

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

12.Diagnostic Procedure with Diagnostic Trouble Code (DTC)

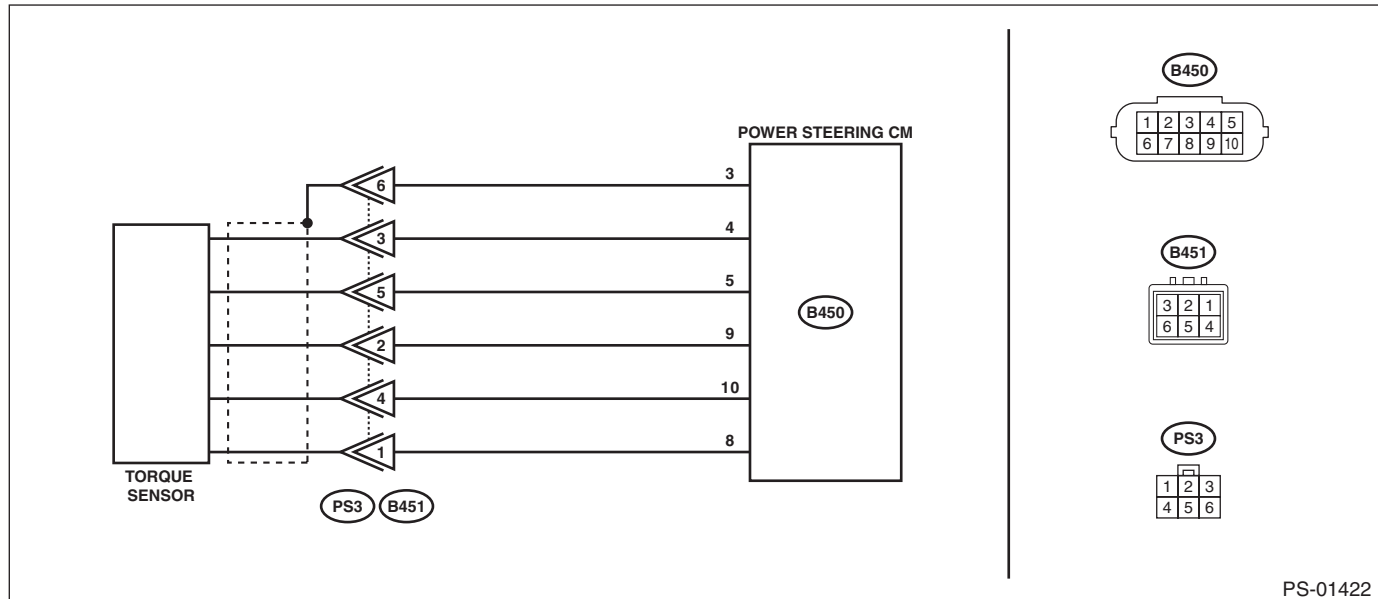
A: DTC C2511 TORQUE SENSOR FAILURE 1 (MAIN)

TROUBLE SYMPTOM:

- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

WIRING DIAGRAM:

Electric power steering system<Ref. to WI-157, Electric Power Steering System.>



PS-01422

Step	Check	Yes	No
1	CHECK TORQUE SENSOR SIGNAL. 1) Display the current data of the power steering control module using the Subaru Select Monitor. 2) Check the voltage of «Torque sensor main output», «Torque sensor sub output», «Torque sensor reference voltage» and «Torque sensor power supply voltage».	Are the voltage of «Torque sensor main output» and «Torque sensor sub output» 2.5 ± 0.1 V? Is the voltage of «Torque sensor reference voltage» 3 ± 0.1 V? Is the voltage of «Torque sensor power supply voltage» 8 ± 0.4 V?	Check for poor contact of the connector, and check the conditions again. If the condition recur, go to the next step. Go to step 2. If it does not recur, complete the inspection.
2	CHECK HARNESS. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors (B450, B451). 3) Using a tester and test harness, check the internal resistance of the harness terminals. Connector & terminal (B450) No. 4 — (B451) No. 3: (B450) No. 5 — (B451) No. 5: (B450) No. 8 — (B451) No. 1: (B450) No. 9 — (B451) No. 2: (B450) No. 10 — (B451) No. 4:	Is the resistance less than 10 Ω ?	Go to step 3. Repair or replace the harness.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

