2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

2005 BRAKES

ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

HOW TO PROCEED WITH TROUBLESHOOTING

Troubleshoot in accordance with the following procedures.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

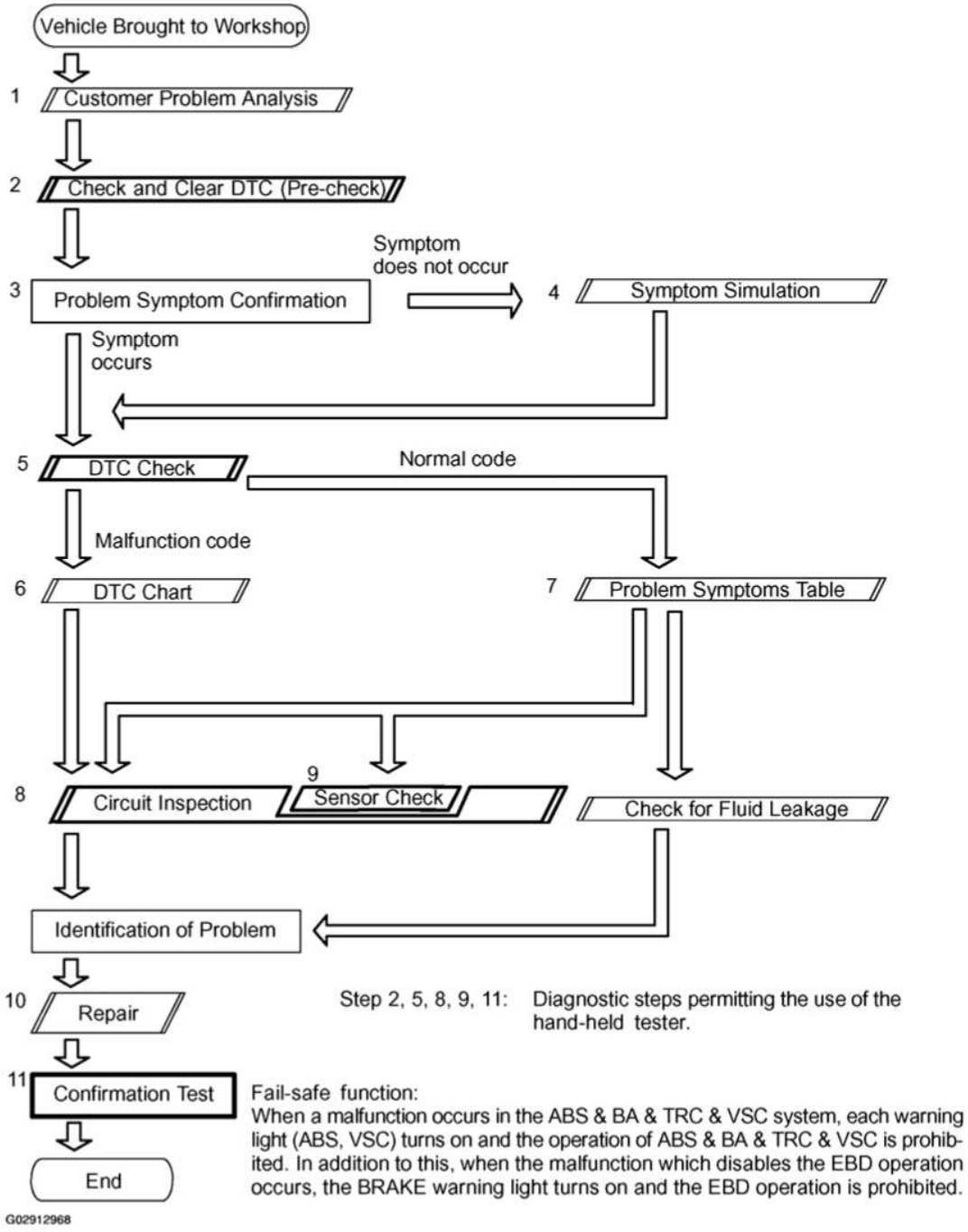


Fig. 1: Troubleshooting Flow Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Fail-safe function:

When a malfunction occurs in the ABS & BA & TRAC & VSC system, each warning light (ABS, VSC) turns

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

on and the operation of ABS & BA & TRAC & VSC is prohibited. In addition to this, when the malfunction which disables the EBD operation occurs, the BRAKE warning light turns on and the EBD operation is prohibited.

CUSTOMER PROBLEM ANALYSIS CHECK

ABS WITH EBD & BA SYSTEM Check Sheet

Inspector's Name :

Customer's Name		**VIN**	
		Production Date	/ /
		License Plate No.	
Date Vehicle Brought in	/ /	**Odometer Reading**	km miles

Date Problem First Occurred	/ /
Frequency Problem Occurs	☐ Continuously ☐ Intermittently (times a day)

Symptoms	☐ ABS does not operate.	
	☐ ABS does not operate efficiently.	
	☐ BA does not operate.	
	☐ EBD does not operate.	
	ABS Warning Light Abnormal	☐ Remains ON ☐ Does not Light Up
	Brake Warning Light Abnormal (PKB released)	☐ Remains ON ☐ Does not Light Up

DTC Check	**1st Time**	☐ Normal Code ☐ Malfunction Code (Code)
	2nd Time	☐ Normal Code ☐ Malfunction Code (Code)

Freeze Frame Data	STOP LIGHT SW	☐ ON ☐ OFF
	SYSTEM	☐ NO SYS ☐ ABS ☐ BA ☐ FAIL SF
	#IG ON	
	VEHICLE SPD	km/h MPH

G02642346

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Fig. 2: Customer Problem Analysis Check Sheet (ABS & EBD & BA System)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

TRAC & VSC SYSTEM Check Sheet

Inspector's Name :

Customer's Name		**VIN**	
		Production Date	/ /
		License Plate No.	
Date Vehicle Brought in	/ /	**Odometer Reading**	km miles

Date Problem First Occurred	/ /
Frequency Problem Occurs	☐ Continuous ☐ Intermittent (times a day)

Symptoms	☐ TRAC does not operate (wheels spin when starting rapidly)	
	☐ VSC does not operate (wheels sideslip at the time of sharp turning)	
	TRAC OFF Indicator Light Abnormal	☐ Remains ON ☐ Does Not Light Up
	VSC Warning Abnormal	☐ Displays ☐ Does Not Display
	Slip Indicator Light Abnormal	☐ Remains ON ☐ Does Not Light Up
	VSC Warning Buzzer Abnormal	☐ Sounds ☐ Does Not Sound

Check Item	**ABS Warning Light**	☐ Normal ☐ Malfunction Code (Code)
	MIL	☐ Normal ☐ Malfunction Code (Code)

DTC Check	**1st Time**	☐ Normal Code ☐ Malfunction Code (Code)
	2nd Time	☐ Normal Code ☐ Malfunction Code (Code)

Freeze Frame Data	VSC/TRAC OFF SW	☐ ON ☐ OFF
	SYSTEM	☐ VSC/TRAC
	SHIFT POSITION	☐ P or N ☐ 2 ☐ R ☐ 3 ☐ D ☐ 4 ☐ L ☐ FAIL
	STEERING ANG	deg
	YAW RAT	deg/s
	MAS CYL PRESS	V
	THROTTLE	deg
	MAS PRESS GRADE	MPa/s
	G (RIGHT&LEFT)	G
	G (BACK&FORTH)	G

G02642347

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Fig. 3: Customer Problem Analysis Check Sheet (TRAC & VSC System)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

PRE-CHECK

1. **DIAGNOSIS SYSTEM**
   a. Check the warning lights.
      1. Release the parking brake pedal.
      2. When the ignition switch is turned ON, check that the ABS warning light, VSC warning light, TRAC OFF indicator light, brake warning light and slip indicator light comes on for approx. 3 seconds.

   HINT:

   - When the parking brake is applied or the level of the brake fluid is low, the brake warning light comes on.
   - If the indicator check result is not normal, proceed to troubleshooting for the ABS warning light circuit, TRAC warning light circuit, TRAC OFF indicator light circuit, brake warning light circuit or slip indicator light circuit.

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

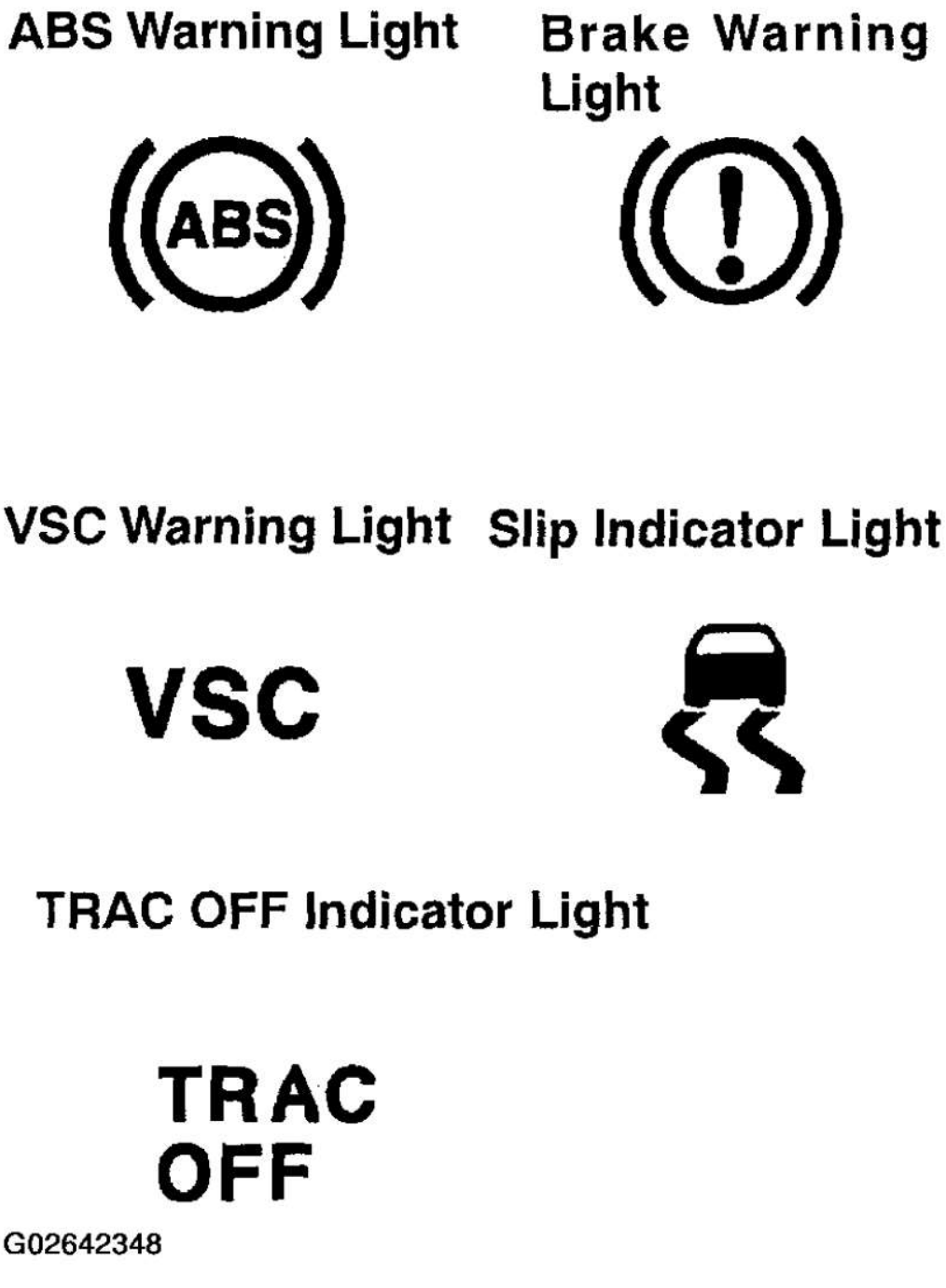


Fig. 4: Identifying Warning Lights
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

WARNING LIGHT TROUBLE AREA

Trouble Area	Refer to
ABS warning light circuit	ABS WARNING LIGHT CIRCUIT (DOES NOT LIGHT UP)
VSC warning light circuit	VSC WARNING LIGHT CIRCUIT (DOES NOT LIGHT UP)
TRAC OFF indicator light circuit	TRAC OFF INDICATOR LIGHT, TRAC OFF SWITCH CIRCUIT
Brake warning light circuit	BRAKE WARNING LIGHT CIRCUIT
Slip indicator light circuit	SLIP INDICATOR LIGHT CIRCUIT

b. When not using the hand-held tester:

Check the DTC.

1. Using SST, connect terminals TC and CG of the DLC3.

   SST 09843-18040

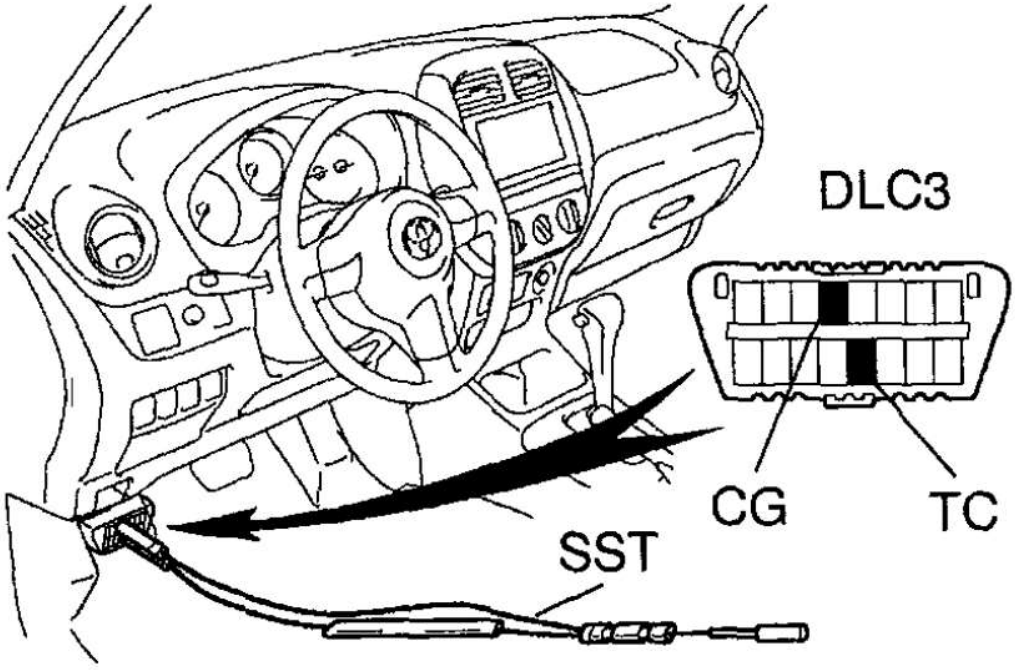
2. Turn the ignition switch ON.
3. Read the DTC from the ABS warning light and VSC warning light on the combination meter.

   HINT:

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4



G02642349

Fig. 5: Connecting Terminals TC And CG Of DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

ABS WARNING LIGHT CIRCUIT OR VSC WARNING LIGHT CIRCUIT TROUBLE AREA

Trouble Area	Refer to
TC terminal circuit	CIRCUIT INSPECTION
ABS warning light circuit	ABS WARNING LIGHT CIRCUIT (DOES NOT LIGHT UP)
VSC warning light circuit	VSC WARNING LIGHT CIRCUIT (DOES NOT LIGHT UP)

- As an example, the blinking patterns for normal code and codes 11 and 21 are shown on the left.

4. Codes are explained in the code table on **DIAGNOSTIC TROUBLE CODE CHART**.
5. After completing the check, disconnect terminals TC and CG of the DLC3, and turn off the display.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

If 2 or more malfunction codes are identified at the same time, the DTC will be displayed in ascending order.

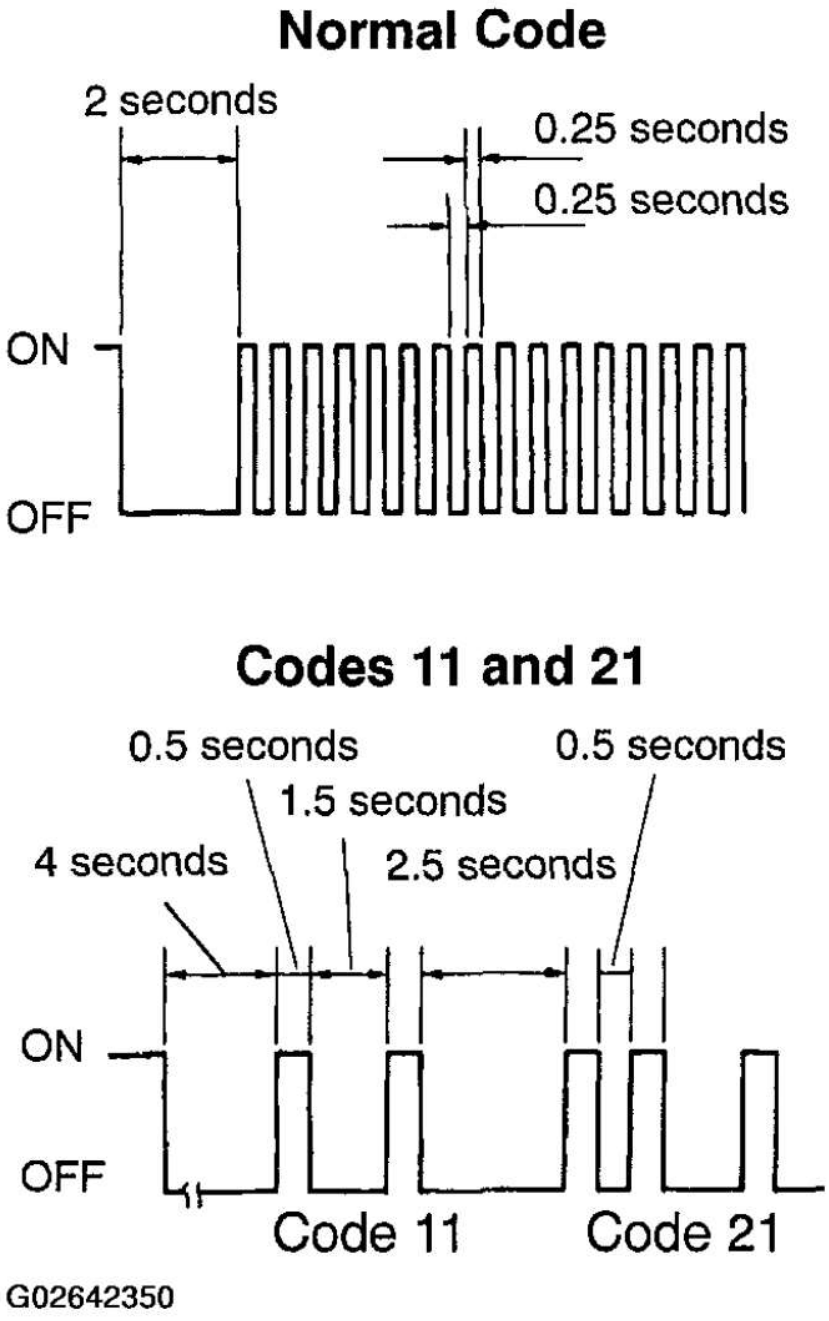


Fig. 6: Blinking Patterns For Normal Code And Codes 11 And 21

cardiagn.com

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

c. When not using the hand-held tester:

Clear the DTC.

1. Using SST, connect terminals TC and CG of the DLC3.

   SST 09843-18040

2. Turn the ignition switch ON.
3. Clear the DTC stored in the ECU by depressing the brake pedal 8 times or more within 5 seconds.
4. Check that the warning light indicates the normal code.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

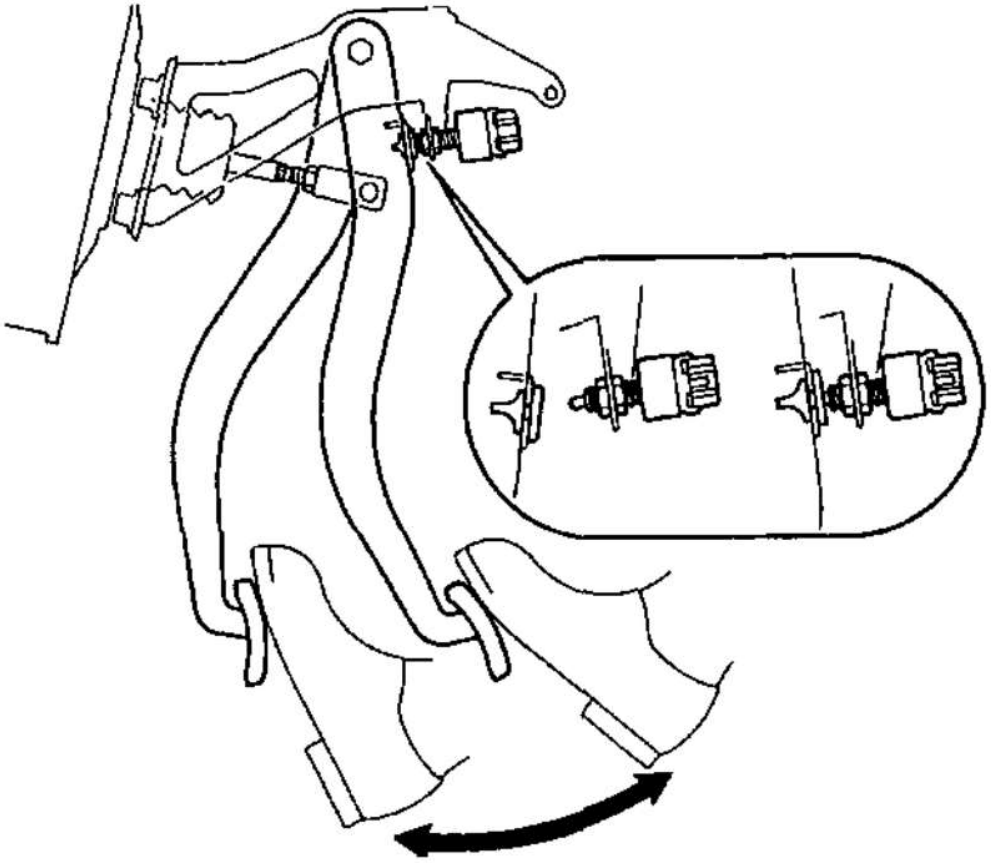


Fig. 7: Depressing Brake Pedal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. Remove the SST from the terminals of the DLC3.

   SST 09843-18040

HINT:

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

d. When using the hand-held tester:

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Check the DTC.

1. Connect hand-held tester to the DLC3.
2. Turn the ignition switch ON.
3. Read the DTC by following the prompts on the tester screen.

HINT:

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

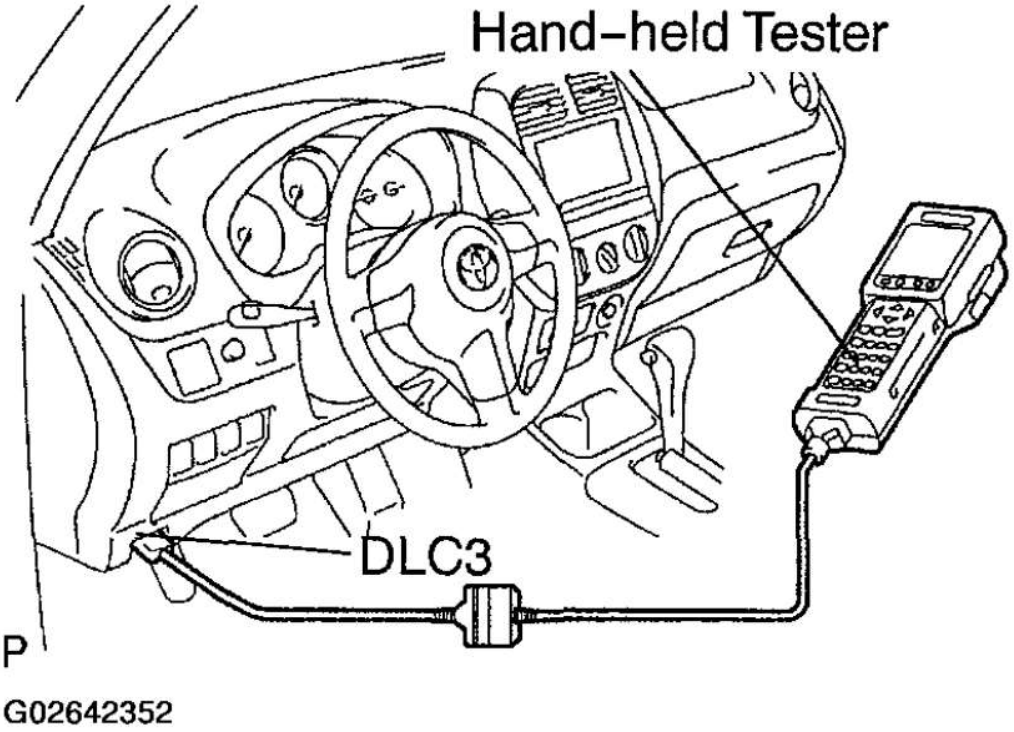


Fig. 8: Connecting Hand-Held Tester To DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

e. When using the hand-held tester:

Clear the DTC.

1. Connect the hand-held tester to the DLC3.
2. Turn the ignition switch ON.
3. Operate the hand-held tester to erase the codes.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

HINT:

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

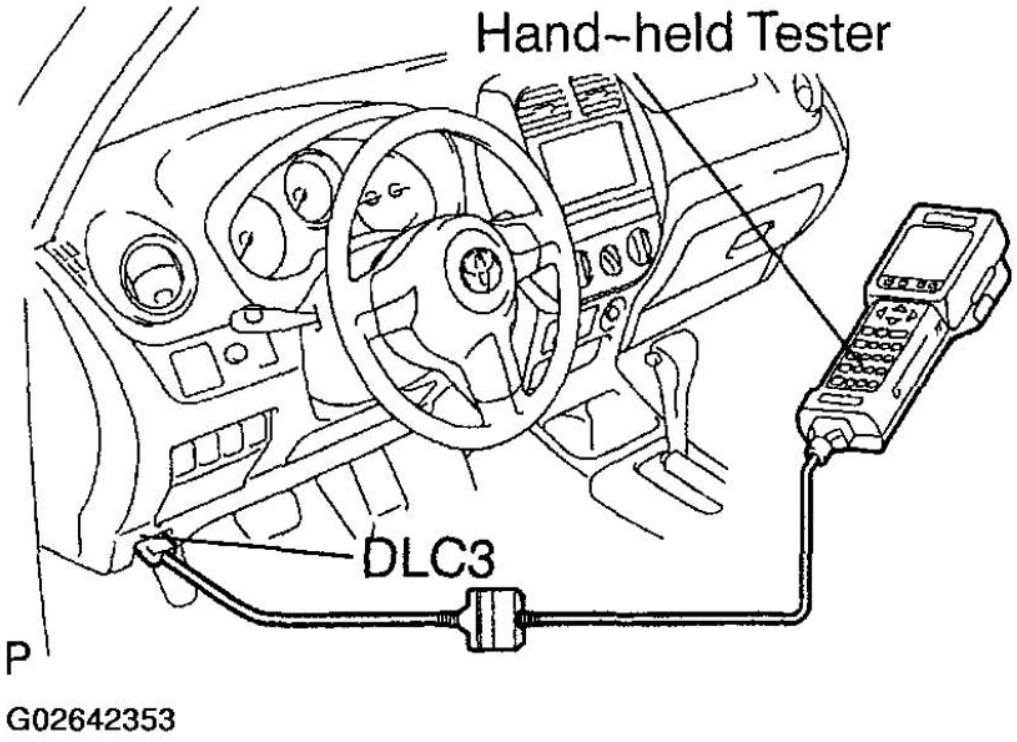


Fig. 9: Connecting Hand-Held Tester To DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **DATA LIST**

HINT:

According to the DATA LIST displayed by the hand-held tester, you can read the value of the switch, sensor, actuator and so on without removing any parts. Reading the DATA LIST as a first step of troubleshooting is one of the method to shorten the labor time.

a. Connect the hand-held tester to the DLC3.
b. Turn the ignition switch ON.
c. Read the "DATA LIST" on the tester.

DATA LIST

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Item	Measurement Item/Range (Display)	Normal Condition *	Diagnostic Note
ABS MOT RELAY	Motor relay status/ ON or OFF	-	-
SOL RELAY	Solenoid relay status/ ON or OFF	-	-
VSC/TRAC OFF SW	VSC OFF switch/ ON or OFF	-	-
IDLE SW	Main idle switch/ ON or OFF	ON: Accelerator pedal released	-
IDLE SW	Main idle switch/ ON or OFF	OFF: Accelerator pedal depressed	-
STOP LIGHT SW	Stop light switch/ ON or OFF	OFF: Brake pedal released	-
STOP LIGHT SW	Stop light switch/ ON or OFF	ON: Brake pedal depressed	-
PKB SW	PKB sw/ ON or OFF	ON: Parking brake applied	-
PKB SW	PKB sw/ ON or OFF	OFF: Parking brake released	-
ABS OPERT FR	Front right wheel operation/ BEFORE or OPERATE	BEFORE: No ABS operation (FR) OPERATE: During ABS operation (FR)	-
ABS OPERT FL	Front left wheel operation/ BEFORE or OPERATE	BEFORE: No ABS operation (FL) OPERATE: During ABS operation (FL)	-
ABS OPERT RR	Rear right wheel operation/ BEFORE or OPERATE	BEFORE: No ABS operation (RR) OPERATE: During ABS operation (RR)	-
ABS OPRET RL	Rear left wheel operation/ BEFORE or OPERATE	BEFORE: No ABS operation (RL) OPERATE: During ABS operation (RL)	-
WHEEL SPD FR	Front right wheel speed / Min.: 0 km/h, Max.: 326.4 km/h	Actual wheel speed	Speed indicated on speedometer
WHEEL SPD FL	Front left wheel speed/ Min.: 0 km/h, Max.: 326.4 km/h	Actual wheel speed	Speed indicated on speedometer
WHEEL SPD RR	Rear right wheel speed/ Min.: 0 km/h, Max.: 326.4 km/h	Actual wheel speed	Speed indicated on speedometer
WHEEL SPD RL	Rear left wheel speed/ Min.: 0 km/h, Max.: 326.4 km/h	Actual wheel speed	Speed indicated on speedometer
DECELERAT SENS	G sensor (GL 1 filter)/ Min: -1.869 G, Max.: 1.869	Approximately 0 +/- 0.13 G at still condition	Reading changes when vehicle is bounced
DECELERAT SENS2	G sensor (GL2 filter)/ Min.: -1.869 G, Max.: 1.869	Approximately 0 +/- 0.13 G at still condition	Reading changes when vehicle is bounced
IG VOLTAGE	ECU IG power voltage/ UNDER	NORMAL: 9.5 V or more	-

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

	or NORMAL or OVER	TOO LOW: Below 9.5 V	
SFRR	SFRR/ ON or OFF	-	-
SFRH	SFRH/ ON or OFF	-	-
SFLR	SFLR/ ON or OFF	-	-
SFLH	SFLH/ ON or OFF	-	-
SRRR (SRR)	SRRR (SRR)/ ON or OFF	-	-
SRRH (SRH)	SRRH (SRH)/ ON or OFF	-	-
SRLR	SRLR/ ON or OFF	-	-
SRLH	SRLH/ ON or OFF	-	-
SMF (BA-SOL)	SMF (BA-SOL)/ ON or OFF	-	-
SMR	SMR / ON or OFF	-	-
ENGINE SPD	Engine Speed/ Min.: 0 rpm, Max.: 6000 rpm	Idling: (M/T) 600 to 700 rpm (A/T) 650 to 750 rpm	-
VEHICLE SPD	Maximum wheel speed sensor reading / Min.: 0 km/h (0 mph) Max.: 326 km/h (202 mph)	Actual vehicle speed	-
YAW RATE	Yaw rate sensor/ Min.: -128 deg/s, Max.: 128 deg/s	Min.: -128 deg/s Max.: 128 deg/s	-
YAW ZERO VALUE	Memorized zero value/ Min.: -128 deg/s, Max.: 128 deg/s	Min.: -128 deg/s Max.: 128 deg/s	-
STEERING ANG	Steering sensor/ Min.: -1152 deg, Max.: 1150.875 deg	Min.: -1152 deg Max.: 1150.875 deg	-
MAS CYL PRS 1	Master cylinder pressure 1/ Min.: 0 V, Max.: 5 V	When brake pedal is released: 0.3 to 0.9 V	Reading increases when brake pedal is depressed
AIR BLD SUPPORT	Air bleed support/ NOT SUP or SUPPORT	w/ BA: Supported w/ VSC: Not supported	-
SPD SEN FR	FR speed sensor open detection/ OPN DET/NORMAL	NORMAL	-
SPD SEN FL	FL speed sensor open detection/ OPN DET/NORMAL	NORMAL	-
SPD SEN RR	RR speed sensor open detection/ OPN DET/NORMAL	NORMAL	-
SPD SEN RL	RL speed sensor open detection/ OPN DET/NORMAL	NORMAL	-
EFI COM	EFI communication open detection/ OPN DET/NORMAL	NORMAL	-
YAWRATE SEN	Yaw rate sensor open detection/ OPN DET/NORMAL	NORMAL	-
DECELE SEN	Deceleration sensor open detection/ OPN DET/NORMAL	NORMAL	-
STEERING SEN	Steering sensor open detection/ OPN DET/NORMAL	NORMAL	-

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

TEST MODE	Test mode operation/ NORMAL or TEST	NORMAL: Normal mode	-
TEST MODE	Test mode operation/ NORMAL or TEST	TEST: During test mode	-
#CODES	Number of Trouble Code/ Min.: 0, Max.: 255	Min.: 0, Max.: 37	-

3. **ACTIVE TEST**

HINT:

Performing the ACTIVE TEST using the hand-held tester allows the relay, VSV, actuator and so on to operate without removing any parts. Performing the ACTIVE TEST as a first step of troubleshooting is one of the methods to reduce troubleshooting time.

It is possible to display the DATA LIST during the ACTIVE TEST.

a. Connect the hand-held tester to the DLC3.
b. Turn the ignition switch ON.
c. Perform the "ACTIVE TEST", according to the display on the tester.

HINT:

Ignition switch must be turned ON to proceed to Active Test using a hand-held tester.

ACTIVE TEST

Item	Test Details	Diagnostic Note
SFRR	Turns ABS solenoid (SFRR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SFRH	Turns ABS solenoid (SFRH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SFLR	Turns ABS solenoid (SFLR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SFLH	Turns ABS solenoid (SFLH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRRR	Turns ABS solenoid (SRRR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRRH	Turns ABS solenoid (SRRH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRLR	Turns ABS solenoid (SRLR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SRLH	Turns ABS solenoid (SRLH) ON / OFF	Operation of solenoid (clicking sound) can be heard
SMF (BA-SOL)	Turns ABS solenoid (SMF)) ON /	Operation of solenoid (clicking sound) can

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

	OFF	be heard
SMR	Turns ABS solenoid (SRMR) ON / OFF	Operation of solenoid (clicking sound) can be heard
SOL RELAY	Turns ABS solenoid relay ON/OFF	Operation of solenoid (clicking sound) can be heard
ABS MOT RELAY	Turns ABS motor relay ON/OFF	Operation of motor (clicking sound) can be heard
ABS WARN LIGHT	Turns ABS warning light ON / OFF	Observe combination meter
VSC WARN LIGHT	Turns VSC warning light ON / OFF	Observe combination meter
VSC/ TRAC OFF IND	Turns VSC / TRAC OFF indicator ON / OFF	Observe combination meter
SLIP INDI LIGHT	Turns slip indicator light ON / OFF	Observe combination meter
BRAKE WRN LIGHT	Turns brake warning light ON / OFF	Observe combination meter
VSC/BR WARN BUZ	Turns VSC / brake warning buzzer ON / OFF	Buzzer can be heard

4. **FREEZE FRAME DATA**

HINT:

- Whenever a DTC is detected or the ABS operates, the skid control ECU stores the current vehicle (sensor) state as freeze frame data.
- The skid control ECU stores the number of times (maximum: 31) the ignition switch has been turned from OFF to ON since the last time ABS was activated. However, if the vehicle was stopped or driver at low speed (7 km/h (4.3 mph) or less), or if a DTC is detected, the skid control ECU will not count the number since then.
- Freeze frame data at the time the ABS operates:

  The skid control ECU stores and updates data whenever the ABS system operates.

