050X8–03

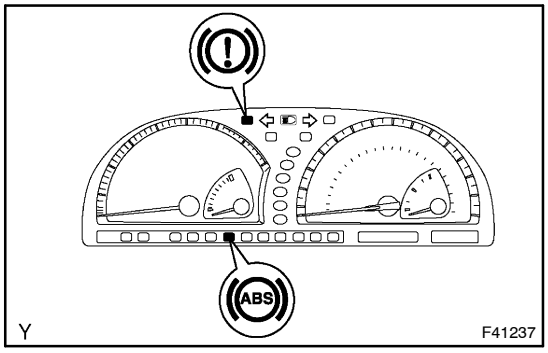
PRE–CHECK

1. DIAGNOSIS SYSTEM

(a) Release the parking brake pedal.

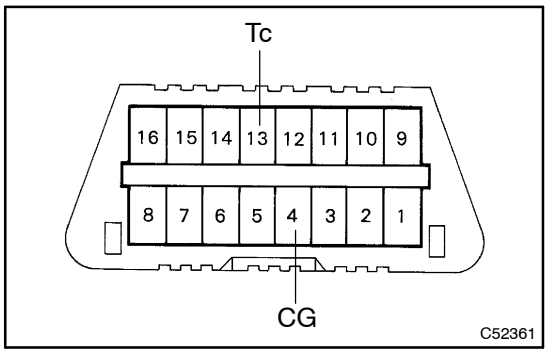
(b) Check the warning light.

When the ignition switch is turned ON, check that the ABS warning light and brake warning light turns 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 05–498 or 05–500) or brake warning light circuit (See page 05–501).



(c) In case of not using hand–held tester:

Check the DTC.

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

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(2) Turn the ignition switch to ON.

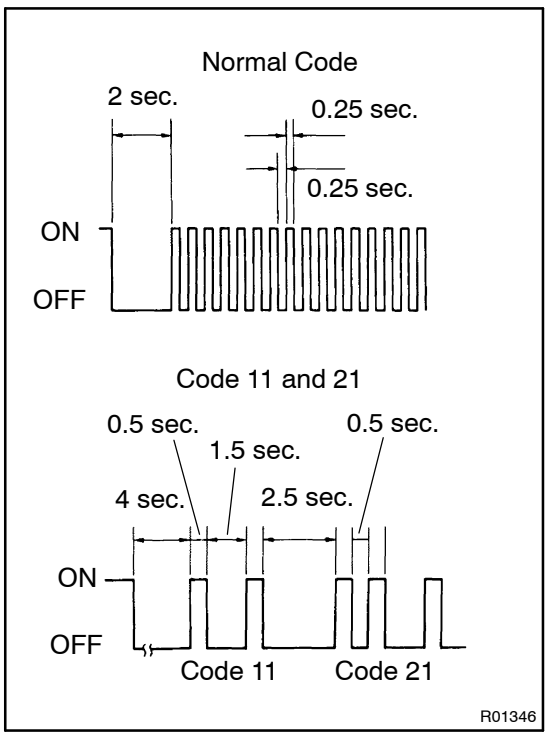
(3) Read the DTC from the ABS warning light on the combination meter.

HINT:

- If not code appears, inspect the diagnostic circuit or ABS warning light circuit (See page 05–505 or 05–500).
- 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 05–458.

If 2 or more malfunctions are indicated at the same time DTC will be displayed in ascending order.



(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.

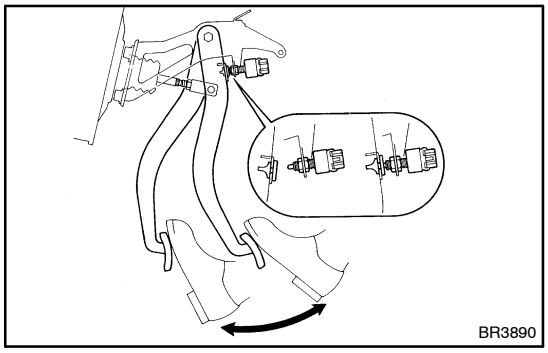
(1) Read the DTC by following the prompts on the tester screen.

