

TRANSMISSION

Active Torque Control 4WD System (Diagnostic Codes & Circuit Tests) - Sienna

ACTIVE TORQUE CONTROL 4WD SYSTEM

DTC C1241: LOW POWER SUPPLY VOLTAGE MALFUNCTION

DESCRIPTION

If a malfunction in the power source circuit occurs, or a malfunction in communication with the skid control ECU or in a speed sensor occurs, the 4WD control ECU will prohibit operations by the fail-safe function.

DTC No.	DTC Detection Condition	Trouble Area
C1241	- When the following continues for 10 seconds or more: - At a vehicle speed of 3 km/h (2 mph) or more, the IG1 terminal voltage is 9.5 V or less. - When either of the following is detected: - With the IG1 terminal voltage 9.5 V or less, communication with the skid control ECU is impossible. - Vehicle speed sensor voltage is reduced for 60 seconds or more. - When the following continues for 3 seconds or more: - The IG1 terminal voltage is 17 V or more.	- Battery - ECU-IG1 No. 1 fuse - Wire harness and connector (IG1 circuit, GND circuit) - Brake control system - CAN communication system 4WD control ECU

WIRING DIAGRAM

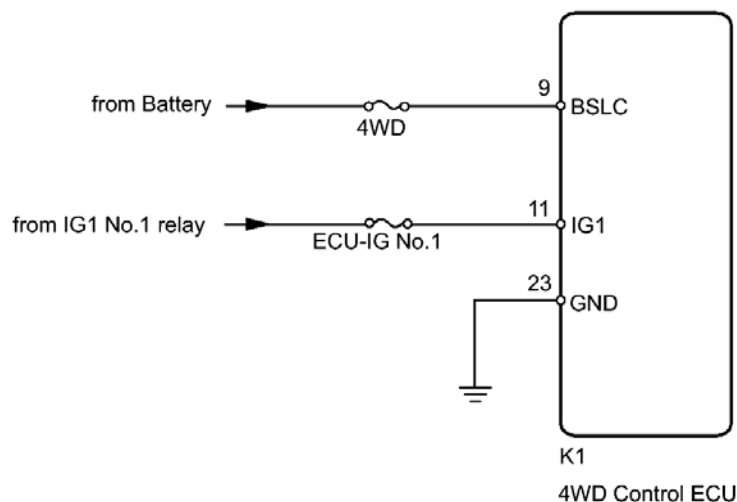


Fig. 1: 4WD Control ECU Power Supply Circuit Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

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

HINT:

Check the condition of each related circuit connector before troubleshooting. Refer to **ELECTRONIC CIRCUIT INSPECTION PROCEDURE** .

PROCEDURE

1. **CHECK FOR DTC (CAN COMMUNICATION SYSTEM AND BRAKE CONTROL SYSTEM)**
 - a. Check if CAN communication system DTCs are output. Refer to **DIAGNOSIS SYSTEM** .
 - b. Start the engine.
 - c. Drive the vehicle, accelerate to a speed of 3 km/h (2 mph) or more, and check if the speed sensor DTC (brake control system DTC) is output. Refer to **DTC CHECK / CLEAR** .

RESULT

Result	Proceed to
Neither CAN communication system DTC nor speed sensor DTC	A

(brake control system DTC) is output	
CAN communication system DTC is output	B
Speed sensor DTC (brake control system DTC) is output	C

B --> See step 9

C --> See step 10

A: Go to next step

2. INSPECT BATTERY

- a. Check the battery voltage.

Standard voltage

11 to 14 V

NG --> See step 6

OK: Go to next step

3. CHECK HARNESS AND CONNECTOR (4WD CONTROL ECU - BATTERY)

*a

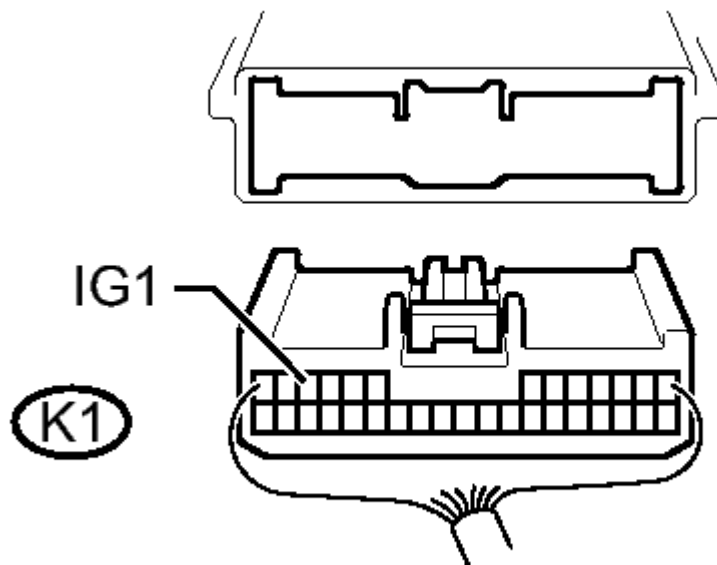


Fig. 2: Measuring Voltage Of 4WD Control ECU To Battery
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Disconnect the ECU connector.
- Measure the voltage according to the value(s) in the table below.

Standard Voltage

Tester Connection	Switch Condition	Specified Condition
K1-11 (IG1) - Body Ground	Ignition switch ON	11 to 14 V

TEXT IN ILLUSTRATION

*a	Rear view of wire harness connector (to 4WD Control ECU)
----	--

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

4. CHECK HARNESS AND CONNECTOR (4WD CONTROL ECU - BODY GROUND)

*a

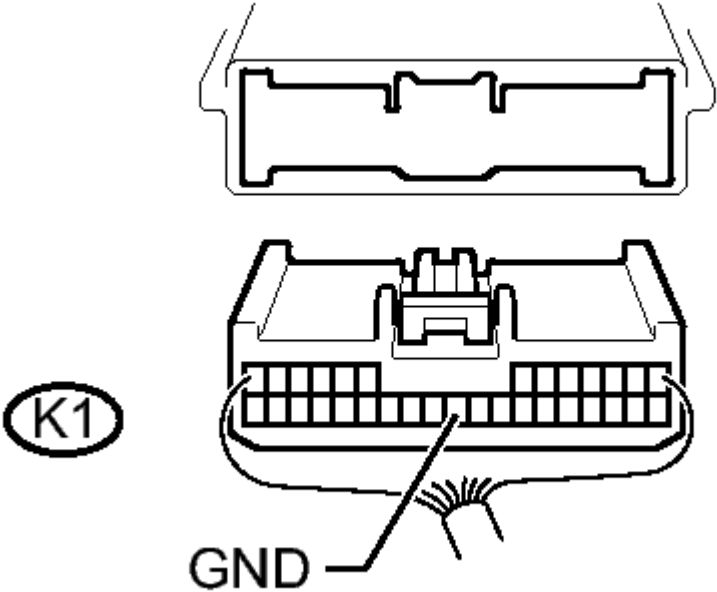


Fig. 3: Measuring Resistance Of 4WD Control ECU To Body Ground
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard Resistance

Tester Connection	Condition	Specified Condition
K1-23 (GND) - Body Ground	Always	Below 1 ohms

TEXT IN ILLUSTRATION

*a	Rear view of wire harness connector (to 4WD Control ECU)
----	--

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

5. RECONFIRM DTC

- a. Clear the DTC. Refer to DTC CHECK / CLEAR.
- b. Start the engine.
- c. Drive the vehicle, accelerate to a speed of 3 km/h (2 mph or more, and check if the same DTC is output.

RESULT

Result	Proceed to
DTC is output	A
DTC is not output	B

HINT:

Reinstall the sensor, connectors, etc. and restore the vehicle to its prior condition before rechecking DTCs.

B --> See step 8

A --> See step 7

6. CHECK CHARGING SYSTEM. Refer to 2GR-FE - ON-VEHICLE INSPECTION or 1AR-FE - ON-VEHICLE INSPECTION
7. REPLACE 4WD CONTROL ECU. Refer to REMOVAL
8. CHECK FOR INTERMITTENT PROBLEMS. Refer to HOW TO PROCEED WITH TROUBLESHOOTING
9. REPAIR CIRCUIT INDICATOR BY OUTPUT CODE (CAN COMMUNICATION SYSTEM). Refer to DIAGNOSTIC TROUBLE CODE CHART
10. REPAIR CIRCUIT INDICATOR BY OUTPUT CODE (BRAKE CONTROL SYSTEM). Refer to DIAGNOSTIC TROUBLE CODE CHART

DTC C1280: ENGINE CIRCUIT MALFUNCTION

DESCRIPTION

If a malfunction in the ECM circuit occurs, the 4WD control ECU will output this DTC.



DTC No.	DTC Detection Condition	Trouble Area
C1280	When the following continues for 5 seconds or more: - Communication with engine control ECM is operating normally, but SFI system is malfunctioning.	• SFI system • 4WD control ECU

INSPECTION PROCEDURE

HINT:

Check the condition of each related circuit connector before troubleshooting. Refer to **ELECTRONIC CIRCUIT INSPECTION PROCEDURE** .

PROCEDURE

1. CHECK FOR DTC (SFI SYSTEM)

- Check if the SFI system DTC is output. Refer to **DTC CHECK / CLEAR** .

RESULT

Result	Proceed to
SFI system DTC is not output	A
SFI system DTC is output	B

B --> See step 3

A --> See step 2

2. REPLACE 4WD CONTROL ECU. Refer to **REMOVAL**

3. GO TO SFI SYSTEM. Refer to **DIAGNOSTIC TROUBLE CODE CHART**

DTC C1296: ABS MALFUNCTION

DESCRIPTION

If a malfunction in the speed sensor signal circuit deceleration sensor circuit occurs, the 4WD control ECU will

output this DTC.

DTC No.	DTC Detection Condition	Trouble Area
C1296	When one of the following conditions is met: 1. Wheel speed sensor malfunction is received from the skid control ECU 2. Deceleration sensor malfunction is received from skid control ECU	• Brake control system (speed sensor circuit) • Brake control system (deceleration sensor circuit) • Skid control ECU • 4WD control ECU

INSPECTION PROCEDURE

HINT:

Check the condition of each related circuit connector before troubleshooting. Refer to **ELECTRONIC CIRCUIT INSPECTION PROCEDURE** .

