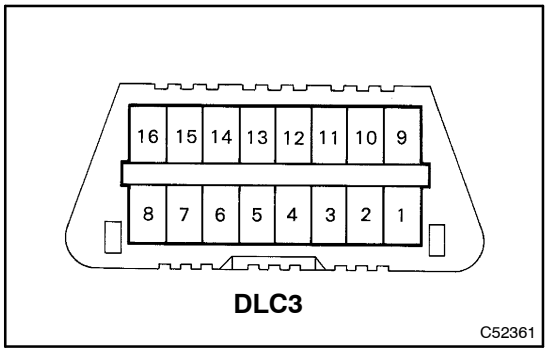
05AF7–02

PRE–CHECK



1. DIAGNOSIS SYSTEM

(a) Inspect the battery voltage.

Battery voltage: 11 to 14 V

If voltage is below 11 V, recharge the battery before proceeding.

(b) Check DLC3.

The vehicle's ECM uses ISO 14230 for communication. The terminal arrangement of DLC3 complies with ISO 15031–3 and matches the ISO 14230 format.

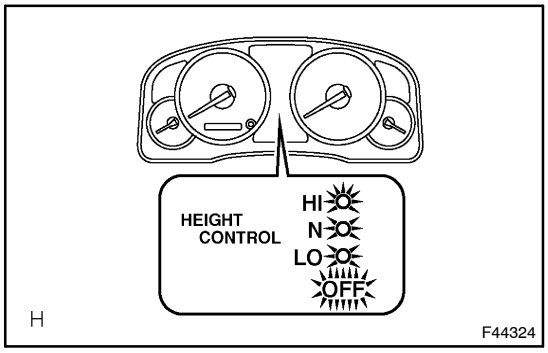
Verify conditions listed in table below:

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

HINT:

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

- If communication is normal when the tester 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 tester itself, so consult the Service Department listed in the tester's instruction manual.

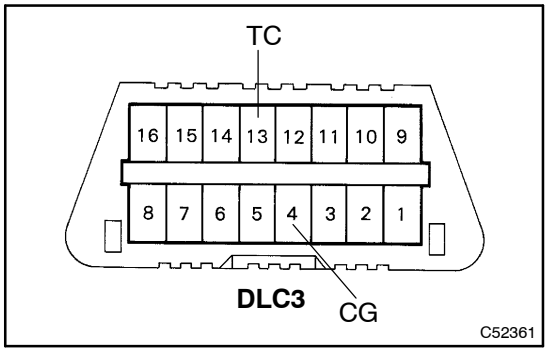


(c) Check the indicator lamp.

(1) Turn the ignition switch ON.

(2) Check that the height control OFF indicator lamp and the height control indicator lamp come on for 2 sec.

If the indicator check result is not normal, proceed to troubleshooting for the height control indicator lamp circuit (See Pub. No. RM990E, page 05–659) and the height control OFF indicator lamp circuit (See Pub. No. RM990E, page 05–661).



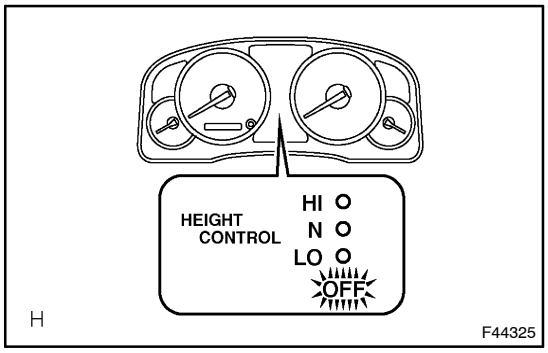
2. DTC CHECK (USING SST CHECK WIRE)

(a) Checking DTCs using a SST check wire.

SST 09843–18040

(1) Using the SST, connect terminals TC and CG of DLC3.

