

PRE-CHECK

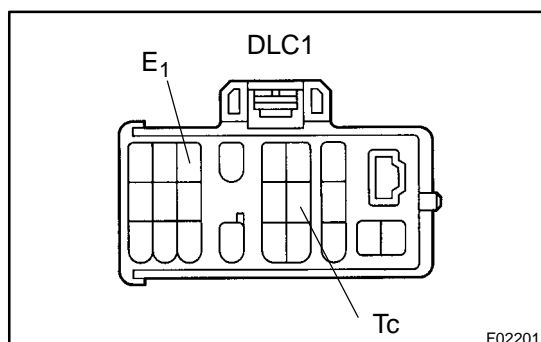
1. DIAGNOSIS SYSTEM

- (a) Inspect the battery positive voltage.
Battery positive voltage: 10 - 14 V
- (b) Check the warning lights and buzzer.
 - (1) Release the parking brake lever.
 - (2) When the ignition switch is ON, check that the ABS, BRAKE, VSC TRAC warning lights, VSC or TRAC OFF and SLIP indicator lights go on for 3 sec.
 - (3) 4WD:
Check that the center diff. lock indicator light and VSC OFF indicator light light up when the center diff. lock switch is pressed.
 - (4) Depressing the brake pedal repeatedly may light the warning light and sound the buzzer.

HINT:

- If the ECU stores DTC, ABS or VSC TRAC indicator light is ON.
- If the indicator check result is not normal, proceed to troubleshooting for the circuits of the ABS, BRAKE warning lights, VSC or TRAC OFF, SLIP, center diff. lock indicator lights.

Trouble Area	See page
ABS warning light circuit	DI-351
BRAKE warning light circuit	DI-365
VSC TRAC warning light circuit	DI-354
VSC OFF indicator light circuit (4WD)	DI-357
TRAC OFF indicator light circuit (2WD)	DI-360
SLIP indicator light circuit	DI-363
Center diff. lock indicator light circuit (4WD)	DI-357
VSC buzzer circuit	DI-367

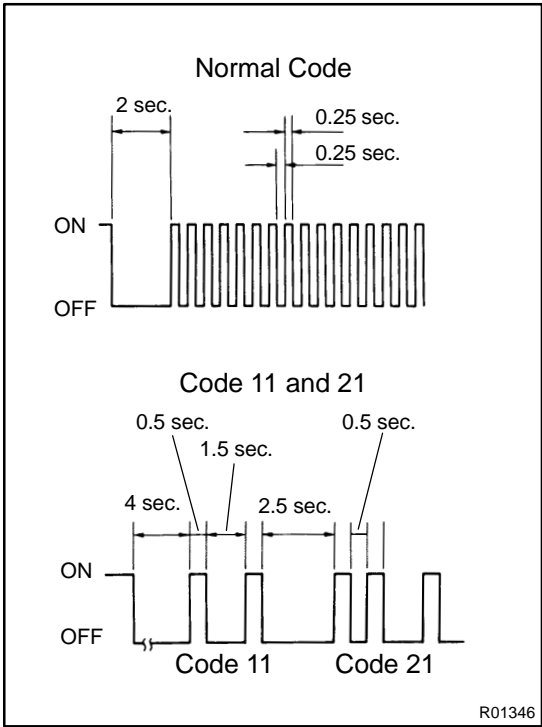


- (c) In case of not using the hand-held tester:
Check the DTC.
 - (1) Using SST, connect terminals Tc and E₁ of DLC1.
SST 09843-18020
 - (2) Turn the ignition switch ON.
 - (3) Read the DTC from the ABS or VSC TRAC warning lights on the combination meter.

HINT:

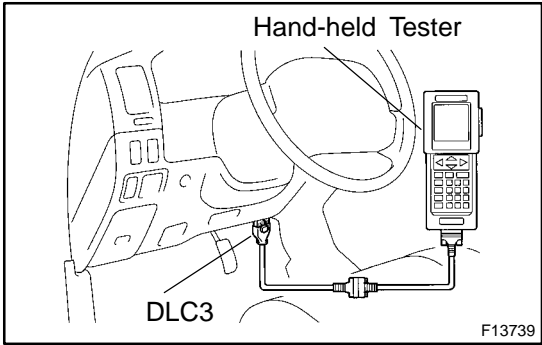
- If no code appears, inspect the diagnostic circuit, ABS or VSC TRAC warning light circuit.

