

Last Modified: 3-10-2010	6.4 C	From: 200901
Model Year: 2010	Model: Corolla	Doc ID: RM00000277F00JX
Title: POWER ASSIST SYSTEMS: POWER STEERING SYSTEM (for 2AZ-FE): C1511-C1514,C1517: Torque Sensor Circuit Malfunction (2010 Corolla)		

DTC	C1511	Torque Sensor Circuit Malfunction
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DTC	C1512	Torque Sensor Circuit Malfunction
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DTC	C1513	Torque Sensor Circuit Malfunction
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DTC	C1514	Torque Sensor Power Supply Abnormal
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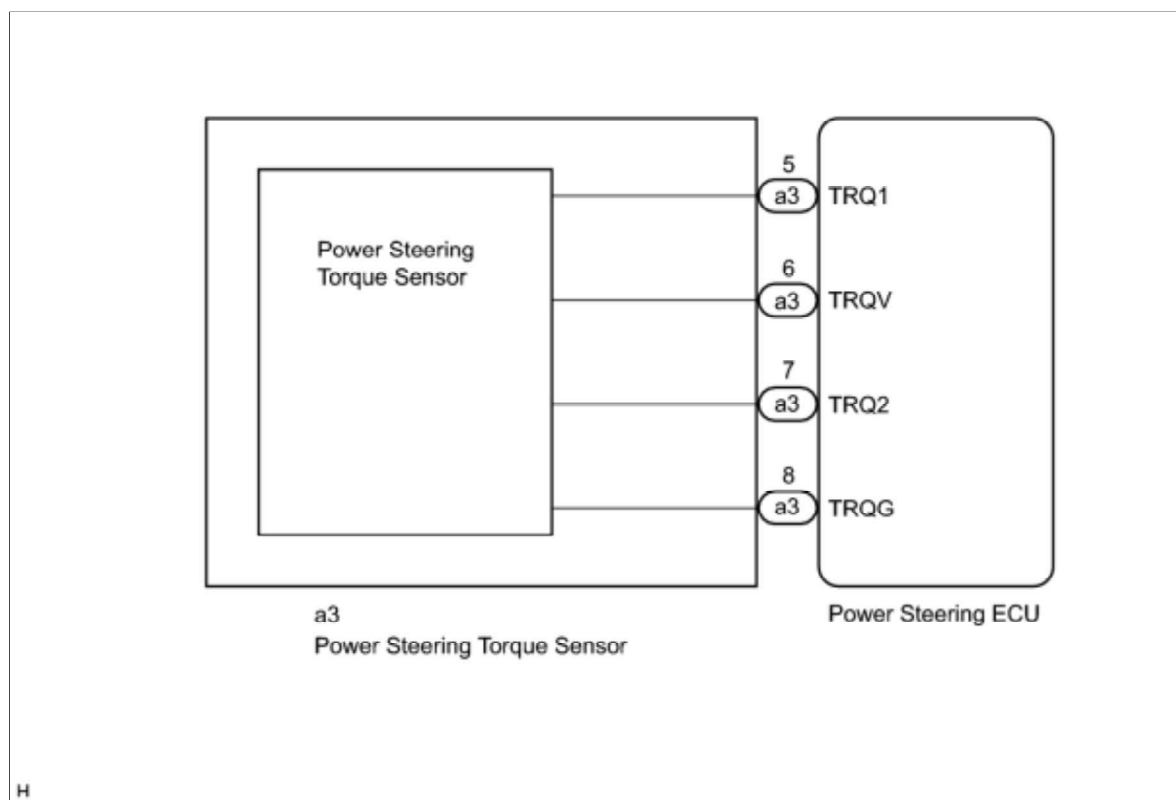
DTC	C1517	Torque Hold Abnormal
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DESCRIPTION

The torque sensor converts the rotation torque input from the steering wheel into electric signals and sends them to the power steering ECU.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1511	Torque sensor malfunction	<ul style="list-style-type: none"> Steering column assembly (torque sensor) Power steering ECU
C1512		
C1513		
C1514		
C1517		

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

If the steering column assembly or power steering ECU has been replaced, perform the rotation angle sensor initialization and torque sensor zero point calibration [INFO](#) .

PROCEDURE

1.	CHECK CONNECTOR CONNECTION CONDITION (TORQUE SENSOR - ECU)
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(a) Check the installation condition of the torque sensor connector.

OK:

Torque sensor connector is securely connected to the power steering ECU.

