

## PRE-CHECK

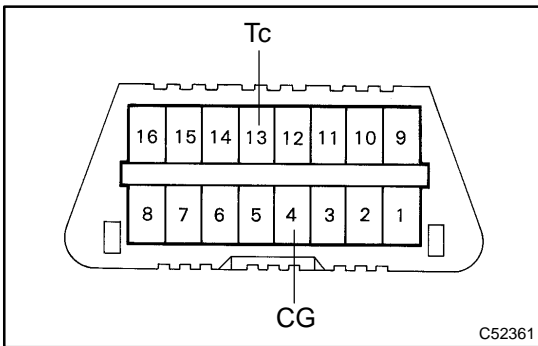
### 1. DIAGNOSIS SYSTEM

- (a) Release the parking brake lever.
- (b) Check the warning lights.

When the ignition switch is turned ON, check that the ABS warning light and brake warning light goes on for 3 sec.

**HINT:**

- When the parking brake is applied or the level of the brake fluid is low, the brake warning light is lit.
- If the indicator check result is not normal, proceed to troubleshooting for the ABS warning light circuit (See page [05-332](#) or [05-335](#)) or brake warning light circuit (See page [05-338](#)).



- (c) In case of not using hand-held tester:  
Check the DTC.

- (1) Using SST, it connects terminal Tc and CG of DLC3.  
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- (2) Turn the ignition switch to ON.
- (3) Read the DTC from the ABS warning light on the combination meter.

**HINT:**

- If not code appears, inspect the diagnostic circuit or ABS warning light circuit (See page [05-332](#) or [05-335](#)).
- As an example, the blinking patterns for normal code and codes 11 and 21 are shown on the left.
- (4) Codes are explained in the code table on page [05-303](#).

If 2 or more malfunctions are indicated at the same time, the lowest numbered DTC will be displayed 1st.

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

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- (d) In case of using hand-held tester:  
Check the DTC.

- (1) Read the DTC by following the prompts on the tester screen.

**HINT:**

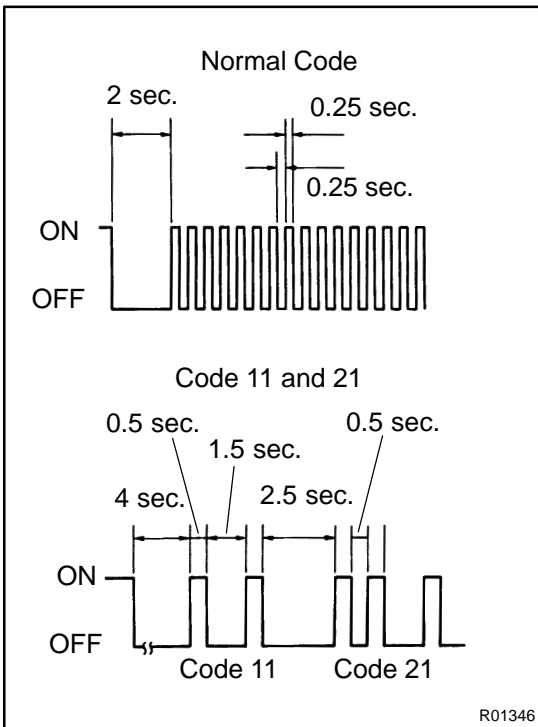
Please refer to the hand-held tester operator's manual for further details.

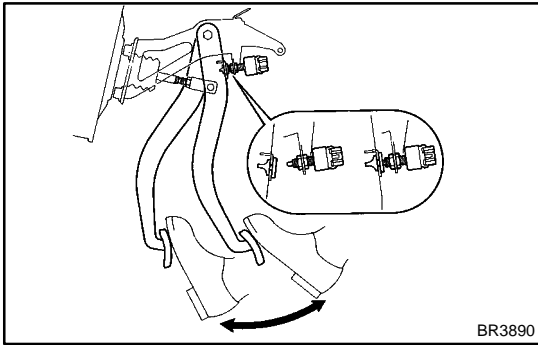
- (e) In case of not using hand-held tester:  
Clear DTC.