PROCEDURE

1. CHECK FOR DTC (BRAKE CONTROL SYSTEM)

- a. Clear the DTC. Refer to **DTC CHECK / CLEAR** .
- b. Turn the ignition switch off.
- c. Turn the ignition switch to ON again.
- d. Drive the vehicle, accelerate to a speed of 20 km/h (12 mph) or more, and check if the speed sensor DTC (brake control system DTC) is output.

RESULT

Result	Proceed to
Brake control system DTC (speed sensor or deceleration sensor DTC) is not output	A
Brake control system DTC (speed sensor or deceleration	B

sensor DTC) is output	
-----------------------------	--

HINT:

When DTCs indicating a CAN communication system malfunction are output, repair the CAN communication system before repairing each corresponding sensor.

B --> See step 6

A: Go to next step

2. READ VALUE USING TECHSTREAM (SPEED SENSOR SIGNAL)

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Chassis / Four Wheel Drive / Data List.
- Read the value displayed on the Techstream.

FOUR WHEEL DRIVE

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
FR Wheel Speed	FR Wheel Speed / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Actual wheel speed	Almost no difference from the speedometer
FL Wheel Speed	FL Wheel Speed / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Actual wheel speed	Almost no difference from the speedometer
RR Wheel Speed	RR Wheel Speed / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Actual wheel speed	Almost no difference from the speedometer
	RL Wheel		

RL Wheel Speed	Speed / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Actual wheel speed	Almost no difference from the speedometer
----------------------	---	--------------------------	--

OK

The speed value output from the speed sensor displayed on the Techstream is the same as the actual vehicle speed measured using a speedometer tester (calibrated chassis dynamometer).

NG --> See step 5

OK: Go to next step

3. READ VALUE USING TECHSTREAM (FORWARD AND REARWARD G)

- Enter the following menus: Chassis / Four Wheel Drive / Data List.
- Read the value displayed on the Techstream.

FOUR WHEEL DRIVE

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
Forward and Rearward G	Deceleration sensor (Forward and Rearward G) / Min.: -25.10 m/s ² Max.: 24.90 m/s ²	Approximately 0 +/-0.13 while stationary	-

OK

The deceleration sensor output value is normal.

NG --> See step 5

OK --> See step 4

- REPLACE 4WD CONTROL ECU. Refer to REMOVAL**
- GO TO BRAKE CONTROL SYSTEM. Refer to HOW TO PROCEED WITH TROUBLESHOOTING**
- REPAIR CIRCUIT INDICATOR BY OUTPUT CODE (BRAKE CONTROL SYSTEM). Refer to DIAGNOSTIC TROUBLE CODE CHART**

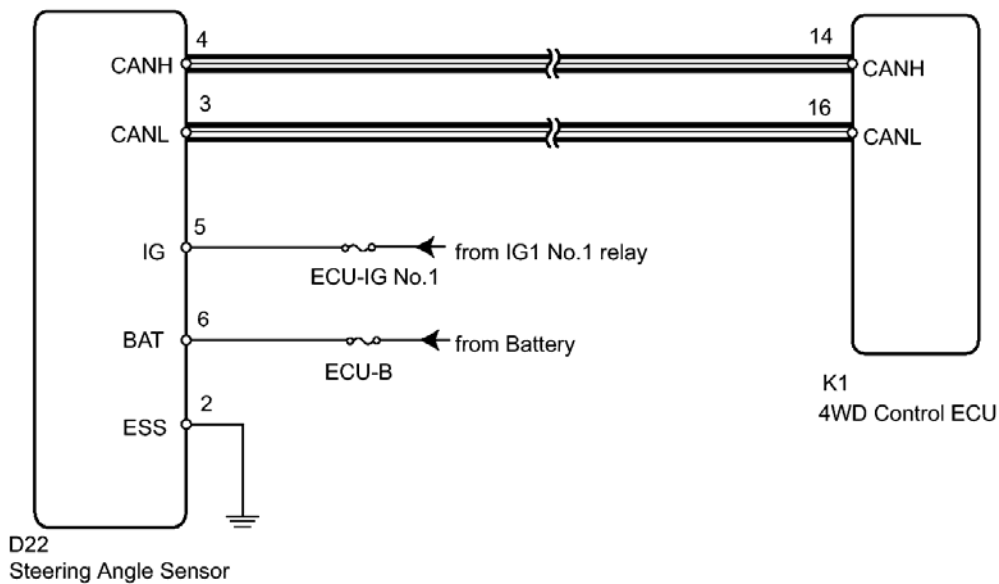
DTC C1297: STEERING ANGLE SENSOR

DESCRIPTION

- The 4WD control ECU determines that the vehicle is turning based on the signals sent from the steering angle sensor.
- The steering angle sensor signal is sent to the 4WD control ECU via the CAN communication system.
- The 4WD control ECU detects the amount of steering wheel movement and performs "slip control at vehicle start up", according to the amount of movement, and "slip control" to secure high turning performance.

DTC No.	DTC Detection Condition	Trouble Area
C1297	When voltage of 4WD control ECU IG terminal is 9.5 V or more, and steering angle sensor malfunction signal is received.	- Steering angle sensor - CAN communication 4WD control ECU - Wire harness and connector

WIRING DIAGRAM



≡ : CAN Communication Line

Fig. 4: Steering Angle Sensor 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.

HINT:

Check the condition of each related circuit connector before troubleshooting. Refer to **ELECTRONIC CIRCUIT INSPECTION PROCEDURE** .

PROCEDURE

1. CHECK FOR DTC

- a. Clear the DTC. Refer to **DTC CHECK / CLEAR** .
- b. Turn the ignition switch off.
- c. Turn the ignition switch to ON again and check that no CAN communication system DTC(s) is output. Refer to **DIAGNOSTIC TROUBLE CODE CHART** .
- d. Start the engine.
- e. Drive the vehicle and turn the steering wheel to the right and left at a speed of 35 km/h (24 mph) and check that no brake control system (steering angle sensor) DTC (C1432, C1433 or C1434) is output. Refer to **DIAGNOSIS SYSTEM** .

RESULT

Result	Proceed to
Neither CAN communication system DTC nor brake control system DTC is output	A
CAN communication system DTC is output	B
Brake control system (steering angle sensor) DTC (C1432, C1433 or C1434) is output	C

HINT:

When DTCs indicating a CAN communication system malfunction are output, repair the CAN communication system before repairing each corresponding sensor.

B --> See step 4

C --> See step 5

A: Go to next step

2. CHECK HARNESS AND CONNECTOR (STEERING ANGLE SENSOR - BATTERY)

- a. Remove the steering wheel and the column cover lower.

*a

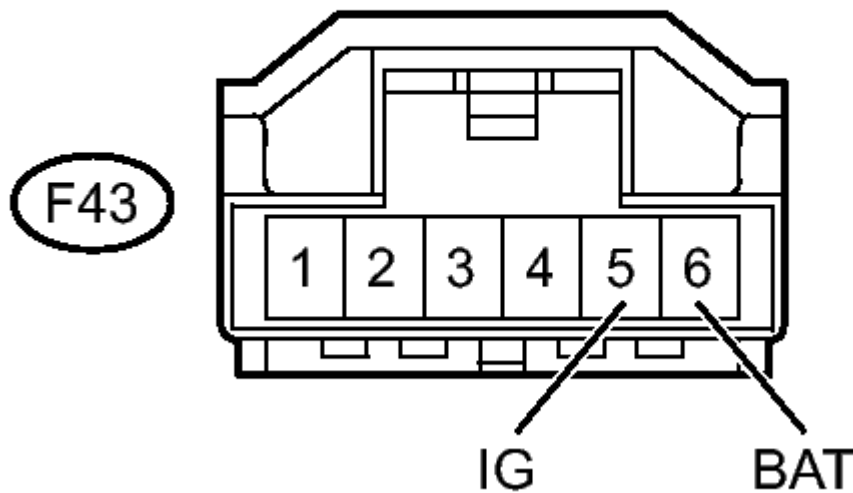


Fig. 5: Measuring Voltage Of SAS To Battery

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

- b. Make sure that there is no looseness at the locking part and the connecting part of the connectors.
c. Disconnect the steering angle sensor connector.
d. Measure the voltage according to the value(s) in the table below.

Standard Voltage

Tester Connection	Switch Condition	Specified Condition
D22-5 (IG) - Body ground	Ignition switch ON	11 to 14 V
D22-6 (BAT) - Body	Always	11 to 14 V

ground		
--------	--	--

TEXT IN ILLUSTRATION

*a	Front view of wire harness connector (to Steering Angle Sensor)
----	---

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

3. CHECK HARNESS AND CONNECTOR (STEERING ANGLE SENSOR - BODY GROUND)
 - a. Turn the ignition switch off.

*a

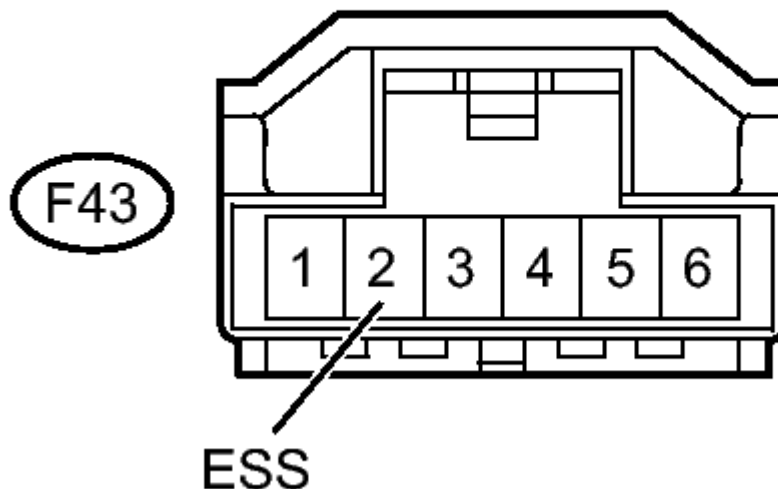


Fig. 6: Measuring Resistance Of SAS To Body Ground
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard Resistance

Tester Connection	Condition	Specified Condition
D22-2 (ESS) - Body ground	Always	Below 1 ohms

TEXT IN ILLUSTRATION

*a	Front view of wire harness connector (to Steering Angle Sensor)
----	---

NG --> **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK --> **See step 6**

4. **REPAIR CIRCUIT INDICATOR OUTPUT CODE (CAN COMMUNICATION SYSTEM). Refer to DIAGNOSTIC TROUBLE CODE CHART**
5. **REPAIR OR REPLACE CIRCUIT INDICATOR OUTPUT CODE (STEERING ANGLE SENSOR CIRCUIT). Refer to DIAGNOSTIC TROUBLE CODE CHART**
6. **REPLACE SPIRAL WITH SENSOR CABLE SUB-ASSEMBLY (STEERING ANGLE SENSOR). Refer to REMOVAL**

DTC C1298: LINEAR SOLENOID CIRCUIT

DESCRIPTION

The 4WD control ECU receives signals from each sensor to control clutch pressure to distribute torque according to the driving conditions.

