PROBLEM SYMPTOMS TABLE

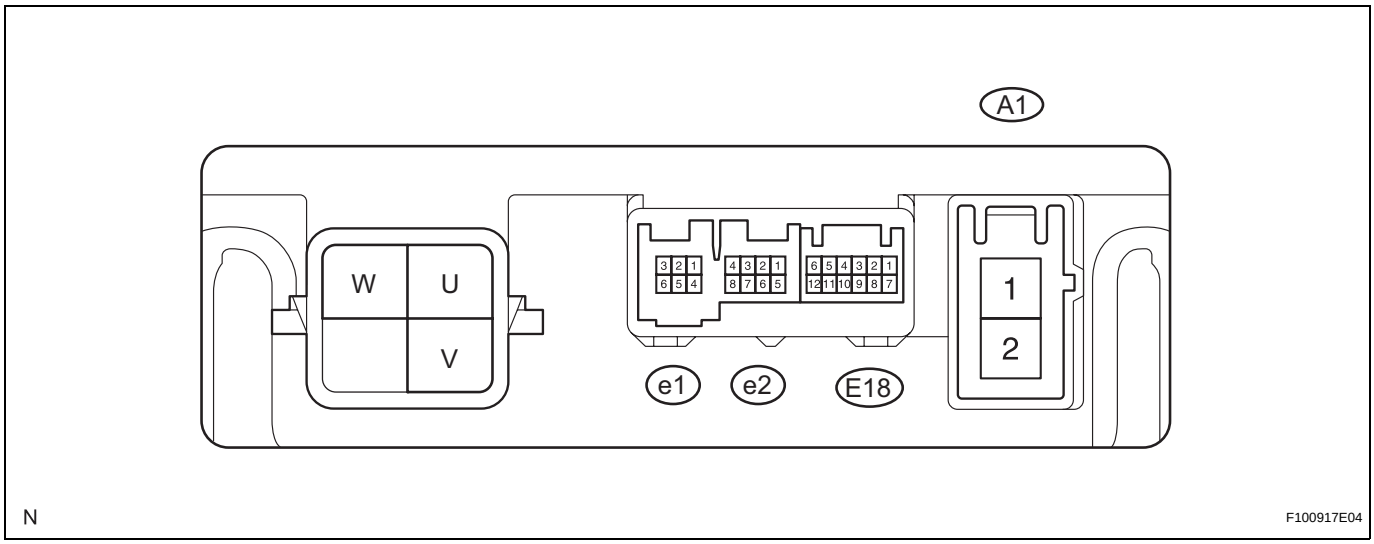
HINT:
Use the table below to help determine the cause of the problem symptom. The potential causes of the symptoms are listed in order of probability in the "Suspected area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.

Electronic power steering system

Symptom	Suspected area	See page
Heavy steering	1. Front tires (improperly inflated, unevenly worn)	TW-1
	2. Front wheel alignment (incorrect)	SP-3
	3. Front suspension (lower ball joint)	SP-27
	4. Steering gear assembly	PS-42
	5. Power steering motor	PS-25
	6. Power source voltage of power steering ECU	PS-37
	7. Power steering ECU	PS-46
Steering effort differs between turning right and left, or steering effort uneven	1. Front tires (improperly inflated, unevenly worn)	TW-1
	2. Front wheel alignment (incorrect)	SP-3
	3. Front suspension (lower ball joint)	SP-27
	4. Steering gear assembly	PS-42
	5. Torque sensor (built into steering column)	PS-22
	6. Steering column assembly	SR-11
	7. Power steering motor	PS-25
	8. Power steering ECU	PS-46
While driving, steering effort does not change in accordance with vehicle speed or steering wheel does not return properly	1. Front suspension (lower ball joint)	SP-27
	2. Speed sensor	BC-28
	3. Skid control ECU	BC-41
	4. Torque sensor (built into steering column)	PS-22
	5. Power steering motor	PS-25
	6. Power steering ECU	PS-46
	7. Controlling CAN communication system	CA-8
Friction occurs when turning steering wheel during low speed driving	1. Power steering motor	PS-25
	2. Steering column assembly	SR-11
High-pitched sound (squeaking) occurs when turning steering wheel slowly with vehicle stopped	1. Power steering motor	PS-25
Steering wheel vibrates and noise occurs when turning steering wheel with vehicle stopped	1. Power steering motor	PS-25
	2. Steering column assembly	SR-11
P/S warning always indicated on combination meter	1. Power source voltage of power steering ECU	PS-37
	2. Combination meter	ME-53
	3. Power steering ECU	PS-46

TERMINALS OF ECU

1. CHECK POWER STEERING ECU



HINT:
Measurements cannot be performed on the C connector side of the power steering ECU.