Step	Check	Yes	No
3 CHECK POWER STEERING CONTROL MODULE. 1) Connect the connector (B450) to the power steering control module. 2) Turn the ignition switch to ON. 3) Short the circuit between connector (B451) terminals. Terminals No. 4 — No. 3: No. 4 — No. 5: 4) Using the Subaru Select Monitor, check the voltages of «Torque sensor main output» and «Torque sensor sub output».	Are the voltages of «Torque sensor main output» and «Torque sensor sub output» before you short the circuit 0 ± 0.1 V? Are the voltages of «Torque sensor main output» and «Torque sensor sub output» after you short the circuit 3 ± 0.1 V?	Replace the steering gearbox.<Ref. to PS-25, Electric Power Steering Gearbox.>	Replace the power steering control module.<Ref. to PS-41, Power Steering Control Module.>

B: DTC C2512 TORQUE SENSOR FAILURE 2 (SUB)

NOTE:

For the diagnostic procedures, refer to “DTC 2511 TORQUE SENSOR FAILURE 1 (MAIN)”. <Ref. to PS(diag)-23, DTC C2511 TORQUE SENSOR FAILURE 1 (MAIN), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

C: DTC C2513 TORQUE SENSOR FAILURE 3 (MUCH TOLERANCE)

NOTE:

For the diagnostic procedures, refer to “DTC 2511 TORQUE SENSOR FAILURE 1 (MAIN)”. <Ref. to PS(diag)-23, DTC C2511 TORQUE SENSOR FAILURE 1 (MAIN), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

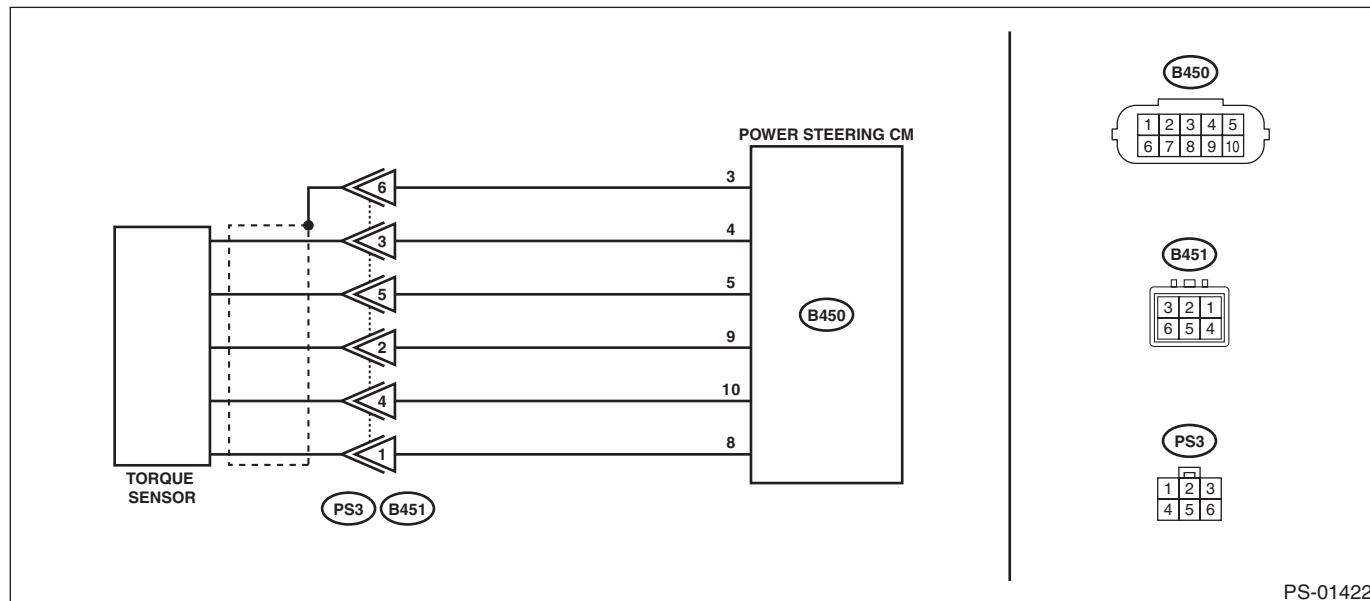
D: DTC C2514 TORQUE SENSOR POWER SUPPLY FAILURE