  When the ECU stores data at the time a DTC is detected, the data stored when the ABS operated is erased.

- Freeze frame data at the time a DTC is detected:

  When the skid control ECU stores data at the time a DTC is detected, no updates will be performed until the data is cleared.

a. Connect the hand-held tester to the DLC3.
b. Turn the ignition switch to the ON position.
c. From the display on the tester, select the "FREEZE FRAME DATA".

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

FREEZE FRAME DATA

Hand-held Tester Display	Measurement Item	Reference Value
VEHICLE SPD	Wheel speed sensor reading	Speed indicated on speedometer
STOP LIGHT SW	Stop light switch signal	Stop light switch ON: ON, OFF: OFF
# IG ON	Number of operations of ignition switch ON after memorizing freeze frame data	0 to 31
MAS CYL PRESS	Master cylinder pressure sensor reading	Brake pedal release: 0.3 to 0.9 V
MAS CYL PRESS	Master cylinder pressure sensor reading	Brake pedal depress: 0.8 to 4.5 V
MASS PRESS GRADE	Master cylinder pressure sensor change	-30 to 200 MPa/s
SYSTEM	System status	ABS activated: ABS
SYSTEM	System status	VSC/TRAC activated: VSC/TRAC
SYSTEM	System status	BA activated: BA
SYSTEM	System status	Fail safe mode activated: FAIL SF
SYSTEM	System status	No system activated: NO SYS
YAW RATE	Yaw rate angle sensor reading	-100 to 100
STEERING ANG	Steering sensor reading	Left turn: Increase
STEERING ANG	Steering sensor reading	Right turn: Decrease
THROTTLE	Throttle position sensor reading	Release accelerator pedal: Approx. 0 deg.
THROTTLE	Throttle position sensor reading	Depress accelerator pedal: Approx. 90 deg.
G (RIGHT & LEFT)	Right and left G	-1.869 to 1.869
G (BACK & FORTH)	Back and forth G	-1.869 to 1.869
VSC (TRAC) OFF SW	VSC OFF switch signal	TRAC OFF SW ON: ON
VSC (TRAC) OFF SW	VSC OFF switch signal	TRAC OFF SW OFF: OFF
SHIFT POSITION	Shift lever position	FAIL
SHIFT POSITION	Shift lever position	P, N
SHIFT POSITION	Shift lever position	R
SHIFT POSITION	Shift lever position	D
SHIFT POSITION	Shift lever position	4
SHIFT POSITION	Shift lever position	3

cardiagn.com

SHIFT POSITION	Shift lever position	2
SHIFT POSITION	Shift lever position	L

5. **When not using hand-held tester:**

ABS SENSOR SIGNAL CHECK (TEST MODE)

NOTE: When having replaced the yaw rate sensor, deceleration sensor and/or ECU, perform zero point calibration of the yaw rate and deceleration sensors (see step 9).

HINT:

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

a. Procedures for test mode:
   1. Turn the ignition switch OFF.
   2. Move the shift lever to the P position.
   3. Using SST, connect terminals TS and CG of the DLC3.

      SST 09843-18040

   4. Check that the steering wheel is in the straight-ahead position.
   5. Turn the ignition switch ON.
   6. Check that the ABS warning light blinks.

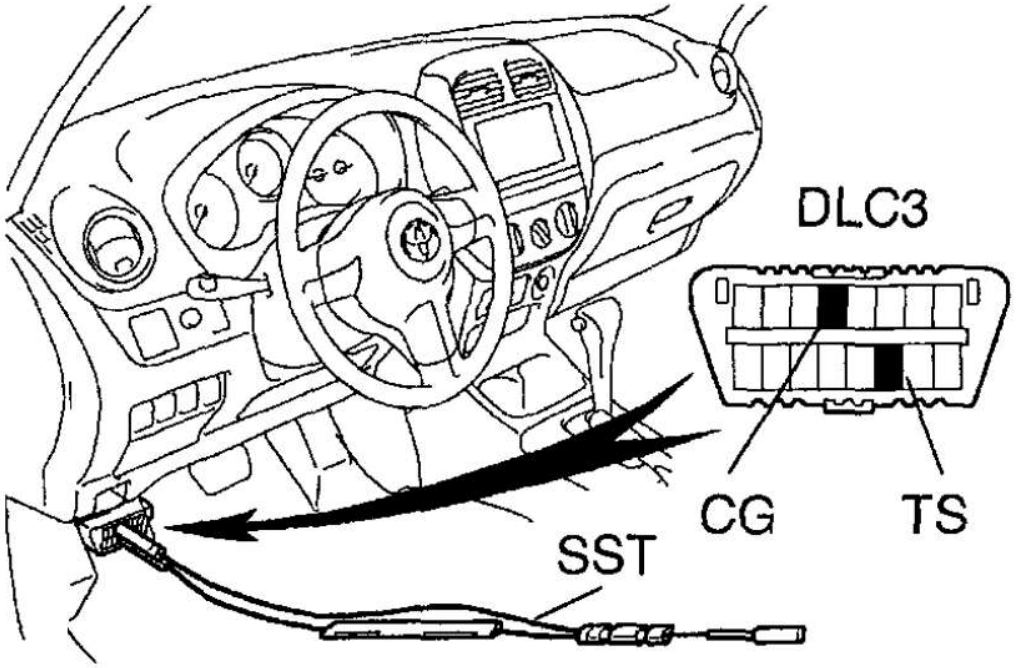
   HINT:

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

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4



G02642354

Fig. 10: Connecting Terminals TS And CG Of DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ABS WARNING LIGHT CIRCUIT OR TS TERMINAL CIRCUIT TROUBLE AREA

Trouble Area	Refer to
TS terminal circuit	TS TERMINAL CIRCUIT
ABS warning light circuit	ABS WARNING LIGHT CIRCUIT (DOES NOT LIGHT UP)

b. Check the brake pedal load sensing switch.
   1. By pumping the brake pedal, release the booster vacuum.
   2. Turn the ignition switch to ON (do not start the engine) and keep depressing the brake pedal for 1 second or more with a force of approximately 59 N (6 kgf, 14 Ibf) or more.
   3. Check that the brake warning light is illuminated and the operating sound of the ABS motor is heard.
   4. Start the engine and depress the brake pedal with a force of approximately 59 N (6 kgf, 14 Ibf) or more.
   5. Check that the brake warning light turns off.

HINT:

cardiagn.com

When rechecking, exit test mode and then activate test mode again.

c. Check the deceleration sensor.

Keep the vehicle in a stationary condition on a level place for 1 second or more.

d. Check the master cylinder pressure sensor.
   1. Leaving the vehicle in a stationary condition and the brake pedal in free condition for 1 second or more, continue to depress the brake pedal with a force of 98 N (10 kgf, 22 Ibf) or more for 1 second or more.
   2. While the vehicle is stopped, release the brake pedal.
   3. While the vehicle is stopped, quickly depress the brake pedal once or more and check that the ABS warning light is illuminated for 3 seconds.

HINT:

Repeat the operation until the ABS warning light is illuminated.

e. Check the speed sensor signal.

Drive the vehicle straightforward.

Drive the vehicle with the speed faster than 45 km/h (28 mph) for several seconds and check that the ABS warning light turns off.

HINT:

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

f. Stop the vehicle.
g. Using SST, connect terminals TC and CG of the DLC3.

SST 09843-18040

h. Read the number of blinks of the ABS warning light.

HINT:

- See the list of DTC on the next page.
- If every sensor is normal, the normal code is output (a cycle of 0.25 seconds ON and 0.25 seconds OFF is repeated).
- If 2 or more malfunctions are detected at the same time, the lowest numbered will be displayed first.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

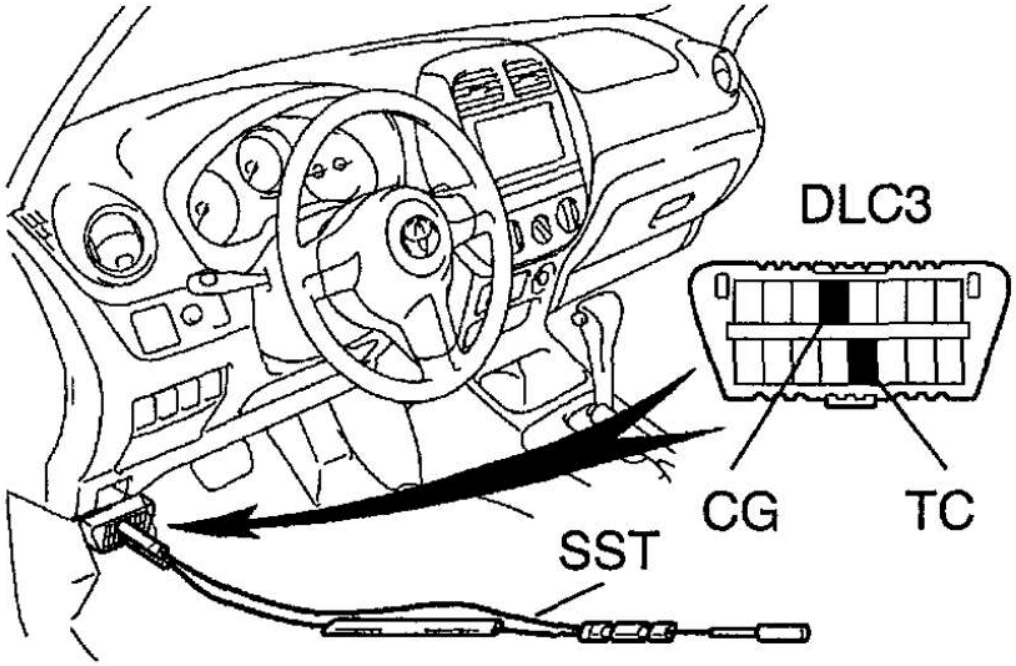


Fig. 11: Connecting Terminals TC And CG Of DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

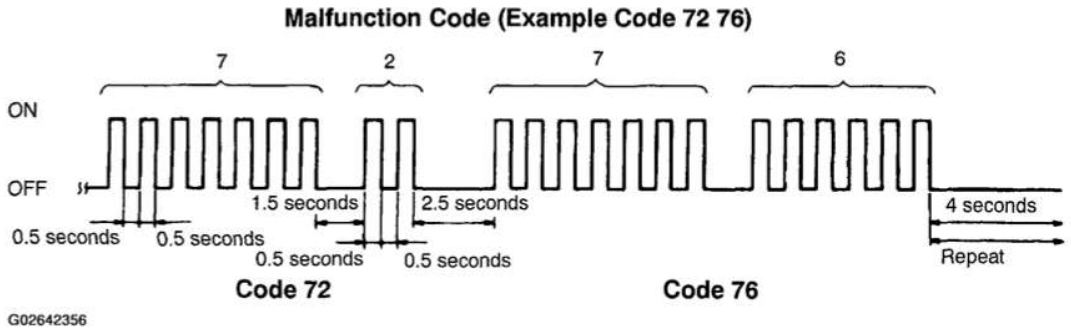


Fig. 12: Blinking Pattern Of Malfunction Code (Example Code 72, 76)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

i. After doing the check, disconnect the SST from terminals TS and CG, TC and CG of the DLC3 and turn the ignition switch OFF.

cardiagn.com

SST 09843-18040

6. **When using hand-held tester:**

ABS SENSOR SIGNAL CHECK (TEST MODE)

NOTE: When having replaced the yaw rate sensor, deceleration sensor and/or ECU, perform zero point calibration of the yaw rate and deceleration sensors (see step 9). Make sure that this operation should be done before starting the following.

HINT:

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

a. Connect the hand-held tester to the DLC3.
b. Do steps 4 and from (a) to e on the previous pages.
c. Read the DTC by following the prompts on the tester screen.

HINT:

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

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

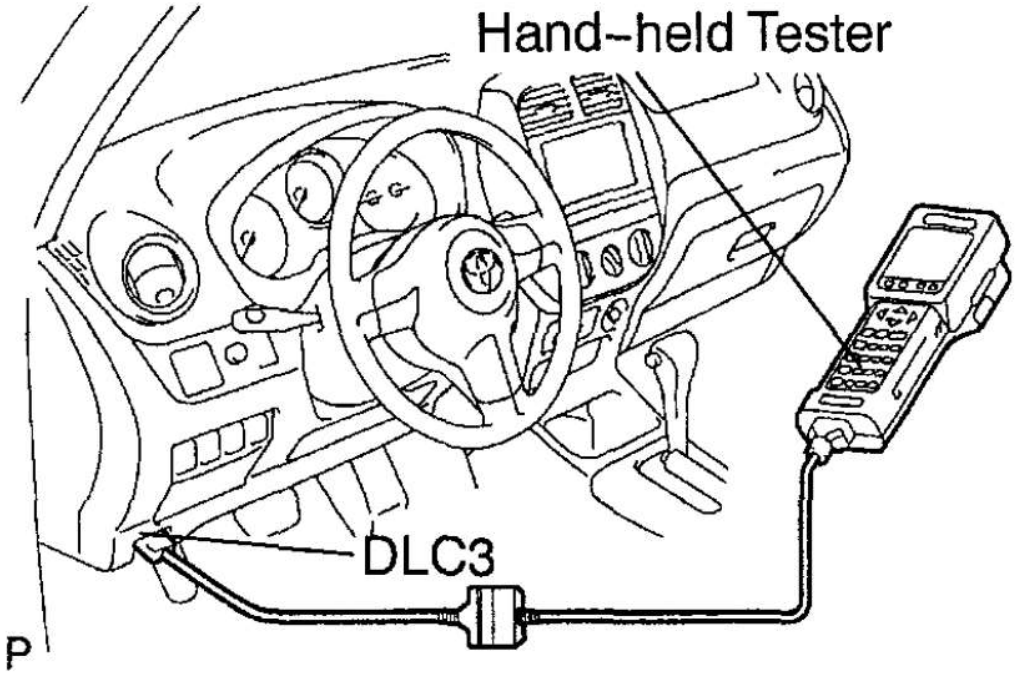


Fig. 13: Connecting Hand-Held Tester To DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DTC of ABS sensor check function:

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Code No.	Diagnosis	Trouble Area
C1271/71	Low output voltage of right front speed sensor	• Right front speed sensor • Sensor installation • Sensor rotor
C1272/72	Low output voltage of left front speed sensor	• Left front speed sensor • Sensor installation • Sensor rotor
C1273/73	Low output voltage of right rear speed sensor	• Right rear speed sensor • Sensor installation • Sensor rotor
C1274/74	Low output voltage of left rear speed sensor	• Left rear speed sensor • Sensor installation • Sensor rotor
C1275/75	Abnormal change in output voltage of right front speed sensor	Right front speed sensor rotor
C1276/76	Abnormal change in output voltage of Left front speed sensor	Left front speed sensor rotor
C1277/77	Abnormal change in output voltage of right rear speed sensor	Right rear speed sensor rotor
C1278/78	Abnormal change in output voltage of Left rear speed sensor	Left rear speed sensor rotor
C1279/79	Deceleration sensor is faulty	• Deceleration sensor • Sensor installation
C1281/81	• Master cylinder pressure sensor output signal is faulty • Problem symptoms in the brake cannot be confirmed	• Master cylinder pressure sensor • Brake booster

G02642358

Fig. 14: ABS Sensor Check Function DTC Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. **When not using hand-held tester:**

VSC SENSOR SIGNAL CHECK (TEST MODE)

NOTE: When having replaced the yaw rate sensor, deceleration sensor and/or ECU, perform zero point calibration of the yaw rate and deceleration sensors (see step 9).

HINT:

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

a. Procedures for test mode:
   1. Turn the ignition switch OFF.
   2. Check that the shift lever position is P. Turn the steering wheel to the straight-ahead position.
   3. Using SST, connect terminals TS and CG of the DLC3.

      SST 09843-18040

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

4. Start the engine.

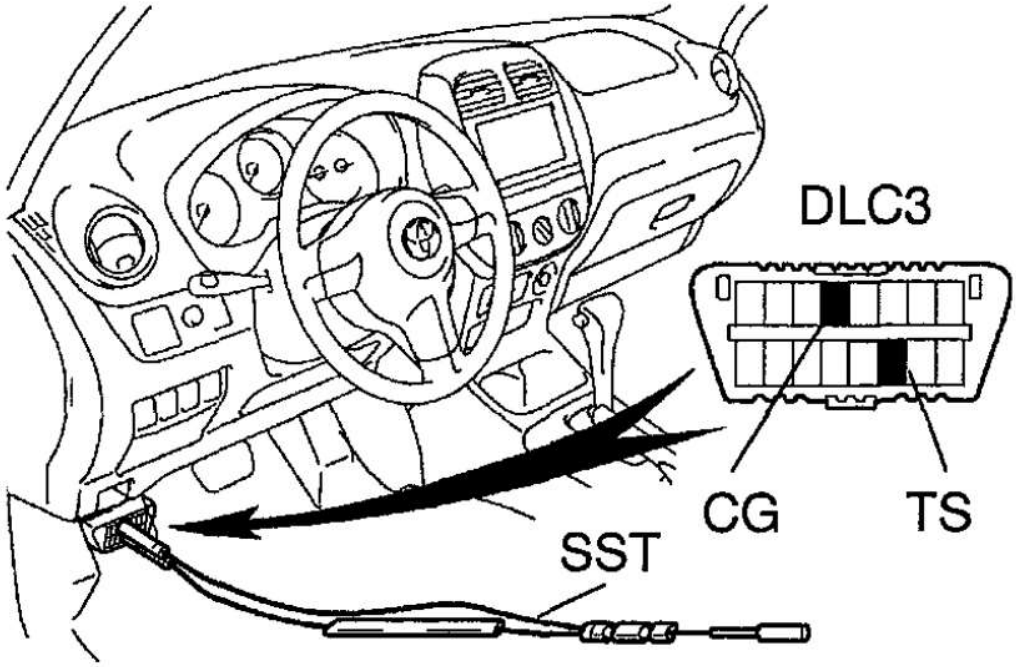


Fig. 15: Connecting Terminals TS And CG Of DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. Check that the VSC warning light blinks.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

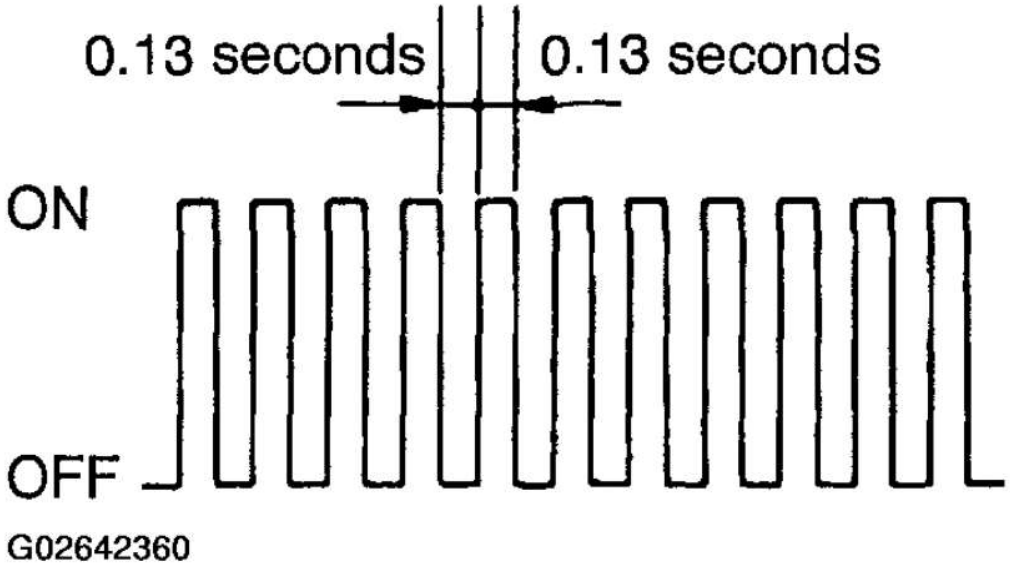


Fig. 16: Blinking Pattern Of VSC Warning Light
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Check the yaw rate sensor.
   1. Move the shift lever to the D position and drive the vehicle at the vehicle speed of approximately 5 km/h (3 mph). Turn the steering wheel either to left or right for 90° or more, and maintain 180° circular drive for the vehicle.
   2. Stop the vehicle and move the shift lever to the P position. Check that the VSC warning buzzer sounds for 3 seconds.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

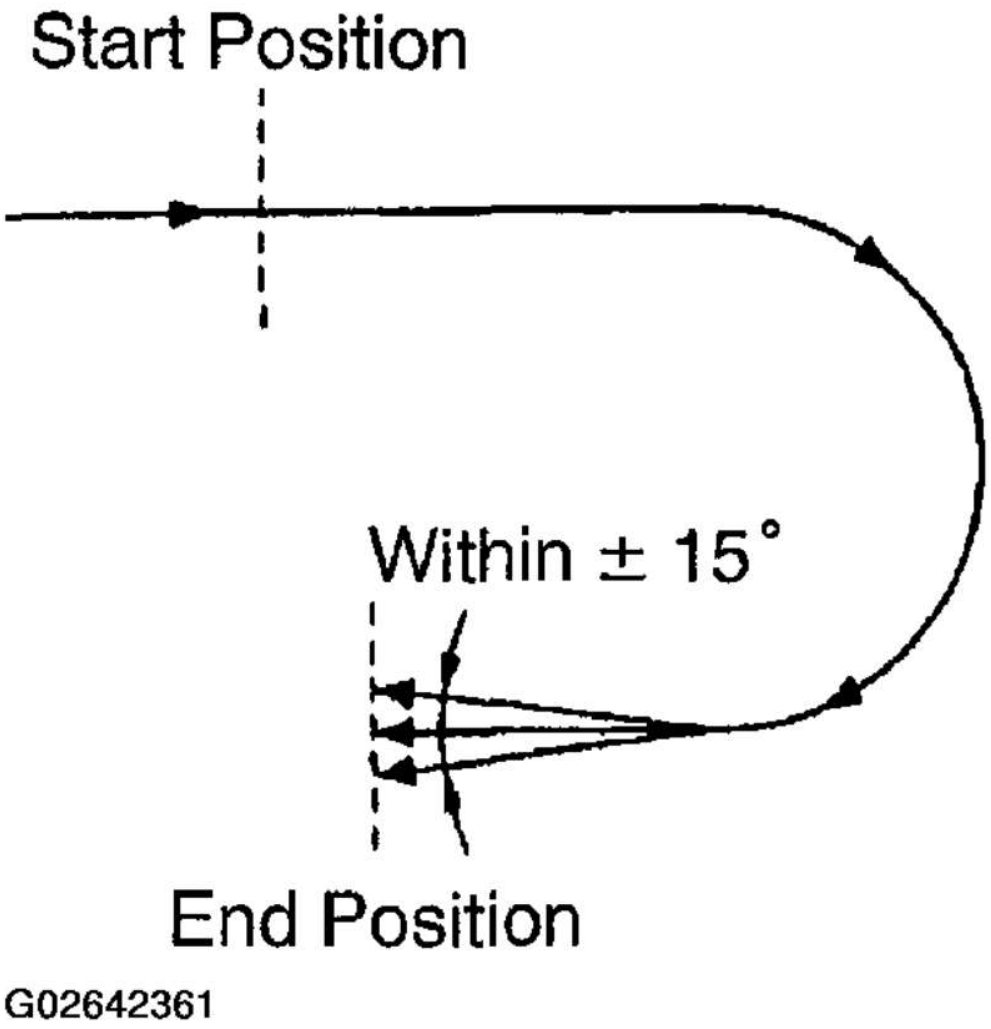


Fig. 17: Checking Yaw Rate Sensor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If the VSC warning buzzer sounds, the sensor check is completed normally.

If the VSC warning buzzer does not sound, check the VSC warning buzzer circuit, then do the sensor check again.

VSC WARNING BUZZER CIRCUIT TROUBLE AREA

Trouble Area	Refer to
VSC warning buzzer circuit	VSC WARNING BUZZER CIRCUIT

cardiagn.com

If the VSC warning buzzer still does not sound, there is malfunction in the VSC sensor, so check the DTC.

HINT:

- Drive the vehicle circularly 180°. At the end of the turn, the direction of the vehicle should be within 180°+/- 5° from its start position.
- Do not spin the wheels.

3. Check the steering angle sensor.

   Turn the steering wheel to either left or right to the full lock position, from the vehicle stationary condition, and turn back the steering wheel to the neutral position.

c. Read the DTC.

1. Using SST, connect terminals TC and CG of the DLC3.

   SST 09843-18040

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

   HINT:

   - See the list of DTC shown on the next page.
   - If every sensor is normal, a normal code is output (a cycle of 0.25 seconds ON and 0.25 seconds OFF is repeated).

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

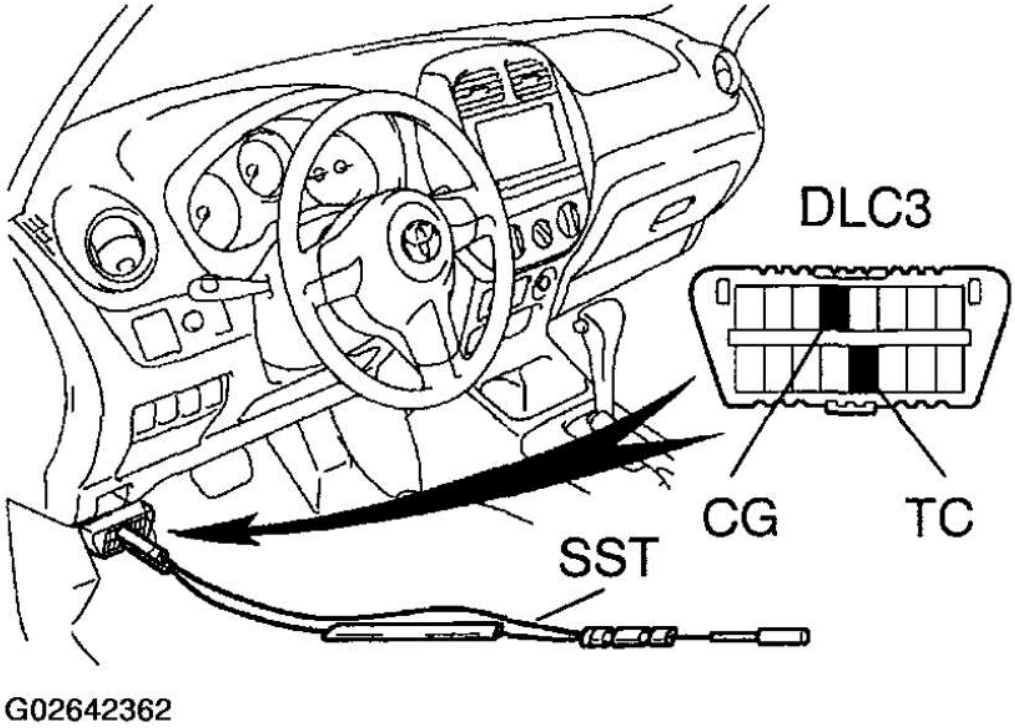


Fig. 18: Connecting Terminals TC And CG Of DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

d. After doing the check, disconnect the SST from terminals TS and CG, TC and CG of the DLC3 and turn the ignition switch OFF.

SST 09843-18040

8. **When using hand-held tester:**

VSC SENSOR SIGNAL CHECK (TEST MODE)

NOTE: When having replaced the yaw rate sensor, deceleration sensor and/or ECU, perform zero point calibration of the yaw rate and deceleration sensors (see step 9). Make sure that this operation should be done before starting the following.

HINT:

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

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

a. Connect the hand-held tester to the DLC3.
b. Do steps 2, 4 and b on the previous pages.
c. Read the DTC by following the prompts on the tester screen.

HINT:

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

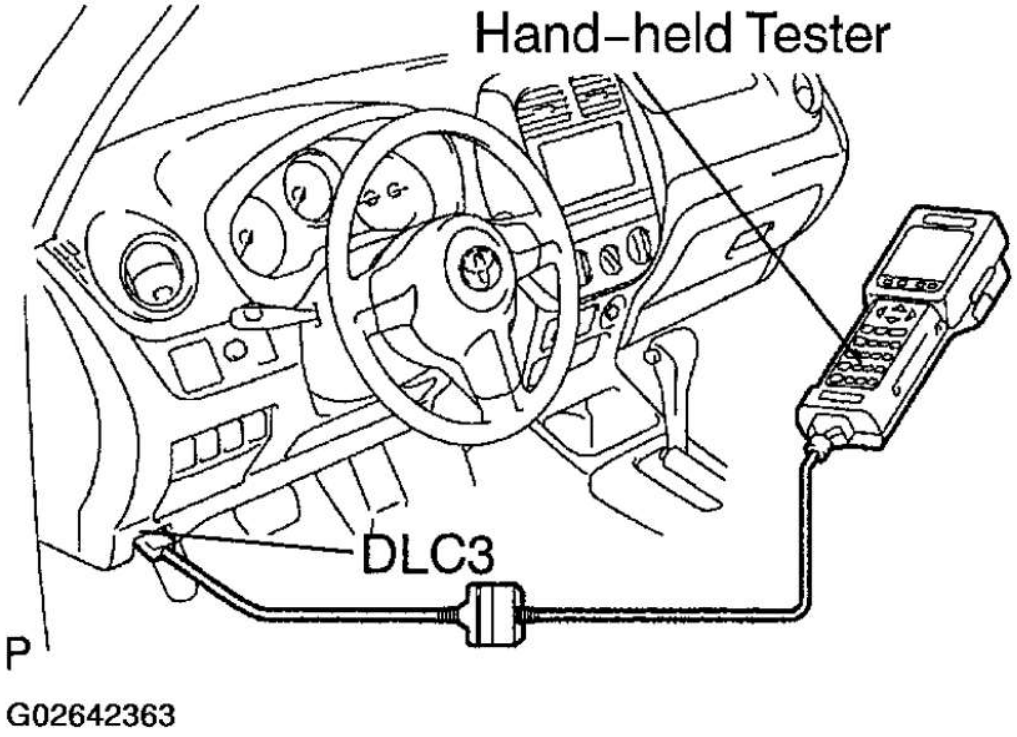


Fig. 19: Connecting Hand-Held Tester To DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DTC of VSC sensor check function:

Code No.	Diagnosis	Trouble Area
C0371/71	Yaw rate sensor output signal malfunction	• Yaw rate sensor • Yaw rate sensor circuit

G02642364

Fig. 20: VSC Sensor Check Function DTC Chart

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

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

9. **When not using hand-held tester:**

IF NECESSARY, PERFORM ZERO POINT CALIBRATION OF YAW RATE AND DECELERATION SENSORS

HINT:

- When having replaced the yaw rate sensor, deceleration sensor or/and the ECU, make sure to perform yaw rate sensor (including deceleration sensor) zero point calibration.
- This operation is also required when the deceleration sensor or yaw rate sensor has been replaced since the calibrated zero point of both sensors will be erased.

NOTE:

- **While obtaining the zero point, do not give any vibration to the vehicle by tilting, moving or shaking it and keep it in a stationary condition (do not start the engine).**
- **Be sure to do this on a level surface (within an inclination of 1 %).**

a. Clear the zero points of the yaw rate and deceleration sensors.

1. Move the shift lever to P position.
2. Turn the ignition switch ON in a stationary condition.
3. With the ignition switch ON, using SST, repeat a cycle of short and open between terminals TS and CG of the DLC3 4 times or more within 8 seconds. Check that the TRAC OFF indicator and VSC warning lights are illuminated, indicating that the recorded zero point is erased.

   SST 09843-18040

4. Turn the ignition switch OFF and VSC within 15 seconds.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

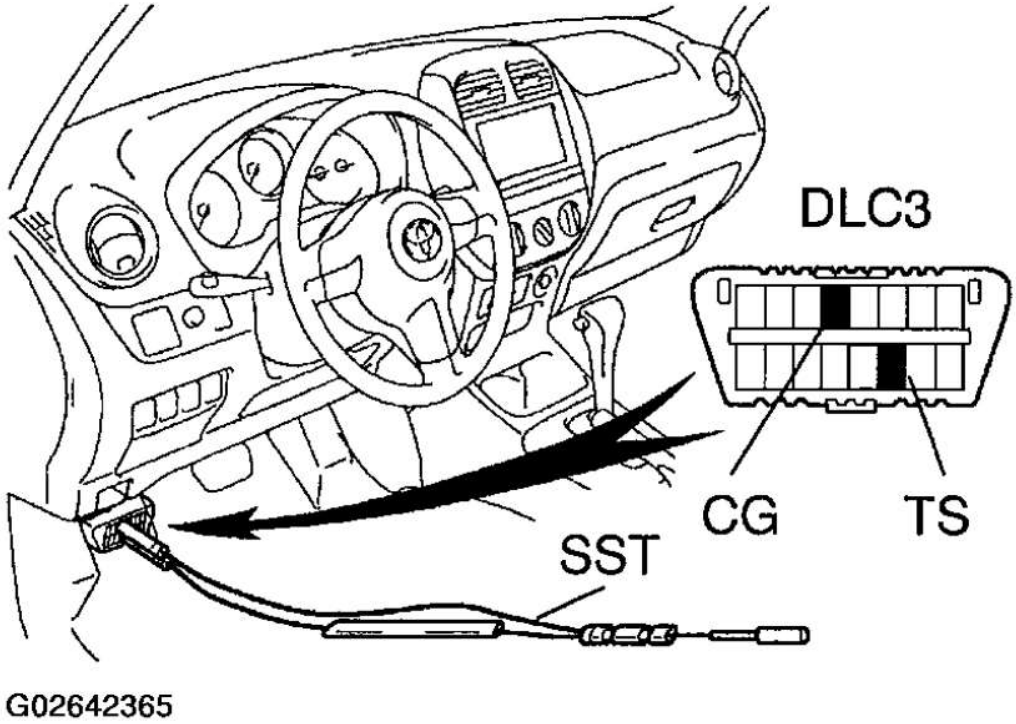


Fig. 21: Connecting TS And CG Terminals Of DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Obtain zero point of the yaw rate sensor.
   1. Disconnect terminals TS and CG of the DLC3.
   2. Turn the ignition switch ON.

      HINT:

      The vehicle should be in a stationary condition with the shift lever in P position.

   3. Check that the TRAC OFF indicator and VSC warning light turns off about 15 seconds after the ignition switch is turned ON.

      HINT:

      Even if the ignition is not turned OFF in step 4 and remains ON, the yaw rate sensor zero point calibration can be completed. In this case, the TRAC OFF indicator and VSC warning lights are illuminated for about 15 seconds and then the VSC warning light starts blinking (normal code).

cardiagn.com

4. After ensuring that the TRAC OFF indicator and VSC warning light remains OFF for 2 seconds, turn the ignition switch OFF.

HINT:

If the ignition switch is not turned OFF in step 4, make sure that the TRAC OFF indicator and VSC warning light blinks for 2 seconds. Then turn the ignition switch OFF.

c. Perform deceleration sensor zero point calibration.

NOTE: After step (b) (the yaw rate sensor zero point calibration), the VSC warning light turns off. At this time, if the vehicle is driven without performing step (c) (deceleration sensor zero point calibration), deceleration sensor zero point calibration malfunction will be detected and the TRAC OFF indicator light and VSC warning light will light up. Therefore, perform step (c) right after step (b).

