI6UB–04

Double lock switch circuit (Europe)

CIRCUIT DESCRIPTION

The double lock detection switch is built in the door lock motor assembly. This switch is ON when the double lock is in the unlock position and OFF when the double lock is in the double lock position. The ECU detects the double lock conditions is this circuit.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check double lock switch (See page BE–18).

NG → Replace the double lock switch.

OK

2	Check wireharness and connector between double lock switch and rear left door ECU.

NG → Repair or replace wireharness or connector.

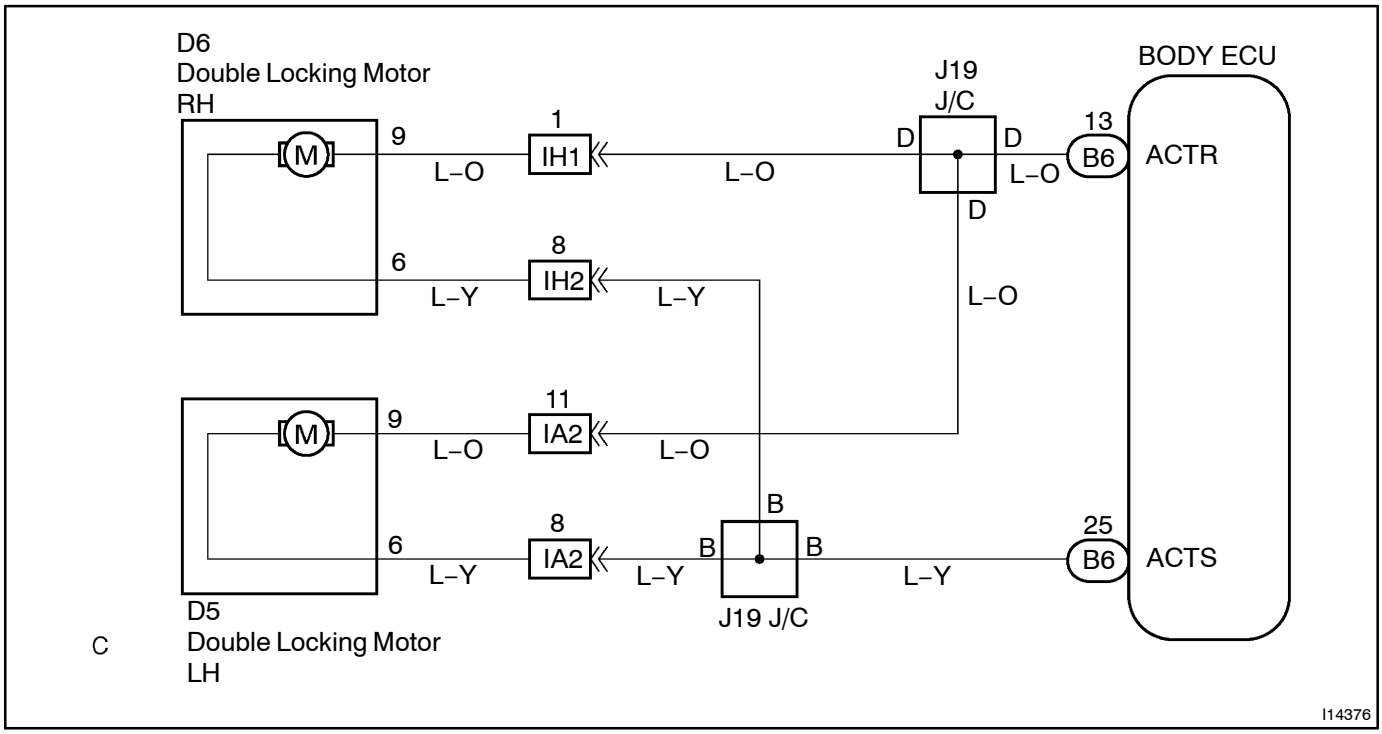
OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI–604).

DI6UA–05

Double lock motor circuit (Europe)

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check double lock motor (See page BE-18).

NG → Replace the double lock motor.

OK

2	Check wire harness and connector between double lock motor and rear left door ECU (See page IN-30).

NG → Repair or replace wire harness or connector.

OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI-697).

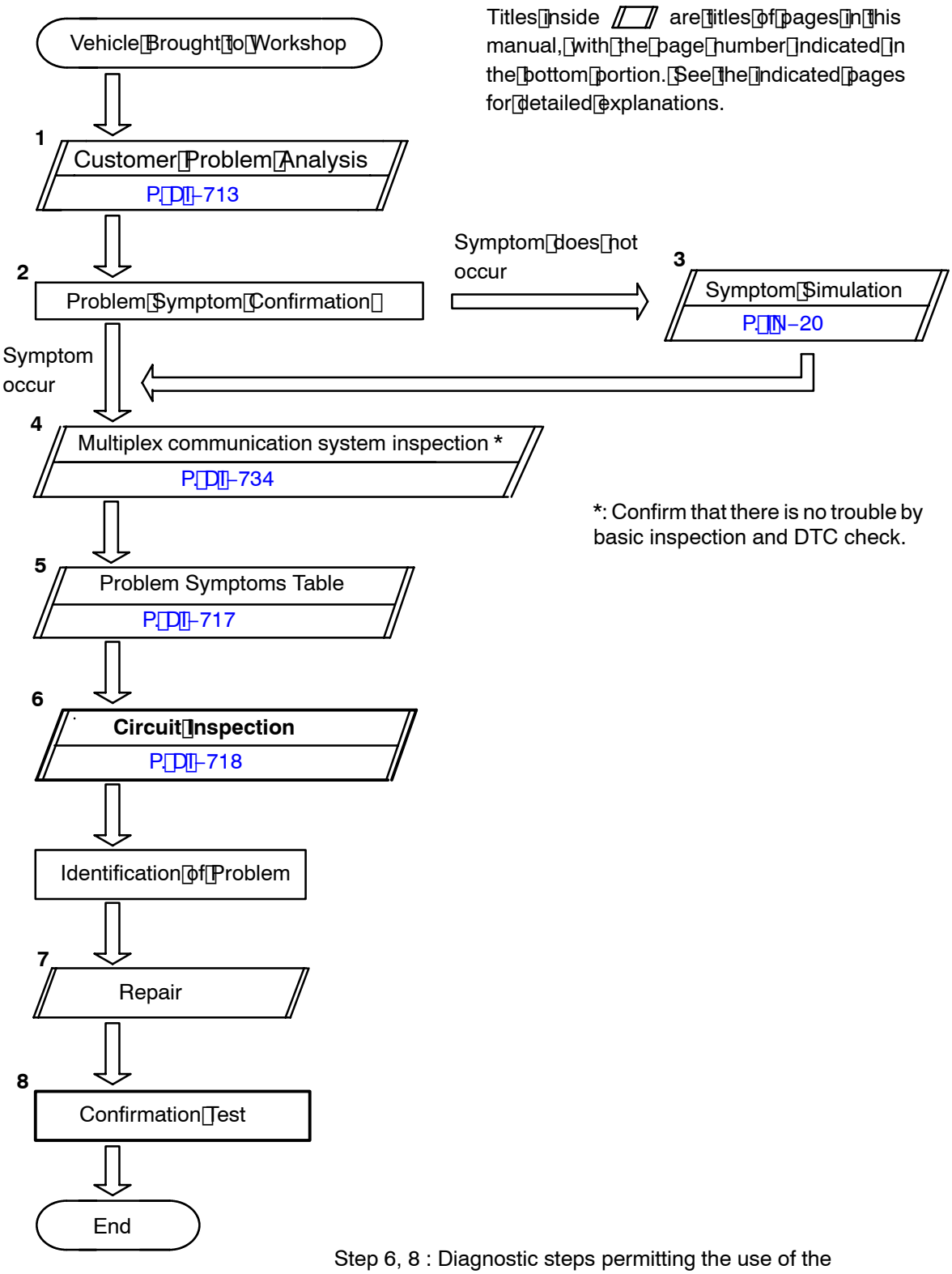
REAR RIGHT DOOR CONTROL SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

DI2FO–02

HINT:

This ECU is connected to the multiplex communication system. Therefore, be sure to check that there is no troubles in the multiplex communication system before performing the troubleshooting.



Step 6, 8 : Diagnostic steps permitting the use of the LEXUS hand–held tester.

DI2FQ–08

CUSTOMER PROBLEM ANALYSIS CHECK

REAR RIGHT DOOR CONTROL SYSTEM Check Sheet

Inspector's name: _____

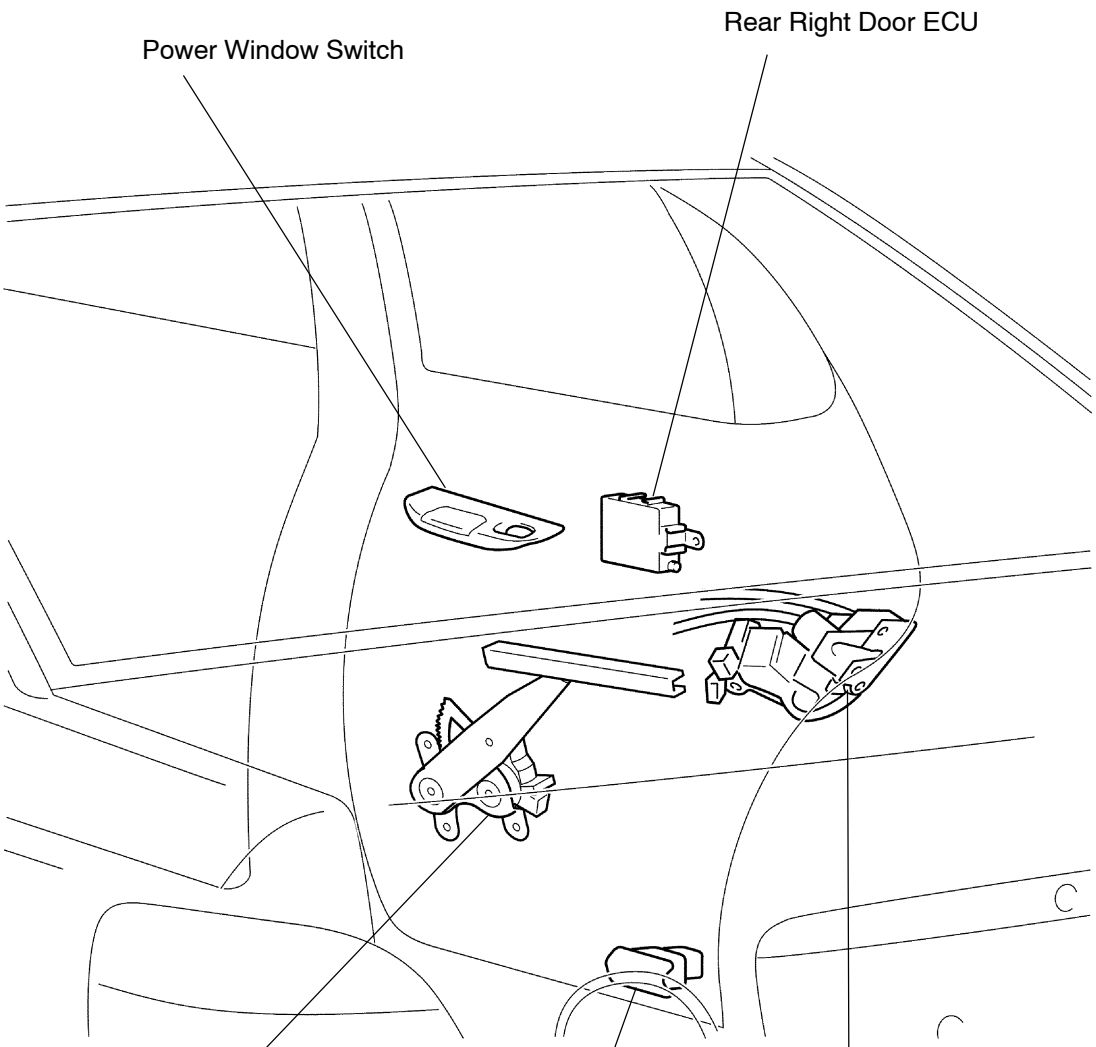
Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date Vehicle Brought in	/ /	**Odometer Reading**	**km Mile**

Date Problem First Occurred		/ /
Frequency Problem Occurs		☐ Constant ☐ Sometimes (times per day, month) ☐ Once only
Weather Conditions When Problem Occurred	**Weather**	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/ Others
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (Approx. °F (°C))

Malfunction System	☐ Power Window Control System
	☐ Power Door Lock Control System
	☐ Theft Deterrent System
	☐ Jam Protection System
	☐ Double Locking System
	☐ Others

DI2EU-07

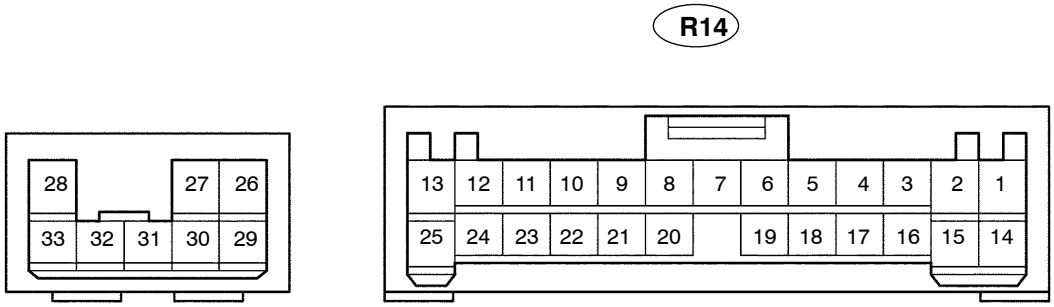
PARTS LOCATION



DI2FR–08

TERMINALS OF ECU

REAR RIGHT DOOR ECU



I03226

Symbols (Terminals No.)	Wiring Color	Condition		STD Voltage (V)
CPUB ↔ GND *1(R14–15 ↔ R14–25) *2(R14–4 ↔ R14–15)	G–W ↔ W–B	Constant		10 – 14 V
BDR ↔ GND *1(R14–14 ↔ R14–25) *2(R14–2 ↔ R14–15)	L–R ↔ W–B	Constant		10 – 14 V
SIG ↔ GND *1(R14–9 ↔ R14–25) *2(R14–8 ↔ R14–15)	B–R ↔ W–B	Constant		10 – 14 V
CTYB ↔ GND *1(R14–2 ↔ R14–25) *2(R14–3 ↔ R14–15)	L–W ↔ W–B	Constant		10 – 14 V
GND ↔ Body Ground *1(R14–25 ↔ Body Ground) *2(R14–15 ↔ Body Ground)	W–B ↔ Body Ground	Constant		Below 1 V
CTY ↔ GND *1(R14–8 ↔ R14–25) *2(R14–18 ↔ R14–15)	R–Y ↔ W–B	Rear right door closed.		10 – 14 V
		Rear right door opened.		Below 1 V
CYL ↔ GND *1(R14–7 ↔ R14–25) *2(R14–5 ↔ R14–15)	R–W ↔ W–B	Constant		10 – 14 V
AUTO ↔ GND *1(R14–22 ↔ R14–25) *2(R14–17 ↔ R14–15)	L–R ↔ W–B	Auto down switch position is OFF.		Below 1 V
		Ignition switch position is ON. Auto down switch position is ON.		10 – 14 V
MUP ↔ GND *1(R14–24 ↔ R14–25)* 2(R14–10 ↔ R14–15)	L–W ↔ W–B	Ignition switch position is ON. Power window switch position	OFF	Below 1 V
			UP	10 – 14 V
MDN ↔ GND *1(R14–23 ↔ R14–25) *2(R14–23 ↔ R14–15)	L–B ↔ W–B	Ignition switch position is ON. Power window switch position	OFF	Below 1 V
			Down	10 – 14 V
UP ↔ GND (R14–28 ↔ R14–25)	R ↔ W–B	Power window (FrRH) is not operating.		Below 1 V
		Power window (FrRH) is operating upward.		10 – 14 V

Symbols (Terminals No.)	Wiring Color	Condition		STD Voltage (V)
DN ↔ GND *1(R14–26 ↔ R14–25) *2(R14–26 ↔ R14–15)	G ↔ W–B	Power window (FrRH) is not operating.		Below 1 V
		Power window (FrRH) is operating downward.		10 – 14 V
A+ ↔ GND *1(R14–13 ↔ R14–25) *2(R14–1 ↔ R14–15)	G–R ↔ W–B	Power door lock (FrRH) is not operating.		Below 1 V
		Power door lock (FrRH) is operating to unlock.		
		Power door lock (FrRH) is operating to lock.		10 – 14 V
A– ↔ GND *1(R14–1 ↔ R14–25) *2(R14–14 ↔ R14–15)	G–B ↔ W–B	Power door lock (FrRH) is not operating.		Below 1 V
		Power door lock (FrRH) is operating to lock.		
		Power door lock (FrRH) is operating to unlock.		10 – 14 V
LMT ↔ GND *1(R14–27 ↔ R14–25) *2(R14–27 ↔ R14–15)	B–W ↔ W–B	Window full–close position		10 – 14 V
		Except window full–close position		Below 1 V
PLS ↔ GND *1(R14–32 ↔ R14–25) *2(R14–32 ↔ R14–15)	Y–B ↔ W–B	During the power window is operation.		Pulse Generation
		Power window is not operated.	SW ON	Below 1 V
			SW OFF	10 – 14 V
PCTI ↔ GND *1(R14–11 ↔ R14–25) *2(R14–20 ↔ R14–15)	Y ↔ W–B	Window lock switch position*	UNLOCK	Below 1 V
			LOCK	10 –14 V
PCTO ↔ GND *1(R14–10 ↔ R14–25) *2(R14–10 ↔ R14–15)	Y–R ↔ W–B	Window lock switch position*	UNLOCK	Below 1 V
			LOCK	10 – 14 V
*2 A1+ ↔ GND (R14–13 ↔ R14–15)	G–R ↔ W–B	Rear RH door double lock is not operating.		Below 1 V
		Rear RH door double lock is not operating to set		10 – 14 V
		Rear RH door double lock is not operating to unset		Below 1V
*2 A1– ↔ GND (R14–25 ↔ R14–15)	G–B ↔ W–B	Rear RH door double lock is not operating		Below 1 V
		Rear RH door double lock is not operating to set		Below 1V
		Rear RH door double lock is not operating to unset		10 – 14 V
*2 DBLS ↔ LSWE (R14–9 ↔ R14–24)	W ↔ BR–B	Rear RH door double lock is set		Below 1 V
		Rear RH door double lock is unset		10 – 14 V
MPX1 *1(R14–6) *2(R14–5)		Multiplex communication circuit		–
MPX2 *1(R14–7) *2(R14–4)		Multiplex communication circuit		–

*: Power window master switch
(*1): w/o double locking
(*2): w/ double locking

DI2FP–05

PROBLEM SYMPTOMS TABLE

DOUBLE LOCKING SYSTEM

Symptom	Suspect Area	See page
Double locking system does not operate	1. Double locking switch circuit	DI–728
	2. Double locking motor circuit	DI–730
	3. Double locking system	BE–18
	4. Rear left door ECU	IN–30

DI2T5–02

CIRCUIT INSPECTION

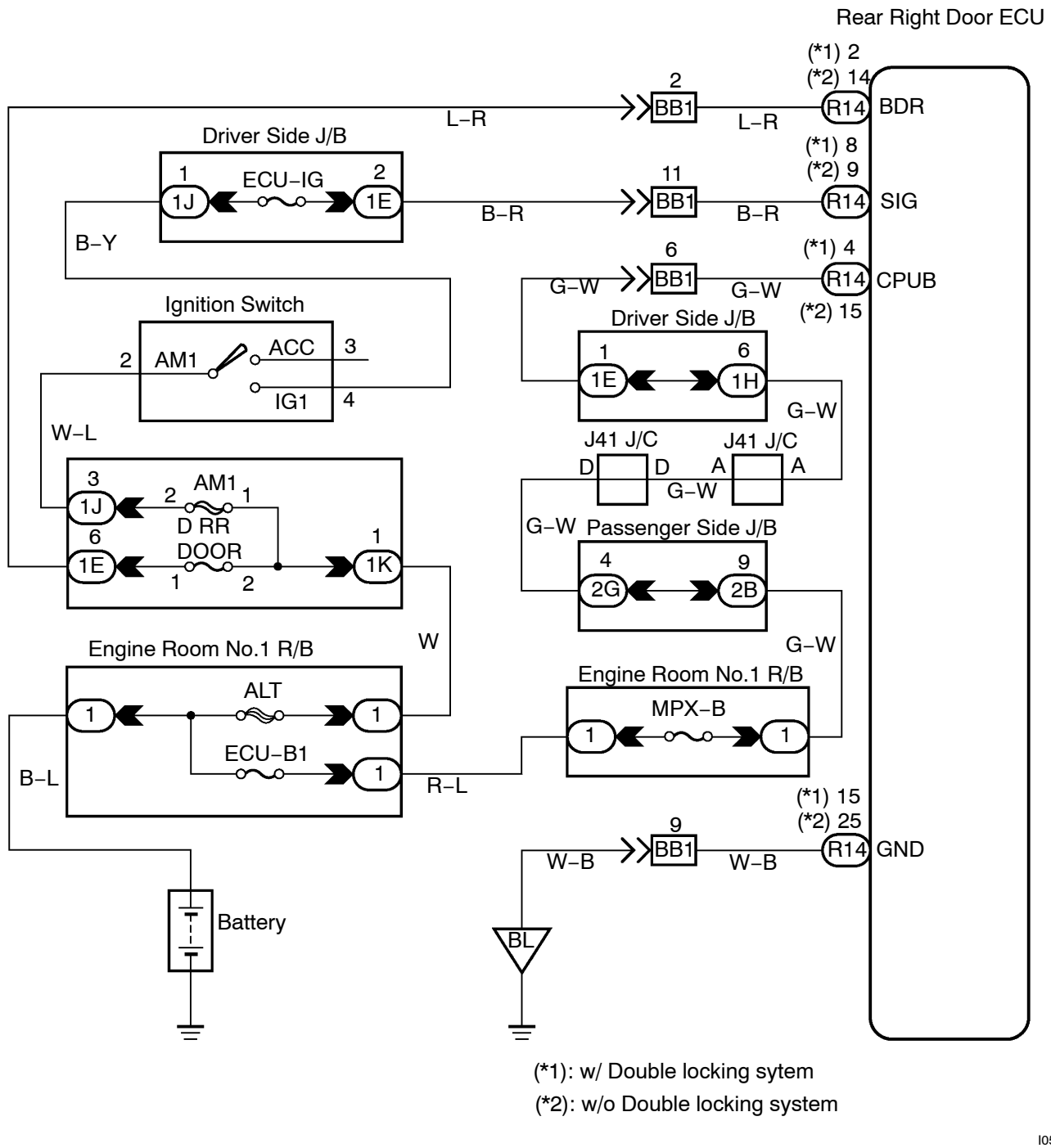
Power source circuit

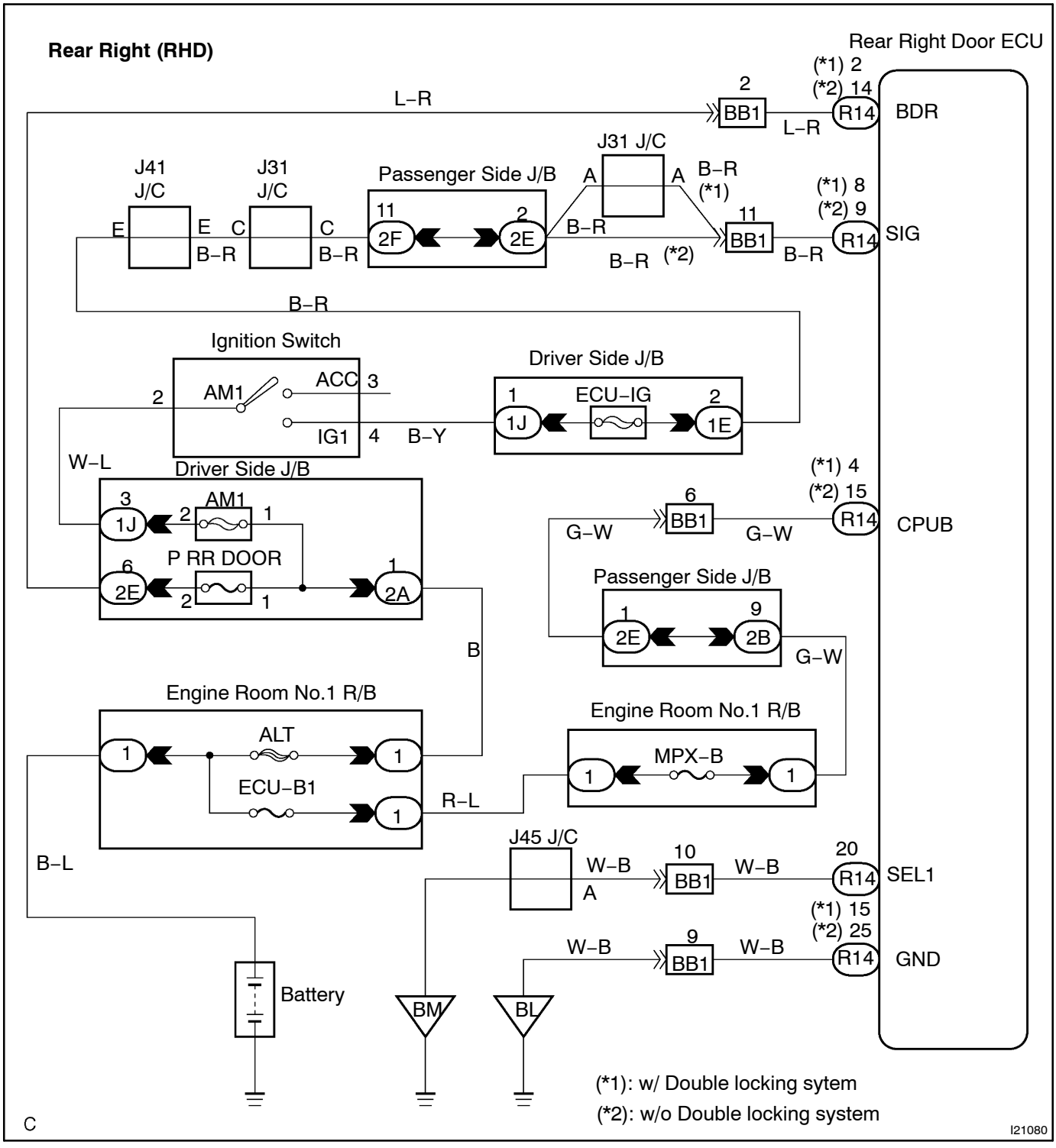
CIRCUIT DESCRIPTION

This circuit provides power to operate the rear right door ECU.

WIRING DIAGRAM

Rear Right (LHD)

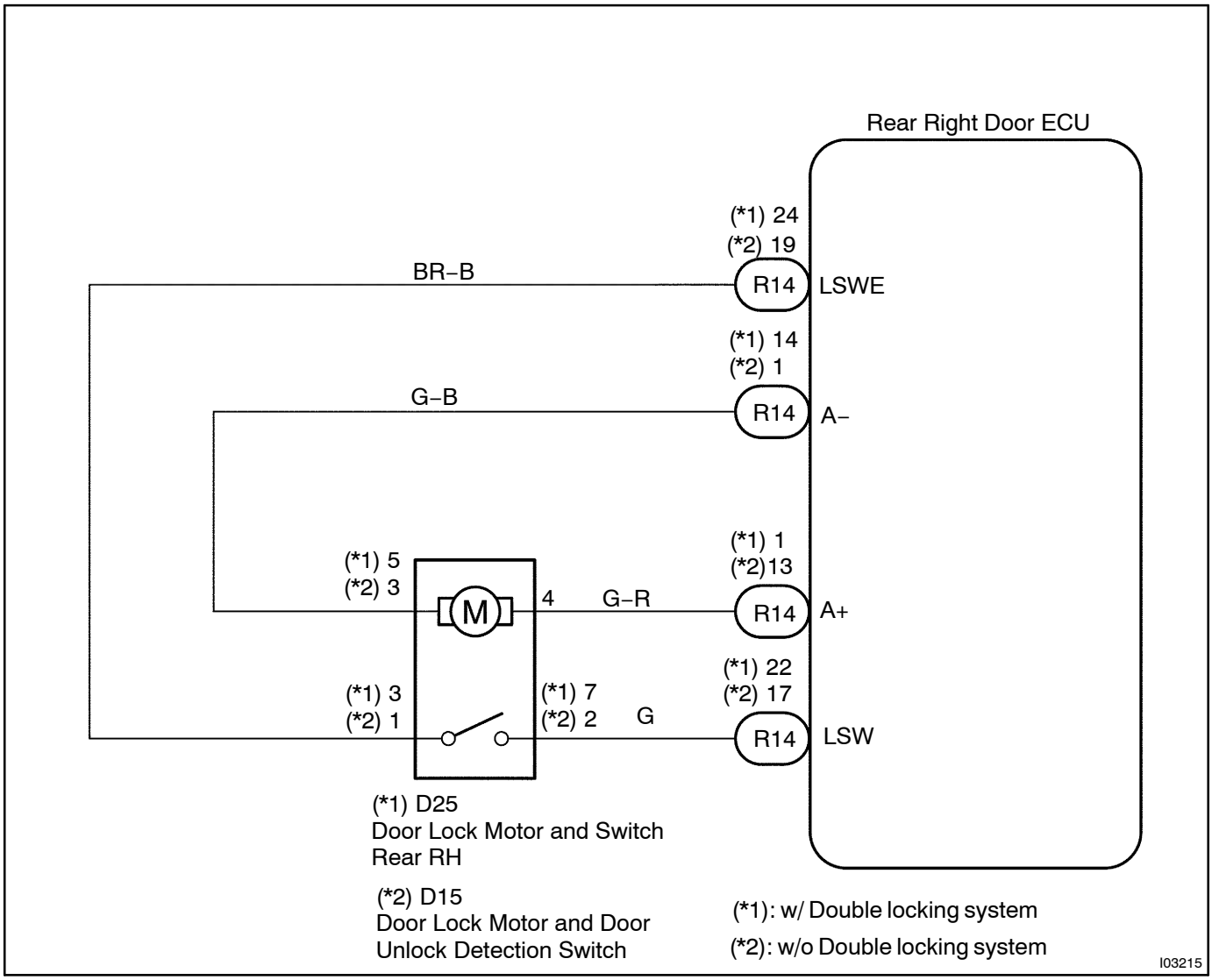



Rear Right (RHD)
Rear Right Door ECU
(*1) 2
(*2) 14
BDR
L–R
2
BB1
R14
J31 J/C
J41 J/C
J31 J/C
Passenger Side J/B
A
B–R
(*1)
(*1) 8
(*2) 9
SIG
11
2F
2E
11
BB1
R14
B–R
(*2)
B–R
B–R
Ignition Switch
Driver Side J/B
AM1
ACC
3
2
IG1
4
B–Y
1
ECU–IG
2
1J
1E
W–L
Driver Side J/B
(*1) 4
(*2) 15
CPUB
3
AM1
1J
2
1
6
BB1
R14
G–W
G–W
P RR DOOR
6
2E
2
1
1
2A
Passenger Side J/B
1
9
2E
2B
G–W
B
Engine Room No.1 R/B
Engine Room No.1 R/B
ALT
MPX–B
1
1
1
1
ECU–B1
1
1
R–L
J45 J/C
B–L
W–B
10
BB1
W–B
20
R14
SEL1
A
(*1) 15
(*2) 25
W–B
9
BB1
W–B
R14
GND
Battery
BM
BL
(*1): w/ Double locking sytem
(*2): w/o Double locking system
C
I21080

DI2FK–07

Door lock motor circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check door lock motor. (w/o double locking system: See Pub. No. RM588E on page BE–148 w/ double locking system: See page BE–12)

NG → Replace the door lock motor.

OK

2	Check wireharness and connector between door lock motor and rear right door ECU.

NG → Repair or replace wireharness or connector.

OK

Proceed to next circuit inspection shown on problem symptom table (See Pub. No. RM588E on page DI–616).

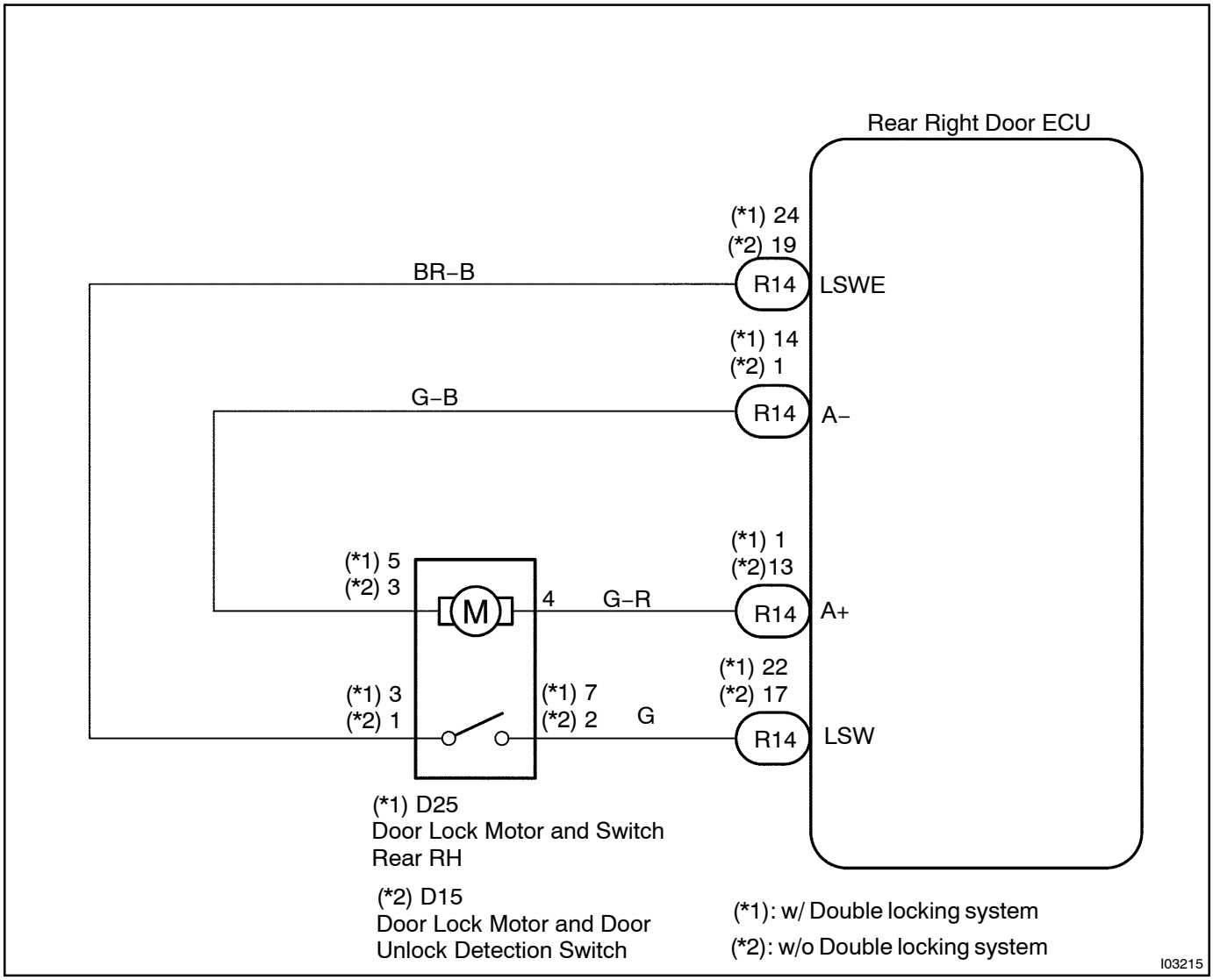
DI2FL–07

Door unlock detectin switch

CIRCUIT DESCRIPTION

The door unlock detection switch is built in the door lock motor assembly. This switch is ON when the door lock knob is in the unlock position and OFF when the lock knob is in the lock position. The ECU detects the door lock knob conditions is this circuit. It is used as one of the operating conditions for the key confinement prevention function.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check door unlock detection switch. (w/o Double locking system: See Pub. No. RM588E on page BE–148 w/ Double locking system: See page BE–12)

NG → Replace the door lock motor.

OK

2	Check wireharness and connector between door unlock detection switch and driver door ECU.

NG → Repair or replace wireharness or connector.

OK

Proceed to next circuit inspection shown on problem symptom table. (See Pub. No. RM588E on page DI–616)

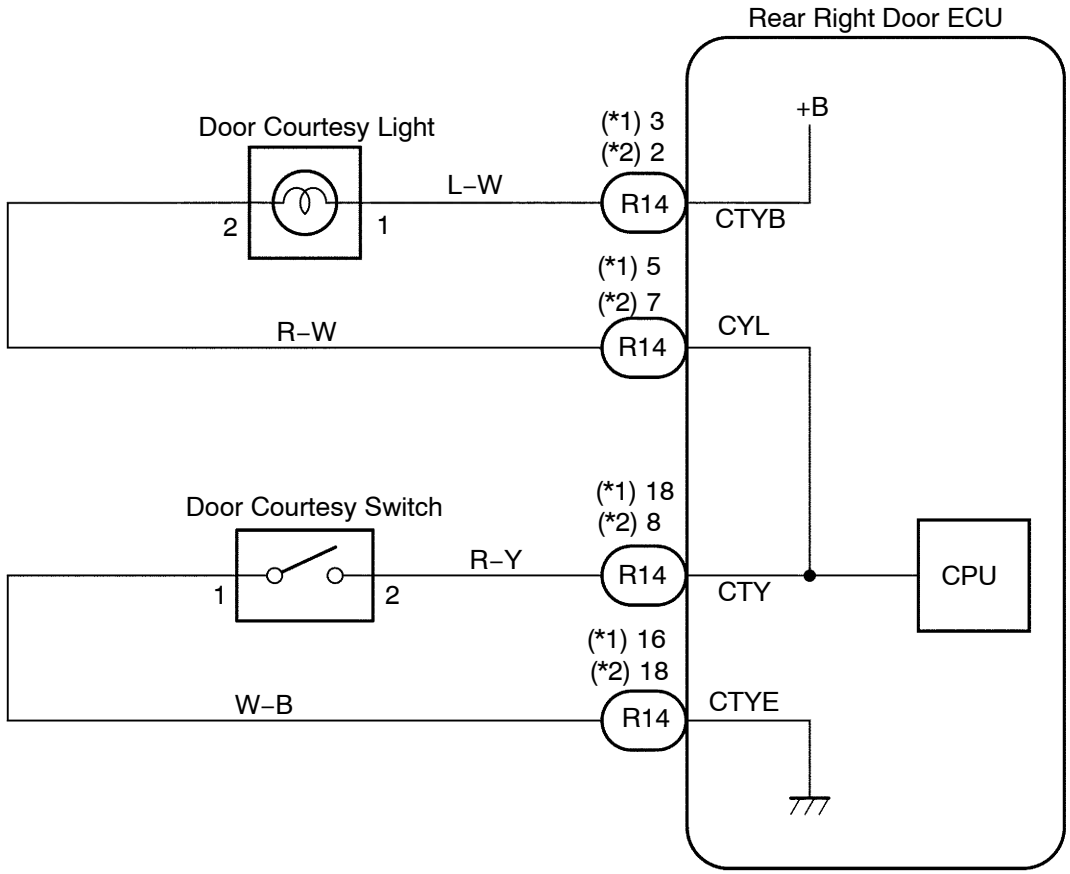
DI2FM–07

Door courtesy light and courtesy switch circuit

CIRCUIT DESCRIPTION

The door courtesy switch goes on when the door is opened and goes off when door is closed.

WIRING DIAGRAM



(*1): w/ Double locking system
(*2) w/o Double locking system

I03216

INSPECTION PROCEDURE

1	Check operation of door courtesy light.

CHECK:

Check that door courtesy light comes on when door opened, and goes off when door is closed.

OK:

Must be operated normally.

OK → Proceed to next circuit inspection shown on problem symptom table (See Pub. No. RM588E on page DI–616).

NG

2	Check courtesy light. (See Pub. No. RM588E on page BE–66)

NG → Replace the courtesy light.

OK

3	Check courtesy switch. (See page BE–3)

NG → Replace the courtesy switch.

OK

4	**Check wireharness and connector between courtesy light and rear right door ECU, courtesy switch and rear right door ECU.**

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

OK

Proceed to next circuit inspection shown on problem symptoms table (See Pub. No. RM588E on page DI–616).

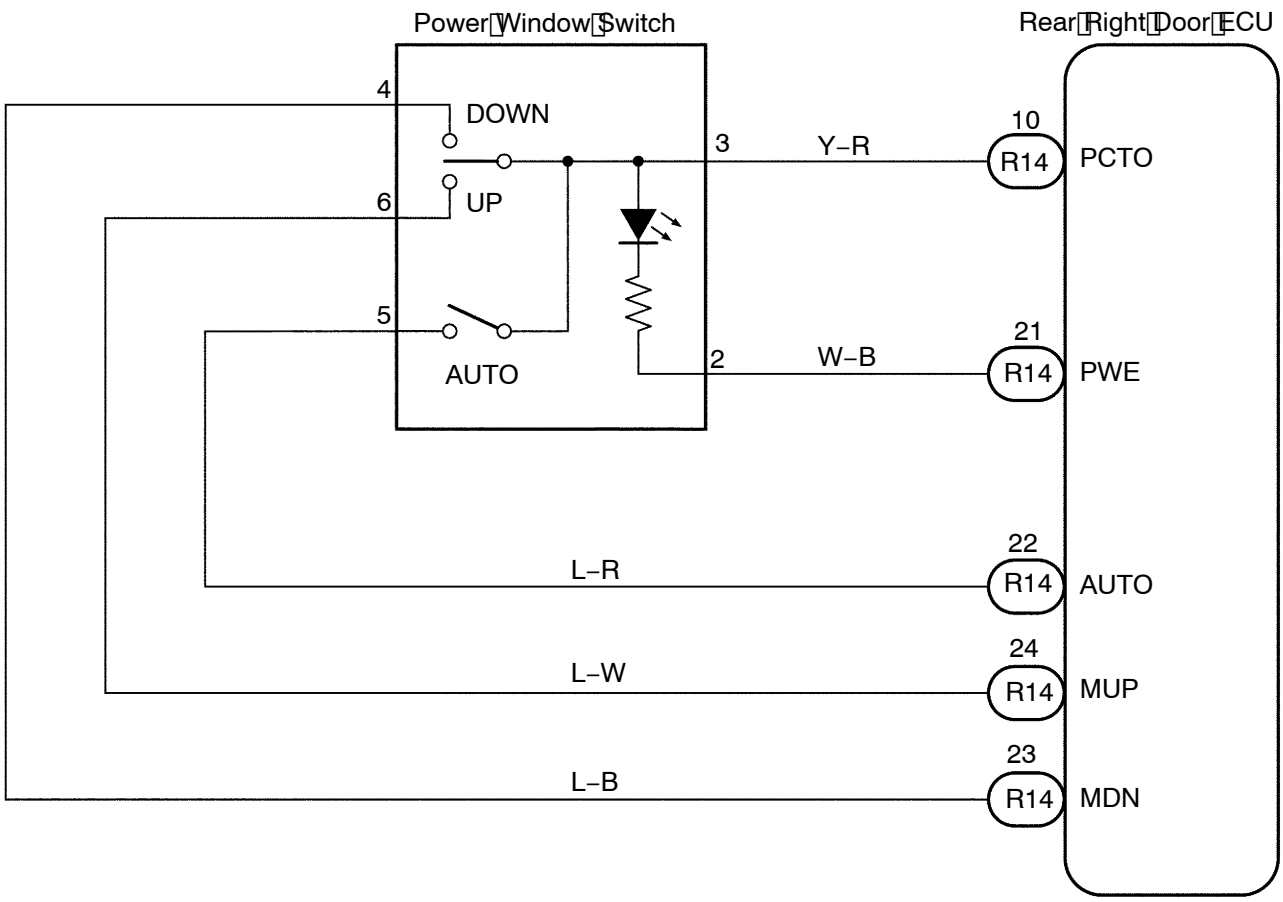
DI2FN–07

Power window switch circuit

CIRCUIT DESCRIPTION

Power window switch circuit can be checked using DTC check. (Refer to DI–769)

WIRING DIAGRAM



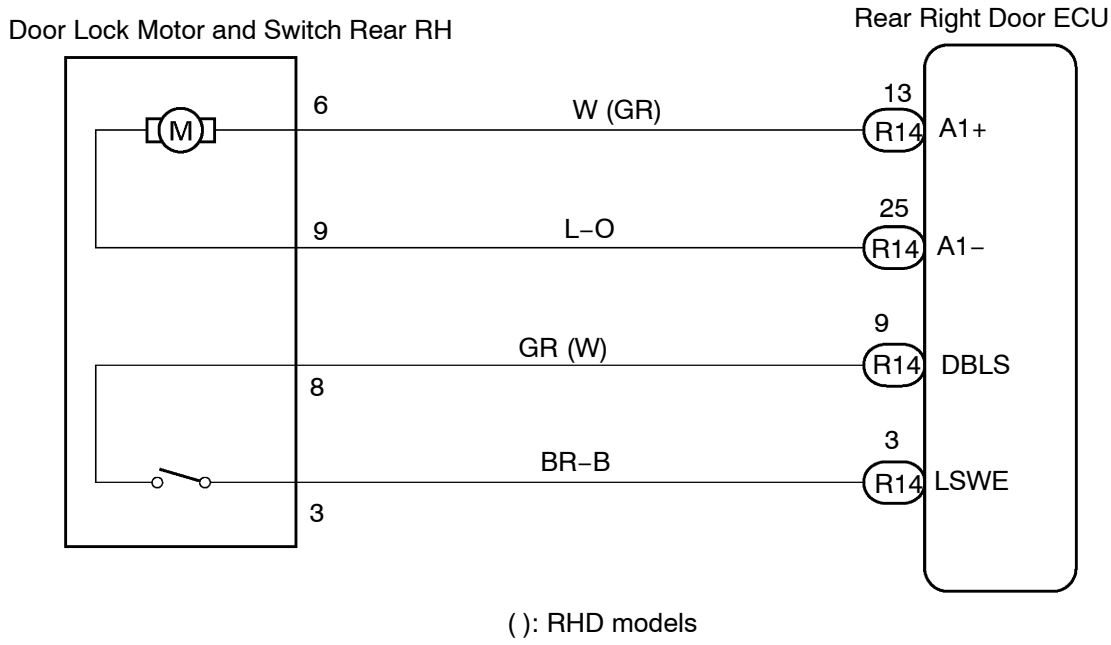
DI6UB–03

Double lock switch circuit (Europe)

CIRCUIT DESCRIPTION

The double lock detection switch is built in the door lock motor assembly. This switch is ON when the double lock is in the unlock position and OFF when the double lock is in the double lock position. The ECU detects the double lock conditions is this circuit.

WIRING DIAGRAM



C

I21083

INSPECTION PROCEDURE

1	Check double lock switch (See page BE–18).

NG → Replace the double lock switch.

OK

2	Check wireharness and connector between double lock switch and body ECU.

NG → Repair or replace wireharness or connector.

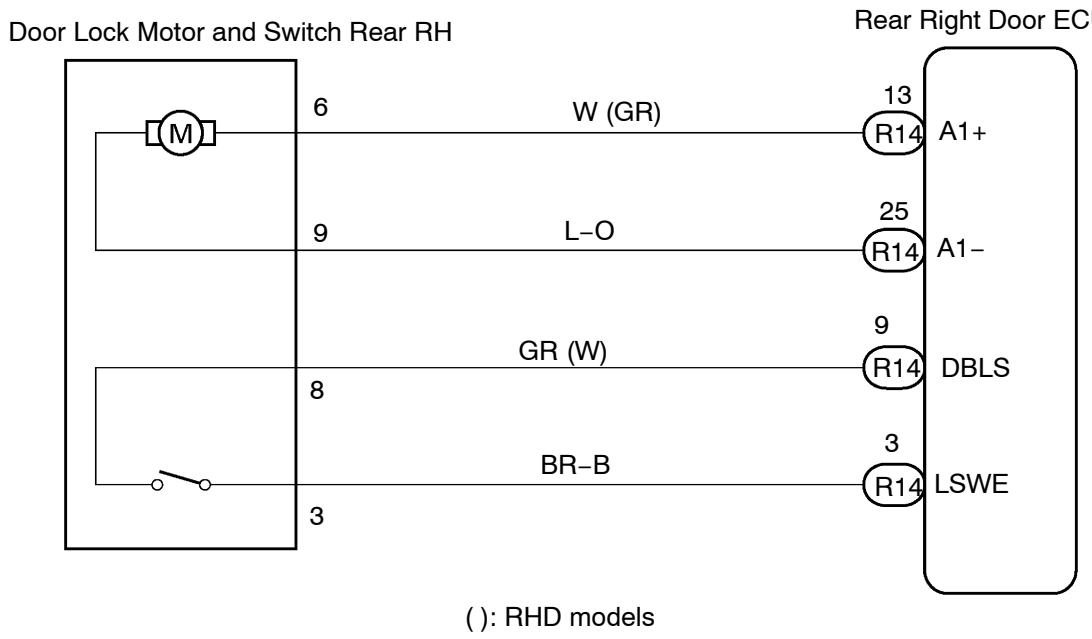
OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI–604).

DI6UA–03

Double lock motor circuit (Europe)

WIRING DIAGRAM



C

I21083

INSPECTION PROCEDURE

1	Check double lock motor (See page BE–18).

NG → Replace the double lock motor.

OK

2	Check wireharness and connector between double lock motor and body ECU.

NG → Repair or replace wireharness or connector.

OK

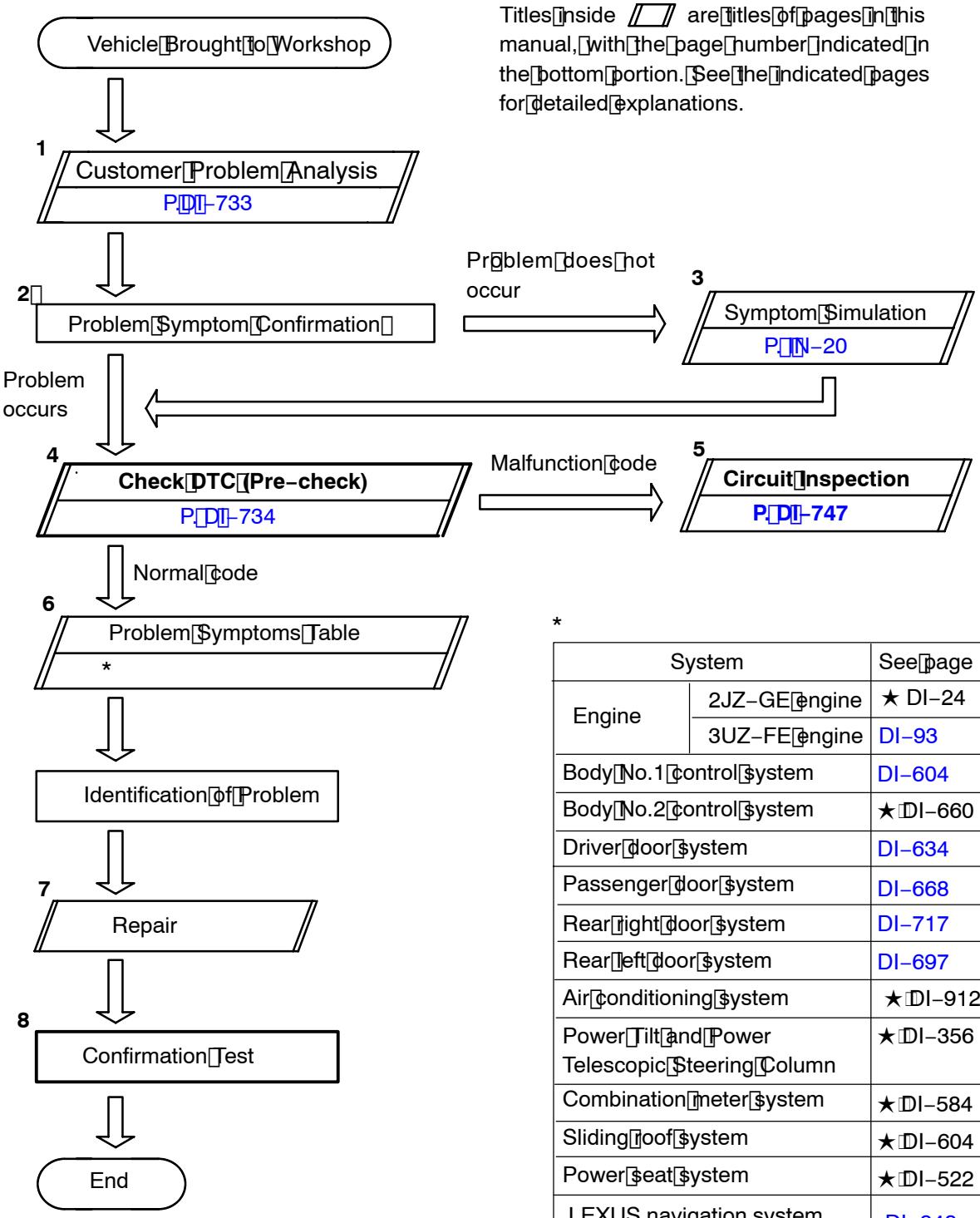
Proceed to next circuit inspection shown on problem symptoms table (See page DI–717).

MULTIPLEX COMMUNICATION SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

DI2AT–12

Perform troubleshooting in accordance with the procedure on the following page.



Titles inside ▱ are titles of pages in this manual, with the page number indicated in the bottom portion. See the indicated pages for detailed explanations.

