

ACCESSORIES & EQUIPMENT

Cruise Control System (Diagnostic Codes & Circuit Tests) - Sienna

CRUISE CONTROL SYSTEM

DTC P0500: VEHICLE SPEED SENSOR MALFUNCTION; DTC P0503: VEHICLE SPEED SENSOR "A" INTERMITTENT / ERRATIC / HIGH

DESCRIPTION

The cruise control system uses the same vehicle speed signal that is sent to the ECM for the SFI system. If DTC P0500 and P0503 are detected, perform the diagnosis using the inspection procedure for DTC P0500 and P0503 in the SFI system. The speed signal is converted for use by the cruise control inside the ECM. Both the SFI system and the cruise control system can set DTC P0500 and P0503, however, the detection conditions of the two systems are different.

DTC No.	DTC Detection Condition	Trouble Area
P0500	The vehicle speed signal from the vehicle speed sensor is cut for 0.14 seconds or more while cruise control is in operation	• Vehicle speed sensor • Vehicle speed sensor signal circuit • Combination meter assembly • ECM
P0503	Momentary interruption and noise trouble codes are detected when a rapid change of vehicle speed occurs while the cruise control is in operation.	• Vehicle speed sensor • Vehicle speed sensor signal circuit • Combination meter assembly • ECM

WIRING DIAGRAM

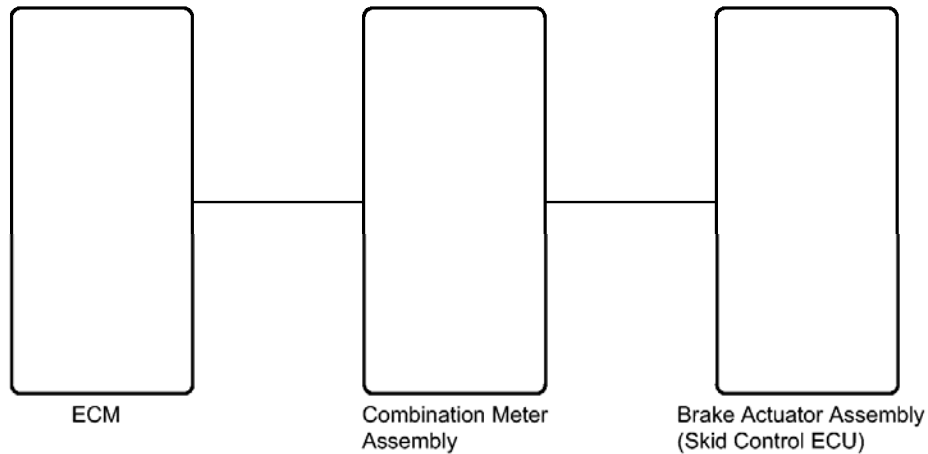


Fig. 1: Vehicle Speed Sensor Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

This DTC may be output by the vehicle stability control system at the same time. In that case, perform troubleshooting for the vehicle stability control system first.

PROCEDURE

1. **CHECK DTC (VEHICLE STABILITY CONTROL SYSTEM)**
 - a. Connect the Techstream to the DLC3.
 - b. Turn the ignition switch on (IG).
 - c. Turn the Techstream on.
 - d. Enter the following menus: Chassis / ABS/VSC/TRA / Trouble Codes.
 - e. Check for DTCs.

RESULT

Result	Proceed to
DTC is not output	A
DTC	

is output	B
--------------	---

B --> See step 4

A: Go to next step

2. REPLACE COMBINATION METER ASSEMBLY

- Replace the combination meter assembly. Refer to **REMOVAL** .

NEXT: Go to next step

3. CHECK DTC (CRUISE CONTROL SYSTEM)

- Clear the DTCs. Refer to **DTC CHECK / CLEAR** .
- Perform the following to make sure that the DTC detection conditions are met.

HINT:

If the detection conditions are not met, the malfunction cannot be detected.

- Drive the vehicle at a speed of 40 km/h (25 mph) or more.
 - Turn the cruise control main switch on.
 - Push the -SET switch to activate the cruise control.
- Check for DTCs. Refer to **DTC CHECK / CLEAR** .

RESULT

Result	Proceed to
DTC is not output	A
DTC is output (for 2GR-FE)	B
DTC is output (for 1AR-FE)	C

B --> See step 5

C --> See step 6

A --> END

4. **GO TO VEHICLE STABILITY CONTROL SYSTEM (DTC CHART). Refer to DIAGNOSTIC TROUBLE CODE CHART**
5. **REPLACE ECM (for 2GR-FE). Refer to REMOVAL**
6. **REPLACE ECM (for 1AR-FE). Refer to REMOVAL**

DTC P0571: BRAKE SWITCH "A" CIRCUIT

DESCRIPTION

When the brake pedal is depressed, the stop light switch sends a signal to the ECM. When the ECM receives this signal, it cancels the cruise control. The fail-safe function operates to enable normal driving even if there is a malfunction in the stop light signal circuit. The cancellation condition occurs when voltage is applied to terminal STP. When the brake is applied, voltage is normally applied to terminal STP of the ECM through the STOP SW fuse and the stop light switch, and the ECM turns the cruise control off.

DTC No.	DTC Detection Condition	Trouble Area
P0571	Voltage of STP terminal and that of ST1- terminal of ECM are less than 1 V for 0.5 seconds or more	• Stop light switch • Stop light switch circuit • ECM

WIRING DIAGRAM

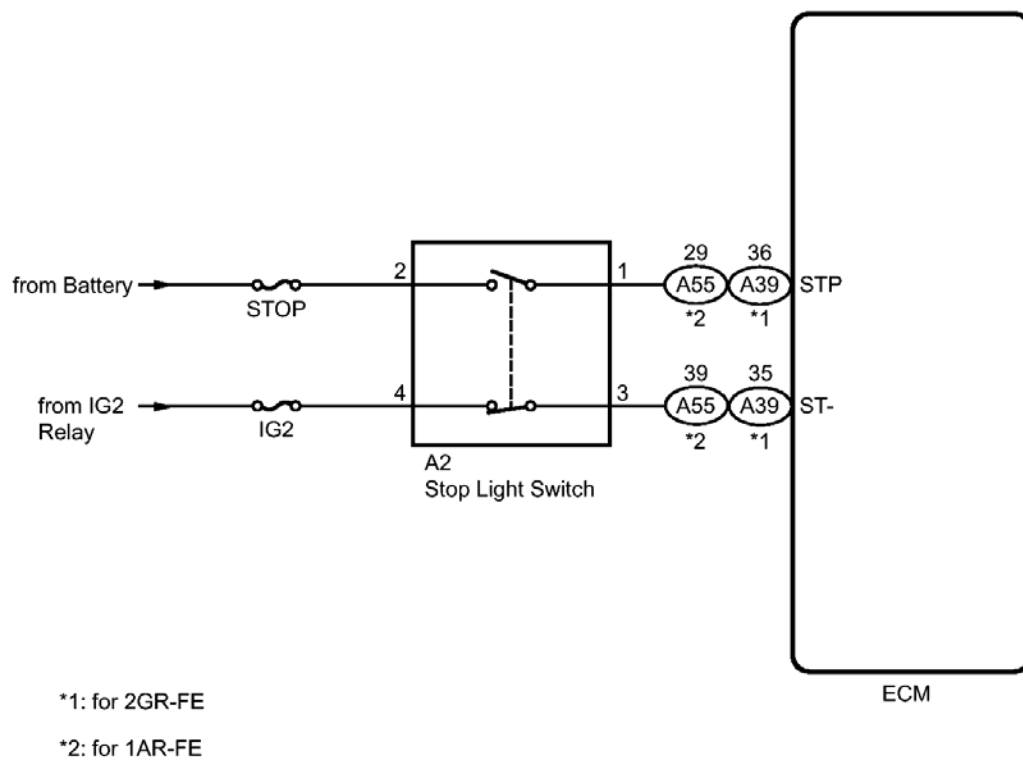


Fig. 2: Brake Switch "A" Circuit Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

NOTE: Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1. **CHECK HARNESS AND CONNECTOR (STOP LIGHT SWITCH - BATTERY)**
 - a. Disconnect the stop light switch connector.

*a

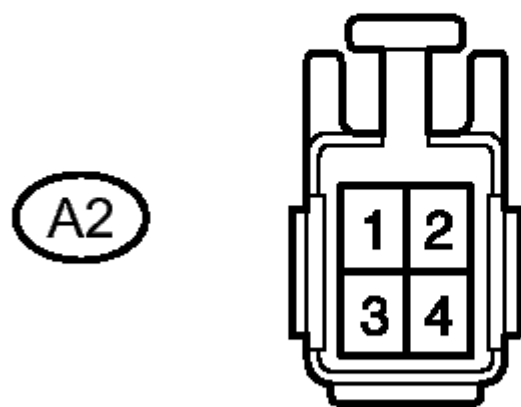


Fig. 3: Measuring Voltage Of Stop Light Switch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Measure the voltage according to the value(s) in the table below.

Standard Voltage

Tester Connection	Switch Condition	Specified Condition
A2-2 - Body ground	Always	11 to 14 V
A2-4 - Body ground	Ignition switch ON	11 to 14 V

TEXT IN ILLUSTRATION

*a	Front view of wire harness connector (to Stop Light Switch)
----	--

- c. Reconnect the stop light switch connector.

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

2. INSPECT STOP LIGHT SWITCH

- a. Remove the stop light switch. Refer to **REMOVAL** .

*a

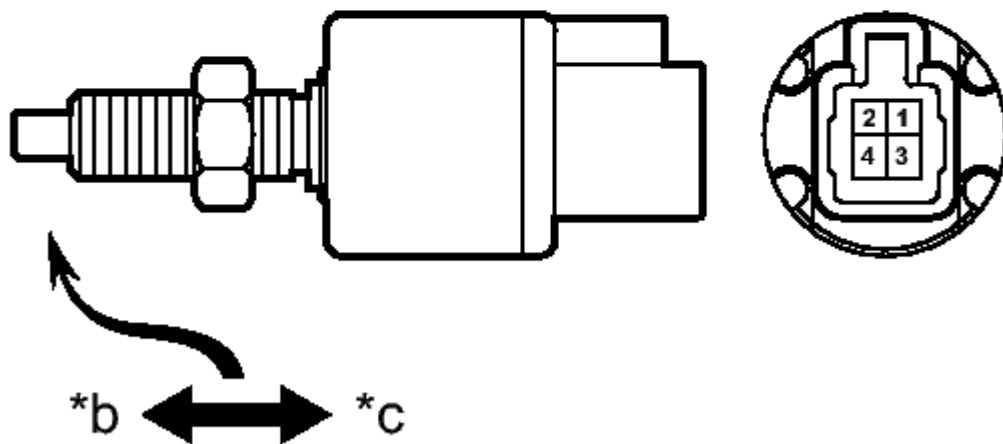


Fig. 4: Inspecting Stop Light Switch

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Switch Condition	Specified Condition
1 - 2	Switch pin not pushed	Below 1 ohms
3 - 4	Switch pin not pushed	10 kohms or higher
	Switch	

1 - 2	pin pushed	10 kohms or higher
3 - 4	Switch pin pushed	Below 1 ohms

TEXT IN ILLUSTRATION

*a	Component without harness connected (Stop Light Switch)
*b	Free
*c	Pushed in

- c. Install the stop light switch. Refer to INSTALLATION .

NG --> See step 7

OK: Go to next step

3. SYSTEM CHECK

- a. Check the vehicle specifications.

RESULT

Result	Proceed to
for 2GR- FE engine	A
for 1AR- FE engine	B

B --> See step 5

A: Go to next step

4. INSPECT ECM

- a. Disconnect the ECM connector.

*a

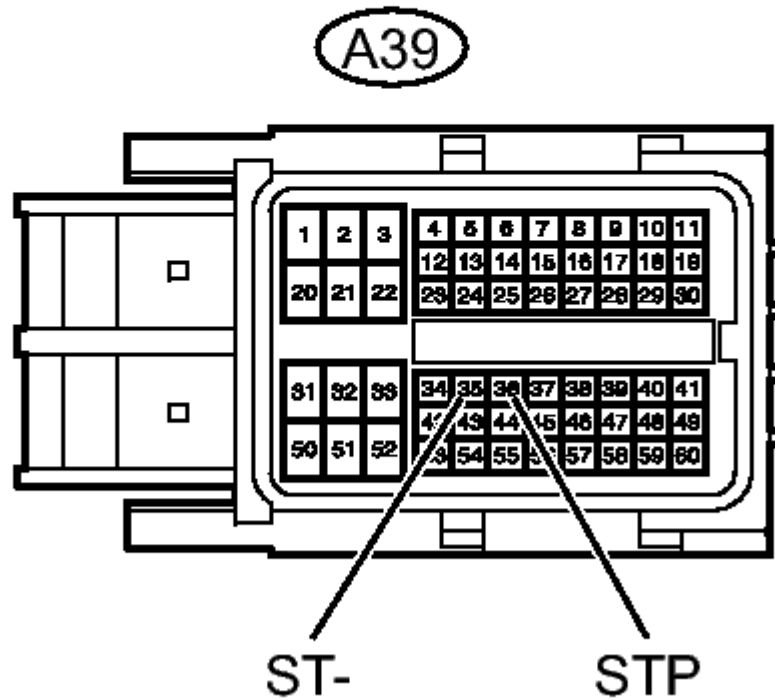


Fig. 5: Measuring Voltage Of ECM
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Turn the ignition switch to ON.
- c. Measure the voltage according to the value(s) in the table below.

Standard Voltage

Tester Connection	Condition	Specified Condition
A39-36 (STP) - Body ground	Brake pedal depressed	11 to 14 V
A39-36	Brake	

(STP) - Body ground	pedal released	Below 1 V
A39-35 (ST-) - Body ground	Brake pedal depressed	Below 1 V
A39-35 (ST-) - Body ground	Brake pedal released	11 to 14 V

TEXT IN ILLUSTRATION

*a	Front view of wire harness connector (to ECM)
----	--

- d. Reconnect the ECM connector.

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR (STOP LIGHT SWITCH - ECM)

OK --> See step 6

5. INSPECT ECM

- a. Disconnect the ECM connector.

*a

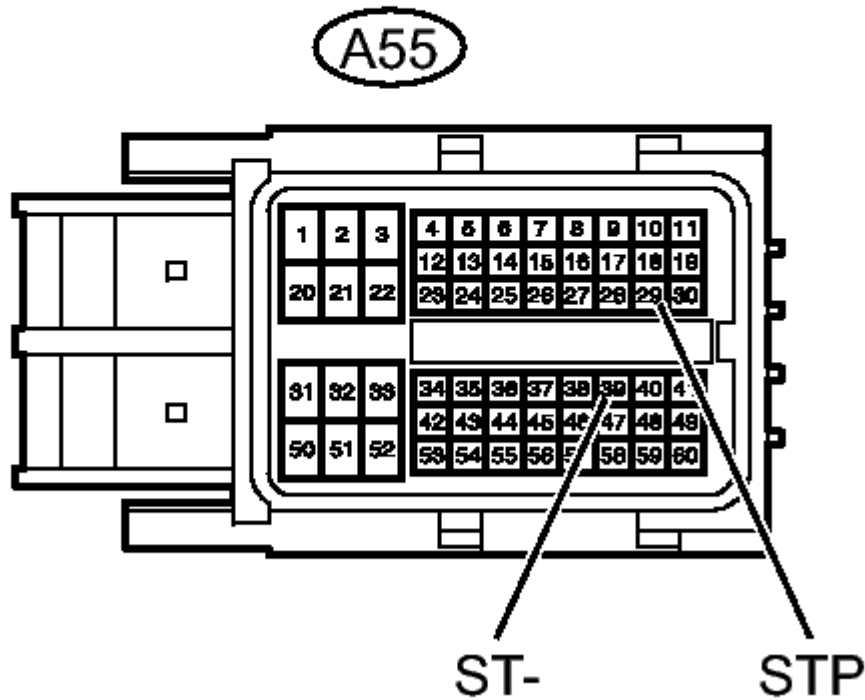


Fig. 6: Measuring Voltage Of ECM
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Turn the ignition switch to ON.
- c. Measure the voltage according to the value(s) in the table below.

Standard Voltage

Tester Connection	Condition	Specified Condition
A55-29 (STP) - Body ground	Brake pedal depressed	11 to 14 V
A55-29	Brake	

(STP) - Body ground	pedal released	Below 1 V
A55-39 (ST-) - Body ground	Brake pedal depressed	Below 1 V
A55-39 (ST-) - Body ground	Brake pedal released	11 to 14 V

TEXT IN ILLUSTRATION

*a	Front view of wire harness connector (to ECM)
----	--

d. Reconnect the ECM connector.

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR (STOP LIGHT SWITCH - ECM)

OK --> See step 6

6. REPLACE ECM. Refer to REMOVAL

7. REPLACE STOP LIGHT SWITCH. Refer to REMOVAL

DTC P0575: CRUISE CONTROL INPUT CIRCUIT

DESCRIPTION

This DTC indicates an internal malfunction in the ECM.

DTC No.	DTC Detection Condition	Trouble Area
P0575	When both of the following conditions are met: - STP signals input to the ECM supervisory CPU and control ECU are different for 0.15 seconds or more 0.4 seconds have passed after cruise cancel input signal (STP input) is input to the ECM	ECM

HINT:

The ECM receives signals from each sensor to control all functions of the cruise control system. When a trouble code is detected, the fail-safe function remains on until the ignition switch is turned off.

INSPECTION PROCEDURE

PROCEDURE

1. SYSTEM CHECK

- a. Check the vehicle specification.

RESULT

Result	Proceed to
for 2GR-FE engine	A
for 1AR-FE engine	B

B --> See step 3

A: Go to next step

2. REPLACE ECM

- a. Replace the ECM. Refer to **REMOVAL** .

NEXT --> END

3. REPLACE ECM

- a. Replace the ECM. Refer to **REMOVAL** .

NEXT --> END

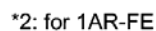
CIRCUIT TESTS

Cruise Control Switch Circuit

DESCRIPTION

The cruise control main switch operates 7 functions: SET, - (COAST), TAP-DOWN, RES (RESUME), + (ACCEL), TAP-UP, and CANCEL. The SET, TAP-DOWN, and - (COAST) functions, and the RES (RESUME), TAP-UP, and + (ACCEL) functions are operated with the same switch. The cruise control main switch is an automatic return type switch which turns on only while operating it in the direction of each arrow and turns off after releasing it. The internal contact point of the cruise control main switch is turned on with the

WIRING DIAGRAM

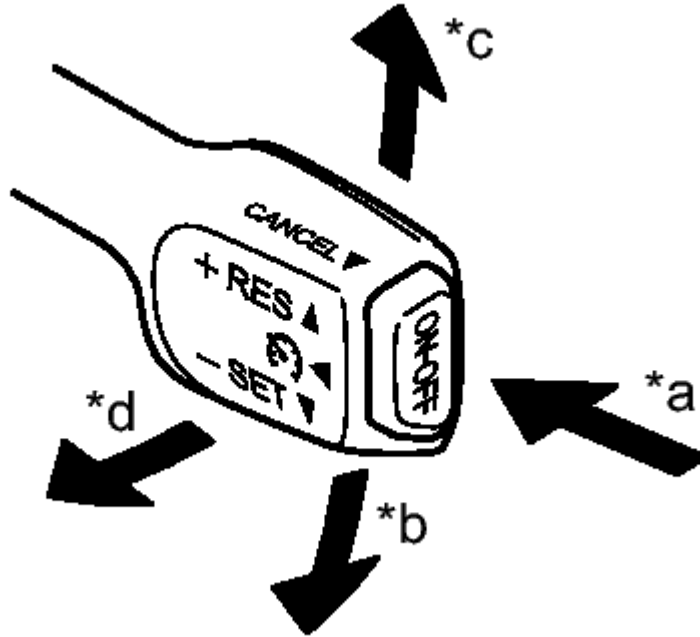


INSPECTION PROCEDURE

1. READ VALUE USING TECHSTREAM

- ## TEXT IN ILLUSTRATION

*a	ON/OFF
*b	- SET
*c	+ RES
*d	CANCEL



H

Fig. 8: Checking Proper Functioning Of The Cruise Control Main Switch
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Enter the following menus: Powertrain / Cruise Control / Data List.
- e. Check the Data List for proper functioning of the cruise control main switch.

