

PRE-CHECK

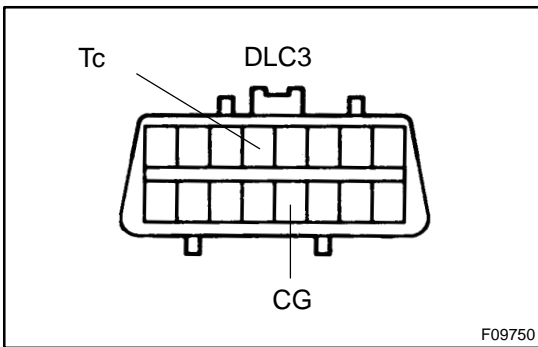
1. DIAGNOSIS SYSTEM

- (a) Check the warning lights.
 - (1) Release the parking brake pedal.
 - (2) When the ignition switch is turned ON, check that the ABS warning light, VSC TRAC warning light, VSC OFF (TRAC OFF) indicator light, BRAKE warning light and SLIP indicator light goes on for approx. 3 seconds.

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, VSC TRAC warning light circuit, VSC OFF (TRAC OFF) indicator light circuit, BRAKE warning light circuit or SLIP indicator light circuit.

| Trouble Area | See page |
|--|------------------------|
| ABS warning light circuit | DI-319 |
| VSC TRAC warning light circuit | DI-321 |
| VSC OFF (TRAC OFF) indicator light circuit | DI-329 |
| BRAKE warning light circuit | DI-324 |
| SLIP indicator light circuit | DI-326 |

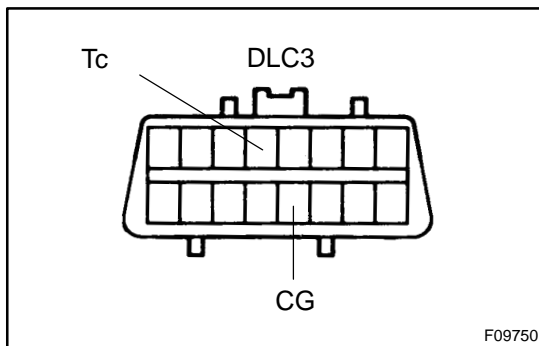
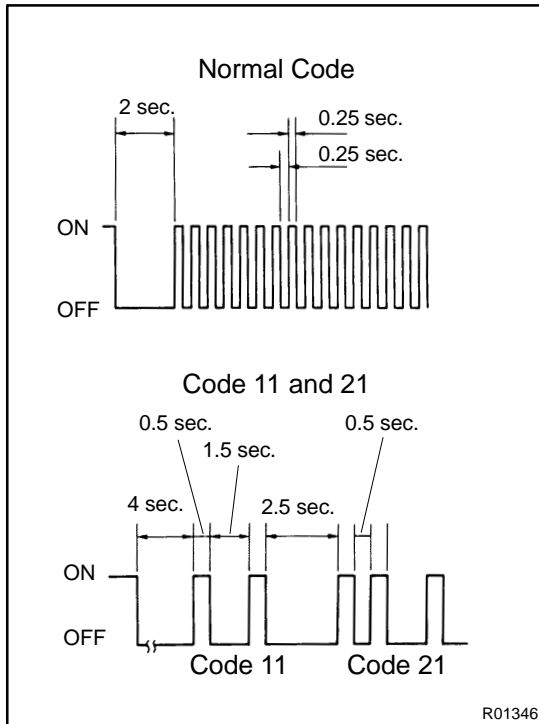


- (b) In case of not using TOYOTA hand-held tester:
 - Check the DTC of skid control ECU.
 - (1) Using SST, connect terminals Tc and CG of DLC3. SST 09843-18040
 - (2) Turn the ignition switch ON.
 - (3) Read the DTC from the ABS warning light and VSC TRAC warning light on the combination meter.

HINT:

- If no code appears, inspect the diagnostic circuit, ABS warning light circuit or VSC TRAC warning light circuit.

| Trouble Area | See page |
|--------------------------------|------------------------|
| Tc terminal circuit | DI-335 |
| ABS warning light circuit | DI-319 |
| VSC TRAC warning light circuit | DI-321 |



- 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 [DI-242](#).
 - (5) After completing the check, disconnect terminals Tc and CG of DLC3, and turn off the display.
- If 2 or more malfunction codes are identified at the same time, the lowest numbered DTC will be displayed 1st.