*

System		See page
Engine	2JZ–GE engine	★ DI–24
	3UZ–FE engine	DI–93
Body No.1 control system		DI–604
Body No.2 control system		★ DI–660
Driver door system		DI–634
Passenger door system		DI–668
Rear right door system		DI–717
Rear left door system		DI–697
Air conditioning system		★ DI–912
Power Tilt and Power Telescopic Steering Column		★ DI–356
Combination meter system		★ DI–584
Sliding roof system		★ DI–604
Power seat system		★ DI–522
LEXUS navigation system		DI–848

★ : LEXUS GS300 Repair Mamual Pub. No. RM588E

Step 4, 8: Diagnostic steps permitting the use of the LEXUS hand–held tester.

DI2AU–12

CUSTOMER PROBLEM ANALYSIS CHECK

MULTIPLEX COMMUNICATION SYSTEM Check Sheet

Inspector's name: _____

Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date Vehicle Brought in	/ /	**Odometer Reading**	**km Mile**

Date Problem First Occurred		/ /
Frequency Problem Occurs		☐ Constant ☐ Sometimes (times per day, month) ☐ Once only
Weather Conditions When Problem Occurred	**Weather**	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/ Others
	Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (Approx. °F (°C))

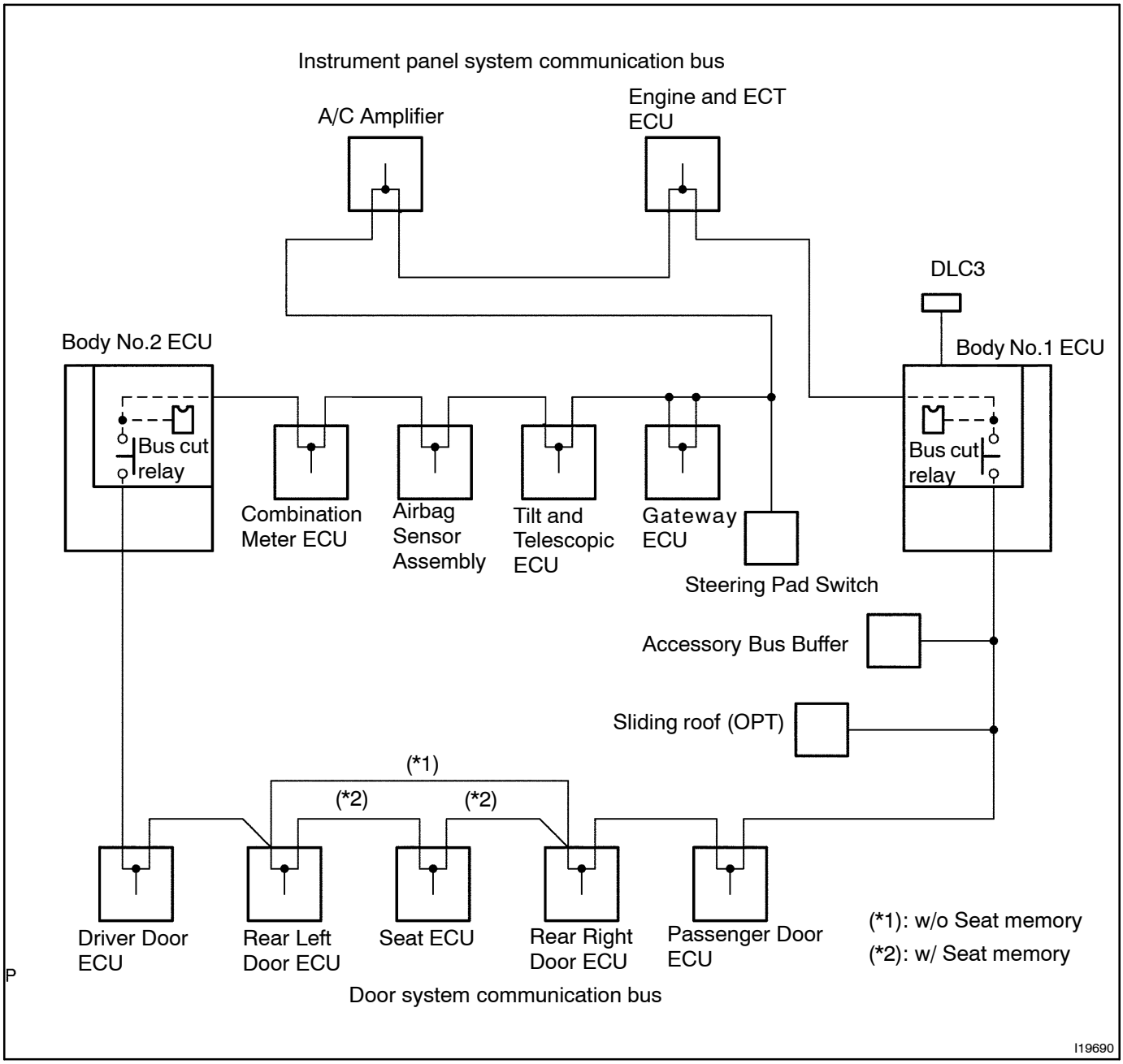
Malfunction System	☐ Engine
	☐ Body No.1 Control System
	☐ Body No.2 Control System
	☐ Driver Door System
	☐ Passenger Door System
	☐ Rear Right Door System
	☐ Rear Left Door System
	☐ Air Conditioning System
	☐ T & T System
	☐ Combination Meter System
	☐ Sliding Roof System
	☐ Power Seat System
	☐ LEXUS Navigation System

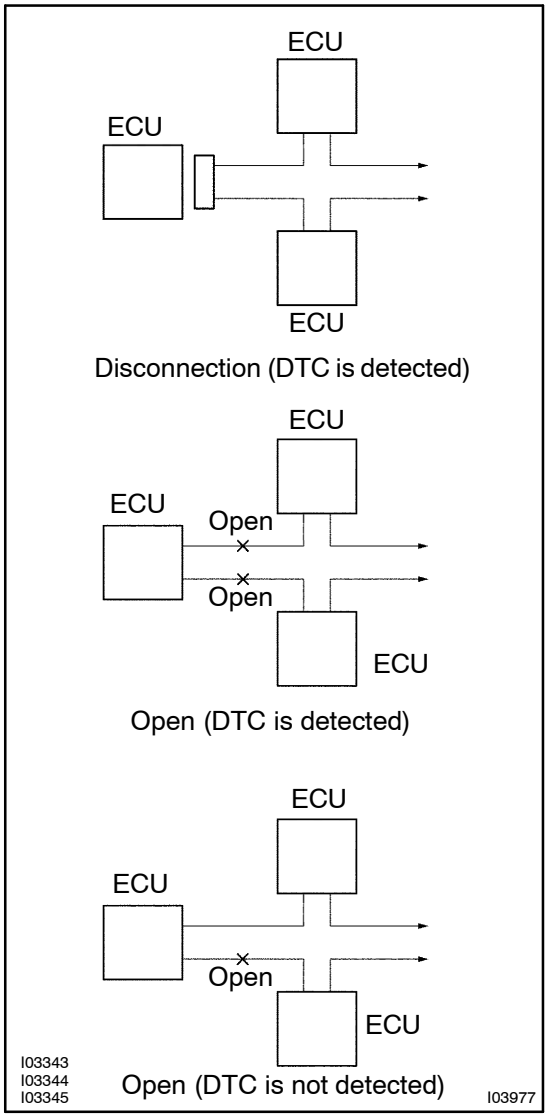
DI2AV–10

PRE–CHECK

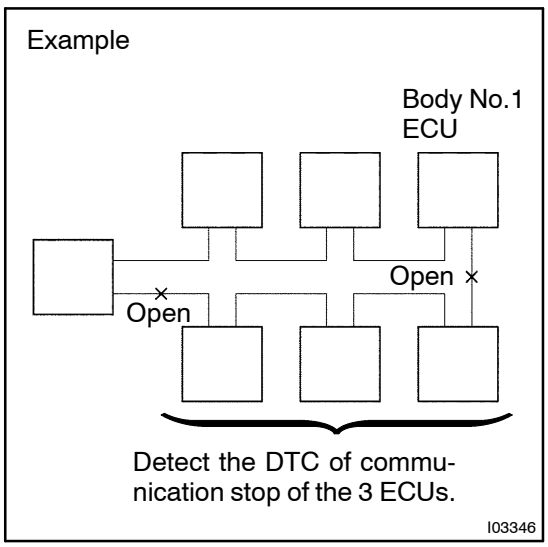
1. DIAGNOSIS SYSTEM

(a) As shown in the following illustration, each ECU of this vehicle is connected by communication bus and it transmits each signal by communication. This communication bus is self–diagnosed by Body No.1 ECU and it memorizes DTC when it detects communication stop to ECU or communication bus +B short or GND short. There is a possibility that Body No.1 ECU cannot self–diagnose accurately unless it doesn't work normal. So, please note that the troubleshooting of Body Electrical System should be done after confirming if Body No.1 ECU and Open door indicator works normal by 2 "BASIC INSPECTION" described later.





(b) If DTC of ECU communication stop is output, there is a possibility of connector disconnection or 2 communication buses open. It will not become abnormal with only 1 communication bus open.



(c) If 2 communication buses are open at the position as shown in the illustration, DTC of ECU communication stop between those 2 buses is output.

2. BASIC INSPECTION

INSPECT BODY No.1 ECU

1	**Check Body No.1 ECU operation.**

HINT:
With this inspection Body No.1 ECU CPU can be diagnosed if it works normal or not.

CHECK:
Check if the luggage compartment door opener works normal.

OK → **Go to next step "OPEN DOOR INDICATOR LIGHT INSPECTION".**

NG

2	**Check luggage compartment door opener system (Except Body No.1 ECU).** **(See page BE–12)**

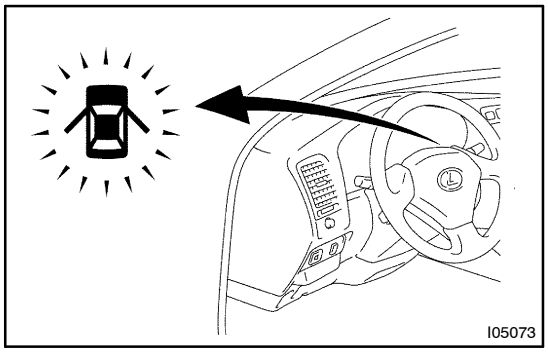
OK → **Replace the Body No.1 ECU.**

NG

Repair of replace malfunction part.

INSPECT OPEN DOOR INDICATOR LIGHT.

1	**Check open door indicator light.**



CHECK:

Check if open door indicator light is turned on when either door open.

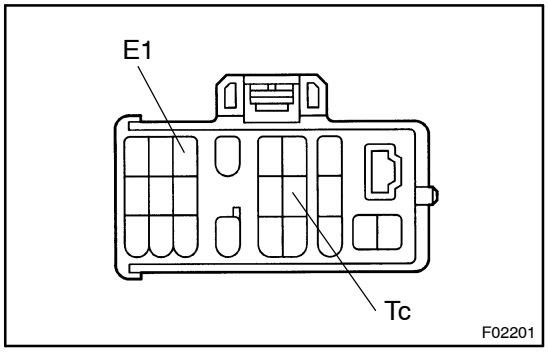
HINT:

If open door indicator light is not turned on, DTC will not be output.

OK → **Go to step 3. "DTC CHECK".**

NG

Repair the open door indicator light.
(See page BE–11)

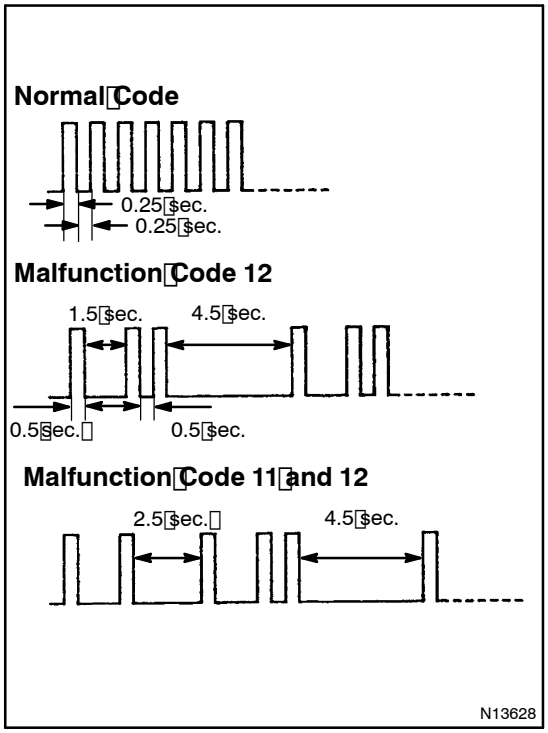


3. DTC CHECK (Using diagnosis check wire)

(a) Using SST, connect terminals Tc and E1 of DLC1.
SST 09843–18020

(b) Turn the ignition switch ON.

(c) Read the DTC on the open door indicator light.

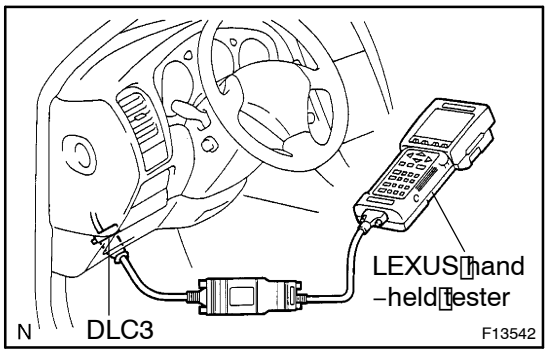


HINT:

As an example, the blinking patterns for codes; normal, 12, and 11 and 12 are shown in the illustration.

(d) Check for the problem using the DTC table on the next page.

(e) After completing the check, turn the ignition switch off, and disconnect terminals Tc and E1.



4. DTC CHECK (Using LEXUS hand–held tester)

(a) Prepare the hand–held tester.

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

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

(d) Use the hand–held tester to check the DTCs, note them down. (For opening instructions, see the hand–held tester's instruction book.)

(e) See page DI–739 to confirm the details of the DTCs.

5. DTC CLEARANCE

DTC will be cleared when the troble output to DTC is recovered normally.

DI2AW–13

DIAGNOSTIC TROUBLE CODE CHART

If a malfunction code is displayed during the DTC check, check the circuit listed for that code in the table below (Proceed to the page given for that circuit).

DTC No. (See Page)	Detection Item	Trouble Area
B1211/11 (DI–747)	Driver door ECU communication stop	• Wireharness • Driver door ECU
B1212/12 (DI–751)	Front passenger door ECU communication stop	• Wireharness • Passenger door ECU
B1213/13 (DI–753)	Tilt and telescopic ECU communication stop	• Wireharness • Tilt and telescopic ECU
B1214/14 B1215/15 (DI–756)	Door system communication bus malfunction (+B short)	• Wireharness • ECU (Door system bus)
	Door system communication bus malfunction (GND short)	
B1216/16 (DI–763)	Rear right door ECU communication stop	• Wireharness • Rear right door ECU
B1217/17 (DI–765)	Rear left door ECU communication stop	• Wireharness • Rear left door ECU
B1218/18 (DI–767)	Body No.2 ECU communication stop	• Wireharness • Body No.2 ECU
B1221/21 (DI–769)	Power window switch circuit on driver door	• Power window master switch • Wireharness
B1222/22 (DI–769)	Door lock switch circuit on driver door	• Door lock control switch • Door key lock and unlock switch • Wireharness
B1223/23 (DI–769)	Power window switch circuit on passenger door	• Power window switch • Wireharness
B1224/24 (DI–769)	Door lock switch circuit on passenger door	• Door lock control switch • Door key lock and unlock switch • Wireharness
B1225/25 (DI–769)	Power window switch circuit on rear right door	• Power window switch • Wireharness
B1226/26 (DI–769)	Power window switch circuit on rear left door	• Power window switch • Wireharness
B1231/31 (DI–772)	Jam protection limit switch circuit on driver door	• Power window motor • Wireharness
B1232/32 (DI–771)	Jam protection pulse switch circuit on driver door	• Power window motor • Wireharness
B1233/33 (DI–772)	Jam protection limit switch circuit on passenger door	• Power window motor • Wireharness
B1234/34 (DI–771)	Jam protection pulse switch circuit on passenger door	
B1235/35 (DI–772)	Jam protection limit switch circuit on rear right door	• Power window motor • Wireharness
B1236/36 (DI–771)	Jam protection pulse switch circuit on rear right door	
B1237/37 (DI–772)	Jam protection limit switch circuit on rear left door	• Power window motor • Wireharness
B1238/38 (DI–771)	Jam protection pulse switch circuit on rear left door	

B1241/41 (DI–769)	Body No.1 ECU switch circuit diagnosis	• Luggage compartment door opener switch • Luggage compartment door key lock and unlock switch • Wireharness
B1242/42 (DI–773)	Wireless door lock tuner circuit malfunction	• Wireharness • Wireless door lock tuner
B1244/44 (DI–775)	Light sensor circuit malfunction	• Light sensor • Wireharness
B1252/52 (DI–769)	Body No.2 ECU switch circuit diagnosis	• Stop light switch • Wireharness
B1261/61 (DI–777)	Engine and ECT ECU communication stop	• Wireharness • Engine and ECT ECU
B1262/62 (DI–779)	A/C amplifier communication stop	• Wireharness • A/C amplifier
B1266/66 B1267/67 (DI–782)	Instrument panel system communication bus malfunction (+B short)	• Wireharness • ECU (Instrument panel system bus)
	Instrument panel system communication bus malfunction (GND short)	
B1271/71 (DI–795)	Combination meter ECU communication stop	• Wireharness • Combination meter ECU
B1272/72 (DI–797)	Power seat ECU communication stop (w/ Seat memory vehicle only)	• Wireharness • Power seat ECU
B1273/73 (DI–799)	Sliding roof ECU communication stop (w/ Sliding roof vehicle only)	• Wireharness • Sliding roof ECU
B1275/75	Accessory bus buffer communication stop	• Wireharness • Accessory
B1281/81 (DI–801)	Airbag sensor assembly communication stop	• Wireharness • Airbag sensor assembly
B1285/85(*) (DI–803)	Steering pad switch communication stop	• Wireharness • Steering pad switch
B1293/93 (DI–805)	Gateway ECU (AVC–LAN adapter) communication stop	• Wireharness • Gateway ECU

(*): GS430 only

HINT:

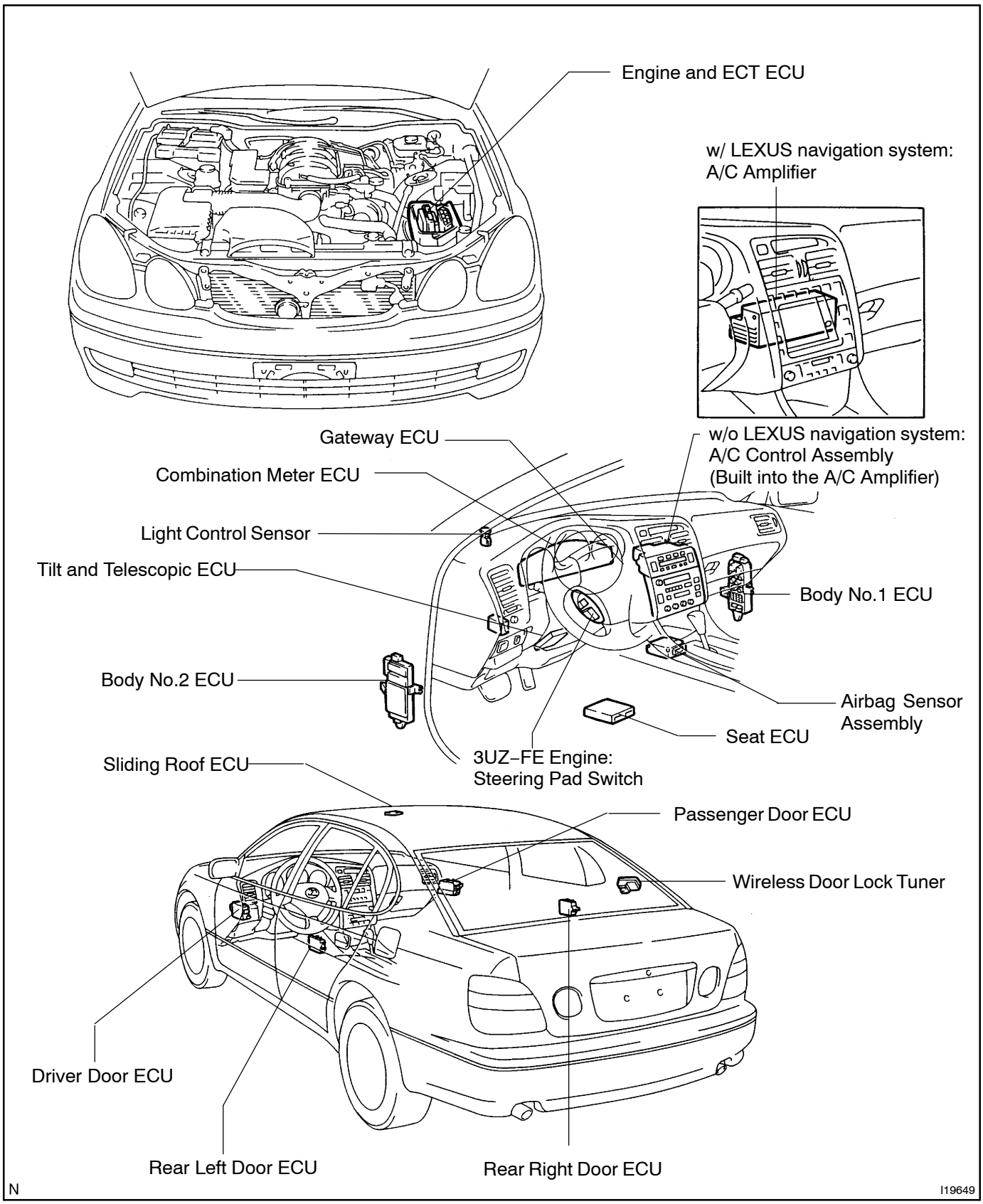
- DTC 61, 66, 67 and 71 are not output through open door warning light on meter because of system itself.
- DTC 21~26, 41 and 52 don't mean switch abnormal but notify how switch works.
  If DTC is not output when operating switch, it means failure of switch contact.
  If DTC is output when not opening switch, it means stick of switch.
- When some of the DTC 14, 15, 66, 67 is output, the DTC of other ECU communication stop is also output. In this case, please repair DTC 14, 15, 66, 67 first. The following shows DTCs which are output when +B or GND short occurs on communication bus.

	Door system communication bus	Instrument panel system communication bus
GND short	After 10 seconds from detecting fail, Instrument panel system communication bus is able to communicate by bus cut function.	After 10 seconds from detecting fail, Door system communication bus is able to communicate by bus cut function.
Communication possible ECU after bus is cut	Body No.1 ECU, Body No.2 ECU, A/C ECU, Multi display, Tilt and telescopic ECU, Combination Meter ECU, Engine and ECT ECU	Driver door ECU, Passenger door ECU, Rear right door ECU, Rear left door ECU, Power seat ECU, Sliding roof ECU, Accessory bus buffer.
DTC(B12XX) ( ): Option	11, 12, 15, 16, 17, (72), (73), (75)	11, 12, 13, 16, 17, 18, 61, 62, 67, 71, (72), (73), (75) *
+B short	(Same as GND short)	(Same as GND short)
Communication possible ECU after bus is cut	(Same as GND short)	(Same as GND short)
DTC(B12XX) ( ): Option	11, 12, 14, 16, 17, (72), (73), (75)	11, 12, 13, 16, 17, 18, 61, 62, 66, 71, (72), (73), (75) *

*: Body No.1 ECU and Door system communication bus are cut off by bus cut relay, so it detects communication stop of ECU connected to Door system communication bus.

DI2AX–07

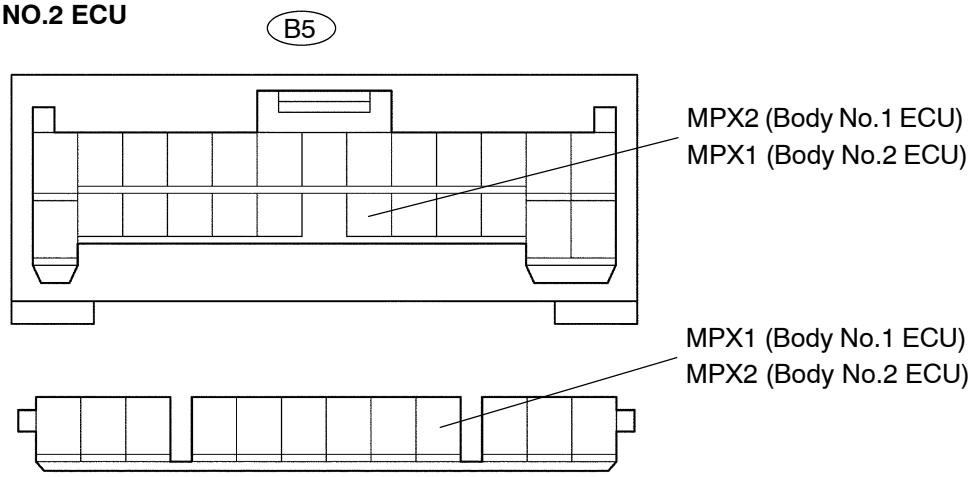
PARTS LOCATION



DI85Z–01

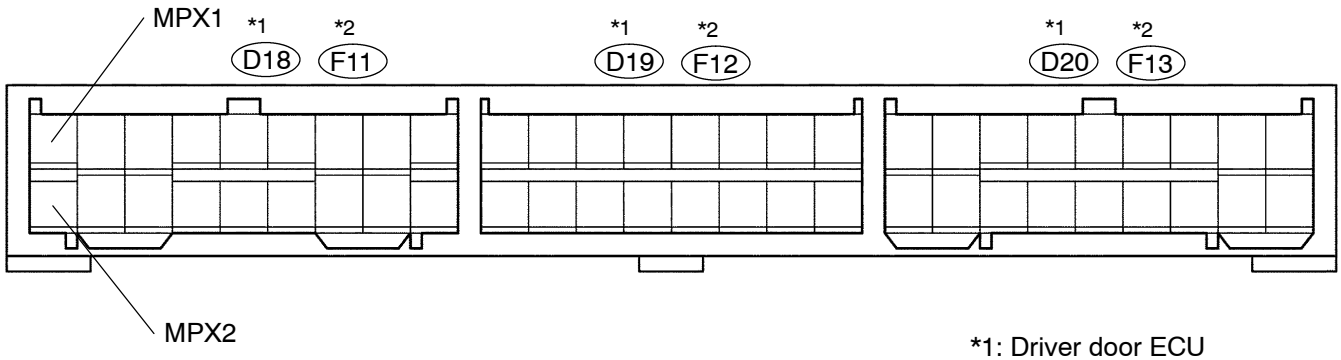
TERMINALS OF ECU

Body NO.1 ECU and Body NO.2 ECU



I04354

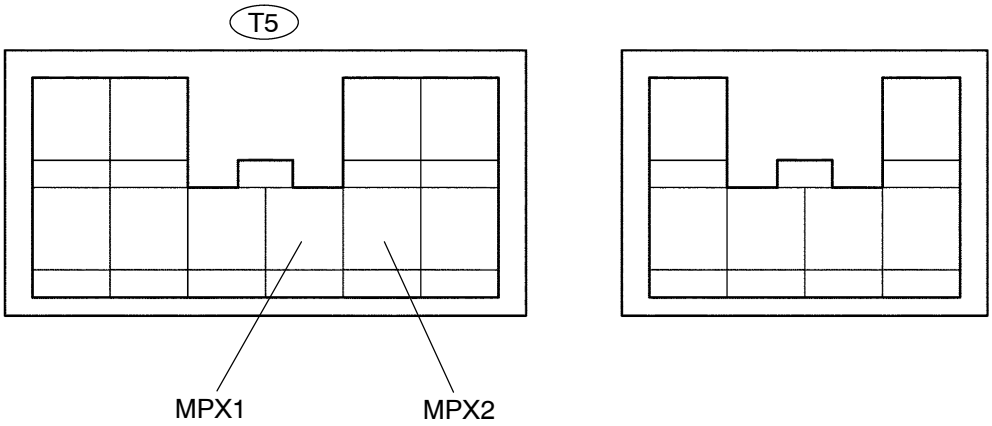
Driver Door ECU and Passenger Door ECU



*1: Driver door ECU
*2: Front passenger door ECU

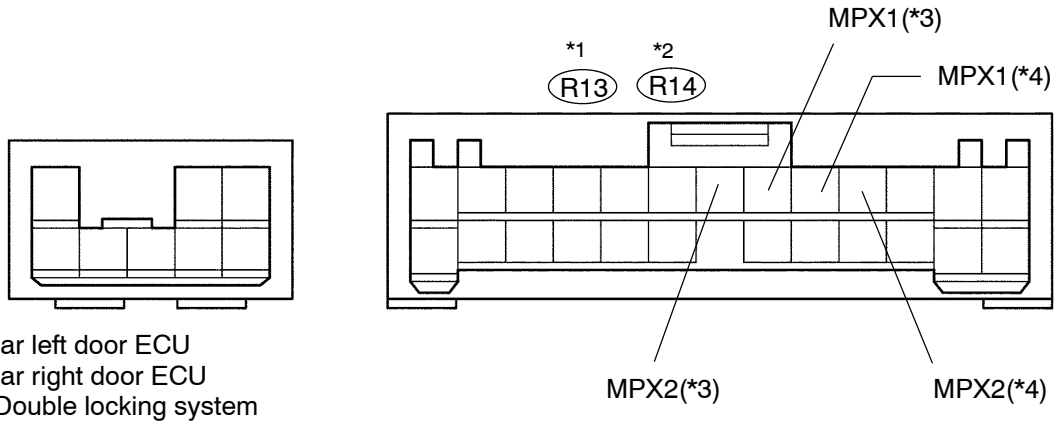
I03225

Tilt and Telescopic ECU



I04355

Rear Right Door ECU and Rear Left Door ECU

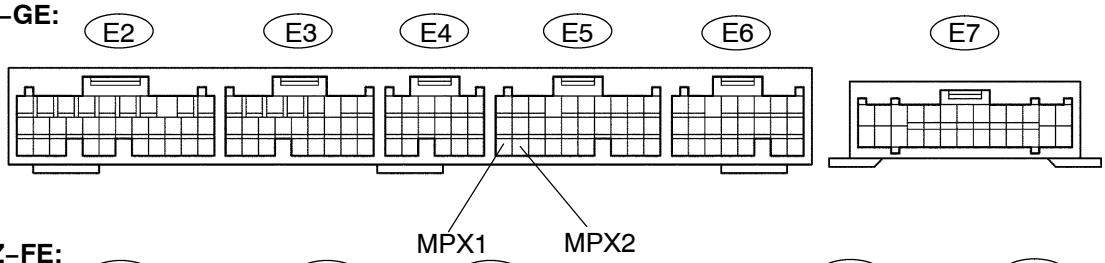


(*1): Rear left door ECU
(*2): Rear right door ECU
(*3): w/Double locking system
(*4): w/o Double locking system

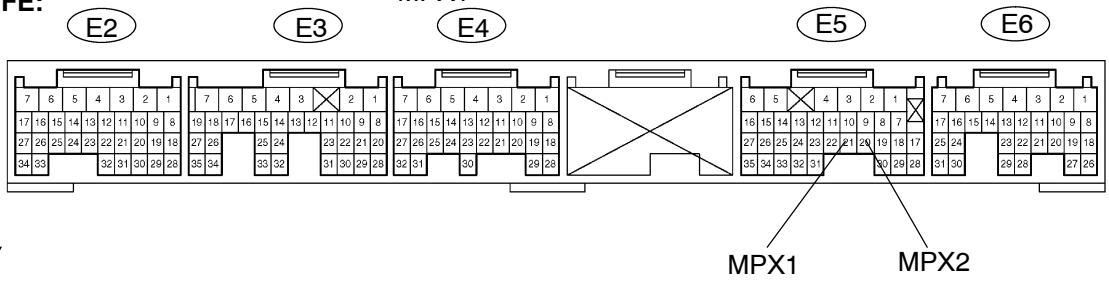
I03226

Engine and ECT ECU

2JZ–GE:



3UZ–FE:

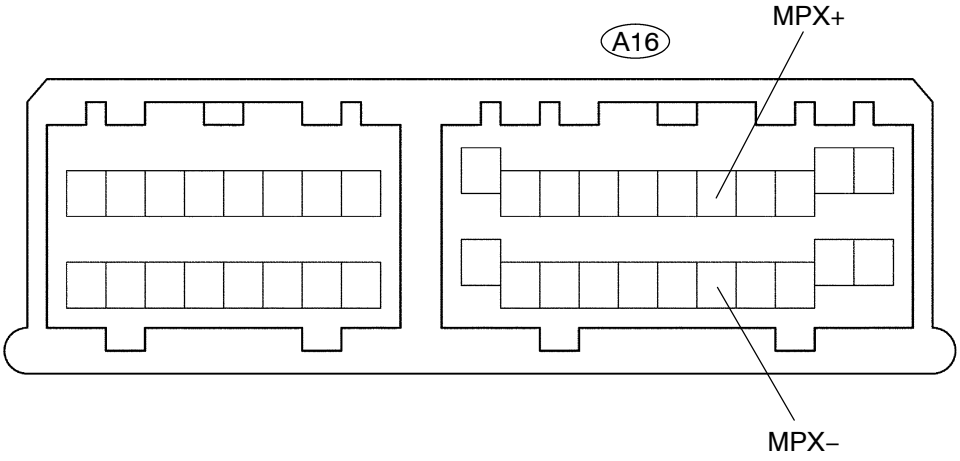


Y

I04347
A14471

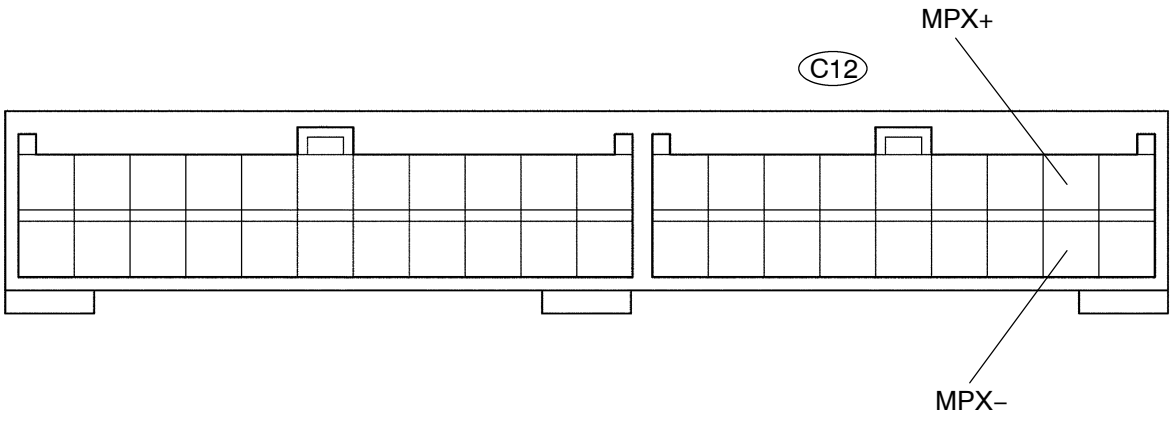
I21072

A/C Amplifier

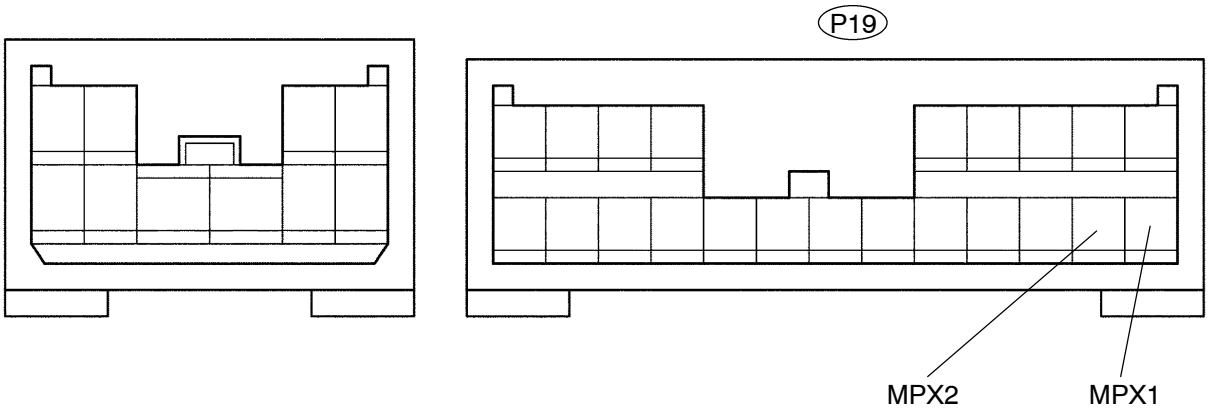


I04359

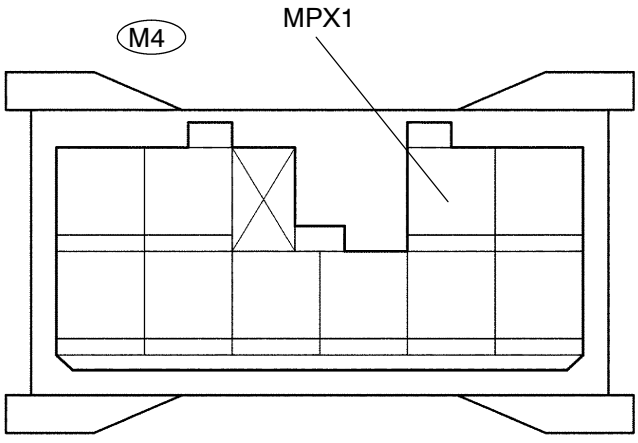
Combination Meter ECU



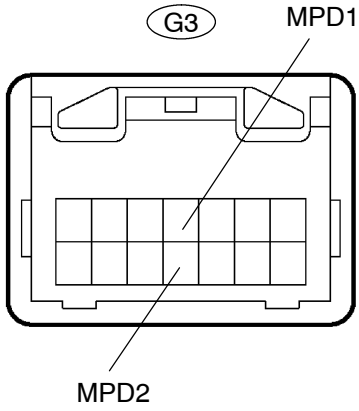
Power Seat ECU



Sliding Roof ECU



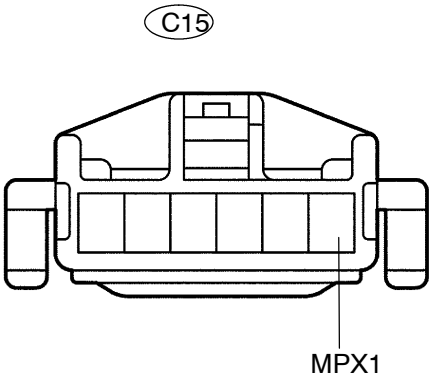
Gateway ECU



N

I13684

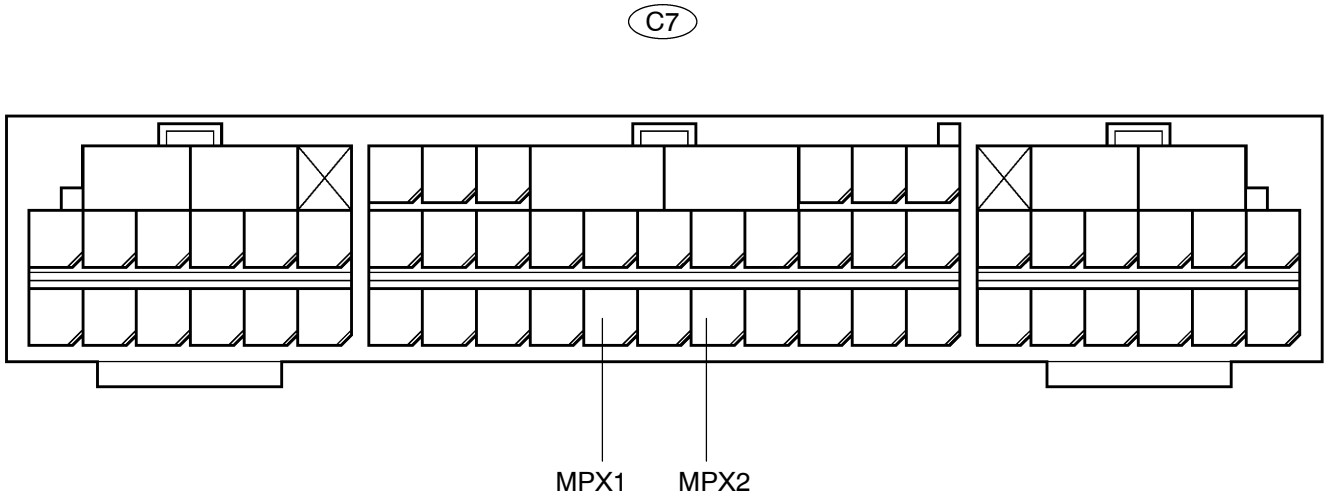
Steering Pad Switch



P

I21108

Airbag Sensor Assembly



H01357

DI860–01

CIRCUIT INSPECTION

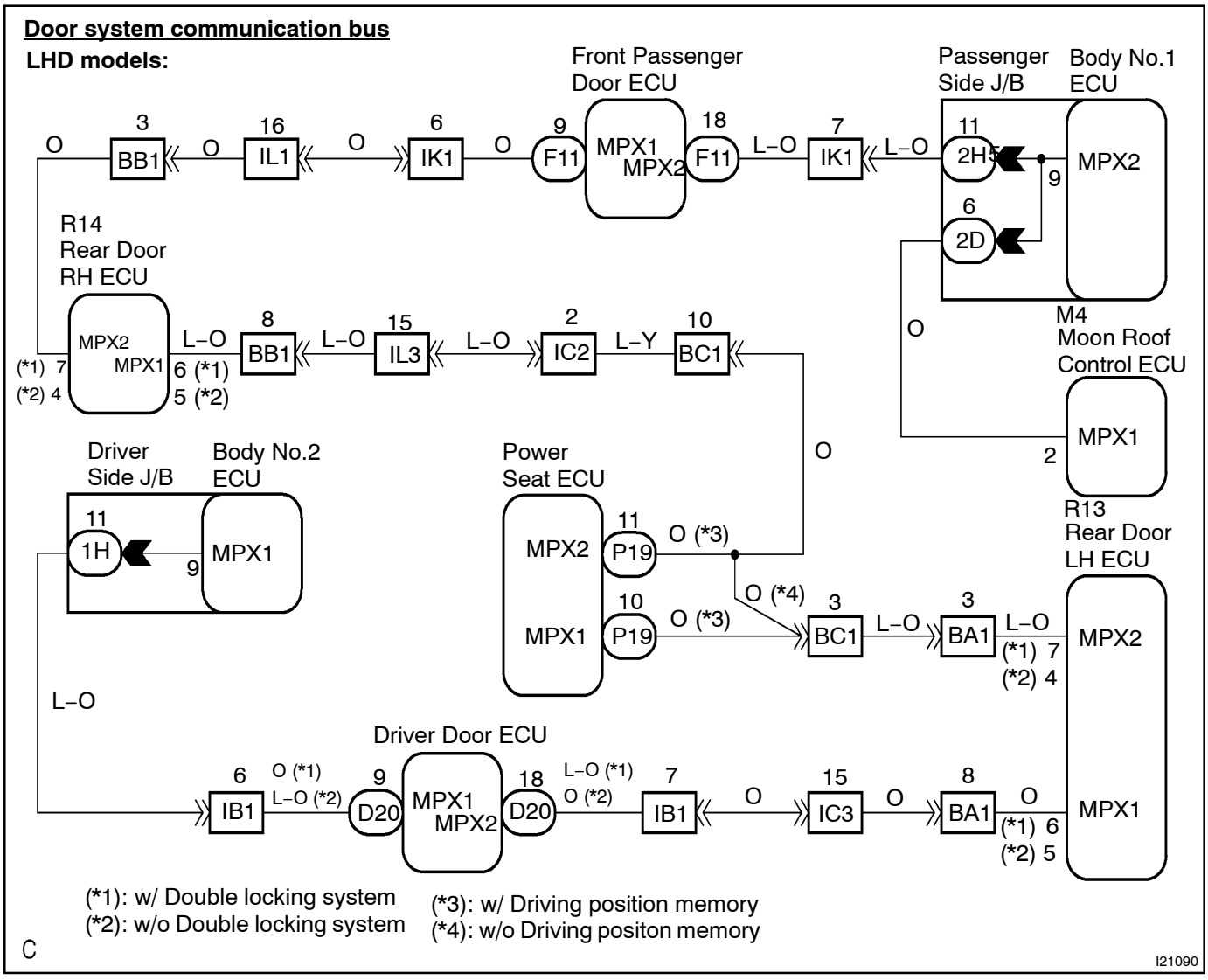
DTC	B1211 / 11	Driver door ECU communication stop

CIRCUIT DESCRIPTION

This DTC is output when communication stops between driver door ECU and body No.1 ECU.

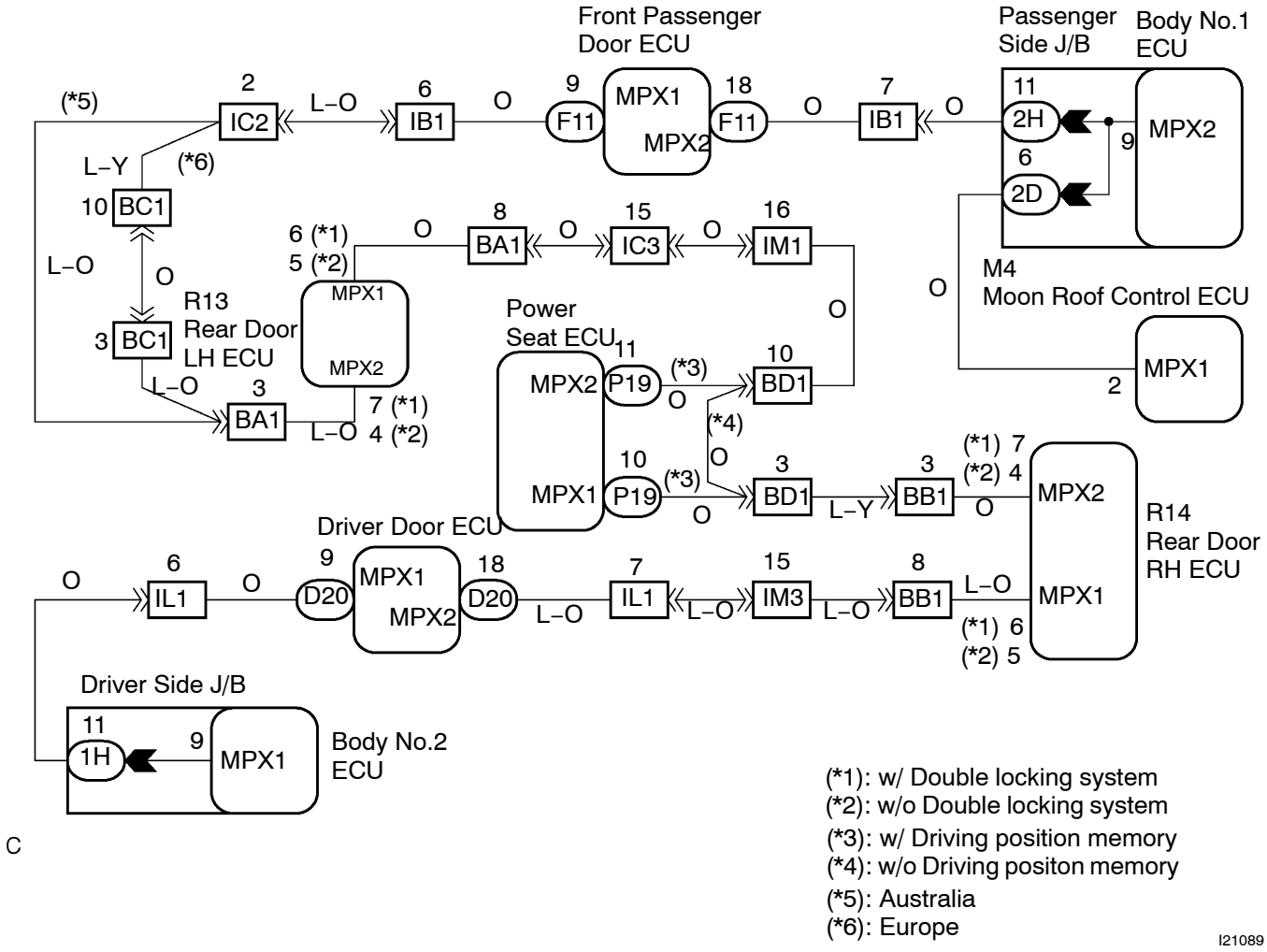
DTC No.	DTC Detecting Condition	Trouble Area
B1211/11	No communication from driver door ECU more than 10 seconds.	• Driver door ECU • Wireharness

WIRING DIAGRAM



Door system communication bus

RHD models:



INSPECTION PROCEDURE

1	**Check driver door ECU.**

CHECK:

Check if the driver door window glass auto up.

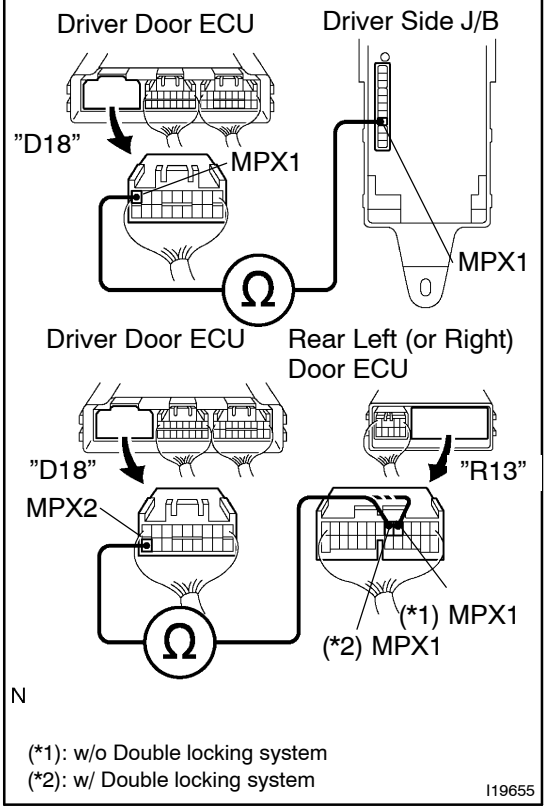
HINT:

With this inspection, the driver door ECU CPU can be diagnosed if it works normally or not.

NG → **Replace the driver ECU.**

OK

2	Check wireharness.



PREPARATION:

Disconnect connector of body No.2 ECU, "D18" of driver door ECU and "R13" of rear left door ECU (or rear right door ECU).
( ): RHD models

CHECK:

(a) ( ): RHD models:
Check continuity between terminals MPX1 of body No.2 ECU and MPX1 of driver door ECU.

(b) ( ): RHD models:
Check continuity between terminals MPX2 of driver door ECU and MPX1 of rear left door ECU (or rear right door ECU).

OK:

Continuity exists in wireharness of both (a) and (b). or either (a) or (b).

HINT:

If there is OPEN in wireharness of either (a) or (b), please repair it.

NG → **Repair or replace wireharness.**

OK

Replace the driver door ECU.

DI2B0–10

DTC	B1212 / 12	Front passenger door ECU communication stop

CIRCUIT DESCRIPTION

This DTC is output when communication stops between front passenger door ECU and body No.1 ECU.

DTC No.	DTC Detecting Condition	Trouble Area
B1212/12	No communication from front passenger door ECU more than 10 seconds.	• Front passenger door ECU • Wireharness

WIRING DIAGRAM

See page DI–747

INSPECTION PROCEDURE

1	Check front passenger door ECU.

CHECK:

Check if the front passenger door window glass auto up.

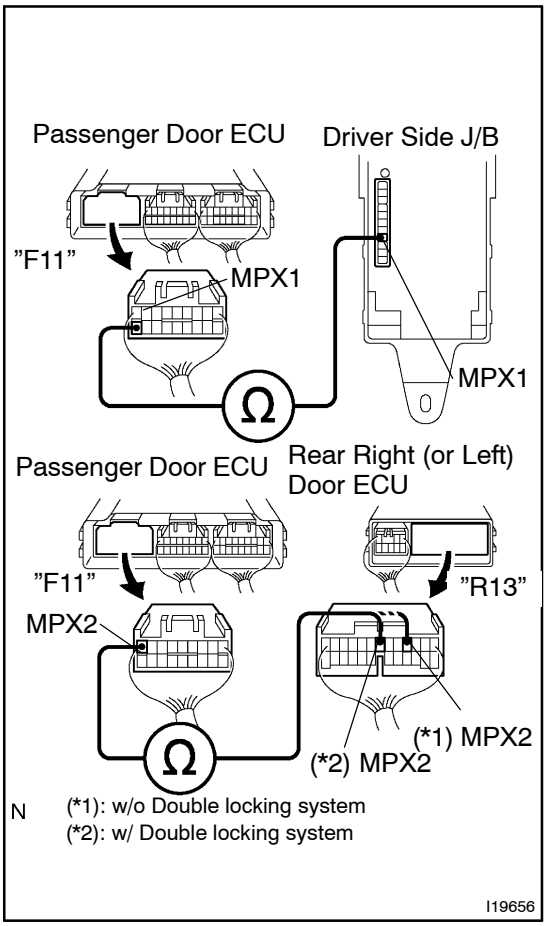
HINT:

With this inspection, the front passenger door ECU CPU can be diagnosed if it works normally or not.

NG → Replace the front passenger door ECU.

OK

2	Check wireharness



PREPARATION:

( )RHD models:

Disconnect connector of body No.1 ECU, "F11" of front passenger door ECU and "R14" of rear right (or left)door ECU.