TROUBLE SYMPTOM:

- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

WIRING DIAGRAM:

Electric power steering system <Ref. to WI-157, Electric Power Steering System.>



Step	Check	Yes	No
1 CHECK TORQUE SENSOR SIGNAL. 1) Display the current data of the power steering control module using the Subaru Select Monitor. 2) Check the voltage of «Torque sensor main output», «Torque sensor sub output», «Torque sensor reference voltage» and «Torque sensor power supply voltage».	Are the voltage of «Torque sensor main output» and «Torque sensor sub output» 2.5 ± 0.1 V? Is the voltage of «Torque sensor reference voltage» 3 ± 0.1 V? Is the voltage of «Torque sensor power supply voltage» 8 ± 0.4 V?	Check for poor contact of the connector, and check the conditions again. If the condition recur, go to the next step. Go to step 2. If it does not recur, complete the inspection.	Go to step 2.
2 CHECK HARNESS. 1) Turn the ignition switch to OFF. 2) Disconnect the connector (B451). 3) Using a tester and test harness, check the internal resistance of the harness terminals. Connector & terminal (B450) No. 4 — (B451) No. 3: (B450) No. 5 — (B451) No. 5: (B450) No. 8 — (B451) No. 1: (B450) No. 9 — (B451) No. 2: (B450) No. 10 — (B451) No. 4:	Is the resistance less than 10 Ω ?	Replace the power steering control module. <Ref. to PS-41, Power Steering Control Module.>	Repair or replace the harness.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

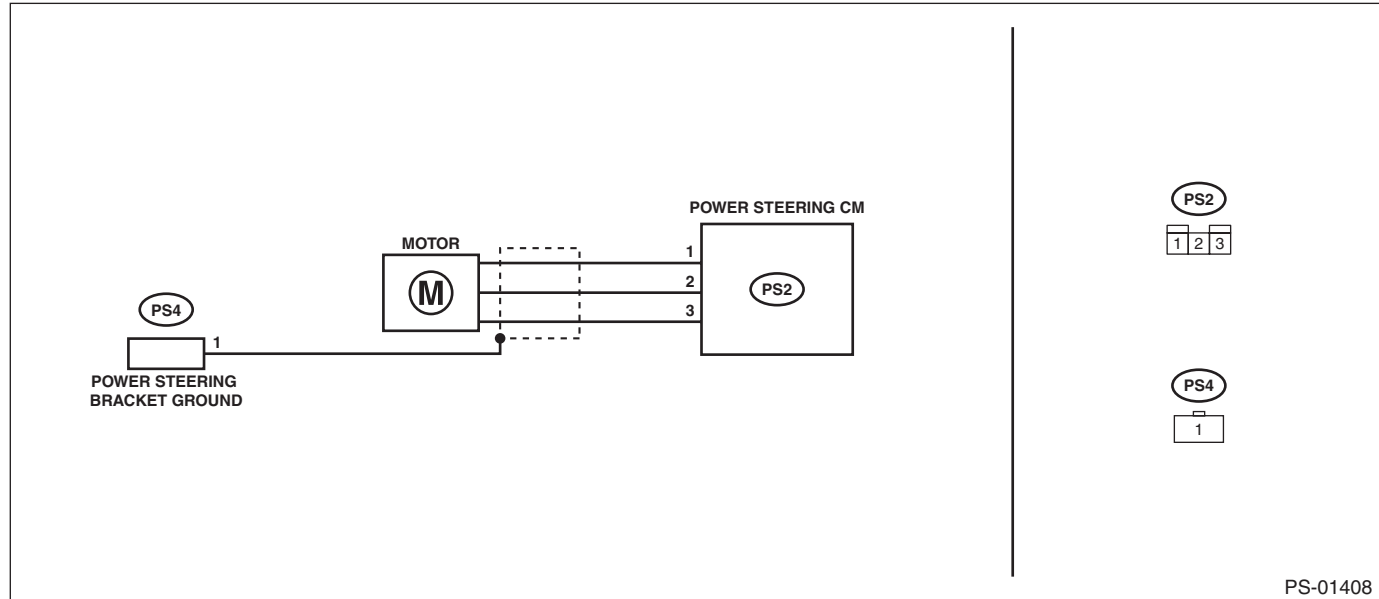
E: DTC C2521 MOTOR FAILURE 1 (MOTOR)