1. Using SST, connect terminals TS and CG of the DLC3.

   SST 09843-18040

2. Turn the ignition switch ON.

   HINT:

   Place the vehicle in a stationary condition with the shift lever in P position.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

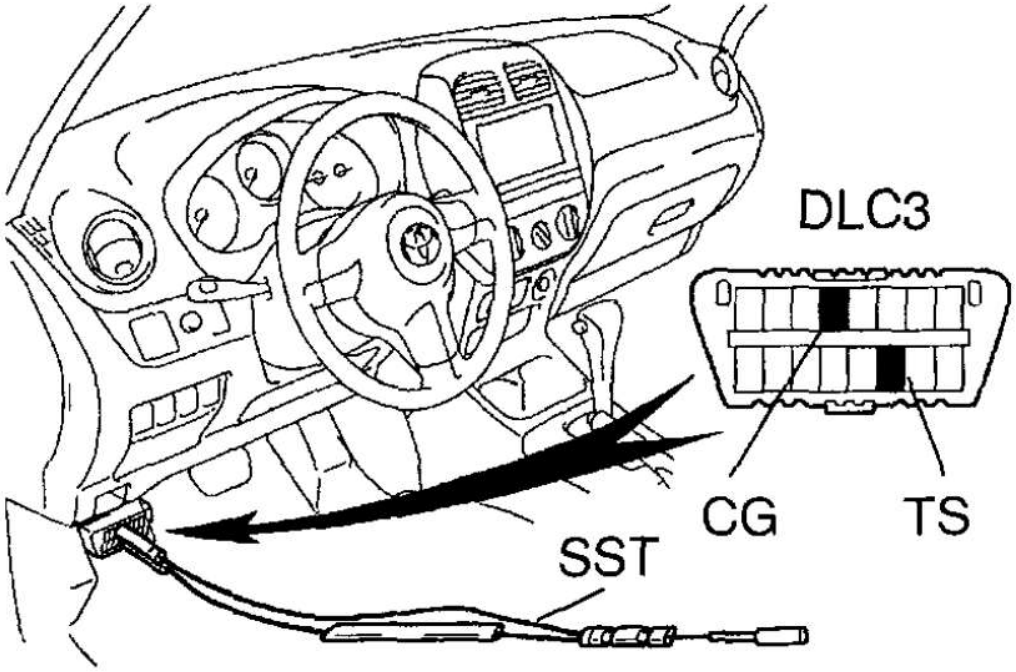


Fig. 22: Connecting Terminals TS And CG Of DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. After turning the ignition switch ON, check that the VSC warning light is illuminated for about 4 seconds and then starts quick blinking at 0.13 seconds intervals.
4. After ensuring the blinking of the VSC warning light for 2 seconds, turn the ignition switch OFF.
5. Remove the SST and disconnect terminals TS and CG of the DLC3.

SST 09843-18040

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

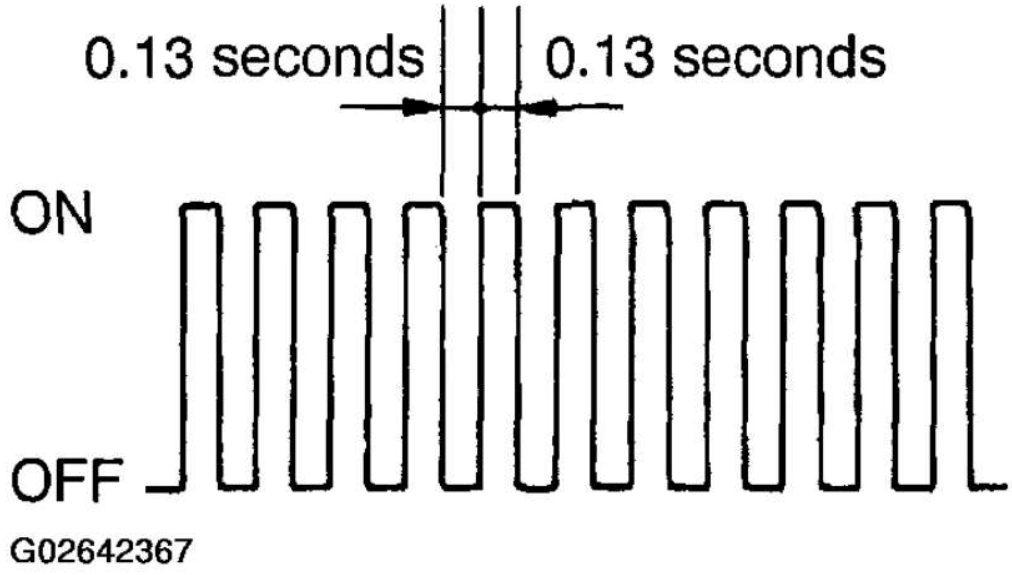


Fig. 23: Blinking Pattern Of VSC Warning Light
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

10. **When using hand-held tester:**

IF NECESSARY, PERFORM ZERO POINT CALIBRATION OF YAW RATE SENSOR AND DECELERATION SENSOR

HINT:

When having replaced the yaw rate sensor and/or the brake actuator assembly, make sure to perform yaw rate sensor and deceleration sensor zero point calibration.

NOTE:

- **While obtaining the zero point, do not give any vibration to the vehicle by tilting, moving or shaking it and keep it in a stationary condition (do not start the engine).**
- **Be sure to do this on a level surface (within an inclination of 1 %).**

a. Connect the hand-held tester to the DLC3.
b. Turn the ignition switch ON.
c. Move the shift lever to P position.
d. Operate the hand-held tester to clear zero point calibration.
e. Operate the hand-held tester to test mode.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

HINT:

When the zero point memorized in the skid control ECU was cleared, the VSC warning light turns ON. When the zero point calibration is completed, the VSC warning light blinks.

f. Keep the vehicle in the stationary condition on the level surface for 2 seconds or more.
g. Check that the VSC warning light blinks.

HINT:

If the VSC warning light does not blink, perform the zero point calibration.

h. Turn the ignition switch OFF.

DIAGNOSTIC TROUBLE CODE CHART

DIAGNOSTIC TROUBLE CODES (DTC) LIST

DTC	Description
DTC C0200/31, C0200/32, C0200/33, C0215/34, C1235/35, C0200/36, C0200/38, C1239/39	Speed Sensor Signal Malfunction
DTC C0226/21, C0236/22, C0246/23, C0256/24	Open or Short Circuit in Brake Actuator Solenoid Circuit
DTC C0273/13, C0274/14, C1361/91	Open or Short Circuit in ABS MTR Relay Circuit & Short circuit in ABS Motor Fail Safe Relay Circuit
DTC C0278/11, C0279/12	ABS Solenoid Valve Relay Circuit
DTC C1201/51	Malfunction in ECM
DTC C1203/53	Malfunction in ECM Communication Circuit
DTC C1210/36, C1336/39	Zero Point Calibration of Yaw Rate Sensor undone/Deceleration Sensor undone
DTC C1223/43	ABS Control System Malfunction
DTC C1224/44	NEO Signal Circuit
DTC C1225/25	VSC Solenoid Circuit
DTC C1231/31	Steering Angle Sensor Circuit
DTC C1232/32, C1234/34, C1243/43, C1244/44, C1245/45, C1381/97	Malfunction in Deceleration Sensor, Malfunction in Yaw Rate Sensor & Malfunction in Power Supply Voltage Yaw/Deceleration Sensor
DTC C1241/41	IG Power Source Circuit
DTC C1246/46	Malfunction in Master Cylinder Pressure Sensor
DTC C1249/49	Stop Light Switch Circuit
DTC C1251/51	ABS Pump Motor Lock
DTC C1337/37	Tires of Different Size (Only for 2WD)

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

NOTE:

- **When removing the part, turn the ignition switch OFF.**
- **When replacing yaw rate sensors and/or the brake actuator assembly (skid control ECU), make sure to perform yaw rate sensor zero point calibration (see PRE-CHECK).**

HINT:

- Using SST 09843-18040, connect terminals TC and CG.
- If any abnormality is not found when inspecting parts, inspect the ECU.
- If a malfunction code is displayed during the DTC check, check the circuit listed for that code.

DTC chart of ABS:

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

DTC No.	Detection Item	Trouble Area
C0200/31	Right front wheel speed sensor signal malfunction	• Right front, left front, right rear, left rear speed sensor • Each speed sensor circuit • Sensor rotor
C0205/32	Left front wheel speed sensor signal malfunction	
C0210/33	Right rear wheel speed sensor signal malfunction	
C0215/34	Left rear wheel speed sensor signal malfunction	
C0226/21	Open or short circuit in brake actuator solenoid circuit (SFR circuit)	• Brake actuator • SFRH or SFRR circuit
C0236/22	Open or short circuit in brake actuator solenoid circuit (SFL circuit)	• Brake actuator • SFLH or SFLR circuit
C0246/23	Open or short circuit in brake actuator solenoid circuit (SRR circuit)	• Brake actuator • SRRH or SRRR circuit
C0256/24	Open or short circuit in brake actuator solenoid circuit (SRL circuit)	• Brake actuator • SRLH or SRLR circuit
C0273/13	Open circuit in ABS MTR relay circuit	• ABS MTR relay • ABS MTR relay circuit
C0274/14	Short circuit in ABS MTR relay circuit	
C0278/11	Open circuit in ABS SOL relay circuit	• ABS SOL relay • ABS SOL relay circuit
C0279/12	Short circuit in ABS SOL relay circuit	
C1225/25	Open or short circuit in brake actuator solenoid circuit (SM circuit)	• Brake actuator • SMF or SMR circuit
C1235/35	Foreign matter is attached on the tip of the right front sensor	• Right front, left front, right rear, left rear speed sensor • Sensor rotor
C1236/36	Foreign matter is attached on the tip of the left front sensor	
C1238/38	Foreign matter is attached on the tip of the right rear sensor	
C1239/39	Foreign matter is attached on the tip of the left rear sensor	
C1241/41	Low battery positive voltage or abnormally high battery positive voltage	• Battery • Charging system • Power source circuit
C1243/43	Malfunction in deceleration sensor (constant output)	• Yaw rate sensor • Wire harness for yaw rate sensor
C1244/44	Malfunction in deceleration sensor	• Yaw rate sensor • Yaw rate sensor circuit
C1245/45	Malfunction in deceleration sensor	• Yaw rate sensor • Wire harness for yaw rate sensor system
C1246/46	Malfunction in master cylinder pressure sensor	• Master cylinder pressure sensor • Master cylinder pressure sensor circuit
C1249/49	Open circuit in stop light switch circuit	• Stop light bulb • Stop light switch circuit
C1251/51	ABS pump motor is locked Open circuit in pump motor circuit	ABS pump motor
C1337/37	Some tire is different in size from the other tires (only for 2WD)	• Tire size
C1361/91	Short circuit in ABS motor fail safe relay circuit	• ABS cut off relay • ABS cut off relay circuit
C1381/97	Malfunction in power supply voltage yaw/deceleration sensor	• Yaw rate sensor • Yaw rate sensor power source circuit
U0073/94	Malfunction in CAN communication	• Wire harness
U0124/95	Malfunction in CAN communication with deceleration sensor	• Wire harness • Yaw rate sensor
Always ON	Malfunction in skid control ECU	• Power source circuit • ABS warning light circuit • Multiplex communication circuit • Skid control ECU

G02912994

Fig. 24: Diagnostic Trouble Code Chart (ABS)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DTC chart of VSC:

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

DTC No.	Detection Item	Trouble Area
C1201/51	Malfunction in ECM	Engine control system
C1203/53	Malfunction in ECM communication circuit	• TRC+ or TRC- circuit • ENG+ or ENG- circuit • ECM
C1210/36	Zero point calibration of yaw rate sensor undone	• Yaw rate sensor • Yaw rate sensor circuit • PNP switch circuit (P position)
C1223/43	Malfunction in ABS control system	ABS control system
C1224/44	Open or short circuit in NEO signal circuit	• NEO circuit • ECM
C1231/31	Malfunction in steering angle sensor	• Steering angle sensor • Steering angle sensor circuit
C1232/32	Malfunction in deceleration sensor	• Deceleration sensor • Deceleration sensor circuit
C1234/34	Malfunction in yaw rate sensor	• Yaw rate sensor • Yaw rate sensor circuit
C1336/39	Zero point calibration of deceleration sensor undone	• Deceleration sensor • Deceleration sensor circuit • PNP switch (P position) circuit
U0123/62	Malfunction in CAN communication with yaw rate sensor	• Wire harness • Yaw rate sensor
U0126/63	Malfunction in CAN communication with steering position sensor	• Wire harness • Skid control ECU
Always ON	Malfunction in skid control ECU Open circuit in VSC warning indicator circuit	• Power source circuit • Skid control ECU

G02912995

Fig. 25: Diagnostic Trouble Code Chart (VSC)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

In some cases, the hand-held tester cannot be used when the VSC warning light is always on.

PARTS LOCATION

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

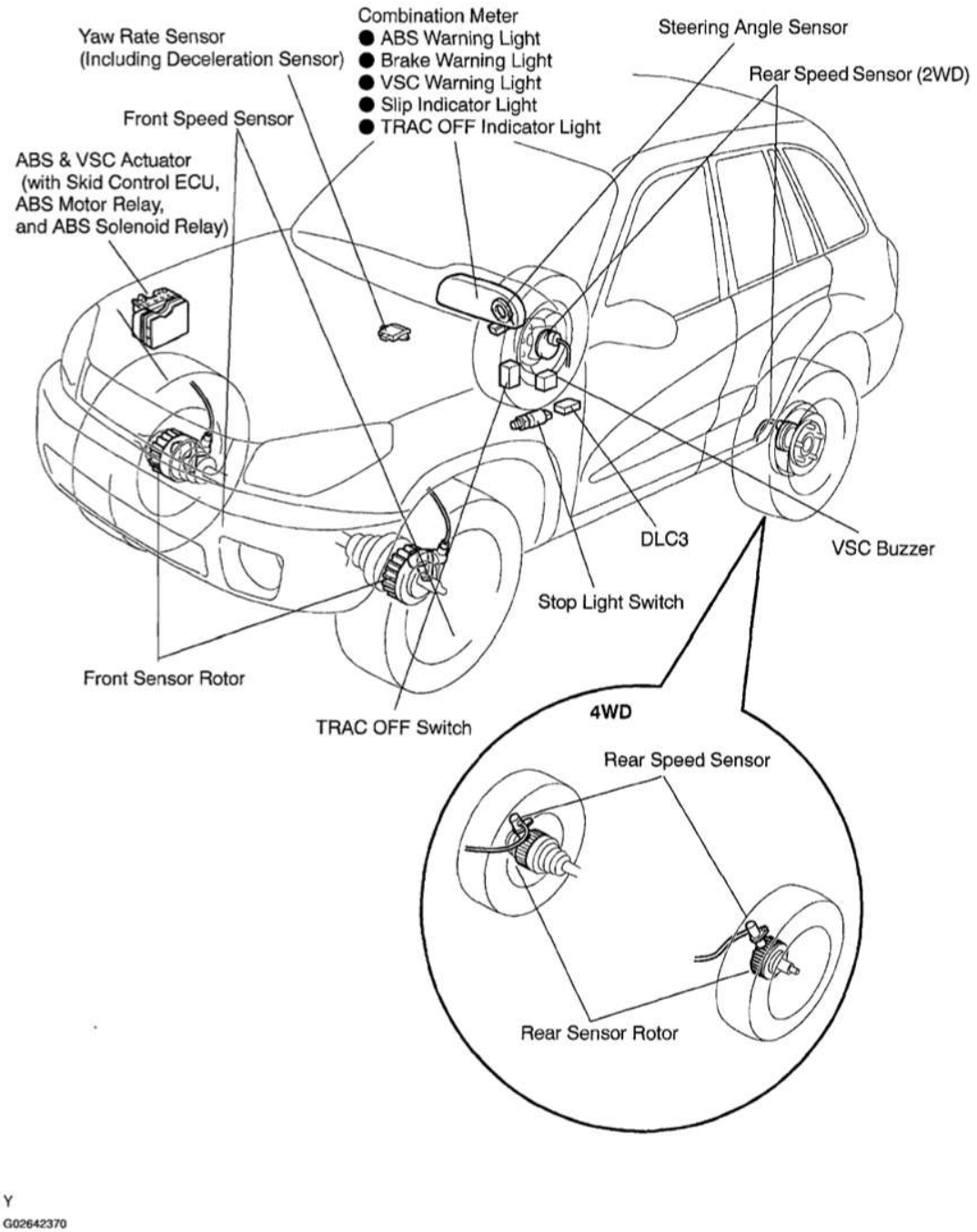


Fig. 26: Identifying ABS With EBD & BA & TRAC & VSC System Parts Location
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TERMINALS OF ECU

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

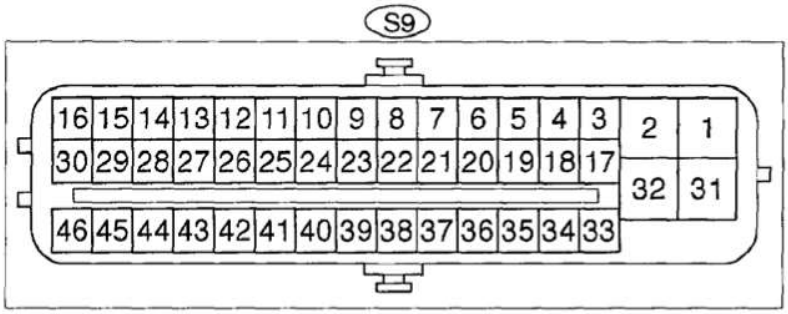


Fig. 27: Identifying ECU Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Symbols (Terminal No.)	Wiring Color	Condition	Specified Condition
BM (S9-2) - GND (S9-1, 32)	L - W-B	Ignition switch ON, pump motor running	10 to 14 V
FR+ (S9-3) - FR- (S9-17)	B - W	Ignition switch ON, slowly turn right front wheel	AC generation
FL+ (S9-18) - FL- (S9-4)	R - G	Ignition switch ON, slowly turn left front wheel	AC generation
RR+ (S9-5) - RR- (S9-19)	Y - BR	Ignition switch ON, slowly turn right rear wheel	AC generation
RL+ (S9-20) - RL- (S9-6)	G - R	Ignition switch ON, slowly turn left rear wheel	AC generation
TRC+ (S9-8) - TRC- (S9-22)	BR-R - Y	Ignition switch ON	Pulse generation
ENG+ (S9-9) - ENG - (S9-23)	B - W-G	Ignition switch ON	Pulse generation
NEO (S9-10) - GND (S9-1, 32)	G-R - W-B	Engine idling	Pulse generation
CANH (S9-11) - CANL (S9-25)	B - W	Ignition switch ON	Pulse generation
D/G (S9-13) - GND (S9-1, 32)	W - W-B	Ignition switch ON	10 to 14 V
MRF (S9-14) - R+ (S9-45)	P - R	Ignition switch ON	10 to 14 V
MR (S9-15) - R+ (S9-45)	Y - R	Ignition switch ON, pump motor running	10 to 14 V
+BS (S9-31) - GND (S9-1, 32)	R-Y - W-B	Always	10 to 14 V
STP (S9-27) - GND (S9-1, 32)	G-W - W-B	Stop light switch ON (Brake pedal depressed)	8 to 14 V
		Stop light switch OFF (Brake pedal released)	Below 1.5 V
PKB (S9-28) - GND (S9-1, 32)	R-B - W-B	Ignition switch ON, parking brake switch ON	Below 1.5 V
		Ignition switch ON, parking brake switch OFF	10 to 14 V
WA (S9-29) - GND (S9-1, 32)	R-Y - W-B	Ignition switch ON, ABS warning light ON	10 to 14 V
		Ignition switch ON, ABS warning light OFF	Below 2.0
BZ (S9-30) - GND (S9-1, 32)	G - W-B	Ignition switch ON, VSC buzzer sounds	Below 1.0 ↔ 10 to 14 V
		Ignition switch ON, VSC buzzer does not sound	10 to 14 V
VSCW (S9-36) - GND (S9-1, 32)	R-W - W-B	Ignition switch ON, VSC warning light ON	Below 2.0 V
		Ignition switch ON, VSC warning light OFF	10 to 14 V
WFSE (S9-42) - GND (S9-1, 32)	P - W-B	Ignition switch ON	10 to 14 V
CSW (S9-43) - GND (S9-1, 32) (2WD only)	L-Y - W-B	TRAC OFF switch OFF	10 to 14 V
BRL (S9-44) - GND (S9-1, 32)	R - W-B	Ignition switch ON, brake warning light ON	10 to 14 V
		Ignition switch ON, brake warning light OFF	Below 2.0 V
R+ (S9-45) - GND (S9-1, 32)	R - W-B	Ignition switch ON, ABS warning light OFF	10 to 14 V
IG1 (S9-46) - GND (S9-1, 32)	R-L - W-B	Ignition switch ON	10 to 14 V

G02642372

Fig. 28: ECU Terminals Specified Condition Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

PROBLEM SYMPTOMS TABLE

If a normal code is indicated during the DTC check but the problem still occurs, check the circuits for each problem symptom in the order given in **Fig. 29**.

NOTE:

- **When replacing brake actuator assembly, sensor or etc., turn the ignition**

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

switch OFF.

- **When replacing yaw rate sensor and/or the brake actuator assembly, make sure to perform yaw rate sensor zero point calibration (see PRE-CHECK).**

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Symptoms	Suspected Area
ABS does not operate	1. Check the DTC that the normal code is output. 2. IG power source circuit 3. Speed sensor circuit 4. Check the hydraulic circuit for leakage. 5. When 1. to 4. are all normal and the problem still occurs, replace the brake actuator assembly.
ABS does not operate efficiently	1. Check the DTC that the normal code is output. 2. Speed sensor circuit 3. Stop light switch circuit 4. Check the hydraulic circuit for leakage. 5. When 1. to 4. are all normal and the problem still occurs, replace the brake actuator assembly.
ABS warning light abnormal	1. ABS warning light circuit 2. Brake actuator assembly
BRAKE warning light abnormal	1. BRAKE warning light circuit 2. Brake actuator assembly
DTC check cannot be done	1. ABS warning light circuit 2. TC terminal circuit 3. VSC warning light circuit 4. When 1. and 3. are all normal and the problem still occurs, replace the brake actuator assembly.
Speed sensor signal check cannot be done	1. Brake actuator assembly
VSC does not operate TRAC does not operate	1. Check the DTC, reconfirming that the normal code is output. 2. Perform zero point calibration 3. IG power source circuit 4. Check the hydraulic circuit for leakage 5. Speed sensor circuit 6. Yaw rate sensor circuit 7. Steering angle sensor circuit 8. When 1. to 7. are all normal and the problem still occurs, replace the brake actuator assembly.
VSC does not operate efficiently TRAC does not operate efficiently	1. Check the DTC, reconfirming that the normal code is output. 2. Perform zero point calibration 3. Check the hydraulic circuit for leakage 4. Speed sensor circuit 5. Yaw rate sensor circuit 6. Steering angle sensor circuit 7. When 1. to 6. are all normal and the problem still occurs, replace the brake actuator assembly.
VSC warning light abnormal	1. VSC warning light circuit 2. Brake actuator assembly
SLIP indicator light abnormal	1. SLIP indicator light circuit 2. Brake actuator assembly
TRAC OFF indicator abnormal	1. TRAC OFF indicator light circuit 2. TRAC OFF switch circuit 3. Brake actuator assembly

G02912999

Fig. 29: Problem Symptoms Table
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

CIRCUIT INSPECTION

DTC C0200/31, C0200/32, C0200/33, C0215/34, C1235/35, C0200/36, C0200/38, C1239/39: SPEED SENSOR SIGNAL MALFUNCTION

CIRCUIT DESCRIPTION

The speed sensor detects wheel speed and sends appropriate signals to the ECU. These signals are used to control the ABS control system. The front and rear rotors have 48 serrations, respectively.

When the rotors rotate, the magnetic field emitted by the permanent magnet in the speed sensor generates an AC voltage. Since the frequency of this AC voltage changes in direct proportion to the speed of the rotor, the frequency is used by the ECU to detect the speed of each wheel.

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

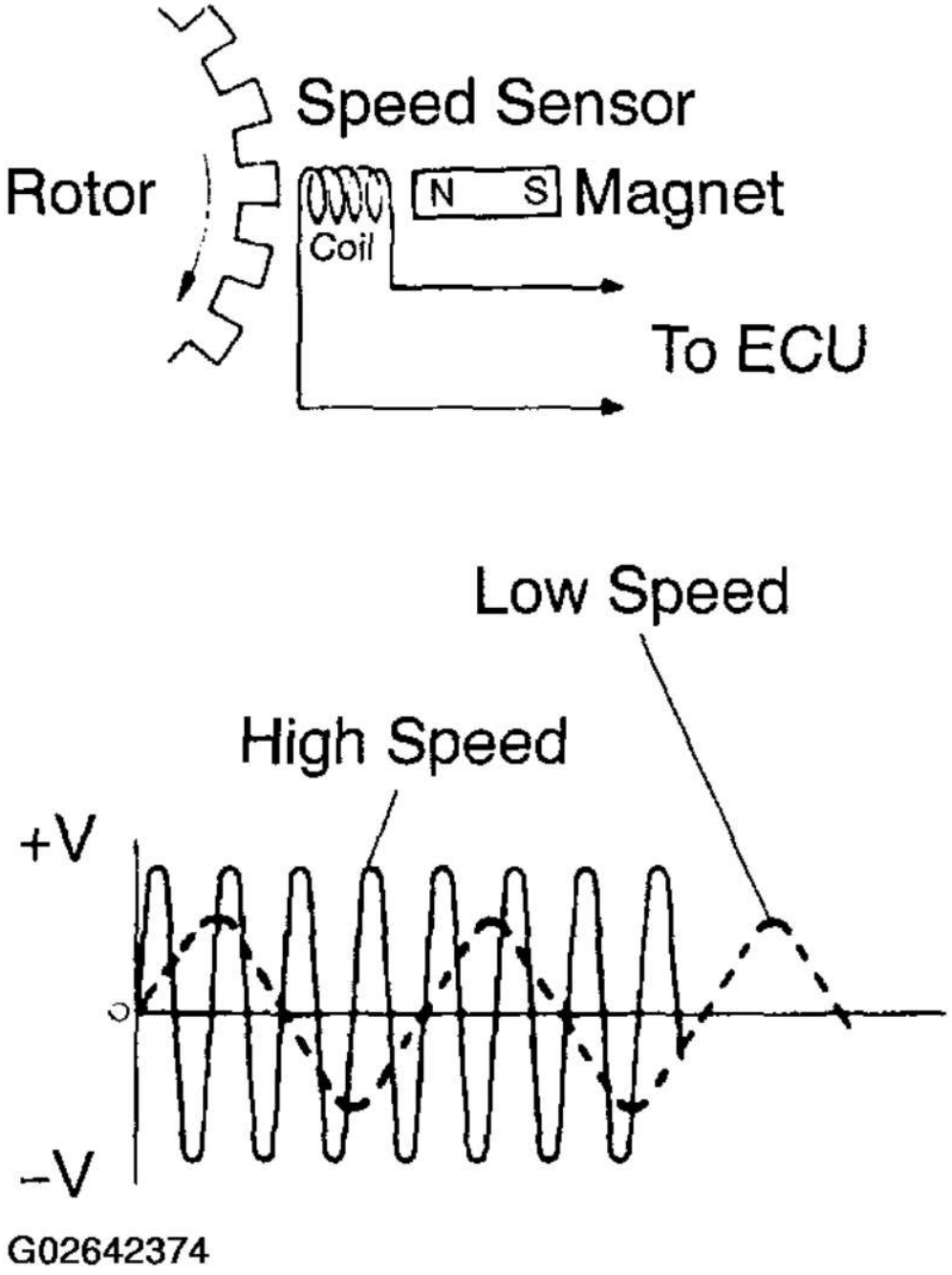


Fig. 30: Speed Sensor Circuit Description
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

DTC No.	DTC Detection Condition	Trouble Area
C0200/31 C0205/32 C0210/33 C0215/34	• With vehicle speed at 10 km/h (6 mph) or more, pulses are not input for 15 seconds • Momentary interruption of sensor signal of faulty wheel has occurred 7 times or more. • Sensor signal circuit is open for 0.5 seconds or more.	• Right front, left front, right rear and left rear speed sensor • Each speed sensor circuit • Sensor rotor
C1235/35 C1236/36 C1238/38 C1239/39	With vehicle speed at 20 km/h (13 mph) or more, sensor signal of faulty wheel generated noise for 5 seconds or more.	• Right front, left front, right rear, left rear speed sensor • Each speed sensor circuit

G02642375

Fig. 31: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

- DTC No. C0200/31 and C1235/35 are for the right front speed sensor.
- DTC No. C0205/32 and C1236/36 are for the left front speed sensor.
- DTC No. C0210/33 and C1238/38 are for the right rear speed sensor.
- DTC No. C0215/34 and C1239/39 are for the left rear speed sensor.

WIRING DIAGRAM

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

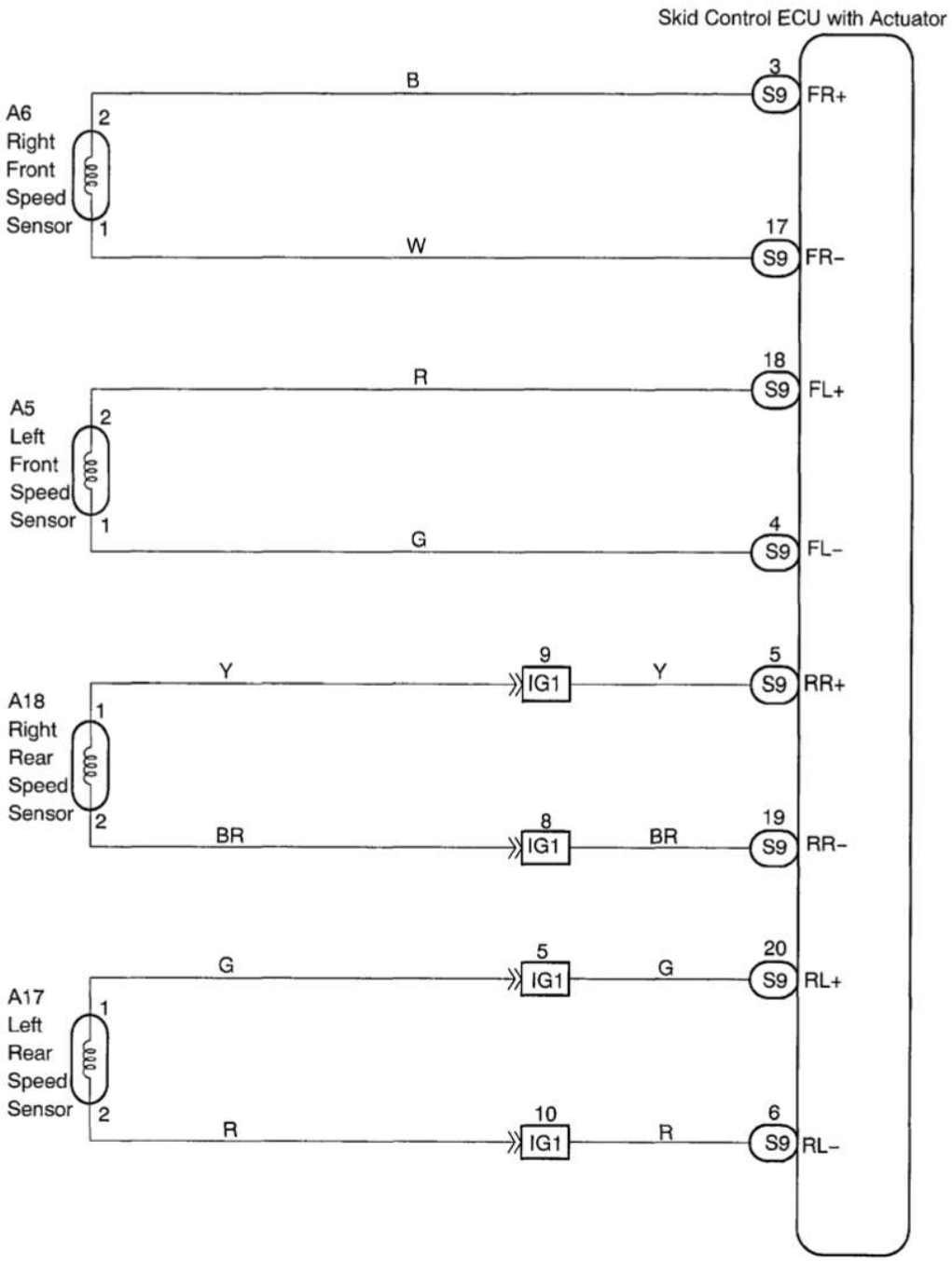


Fig. 32: Wiring Diagram - Speed Sensor Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

HINT:

Start the inspection from step 1 when using the hand-held tester and start from 2 when not using hand-held tester.

1. **Check output value of speed sensor.**

   PREPARATION:

   a. Connect the hand-held tester to the DLC3.
   b. Turn the ignition switch ON and push the hand-held tester main switch ON.
   c. Select the DATA LIST mode on the hand-held tester.

   CHECK:

   Check that there is no difference between the speed value output from the speed sensor displayed on the hand-held tester and the speed value displayed on the speedometer when driving the vehicle.

   OK:

   There is almost no difference from the displayed speed values.

   HINT:

   There is tolerance of +/- 10 % in the speedometer indication.

   OK: Go to step 4.
   NG: Go To Next Step

2. **Check speed sensor.**

   Front speed sensor:

   PREPARATION:

   a. Remove the front fender liner.
   b. Make sure that there is no looseness at the connector lock part and connecting part of the connector.
   c. Disconnect the speed sensor connector.

   CHECK:

   Measure the resistance between terminals 1 and 2 of the speed sensor connector.

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

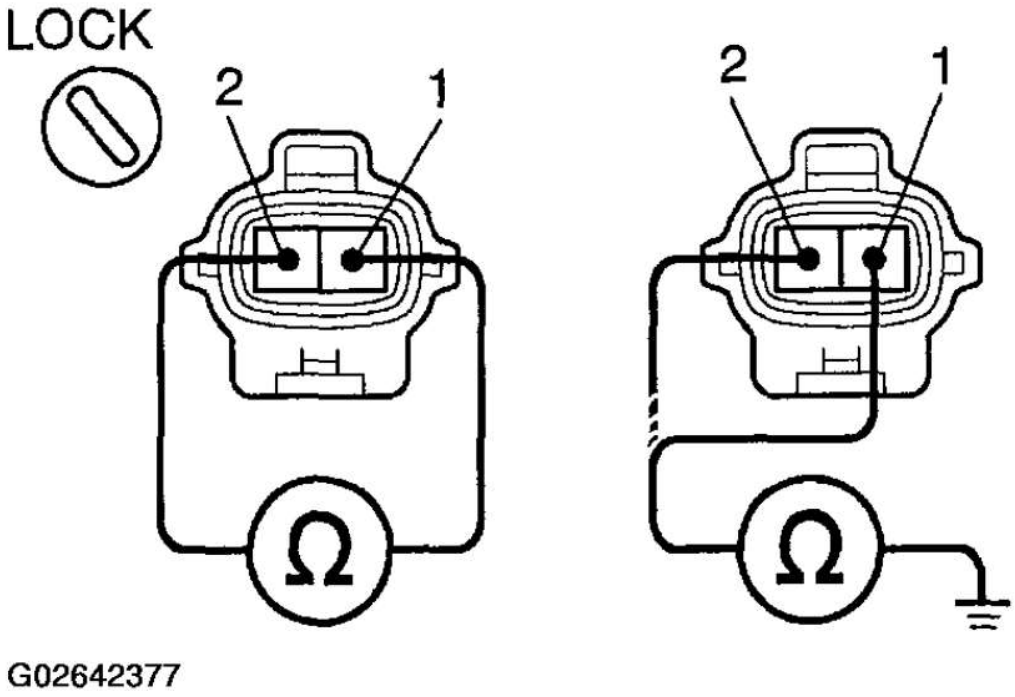


Fig. 33: Checking Front Speed Sensor Resistance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK:

Resistance: 0.6 to 2.5 kohm at -40 to 120°C (-40 to 248°F)

CHECK:

Measure the resistance between terminals 1 and 2 of the speed sensor connector and the body ground.

OK:

Resistance: 10 Mohm or higher

Rear speed sensor (2WD):

PREPARATION:

a. Make sure that there is no looseness at the connector lock part and connecting part of the connector.
b. Disconnect the speed sensor connector at the hub bearing.

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

CHECK:

Measure the resistance between terminals 1 and 2 of the speed sensor connector.