- (1) Using SST, it connects the terminal Tc and CG of the DLC3.

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- (2) Turn the ignition switch to ON.





- (3) Clear DTC stored in ECU by depressing the brake pedal 8 or more times within 5 sec.
- (4) Check that the ABS warning light shows the normal code.
- (5) Remove the SST from the DLC3.  
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**HINT:**

Disconnect the battery cable during repairs will not erase the DTC in the ECU.

- (f) In case of using hand-held tester:

Clear the DTC.

- (1) Turn the ignition switch to ON.
- (2) Operate the hand-held tester to erase the codes.

**HINT:**

Please refer to the hand-held tester operator's manual for further details.

**2. DATA LIST**

**HINT:**

According to the DATA LIST displayed by the Hand-held tester, you can read the value of the switch, sensor, actuator and so on without parts removal. 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 the DLC3.
- (b) Turn the ignition switch to ON.
- (c) According to the display on tester, read the "DATA LIST".

| Item          | Measurement Item / Range (Display)     | Normal Condition  | Diagnostic Note |
|---------------|--|---|-----------------|
| ABS MOT RELAY | ABS motor relay / ON or OFF            |   |                 |
| SOL RELAY     | Solenoid relay / ON or OFF             |   |                 |
| STOP LIGHT SW | Stop light switch / ON or OFF          | ON : Brake pedal depressed<br>OFF : Brake pedal released              |                 |
| PKB SW        | Parking brake switch / ON or OFF       | ON : Parking brake applied<br>OFF : Parking brake released            |                 |
| ABS OPERT FR  | ABS operation (FR) / BEFORE or OPERATE | BEFORE : No ABS operation (FR)<br>OPERATE : During ABS operation (FR) |                 |
| ABS OPERT FL  | ABS operation (FL) / BEFORE or OPERATE | BEFORE : No ABS operation (FL)<br>OPERATE : During ABS operation (FL) |                 |
| ABS OPERT RR  | ABS operation (RR) / BEFORE or OPERATE | BEFORE : No ABS operation (RR)<br>OPERATE : During ABS operation (RR) |                 |
| ABS OPERT RL  | ABS operation (RL) / BEFORE or OPERATE | BEFORE : No ABS operation (RL)<br>OPERATE : During ABS operation (RL) |                 |

| Item            | Measurement Item / Range (Display)  | Normal Condition                                | Diagnostic Note                |
|-----------------|---|---|--------------------------------|
| WHEEL SPD FR    | Wheel speed sensor (FR) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH) | Actual wheel speed                              | Speed indicated on speedometer |
| WHEEL SPD FL    | Wheel speed sensor (FL) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH) | Actual wheel speed                              | Speed indicated on speedometer |
| WHEEL SPD RR    | Wheel speed sensor (RR) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH) | Actual wheel speed                              | Speed indicated on speedometer |
| WHEEL SPD RL    | Wheel speed sensor (RL) reading / min.: 0 km/h (0 MPH, max.: 326 km/h (202 MPH) | Actual wheel speed                              | Speed indicated on speedometer |
| IG VOLTAGE      | ECU power supply voltage / NORMAL or TOO LOW                                    | NORMAL : 9.5 V or over<br>TOO LOW : Below 9.5 V |                                |
| SFRR            | ABS solenoid (SFRR) ON / OFF  |   |                                |
| SFRH            | ABS solenoid (SFRH) ON / OFF  |   |                                |
| SFLR            | ABS solenoid (SFLR) ON / OFF  |   |                                |
| SFLH            | ABS solenoid (SFLH) ON / OFF  |   |                                |
| SRRR            | ABS solenoid (SRRR) ON / OFF  |   |                                |
| SRRH            | ABS solenoid (SRRH) ON / OFF  |   |                                |
| SRLR            | ABS solenoid (SRLR) ON / OFF  |   |                                |
| SRLH            | ABS solenoid (SRLH) ON / OFF  |   |                                |
| AIR BLD SUPPORT | Air bleed support / SUPPORT or NOT SUP  | Supported                                       |                                |
| TEST MODE       | Test mode / NORMAL or TEST  | NORMAL : Normal mode<br>TEST : During test mode |                                |
| #CODES          | Number of DTC recorded / min.: 0, max.: 255                                     | Min.: 0, max.: 19                               |                                |

