

Subaru Select Monitor

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

6. Subaru Select Monitor

A: OPERATION

1. HOW TO USE SUBARU SELECT MONITOR

For detailed operation procedures, refer to “PC application help for Subaru Select Monitor”.

2. READ CURRENT DATA

For detailed operation procedures, refer to “PC application help for Subaru Select Monitor”.

Display	Contents to be displayed	Range	Unit
Torque sensor main output	Main torque sensor output voltage is displayed.	0 — 5	V
Torque sensor sub output	Sub torque sensor output voltage is displayed.	0 — 5	V
Vehicle speed	Vehicle speed is displayed. (CAN communication data)	0 — 255	km/h
Engine Speed	Engine speed is displayed. (CAN communication data)	0 — 12750	rpm
CU Sensing Current(q)	The current flowing to the motor relay is displayed.	−128 — 127	A
3-phase motor current (U-phase)	The U phase actual current value as calculated by the micro-computer from the torque sensor input is displayed.	−128 — 127	A
3-phase motor current (V-phase)	The V phase actual current value as calculated by the micro-computer from the torque sensor input is displayed.	−128 — 127	A
Motor angular speed	Data from the resolver sensor is displayed.	−4096 — 4064	rpm
CU Temperature	The thermistor temperature of the steering control module is displayed.	−50 — 205	°C
Power supply voltage	Battery voltage is displayed.	0 — 25.5	V
Torque sensor power supply voltage	The power supply voltage output to the torque sensor is displayed.	0 — 10.2	V
IG Voltage	The power supply voltage supplied to the ECM is displayed.	0 — 25.5	V
CAN Bus Status	Either Active/Passive/Bus Off is displayed.	—	—
EPS Status	Either Normal/Assist Stop/Assist Limitation is displayed.	—	—
CU Target current(q)	The motor target current value required for assist is displayed.	−128 — 127	A
Steering Angle	Steering angle of steering wheel is displayed.	−640 — 635	deg
Overheating protection intervention history	Number of interventions to the overheat protection control (assist limitation for protecting the power steering from overheating)*1	0 — 250	times
IG Count after ECU Overheat Protection(latest)	Number of times the ignition switch is ON from the intervention to overheat protection control (most recent) until now*2	0 — 65000	times
IG Count after ECU Overheat Protection(Previous)	Number of times the ignition switch is ON from the intervention to overheat protection control (previous) until now*2	0 — 65000	times
IG Count after ECU Overheat Protection(Before Previous)	Number of times the ignition switch is ON from the intervention to overheat protection control (before previous) until now*2	0 — 65000	times
Assist limit history (low voltage)	Number of intervention to assist limit when the power supply voltage is low or high*1	0 — 250	times
Torque Sensor Amplifier	Torque sensor control voltage is displayed.	0 — 5	V
Motor Current	The current flowing to the motor relay is displayed.	−128 — 127	Arms

NOTE:

- *1 When the value exceeds the maximum of 250 times, 250 is displayed.
- *2 When there is no intervention of the overheating protection control, “65535” is displayed. If an error such as control unit memory error, etc. occurs, “65534” is displayed.

Subaru Select Monitor

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

3. FREEZE FRAME DATA

For detailed operation procedures, refer to “PC application help for Subaru Select Monitor”.

Display	Contents to be displayed	Range	Unit
Torque sensor main output	Main torque sensor output voltage is displayed.	0 — 5	V
Torque sensor sub output	Sub torque sensor output voltage is displayed.	0 — 5	V
Vehicle speed	Vehicle speed is displayed. (CAN communication data)	0 — 255	km/h
Engine Speed	Engine speed is displayed. (CAN communication data)	0 — 12750	rpm
CU Sensing Current(q)	The current flowing to the motor relay is displayed.	−128 — 127	A
3-phase motor current (U-phase)	The U phase actual current value as calculated by the micro-computer from the torque sensor input is displayed.	−128 — 127	A
3-phase motor current (V-phase)	The V phase actual current value as calculated by the micro-computer from the torque sensor input is displayed.	−128 — 127	A
Motor angular speed	Data from the resolver sensor is displayed.	−4096 — 4064	rpm
CU Temperature	The thermistor temperature of the steering control module is displayed.	−50 — 205	°C
Power supply voltage	Battery voltage is displayed.	0 — 25.5	V
Torque sensor power supply voltage	The power supply voltage output to the torque sensor is displayed.	0 — 10.2	V
IG Voltage	The power supply voltage supplied to the ECM is displayed.	0 — 25.5	V
CAN Bus Status	Either Active/Passive/Bus Off is displayed.	—	—
EPS Status	Either Normal/Assist Stop/Assist Limitation is displayed.	—	—
CU Target current(q)	The motor target current value required for assist is displayed.	−128 — 127	A
Steering Angle	Steering angle of steering wheel is displayed.	−640 — 635	deg
Overheating protection intervention history	Number of interventions to the overheat protection control (assist limitation for protecting the power steering from overheating)*1	0 — 250	times
IG Count after ECU Overheat Protection(latest)	Number of times the ignition switch is ON from the intervention to overheat protection control (most recent) until now*2	0 — 65000	times
IG Count after ECU Overheat Protection(Previous)	Number of times the ignition switch is ON from the intervention to overheat protection control (previous) until now*2	0 — 65000	times
IG Count after ECU Overheat Protection(Before Previous)	Number of times the ignition switch is ON from the intervention to overheat protection control (before previous) until now*2	0 — 65000	times
Assist limit history (low voltage)	Number of intervention to assist limit when the power supply voltage is low or high*1	0 — 250	times
Torque Sensor Amplifier	Torque sensor control voltage is displayed.	0 — 5	V
Motor Current	The current flowing to the motor relay is displayed.	−128 — 127	Arms