Symbols	Wiring Color	Terminal Description
U	W	U phase motor output
V	B	V phase motor output
W	W-R	W phase motor output

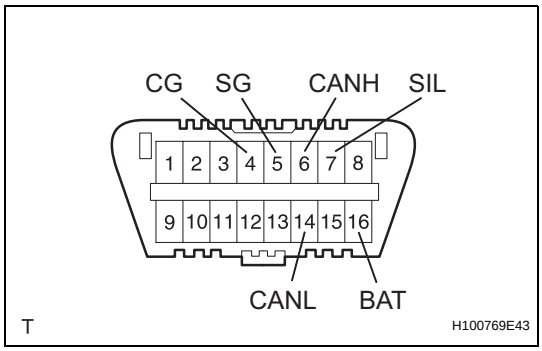
(a) Measure the voltage and resistance of the connectors.

PS

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
PIG (A1-1) - PGND (A1-2)	W-B - W-B	Power source	Always	10 to 14 V
IG (E18-5) - PGND (A1-2)	L - W-B	IG power source	Ignition switch ON	10 to 14 V
TRQ1 (e1-6) - TRQG (e1-1)	G - B	Torque sensor signal	Ignition switch ON Steering wheel not turned (without load)	2.3 to 2.7 V
			Ignition switch ON Steering wheel turned to right with vehicle stopped	2.5 to 4.04 V
			Ignition switch ON Steering wheel turned to left with vehicle stopped	0.95 to 2.5 V
TRQ2 (e1-2) - TRQG (e1-1)	Y - B	Torque sensor signal	Ignition switch ON Steering wheel not turned (without load)	2.3 to 2.7 V
			Ignition switch ON Steering wheel turned to right with vehicle stopped	0.95 to 2.5 V
			Ignition switch ON Steering wheel turned to left with vehicle stopped	2.5 to 4.04 V
TRQF (e1-4) - TRQG (e1-1)	W - B	Torque sensor reference voltage	Ignition switch ON	3.35 to 3.37 V
TRQV (e1-3) - TRQG (e1-1)	R - B	Torque sensor voltage source	Ignition switch ON	8.5 to 10.5 V
TRQG (e1-1) - Body ground	B - Body ground	Torque sensor ground	Always	Below 1 Ω

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
PGND (A1-2) - Body ground	W-B - Body ground	Power ground	Always	Below 1 Ω
C1 (e2-1) - PGND (A1-2)	R - W-B	Resolver signal	Ignition switch ON Steering wheel is turned	0.68 to 4.42 V
C2 (e2-5) - PGND (A1-2)	L - W-B	Resolver signal	Ignition switch ON Steering wheel is turned	0.68 to 4.42 V
S1 (e2-2) - PGND (A1-2)	B - W-B	Resolver signal	Ignition switch ON Steering wheel is turned	0.68 to 4.42 V
S2 (e2-6) - PGND (A1-2)	Y - W-B	Resolver signal	Ignition switch ON Steering wheel is turned	0.68 to 4.42 V
R1 (e2-4) - PGND (A1-2)	W - W-B	Resolver excitation signal	Ignition switch ON Steering wheel is turned	2.9 to 5.1 V
R2 (e2-8) - PGND (A1-2)	G - W-B	Resolver excitation signal	Ignition switch ON Steering wheel is turned	2.9 to 5.1 V
CANH (E18-2) - CANL (E18-8)	Y - W	CAN communication line	Ignition switch OFF	54 to 67 Ω

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



DIAGNOSIS SYSTEM

1. CHECK DLC3

(a) Check the DLC3:

The power steering ECU uses CAN (ISO11898-1) and ISO9141-2 for communication protocol. The terminal arrangement of the DLC3 complies with SAE J1962 and matches the ISO9141-2 format.

PS

Symbols (Terminal No.)	Terminal Description	Condition	Specified Condition
SIL (7) - SG (5)	Bus [+] line	During transmission	Pulse generation
CG (4) - Body ground	Chassis ground	Always	Below 1 Ω
SG (5) - Body ground	Signal ground	Always	Below 1 Ω
BAT (16) -Body ground	Battery positive	Always	11 to 14 V
CANH (6) - CANL (14)	HIGH-level CAN bus line	Ignition switch OFF*	54 to 67 Ω
CANH (6) - Battery positive	HIGH-level CAN bus line	Ignition switch OFF*	1 MΩ or higher
CANH (6) - CG (4)	HIGH-level CAN bus line	Ignition switch OFF*	200 Ω or higher
CANL (14) - Battery positive	LOW-level CAN bus line	Ignition switch OFF*	1 MΩ or higher
CANL (14) - CG (4)	LOW-level CAN bus line	Ignition switch OFF*	200 Ω or higher

NOTICE:

***: Before measuring the resistance, leave the vehicle as is for at least 1 minute and do not operate the ignition switch, other switches or the doors.**

If the result is not as specified, the DLC3 may have a malfunction. Repair or replace the harness and connector.