CRUISE CONTROL (ECM)

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Main SW M-CPU	Main switch signal (Main CPU)/ON or OFF	ON: Main switch depressed OFF: Main switch released	-
Cancel Switch	CANCEL switch signal/ON or OFF	ON: While switch is being operated OFF: Switch not operated	-

SET/COAST Switch	SET/COAST switch signal/ON or OFF	ON: While switch is being operated OFF: Switch not operated	-
RES/ACC Switch	RES/ACC switch signal/ON or OFF	ON: While switch is being operated OFF: Switch not operated	-

OK

When the cruise control main switch is operated, the display changes as shown above.

RESULT

Result	Proceed to
OK	A
NG (All items are defective)	B
NG (1 to 3 items are defective)	C

B --> See step 2

C --> See step 9

A --> See step 8

2. INSPECT CRUISE CONTROL MAIN SWITCH

- Remove the cruise control main switch. Refer to **REMOVAL** .

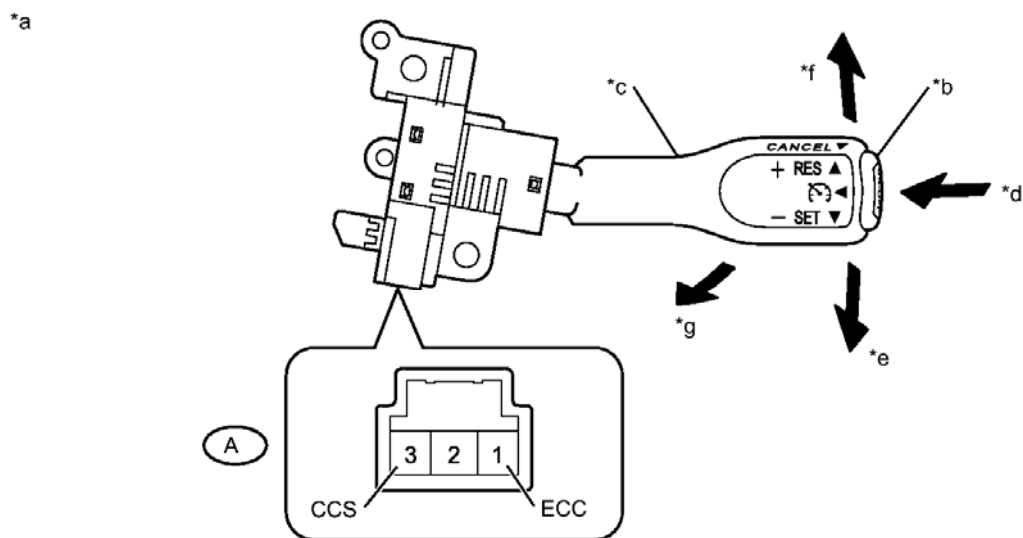


Fig. 9: Inspecting Cruise Control Main Switch
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Component without harness connected (Cruise Control Main Switch)	*b	Main Switch
*c	Lever	*d	ON/OFF
*e	- SET	*f	+ RES
*g	CANCEL	-	-

- b. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Switch Condition	Specified Condition
A-1 (ECC) - A-3 (CCS)	Main switch off*1	1 Mohms or higher
	Main switch on	Below 2.5 ohms
	+ RES	235 to 245 ohms

	- SET	617 to 643 ohms
	CANCEL	1509 to 1571 ohms

*1: The lever is in the neutral position.

- c. Install the cruise control main switch. Refer to **INSTALLATION** .

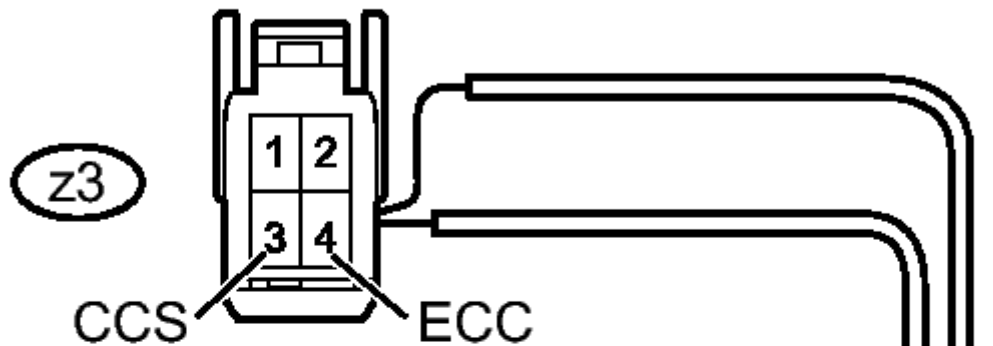
NG --> See step 9

OK: Go to next step

3. CHECK HARNESS AND CONNECTOR (CRUISE CONTROL MAIN SWITCH - SPIRAL CABLE SUB-ASSEMBLY)

- a. Disconnect the connector from the spiral cable sub-assembly.

*a



*b

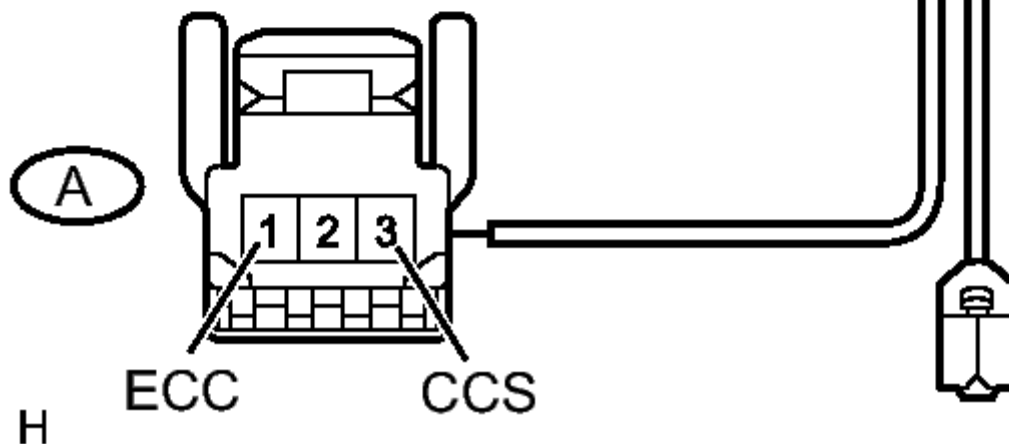


Fig. 10: Checking Harness And Connector (Cruise Control Main Switch - Spiral Cable Sub-Assembly)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the connector from the cruise control main switch.

- c. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
A-3 (CCS) - z3-3 (CCS)	Always	Below 1 ohms
A-1 (ECC) - z3-4 (ECC)	Always	Below 1 ohms

TEXT IN ILLUSTRATION

*a	Front view of wire harness connector (to Spiral Cable Sub-assembly)
*b	Front view of wire harness connector (to Cruise Control Main Switch)

- d. Reconnect the connector from the cruise control main switch.
e. Reconnect the connector from the spiral cable sub-assembly.

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

4. INSPECT SPIRAL CABLE SUB-ASSEMBLY

NOTE: The spiral cable sub-assembly is an important part of the SRS airbag system. Incorrect removal or installation of the spiral cable sub-assembly may cause airbag deployment. Be sure to read the information shown in the brackets.

- a. Remove the spiral cable sub-assembly. Refer to **REMOVAL** .

*a

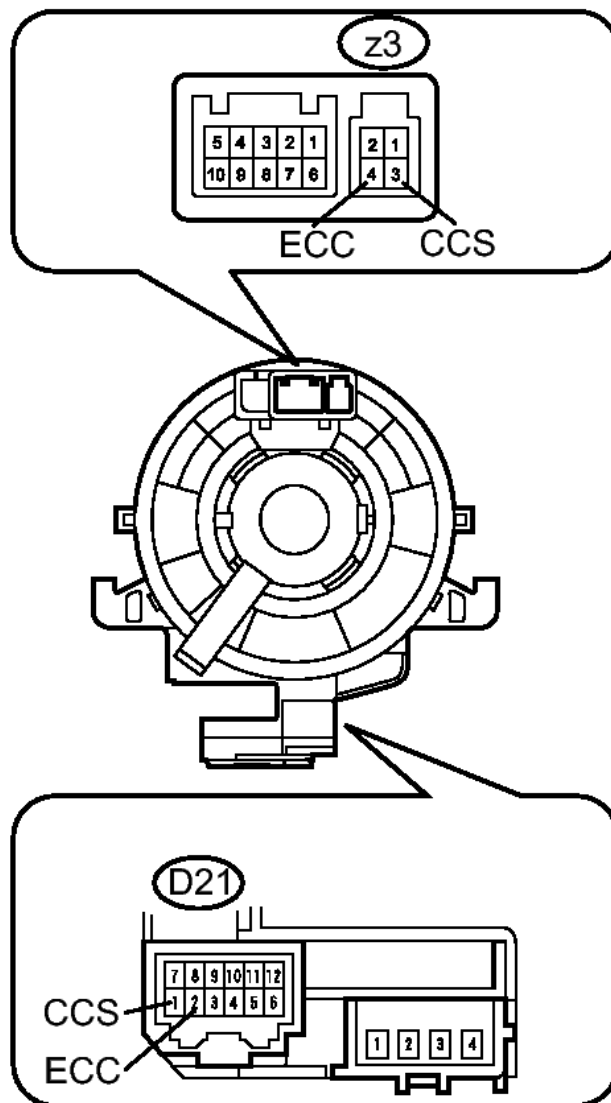


Fig. 11: Inspecting Spiral Cable Sub-Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
z3-3 (CCS) - D21-1 (CCS)	The spiral cable sub-assembly position is center	Below 1 ohms
	The spiral cable sub-assembly position is 2.5 rotations to the left	
	The spiral cable sub-assembly position is 2.5 rotations to the right	
z3-4 (ECC) - D21-2 (ECC)	The spiral cable sub-assembly position is center	Below 1 ohms
	The spiral cable sub-assembly position is 2.5 rotations to the left	
	The spiral cable sub-assembly position is 2.5 rotations to the right	

TEXT IN ILLUSTRATION

	Component without harness
*a	connected: (Spiral Cable Sub- assembly)

HINT:

The spiral cable sub-assembly makes a maximum of approximately 5 rotations.

- c. Install the spiral cable sub-assembly. Refer to **INSTALLATION** .

NG --> See step 10

OK: Go to next step

5. SYSTEM CHECK

- a. Check the vehicle specifications.

RESULT

Result	Proceed to
for 2GR- FE engine	A
for 1AR- FE engine	B

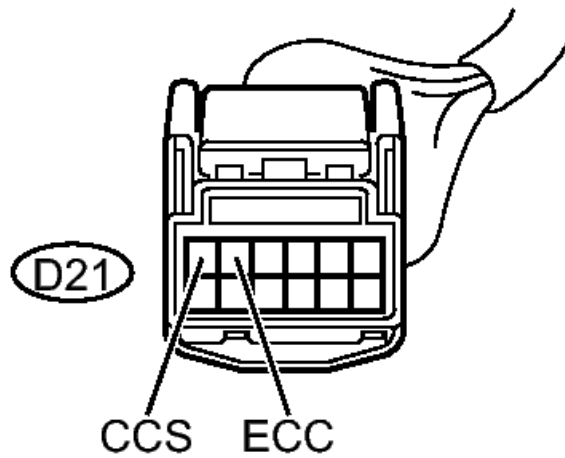
B --> See step 7

A: Go to next step

6. CHECK HARNESS AND CONNECTOR (SPIRAL CABLE - ECM AND BODY GROUND)

- a. Disconnect the ECM connector.

*a



*b

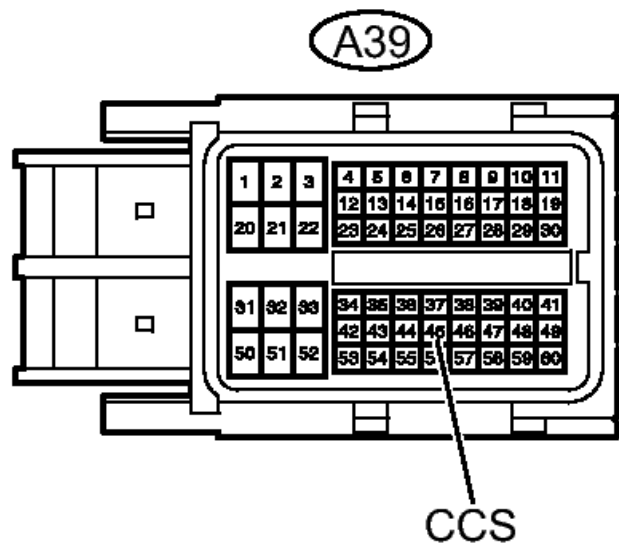


Fig. 12: Checking Harness And Connector (Spiral Cable - ECM And Body Ground)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the spiral cable sub-assembly connector.
- c. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
D21-1 (CCS) - A39-45 (CCS)	Always	Below 1 ohms
A39-45 (CCS) - Body ground	Always	10 kohms or higher
D21-2 (ECC) - Body ground	Always	Below 1 ohms

TEXT IN ILLUSTRATION

*a	Front view of wire harness connector (to Spiral Cable Sub-assembly)
*b	Front view of wire harness connector (to ECM)

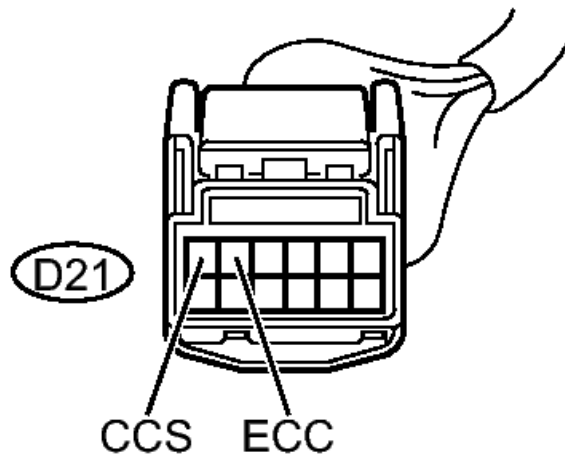
- d. Reconnect the spiral cable sub-assembly connector.
- e. Reconnect the ECM connector.

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK --> See step 11

7. **CHECK HARNESS AND CONNECTOR (SPIRAL CABLE - ECM AND BODY GROUND)**
 - a. Disconnect the ECM connector.

*a



*b

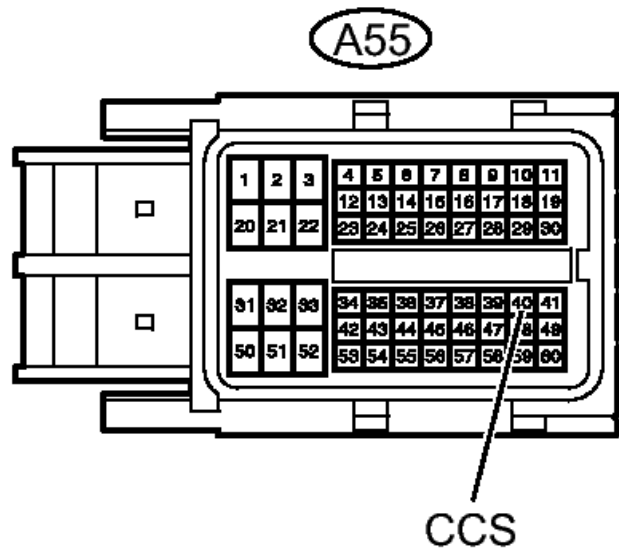


Fig. 13: Checking Harness And Connector (Spiral Cable - ECM And Body Ground)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the spiral cable sub-assembly connector.
- c. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
D21-1 (CCS) - A55-40 (CCS)	Always	Below 1 ohms
A55-40 (CCS) - Body ground	Always	10 kohms or higher
D21-2 (ECC) - Body ground	Always	Below 1 ohms

TEXT IN ILLUSTRATION

*a	Front view of wire harness connector (to Spiral Cable Sub-assembly)
*b	Front view of wire harness connector (to ECM)

- d. Reconnect the spiral cable sub-assembly connector.
- e. Reconnect the ECM connector.

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK --> See step 11

8. **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE. Refer to PROBLEM SYMPTOMS TABLE**
9. **REPLACE CRUISE CONTROL MAIN SWITCH. Refer to REMOVAL**
10. **REPLACE SPIRAL CABLE SUB-ASSEMBLY. Refer to REMOVAL**

11. REPLACE ECM. Refer to REMOVAL

Cruise Main Indicator Light Circuit

DESCRIPTION

- The ECM detects a cruise control switch signal and sends it to the combination meter through CAN. Then the cruise main indicator light comes on.
- The cruise main indicator light circuit uses CAN for communication. If there is a malfunction in this circuit, check for DTCs in the CAN communication system before troubleshooting this circuit.

INSPECTION PROCEDURE

PROCEDURE

1. PERFORM ACTIVE TEST USING TECHSTREAM

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Body Electrical / Combination Meter / Active Test.
- Check the cruise main indicator light by performing the Active Test.

COMBINATION METER

Tester Display	Test Part	Control Range	Diagnostic Note
Indicat. Lamp Cruise	Cruise main indicator light	OFF or ON	Operate with IG ON and the vehicle is stopped

OK

Cruise main indicator light blinks/goes off.

NG --> See step 4

OK: Go to next step

2. READ VALUE USING TECHSTREAM

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Powertrain / Cruise Control / Data List.

- e. Check the Data List for proper functioning of the cruise main indicator light.

CRUISE CONTROL (ECM)

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
CCS Indicator M-CPU	Cruise indicator signal (Main CPU)/ON or OFF	ON: Cruise main indicator light on OFF: Cruise main indicator light off	-

OK

When the cruise control main switch is operated, the display changes as shown above.

Result

Result	Proceed to
OK	A
NG (for 2GR-FE)	B
NG (for 1AR-FE)	C

B --> See step 5

C --> See step 6

A --> See step 3

3. **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE. Refer to PROBLEM SYMPTOMS TABLE**
4. **REPLACE COMBINATION METER ASSEMBLY. Refer to REMOVAL**
5. **REPLACE ECM. Refer to REMOVAL**
6. **REPLACE ECM. Refer to REMOVAL**

Cruise SET Indicator Light Circuit

DESCRIPTION

- When the ECM detects a cruise control switch on signal from the cruise control switch, it sends it to the combination meter assembly through CAN communication. Then the cruise control SET indicator light turns on.
- The cruise control SET indicator light circuit uses CAN communication. If there is a malfunction in this circuit, check for DTCs in the CAN communication system before troubleshooting this circuit.

INSPECTION PROCEDURE

PROCEDURE

1. PERFORM ACTIVE TEST USING TECHSTREAM

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Enter the following menus: Body Electrical / Combination Meter / Active Test.
- e. Check the cruise indicator light by performing the Active Test.

COMBINATION METER

Tester Display	Test Part	Control Range	Diagnostic Note
Indicat. SET	Cruise control SET indicator light	OFF or ON	Operate with IG ON and the vehicle is stopped

OK

Cruise control SET indicator light turns on/off.

NG --> See step 3

OK: Go to next step

2. READ VALUE USING TECHSTREAM

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Enter the following menus: Powertrain / Radar Cruise / Data List.
- e. Check the Data List for proper functioning of the Cruise control SET indicator light.

CRUISE CONTROL

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
SET/COAST Switch	-SET switch signal / ON or OFF	ON: While switch is being operated OFF: Switch not operated	-

OK

On screen, item changes between ON and OFF according to above chart.

Result

Result	Proceed to
OK	A
NG (for 2GR-FE)	B
NG (for 1AR-FE)	C

B --> See step 5

C --> See step 6

A --> See step 4

- 3. GO TO METER / GAUGE SYSTEM. Refer to PROBLEM SYMPTOMS TABLE**
- 4. PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE. Refer to PROBLEM SYMPTOMS TABLE**
- 5. REPLACE ECM. Refer to REMOVAL**
- 6. REPLACE ECM. Refer to REMOVAL**

TC and CG Terminal Circuit

DESCRIPTION

Connecting terminals TC and CG of the DLC3 causes the system to enter self-diagnostic mode. If a malfunction is present, the MIL will blink.