Trouble Area	See page
Tc terminal circuit	DI-370
ABS warning light circuit	DI-351
VSC TRAC warning light circuit	DI-354



- 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-234](#).
- (5) After completing the check, disconnect terminals Tc and E₁ of DLC1, and turn off the display.

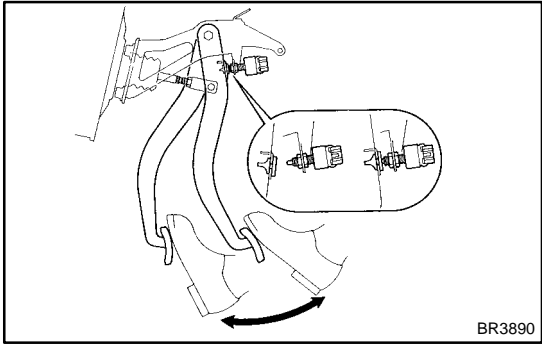
If 2 or more malfunctions are indicated at the same time, the lowest numbered DTC will be displayed 1st.



- (d) In case of using the hand-held tester:
Check the DTC.
- (1) Hook up the hand-held tester to DLC3.
 - (2) Turn the ignition switch ON.
 - (3) Read the DTC by following the prompts on the tester screen.

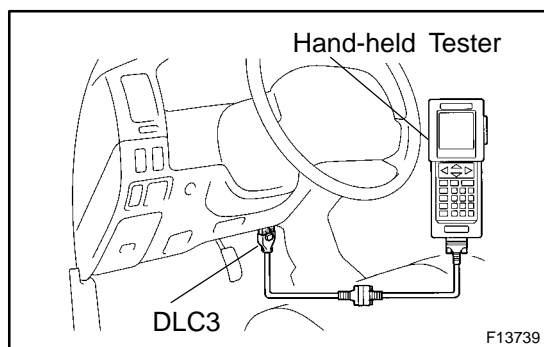
HINT:

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



- (e) In case of not using the hand-held tester:
Clear the DTC.
- (1) Using SST, connect terminals Tc and E₁ of DLC1. SST 09843-18020
 - (2) Turn the ignition switch ON.
 - (3) Clear the DTC stored in ECU by depressing the brake pedal 8 times or more within 5 sec.
 - (4) Check that the warning light shows the normal code blinking pattern.

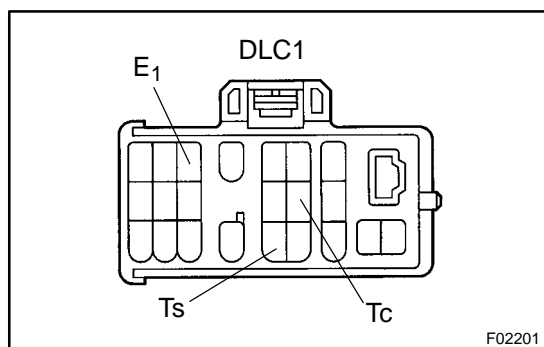
- (5) Remove the SST from terminals Tc and E₁ of DLC1.
SST 09843-18020



- (f) In case of using the hand-held tester:
Clear the DTC.
- (1) Hook up the hand-held tester to DLC3.
 - (2) Turn the ignition switch ON.
 - (3) Operate the hand-held tester to erase the codes.

HINT:

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

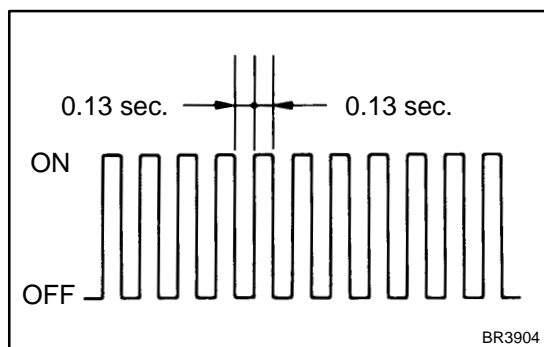


2. In case of not using the hand-held tester: ABS SENSOR SIGNAL CHECK (TEST MODE)

HINT:

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

- (a) Procedures for the test mode:
- (1) Turn the ignition switch OFF.
 - (2) Shift the shift lever to P range.
 - (3) Using SST, connect terminals Ts and E₁ of DLC1.
SST 09843-18020
 - (4) Check that the steering wheel is in the straight-ahead position.
 - (5) Turn the ignition switch ON.



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

HINT:

If the ABS warning light does not blink, inspect the ABS warning light circuit or the Ts terminal circuit.