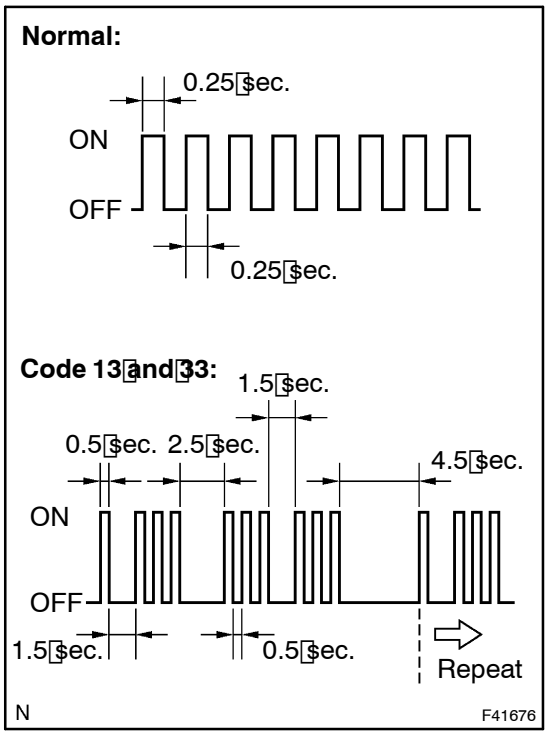
(2) Turn the ignition switch ON.



(3) Read and record any DTCs from the height control OFF indicator lamp on the combination meter. Refer to the chart on the left for examples of a normal code and codes 13 and 33.

HINT:

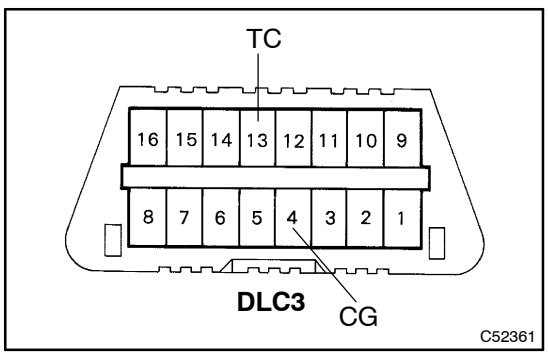
- If the height control OFF indicator lamp does not blink any DTC codes or the normal code, inspect the height control OFF indicator lamp circuit (See Pub. No. RM990E, page 05–661) and the TC terminal circuit (See Pub. No. RM990E, page 05–664).
- If 2 or more malfunctions are indicated at the same time, the lowest numbered DTC is displayed first.



(4) Refer to the Diagnostic Trouble Code Chart (See page 05–267) for DTC information.

(5) After completing the check, remove SST check wire from DLC3.

SST 09843–18040

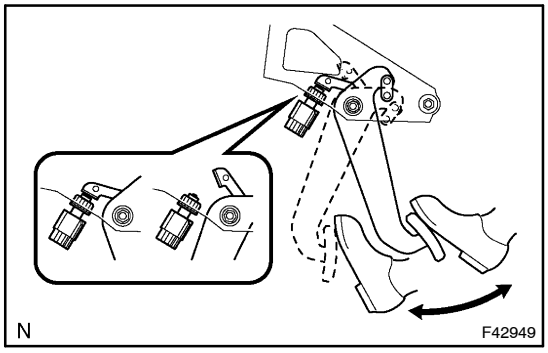


(b) Clearing the DTCs using the SST check wire.

SST 09843–18040

(1) Using SST, connect terminals TC and CG of DLC3.

(2) Turn the ignition switch ON.



(3) Clear DTC stored in ECU by depressing the brake pedal 8 times or more within 5 sec.
(4) Check that the height control OFF indicator lamp shows the normal code.
(5) Remove SST check wire from DLC3.

SST 09843–18040

HINT:
Disconnect the battery cable during the operation will not erase DTC in ECU.

3. DTC CHECK (USING HAND–HELD TESTER)

(a) Checking DTCs using the Hand–held tester.
(1) Connect the hand–held tester to DLC3.
(2) Turn the ignition switch ON.
(3) Read DTCs by following the prompts on the tester screen.

HINT:
Refer to the hand–held tester operator's manual for further details.

(b) Clearing the DTCs using the Hand–held tester.
(1) Connect the hand–held tester to DLC3
(2) Turn the ignition switch ON.
(3) Erase the DTCs following the prompts on the tester screen.

HINT:
Refer to the hand–held tester operator's manual for further details.

4. DATA LIST

HINT:

By the DATA LIST displayed by the hand–held tester, you can read the value of the switch and the sensor and so on without removing any parts. Reading the DATA LIST as a first step of troubleshooting is one of the method to shorten the labor time.

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

(b) Turn the ignition switch to ON.

(c) Following to the display on tester, read the ”DATA LIST”.