HINT:

When a particular warning light remains blinking, a ground short in the wiring of terminal TC of the DLC3 or an internal ground short in the relevant ECU is suspected.

WIRING DIAGRAM

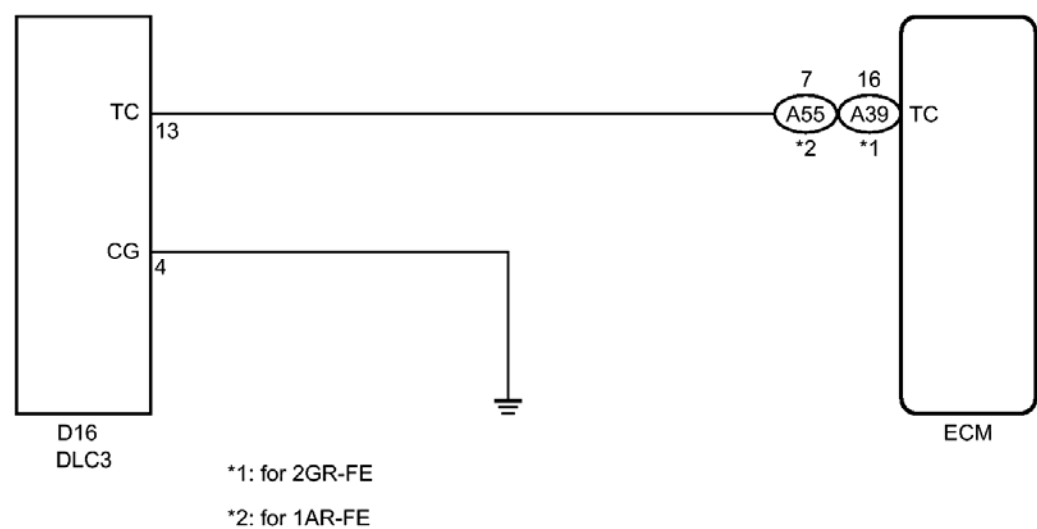


Fig. 14: TC And CG Terminal Circuit Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

PROCEDURE

- 1. **SYSTEM CHECK**
 - a. Check the vehicle specifications.

RESULT

Result	Proceed to
for 2GR-FE engine	A
for 1AR-FE	B

engine

B --> See step 3

A: Go to next step

2. CHECK HARNESS AND CONNECTOR (TERMINAL TC of DLC3 - ECM)

- a. Disconnect the ECM connector.
- b. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
A39-16 (TC) - D16-13 (TC)	Always	Below 1 ohms

- c. Reconnect the ECM connector.

RESULT

Result	Proceed to
NG	A
OK	B

B --> See step 4

A --> REPAIR OR REPLACE HARNESS OR CONNECTOR

3. CHECK HARNESS AND CONNECTOR (TERMINAL TC of DLC3 - ECM)

- a. Disconnect the ECM connector.
- b. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
A55-7 (TC) - D16-13 (TC)	Always	Below 1 ohms

- c. Reconnect the ECM connector.

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

4. **CHECK HARNESS AND CONNECTOR (TERMINAL CG of DLC3 - BODY GROUND)**
 - a. Measure the resistance according to the value(s) in the table below.

*a

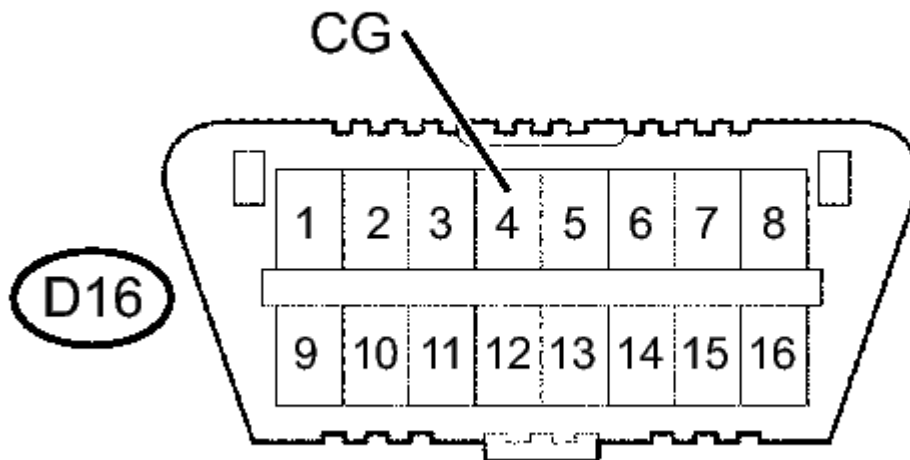


Fig. 15: Checking Harness And Connector (Terminal CG Of DLC3 - Body Ground)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard Resistance

Tester Connection	Condition	Specified Condition
D16-4 (CG) - Body ground	Always	Below 1 ohms

TEXT IN ILLUSTRATION

*a DLC3

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

5. **CHECK HARNESS AND CONNECTOR (TERMINAL TC of DLC3 - BODY GROUND)**

- a. Measure the resistance according to the value(s) in the table below.

***a**

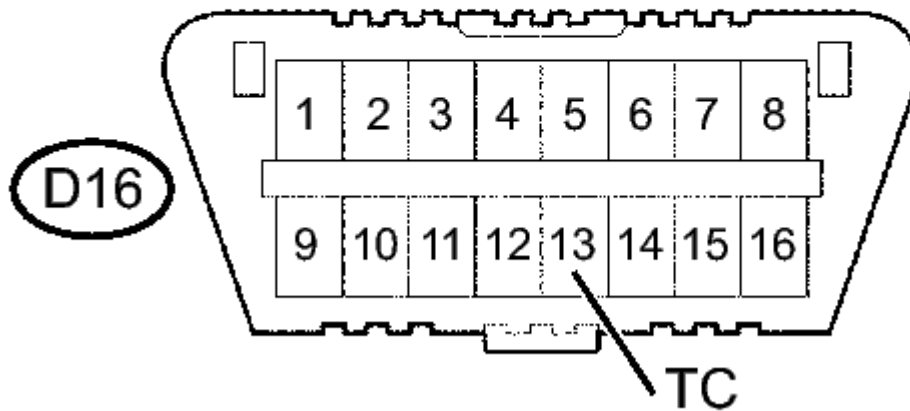


Fig. 16: Checking Harness And Connector (Terminal TC Of DLC3 - Body Ground)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard Resistance

Tester Connection	Condition	Specified Condition
D16-13 (TC) - Body ground	Always	10 kohms or higher

TEXT IN ILLUSTRATION

***a** DLC3

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR OR EACH ECU

OK --> See step 6

6. **PROCEED TO NEXT SUSPECTED AREA SHOWN IN PROBLEM SYMPTOMS TABLE. Refer to PROBLEM SYMPTOMS TABLE**

ACCESSORIES & EQUIPMENT

Cruise Control System (Diagnostics - Introduction) - Sienna

CRUISE CONTROL SYSTEM

PRECAUTION

PRECAUTION

1. IGNITION SWITCH EXPRESSIONS

- a. The type of ignition switch used on this model differs according to the specifications of the vehicle. The expressions listed in the table below are used in this information.

Expression	Ignition Switch (Position)	Engine Switch (Condition)
Ignition Switch off	Lock	Off
Ignition Switch ON	ON	On (IG)
Ignition Switch ACC	ACC	On (ACC)
Engine Start	START	Start

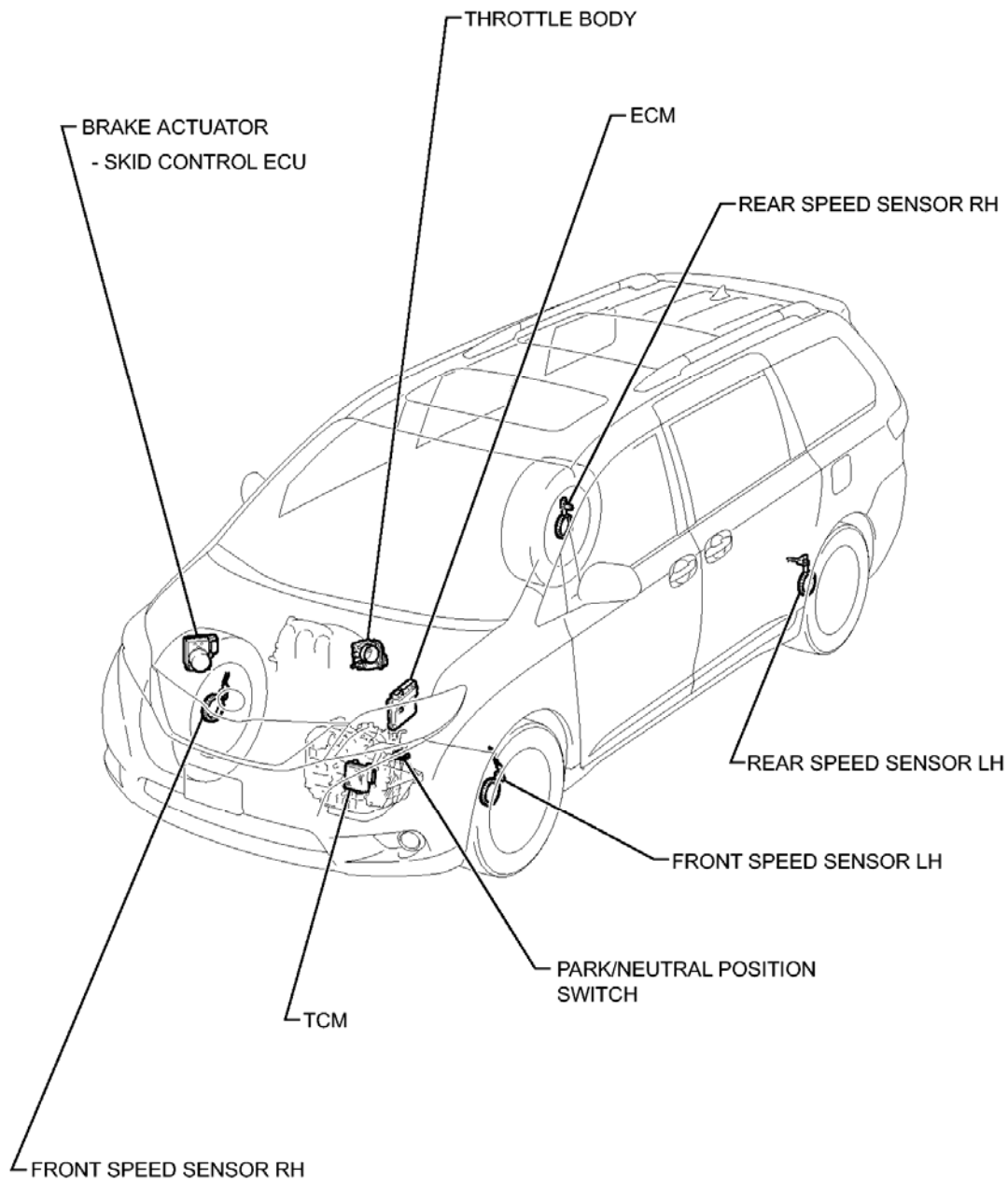
2. HANDLING PRECAUTION FOR CRUISE CONTROL SYSTEM

- a. Turn the cruise control main switch off when not using the cruise control system.
- b. Be careful as the vehicle speed increases when driving downhill with the cruise control system on.
- c. The + (ACCEL)/RES (RESUME) operation changes according to the cruise control system status. When the cruise control system is operating, the + (ACCEL) function operates. When the cruise control system is not operating, the RES (RESUME) function operates.
- d. If the cruise main indicator light blinks while the cruise control system is operating, turn the cruise control main switch off to reset the cruise control system. After the reset, if the cruise control main switch cannot be turned on, or the cruise control system is canceled immediately after turning the cruise control main switch on, the system may have a malfunction.
- e. Do not use the cruise control system where the road conditions are as follows:
- Heavy traffic
 - Steep decline
 - Roads with sharp turns
 - Icy or snowy roads
 - Slippery roads

- f. Do not use the cruise control system while towing.

PARTS LOCATION

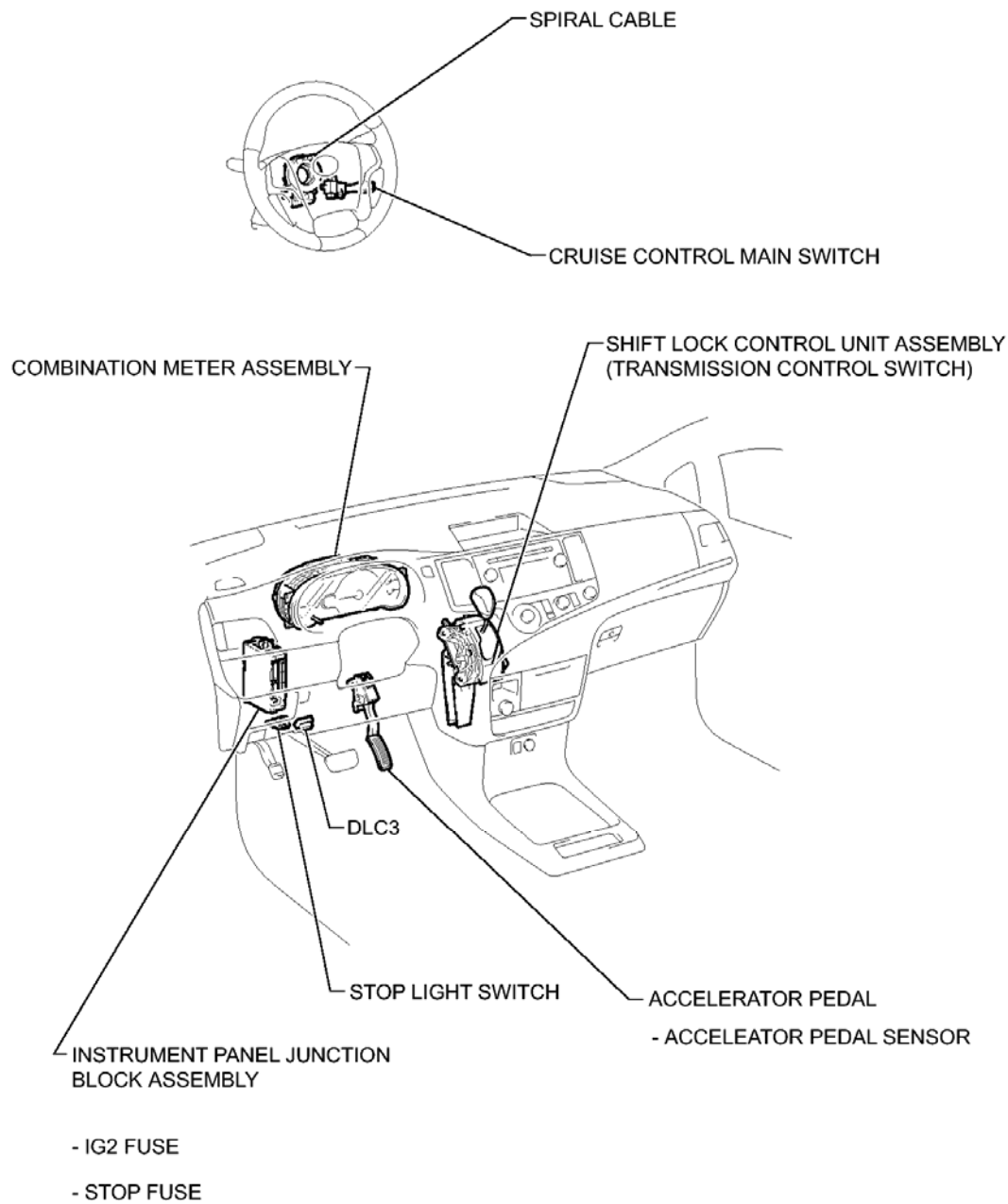
ILLUSTRATION



P

Fig. 1: Cruise Control System Components Location (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



P

Fig. 2: Cruise Control System Components Location (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SYSTEM DIAGRAM

SYSTEM DIAGRAM

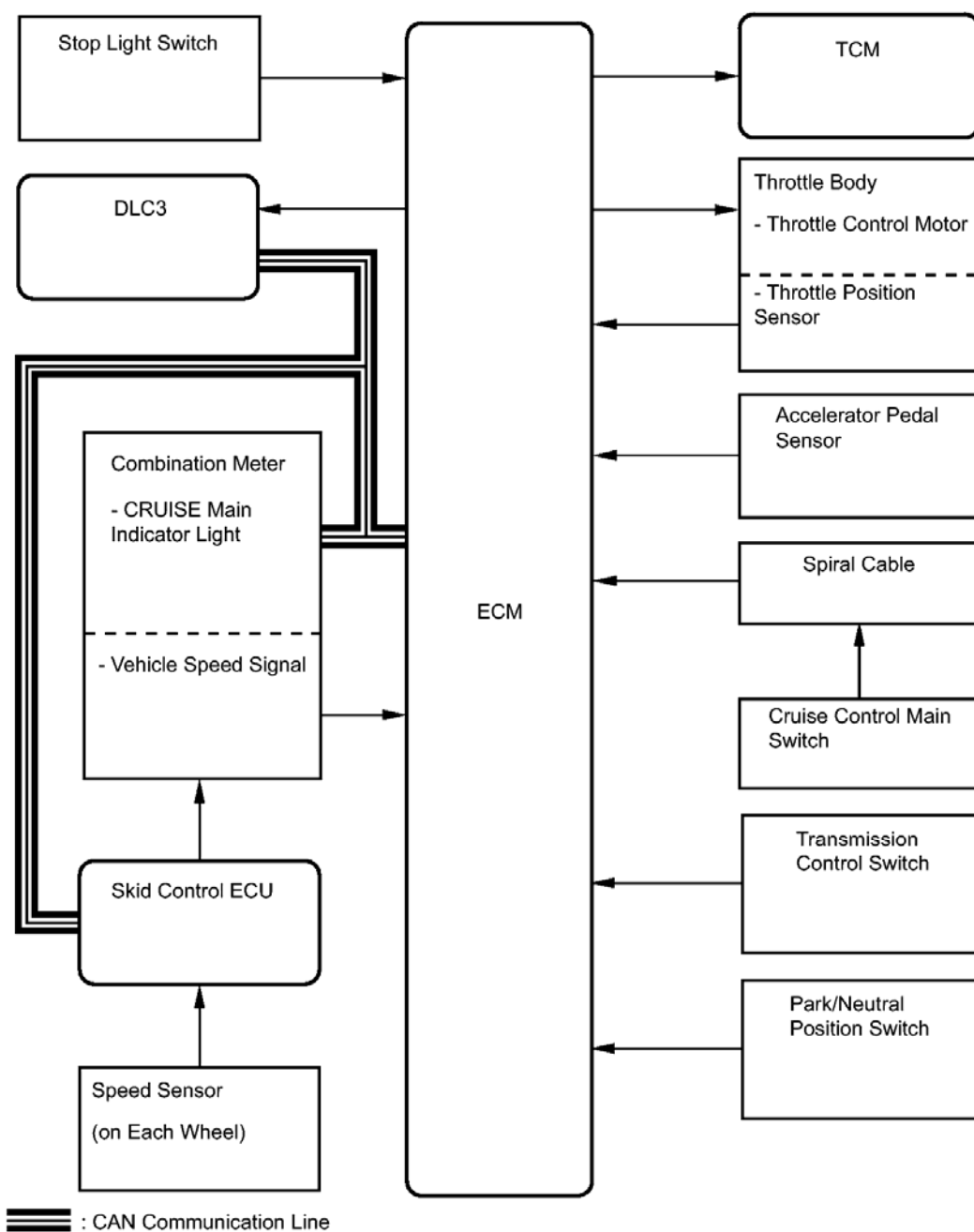


Fig. 3: Cruise Control System Diagram

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

COMMUNICATION TABLE

Sender	Receiver	Signal	Line
ECM	Combination Meter ECU (Cruise Main Indicator Light)	Cruise main indicator operation signal	CAN
		Shift up/down request	

ECM	TCM	signal	CAN
TCM	ECM	Shift up/down response signal	CAN

SYSTEM DESCRIPTION

SYSTEM DESCRIPTION

1. CRUISE CONTROL SYSTEM

This system is controlled by the ECM, and is activated by the throttle position sensor and motor. The ECM controls the following functions: ON-OFF, - (COAST)/SET, + (ACCEL)/RES (RESUME), CANCEL, vehicle speed operation, motor output control, and overdrive control.