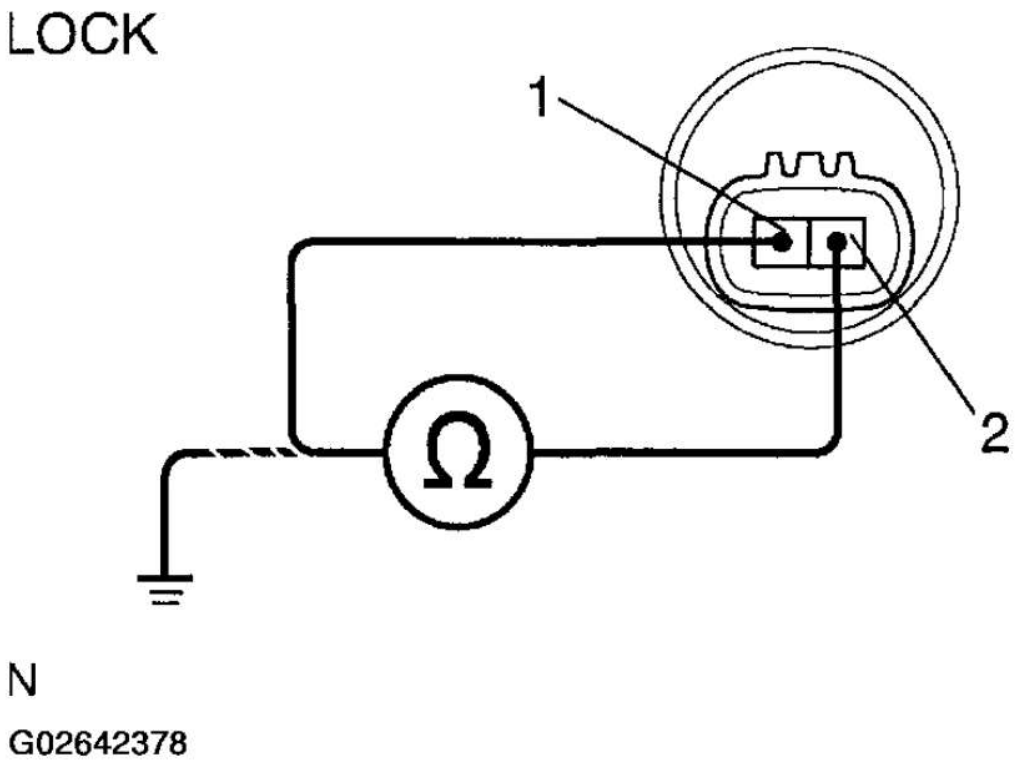


Fig. 34: Checking Rear Speed Sensor (2WD) Resistance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK:

Resistance: 0.8 to 1.9 kohm at -40 to 120°C (-40 to 248°F)

CHECK:

Measure the resistance between terminals 1 and 2 of the speed sensor connector and the body ground.

OK:

Resistance: 1 Mohm or higher

Rear speed sensor (4WD):

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

PREPARATION:

a. Make sure that there is no looseness at the connector lock part and connecting part of the connector.
b. Disconnect the speed sensor connector at the hub bearing.

CHECK:

Measure the resistance between terminals 1 and 2 of the speed sensor connectors.

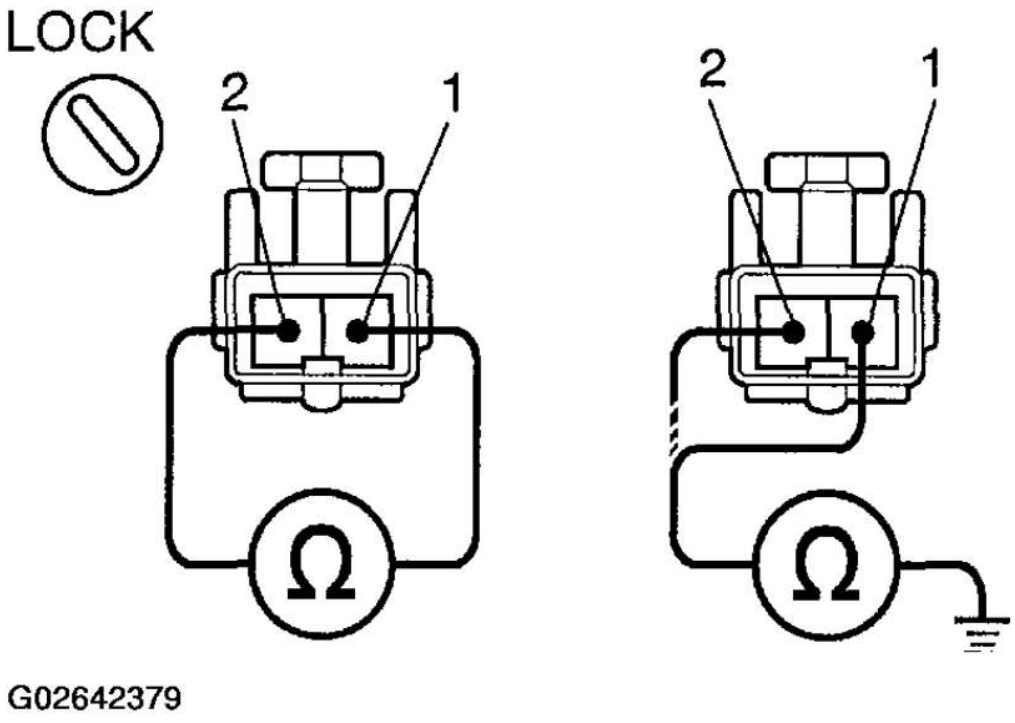


Fig. 35: Checking Rear Speed Sensor (4WD) Resistance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK:

Resistance: 0.65 to 1.8 kohm at -40 to 120°C (-40 to 248°F)

CHECK:

Measure the resistance between terminals 1 and 2 of the speed sensor connector and the body ground.

OK:

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Resistance: 1 Mohm or higher

Rear speed sensor sub-wire harness (2WD):

PREPARATION:

a. Remove the seat cushion and seat back.
b. Make sure that there is no looseness at the connector lock part and connecting part of the connector.
c. Disconnect the speed sensor connector inside the vehicle.

CHECK:

a. Measure the resistance between terminal 1 of connector 1 and terminal 2 of connector 2.

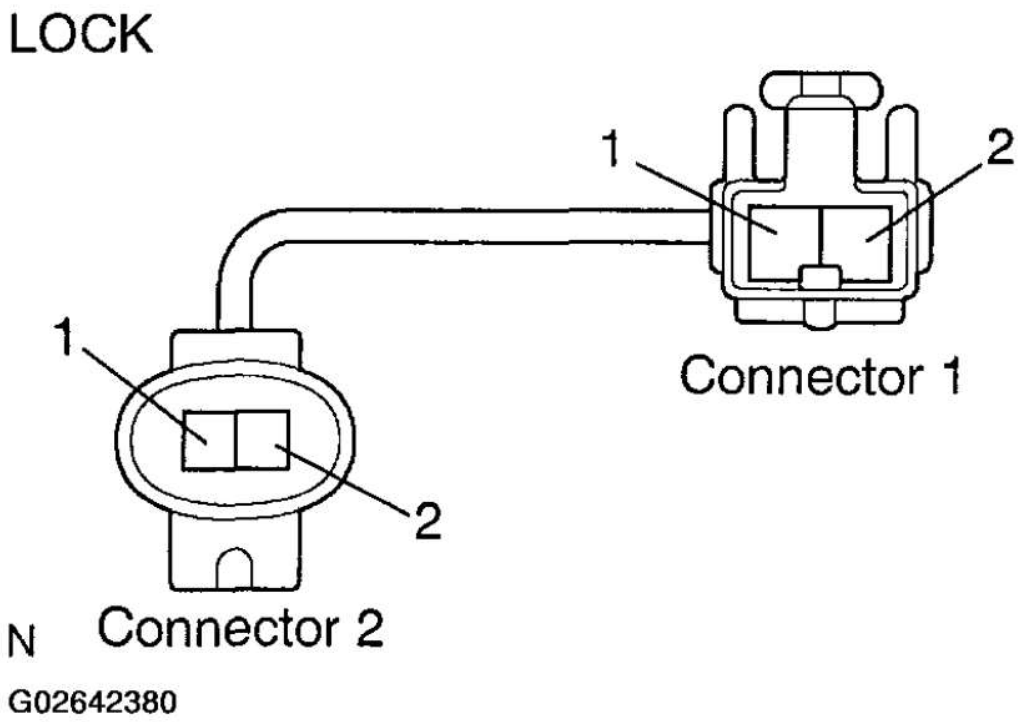


Fig. 36: Checking Rear Speed Sensor Sub-Wire Harness (2WD) Connectors
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Measure the resistance between terminal 2 of connector 1 and terminal 1 of connector 2.

OK:

cardiagn.com

Resistance: Below 1 ohm

CHECK:

Measure the resistance between terminals 1 and 2 of the speed sensor connector 1 and the body ground.

OK:

Resistance: 10 Mohm or higher

NG: Replace speed sensor or sub-wire harness.

NOTE: Finally, check the speed sensor signal (see PRE-CHECK).

OK: Go To Next Step.

3. **Check for open and short circuit in harness and connector between each speed sensor and skid control ECU with actuator (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**

   NG: Repair or replace harness and connector.

   OK: Go To Next Step.

4. **Check sensor installation.**

CHECK:

Check the speed sensor installation.

OK:

FRONT (2WD, 4WD), Rear (4WD):

The installation bolt is tightened properly and there is no clearance between the sensor and steering knuckle or rear axle carrier.

Torque: 8.0 Nm (8.2 kgf.cm, 71 in.lbf).

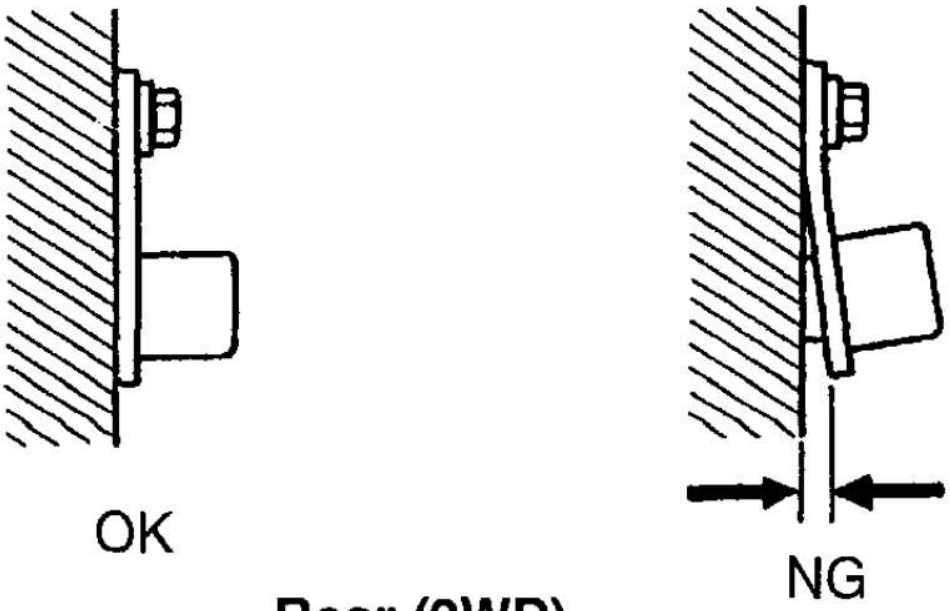
Rear (2WD):

There is no clearance between the sensor and rear axle carrier.

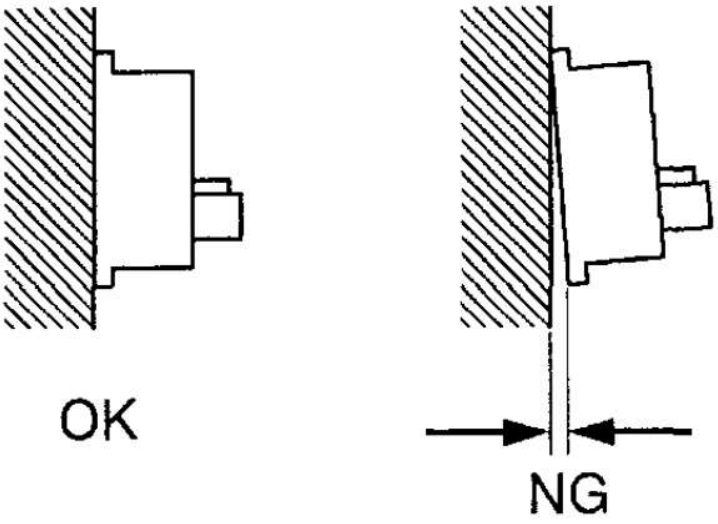
cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Front (2WD, 4WD), Rear (4WD)



Rear (2WD)



N

G02642381

cardiagn.com

Fig. 37: Checking Speed Sensor Installation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Replace speed sensor.

NOTE: Finally, check the speed sensor signal (see PRE-CHECK).

OK: Go To Next Step.

5. **Check speed sensor and sensor rotor serrations.**

(REFERENCE) INSPECTION USING OSCILLOSCOPE

PREPARATION:

Connect an oscilloscope to terminals FR+ - FR-, FL+ - FL-, RR+ - RR- and RL+ - RL- of the ABS actuator with ECU.

CHECK

Drive the vehicle at about 20 km/h (12 mph), and check the signal waveform.

OK:

A waveform as shown in a figure should be output.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

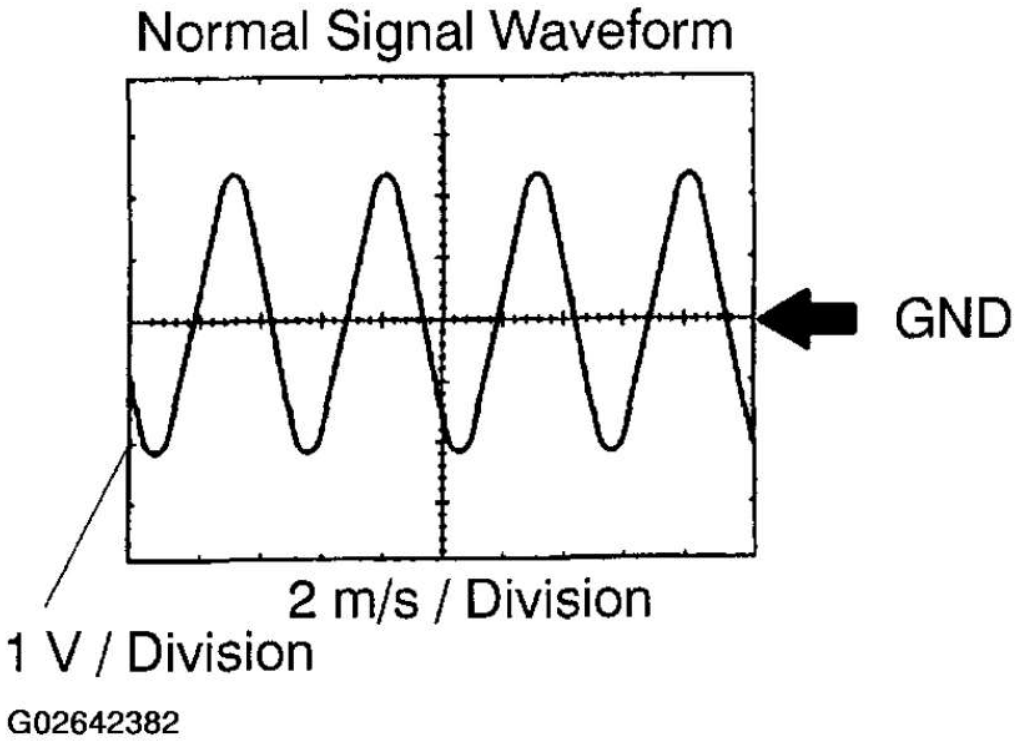


Fig. 38: Normal Speed Sensor Signal Waveform
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

- As the vehicle speed (wheel revolution speed) increases, a cycle of the waveform becomes shorter and the fluctuation in the output voltage becomes greater.
- When noise is identified in the waveform on the oscilloscope, error signals are generated due to the speed sensor rotor's scratches, looseness or foreign matter deposited on it.

OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

NG: Go To Next Step.

6. **Check sensor rotor and sensor tip.**

Front:

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

PREPARATION:

Remove the front drive shaft (see **REMOVAL**).

CHECK:

Check sensor rotor serrations.

OK:

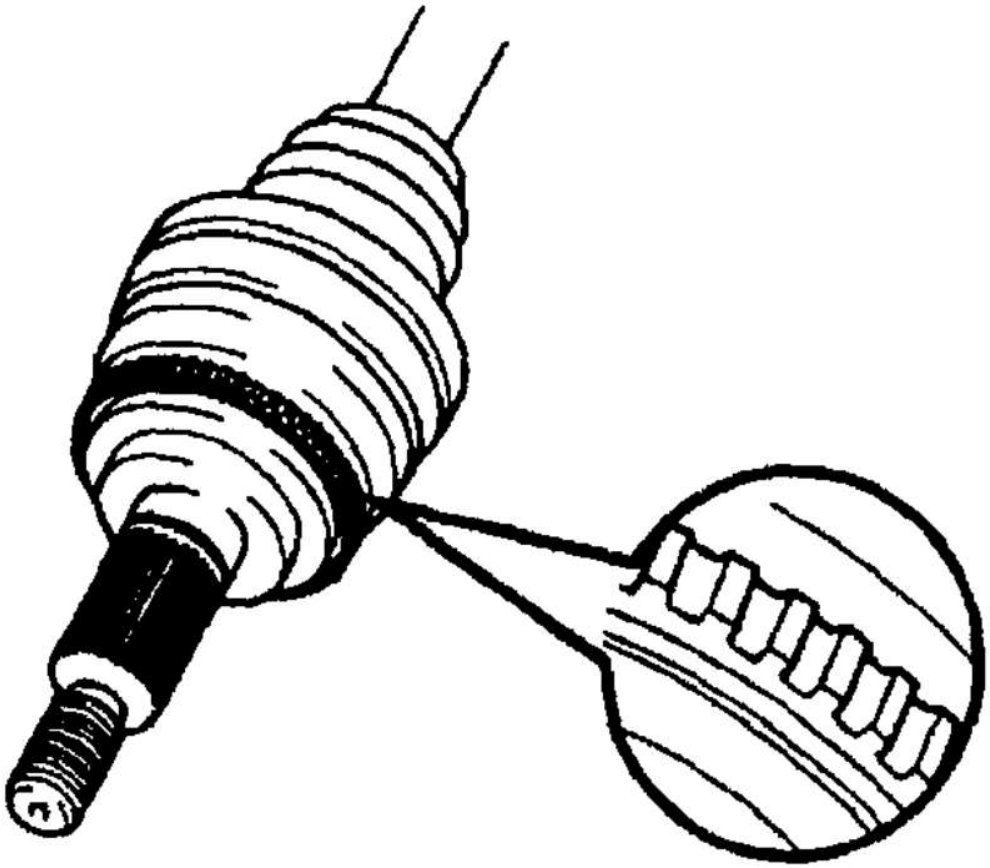
No scratches, missing teeth or foreign objects.

PREPARATION:

Remove the front speed sensor (see **REMOVAL**).

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4



G02642383

Fig. 39: Checking Sensor Rotor Serrations (Front Axle)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

CHECK:

Check the sensor tip.

OK:

No scratches or foreign objects on the sensor tip.

NOTE: Finally, check the speed sensor signal (see PRE-CHECK).

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Rear (2WD):

PREPARATION:

Remove the axle hub and disconnect the rear speed sensor (see **REMOVAL**).

CHECK:

Check the sensor rotor serrations.

OK:

No scratches or missing teeth or no foreign objects.

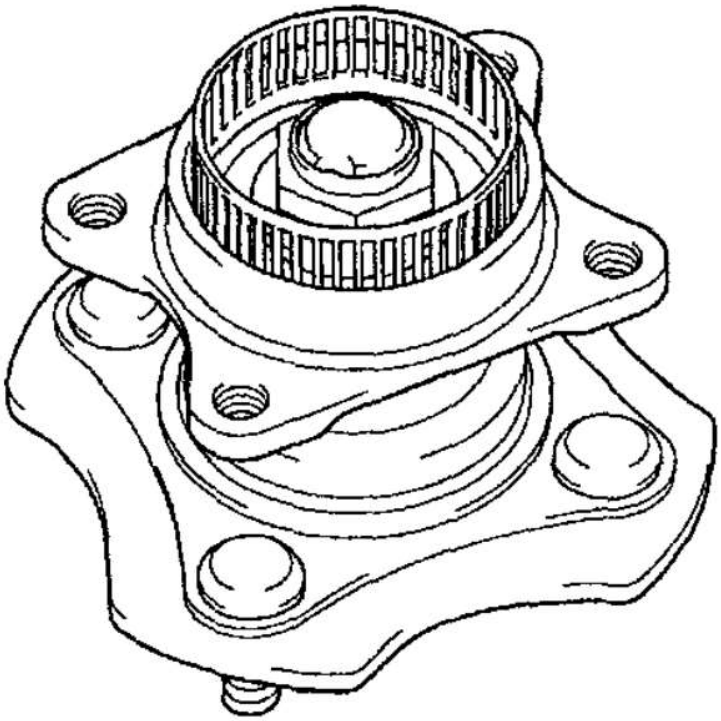
CHECK:

Check the sensor tip.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4



P

G02642384

Fig. 40: Checking Sensor Rotor Serrations Rear (2WD Axle Hub)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK:

No scratches or no foreign objects on the sensor tip.

Rear (4WD):

PREPARATION:

Remove the rear drive shaft (see **REMOVAL**).

CHECK:

Check the sensor rotor serrations.

cardiagn.com

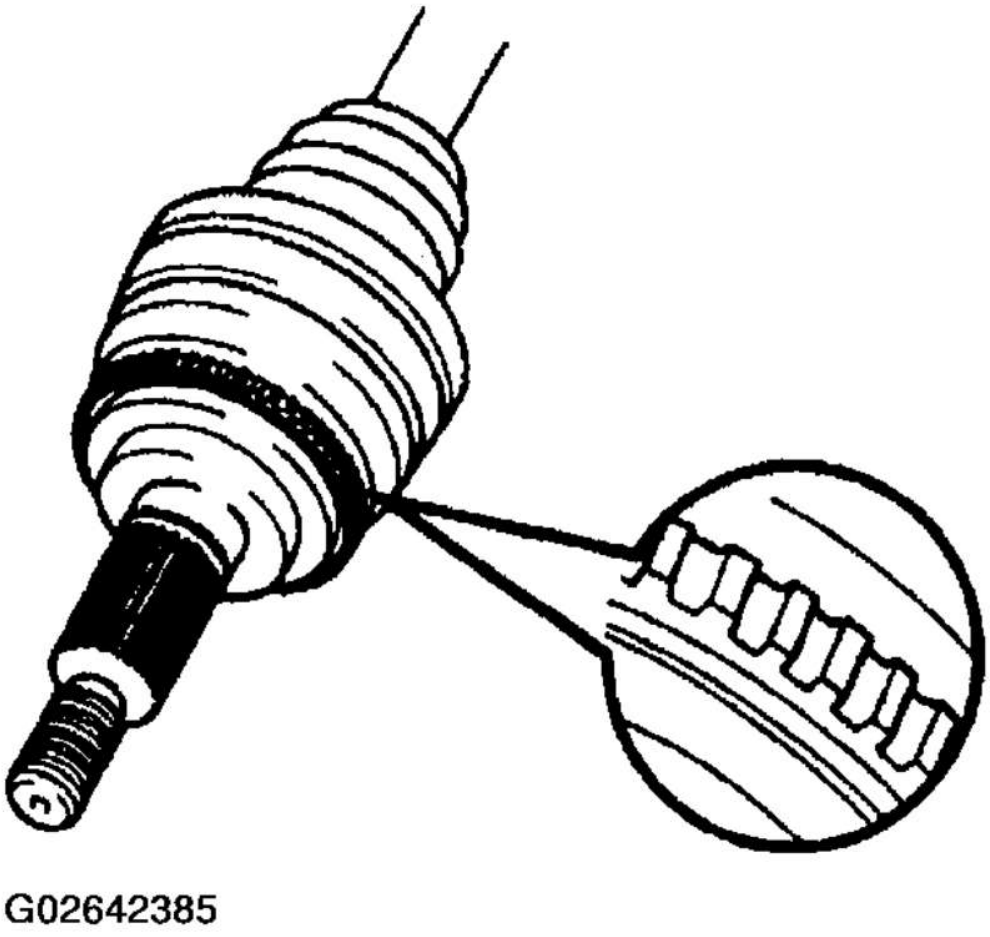
2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

OK:

No scratches or missing teeth or no foreign objects.

HINT:

If foreign objects are stuck to the rotor, remove them.



G02642385

Fig. 41: Checking Sensor Rotor Serrations Rear (4WD)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

PREPARATION:

Remove the rear drive shaft (see **REMOVAL**).

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

CHECK:

Check the sensor tip.

OK:

No scratches or no foreign objects on the sensor tip.

HINT:

If foreign objects are stuck to the sensor tip, remove them before reuse. Check the rotor for the presence of foreign objects and remove them if they are stuck.

NG: Replace speed sensor or rear axle hub assembly.

NOTE: Finally, check the speed sensor signal (see PRE-CHECK).

HINT:

Remove any foreign matters if identified.

Check the output waveform again after reassembling.

OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

DTC C0226/21, C0236/22, C0246/23, C0256/24: OPEN OR SHORT CIRCUIT IN BRAKE ACTUATOR SOLENOID CIRCUIT

CIRCUIT DESCRIPTION

This solenoid turns on when signals are received from the ECU and controls the pressure acting on the wheel cylinders to control the braking force.

DTC No.	DTC Detection Condition	Trouble Area
C0226/21	Open or short circuit of front right solenoid circuit (SFRR or SFRH) continues for 0.05 seconds or more.	• Brake actuator assembly • SFRH or SFRR circuit • SFLH or SFLR circuit • SRRH or SRRR circuit • SRLH or SRLR circuit
C0236/22	Open or short circuit of front left solenoid circuit (SFLR or SFLH) continues for 0.05 seconds or more.	
C0246/23	Open or short circuit of rear right solenoid circuit (SRRR or SRRH) continues for 0.05 seconds or more.	
C0256/24	Open or short circuit of rear left solenoid circuit (SRLR or SRLH) continues for 0.05 seconds or more.	

G02642386

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Fig. 42: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

WIRING DIAGRAM

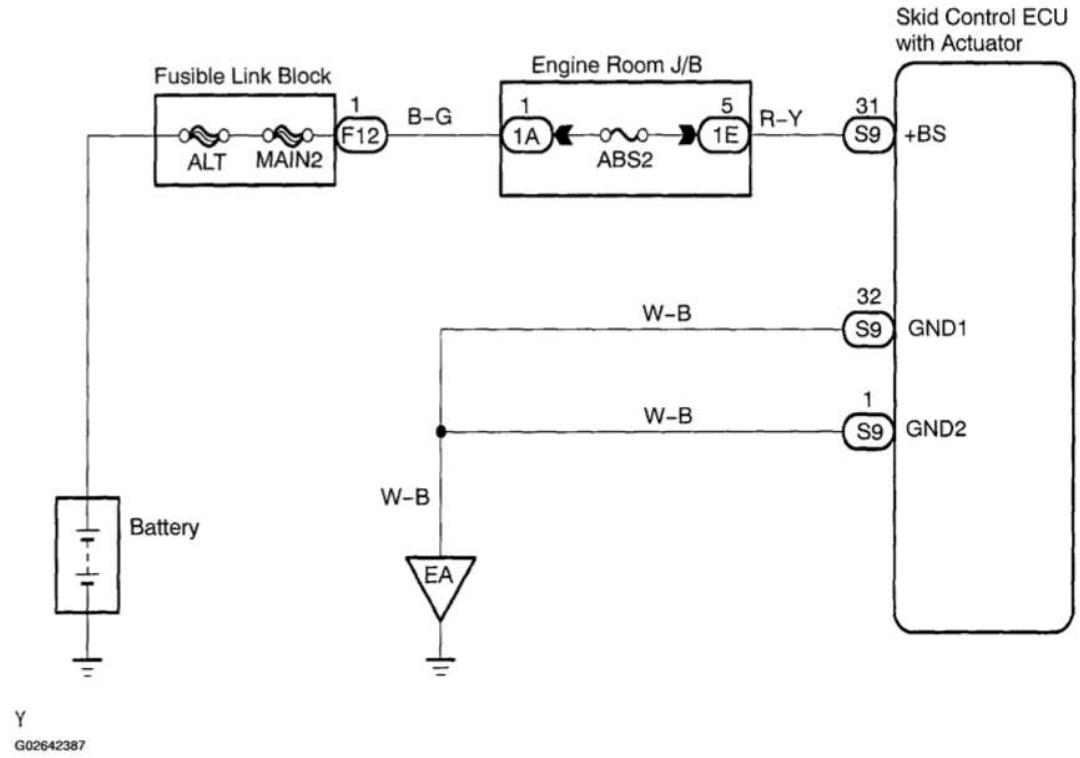


Fig. 43: Wiring Diagram - Brake Actuator Solenoid Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. **Check DTC once more (See PRE-CHECK).**

   PREPARATION:

   a. Clear the DTC.
   b. Turn the ignition switch OFF.

   CHECK:

   a. Turn the ignition switch ON.
   b. Is the same DTC output again?
      NO: END

cardiagn.com

YES Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

DTC C0273/13, C0274/14, C1361/91: OPEN OR SHORT CIRCUIT IN ABS MTR RELAY CIRCUIT & SHORT CIRCUIT IN ABS MOTOR FAIL SAFE RELAY CIRCUIT

CIRCUIT DESCRIPTION

The ABS motor relay supplies power to the ABS pump motor. While the ABS & TRAC & VSC are activated, the ECU switches the ABS motor relay ON and operates the ABS pump motor.

DTC No.	DTC Detection Condition	Trouble Area
C0273/13	• With IG1 terminal voltage at 9.0 to 17.2 V, during initial check, ABS control, TRAC control VSC control or BA control, pump motor relay is turned ON, and relay contact is "OFF" for 0.12 seconds or more.	• ABS MTR relay • ABS MTR relay circuit • Brake actuator assembly
C0274/14	When pump motor relay is turned OFF, relay contact is "ON" for 4 seconds or more.	
C1361/91	• Immediately after IG1 is turned ON, when pump motor fail-safe relay is tuned OFF, relay contact is "ON" for 0.2 seconds or more.	• ABS CUT relay • ABS CUT relay circuit

G02642388

Fig. 44: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

WIRING DIAGRAM

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

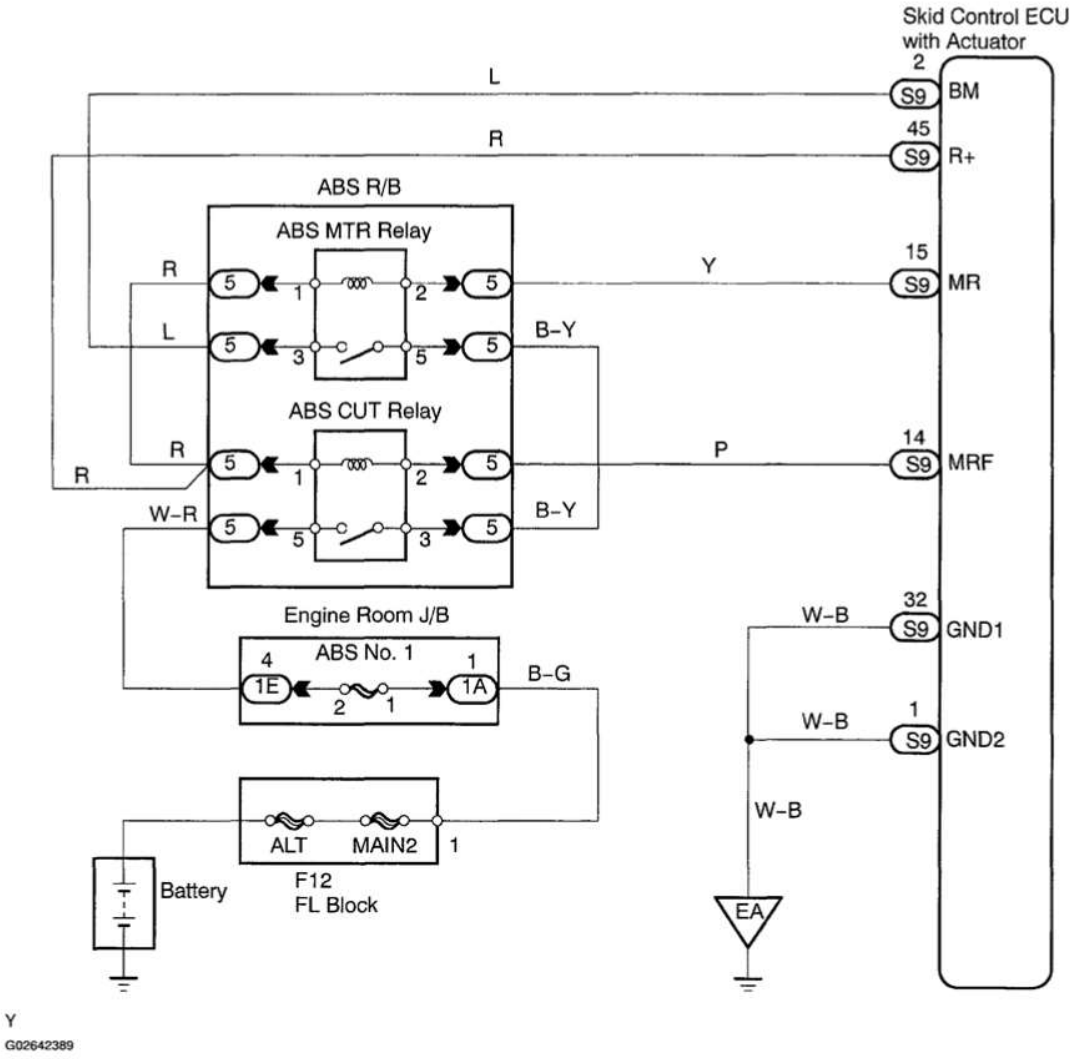


Fig. 45: Wiring Diagram - ABS MTR Relay Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

HINT:

Start the inspection from step 1 when using the hand-held tester and start from step 2 when not using the hand-held tester.

1. **Check ABS motor relay operation.**

   PREPARATION:

   a. Connect the hand-held tester to the DLC3.

cardiagn.com

b. Turn the ignition switch ON and press the hand-held tester main switch ON.
c. Select the item "ABS MTR RELAY" in the ACTIVE TEST and operating it using the hand-held tester.

CHECK:

Check the operation sound of the ABS motor relay when operating it using the hand-held tester.

OK:

The operation sound of the ABS motor relay should be heard.

OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

NG: Go To Next Step.

2. **Measure voltage between terminal 5 of ABS R/B and body ground.**

PREPARATION:

a. Remove the ABS MTR relay from the ABS R/B.
b. Turn the ignition switch ON.

CHECK:

Measure the voltage between terminal 5 of the ABS R/B (for ABS MTR relay) and body ground.