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

HINT:

Once the ignition switch is turned off, all DTC in the translate ECU are cleared.

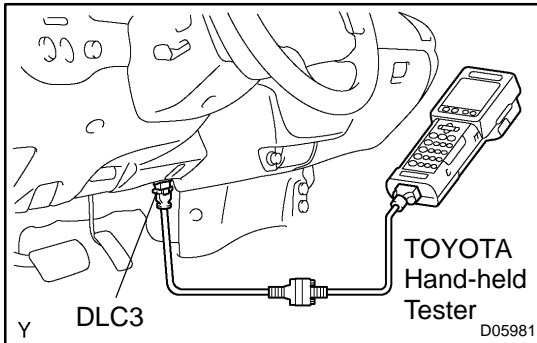
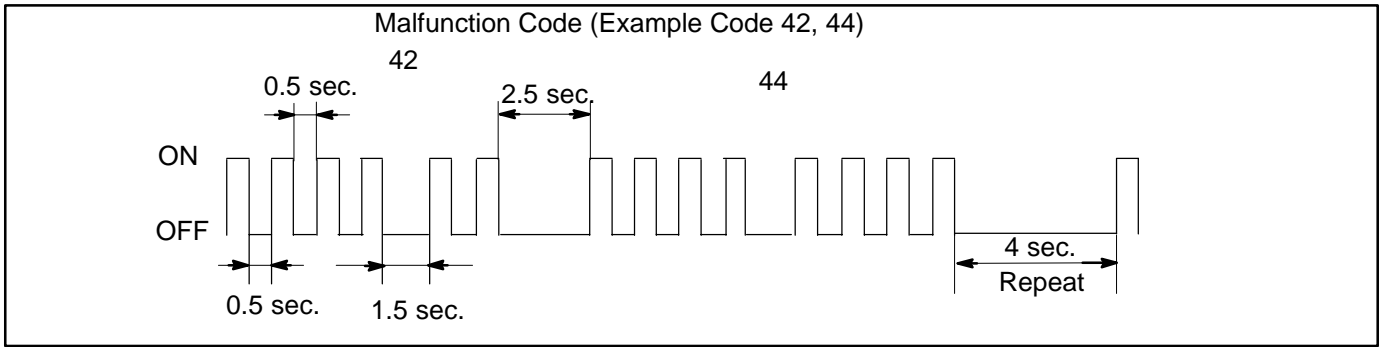
- (1) Release the parking brake pedal.
- (2) Check the brake fluid level.
- (3) Using SST, connect terminals Tc and CG of DLC3.
SST 09843-18040
- (4) Read the DTC from the BRAKE warning light.

HINT:

- If no code appears, inspect the diagnostic circuit, and BRAKE warning light circuit.

| Trouble Area | See page |
|-----------------------------|------------------------|
| Tc terminal circuit | DI-335 |
| BRAKE warning light circuit | DI-324 |

- When the parking brake is applied or the level of the brake fluid is low, the BRAKE warning light is lit.
- 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 malfunction codes are identified at the same time, the lowest numbered code will be displayed 1st.

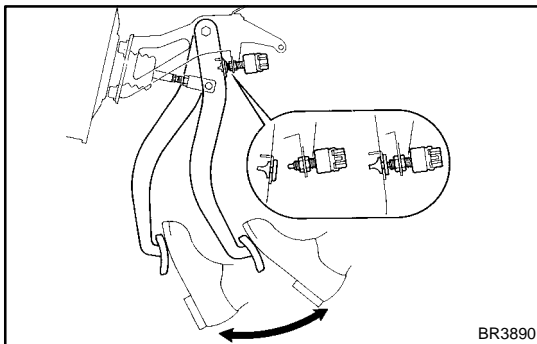


(d) In case of using TOYOTA hand-held tester:
Check the DTC.

- (1) Hook up the TOYOTA 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 TOYOTA hand-held tester operator's manual for further details.