CHECK:

(a) Check continuity between terminals MPX2 of body No.1 ECU and MPX2 of passenger door ECU.

(b) ( ): RHD models:
Check continuity between terminals MPX1 of passenger door ECU and MPX2 of rear right (or left) door ECU.

OK:

Continuity exists in wireharness of both (a) and (b) or (a) or either (a) or (b).

HINT:

If there is OPEN in wireharness of either (a) or (b), please repair it.

NG → **Repair or replace wireharness.**

OK

Replace the passenger door ECU.

DI2B1–07

DTC	B1213 / 13	Tilt and telescopic ECU communication stop

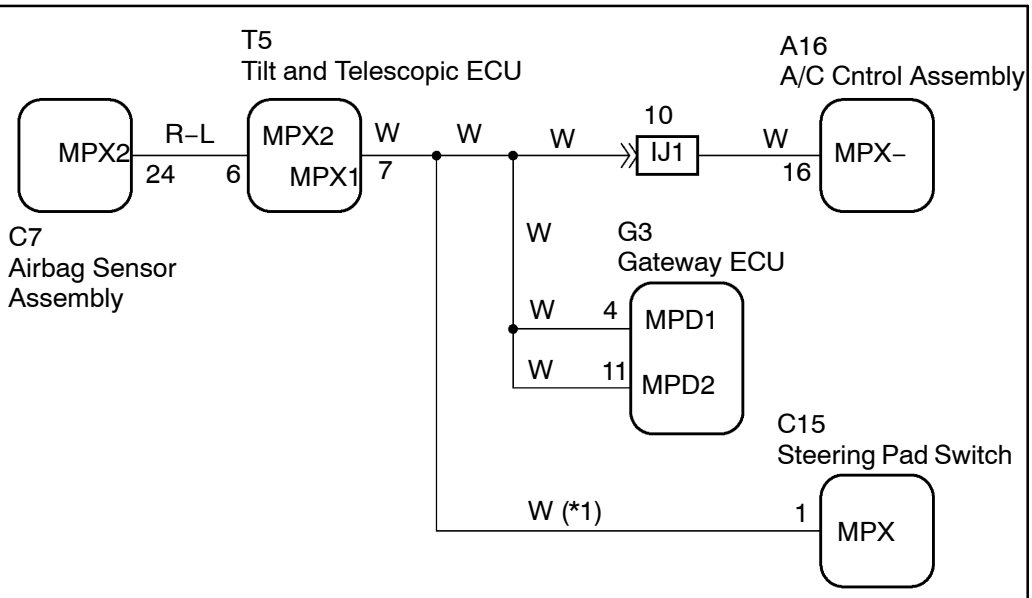
CIRCUIT DESCRIPTION

This DTC is output when communication stops between tilt and telescopic ECU and Body No.1 ECU.

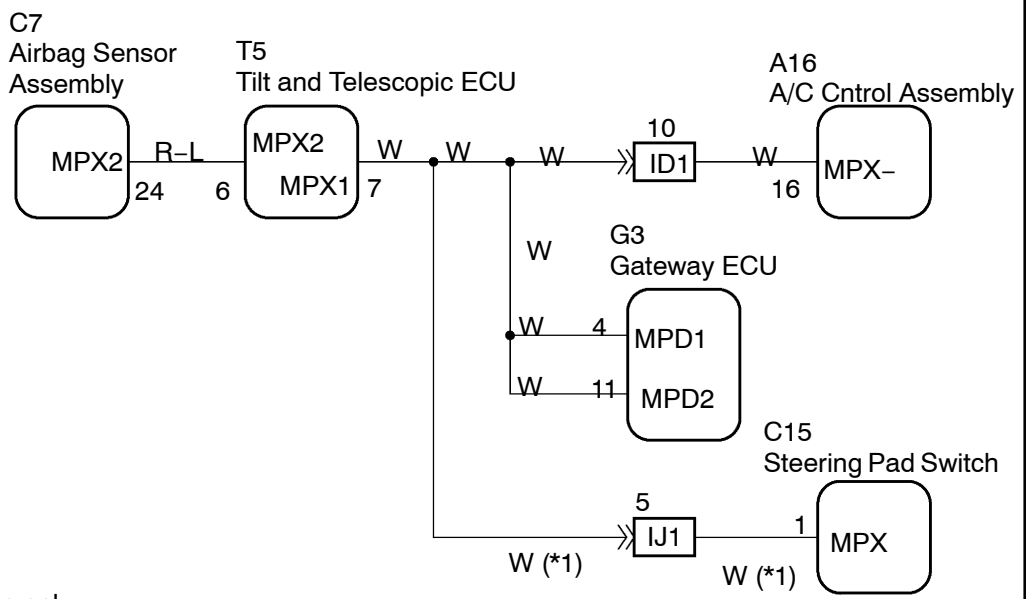
DTC No.	DTC Detecting Condition	Trouble Area
B1212/12	No communication from tilt and telescopic ECU more than 10 seconds.	• Tilt and telescopic ECU • Wireharness

WIRING DIAGRAM

LHD models:



RHD models:



(*1): 3UZ–FE engine only

C

I21088

INSPECTION PROCEDURE

1	**Check tilt and telescopic ECU.**

CHECK:

Check the operation of the manual tilt and telescopic.

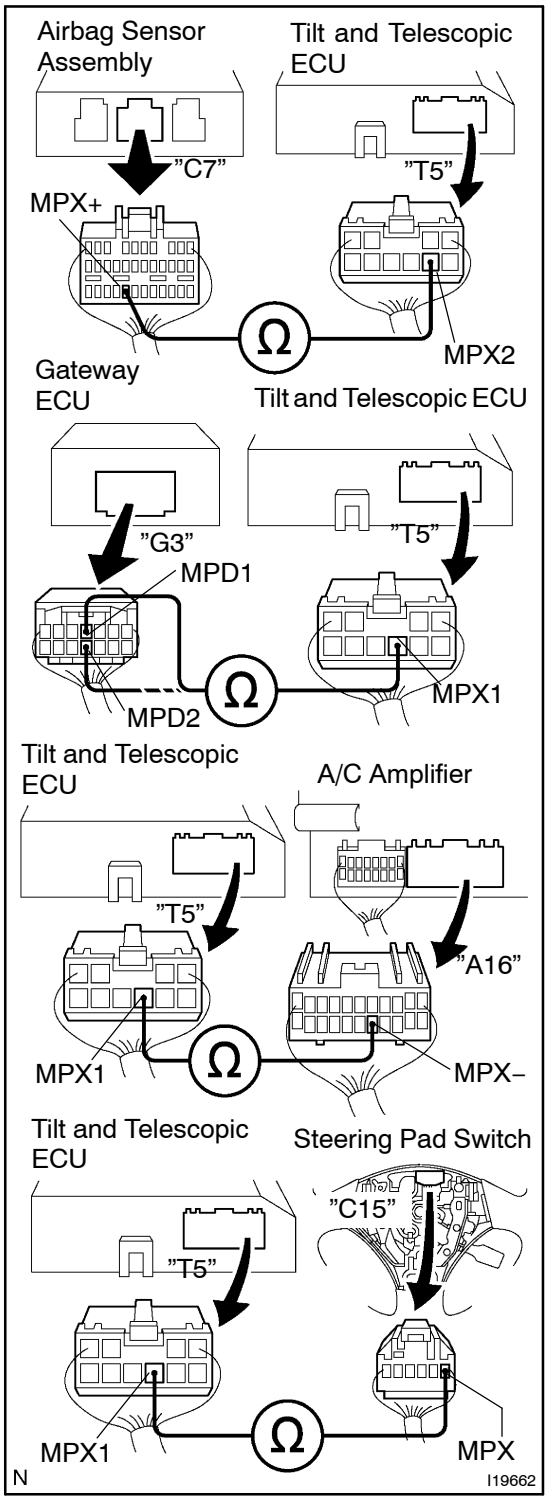
HINT:

With this inspection, the tile and telescopic ECM CPU can be diagnosed if it works normally or not.

NG → **Replace the tilt and telescopic ECU.**

OK

2	Check wireharness



PREPARATION:

Disconnect connector "C7 of airbag sensor assembly, "T5" of tilt and telescopic ECU, "C15" of steering pad switch, "G3" of gateway ECU and "A16" of A/C control assembly.

CHECK:

(a) Check continuity between terminals MPX2 of airbag sensor assembly and MPX2 of tilt and telescopic ECU.

(b) Check continuity between terminals MPX1 of tilt and telescopic ECU and MPD1, MPD2 of gateway ECU.

(c) Check continuity between terminals MPX1 of tilt and telescopic ECU and MPX– of A/C amplifier.

(d) 3UZ–FE only:
Check continuity between terminals MPX of steering pad switch and MPX2 of tilt and telescopic ECU.

OK:

Continuity exists in wireharness.

HINT:

If there is OPEN in wireharness of either (a), (b), (c) or (d), please repair it.

NG → **Repair or replace wireharness.**

OK

Replace the tilt and telescopic ECU.

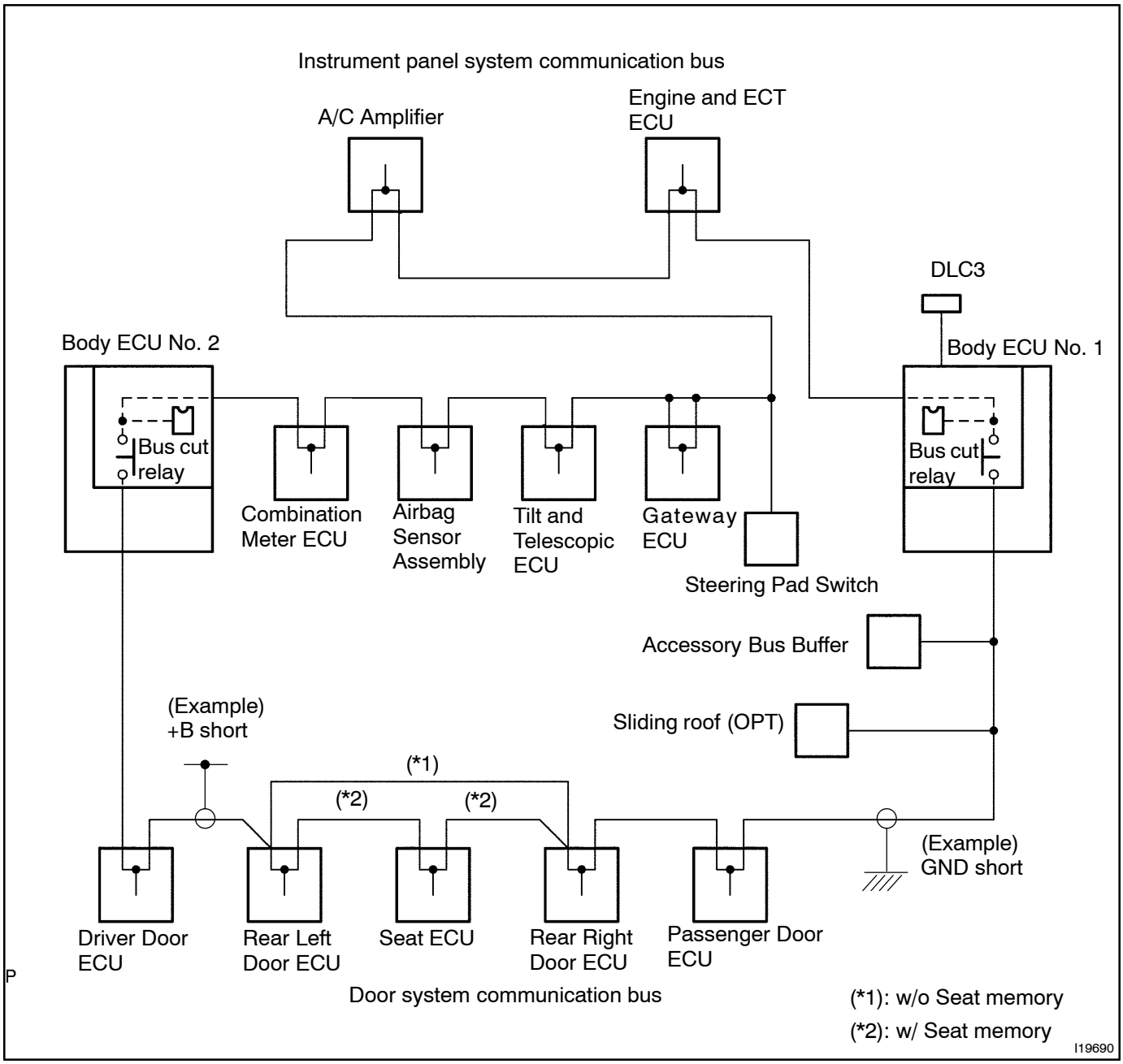
DI861–01

DTC	B1214 / 14	Door system communication bus malfunction (+B short)

DTC	B1215 / 15	Door system communication bus malfunction (GND short)

CIRCUIT DESCRIPTION

This DTC is output when +B or GND short occurs on door system communication bus. If +B or GND short is detected on door system communication bus, separate it by bus cut relay in Body ECU No. 1 and Body ECU No. 2 to prevent while communication buses' failure.

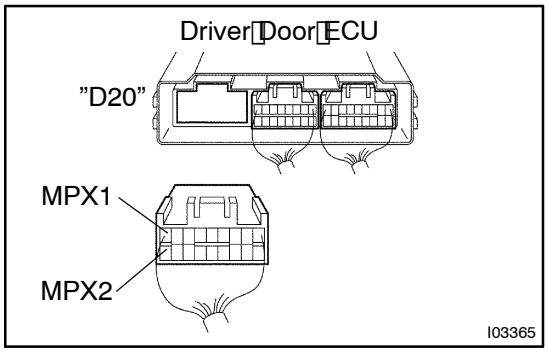


WIRING DIAGRAM

See page DI–747, DI–753

INSPECTION PROCEDURE

1	**Check the communication circuit inside passenger door ECU.**

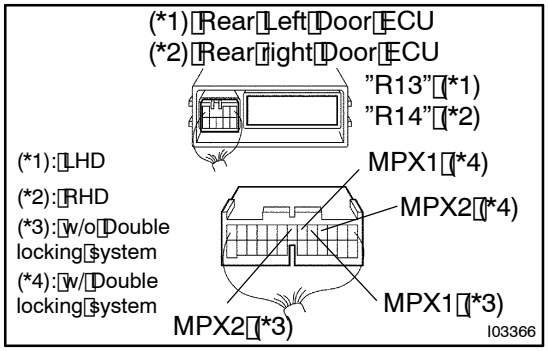


PREPARATION:
Disconnect the connector "D20" of driver door ECU.
CHECK:
Check the DTC.
OK:
Code B1214/14 or B1215/15 is not output

OK	**Replace the driver door ECU.**

NG

2	**Check the communication circuit inside rear left (or right) door ECU.** **( ): RHD models**



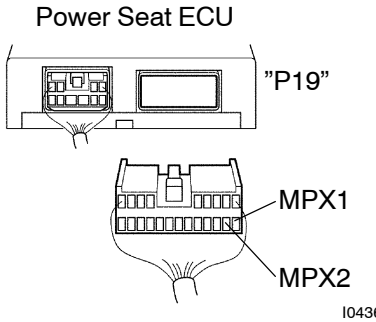
PREPARATION:
(a) Connect the connector "D24" of driver door ECU.
(b) ( ): RHD models:
Disconnect the connector "R13" (or "R14") of rear left (or right) door ECU.
CHECK:
Check the DTC.
OK:
Code B1214/14 or B1215/15 is not output

OK	**Replace the rear left (or right) door ECU.**

NG

w/ Driving position memory seat: Proceed to step 3.
w/o Driving position memory seat: Proceed to step 4.

3	Check the communication circuit inside seat ECU.



PREPARATION:

(a) ( ): RHD models:
Connect the connector ”R13” (or ”R14) of rear left (or right) door ECU.

(b) Disconnect the connector ”P19” of power seat ECU.

CHECK:

Check the DTC.

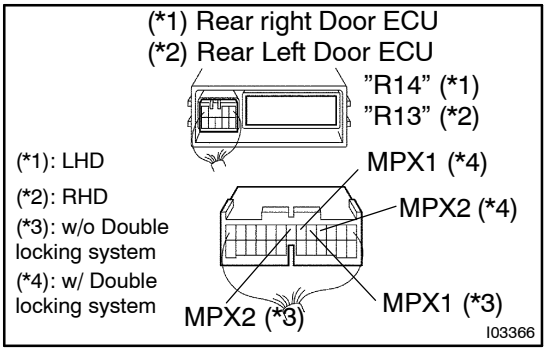
OK:

Code B1214/14 or B1215/15 is not output

OK	Replace the power seat ECU.

NG

4	Check the communication circuit inside rear right (or left) door ECU.



PREPARATION:

(a) Connect the connector ”P19” of power seat ECU.

(b) ( ): RHD models:
Disconnect the connector ”R14” (or ”R13”)of rear right (or left) door ECU.

CHECK:

Check the DTC.

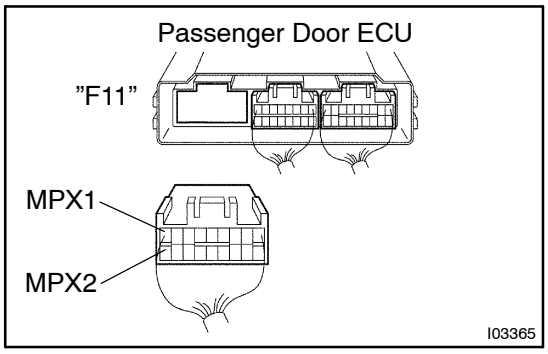
OK:

Code B1214/14 or B1215/15 is not output

OK	Replace the rear right (or left) door ECU. ( ): RHD models

NG

5	Check the communication circuit inside passenger door ECU.



PREPARATION:

(a) ( ): RHD models:
Connect the connector ”R14” (”R13”) of rear right (or left) door ECU.

(b) Disconnect the connector ”F11” of passenger door ECU.

CHECK:

Check the DTC.

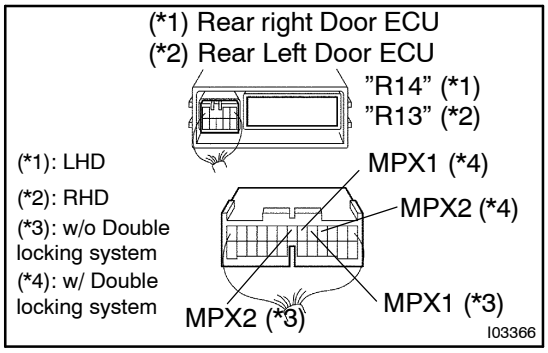
OK:

Code B1214/14 or B1215/15 is not output

OK	Replace the passenger door ECU.

NG

6	Check for short circuit between passenger door ECU and rear right (or left) door ECU. ( ): RHD models



PREPARATION:

( ): RHD models:
Disconnect the connector R14 (or ”R13”) of rear right (or left) door ECU.

CHECK:

Check the DTC.

OK:

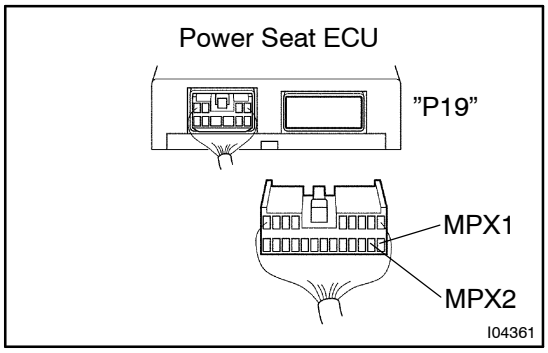
Code B1214/14 or B1215/15 is not output

OK	Repair or replace the wireharness between passenger door ECU and rear right (or left) door ECU. ( ): RHD models

NG

w/ Driving position memory seat: Proceed to step 7.
w/o Driving position memory seat: Proceed to step 9.

7	Check for short circuit between rear right (or left) door ECU and power seat ECU. ( ): RHD models



PREPARATION:

(a) Connect the connector ”F11” of passenger door ECU.

(b) Disconnect the connector ”P19” of power seat ECU.

CHECK:

Check the DTC.

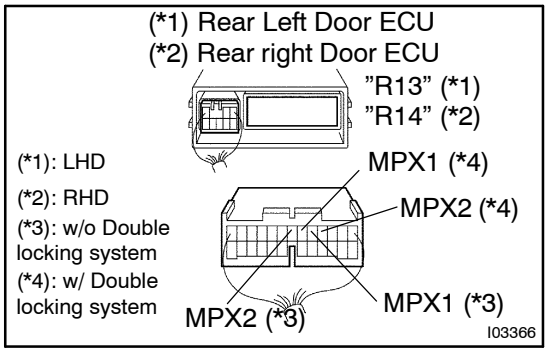
OK:

Code B1214/14 or B1215/15 is not output

OK	Repair or replace the wireharness between rear right door ECU and power seat ECU.

NG

8	Check for short circuit between power seat ECU and rear left (or right) door ECU. ( ): RHD models



PREPARATION:

(a) ( ): RHD models:
Connect the connector ”R14”(or ”R13”) of rear right (or left) door ECU.

(b) ( ):RHD models:
Disconnect the connector ”R13” (or ”R14”) of rear left (or right) door ECU.

CHECK:

Check the DTC.

OK:

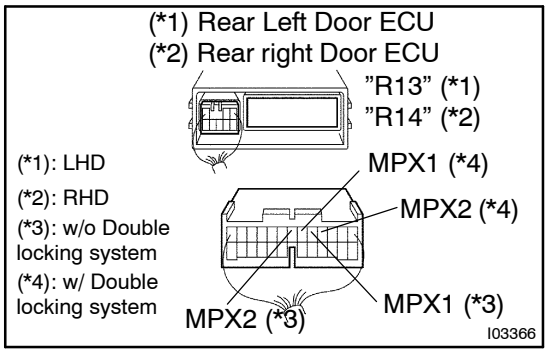
Code B1214/14 or B1215/15 is not output

OK	Repair or replace the wireharness between seat ECU and rear left (or right) door ECU. ( ): RHD models

NG

Proceed to step 11

9	Check for short circuit between rear left door ECU and rear right door ECU.



PREPARATION:

(a) Connect the connector "P19" of power seat ECU.

(b) ( ): RHD models:
Disconnect the connector "R14 (or "R13") rear right (or left) door ECU.

CHECK:

Check the DTC.

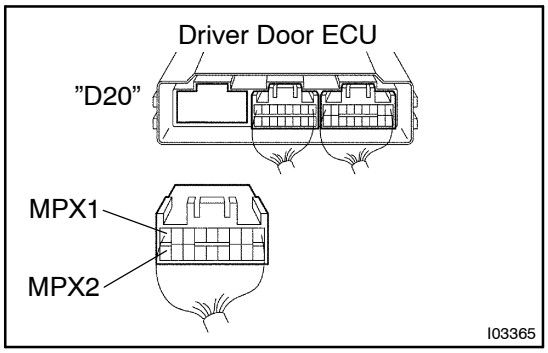
OK:

Code B1214/14 or B1215/15 is not output

OK	Repair or replace the wireharness between rear left (or right) door ECU and rear right door ECU. ( ): RHD models

NG

10	Check for short circuit between rear left (or right) door ECU and driver door ECU. ( ): RHD models



PREPARATION:

(a) ( ): RHD models:
Connect the connector "R13" (or "R14") of rear left (or right) door ECU.

(b) Disconnect the connector "D20" of driver door ECU.

CHECK:

Check the DTC.

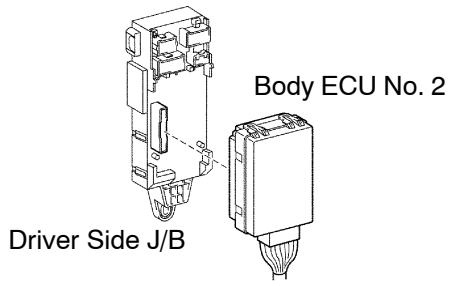
OK:

Code B1214/14 or B1215/15 is not output

OK	Repair or replace the wireharness between rear left ECU and driver door ECU.

NG

11	Check for short circuit between driver door ECU and Body ECU No. 2.



PREPARATION:

(a) Connect the connector ”R13” of rear left door ECU.
(b) Disconnect the connector of Body ECU No. 2.

HINT:

Connector is disconnected by removing Body ECU No. 2 from driver side junction block.

CHECK:

Check the DTC.

OK:

Code B1214/14 or B1215/15 is not output

OK	Repair or replace the wireharness between driver door ECU and Body ECU No. 2.

NG

12	Check for short circuit between passenger door ECU, sliding roof ECU and Body ECU No. 1.

PREPARATION:

(a) Connect the connector ”D20” of driver door ECU.
(b) Install the Body ECU No. 2 to driver side junction block.
(c) Disconnect the connector of siding roof ECU and ”F11” of passenger door ECU.
(d) Disconnect the connector of Body ECU No. 1.

HINT:

Connector is disconnected by removing Body ECU No. 1 from passenger side junction block.

CHECK:

Check wireharness between passenger door ECU, sliding roof ECU and Body ECU No. 1.

OK:

NG	Repair or replace the wireharness between driver door ECU, sliding roof ECU and Body ECU No. 1.

OK

Replace the Body ECU No. 1.

DI2B3-08

DTC	B1216 / 16	Rear right door ECU communication stop

CIRCUIT DESCRIPTION

This DTC is output when communication stops between rear right door ECU and body No.1 ECU.

DTC No.	DTC Detecting Condition	Trouble Area
B1216/16	No communication from rear right door ECU more than 10 seconds.	• Rear right door ECU • Wire harness

WIRING DIAGRAM

See page DI–747

INSPECTION PROCEDURE

1	Check rear right door ECU.

CHECK:

Check if the rear right door window glass auto up.

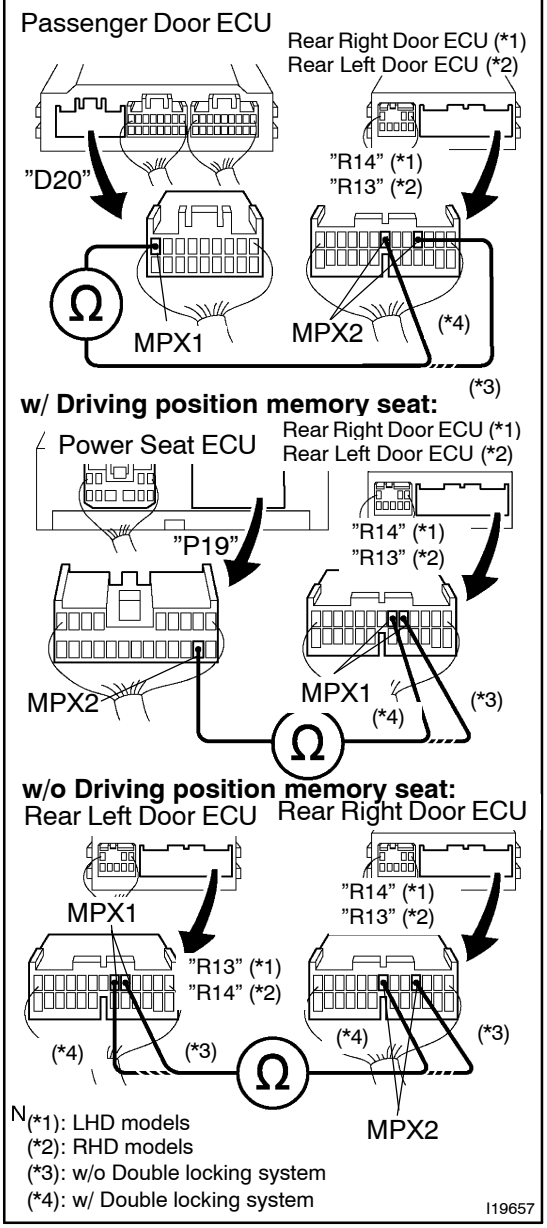
HINT:

With this inspection rear right door ECU CPU can be diagnosed if it works normal or not.

NG → Replace the rear right door ECU.

OK

2	Check wireharness.



PREPARATION:

( ): RHD models:

Disconnect connector "F11" of passenger door ECU, "R14" ("R13") of rear right door ECU and "P19" of power seat ECU.

CHECK:

(a) Check continuity between terminals MPX1 of passenger door ECU and MPX2 of rear right door ECU.

(b) W/ Driving position memory seat:
Check continuity between terminals MPX1 of rear right door ECU and MPX2 of power seat ECU.

(c) w/o Driving position memory seat:
Check continuity between terminals MPX2 of rear right door ECU and MPX1 of rear left door ECU.

OK:

If there is OPEN in wireharness of either (a), (b) or (c), please repair it.

Continuity exists in wireharness of both (a) and (b), or either (a) or (b).

HINT:

If there is OPEN in wireharness of either (a) or (b), please repair it.

NG → **Repair or replace wireharness.**

OK

Replace the rear right door ECU.

DI2B4–08

DTC	B1217 / 17	Rear left door ECU communication stop

CIRCUIT DESCRIPTION

This DTC is output when communication stops between rear left (or right) door ECU and body No.1 ECU.

DTC No.	DTC Detecting Condition	Trouble Area
B1217/17	No communication from rear left door ECU more than 10 seconds.	• Rear left door ECU • Wireharness

WIRING DIAGRAM

See page DI–747

INSPECTION PROCEDURE

1	Check rear left door ECU.

CHECK:

Check if the rear left door window glass auto up.

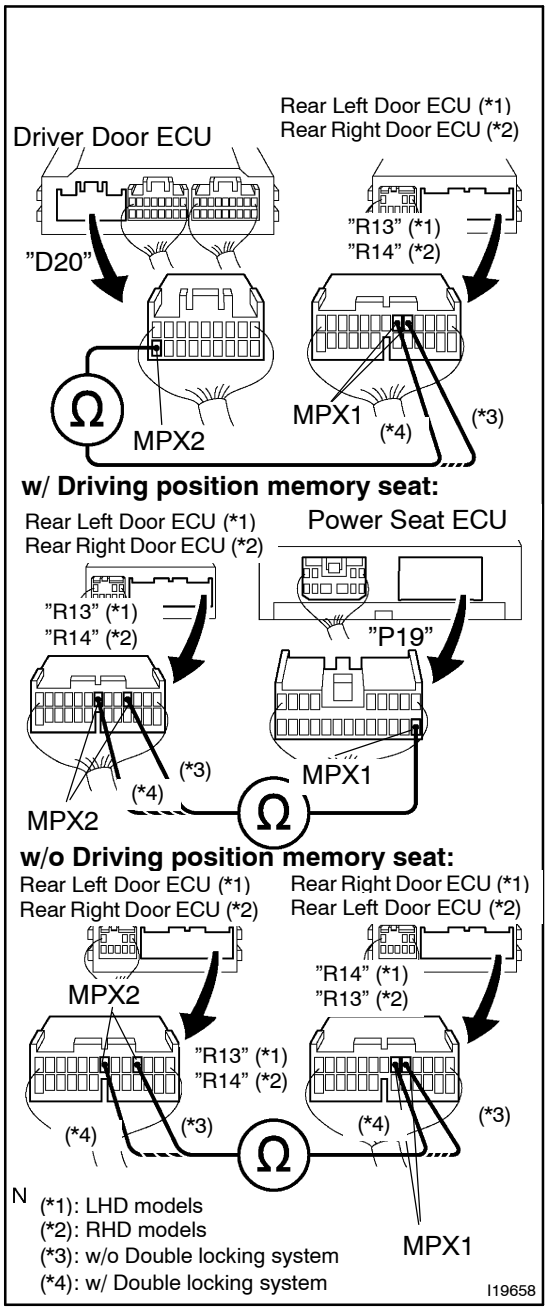
HINT:

With this inspection rear left door ECU CPU can be diagnosed if it works normal or not.

NG → **Replace the rear left door ECU.**

OK

2	Check wireharness



PREPARATION:

( ):RHD models:

Disconnect connector "D20" of driver door ECU,"R14" (or "R13") of rear left (or right) door ECU and "P19" of power seat ECU (or "R14" ("R13") of rear right (or left) door ECU).

CHECK:

(a) Check continuity between terminals MPX2 of driver door ECU and MPX1 of rear left door ECU.

(b) w/Seat memory, ( ): RHD models
Check continuity between terminals MPX2 of rear left (or-right) door ECU and MPX1 of power seat ECU.

(c) w/o Seat memory, ( ): RHD models
Check continuity between terminals MPX2 of rear left door ECU and MPX1 of rear right (or left) door ECU.

OK:

Continuity exists in wireharness of both (a) and (b) or (a) and (c), (a) or either (b) or (c).

HINT:

If there is OPEN in wireharness of either (a), (b) or (c), please repair it.

NG → **Repair or replace wireharness.**

OK

Replace the rear left (or right) door ECU.

DI2B5-04

DTC	B1218 / 18	Body No.2 ECU communication stop

CIRCUIT DESCRIPTION

This DTC is output when communication stops between Body No.2 ECU and Body No.1 ECU.

DTC No.	DTC Detecting Condition	Trouble Area
B1218/18	No communication from Body No.2 ECU for more than 10 seconds.	• Body No.2 ECU • Wireharness

WIRING DIAGRAM

See page DI–747, DI–753

INSPECTION PROCEDURE

1	Check Body No.2 ECU.

CHECK:

Check that the headlight comes on when operating the light control switch with the ignition switch off.

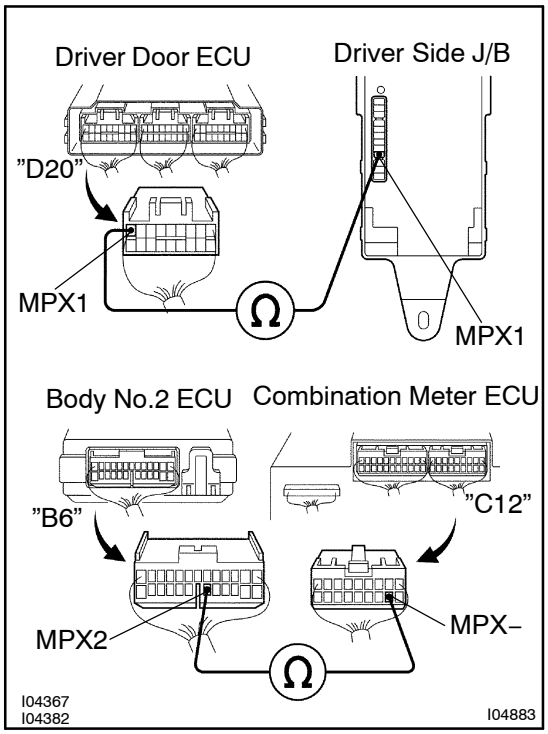
HINT:

With this inspection rear left door ECU CPU can be diagnosed if it works normal or not.

NG → **Replace the Body No.2 ECU.**

OK

2	Check wireharness



PREPARATION:

(a) Disconnect connector of Body No.2 ECU, ”D20” of Driver door ECU and ”C12” of Combination meter ECU.

(b) Remove the Body No.2 ECU from Driver side junction block.

CHECK:

(a) Check continuity between terminals MPX1 of Body No.2 ECU and MPX1 of Driver door ECU.

(b) Check continuity between terminals MPX2 of Body No.2 ECU and MPX– of Combination meter ECU.

OK:

Continuity exists in wireharness of both (a) and (b), or either (a) or (b).

HINT:

If there is OPEN in wireharness of either (a) or (b), please repair it.

NG → **Repair or replace wireharness.**

OK →

Replace the Body No.2 ECU.

DI2B6–04

DTC	B1221 / 21	Power window switch circuit on driver door

DTC	B1222 / 22	Door lock switch circuit on driver door

DTC	B1223 / 23	Power window switch circuit on passenger door

DTC	B1224 / 24	Door lock switch circuit on passenger door

DTC	B1225 / 25	Power window switch circuit on rear right door

DTC	B1226 / 26	Power window switch circuit on rear left door

DTC	B1241 / 41	Body No.1 ECU switch circuit diagnosis

DTC	B1252 / 52	Body No.2 ECU switch circuit diagnosis

CIRCUIT DESCRIPTION

These DTC notify how switch works as follows:
If DTC is not output when operating switch, it means failure of switch contact. If DTC is output when not operating switch, it means stick of switch. When something wrong is found by this diagnosis, inspect each switch. Then, replace the switch if there is a problem, or check the wireharness if there is no problem.

DTC No.	DTC Detecting Condition	Trouble Area
B1221/21	Stick of either of the power window master switch (except window lock switch)	• Power window master switch • Wireharness

B1222/22	Stick of door key lock and unlock switch	• Door lock control switch • Door key lock and unlock switch • Wireharness
B1223/23	Stick of power window switch or door lock control	• Power window switch • Door lock control switch • Wireharness
B1224/24	Stick of door key lock and unlock switch	• Door lock control switch • Door key lock and unlock switch • Wireharness
B1225/25	Stick of power window switch	• Power window switch • Wireharness
B1226/26	Stick of power window switch	• Power window switch • Wireharness
B1241/41	Stick of switch	• Luggage compartment door opener switch • Luggage compartment door lock and unlock switch • Wireharness
B1252/52	Stick of switch	• Step light switch • Wireharness

HINT:
Please refer to BE section for switch inspection, and to each door system of DI section for wireharness inspection.

DI1SR–04

DTC	B1232 / 32	Jam protection pulse switch circuit on driver door

DTC	B1234 / 34	Jam protection pulse switch circuit on passenger door

DTC	B1236 / 36	Jam protection pulse switch circuit on rear right door

DTC	B1238 / 38	Jam protection pulse switch circuit on rear left door

CIRCUIT DESCRIPTION

These DTCs are output when a malfunction of pulse switch within power window motor is detected.

DTC No.	DTC Detecting Condition	Trouble Area
B1232/32	No change in pulse switch more than 2.0 seconds even if opening glass down when limit switch is OFF (window glass is fully closed).	• Jam protection pulse switch • Wireharness
B1234/34		
B1236/36		
B1238/38		

HINT:

Please refer to power window control system of BE section for switch inspection, and to each door system of DI section for wireharness inspection.

DI862–01

DTC	B1231 / 31	Jam protection limit switch circuit on driver door

DTC	B1233 / 33	Jam protection limit switch circuit on passenger door

DTC	B1235 / 35	Jam protection limit switch circuit on rear right door

DTC	B1237 / 37	Jam protection limit switch circuit on rear left door

CIRCUIT DESCRIPTION

These DTCs are output when a malfunction of limit switch within power wIndow motor is detected.

DTC No.	DTC Detection Condition	Trouble Area
B1231/31	No change in limit switch more than 2.0 seconds even if operating glass down when limit switch is OFF (window glass is fully closed)	• Jam protection limit switch • Wireharness
B1233/33		
B1235/35		
B1237/37		

HINT:

Please refer to power window control system of BE section for switch inspection, and to each door system of DI section for wireharness inspection.

DI2B7–10

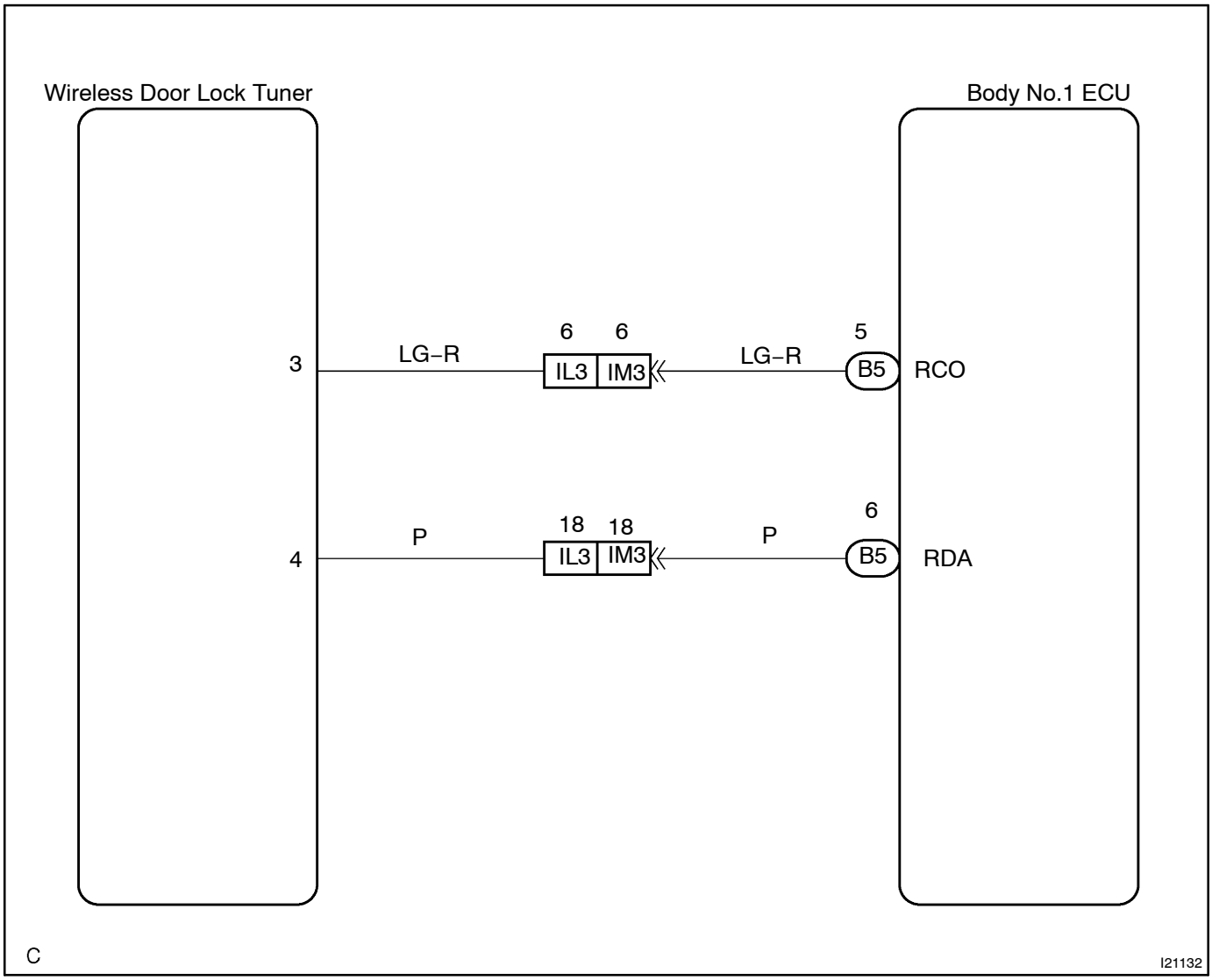
DTC	B1242 / 42	Wireless door lock tuner circuit malfunction

CIRCUIT DESCRIPTION

This DTC is output when GND short of RDA terminal is detected.

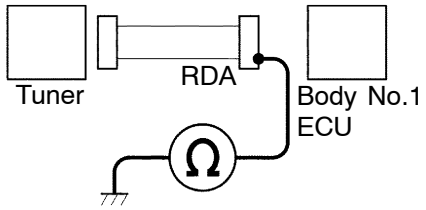
DTC No.	DTC Detecting Condition	Trouble Area
B1242/42	GND short of RDA terminal	• Wireharness • Wireless door lock tuner • Body No.1 ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check wireharness.**

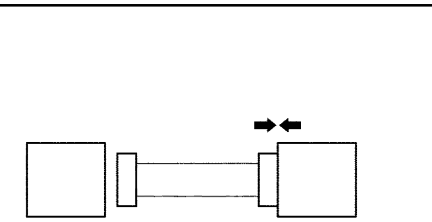


PREPARATION:
Disconnect the connector of tuner and body No.1 ECU.
CHECK:
Check the continuity between wireharness and body ground.
OK:
No continuity.

NG	**Repair or replace the wireharness.**

OK

2	**Check body No.1 ECU.**



PREPARATION:
Connect the connector of body No.1 ECU.
CHECK:
Check the DTC.
OK:
B1242/42 is not output.

NG	**Replace the body No.1 ECU.**

OK

Replace the tuner.

D12B9–10

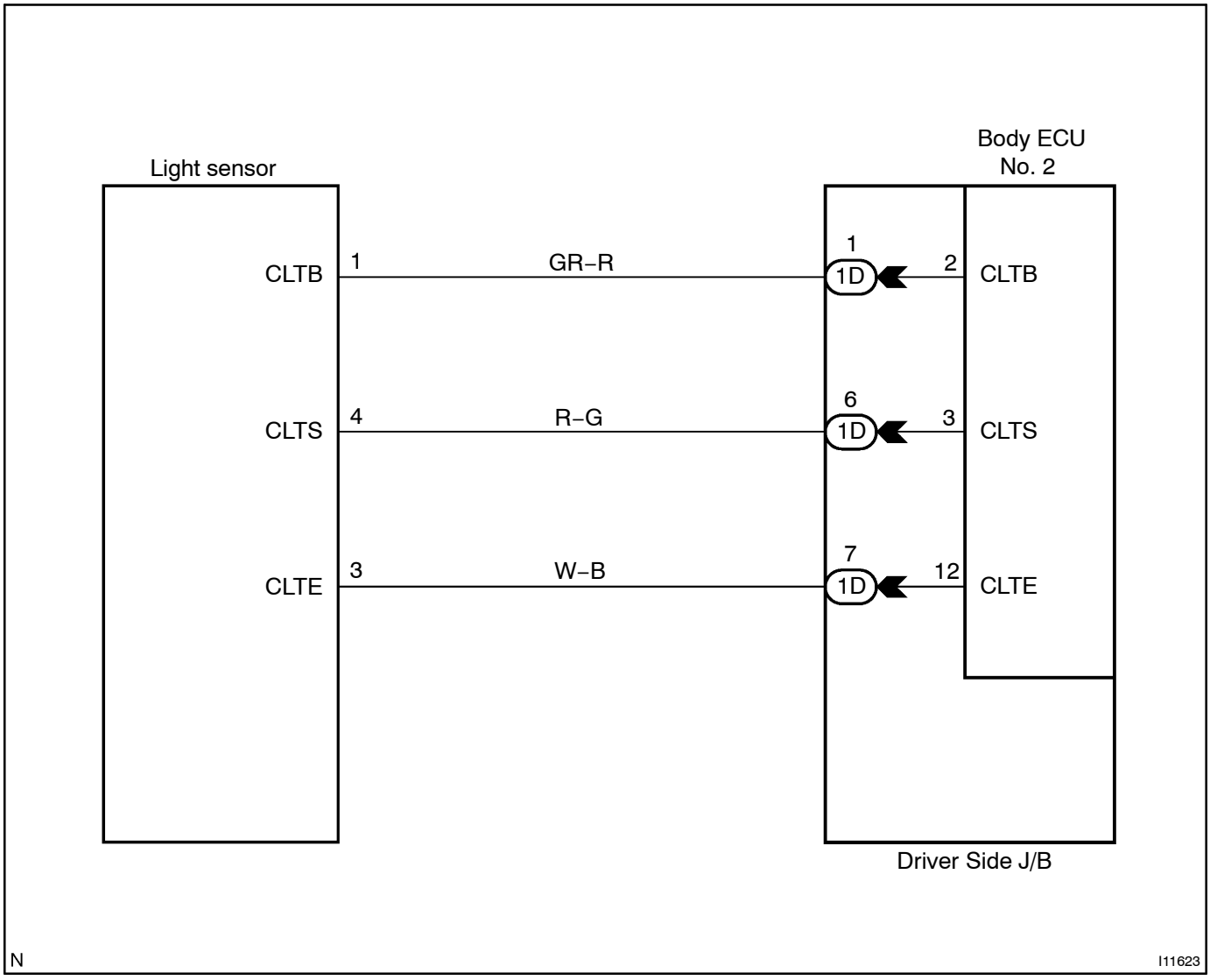
DTC	B1244 / 44	Light sensor circuit malfunction

CIRCUIT DESCRIPTION

This DTC is output when failure of light sensor circuit is detected.

DTC No.	DTC Detecting Condition	Trouble Area
B1244/44	• Malfunction of light sensor • Open or short of light sensor circuit	• Light sensor • Wireharness • Body No.2 ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

Using LEXUS hand –held tester:

1	**Check light sensor.**

PREPARATION:

(a) Connect the LEXUS hand–held tester to the DLC3.

(b) Turn ignition switch ON and LEXUS hand–held tester main switch ON.

CHECK:

The value of the illumination rate should change in the following range when the light sensor is put in the light or covered by a hand

OK:

0.8 ms – 22.0 ms

HINT:

- This is the time to be taken for the light sensor to generate one circle of frequency according to the brightness.
- When not using LEXUS hand–held tester (See Pub. No. RM588E on page BE–38).

NG → **Replace the light sensor.**

OK

2	**Check wireharness and connector between light sensor and Body No.2 ECU.**

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

OK

Replace the Body No.2 ECU.

DI2BB-08

DTC	B1261/61	Engine and ECT ECU communication stop

CIRCUIT DESCRIPTION

This DTC is output when communication stops between engine and ECT ECU and Body No.1 ECU.

DTC No.	DTC Detecting Condition	Trouble Area
B1261/61	No communication from engine and ECT ECU more than 10 seconds.	• Engine and ECT ECU • Wireharness

WIRING DIAGRAM

See page DI–753

INSPECTION PROCEDURE

1	Check engine and ECT ECU.

CHECK:

Check that the engine starts normally.

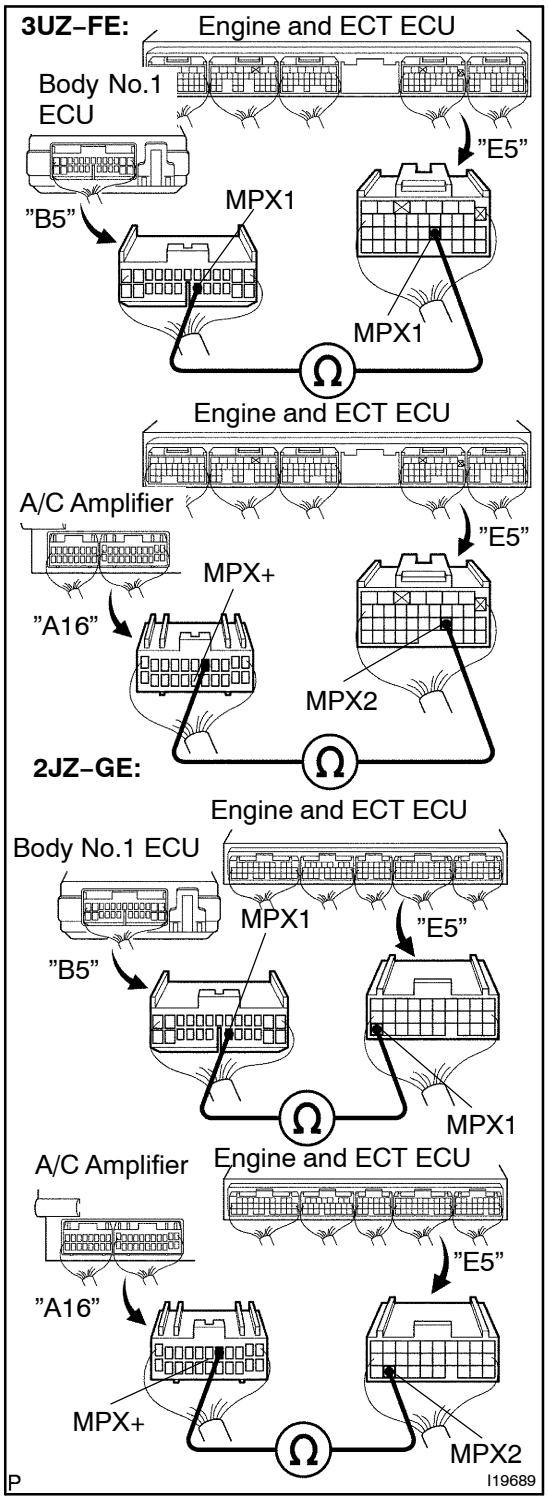
HINT:

With this inspection, engine and ECT ECU CPU can be diagnosed if it works normally or not.

NG → **Replace the engine and ECT ECU.**

OK

2	Check wireharness



PREPARATION:

Disconnect connector "B5" of body No.1 ECU, E5 of engine and ECT ECU, "A16" of A/C amplifier.

CHECK:

(a) Check continuity between terminals MPX1 of body No.1 ECU and MPX1 of engine and ECT ECU.

(b) Check continuity between terminals MPX2 of engine and ECT ECU and MPX+ of A/C amplifier.

OK:

Continuity exists in wireharness of both (a) and (b), or either (a) or (b).

HINT:

If there is OPEN in wireharness of either (a) or (b), please repair it.

NG → **Repair or replace wireharness.**

OK

Replace the engine and ECT ECU.