NOTE:

- *1 When the value exceeds the maximum of 250 times, 250 is displayed.
- *2 When there is no intervention of the overheating protection control, “65535” is displayed. If an error such as control unit memory error, etc. occurs, “65534” is displayed.
- Freeze frame data stored at the time of trouble occurrence is shown on the display.
- Data of the first trouble occurrence is stored as the freeze frame data in memory.
- Three freeze frame data are stored.

Subaru Select Monitor

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

B: INSPECTION

1. COMMUNICATION FOR INITIALIZING IMPOSSIBLE

DETECTING CONDITION:

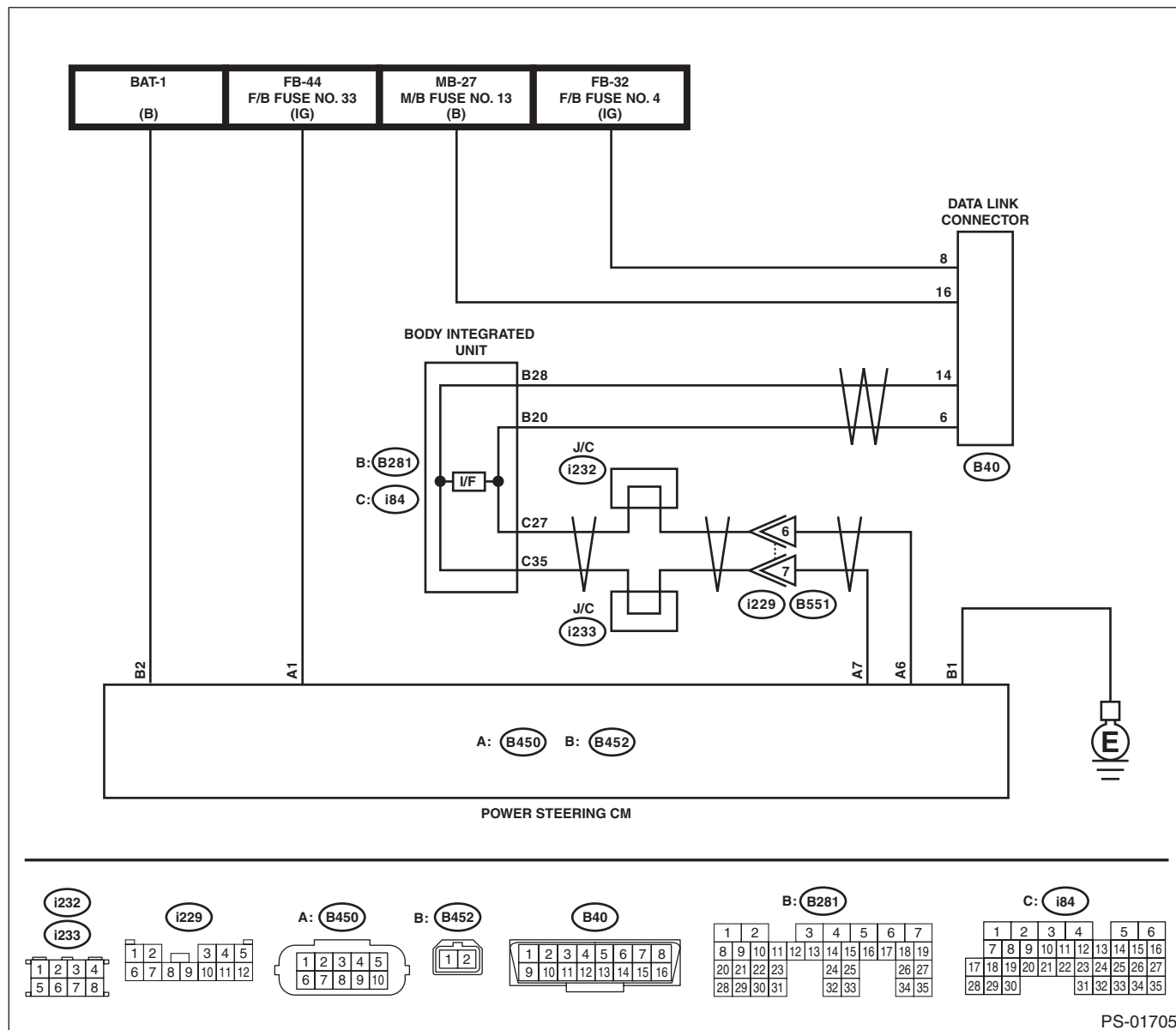
- Defective harness connector
- Defective power steering control module