TROUBLE SYMPTOM:

- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

WIRING DIAGRAM:

Electric power steering system <Ref. to WI-157, Electric Power Steering System.>



Step	Check	Yes	No
1 CHECK MOTOR UNIT. 1) Turn the ignition switch to OFF. 2) Disconnect the connector (PS2) from the power steering control module. 3) Use a tester to check for continuity in the motor. Connector & terminal (PS2) No. 1 — No. 2: (PS2) No. 1 — No. 3: (PS2) No. 2 — No. 3:	Is there continuity?	Go to step 2.	Replace the steering gearbox. <Ref. to PS-25, Electric Power Steering Gearbox.>
2 CHECK MOTOR INSULATION. Use a tester to check for short circuits in the motor. Connector & terminal (PS2) No. 1 — Steering gearbox body: (PS2) No. 2 — Steering gearbox body: (PS2) No. 3 — Steering gearbox body:	Is the resistance 1 MΩ or more?	Replace the power steering control module. <Ref. to PS-41, Power Steering Control Module.>	Replace the steering gearbox. <Ref. to PS-25, Electric Power Steering Gearbox.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

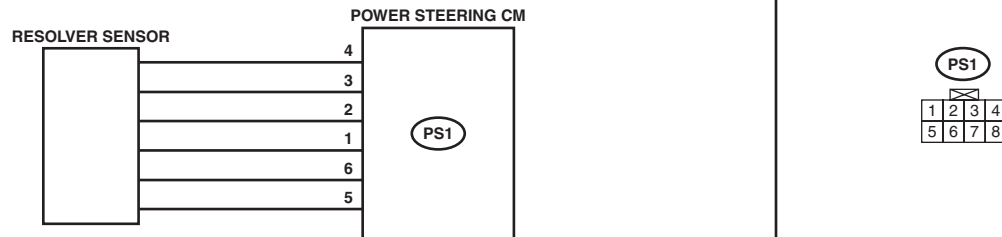
F: DTC C2522 MOTOR MALFUNCTION 2 (RESOLVER)

TROUBLE SYMPTOM:

- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

WIRING DIAGRAM:

Electric power steering system <Ref. to WI-157, Electric Power Steering System.>



PS-01423

Step	Check	Yes	No
1 CHECK MOTOR UNIT. 1) Turn the ignition switch to OFF. 2) Disconnect the connector (PS1) from the power steering control module. 3) Use a tester to check for continuity in the resolver sensor. Connector & terminal (PS1) No. 1 — No. 2 : (PS1) No. 3 — No. 4 : (PS1) No. 5 — No. 6 :	Is there continuity?	Go to step 2.	Replace the steering gearbox. <Ref. to PS-25, Electric Power Steering Gearbox.>
2 CHECK RESOLVER SENSOR INSULATION. Using a tester, check for short circuits in the resolver sensor. Connector & terminal (PS1) No. 1 — Steering gearbox body: (PS1) No. 2 — Steering gearbox body: (PS1) No. 3 — Steering gearbox body: (PS1) No. 4 — Steering gearbox body: (PS1) No. 5 — Steering gearbox body: (PS1) No. 6 — Steering gearbox body:	Is the resistance 1 MΩ or more?	Replace the power steering control module. <Ref. to PS-41, Power Steering Control Module.>	Replace the steering gearbox. <Ref. to PS-25, Electric Power Steering Gearbox.>

G: DTC C2531 ECU FAILURE 1 (CPU FAILURE)

TROUBLE SYMPTOM:

- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

NOTE:

When this code is displayed, replace the power steering control module with new parts. <Ref. to PS-41, Power Steering Control Module.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