DTC No.	DTC Detection Condition	Trouble Area
C1298	When the following continues for 1 second or more: - With the current of 0.8 A or more, an open or short in the electromagnetic solenoid circuit occurs.	• 4WD fuse • Wire harness and connector • Electromagnetic control coupling • 4WD control ECU

WIRING DIAGRAM

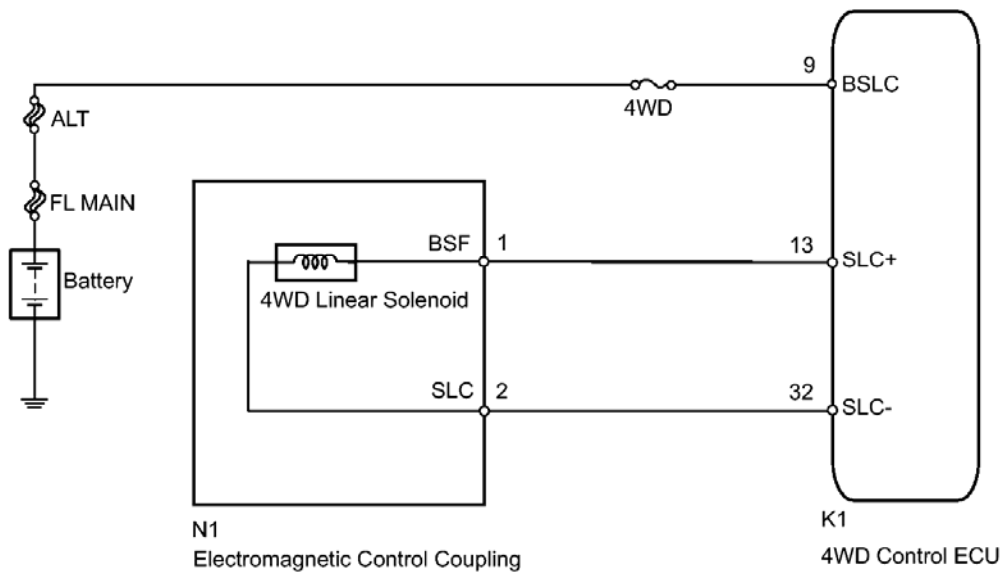


Fig. 7: 4WD Linear Solenoid Circuit Wiring Diagram

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.

HINT:

Check the condition of each related circuit connector before troubleshooting. Refer to **ELECTRONIC CIRCUIT INSPECTION PROCEDURE** .

PROCEDURE

1. **CHECK HARNESS AND CONNECTOR (4WD CONTROL ECU - BATTERY)**
 - a. Disconnect the ECU connector.

*a

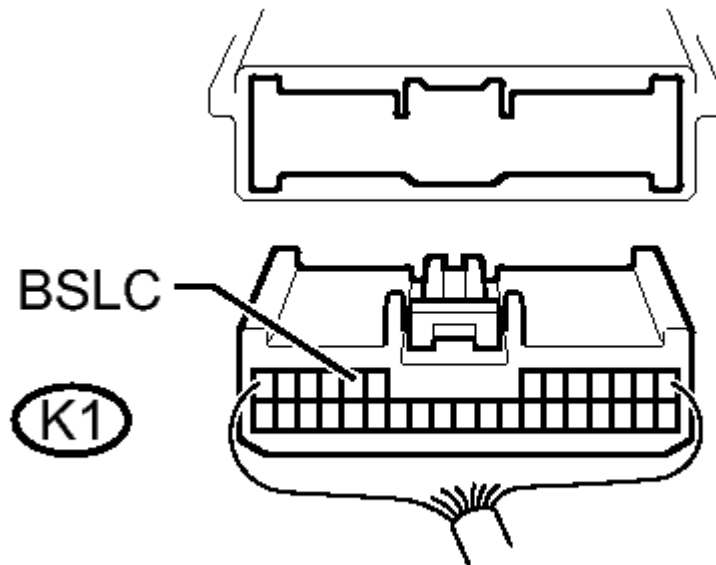


Fig. 8: Measuring Voltage Of 4WD Control ECU To Battery
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard Voltage

Tester Connection	Condition	Specified Condition
K1-9 (BSLC) - Body Ground	Always	11 to 14 V

TEXT IN ILLUSTRATION

*a	Rear view of wire harness connector (to 4WD Control ECU)
----	---

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

2. **INSPECT ELECTRO MAGNETIC CONTROL COUPLING (ELECTROMAGNETIC SOLENOID)**

- a. Disconnect the coupling connector.

*a

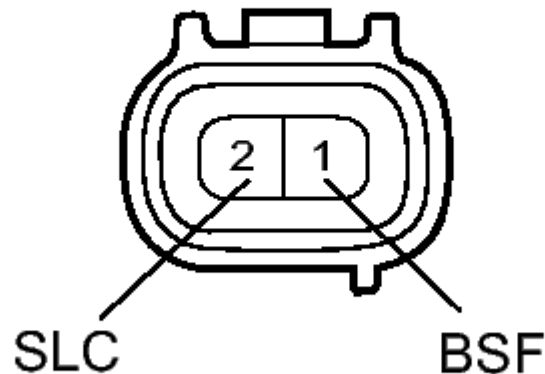


Fig. 9: Measuring Resistance Of Electro Magnetic Control Coupling
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard Resistance

Tester Connection	Condition	Specified Condition
1 (BSF) - 2 (SLC)	Always	2.2 to 2.6 ohms
1 (BSF) - Body ground	Always	10 kohms or higher
2 (SLC) - Body ground	Always	10 kohms or higher

TEXT IN ILLUSTRATION

*a	Electromagnetic Solenoid
----	--------------------------

NG --> See step 5

OK: Go to next step

3. **CHECK HARNESS AND CONNECTOR (ELECTROMAGNETIC CONTROL COUPLING - 4WD CONTROL ECU)**

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

Standard Resistance

Tester Connection	Condition	Specified Condition
K1-13 (SLC+) - 1 (BSF)	Always	Below 1 ohms
K1-32 (SLC-) - 2 (SLC)	Always	Below 1 ohms
K1-13 (SLC+) - Body ground	Always	10 kohms or higher
K1-32 (SLC-) - Body ground	Always	10 kohms or higher

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK --> See step 4

4. **REPLACE 4WD CONTROL ECU. Refer to REMOVAL**
5. **REPLACE ELECTRO MAGNETIC CONTROL COUPLING SUB-ASSEMBLY. Refer to REMOVAL**

DTC C1299: CANCELLATION OF 4WD CONTROL

DESCRIPTION

- If wheel slip continues, differential control will be disabled when the torque-distribution ratio of the differential clutch exceeds the set value and a malfunction in the output of the wheel speed sensors, etc. occurs.
- If a difference in diameter between the front and rear wheels is determined, differential control will be disabled.

DTC No.	DTC Detection Condition	Trouble Area
C1299	When one of the following conditions is met: - Condition that controls coupling calorific value is predefined value or more. - The estimated transfer oil temperature exceeds the specified value. - Vehicle is driven and energy load tire radius difference between front tires and rear tires is more than 3%.	• Tire size • Electromagnetic control coupling • 4WD control ECU

INSPECTION PROCEDURE

HINT:

Check the condition of each related circuit connector before troubleshooting. Refer to **ELECTRONIC CIRCUIT INSPECTION PROCEDURE** .

PROCEDURE

1. CHECK TIRE CONDITION

- a. Check the size and condition of all 4 tires. Refer to **INSPECTION** .

HINT:

This DTC is output when tire deformation or a difference in tire size is detected.

OK

The diameter and air pressure of all 4 tires are the same.

NG --> REPLACE TIRE SO THAT ALL 4 TIRES ARE THE SAME IN SIZE

OK: Go to next step

2. CHECK FOR DTC

- a. Connect the Techstream to the DLC3.
- b. Turn the ignition switch to ON.
- c. Turn the Techstream on.
- d. Check if the Brake control system DTC is output. Refer to **DTC CHECK / CLEAR** .
- e. Read the DTCs using the Techstream.

RESULT

Result	Proceed to
Only "C1299" is output	A
"C1299" and other DTCs (Brake control system DTC)	B

B --> See step 6

A: Go to next step

3. RECONFIRM DTC

- a. Clear the DTC. Refer to **DTC CHECK / CLEAR** .
- b. Start the engine.
- c. Drive the vehicle at the speed of 20 km/h (12 mph) or more and check that the same DTC is output.

RESULT

Result	Proceed to
DTC is output (C1299)	A
DTC is not output	B

B --> END

A: Go to next step

4. REPLACE 4WD CONTROL ECU

- a. Replace 4WD control ECU. Refer to **REMOVAL** .

NEXT: Go to next step

5. RECONFIRM DTC

- a. Clear the DTC. Refer to **DTC CHECK / CLEAR** .
- b. Start the engine.
- c. Drive the vehicle at the speed of 20 km/h (12 mph) or more and check that the same DTC is output.

RESULT

Result	Proceed to
DTC is output (C1299)	A
DTC is not output	B

B --> END

A --> REPLACE ELECTRO MAGNETIC CONTROL COUPLING SUB-ASSEMBLY

6. REPAIR CIRCUITS INDICATED BY OUTPUT DTCS (BRAKE CONTROL SYSTEM). Refer to DIAGNOSTIC TROUBLE CODE CHART

DTC U0073: CONTROL MODULE COMMUNICATION BUS OFF; DTC U0100: LOST COMMUNICATION WITH ECM / PCM "A"; DTC U0126: LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE; DTC U0129: LOST COMMUNICATION WITH BRAKE SYSTEM CONTROL MODULE

DESCRIPTION

- The 4WD control ECU inputs the signals sent from the ECM and skid control ECU via the CAN communication system.
- When DTCs indicating a CAN communication system malfunction are output, repair the CAN communication system before repairing each corresponding sensor.