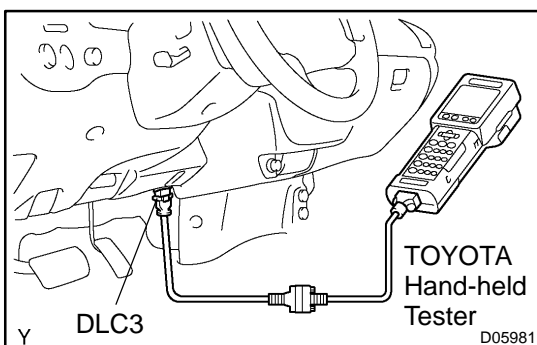


(e) In case of not using TOYOTA hand-held tester:
Clear the DTC.

- (1) Using SST, connect terminals Tc and CG of DLC3.
SST 09843-18040
- (2) Turn the ignition switch ON.
- (3) Clear the DTC stored in ECU by depressing the brake pedal 8 times or more within 5 seconds.
- (4) Check that the warning light shows the normal code.
- (5) Remove the SST from the terminals of DLC3.
SST 09843-18040

HINT:

Cancellation cannot be done by removing the battery cable or ECU-IG fuse.



(f) In case of using TOYOTA hand-held tester:
Clear the DTC.

- (1) Hook up the TOYOTA hand-held tester to the DLC3.
- (2) Turn the ignition switch ON.
- (3) Operate the TOYOTA hand-held tester to erase the codes.

HINT:

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

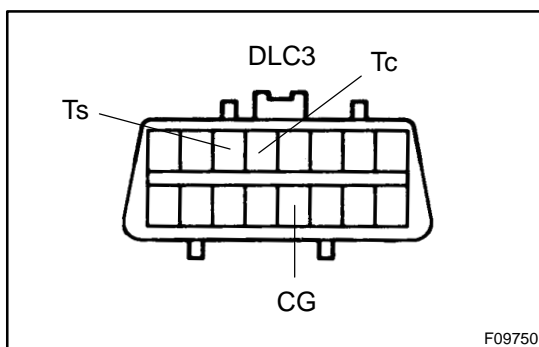
2. In case of not using TOYOTA hand-held tester: SENSOR CHECK (TEST MODE)

NOTICE:

When having replaced the steering angle sensor, master cylinder pressure sensor, deceleration sensor and/or ECU, perform zero point calibration of the steering angle, master cylinder pressure and deceleration sensors (See step 6.).

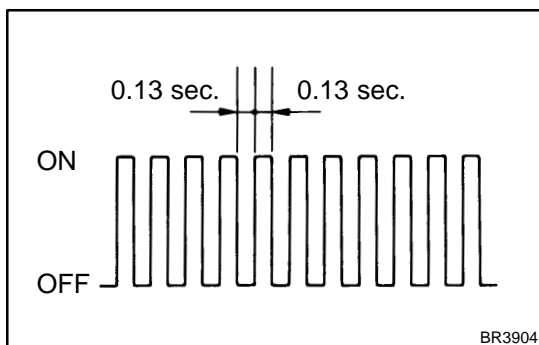
HINT:

If the ignition switch is turned from ON to ACC or LOCK during test mode, DTC will be erased.



(a) Procedures for test mode:

- (1) Turn the ignition switch OFF.
- (2) Check that the shift lever position is at P position, turn the steering wheel to the neutral position.
- (3) Using SST, connect terminals Ts and CG of DLC3.
SST 09843-18040
- (4) Start the engine.



- (5) Check that the ABS warning light and VSC TRAC warning light blinks.

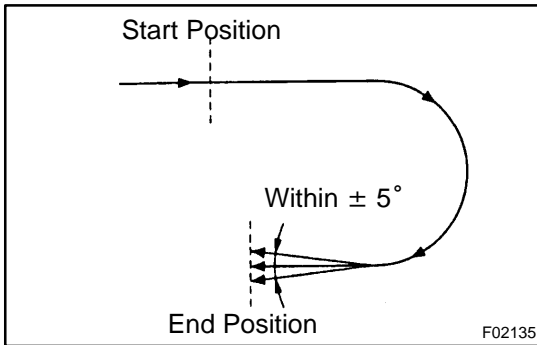
HINT:

If the ABS warning light and VSC TRAC warning light does not blink, inspect the ABS warning light circuit, VSC TRAC warning light circuit and Ts terminal circuit (See page [DI-319](#), [DI-321](#) and [DI-337](#)).