DI2BC–09

DTC	B1262/62	A/C amplifier communication stop

CIRCUIT DESCRIPTION

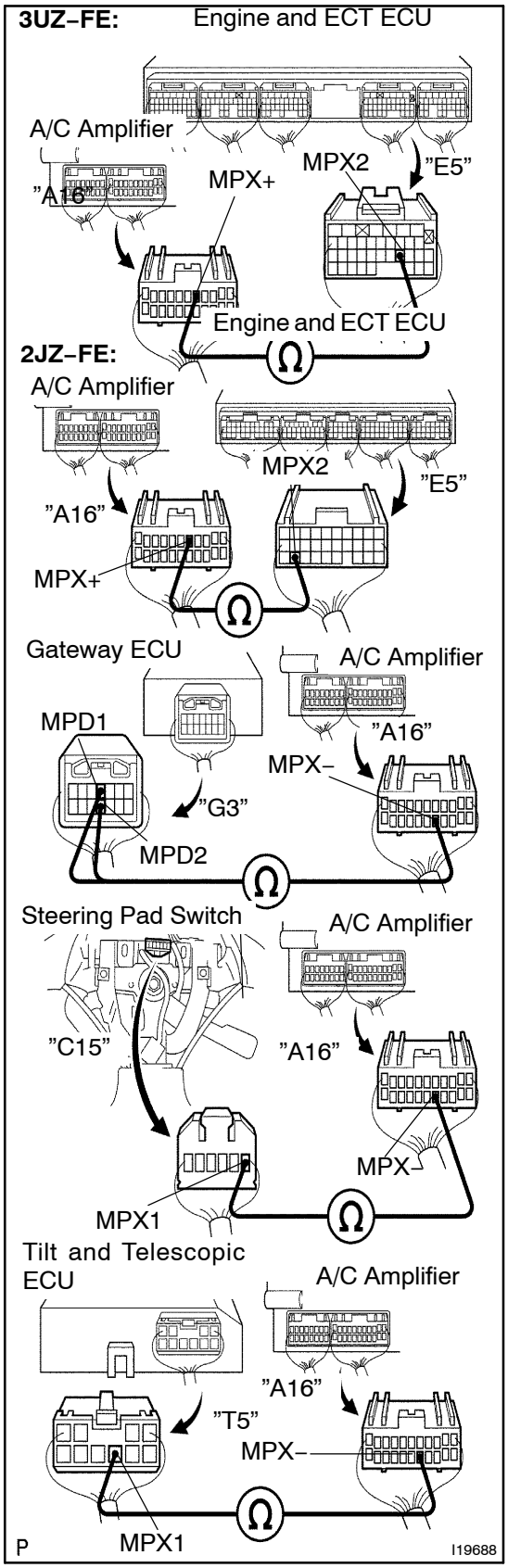
This DTC is output when communication stops between engine and ECT ECU and Body No.1 ECU.

DTC No.	DTC Detecting Condition	Trouble Area
B1262/62	No communication from ECU more than 10 seconds.	• A/C amplifier • Wireharness

WIRING DIAGRAM

See page DI–753

1	Check wireharness



PREPARATION:

Disconnect the connector "E5" of engine and ECT ECU, "G3" of gateway ECU, "C15" of steering pad switch, T5 of tilt and telescopic ECU and A/C amplifier.

CHECK:

(a) Check continuity between terminals MPX+ of A/C amplifier and MPX2 of engine and ECT ECU.

(b) Check continuity between terminals MPD1, MPD2 of gateway ECU and MPX2 of A/C amplifier.

(c) 3UZ–FE engine:
Check eontinuity between terminals MPX of pad switch and MPX+ of A/C amplifier.

(d) Check continuity between MPX1 of tilt and telescopic ECU and MPX– of A/C amplifier.

OK:

Continuity exists in wireharness.

NG → **Repair or replace wireharness.**

OK

Replace the A/C amplifier.

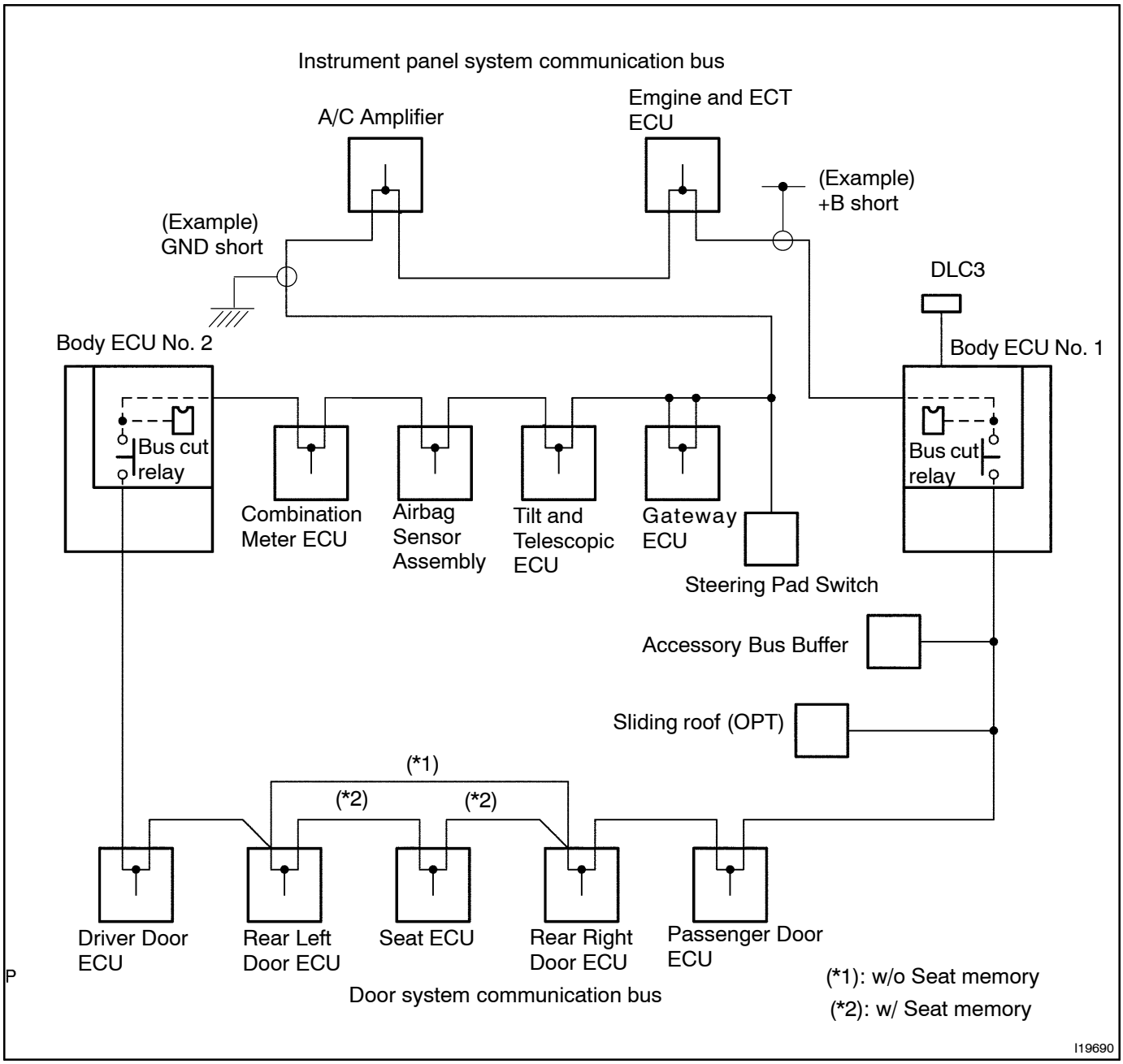
DI863–01

DTC	B1266 / 66	Instrument panel system communication bus malfunction (+B short)

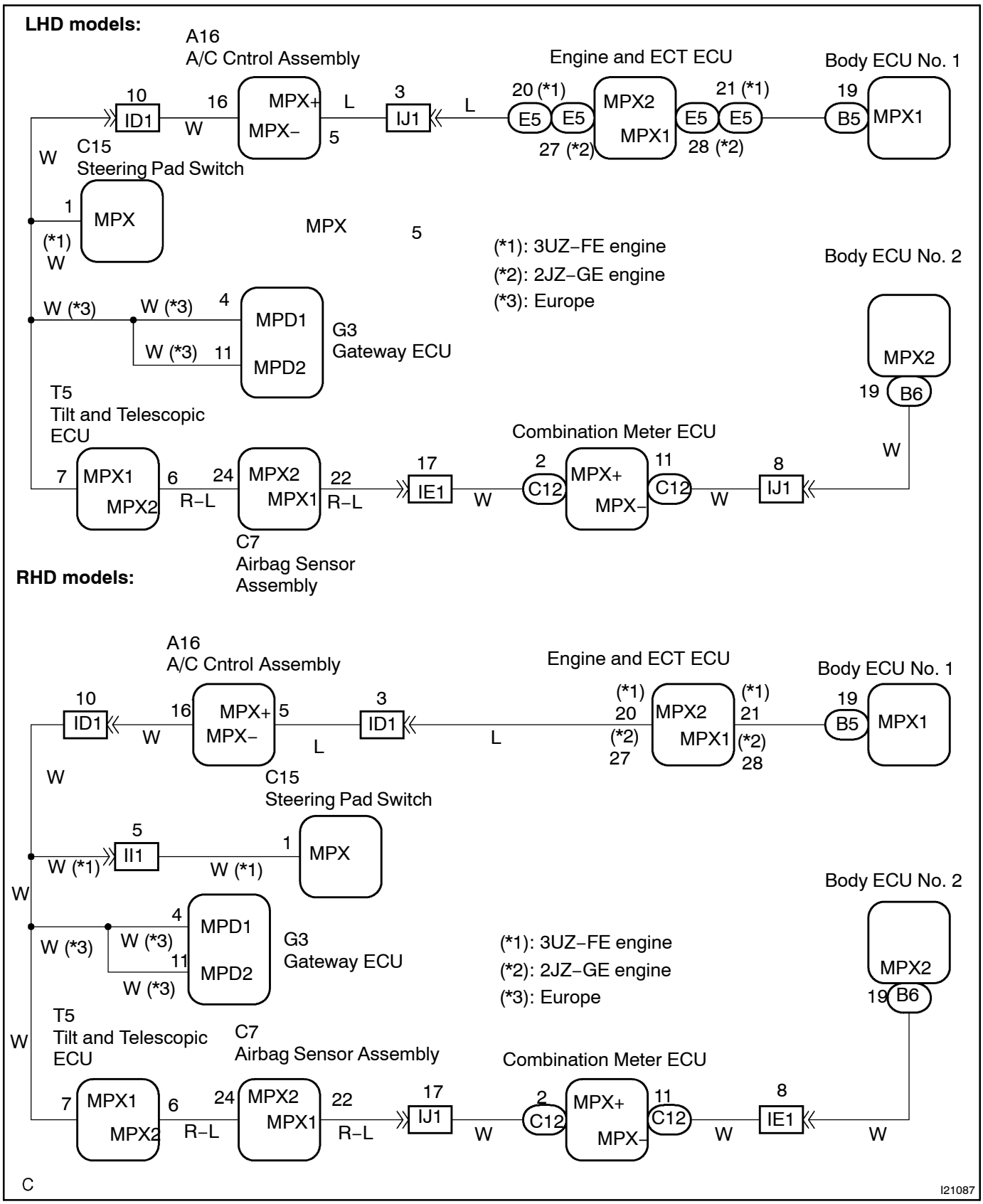
DTC	B1267 / 67	Instrument panel system communication bus malfunction (GND short)

CIRCUIT DESCRIPTION

This DTC is output when +B or GND short occurs on instrument panel system communication bus. If +B or GND short is detected on instrument panel system communication bus, separate it by bus cut relay in Body ECU No. 1 and Body ECU No. 2 to prevent while communication buses' failure.



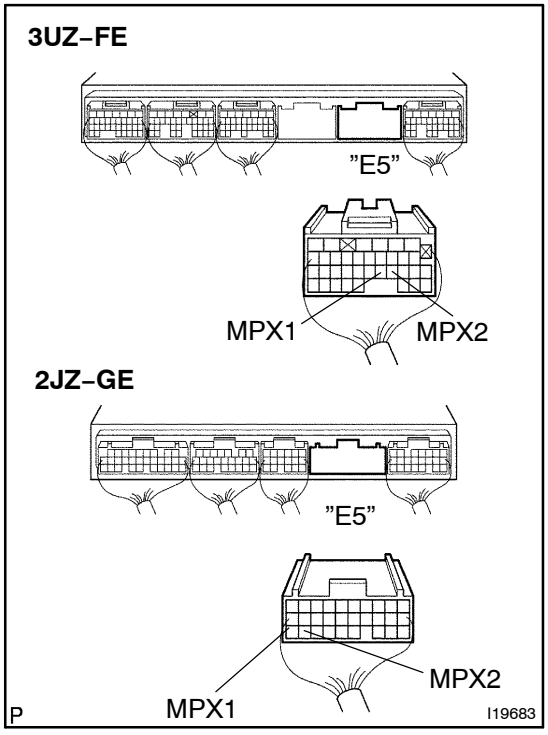
WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
On the system structure point of view, this DTC cannot display meter. In case of checking DTC, please use LEXUS hand held tester.

1	**Check the communication circuit inside engine and ECT ECU.**

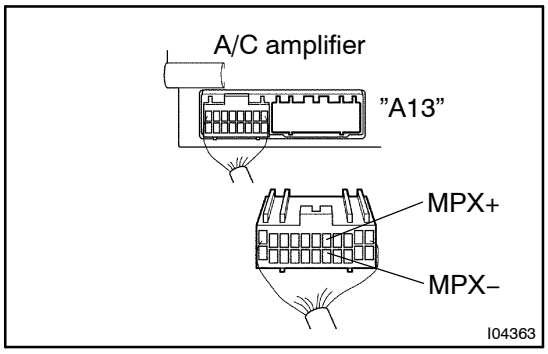


PREPARATION:
Disconnect the connector ”E5” of engine ECT ECU.
CHECK:
Check the DTC.
OK:
Code B1266 or B1267 is not output.

OK	**Replace the engine ECT ECU.**

NG

2	Check the communication circuit inside A/C amplifier.



PREPARATION:
(a) Connect the connector ”C8” of aribag sensor assembly.
(b) Disconnect the connector ”A16” of A/C amplifier.

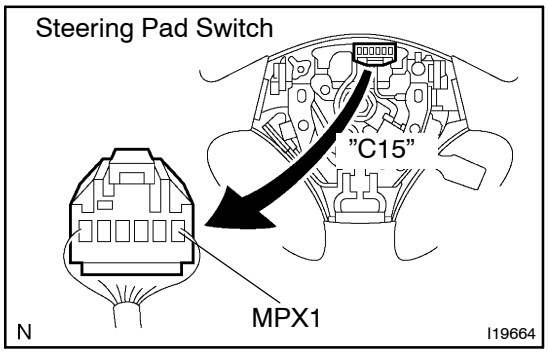
CHECK:
Check the DTC.

OK:
Code B1266 or B1267 is not output.

OK	Replace the A/C amplifier.

NG

3	Check the communication circuit inside steering pad switch.



HINT:
Proceed to next step, when vehicle has no pad switch.

PREPARATION:
(a) Connect the connector ”A16” of A/C amplifier.
(b) Disconnect the connector of ”C15” steering pad switch.

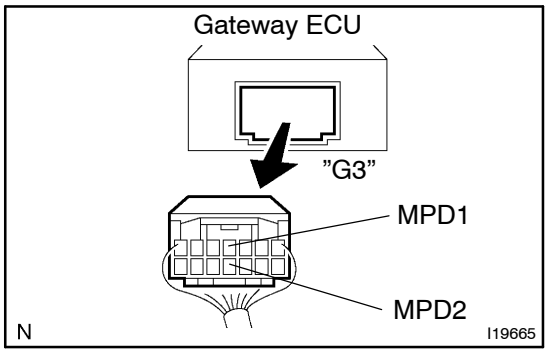
CHECK:
Check the DTC.

OK:
Code B1266 or B1267 is not output.

OK	Replace steering pad switch.

NG

4	Check the communication circuit inside gateway ECU.



PREPARATION:
(a) Connect the connector "C15" of pad switch.
(b) Disconnect the connector "G3" of gateway ECU.

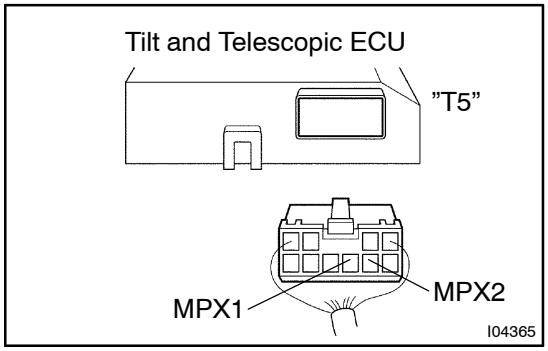
CHECK:
Check the DTC.

OK:
Code B1266 or B1267 is not output.

OK	Replace the gateway ECU.

NG

5	Check the communication circuit inside tilt and telescopic ECU.



PREPARATION:
(a) Connect the connector "M3" of gateway ECU.
(b) Disconnect the connector "T5" of tilt and telescopic ECU.

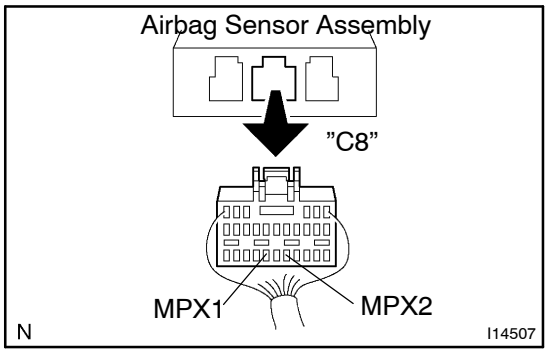
CHECK:
Check the DTC.

OK:
Code B1266 or B1267 is not output.

OK	Replace the tilt and telescopic ECU.

NG

6	Check the communication circuit inside airbag sensor assembly.



PREPARATION:

(a) Connect the connector "T5" of tilt and telescopic ECU.

(b) Disconnect the connector "C8" (or "C7") of airbag of sensor assembly.

CHECK:

Check the DTC.

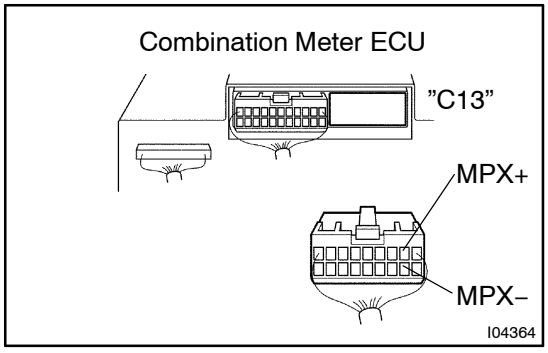
OK:

Code B1266 or B1267 is not output.

OK	Replace airbag sensor assembly.

NG

7	Check the communication circuit inside combination meter ECU.



PREPARATION:

(a) Connect the connector airbag sensor assembly.

(b) Disconnect the connector "C13" of combination meter ECU.

CHECK:

Check the DTC.

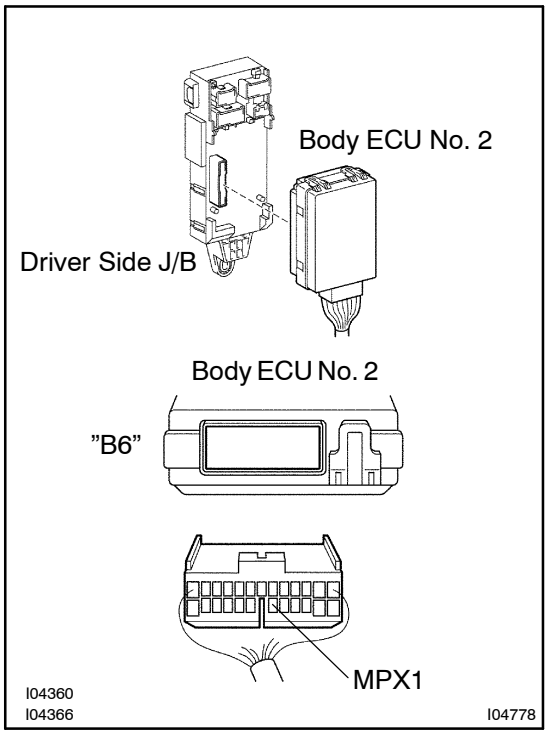
OK:

Code B1266 or B1267 is not output.

OK	Replace the combination meter ECU.

NG

8	Check the communication circuit inside Body ECU No. 2.



PREPARATION:

(a) Connect the connector ”C13” of combination meter ECU.
(b) Disconnect the connector ”B6” of Body ECU No. 2.
(c) Remove the Body ECU No. 2 from Driver side J/B.

CHECK:

Check the DTC.

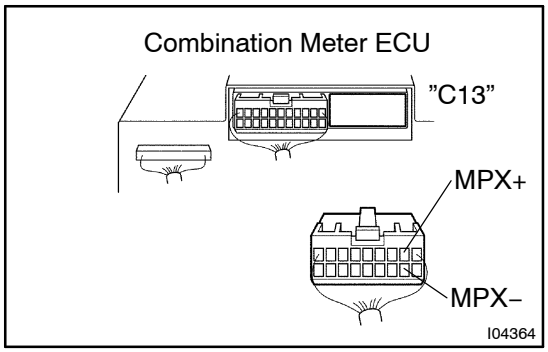
OK:

Code B1266 or B1267 is not output.

OK	Replace the Body ECU No. 2.

NG

9	Check for short circuit between combination meter ECU and Body ECU No. 2.



PREPARATION:

Disconnect the connector ”C12” of combination meter ECU.

CHECK:

Check the DTC.

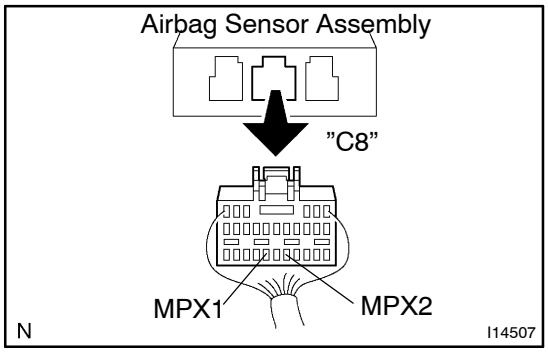
OK:

Code B1266 or B1267 is not output.

OK	Repair or replace the wireharness between combination meter ECU and Body ECU No. 2.

NG

10	Check short circuit between combination meter ECU and airbag sensor assembly.



PREPARATION:

(a) Install the Body ECU No. 2 to driver side J/B.
(b) Connect the connector "B6" of Body ECU No. 2.
(c) Disconnect the connector "C8" of airbag sensor assembly.

CHECK:

Check DTC.

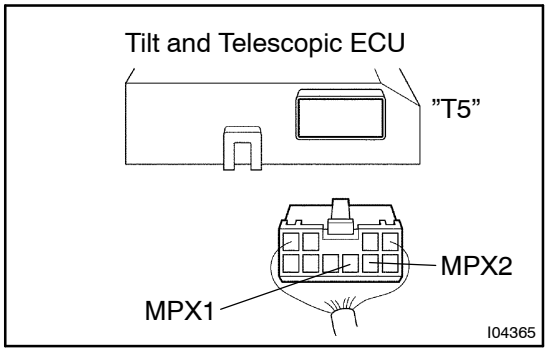
OK:

Code B1266 or B1267 is not output.

OK	Repair or replace the wireharness between combination meter ECU and airbag sensor assembly.

NG

11	Check for short circuit between combination meter ECU and tilt and telescopic ECU.



PREPARATION:

(a) Install the Body ECU No. 2 to driver side J/B.
(b) Connect the connector "B6" of Body ECU No. 2.
(c) Disconnect the connector "T5" of tilt and telescopic ECU.

CHECK:

Check the DTC.

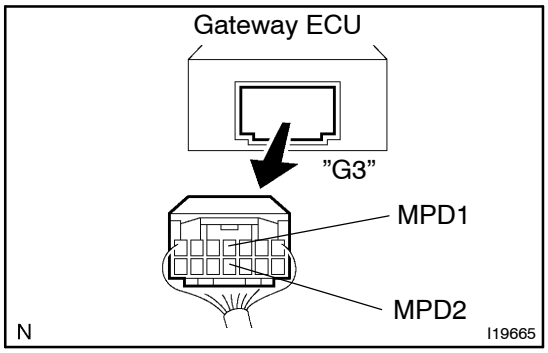
OK:

Code B1266 or B1267 is not output

OK	Repair or replace the wireharness between combination meter ECU and tilt and telescopic ECU.

NG

12	Check for short circuit between tilt and telescopic ECU and gateway ECU.



PREPARATION:

(a) Connect the connector "C12" of combination meter ECU.

(b) Disconnect the connector "G3" of gateway ECU.

CHECK:

Check the DTC.

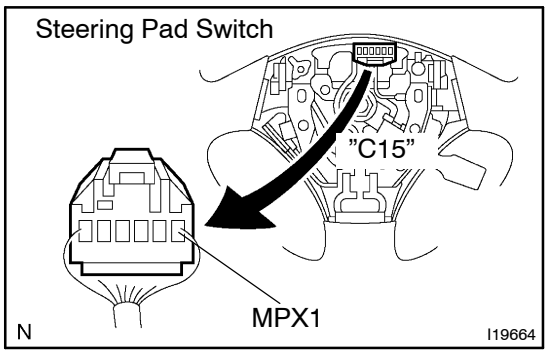
OK:

Code B1266 or B1267 is not output

OK	Repair or replace the wireharness between tilt and telescopic ECU and gateway ECU.

NG

13	Check for short circuit between tilt and telescopic ECU and steering pad switch.



PREPARATION:

HINT:

Proceed to next step, when vehicle has not steering pad switch.

(a) Connect the connector "G3" of gateway ECU.

(b) Disconnect the connector "C15" of steering pad switch.

CHECK:

Check the DTC.

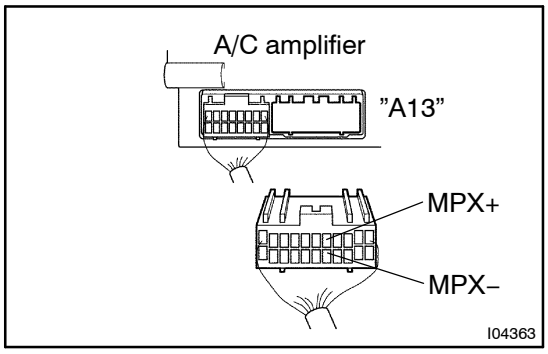
OK:

Code B1266 or B1267 is not output.

OK	Repair or replace the wireharness between steering pad switch and tilt and telescopic ECU.

NG

14	Check for short circuit between tilt and telescopic ECU and A/C amplifier.



PREPARATION:

(a) w/ Steering pad switch:
Connect the connector ”C15” of steering pad switch.

(b) w/o Steering pad switch:
Connect the connector ”G3” of gateway ECU.

(c) Disconnect the connector ”A16” of A/C amplifier.

CHECK:

Check the DTC.

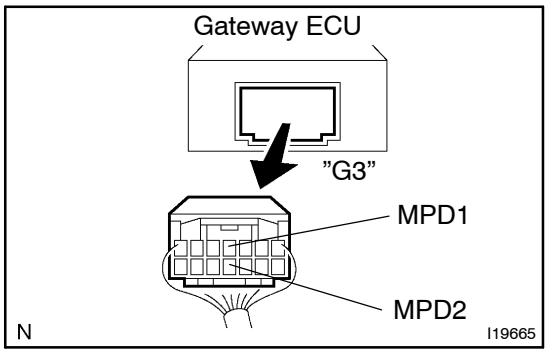
OK:

Code B1266 or B1267 is not output.

OK	Repair or replace the wireharness between tilt and telescopic ECU and A/C amplifier.

NG

15	Check for short circuit between gateway ECU and A/C amplifier.



PREPARATION:

(a) Connect the connector ”T5” of tilt and telescopic ECU.

(b) Disconnect the connector ”G3” of gateway ECU.

CHECK:

\Check the DTC.

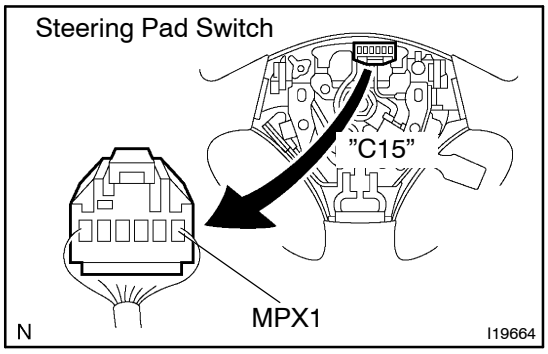
OK:

Code B1266 or B1267 is not output.

OK	Repair or replace the wireharness between gateway ECU and A/C amplifier.

NG

16	Check for short circuit between gateway ECU and steering pad switch.



PREPARATION:

HINT:

Proceed to next step, when vehicle has not steering pad switch.

(a) Connect the connector ”A16” of A/C amplifier.

(b) Disconnect the connector ”C15” of steering pad switch.

CHECK:

Check the DTC.

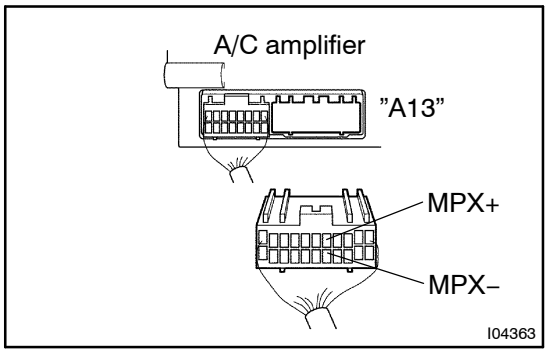
OK:

Code B1266 or B1267 is not output.

OK	Repair or replace the wireharness between gateway ECU and steering pad switch.

NG

17	Check short circuit between steering pad switch and A/C amplifier.



PREPARATION:

(a) Connect the connector ”G3” of gateway ECU.

(b) Disconnect the connector ”A16” of A/C amplifier.

CHECK:

Check the DTC.

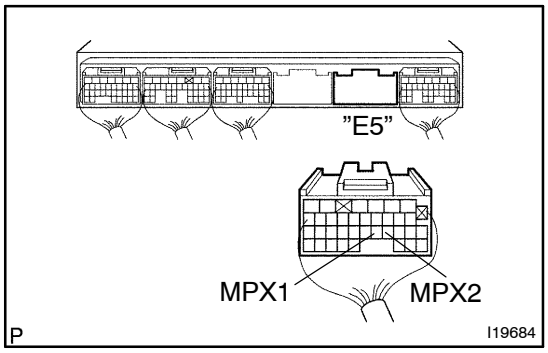
OK:

Code B1266 or B1267 is not output.

OK	Repair or replace the wireharness between steering pad switch and A/C amplifier.

NG

18	Check for short circuit between airbag sensor assembly and engine and ECT ECU.



PREPARATION:

(a) Connect the connector " A16" of A/C amplifier.

(b) Disconnect the connector "E5" of engine and ECT ECU.

CHECK:

Check the DTC.

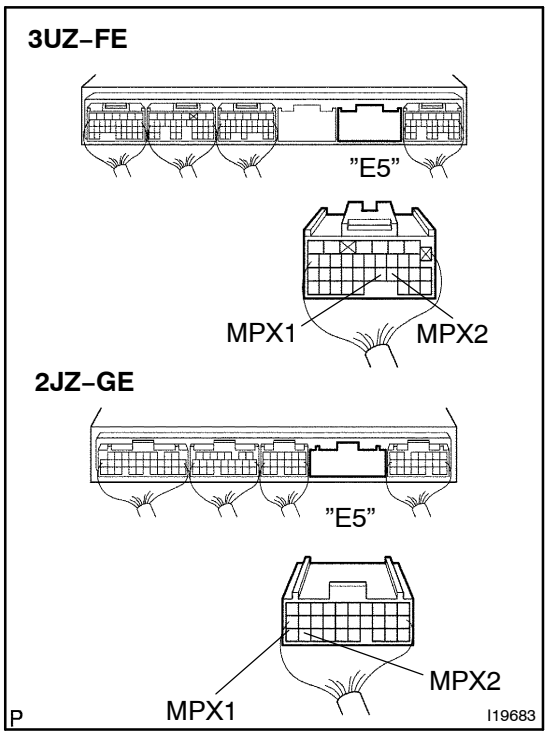
OK:

Code B1266 or B1267 is not output.

OK	Repair or replace the wireharness between airbag sensor assembly and engine and ECT ECU.

NG

19	Check for short circuit between A/C amplifier and engine and ECT ECU.



PREPARATION:

(a) Connect the connector " C15" of pad switch.

(b) Disconnect the connector " E5" of engine and ECT ECU.

CHECK:

Check the DTC.

OK:

Code B1266 or B1267 is not output.

OK	Repair or replace the wireharness between A/C amplifier and engine and ECT ECU.

NG

20	**Check for short circuit between engine and ECT ECU and Body ECU No. 1.**

PREPARATION:

(a) Connect the connector ”A16” of A/C amplifier.

(b) Disconnect the connector ”B5” of Body ECU No. 1.

CHECK:

Check wireharness between engine and ECT ECU and Body ECU No. 1.

NG → **Repair or replace the wireharness between engine and ECT ECU and Body ECU No. 1.**

OK

Replace the Body ECU No. 1.

DI2BE–07

DTC	B1271/71	Combination meter ECU communication stop

CIRCUIT DESCRIPTION

This DTC is output when communication stops between combination meter ECU and body No.1 ECU.

DTC No.	DTC Detecting Condition	Trouble Area
B1271/71	No communication from Combination meter ECU more than 10 seconds.	• Combination meter ECU • Wireharness

WIRING DIAGRAM

See page DI–753

INSPECTION PROCEDURE

1	Check combination meter ECU.

CHECK:

Start the engine and check that the speed meter and tacometer operate normally.

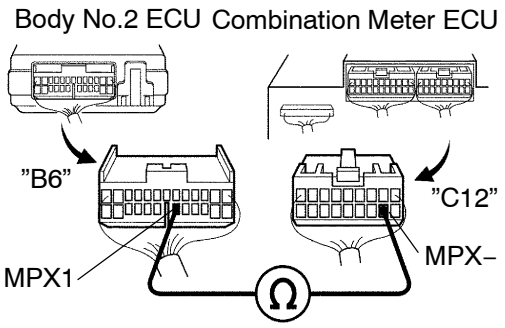
HINT:

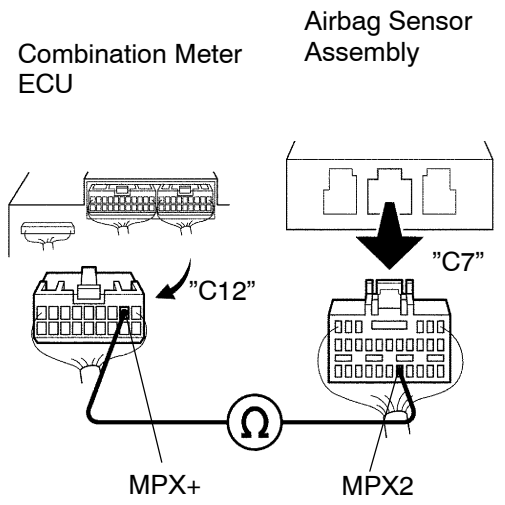
With this inspection, the combination meter ECU CPU can be diagnosed if it works normally or not.

NG → **Replace the combination meter ECU.**

OK

2	Check wireharness





I19687

PREPARATION:

Disconnect connector ”B6” of body No.2 ECU, ”C12” of combination meter ECU, ”C8” of airbag sensor assembly.

CHECK:

(a) Check continuity between terminals MPX1 of body No.2 ECU and MPX– of combination meter ECU.

(b) Check continuity between terminals MPX2 of airbag sensor assembly and MPX+ of combination meter ECU.

OK:

Continuity exists in wireharness of both (a) and (b), or either (a) or (b).

HINT:

If there is OPEN in wireharness of either (a), or (b), please repair it.

NG → **Repair or replace wireharness.**

OK

Replace the combination meter ECU.

D12BF-09

DTC	B1272/72	Power seat ECU communication stop (w/ Seat memory vehicle only)

CIRCUIT DESCRIPTION

This DTC is output when communication stops between power seat ECU and Body No.1 ECU.

DTC No.	DTC Detecting Condition	Trouble Area
B1272/72	No communication from seat ECU more than 10 seconds.	• Power seat ECU • Wireharness

WIRING DIAGRAM

See page DI–747

INSPECTION PROCEDURE

1	Check power seat ECU.

CHECK:

Check that the operation of front vertical and rear vertical is normal.

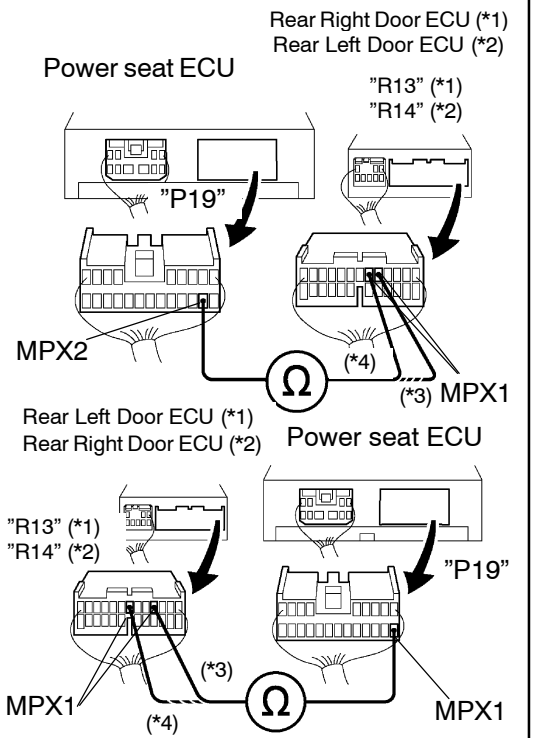
HINT:

With this inspection, the power seat ECU CPU can be diagnosed if it works normally or not.

NG → **Replace the power seat ECU.**

OK

2	Check wireharness



PREPARATION:

( ): RHD models:

Disconnect connector "R13" (or "R14") of rear right door ECU, "P19" of power seat ECU and "R14" (or "R13") of rear left door ECU.

CHECK:

(a) Check continuity between terminals MPX2 of rear right (or left) door ECU and MPX1 of power seat ECU.

(b) Check continuity between terminals MPX2 of power seat ECU and MPX1 of rear left (or right) door ECU.

OK:

Continuity exists in wireharness of both (a) and (b), or either (a) or (b).

HINT:

If there is OPEN in wireharness of either (a) or (b), please repair it.

NG → **Repair or replace wireharness.**

OK

Replace power seat ECU.

DI2BG–07

DTC	B1273/73	Sliding roof ECU communication stop (w/ Sliding roof vehicle only)

CIRCUIT DESCRIPTION

This DTC is output when communication stops between sliding roof ECU and body No.1 ECU.

DTC No.	DTC Detecting Condition	Trouble Area
B1273/73	No communication from sliding roof ECU more than 10 seconds.	• Sliding roof ECU • Wireharness

WIRING DIAGRAM

See page DI–747.

INSPECTION PROCEDURE

1	Check sliding roof ECU.

CHECK:

Check that the operation of the sliding roof function is normal.

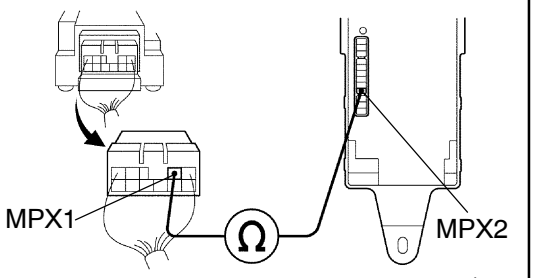
HINT:

With this inspection, the sliding roof ECU CPU can be diagnosed if it works normally or not.

NG → **Replace the sliding roof ECU.**

OK

2	Check wireharness



PREPARATION:
Disconnect connector sliding roof ECU and body No.1 ECU.
HINT:
Connecter is disconnected by removing Body No.1 ECU from passenger side junction block.

CHECK:
Check continuity between terminals MPX2 of body No.1 ECU and MPX1 of sliding roof ECU.

OK:
Continuity exists in wireharness.

NG → **Repair or replace wireharness.**

OK

Replace the sliding roof ECU.

DI864–01

DTC	B1281/81	Airbag sensor assembly communication stop

CIRCUIT DESCRIPTION

This DTC is output when communication stops between airbag sensor assembly, combination meter ECU and tilt and telescopic ECU.

DTC No.	DTC Detecting Condition	Trouble Area
B1281/81	No communication from airbag sensor assembly for more than 10 seconds.	• Airbag sensor assembly • Wireharness

WIRING DIAGRAM

See page DI–801

INSPECTION PROCEDURE

1	Check airbag sensor assembly.

CHECK:

Check whether or not DTC is output when changing to other airbag sensor assembly.

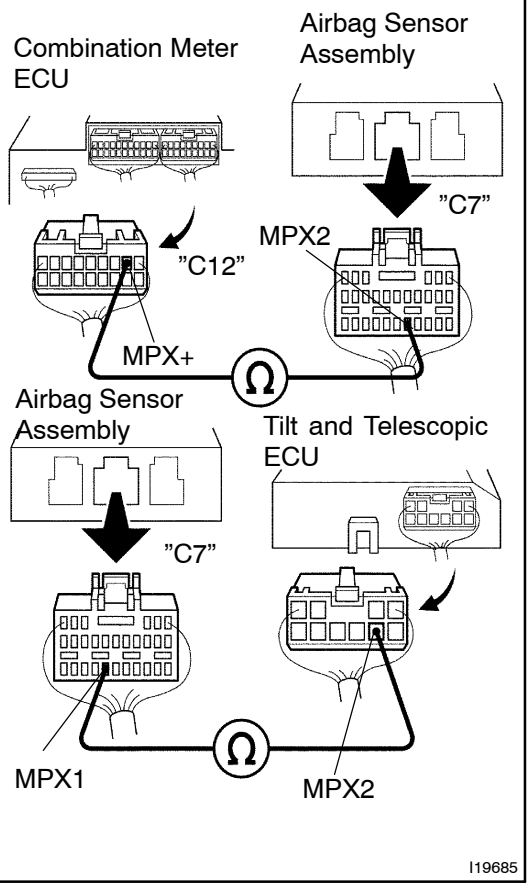
OK:

DTC must not be output.

OK: **Replace the airbag sensor assembly. (Original airbag sensor assembly is failure)**

NG

2	**Check wireharness.**



PREPARATION:

Disconnect connectors " C12 " of combination meter ECU, "T5 " of tilt and telescopic ECU and "C7 " of airbag sensor assembly.

CHECK:

(a) Check continuity between terminals MPX1 of airbag sensor assembly and MPX2 of tilt and telescopic ECU.

(b) Check continuity between terminals MPX2 of airbag sensor assembly and MPX+ of combination meter ECU.

OK:

Continuity exists in wireharness of both (a) and (b), or either (a) or (b).

HINT:

If there is OPEN in wireharness of either (a) or (b), please repair it.

NG	**Repair or replace wireharness.**

OK

Replace the airbag sensor assembly.

DI865–01

DTC	B1285/85	Steering pad switch communication stop (GS 430 only)

CIRCUIT DESCRIPTION

This DTC is output when communication stops between steering pad switch and A/C amplifier, gateway ECU, tilt and telescopic ECU.

DTC No.	DTC Detecting Condition	Trouble Area
B1285/85	No communication from steering pad switch more than 10 seconds.	• Steering pad switch • Wireharness

WIRING DIAGRAM

See page DI–753

INSPECTION PROCEDURE

1	Check steering pad switch.

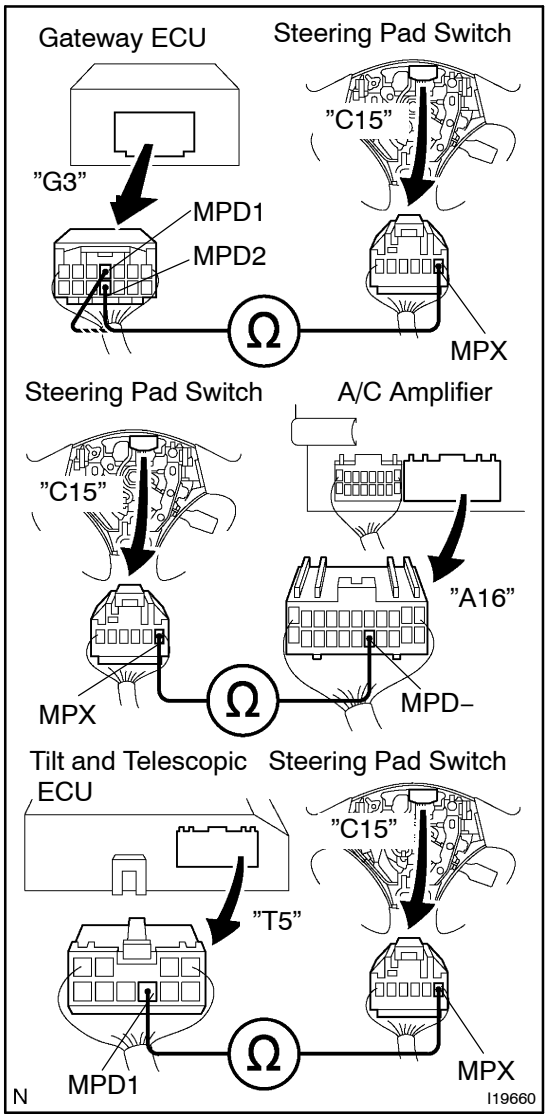
CHECK:

Turn ignition switch ON and check that the steering pad switch operate normally.

NG → **Replace steering pad switch.**

OK

2	**Check wireharness.**



PREPARATION:

Disconnect connector " G3" of gateway ECU "A16" of A/C amplifier ECU, "T5" of tilt and telescopic ECU and " C15" of steering pad switch.

CHECK:

(a) Check continuity between terminals MPX of steering pad switch and MPD1, MPD2 of gateway ECU.

(b) Check continuity between terminals MPX of steering pad switch and MPX– of A/C amplifier.

(c) Check continuty between terminals MPX of steering pad switch and MPX1 of tilt and telescopic ECU.

OK:

There is a continuity in wireharness of both (a) and (b) or (a) and (c), or either (b) or (c).

HINT:

If there is OPEN in wireharness of either (a) or (b), please repair it.

NG → **Repair or replace wireharness.**

OK

Replace the steering pad switch.

DI866–01

DTC	B1293/93	Gateway ECU (AVC–LAN adapter) communication stop

CIRCUIT DESCRIPTION

This DTC is output when communication stops between tilt and telescopic ECU, A/C amplifier and gateway ECU.

DTC No.	DTC Detecting Condition	Trouble Area
B1293/93	No communication from gateway ECU more than 10 seconds.	• Gateway ECU • Wireharness

WIRING DIAGRAM

See page DI–753

INSPECTION PROCEDURE

1	Check gateway ECU.

CHECK:

Check that the operation of is normal.

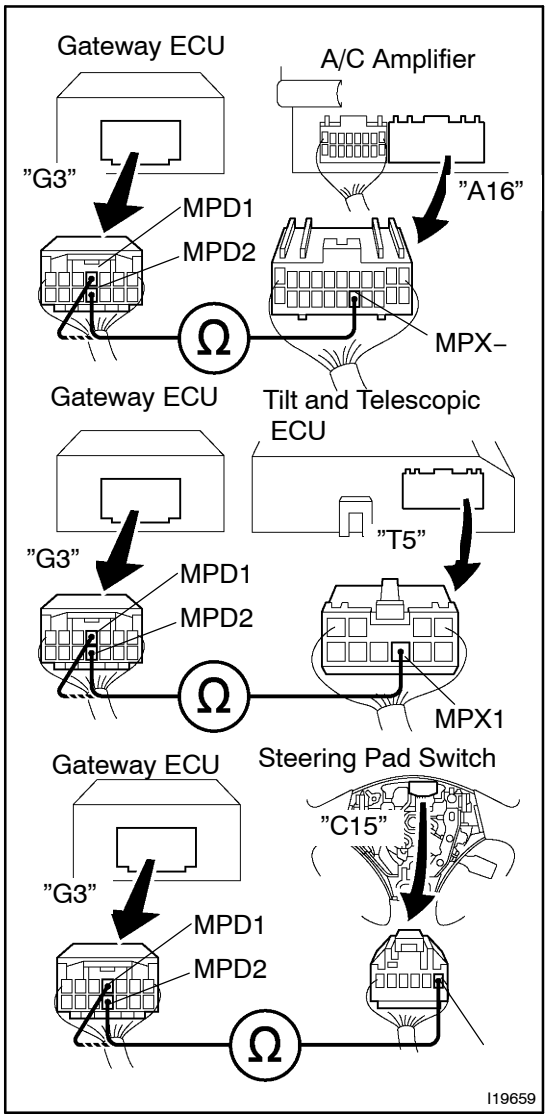
HINT:

With this inspection, the gateway ECU CPU can be diagnosed if it works normally or not.

NG → **Replace the gateway ECU.**

OK

2	**Check wireharness.**



PREPARATION:

Disconnect connector "T5 " of tilt and telescopic ECU, "A16 " of A/C amplifier ECU, steering pad switch and "G3 " of gateway ECU.

CHECK:

(a) Check continuity between terminals MPD1, MPD2 of gateway ECU and MPX– of A/C amplifier.

(b) Check continuity between terminals MPD1, MPD2 of gateway ECU and MPX1 of tilt and telescopic ECU.

(c) Check continuity between terminal MPD1, MPD2 of gateway ECU and MPX of steering pad switch.

OK:

There is a continuity in wireharness of both (a) and (b) or (a) and (c), or either (b) or (c).

HINT:

If there is OPEN in wireharness of either (a) or (b), please repair it.

NG	**Repair or replace wireharness.**

OK

Replace the gateway ECU.

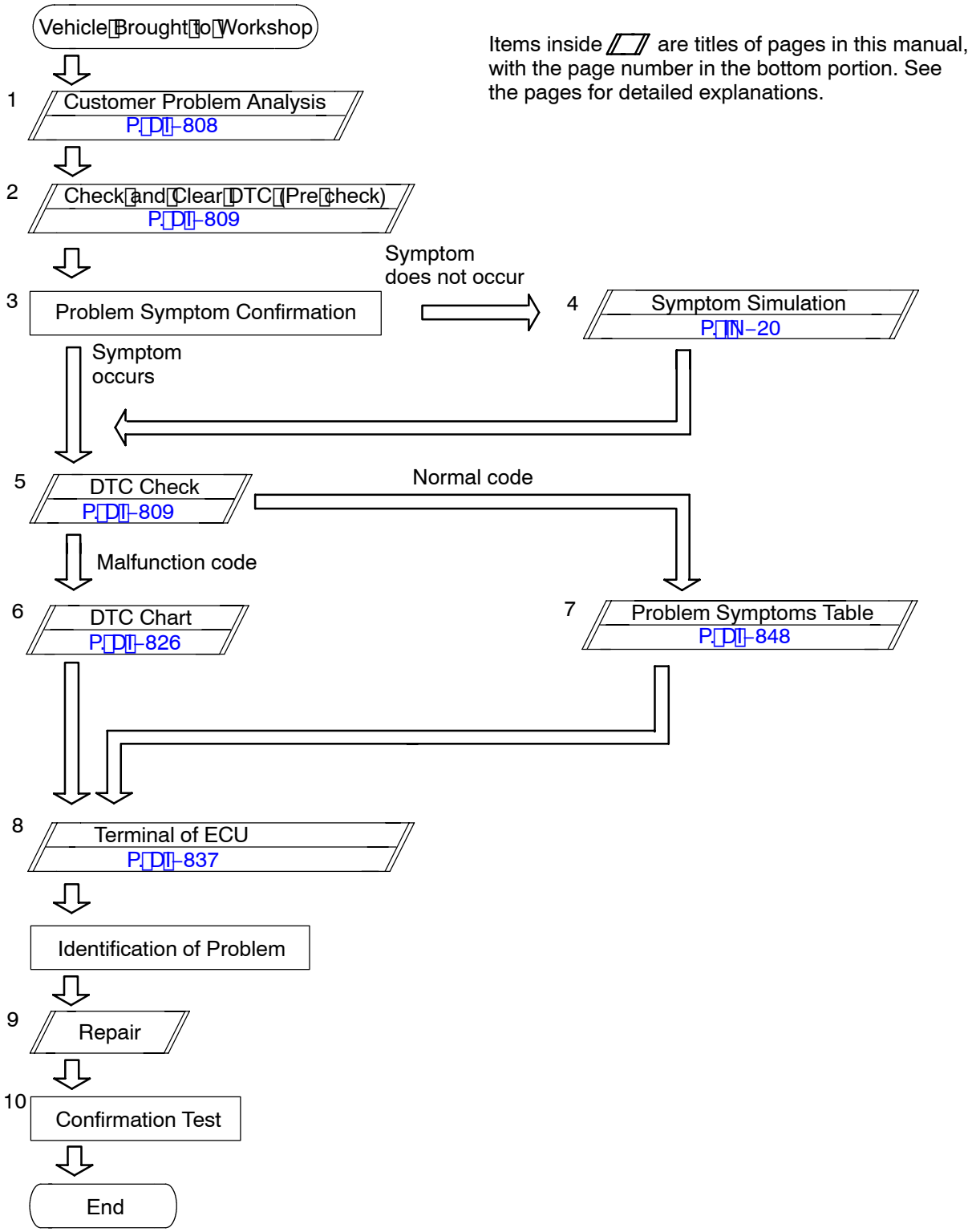
LEXUS NAVIGATION SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

DI27W–08

HINT:

The ECU of this system is connected to the multiplex communication system. Therefore, before starting troubleshooting, make sure to check that there is no trouble in the multiplex communication system.



