

CALIBRATION

1. VGRS SYSTEM CALIBRATION PROCEDURE (USING SST CHECK WIRE)

NOTICE:

Use this procedure to center the steering wheel position if:

- VGRS actuator has been replaced
- VGRS ECU has been replaced
- Steering column or gear has been disconnected
- Steering wheel is still off-center after completing the steering angle sensor initialization in step 6.

Actuator angle initialization:

1	Face the tires straight ahead.
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NOTICE:

Drive the vehicle to confirm steering wheel is centered.



2	Check for DTCs
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Is DTC C1515/15 output?

A	DTC C1515/15 is not output
B	DTC C1515/15 is output

B	Go to step 4
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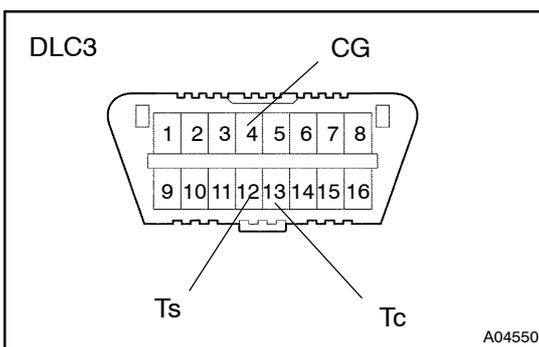


3	Actuator angle initialization
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NOTICE:

Complete steps (e) to (g) within 1 minute.

- Turn the ignition switch ON.
- Start the engine.
- Turn the steering wheel to the center.
- Using SST check wire, connect the terminals Ts and CG of DLC3.
- Connect and disconnect the SST check wire to the terminal Tc of DLC3 10 times or more within 20 sec.
- Turn the steering wheel to the left 180° or more and then return to the center position.
- Connect and disconnect the SST check wire to the terminal Tc of DLC3 10 times or more within 20 sec.



(h) Check that the VGRS warning light is ON.

HINT:

When the VGRS warning light illuminates, DTC 1515/15 is memorized.

- (i) Disconnect the SST check wire from the DLC3.
- (j) Turn the ignition switch OFF.

NEXT

Go to step 1

Steering angle adjustment:

4 Confirm steering center

Confirm that the steering wheel is centered when facing the tires straight ahead.

NOTICE:

Drive the vehicle to confirm steering wheels centered.

A	Steering wheel is off-center
B	Steering wheel is center

B

Go to step 8

A

5 Unlock the VGRS actuator

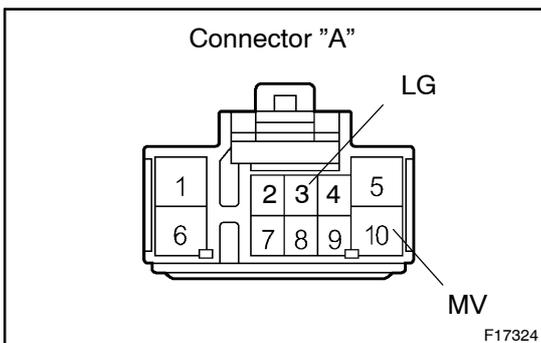
NOTICE:

Do not start the engine.

- (a) Turn the ignition switch OFF. (Engine stop)
- (b) Disconnect the negative battery terminal.
- (c) Disconnect the VGRS ECU connector "A".
- (d) Connect the jumper wire from terminal MV to Battery (+) and another jumper wire from terminal LG to ground(-).

NOTICE:

Do not apply the voltage for more than 3 minutes.



NEXT

LAND CRUISER (W/G) SUP (RM970E)

6 Steering center adjustment

(a) Turn the steering wheel to the center.

NOTICE:

If the spiral cable for the airbag is not centered when installing the steering wheel, adjust the spiral cable to the center (See page SR-19).

NEXT

7 Lock the VGRS actuator

- Confirm the ignition switch is turned OFF.
- Reconnect the VGRS ECU connector "A".
- Reconnect the battery terminal.
- Turn the steering wheel to the right and left by about 5 degrees and check that the steering wheel is level.

NOTICE:

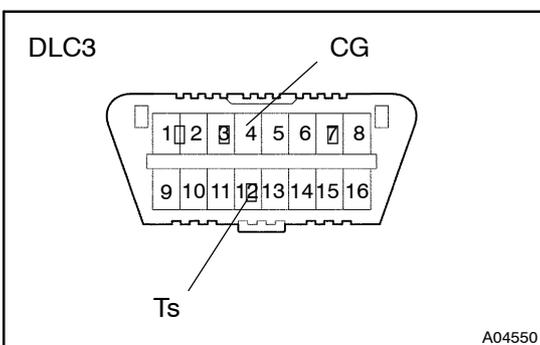
The DTC will be detected later on when not turning the steering wheel to the right and left by about 5 degrees.