OK:

Voltage: 10 to 14 V

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

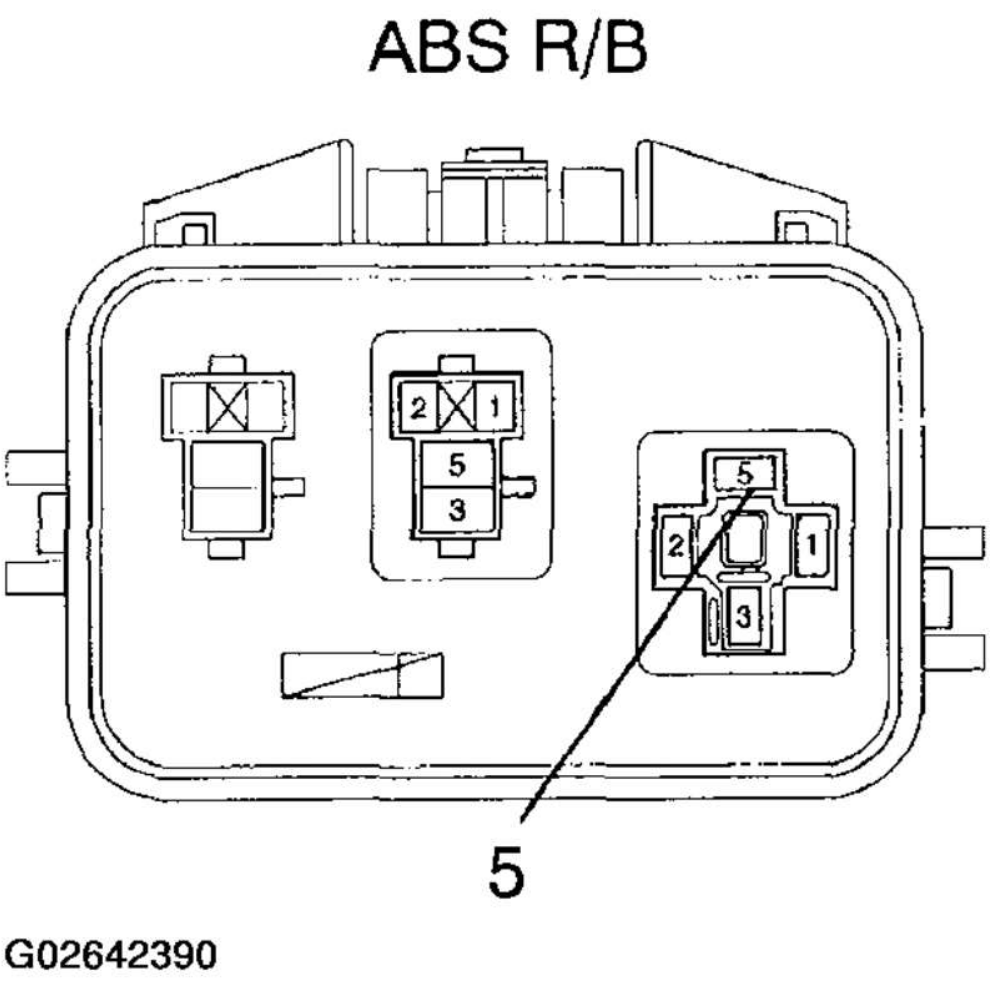


Fig. 46: Identifying ABS R/B Connector Terminal 5
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Go to step 5.

OK: Go To Next Step.

3. **Check ABS MTR relay.**

CHECK:

Measure the resistance between each pair of the terminal of the motor relay.

OK:

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

ABS MTR RELAY RESISTANCE

Tester Connection	Specified Condition
Terminals 1 and 2	Approximately 80 ohm
Terminals 3 and 5	10 kohm or higher

CHECK:

a. Apply battery positive voltage between terminals 1 and 2.
b. Measure the resistance between terminals.

OK:

ABS MTR RELAY RESISTANCE

Tester Connection	Specified Condition
Terminals 3 and 5	Below 1 ohm

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

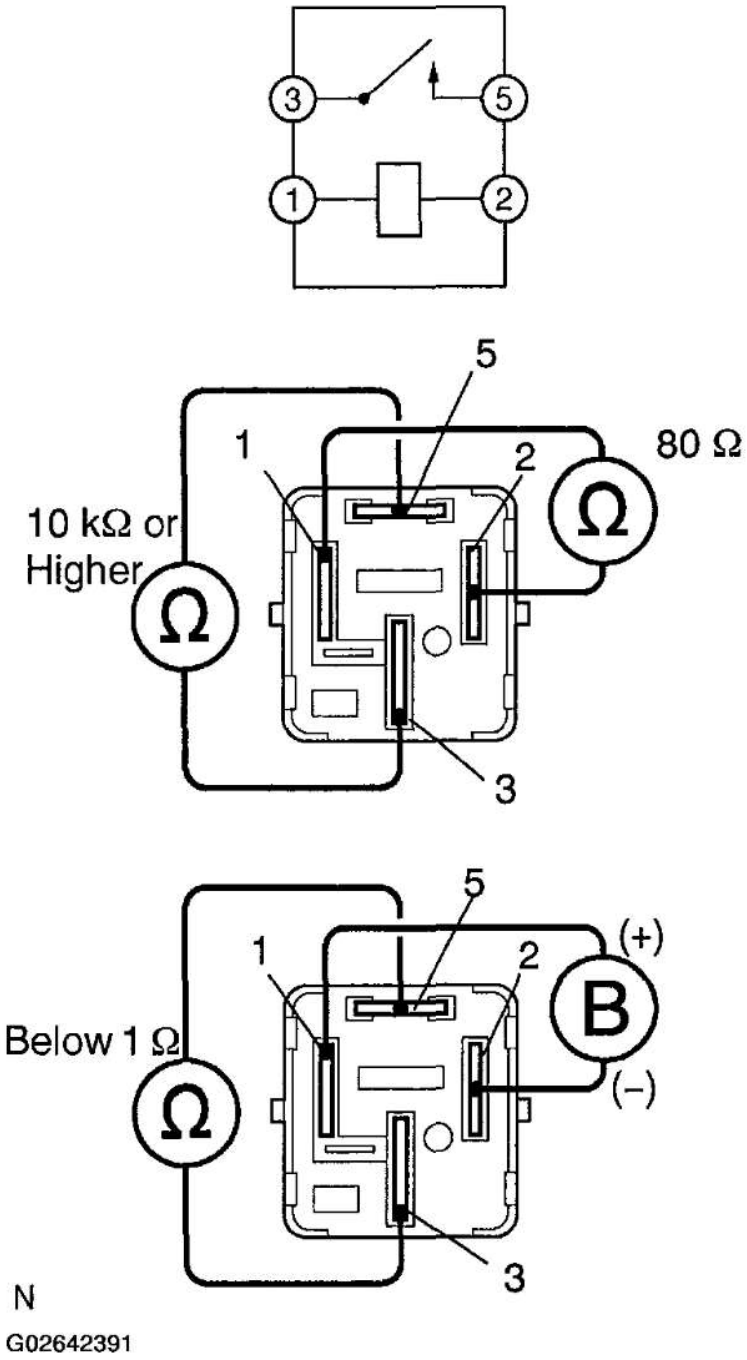


Fig. 47: Checking ABS MTR Relay
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Replace ABS MTR relay.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

OK: Go To Next Step.

4. **Check for open and short circuit in harness and connector between ABS R/B (for ABS MTR relay) and skid control ECU (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**

   NG: Repair or replace harness and connector.

   OK: If same code is still output after DTC is deleted, check contact condition of each connection. If connections are normal, ECU may be defective.

5. **Check ABS CUT relay.**

CHECK:

Measure the resistance between each terminal of the ABS CUT relay.

OK:

ABS CUT RELAY RESISTANCE

Tester Connection	Specified Condition
Terminals 1 and 2	Approximately 100 ohm
Terminals 3 and 5	10 kohm or higher

CHECK:

a. Apply battery voltage between terminals 1 and 2.
b. Measure the resistance between terminals 3 and 5 of ABS CUT relay.

OK:

ABS CUT RELAY RESISTANCE

Tester Connection	Specified Condition
Terminals 3 and 5	Below 1ohm

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

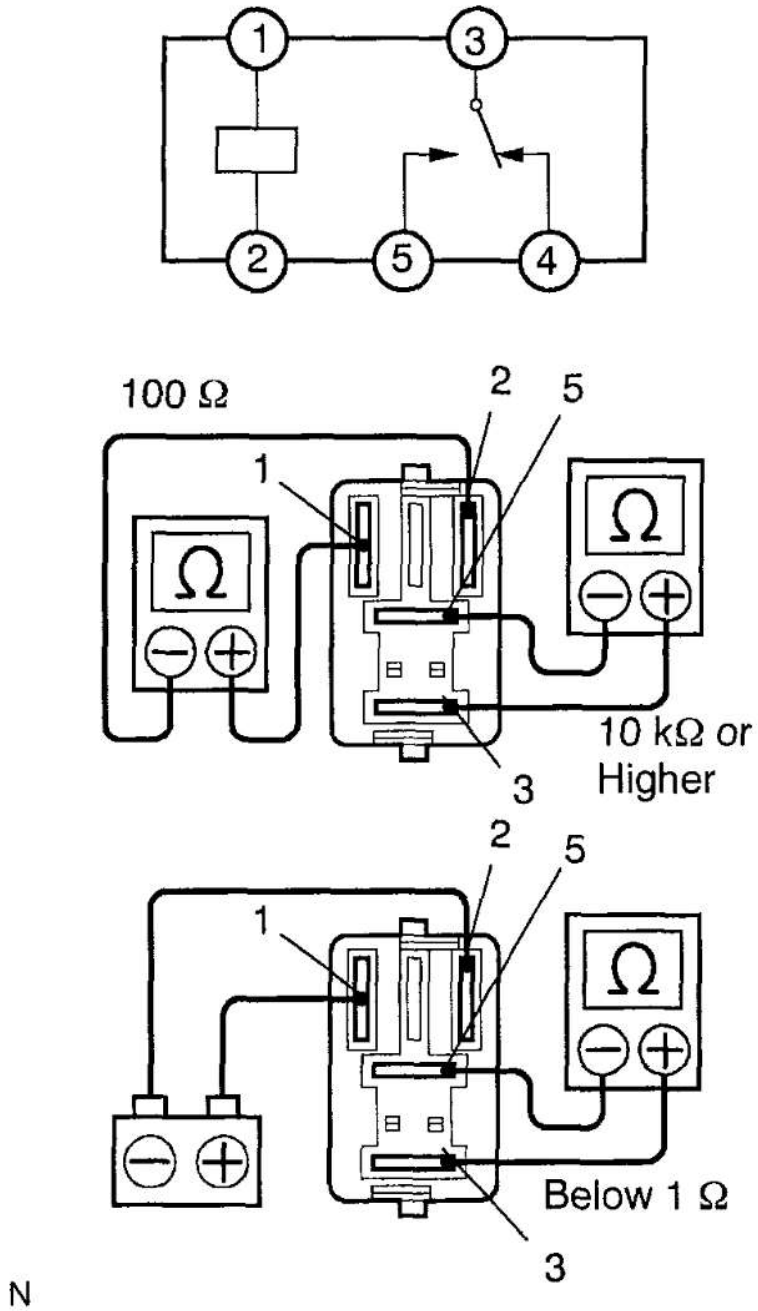


Fig. 48: Checking ABS CUT Relay
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Replace ABS CUT relay.

cardiagn.com

OK: Go To Next Step.

6. **Check ABS No. 1 fuse.**

PREPARATION:

Remove the ABS No. 1 fuse from the engine room J/B.

CHECK:

Measure the resistance.

OK:

Resistance: Below 1 ohm

NG: Replace ABS No. 1 fuse.
OK: Repair or replace harness and connector.

DTC C0278/11, C0279/12: ABS SOLENOID VALVE RELAY CIRCUIT

CIRCUIT DESCRIPTION

This relay supplies power to each ABS solenoid. After the ignition switch is turned ON, if the initial check is OK, the relay turns on.

DTC No.	DTC Detection Condition	Trouble Area
C0278/11	• With IG terminal voltage at 9.5 to 17.2 V, when solenoid relay is turned on, relay contact is "OFF" for 0.2 seconds or more.	• Brake actuator assembly • ABS solenoid relay circuit
C0279/12	Immediately after IG1 is turned ON, when solenoid relay is turned OFF, relay contact is "ON" for 0.2 seconds or more.	

G02642393

Fig. 49: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

WIRING DIAGRAM

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

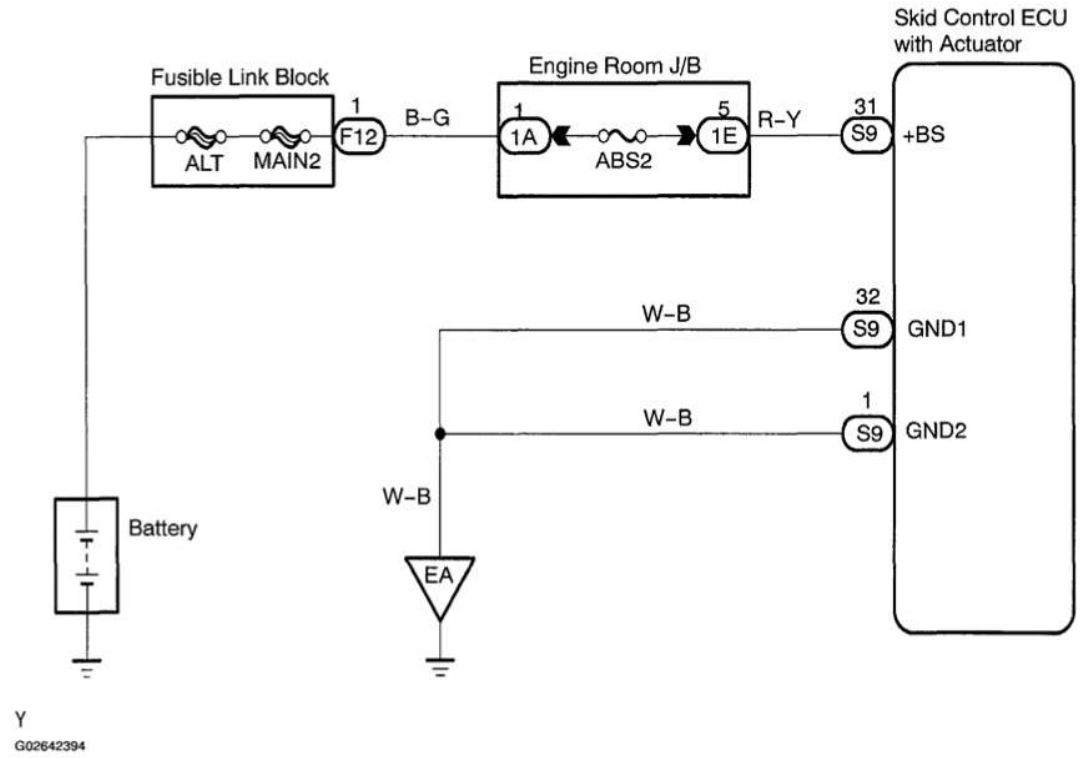


Fig. 50: Wiring Diagram - ABS Solenoid Valve Relay Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. **Measure voltage between terminals +BS and GND1 of brake actuator connector.**

   PREPARATION:

   Disconnect the brake actuator connector.

   CHECK:

   Measure the voltage between terminals +BS and GND1 of the brake actuator harness side connector.

   OK:

   Voltage: 10 to 14 V

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

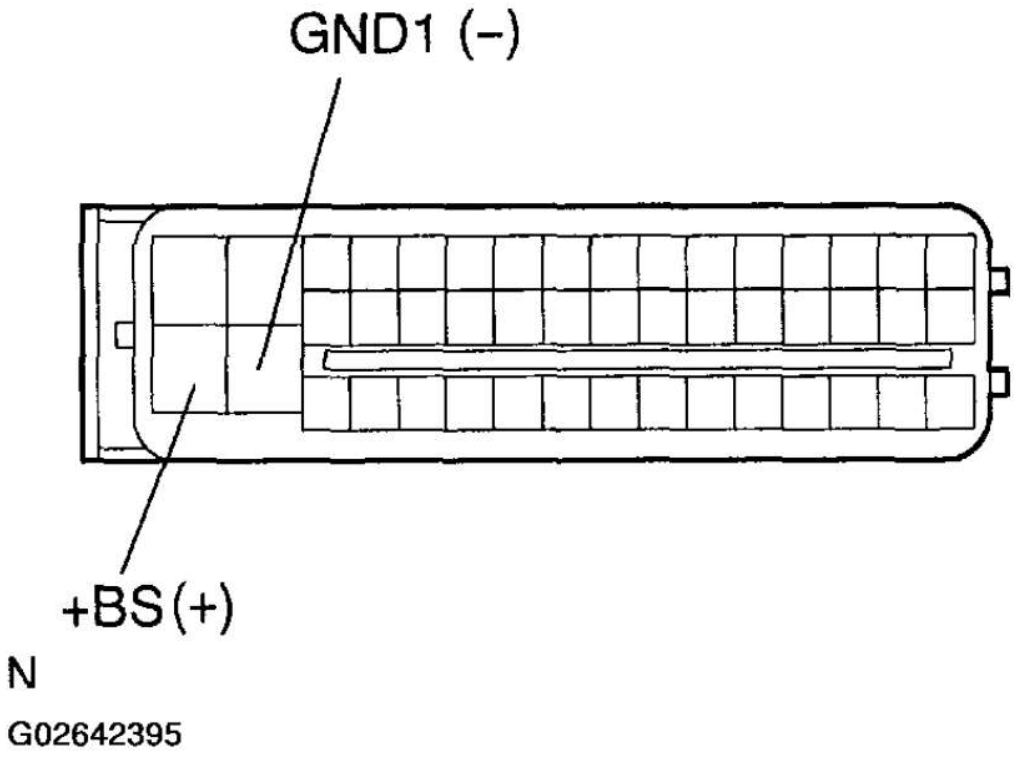


Fig. 51: Identifying Brake Actuator Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Go to step 2.

OK: If same code is still output after DTC is deleted, check contact condition of each connection. If connections are normal, ECU may be defective.

2. **Check ABS2 fuse.**

PREPARATION:

Remove the ABS2 fuse from the engine room J/B.

CHECK:

Measure the resistance.

OK:

Resistance: Below 1 ohm

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

NG: Replace ABS2 fuse.

OK: Go To Next Step.

3. **Measure resistance between terminal GND1 of skid control ECU connector and body ground.**

PREPARATION:

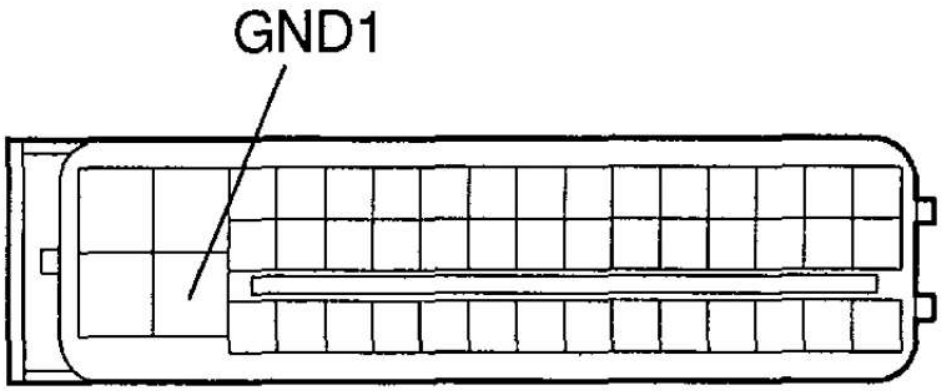
Disconnect the brake actuator connector.

CHECK:

Measure the resistance between terminal GND1 of the skid control ECU harness side connector and body ground.

OK:

Resistance: Below 1 ohm



N

G02642396

Fig. 52: Identifying Skid Control ECU Connector Terminal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Replace brake actuator assembly.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

NG: Repair or replace harness and connector.

DTC C1201/51: MALFUNCTION IN ECM

CIRCUIT DESCRIPTION

If trouble occurs in the engine control system, the ECU prohibits TRAC and VSC control.

DTC No.	DTC Detection Condition	Trouble Area
C1201/51	At engine speed of 500 rpm or more, trouble signal in engine control system continues for 5 seconds or more.	• Engine control system • Wire harness

G02642397

Fig. 53: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. **Check DTC for engine (See PRE-CHECK).**

DTC OUTPUT

A	Output NG code
B	Output normal code

B: Replace ECM.

A: Repair engine control system according to code output.

DTC C1203/53: MALFUNCTION IN ECM COMMUNICATION CIRCUIT

CIRCUIT DESCRIPTION

The circuit is used to send TRAC & VSC control information from the skid control ECU to the ECM (TRC+, TRC-), and engine control information from the ECM to the skid control ECU (ENG+, ENG-).

cardiagn.com

2005 Toyota RAV4

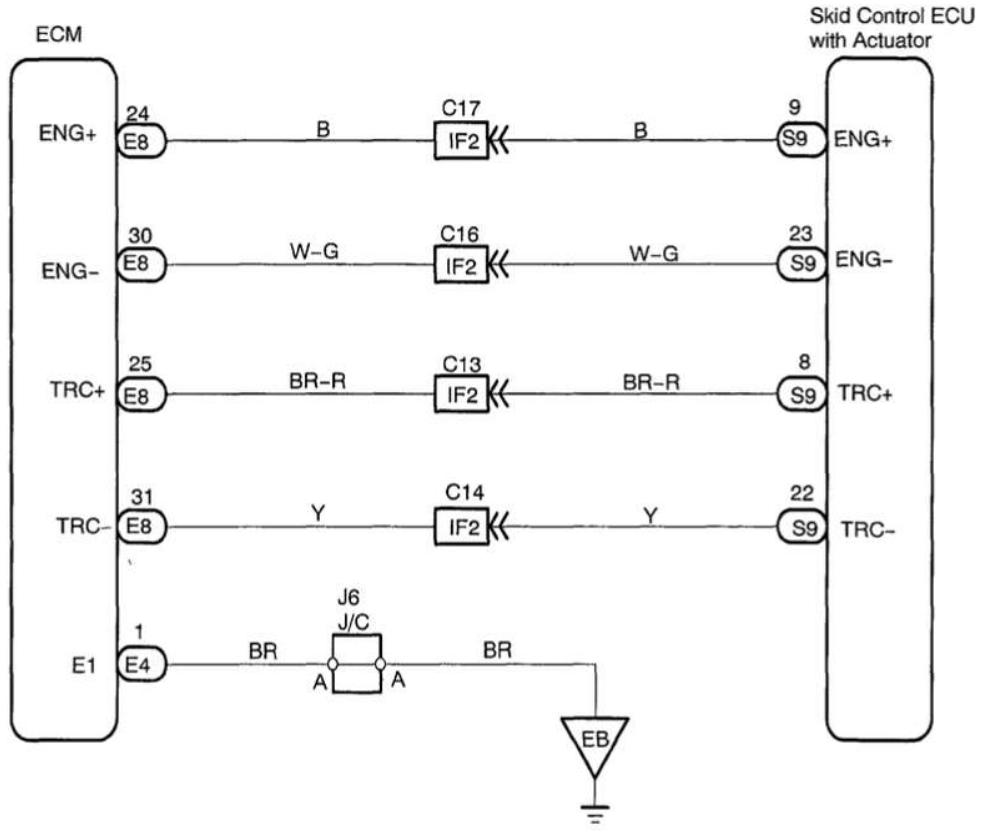
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

DTC No.	DTC Detection Condition	Trouble Area
C1203/53	• When IG1 terminal voltage is 9.5 V or more, condition that data is not transmitted to ECM continues for more than 5 seconds. • When ECU IG1 terminal voltage is 9.5 V or more and engine speed is 500 rpm or more, data reception from ECM is impossible for 5 seconds or more. • The condition that data transmission and reception to/from ECM is impossible once or more within 5 seconds repeatedly occurs to times. • When data about engine, drive system, and user country from ECM are not match up to skid control ECU.	• TRC+ or TRC− circuit • ENG+ or ENG− circuit • Brake actuator assembly • ECM

G02642398

Fig. 54: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

WIRING DIAGRAM



G02642399

Fig. 55: Wiring Diagram - ECM Communication Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

1. **Check for open and short circuit in harness and connector between skid control ECU and ECM (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**

   NG: Repair or replace harness and connector.

   OK: Go To Next Step.

2. **Check for open and short circuit in harness and connector between terminal E1 of ECM and body ground (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**

   PREPARATION:

   a. Remove the glove compartment (see **COMPONENTS**).
   b. Disconnect the ECM from the heater control assembly.
   c. Turn the ignition switch ON.

   CHECK:

   Measure the resistance between terminal E1 of the ECM connector and body ground.

   OK:

   Resistance: Below 1 ohm

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

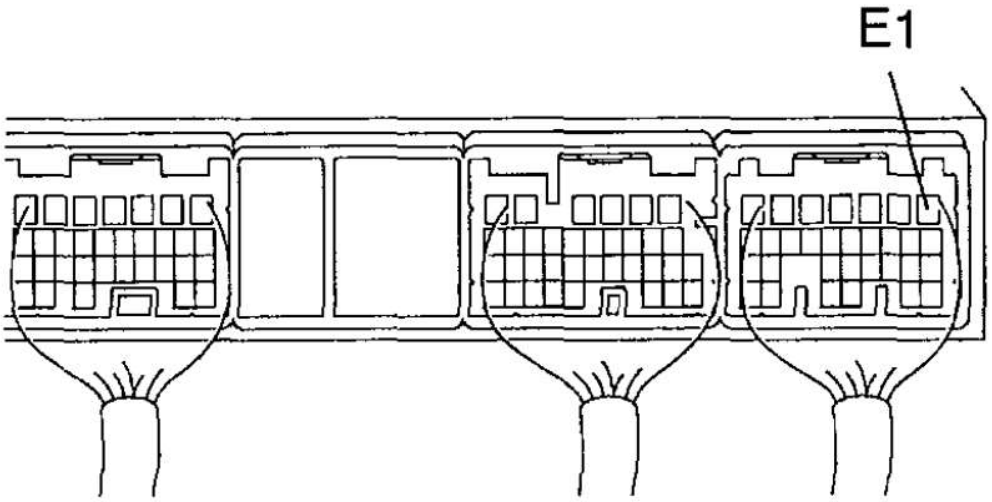


Fig. 56: Checking For Open And Short Circuit In Harness And Connector Between Terminal E1 Of ECM And Body Ground
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Repair or replace harness and connector.

OK: Replace brake actuator assembly.

NOTE: **When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).**

DTC C1210/36, C1336/39: ZERO POINT CALIBRATION OF YAW RATE SENSOR UNDONE/DECELERATION SENSOR UNDONE

CIRCUIT DESCRIPTION

The deceleration sensor is included in the yaw rate sensor.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

DTC No.	DTC Detection Condition	Trouble Area
C1210/36	When any of following 1. through 2. is detected: 1. After replacing skid control ECU or erasing DTC, when shift lever is moved other than to P position within 15 seconds soon after ECU terminal IG1 become ON for the first time. 2. When yaw rate sensor zero point recorded in ECU is deleted.	• Yaw rate sensor • Yaw rate sensor circuit • PNP switch circuit (P position)
C1336/39	At the initial time after replacing computer, or after erasing the deceleration sensor memory by operating terminals TS and CG of DLC3, ignition is turned ON and the vehicle is driven in any mode except for test mode.	• Yaw rate sensor (Deceleration sensor) • Yaw rate sensor (Deceleration sensor) circuit • Zero point calibration not done

G02642401

Fig. 57: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

WIRING DIAGRAM

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

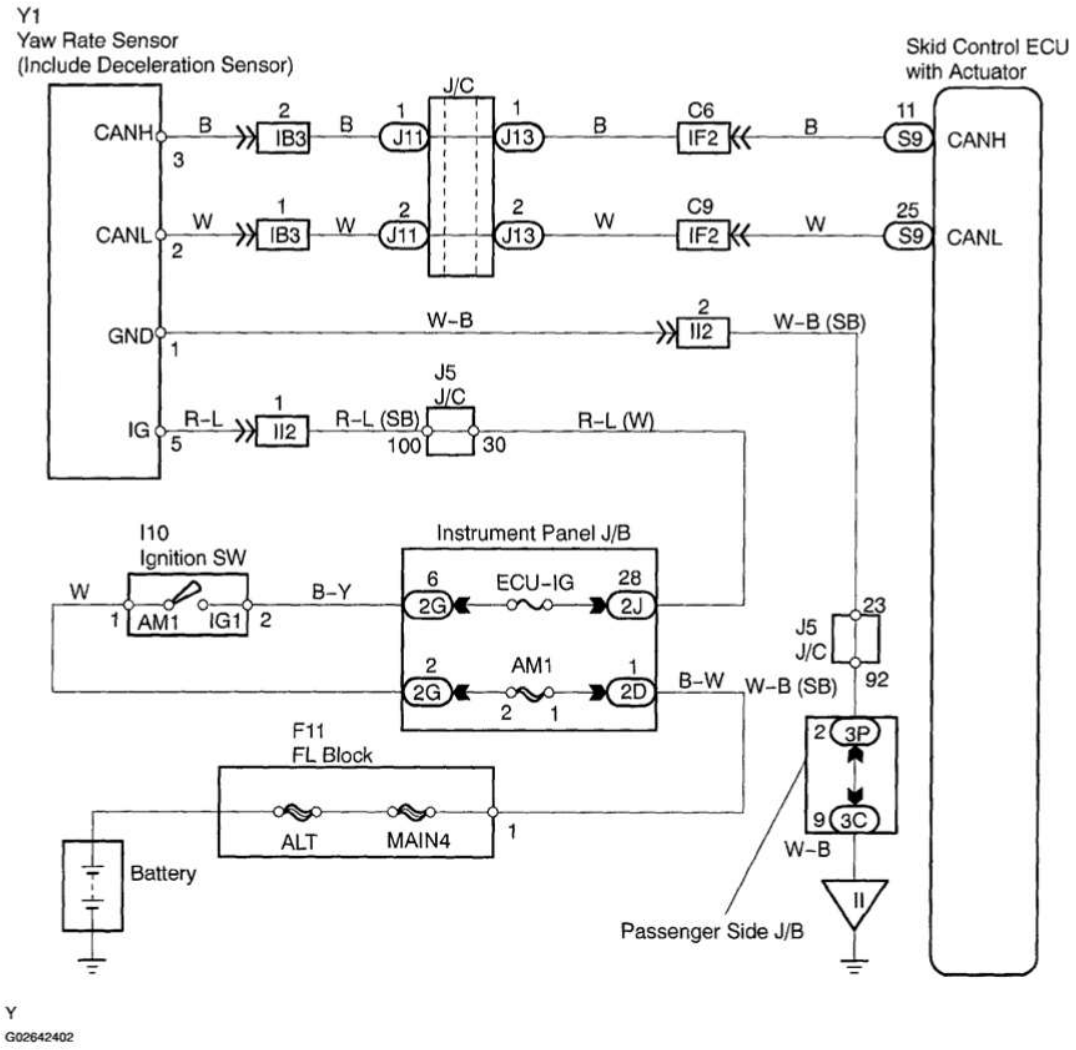


Fig. 58: Wiring Diagram - Yaw Rate Sensor Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

HINT:

When U0073/94, U0123/62, U0124/95 or U0126/63 is output accompanied with C1210/36 or C1336/39, inspect and repair the trouble areas indicated by U0073/94, U0123/62, U0124/95 or U0126/63 first.

1. **Check installation condition of yaw rate sensor.**
   NG: Repair or replace yaw rate sensor.
   OK: Go To Next Step.
2. **Perform zero point calibration of yaw rate sensor and deceleration sensor (See PRE-CHECK).**

cardiagn.com

3. **Check DTC once more.**

PREPARATION:

a. Clear the DTC (see **PRE-CHECK**).
b. Turn the ignition switch OFF.

CHECK:

a. Turn the ignition switch ON.
b. Is the same DTC output again?
NO: END
YES: Replace yaw rate sensor.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

DTC C1223/43: ABS CONTROL SYSTEM MALFUNCTION

CIRCUIT DESCRIPTION

DTC DETECTION CONDITION AND TROUBLE AREA

DTC No.	DTC Detection Condition	Trouble Area
C1223/43	ABS control system is abnormal.	ABS control system

INSPECTION PROCEDURE

1. **Check DTC for the ABS (See PRE-CHECK).**

DTC OUTPUT

A	Output NG code
B	ABS warning light remains ON

B Check ABS warning light circuit.
A Repair ABS control system according to code output.

DTC C1224/44: NEO SIGNAL CIRCUIT

CIRCUIT DESCRIPTION

The skid control ECU receives engine revolution speed signals (NEO signals) from the ECM.

cardiagn.com

2005 Toyota RAV4

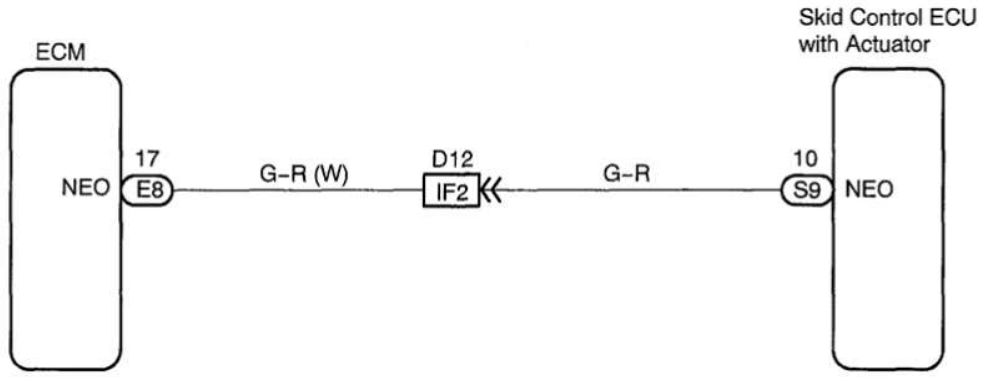
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

DTC No.	DTC Detection Condition	Trouble Area
C1224/44	Detection of either condition 1. or 2.: 1. When vehicle speed is 30 km/h (19 mph) or more and data reception from ECM is in normal condition, open or short circuit of engine revolution signal continues for 10 seconds or more. 2. When TRAC is in operation, open or short circuit of engine revolution signal continues for 0.24 seconds or more.	•NEO circuit •ECM

G02642403

Fig. 59: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

WIRING DIAGRAM



Y
G02642404

Fig. 60: Wiring Diagram - NEO Signal Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. **Check for open and short circuit in harness and connector between terminal NEO of skid control ECU and terminal NEO of ECM (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**

   NG: Repair or replace harness and connector.

   OK: Go To Next Step

2. **Measure voltage between terminal NEO of ECM and body ground.**

   CHECK:

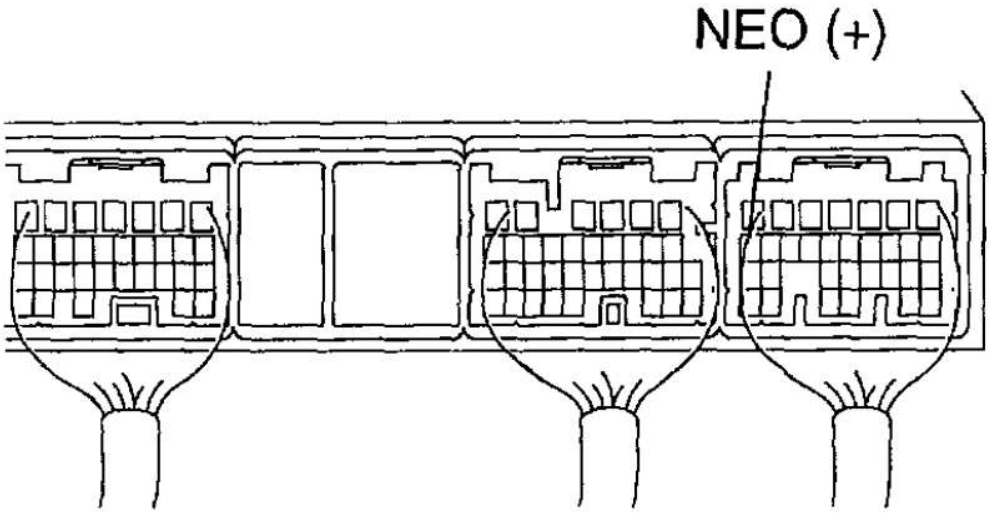
   Measure the voltage between terminal NEO of the ECM and body ground for the engine conditions below.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

OK:



Y

G02642405

Fig. 61: Measuring Voltage Between Terminal NEO Of ECM And Body Ground (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Engine Condition	Voltage
OFF (ignition switch ON)	10 to 14 V or below 1 V
ON (Idling)	10 to 14 V ↔ Below 1 V (Pulse)

G02642406

Fig. 62: Measuring Voltage Between Terminal NEO Of ECM And Body Ground (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

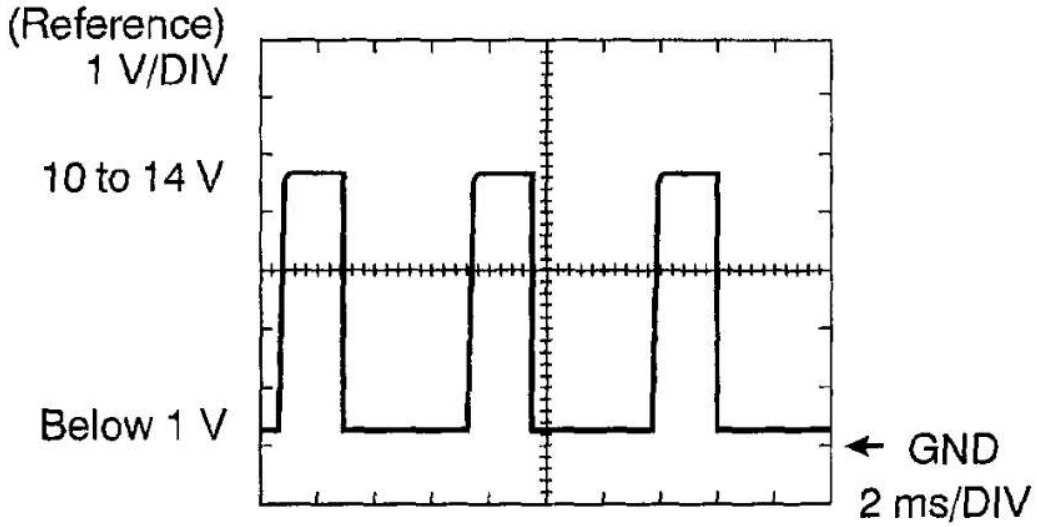


Fig. 63: NEO Of ECM And Body Ground Waveform
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Replace ECM.