DI27X–07

CUSTOMER PROBLEM ANALYSIS CHECK

LEXUS NAVIGATION SYSTEM Check Sheet

Inspector's name: _____

Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date of Vehicle Brought in	/ /	**Odometer Reading**	**km Mile**

Date Problem First Occurred	/ /
Frequency Problem Occurs	☐ Constant ☐ Intermittent (Times a day)

Problem Symptom	**Navigation malfunction**	☐ Cursor movement is defective.
		☐ Cursor does not move.
		☐ GPS mark does not appear.
		☐ Map is not displayed.
		☐ Others ( )
	Display malfunction	☐ Screen is dark.
		☐ Screen is white.
		☐ Color is not uniform.
		☐ Screen is in disorder.
		☐ Others ( )
	Control Switch malfunction	☐ Can not operate with panel switches.
		☐ Can not operate with touch switches.
		☐ Others ( )

	Parts name	**1st time malfunction code.**	**2nd time malfunction code.**
DTC Check	Navigation ECU		
	Multi – Display		
	Radio receiver assembly		
	Gateway ECU		
	Power amplifier		
	CD auto changer		

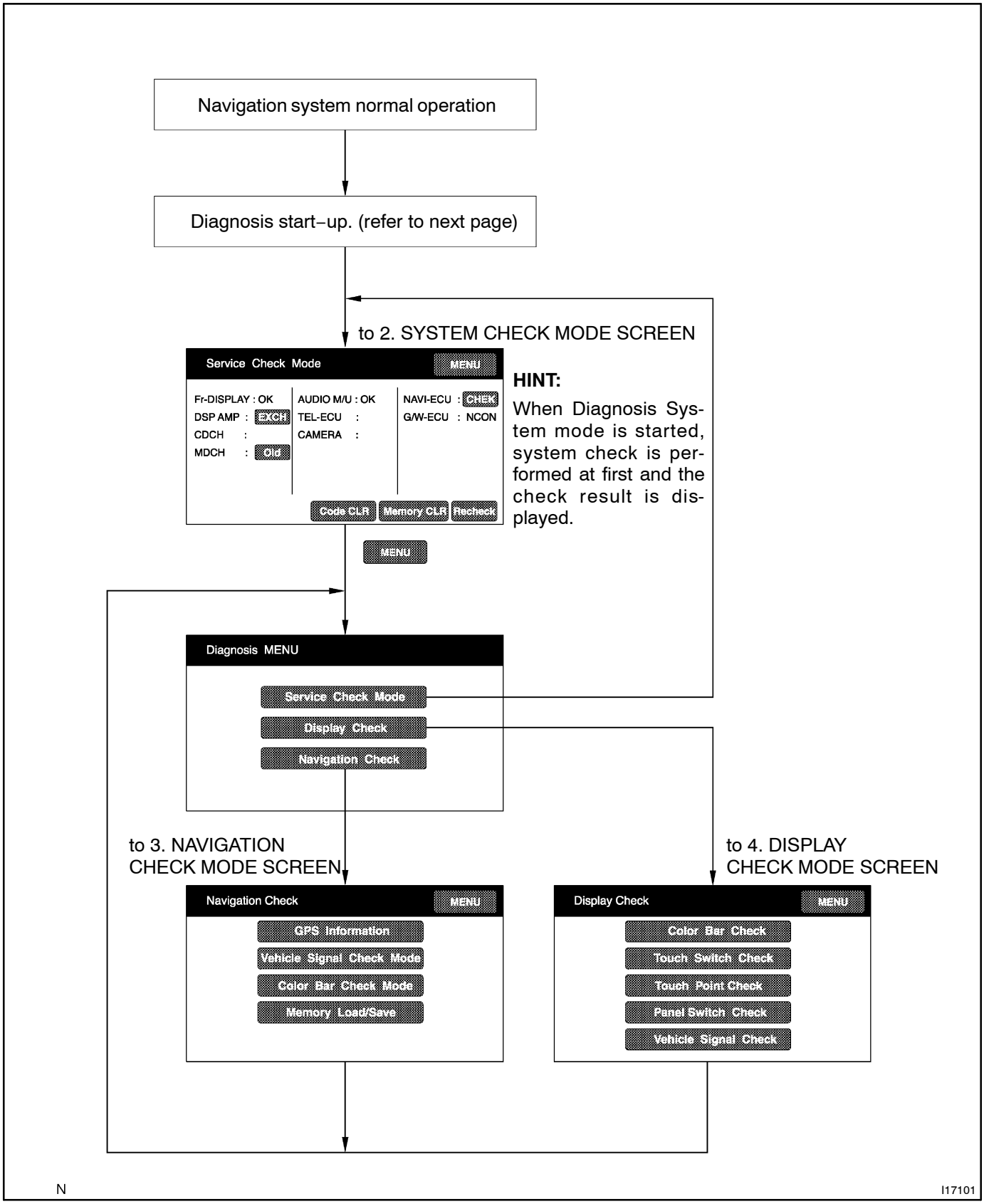
DI7OR–04

PRE–CHECK

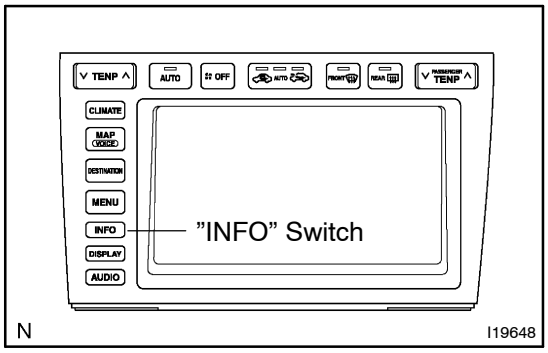
1. DIAGNOSIS SYSTEM MODE

HINT:

Diagnosis System Mode is operated as follows.

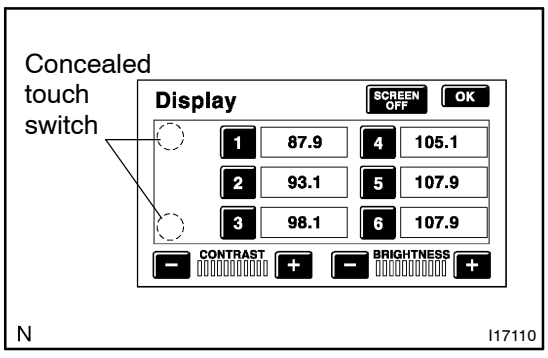


(a) DIAGNOSIS START–UP
To start the diagnosis menu, there are 3 ways: using a diagnosis check wire and using a switch.



(b) START–UP BY SWITCH OPERATION
(light control switch)
(1) Vehicle speed is 0 km/h (0 mph).
(2) Parking brake switch is pressed.
(3) While pressing "INFO" switch, by turning the light control switch to OFF, TAIL, OFF, TAIL, and OFF the system is started up.

(c) START–UP BY SWITCH OPERATION (touch panel)
(1) Vehicle speed is 0 km/h (0 mph).
(2) Parking brake switch is pressed.
(3) Press the "INFO" switch to display the Screen Adjustment screen.



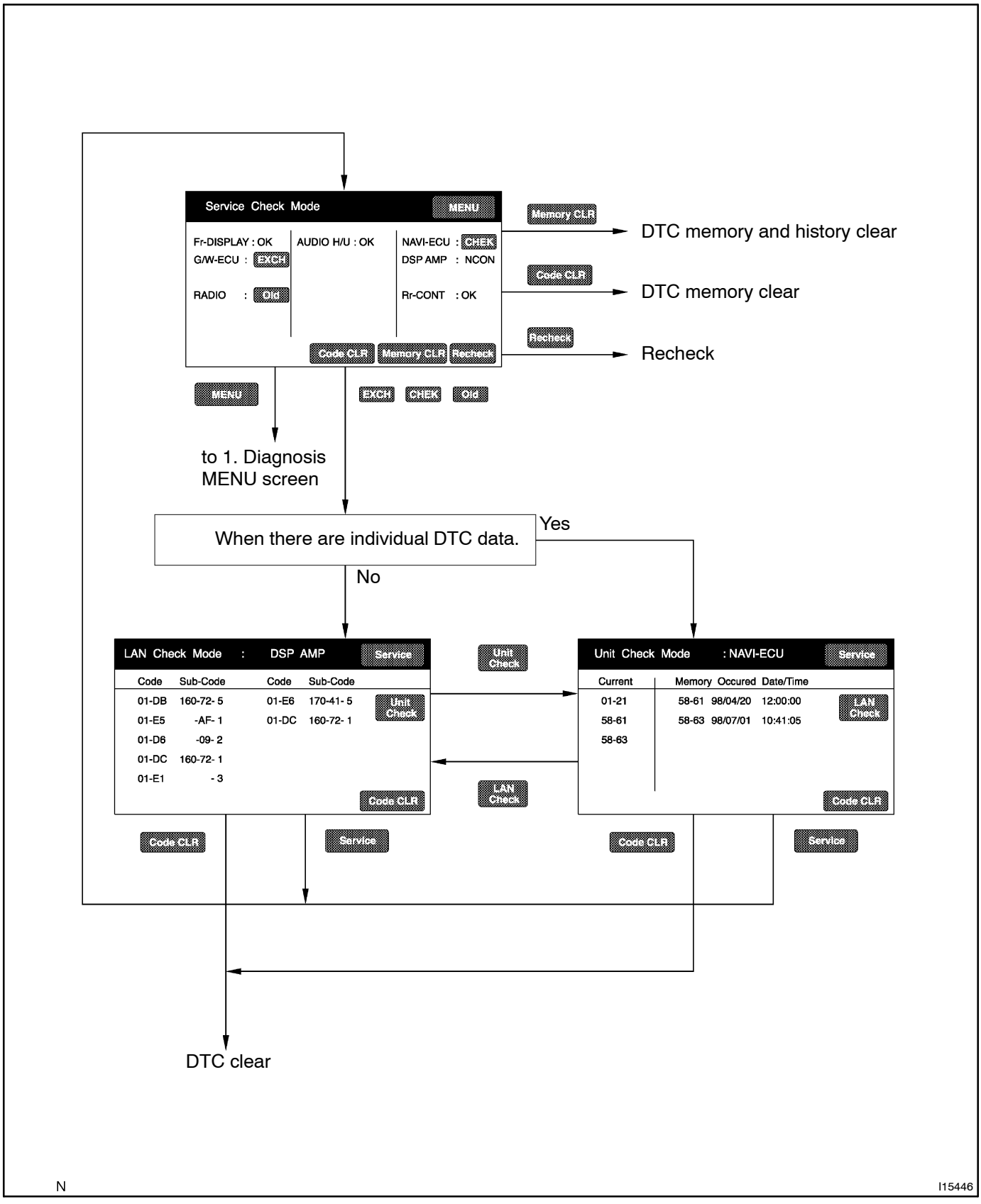
(4) Repeatedly touch the upper and lower bottom parts of the left end of the screen 3 times.

(d) FINISHING DIAGNOSIS SYSTEM MODE
Turn the ignition switch from ACC to OFF to finish the mode. If it is started by switch operation.

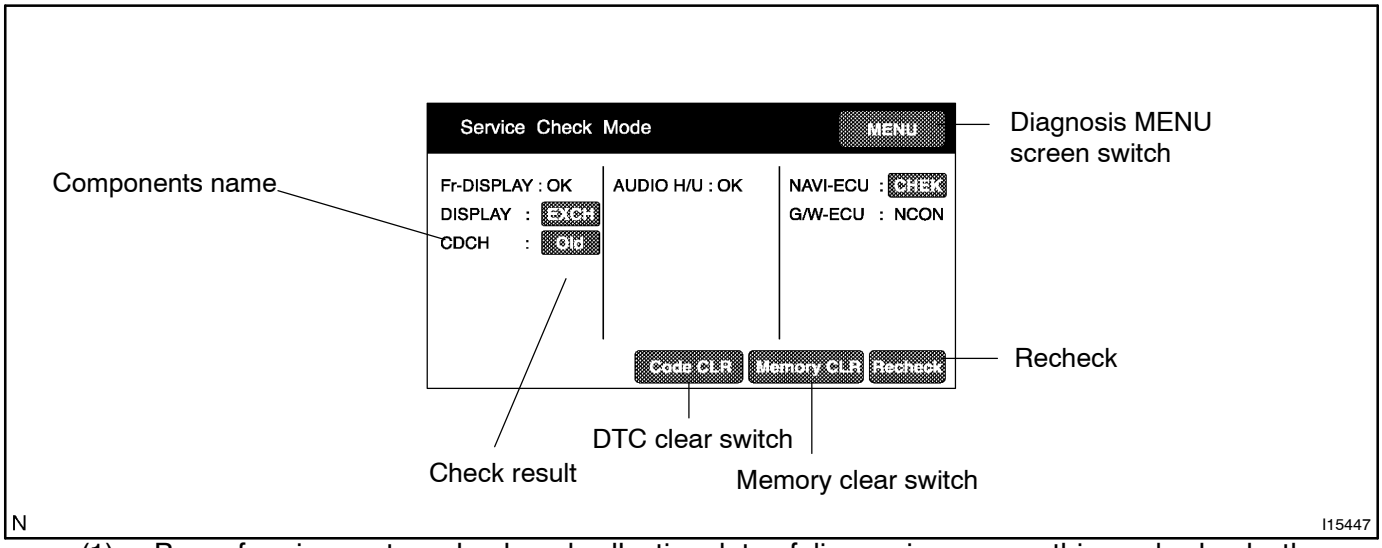
2. SERVICE CHECK MODE

HINT:

Service Check Mode is operated as follows.



(a) SERVICE CHECK SCREEN



(1) By performing system check and collecting data of diagnosis memory, this mode checks the current and past condition of the vehicle.

(2) List of all components name or physical addresses.
It displays only the components that have been connected at least once.

(3) The check result is displayed for all components.

(4) The check result is displayed by 6 abbreviations: ”OK”, ”EXCH”, ”CHEK”, ”NCON”, ”NRES” and ”Old”. (”EXCH”, ”CHEK” and ”Old” have a function as switches.)

(5) Based on all information obtained from ”System Check Request”, ”Diagnosis Memory Request” and ”Current Diagnosis Result” command, the following results are displayed:
OK: No error is identified.
EXCH: One or more error codes requesting for exchange are detected in any check result.
CHEK: Except the conditions for ”EXCH”, one or more error codes requesting for check are detected in any check result.

(6) The other check results are as follows:
NCON: No response to ”Diagnosis ON Instruction” command and it is not connected when the system is started.
Old: One or more error codes are detected when responding to ”Diagnosis ON Instruction” command because of the old version .
NRES: No response to all commands of ”System Check Request”, ”Diagnosis Memory Request” and ”Current Diagnosis Result”. Or no error is detected by any one of ”System Check Request” or ”Diagnosis Memory Request” when no response to the other command.

(7) ”EXCH”, ”CHEK” and ”Old” are functioned as switches any by pressing these, LAN Check Mode and Unit Check Mode are activated.

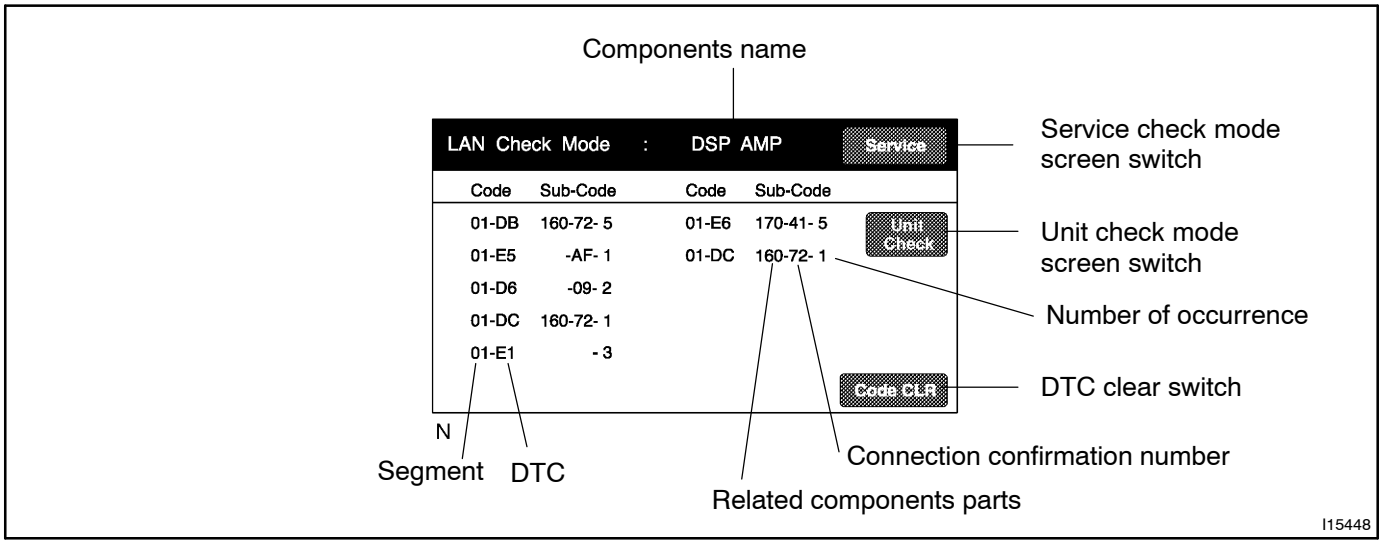
(8) Memory Clear Switch
Pressing this switch for 3 sec. deletes all information about master component registration and diagnosis memory of all components.

(9) DTC Clear Switch
Pressing this switch for 3 sec. deletes diagnosis memory of all components.

(10) Recheck Switch
Pressing this switch rechecks the system.

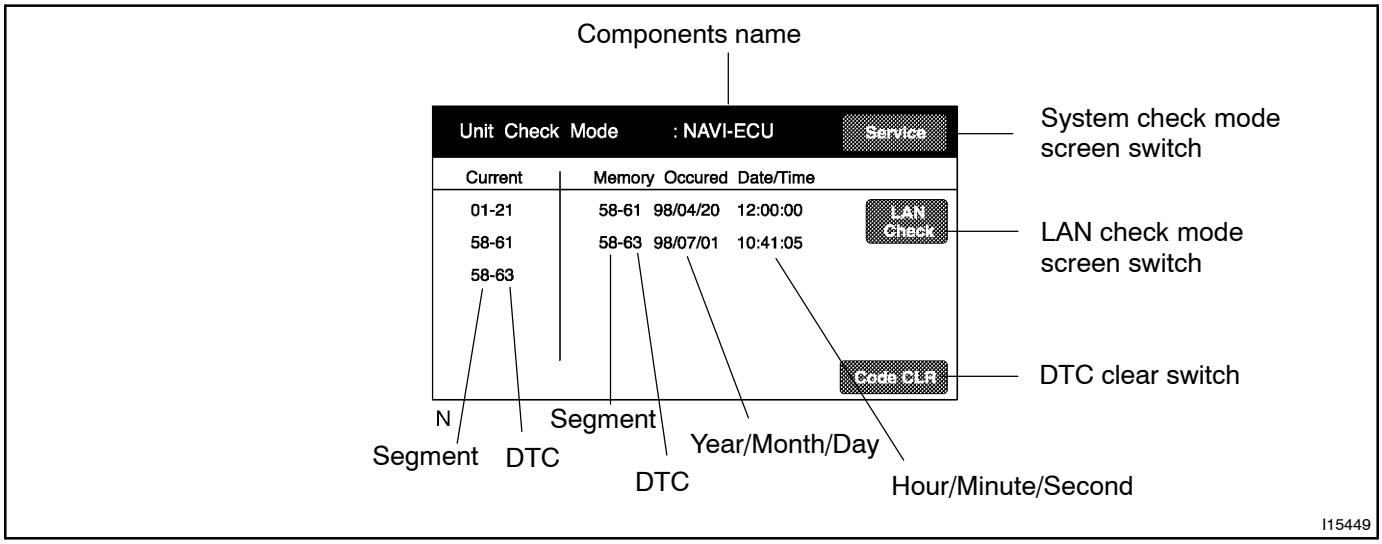
(11) Menu Switch
Pressing this switch activated the Diagnosis Menu Screen.

(b) LAN CHECK MODE SCREEN



(1) As a detailed screen in the System Check Mode, LAN Check Mode is displayed.
(2) Communication codes (logical address ”01”) are extracted from the diagnosis data obtained by ”Diagnosis Memory Request” and displayed.
(3) Component Name
Names of the components to be checked are displayed.
(4) Segment
Logical address codes corresponding to DTC are displayed.
(5) DTC
DTC displayed.
(6) Related components address
Physical address codes corresponding to DTC are displayed.
(7) Connection Confirmation Number
Connection confirmation numbers corresponding to DTC is displayed.
(8) Number of Occurrence
The number of occurrence of the same DTC is displayed.
(9) DTC Clear Switch
Pressing this switch for 3 sec. deletes DTC memory of the selected diagnosis component. When returning to the System Check Mode, the check result is shown as a blank.
(10) Unit Check Mode Screen Switch
Pressing this switch activates the Unit Check Mode screen.
(11) System Check Mode Screen Switch
Pressing this switch activates the System Check Mode screen.

(c) UNIT CHECK MODE SCREEN



(1) As a detailed screen in the System Check Mode, the Unit Check Mode is displayed.
(2) Up to 6 error codes detected by ”The DTC obtained during the system check (including when starting the diagnosis mode)” can be displayed as ”Current”.
(3) Up to 6 error codes detected by ”DTC stored in the past” can be displayed as ”Memory”.
(4) Component Name
Names of the components are displayed.
(5) Segment
Logical address numbers corresponding to DTC are displayed.
(6) DTC
DTC is displayed.
(7) Year/Month/Day/Hour/Minute/Second
The date and time stamped at the time of code occurrence is displayed in the order of year–month–day–hour–minute–second. (Year is shown in 2–digit number.) If the date and time data is invalid, it is displayed as a blank.

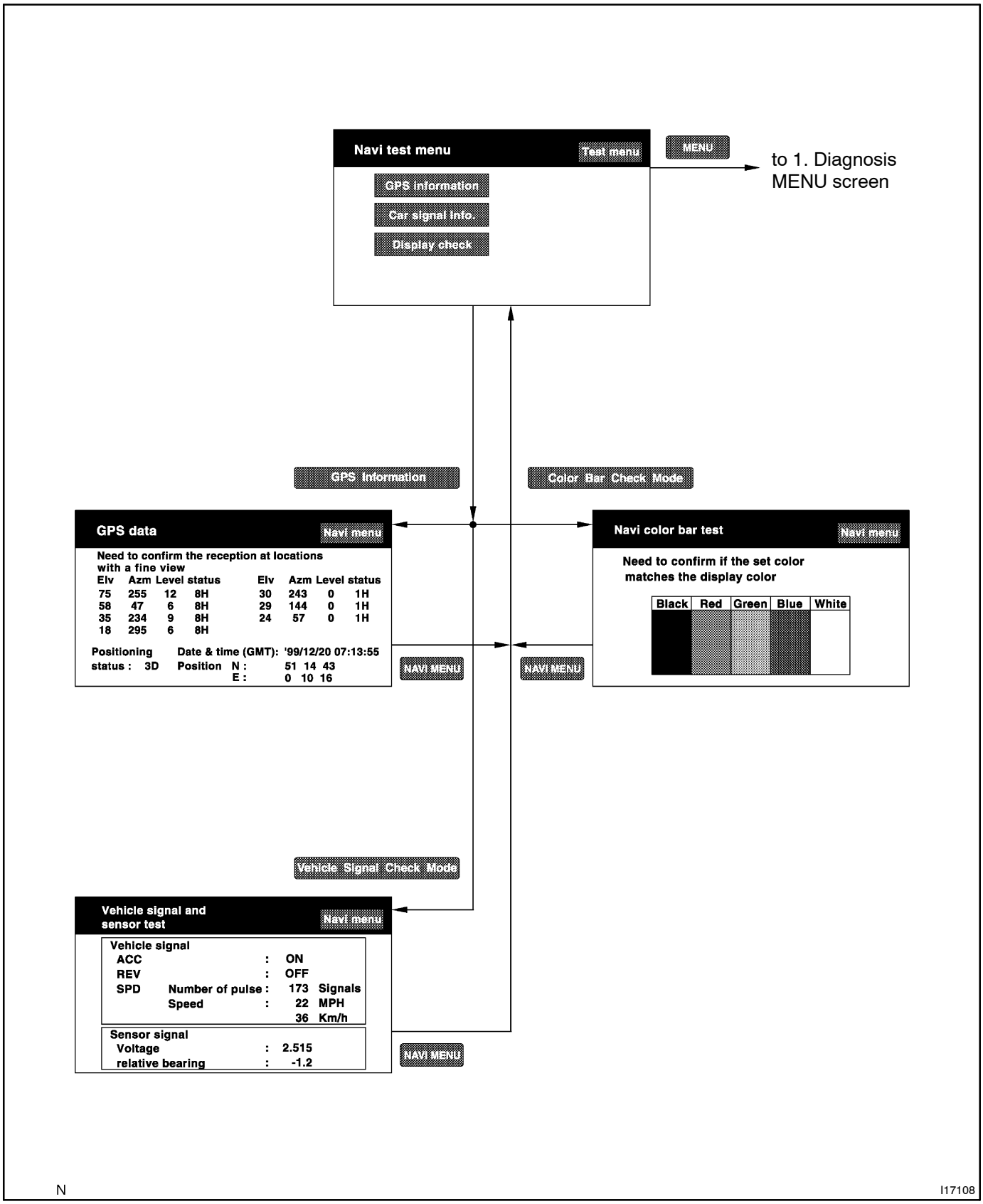
HINT:
Time data is obtained after turning the ignition from ACC to ON. Until the valid time data is obtained, the data shown in the display shall be considered as invalid.
If stored before a valid time data is obtained, the data shall not be displayed.

(8) DTC Clear Switch
Pressing this switch for 3 sec. deletes all diagnosis memory of the component. When returning to the System Check Mode, the check result is displayed as a blank.
(9) Lan Check Mode Screen Switch
Pressing this switch activates the LAN Check Mode screen.
(10) System Check Mode Screen .Switch
Pressing this switch activates the System Check Mode screen.

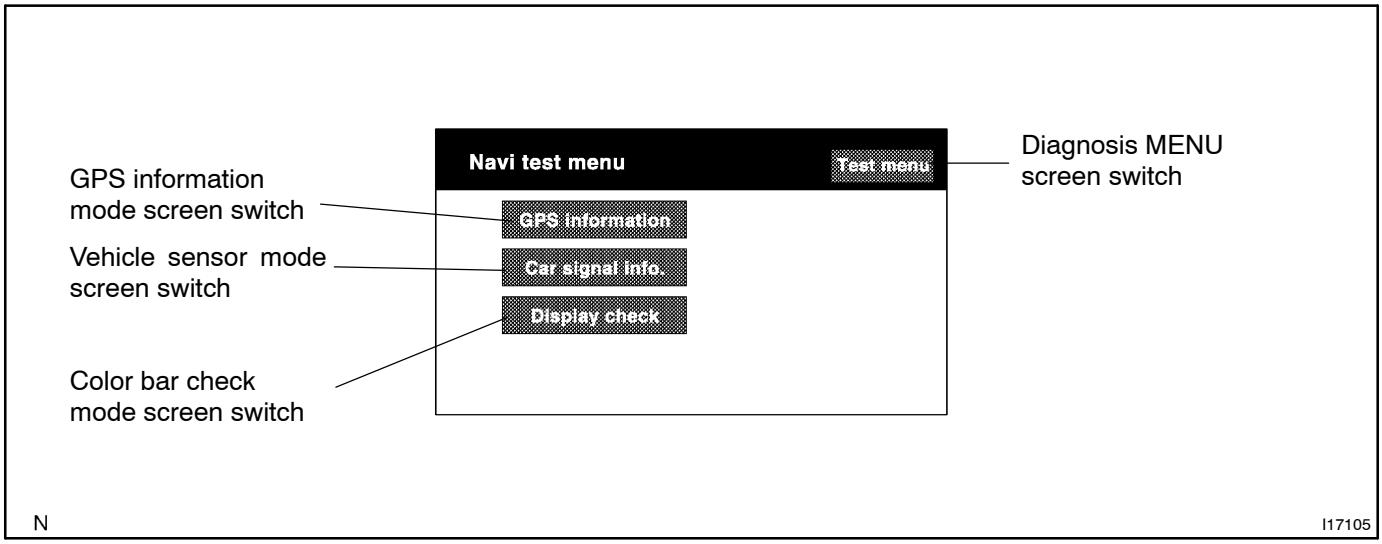
3. NAVIGATION CHECK MODE

HINT:

Navigation Check Mode is operated as follows.

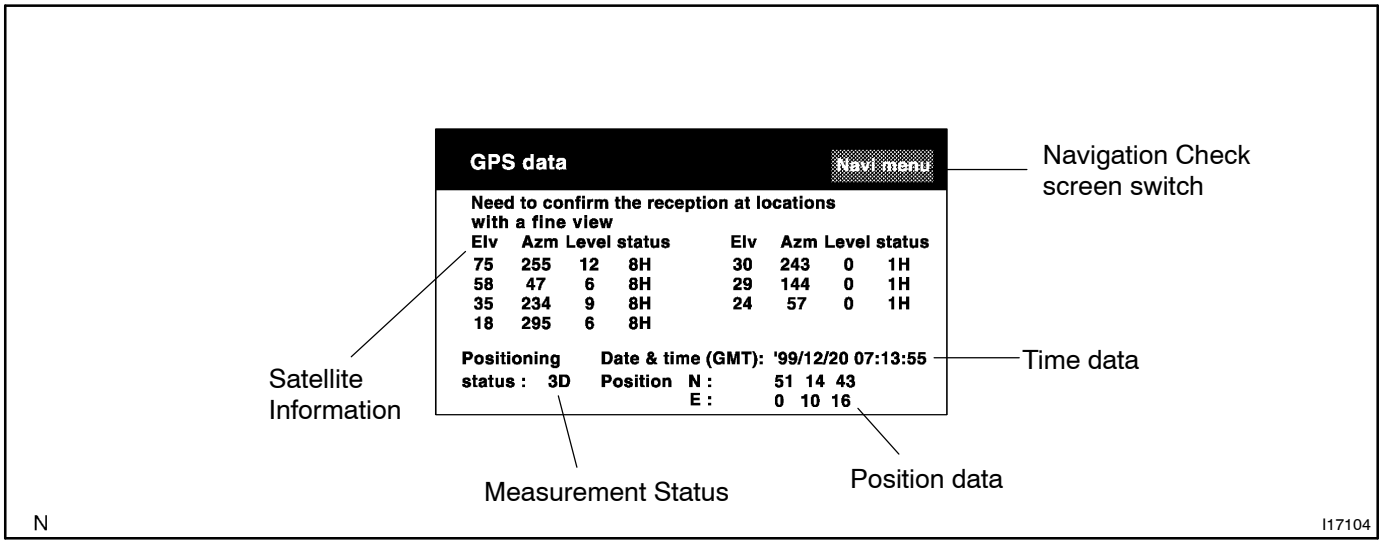


(a) NAVIGATION CHECK MODE SCREEN



(1) Various check screens for the Navigation ECU can be started from this menu screen.
(2) GPS Information Mode Screen Switch
Pressing this switch activates GPS Information Mode Screen.
(3) Vehicle Sensor Mode Screen Switch
Pressing this switch activates the Vehicle Signal Mode screen.
(4) Color Bar Check Mode Screed Switch
Pressing this switch activates the Color Bar Check Mode screen.
(5) Diagnosis Menu Screen Switch
Pressing this switch activates the Diagnosis Menu screen.

(b) GPS INFORMATION MODE SCREEN



(1) This screen displays GPS related data.

HINT:

Data are updated every 1 sec.

(2) Satellite Information
The angle of elevation of relevant satellite, azimuth signal level, and receiving condition of signals are displayed.

HINT:

The reception status shows receiving.

”T”: means in operation but measurement is not being used for positioning.

”P”: means measurement is being used for positioning.

”–”: means no data can be received.

Display area for up to 8 satellites is ensured.

Data shall be updated corresponding to change of information.

(3) Time data: The time data obtained from a GPS receiver is displayed in month, day, year, hour and minute.

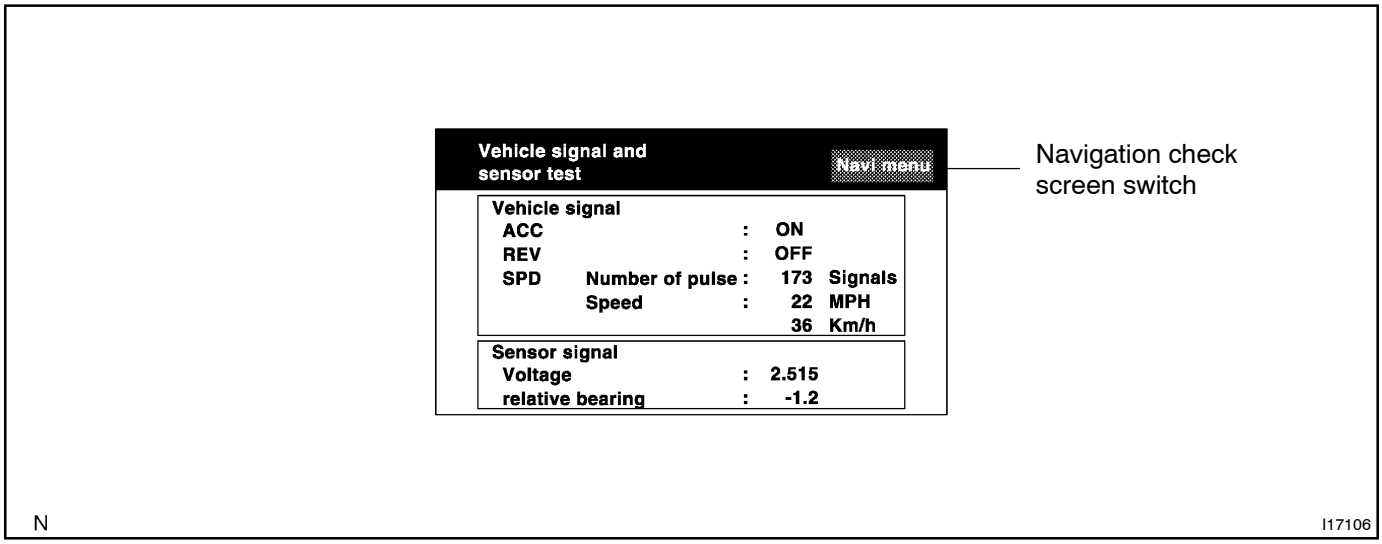
(4) The displayed time is Greenwich Mean Time.

(5) Position Data: The latitude and longitude of the current location are displayed in degree and minute.

(6) Measurement Status is displayed in the following 5 items.
2D: 2 dimensions.
3D: 3 dimensions.
NG: GPS information cannot be used.
error: Receiving error occurs.
–: Other than the above.

(7) Navigation Check Screen Switch
Pressing this switch activates the Navigation Check screen.

(c) VEHICLE SIGNAL CHECK MODE SCREEN



(1) Status of the vehicle sensor which are input to the Navigation ECU is checked in this screen.

HINT:

Data are updated every 1 sec.

(2) ACC signal status: Displayed as ON/OFF.

(3) REV signal status: Displayed as ON/OFF.

(4) SPD signal status: The following is displayed:

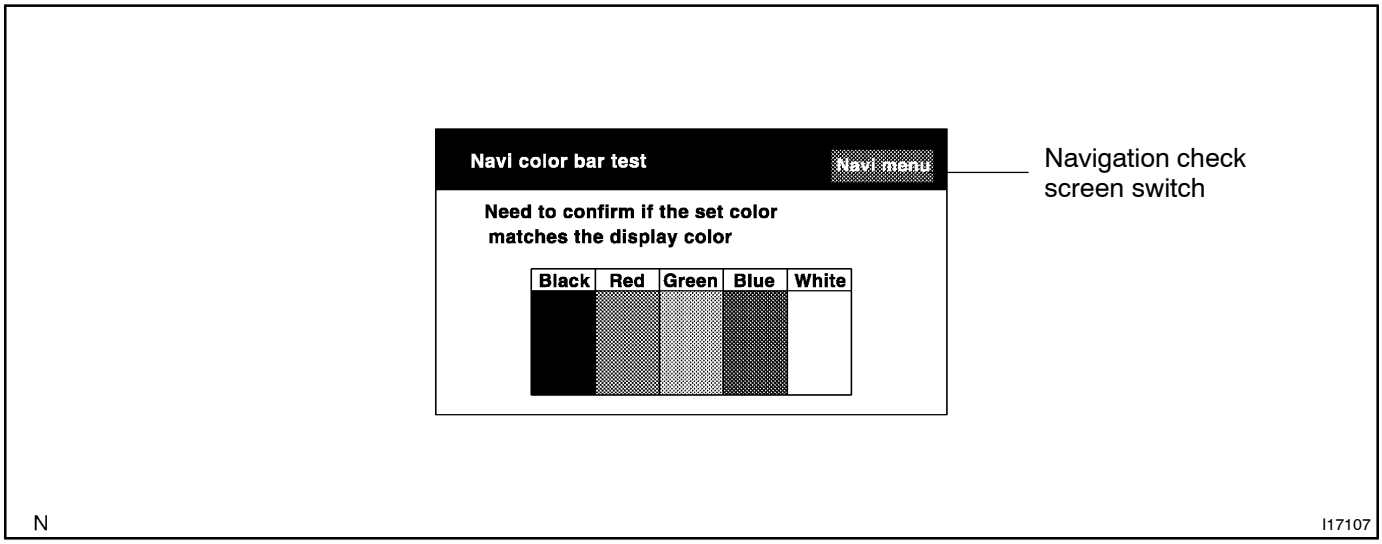
- The cumulative value of the input pulse after displaying this screen. (shown in 5 digits)
- Vehicle speed (Unit: km/h, mph)

(5) Output condition of the gyro sensor: The following is displayed:

- Voltage (Unit: mV, LSB: 1mV)
- Relative azimuthal angle to the current point (0 degree).
  Assuming the angle at a point when this screen is activated as 0 degree.

(6) Navigation Check Menu Screen Switch
Pressing this switch displays the Navigation Check screen.

(d) COLOR BAR CHECK MODE SCREEN

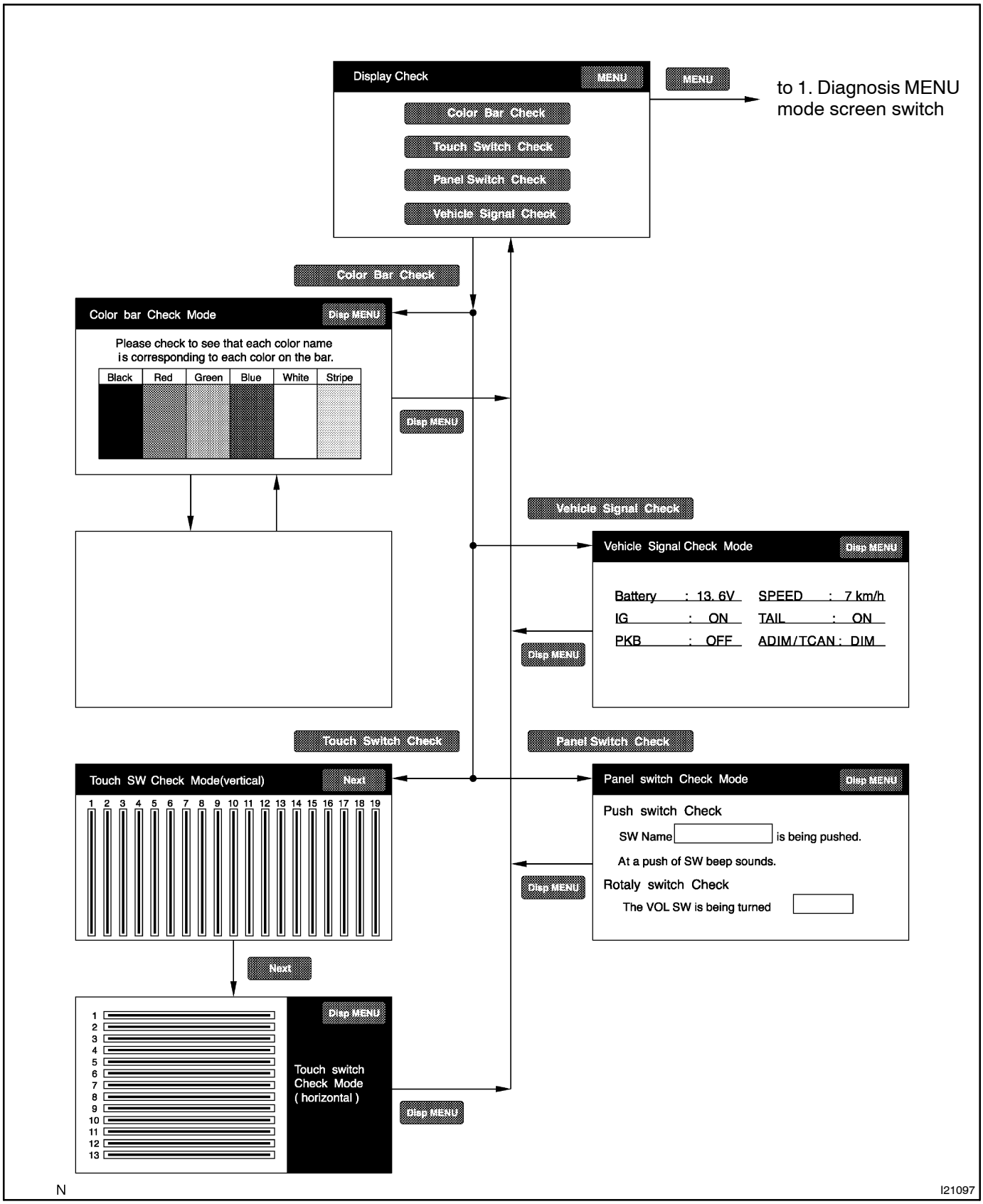


(1) Color display of the Navigation ECU is checked in this screen.
(2) Color Bars:
Five colors of ”BLACK”, ”RED”, ”GREEN”, ”BLUE” and ”WHITE” are displayed as bars.
(3) Navigation Check Screen Switch
Pressing this switch displays the Navigation Check screen.

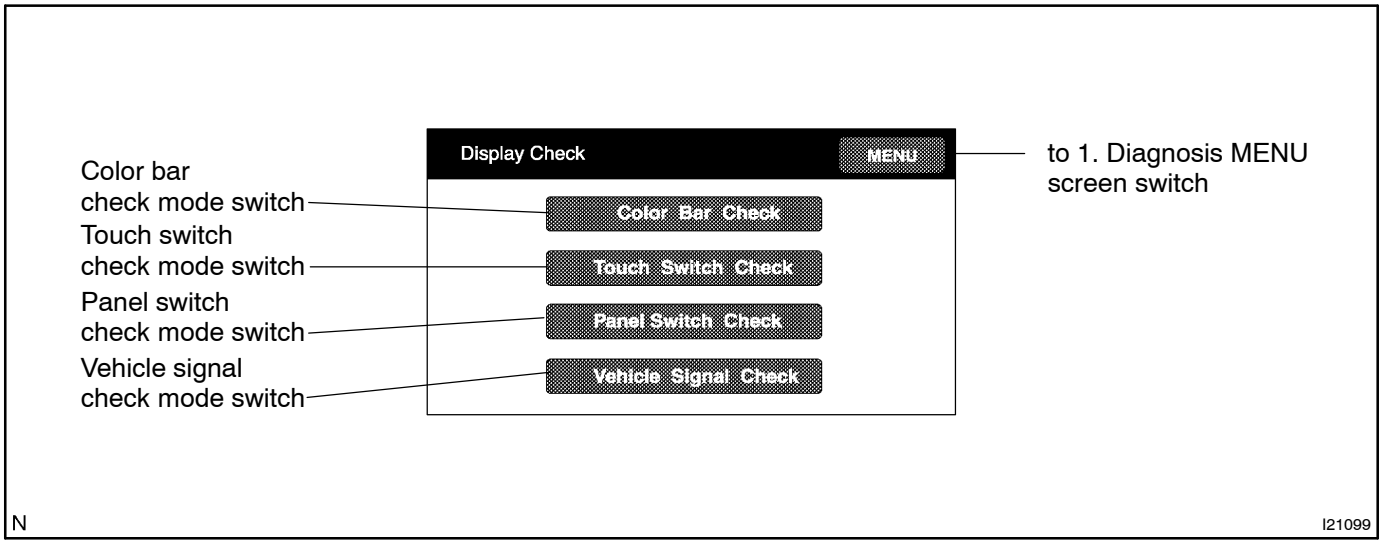
4. DISPLAY CHECK MODE

HINT:

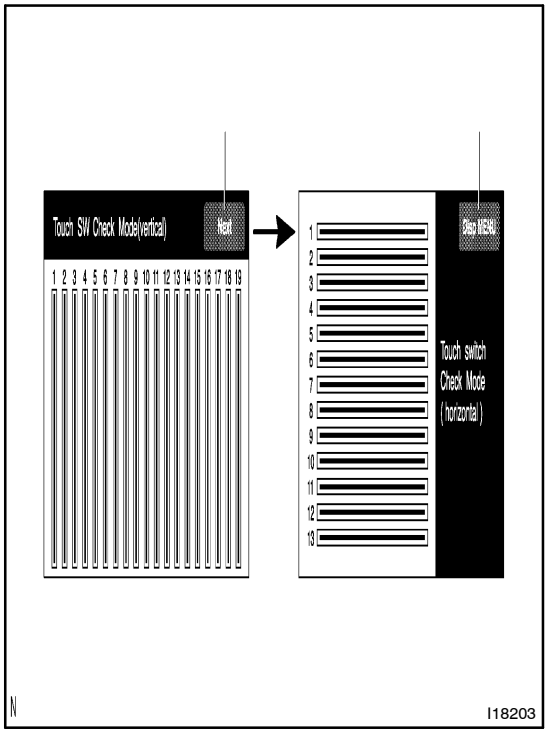
Display Check Mode is operated as follows.



(a) DISPLAY CHECK MENU SCREEN



(1) Various screens to check the display are started from this screen.
(2) Color Bar Check Mode Switch
Pressing this switch activates the Color Bar Check Mode screen.
(3) Touch Switch Check Mode Switch
Pressing this switch activates the Touch Switch Check Mode screen.
(4) Vehicle Signal Check Mode Switch
Pressing this switch activates the Vehicle Signal Check Mode screen.
(5) Diagnosis MENU Screen Switch
Pressing this switch activates the Diagnosis MENU screen.
(6) Panel Switch Check Mode Switch
Pressing this switch activates the Panel Switch Check Mode screen.



(b) TOUCH SWITCH CHECK MODE SCREEN

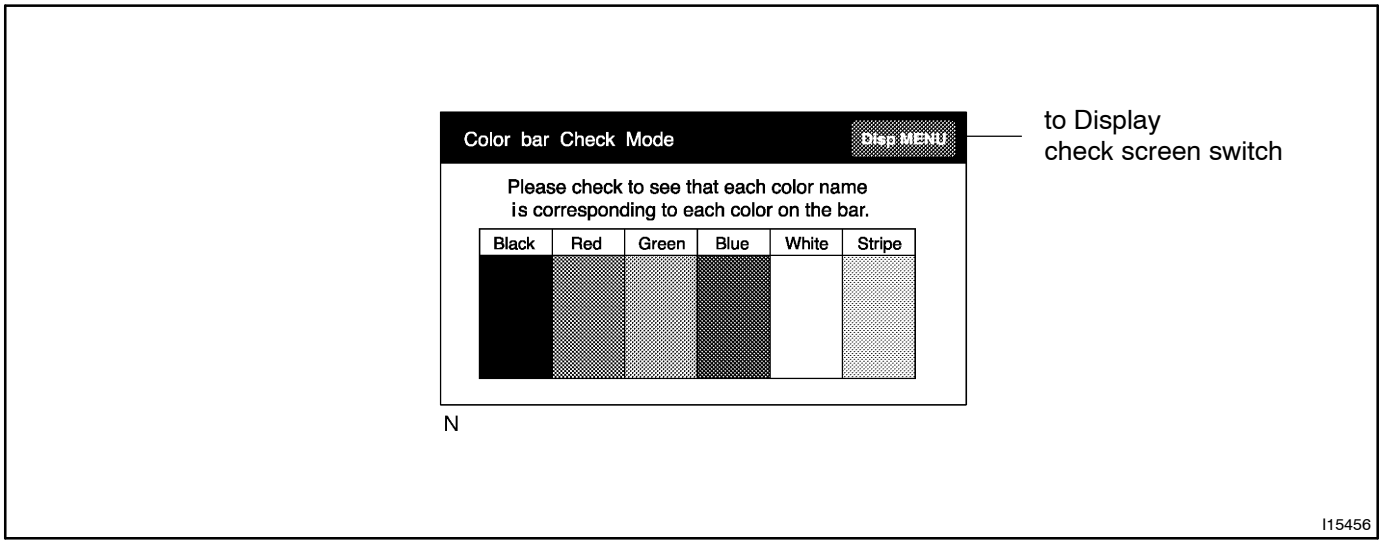
(1) Operating condition is checked line by line in the Touch Switch Check Mode screen.

(2) Check Line:
Lines are displayed by using infrared beams in this screen.
Once a beam is blocked off by touching the screen with a fingertip, the blocked part of the line is deleted.

(3) Horizontal Line Check Screen Switch:
Pressing this switch activates a screen in which beams of horizontal lines are checked.

(4) Display Check Mode Switch
Pressing this switch activates the Display Check Mode screen.

(c) COLOR BAR CHECK MODE SCREEN



(1) Color display is checked in this screen.

(2) Color Bar:

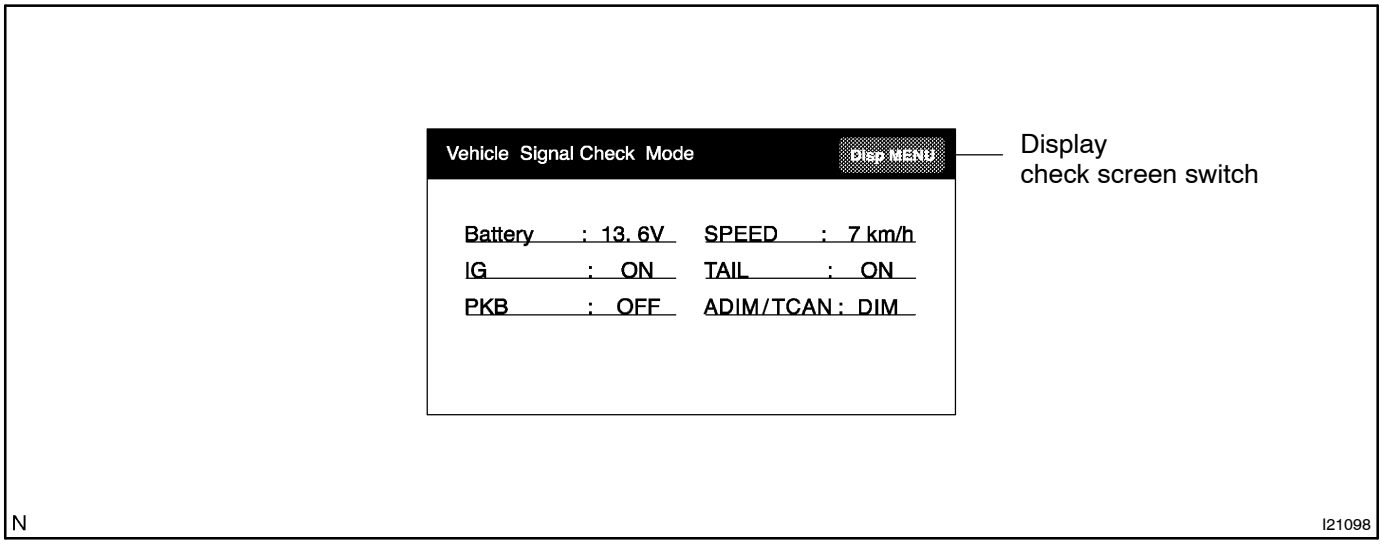
Black, Red, Green, Blue, White and Stripe is displayed in bars.

If a bar is touched, color or stripe of the bar is appeared all over the screen. When touched again, it returns to the previous screen.

(3) Display Check Screen Switch

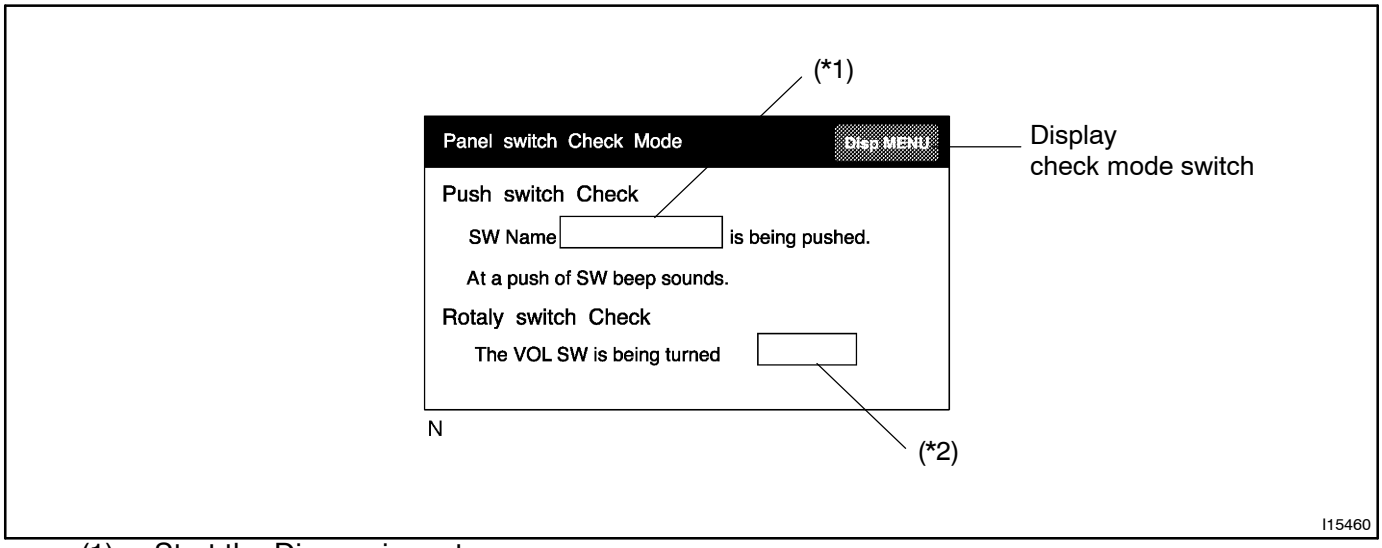
Pressing this switch activates the Display Check Mode screen.