- (6) Keep the vehicle in the stationary condition on the flat place for 4 sec. or more.
- (b) Check the deceleration sensor.
Shift the shift lever to the D position and drive the vehicle at the vehicle speed of approx. 5 km/h (3 mph), turn the steering wheel either to left or right 90° or more, and maintain 180° circular drive for the vehicle.

HINT:

- If the VSC buzzer sounds, the sensor check is in normal completion.
- If the VSC buzzer does not sound, check the VSC buzzer circuit (See page [DI-332](#)), then do the sensor check again.



- (c) Check the yaw rate sensor.
Shift the shift lever to the D position 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 position, check that the VSC buzzer sounds for 3 sec.

HINT:

- If the VSC buzzer sounds, the sensor check is in normal completion.
- If the VSC buzzer does not sound, check the VSC buzzer circuit (See page [DI-332](#)), then do the sensor check again.
- 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 wheels.
- When the vehicle is driven to circle during the other sensor's check, even if the deceleration sensor check is not completed, the buzzer that indicates completion of the deceleration check may sound.

- (d) Check the master cylinder pressure sensor.

- (1) Keep the vehicle in the stationary condition on the flat place for 2 sec. or more.
- (2) Keeping the vehicle in the stationary condition and the brake pedal in free condition for 1 sec. or more, continue to depress the brake pedal with 147 N (15 kgf, 33 lbf) or more for 2 sec. or more.

HINT:

- At this time, the buzzer sounds for 3 seconds.
- If zero point calibration has not performed, sensor check cannot be completed correctly.

- (e) Check the steering angle sensor.

Fully turn the steering wheel to either right or left until it is locked and keep it for 1 sec. And then, turn it to the other full lock position and keep it for 1 sec.

HINT:

- At this time, the VSC buzzer sounds for 3 seconds.
- If zero point calibration has not performed, sensor check cannot be completed correctly.

- (f) Check the speed sensor.

Drive vehicle straight forward.

When driving the vehicle at the speed faster than 45 km/h (28 mph) for several seconds, check that the ABS warning light comes off.

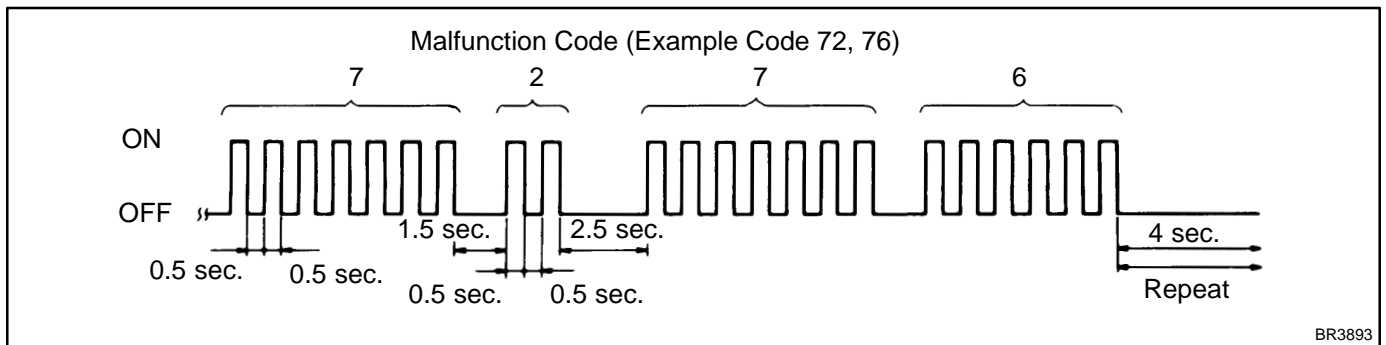
HINT:

There is a case that the sensor check is not completed if the vehicle has its wheels spun or its steering wheel steered during this check.

- (g) Stop the vehicle.
- (h) Read the DTC.
 - (1) Using SST, connect terminals Tc and CG of DLC3.
 - SST 09843-18040
 - (2) Read the number of blinks of the warning light.