DTC No.	DTC Detection Condition	Trouble Area
U0073	1. When the following continues for 5 seconds or more: - Signals from the 4WD control ECU are not received. 2. When the following occurs 10 times consecutively: - A communication malfunction (bus off) occurs one or more times within 0.1 seconds.	CAN communication system
U0100	1. When both of the following continue for 2 seconds or more: - The voltage of the IG1 terminal is 10 V or more. - At a vehicle speed of 60 km/h (38 mph) or more, communication with the ECM cannot be performed.	CAN communication system
	1. When both of the following continue for 1 second or more: - The voltage of the IG1 terminal is 10 V or more. - Communication with the steering angle sensor cannot be performed.	

U0126	2. When all of the following occur 10 times consecutively: - The condition that communication with the steering angle sensor cannot be performed occurs once within 5 seconds. - The voltage of the IG1 terminal is 10 V or more. - Occurs 10 times or more within 60 seconds.	CAN communication system
U0129	1. When the following continues for 3 seconds or more: - The voltage of the IG1 terminal is 10 V or more. - Communication with the skid control ECU cannot be performed.	CAN communication system

INSPECTION PROCEDURE

PROCEDURE

1. CHECK FOR DTC (ACTIVE TORQUE CONTROL 4WD SYSTEM)

- Check for DTCs. Refer to **DTC CHECK / CLEAR** .
- Record the output DTCs (active torque control 4WD system).

HINT:

When DTCs indicating a CAN communication system malfunction are output, repair the CAN communication system before repairing each corresponding sensor.

NEXT --> See step 2

2. GO TO CAN COMMUNICATION SYSTEM. Refer to **DIAGNOSTIC TROUBLE CODE CHART**

SYMPTOM TESTS

AWD Warning Light Remains ON

DESCRIPTION

The 4WD control ECU is connected to the combination meter via the CAN communication system.

If the 4WD control ECU stores any DTCs which are related to the active torque control 4WD system, the AWD

warning light comes on in the combination meter.

WIRING DIAGRAM

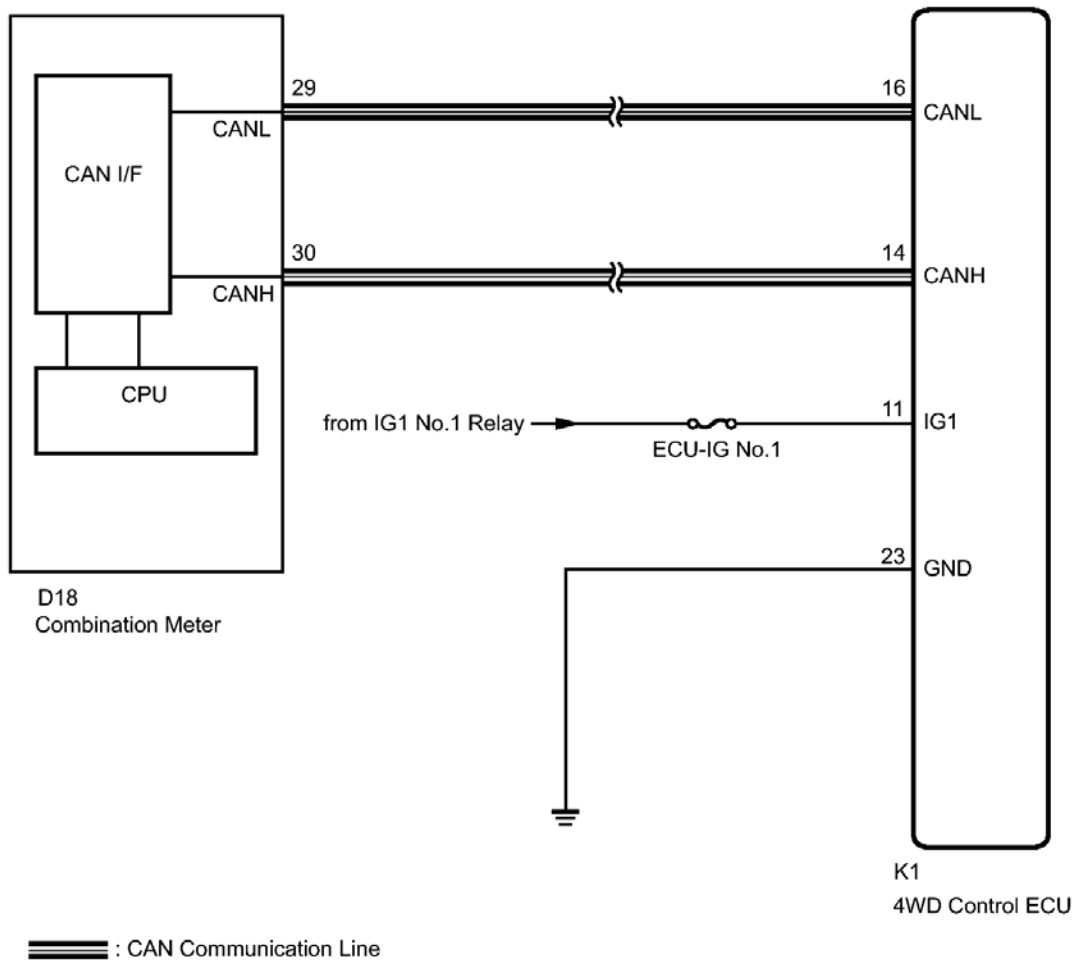


Fig. 10: AWD Warning Light Circuit Wiring Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

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

HINT:

Check the condition of each related circuit connector before troubleshooting. Refer to **ELECTRONIC CIRCUIT INSPECTION PROCEDURE** .

PROCEDURE

1. CHECK FOR DTC (CAN COMMUNICATION SYSTEM AND ACTIVE TORQUE CONTROL 4WD SYSTEM)

- Check if CAN communication system DTCs are output. Refer to **DIAGNOSIS SYSTEM** .
- Check if the active torque control 4WD system DTC is output. Refer to **DTC CHECK / CLEAR** .

RESULT

Result	Proceed to
Neither CAN communication system DTC nor active torque control 4WD system DTC is output	A
CAN communication DTC is output	B
Active torque control 4WD system DTC is output	C

HINT:

When DTCs indicating a CAN communication system malfunction are output, repair the CAN communication system before repairing each corresponding sensor.

B --> See step 9

C --> See step 10

A: Go to next step

2. CHECK IF 4WD CONTROL ECU CONNECTOR IS SECURELY CONNECTED

- Check if the skid control ECU connector is securely connected.

OK

The connector is securely connected.

NG --> CONNECT CONNECTOR TO ECU CORRECTLY

OK: Go to next step

3. INSPECT BATTERY

- a. Check the battery voltage.

Standard voltage

11 to 14 V

NG --> See step 11

OK: Go to next step

4. PERFORM ACTIVE TEST USING TECHSTREAM (AWD WARNING LIGHT)

- a. Warm up the engine.
- b. Turn the ignition switch off.
- c. Connect the Techstream to the DLC3.
- d. Turn the ignition switch to ON.
- e. Turn the Techstream on.
- f. Enter the following menus: Chassis / Four Wheel Drive / Active Test.
- g. According to the display on the Techstream, perform the Active Test.

FOUR WHEEL DRIVE

Tester Display	Test Part	Control Range	Diagnostic Note
4WD Warning Light	AWD warning light	Warning light is ON/OFF	Observe combination meter

OK

The AWD warning light turns off.

NG --> See step 6

OK --> See step 5

5. REPLACE 4WD CONTROL ECU. Refer to REMOVAL

6. CHECK HARNESS AND CONNECTOR (4WD CONTROL ECU - BATTERY)

- a. Disconnect the ECU connector.

*a

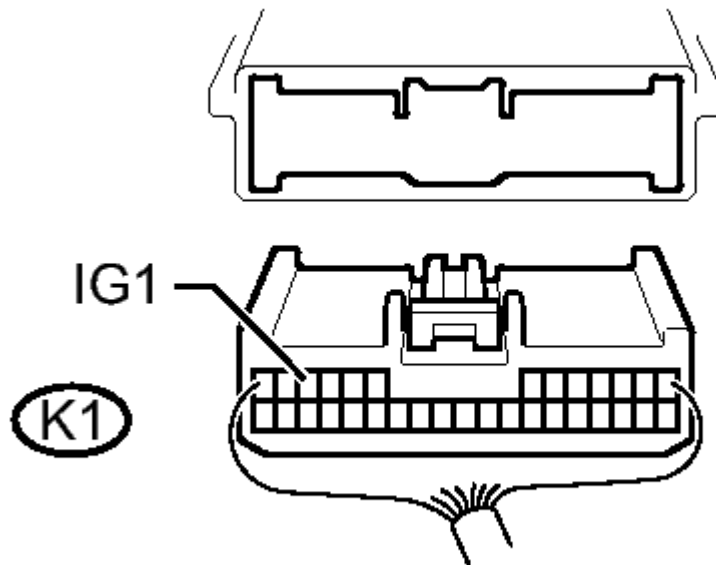


Fig. 11: Measuring Voltage Of 4WD Control ECU To Battery
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Standard Voltage

Tester Connection	Switch Condition	Specified Condition
K1-11 (IG1) - Body Ground	Ignition switch ON	11 to 14 V