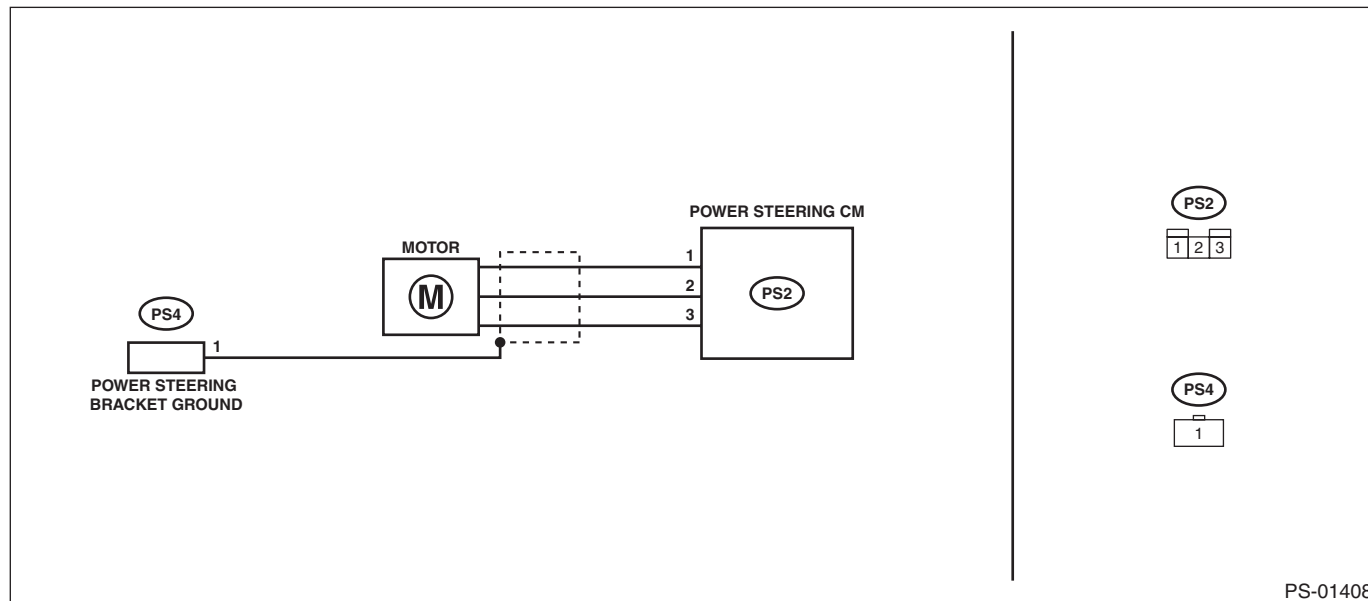
H: DTC C2532 ECU FAILURE 2 (PERIPHERAL CIRCUIT FAILURE)

TROUBLE SYMPTOM:

- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

WIRING DIAGRAM:

Electric power steering system<Ref. to WI-157, Electric Power Steering System.>



Step	Check	Yes	No
1 CHECK CONNECTOR. Check the connection status of the power steering control module and motor harness (PS2).	Is the connector firmly installed?	Go to step 2.	Install the connector, and check again.
2 CHECK CONNECTOR. Check the appearance at connection of the power steering control module and motor harness (PS2).	Is the motor harness grommet coming out from the connector?	Replace the steering gearbox.<Ref. to PS-25, Electric Power Steering Gearbox.>	Go to step 3.
3 CHECK MOTOR UNIT. 1) Turn the ignition switch to OFF. 2) Disconnect the connector (PS2) from the power steering control module. 3) Use a tester to check for continuity in the motor. <i>Connector & terminal</i> <i>(PS2) No. 1 — No. 2:</i> <i>(PS2) No. 1 — No. 3:</i> <i>(PS2) No. 2 — No. 3:</i>	Is there continuity? (While shaking the harness)	Go to step 4.	Replace the steering gearbox.<Ref. to PS-25, Electric Power Steering Gearbox.>
4 CHECK MOTOR INSULATION. Use a tester to check for short circuits in the motor. <i>Connector & terminal</i> <i>(PS2) No. 1 — Steering gearbox body:</i> <i>(PS2) No. 2 — Steering gearbox body:</i> <i>(PS2) No. 3 — Steering gearbox body:</i>	Is the resistance 1 MΩ or more? (While shaking the harness)	Replace the power steering control module.<Ref. to PS-41, Power Steering Control Module.>	Replace the steering gearbox.<Ref. to PS-25, Electric Power Steering Gearbox.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

I: DTC C2533 ECM FAILURE 3 (BOARD TEMPERATURE SENSOR FAILURE)

TROUBLE SYMPTOM:

The steering wheel operation feels heavy.