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
VEHICLE SPD	Vehicle speed reading / min.: 0 km/h (0 mph), max.: 255 km/h (158 mph)	Actual vehicle speed	Speed indicated on the combination meter
IG VOLTAGE	ECU power supply voltage / min.: 0 V, max.: 25.5 V	Actual ECU power supply voltage: 10 to 14 V	–
STEERING ANGLE	Steering angle sensor reading / min.: –49152 deg, max.: 49150.5 deg	Actual steering angle Left turn: Reading increases Right turn: Reading decreases	Zero point is set at the point when battery is connected
ENGINE SPD	Cam position sensor reading / min.: 0 rpm, max.: 25,500 rpm	Actual engine speed	Speed indicated on the combination meter
HEIGHT SW DOWN	Height control switch (DOWN) / ON or OFF	ON: Height control switch while pressing ”DOWN” button OFF: –	–
HEIGHT SW UP	Height control switch (UP) / ON or OFF	ON: Height control switch while pressing ”UP” button OFF: –	–
HEIGHT SW HOLD	Height control OFF switch / ON or OFF	ON: Height control OFF switch pressing OFF: –	–
STOP LIGHT SW	Stop light switch / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	–
DOOR SW	Door switch / ON or OFF	ON: Open each door OFF: Close all doors	–
DAMPER SW1	Damping force switch 1 / ON or OFF	The same as absorber control switch position	Operate the absorber control switch
TS	TS terminal / ON or OFF	ON: During test mode OFF: Normal mode	–
TC	TC terminal / ON or OFF	ON: DTC recorded OFF: No DTC recorded	–
SOL SLRL	Height control valve solenoid (SLRL) / ON or OFF	ON or OFF	–
SOL SLRG	Height control valve solenoid (SLRG) / ON or OFF	ON or OFF	–
LOW PRS TNK SOL	Tank solenoid valve (SLLO) / ON or OFF	ON or OFF	–
MOTOR RELAY	AIR SUS relay / ON or OFF	ON or OFF	–
G (UP & DOWN) FR	G (up & down) FR sensor reading / min.: –1045267.3 mm/s^2, max.: 1045299.2 mm/s^2	0 ± 0.1 G at still condition	Reading changes when vehicle (FR) is bounced
G (UP & DOWN) FL	G (up & down) FL sensor reading / min.: –1045267.3 mm/s^2, max.: 1045299.2 mm/s^2	0 ± 0.1 G at still condition	Reading changes when vehicle (FL) is bounced
G (UP & DOWN) R	G (up & down) rear sensor reading / min.: –1045267.3 mm/s^2, max.: 1045299.2 mm/s^2	0 ± 0.1 G at still condition	Reading changes when vehicle (rear) is bounced

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
RR HEIGHT	Right rear height control sensor reading / min.: –3276.7 mm (–129.004 in.), max.: 3276.8 mm (129.007 in.)	Min.: –30 mm (–1.18 in.) Max.: Europe: 30 mm (1.18 in.) Others: 40 mm (1.57 in.)	–
RL HEIGHT	Left rear height control sensor reading / min.: –32776.7 mm (–129.004 in.), max.: 3276.8 mm (129.007 in.)	Min.: –30 mm (–1.18 in.) Max.: Europe: 30 mm (1.18 in.) Others: 40 mm (1.57 in.)	–
DAMPER FR	Damper step FR / min.: 0 step, max.: 255 step	Min.: 0 step, max.: 16 step	–
DAMPER FL	Damper step FL / min.: 0 step, max.: 255 step	Min.: 0 step, max.: 16 step	–
DAMPER RR	Damper step RR / min.: 0 step, max.: 255 step	Min.: 0 step, max.: 16 step	–
DAMPER RL	Damper step RL / min.: 0 step, max.: 255 step	Min.: 0 step, max.: 16 step	–
MAX DMP STEP FR	Max. damper step FR / min.: 0 step, max.: 255 step	16 step	–
MAX DMP STEP FL	Max. damper step FL / min.: 0 step, max.: 255 step	16 step	–
MAX DMP STEP RR	Max. damper step RR / min.: 0 step, max.: 255 step	16 step	–
MAX DMP STEP RL	Max. damper step RL / min.: 0 step, max.: 255 step	16 step	–
#CODES	Number of DTC recorded / min.: 0, max.: 255	Min.: 0, Max.: –	–

5. ACTIVE TEST LIST

HINT:

Performing the ACTIVE TEST using the hand–held tester allows the sensors, relay and solenoid without removing any parts. Performing the ACTIVE TEST as a first step of troubleshooting is one of the methods to shorten the labor time. It is possible to display the DATA LIST during the ACTIVE TEST.