Trouble Area	See page
Ts terminal circuit	DI-372
ABS warning light circuit	DI-351

- (b) Check the deceleration sensor.
Keep the vehicle in a stationary condition on a level place for 1 sec. or more.
- (c) Check the master cylinder pressure sensor.
Leaving the vehicle in a stationary condition and the brake pedal in free condition for 1 sec. or more, continue to depress the brake pedal with the force of 98 N (10 kgf, 22 lbf) or more for 1 sec. or more.

HINT:

At this time, the ABS warning light goes on for 3 sec.

- (d) 4WD:
Check the center diff. lock switch.
Turn the center diff. lock switch from OFF to ON and OFF again.
- (e) 4WD:
Check the L4 position switch.
(1) Shift the transfer lever to L4 position and turn the center diff. lock switch ON.
(2) Shift the transfer lever to H4 position.
- (f) Check the speed sensor signal.
Drive the vehicle straight forward.
Drive the vehicle with a speed faster than 45 km/h (28 mph) for several seconds. Check that the ABS warning light comes off.

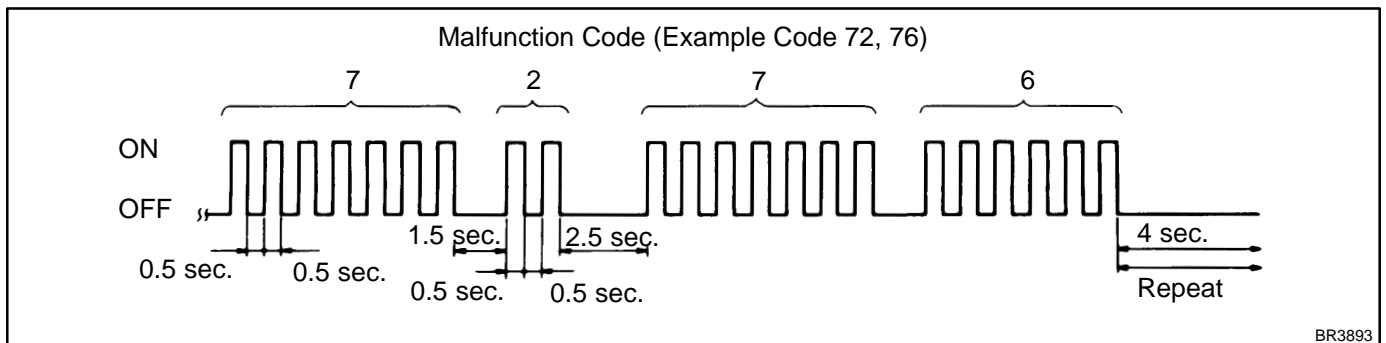
HINT:

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

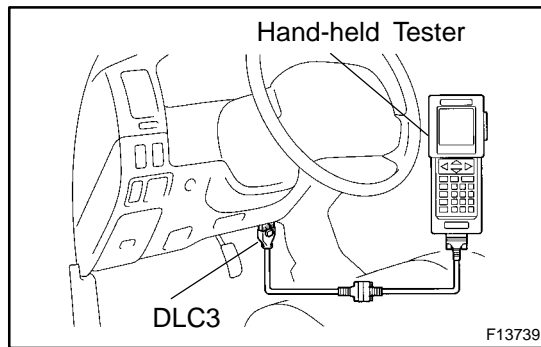
- (g) Stop the vehicle.
- (h) Using SST, connect terminals Tc and E₁ of DLC1.
SST 09843-18020
- (i) Read the number of blinks of the ABS warning light.

HINT:

- See the list of DTC on 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 number code will be displayed 1st.



- (j) After doing the check, disconnect SST from the terminals of DLC1 and turn the ignition switch OFF.
SST 09843-18020



**3. In case of using the hand-held tester:
ABS SENSOR SIGNAL CHECK (TEST MODE)**

- (a) Hook up the hand-held tester to DLC3.
- (b) Do step (b) - (g) on the previous page.
- (c) 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 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
C1282 / 82*	Transfer indicator (center diff. lock) switch malfunction	Transfer indicator (center diff. lock) switch
C1283 / 83*	Transfer L4 position switch malfunction	Transfer L4 position switch

*: 4WD

**4. In case of not using the hand-held tester:
VSC SENSOR SIGNAL CHECK (TEST MODE)**

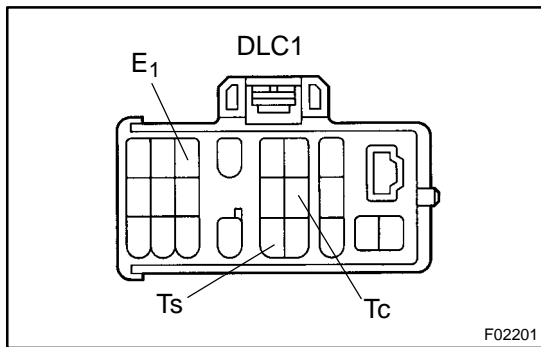
NOTICE:

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 7.).