- The ECM compares the driving vehicle speed from the speed sensors with the stored vehicle speed set through the cruise control main switch. The ECM instructs the throttle valve motor of the throttle body assembly to close the valve when the driving speed is greater than the stored speed, and instructs it to open the valve when the driving speed is less than the stored speed.
- The ECM receives signals such as ON-OFF, - SET, + RES, and CANCEL from the cruise control main switch and executes the command.
- The ECM illuminates the combination meter's cruise main indicator light when it receives a cruise control main switch ON signal.
- The ECM cancels the cruise control system when the brake pedal is depressed and the ECM receives a stop light switch signal.
- The ECM cancels the cruise control system when the shift lever is moved from D to N or the transmission is shifted to the 3rd, 2nd, or 1st gear with the shift lever in S, and the ECM receives a park/neutral position switch signal.

2. LIMIT CONTROL

a. Low speed limit

The lowest possible limit of the speed setting range is set at approximately 40 km/h (25 mph). The cruise control system cannot be set when the driving vehicle speed is below the low speed limit. Cruise control operation will be automatically canceled but the stored vehicle speed will be retained when the vehicle speed drops below the low speed limit of 40 km/h (25 mph) while the cruise control is in operation.

b. High speed limit

The highest possible limit of the speed setting range is set at approximately 200 km/h (125 mph). The cruise control system cannot be set when the driving vehicle speed is over the high speed limit. Also, + RES cannot be used to increase speed over the high speed limit.

3. CRUISE CONTROL OPERATION

The cruise control main switch operates 7 functions: SET, - (COAST), TAP-DOWN, RES (RESUME), + (ACCEL), TAP-UP, and CANCEL. The SET, TAP-DOWN, and - (COAST) functions, and the RES

(RESUME), TAP-UP, and + (ACCEL) functions are operated with the same switch. The cruise control main switch is an automatic return type switch which turns on only while operating it in the direction of each arrow and turns off after releasing it.

a. SET CONTROL

Vehicle speed is stored and constant speed control is maintained when pushing the cruise control main switch to - SET while driving with the main switch on (the cruise main indicator light and "SET" indicator come on), and the vehicle speed is within the set speed range (between the low and high speed limits).

b. - (COAST) CONTROL

When the cruise control main switch is held to - SET while the cruise control system is operating, the ECM sends a "throttle valve opening angle 0°" demand signal to the cruise control system. Then the vehicle speed, when the cruise control main switch is released, is stored and maintained.

HINT:

An actual throttle valve opening angle of 0° is not possible due to the idle speed control, etc.

c. TAP-DOWN CONTROL

When tapping down the cruise control main switch to - SET (for approximately 0.6 seconds) while the cruise control system is in operation, the stored vehicle speed decreases each time by approximately 1.6 km/h (1 mph). When the cruise control main switch is released from - SET and the difference between the driving and stored vehicle speeds is more than 5 km/h (3 mph), the driving vehicle speed is stored and constant speed control is maintained.

d. + (ACCEL) CONTROL

The throttle valve motor of the throttle body assembly is instructed by the ECM to open the throttle valve when + RES on the cruise control main switch is pressed and held while the cruise control system is in operation. When the cruise control main switch is released from + RES, the vehicle speed is stored and the vehicle is controlled at a constant speed.

e. TAP-UP CONTROL

When tapping up the cruise control main switch to + RES (for approximately 0.6 seconds) while the cruise control system is in operation, the stored vehicle speed increases each time by approximately 1.6 km/h (1 mph). However, when the difference between the driving and the stored vehicle speeds is more than 5 km/h (3 mph), the stored vehicle speed will not be changed.

f. RES (RESUME) CONTROL

If cruise control operation was canceled with the stop light switch or the CANCEL switch, and if driving speed is within the limit range, pushing the cruise control main switch to + RES restores vehicle speed memorized at the time of cancellation, and maintains constant speed control.

g. **MANUAL CANCEL CONTROL**

Performing any of the following cancels the cruise control system while in operation (the stored vehicle speed in the ECM is maintained).

- Depressing the brake pedal
- Moving the shift lever from D to N or shifting the transmission to the 3rd, 2nd, or 1st gear with the shift lever in S
- Pushing the cruise control main switch to CANCEL
- Turning the cruise control main switch off (the stored vehicle speed in the ECM is not maintained)

4. **AUTO CANCEL (FAIL-SAFE)**

This system has an automatic cancellation function (fail-safe). Refer to **FAIL-SAFE CHART**.

HOW TO PROCEED WITH TROUBLESHOOTING

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedure to troubleshoot the cruise control system.
- *: Use the Techstream.

1. **VEHICLE BROUGHT TO WORKSHOP**

NEXT: Go to next step

2. **INSPECT BATTERY VOLTAGE**

Standard Voltage

11 to 14 V

If the voltage is below 11 V, replace or recharge the battery before proceeding to the next step.

NEXT: Go to next step

3. **CHECK COMMUNICATION FUNCTION OF CAN COMMUNICATION SYSTEM***

- a. Use the Techstream to check if the CAN communication system is functioning normally.

RESULT

Result	Proceed to
CAN	

DTC is not output	A
CAN DTC is output	B

B --> GO TO CAN COMMUNICATION SYSTEM. Refer to HOW TO PROCEED WITH TROUBLESHOOTING

A: Go to next step

4. CHECK FOR DTC*

- Check for DTCs. Refer to **DTC CHECK / CLEAR.**
- Clear the DTCs.
- Recheck for DTCs.

RESULT

Result	Proceed to
DTC does not reoccur	A
DTC reoccurs	B

B --> GO TO DTC CHART. Refer to DIAGNOSTIC TROUBLE CODE CHART

A: Go to next step

5. PROBLEM SYMPTOMS TABLE

Refer to **PROBLEM SYMPTOMS TABLE.**

RESULT

Result	Proceed to
Fault is not listed in problem symptoms table	A
Fault is	

listed in problem symptoms table	B
---	---

B --> Go to step 7

A: Go to next step

6. OVERALL ANALYSIS AND TROUBLESHOOTING*

- a. Terminals of ECM. Refer to **TERMINALS OF ECM**
- b. Data List / Active Test. Refer to **DATA LIST / ACTIVE TEST**

NEXT: Go to next step

7. ADJUST, REPAIR OR REPLACE

NEXT: Go to next step

8. CONFIRMATION TEST

NEXT --> END

ROAD TEST

ROAD TEST

1. PROBLEM SYMPTOM CONFIRMATION

- a. Inspect the SET function.

TEXT IN ILLUSTRATION

*a	ON/OFF
*b-	SET

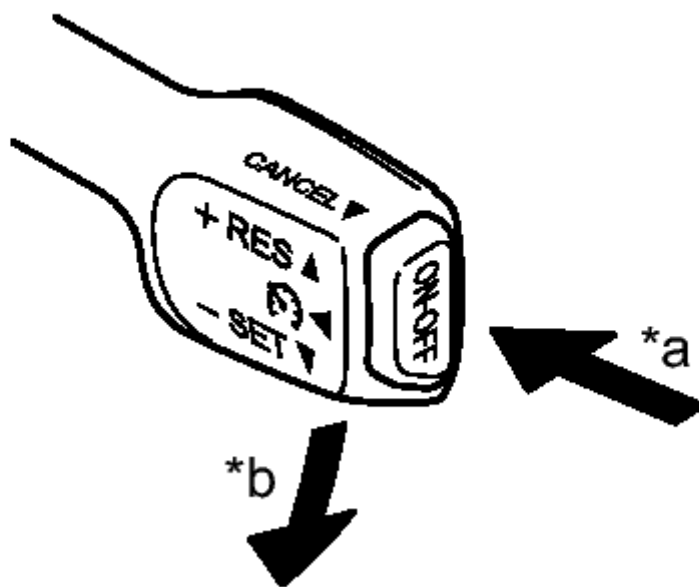


Fig. 4: Inspecting Cruise Control Main Switch SET/Coast Function
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

1. Turn the cruise control main switch on.
 2. Check that the cruise main indicator light illuminates on the combination meter.
 3. Drive at a speed between 40 km/h (25 mph) and 200 km/h (125 mph).
 4. Push the cruise control main switch to - SET.
 5. After releasing the switch, check that the vehicle cruises at the set speed.
- b. Inspect the + (ACCEL) function.

TEXT IN ILLUSTRATION

*a	ON/OFF
*b	- SET
*c	+ RES

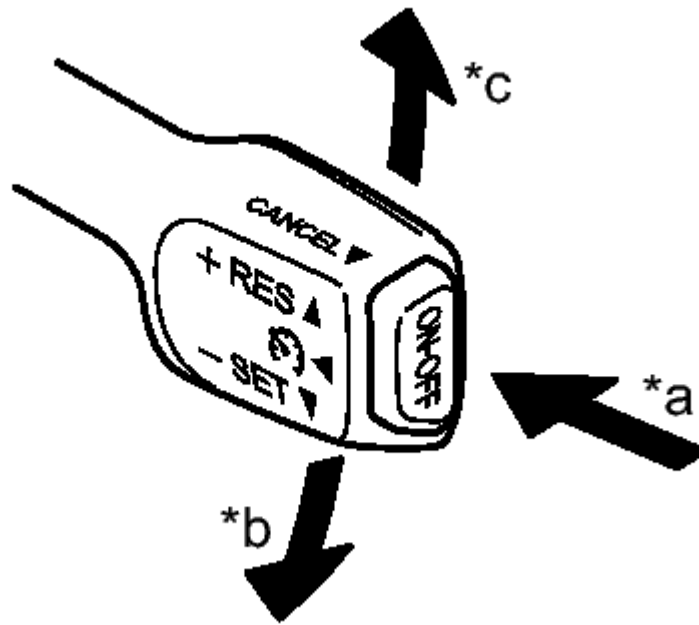
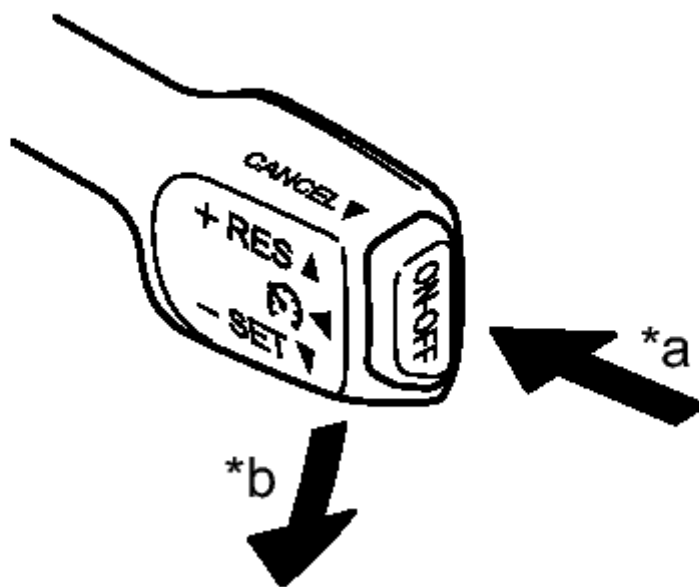


Fig. 5: Inspecting Cruise Control Main Switch + (ACCEL)/RESUME Function
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

1. Turn the cruise control main switch on.
 2. Drive at the required speed between 40 km/h (25 mph) and 200 km/h (125 mph).
 3. Push the cruise control main switch to - SET.
 4. Check that vehicle speed increases while the cruise control main switch is pushed to + RES, and that the vehicle cruises at the newly set speed when the switch is released.
 5. Push the cruise control main switch to + RES and then release it immediately. Check that vehicle speed increases by approximately 1.6 km/h (1.0 mph) (tap-up control).
- c. Inspect the - (COAST) function.

TEXT IN ILLUSTRATION

*a	ON/OFF
*b	- SET



H

Fig. 6: Inspecting Cruise Control Main Switch SET/Coast Function
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

1. Turn the cruise control main switch on.
 2. Drive at a speed between 40 km/h (25 mph) and 200 km/h (125 mph).
 3. Push the cruise control main switch to - SET.
 4. Check that vehicle speed decreases while the cruise control main switch is pushed to - SET, and the vehicle cruises at the newly set speed when the switch is released.
 5. Push the cruise control main switch to - SET, and then release it immediately. Check that vehicle speed decreases by approximately 1.6 km/h (1.0 mph) (tap-down control).
- d. Inspect the CANCEL function.

TEXT IN ILLUSTRATION

*a	ON/OFF
*b	- SET
*c	CANCEL

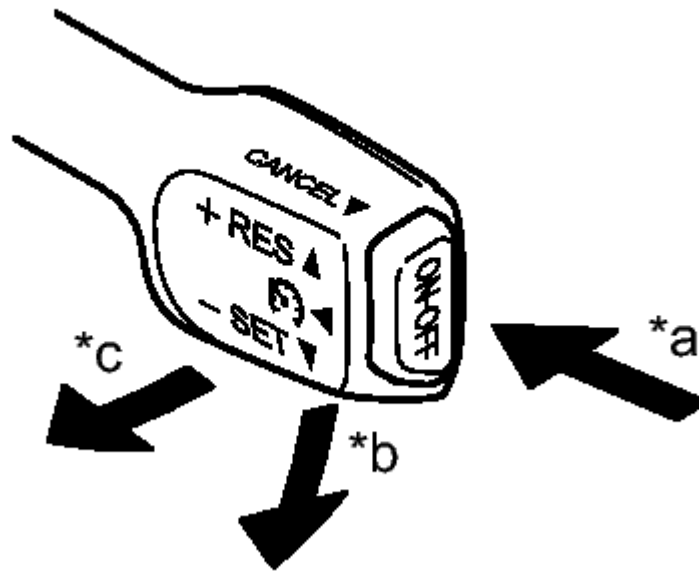


Fig. 7: Inspect Cruise Control Main Switch CANCEL Function
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

1. Turn the cruise control main switch on.
2. Drive at a speed between 40 km/h (25 mph) and 200 km/h (125 mph).
3. Push the cruise control main switch to - SET.
4. When performing any one of the following, check that the operation of the cruise control system is cancelled, normal driving mode is reset and "SET" on the multi-information display goes off.
 - Depressing the brake pedal
 - Moving the shift lever from D to N or shifting the transaxle to the 3rd, 2nd, or 1st gear with the shift lever in S
 - Turning the cruise control main switch off
 - Pulling the cruise control main switch to CANCEL
- e. Inspect the RES (RESUME) function.

TEXT IN ILLUSTRATION

*a	ON/OFF
*b	- SET
*c	+ RES

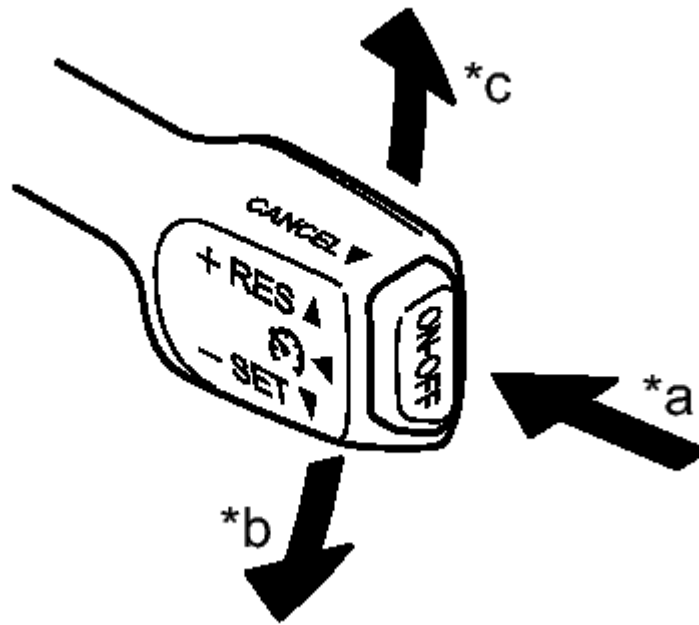


Fig. 8: Inspecting Cruise Control Main Switch + (ACCEL)/RESUME Function
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

1. Turn the cruise control main switch on.
2. Drive at a speed between 40 km/h (25 mph) and 200 km/h (125 mph).
3. Push the cruise control main switch to -SET.
4. Cancel the cruise control system by performing any of the above operations (other than turning the main switch off).
5. After pushing the cruise control main switch to "+ RES" at a driving speed of more than 40 km/h (25 mph), check that the vehicle resumes the speed set prior to the cancellation and that "SET" is also displayed on the multi-information display.

PROBLEM SYMPTOMS TABLE

PROBLEM SYMPTOMS TABLE

HINT:

- Use the table below to help determine the cause of problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.
- Inspect the fuses and relays related to this system before inspecting the suspected areas below.

CRUISE CONTROL SYSTEM

Symptom	Suspected Area	See

The cruise control main switch cannot be turned on.	Cruise control switch circuit	Refer to <u>Cruise Control Switch Circuit</u>
	Cruise main indicator light circuit	Refer to <u>Cruise Main Indicator Light Circuit</u>
	ECM (for 2GR-FE)	Refer to <u>REMOVAL</u>
	ECM (for 1AR-FE)	Refer to <u>REMOVAL</u>
Vehicle speed setting cannot be performed (the cruise main indicator light on the combination meter illuminates when the main switch is turned on, but turns off when SET function is operating).	Cruise control switch circuit	Refer to <u>Cruise Control Switch Circuit</u>
	ECM (for 2GR-FE)	Refer to <u>REMOVAL</u>
	ECM (for 1AR-FE)	Refer to <u>REMOVAL</u>
Vehicle speed setting cannot be performed (the cruise main indicator light on the combination meter illuminates when the main switch is turned on, and remains illuminated when SET function is operating).	Stop light switch circuit	Refer to <u>DTC P0571: Brake Switch "A" Circuit</u>
	Vehicle speed sensor circuit	Refer to <u>DTC P0500: Vehicle Speed Sensor "A"</u>
	Cruise control switch circuit	Refer to <u>Cruise Control Switch Circuit</u>
	Transmission range sensor circuit (for 2GR-FE)	Refer to <u>DTC P0705: Transmission Range Sensor Circuit Malfunction (PRNDL Input)</u>
	Transmission range sensor circuit (for 1AR-FE)	Refer to <u>DTC P0705: Transmission Range Sensor Circuit Malfunction (PRNDL Input)</u>
	ECM (for 2GR-FE)	Refer to <u>REMOVAL</u>
	ECM (for 1AR-FE)	Refer to <u>REMOVAL</u>
The cruise control is canceled while it is operating.	Stop light switch circuit	Refer to <u>DTC P0571: Brake Switch "A" Circuit</u>
	Transmission range sensor circuit (for 2GR-FE)	Refer to <u>DTC P0705: Transmission Range Sensor Circuit Malfunction (PRNDL Input)</u>
	Transmission range sensor circuit (for 1AR-FE)	Refer to <u>DTC P0705: Transmission Range Sensor Circuit Malfunction (PRNDL Input)</u>
	Cruise control switch circuit	Refer to <u>Cruise Control Switch Circuit</u>
	Vehicle speed sensor circuit	Refer to <u>DTC P0500: Vehicle Speed Sensor "A"</u>
	Park/neutral position switch (for U660F)	Refer to <u>INSPECTION</u>
	Park/neutral position switch (for U660E)	Refer to <u>INSPECTION</u>
	Park/neutral position switch (for U760E)	Refer to <u>INSPECTION</u>