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, connect the terminals 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:
Disconnecting 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 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 OFF : Brake pedal released	
PKB SW	Parking brake switch / ON or OFF	ON : Parking brake applied OFF : Parking brake released	
ABS OPERT FR	ABS operation (FR) / BEFORE or OPERATE	BEFORE : No ABS operation (FR) OPERATE : During ABS operation (FR)	
ABS OPERT FL	ABS operation (FL) / BEFORE or OPERATE	BEFORE : No ABS operation (FL) OPERATE : During ABS operation (FL)	
ABS OPERT RR	ABS operation (RR) / BEFORE or OPERATE	Actual wheel speed	

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
ABS OPERT RL	ABS operation (RL) / BEFORE or OPERATE	Actual wheel speed	
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 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 (SRR)	ABS solenoid (SRRR (SRR)) ON / OFF		
SRRH (SRH)	ABS solenoid (SRRH (SRH)) ON / OFF		
SRLR	ABS solenoid (SRLR) ON / OFF		
SRLH	ABS solenoid (SRLH) ON / OFF		
MAS CYL PRESS 1	Master cylinder pressure sensor 1 reading / min.: 0 V, max.: 5 V	When brake pedal is released : 0.3 – 0.9 V	Reading increases when brake pedal is depressed
AIR BLD SUPPORT	Air bleed support / SUPPORT or NOT SUP	Supported	
TEST MODE	Test mode / NORMAL or TEST	NORMAL : Normal mode TEST : During test mode	
#CODES	Number of DTC recorded / min.: 0, max.: 255	Min.: 0, max.: 21	

3. ACTIVE TEST

HINT:

Performing the ACTIVE TEST using the Hand–held tester allows the relay, VSV, actuator and so on to operate without parts removal. Performing the ACTIVE TEST as a first step of troubleshooting is one of the method 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 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
SRH & SRR	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

Item	Vehicle Condition / Test Details	Diagnostic Note
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

(a) The vehicle (sensor) status at the occurrence of abnormality of the diagnosis code and during the ABS operation can be memorized and displayed by the hand–held tester.

(b) Only one record of freeze frame data is stored, however, freeze frame data during the ABS operating is always up–dated. After the storage of freeze frame data, up to 31 ignition "ON" operations are stored and 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	Wheel speed reading	Speed indication of a meter
STOP LIGHT SW	Stop light switch signal	Stop light switch ON: ON, OFF: OFF
# IG ON	Number of operations of ignition switch ON after memorizing freeze frame data	0 – 31
MAS CYL PRESS	Master cylinder pressure sensor reading	Brake pedal release : 0.3 – 0.9 V Brake pedal depress: 0.8 – 4.5 V
MASS PRESS GRADE	Master cylinder pressure sensor change	–30 – 200 MPa/s
SYSTEM	System status	ABS activated: ABS BA activated: BA Fail safe mode activated: FAIL SF No system activated: NO SYS

*: 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:

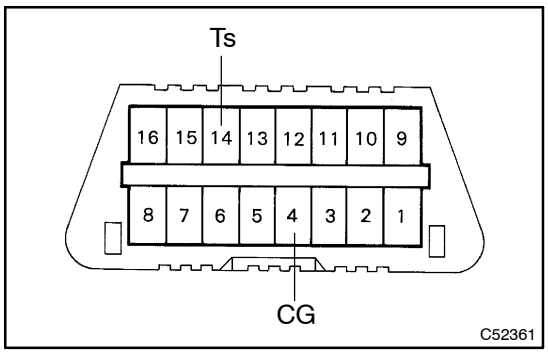
- If the ignition switch is turned from ON to ACC or LOCK during test mode, DTC of sensor check function will be erased.
- During test mode, ECU records all DTC of sensor check function. By preforming sensor signal check, the codes are erased if normality is confirmed. The codes left over are the codes where abnormality was found.

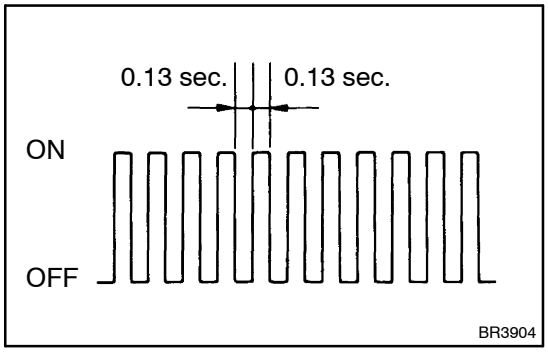
(a) In case of not using hand–held tester:
Check the speed sensor signal.