TROUBLE SYMPTOM:

- Communication is impossible between the power steering control module and Subaru Select Monitor.
- After starting the engine, the STEERING warning light does not illuminate but steering effort is heavy.

WIRING DIAGRAM:

Electric power steering system <Ref. to WI-159, Electric Power Steering System.>



Step	Check	Yes	No
1	CHECK IGNITION SWITCH.		
	Is the ignition switch ON?	Go to step 2.	Turn the ignition switch to ON, and select the power steering mode using the Subaru Select Monitor.

Subaru Select Monitor

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

Step	Check	Yes	No	
2	CHECK BATTERY. 1) Turn the ignition switch to OFF. 2) Measure the battery voltage.	Is the voltage 11 V or more?	Go to step 3.	Charge or replace the battery.
3	CHECK BATTERY TERMINAL.	Is there poor contact at battery terminal?	Repair or tighten the battery terminal.	Go to step 4.
4	CHECK POWER STEERING CONTROL MODULE CONNECTOR INSTALLATION. Turn the ignition switch to OFF.	Is the power steering control module connector inserted into the power steering control module until the clamp locks?	Go to step 5.	Insert the power steering control module connector into the power steering control module.
5	CHECK LAN SYSTEM. Perform the diagnosis for LAN system. <Ref. to LAN(diag)-2, Basic Diagnostic Procedure.>	Is there any fault in LAN system?	Perform the diagnosis according to DTC for LAN system. <Ref. to LAN(diag)-70, List of Diagnostic Trouble Code (DTC).>	Go to step 6.
6	CHECK SUBARU SELECT MONITOR COMMUNICATION. 1) Turn the ignition switch to ON. 2) Check whether communication to electric power steering system can be executed normally.	Is the system name displayed on Subaru Select Monitor?	Check DTC of electric power steering system. <Ref. to PS(diag)-16, Read Diagnostic Trouble Code (DTC).>	Go to step 7.
7	CHECK POWER SUPPLY CIRCUIT. 1) Turn the ignition switch to ON. (engine OFF) 2) Measure the ignition power supply voltage between the power steering control module connector and chassis ground. Connector & terminal (B450) No. 1 (+) — Chassis ground (-): (B452) No. 2 (+) — Chassis ground (-):	Is the voltage 10 — 15 V?	Go to step 8.	Repair the open circuit in the harness between the power steering control module and the battery.
8	CHECK HARNESS CONNECTOR BETWEEN POWER STEERING CONTROL MODULE AND CHASSIS GROUND. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the power steering control module. 3) Measure the resistance of harness between power steering control module connector and chassis ground. Connector & terminal (B452) No. 1 — Chassis ground:	Is the resistance less than 10 Ω?	Go to step 9.	Repair the open circuit of the power steering control module ground circuit and the poor contact of connector.
9	CHECK POOR CONTACT OF CONNECTOR.	Is there poor contact of power steering control module power supply, ground circuit and data link connector?	Repair the connector.	Replace the power steering control module. <Ref. to PS-84, Power Steering Control Module.>

Subaru Select Monitor

POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS)

2. WITHOUT DTC

DETECTING CONDITION:

- Defective combination meter
- Open circuit of harness

TROUBLE SYMPTOM:

- The steering warning light will not turn off.
- “No diagnostic Code Present” will be displayed on the Subaru Select Monitor.

NOTE:

When the steering warning light is OFF and “No diagnostic Code Present” is displayed on Subaru Select Monitor when all DTCs are read, the system is operating properly.

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 DTC U0131 detected?	Perform the diagnosis according to DTC for LAN system. <Ref. to LAN(diag)-70, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 CHECK COMBINATION METER. Check the steering warning light when the ignition is turned from OFF to ON.	Does the steering warning light illuminate at ignition switch ON, and turn off two seconds after the engine is started?	Finish the diagnosis.	Replace the combination meter. <Ref. to IDI-13, Combination Meter.>