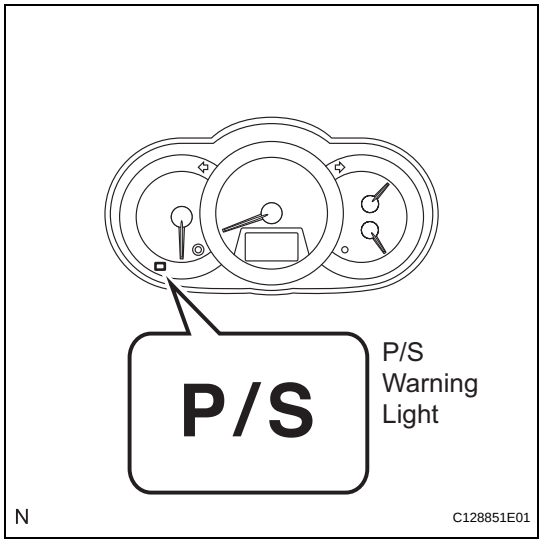
HINT:

Connect the cable of the intelligent tester to the DLC3, turn the ignition switch ON and attempt to use the tester. If the display indicates that a communication error has occurred, there is a problem either with the vehicle or with the tester.

- If communication is normal when the tester is connected to another vehicle, inspect the DLC3 of the original vehicle.
- If communication is still not possible when the tester is connected to another vehicle, the problem may be in the tester itself. Consult the Service Department listed in the tester's instruction manual.

2. WARNING LIGHT

(a) When a problem occurs in the electronic power steering system, the P/S warning light on the combination meter comes on to inform the driver of the problem.



DTC CHECK / CLEAR

1. CHECK DTC

(a) When using intelligent tester:

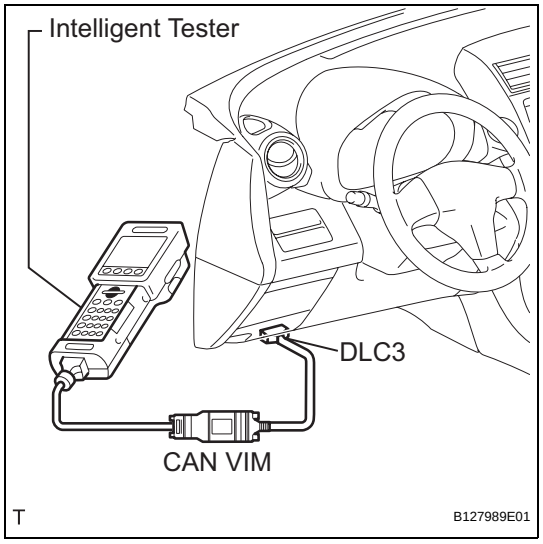
(1) Connect the intelligent tester (with CAN VIM) to the DLC3.

(2) Turn the ignition switch ON and press the intelligent tester main switch ON.

(3) Read the DTCs by following the prompts on the intelligent tester.

HINT:

Refer to the intelligent tester operator's manual for further details.

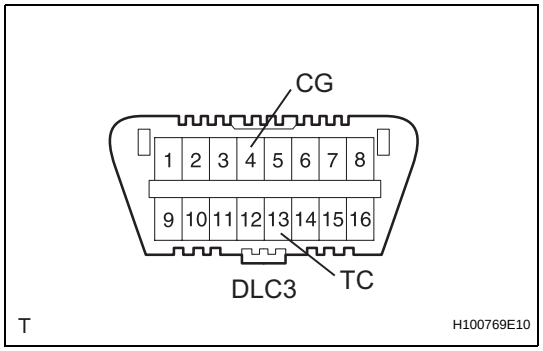


(b) When not using intelligent tester:

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

SST 09843-18040

(2) Turn the ignition switch ON.