TEXT IN ILLUSTRATION

*a	Rear view of wire harness connector (to 4WD Control ECU)
----	--

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

7. CHECK HARNESS AND CONNECTOR (4WD CONTROL ECU - BODY GROUND)

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

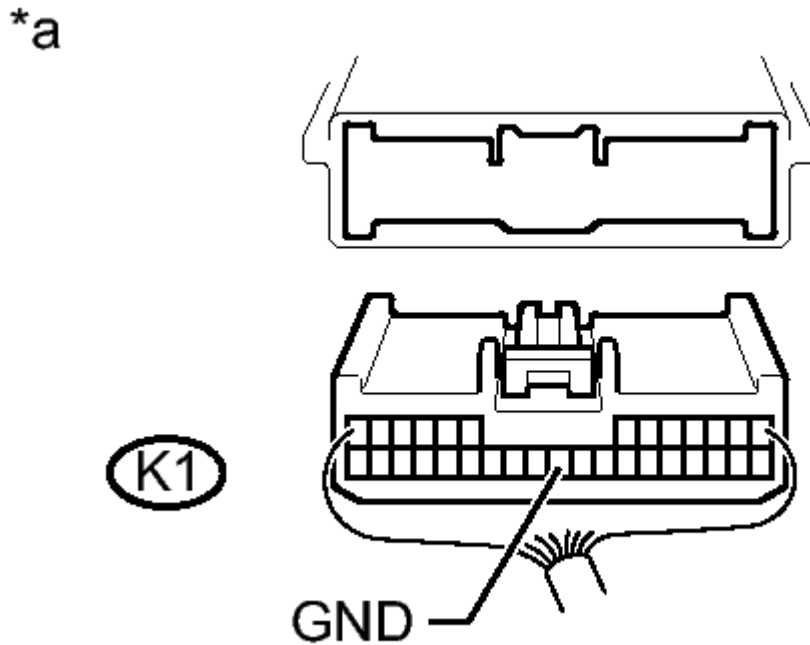


Fig. 12: Measuring Resistance Of 4WD Control ECU To Body Ground
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard Resistance

Tester Connection	Condition	Specified Condition
K1-23 (GND) - Body Ground	Always	Below 1 ohms

TEXT IN ILLUSTRATION

*a	Rear view of wire harness connector (to 4WD Control ECU)
-----------	--

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK --> See step 8

8. GO TO METER / GAUGE SYSTEM.. PROBLEM SYMPTOMS TABLE
9. REPAIR CIRCUIT INDICATOR BY OUTPUT CODE (CAN COMMUNICATION SYSTEM). Refer to DIAGNOSTIC TROUBLE CODE CHART
10. REPAIR CIRCUIT INDICATOR BY OUTPUT CODE (ACTIVE TORQUE CONTROL 4WD SYSTEM). Refer to DIAGNOSTIC TROUBLE CODE CHART
11. CHECK CHARGING SYSTEM. Refer to 2GR-FE - ON-VEHICLE INSPECTION or 1AR-FE - ON-VEHICLE INSPECTION

AWD Warning Light does not Come ON

DESCRIPTION

Refer to "AWD Warning Light Remains ON". Refer to DESCRIPTION.

WIRING DIAGRAM

Refer to "AWD Warning Light Remains ON". Refer to WIRING DIAGRAM.

INSPECTION PROCEDURE

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

HINT:

Check the condition of each related circuit connector before troubleshooting. Refer to ELECTRONIC CIRCUIT INSPECTION PROCEDURE .

PROCEDURE

1. CHECK CAN COMMUNICATION SYSTEM

- a. Check if CAN communication system DTCs are output.

RESULT

Result	Proceed to
CAN communication system DTC is not output	A
CAN communication	B

system DTC is output	
-------------------------	--

HINT:

When DTCs indicating a CAN communication system malfunction are output, repair the CAN communication system before repairing each corresponding sensor.

B --> See step 3

A: Go to next step

2. INSPECT AWD WARNING LIGHT

- a. Disconnect the 4WD control ECU connector.
- b. Turn the ignition switch to ON.
- c. Check that the AWD warning light comes on.

OK

AWD warning light comes on.

NG --> See step 5

OK --> See step 4

3. **REPAIR CAN COMMUNICATION SYSTEM. Refer to HOW TO PROCEED WITH TROUBLESHOOTING**
4. **REPLACE 4WD CONTROL ECU. Refer to REMOVAL**
5. **GO TO METER / GAUGE SYSTEM. Refer to PROBLEM SYMPTOMS TABLE**

CIRCUIT TESTS

TC and CG Terminal Circuit

DESCRIPTION

Connecting terminals TC and CG of the DLC3 causes the 4WD control ECU to display 2-digit DTCs by flashing the AWD warning light.

HINT:

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

WIRING DIAGRAM

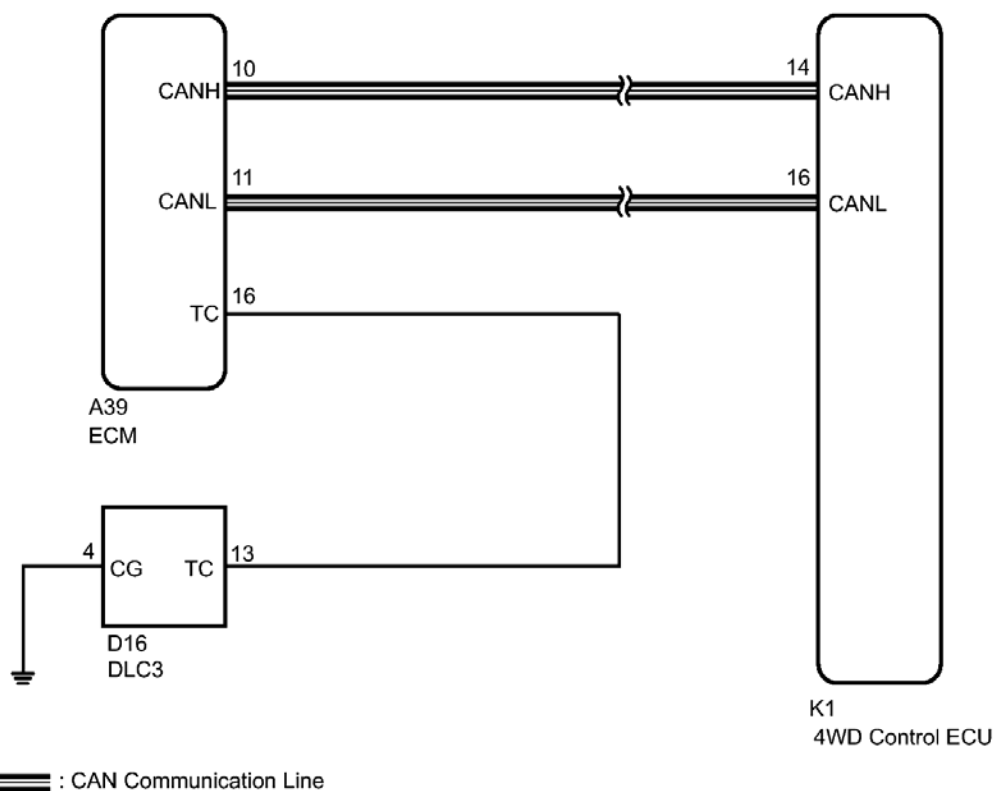


Fig. 13: TC and CG Terminal Circuit Wiring Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

HINT:

Check the condition of each related circuit connector before troubleshooting. Refer to **ELECTRONIC CIRCUIT INSPECTION PROCEDURE** .

PROCEDURE

1. **CHECK FOR DTC (CAN COMMUNICATION SYSTEM)**
 - a. Check if the CAN communication DTC is output. Refer to **DIAGNOSIS SYSTEM** .

RESULT

Result	Proceed to
DTC is not output	A

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

B --> See step 6

A: Go to next step

2. CHECK HARNESS AND CONNECTOR (TC OF DLC3 - TC OF ECM AND BODY GROUND)

- a. Turn the ignition switch off.
- b. Disconnect the ECM connector.
- c. Measure the resistance according to the value(s) in the table below.

Standard Resistance

Tester Connection	Condition	Specified Condition
D16-13 (TC) - A39- 16 (TC)	Always	Below 1 ohms
D16-13 (TC) - Body Ground	Always	10 kohms or higher

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

3. CHECK HARNESS AND CONNECTOR (CG OF DLC3 - BODY GROUND)

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

Standard Resistance

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

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK: Go to next step

4. CHECK HARNESS AND CONNECTOR (TC OF DLC3 - BODY GROUND)

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

Standard Resistance

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

NG --> REPAIR OR REPLACE HARNESS OR CONNECTOR

OK --> See step 5

5. **REPLACE 4WD CONTROL ECU. Refer to REMOVAL**
6. **REPAIR CAN COMMUNICATION SYSTEM. Refer to HOW TO PROCEED WITH TROUBLESHOOTING**

TRANSMISSION

Active Torque Control 4WD System - Sienna

ACTIVE TORQUE CONTROL 4WD 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	Switch (Position)	Engine Switch (Condition)
Ignition switch off	LOCK	Off
Ignition switch ACC	ACC	On (ACC)
Ignition switch ON	ON	On (IG)
Engine start	START	Start

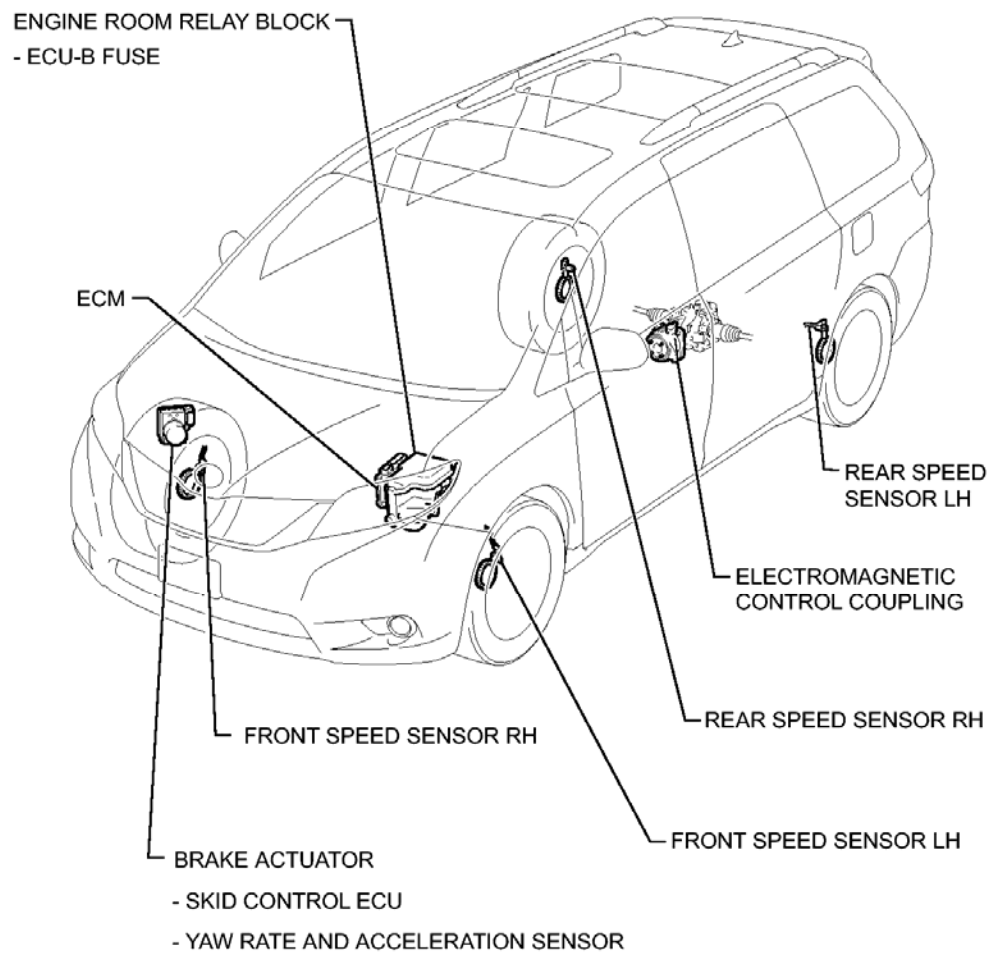
2. TROUBLESHOOTING PRECAUTION

NOTE:

- Since the Active Torque Control 4WD system may be influenced by a malfunction in other systems, be sure to check for DTCs in the other systems.
- When removing and installing the 4WD control ECU and each sensor, be sure to check that the normal display is output in test mode inspection and in DTC output inspection after installing all the parts.
- If the DTC of the CAN communication line is output, repair the malfunction in the communication line and troubleshoot the Active Torque Control 4WD system.
- Since the CAN communication line has its own length and route, it cannot be repaired temporarily with a bypass wire, etc.

PARTS LOCATION

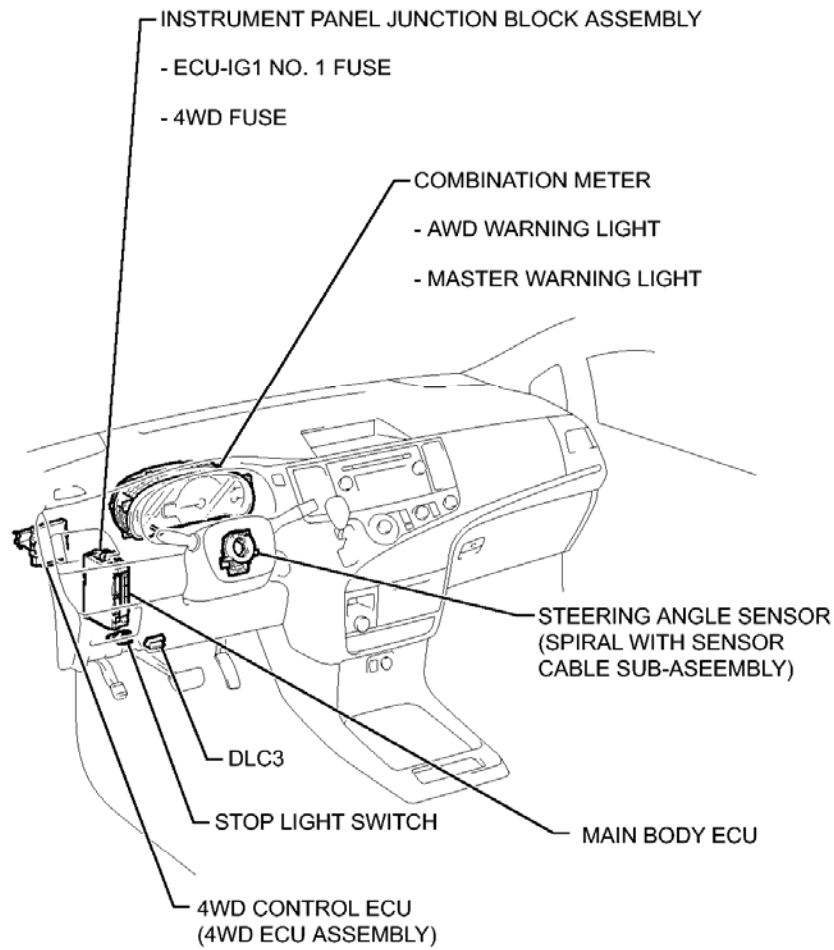
ILLUSTRATION



P

Fig. 1: Active Torque Control 4WD System Components Location (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



P
Fig. 2: Active Torque Control 4WD System Components Location (2 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SYSTEM DIAGRAM

SYSTEM DIAGRAM

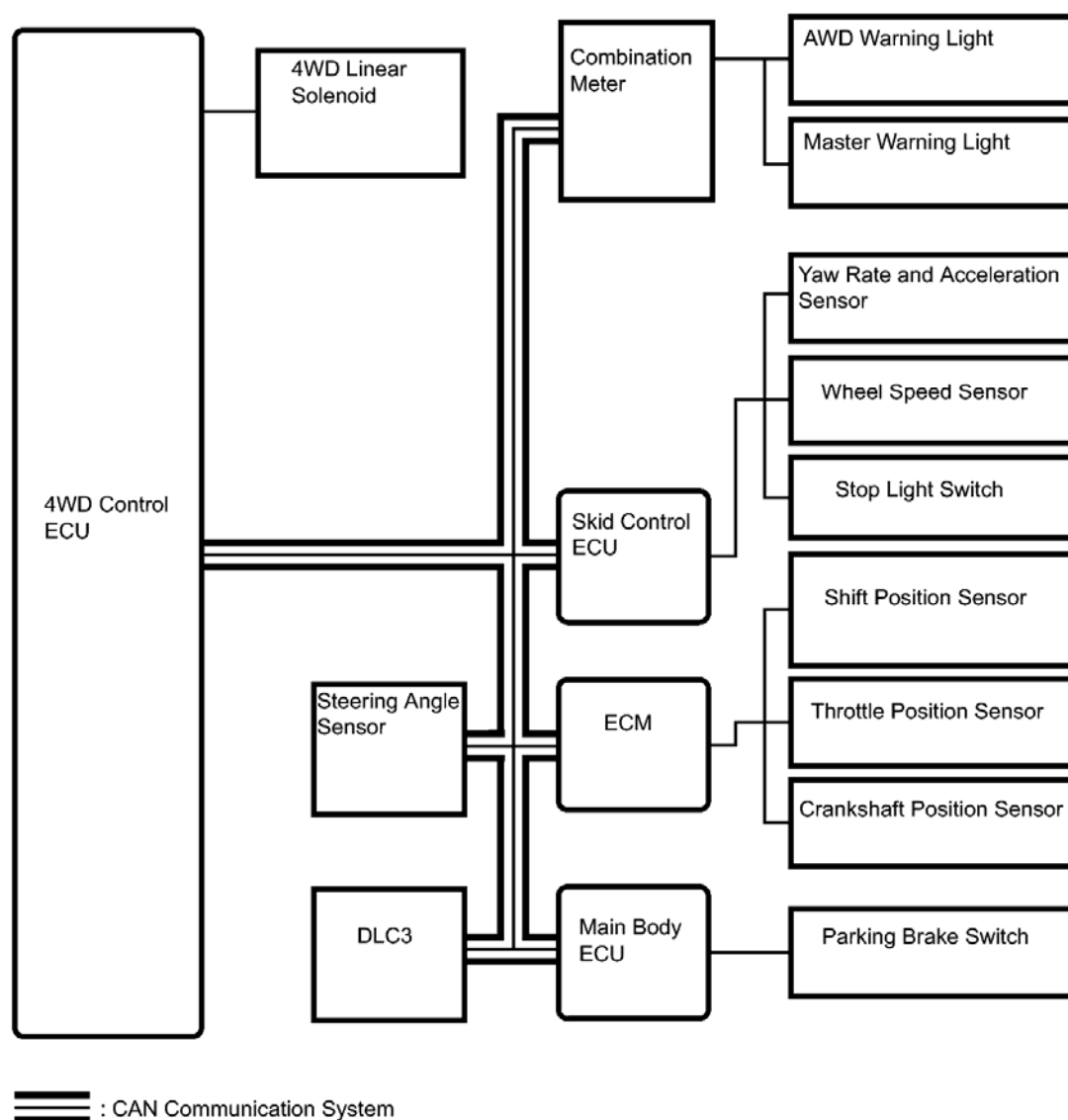


Fig. 3: CAN System Diagram

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

COMMUNICATION TABLE

Transmitting ECU	Receiving ECU	Signal	Communication Method
Skid control ECU	4WD control ECU	- Wheel speed sensor signal - Stop light switch signal - Deceleration sensor signal	CAN communication system
		Shift position sensor	

ECM	4WD control ECU	signal • Throttle position sensor signal • Crankshaft position sensor signal	CAN communication system
Main body ECU	4WD control ECU	Parking brake switch signal	CAN communication system
4WD control ECU	Combination meter	AWD warning light signal	CAN communication system

SYSTEM DESCRIPTION

SYSTEM DESCRIPTION

1. FUNCTION OF MAIN COMPONENTS

Component		Function
Combination Meter Assembly	AWD Warning Light	• Illuminates to warn the driver of a malfunction in the active torque control 4WD system. • Blinks to inform the driver of the DTCs in diagnostic mode.
Speed Sensors (4)		Detects the wheel speed of each wheel.
Crankshaft Position Sensor		Detects the engine speed and outputs it to the ECM.
Throttle Position Sensor		Detects the throttle valve position and outputs it to the ECM.
Park/Neutral Position Switch Assembly		Detects the shift position of the transaxle and outputs it to the ECM.
Stop Light Switch Assembly		Detects when the brake pedal is

		depressed.
Parking Brake Switch Assembly		Detects when the parking brake is applied.
Steering Angle Sensor		Detects turning of steering wheel
Yaw Rate and Acceleration sensor		Detects the vehicle's yaw rate and vehicle's longitudinal acceleration and deceleration.
Transfer		Drive force input into the differential is redirected 90 degrees and output to the propeller shaft by the transfer.
Rear Differential	Electromagnetic Control Coupling - Electromagnetic Solenoid	Distributes drive torque in accordance with the amperage applied by the 4WD control ECU.
4WD Control ECU		- Controls the amperage applied to the electromagnetic solenoid based on signals provided by the sensors in order to optimally distribute drive torque in accordance with driving conditions. - Turns AWD mode off when a parking brake ON signal is received from the main body ECU (instrument panel junction

	block). • Turns AWD mode off when a shift position signal (P or N) is received from the ECM.
ECM	Outputs signals such as the shift position signal, throttle position signal, and crankshaft position signal to the 4WD control ECU.
Skid Control ECU	Outputs signals such as the vehicle speed signal and deceleration signal to the 4WD control ECU.
Main Body ECU	Outputs signals such as the parking brake signal to the 4WD control ECU.
Ambient Temperature	Detects external ambient temperature and inputs it into body ECU
Electromagnetic Control Coupling	Based on amount of current sent from 4WD control ECU, torque is distributed to rear wheels

2. DRIVING FUNCTION

Vehicle Condition	Status
Control at Vehicle	This controls the amount of sideways sliding that occurs at rear of vehicle

Startup	when accelerating from stop to improve acceleration and hill climbing capacity
Slip Control at Vehicle Startup	This helps prevent vehicle from sliding sideways. When accelerating a stopped vehicle with the steering wheel turned, it ensures steering stability
Slip Control	This ensures high turning performance and that stability is not affected by road surface conditions during mid and high speed running
Control During Acceleration	This controls straight-line running when accelerating during mid and high speeds to ensure straight-line

	stability of the vehicle
--	-----------------------------

HOW TO PROCEED WITH TROUBLESHOOTING

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use the following procedure listed to troubleshoot the Active Torque Control 4WD 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, recharge or replace the battery before proceeding to the next step.