	ECM (for 2GR-FE)	Refer to <u>REMOVAL</u>
	ECM (for 1AR-FE)	Refer to <u>REMOVAL</u>
Pulling back on the control main switch does not cancel the cruise control. (The cruise main indicator light remains on.)	Cruise control switch circuit	Refer to <u>Cruise Control Switch Circuit</u>
	ECM (for 2GR-FE)	Refer to <u>REMOVAL</u>
	ECM (for 1AR-FE)	Refer to <u>REMOVAL</u>
Pulling back on the control main switch does not cancel the cruise control. (The cruise main indicator light goes off.)	ECM (for 2GR-FE)	Refer to <u>REMOVAL</u>
	ECM (for 1AR-FE)	Refer to <u>REMOVAL</u>
The cruise control is not canceled when vehicle speed drops below the low speed limit. (The cruise main indicator light remains on.)	Vehicle speed sensor circuit	Refer to <u>DTC P0500: Vehicle Speed Sensor "A"</u>
	ECM (for 2GR-FE)	Refer to <u>REMOVAL</u>
	ECM (for 1AR-FE)	Refer to <u>REMOVAL</u>
The cruise control is not canceled when vehicle speed drops below the low speed limit. (The cruise main indicator light goes off.)	ECM (for 2GR-FE)	Refer to <u>REMOVAL</u>
	ECM (for 1AR-FE)	Refer to <u>REMOVAL</u>
Depressing the brake pedal does not cancel the cruise control. (The cruise main indicator light remains on.)	Stop light switch circuit	Refer to <u>DTC P0571: Brake Switch "A" Circuit</u>
	ECM (for 2GR-FE)	Refer to <u>REMOVAL</u>
	ECM (for 1AR-FE)	Refer to <u>REMOVAL</u>
Depressing the brake pedal does not cancel the cruise control. (The cruise main indicator light goes off.)	ECM (for 2GR-FE)	Refer to <u>REMOVAL</u>
	ECM (for 1AR-FE)	Refer to <u>REMOVAL</u>
	Transmission range sensor circuit (for 2GR-FE)	Refer to <u>DTC P0705: Transmission Range Sensor Circuit Malfunction (PRNDL Input)</u>
	Transmission range sensor circuit (for 1AR-FE)	Refer to <u>DTC P0705: Transmission Range Sensor Circuit Malfunction (PRNDL Input)</u>
	Park/neutral position switch (for U660F)	Refer to <u>INSPECTION</u>
	Park/neutral position switch (for U660E)	Refer to <u>INSPECTION</u>
	Park/neutral position switch (for U760E)	Refer to <u>INSPECTION</u>
Hunting (Speed is not constant.)	Vehicle speed sensor circuit	Refer to <u>DTC P0500: Vehicle Speed Sensor "A"</u>
	SFI system (for 2GR-FE)	Refer to <u>PROBLEM SYMPTOMS TABLE</u>
	SFI system (for 1AR-FE)	Refer to <u>PROBLEM SYMPTOMS TABLE</u>

The cruise main indicator light remains blinking.	ECM (for 2GR-FE)	Refer to <u>REMOVAL</u>
	ECM (for 1AR-FE)	Refer to <u>REMOVAL</u>
	TC and CG terminal circuit	Refer to <u>TC and CG Terminal Circuit</u>
	ECM (for 2GR-FE)	Refer to <u>REMOVAL</u>
Cruise main indicator light does not come on.	ECM (for 1AR-FE)	Refer to <u>REMOVAL</u>
	Cruise main indicator light circuit	Refer to <u>Cruise Main Indicator Light Circuit</u>
Cruise SET indicator light does not come on.	Meter/gauge system	Refer to <u>PROBLEM SYMPTOMS TABLE</u>
	Cruise SET indicator light circuit	Refer to <u>Cruise SET Indicator Light Circuit</u>
	Meter/gauge system	Refer to <u>PROBLEM SYMPTOMS TABLE</u>

TERMINALS OF ECM

TERMINALS OF ECM

1. CHECK ECM (for 2GR-FE)

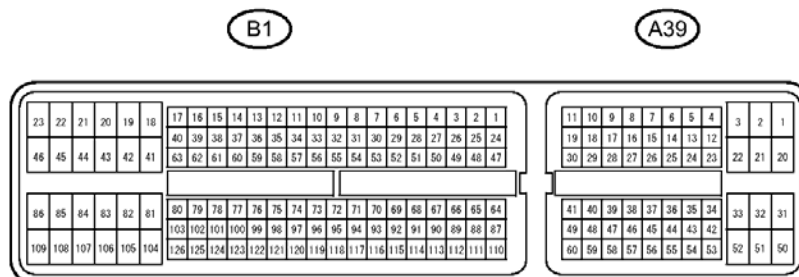


Fig. 9: ECM Connector Terminal Identification - For 2GR-FE
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
A39-16 (TC) - B1-81 (E1)	P-B - BR	Ground	Ignition switch ON	10 to 14 V
			Terminals TC and CG of	Below 1 V

			DLC3 connected	
A39-36 (STP) - B1-81 (E1)	L - BR	Stop light signal	Ignition switch ON, Brake pedal depressed	10 to 14 V
			Ignition switch ON, Brake pedal released	Below 1 V
A39-35 (ST-) - B1-81 (E1)	LG-R - BR	Stop light signal	Ignition switch ON, Brake pedal depressed	Below 1 V
			Ignition switch ON, Brake pedal released	10 to 14 V
A39-45 (CCS) - B1-81 (E1)	B - BR	Cruise control main switch circuit	Ignition switch ON	10 to 14 V
			Ignition switch ON, CANCEL switch on	6.6 to 10.1 V
			Ignition switch ON, - SET switch on	4.5 to 7.1 V
			Ignition switch ON, + RES switch on	2.3 to 4.0 V
			Ignition switch	Below 1

			ON, MAIN switch on	V
--	--	--	--------------------------	---

2. CHECK ECM (for 1AR-FE)

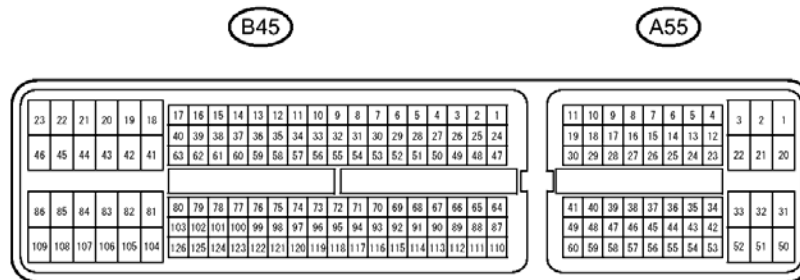


Fig. 10: ECM Connector Terminal Identification - For 1AR-FE
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
A55-7 (TC) - B45-104 (E1)	P-B - BR	Ground	Ignition switch ON	10 to 14 V
			Terminals TC and CG of DLC3 connected	Below 1 V
A55-29 (STP) - B45-104 (E1)	L - BR	Stop light signal	Ignition switch ON, Brake pedal depressed	10 to 14 V
			Ignition switch ON, Brake pedal released	Below 1 V
			Ignition switch	

A55-39 (ST-) - B45-104 (E1)	LG-R - BR	Stop light signal	ON, Brake pedal depressed	Below 1 V
			Ignition switch ON, Brake pedal released	10 to 14 V
A55-40 (CCS) - B45-104 (E1)	B - BR	Cruise control main switch circuit	Ignition switch ON	10 to 14 V
			Ignition switch ON, CANCEL switch on	6.6 to 10.1 V
			Ignition switch ON, - SET switch on	4.5 to 7.1 V
			Ignition switch ON, + RES switch on	2.3 to 4.0 V
			Ignition switch ON, MAIN switch on	Below 1 V

DIAGNOSIS SYSTEM

DIAGNOSIS SYSTEM

1. CHECK DLC3

- Check the DLC3. Refer to **GENERAL INFORMATION** .

2. CHECK INDICATOR

- Turn the ignition switch to ON.

TEXT IN ILLUSTRATION

Cruise Main

*a Indicator
Light

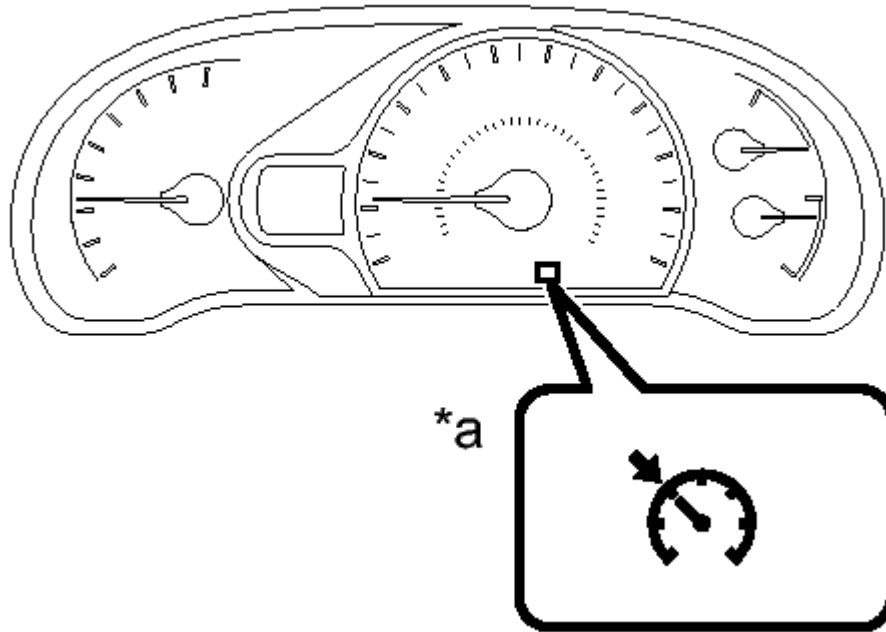


Fig. 11: Identifying Cruise Main Indicator Light
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Check that the cruise main indicator light illuminates when the cruise control main switch is turned on, and that the indicator light turns off when the main switch is turned off. If the results are not as specified, inspect the cruise main indicator light circuit. Refer to **Cruise Main Indicator Light Circuit** .

HINT:

While driving with cruise control on, the ECM activates AUTO CANCEL of the cruise control system when a malfunction occurs in one of the following: vehicle speed sensors, stop light switch, or other related parts. When AUTO CANCEL is activated, the cruise main indicator light outputs the blinking pattern shown in the illustration. At the same time, data of the malfunction is stored as a DTC.

CRUISE Main Indicator Light:

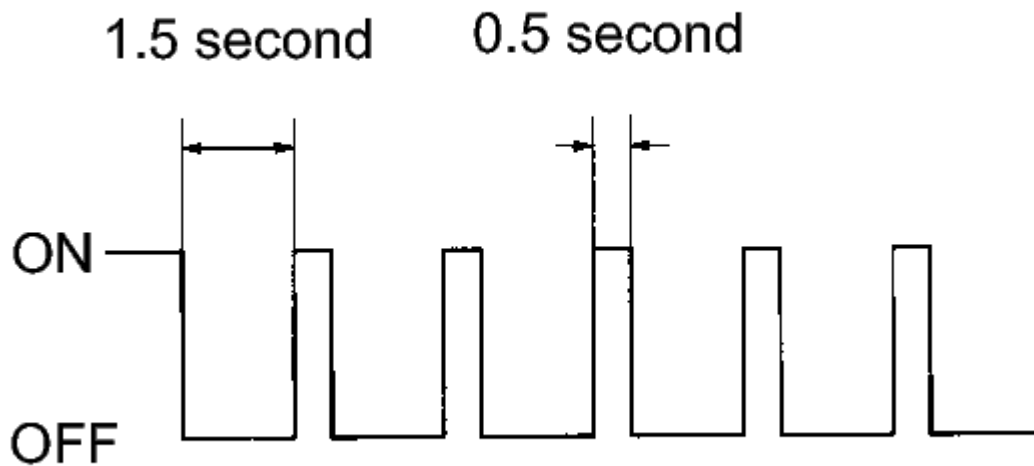


Fig. 12: Identifying Cruise Main Indicator Light Pulse Pattern
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DTC CHECK / CLEAR

DTC CHECK / CLEAR

1. CHECK DTC

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Powertrain / Cruise Control / Trouble Codes.
- Check the details of the DTC(s). Refer to **DIAGNOSTIC TROUBLE CODE CHART**.

2. CLEAR DTC

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Powertrain / Cruise Control / Trouble Codes.
- Clear the DTCs.

FAIL-SAFE CHART

FAIL-SAFE CHART

HINT:

If the following conditions are detected while the cruise control is in operation, the system clears the stored vehicle speed in the ECM and cancels the cruise control operation.

Vehicle Condition	Auto Cancel Condition	Re-operation Condition
Cruise main indicator light blinks	- There is open or short in stop light switch circuit - There is problem with vehicle speed signal	Turn cruise control main switch on again
Cruise main indicator light blinks	- There is problem with input circuit of stop light switch - There is problem with cancel circuit	- Turn ignition switch off then on again - Turn cruise control main switch on again
Cruise main indicator light remains on	Under the following conditions, the stored vehicle speed is maintained: - Vehicle speed is lower than low speed limit (approx. 40 km/h (25 mph)) while driving with cruise control on - VSC system is operated	Push cruise control main switch to + RES
	Vehicle speed is lower than stored speed by approx. 16 km/h (10 mph) or more	Push cruise control main switch to - SET
Cruise indicator light goes off	There is problem with throttle position sensor and motor	Turn cruise control main switch on again

DATA LIST / ACTIVE TEST

DATA LIST / ACTIVE TEST

1. DATA LIST

HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

NOTE: In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

- Connect the Techstream to the DLC3.

- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Enter the following menus: Powertrain / Cruise Control / Data List.
- e. Read the Data List according to the display on the Techstream.

CRUISE CONTROL (ECM)

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
CCS Vehicle Spd	Vehicle speed/min.: 0 km/h (0 mph), max.: 255 km/h (158 mph)	Actual vehicle speed	-
CCS Mem Vehicle Spd	Cruise control memorized speed/min.: 0 km/h (0 mph), max.: 200 km/h (125 mph)	Actual stored vehicle speed	-
Throttle Opening Angle	Throttle opening angle/min.: 0 degrees, max.: 125 degrees	Actual demanded throttle angle	-
Cruise Control	Cruise control system active condition/ON or OFF	ON: Cruise control activated OFF: Cruise control deactivated	-
Main SW M-CPU	Main switch signal (Main CPU)/ON or OFF	ON: Main switch depressed OFF: Main switch released	3
CCS Ready M-CPU	Cruise control system standby condition (Main CPU)/ON or	Each time main switch is pushed, ON/OFF	1

	OFF	changes	
CCS Indicator M- CPU	Cruise indicator signal (Main CPU)/ON or OFF	ON: Cruise main indicator light on OFF: Cruise main indicator light off	2
Cancel Switch	CANCEL switch signal/ON or OFF	ON: While switch is being operated OFF: Switch not operated	-
SET/COAST Switch	SET/COAST switch signal/ON or OFF	ON: While switch is being operated OFF: Switch not operated	-
RES/ACC Switch	RES/ACC switch signal/ON or OFF	ON: While switch is being operated OFF: Switch not operated	-
Stp Light SW M-CPU	Stop light switch signal (Main CPU)/ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
Cruise Operation Status	PNP switch signal (D position)/ON or OFF	ON: Shift lever in D OFF: Shift lever not in D	-
Brake	Brake Cancel	ON: Brake pedal depressed	

Cancel Switch	signal/ON or OFF	OFF: Brake pedal released	-
---------------	------------------	---------------------------	---

HINT:

- 3 is OK but 1 is NG --> ECM failure
- 1 is OK but 2 is NG --> DTC output or ECM failure
- 3 is OK but the cruise main indicator light does not illuminate --> Cruise main indicator light, wire harness, or ECM failure

2. ACTIVE TEST

HINT:

Using the Techstream to perform Active Tests allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Tests early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Tests.

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Body Electrical / Combination Meter / Active Test.
- Perform Active Test according to the display on the Techstream.

HINT:

The ignition switch must be turned to ON to proceed with Active Test using the Techstream.

COMBINATION METER

Tester Display	Test Part	Control Range	Diagnostic Note
Indicat. Lamp Cruise	Cruise main indicator light	OFF or ON	Operate with IG ON and the vehicle is stopped
Indicat. SET	Cruise control SET indicator light	OFF or ON	Operate with IG ON and the vehicle is stopped

DIAGNOSTIC TROUBLE CODE CHART

DIAGNOSTIC TROUBLE CODE CHART

If a trouble code is displayed during the DTC check, check the trouble areas listed for that code in the table below and proceed to the appropriate information.

CRUISE CONTROL SYSTEM

DTC Code	Detection Item	Trouble Area	See
P0500	Vehicle Speed Sensor Malfunction	- Vehicle speed sensor - Vehicle speed sensor signal circuit - Combination meter assembly - ECM	Refer to <u>DTC P0500: Vehicle Speed Sensor Malfunction;</u> <u>DTC P0503: Vehicle Speed Sensor "A" Intermittent / Erratic / High</u>
P0503	Vehicle Speed Sensor "A" Intermittent / Erratic / High	- Vehicle speed sensor - Vehicle speed sensor signal circuit - Combination meter assembly - ECM	Refer to <u>DTC P0500: Vehicle Speed Sensor Malfunction;</u> <u>DTC P0503: Vehicle Speed Sensor "A" Intermittent / Erratic / High</u>
P0571	Brake Switch "A" Circuit	- Stop light switch - Stop light switch circuit - ECM	Refer to <u>DTC P0571: Brake Switch "A" Circuit</u>
P0575	Cruise Control Input Circuit	- ECM	Refer to <u>DTC P0575: Cruise Control Input Circuit</u>

ACCESSORIES & EQUIPMENT

Cruise Control System (Preparation) - Sienna

CRUISE CONTROL

SST

SST

	09870-60000	Laser Radar Adjusting Reflector	
	(09870-60010)	Base Stand	
	09870-60040	Reflector C	

RECOMMENDED TOOLS

RECOMMENDED TOOLS

	09080-1C110	Toyota Electrical Tester Set	
	09080-2C100	Test Lead Set	

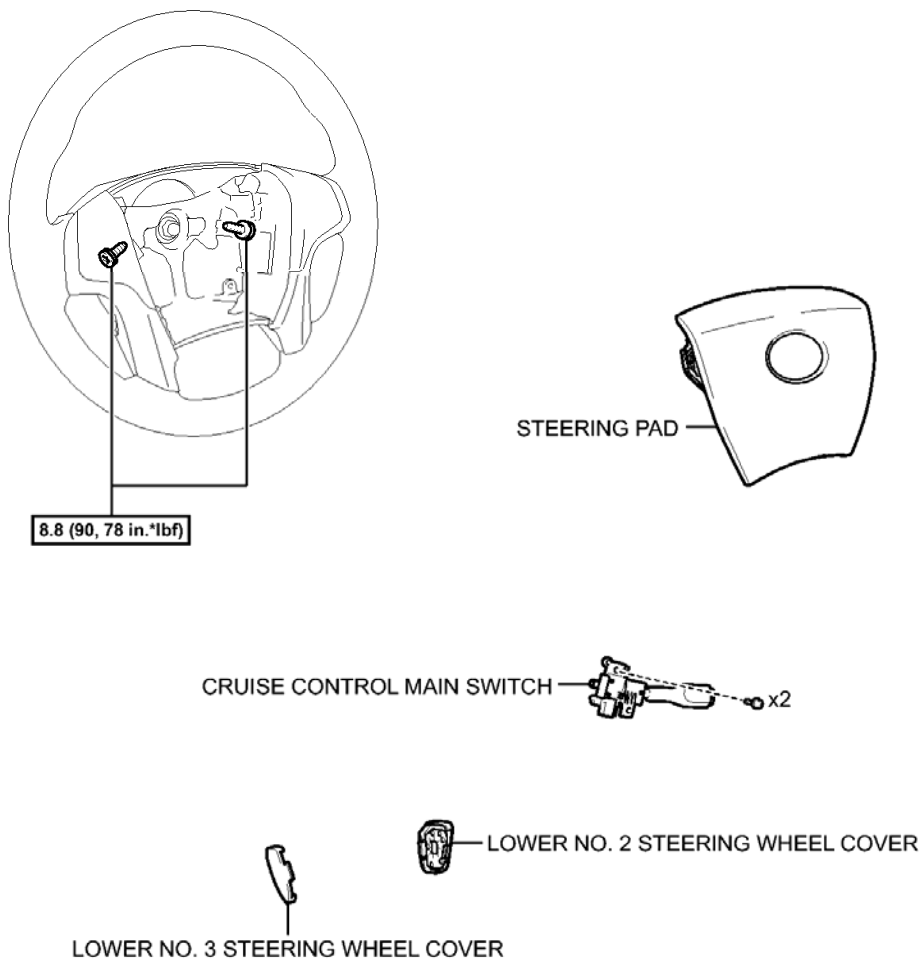
ACCESSORIES & EQUIPMENT

Cruise Control System (Service Information) - Sienna

CRUISE CONTROL MAIN SWITCH

COMPONENTS

ILLUSTRATION



$\boxed{\text{N*m (kgf*cm, ft*lbf)}}$: Specified torque

P

Fig. 1: Cruise Control Main Switch Replacement Components With Torque Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