NG **CONNECT CONNECTOR**

OK



2.	READ VALUE USING TECHSTREAM (TORQUE SENSOR1, TORQUE SENSOR2)
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- (a) Turn the ignition switch off.
- (b) Connect the Techstream to the DLC3.
- (c) Turn the ignition switch on (IG).
- (d) Turn the Techstream on.
- (e) Enter the following menus: Chassis / EMPS / Data List.
- (f) Select the items "Torque sensor 1 output" and "Torque sensor 2 output" in the Data List and read the value displayed on the Techstream.

EMPS

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Torque Sensor 1 Output	Torque sensor voltage/ Min.: 0 V Max.: 5 V	2.3 to 2.7 V	Steering wheel not turned (without load)
		2.5 to 3.8 V	Steering wheel turned to right with vehicle stopped
		1.2 to 2.5 V	Steering wheel turned to left with vehicle stopped
Torque Sensor 2 Output	Torque sensor voltage/ Min.: 0 V Max.: 5 V	2.3 to 2.7 V	Steering wheel not turned (without load)
		1.2 to 2.5 V	Steering wheel turned to right with vehicle stopped
		2.5 to 3.8 V	Steering wheel turned to left with vehicle stopped

OK:

Normal condition value is displayed on the Techstream during each steering operation.

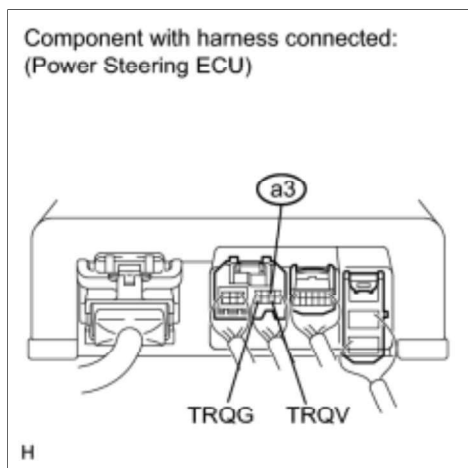
NG ► **CHECK POWER STEERING ECU (TRQV VOLTAGE)**

OK ► **REPLACE POWER STEERING ECU**

3.	CHECK POWER STEERING ECU (TRQV VOLTAGE)
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- (a) Turn the ignition switch on (IG).
- (b) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

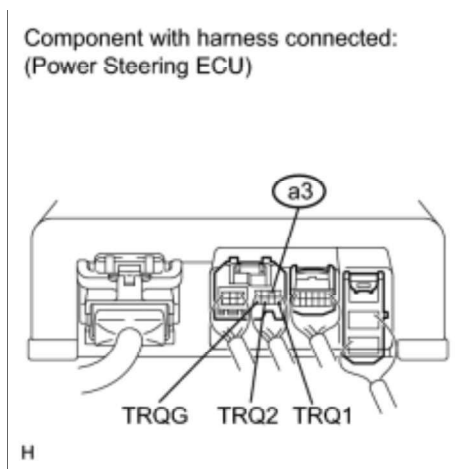


TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
a3-6 (TRQV) - a3-8 (TRQG)	Ignition switch on (IG)	4.5 to 5.5 V

NG **REPLACE POWER STEERING ECU**

OK

4. CHECK POWER STEERING ECU (TRQ1, TRQ2 VOLTAGE)



(a) Turn the ignition switch on (IG).

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

Standard Voltage:

TESTER CONNECTION	SWITCH CONDITION (STEERING POSITION)	SPECIFIED CONDITION
a3-5 (TRQ1) - a3-8 (TRQG)	Ignition switch on (IG) Steering wheel not turned (without load)	2.3 to 2.7 V
	Ignition switch on (IG) Steering wheel turned to right with vehicle stopped	2.5 to 3.8 V

TESTER CONNECTION	SWITCH CONDITION (STEERING POSITION)	SPECIFIED CONDITION
	Ignition switch on (IG) Steering wheel turned to left with vehicle stopped	1.2 to 2.5 V
a3-7 (TRQ2) - a3-8 (TRQG)	Ignition switch on (IG) Steering wheel not turned (without load)	2.3 to 2.7 V
	Ignition switch on (IG) Steering wheel turned to right with vehicle stopped	1.2 to 2.5 V
	Ignition switch on (IG) Steering wheel turned to left with vehicle stopped	2.5 to 3.8 V

NG ► **REPLACE STEERING COLUMN ASSEMBLY**

OK ► **REPLACE POWER STEERING ECU**



TOYOTA