NEXT: Go to next step

3. CHECK COMMUNICATION FUNCTION OF CAN COMMUNICATION SYSTEM*

- 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

A: Go to next step

4. CHECK DTC*

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

RESULT

Result	Proceed to
DTC does not reoccur	A
DTC does reoccur	B

B --> GO TO STEP 7

A: Go to next step

5. PROBLEM SYMPTOMS TABLE

RESULT

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

B --> GO TO STEP 7

A: Go to next step

6. OVERALL ANALYSIS AND TROUBLESHOOTING*

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

NEXT: Go to next step

7. REPAIR OR REPLACE

NEXT: Go to next step

8. CONFIRMATION TEST

NEXT --> END

TEST MODE PROCEDURE

TEST MODE PROCEDURE

1. DESCRIPTION

HINT:

When using a chassis dynamometer, brake tester, etc. to perform a vehicle test, activate test mode to avoid a "different tire diameter installed" incorrect judgment.

Test mode does not have an AWD parameter. Test mode is activated because it will prohibit a different tire diameter judgment.

Control Status	AWD Control Status
During test mode	Different tire diameter malfunction judgement (detection that tire diameter of all wheels are not same) is not performed. Other than above item, normal control is performed.

2. ACTIVATE TEST MODE

HINT:

Activate test mode before using a chassis dynamometer, brake tester, etc. to perform a vehicle test.

- a. Check that the ignition switch is off.
- b. Use either of the following methods to change the 4WD control ECU to test mode.
 1. Test mode activation by shorting the TS terminal
 - With the ignition switch off, connect the TS and CG terminals of the DLC3 connector. Then turn the ignition switch to ON to activate test mode.

NOTE:

- When the ignition switch is turned from off to ON, the AWD warning light will illuminate for 4 seconds. Then it will turn off.
- If a part of the active torque control 4WD system has a defect, the AWD warning light will illuminate.

- c. Check if the AWD warning light has changed to the test mode display.
- d. Start the engine.

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.

ACTIVE TORQUE CONTROL 4WD SYSTEM

Symptom	Suspected Area	See
Tight-corner braking phenomenon *	Linear solenoid circuit	Refer to <u>DTC C1298: Linear Solenoid Circuit</u>
	Steering angle sensor circuit	Refer to <u>DTC C1297: Steering Angle Sensor</u>
	Brake control system	Refer to <u>DTC C1296: ABS Malfunction</u>
	4WD control ECU	Refer to <u>TERMINALS OF ECU</u>
AWD warning light remains on	AWD warning light circuit	Refer to <u>AWD Warning Light Remains ON</u>
AWD warning light does not come on	AWD warning light circuit	Refer to <u>AWD Warning Light does not Come ON</u>
The system is in DTC output mode although terminals TC and	TC and CG terminal circuit	Refer to <u>TC and CG Terminal Circuit</u>

CG of the DLC3 are not connected		
The system is not in DTC output mode although terminals TC and CG of the DLC3 are connected	TC and CG terminal circuit	Refer to TC and CG Terminal Circuit
	AWD warning light circuit	Refer to <u>AWD Warning Light does not Come ON</u>

HINT:

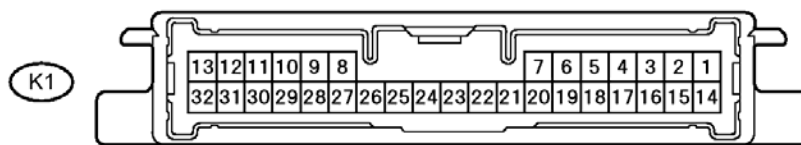
*: Tight corner braking phenomenon: a phenomenon in which a AWD vehicle may lurch and decelerate due to a rotational speed difference between the front and rear wheels, such as during low-speed cornering in AWD mode.

TERMINALS OF ECU

TERMINALS OF ECU

1. CHECK 4WD CONTROL ECU

*a



c

Fig. 4: 4WD Control ECU Connector Terminal Identification
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

Component without harness connected (4WD Control ECU)	*a	--
---	----	----

- Measure the voltage and resistance of the connector.

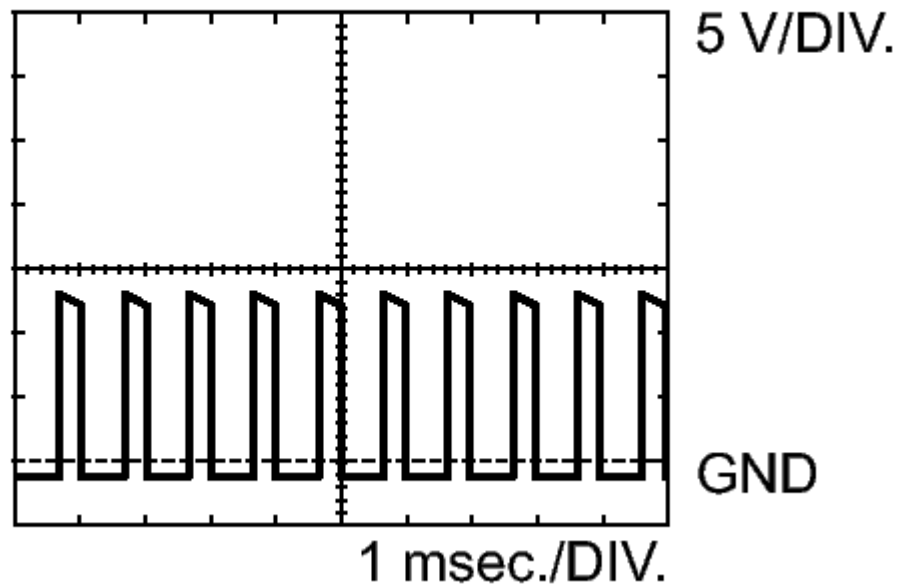
Terminal No. (Symbol)	Wiring Color	Terminal Description	Condition	Specified Condition
K1-14 (CANH) - K1-16 (CANL)	L - W	CAN communication	Ignition switch off	54 to 69 ohms

K1-23 (GND) - Body ground	W-B - Body ground	Ground	Always	Below 1 ohms
K1-11 (IG1) - K1-23 (GND)	L - W- B	Power source voltage	Ignition switch ON	11 to 14 V
K1-13 (SLC+) - K1-32 (SLC-)	W - B	Electromagnetic solenoid signal	D position, Idling	Pulse generation (See Fig. 5)
K1-9 (BSLC) - K1-23 (GND)	R - W- B	Power source voltage	Always	11 to 14 V

If the result is not as specified, the 4WD control ECU may have a malfunction.

- b. Using an oscilloscope, check the waveform 1.

Waveform 1



P

Fig. 5: Identifying Waveform 1

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

WAVEFORM 1 (REFERENCE)

Item	Content

Terminal No. (Symbol)	SLC+ - SLC-
Tester Range	5 V/DIV., 1 msec./DIV.
Condition	D position, Idling

DIAGNOSIS SYSTEM

DIAGNOSIS SYSTEM

1. DESCRIPTION

Active torque control 4WD system data can be read in the Data Link Connector 3 (DLC3) of the vehicle. When the system seems to be malfunctioning, use the Techstream to check for malfunctions and perform repairs. Therefore when there seems to be a problem with the active torque control 4WD system, use the Techstream or SST to check and troubleshoot it.

2. CHECK DATA LINK CONNECTOR 3 (DLC3)

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

3. WARNING LIGHT

- a. When a problem occurs in the active torque control 4WD system, the AWD warning light on the combination meter comes on to inform the driver of the problem.

DTC CHECK / CLEAR

DTC CHECK / CLEAR

1. CHECK DTC (When Using Techstream)

- a. Check the DTCs.
 1. Connect the Techstream to the DLC3.
 2. Turn the ignition switch to ON.
 3. Turn the Techstream on.
 4. Read the DTCs following the prompts on the Techstream screen. Enter the following menus: Chassis / Four Wheel Drive / Trouble Codes.
 5. Check the details of the DTCs. Refer to **DIAGNOSTIC TROUBLE CODE CHART**.

2. CLEAR DTC (When Using Techstream)

- a. Clear the DTCs.
 1. Connect the Techstream to the DLC3.
 2. Turn the ignition switch to ON.
 3. Turn the Techstream on.

4. Operate the Techstream to clear the DTCs. Enter the following menus: Chassis / Four Wheel Drive / Trouble Codes.
5. According to the display on the Techstream, select the trouble code data display with the clear button.

3. CHECK DTC (When not Using Techstream)

a. Check the DTCs.