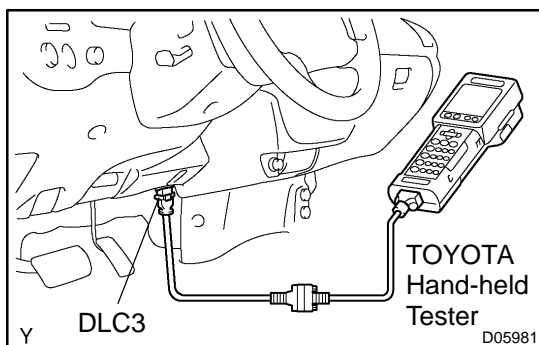
HINT:

- See the list of DTC shown in 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.



- (3) After doing the check, disconnect terminals Ts and CG, Tc and CG of DLC3, and turn the ignition switch OFF.

SST 09843-18040



3. In case of using TOYOTA hand-held tester: SENSOR CHECK (TEST MODE)

NOTICE:

When having replaced the steering angle sensor, master cylinder pressure sensor, deceleration sensor and/or ECU, perform zero point calibration of the steering angle, master cylinder pressure and deceleration sensors (See step 6.). **Make sure that this operation should be done before starting the following.**

- (a) Hook up the TOYOTA hand-held tester to the DLC3.
- (b) Do steps (a)-(2) and from (a)-(4) to (g) on the previous pages.
- (c) Read the DTC by following the prompts on the tester screen.

HINT:

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

DTC of ABS sensor check function:

| Code No. | Diagnosis | Trouble Area |
|------------|---|---|
| C1271 / 71 | Low output voltage of right front speed sensor | <ul style="list-style-type: none"> • Right front speed sensor • Sensor installation • Sensor rotor |
| C1272 / 72 | Low output voltage of left front speed sensor | <ul style="list-style-type: none"> • Left front speed sensor • Sensor installation • Sensor rotor |
| C1273 / 73 | Low output voltage of right rear speed sensor | <ul style="list-style-type: none"> • Right rear speed sensor • Sensor installation • Sensor rotor |
| C1274 / 74 | Low output voltage of left rear speed sensor | <ul style="list-style-type: none"> • Left rear speed sensor • Sensor installation • Sensor rotor |
| C1275 / 75 | Abnormal change in output voltage of right front speed sensor | Right front speed sensor rotor |
| C1276 / 76 | Abnormal change in output voltage of left front speed sensor | Left front speed sensor rotor |
| C1277 / 77 | Abnormal change in output voltage of right rear speed sensor | Right rear speed sensor rotor |
| C1278 / 78 | Abnormal change in output voltage of left rear speed sensor | Left rear speed sensor rotor |
| C1279 / 79 | Deceleration sensor is faulty | <ul style="list-style-type: none"> • Deceleration sensor • Sensor installation |
| C1281 / 81 | Master cylinder pressure sensor output signal is faulty | Master cylinder pressure sensor |

HINT:

Read the number of blinks of the ABS warning light.

DTC of VSC sensor check function:

| Code No. | Diagnosis | Trouble Area |
|------------|--|--|
| C0371 / 71 | Yaw rate sensor output signal malfunction | <ul style="list-style-type: none"> • Yaw rate sensor • Yaw rate sensor circuit |
| C1208 / 72 | Steering position sensor output signal malfunction | <ul style="list-style-type: none"> • Steering position sensor • Steering position sensor circuit |

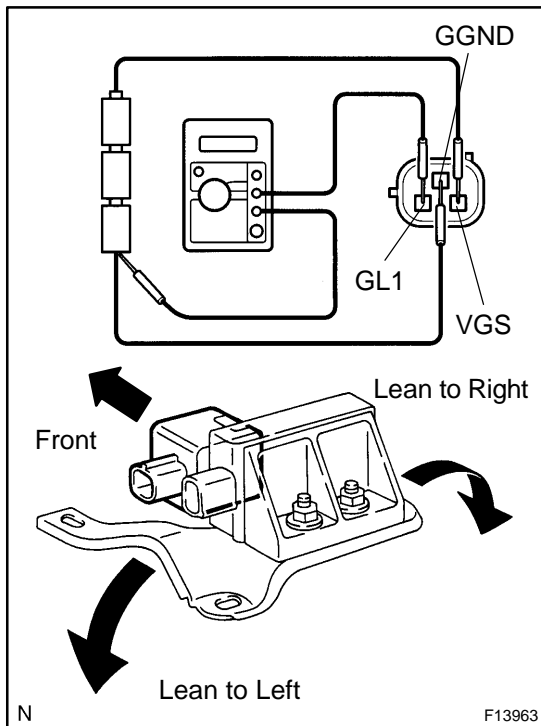
HINT:

Read the number of blinks of the VSC TRAC warning light.