NOTE:

When this code is displayed, replace the power steering control module with new parts. <Ref. to PS-41, Power Steering Control Module.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

J: DTC C2541 VEHICLE SPEED IS ABNORMAL

TROUBLE SYMPTOM:

The steering wheel operation feels heavy.

Step	Check	Yes	No
1 CHECK DTC. Read all DTCs using the Subaru Select Monitor.	Is a DTC related to VDC CM or vehicle speed signal detected?	Perform the diagnosis according to the DTC.	Go to step 2.
2 CHECK LAN SYSTEM. Perform the diagnosis for LAN system using the Subaru Select Monitor. <Ref. to LAN(diag)-2, Basic Diagnostic Procedure.>	Is a DTC related to CAN communication detected?	Perform the diagnosis according to the DTC. <Ref. to LAN(diag)-101, List of Diagnostic Trouble Code (DTC).>	Go to step 3.
3 CHECK VEHICLE SPEED SIGNAL. 1) Display the current data «Vehicle Speed» of the power steering control module using the Subaru Select Monitor. 2) Lift up the vehicle (so that the wheels turn freely), start the engine, and raise engine speed in gear. CAUTION: Be careful that no one is near the spinning tires and nothing gets caught in them. 3) Check for whether the data changes according to vehicle speed.	Is the data in sync with the vehicle speed?	It is possible that temporary poor communication occurs. Perform memory clear.	Replace the power steering control module. <Ref. to PS-41, Power Steering Control Module.>

K: DTC C2543 ERROR PASSIVE STATUS

TROUBLE SYMPTOM:

The steering wheel operation feels heavy.

Step	Check	Yes	No
1 CHECK LAN SYSTEM. Perform the diagnosis for LAN system using the Subaru Select Monitor. <Ref. to LAN(diag)-2, Basic Diagnostic Procedure.>	Is a DTC related to CAN communication detected?	Perform the diagnosis according to the DTC. <Ref. to LAN(diag)-101, List of Diagnostic Trouble Code (DTC).>	Check for poor contact of the connector, and check the conditions again. If the condition recurs, perform the diagnosis according to the DTC. <Ref. to LAN(diag)-101, List of Diagnostic Trouble Code (DTC).> If it does not recur, complete the inspection.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

L: DTC C2551 POWER SUPPLY RELAY FAILURE

TROUBLE SYMPTOM:

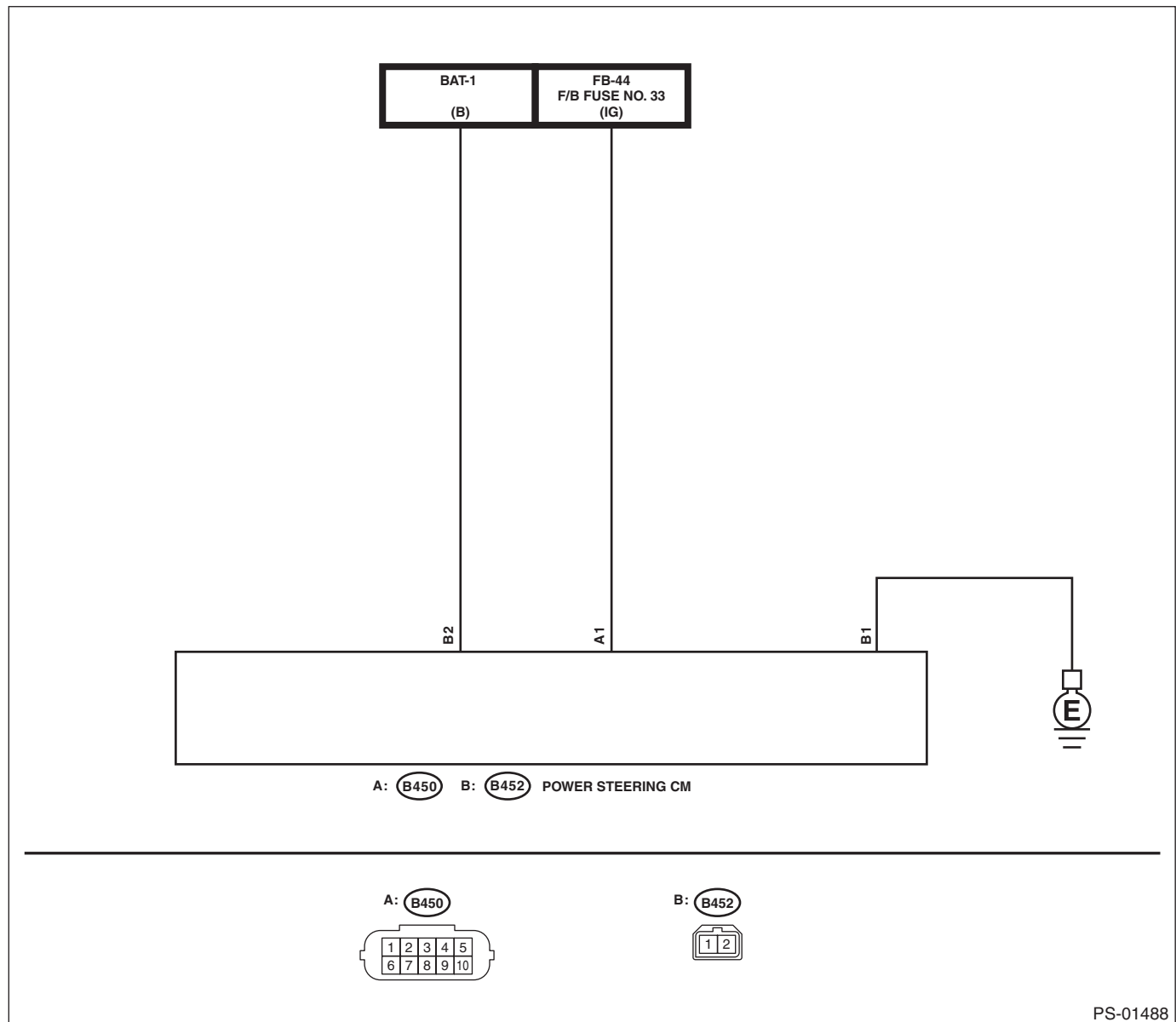
- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

NOTE:

If power supply voltage failure exists at the vehicle side, the warning light goes off if the normal voltage returns.

WIRING DIAGRAM:

Electric power steering system<Ref. to WI-157, Electric Power Steering System.>



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

Step		Check	Yes	No
1	CHECK BATTERY AND FUSE. Check the battery and fuse.	Is the voltage 12 V or more? Is the specific gravity 1.260 or more? Is the battery terminal installed properly? Is the fuse OK?	Go to step 2.	Repair or replace faulty parts.
2	CHECK WIRING HARNESS. 1) Disconnect the connector of the power steering control module. 2) Turn the ignition switch to ON. 3) Using a tester and test harness, check the voltage between terminals. Connector & terminal (B452) No. 2 (+) — Chassis ground (-):	Is the voltage 12 V or more?	Go to step 3.	Repair the open circuit of harness or the poor contact of connector between the power steering control module and the battery.
3	CHECK GROUND CIRCUIT. 1) Turn the ignition switch to OFF. 2) Using a tester and test harness, check the resistance between terminals. Connector & terminal (B450) No. 1 — Chassis ground:	Is the resistance less than 1 Ω ?	Check for poor contact of terminals in the power steering control module, and if there are no malfunctions, replace the power steering control module.<Ref. to PS-41, Power Steering Control Module.>	Repair the open circuit or poor contact of the harness between the power steering control module and chassis ground.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

M: DTC C2552 MOTOR RELAY ABNORMAL

TROUBLE SYMPTOM:

- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

NOTE:

When this code is displayed, replace the power steering control module with new parts. <Ref. to PS-41, Power Steering Control Module.>

N: DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

NOTE:

Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. <Ref. to LAN(diag)-2, Basic Diagnostic Procedure.>

O: DTC U0100 LOST COMMUNICATION WITH ECM/PCM “A”

NOTE:

Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. <Ref. to LAN(diag)-2, Basic Diagnostic Procedure.>

P: DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

NOTE:

Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. <Ref. to LAN(diag)-2, Basic Diagnostic Procedure.>

Q: DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

NOTE:

Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. <Ref. to LAN(diag)-2, Basic Diagnostic Procedure.>

R: DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM “A”

NOTE:

Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. <Ref. to LAN(diag)-2, Basic Diagnostic Procedure.>

S: DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

NOTE:

Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. <Ref. to LAN(diag)-2, Basic Diagnostic Procedure.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

BODY SECTION

This service manual has been prepared to provide SUBARU service personnel with the necessary information and data for the correct maintenance and repair of SUBARU vehicles.

