DTC	C1511	TORQUE SENSOR ABNORMAL

DTC	C1512	TORQUE SENSOR ABNORMAL

DTC	C1513	TORQUE SENSOR ABNORMAL

DTC	C1514	TORQUE SENSOR POWER SUPPLY ABNORMAL

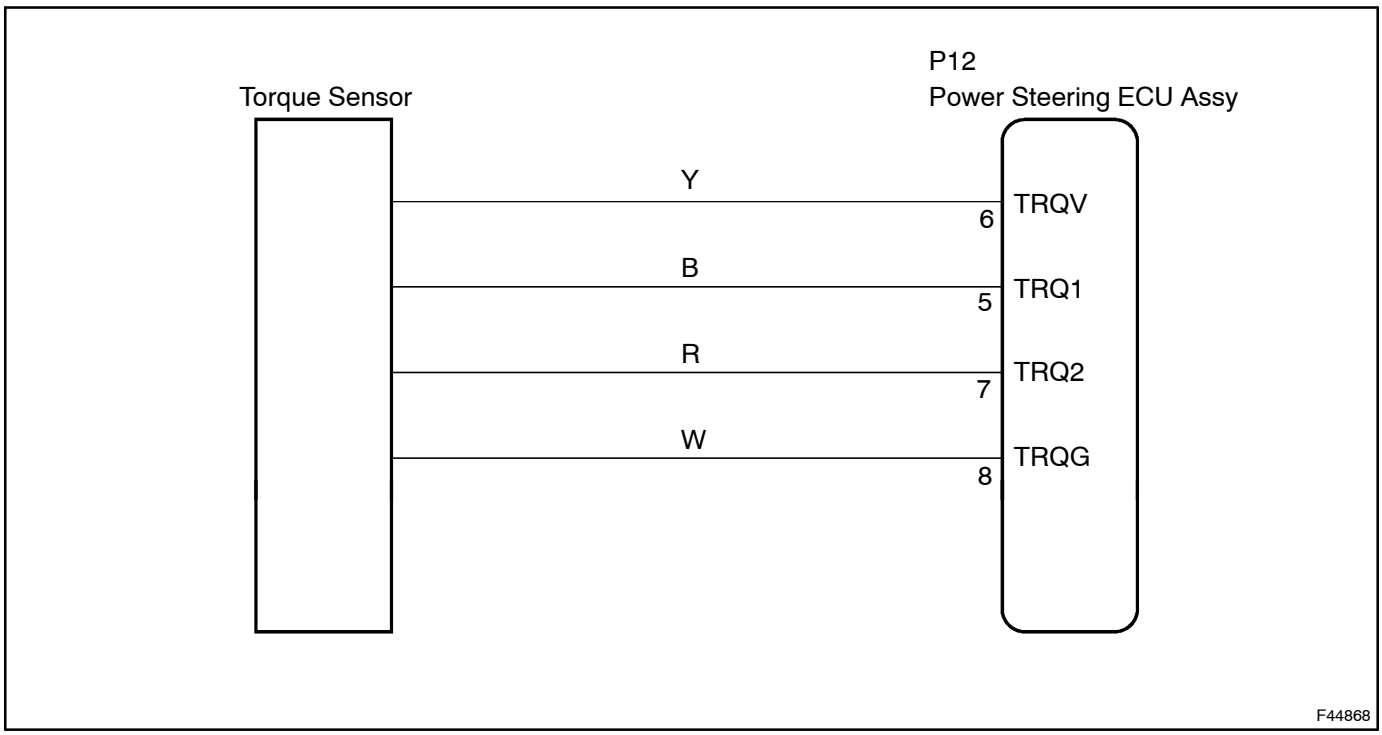
DTC	C1517	TORQUE HOLD ABNORMAL

CIRCUIT DESCRIPTION

The torque sensor converts rotation torque input to the steering wheel into an electrical signal and sends it to the ECU. Based on this signal, the ECU detects steering effort.

DTC No.	Detection Item	Trouble Area
C1511	Torque sensor (TRQ1) signal error or stop	• Torque sensor (built into steering column assy) • Power steering ECU assy
C1512	Torque sensor (TRQ2) signal error or stop	• Torque sensor (built into steering column assy) • Power steering ECU assy
C1513	Deviation between torque sensors TRQ1 and TRQ2 is out of specification	• Torque sensor (built into steering column assy) • Power steering ECU assy
C1514	Torque sensor power source voltage error	• Torque sensor (built into steering column assy) • Power steering ECU assy
C1517	Temporary control due to malfunction related to torque sensor continues for a long time	• Torque sensor (built into steering column assy) • Power steering ECU assy

WIRING DIAGRAM



INSPECTION PROCEDURE

1	READ VALUE ON INTELLIGENT TESTER II

Connect the intelligent tester II to the DLC3.
Turn the power switch on (IG), and turn the intelligent tester II main switch on.
Select the items ”Torque Sensor 1 Output” and ”Torque Sensor 2 Output” in the DATA LIST.