(d) VEHICLE SIGNAL CHECK MODE SCREEN



(1) Status of the Vehicle Signal which has been loaded into the display is checked in this screen.
(2) Signal Description
Battery: Displays battery voltage in V.
IG: Displays ON or OFF of the ignition switch.
PKB: Displays ON (applied) or OFF (released) of the parking brake.
SPEED: Displays the vehicle speed in km/h.
TAIL: Displays ON or OFF of the tail light switch.
ADIM/TCAN: Displays DIM r BRIGHT of the ADIM signal information
(3) Display Check Screen Switch
Pressing this switch activates the Display Check Mode screen.

(e) PANEL SWITCH CHECK MODE SCREEN



(1) Start the Diagnosis system.
(2) Select ”MENU”.
(3) Select ”Display Check”.
(4) Select ”Panel Switch Check”.
(5) Press each switch and make sure that it corresponds to the display on the screen.

Display Data	Contents
Names of push–button switches/*1	Names of push–button switches pressed are displayed. Pressing 2 or more push–button switches is displayed as ”Multi SW”. After that if the number of push–button switches being pressed becomes 1, the name of the push–button switch being pressed is displayed.
Direction of the rotation/*2	Direction of a rotary switch (Volume switch, etc.) is displayed as ”right” or ”left”.
Disp MENU	Pressing this switch activates Display Check Menu.

DI27Z–07

DIAGNOSTIC TROUBLE CODE CHART

Terms	Meaning
Physical address	Three–digit code (shown in hexadecimal) which is given to each component comprising the AVC–LAN. Corresponding to the function, individual symbols are specified.
Logical address	Two–digit code (shown in hexadecimal) which is given to each function comprising the inner system of the AVC–LAN.

1. PHYSICAL ADDRESS: 110 MULTI DISPLAY

HINT:

- *1: Even if no failure is detected, it may be stored depending on the battery condition or voltage for starting an engine.
- *2: It is stored when 180 sec. has passed after the power supply connector is pulled out after engine start.
- *3: It may be stored when the engine key is turned again after engine start.
- *4: It may be stored when the engine key is turned 1 min. again after engine start.

(a) Logical address: 01 (Communication control)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
21	ROM Error	Abnormal condition of ROM is detected.	Replace multi–display assembly.
22	RAM Error	Abnormal condition of RAM is detected.	Replace multi–display assembly.
D5 *1	Registered component disconnected	Component shown by auxiliary code is or was disconnected from system with ignition switch in ACC or ON. Communication with component shown by auxiliary code is not ensured when engine is started.	• Check harness for power supply of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
D8 *2	No response to connection check	Component shown by auxiliary code is or was disconnected from system after engine is started.	• Check harness for power supply of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
D9 *1	Last Mode Error	Component operated (sound and/or image was provided) before engine stop is or was disconnected with ignition switch in ACC or ON.	• Check harness for power supply of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
DB *1	Mode Status Error	Dual alarm is detected.	• Check harness for power supply system of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
DC *4	Transmission Error	Transmission to component shown by auxiliary code has been failed. (This code does not necessarily mean actual failure.)	If same auxiliary code is recorded in order component(s), check harness for power supply and communication system of all components shown by code.
DE *3	Slave Reset (Momentary Interruption)	After engine start, slave component has been disconnected. DB	• Check harness for power supply system of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
E2	ON/OFF Instruction Parameter Error	Error is detected in ON/OFF control command from multi–display assembly.	Replace multi–display assembly.
E3 *1	Registration Request Transmission	• Registration Request command is output from slave component. • By reception of connection check instruction, Registration Request command is output from sub–master component.	Since this DTC is provided for engineering, it may be detected when no actual failure exists.

(b) Logical address: 21 (Switch)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
10	Panel Switch Error	Error in panel switch input part is detected. (Error in switch control part, or internal communication error with switch control part is detected.)	• Inspect all switches on panel switch test screen in display check mode. If any of them does not function, replace multi–display assembly. • If all switches function without problem, observe them for a while.
11	Touch Switch Error	Error in touch switch sensor is detected. (Light level of LED is detected to be less than a fixed value.)	• Inspect all touch switches on touch switch test screen in display check mode. If any of lines does not react, replace multi–display assembly. • If all of vertical and horizontal lines react normally, observe them for a while.

(c) Logical address: 34 (Front passenger monitor)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
10	Error in Picture Circuit	Error in power supply system for picture circuit (abnormal voltage) is detected.	Replace multi–display assembly.
11	Back–light Error (No current)	Decline in power output from inverter circuit for back–light.	Replace multi–display assembly.
12	Back–light Error (Excess current)	Excess power output from inverter circuit for back–light.	Replace multi–display assembly.

2. PHYSICAL ADDRESS: 178 NAVIGATION ECU

HINT:

- *1: Even if no failure is detected, it may be stored depending on the battery condition or voltage for starting an engine.
- *2: When 210 sec. has passed after pulling out the power supply connector of the master component with the ignition switch in ACC or ON, this code is stored.
- *3: It may be stored when the engine key is turned 1 min. again after engine start.
- *4: It may be stored when the engine key is turned again after engine start.

(a) Logical address: 01 (Communication control)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
D6 *1	Absence of Master	Component in which this code is recorded has been disconnected from system with ignition in ACC or ON. Or, when this code was recorded, multi–display assembly was disconnected.	• Check harness for power supply system of multi–display. • Check harness for communication system of multi–display. • Check harness for power supply system of navigation ECU. • Check harness for communication system of navigation ECU.
D7 *2	Communication Check Error	Component in which this code is recorded has been disconnected from system after engine start. Or, when this code was recorded, multi–display assembly was disconnected. D6	• Check harness for power supply system of multi–display. • Check harness for communication system of multi–display. • Check harness for power supply system of navigation ECU. • Check harness for communication system of navigation ECU.
DC *3	Transmission Error	Transmission to component shown by auxiliary code has been failed. (This code does not necessarily mean actual failure.)	If same auxiliary code is recorded in other component(s), check harness for power supply and communication system of all components shown by code.
DD *4	Master Reset (Momentary Interruption)	Component that is to be master has been disconnected after engine start.	• Check harness for power supply system of multi–display assembly. • Check harness for communication system of multi–display assembly. • If error occurs frequently, replace multi–display assembly.
E0 *1	Registration Completion Instruction Error	”Registration Completion Instruction” command from master cannot be received.	Since this DTC is provided for engineering, it may be detected when no actual failure exists.
E2	ON/OFF Instruction Parameter Error	Error is detected in ON/OFF control command from multi–display assembly.	Replace multi–display assembly.
E3 *1	Registration Request Transmission	• Registration Request command is output from slave component. • Registration Request command is output from sub–master component.	Since this DTC is provided for engineering, it may be detected when no actual failure exists.

(b) Logical address: 58 (Navigation ECU)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
10	Gyro Error	Error in gyro sensor is detected. (Abnormal value in voltage output from sensor is detected for more than specified time.)	Replace navigation ECU.
42	Map Disc Error	Data cannot be read for a certain time due to scratches or dirt on disc surface or insertion of disc.	Inspect disc and replace if necessary. (Visually check disc surface and wipe it with soft cloth.)
43	Vehicle Signal Error	Input error of vehicle signal is detected. (When no vehicle signal has been input for a certain time.)	• Inspect wire harness. • If wire harness is normal, replace navigation ECU.
44	Player Error	Malfunction of player continues for a certain length of time.	• Check if disc can be inserted/taken out or not. If not, replace navigation ECU. • If it can be inserted/taken out and this code is output, replace navigation ECU.

(c) Logical address: 80 (GPS receiver)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
11	GPS Receiver Error	Operation error of GPS receiver is detected.	At an outdoor site with a clear view, operate to display GPS data. If GPS mark is not properly displayed after 15 min. or more, replace navigation ECU.
40	GPS Antenna Error	Open condition of GPS antenna is detected. (Open circuit, connection failure of connectors, etc.)	Inspect antenna and replace if necessary.
41	Power Supply Error of GPS Antenna	Abnormal voltage of GPS antenna cable or short circuit is detected.	• Inspect GPS antenna and replace if necessary. (When no continuity is identified between connector's core and sealed part, GPS antenna is normal.) • If GPS antenna is normal, replace navigation ECU.
45	Player Temp. Too High	Readout cannot be done because temperature around player's pickup (reading part) is too high.	• With ignition switch OFF, leave vehicle in cool shaded place for a while and recheck. • If same code detected, replace navigation ECU.

3. PHYSICAL ADDRESS: 1C4 GATEWAY ECU

HINT:

*1: When 210 sec. has passed after pulling out the power supply connector of the master component with the ignition switch in ACC or ON, this code is stored.

Logical address: 01 (Communication control)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
D4 *1	Regular Communication Error	Component in which this code is recorded has been disconnected after engine start. Or, when this code was recorded, multi–display was disconnected.	• Check harness for power supply system of multi–display assembly. • Check harness for communication system of multi–display assembly. • Check harness for power supply system of gateway ECU. • Check harness for communication system of gateway ECU.

4. PHYSICAL ADDRESS: 190 RADIO AND PLAYER

HINT:

- *1: Even if no failure is detected, it may be stored depending on the battery condition or voltage for starting an engine.
- *2: It is stored when 180 sec. has passed after the power supply connector is pulled out after engine start.
- *3: It may be stored when the engine key is turned 1 min. again after engine start.
- *4: It may be stored when the engine key is turned again after engine start.
- *5: When 210 sec. has passed after pulling out the power supply connector of the master component with the ignition switch in ACC or ON, this code is stored.

(a) Logical address: 01 (Communication control)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
D6 *1	Absence of Master	Component in which this code is recorded has been disconnected from system with ignition in ACC or ON. Or, when this code was recorded, multi–display assembly was disconnected.	• Check harness for power supply system of multi–display. • Check harness for communication system of multi–display. • Check harness for power supply system of radio and player. • Check harness for communication system of radio and player.
D8 *2	No Response to Connection Check	Component shown by auxiliary code is or had been disconnected from system after engine is start. D9	• Check harness for power supply system of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
D9 *1	Last Mode Error	Component operated (sounds and/or images were provided) before engine stop is or has been disconnected with ignition switch in ACC or ON.	• Check harness for power supply system of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
DA	No Response to ON/OFF Instruction	No response is identified when changing mode (audio and visual mode change). Detected when sound and picture does not change by button operation.	• Check harness for power supply system of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code. • If error occurs again, replace component shown by auxiliary code.
DB *1	Mode Status Error	Dual alarm is detected.	• Check harness for power supply of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
DC *3	Transmission Error	Transmission to component shown by auxiliary code has been failed. (Detecting this DTC does not necessarily mean actual failure.)	If same auxiliary code is recorded in order component, check harness for power supply and communication system of all components shown by code.
DD *4	Master Reset (Momentary Interruption)	After engine is started, multi–display assembly was disconnected from system.	• Check harness for power supply system of multi–display. • Check harness for communication system of multi–display. • Check harness for power supply system of radio and player. • Check harness for communication system of radio and player. • If this error occurs frequently, replace multi–display assembly.

DE *4	Slave Reset (Momentary Interruption)	After engine is started, slave component was disconnected from system.	• Check harness for power supply of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
DF *5	Master Error	Due to defective condition of component with a display, master function is switched to audio equipment. Error occurs in communication between sub–master (audio) and master component.	• Check harness for power supply of multi–display assembly. • Check harness for communication system of multi–display assembly. • Check harness for communication system between multi–display assembly and sub–master component.
E0 *1	Registration Completion Instruction Error	”Registration Completion Instruction” command from master cannot be received.	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.
E1 *1	Audio processor ON error	While source equipment is operating, AMP output is stopped.	• Check harness for power supply of multi–display assembly. • Check harness for communication system of multi–display assembly.
E2	ON/OFF Instruction Parameter Error	Error occurs in ON/OFF controlling command from multi–display assembly.	Replace multi–display assembly.
E3 *1	Registration Request Transmission	Registration Request command is output from slave component. Receiving Connection Check Instruction, Registration Request command is output from sub–master component.	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.
E4 *1	Multiple Frame Abort	Multiple frame transmission is aborted.	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.

(b) Logical address: 61 (Cassette switch)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
40	Mechanical of Media Error	Malfunction due to mechanical failure is identified. Or cassette tape is cut or entangled.	• Inspect cassette tape. • Replace radio and player.

5. PHYSICAL ADDRESS: 440 STEREO COMPONENT AMPLIFIER

HINT:

- *1: Even if no failure is detected, it may be stored depending on the battery condition or voltage for starting an engine.
- *2: It may be stored when the engine key is turned 1 min. again after engine start.
- *3: It may be stored when the engine key is turned again after engine start.
- *4: When 210 sec. has passed after pulling out the power supply connector of the master component with the ignition switch in ACC or ON, this code is stored.

Logical address: 01 (Communication control)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
D6 *1	Absence of Master	Component in which this code is recorded has been disconnected from system with ignition in ACC or ON. Or, when this code was recorded, multi–display assembly was disconnected.	• Check harness for power supply of radio and player. • Check harness for communication system of radio and player. • Check harness for power supply of stereo component amplifier. • Check harness for communication system of stereo component amplifier.

D7	Communication Check Error	Component in which this code is recorded is or was disconnected from system after engine start. Or, when recording this code, multi–display assembly was disconnected.	• Check harness for power supply of radio and player. • Check harness for communication system of radio and player. • Check harness for power supply of stereo component amplifier. • Check harness for communication system of stereo component amplifier.
DC *2	Transmission Error	Transmission to component shown by auxiliary code has been failed. (Detecting this DTC does not necessarily mean actual failure.)	If same auxiliary code is recorded in order component, check harness for power supply and communication system of all components shown by code.
DD *3	Master Reset (Momentary Interruption)	After engine is started, multi–display assembly was disconnected from system.	• Check harness for power supply of radio and player. • Check harness for communication system of radio and player. • Check harness for power supply of stereo component amplifier. • Check harness for communication system of stereo component amplifier. • If this error occurs frequently, replace multi–display assembly.
DF *4	Master Error	Due to defective condition of component with a display, master function is switched to audio equipment. Error occurs in communication between sub–master (audio) and master component.	• Check harness for power supply of multi–display assembly. • Check harness for communication system of multi–display assembly. • Check harness for communication system between multi–display assembly and sub–master component.
E0 *1	Registration Completion Instruction Error	”Registration Completion Instruction” command from master cannot be received.	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.
E1 *1	Audio processor ON error	While source equipment is operating, AMP output is stopped.	• Check harness for power supply of multi–display assembly. • Check harness for communication system of multi–display assembly.
E2	ON/OFF Instruction Parameter Error	Error occurs in ON/OFF controlling command from multi–display assembly.	Replace multi–display assembly.
E3 *1	Registration Request Transmission	• Registration Request command is output from slave component. • Registration Connection Check Instruction, Registration Request command is output from sub–master component.	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.

6. PHYSICAL ADDRESS: 240 CD AUTO CHANGER

HINT:

- *1: Even if no failure is detected, it may be stored depending on the battery condition or voltage for starting an engine.
- *2: It may be stored when the engine key is turned 1 min. again after engine start.
- *3: It may be stored when the engine key is turned again after engine start.
- *4: It may be stored when the engine key is turned again after engine start.
- *5: When 210 sec. has passed after pulling out the power supply connector of the master component with the ignition switch in ACC or ON, this code is stored.

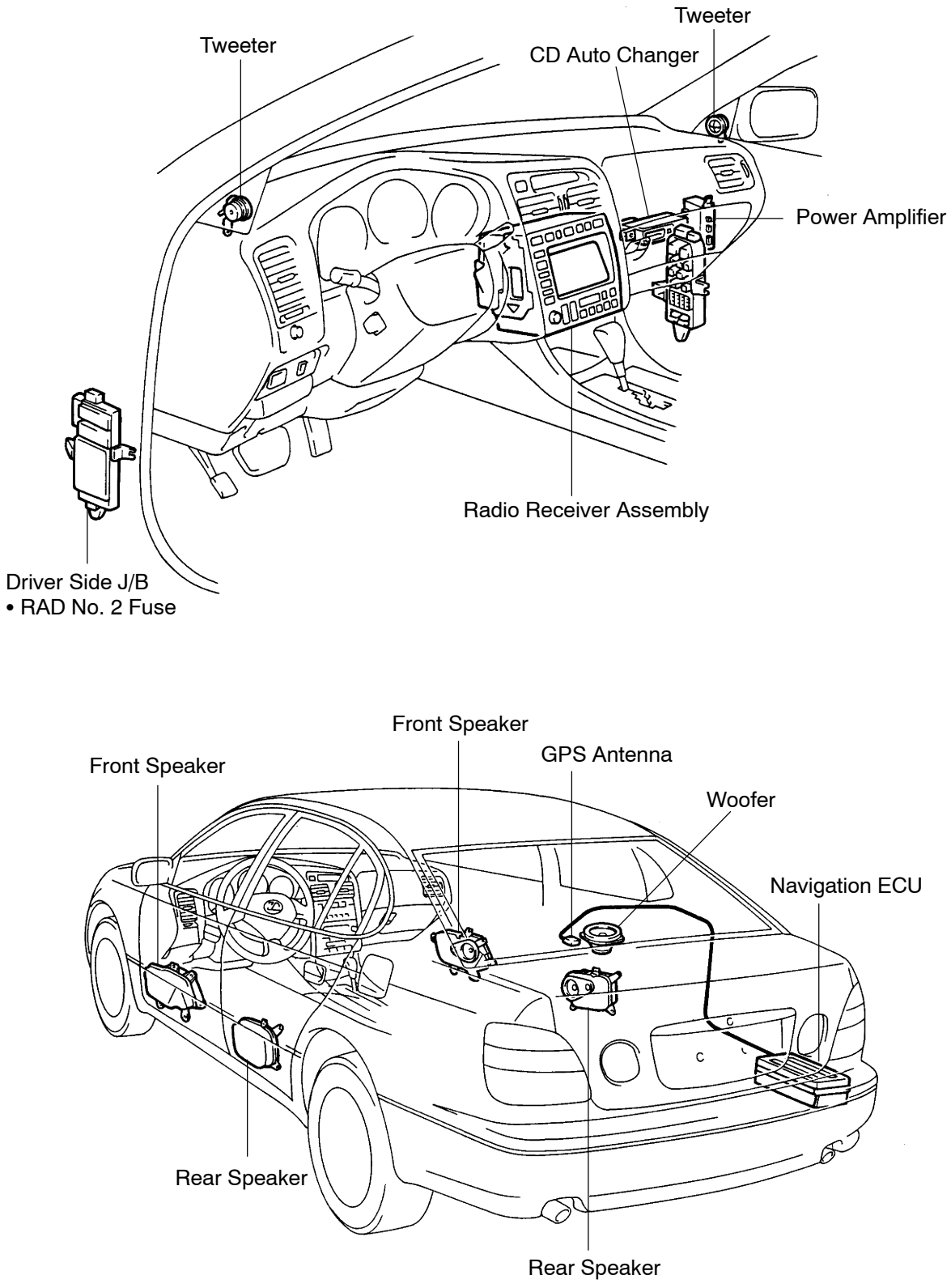
Logical address: 01 (Communication control)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
21	ROM Error	Abnormal condition of ROM is detected.	Replace CD auto changer.
22	RAM Error	Abnormal condition of ROM is detected.	Replace CD auto changer.
D6 *2	Absence of Master	Component in which this code is recorded is or was disconnected from system after engine start. Or, when recording this code, multi–display assembly was disconnected.	• Check harness for power supply system of multi–display. • Check harness for communication system of multi–display. • Check harness for power supply system of CD auto changer • Check harness for communication system CD auto changer
D7 *5	Connection check Error	Component in which this code is recorded is or was disconnected from system after engine start. Or, when recording this code, multi–display assembly was disconnected.	• Check harness for power supply of multi–displaly. • Check harness for communication system of multi–display. • Check harness for power supply of CD auto changer. • Check harness for communication system of CD auto changer.
DC *2	Transmission Error	Transmission to component shown by auxiliary code has been failed. (Detecting this DTC does not necessarily mean actual failure.)	If same auxiliary code is recorded in order component, check harness for power supply and communication system of all components shown by code.

DD *3	Master Reset (Momentary Interruption)	After engine is started, multi–display assembly was disconnected from system.	• Check harness for power supply system of multi–display. • Check harness for communication system multi–display. • Check harness for power supply system of CD auto changer. • Check harness for communication system CD auto changer. • If this error occurs frequently, replace multi–display assembly.
DF *4	Master Error	Due to defective condition of component with a display, master function is switched to audio equipment. Error occurs in communication between sub–master (audio) and master component.	• Check harness for power supply of multi–display assembly. • Check harness for communication system of multi–display assembly. • Check harness for communication system between multi–display assembly and sub–master component.
E0 *1	Registration Completion Instruction Error	”Registration Completion Instruction” command from master cannot be received.	Since this DTC is provided for engineering, it may be detected when no actual failure exists.
E2	ON/OFF Instruction Parameter Error	Error occurs in ON/OFF controlling command from multi–display assembly.	Replace multi–display assembly.
E3 *1	Registration Request Transmission	• Registration Request command is output from slave component. • Receiving Connection Check Instruction, Registration Request command is output from sub–master component.	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.
E4 *1	Multiple Frame Abort	Multiple frame transmission is aborted.	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.

DI7OS–04

PARTS LOCATION



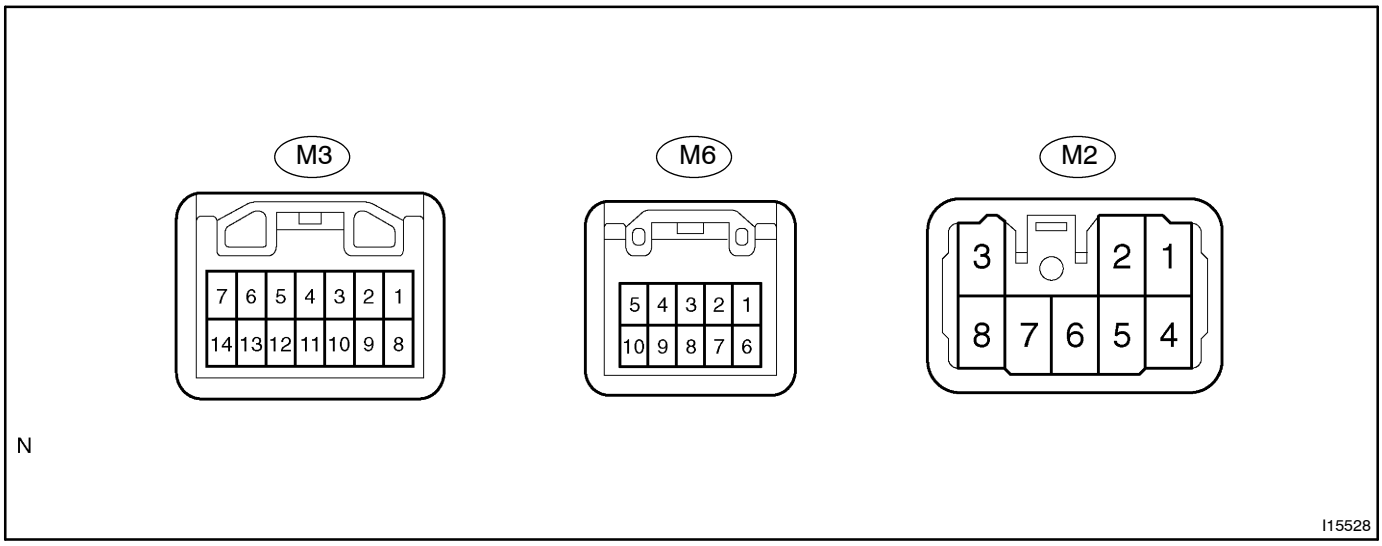
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DI86D–01

TERMINALS OF ECU

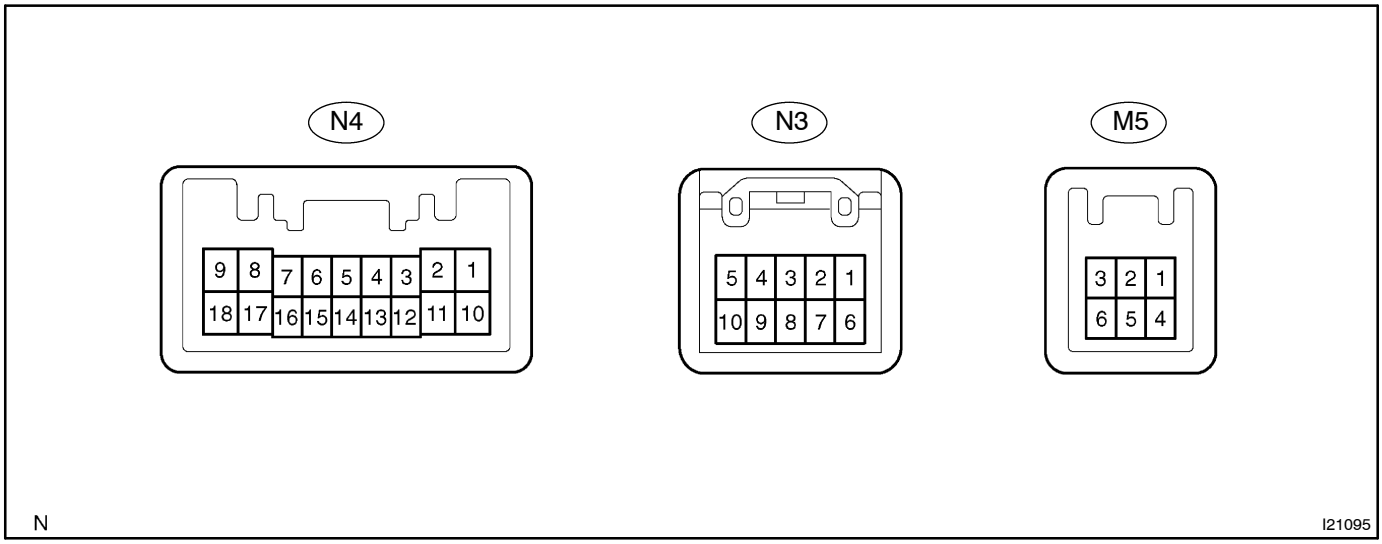
MULTI DISPLAY



Symbols (Terminal No.)	Condition	STD Voltage (V)	Problem symptom when open circuit is detected. / Problem symptoms when short circuit is detected.
+B ↔ GND1 (M2–1 ↔ M2–6)	Constant	10–14	Navigation system does not operate.
TX2 ↔ GND1 (M2–2 ↔ M2–6)	Ignition switch ON	10–14	Navigation system does not operate.
ACC ↔ GND1 (M2–2 ↔ M2–6)	Ignition switch ACC	10–14	Navigation system does not operate.
GND1 ↔ Body ground (M2–6 ↔ Body ground)	Constant	Continuity	Audio system is normal.
TX1+ (M3–3)	AVC–LAN communication circuit	–	Navigation system does not operate.
SPD ↔ GND1 (M3–5 ↔ M2–6)	Ignition switch ON, and driving wheel rotated smoothly	Repeatedly changes from below 1 to 9 V	Fuel efficiency cannot be calculated.
TX3+ ↔ GND1 (M3–4 ↔ M2–6)	Ignition switch ACC or ON	About 2.5	Screen is disorder.
TX1– (M3–10)	AVC–LAN communication circuit	–	Navigation system does not operate.
TX3– ↔ GND1 (M3–11 ↔ M2–6)	Ignition switch ACC or ON	About 2.5	Screen is disorder.
PKB ↔ GND1 (M3–13 ↔ M2–6)	Ignition switch ON, and parking brake switch ON (parking brake pedal released)	5	The system cannot enter Diagnostic system mode.
TC ↔ GND1 (M3–14 ↔ M2–6)	Ignition switch OFF and connect terminals TC and E1 of check connector	Continuity	Navigation system is normal. / The system does not exit Service check mode.
VR ↔ VG (M6–1 ↔ M6–6)	Constant	Continuity	Screen noise or other types of noise occur.
R ↔ VG (M6–2 ↔ M6–6)	Diagnosis display check screen is white (Using an oscilloscope)	0.7 ± 0.1 *2	Screen color turns to blue

B ↔ VG (M6–3 ↔ M6–6)	Diagnosis display check screen is white (Using an oscilloscope)	0.7 ± 0.1 *2	Screen color turns to yellow
G ↔ VG (M6–7 ↔ M6–6)	Diagnosis display check screen is white (Using an oscilloscope)	0.7 ± 0.1 *2	Screen color turns to red–purple.
SYVC ↔ VG (M6–8 ↔ M6–6)	Display ON (Using an oscilloscope)	0.5 – 1.3 *1	Screen is in disorder

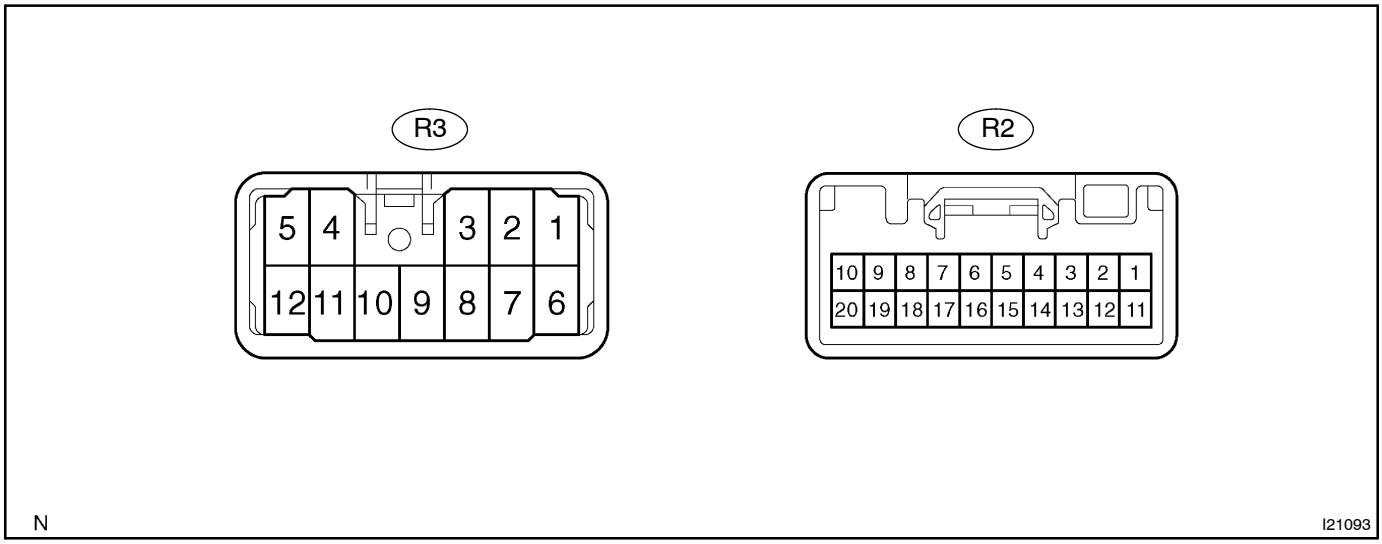
NAVIGATION ECU



Symbols (Terminal No.)	Condition	STD Voltage (V)	Problem symptom when open circuit is detected.
			Problem symptom when short circuit is detected.
VR ↔ VG (N3–1 ↔ N3–6)	Constant	Continuity	Screen noise or other types of noise occur.
			Navigation system does not operate.
R ↔ VG (N3–2 ↔ N3–6)	Diagnosis display check screen is white (Using an oscilloscope)	0.7 ± 0.1 *1	Screen color turns to blue.
B ↔ VG (N3–3 ↔ N3–6)	Diagnosis display check screen is white (Using an oscilloscope)	0.7 ± 0.1 *1	Screen color turns to yellow.
TX+ (N3–5)	AVC–LAN Communication circuit	–	Navigation system does not operate.
G ↔ VG (N3–7 ↔ N3–6)	Diagnosis display check screen is white (Using an oscilloscope)	0.7 ± 0.1 *1	Screen color turns to red–purple.
SYNC ↔ VG (N3–8 ↔ N3–6)	Display ON (Using an oscilloscope)	0.5 – 1.3 *1	Screen is in disorder.
TX– (N3–10)	AVC–LAN Communication circuit	–	Navigation system does not operate.
AUI+ ↔ GND (N4–1 ↔ N4–17)	Radio switch ON	5 – 7	Driver's side speaker does not sound.
AUI+ ↔ GND (N4–2 ↔ N4–17)	Radio switch ON	5 – 7	Driver's side speaker does not sound.
SPD ↔ GND (N4–5 ↔ N4–17)	Ignition switch ON, and driving wheel rotated smoothly.	Repeatedly changes from below 1 to 9 V	Fuel efficiency cannot be calculated.
AUI– ↔ GND (N4–10 ↔ N4–17)	Radio switch ON	5 – 7	Driver's side speaker does not sound.
AUI– ↔ GND (N4–11 ↔ N4–17)	Radio switch ON	5 – 7	Driver's side speaker does not sound.
+B ↔ GND (N4–9 ↔ N4–17)	Constant	10 – 14	Navigation system does not operate.

REV ↔ GND (N4–11 ↔ N4–17)	A/T shift position R	5	The direction of advance of the vehicle is different from that of cursor.
MUTE ↔ GND (N4–15 ↔ N4–17)	Radio switch ON	5	Pop sound etc.
			Navigation system does not operate.
GND ↔ Body ground (N4–17 ↔ Body ground)	Constant	Continuity	Audio system is normal
ACC ↔ GND (N4–18 ↔ N4–17)	Ignition switch ACC	10 – 14	Navigation system does not operate.

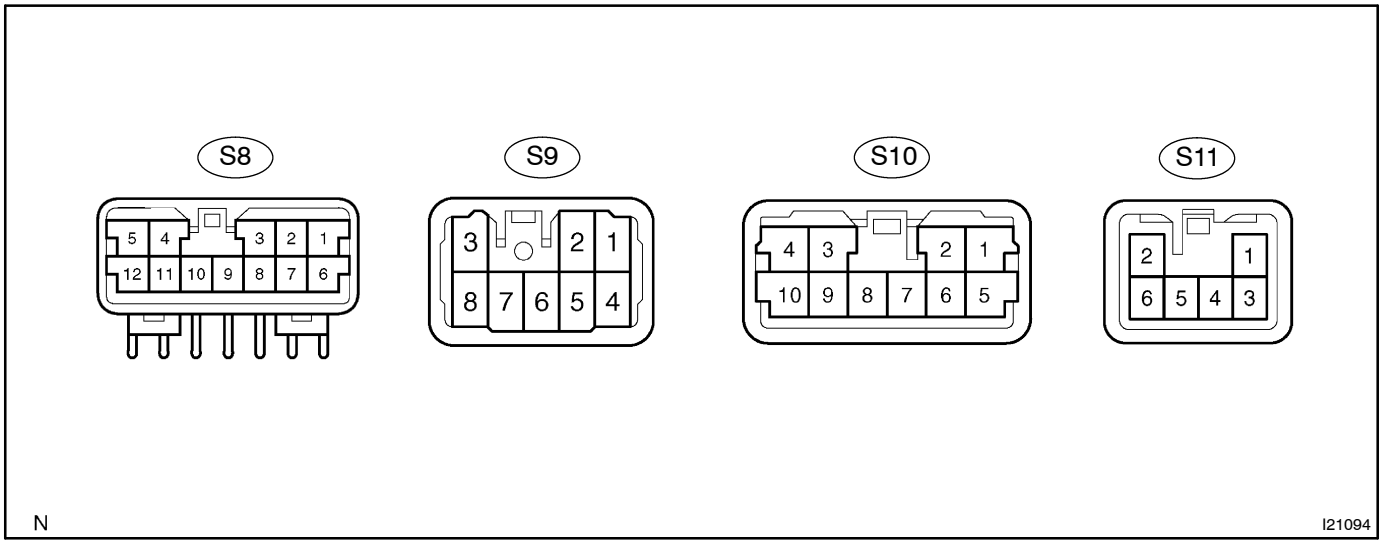
AUDIO HEAD UNIT



Symbols (Terminal No.)	Condition	STD Voltage (V)	Problem symptom when open circuit is detected. / Problem symptoms when short circuit is detected.
B ↔ GND (R2–1 ↔ R2–20)	Constant	10 – 14	Audio system does not operate.
ILL+ ↔ GND (R2–2 ↔ R2–20)	Light control switch TAIL	10 – 14	Audio head unit illumination does not light up. / Fuse is blown.
ANT ↔ GND (R2–4 ↔ R2–20)	Radio switch ON	10 – 14	Antenna does not extend.
BUS+ (R2–5)	AVC–LAN Communication circuit	–	Audio system does not operate.
MUTE ↔ GND (R2–7 ↔ R2–20)	Radio switch ON	5	Pop sound etc. / Audio system does not operate.
R+ ↔ GND (R2–8 ↔ R2–20)	Constant	10 – 14	Sound from right side speaker is small.
L+ ↔ GND (R2–9 ↔ R2–20)	Constant	10 – 14	Sound from left side speaker is small.
ACC ↔ GND (R2–11 ↔ R2–20)	Ignition switch ACC	10 – 14	Audio system does not operate.
ILL– ↔ GND (R2–12 ↔ R2–20)	Light control switch TAIL	Below 0.5	Audio head unit illumination does not light up. / Fuse is blown.
ANTB ↔ GND (R2–13 ↔ R2–20)	Radio switch ON	10 – 14	Antenna does not extend.
ANTA ↔ GND (R2–14 ↔ R2–20)	Radio switch ON	10 – 14	Antenna does not extend.
BUS– (R2–15)	AVC–LAN Communication circuit	–	Audio system does not operate.
L– ↔ GND (R2–19 ↔ R2–20)	Constant	10 – 14	Sound from left side speaker is small.
GND ↔ Body ground (R2–20 ↔ Body ground)	Constant	Continuity	Audio system is normal.

TX– (R3–9)	AVC–LAN Communication circuit	–	Audio system does not operate.
TX+ (R2–10)	AVC–LAN Communication circuit	–	Audio system does not operate.

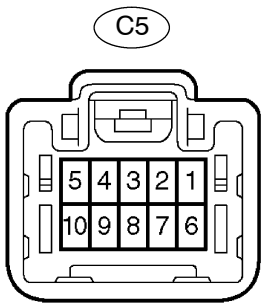
STEREO COMPONENT AMPLIFIER



Symbols (Terminal No.)	Condition	STD Voltage (V)	Problem symptom when open circuit is detected. / Problem symptoms when short circuit is detected.
R+ (S8–1)	–	–	RH side speaker does not sound.
L+ (S8–2)	–	–	LH side speaker does not sound.
MUTE ↔ E (S8–4 ↔ S10–7)	Radio switch ON	5	Pop sound etc. / Audio system does not operate.
R– (S8–6)	–	–	RH side speaker does not sound.
L– (S8–7)	–	–	LH side speaker does not sound.
BUS+ (S8–9)	AVC–LAN Communication circuit	–	Audio system does not operate.
BUS– (S8–10)	AVC–LAN Communication circuit	–	Audio system does not operate.
ACC ↔ E (S8–12 ↔ S10–7)	Ignition switch ACC	10 – 14	Audio system does not operate.
TXM+ (S9–1)	AVC–LAN Communication circuit	–	Audio system does not operate.
CDR+ (S9–2)	–	–	Sound from right side speaker is small.
CDL+ (S9–3)	–	–	Sound from left side speaker is small.
TXM– ↔ E (S9–4)	AVC–LAN Communication circuit	–	Audio system does not operate.
CDR– (S9–5)	–	–	Sound from right side speaker is small.
MUTE ↔ E (S9–6 ↔ S10–7)	CD auto changer switch ON	5 – 7	Pop sound etc. / Audio system does not operate.
CDL– (S9–8)	–	–	Sound from left side speaker is small.

FR+ ↔ E (S10–1 ↔ S10–7)	Radio switch ON	5 – 7	RH side speaker does not sound.
FL+ ↔ E (S10–2 ↔ S10–7)	Radio switch ON	5 – 7	LH side speaker does not sound.
FR– ↔ E (S10–5 ↔ S10–7)	Radio switch ON	5 – 7	RH side speaker does not sound.
FL– ↔ E (S10–6 ↔ S10–7)	Radio switch ON	5 – 7	LH side speaker does not sound.
E ↔ Body ground (S10–7 ↔ Body ground)	Constant	Continuity	
N–MU (S10–10)	AVC–LAN Communication circuit	–	Navigation system does not operate.
RR+ ↔ E (S11–1 ↔ S10–7)	Radio switch ON	5 – 7	Rear RH side speaker does not sound.
RL+ ↔ E (S11–2 ↔ S10–7)	Radio switch ON	5 – 7	Rear LH side speaker does not sound.
RR– ↔ E (S11–3 ↔ S10–7)	Radio switch ON	5 – 7	Rear RH side speaker does not sound.
WF+ ↔ E (S11–4 ↔ S10–7)	Radio switch ON	5 – 7	Woofer does not sound.
WF– ↔ E (S11–5 ↔ S10–7)	Radio switch ON	5 – 7	Woofer does not sound.
RL– ↔ E (S11–6 ↔ S10–7)	Radio switch ON	5 – 7	Rear LH side speaker does not sound.

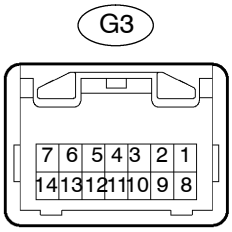
CD AUTO CHANGER



I04235

Symbols (Terminal No.)	Condition	STD Voltage (V)	Problem symptom when open circuit is detected. / Problem symptoms when short circuit is detected.
CDR+ (C5–1)	–	–	Sound from right side speaker is small.
CDL+ (C5–2)	–	–	Sound from left side speaker is small.
MUTE ↔ GND (C5–3 ↔ C5–8)	Radio switch ON	5	Pop sound etc. / Audio system does not operate.
TXM+ ↔ GND (C5–3 ↔ C5–8)	Ignition switch ON	2 – 3	Audio system does not operate.
B ↔ GND (C5–5 ↔ C5–8)	Constant	10 – 14	CD auto changer does not operate. / Audio system does not operate.
CDR– (C5–6)	–	–	Sound from right side speaker is small.
CDL– (C5–7)	–	–	Sound from left side speaker is small.
GND ↔ Body ground (C5–8 ↔ Body ground)	Constant	Continuity	Audio system does not operate.
TXM– ↔ GND (C5–3 ↔ C5–8)	Ignition switch ON	2 – 3	Audio system does not operate.
ACC ↔ E (C5–10 ↔ C5–8)	Ignition switch ACC	10 – 14	CD auto changer does not operate.

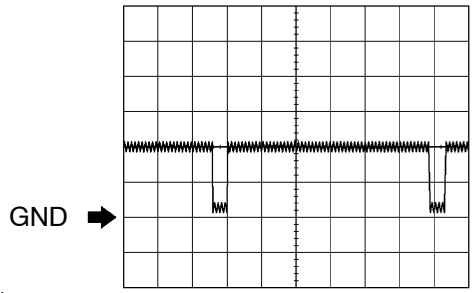
GATEAY ECU



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I13684

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
IG ↔ GND (G3–2 ↔ G3–14)	GR ↔ W–B	Ignition switch ON	10 – 14
MPD1 (G3–2)	W	Multiplex communication circuit	–
GTX+ (G3–5)	BR	AVC–LAN communication circuit	–
CG ↔ BOdy ground (G3–7 ↔ Body ground)	W–B ↔ Body ground	Constant	Continuity
BATT ↔ GND (G3–8 ↔ G3–14)	G–W ↔ W–B	Constant	10 – 14
ACC ↔ GND (G3–9 ↔ G3–14)	GR ↔ W–B	Ignition switch ACC	10 – 14
MPD2 (G3–11)	W	Multiplex communication circuit	–
GTX– (G3–12)	Y	AVC–LAN communication circuit	–
GND ↔ Body ground (G3–14 ↔ Body ground)	W–B ↔ Body ground	Constant	Continuity

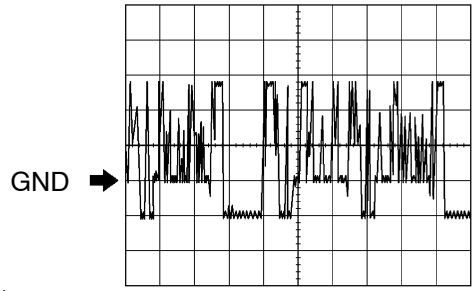


Oscilloscope

*1: wave1

- Measure terminal: SYNC ↔ GND1
- Measure set: 500 mV/DIV 10 μs/DV
- Condition: Navigation display is displayed

I15531



Oscilloscope

*1: wave1

- Measure terminal: R, G, B ↔ GND1
- Measure set: 200 mV/DIV 10 μs/DV
- Condition: Navigation map is switched

I15532

DI86E–01

PROBLEM SYMPTOMS TABLE

Flow chart No.	Component	Symptom
1.	Multi display	Black screen (Nothing displayed)
2.		No sound with Power switch pressed. (”AUTO OFF” on audio screen)
3.		No navigation screen displayed when ”MAP”, ”MENU” or ”DEST” switch pressed. (Screen cannot be switched.)
4.		No corresponding screen displayed when ”AUDIO” or ”Information” switch pressed.
5.		No navigation displayed, ”Audio OFF” on audio screen and no audio sound.
6.		Screen cannot be dimmed in night time.
7.		Navigation screen not stabilized. (Synchronous error)
8.		Color on navigation screen is unusual (RGB signal error)
9.		Black screen appears when ”MAP”, ”Menu” or ”DEST” switch pressed.
10.		Sound of radio, cassette tape or CD only cannot be heard from speaker.
11.		No sound (radio, cassette tape, CD) can be heard from driver side door speaker only.
12.		Map DISC cannot be inserted.
13.		MAP screen display does not appear. (Disc Caution screen does not change.)
14.		MAP is displayed in white or blue screen. (Switch and vehicle position mark is displayed.)
15.		Touch switch does not function. (Navigation screen only)
16.		Touch switch does not function. (A/C control screen only)
17.		Panel switch does not function. (Navigation screen only)
18.		Panel switch does not function. (A/C control screen only)
19.		The screen cannot be change to night mode color.
20.		Vehicle position is deviated from correct point badly.
21.		GPS mark does not appear.

22.		No voice navigation.
23.		Vehicle position rotates without control. (Map rotates without control)
24.		Driving direction is opposite to moving direction of vehicle position mark.
25.	Audio Head Unit	Radio reception poor.
26.		Cassette tape cannot be inserted.
27.		Cassette tape cannot be ejected.
28.		Any speaker does not work.
29.	CD AUTO Changer	CD magazine cannot be inserted.
30.		CD magazine inserted, but no power.
31.		Power coming in, but CD auto changer not operating..
32.		Sound jumps.
33.		Sound quality poor. (Volume faint)
34.		CD magazine will not be ejected.
35.		Any speaker does not work.
36.	Power Amplifier	No power coming in.
37.		Any speaker does not work.
38.		No power coming, but woofer amplifier not operating.
39.	Noise	Noise occurs
40.		Noise produced by vibration or shock while driving.
41.		Noise produced when engine starts.

DI7OU–04

CIRCUIT INSPECTION

1. Black screen (Nothing displayed)

INSPECTION PROCEDURE

1	**Check the ECU–IG fuse.**

NG → **Replace the fuse.**

OK

2	**Check multi display.**

PREPARATION:
Disconnect the multi display connector.
CHECK:
Check voltage terminals +B.
OK:
+B: 10 – 14 V
CHECK:
Check voltage terminal ACC when turn ignition switch ACC or ON position.
OK:
ACC: 10 – 14 V
CHECK:
Check continuity terminal GND1.
OK:
GND1: Continuity

NG → **Replace or repair wire harness or connector.**

OK

Replace the multi display.

DI7OV–03

2. No sound with POWER switch pressed. (”Audio OFF” on audio screen)

INSPECTION PROCEDURE

1	**Service check mode. (Check radio receiver assembly)**

NG → **Troubleshoot for each diagnosis.**

OK

2	**Check the radio receiver assembly.**

PREPARATION:
Disconnect the radio receiver assembly connector.
CHECK:
Check voltage terminals +B.
OK:
+B: 10 – 14 V
CHECK:
Check voltage terminal ACC when turn ignition switch ACC or ON position.
OK:
ACC: 10 – 14 V
CHECK:
Check continuity terminal GND1.
OK:
GND1: Continuity

NG → **Replace or repair wire harness or connector.**

OK

Replace the radio receiver assembly.

DI7OW–03

3. No navigation screen displayed when ”MAP”, ”Menu”, or ”DEST” switch pressed. (Screen cannot be switched.)

INSPECTION PROCEDURE

1	**Service check mode. (Check the navigation ECU)**

NG → **Troubleshoot for each diagnosis.**

OK → **Replace multi display.**

Ncon

2	**Check the navigation ECU.**

PREPARATION:
Disconnect the navigation ECU connector.
CHECK:
Check voltage terminals +B.
OK:
+B: 10 – 14 V
CHECK:
Check voltage terminal ACC when turn ignition switch ACC or ON position.
OK:
ACC: 10 – 14 V
CHECK:
Check continuity terminal GND1.
OK:
GND1: Continuity

NG → **Replace or repair wire harness or connector.**

OK

3	**Check the navigation ECU.**

CHECK:
Check terminal R, G and B.
OK:
R, G, B: See ”Naavigation ECU” of ”TERMINAL OF ECU”.

NG → **Replace the navigation ECU.**

OK

4	**Check the multi display.**

PREPARATION:
Disconnect the multi display connector.
CHECK:
Check voltage terminals +B.
OK:
+B: 10 – 14 V
CHECK:
Check voltage terminal ACC when turn ignition switch ACC or ON position.
OK:
ACC: 10 – 14 V
CHECK:
Check continuity terminal GND1.
OK:
GND1: Continuity

NG → **Replace or repair wire harness or connector.**

OK

5	**Check the multi display.**

CHECK:
Check terminal R, G and B.
OK:
R, G, B: See ”multi display” of ”TERMINAL OF ECU”.

NG → **Replace or repair wire harness or connector.**

OK

Replace multi display.

DI7OX–04

4. No corresponding screen displayed when "Audio" or "Information" switch pressed.

INSPECTION PROCEDURE

1	Service check mode (Panel switch check mode screen)

NG → Troubleshoot for each diagnosis.

OK

2	Check AVC–LAN communication circuit (See page DI–914).

NG → Repair or replace AVC–LAN circuit.

OK

Replace the multi display.

DI7OY–04

5. No navigation displayed, "Audio OFF" on audio screen and no audio sound.

INSPECTION PROCEDURE

1	Service check mode.

NG → Troubleshoot for each diagnosis.

OK

2	Check the radio receiver assembly.

PREPARATION:
Disconnect the radio receiver assembly connector.
CHECK:
Check voltage terminals +B.
OK:
+B: 10 – 14 V
CHECK:
Check voltage terminal ACC when turn ignition switch ACC or ON position.
OK:
ACC: 10 – 14 V
CHECK:
Check continuity terminal GND.
OK:
GND: Continuity

NG → Replace or repair wire harness.

OK

3	Check "AVC–LAN communication circuit" (See page DI–914).

NG → Replace the AVC–LAN circuit or radio receiver assembly.

OK

Replace the multi display.

DI7OZ–02

6. Screen cannot be dimmed in night time.

INSPECTION PROCEDURE

1	**Check if the screen is dimmed at night. (With the light control switch ON), do all screens except the navigation screen appear in Night Mode?)**

NG → **Check the light control switch.**

OK

2	**Check the multi display.**

CHECK:
Check terminal TAIL.
OK:
TAIL: See ”Multi display” of ”TERMINAL OF ECU”.

NG → **Replace or repair wire harness.**

OK

3	**Check the multi display.**

PREPARATION:
Disconnect the multi display connector.
CHECK:
Check voltage terminals +B.
OK:
+B: 10 – 14 V
CHECK:
Check voltage terminal ACC when turn ignition switch ACC or ON position.
OK:
ACC: 10 – 14 V
CHECK:
Check continuity terminal GND.
OK:
GND: Continuity

NG → **Replace or repair wire harness.**

OK

Replace the multi display.

DI7P0–02

7. Navigation screen not stabilized (Synchronous error).

INSPECTION PROCEDURE

1	**Check the navigation ECU.**

CHECK:

Check terminals +B.

OK:

+B: 10 – 14 V

CHECK:

Check terminal ACC when turn ignition switch ACC or ON position.

OK:

ACC: 10 – 14 V

CHECK:

Check terminal SYNC, VR or VG.

OK:

SYNC, VR, VG: See ”Navigation ECU” of ”TERMINAL OF ECU”

NG → **Replace the wire harness when all terminals are faulty. Replace the wire harness when the SYNC terminal is faulty.**

OK

Replace the multi display.

DI7P1–02

8. Color on navigation screen is unusual (RGB signal error).

INSPECTION PROCEDURE

1	Display check mode (Color bar check).

NG → Replace the multi display.

2	Navigation check mode (Color bar check).

NG → Go to step 4.

OK

3	Check the screen setting. (Day or Night mode)

OK → Normal.

NG

4	Check the navigation ECU.

CHECK:
Check terminals +B.
OK:
+B: 10 – 14 V
CHECK:
Check terminal ACC when turn ignition switch ACC or ON position.
OK:
ACC: 10 – 14 V
CHECK:
Check terminal R, G, B, VR or VG.
OK:
R, G, B, VR or VG: See ”Navigation ECU” of ”TERMINAL OF ECU”

NG → Replace the wire harness when all terminals are faulty. Replace the wire harness when SYNC terminal is faulty.

OK

Replace the multi display.

9. Black screen appears when ”MAP”, ”Menu” or ”DESTINATION” switch pressed.

INSPECTION PROCEDURE

1	**Check the navigation ECU.**

CHECK:
Check terminals +B.
OK:
+B: 10 – 14 V
CHECK:
Check terminal ACC when turn ignition switch ACC or ON position.
OK:
ACC: 10 – 14 V
CHECK:
Check terminal R, G, B, VR or VG.
OK:
R, G, B, VR or VG: See ”Navigation ECU” of ”TERMINAL OF ECU”

NG → **Replace the wire harness when all terminals are faulty. Replace the wire harness when SYNC terminal is faulty.**

OK

Replace the multi display.