4. DECELERATION SENSOR OPERATION DIAGNOSIS SYSTEM

CAUTION:

While checking the deceleration sensor operating diagnosis system, ABS does not work and brake system works as a conventional brake system.



5. DECELERATION SENSOR CHECK

- Connect 3 dry batteries of 1.5 V in series.
- Connect VGS terminal to the batteries' positive (+) terminal, and GGND terminal to the batteries' negative (-) terminal, apply about 4.5 V between VGS and GGND terminals.

NOTICE:

Do not apply voltage of 6 V or more to terminals VGS and GGND.

- Check the output voltage of GL1 terminal.

| Symbols | Condition | Standard Value |
|---------|---------------|---------------------|
| GL1 | Horizontal | About 2.3 V |
| GL1 | Lean to left | 0.4 V - about 2.3 V |
| GL1 | Lean to right | About 2.3 V - 4.1 V |

HINT:

- If the sensor is tilted too much it may show the wrong value.
- If dropped, the sensor should be replaced with a new one.
- The sensor removed from the vehicle should not be placed upside down.

- When replacing the deceleration sensor:
Perform the deceleration sensor zero point calibration.

6. IF NECESSARY, PERFORM ZERO POINT CALIBRATION OF STEERING ANGLE, MASTER CYLINDER PRESSURE, YAW RATE AND DECELERATION SENSORS

HINT:

- When having replacing the steering angle, master cylinder pressure yaw rate and deceleration sensors or/and the ECU, make sure to perform steering angle, master cylinder pressure, yaw rate and deceleration sensors zero point calibration.
- Zero point calibration is needed not only when replacing the VSC related parts, but also when replacing or repairing the steering related parts and when changing the vehicle's straight-ahead condition for toe adjustment.

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) When replacing the ECU:
Perform registration to a new ECU.

NOTICE:

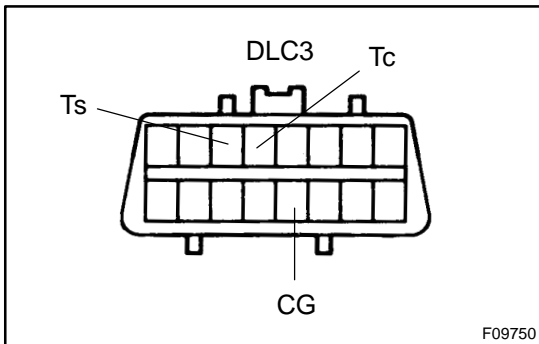
In case of replacing the skid control ECU on the 4WD vehicles, the registration for the 4WD vehicle to the ECU is necessary. If performing this registration on the 2WD vehicles by mistake, the registration cannot be put back for the 2WD vehicle.

- (1) In case of 2WD:
Nothing to do.
- (2) In case of 4WD:
After turning the ignition switch ON, with the shift lever in P position, move the transfer shift lever to L4 position.

HINT:

At this time, buzzer sounds for 3 seconds.

- (3) Turn the ignition switch OFF.



- (b) Perform steering angle, master cylinder pressure, yaw rate and deceleration sensors zero point calibration.
- (1) Using SST, connect terminals Ts and CG of DLC3.
SST 09843-18040
 - (2) Shift the shift lever to P position.
 - (3) Turn the ignition switch ON.
 - (4) Keep the vehicle in the stationary condition on the flat place for 4 sec. or more.
 - (5) After turning the steering wheel to an angle of 5 degrees or more, set it in the straight-ahead position and press the VSC OFF (TRAC OFF) switch 3 times within 3 sec.
 - (6) Check that the VSC buzzer sounds for 3 seconds.

HINT:

- If the VSC buzzer does not sound, do the zero point calibration again.
 - If the VSC buzzer does not sound, check the VSC buzzer circuit (See page [DI-332](#)).
 - When setting the steering wheel in the straight-ahead position, the tires shall be positioned within ± 0.4 degrees from the straight ahead.
- (7) Turn the ignition switch OFF.
 - (8) Disconnect terminals Ts and CG of DLC3.