1. Using SST, connect terminals TC (13) and CG (4) of the DLC3.
 - SST: 09843-18040

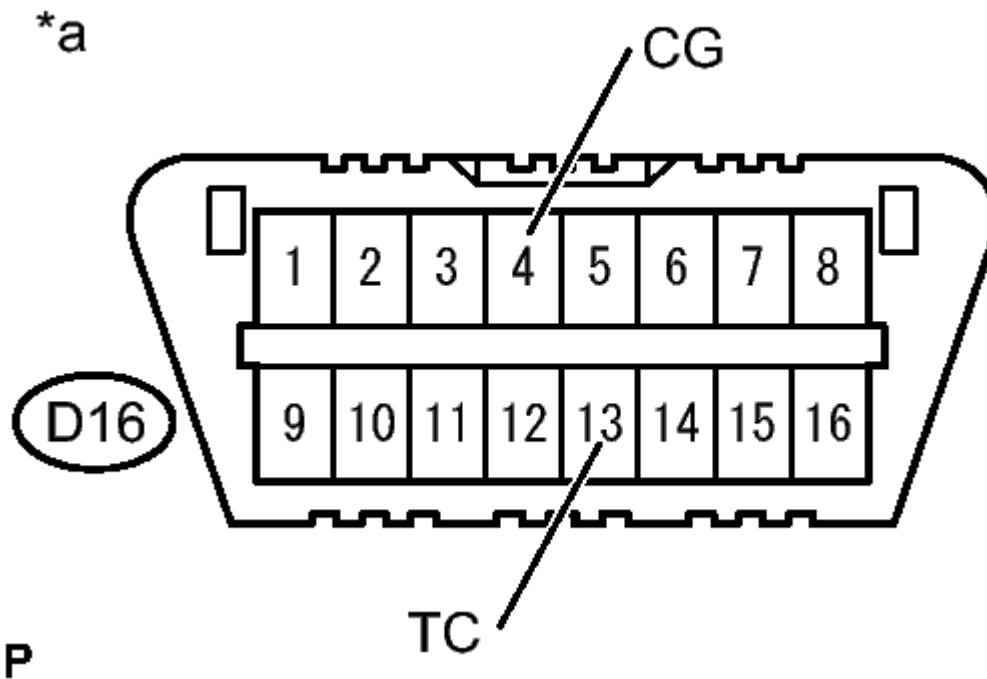


Fig. 6: DLC3 Connector Terminal Identification

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

TEXT IN ILLUSTRATION

*a	Front view of DLC3
----	-----------------------------

2. Turn the ignition switch to ON.
3. Read DTCs from the AWD warning light on the combination meter.

HINT:

- If the AWD warning light does not blink, perform relevant troubleshooting procedures. The relevant troubleshooting procedures are in the sections listed in the table below.

- When the system is operating correctly, each light will blink continuously in a pattern of 0.25 seconds on, then 0.25 seconds off.
- When one DTC is output, each lamp will output the same code at 4 second intervals. (For example, Code 21 would be output as 2 flashes, a 1.5-second pause, and then 1 flash).
- When 2 or more DTCs are output, each lamp will output a different code at 2.5-second intervals, and when all codes have been output, there will be a 4-second pause and the sequence will repeat.
- When multiple codes are set, they are output in order starting with the lowest DTC number.
- See the list of DTCs (See procedure "A").

Section Title	See Procedure
AWD warning light does not come ON	Refer to <u>AWD Warning Light does not Come ON</u>
TC and CG Terminal Circuit	Refer to <u>TC and CG Terminal Circuit</u>

b. The codes are explained in the code table.

AWD Warning Light Number of Blinks	Techstream Tester Display
82	C1280
83	U0129
84	U0126
85	U0100
86	U0073
94	C1241
96	C1296
97	C1297
98	C1298
99	C1299

4. CLEAR DTC (When not Using Techstream)

- a. Using SST, connect terminals 13 (TC) and 4 (CG) of the DLC3.
 - **SST: 09843-18040**
- b. Turn the ignition switch to ON.
- c. Clear the DTCs stored in the 4WD control ECU by depressing the brake pedal 8 times or more within 5 seconds.

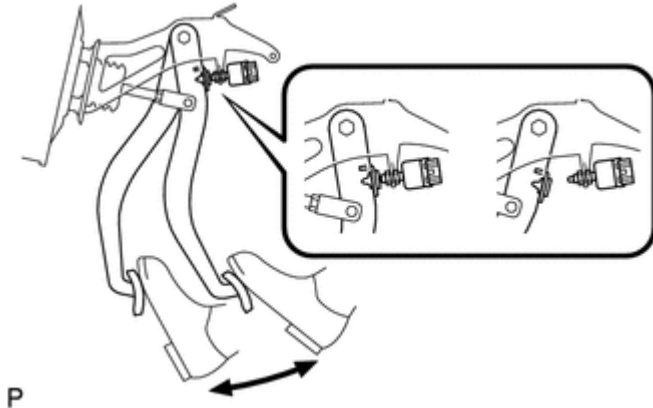


Fig. 7: Depressing Brake Pedal

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

- d. Check that the warning light blinks in the normal system code pattern.
- e. Remove SST from the terminals of the DLC3.
- f. Turn the ignition switch off.

HINT:

DTCs cannot be cleared by disconnecting the cable from the negative (-) battery terminal or removing the 4WD fuse.

FAIL-SAFE CHART

FAIL-SAFE CHART

1. FAIL-SAFE FUNCTION

- If the following malfunctions occur, the 4WD control ECU will stop the function of AWD control system or partly change the function to control the system.
- If a malfunction occurs in the sensor signal or actuator, the flow of electricity to the electromagnetic solenoid of the electromagnetic control coupling is prohibited. As a result, the system enters front wheel drive condition.
- When a component of the system malfunctions and the fail-safe function activates, the component operation is prohibited. However, if the system is controlling the component and the fail-safe function activates, the system operation is gradually stopped to prevent sudden changes in the vehicle condition.

- When system control is not possible, the warning light is illuminated to stop operation of the system operation.

DATA LIST / ACTIVE TEST

DATA LIST / ACTIVE TEST

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.

1. DATA LIST OF 4WD CONTROL ECU

- Connect the Techstream to the DLC3.
- Turn the ignition switch to ON.
- Turn the Techstream on.
- Enter the following menus: Chassis / Four Wheel Drive / Data List.
- According to the display on the Techstream, read the Data List.

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
4WD Warning Light	AWD Warning Light / OFF or ON	OFF: AWD warning light off ON: AWD warning light on	-
Stop Light SW	Stop Light Switch / OFF or ON	OFF: Brake pedal released ON: Brake pedal depressed	-
Lateral G	Lateral G / min.: -25.10 m/s ² , max.: 24.90 m/s ²	-	-
	Deceleration sensor (Forward and Rearward		

Forward and Rearward G	G) / Min.: -25.10 m/s ² Max.: 24.90 m/s ²	Approximately 0 +/-0.13 while stationary	-
Yaw Rate Value	Yaw rate value / min.: -128 deg/s, max.: 127 deg/s	-	-
Steering Angle Value	Steering angle value / min.: -3276.8 deg, max.: 3276.7 deg	-	-
FR Wheel Speed	FR Wheel Speed / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Almost no difference from the speedometer
FL Wheel Speed	FL Wheel Speed / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Almost no difference from the speedometer
RR Wheel Speed	RR Wheel Speed / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Almost no difference from the speedometer
RL Wheel Speed	RL Wheel Speed / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Almost no difference from the speedometer
SLC Solenoid Current	SLC Solenoid (electromagnetic solenoid) Current / Min.: 0 A Max.: 3 A	Min.: 0 A Max.: 3 A	-
Number of DTC	Number of DTCs /	0 to 255	-

	0 to 255		
--	----------	--	--

2. ACTIVE TEST OF 4WD CONTROL ECU

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: Chassis / Four Wheel Drive / Active Test.
- According to the display on the Techstream, perform the Active Test.

Tester Display	Test Part	Control Range	Diagnostic Note
4WD Warning Light	AWD Warning Light	ON: AWD warning light on OFF: AWD warning light off	Observe accessory meter

DIAGNOSTIC TROUBLE CODE CHART

DIAGNOSTIC TROUBLE CODE CHART

ACTIVE TORQUE CONTROL 4WD SYSTEM

DTC Code	Detection Item	Trouble Area	See
C1241	Low Power Supply Voltage Malfunction	- Battery - ECU-IG1 fuse - Wire harness and connector (IG1 circuit, GND circuit) - Brake control system - CAN communication system - 4WD control ECU	Refer to <u>DTC C1241: Low Power Supply Voltage Malfunction</u>
C1280	Engine Circuit Malfunction	- SFI system - 4WD control ECU	Refer to <u>DTC C1280: Engine Circuit Malfunction</u>

C1296	ABS Malfunction	- Brake control system (speed sensor circuit) - Brake control system (deceleration sensor circuit) - Skid control ECU - 4WD control ECU	Refer to <u>DTC C1296: ABS Malfunction</u>
C1297	Steering Angle Sensor	- Steering angle sensor - CAN communication system - 4WD control ECU - Wire harness and connector	Refer to <u>DTC C1297: Steering Angle Sensor</u>
C1298	Linear Solenoid Circuit	- 4WD fuse - Wire harness and connector - Electromagnetic control coupling - 4WD control ECU	Refer to <u>DTC C1298: Linear Solenoid Circuit</u>
C1299	Cancellation of 4WD Control	- Tire size - Electromagnetic control coupling - 4WD control ECU	Refer to <u>DTC C1299: Cancellation of 4WD Control</u>
U0073	Control Module Communication Bus OFF	- CAN communication system	Refer to <u>DTC U0073: Control Module Communication Bus OFF; DTC U0100: Lost Communication with ECM / PCM "A"; DTC U0126: Lost Communication with Steering Angle Sensor Module; DTC U0129: Lost Communication with Brake System Control Module</u>
U0100	Lost Communication with ECM / PCM "A"	- CAN communication system	Refer to <u>DTC U0073: Control Module Communication Bus OFF; DTC U0100: Lost Communication with ECM / PCM "A"; DTC U0126: Lost Communication with Steering Angle Sensor Module; DTC U0129: Lost Communication with Brake System Control Module</u>
U0126	Lost Communication with Steering Angle Sensor Module	- CAN communication system	Refer to <u>DTC U0073: Control Module Communication Bus OFF; DTC U0100: Lost Communication with ECM / PCM "A"; DTC U0126: Lost Communication with Steering Angle Sensor</u>

			<u>Module; DTC U0129: Lost Communication with Brake System Control Module</u>
U0129	Lost Communication with Brake System Control Module	- CAN communication system	Refer to <u>DTC U0073: Control Module Communication Bus OFF; DTC U0100: Lost Communication with ECM / PCM "A"; DTC U0126: Lost Communication with Steering Angle Sensor Module; DTC U0129: Lost Communication with Brake System Control Module</u>