Item	Item Description	Inspection Condition	Reference Value
Torque Sensor 1 Output	Torque sensor 1 output value/ Min.: 0 V, Max.: 5 V	1. Steering wheel is not turned (without load) 2. Turning steering wheel to right with vehicle stopped 3. Turning steering wheel to left with vehicle stopped	1. 2.3 to 2.7 V 2. 2.5 to 4.7 V 3. 0.3 to 2.5 V
Torque Sensor 2 Output	Torque sensor 2 output value/ Min.: 0 V, Max.: 5 V	1. Steering wheel is not turned (without load) 2. Turning steering wheel to right with vehicle stopped 3. Turning steering wheel to left with vehicle stopped	1. 2.3 to 2.7 V 2. 2.5 to 4.7 V 3. 0.3 to 2.5 V

Read the values of ”Torque Sensor 1 Output” and ”Torque Sensor 2 Output” on the tester display when the steering wheel is centered (without load).

Standard:

Voltage: 2.3 to 2.7 V

Check the difference in values between ”Torque Sensor 1 Output” and ”Torque Sensor 2 Output” when the steering wheel is centered (without load).

Standard:

Voltage: 0.3 V or less

Read the value of the torque sensor on the tester display when the steering wheel is turned.

Turn the steering wheel from its center position to the right full lock position and read the values of ”Torque Sensor 1 Output” and ”Torque Sensor 2 Output” on the tester display.

Standard:

Voltage: 2.5 to 4.7 V

Turn the steering wheel from its center position to the left full lock position and read the values of ”Torque Sensor 1 Output” and ”Torque Sensor 2 Output” on the tester display.

Standard:

Voltage: 0.3 to 2.5 V

Check the difference in values between ”Torque Sensor 1 Output” and ”Torque Sensor 2 Output”.

Standard:

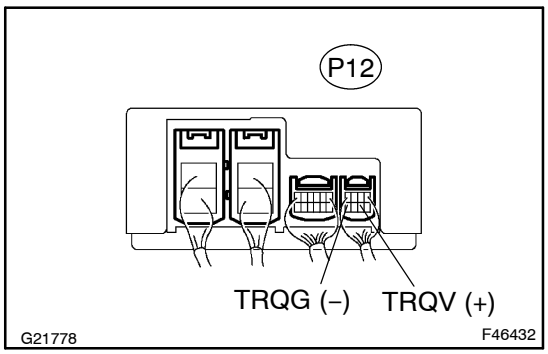
Voltage: 0.3 V or less

NG → **Go to step 2**

OK

REPLACE POWER STEERING ECU ASSY

2 INSPECT STEERING COLUMN ASSY(TORQUE SENSOR)



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

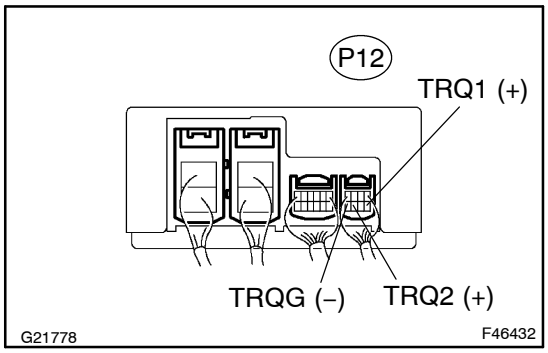
Standard:

Tester Connection	Condition	Specified Condition
P12–6 (TRQV) – P12–8 (TRQG)	Power switch is on (IG)	7.5 to 8.5 V

OK → **REPLACE POWER STEERING ECU ASSY (SEE PAGE 50–17)**

NG

3 INSPECT POWER STEERING ECU ASSY



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

Standard:

Tester Connection	Condition (Steering position)	Specified Condition
P12–5 (TRQ1) – P12–8 (TRQG)	Power switch is on (IG) (Center position)	2.3 to 2.7 V
P12–7 (TRQ2) – P12–8 (TRQG)	Power switch is on (IG) (Center position)	2.3 to 2.7 V
P12–5 (TRQ1) – P12–8 (TRQG)	Power switch is on (IG) (Turned to the right)	2.5 to 4.7 V
P12–7 (TRQ2) – P12–8 (TRQG)	Power switch is on (IG) (Turned to the right)	2.5 to 4.7 V
P12–5 (TRQ1) – P12–8 (TRQG)	Power switch is on (IG) (Turned to the left)	0.3 to 2.5 V
P12–7 (TRQ2) – P12–8 (TRQG)	Power switch is on (IG) (Turned to the left)	0.3 to 2.5 V

OK → **REPLACE STEERING COLUMN ASSY (SEE PAGE 50–8)**

NG

REPLACE POWER STEERING ECU ASSY (SEE PAGE 50–17)