WARNING: Some of these service operations affect the SRS airbag system. Read the

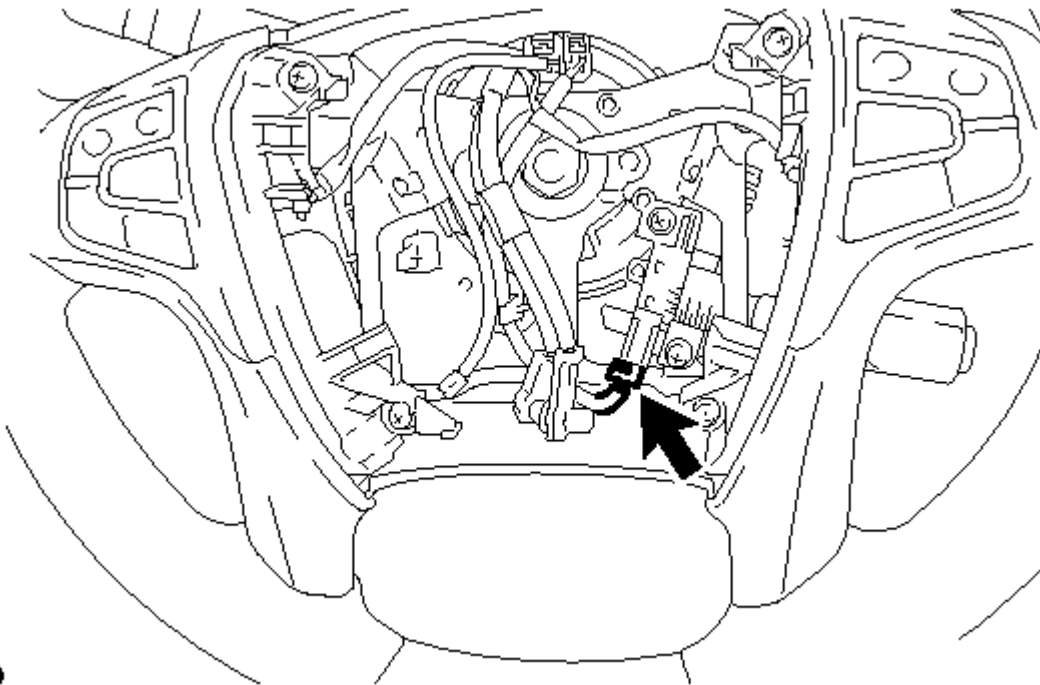
precautionary notices concerning the SRS airbag system before servicing the steering column. Refer to PRECAUTION .

1. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**

WARNING: Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to disable the SRS system.

NOTE: When disconnecting the cable, some systems need to be initialized after the cable is reconnected. Refer to INITIALIZATION .

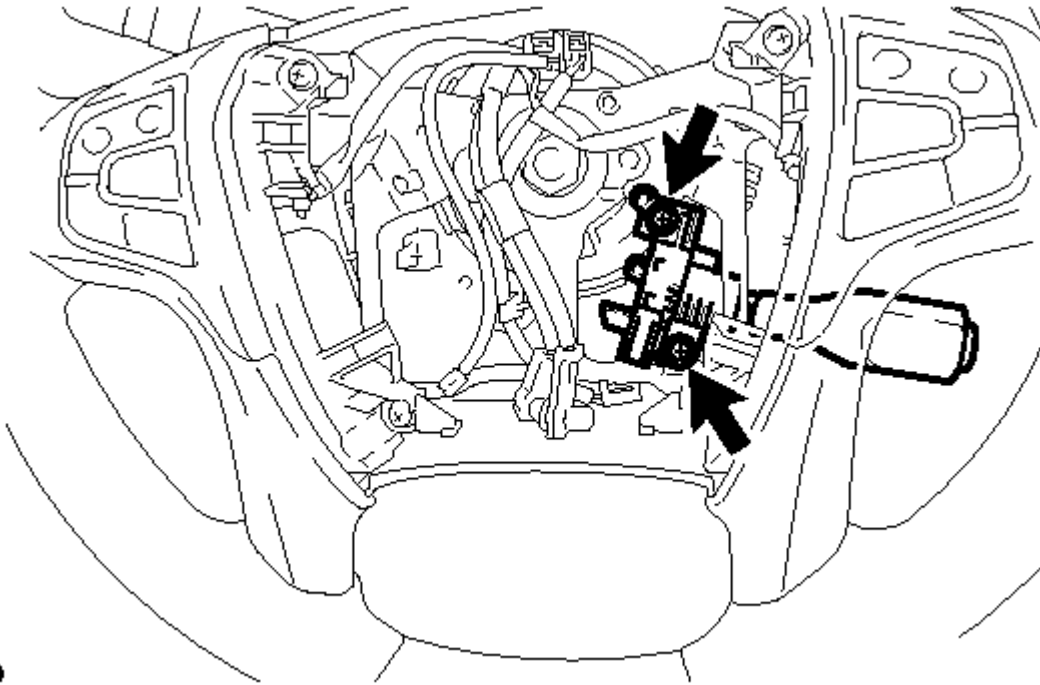
2. **REMOVE LOWER NO. 3 STEERING WHEEL COVER** . Refer to REMOVAL - Step 2
3. **REMOVE LOWER NO. 2 STEERING WHEEL COVER** . Refer to REMOVAL - Step 3
4. **REMOVE STEERING PAD** . Refer to REMOVAL - Step 4
5. **REMOVE CRUISE CONTROL MAIN SWITCH**
 - a. Disconnect the connector.



P

Fig. 2: Identifying Cruise Control Main Switch Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 2 screws and the cruise control main switch.



P

Fig. 3: Identifying Cruise Control Main Switch & Screws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

INSPECTION

- 1. INSPECT CRUISE CONTROL MAIN SWITCH (w/o Dynamic Radar Cruise Control System)**
 - a. Measure the resistance according to the value(s) in the table below.

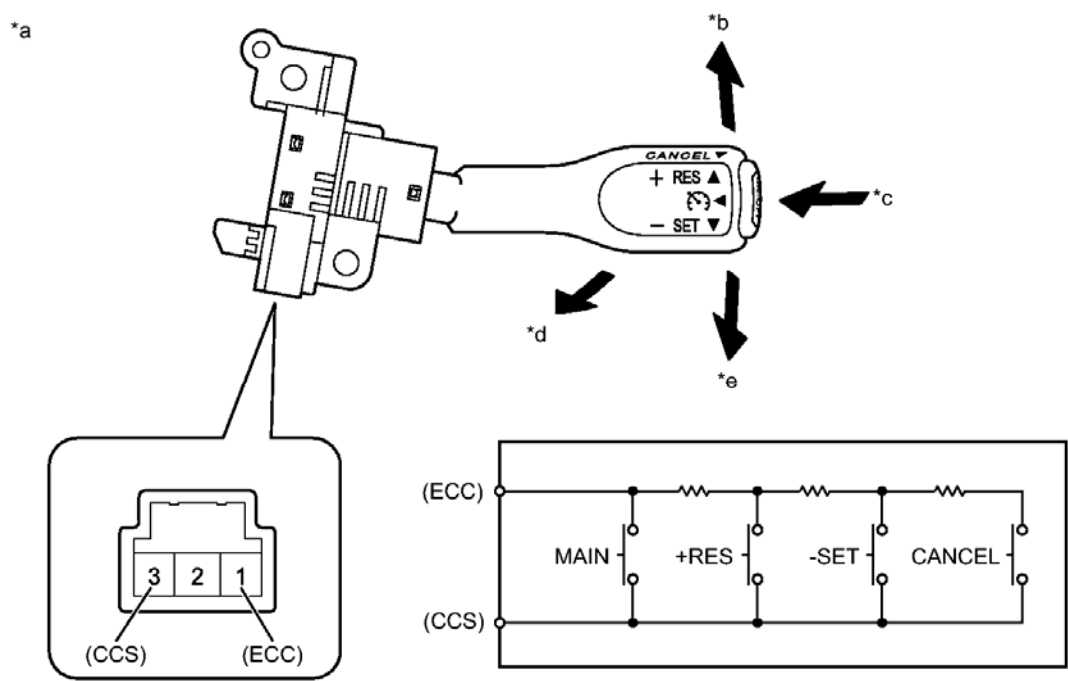


Fig. 4: Cruise Control Main Switch Connector End View (w/o Dynamic Radar Cruise Control System)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Component without harness connected: (Cruise Control Main Switch)	*b	+RES
*c	ON/OFF	*d	CANCEL
*e	-SET	-	-

Standard Resistance

Tester Connection	Switch Condition	Specified Condition
	Main Switch off*1	1 Mohms or higher
	Main Switch on	Below 2.5 ohms

1 (ECC) - 3 (CCS)	+ RES	235 to 245 ohms
	- SET	617 to 643 ohms
	CANCEL	1509 to 1571 ohms

*1: Lever is in the neutral position

If the result is not as specified, replace the cruise control main switch.

2. **INSPECT CRUISE CONTROL MAIN SWITCH (w/ Dynamic Radar Cruise Control System)**

- a. Measure the resistance according to the value(s) in the table below.

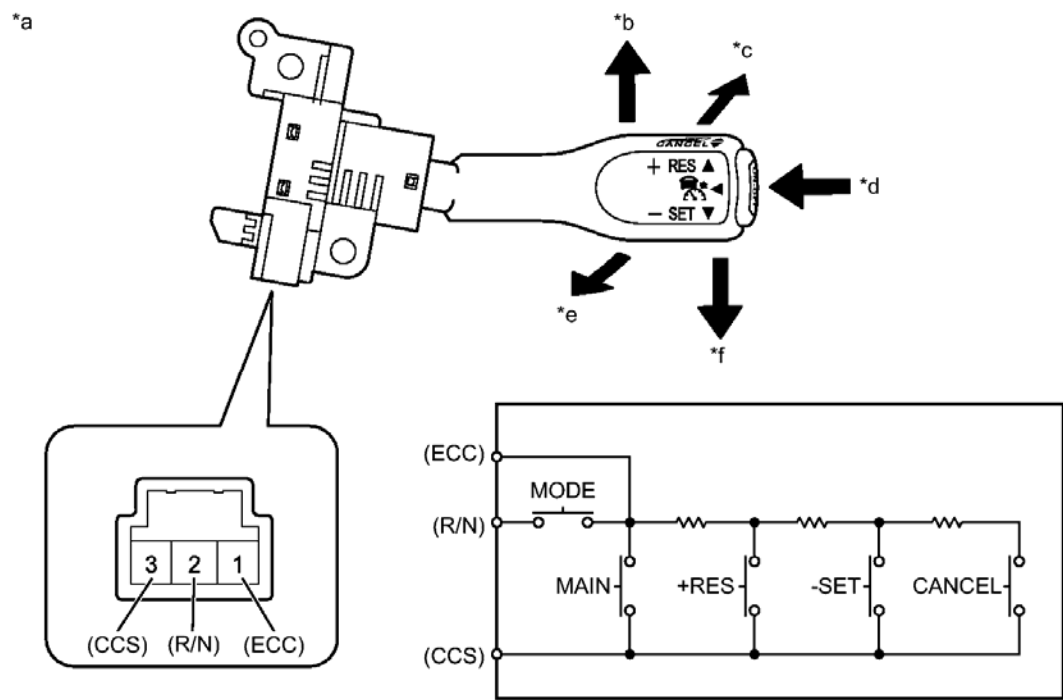


Fig. 5: Cruise Control Main Switch Connector End View (w/ Dynamic Radar Cruise Control System)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Component without harness connected: (Cruise	*b	+RES
----	--	----	------

	Control Main Switch)		
*c	MODE	*d	ON/OFF
*e	CANCEL	*f	-SET

Standard Resistance

Tester Connection	Switch Condition	Specified Condition
1 (ECC) - 2 (R/N)	Main Switch off*1	1 Mohms or higher
	MODE	Below 2.5 ohms
1 (ECC) - 3 (CCS)	Main Switch off*1	1 Mohms or higher
	Main switch on	Below 2.5 ohms
	+ RES	235 to 245 ohms
	- SET	617 to 643 ohms
	CANCEL	1509 to 1571 ohms

*1: Lever is in the neutral position

If the result is not as specified, replace the cruise control main switch.

INSTALLATION

INSTALLATION

1. INSTALL CRUISE CONTROL MAIN SWITCH

- Install the cruise control main switch with the 2 screws.
- Connect the connector.

2. INSTALL STEERING PAD . Refer to INSTALLATION - Step 1

3. INSTALL LOWER NO. 3 STEERING WHEEL COVER . Refer to INSTALLATION - Step 2

4. INSTALL LOWER NO. 2 STEERING WHEEL COVER . Refer to INSTALLATION - Step 3

5. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

Torque: 5.4 N*m (55 kgf*cm, 48 in.*lbf)

NOTE: When disconnecting the cable, some systems need to be initialized after the cable is reconnected. Refer to INITIALIZATION .

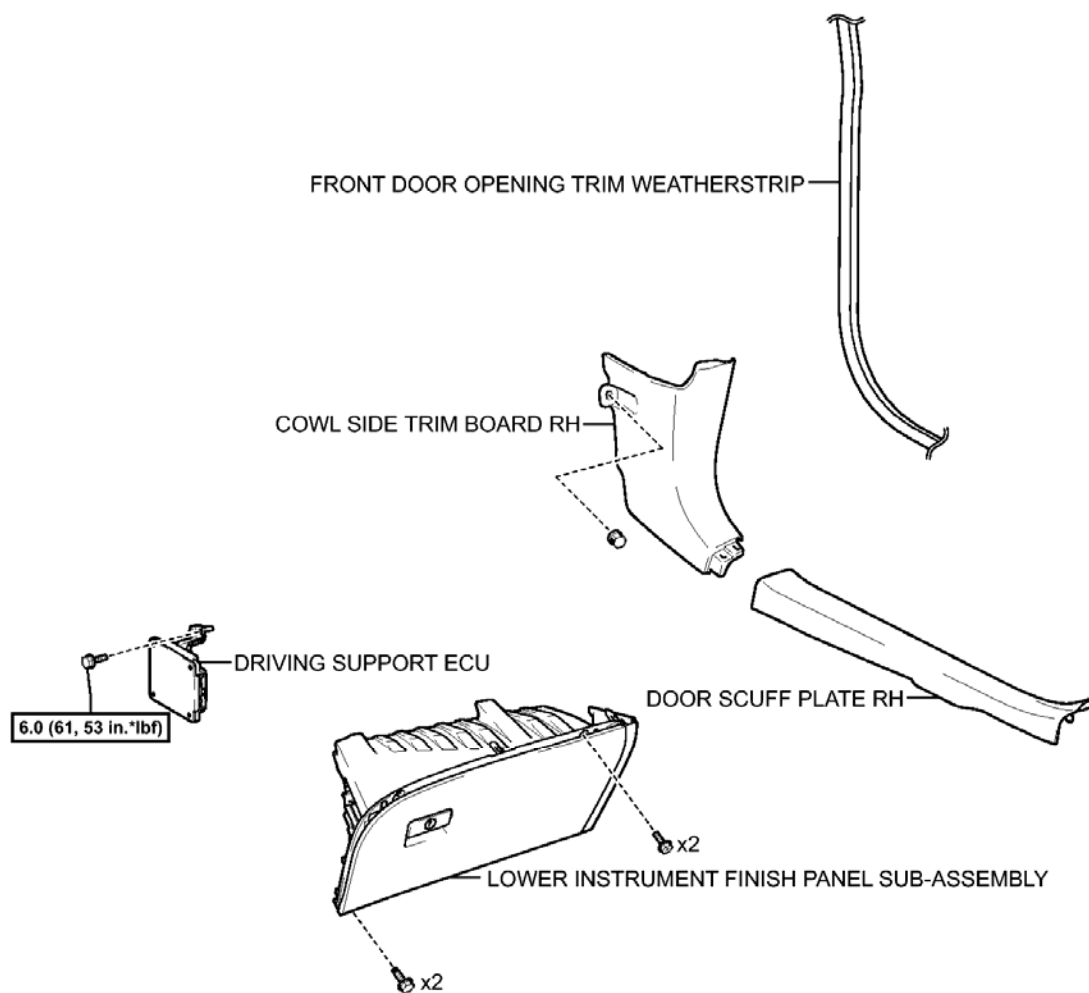
6. **INSPECT STEERING PAD** . Refer to INSTALLATION - Step 5
7. **INSPECT SRS WARNING LIGHT**

Refer to CHECK MODE PROCEDURE

DRIVING SUPPORT ECU

COMPONENTS

ILLUSTRATION



$\boxed{\text{N}^*\text{m (kgf}^*\text{cm, ft}^*\text{lbf)}}$: Specified torque

P

Fig. 6: Driver Support ECU Replacement Components With Torque Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

1. REMOVE DOOR SCUFF PLATE RH . Refer to **REMOVAL - Step 3**

2. **REMOVE COWL SIDE TRIM BOARD RH** . Refer to **REMOVAL - Step 5**
3. **SEPARATE FRONT DOOR OPENING TRIM WEATHERSTRIP**
4. **REMOVE LOWER INSTRUMENT FINISH PANEL SUB-ASSEMBLY** . Refer to **REMOVAL - Step 34**
5. **REMOVE DRIVING SUPPORT ECU**
 - a. Disconnect the connector.

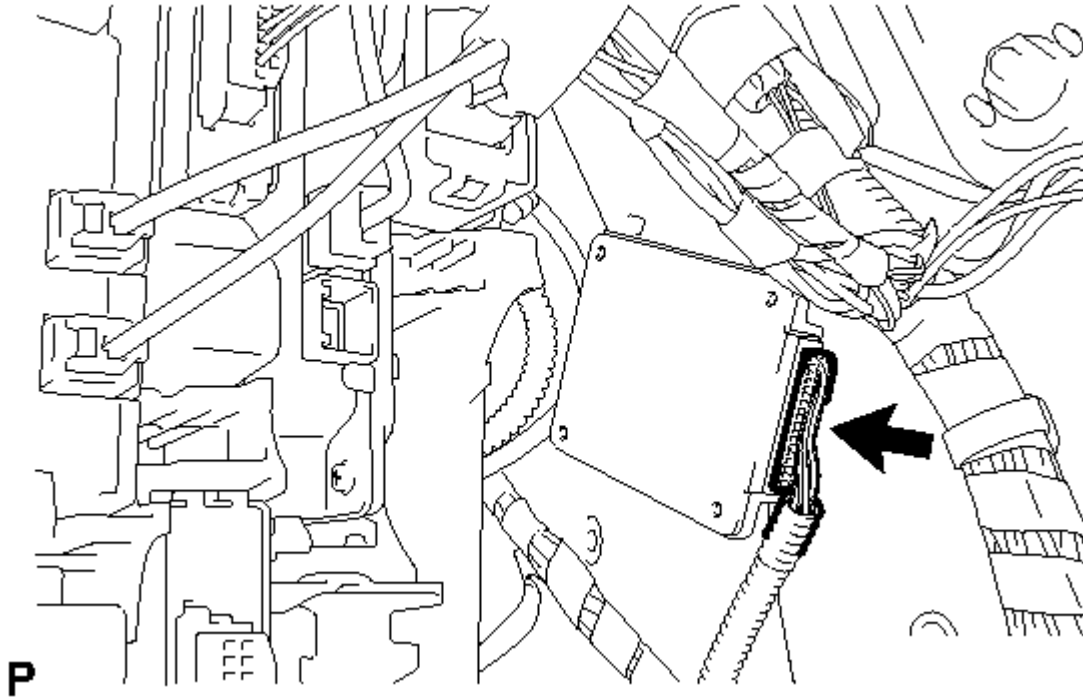


Fig. 7: Identifying Driver Support ECU Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the bolt and the driving support ECU.