This manual includes the procedures for maintenance, disassembling, reassembling, inspection and adjustment of components and diagnostics for guidance of experienced mechanics.

Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicle in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

All information, illustration and specifications contained in this manual are based on the latest product information available at the time of publication approval.

**HVAC SYSTEM
(HEATER, VENTILATOR AND A/C)** AC

**HVAC SYSTEM (AUTO A/C)
(DIAGNOSTICS)** AC(diag)

AIRBAG SYSTEM AB

AIRBAG SYSTEM (DIAGNOSTICS) AB(diag)

**OCCUPANT DETECTION SYSTEM
(DIAGNOSTICS)** OD(diag)

SEAT BELT SYSTEM SB

LIGHTING SYSTEM LI

**AUTO HEADLIGHT BEAM LEVELER
SYSTEM (DIAGNOSTICS)** AL(diag)

WIPER AND WASHER SYSTEMS WW

ENTERTAINMENT ET

COMMUNICATION SYSTEM COM

GLASS/WINDOWS/MIRRORS GW

BODY STRUCTURE BS

INSTRUMENTATION/DRIVER INFO IDI

**INSTRUMENTATION/DRIVER INFO
(DIAGNOSTICS)** IDI(diag)

SEATS SE

SECURITY AND LOCKS SL

BODY SECTION

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)	SR
--	----

EXTERIOR/INTERIOR TRIM	EI
------------------------	----

EXTERIOR BODY PANELS	EB
----------------------	----

POWER REAR GATE SYSTEM	PRG
------------------------	-----

POWER REAR GATE SYSTEM (DIAGNOSTICS)	PRG(diag)
---	-----------

CRUISE CONTROL SYSTEM	CC
-----------------------	----

CRUISE CONTROL SYSTEM (DIAGNOSTICS)	CC(diag)
--	----------

IMMOBILIZER (DIAGNOSTICS)	IM(diag)
---------------------------	----------

LAN SYSTEM (DIAGNOSTICS)	LAN(diag)
--------------------------	-----------

EyeSight	ES
----------	----

EyeSight (DIAGNOSTICS)	ES(diag)
------------------------	----------

KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM (DIAGNOSTICS)	KPS(diag)
---	-----------

BODY CONTROL SYSTEM (DIAGNOSTICS)	BC(diag)
-----------------------------------	----------

HVAC SYSTEM (HEATER, VENTILATOR AND A/C)

AC

	Page
1. General Description	2
2. Air Conditioning System	22
3. Refrigerant Pressure with Manifold Gauge Set	23
4. Refrigerant Recovery Procedure	28
5. Refrigerant Charging Procedure	29
6. Refrigerant Leak Check	32
7. Relay and Fuse	34
8. Compressor Oil	36
9. Blower Motor Unit Assembly	37
10. Blower Motor	39
11. Power Transistor (Auto A/C Model)	41
12. Blower Resistor (Manual A/C Model)	42
13. Heater Core	44
14. Control Panel	50
15. Compressor	54
16. Condenser	57
17. Heater and Cooling Unit	61
18. Evaporator	65
19. Expansion Valve	72
20. Hose and Pipe	74
21. Pressure Switch (Triple Pressure Switch)	78
22. Ambient Sensor	80
23. Sunload Sensor (Auto A/C Model)	82
24. In-Vehicle Sensor (Auto A/C Model)	84
25. Evaporator Sensor	88
26. FRESH/RECIRC Door Actuator	91
27. Mode Door Actuator	96
28. Air Mix Door Actuator	98
29. Air Vent Grille	100
30. Heater Duct	103
31. Heater Vent Duct	104
32. A/C Filter	105
33. Diagnostics with Phenomenon	106