### 3. ACTIVE TEST

#### HINT:

Performing the ACTIVE TEST using the Hand-held tester allows the relay, actuator and so on to operate without parts removal. 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) According to the display on tester, perform the "ACTIVE TEST".

| Item            | Vehicle Condition / Test Details        | Diagnostic Note                                     |
|-----------------|---|---|
| SFRR            | Turns ABS solenoid (SFRR) ON / OFF      | Operation of solenoid (clicking sound) can be heard |
| SFRH            | Turns ABS solenoid (SFRH) ON / OFF      | Operation of solenoid (clicking sound) can be heard |
| SFLR            | Turns ABS solenoid (SFLR) ON / OFF      | Operation of solenoid (clicking sound) can be heard |
| SFLH            | Turns ABS solenoid (SFLH) ON / OFF      | Operation of solenoid (clicking sound) can be heard |
| SRRR            | Turns ABS solenoid (SRRR) ON / OFF      | Operation of solenoid (clicking sound) can be heard |
| SRRH            | Turns ABS solenoid (SRRH) ON / OFF      | Operation of solenoid (clicking sound) can be heard |
| SRLR            | Turns ABS solenoid (SRLR) ON / OFF      | Operation of solenoid (clicking sound) can be heard |
| SRLH            | Turns ABS solenoid (SRLH) ON / OFF      | Operation of solenoid (clicking sound) can be heard |
| SFRR & SFRH     | Turns ABS solenoid SFRR & SFRH ON / OFF | Operation of solenoid (clicking sound) can be heard |
| SFLR & SFLH     | Turns ABS solenoid SFLR & SFLH ON / OFF | Operation of solenoid (clicking sound) can be heard |
| SRRH & SRRR     | Turns ABS solenoid SRH & SRR ON / OFF   | Operation of solenoid (clicking sound) can be heard |
| SRLR & SRLH     | Turns ABS solenoid SRLR & SRLH ON / OFF | Operation of solenoid (clicking sound) can be heard |
| SFRH & SFLH     | Turns ABS solenoid SFRH & SFLH ON / OFF | Operation of solenoid (clicking sound) can be heard |
| SOL RELAY       | Turns ABS solenoid relay ON / OFF       | Operation of solenoid (clicking sound) can be heard |
| ABS MOT RELAY   | Turns ABS motor relay ON / OFF          | Operation of motor can be heard                     |
| ABS WARN LIGHT  | Turns ABS warning light ON / OFF        | Observe combination meter                           |
| BRAKE WRN LIGHT | Turns BRAKE warning light ON / OFF      | Observe combination meter                           |

#### 4. FREEZE FRAME DATA

- The vehicle (sensor) status memorized during ABS operation or at the time of error code detection can be displayed using the hand-held tester.
- Only one record of freeze frame data is stored and the freeze frame data generated during ABS operation are constantly updated. Also, the number of the ignition switch's "ON" after the freeze frame data is stored can be memorized up to 31 and it can be displayed.

#### HINT:

If the ignition switch "ON" operation exceeds 31 times, "31" appears on the display.

- (c) If the diagnosis code abnormality occurs, the freeze frame data at the occurrence of the abnormality is stored but the ABS actuation data is deleted.

| Hand-held tester display | Measurement Item   | Reference Value*                   |
|--------------------------|--|------------------------------------|
| VEHICLE SPD              | Vehicle speed  | Speed indication of a meter        |
| STOP LIGHT SW            | Stop light switch signal   | Stop light switch ON: ON, OFF: OFF |
| # IG ON                  | Numbers of operations of ignition switch ON after memorizing freeze frame data | 0 - 31                             |
| SYSTEM                   | Operate system   | ABS operate: ABS                   |

\*: 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.