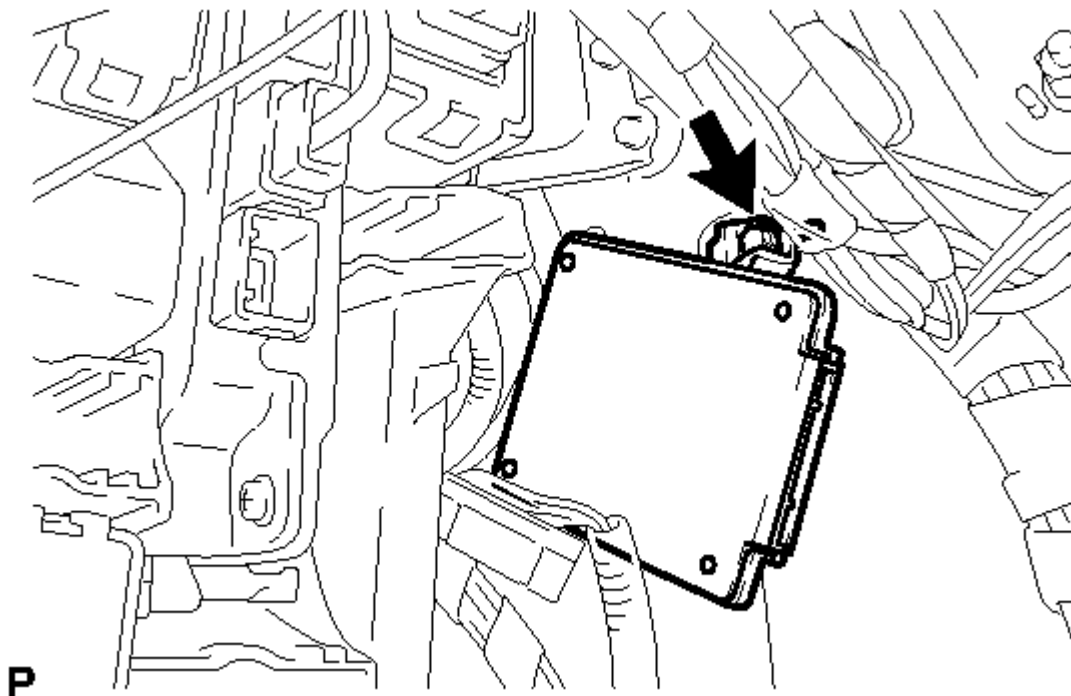


Fig. 8: Identifying Driver Support ECU Bolt
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

INSTALLATION

1. INSTALL DRIVING SUPPORT ECU

- a. Install the driving support ECU with the bolt.

Torque: 6.0 N*m (61 kgf*cm, 53 in.*lbf)

NOTE: Do not install the driving support ECU if it has been damaged or impacted in any way.

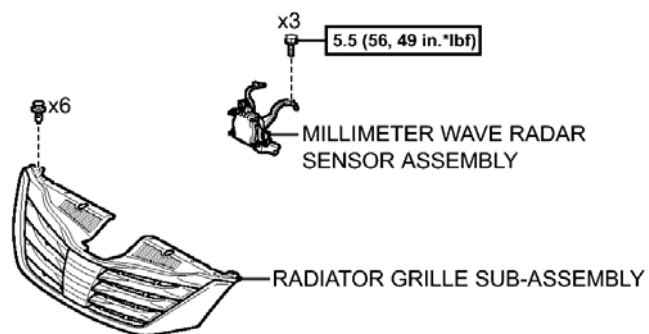
- b. Connect the connector.

2. **INSTALL LOWER INSTRUMENT FINISH PANEL SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 24**
3. **INSTALL FRONT DOOR OPENING TRIM WEATHERSTRIP**
4. **INSTALL COWL SIDE TRIM BOARD RH** . Refer to **INSTALLATION - Step 35**
5. **INSTALL DOOR SCUFF PLATE RH** . Refer to **INSTALLATION - Step 37**

MILLIMETER WAVE RADAR SENSOR

COMPONENTS

ILLUSTRATION



$\boxed{\text{N*m (kgf*cm, ft*lbf)}}$: Specified torque

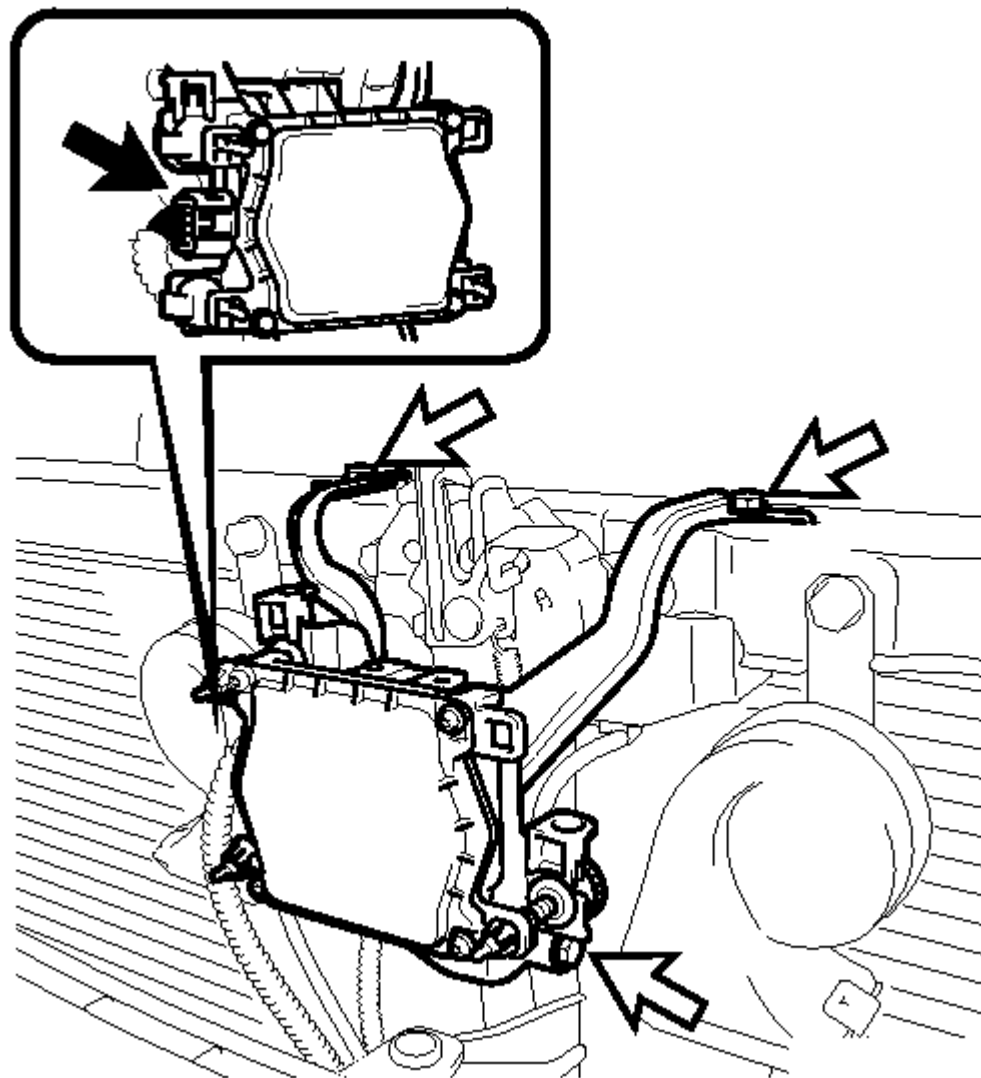
P

Fig. 9: Millimeter Wave Radar Sensor With Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

1. **REMOVE RADIATOR GRILLE SUB-ASSEMBLY** . Refer to **REMOVAL - Step 3**
2. **REMOVE MILLIMETER WAVE RADAR SENSOR ASSEMBLY**
 - a. Disconnect the connector.



P

Fig. 10: Identifying Millimeter Wave Radar Sensor Assembly Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 3 bolts and the millimeter wave radar sensor assembly.

ADJUSTMENT

ADJUSTMENT

1. ADJUST MILLIMETER WAVE RADAR SENSOR ASSEMBLY

WARNING: Exposure to radio frequency emissions is hazardous to your health. It is hazardous to your health to be within 20 cm (7.87 in.) of the device's radio frequency aperture.

NOTE:

- This device complies with FCC radio frequency emission regulations.
- Perform measurements on a level surface.
- Make sure that no large pieces of metal are within a 10 m (32.8 ft.) x 14 m (45.9 ft.) area in front of the vehicle. If possible, the surrounding area should also be free of large metal objects.

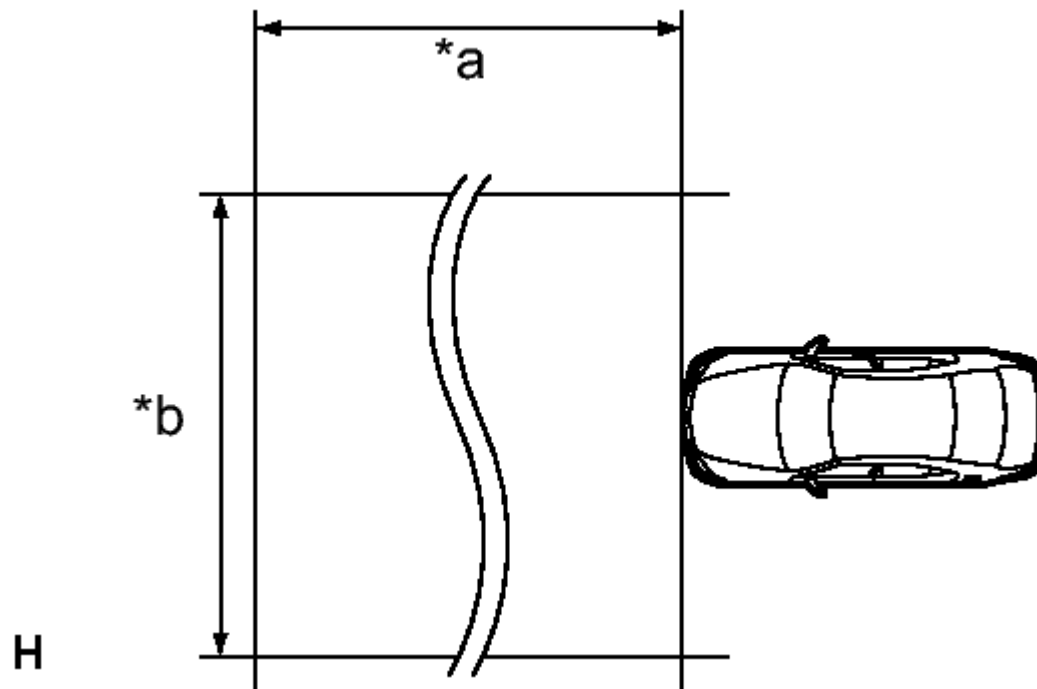
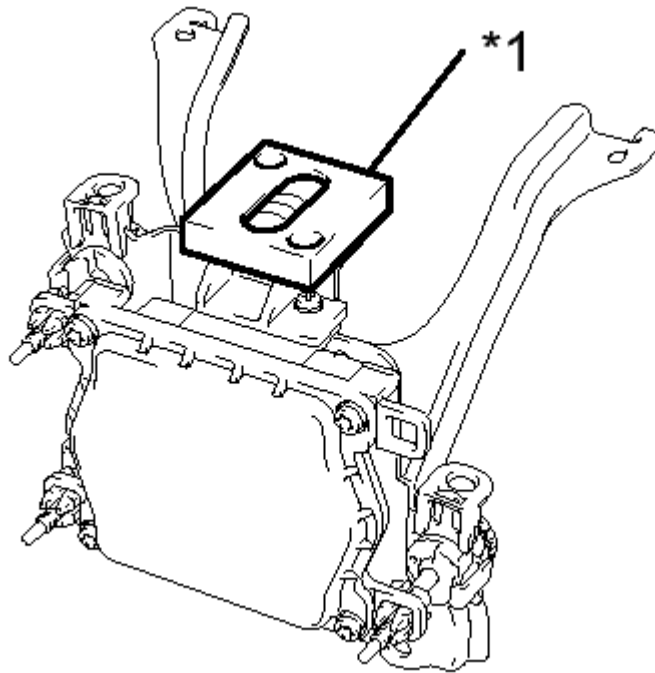


Fig. 11: Measuring Millimeter Wave Radar Sensor Assembly Frequency
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Approximately 10 m
*b	Approximately 14 m

- Before adjusting the radar beam axis, prepare the vehicle as follows.
 - Check the tire pressure and adjust it if necessary.
 - Remove all excess weight from the vehicle (luggage, heavy objects, etc.).
- Check and adjust the vertical direction of the radar sensor.



P

Fig. 12: Identifying Radar Sensor Level Rack

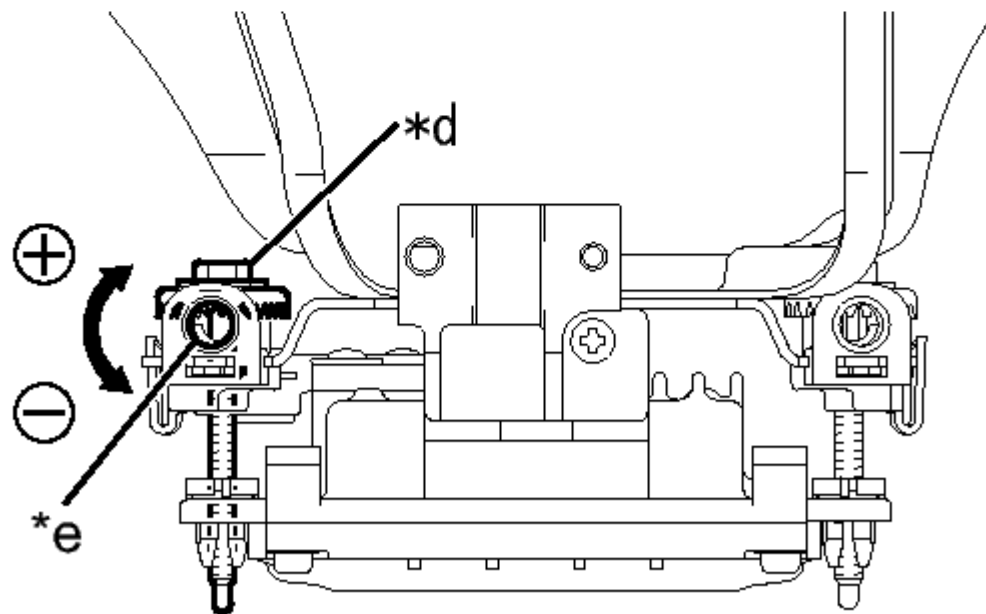
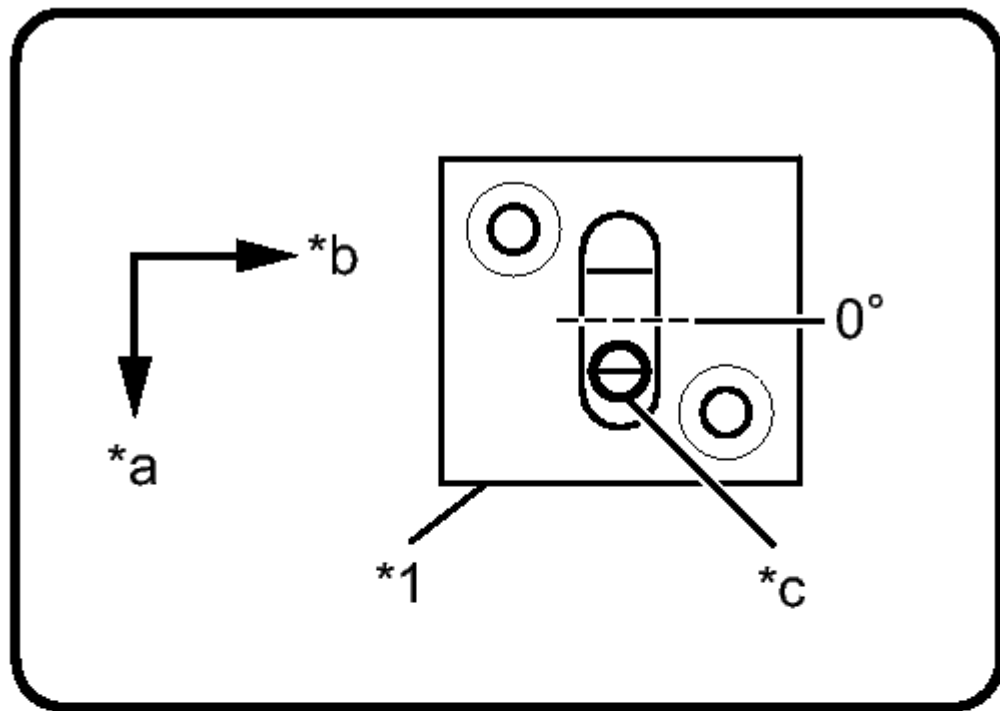
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

1. Remove dust, oil and foreign matter from the radar sensor's level rack.
2. Set a level on the radar sensor's level rack.

TEXT IN ILLUSTRATION

***1** Level

3. Check that the level's air bubble is within the red frame.



P

Fig. 13: Checking Radar Sensor Level Within Red Frame
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

$*1$	Level
------	-------

*a	FR
*b	LH
*c	Air Bubble
*d	Adjust Bolt A
*e	Adjustment Hole

OK

Level's air bubble is within red frame.

If the bubble is not within the red frame, use a screwdriver with the adjustment hole to adjust bolt A until the air bubble is within the red frame.

HINT:

- The adjustable range within the level's red frame is $\pm 0.2^\circ$.
- The target angle is $+0.2^\circ$ (upward angle of 0.2°).

Result

Adjustment Direction	Adjustment Procedure	Adjustment Angle
Vertical adjustment	Upward direction: Turn bolt A to negative (-) side	For every full rotation of the screwdriver, sensor moves 0.12°
	Downward direction: Turn bolt A to positive (+) side	

- c. Adjust the reflector height.