OK: If same code is still output after DTC is deleted, check contact condition of each connection.

DTC C1225/25: VSC SOLENOID CIRCUIT

CIRCUIT DESCRIPTION

This solenoid turns on when signals are received from the ECU and controls the pressure acting on the wheel cylinders to control the braking force.

DTC No.	DTC Detection Condition	Trouble Area
C1225/25	Detection of any of conditions 1. to 4.: 1. When SM1 or SM2 is ON, excessive electric current on SM1 or SM2 continues for 0.05 seconds or more. 2. When SM1 or SM2 is OFF, open circuit of SM1 or SM2 continues for 0.05 seconds or more. 3. When SM1 or SM2 is ON, open circuit of SM1 or SM2 continues for 0.1 seconds or more. 4. When SM1 or SM2 is OFF, electric current application on SM1 or SM2 continues for 0.1 seconds or more.	• Brake actuator assembly • SMF or SMR circuit

G02642408

Fig. 64: DTC Detection Condition And Trouble Area Chart

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

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

WIRING DIAGRAM

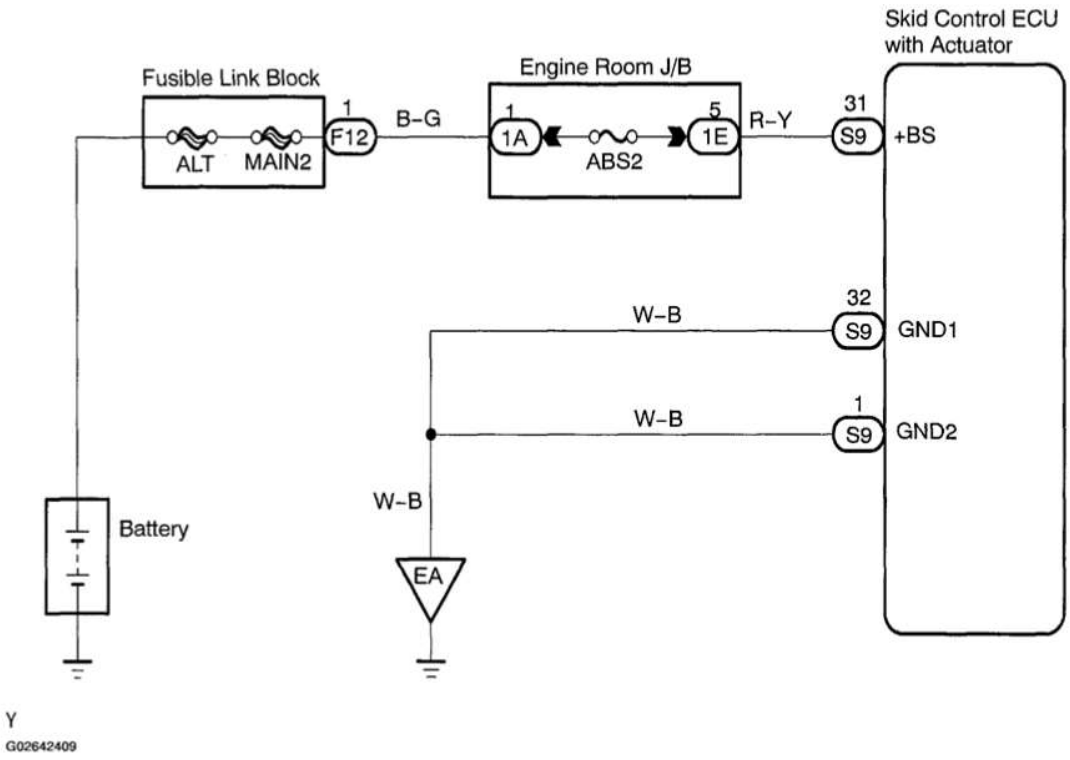


Fig. 65: Wiring Diagram - VSC Solenoid Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. **Check DTC once more (See PRE-CHECK).**

   PREPARATION:

   a. Clear the DTC.
   b. Turn the ignition switch OFF.

   CHECK:

   a. Turn the ignition switch ON.
   b. Is the same DTC output again?
      NO: END
      YES: Replace brake actuator assembly.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

DTC C1231/31: STEERING ANGLE SENSOR CIRCUIT

CIRCUIT DESCRIPTION

The steering angle sensor signal is sent to the skid control ECU through the CAN communication system. When there is malfunction in communication, it will be detected by the diagnosis function of the CAN communication system.

DTC No.	DTC Detection Condition	Trouble Area
C1231/31	When ECU IG1 terminal voltage is 9.5 V or more, ECU does not receive data from steering angle sensor for 1 second or more.	• Steering angle sensor • Steering angle sensor circuit • Power source circuit

G02642410

Fig. 66: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

WIRING DIAGRAM

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

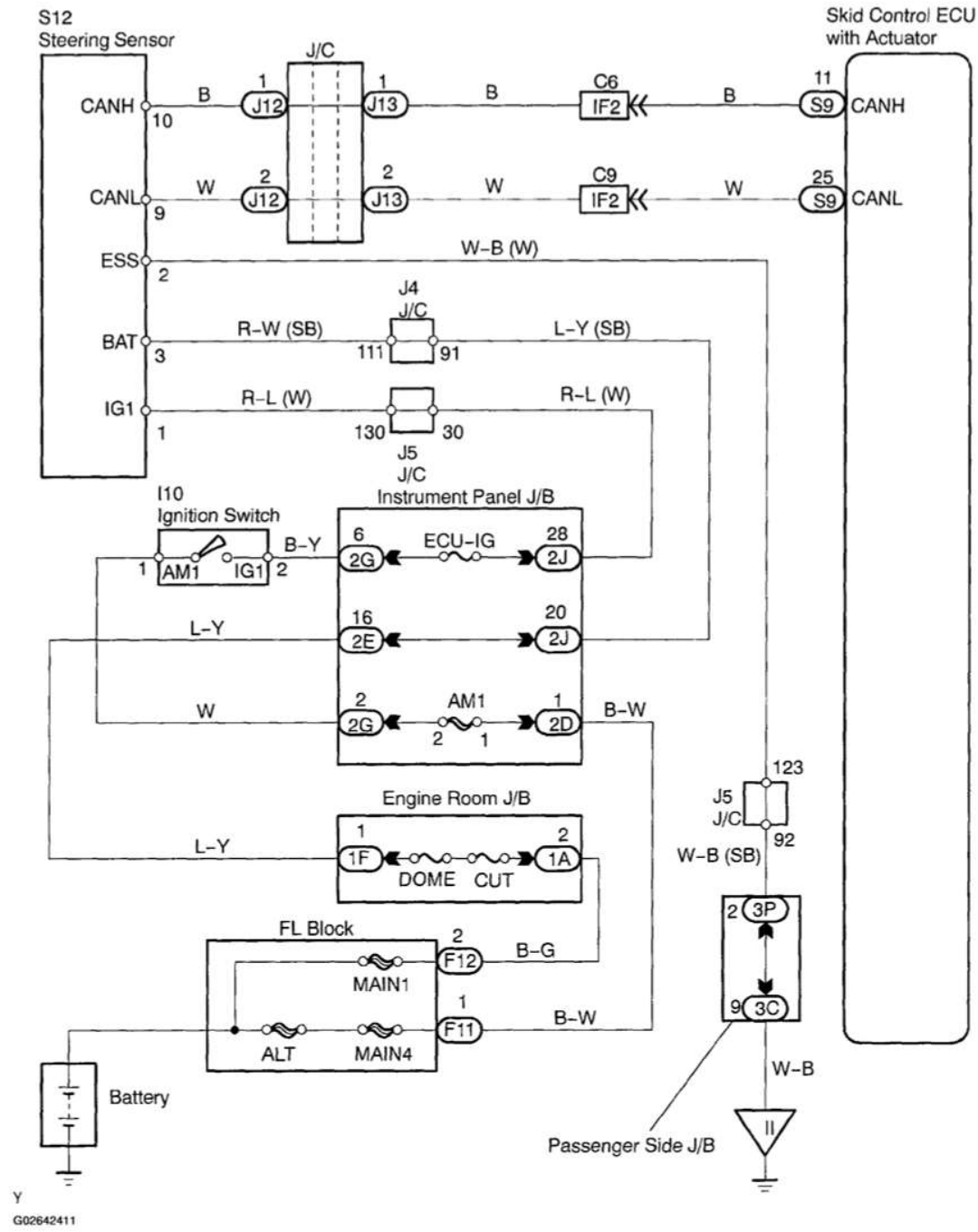


Fig. 67: Wiring Diagram - Steering Angle Sensor Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

HINT:

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

- When U0073/94, U0123/62, U0124/95 or U0126/63 is output accompanied with C1231/31, inspect and repair the trouble areas indicated by U0073/94, U0123/62, U0124/95 or U0126/63 first.
- When the speed sensor or the yaw rate sensor has trouble, DTCs for the steering angle sensor may be output even when the steering angle sensor is normal. When DTCs for the speed sensor or yaw rate sensor are output accompanied with other DTCs for the steering angle sensor, inspect and repair the speed sensor and yaw rate sensor first, and then inspect and repair the steering angle sensor.

1. **Measure input voltage of steering angle sensor.**

   PREPARATION:

   a. Remove the steering wheel and column lower cover (see **REMOVAL**).
   b. Disconnect the steering angle sensor connector.

   CHECK:

   a. Turn the ignition switch ON.
   b. Measure the voltage between terminals 1 and 2, 2 and 3 of the steering angle sensor harness side connector.

   OK:

   Voltage: 10 to 14 V

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

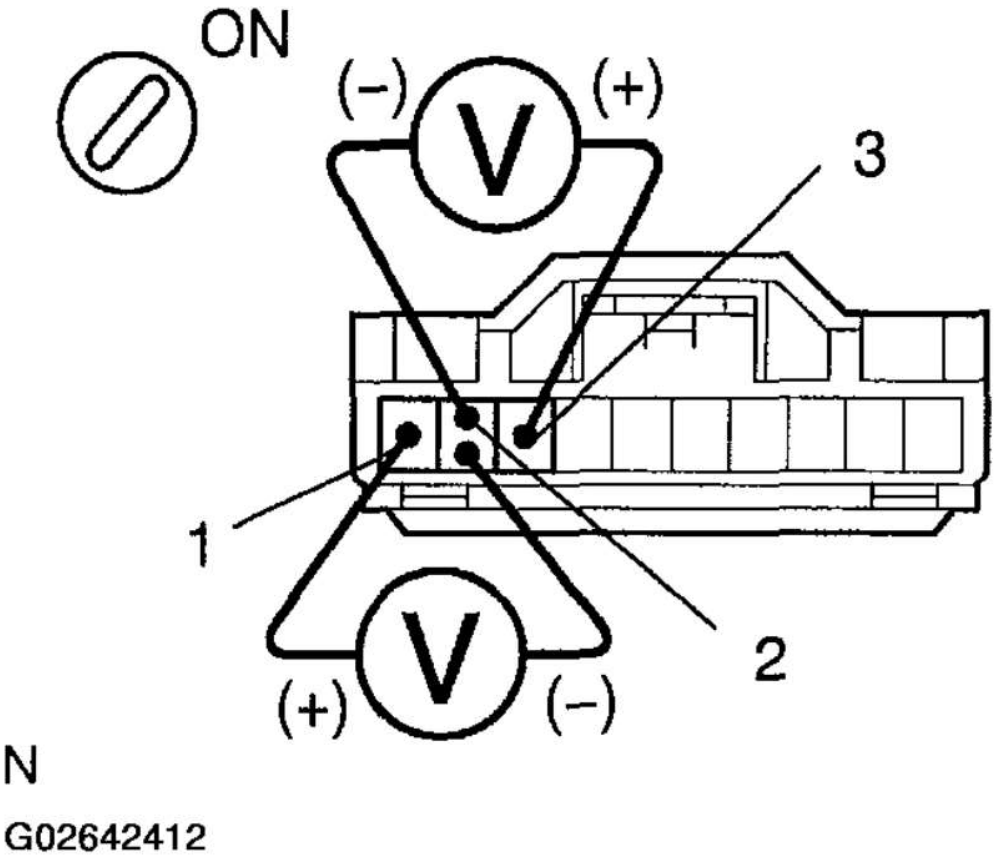


Fig. 68: Measuring Input Voltage Of Steering Angle Sensor
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Repair or replace harness and connector.

OK: Replace steering angle sensor.

DTC C1232/32, C1234/34, C1243/43, C1244/44, C1245/45, C1381/97: MALFUNCTION IN DECELERATION SENSOR, MALFUNCTION IN YAW RATE SENSOR & MALFUNCTION IN POWER SUPPLY VOLTAGE YAW/DECELERATION SENSOR

CIRCUIT DESCRIPTION

The deceleration sensor is included in the yaw rate sensor.

The deceleration sensor and yaw rate sensor signal is sent to the skid control ECU through the CAN communication system.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

When there is malfunction in communication, it will be detected by the diagnosis function of the CAN communication system.

DTC No.	DTC Detection Condition	Trouble Area
C1232/32	When lateral deceleration output turns 4.8 V or more or 0.2 V or less per 0.5 seconds.	• Deceleration sensor • Deceleration sensor circuit
C1234/34	Yaw rate sensor malfunction signal is received.	• Yaw rate sensor • Yaw rate sensor circuit
C1243/43	While vehicle speed becomes 0 km/h (0 mph) from 30 km/h (18 mph) or more, condition that both GL1 and GL2 signals of ECU terminals do not change 2 LSB or more continues in sequence 16 times.	• Yaw rate sensor • Wire harness for yaw rate sensor
C1244/44	• With vehicle speed at 0 km/h (0 mph), after deference of output absolute value of G conversion value between deceleration sensor terminals GL1 and GL2 becomes 0.6 G or more, and condition that does not become 0.4 G continues for 60 seconds or more. • Deceleration sensor malfunction signal is received.	• Yaw rate sensor (Deceleration sensor) • Yaw rate sensor (Deceleration sensor) circuit
C1245/45	At vehicle speed of 30 km/h (18 mph) or more, acceleration and deceleration values calculated from deceleration sensor values and from vehicle speed are different, and the condition that difference exceeds 0.35 G continues for 60 seconds or more.	• Yaw rate sensor (Deceleration sensor) • Wire harness for deceleration sensor system
C1381/97	With vehicle speed at 3 km/h or more, malfunction signal of deceleration sensor terminal IG1 is received for 10 seconds or more.	• Battery • Charging system • Yaw rate sensor power source circuit

G02642413

Fig. 69: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

WIRING DIAGRAM

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

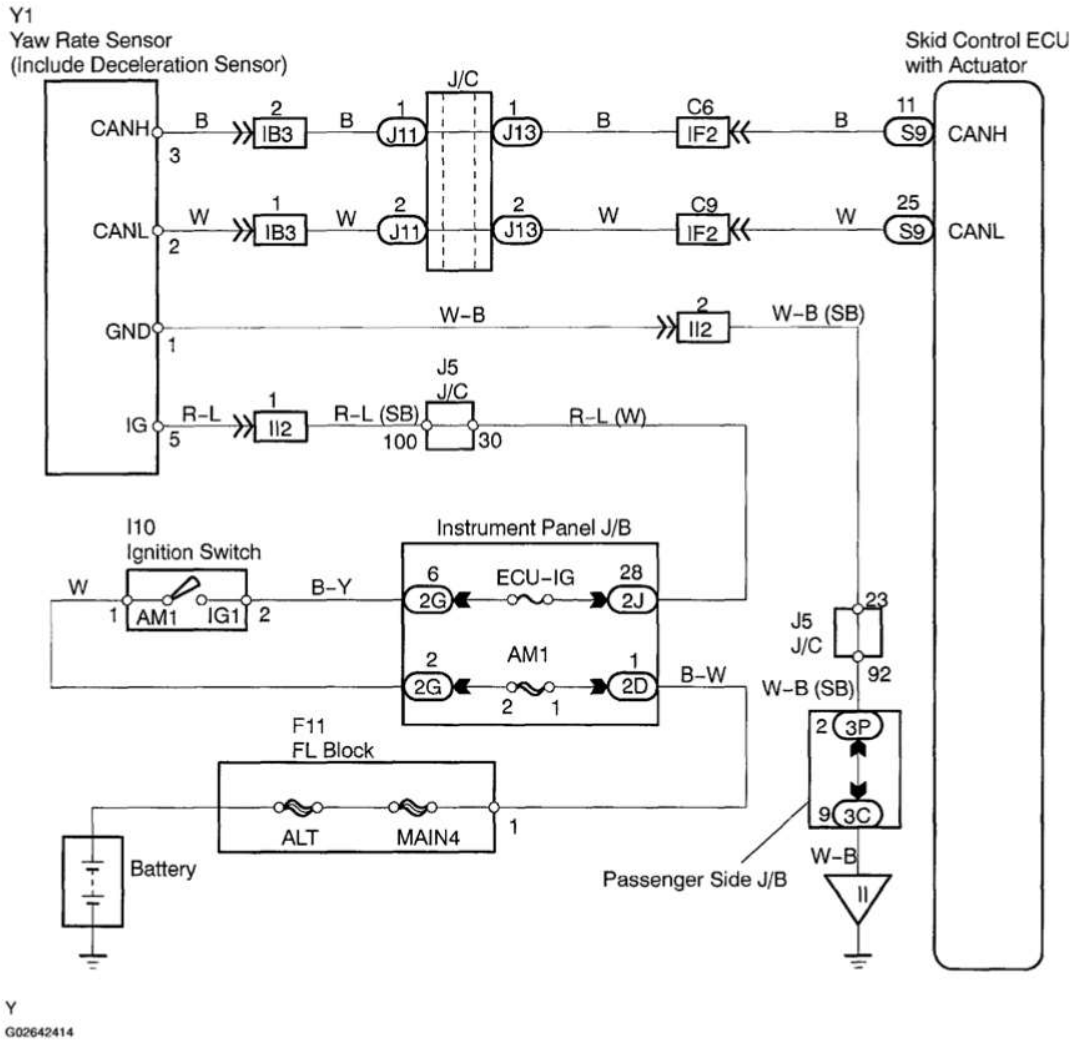


Fig. 70: Wiring Diagram - Yaw Rate Sensor (Include Deceleration Sensor)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

HINT:

When U0073/94, U0123/62, U0124/95 or U0126/63 is output accompanied with C1232/32, C1234/34, C1244/44, C1245/45, or C1381/97, inspect and repair the trouble areas indicated by U0073/94, U0123/62, U0124/95 or U0126/63 first.

1. **Measure voltage of IG power source.**

   PREPARATION:

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Disconnect the yaw rate sensor connector.

CHECK:

a. Turn the ignition switch ON.
b. Measure the voltage between terminal IG and GND of the yaw rate sensor connector.

OK:

Voltage: 10 to 14 V

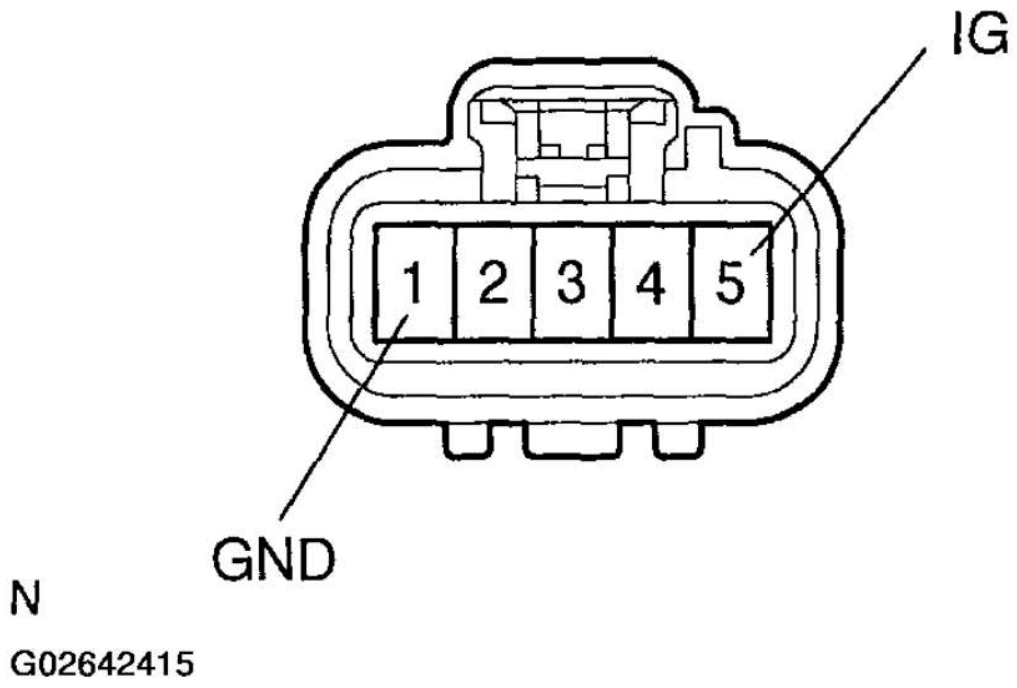


Fig. 71: Identifying Yaw Rate Sensor Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Replace yaw rate sensor.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

NG: Go To Next Step

2. **Check for open or short circuit in harness and connector between yaw rate sensor and battery (See**

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).

NG: Repair or replace harness and connector.

OK: Go To Next Step

3. **Check resistance between terminal GND of yaw rate sensor connector and body ground.**

PREPARATION:

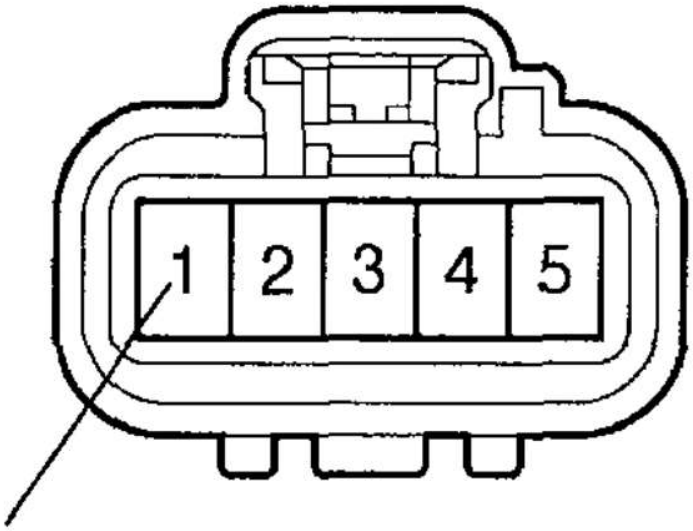
Disconnect the yaw rate sensor connector.

CHECK:

Measure the resistance between terminal GND of the yaw rate sensor harness side connector and body ground.

OK:

Resistance: Below 1 ohm



N

G02642416

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Fig. 72: Identifying Yaw Rate Sensor Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Repair or replace harness and connector.

OK: Replace yaw rate sensor.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

DTC C1241/41: IG POWER SOURCE CIRCUIT

CIRCUIT DESCRIPTION

DTC No.	DTC Detection Condition	Trouble Area
C1241/41	• With vehicle speed at 3 km/h or more, IG1 voltage is 9.5 V or less for 10 seconds or more.	• Battery • Charging system • *Power source circuit*

G02642417

Fig. 73: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

WIRING DIAGRAM

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

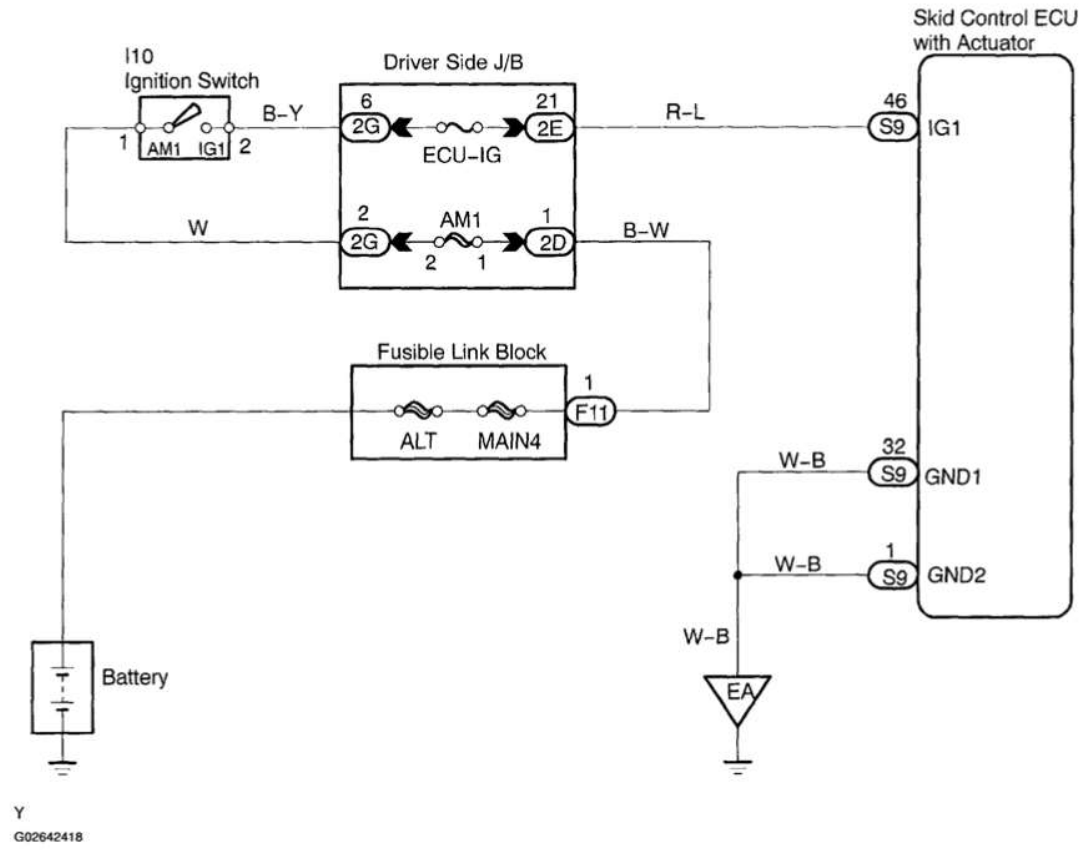


Fig. 74: Wiring Diagram - IG Power Source Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. **Check ECU-IG fuse.**

   PREPARATION:

   Remove the ECU-IG fuse from the driver side J/B.

   CHECK:

   Measure the resistance.

   OK:

   Resistance: Below 1 ohm

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

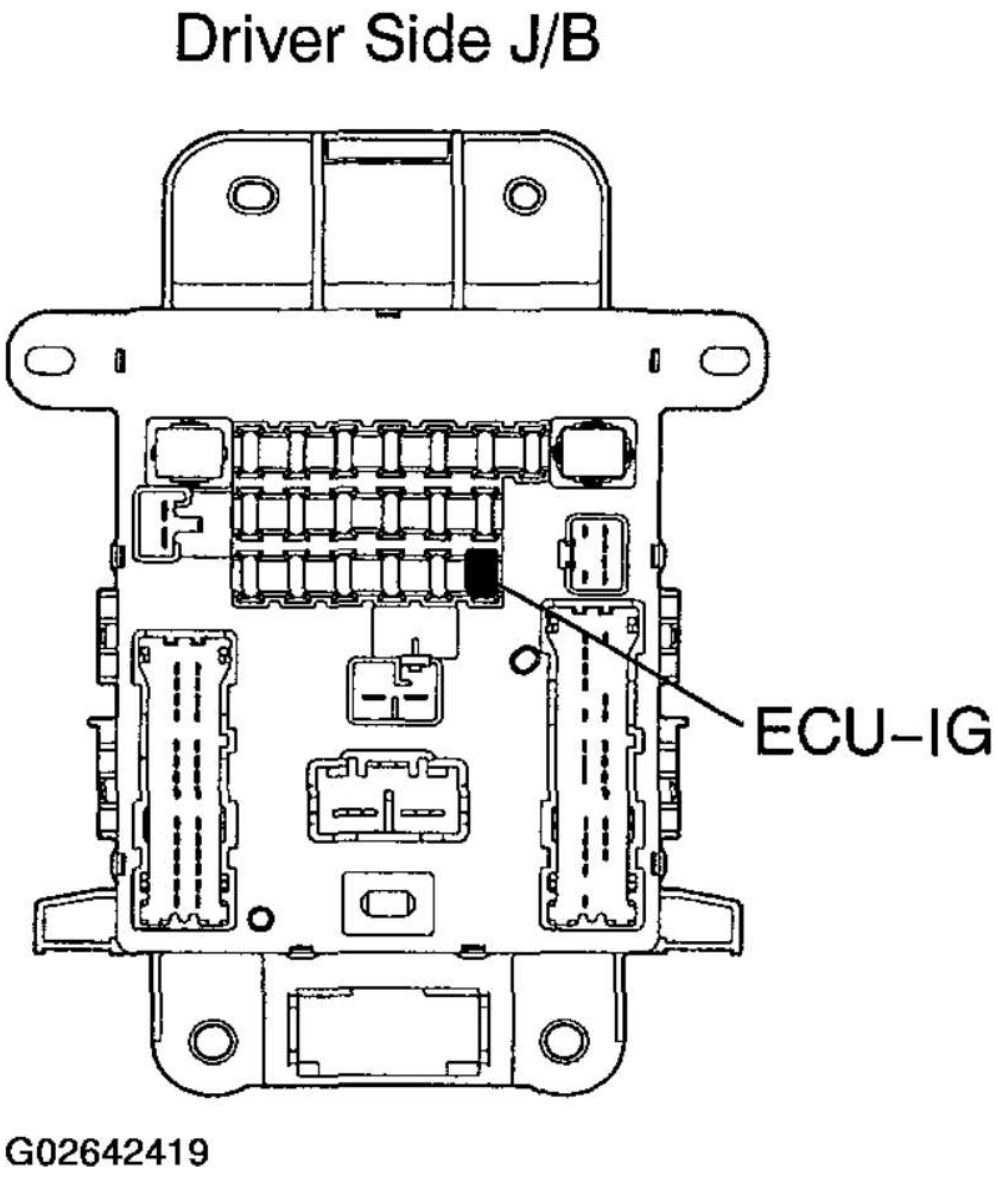


Fig. 75: Identifying Location Of ECU-IG Fuse
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Replace fuse.

OK: Go To Next Step

2. **Measure battery positive voltage.**

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

CHECK:

Check the battery positive voltage.

OK:

Voltage: 10 to 14 V

NG: Check and repair charging system.
OK: Go To Next Step

3. **Measure voltage of ECU IG power source.**

When using the hand-held tester:

PREPARATION:

a. Connect the hand-held tester to the DLC3.
b. Turn the ignition switch ON and press the hand-held tester main switch ON.
c. Select the DATA LIST mode on the hand-held tester.

CHECK:

Measure the voltage condition output from the ECU displayed on the hand-held tester.

OK:

"Normal" is displayed.

When not using the hand-held tester:

PREPARATION:

Disconnect the brake actuator connector.

CHECK:

a. Turn the ignition switch ON.
b. Measure the voltage between terminal IG1 and GND1 of brake actuator harness side connector.

OK:

Voltage: 10 to 14 V

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

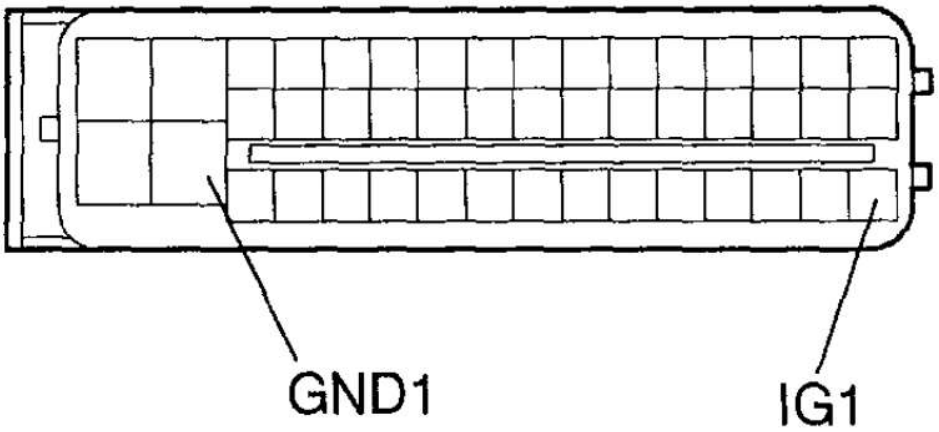


Fig. 76: Identifying Terminals Of Brake Actuator Harness Side Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

NG: Go To Next Step

4. **Measure resistance between terminal GND1 of skid control ECU connector and body ground.**

PREPARATION:

Disconnect the brake actuator connector.

CHECK:

Measure the resistance between terminal GND1 of the skid control ECU harness side connector and the body ground.

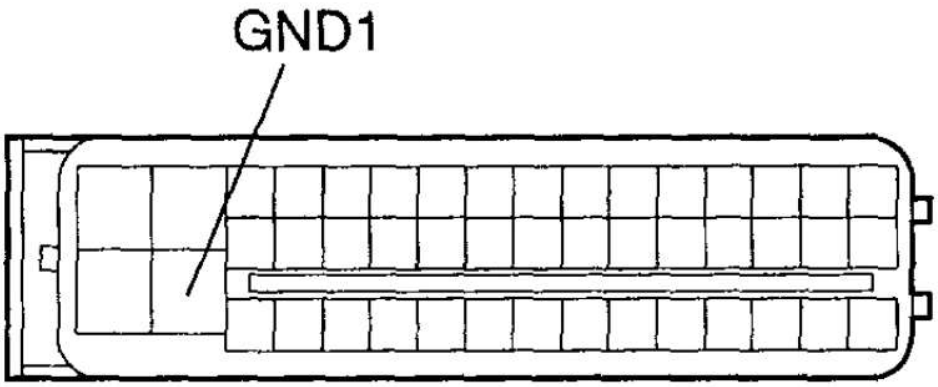
OK:

Resistance: Below 1 ohm

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4



N

G02642421

Fig. 77: Identifying Terminals Of Skid Control ECU Harness Side Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Repair or replace harness and connector.

OK: Check for open circuit in harness and connector between skid control ECU and battery, skid control ECU and body ground (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).

DTC C1246/46: MALFUNCTION IN MASTER CYLINDER PRESSURE SENSOR

CIRCUIT DESCRIPTION

The master cylinder pressure sensor is connected to the skid control ECU in the actuator.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

DTC No.	DTC Detection Condition	Trouble Area
C1246/46	• When vehicle speed is 7 km/h (4 mph) or more and ECU PMC terminal voltage exceeds 0.86 V, condition that voltage does not change 1 V or more continues for 30 seconds. • Noise in ECU PMC terminal occurs 7 times or more within 5 seconds. • When ECU STP terminal is OFF, condition that ECU PMC terminal voltage is 0.86 V or more, or less than 0.3 V continues for 5 seconds or more. • When IG1 terminal voltage is 9.5 to 17.2 V, condition that ECU VCM terminal voltage is out of range from 4.4 to 5.6 V continues for 1.2 seconds or more. • When ECU VCM terminal voltage is 4.4 to 5.6 V, condition that ECU PMC terminal voltage is out of range from 0.19 to 4.57 V continues for 1.2 seconds or more.	• Master cylinder pressure sensor • Master cylinder pressure sensor circuit • Brake actuator assembly

G02642422

Fig. 78: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

HINT:

Start the inspection from step 1 when using the hand-held tester and start from step 2 when not using the hand-held tester.