NEXT

Go to step 1

Actuator angle adjustment:

8 Adjust the actuator angle



HINT:

Actuator angle adjustment is completed by turning the Test Mode ON and OFF.

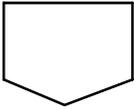
- Make sure the ignition switch is OFF.
- Using the SST check wire, connect the terminals Ts and CG of DLC3.
- Turn the ignition switch ON.
- Check that the VGRS warning light is blinking.
- Turn the ignition switch OFF and disconnect the SST check wire from the DLC3.
- Actuator angle sensor learning confirmation procedure:
 - Start the engine.
 - Turn the steering wheel from center to the left 90° and then back to center.
 - Turn the steering wheel from center to the right 90° and then back to center.
 - Confirm that the steering wheel is centered.

- (5) Hold the steering wheel in the centered position for 3 seconds.
- (6) Perform the following check procedure;
 - Turn the steering wheel slowly to the left.
 - While turning the steering wheel to the left, turn off the engine.
 - Continue to turn the steering wheel slowly to the left for 3 seconds.
- (7) Repeat steps (1) to (6) 15 times.

NOTICE:

DTC C1568/68 requires that the fault occurs 5 consecutive times to set. The confirmation procedure must be performed multiple times to ensure the condition does not repeat.

- (8) Recheck for DTCs
 - If C1568/68 is set, repeat the procedure for a second time. If C1568/68 is set again, replace the VGRS actuator.



END

2. VGRS SYSTEM CALIBRATION PROCEDURE (USING HAND-HELD TESTER)

- (a) Stop the vehicle and face the tires straight ahead.
- (b) Connect the hand-held tester to DLC3.
- (c) Turn the ignition switch ON.
- (d) Perform the steering angle adjust procedure from the VGRS menu.

Tester menu flow:

DIAGNOSTIC MENU
VGRS

- 1: DATA LIST
- 2: DTC INFO
- 5: STEERING ANG ADJ**
- 6: RECORDS CLEAR
- 7: SIGNAL CHECK
- 8: COUNTER CLEAR

[AUTO]

NOTICE

When executing STEERING ANGLE ADJUST, There can be no DTCs other than C1515, C1516, C1532 and C1568

PRESS[ENTER]

[ENTER]

NOTICE

CONFIRM:

- Vehicle on flat and level surface
- Tires pointed straight ahead
- Key ON, Engine OFF

PRESS[ENTER]

[ENTER]

STEERING ANG ADJ

When pressing [YES], the actuator lock will be disengaged. Do you wish to start adjustment?

PRESS[YES]or[NO]

[YES]

STEERING ANGLE ADJ

Please center the steering wheel.

When the steering wheel is centered press [ENTER] to proceed.

[ENTER]

NOTICE

- Hold steering wheel centered
- Turn IG SW OFF
- Wait 3 seconds
- Turn IG SW ON

PRESS [ENTER]

[ENTER]

NOTICE

Please turn the steering Wheel to the right and left by about 5 degrees and check that the steering wheel is level.

PRESS [ENTER]

[ENTER]

NOTICE

CONFIRM:

- Vehicle is stopped.
- IG SW is on.
- Engine is OFF.
- Steering wheel is neutral position and is fixed.

PRESS [ENTER]

[ENTER]

STEERING ANGLE ADJ
ECU:VGRS

* NOW PROCESSING *

TIME REMAINING:
2 SEC.

STEERING ANGLE ADJ

COMPLETED

Confirm VGRS Warning Lamp is OFF.

PRESS [ENTER]

- (e) Follow the tester prompts to complete procedure.
- (f) Confirm that the VGRS warning light OFF.
- (g) Turn the ignition switch OFF.
- (h) Disconnect the hand-held tester.
- (i) Confirm normal VGRS light operation.
- (j) Start the engine.
- (k) Turn the steering wheel from lock to lock to check that it rotates approximately 2.4 turns.
- (l) Actuator angle sensor learning confirmation procedure:
 - (1) Start the engine.
 - (2) Turn the steering wheel from center to the left 90° and then back to center.
 - (3) Turn the steering wheel from center to the right 90° and then back to center.
 - (4) Confirm that the steering wheel is centered.
 - (5) Hold the steering wheel in the centered position for 3 seconds.
 - (6) Perform the following check procedure;
 - Turn the steering wheel slowly to the left.
 - While turning the steering wheel to the left, turn off the engine.
 - Continue to turn the steering wheel slowly to the left for 3 seconds.
 - (7) Repeat steps (1) to (6) 15 times.

NOTICE:

DTC C1568/68 requires that the fault occurs 5 consecutive times to set. The confirmation procedure must be performed multiple times to ensure the condition does not repeat.

- (8) Recheck for DTCs
 - If C1568/68 is set, repeat the procedure for a second time. If C1568/68 is set again, replace the VGRS actuator.
- (m) Drive vehicle to confirm steering wheel is centered.