(1) Turn the ignition switch to ON.

(2) Using SST, connect the terminals 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 05–500 and 05–503).

(5) Drive the vehicle straight forward.

HINT:

Drive the vehicle higher than 45 km/h (28 mph) for several sec.

(6) Stop the vehicle.

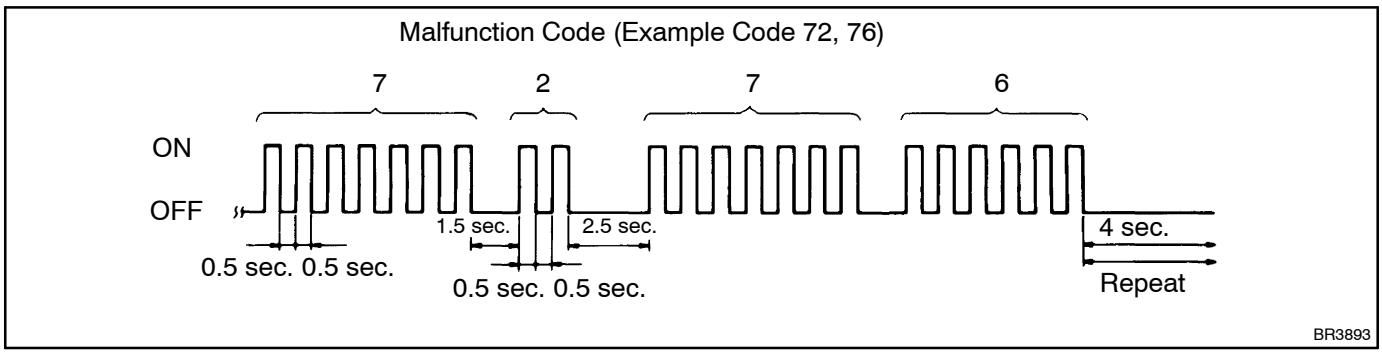
(7) Using SST, connect the terminals Tc and CG of the DLC3.

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

HINT:

- See the list of DTC shown on the 05–458.
- If every sensor is normal, there is a normal code 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 DTC will be displayed in ascending order.



(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) Perform step (3) to (6) on the this page.

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

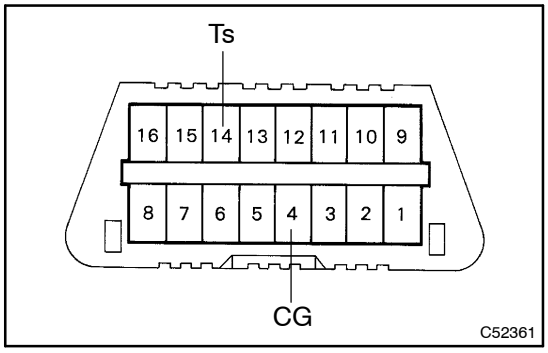
HINT:

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

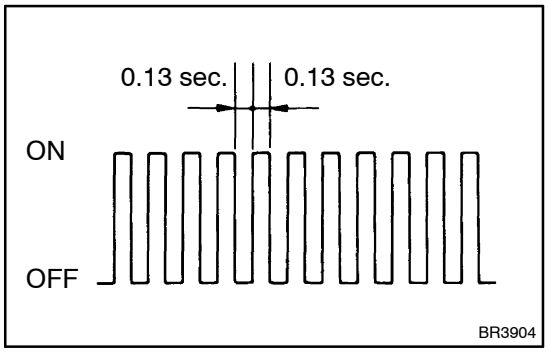
6. BRAKE ASSIST OPERATE CHECK

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 brake assist operate.
(1) Using SST, connect terminals Ts and CG of DLC3.
SST 09843–18040
(2) Start the engine.



(3) 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 05–500 and 05–503).

(4) While the vehicle is stationary, release the brake pedal for 1 sec. Then depress the brake pedal with a force of at least 98 N (10 kgf) for more than 1 sec.
(5) While the vehicle is stationary, quickly depress the brake pedal. At this time, confirm that the ABS warning light remains lit for approximately 3 sec.

(b) In case of using hand–held tester:
Check the brake assist operate.
Perform step (2) to (5) on the this page.

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