1. **Check output value of master cylinder pressure sensor.**

   PREPARATION:

   a. Connect the hand-held tester to the DLC3.
   b. Turn the ignition switch ON and push the hand-held tester main switch ON.
   c. Select the DATA LIST mode on the hand-held tester.

   CHECK:

   Check that the brake fluid pressure value of the master cylinder pressure sensor observed in the hand-held tester changes when the brake pedal is depressed.

   OK:

   Brake fluid pressure value should change.

   OK: Replace brake actuator assembly.

   NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

cardiagn.com

NG: Go To Next Step

2. **Check whether or not ECU terminal STP input voltage changes when stop light switch comes on and off.**

   NO: Check stop light switch circuit (See PROBLEM SYMPTOMS TABLE).

   YES: If same code is still output after DTC is deleted, check contact condition of each connection. If connections are normal, ECU may be defective.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

DTC C1249/49: STOP LIGHT SWITCH CIRCUIT

CIRCUIT DESCRIPTION

DTC No.	DTC Detection Condition	Trouble Area
C1249/49	• When IG1 terminal voltage is 9.5 to 17.2 V, open circuit of stop light switch continues for 0.3 seconds or more.	• Stop light bulb • Stop light switch circuit

G02642423

Fig. 79: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

WIRING DIAGRAM

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

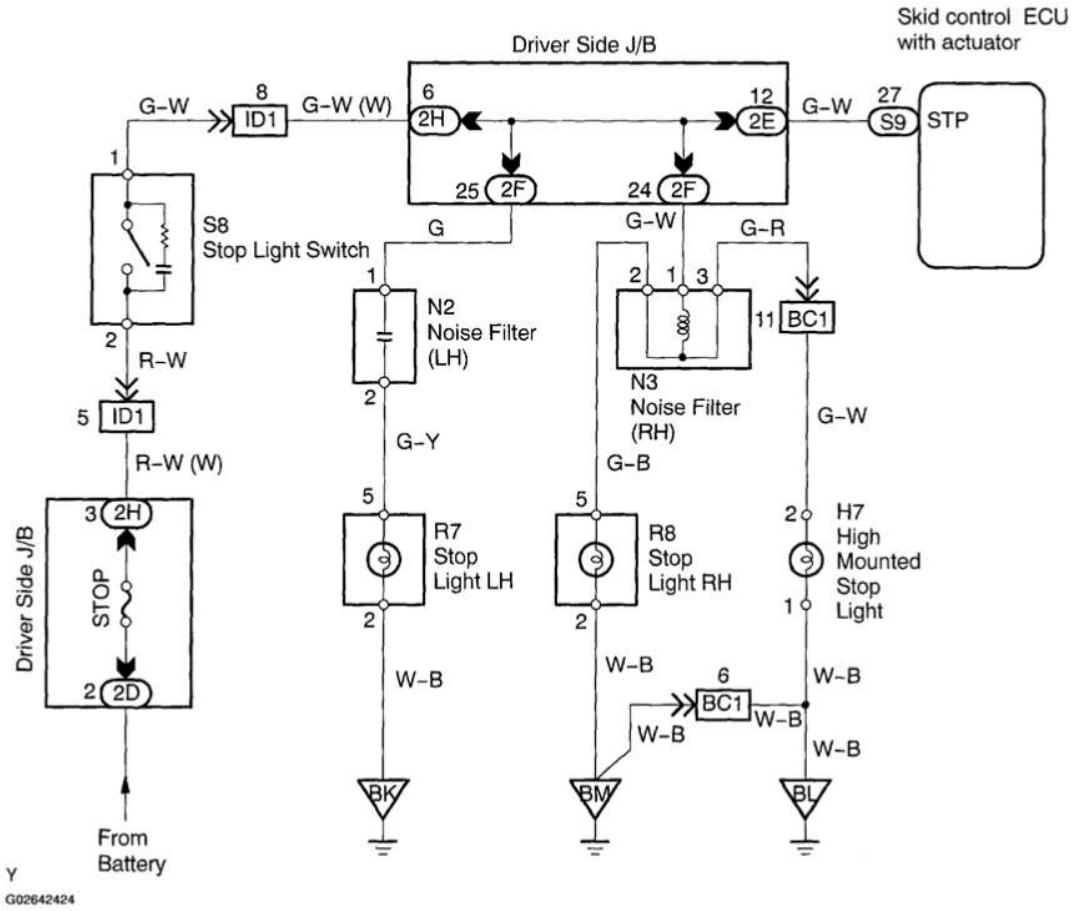


Fig. 80: Wiring Diagram - Stop Light Switch Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. **Check operation of stop light switch.**

   CHECK:

   Check that the stop lights turn on when the brake pedal is depressed and turn off when the brake pedal is released.

   OK: Go to step 4.
   NG: Go To Next Step

2. **Measure voltage between terminal STP of skid control ECU and body ground.**

   PREPARATION:

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Disconnect the brake actuator connector.

CHECK:

Measure the voltage between terminal STP of the skid control ECU and body ground when the brake pedal is depressed.

OK:

Voltage: 8 to 14 V

CHECK:

Measure the voltage between terminal STP of the skid control ECU and body ground when the brake pedal is released.

OK:

Voltage: Below 1 V

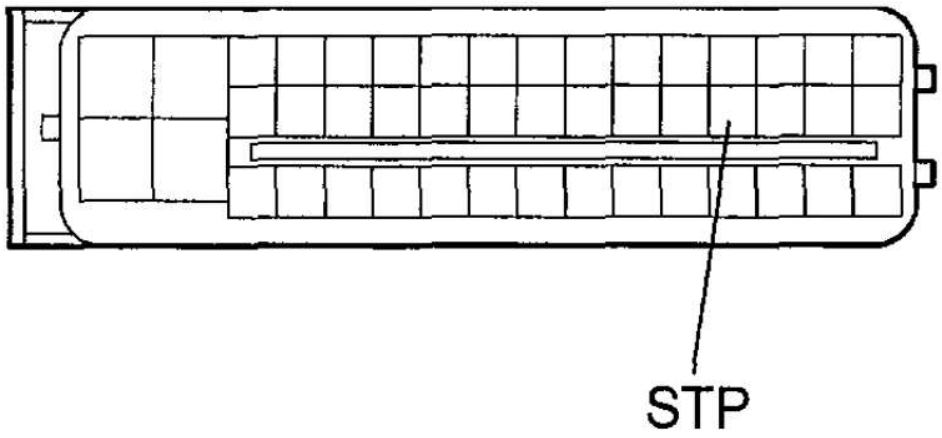


Fig. 81: Identifying Terminals STP Of Skid Control ECU Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Go to step 3

OK: If same code is still output after DTC is deleted, check contact condition of each connection. If connections are normal, ECU may be defective.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

NOTE: **When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).**

3. **Check stop light circuit (See PROBLEM SYMPTOMS TABLE)**
   NG: Repair or replace stop light circuit.
   OK: Go To Next Step
4. **Check for open circuit in harness and connector between skid control ECU and stop light switch (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**
   NG: Repair or replace harness and connector.
   OK: Replace brake actuator assembly.

NOTE: **When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).**

DTC C1251/51: ABS PUMP MOTOR LOCK

CIRCUIT DESCRIPTION

DTC No.	DTC Detection Condition	Trouble Area
C1251/51	When either condition 1. or 2. is defected: 1. ABS pump motor is not operating normally. 2. Open circuit of ABS pump motor continues for 2 sec. or more.	• Brake actuator assembly • Brake actuator circuit

G02642426

Fig. 82: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

WIRING DIAGRAM

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

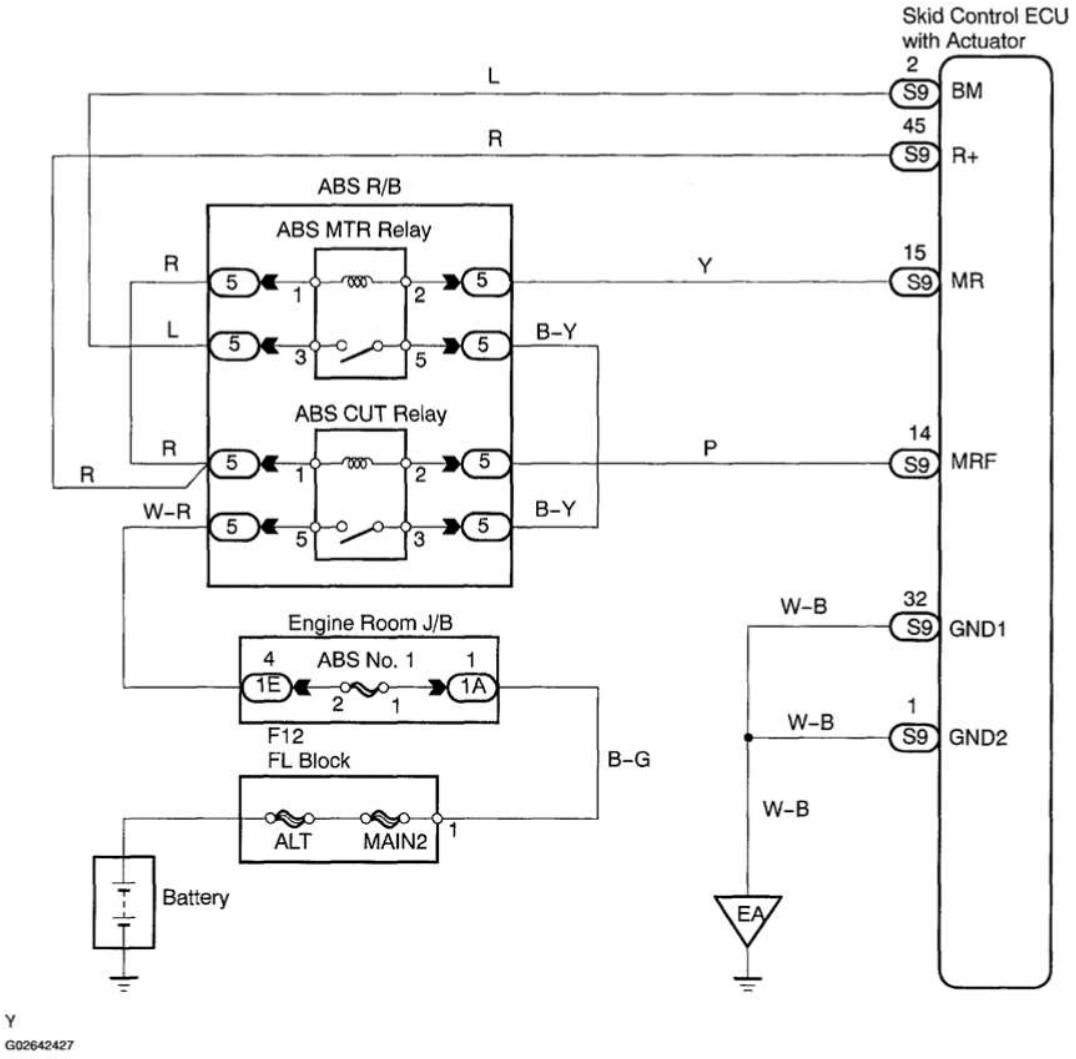


Fig. 83: Wiring Diagram - ABS Pump Motor Lock
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

HINT:

Start the inspection from step 1 when using the hand-held tester and start from 2 when not using the hand-held tester.

1. **Check ABS motor operation.**

   PREPARATION:

   a. Connect the hand-held tester to the DLC3.

cardiagn.com

b. Turn the ignition switch ON and push the hand-held tester main switch ON.
c. Select the item "ABS MTR RELAY" in the ACTIVE TEST and operating it with the hand-held tester.

CHECK:

Check the operation sound of the ABS motor when operating it with the hand-held tester.

OK:

The operation sound of the ABS motor should be heard.

OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

NG: Go To Next Step

2. **Measure resistance between terminal GND2 of skid control ECU connector and body ground.**

PREPARATION:

Disconnect the brake actuator connector.

CHECK:

Measure the resistance between terminal GND2 of the skid control ECU harness side connector and body ground.

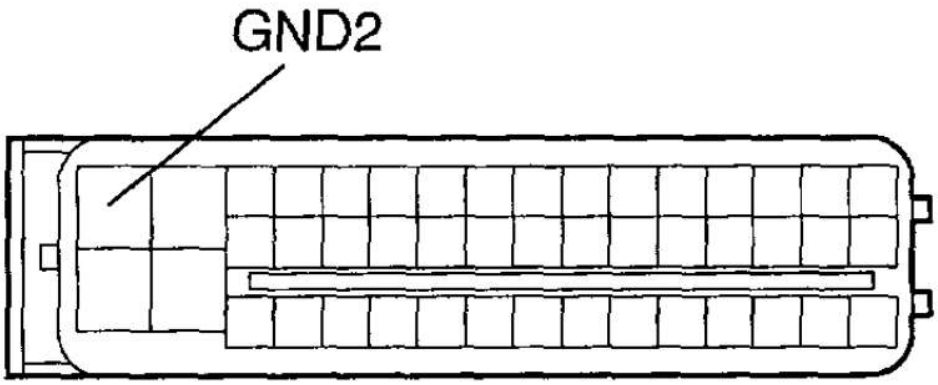
OK:

Resistance: Below 1 ohm

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4



N

G02642428

Fig. 84: Identifying GND2 Terminal Of Skid Control ECU Harness Side Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Repair or replace harness and connector.

OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

DTC C1337/37: TIRES OF DIFFERENT SIZE (ONLY FOR 2WD)

CIRCUIT DESCRIPTION

DTC DETECTION CONDITION AND TROUBLE AREA

DTC No.	DTC Detection Condition	Trouble Area
C1337/37	Driving at more than 20 km/h (12 mph) for more than 20 seconds with 1 or 2 tires of different size 3 times continuously	Tire size

INSPECTION PROCEDURE

1. **Check tire size.**

cardiagn.com

NG: Replace tires so that all 4 tires are same in size.

OK: Go To Next Step

2. **Check sensor rotor (Under DTC C0200/31, C0200/32, C0200/33, C0200/34, C0200/35, C0200/36, C0200/38, C1239/39: SPEED SENSOR CIRCUIT).**

   NG: Replace speed sensor rotor.

   OK: Go To Next Step

3. **Check speed sensor (See DTC C0200/31, C0200/32, C0200/33, C0200/34, C0200/35, C0200/36, C0200/38, C1239/39: SPEED SENSOR CIRCUIT).**

   NG: Replace speed sensor.

   OK: Go To Next Step

4. **Check for open and short circuit in harness and connector between speed sensor and skid control ECU (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**

   NG: Repair or replace harness and connector.

   OK: Check and replace brake actuator assembly.

DIAGNOSTIC TROUBLE CODES ALWAYS ON* MALFUNCTION IN SKID CONTROL ECU

*: ABS warning light

CIRCUIT DESCRIPTION

DTC No.	DTC Detection Condition	Trouble Area
Always ON	Malfunction in ECU internal circuit.	• Battery • Charging system • Power source circuit • ABS warning light circuit • Brake actuator assembly

G02642429

Fig. 85: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

In some cases, the hand-held tester cannot be used when the ECU is abnormal.

WIRING DIAGRAM

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

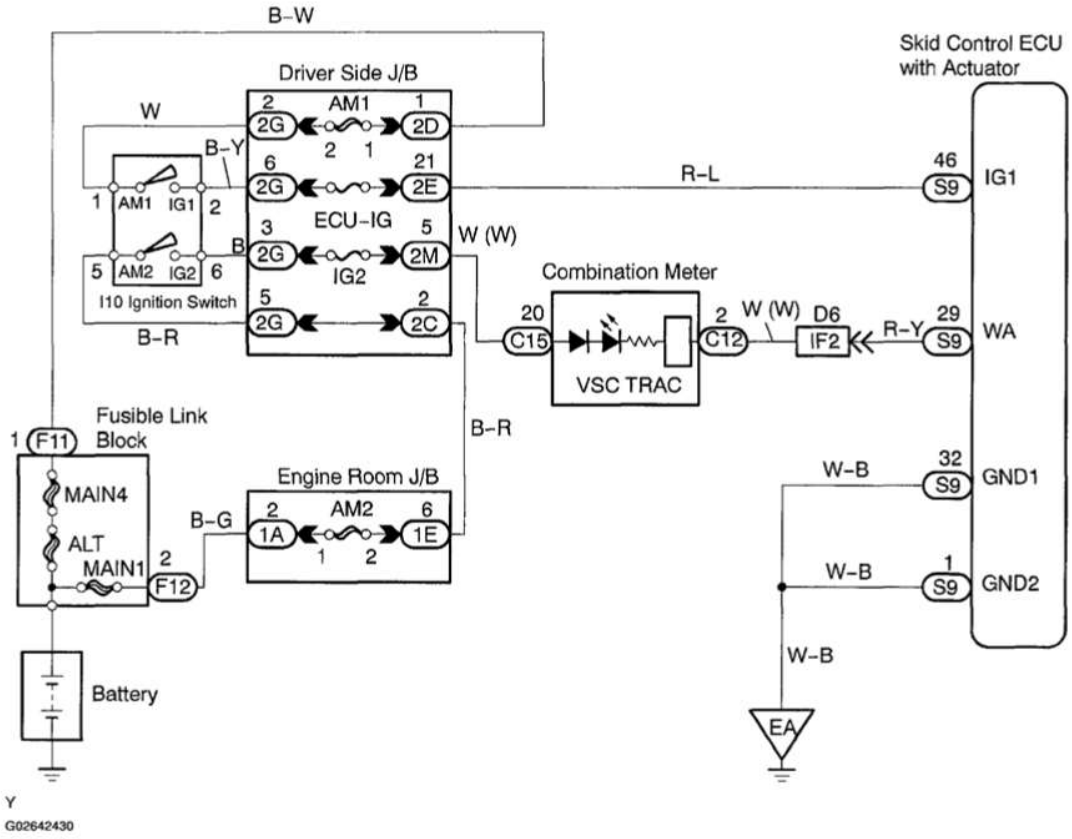


Fig. 86: Wiring Diagram - Skid Control ECU Internal Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. **Is DTC output?**

   Check for DTC (see **PRE-CHECK**).

   YES: Repair circuit indicated by output code.
   NO: Go To Next Step
2. **Check that skid control ECU connector are securely connected to skid control ECU.**
   NG: Connect connector to skid control ECU.
   OK: Go To Next Step
3. **Measure voltage between terminals IG1 and GND1 of brake actuator connector.**

   PREPARATION:

   Disconnect the brake actuator connector.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

CHECK:

a. Turn the ignition switch ON.
b. Measure the voltage between terminal IG1 and GND1 of the skid control ECU harness side connector.

OK:

Voltage: 10 to 14 V

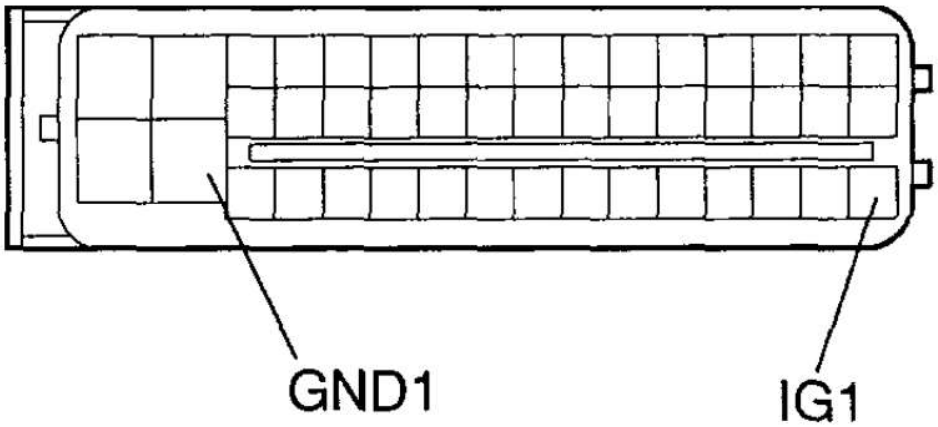


Fig. 87: Identifying IG1 And GND1 Terminals Of Skid Control ECU Harness Side Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Check for open and short circuit in harness and connector between ECU-IG fuse and skid control ECU (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).

OK: Go To Next Step

4. **Measure resistance between terminal GND1 of skid control ECU connector and body ground.**

PREPARATION:

Disconnect the brake actuator connector.

CHECK:

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Measure the resistance between terminal GND1 of the skid control ECU harness side connector and body ground.

OK:

Resistance: Below 1ohm

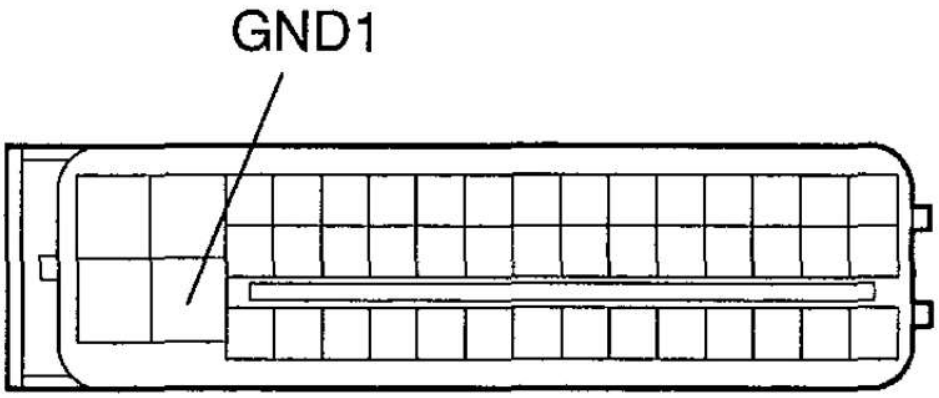


Fig. 88: Identifying GND1 Terminal Of Skid Control ECU Harness Side Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Repair or replace harness and connector.

OK: Go To Next Step

5. **Measure battery positive voltage.**

CHECK:

Check the battery positive voltage.

OK:

Voltage: 10 to 14 V

cardiagn.com

NG: Check and repair charging system (See CHARGING SYSTEM).

OK: Go To Next Step

6. **Check operation of ABS warning light.**

PREPARATION:

a. Turn the ignition switch OFF.
b. Disconnect the connector from the brake actuator.
c. Ground terminal WA of the skid control ECU.
d. Turn the ignition switch ON.

CHECK:

Check that the ABS warning light turns off.

NG: Check and repair for ABS warning light circuit (See CIRCUIT).

OK: Go To Next Step

7. **Check ABS warning light**

PREPARATION:

a. Reconnect the connector to the brake actuator.

CHECK:

Check that the ABS warning light turns off.

NG: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

OK: END

DIAGNOSTIC TROUBLE CODES ALWAYS ON* MALFUNCTION IN SKID CONTROL ECU

*: VSC warning light

CIRCUIT DESCRIPTION

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

DTC No.	DTC Detection Condition	Trouble Area
Always ON	Malfunction in ECU internal circuit.	•Battery •Charging system •Power source circuit •VSC warning light circuit •Brake actuator assembly

G02642433

Fig. 89: DTC Detection Condition And Trouble Area Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

In some cases, the hand-held tester cannot be used when the ECU is abnormal.

WIRING DIAGRAM

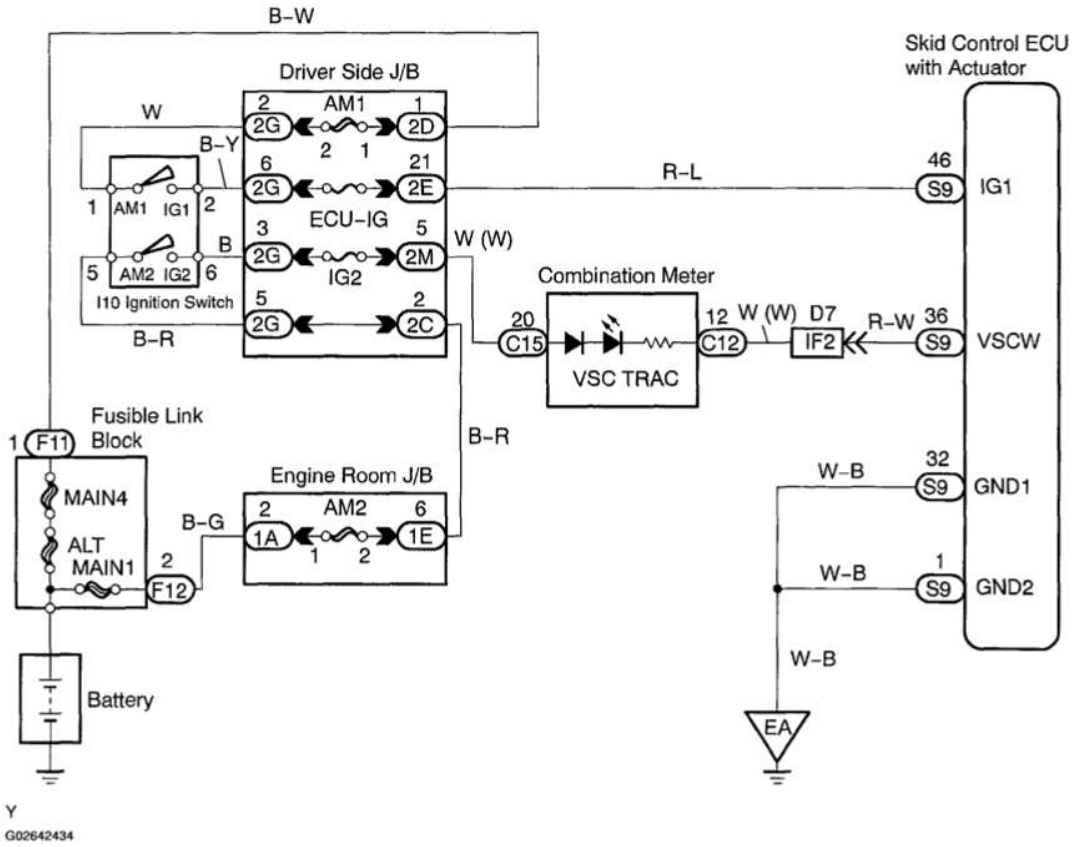


Fig. 90: Skid Control ECU Internal Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

1. **Is DTC output for VSC?**

   Check for DTC (see **PRE-CHECK**).

   YES: Repair circuit indicated by output code.

   NO: Go To Next Step

2. **Check that skid control ECU connector are securely connected to skid control ECU.**

   NG: Connect connector to skid control ECU.

   OK: Go To Next Step

3. **Measure voltage between terminals IG1 and GND1 of brake actuator connector.**

   PREPARATION:

   Disconnect the brake actuator connector.

   CHECK:

   a. Turn the ignition switch ON.
   b. Measure the voltage between terminals IG1 and GND1 of the skid control ECU harness side connector.

   OK:

   Voltage: 10 to 14 V

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

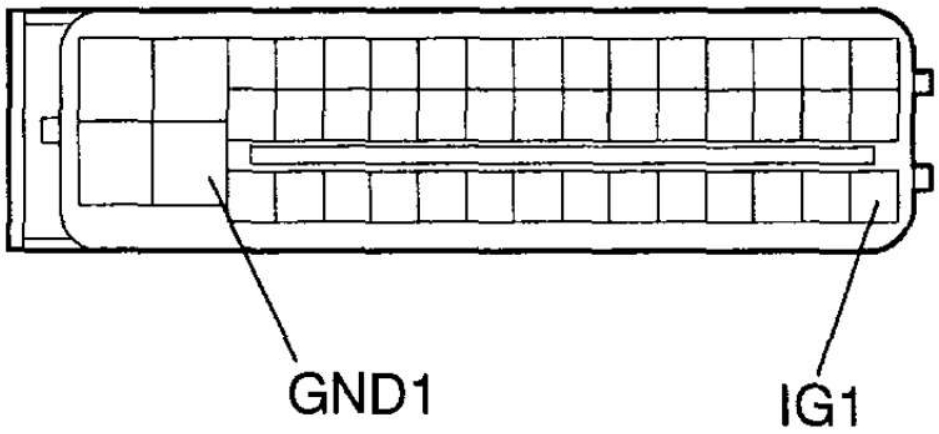


Fig. 91: Identifying IG1 And GND1 Terminals Of Skid Control ECU Harness Side Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Check for open and short circuit in harness and connector between ECU-IG fuse and skid control ECU (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).

OK: Go To Next Step

4. **Measure resistance between terminal GND1 of skid control ECU connector and body ground.**

PREPARATION:

Disconnect the brake actuator connector.

CHECK:

Measure the resistance between terminal GND1 of the skid control ECU harness side connector and body ground.

OK:

Resistance: Below 1 ohm

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

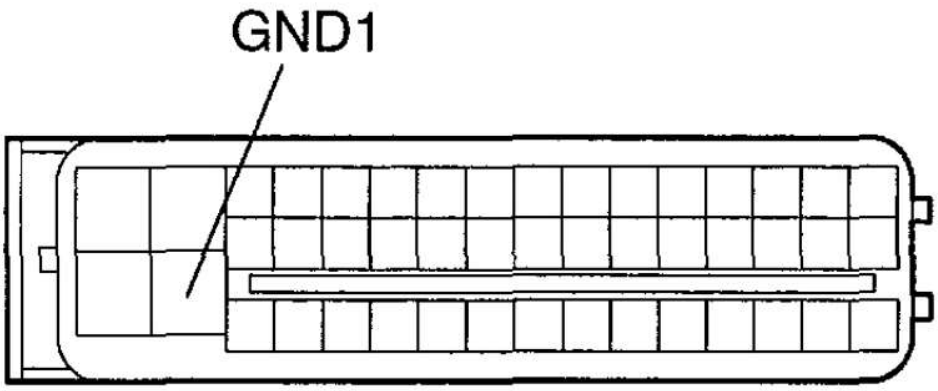


Fig. 92: Identifying GND1 Terminal Of Skid Control ECU Harness Side Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Repair or replace harness and connector.
OK: Go To Next Step

5. **Measure battery positive voltage.**

CHECK:

Check the battery positive voltage.

OK:

Voltage: 10 to 14 V

NG: Check and repair charging system (see CHARGING SYSTEM).
OK: Go To Next Step

6. **Check TC terminal circuit (see CIRCUIT INSPECTION).**
   NG: Repair or replace harness and connector.
   OK: Go To Next Step
7. **Check operation of VSC warning light.**

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

PREPARATION:

a. Turn the ignition switch OFF.
b. Disconnect the connector from the brake actuator.
c. Turn the ignition switch ON.

CHECK:

Check that the VSC warning light turns off.

OK:

The VSC warning light turns off for 2 seconds after turning the ignition switch ON.

OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

NG: Check and repair for VSC warning light circuit (See CIRCUIT).

ABS WARNING LIGHT CIRCUIT (DOES NOT LIGHT UP)

CIRCUIT DESCRIPTION

If the ECU detects trouble, it turns on the ABS warning light and prohibits ABS control. At this time, ECU stores a DTC in memory.

Connect terminals TC and CG of the DLC3 to make the ABS warning light blinks and the DTC is indicated.

WIRING DIAGRAM

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

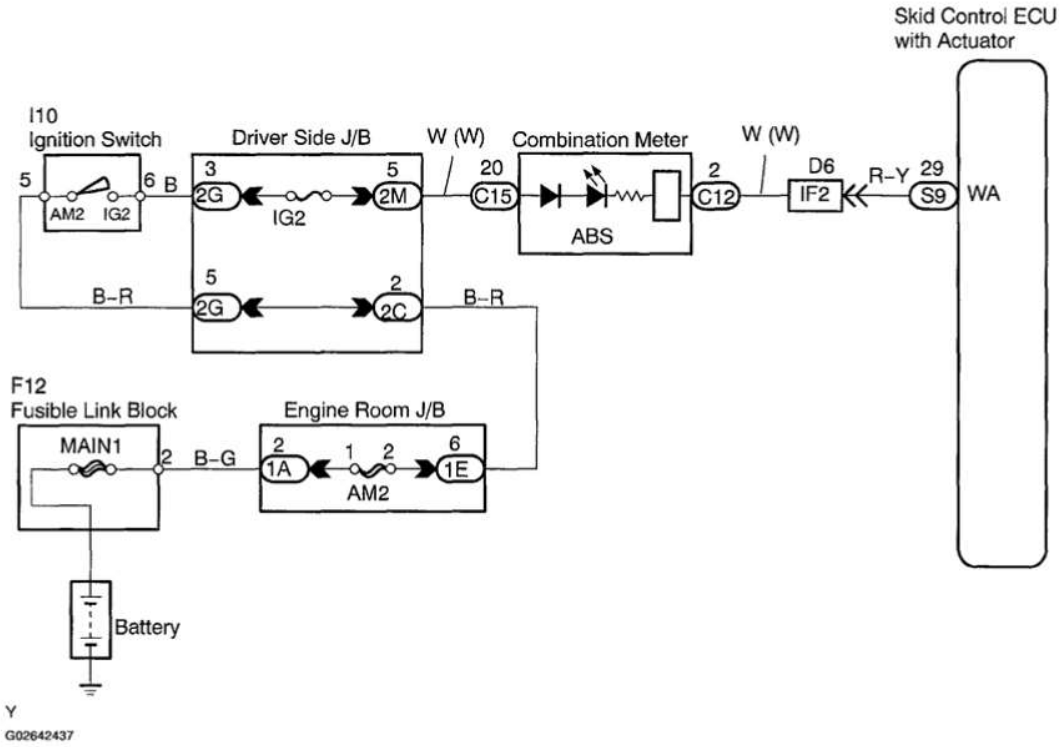


Fig. 93: Wiring Diagram - ABS Warning Light Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

HINT:

Start the inspection from step 1 when using the hand-held tester and start from 2 when not using the hand-held tester.

1. **Check operation of ABS warning light.**

   PREPARATION:

   a. Connect the hand-held tester to the DLC3.
   b. Turn the ignition switch ON and push the hand-held tester main switch ON.
   c. Select the ACTIVE TEST mode on the hand-held tester.

   CHECK:

   Check that the ABS warning light can be turned ON and OFF on the combination meter using the hand-held tester.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

OK:

The ABS warning light illuminates.

OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

NG: Go To Next Step

2. **Check ABS warning light.**

See the combination meter troubleshooting on **INSPECTION** .

NG: Repair bulb or combination meter assembly (See CIRCUIT).

OK: Go To Next Step

3. **Check for open and short circuit in harness and connector between skid control ECU and ABS warning light (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**

NG: Repair or replace harness and connector.

OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

VSC WARNING LIGHT CIRCUIT (DOES NOT LIGHT UP)

CIRCUIT DESCRIPTION

If the ECU stores DTC to shut down VSC & TRAC operation, the VSC warning light turns on the combination meter.

WIRING DIAGRAM

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

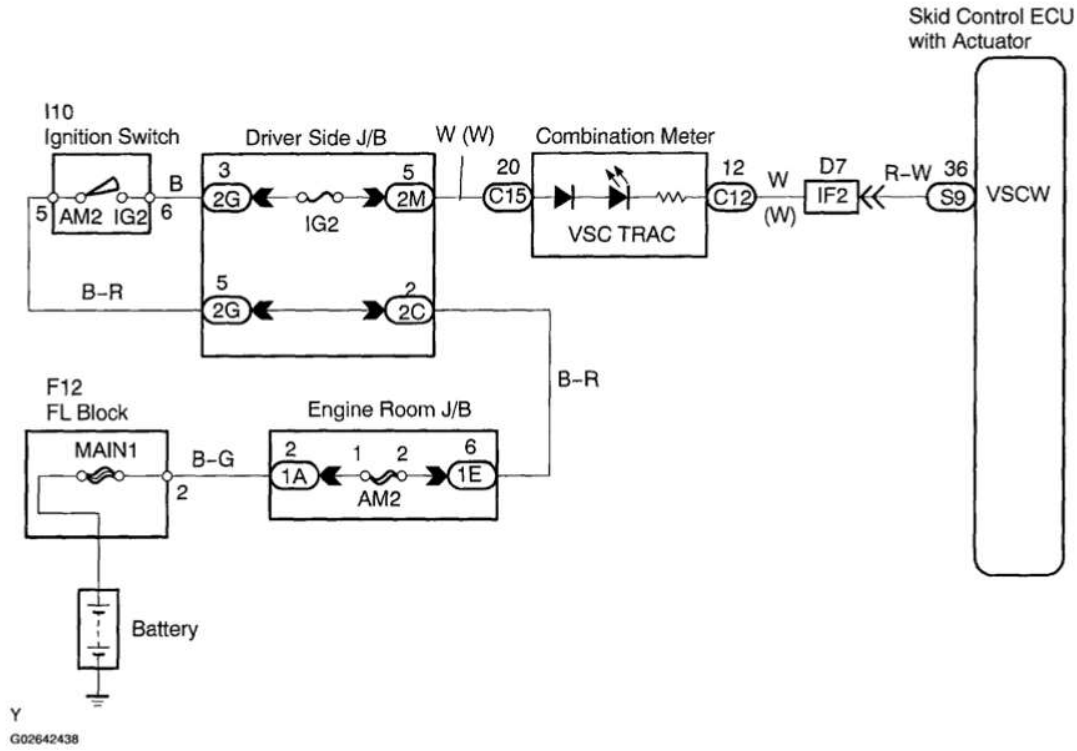


Fig. 94: Wiring Diagram - VSC Warning Light Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

HINT:

Start the inspection from step 1 when using the hand-held tester and start from 2 when not using the hand-held tester.