10. Sound of radio, cassette tape or CD only cannot be heard from speaker.

INSPECTION PROCEDURE

1	**Check the radio receiver assembly.**

PREPARATION:
Disconnect the radio receiver assembly connector.
CHECK:
Check voltage terminals +B.
OK:
+B: 10 – 14 V
CHECK:
Check voltage terminal ACC when turn ignition switch ACC or ON position.
OK:
ACC: 10 – 14 V
CHECK:
Check continuity terminal GND.
OK:
GND: Continuity

NG → **Replace or repair wire harness or connector.**

OK ↓

Replace the radio receiver assembly.

11. No sound (radio, cassette tape, CD) can be heard from driver side door speaker only.

INSPECTION PROCEDURE

1	**Service check mode.**

NG → **Troubleshoot for each diagnosis.**

OK

2	**Check wire harness (between navigation ECU and stereo component amplifier).**

PREPARATION:

Disconnect the navigation ECU and radio receiver assembly connector.

CHECK:

(a) Check continuity between terminal AUI+ of navigation ECU connector and terminal FL+ of radio receiver assembly.

(b) Check continuity between terminal AUI– of navigation ECU connector and terminal FL– of radio receiver assembly.

OK:

Continuity

NG → **Replace or repair wire harness.**

OK

3	**Check the navigation system voice.**

OK → **Go to step 6.**

NG

4	**Check wire harness (between navigation ECU and driver side door speaker).**

PREPARATION:

Disconnect the navigation ECU and driver side door speaker connector.

CHECK:

(a) Check continuity between terminal AUO+ of navigation ECU connector and terminal 1 of driver side door speaker.

(b) Check continuity between terminal AUO– of navigation ECU connector and terminal 2 of driver side door speaker.

OK:

Continuity

NG → **Replace or repair wire harness.**

OK

5	**Check the driver side door speaker.**

NG → **Replace the speaker.**

OK

Replace the navigation ECU.

6	**Check the navigation ECU.**

CHECK:

Check terminal AUO+, AUO–, AUI+ and AUI–.

OK:

AUO+, AUO–, AUI+ and AUI–: See ”Navigation ECU” of ”TERMINAL OF ECU”.

NG → **Replace the navigation ECU.**

OK

Replace the stereo component amplifier.

DI7P5–02

12. Map DISC cannot be inserted.

INSPECTION PROCEDURE

1	**Check the MAP DISC.**

NG → **Replace the MAP DISC.**

OK

2	**Insert a MAP DISC without tilt.**

OK → **Normal.**

NG

3	**Check the navigation ECU.**

PREPARATION:
Disconnect the navigation ECU connector.
CHECK:
Check voltage terminals +B.
OK:
+B: 10 – 14 V
CHECK:
Check voltage terminal ACC when turn ignition switch ACC or ON position.
OK:
ACC: 10 – 14 V
CHECK:
Check continuity terminal GND.
OK:
GND: Continuity

NG → **Replace or repair wire harness.**

OK

Replace the navigation ECU.

DI7P6–02

13. MAP screen display does not appear. (Disc Caution screen does not change)

INSPECTION PROCEDURE

1	Take appropriate measures according to the caution screen.

OK → Normal.

NG

2	Check map DISC.

NG → Replace the disc.

OK

Replace the navigation ECU.

CAUTION SCREEN

CAUTION MESSAGE	CAUSE	CORRECTIVE ACTION
Cover is open. Close it.	The cover of the map disk slot is open.	Close the cover,
No disc is set. Set a map disc.	No map disk is inserted.	Insert a proper map disc.
Data cannot be read properly. Check it for scratches or dirt.	Data cannot be read because the map disc is dirty or scratched.	Wipe off dirt on the both disc surface with soft cloth.
Data cannot be read. Check the correct map disc is set.	Something other than map disc is inserted.	Insert a correct map disc.
Due to high temperature of the player, data cannot be read.	Pick–up part of the player is heated to a high temperature.	Stop the vehicle at a shaded cool place and turn the ignition switch OFF. When confirming that the temperature of the navigation ECU has been lowered, turn the ignition switch ON.
Data cannot be read. Contact your sales dealer.	The player cannot read data from the map disc temporarily.	Turn the ignition switch OFF and ON.*1

*1: If the same caution screen appears again after turning the ignition switch ON, replace the navigation ECU.

DI7P7–02

14. Map is displayed in white or blue screen. (Switches and vehicle position mark is displayed)

INSPECTION PROCEDURE

1	**Set the map scale to the max.**

OK → **Normal.**

HINT:
Correct the current position and check it again.

NG

2	**Wipe the disc with a soft cloth, insert it again, and turn the ignition switch ON from OFF.**

NG → **Replace the disc.**

OK

Normal.

HINT:
If the trouble still occurs, replace the navigation ECU.

DI86F–01

15. Touch switch does not function. (Navigation screen only)

INSPECTION PROCEDURE

1	Display check mode (Touch switch, Touch point screen).

NG → Replace the multi display.

OK

2	Check "AVC–LAN communication circuit" (See page DI–914).

NG → Replace or repair AVC–LAN circuit.

OK

Replace the navigation ECU.

DI86G–01

16. Touch switch does not function. (A/C control screen only)

INSPECTION PROCEDURE

1	Display check mode (Touch switch, Touch point screen).

NG → Replace the multi display.

OK

2	Check "AVC–LAN communication circuit". (See page DI–914)

NG → Replace or repair AVC–LAN circuit.

OK

3	Check multiplex communication circuit (See page DI–732).

NG → Replace or repair multiplex communication circuit.

OK

Replace A/C amplifier.

DI86H–01

17. Panel switch does not function. (Navigation screen only)

INSPECTION PROCEDURE

1	Display check mode (Panel switch check screen).

NG → Replace the multi display.

OK

2	Check "AVC–LAN communication circuit" (See page DI–914).

NG → Replace or repair AVC–LAN circuit.

OK

Replace the navigation ECU.

DI86I–01

18. Panel Switch Does Not Function (A/C control only)

INSPECTION PROCEDURE

1	Display check mode (Panel Switch Check screen).

NG → Replace the multi display.

OK

2	Check "AVC–LAN communication circuit" (See page DI–914).

NG → Replace or repair AVC–LAN circuit.

OK

3	Check multiplex communication circuit (See page DI–732).

NG → Replace or repair multiplex communication circuit.

OK

Replace A/C amplifier.

DI86J–01

19. Navigation screen cannot change to the night mode color.

INSPECTION PROCEDURE

1	Check the setting. (Is it set to Day Mode in screen adjustment?)

Yes → Normal.

No

2	Check if the screen is dimmed at night. (With the light control switch ON, do all screens except the navigation screen appear in Night Mode?)

NG → Go to step 5.

OK

3	Does the beep sound by operating switches on the navigation screen?

OK → Replace the navigation ECU.

NG

4	Check "AVC–LAN communication circuit". (See page DI–914)

NG → Replace or repair AVC–LAN circuit.

OK

Replace the navigation ECU.

5	**Check the multi display.**

CHECK:

Check terminal TAIL.

OK:

TAIL: See ”Multi Display” of ”TERMINAL OF ECU”.

OK → **Replace the multi display.**

NG

Replace or repair wire harness.

DI86K–01

20. Vehicle position is deviated from correct point badly.

INSPECTION PROCEDURE

1	Check the mark display. (At a place with a fine view, is GPS mark displayed or not?)

No → Go to step 7.

Yes

2	Does the trouble occur in the specific area or not?

Yes → Normal. (If the vehicle is positioned in the place where it is difficult to be identified, the current vehicle position may be incorrectly displayed.)

No

3	Check the setting (Color of the automatic calibration button on the calibration screen).

Green → Normal. (Drive the vehicle (10 km or more) until calibration is completed.

Blue

4	Service check mode. (Is ”58–43” displayed in the unit check mode of the navigation ECU?)

Yes → Troubleshoot for each diagnosis.

No

5	Navigation check mode (vehicle signal check mode: SPD).

NG → Replace or repair speed sensor wire harness.

OK

6	Is there anything such as a film stuck to the window or any metal object on the instrument panel?

Yes → Reception may be affected by a screen such as a film.

No

7	Recurrence Test (Confirm the phenomenon) (Correct the current position and drive the vehicle for a while with the GPS mark displayed).

OK → Normal.

NG

Replace the navigation ECU.

8	Check if the harness is caught or sharply bent or not.

NG → Navigation antenna is surely connected.

OK

9	**Check optional components. (Does it become if the optionals such as the theft deterrent system is removed?)**

Yes → **Remove or change the position of the components.**

HINT:
Some optionals receive radio signals, and if this happens, GPS reception may be affected.

No

10	**Is there anything such as a film stuck to the window?**

Yes → **Reception may be affected by a screen such as a film.**

No

11	**Service check mode. (Is ”80–40, 41” is displayed in the unit check mode of the navigation ECU?)**

Yes → **Troubleshoot for each diagnosis.**

No

Replace the navigation antenna.

HINT:
If the trouble still occurs, replace the navigation ECU.

DI86L–01

21. GPS mark does not appear.

INSPECTION PROCEDURE

1	**Check the mark display. (At a place with a fine view, is GPS mark displayed or not?)**

Yes → **Normal.**

No

2	**Is there anything such as a film stuck to the window or any matal object on the instrument panel?**

Yes → **Reception may be affected by a screen such as a film.**

No

3	**Check if the harness is caught or sharply bent or not.**

NG → **Navigation antenna is surely connected.**

OK

4	**Check optional components. (Does it become normal if the optionals such as the theft deterrent system is removed?)**

Yes → **Remove or change the position of the components.**

HINT:
Some optionals receive radio signals, and if this happens, GPS reception may be affected.

No

5	**Is there anything such as a film stuck to the window?**

Yes → **Reception may be affected by a screen such as a film.**

No

6	**Service check mode. (Is ”80–40, 41” is displayed in the unit check mode of the navigation ECU?)**

Yes → **Troubleshoot for each diagnosis.**

No

Replace the navigation antenna.

HINT:
If the trouble still occurs, replace the navigation ECU.

DI86M–01

22. No voice navigation.

INSPECTION PROCEDURE

1	**Set the volume to the max in the menu screen.**

OK → **Normal (Voice navigation is not available. No destination is set, or the vehicle is running off the route.)**

NG

2	**Check wire harness (navigation ECU and driver side door speaker).**

PREPARATION:

Disconnect the navigation ECU connector and driver side door speaker connector.

CHECK:

(a) Check continuity between terminal AUO+ of navigation ECU connector and terminal 1 of driver side door speaker.

(b) Check continuity between terminal AUO– of navigation ECU connector and terminal 2 of driver side door speaker.

OK:

Continuity

NG → **Replace or repair wire harness.**

OK

3	**Check the sound (Check if the radio sound can be heard from the driver side door speaker.).**

OK → **Replace the navigation ECU.**

NG

Replace the speaker.

23. Vehicle position rotates without control. (Map rotates without control)

INSPECTION PROCEDURE

1	Recheck. (While not rotating the vehicle, turn the ignition switch ON from OFF again.)

OK → Normal. (While the vehicle was turning, the ignition switch was turned ON.)

NG

2	System check mode. (Is ”58–10” is displayed in the unit check mode of the navigation ECU?)

Yes → Replace the navigation ECU.

No

3	System check mode. (Is ”58–43” is displayed in the unit check mode of the navigation ECU?)

Yes → Replace and repair SPD terminal wire harness.

No

4	Navigation check mode (vehicle signal check mode: SPD and gyro).

OK → Replace the navigation ECU.

NG

Replace or repair wire harness.

DI86O–01

24. Driving direction is opposite to moving direction of vehicle position mark.

INSPECTION PROCEDURE

1	**Navigation check mode (vehicle signal check mode REV).**

OK → **Replace the navigation ECU.**

NG

2	**Check the navigation ECU.**

CHECK:

Check terminal REV.

OK:

REV: See ”Navigation ECU” of ”TERMINAL OF ECU”.

OK → **Replace the navigation ECU.**

NG

Replace or repair wire harness.

DI86P–01

25. Radio reception poor.

INSPECTION PROCEDURE

1	Check the reception. (Select an AM or FM station band which signals are strong)

Yes → An electric wave environment is bad.

No

2	Are there any additional installation parts? (Telephone antenna, etc.)

Yes → Does the condition get better if removing them? Influence of additional installation parts.

No

3	Is the contact of the plug jack of the radio OK?

NG → Take a measure for contact.

OK

Is the antenna cord caught or broken?

DI86Q–01

26. Cassette tape cannot be inserted.

INSPECTION PROCEDURE

1	Is there a foreign object inside tape player?

Yes → Remove foreign object.

No

2	Is auto search button radio operating normally?

NG → Radio assembly faulty.

OK

3	Check the cassette tape for deformation or peeling–off of the label.

NG → Replace cassette.

OK

4	Is the tape slack?

NG → Remove slack before using.

OK

Replace the radio receiver assembly.

DI86R–01

27. Cassette tape cannot be eject.

INSPECTION PROCEDURE

1	**Check if ACC or DOME fuse is OK?**

NG → **Replace fuse.**

OK

2	**Check the radio receiver assembly.**

PREPARATION:
Disconnect the radio receiver assembly connector.
CHECK:
Check voltage terminals +B.
OK:
+B: 10 – 14 V
CHECK:
Check voltage terminal ACC when turn ignition switch ACC or ON position.
OK:
ACC: 10 – 14 V
CHECK:
Check continuity terminal GND.
OK:
GND: Continuity

NG → **Replace or repair wire harness.**

HINT:
When sending it for repair, leave as it is without attempting to take it out by force.

OK

Replace the radio receiver assembly.

DI86S–01

28. Any speaker does not work.

INSPECTION PROCEDURE

1	Is radio operating normally?

YES → Radio assembly faulty.

NO

2	Is hiss noise produced by non–functioning speaker.

YES → Radio assembly faulty.
Recheck system after repair.

NO

3	Does continuity exist in speaker wire harness?

NO → Speaker wire harness faulty.

YES

4	Temporarily install another speaker. Function OK?

YES → Speaker faulty.

NO

Power amplifier faulty.
Recheck system after repair.

DI86T–01

29. CD MAGAZINE CONNOT BE INSERTED

INSPECTION PROCEDURE

1	Is CD magazine already inserted?

YES → Eject CD magazine.

NO

2	Is auto search button of radio operating normally?

YES → Go to step 6.

NO

3	Check if RADIO No. 1 fuse is OK?

NG → Replace RADIO No. 1 fuse.

OK

4	Is power supplied to +B terminal of stereo component amplifier?

NO → +B wire harness faulty.

YES

5	Check if GND (wire harness side) of radio receiver assembly.

NG → +B wire harness faulty.

OK

Radio assembly faulty.

6	Is power supplied to +B terminal of CD auto changer?

No → Radio receiver assembly faulty.

YES

7	Check if GND (wire harness side) of CD auto changer grounded normally?

NG → Radio receiver assembly faulty.

OK

CD auto changer faulty.

DI86U–01

30 CD magazine inserted, but no power.

INSPECTION PROCEDURE

1	Is radio operating normally?

YES → Go to step 5.

NO

2	Check RADIO No. 2 fuse is OK?

NG → Replace fuse.

OK

3	Is power supplied to ACC terminal of stereo component amplifier?

NO → ACC wire harness faulty.

YES

4	Is power supplied to ACC terminal of radio receiver assembly?

NO → Stereo component amplifier faulty.

YES

Radio receiver assembly faulty.

5	**Is power supplied to ACC terminal of CD auto changer?**

NO → **Radio receiver assembly faulty.**

YES

CD auto changer faulty.

DI86V–01

31. Power coming in, but CD auto changer not operating

INSPECTION PROCEDURE

1	Is CD inserted with correct side up?

NO → Insert correctly.

YES

2	Function OK if different CD magazine inserted?

YES → CD magazine faulty.

NO

3	Is radio operating normally?

YES → Go to step 7.

NO

4	Does contunuity exist in speaker wire harness?

NO → Speaker wire harness faulty.

YES

5	**Temporarily install another speaker. Function OK?**

YES → **Speaker faulty.**

NO

6	**Hiss noise from speaker?**

NO → **Power amplifier faulty. Recheck system after repair.**

YES

Radio assembly faulty. Recheck system after repair.

7	**Is temperature inside cabin hot?**

YES → **Protective circuit in operation.**

NO

8	**Has sudden temperature change?**

YES → **Formation of condensation due to temp. changes.**

NO

CD auto changer faulty.

DI86W–01

32. Sound jumps

INSPECTION PROCEDURE

1	Does sound jump only during strong vibration?

Yes → Jumping caused by vibration.

No

2	Is CD auto changer properly installed?

No → Install properly.

Yes

3	Functions OK if another CD is played?

Yes → CD faulty.

No

4	Has sudden temperature change occurred inside cabin?

Yes → Formation of condensation due to temp. changes.

No

CD auto changer faulty.

DI86X–01

33. Sound quality poor (volume faint)

INSPECTION PROCEDURE

1	Function OK if another CD is played?

Yes → CD faulty.

No

2	Is radio operating normally?

Yes → Radio receiver assembly faulty.

No

3	Is speaker properly installed?

No → Install properly

YES

4	Temporarily install another speaker. Function OK?

Yes → Speaker faulty.

No

Radio assembly or CD auto changer or power amplifier faulty.

DI86Y–01

34. CD magazine will not be ejected.

INSPECTION PROCEDURE

1	Is auto search button of radio operating normally?

Yes → Go to step 5.

No

2	Check if RADIO No. 1 fuse is OK?

NG → Replace fuse.

OK

3	Is power supplied to +B terminal of power amplifier?

No → +B wire harness faulty.

YES

4	Is power supplied to +B terminal of radio receiver?

No → Power amplifier faulty.

YES

Radio assembly faulty.

5	**Is power supplied to +B terminal of CD auto changer?**

No → **Radio assembly faulty.**

Yes

CD auto changer faulty.

DI86Z–01

35. Any speaker does not work

INSPECTION PROCEDURE

1	Is radio operating normally?

YES → CD auto changer faulty.

NO

2	Is hiss noise produced by non–functioning speaker.

YES → Radio assembly faulty.
Recheck system after repair.

NO

3	Does continuity exist in speaker wire harness?

NO → Speaker wire harness faulty.

YES

4	Temporarily install another speaker. Function OK?

YES → Speaker faulty.

NO

Radio assembly faulty.
Recheck system after repair.

DI870–01

36. No power coming in.

INSPECTION PROCEDURE

1	Is tape player operating normally?

Yes → Radio assembly faulty.

No

2	Check if RADIO No. 1 fuse is OK?

NG → Replace fuse.

OK

3	Is power supplied to ACC terminal of power amplifier?

No → ACC wire harness faulty.

YES

4	Check if RADIO No. 1 fuse is OK?

No → Replace fuse.

YES

5	Is power supplied to +B terminal of power amplifier?

No → +B wire harness faulty.

YES

6	Check if GND (wire harness side) of power amplifier grounded normally?

NG → Ground faulty.

OK

7	Is power supplied to ACC terminal of radio assembly?

No → Power amplifier or wire harness faulty.

YES

8	Is power supplied to +B terminal of radio assembly?

No → Power amplifier or wire harness faulty.

YES

9	**Check if GND (wire harness side) of radio assembly grounded normally?**

NG → **Ground faulty.**

OK

Radio assembly faulty.

DI871–01

37. Any speaker does not work.

INSPECTION PROCEDURE

1	Is radio operating normally?

Yes → CD auto changer faulty.

No

2	Is hiss noise produced by non–functioning speaker?

Yes → Radio receiver assembly faulty.
Recheck system after repair.

No

3	Does continuity exist in speaker sire harness?

No → Speaker wire harness faulty.

YES

4	Temporarily install another speaker. Function OK?

Yes → Speaker faulty.

No

Radio receiver assembly faulty.
Recheck system after repair.

DI872–01

38. No power coming, but woofer amplifier not operating.

INSPECTION PROCEDURE

1	Is tape player operating normally?

Yes → Radio receiver assembly faulty.

No

2	Check if RADIO No. 2 fuse is OK?

NG → Replace fuse.

OK

3	Is power supplied to ACC terminal of stereo component amplifier?

No → ACC wire harness faulty.

YES

4	Check if RADIO No.1 fuse is OK?

NG → Replace fuse.

OK

5	Is power supplied to +B terminal of stereo component amplifier?

No → +B wire harness faulty.

YES

6	Check if GND (wire harness side) of radio receiver assembly grounded normally.

NG → GND faulty.

OK

7	Is power supplied to ACC terminal of radio receiver assembly?

No → Stereo component amplifier faulty.

YES

8	Is power supplied to +B terminal of radio receiver assembly?

No → Stereo component amplifier faulty.

YES

9	Check if GND (wire harness side) of radio receiver assembly grounded normally.

NG → GND faulty.

OK

10	**Does continuity exist in speaker wire harness?**

No → **Speaker wire harness faulty.**

YES

11	**Temporarily install another speaker. Functions OK?**

Yes → **Speaker faulty.**

No

12	**Hiss noise from speaker?**

No → **Stereo component amplifier faulty. Recheck system after repair.**

YES

Radio receiver assembly faulty. Recheck system after repair.

DI873–01

39. Noise occurs

INSPECTION PROCEDURE

1	Does the noise occur only in the radio?

NO → Refer to No. 24. (It occurs in the cassette and CD.)

YES

2	Does the noise occur in a particular place?

YES → An electric environment.

NO

3	Is there any additional installation part around the glass imprinted antenna? (Sun shade film, telephone antenna etc.)

YES → Does the noise stop by removing it? Influence of the film or the noise radiation of the additional installation part.

NO

4	Does the noise occur even pulling out the antenna cord from the radio?

YES → Check the radio.

NO

5	**Does the noise occur even pulling out the antenna terminal on the glass surface?**

YES → **Noise mixing into the antenna cable.**

NO

6	**Isn't there any adhesive (Butyl rubber) stuck on the bases of the antenna terminal, defogger terminal and bus bar?**

YES → **Failure of glass installation. Must plane the butyl rubber.**

NO

7	**Does the noise occur even pulling out the defogger terminal?**

YES → **Interfering noise from the defogger line and choke coil.**

NO

8	**Check the grounding of the antenna, antenna cord, coke coil, and noise filter (See Pub. No. RM588E on page BE–237).**

NG → **Grounding failure.**

OK

9	**Does the condition get better by replacing the choke coil?**

YES → **Replace the choke coil.**

NO

10	**Does the condition get better by replacing the antenna cord.**

YES → **Replace the antenna cord.**

NO

Noise rediates directly to the antenna from the generation source.

DI874–01

40. Noise produced by vibration or shock while driving

INSPECTION PROCEDURE

1	Is speaker properly installed?

NO → Install properly.

YES

2	Is speaker properly installed?

NO → Install properly.

YES

3	With vehicles stationary lightly tap each system. Is noise produced?

YES → Each system faulty.

NO

Noise is produced from static electricity accumulating in the vehicle body.

DI875–01

41. Noise produced when engine starts

INSPECTION PROCEDURE

1	Whistling noise which becomes high–pitched when accelerator strongly depressed, disappears shortly after engine stops.

YES → Alternator noise.

NO

2	Whining noise occurs when A/C is operating.

YES → A/C noise.

NO

3	Scratching noise occurs during sudden acceleration, driving on rough roads or when ignition switch is turned ON.

YES → Fuel gauge noise.

NO

4	Clicking sound is heard when horn button is pressed, then released. Whirring/grating sound is heard when pushed continuously.

YES → Horn noise.

NO

5	Murmuring sound stops when engine stops.

YES → Ignition noise.

NO

6	Tick–tack noise occurs in co–ordination with blinking offflasher.

YES → Turn signal noise.

NO

7	Noise occurs during window washer operation.

YES → Washer noise.

NO

8	Scratching noise occurs while engine is running, and continues a while even after engine stops.

YES → Water temp. gauge noise.

NO

9	Scraping noise in line with wiper beat.

YES → Wiper noise.

NO

Other type of noise.

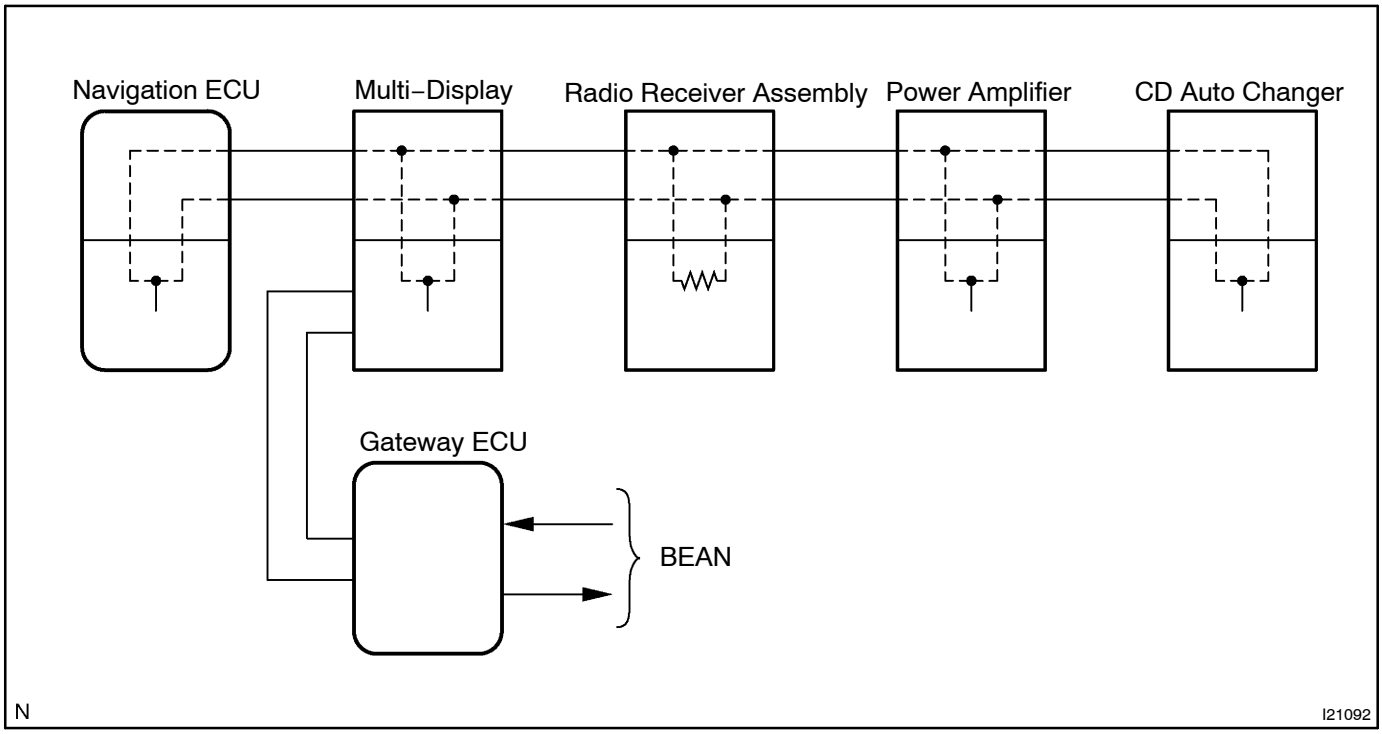
DI876–01

AVC–LAN (Communication bus) Circuit

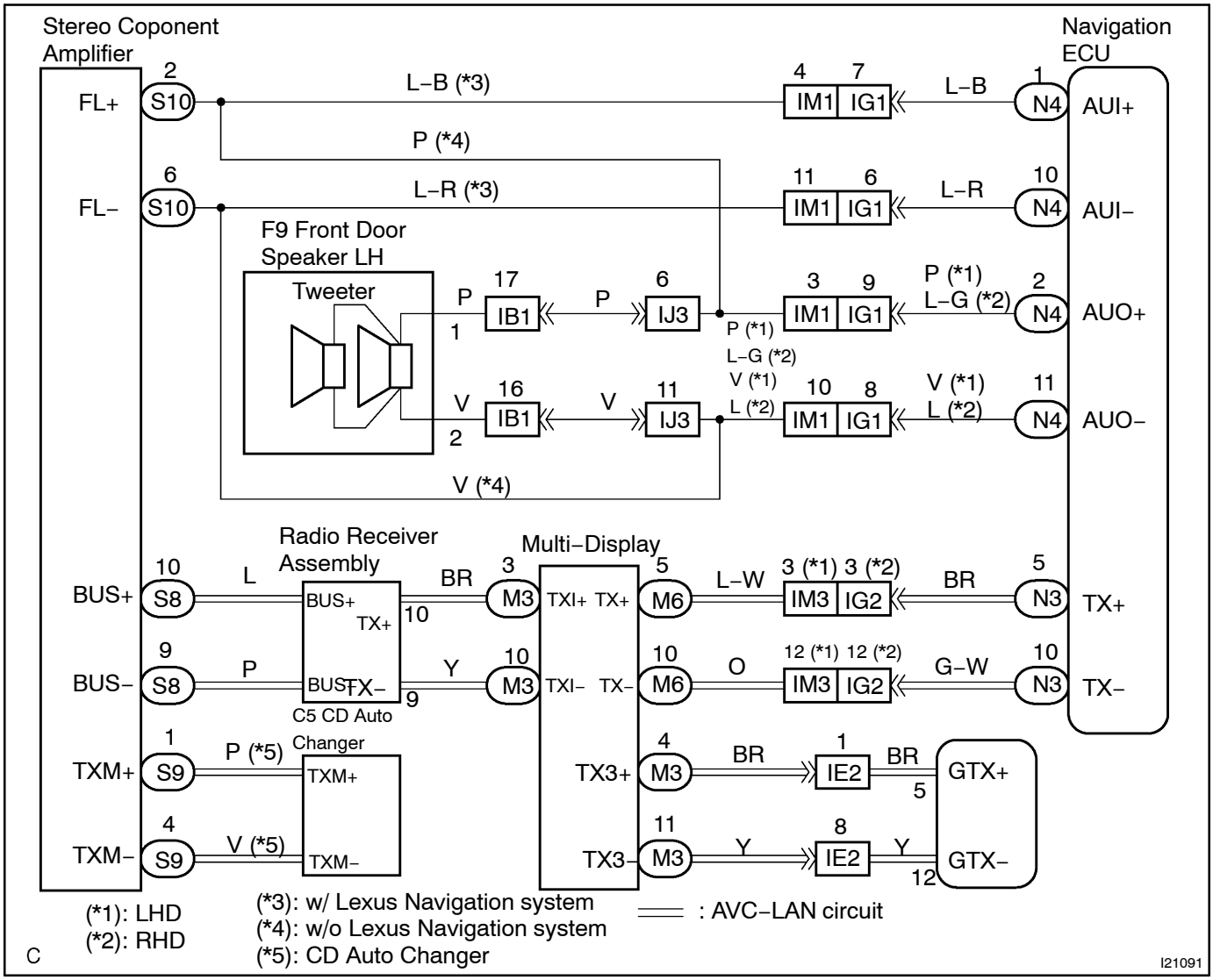
CIRCUIT DESCRIPTION

Each unit of LEXUS navigation system connected with AVC–LAN (communication bus) transfers the signal of each switch by communication.
When +B short and GND short occur in this AVC–LAN, LEXUS navigation system will not function normally as the communication is discontinued.
In this AVC–LAN, multi display becomes the master of the communication, and the audio head unit has a resistance necessary for transmitting the communication.
Multi display is connected between Navigation ECU and Audio head unit, LEXUS navigation system has the structure that makes communication impossible without Navigation ECU, or Audio head unit.

AVC–LAN



WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Disconnect the connector of CD auto changer and check if AVC–LAN will be recovered normally.**

CHECK:

Check that the display will change by pressing either of the Panel switch or Touch switch on the display.

HINT:

It can be judged that AVC–LAN is recovered if the display is changed.

OK	**Replace the CD auto changer.**

NG

2	**Disconnect the ”S8” connector of the stereo component amplifier, check if AVC–LAN will be recovered normally.**

CHECK:

Check that the display will change by pressing either of the Panel switch or Touch switch on the display.

HINT:

It can be judged that AVC–LAN is recovered if the display is changed.

OK	**Repair or replace wire harness or connector between stereo component amplifier and CD auto changer.**

NG

3	**Disconnect the ”S9” connector of the stereo component amplifier, check if AVC–LAN will be recovered normally.**

CHECK:

Check that the display will change by pressing either of the Panel switch or Touch switch on the display.

HINT:

It can be judged that AVC–LAN is recovered if the display is changed.

OK	**Replace the stereo component amplifier.**

NG

4	**Disconnect the "R2" connector of the audio head unit, check if AVC–LAN will be recovered normally.**

CHECK:
Check that the display will change by pressing either of the Panel switch or Touch switch on the display.
HINT:
It can be judged that AVC–LAN is recovered if the display is changed.

OK	**Repair or replace wire harness or connector between Audio head unit and stereo component amplifier.**

NG

5	**Check wire harness and connector between audio head unit and multi display (See page IN–30)**

NG	**Repair or replace wire harness or connector between audio head unit and multi display.**

OK

6	**Check wire harness and connector between multi display and navigation ECU. (See page IN–30)**

NG	**Repair or replace wire harness or connector between multi display and navigation ECU.**

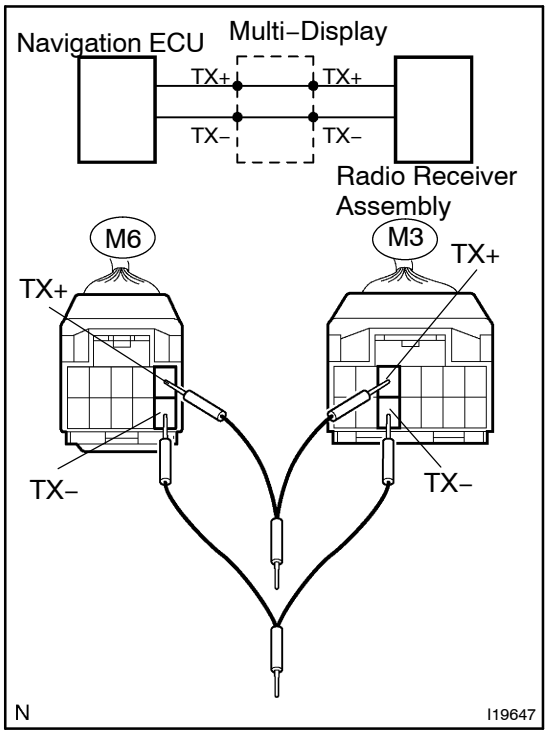
OK

7	**Check wire harness and connector between multi display and gateway ECU. (See page IN–30)**

NG	**Repair or replace wire harness or connector between multi display and gateway ECU.**

OK

8	Skip multi display and check AVC–LAN.



PREPARATION:

(a) Connect all the connectors except ”M3” and ”M6” of the multi display..

(b) Using 2 SSTs (Diagnosis check wire P/N 09893–12040), connect the terminal TX+ of connector ”M3” and TX+ of connector ”M6”, the terminal TX– of connector ”M3” and TX– of connector ”M6” respectively of Display ECU.

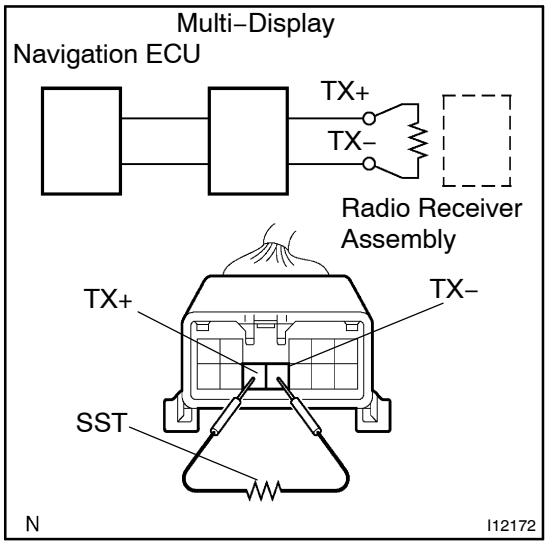
CHECK:

Operate audio head unit (CD, Cassette tape, etc.) and check that the sound comes out from the speaker.
(Check that AVC–LAN is recovered.)

OK	Replace the Display ECU.

NG

9	Skip Audio head unit and check AVC–LAN.



PREPARATION:

(a) Connect multi display connector.
(b) Disconnect Audio head unit "R3" connector.
(c) Using SST (Navigation Check Wire P/N 09843–18050), connect the terminal TX+ to terminal TX– of "R3" connector of Audio head Unit.

CHECK:

Operate the panel switch and the touch switch of the display and check that the navigation functions.
(Check that AVC–LAN is recovered.)

OK → **Replace the audio head unit.**

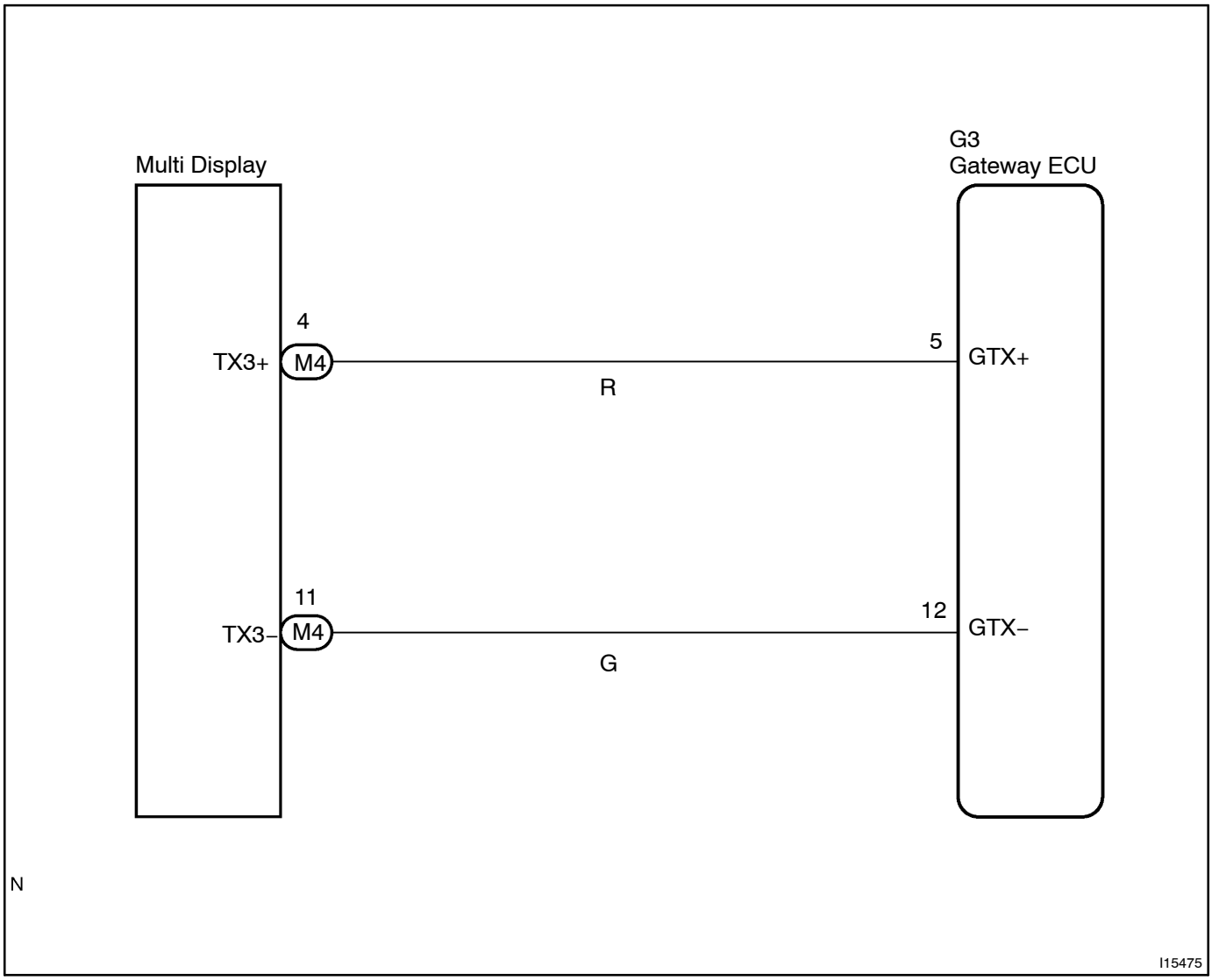
NG

Replace the navigation ECU.

DI877–01

Gateway ECU (AVC–LAN adapter) circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

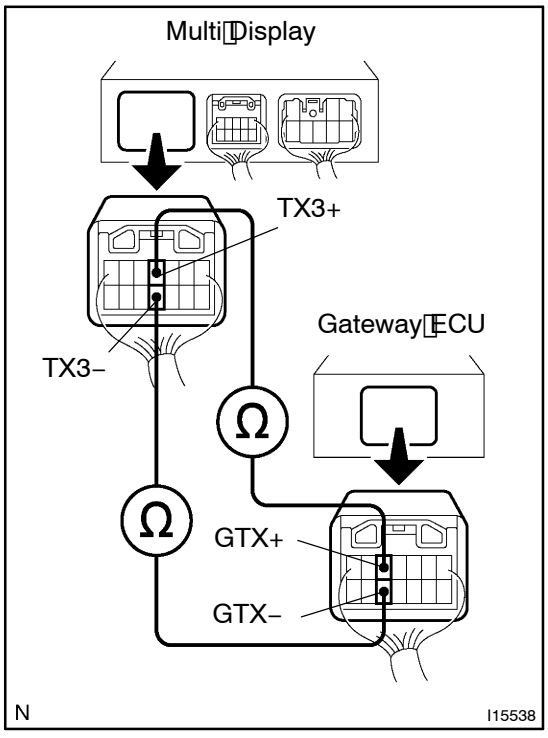
1	**Check ”Service check mode” of audio system (AVC–LAN diagnosis check) (See page DI–809).**

CHECK:
Connection of the gateway ECU can be checked by AVC–LAN diagnosis. (”Servive check mode” of audio system)
OK:
Display
G/W: OK (System is normal)
G/W: NG (Communication error)
G/W: None (Never registered)

NG → **Replace the gateway ECU.**

OK

2	**Check wireharness**



PREPARATION:
Disconnect connector ”G3” of gateway ECU and ”M3” of multi display.
CHECK:
(a) Check continuity between terminals GTX+ of gateway ECU and TX3+ of multi display.
(b) Check continuity between terminals GTX– of gateway ECU and TX3– of multi display.
OK:
There is a continuity in wireharness of both (a) and (b), or either (a) or (b).
HINT:
If there is OPEN in wireharness of either (a) or (b), please repair it.

NG → **Repair or replace wireharness.**

OK

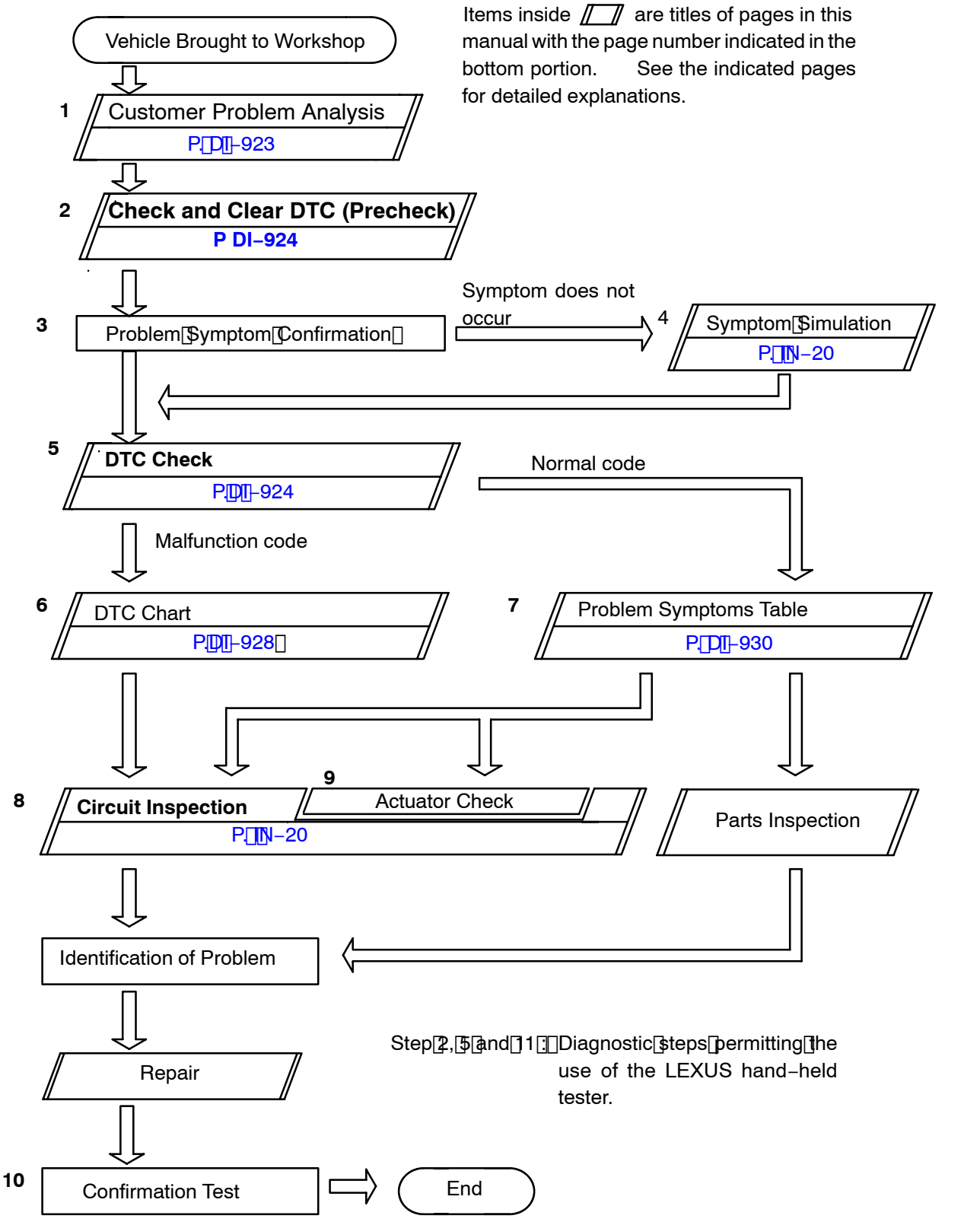
Replace the gateway ECU.

AIR CONDITIONING SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

DI261–01

Perform troubleshooting in accordance with the procedure on the following page.



DI262–01

CUSTOMER PROBLEM ANALYSIS CHECK

AIR CONDITIONING SYSTEM Check Sheet

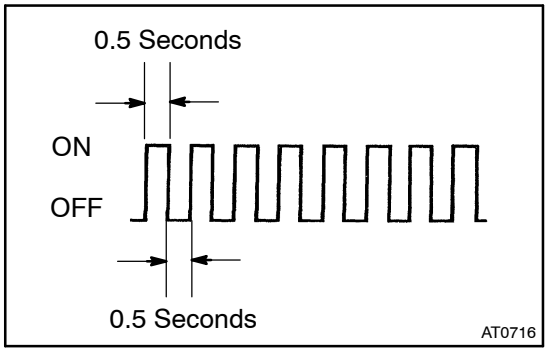
Inspector's name:

Customer's Name		**Registration No.**	
		Registration Year	
		Frame No.	
Date vehicle Brought In	/ /	**Odometer Reading**	**km Miles**

Date of Problem Occurrence	/ /
How Often does Problem Occur?	☐ Continuous ☐ Intermittent (times a day)
Weather	☐ Fine ☐ Cloudy ☐ Snowy ☐ Various / Other
Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (Approx. °F °C)

Symptoms	**Air Flow Control is Faulty**	☐ Blower motor does not operation ☐ Blower motor speed does not change (Always Hi, Always Med, Always Lo)
	Temperature Control is Faulty	☐ Cabin temperature does not go down ☐ Cabin temperature does not rise ☐ Response is slow
	Air Inlet Control is Faulty	☐ Cannot change between FRS and REC (Always Fresh or always Recirculating)
	Vent Control is Faulty	☐ Mode will not chage ☐ Will not enter the desired mode

DTC Check	**1st Time**	☐ Normal Code ☐ Malfunction Code (Code)
	2nd Time	☐ Normal Code ☐ Malfunction Code (Code)



DI2QW–01

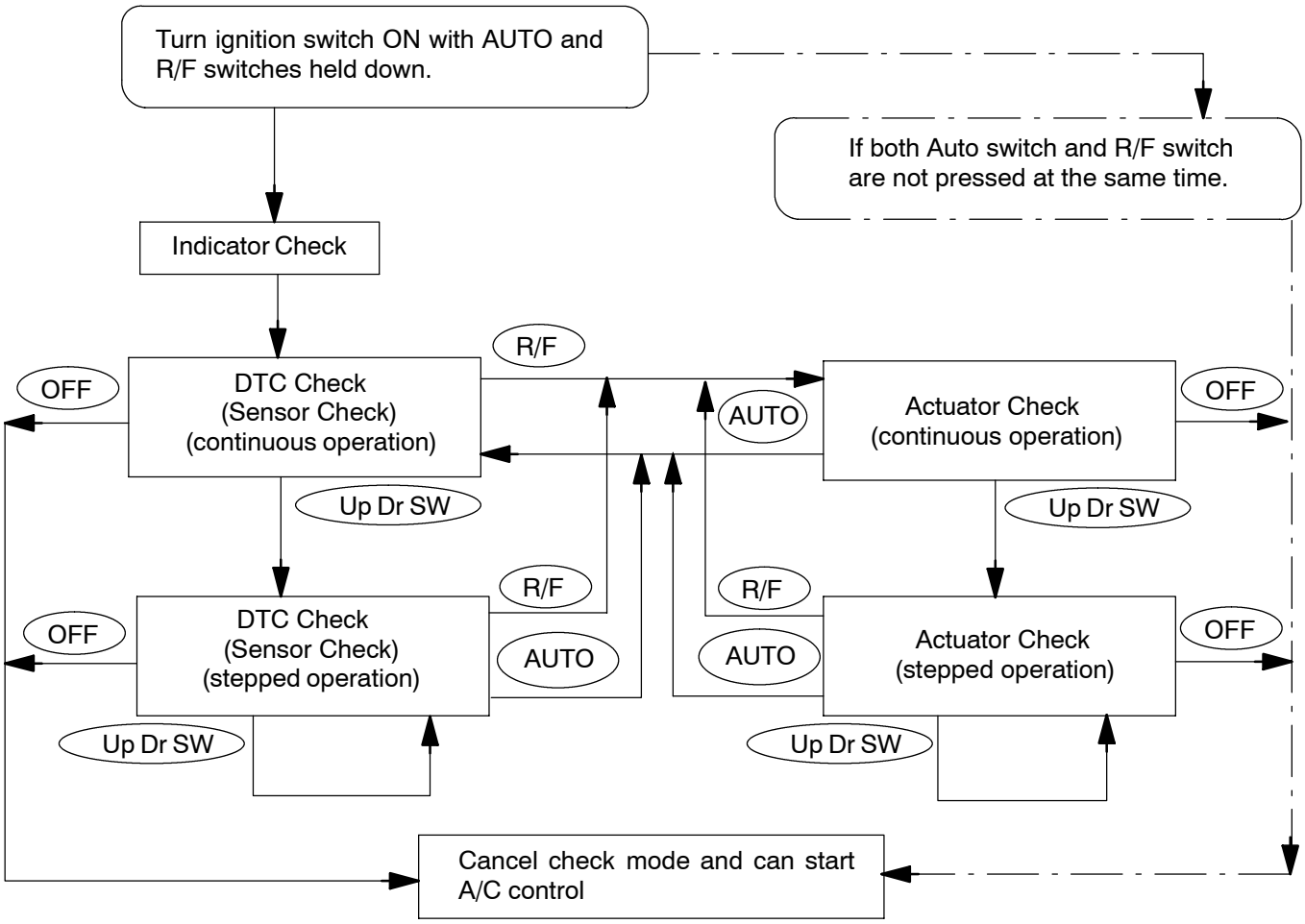
PRE–CHECK

1. WARNING FOR A/C COMPRESSOR LOCK

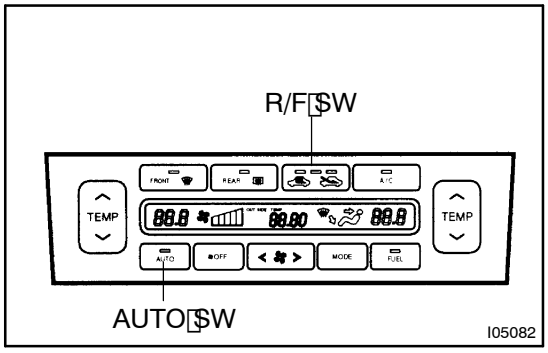
If compressor lock occurs during A/C operation, the A/C switch indicator on the A/C control assembly starts blinking.
When this occurs, check for compressor lock (DTC B1422/22) using diagnosis trouble code check then proceed to inspect the circuit or the component.
Compressor lock sensor circuit. → (See page DI–936)

2. LIST OF OPERATION METHODS

By operating each of the A/C control switches as shown in the diagram below, it is possible to enter the diagnosis check mode.