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

(b) Turn the ignition switch to ON.

(c) Following the display on tester, perform the ”ACTIVE TEST”.

Item	Vehicle Condition / Test Details	Diagnostic Note
RR HEIGHT	Turn height control switch / UP or DOWN	–
DAMPER FR	Changes damper step / min.: 1 step, max.: 16 step	Shock absorber hardens as damper step increases
DAMPER FL	Changes damper step / min.: 1 step, max.: 16 step	Shock absorber hardens as damper step increases
DAMPER RR	Changes damper step / min.: 1 step, max.: 16 step	Shock absorber hardens as damper step increases
DAMPER RL	Changes damper step / min.: 1 step, max.: 16 step	Shock absorber hardens as damper step increases
MOTOR RELAY	Turn AIR SUS relay / ON or OFF	Operation of motor can be heard
LEVEL SOL REAR	Turn leveling solenoid valve / ON or OFF	Operation of solenoid (clicking sound) can be heard
GATE SOL REAR	Turn gate solenoid valve / ON or OFF	Operation of solenoid (clicking sound) can be heard
LOW PRS TNK SOL	Turn tank solenoid valve / ON or OFF	Operation of solenoid (clicking sound) can be heard

6. INPUT SIGNAL CHECK (TEST MODE CHECK)

HINT:

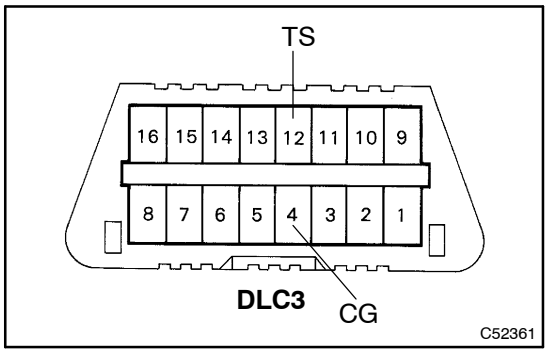
This function checks that whether signals from the stop lamp switch assy and the door courtesy switch, etc. are being input normally to the ECU.

(a) Procedure for Input Signal Check Mode (Test Mode) using SST check wire.

SST 09843–18040

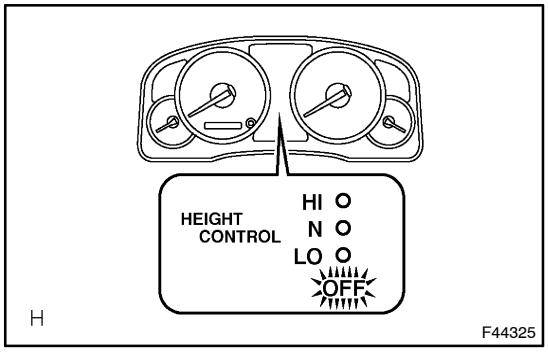
(1) Make sure the ignition switch is OFF.

(2) Set each of the check items in the table below to the condition in Operation (A).



(3) Using SST, connect the terminals TS and CG of DLC3.

(4) Turn the ignition switch ON.



(5) Check that the height control OFF indicator lamp come on and go off at 0.125 second intervals.

HINT:

If the height control OFF indicator light does not blink, inspect the height control OFF indicator lamp circuit (See Pub. No. RM990E, page 05–661) and the TS terminal circuit (See Pub. No. RM990E, page 05–666).

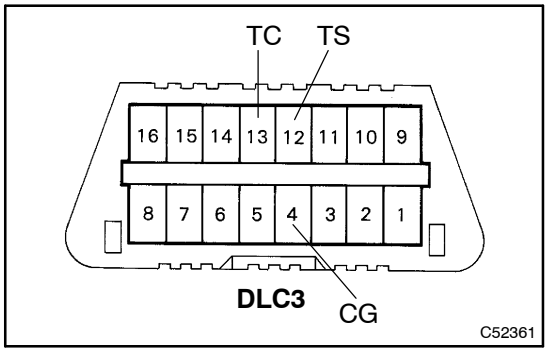
(6) Set each of the check items to the condition in Operation (B).