1. **Check operation of the VSC warning light.**

   PREPARATION:

   a. Connect the hand-held tester to the DLC3.
   b. Turn the ignition switch ON and push the hand-held tester main switch ON.
   c. Select the ACTIVE TEST mode on the hand-held tester.

   CHECK:

   Check that the VSC warning light can be turned ON and OFF on the combination meter using the hand-held tester.

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

OK:

VSC WARNING LIGHT TEST DETAILS

Item	Test Details	Diagnostic Note
VSC/ TRAC OFF IND	Turns VSC / TRAC OFF indicator ON / OFF	Observe combination meter

OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

NG: Go To Next Step

2. **Check VSC warning light.**

See combination meter **INSPECTION** .

NG: Repair bulb or combination meter assembly (See CIRCUIT).

OK: Go To Next Step

3. **Check for open and short circuit in harness and connector between skid control ECU and VSC warning light (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**

NG: Repair or replace harness and connector.

OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

BRAKE WARNING LIGHT CIRCUIT

CIRCUIT DESCRIPTION

The brake warning light turns on when the brake fluid is insufficient, the parking brake is applied or the EBD is defective.

WIRING DIAGRAM

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

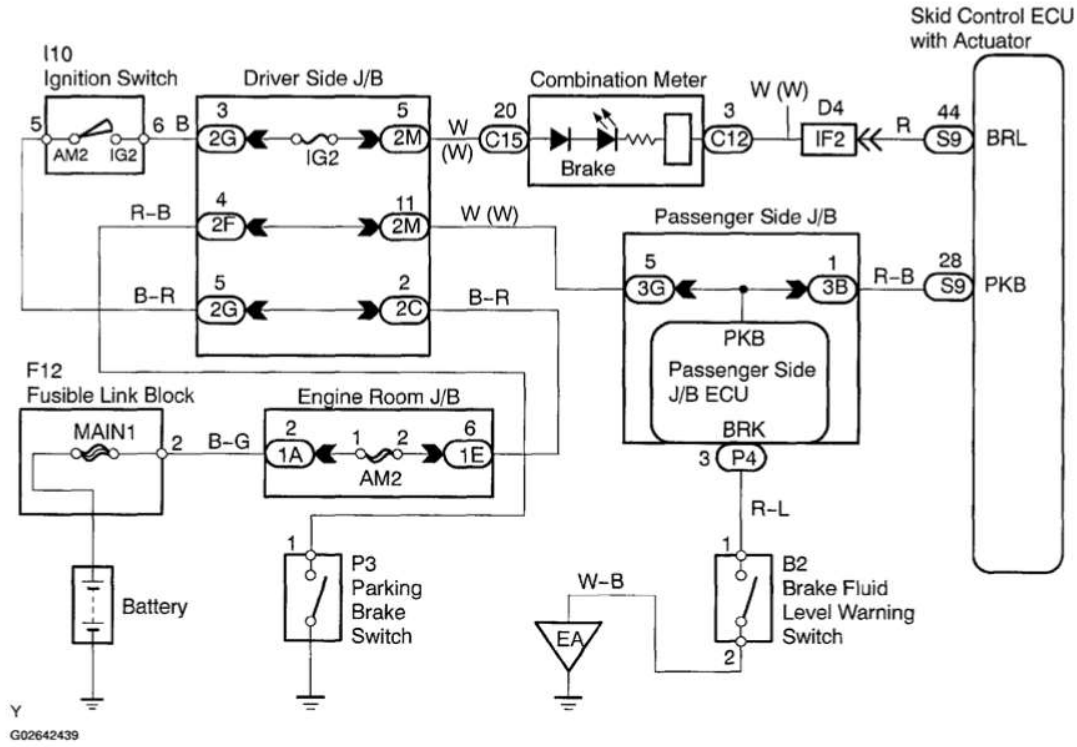


Fig. 95: Wiring Diagram - Brake Warning Light Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. **Check parking brake switch circuit (see PROBLEM SYMPTOMS TABLE).**
   NG: Repair or replace parking brake switch circuit.
   OK: Go To Next Step
2. **Check brake fluid level warning switch circuit (see PROBLEM SYMPTOMS TABLE).**
   NG: Repair or replace brake fluid level warning switch circuit.
   OK: Go To Next Step
3. **Is DTC output?**

   Check for DTCs (see **PRE-CHECK**).

   YES: Repair circuit indicated by output code.
   NO: Go To Next Step
4. **Check BRAKE warning light.**

   See combination meter **INSPECTION** .

   NG: Repair or replace combination meter.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

SLIP INDICATOR LIGHT CIRCUIT

CIRCUIT DESCRIPTION

The Slip indicator light blinks during VSC & TRAC operation.

WIRING DIAGRAM

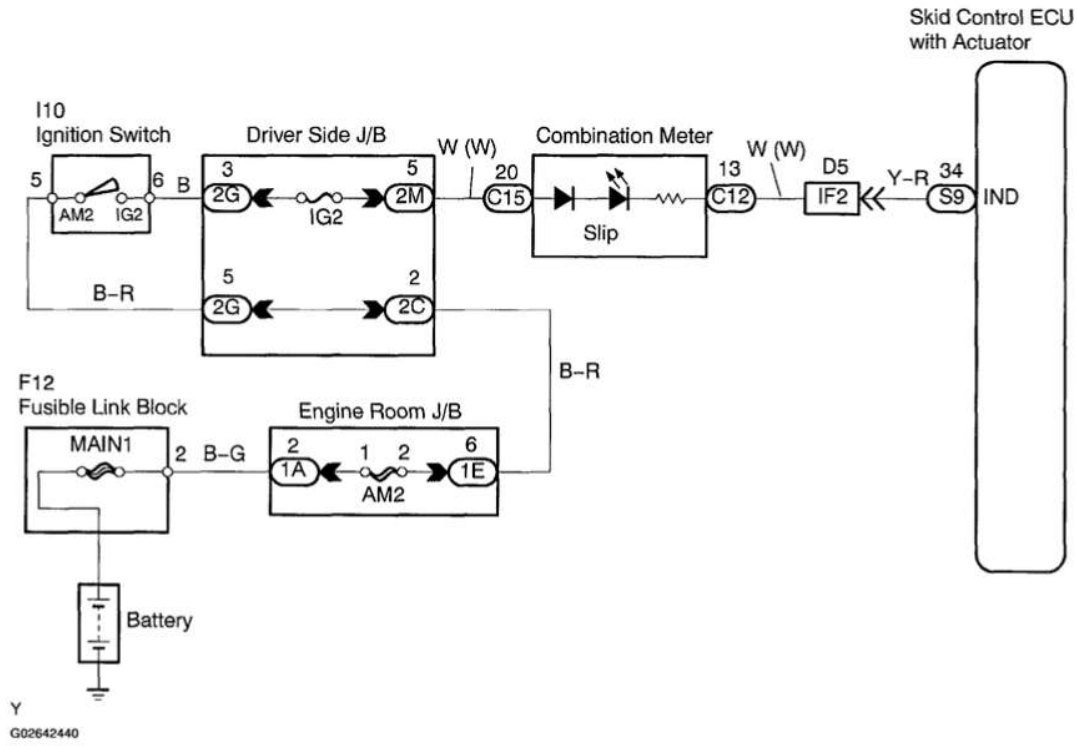


Fig. 96: Wiring Diagram - Slip Indicator Light Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

HINT:

Start the inspection from step 1 when using the hand-held tester and start from 2 when not using the hand-held tester.

cardiagn.com

1. **Check operation of slip indicator light.**

   PREPARATION:

   a. Connect the hand-held tester to the DLC3.
   b. Turn the ignition switch ON and push the hand-held tester main switch ON.
   c. Select the ACTIVE TEST mode on the hand-held tester.

   CHECK:

   Check that the slip indicator light can be turned ON and OFF on the combination meter using the hand-held tester.

   OK:

   The slip indicator light illuminates.

   NG: Go to step 4.

   OK: Go To Next Step

2. **Check that slip indicator light is ON for 3 seconds immediately after ignition switch is turned ON.**

   OK: Proceed to next circuit inspection shown on problem symptoms table (see PROBLEM SYMPTOMS TABLE).

   NG: Go To Next Step

3. **Check slip indicator light.**

   See combination meter **INSPECTION** .

   NG: Repair or replace combination meter.

   OK: Go To Next Step

4. **Check for open and short circuit in harness and connector between skid control ECU and slip indicator light (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**

   NG: Repair or replace harness and connector.

   OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

TRAC OFF INDICATOR LIGHT, TRAC OFF SWITCH CIRCUIT

CIRCUIT DESCRIPTION

This is the TRAC control main switch. When the TRAC OFF switch is pushed on, TRAC control turns off and

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

the TRAC OFF indicator turns on. Turn the ignition switch OFF, and check that TRAC control turns on when turning the ignition switch ON again.

WIRING DIAGRAM

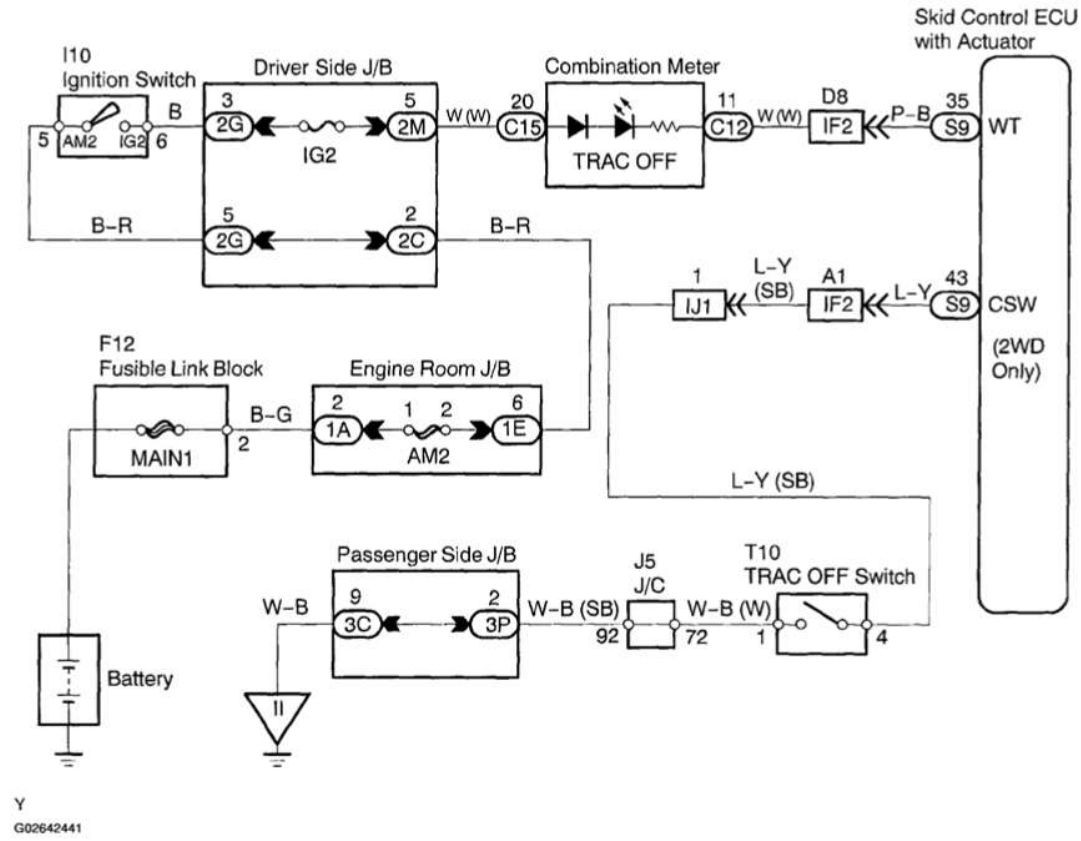


Fig. 97: Wiring Diagram - TRAC OFF Indicator Light, TRAC OFF Switch Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

HINT:

Start the inspection from step 1 when using the hand-held tester and start from 2 when not using the hand-held tester.

1. **Check operation of TRAC OFF indicator light.**

   PREPARATION:

   a. Connect the hand-held tester to the DLC3.
   b. Turn the ignition switch ON and press the hand-held tester main switch ON.

cardiagn.com

c. Select the ACTIVE TEST mode on the hand-held tester.

CHECK:

Check that the TRAC OFF indicator light can be turned ON and OFF on the combination meter using the hand-held tester.

OK:

TRAC OFF INDICATOR LIGHT INSPECTION

Item	Measurement Item / Range (Display)	Diagnostics Note
TRAC OFF IND	Turns TRAC indicator ON/OFF	Observe combination meter

NG: Go to step 4.

OK: Go To Next Step

2. **Check TRAC OFF switch.**

PREPARATION:

Remove the TRAC OFF switch.

CHECK:

Measure the resistance between terminals 2 and 5 of the TRAC OFF switch when the TRAC OFF switch is ON and OFF.

OK:

TRAC OFF SWITCH RESISTANCE

TRAC OFF Switch	Resistance
ON	Below 1 ohm
OFF	1 Mohm or higher

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

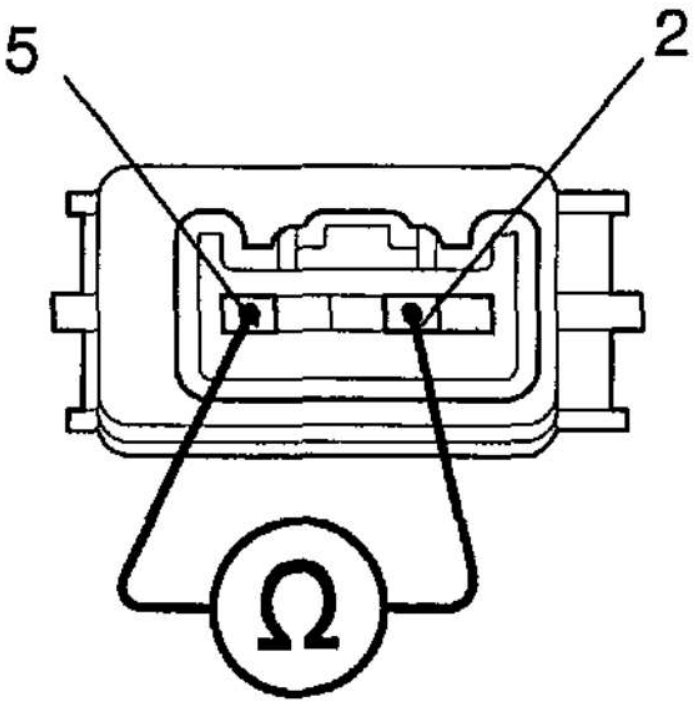


Fig. 98: Checking TRAC OFF Switch Resistance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Replace TRAC OFF switch.

OK: Go To Next Step

3. **Check for open and short circuit in harness and connector between terminal CSW of skid control ECU and TRAC OFF switch and body ground (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**

   NG: Repair or replace harness and connector.

   OK: Go To Next Step

4. **Check TRAC OFF indicator light.**

   See combination meter **INSPECTION** .

cardiagn.com

NG: Repair or replace combination meter.

OK: Go To Next Step

5. **Check for open and short circuit in harness and connector between terminal WT of skid control ECU and TRAC OFF indicator light (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**

NG: Repair or replace harness and connector.

OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

VSC WARNING BUZZER CIRCUIT

CIRCUIT DESCRIPTION

The VSC warning buzzer sounds during VSC operation.

WIRING DIAGRAM

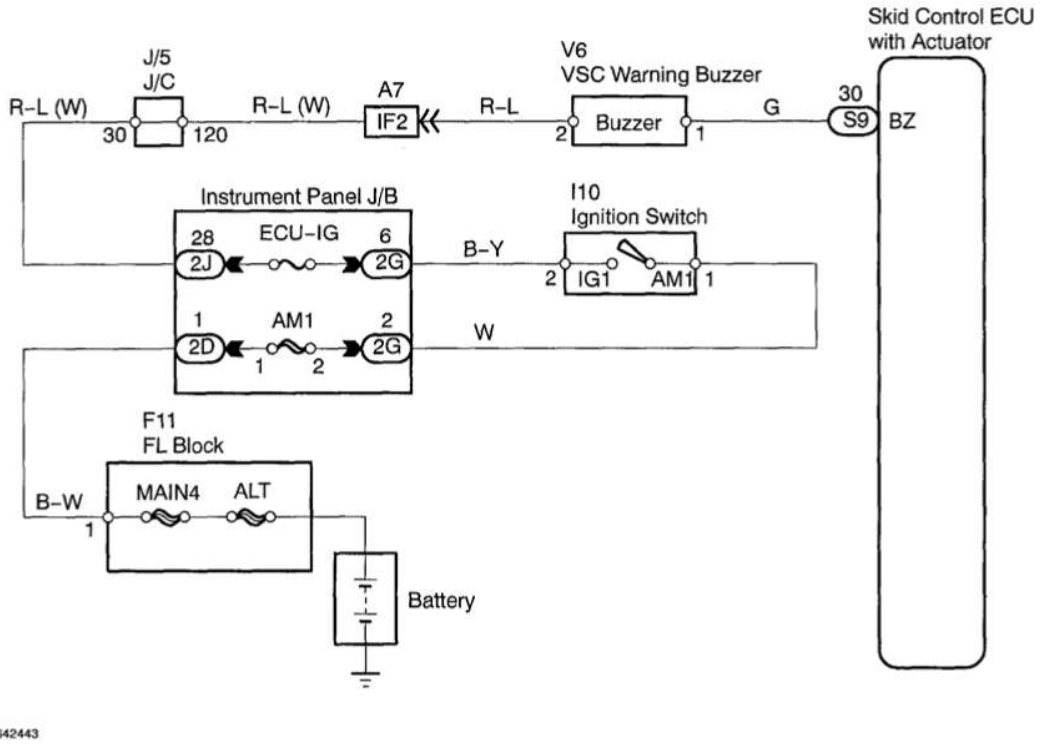


Fig. 99: Wiring Diagram - VSC Warning Buzzer Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

INSPECTION PROCEDURE

HINT:

Start the inspection from step 1 when using the hand-held tester and start from 2 when not using the hand-held tester.

1. **Check operation of VSC warning buzzer.**

   PREPARATION:

   a. Connect the hand-held tester to the DLC3.
   b. Turn the ignition switch ON and push the hand-held tester main switch ON.
   c. Select the ACTIVE TEST mode on the hand-held tester.

   CHECK:

   Check "ON-OFF" function of the VSC warning buzzer using the hand-held tester.

   OK:

   The VSC warning buzzer operates according to the tester instruction.

   OK: Replace brake actuator assembly.

   NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

   NG: Go To Next Step

2. **Measure voltage between terminal 2 of VSC warning buzzer and body ground.**

   PREPARATION:

   Remove the VSC warning buzzer with the connectors being connected.

   CHECK:

   a. Turn the ignition switch ON.
   b. Measure the voltage between terminal 2 of the VSC warning buzzer and the body ground.

   OK:

   Voltage: 10 to 14 V

   NG: Repair or replace harness and connector from voltage supply to VSC warning buzzer.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

OK: Go To Next Step

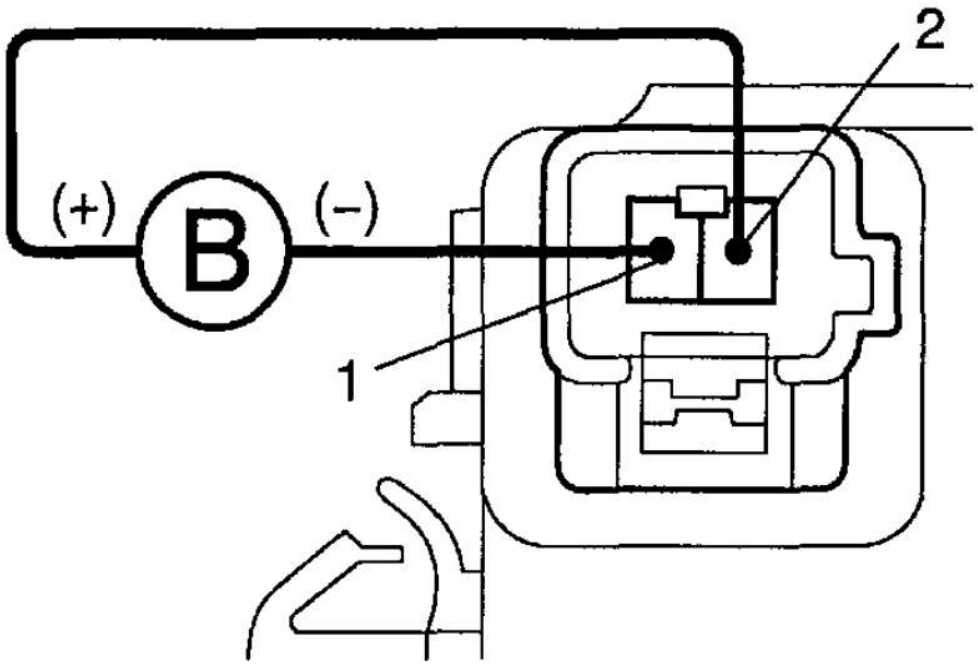
3. **Check VSC warning buzzer.**

PREPARATION:

Disconnect the VSC warning buzzer connector.

CHECK:

Apply battery positive voltage to terminals 1 and 2 of the VSC buzzer connector and check that the VSC warning buzzer sounds.



G02642444

Fig. 100: Checking VSC Warning Buzzer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NG: Replace VSC warning buzzer.

OK: Go To Next Step

4. **Check for open and short circuit in harness and connector between skid control ECU and VSC warning buzzer (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION**

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

PROCEDURE).

NG: Repair or replace harness and connector.

OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

TC TERMINAL CIRCUIT

CIRCUIT DESCRIPTION

Connecting terminals TC and CG of the DLC3 causes the ECU to indicate the DTC by blinking the ABS warning light, VSC warning light and Brake warning light.

TC signal is sent to the skid control ECU from the ECM.

WIRING DIAGRAM

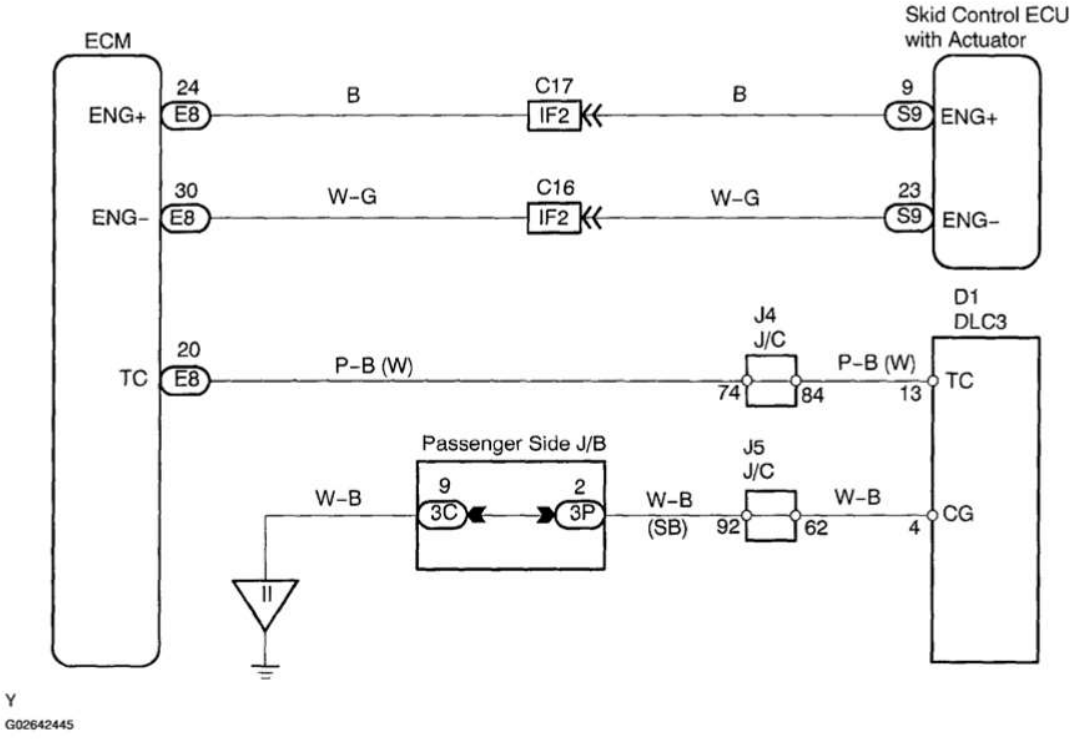


Fig. 101: Wiring Diagram - TC Terminal Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

1. **Measure voltage between terminals TC and CG of DLC3.**

   PREPARATION:

   Turn the ignition switch ON.

   CHECK:

   Measure the voltage between terminals TC and CG of the DLC3.

   OK:

   Voltage: 10 to 14 V

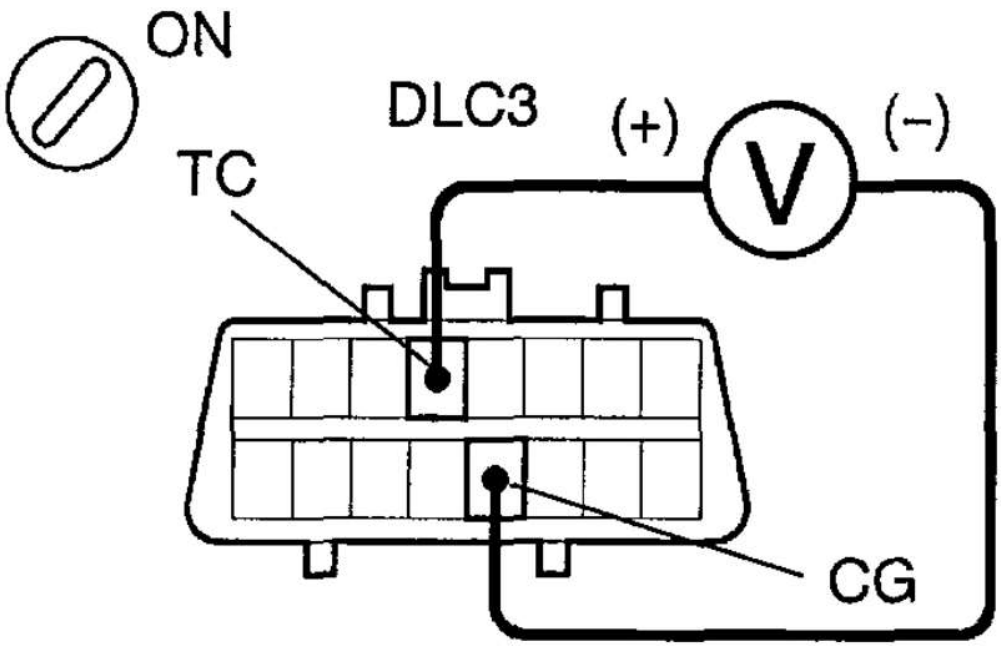


Fig. 102: Measuring Voltage Between Terminals TC And CG Of DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

NG: Go to step 4.

OK: Go To Next Step.

2. **With ignition switch OFF, check for open and short circuit in harness and connector between ECM and DLC3, and DLC3 and body ground (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**

   NG: Repair or replace harness and connector.

   OK: Go To Next Step.

3. **Check for open and short circuit in harness and connector between skid control ECU and ECM (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**

   NG: Repair or replace harness and connector.

   OK: Replace brake actuator assembly.

NOTE: When replacing the brake actuator assembly, perform the zero point calibration (see PRE-CHECK).

4. **Check for open and short circuit in harness and connector between terminals TC of the DLC3 and ECM (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**

   NG: Repair or replace harness and connector.

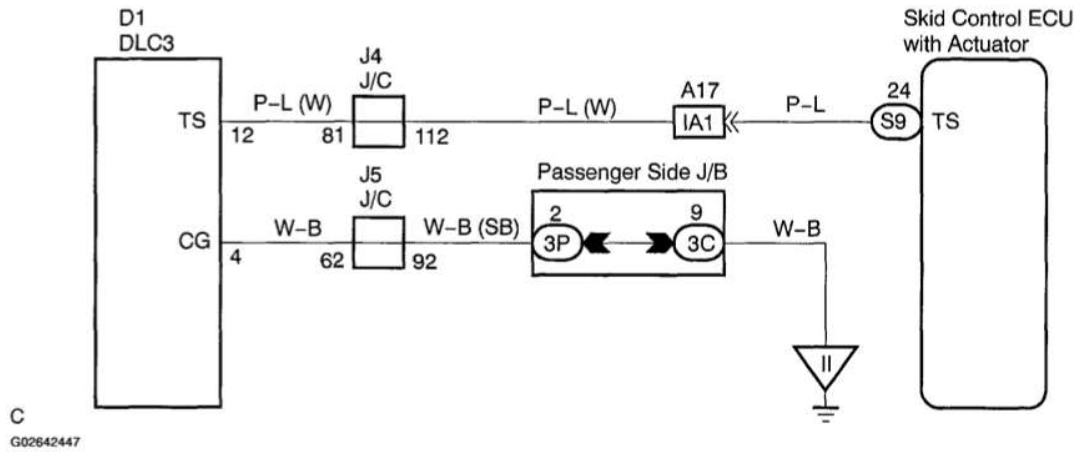
   OK: Replace ECM.

TS TERMINAL CIRCUIT

CIRCUIT DESCRIPTION

The sensor check circuit detects abnormalities in the speed sensor signal which cannot be detected with the DTC check. Connecting terminals TS and CG of the DLC3 starts the check.

WIRING DIAGRAM



cardiagn.com

2005 Toyota RAV4
2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

Fig. 103: Wiring Diagram - TS Terminal Circuit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION PROCEDURE

1. **Measure voltage between terminals TS and CG of DLC3.**

   CHECK:

   a. Turn the ignition switch ON.
   b. Measure the voltage between terminals TS and CG of the DLC3.

   OK:

   Voltage: 10 to 14 V

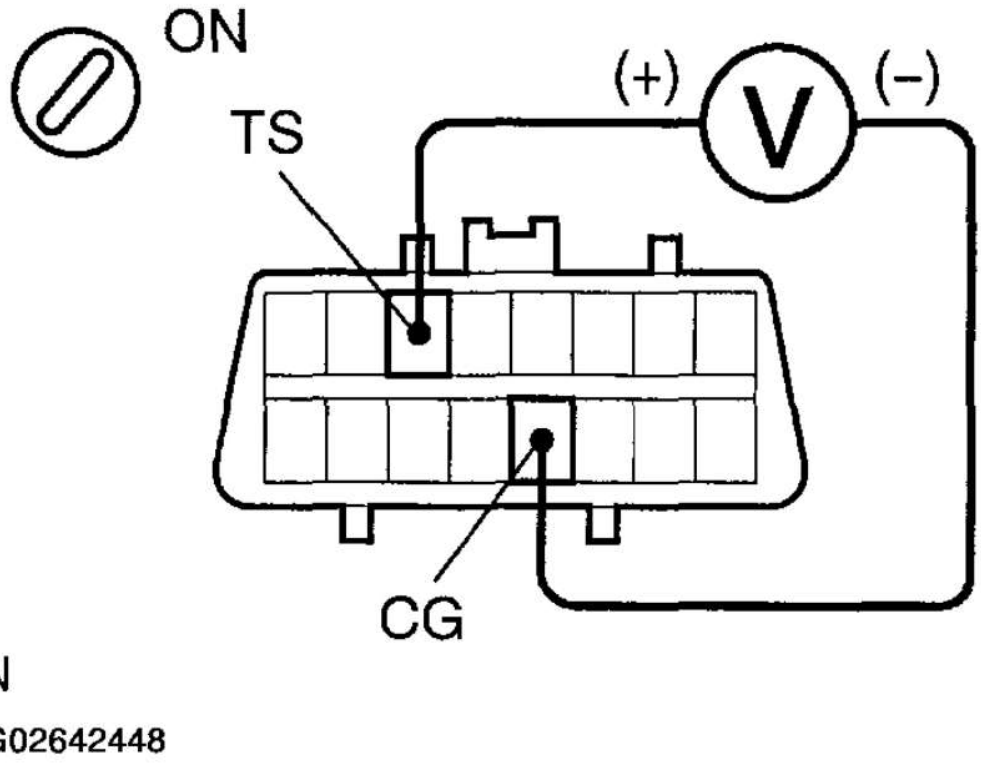


Fig. 104: Measuring Voltage Between Terminals TS And CG Of DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

cardiagn.com

2005 Toyota RAV4

2005 BRAKES ABS With EBD & BA & TRAC & VSC System - Diagnostics - RAV4

OK: If ABS warning light does not blink even after TS and CG have been connected, the ECU may be defective.

NG: Go To Next Step.

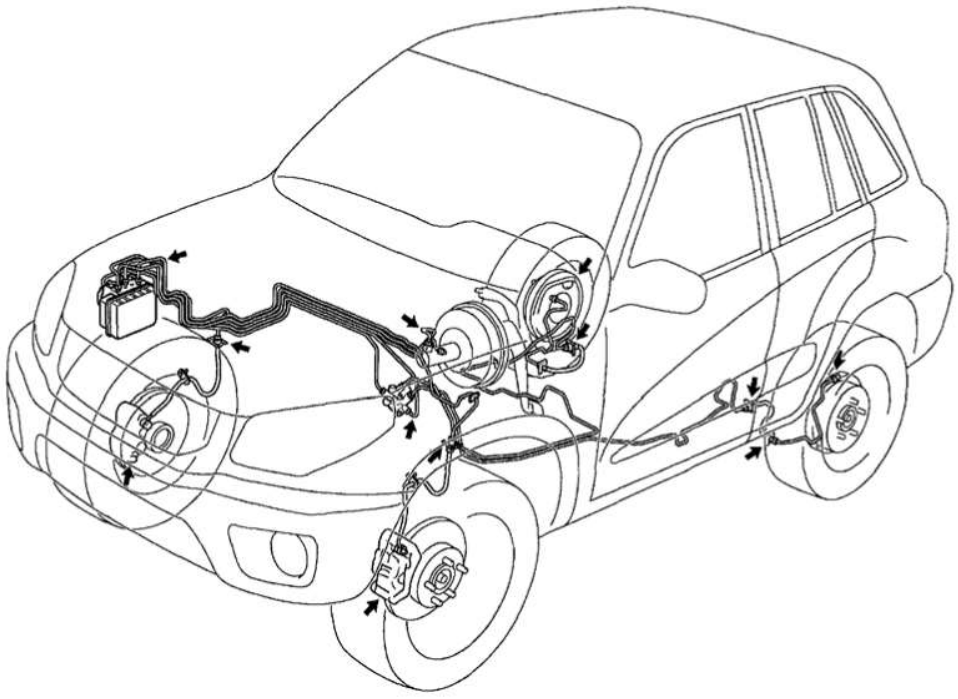
2. **Check for open and short circuit in harness and connector between skid control ECU and DLC3, and DLC3 and body ground (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).**

NG: Repair or replace harness and connector.

OK: Check and replace skid control ECU (See HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE).

CHECK FOR FLUID LEAKAGE

Check for fluid leakage from actuator or hydraulic lines.



Y
G02642449

Fig. 105: Checking For Fluid Leakage
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

cardiagn.com