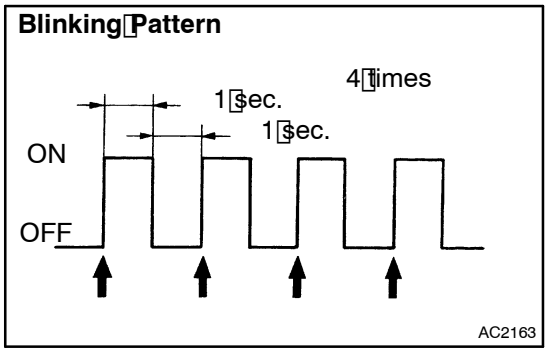


: Indicates a switch operation.
Up Dr SW: Driver Side Temp. Control Switch



3. INDICATOR CHECK

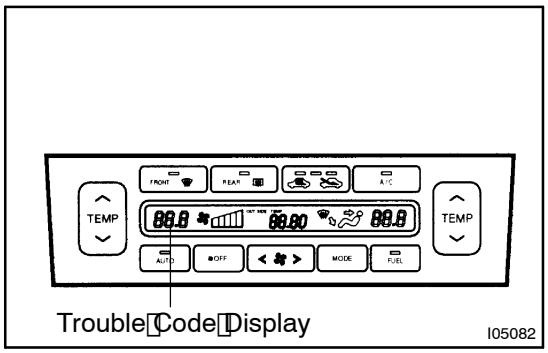
(a) Turn the ignition switch on while pressing the A/C control AUTO switch and R/F SW simultaneously.



(b) Check that all the indicators light up and go off at 1 second intervals 4 times in succession.

HINT:

- After the indicator check is ended, the diagnostic trouble code check begins automatically.
- Press the OFF switch when desiring to cancel the check mode.



4. DTC CHECK (SENSOR CHECK)

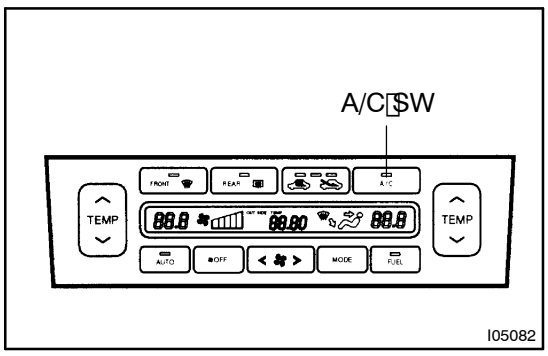
(a) Perform an indicator check. After the indicator check is completed, the system enters the DTC check mode automatically.

(b) Read the DTC displayed on the panel. Refer to the list of DTCs on page DI–928 when reading the DTCs.
(DTCs are out put at the temperature display.)
If the slower display is desired, press the Driver Side Temp. Control Switch and change it to step operation. Each time the Driver Side Temp. Control switch is pressed, the display changes by 1 step.

HINT:

W/ EMV only

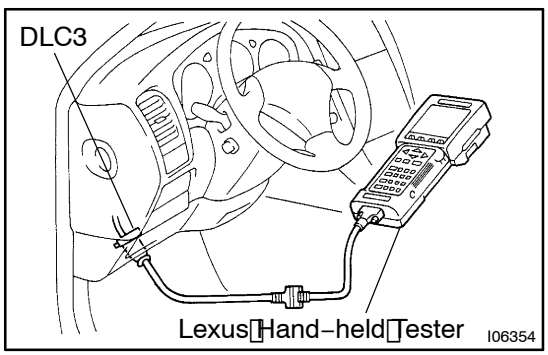
- If the buzzer sounds when a DTC is being read, it means the trouble indicated by that DTC continues to occur.
- If the buzzer does not sound when a DTC is being read, it means the trouble indicated by that DTC occurred earlier (such as poor connector contacts, etc.)

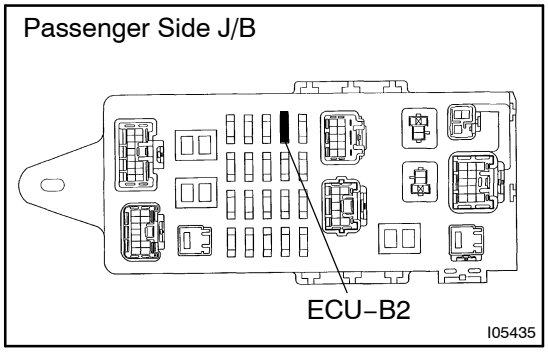


5. DTC CHECK USING LEXUS HAND–HELD TESTER

(a) Hook up the LEXUS hand–held tester to the DLC3.

(b) Read the diagnostic trouble codes by following the prompts on the tester screen.
Please refer to the LEXUS hand–held tester operator's manual for further details.

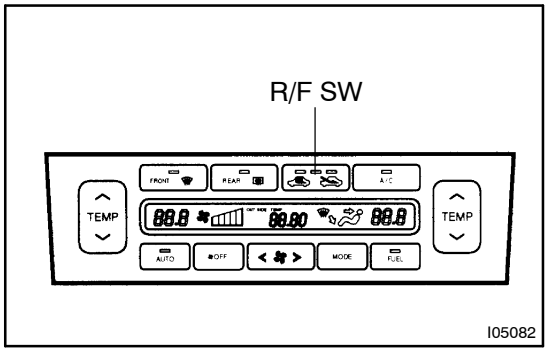


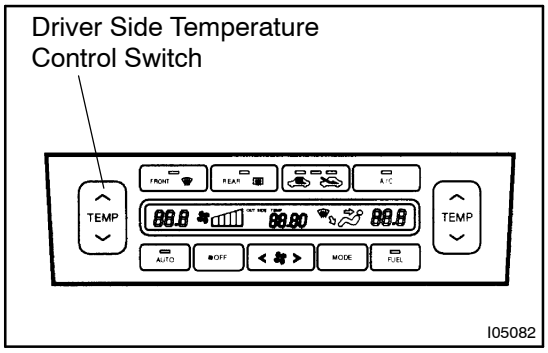


6. CLEARING DTC

(a) Pull out the ECU–B2 fuse in Passenger Side J/B for 10 sec. or longer to clear diagnostic the DTC's memory.

(b) After reinserting the fuse, check that the normal code is output.





7. ACTUATOR CHECK

(a) After entering the sensor check mode, press the R/F switch.

(b) Since each damper, motor and relay automatically operates at 1 second intervals beginning in order from 0 in the temperature display, check the temperature and air flow visually and by hand.

If a slower display is desired, press the driver side temp. control switch and change it to step operation. Each time the driver side temp. control switch is pressed, the display changes by 1 step.

HINT:

- The buzzer sounds when the display trouble code changes.(w/ EMV)
- Code are displayed in order from the smaller to the larger numbers.
- To cancel the check mode, press the Off switch.

Step No.	Display code	Conditions				
		Blower motor	Air flow vent	Air inlet damper	Magnetic clutch	Air mix damper
1	0	OFF	FACE	FRESH	OFF	Cool side (–10% open)
2	1	LO	↑	↑	↑	↑
3	2	MED	↑	R/F (54.5% open)	ON	↑
4	3	↑	↑	↑	↑	↑
5	4	↑	↑	(RECIRC)	↑	Cool / Hot (50% open)
6	5	↑	BI–LEVEL	↑	↑	↑
7	6	↑	FOOT*1 (52.0% open)	↑	↑	Hot side (110% open)
8	7	↑	FOOT*2 (31.0% open)	↑	↑	↑
9	8	↑	FOOT/DEF	↑	↑	↑
10	9	HI	DEF	↑	↑	↑

*1: There is air leakage from defroster.

*2: There is no air leakage from defroster.

DI264–09

DIAGNOSTIC TROUBLE CODE CHART

If malfunction code is displayed during the DTC check, check the circuit listed for that code in the table below (Proceed to the page given for that circuit.).

DTC No. (See page)	Detection Item	Trouble Area	Memory
00	Normal	–	–
B1412/12 (DI–932)	Ambient temperature sensor circuit	• Ambient temp. sensor • Harness or connector between ambient temp. sensor and A/C amplifier • A/C amplifier	○ (8.5 min. or more)
B1422/22 *1 (DI–936)	All conditions below are detected for 3 sec. or more (a) Engine speed: 450 rpm or more (b) Ratio between engine and compressor rpm deviates 20% or more in comparison to normal operation.	• Compressor drive belt • Compressor lock sensor • Compressor • Harness and connector between A/C amplifier and compressor, compressor lock sensor • A/C amplifier	–
B1423/23 (DI–939)	Open in pressure sensor circuit Abnormal refrigerant pressure [below 196 kPa (2.0 kgf/cm², 28 psi) over 3,140 kPa (32.0 kgf/cm², 455 psi)]	• Pressure switch • Harness or connector between pressure switch and A/C amplifier • Refrigerant pipe line • A/C amplifier • Compressor	–

*1 Compressor lock (DTC B1422/22) is indicated only for a current malfunction (See page DI–936).
To confirm DTC B1422/22, perform the following steps.

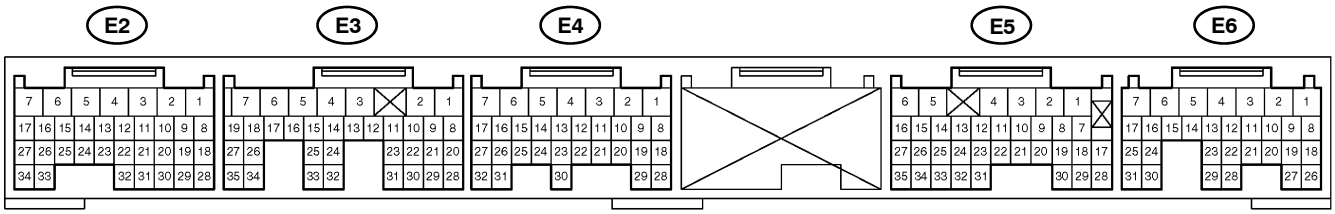
(1) With the engine ON, enter the DTC check mode.
(2) Press the R/F switch to enter actuator check mode, and set the operation to Step No. 3.
(3) Press the AUTO switch to return to DTC check mode.
(4) The DTC is displayed after approx. 3 secs.

AIR CONDITIONING SYSTEM

TERMINALS OF ECU

DI85Y–01

3UZ–FE:
Engine and ECT ECU terminals



Y

A14471

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
LCKI ↔ E01 (E2–34 ↔ E4–2)	GR ↔ W–B	IG ON.	10 – 14
		Engine speed between 2,500 – 4,000 rpm	Below 3.0
TAM ↔ E2 (E6–18 ↔ E6–19)	LG–R ↔ BR	IG ON. Ambient temp.: 25 °C (77 °F)	1.4 – 1.8
		IG ON. Ambient temp.: 40 °C (104 °F)	0.8 – 1.3
ACMG ↔ E01 (E6–16 ↔ E4–2)	L–O ↔ W–B	Start engine (idling). A/C switch: ON	Below 1.0
		Start engine (idling). A/C switch: OFF	10 – 14
PRE ↔ E01 (E6–25 ↔ E4–2)	L–B ↔ W–B	Refrigerant pressure: Less than 0.19 MPa (2.0 kgf/cm^2) or more than 3.14 MPa (32 kgf/cm^2).	From 10–14 to below 1.0

DI29M–07

PROBLEM SYMPTOMS TABLE

Symptom	Suspect Area	See page
Whole functions of the A/C system does not operate	1. A/C control assembly	IN–30
	2. ACC power source circuit	DI–945
Air Flow Control: No blower operation	1. ACC power source circuit	DI–945
	2. Heater main relay circuit	DI–646*
	3. Blower motor circuit	DI–967*
	4. A/C control assembly	IN–30
Air Flow Control: No blower control	1. Heater main relay circuit	DI–646*
	2. Blower motor circuit	DI–967*
	3. A/C control assembly	IN–30
	4.Solar sensor circuit	DI–926*
		DI–935*
Air Flow Control: Insufficient air flow	Blower motor circuit	DI–967*
Temperature Control: No cool air comes out	1. Refrigerant volume	AC–22*
	2. Drive belt tension	AC–2
	3. Refrigeration system inspection with manifold gauge set	AC–3*
	4. Compressor circuit	DI–948
	5. Pressure switch circuit	DI–939
	6. Compressor lock sensor circuit	DI–936
	7. Air mix damper position sensor circuit	DI–938*
		DI–947*
	8. Air mix damper control servomotor circuit	DI–950*
		DI–959*
	9. Room temp. sensor circuit	DI–914*
	10. Ambient temp. sensor circuit	DI–932
	11. A/C control assembly	IN–30
Temperature Control: No warm air comes out	1. Air mix damper position sensor circuit	DI–938*
		DI–947*
	2. Air mix damper control servomotor circuit	DI–950*
		DI–959*
	3. Room temp. sensor circuit	DI–914*
	4. Ambient temp. sensor circuit	DI–932
	5. Evaporator temp. sensor circuit	DI–920*
	6. A/C control assembly	IN–30
Temperature Control: Output air is warmer or cooler that the set temperature or response is slow	1. Refrigerant volume	AC–22*
	2. Drive belt tension	AC–2
	3. Refrigeration system inspection with manifold gauge set	AC–3*
	4. Cooling fan system	CO–22*
	5. Solar sensor circuit	DI–926*
		DI–935*
	6. Room temp. sensor circuit	DI–914*
	7. Ambient temp. sensor circuit	DI–932
	8. Evaporator temp. sensor circuit	DI–920*
	9. Air mix damper position sensor circuit	DI–938*
		DI–947*
	10. Air mix damper control servomotor circuit	DI–950*
		DI–959*
	11. Air inlet damper position sensor circuit	DI–941*
	12. Air inlet damper control servomotor circuit	DI–953*
	13. Condenser	AC–52*
	14. Evaporator	AC–57*
	15. Heater radiator	AC–60*
	16. Expansion valve	AC–62*
	17. A/C control assembly	IN–30

Symptom	Suspect Area	See page
Temperature Control: No temperature control (only Max. cool or Max. warm)	1. Room temp. sensor circuit 2. Ambient temp. sensor circuit 3. Air mix damper position sensor circuit 4. Air mix damper control servomotor circuit 5. A/C control assembly	DI–914* DI–932 DI–938* DI–947* DI–950* DI–959* IN–30
No air inlet control	1. Air inlet damper position sensor circuit 2. Air inlet damper control servomotor circuit 3. A/C control assembly	DI–941* DI–953* IN–30
No air flow mode	1. Air outlet damper position sensor circuit 2. Air outlet damper control servomotor circuit 3. A/C control assembly 4. Exhaust gas sensor	DI–944* DI–956* IN–30 DI–923*
Engine idle up does not occur, or is continuous	1. Compressor circuit 2. A/C control assembly	DI–948 IN–30
Blinking of A/C indicator	1. Compressor circuit 2. A/C control assembly	DI–948 IN–30
Set temp. value displayed does not change up with operation of temp. control switch.	A/C control assembly	IN–30
DTC not recorded. Set mode is cleared when IG switch is turned off.	1. Back–up power source circuit 2. A/C control assembly	DI–942 IN–30

*: See Pub. No. RM588E

DI266–05

CIRCUIT INSPECTION

DTC	B1412/12	Ambient Temperature Sensor Circuit

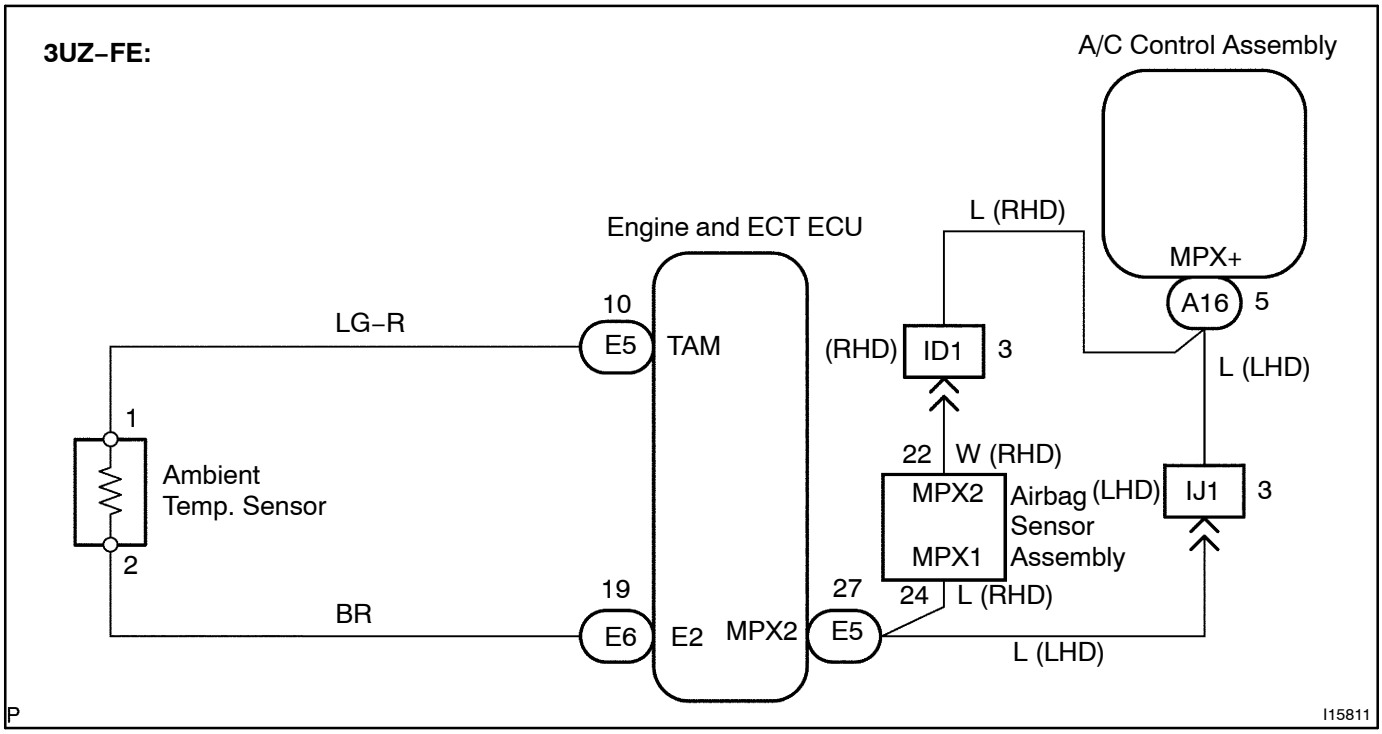
CIRCUIT DESCRIPTION

This sensor detects the ambient temperature and sends the appropriate signals to the A/C control assembly.

DTC No.	Detection Item	Trouble Area
B1412/12	Open or short in ambient temperature sensor circuit.	• Ambient temperature sensor. • Harness or connector between ambient temperature sensor and engine and ECT ECU • Harness or connector between engine and ECT ECU and A/C control assembly • Harness or connector between engine and airbag sensor assembly. • Harness or connector between airbag sensor assembly and A/C control assembly • Engine and ECT ECU • A/C control assembly

WIRING DIAGRAM

3UZ–FE:



INSPECTION PROCEDURE

HINT:
In case of using the hard–held tester, start the inspection step 1 and in case of not using the hard–held tester, start form step 2.

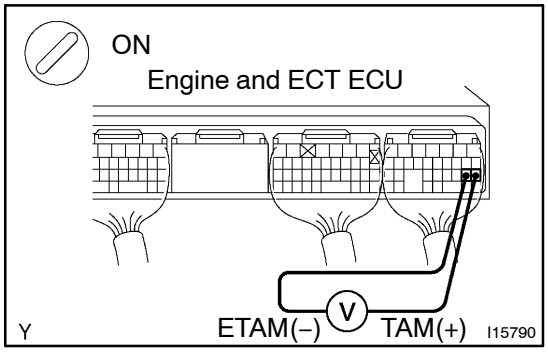
1	**Check ambient temp. sensor using hard–held tester.**

PREPARATION:
Connect the hard–held tester to the DLC3.
CHECK:
Check the ambient temp. sensor using DATA LIST.

OK → **Check and replace A/C control assembly.**

NG

2	**Check voltage between terminals TAM and ETAM of engine and ECT ECU.**



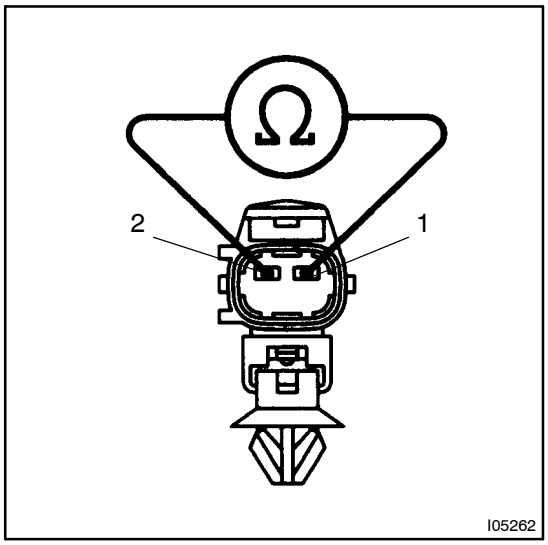
PREPARATION:
Remove engine and ECT ECU with connectors still connected.
CHECK:
(a) Turn ignition switch ON.
(b) Measure voltage between terminals TAM and ETAM of engine and ECU ECU connector at each temperature.
OK:
Voltage :
at 25°C (77°F) : 1.35 – 1.75 V
at 40°C (104°F) : 0.85 – 1.25 V
HINT:
As the temperature increases, the voltage decreases.

NG → **Go to step 3.**

OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI–930). However, if DTC B1412/12 is displayed, check and replace engine and ECT ECU and A/C control assembly.

3	Check ambient temperature sensor.



PREPARATION:
Disconnect ambient temperature sensor connector.
CHECK:
Measure resistance between terminals 1 and 2 of ambient temperature sensor connector at each temperature.
OK:

Resistance :
at 25°C (77°F) : 1.6 – 1.8 kΩ
at 50°C (122°F) : 0.5 – 0.7 kΩ

HINT:
As the temperature increases, the resistance decreases.
NOTICE:
When installing the ambient temperature sensor, be sure to connect the sensor connector before connecting the battery.

NG → **Replace ambient temperature sensor.**

OK

4	Check harness and connector between engine and ECT ECU and ambient temperature sensor (See page IN–30).

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

OK

5	**Check harness and connector between engine and ECT ECU and A/C control assembly (See page IN–30).**

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

OK

Check and replace engine and ECT ECU and A/C control assembly.

DI26A–05

DTC	B1422/22	Compressor Lock Sensor Circuit

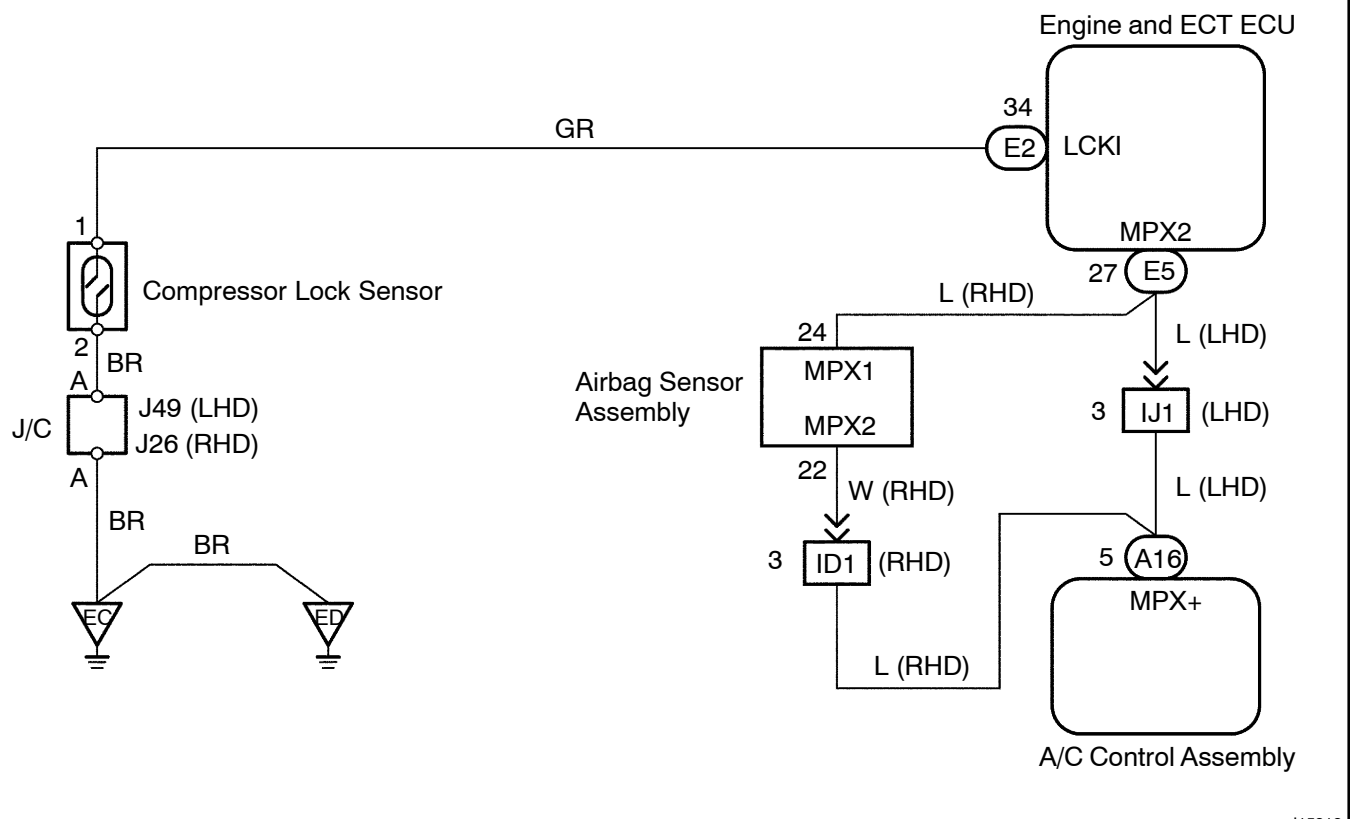
CIRCUIT DESCRIPTION

This sensor sends 1 pulses per engine revolution to the engine and ECT ECU.
If the number ratio of the compressor speed divided by the engine speed is smaller than a predetermined value, the engine and ECT ECU turns the compressor OFF. And, the indicator flashes at about 1 second intervals.

DTC No.	Detection Item	Trouble Area
B1422/22	All conditions below are detected for 3 secs. or more (a) Engine speed : 450rpm or more (b) Ratio between engine and compressor speed deviates 20% or more in comparison to normal operation.	• Compressor. • Compressor drive belt. • Compressor lock sensor. • Harness and connector between compressor and engine and ECT ECU • Harness and connector between engine and ECT ECU and A/C control assembly • Harness or connector between engine and airbag sensor assembly. • Harness or connector between airbag sensor assembly and A/C control assembly • Engine and ECT ECU • A/C control assembly.

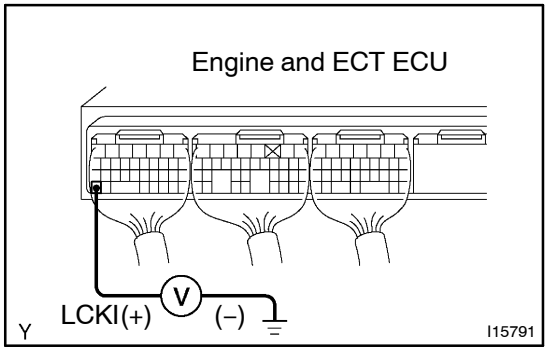
WIRING DIAGRAM

3UZ–FE:



INSPECTION PROCEDURE

1	**Check voltage between terminal LCKI of engine and ECT ECU and body ground.**



CHECK:

(a) Start engine.
(b) Push AUTO SW.
(c) Measure voltage between terminal LCKI of engine and ECT ECU connector and body ground when A/C switch is ON.

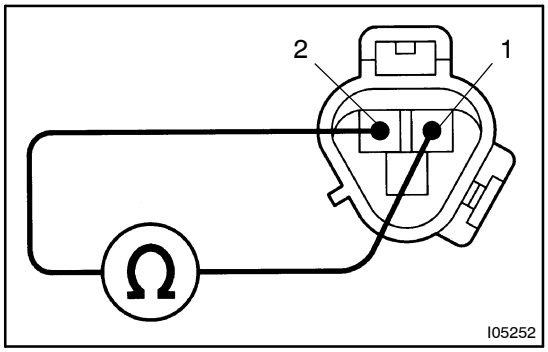
OK:

Voltage : 10 – 14 V

OK	**Proceed to next circuit inspection shown on problem symptoms table (See page DI–930).**

NG

2	**Check compressor lock sensor.**



PREPARATION:

(a) Jack up the vehicle.
(b) Disconnect compressor lock sensor connector.

CHECK:

Measure resistance between terminals 1 and 2 of compressor lock sensor connector.

OK:

Resistance :
at 20°C (68°F) : 990 – 1210 Ω
at 100°C (212°F) : 1280 – 1550 Ω

NG	**Replace compressor lock sensor.**

OK

3	Check harness and connectors between engine and ECT ECU and compressor lock sensor.(See page IN–30).

NG → Repair or replace harness or connector.

OK

4	Check multiplex communication system.(See page DI–732).

DI26B–06

DTC	B1423/23	Pressure Switch Circuit

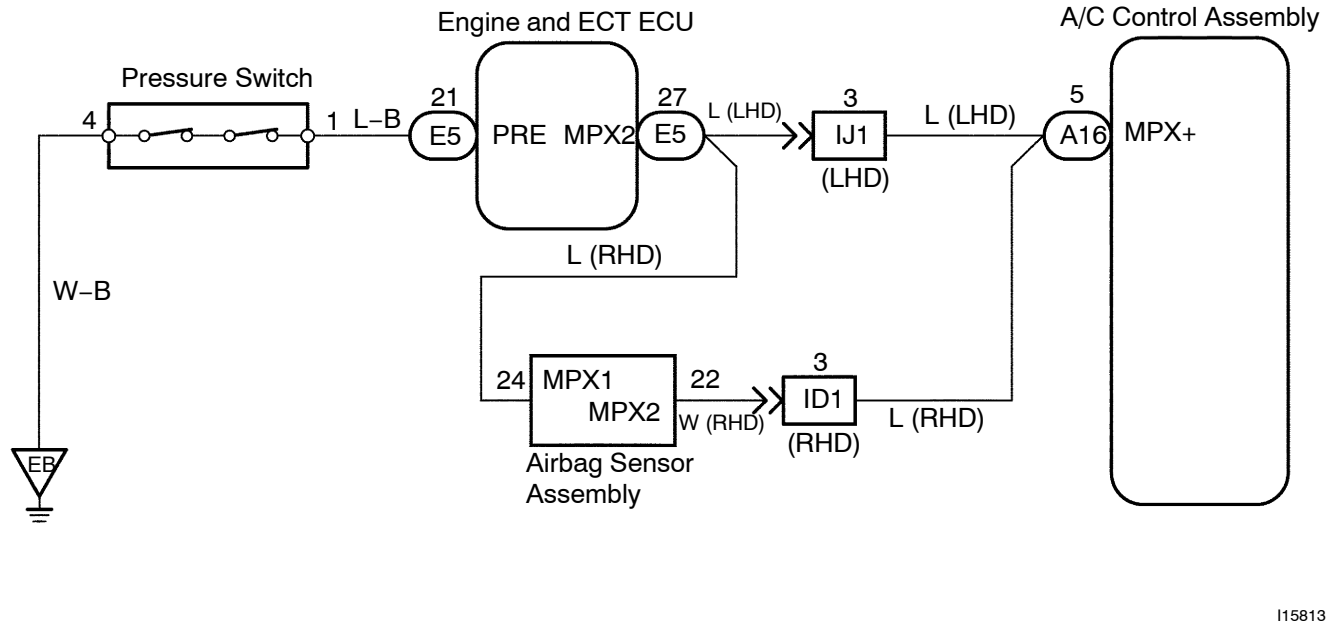
CIRCUIT DESCRIPTION

The pressure switch sends the appropriate signals to the engine and ECT ECU when the A/C refrigerant pressure drops too low or rises too high. When the engine and ECT ECU receives these signals, it outputs signals via the engine and ECT ECU to switch OFF the compressor relay and turns the magnetic clutch OFF.

DTC No.	Detection Item	Trouble Area
B1423/23	• Open in pressure sensor circuit. • Abnormal refrigerant pressure. below 181 kPa (2.0 kg/cm^2, 28 psi) over 3,140 kPa (32.0 kgf/cm^2, 455 psi)	• Pressure switch. • Harness or connector between pressure switch and engine and ECT ECU • Harness or connector engine and ECT ECU and A/C control assembly • Harness or connector between engine and airbag sensor assembly. • Harness or connector between airbag sensor assembly and A/C control assembly • Refrigerant pipe line. • Engine and ECT ECU

WIRING DIAGRAM

3UZ–FE:

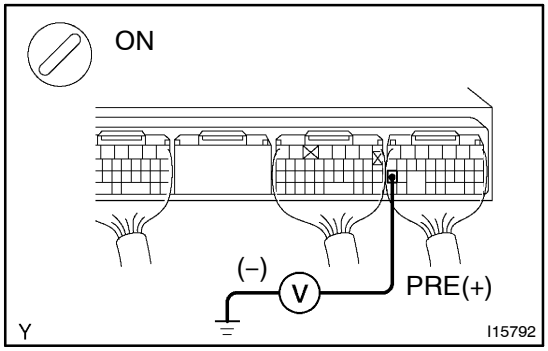


P

I15813

INSPECTION PROCEDURE

1	Check voltage between terminal PRE of engine and ECT ECU and body ground.



PREPARATION:

Install the manifold gauge set.

CHECK:

(a) Turn ignition switch ON.

(b) Check voltage between terminal PRE of engine and ECT ECU connector and body ground when A/C gas pressure is changed.

OK:

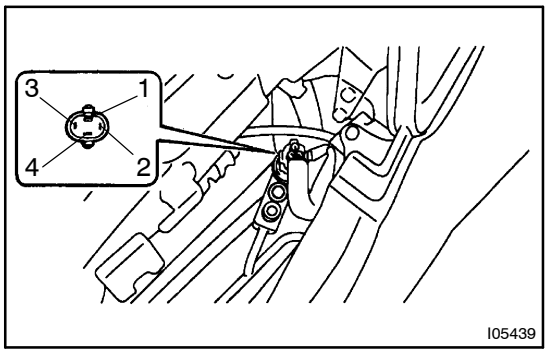
The voltage changes with gas pressure, as shown in the diagram below.

Low Pressure Cut Side	Reference : High Pressure Cut Side
ON (0V) 225 kPa 196 kPa OFF (12V)	ON (0V) 2,550 kPa 3,140 kPa OFF (12V)

OK	Proceed to next circuit inspection shown on problem symptoms table (See page DI–930).

NG

2	Check pressure switch.



PREPARATION:

Disconnect pressure switch connector.

CHECK:

(a) Turn ignition switch ON.

(b) Check continuity between terminals 1 and 4 of pressure switch when A/C gas pressure is changed.

OK:

The continuity changes with gas pressure as shown below.

Low Pressure Cut Side	Reference : High Pressure Cut Side
ON (continuity) 211 kPa 181 kPa OFF (continuity)	ON (continuity) 2,550kPa 3,140kPa OFF (continuity)

NG → Repair or replace harness or connector.

OK

3	Check harness and connector between engine and ECT ECU and pressure switch, pressure switch and body ground (See page IN–30).

NG → Repair or replace harness or connector.

OK

4	Check multiplex communication system (See page DI–732).

DI26K–03

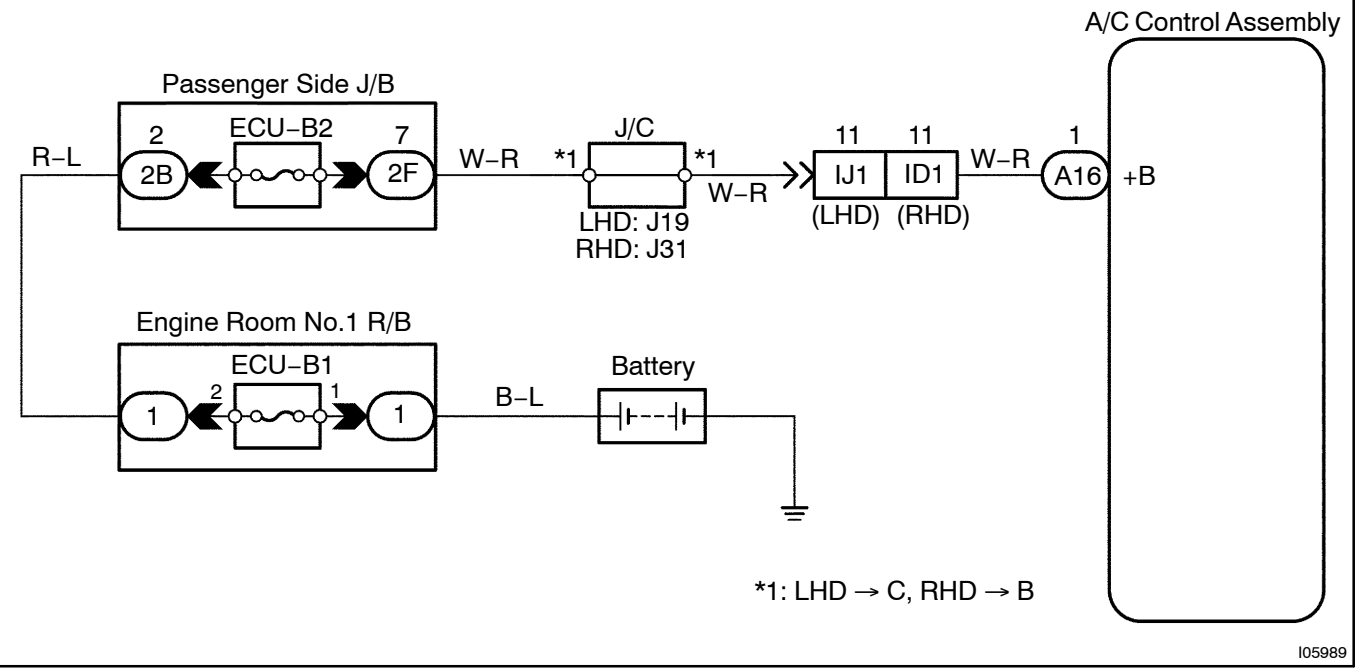
Back Up Power Source Circuit

CIRCUIT DESCRIPTION

This is the backup poser source for the A/C control assembly. Power is supplied even when the ignition switch is off and is used for diagnostic trouble code memory, etc.

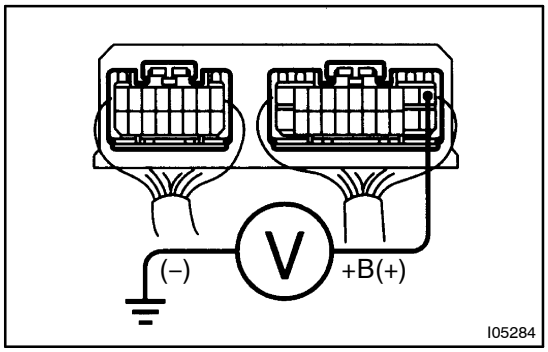
WIRING DIAGRAM

3UZ–FE:



INSPECTION PROCEDURE

1	**Check voltage between terminal +B of A/C control assembly connector and body ground.**



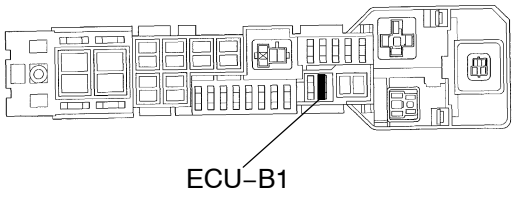
PREPARATION:
Remove the A/C control assembly with connector still connected.
CHECK:
Measure voltage between terminal +B of A/C control assembly connector and body ground.
OK:
Voltage : Battery positive voltage

OK	**Proceed to next circuit inspection shown on problem symptoms table (See page DI–930).**

NG

2	**Check ECU–B1 fuse.**

Engine Room No.1 R/B



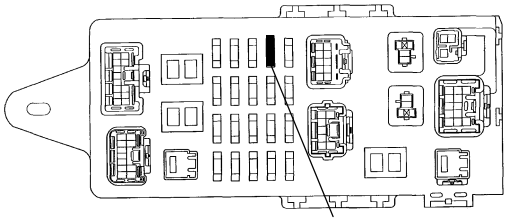
PREPARATION:
Remove ECU–B1 fuse from Engine Room No.1 R/B.
CHECK:
Check continuity of ECU–B1 fuse.
OK:
Continuity

NG	**Check for short in all the harness and components connected to the ECU–B1 fuse (See attached wiring diagram).**

OK

3	Check ECU–B2 fuse.

Passenger Side J/B



PREPARATION:

Remove ECU–B2 fuse from Passenger Side J/B.

CHECK:

Check continuity of ECU–B2 fuse.

OK:

Continuity

NG → **Check for short in all the harness and components connected to the ECU–B2 fuse (See attached wiring diagram).**

OK

Check and repair harness and connector between A/C control assembly and battery.

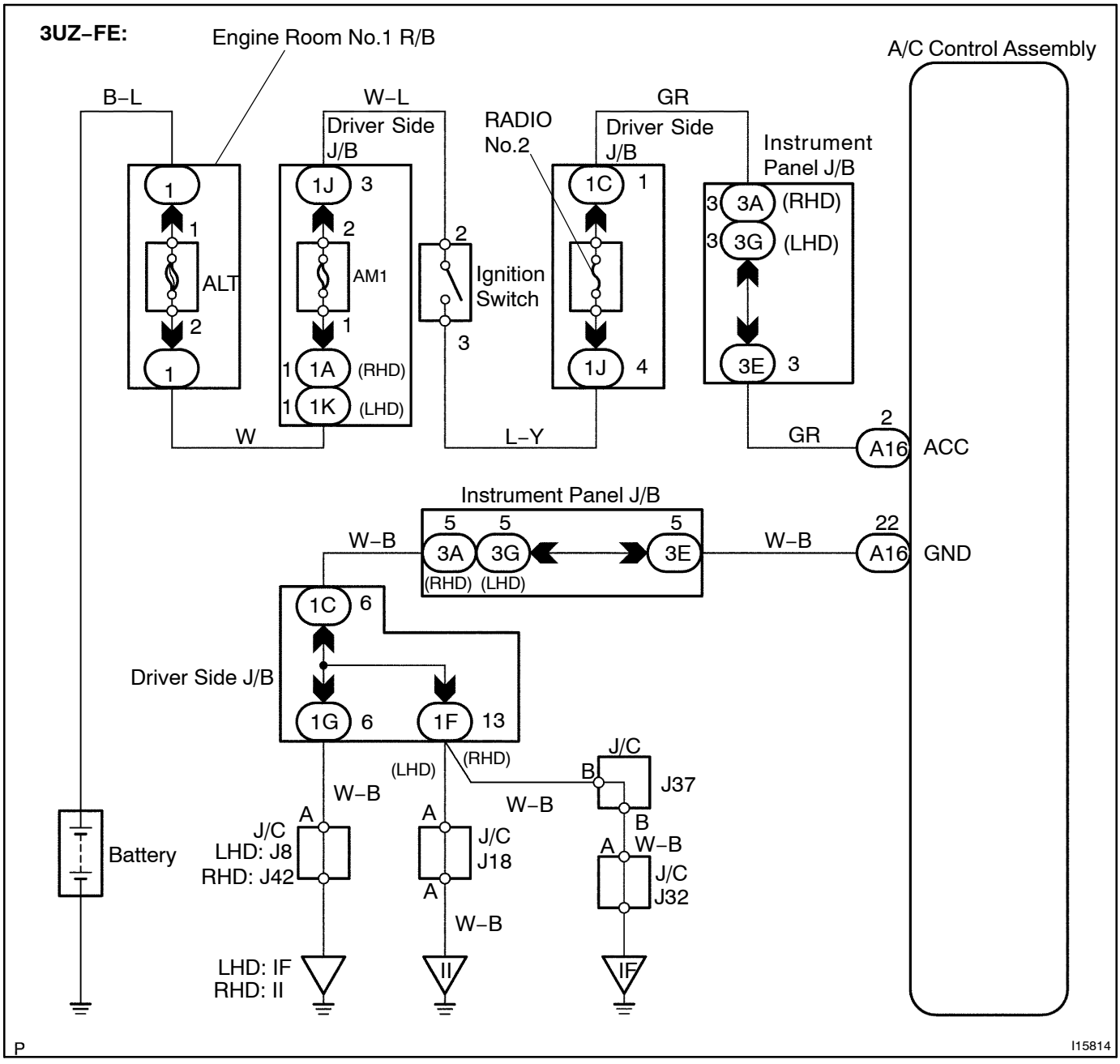
DI26L–03

ACC Power Source Circuit

CIRCUIT DESCRIPTION

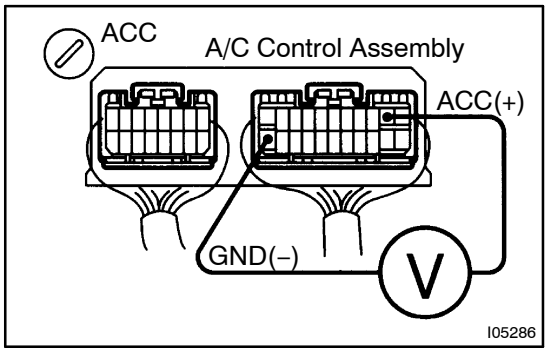
This is the power source for A/C control assembly and servomotors, etc.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	**Check voltage between terminals ACC and GND of A/C control assembly connector.**

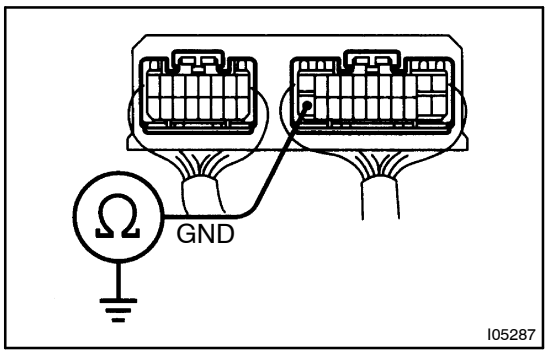


PREPARATION:
Remove A/C control assembly with connectors still connected.
CHECK:
(a) Turn ignition switch ON.
(b) Measure voltage between terminals ACC and GND of A/C control assembly.
OK:
Voltage : Battery positive voltage

OK	**Proceed to next circuit inspection shown on problem symptoms table (See page DI–930).**

NG

2	**Check continuity between terminal GND of A/C control assembly and body ground.**



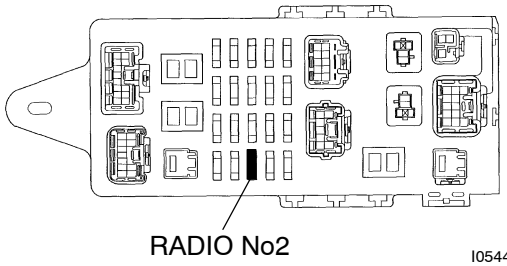
CHECK:
Measure resistance between terminal GND of A/C control assembly and body ground.
OK:
Resistance : 0 Ω (continuity)

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

OK

3	Check RADIO No.2 fuse.

Driver Side J/B



PREPARATION:

Remove RADIO No.2 fuse from driver side J/B.

CHECK:

Check continuity of RADIO No.2.

OK:

Continuity

NG → **Check for short in all the harness and components connected to the RADIO No.2 fuse (See attached wiring diagram).**

OK

Check and repair harness and connector between A/C control assembly and battery.

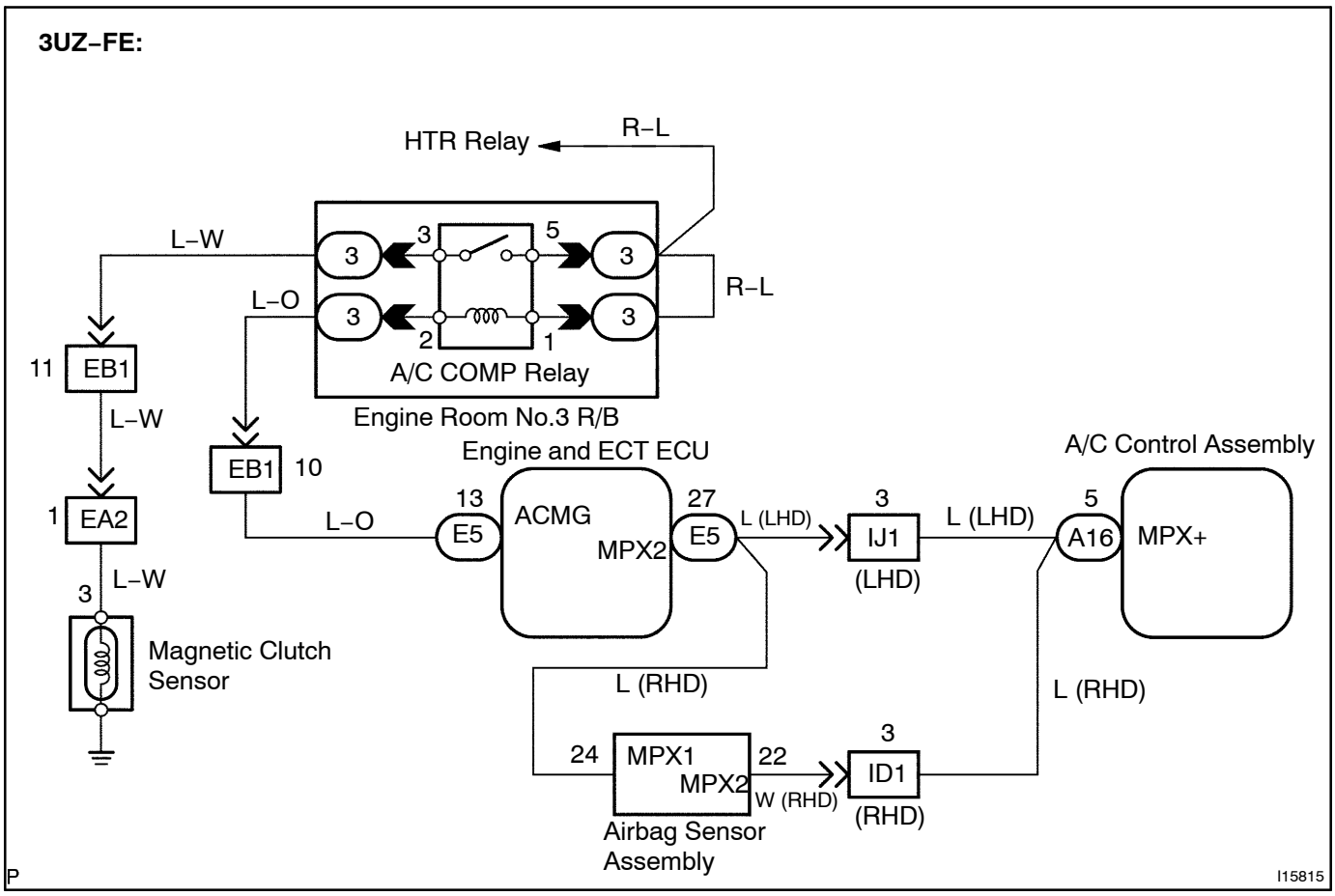
DI26N–03

Compressor Circuit

CIRCUIT DESCRIPTION

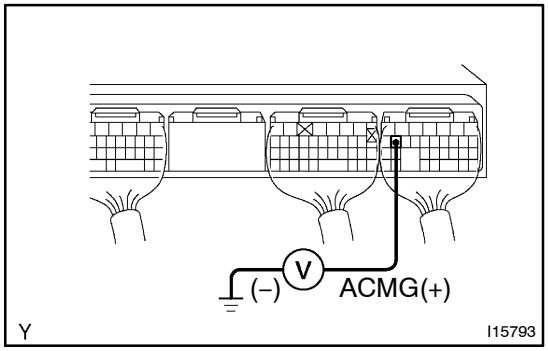
The A/C control assembly outputs the magnetic clutch ON signal from terminal MGC to the ECM. When the ECM receives this signal, it sends a signal from terminal ACMG and switches the A/C magnetic clutch relay ON, thus turning the A/C compressor magnetic clutch ON.

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check voltage between terminal ACMG of engine and ECT ECU.



CHECK:

(a) Start engine.
(b) Push AUTO SW.
(c) Measure voltage between terminal ACMG of ECM connector and body ground when A/C switch is ON and OFF.

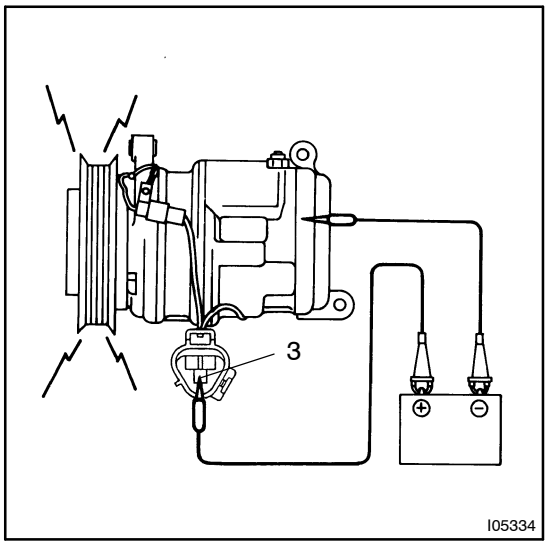
OK:

A/C switch	Voltage
ON	10 – 4 V
OFF	0 V

OK → **Check and replace engine and ECT ECU and/or A/C control assembly.**

NG

2	Check A/C compressor magnetic clutch.



PREPARATION:

Disconnect magnetic clutch connector.

CHECK:

Connect positive (+) lead connected to battery to magnetic clutch connector terminal 3.

OK:

Magnetic clutch is energized.

NG → **Repair A/C compressor magnetic clutch.**

OK

3	Check harness and connector between A/C compressor and compressor relay (See page IN–30)

NG → Repair or replace harness or connector.

OK

4	Check harness and connector between compressor relay and and ECM (See page IN–30).

NG → Repair or replace harness or connector.

OK

5	Check multiplex communication system (See page DI–732).