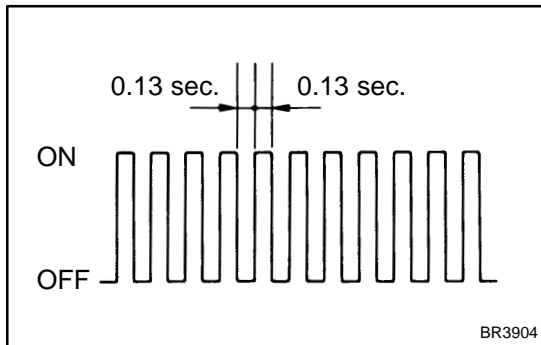
HINT:

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

- (a) Procedures for the test mode:
 - (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 E₁ of DLC1.
SST 09843-18020
- (4) Start the engine.



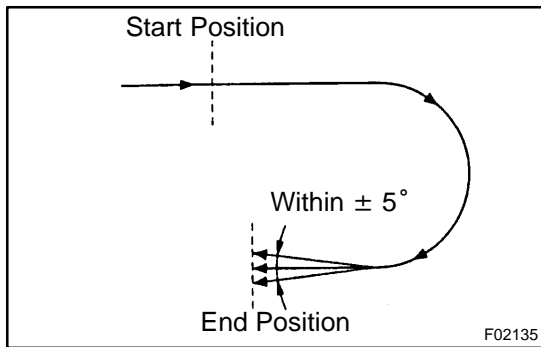
- (5) Check that the VSC TRAC warning light blinks.

HINT:

If the VSC TRAC warning light does not blink, inspect the VSC TRAC warning light circuit or the Ts terminal circuit.

Trouble Area	See page
Ts terminal circuit	DI-372
VSC TRAC warning light circuit	DI-354

- (b) 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.



- (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 wheel 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, then do the sensor check again.

Trouble Area	See page
VSC buzzer circuit	DI-367

- If the VSC buzzer still won't sound, there is malfunction in the VSC sensor, so check the DTC.

HINT:

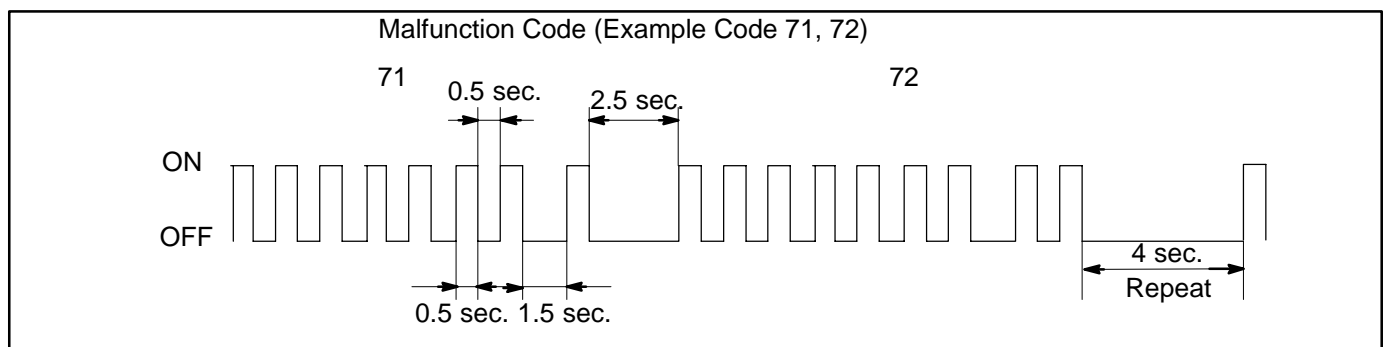
- Drive the vehicle circularly by 180° . At the end of the turn, the direction of the vehicle should be within $180^\circ \pm 5^\circ$ of its start position.
- Do not spin the wheels.

(d) Read the DTC.

- (1) Using SST, connect terminals Tc and E₁ of DLC1.
SST 09843-18020
- (2) Read the number of blinks of the VSC OFF indicator light.