HINT:

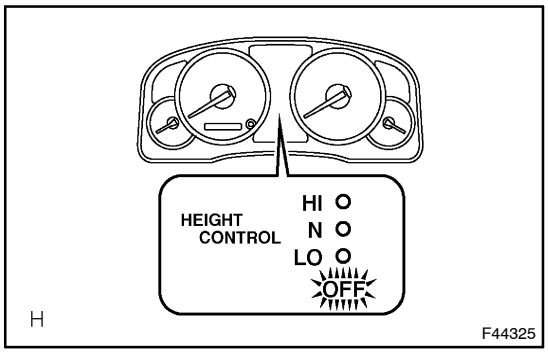
When checking each item, the height control OFF indicator lamp should come on for 1 sec.

Check Item	Operation (A)	Operation (B)
Stop lamp switch signal	OFF (Brake pedal not depressed)	ON (Brake pedal depressed)
Door courtesy switch signal	ON (Each door opened)	OFF (All doors closed)
Height control switch signal	–	Press the height control switch ”UP” first and then press ”DOWN”
Absorber control switch signal	–	Slowly move the absorber control switch ”COMFORT” to ”SPORT” and ”COMFORT”
Height control OFF switch signal	OFF (Height control OFF switch not pushed in)	ON to OFF (Height control OFF switch pushed in and released)
Right front acceleration sensor signal	–	Keep the vehicle still without any vertical movement for 1 second
Left front acceleration sensor signal	–	Keep the vehicle still without any vertical movement for 1 second

Rear acceleration sensor signal	–	Keep the vehicle still without any vertical movement for 1 second
Right front speed sensor signal	Vehicle speed below 20 km/h (12 mph)	Vehicle speed 20 km/h (12 mph) or higher
Left front speed sensor signal	Vehicle speed below 20 km/h (12 mph)	Vehicle speed 20 km/h (12 mph) or higher
Crankshaft position sensor signal	Engine speed below 2,000 rpm	Engine speed 2,000 rpm or higher



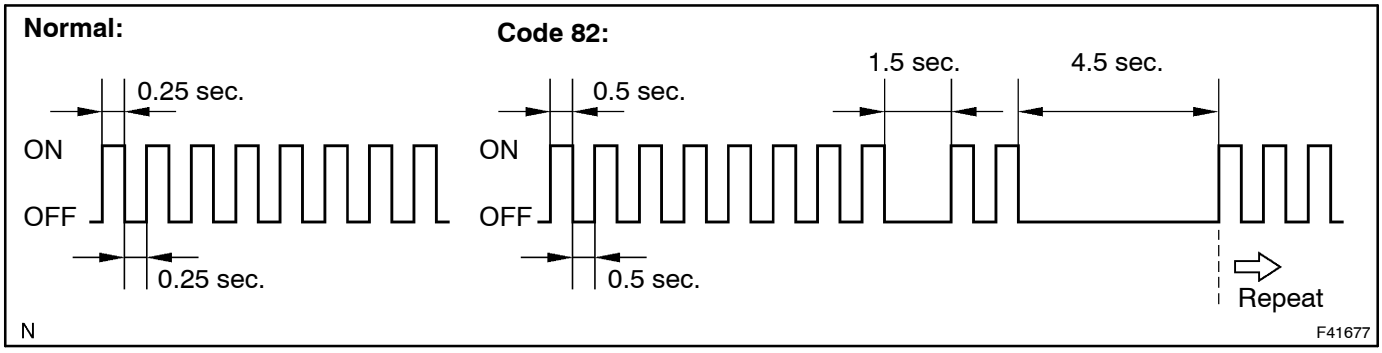
(7) Using SST, connect the 3rd terminal of the SST check wire to terminal TC in DLC3.
SST 09843–18040



(8) Read the number of blinks of the height control OFF indicator lamp.

HINT:
- As an example, the blinking patterns of normal code and code 82 are shown in the illustration.
- If 2 or more malfunctions are indicated at the same time, the lowest numbered code is displayed first.
- When DTC is not output, check the TC terminal circuit on page See Pub. No. RM990E, page 05–664.

(9) Check the malfunction using the code table on the next page.



(b) Ending the Input Signal Check Mode (Test Mode) using SST check wire.
SST 09843–18040

(1) With the ignition switch to OFF, disconnect the SST check wire from the terminals of DLC3 and then turn the ignition switch ON.