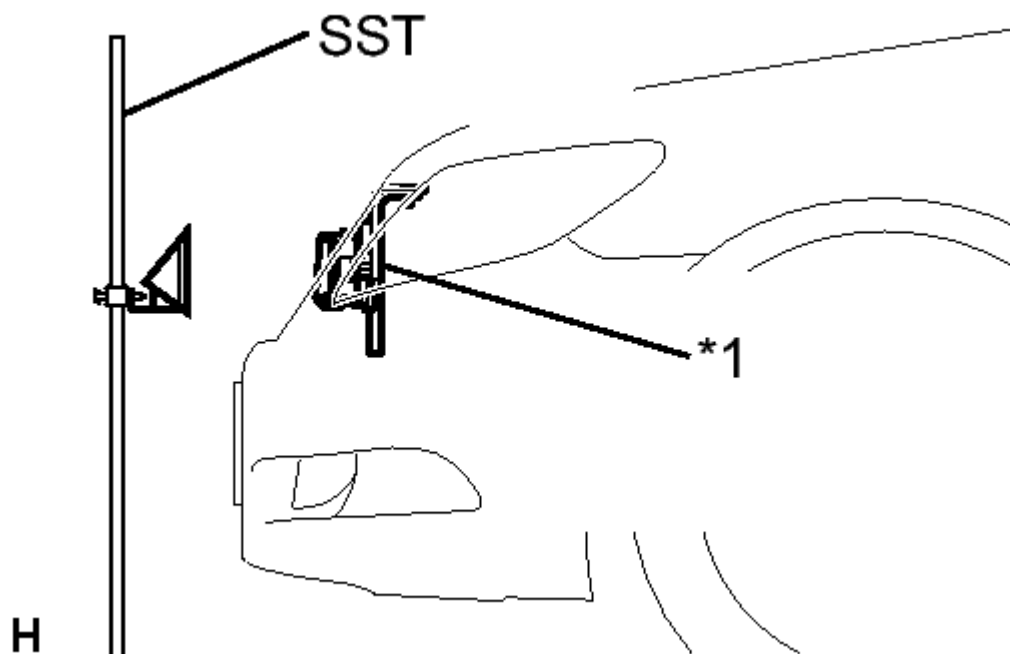


Fig. 14: Inspecting Radar Sensor Reflector Height
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Millimeter
	Wave
	Radar
	Sensor

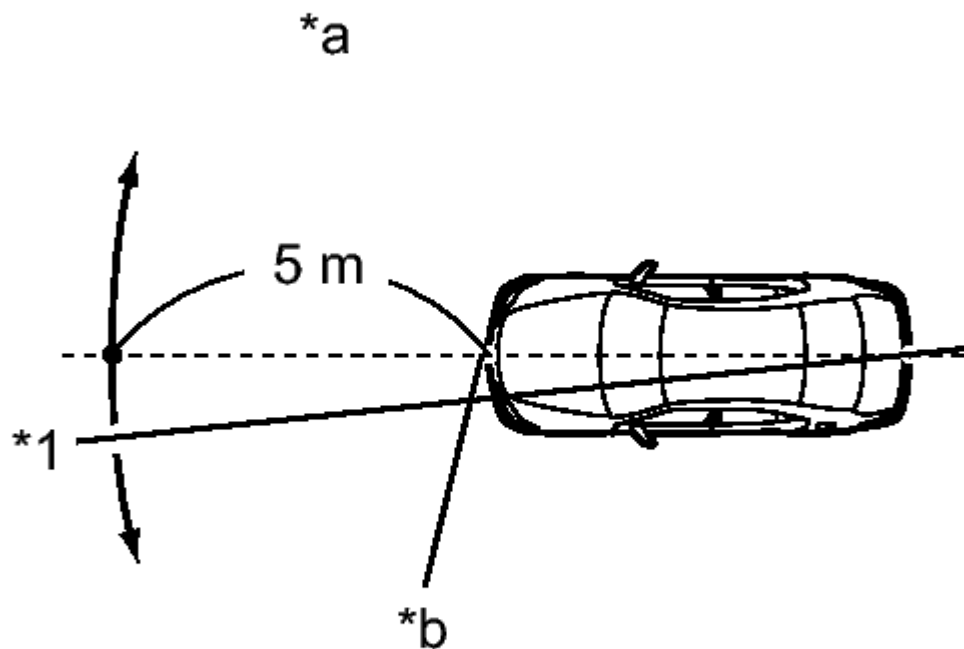
1. Adjust the reflector so that the center of SST reflector is the same height as the millimeter wave radar sensor.

- **SST: 09870-60000**
09870-60010
- **SST: 09870-60040**

HINT:

Prepare a 10 m (32.8 ft.) string, a string with a sharp-pointed weight (plumb bob), and a 5 m (16.4 ft.) tape measure.

- d. Place the reflector.



H

Fig. 15: Identifying String Location At Point B & Distance From Front Of Vehicle
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

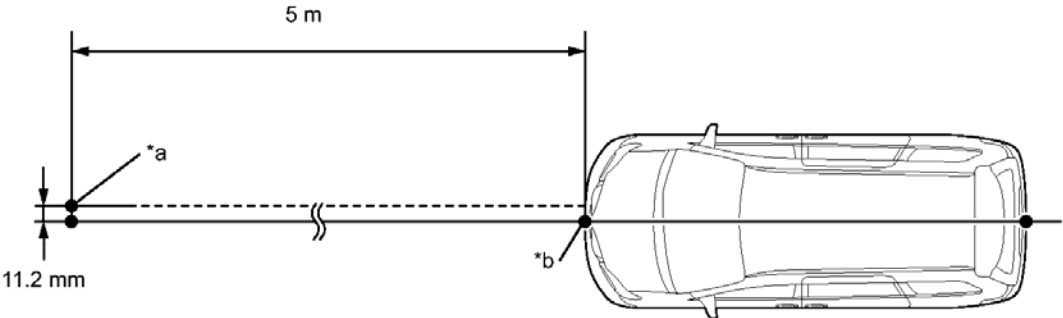
TEXT IN ILLUSTRATION

*1	String
*a	Adjust center by moving string to right and left
*b	Extend string through front

center mark

1. Hang the string (with weight) from the center of the vehicle's rear emblem. Mark the vehicle's rear center point on the ground. Repeat for the front of the vehicle.
2. Set one end of the 10 m (32.8 ft.) string on the vehicle's rear center point. Run the string over the vehicle's front center point to a position 5 m (16.4 ft.) beyond the vehicle's front center point, as shown in the illustration. Mark the 5 m (16.4 ft.) position.
3. Using a tape measure, measure 11.2 mm (0.441 in.) to the right of the 5 m (16.4 ft.) position. Place the reflector at that position.

NOTE: Perform the operation as precisely as possible.



P

Fig. 16: Inspecting Radar Beam Axis
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

	Reflector	Millimeter
*a	Placement	Wave
	Point	
*b	Radar	Sensor
		Position

- e. Check the radar beam axis.
 1. When using the Techstream:
 - a. Connect the Techstream to the DLC3.
 - b. Turn the ignition switch to ON.
 - c. Turn the Techstream on, and turn the cruise control main switch on.
 - d. Enter the following menus: Radar Cruise / Utility / Beam Axis Adjustment.

HINT:

A buzzer will sound for 1 second.

- e. Follow the Techstream display, and continue with the adjustment.

WARNING: Do not come within 20 cm (7.87 in.) of the radar sensor.

NOTE:

- Turn the cruise control main switch on before pressing Next.
- Make sure there is at least 20 cm (7.87 in.) between the radar sensor and any nearby individuals.

2. Check the following items on the radar cruise divergence data screen.

NOTE:

While using the Techstream beam axis adjustment mode, the actual direction and angle of the radar sensor may be different from the Techstream data. In such a case, the deviation is displayed on the combination meter's multi-information display.

- a. Confirm that the distance value is approximately 5 m (16.4 ft.).

HINT:

- A value between 0.0 m (0.0 ft.) and 6.3 m (20.7 ft.) is indicated.
 - If the distance is 0.0 m (0.0 ft.), the sensor cannot detect the target. Reconfirm that there is no metal in the specified area in front of the vehicle (refer to the NOTICE at the beginning of this adjustment procedure).
- b. Confirm that the left/right side value is between 0.0 m (0.0 ft.) and 6.3 m (20.7 ft.).

HINT:

If the distance is 0.0 m (0.0 ft.), the sensor cannot detect the target. Reconfirm that there is no metal in the specified area in front of the vehicle (refer to the NOTICE at the beginning of this adjustment procedure).

- f. Check and adjust the horizontal direction of the radar sensor.

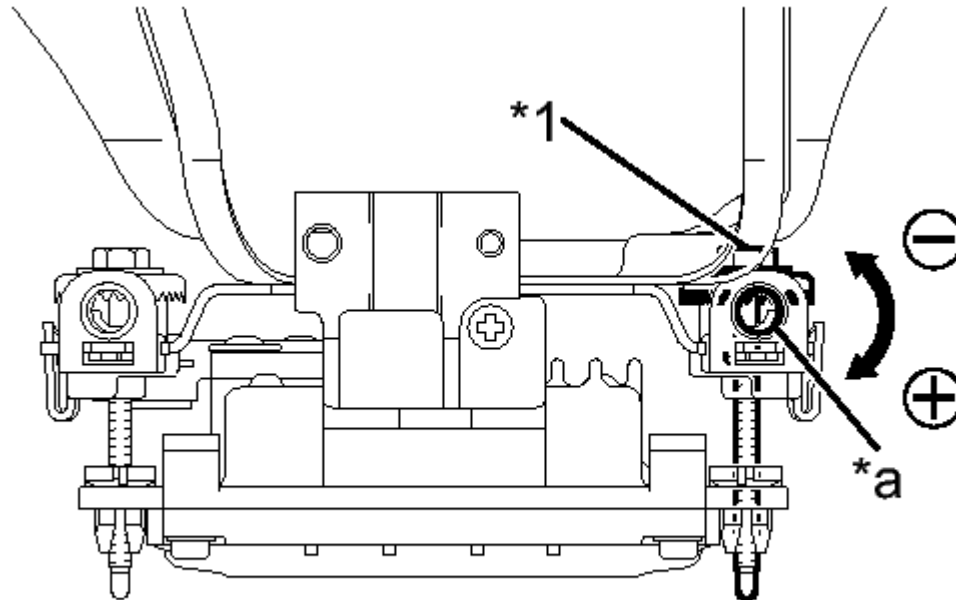
1. Check that the divergence of the radar beam axis is 0°.

Standard

0° (Both right and left)

If the axis is not as specified, use a screwdriver with the adjustment hole to adjust bolt B until the divergence of the radar beam axis is 0°.

2. Based on the measured divergence of the beam axis, turn and adjust bolt B for horizontal adjustment of the millimeter wave radar sensor using a screwdriver.



P

Fig. 17: Identifying Millimeter Wave Radar Sensor Adjustment Hole
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Adjust Bolt B
*a	Adjustment Hole

Result

Adjustment Direction	Adjustment Procedure	Adjustment Angle
Horizontal adjustment	Right direction: Turn bolt B to positive (+) side.	For every full rotation of the screwdriver, sensor moves 0.07°
	Left direction: Turn bolt B to negative (-) side.	

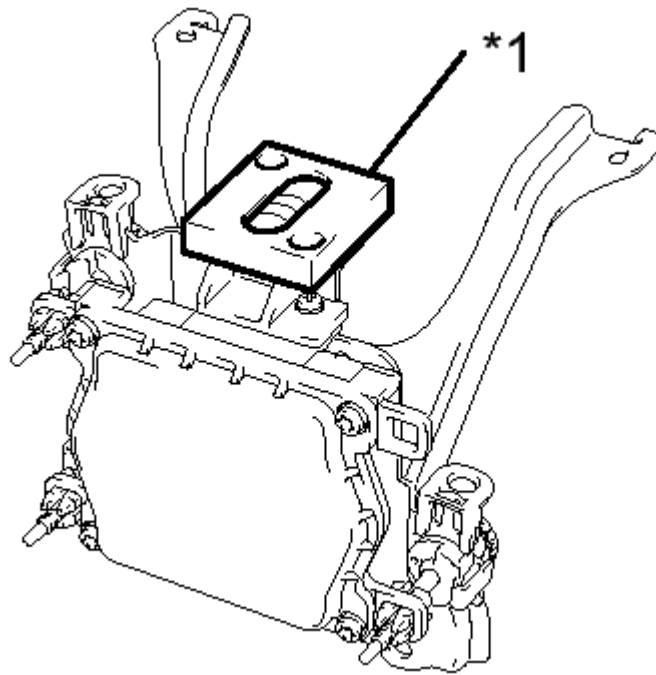
HINT:

- If "LEFT SIDE: 1.0°" is displayed, the divergence is 1.0° in the left direction. Turn bolt B approximately 2.5 turns to the negative (-) side.
 - If the value does not change to 0°, it is possible that the sensor is aiming at something different. Reconfirm that there are no reflective materials in the surrounding area.
3. Select "Next". The driving learning value is automatically reset.

HINT:

A buzzer will sound for 10 seconds or more.

4. Disconnect the Techstream from the DLC3.
- g. Recheck and readjust the vertical direction of the radar sensor.
1. Set a level on the radar sensor's level rack.



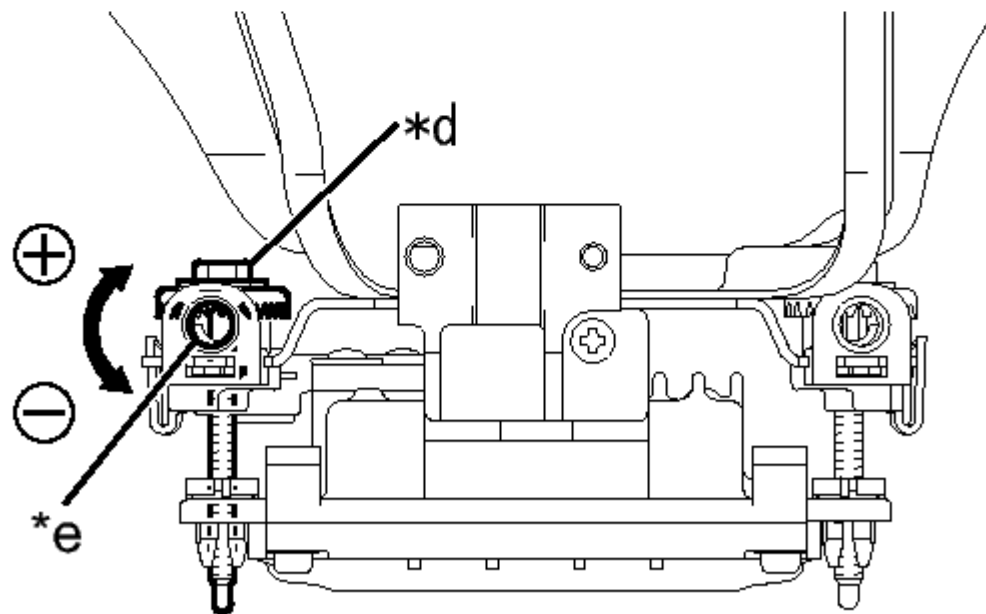
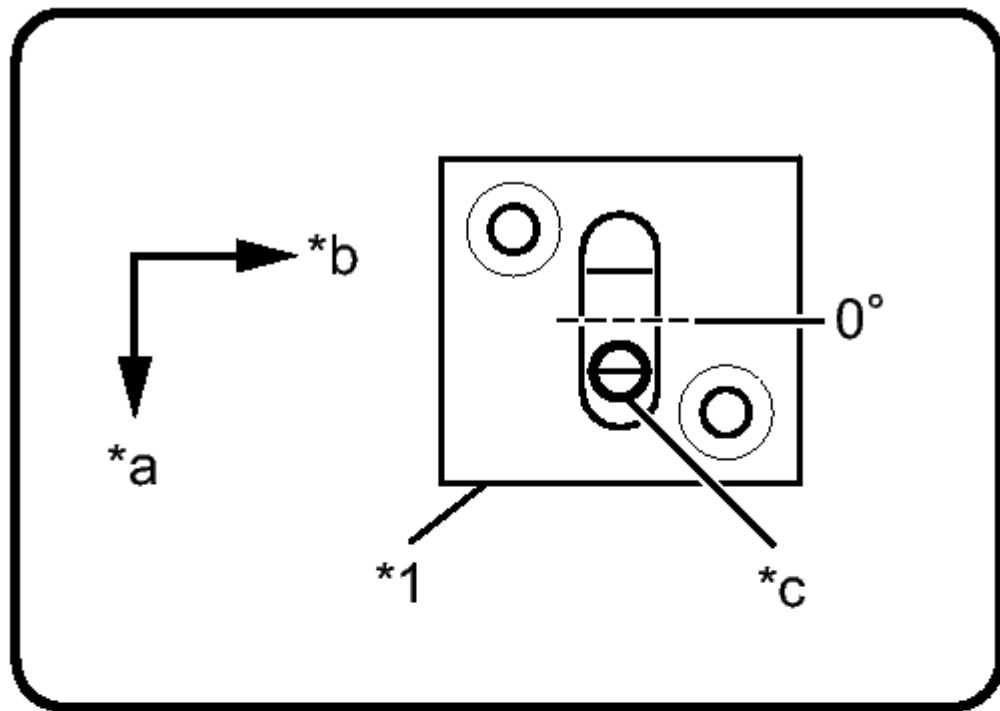
P

Fig. 18: Identifying Radar Sensor Level Rack
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Level
----	-------

2. Check that the level's air bubble is within the red frame.



P

Fig. 19: Checking Radar Sensor Level Within Red Frame
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

$*1$	Level
------	-------

*a	FR
*b	LH
*c	Air Bubble
*d	Adjust Bolt A
*e	Adjustment Hole

OK

Level's air bubble is within the red frame.

If the bubble is not within the red frame, use a screwdriver with the adjustment hole to adjust bolt A until the air bubble is within the red frame.

HINT:

- The adjustable range within the red frame is $\pm 0.2^\circ$.
- The target angle is $+0.2^\circ$ (upward angle of 0.2°).

Result

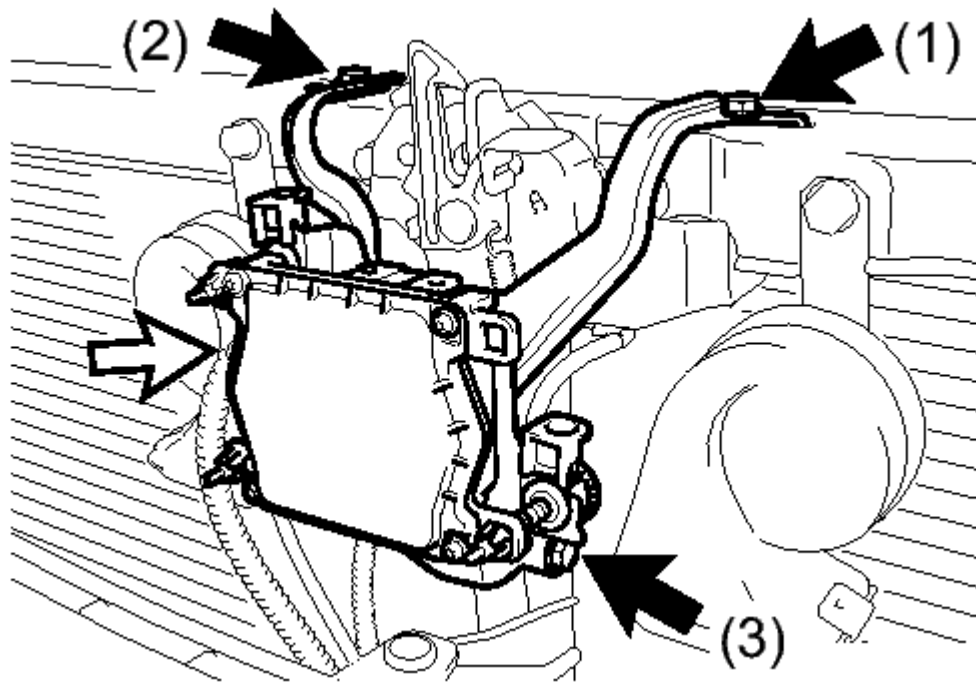
Adjustment Direction	Adjustment Procedure	Adjustment Angle
Vertical adjustment	Upward direction: Turn bolt A to negative (-) side	For every full rotation of the screwdriver, sensor moves 0.12°
	Downward direction: Turn bolt A to positive (+) side	

INSTALLATION

INSTALLATION

1. INSTALL MILLIMETER WAVE RADAR SENSOR ASSEMBLY

- Tighten the 3 bolts on the millimeter wave radar sensor assembly.



P

Fig. 20: Identifying Millimeter Wave Radar Sensor Assembly Bolts & Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Torque: 5.5 N*m (56 kgf*cm, 49 in.*lbf)

HINT:

Tighten the bolts in the order indicated in the illustration.

b. Connect the connector.

2. **ADJUST MILLIMETER WAVE RADAR SENSOR** See step 1
3. **INSTALL RADIATOR GRILLE SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 2**

ACCESSORIES & EQUIPMENT

Cruise Control System (Service Specifications) - Sienna

CRUISE CONTROL

SERVICE DATA

SERVICE DATA

CRUISE CONTROL MAIN SWITCH (W/O DYNAMIC RADAR CRUISE CONTROL SYSTEM)

Resistance	1 (ECC) - 3 (CCS)	Main switch off (Neutral)	1 Mohms or higher
		Main switch on	Below 2.5 ohms
		+RES	235 to 245 ohms
		-SET	617 to 643 ohms
		CANCEL	1509 to 1571 ohms

CRUISE CONTROL MAIN SWITCH (W/ DYNAMIC RADAR CRUISE CONTROL SYSTEM)

Resistance	1 (ECC) - 2 (R/N)	Main switch off (Neutral)	1 Mohms or higher
		MODE	Below 2.5 ohms
	1 (ECC) - 3 (CCS)	Main switch off (Neutral)	1 Mohms or higher
		Main switch on	Below 2.5 ohms
		+RES	235 to 245 ohms
		-SET	617 to 643 ohms
		CANCEL	1509 to 1571 ohms

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Driving support ECU x Body	6.0	61	53 in.*lbf
Millimeter wave radar sensor assembly x Body	5.5	56	49 in.*lbf