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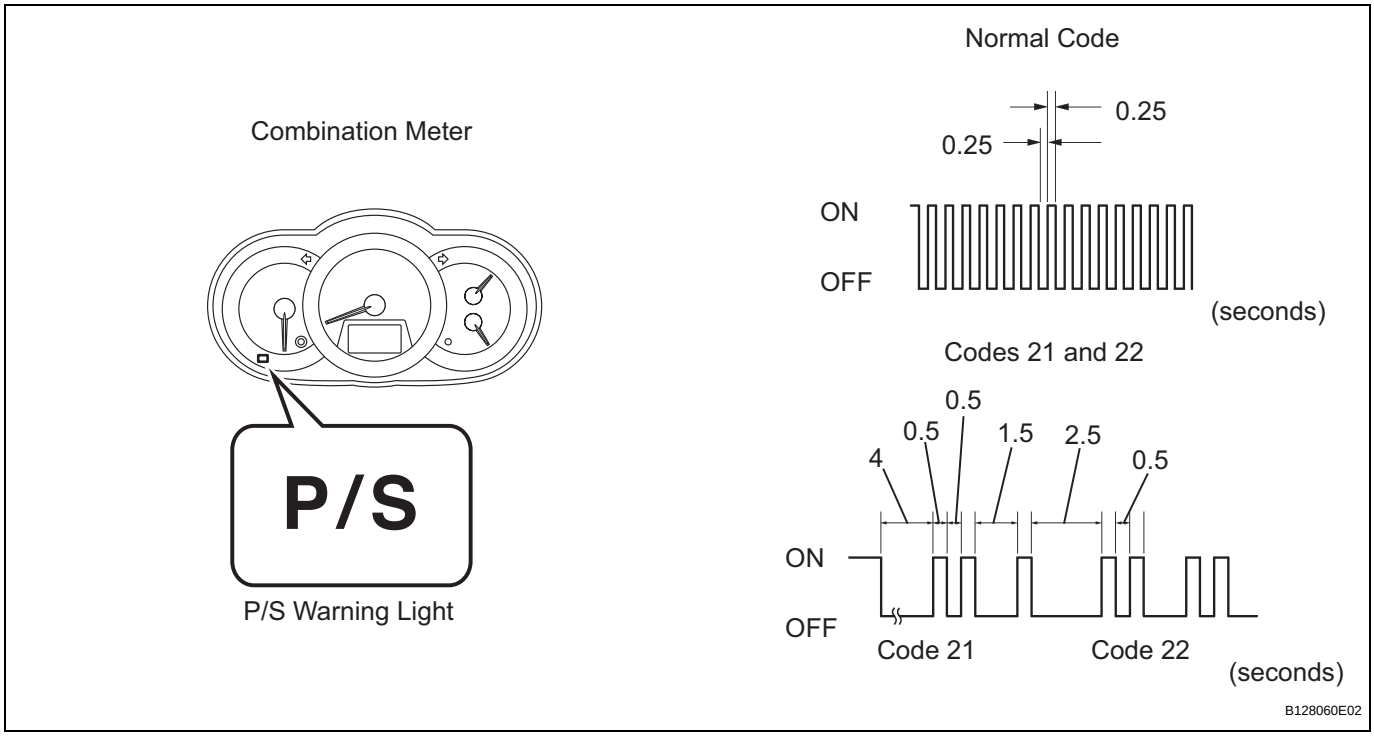
(3) Read and write down any DTCs indicated by the P/S warning light on the combination meter. Refer to the chart below for examples of a normal code and DTCs 21 and 22.



HINT:

- If the P/S warning light does not blink to display any DTCs set or the normal code, inspect the circuit shown in the table below.

Trouble Area	See Page
EPS warning light circuit	PS-37

- If two or more malfunctions are detected simultaneously, DTCs will be displayed in ascending numerical order.

(4) Refer to the Diagnostic Trouble Code Chart (See page PS-16) for DTC information.

2. CLEAR DTC

(a) When using intelligent tester:

(1) Connect the intelligent tester (with CAN VIM) to the DLC3.

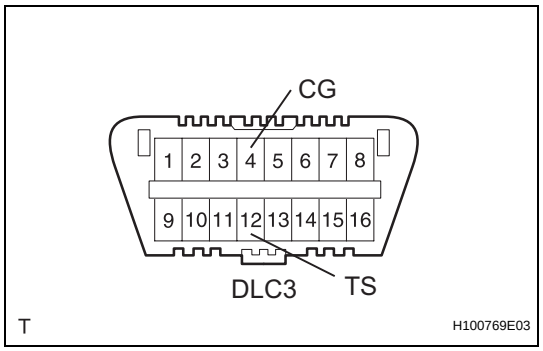
(2) Turn the ignition switch ON and press the intelligent tester main switch ON.

(3) Clear the DTCs by following the prompts on the intelligent tester.

(4) Turn the ignition switch OFF.

(5) Disconnect the intelligent tester from the DLC3.

PS



(b) When not using intelligent tester:
(1) Using SST, connect terminals 12 (TS) and 4 (CG) of the DLC3.
SST 09843-18040
(2) Turn the ignition switch ON.
(3) Disconnect the SST check wire from terminal 4 (CG) and reconnect it, and repeat this procedure 4 times or more within 8 seconds.
(4) Check that the P/S warning light blinking pattern is the normal code.
(5) Turn the ignition switch OFF.
(6) Remove SST from the DLC3.