(c) Procedure for Sensor Test Mode (Test Mode) using the hand–held tester.

(1) Make sure the ignition switch OFF.
(2) Set each of the check items to the condition in Operation (A) on the previous page.
(3) Connect the hand–held tester to DLC3.
(4) Turn the ignition switch ON.
(5) Select the SIGNAL CHECK mode on the hand–held tester.
(6) Set each of the check items to the condition in Operation (B) on the previous page.

HINT:
In step (6), all signals can be checked together.

(7) Read the DTCs by following the prompts on the tester screen.

HINT:
Refer to the hand–held tester operator's manual for further details.

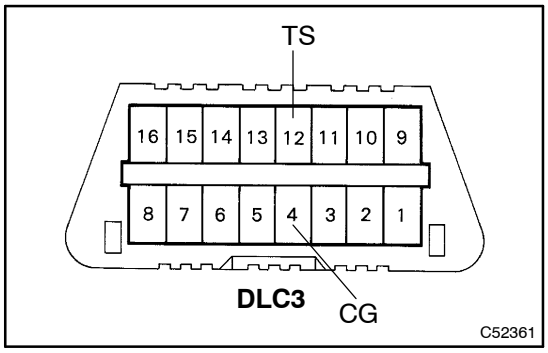
DTC from input signal check

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

DTC No. (See Page)	Detection Item	Trouble Area
C1782/82 (★)	Stop light switch circuit malfunction	• Stop lamp switch assy • Stop light switch circuit • Suspension control ECU
C1783/83 (★)	Door courtesy switch circuit malfunction	• Door courtesy switch assy • Back door courtesy switch assy • Door courtesy switch circuit • Multiplex network body ECU • Suspension control ECU
C1786/86 (★)	Height control switch circuit malfunction	• Height control switch (Suspension control switch) • Height control switch circuit • Suspension control ECU
C1787/87 (★)	Absorber control switch malfunction	• Absorber control switch assy (Suspension control switch) • Absorber control switch circuit • Suspension control ECU
C1788/88 (★)	Height control OFF switch circuit malfunction	• Height control OFF switch (Suspension control switch) • Height control OFF switch circuit • Suspension control ECU
C1791/91 (★)	Open or short circuit in right front acceleration sensor circuit	• Acceleration sensor assy front RH • Right front acceleration sensor circuit • Suspension control ECU
C1792/92 (★)	Open or short circuit in left front acceleration sensor circuit	• Suspension control ECU (Acceleration sensor LH is a built–in equipment)
C1793/93 (★)	Open or short circuit in rear acceleration sensor circuit	• Acceleration sensor rear • Rear acceleration sensor circuit • Suspension control ECU
C1794/94 (★)	Right front speed sensor circuit malfunction	• Right front speed sensor • Right front speed sensor circuit • Skid control ECU assy • Suspension control ECU

C1795/95 (★)	Left front speed sensor circuit malfunction	• Left front speed sensor • Left front speed sensor circuit • Skid control ECU assy • Suspension control ECU
C1797/97 (05–274)	Crankshaft position sensor circuit malfunction	• Crankshaft position sensor • Crankshaft position sensor circuit • ECM • Suspension control ECU

HINT:
★: See Pub. No. RM990E



7. CHECK DAMPING FORCE CONTROLLING CONDITION (USING SST CHECK WIRE)

(a) Checking the damping force controlling condition using the SST check wire.

SST 09843–18040

(1) Using SST, connect terminals TS and CG of DLC3 with the ignition switch at OFF (Test Mode).

(2) Start the engine.
Under this condition, the absorber control actuator position is 1 (Soft).

(3) Starting from the above mentioned position, as the brake pedal is depressed, the absorber control actuator position increases (1 → 2 → 3 → ... 15 → 16). At this time, bounce the vehicle and check that the shock absorber becomes harder.

HINT:

- To hold the absorber control actuator at a specific position, adjust it to the position using the above mentioned procedure, and then increase the vehicle speed to over 5 km/h (3 mph).
After that speed is reached, the absorber control actuator position does not change until the ignition switch is turned to OFF.
- If the absorber control actuator does not operate, inspect the absorber control actuator circuit and the suspension control ECU.

8. FAIL–SAFE FUNCTION

(a) In the normal control operation, if there is short or open in the sensors, actuators, etc., the suspension control ECU suspends the damping force control operation and the vehicle height control operation.