HINT:

- See the list of DTC shown on 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.



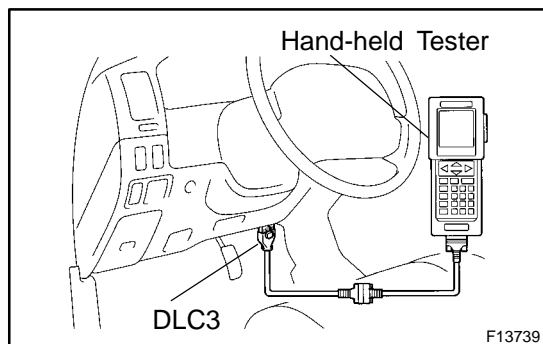
- (3) After doing the check, disconnect SST from terminals Ts and E₁ of DLC1 and turn the ignition switch OFF.

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**5. In case of using the hand-held tester:
VSC SENSOR SIGNAL 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 7.). Make sure that this operation should be done before starting the following is started.



- (a) Hook up the hand-held tester to DLC3.
- (b) Do steps (a)-(2), (a)-(4), (b) and (c) on the previous pages.
- (c) 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 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

6. DECELERATION SENSOR OPERATION DIAGNOSIS SYSTEM

CAUTION:

While the deceleration sensor operating diagnosis system is checked, ABS does not work.

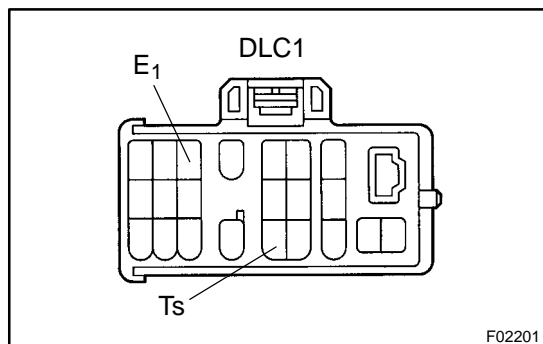
7. IF NECESSARY, YAW RATE SENSOR ZERO POINT CALIBRATION

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.
- This operation is also required when the deceleration sensor or yaw rate sensor has been replaced since the calibrated zero point of both sensors will be erased.

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 point 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 ignition switch ON, using SST, repeat a cycle of connect and disconnect between terminals Ts and E₁ of DLC1 4 times or more within 8 sec. Check that the VSC TRAC warning light is lit indicating the recorded zero point is erased.

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- (4) Turn the ignition switch OFF.
- (b) Obtain zero point of the yaw rate sensor.
 - (1) Make terminals Ts and E₁ of DLC1 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 TRAC warning light goes off about 15 sec. after the ignition switch is turned ON.

HINT:

Even if the ignition switch 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 TRAC warning light is lit for about 15 sec. and starts blinking. (Normal code)

- (4) After ensuring that the VSC warning light remains OFF for 2 sec., turn the ignition switch OFF.

HINT:

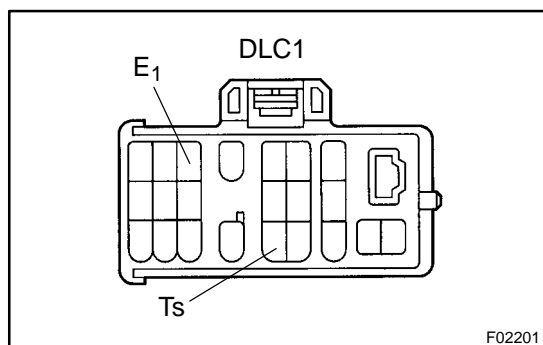
If the ignition switch is not turned OFF in step (a)-(4), make sure that the light blinks for 2 sec. and turn the ignition switch OFF.

- (c) Perform deceleration sensor zero point calibration.

NOTICE:

After step (b) (the yaw rate sensor zero point calibration), the VSC TRAC 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 terminals Ts and E₁ of DLC1.
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- (2) Turn the ignition switch ON.

HINT:

Make sure that the vehicle is in a stationary condition with the shift lever in P range.

- (3) After turning the ignition switch ON, check that the VSC TRAC warning light is lit for about 4 sec. and then starts quick blinking at 0.13 sec. intervals.

- (4) After making sure that the VSC TRAC warning light blinks for 2sec., turn the ignition switch OFF.
- (5) Remove SST and make terminals Ts and E₁ of DLC1 disconnected.