## 5. SPEED SENSOR SIGNAL CHECK

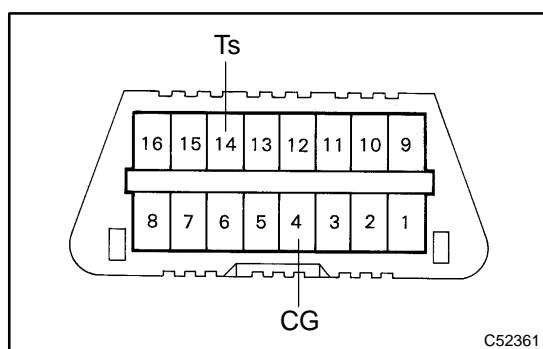
HINT:

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 speed sensor signal.

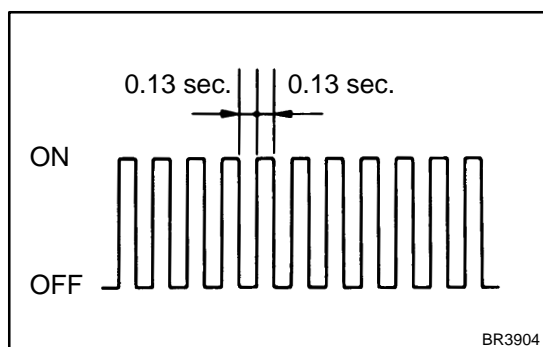
- (1) Turn the ignition switch to ON.



- (2) Using SST, it connects the terminal Ts and CG of DLC3.

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- (3) Start the engine.



- (4) Check that the ABS warning light blinks.

HINT:

If the ABS warning light does not blink, inspect the ABS warning light circuit and Ts circuit (See page 05-332 or 05-335).

- (5) Drive the vehicle straight forward at the speed of 45 km/h (28 mph) or over for several seconds and check that the ABS warning light comes off.

HINT:

The sensor check may not be completed if the wheels spin or the steering wheels steered during check.

- (6) Stop the vehicle.

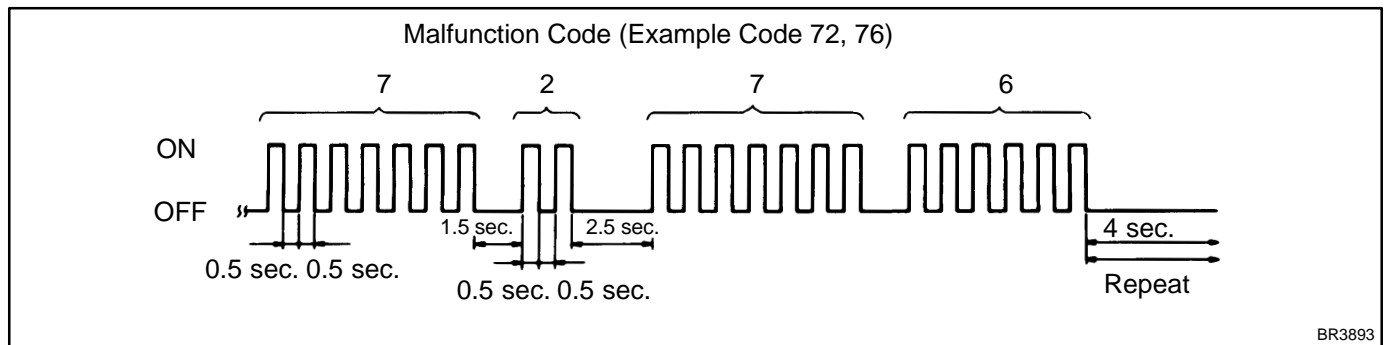
- (7) Using SST, it connects the terminal Tc and CG of the DLC3.

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- (8) Read the number of blinks of the ABS warning light.

## HINT:

- See the list of DTC shown on the [05-303](#).
- 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.



- (9) After performing the check, turn the ignition switch to OFF, and remove the SST from the DLC3.

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- (b) In case of using hand-held tester:

Check the speed sensor signal.

- (1) Do step (3) to (6) on the previous page.

- (2) 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.