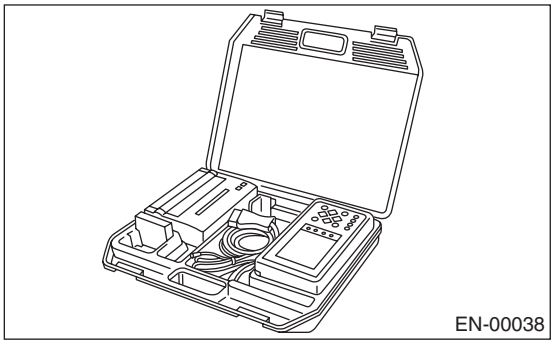
9. Subaru Select Monitor

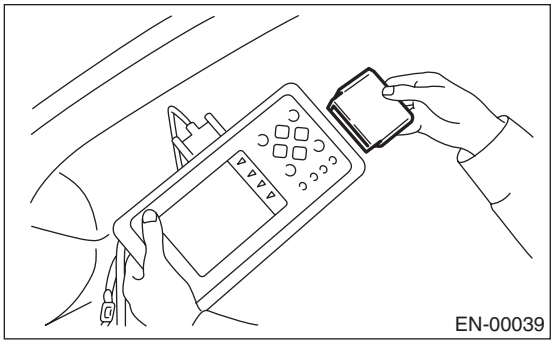
A: OPERATION

1. HOW TO USE SUBARU SELECT MONITOR

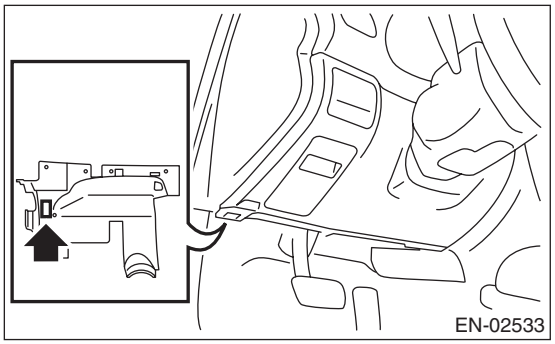
1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4SO U5)(diag)-8, PREPARATION TOOL, General Description.>



2) Connect the diagnosis cable to Subaru Select Monitor.
3) Insert the cartridge to Subaru Select Monitor. <Ref. to EN(H4SO U5)(diag)-8, PREPARATION TOOL, General Description.>



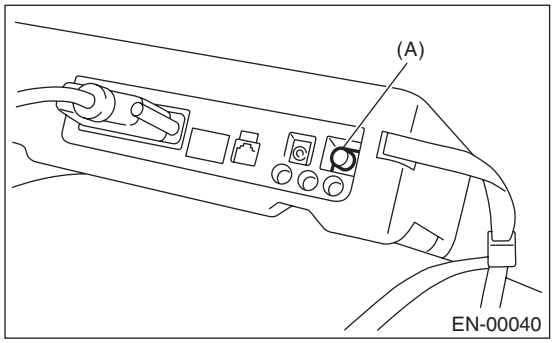
4) Connect the Subaru Select Monitor to the data link connector.
(1) Data link connector is located in the lower portion of instrument panel (on the driver's side).



(2) Connect the diagnosis cable to data link connector.

CAUTION:
Do not connect any scan tools except Subaru Select Monitor or general scan tool.

5) Turn the ignition switch to ON (engine OFF) and Subaru Select Monitor switch to ON.



(A) Power switch

6) Using the Subaru Select Monitor, call up DTCs and data, then record them.

2. READ DIAGNOSTIC TROUBLE CODE (DTC) FOR ENGINE (NORMAL MODE)

Refer to "Read Diagnostic Trouble Code" for information about how to indicate DTC. <Ref. to EN(H4SO U5)(diag)-35, Read Diagnostic Trouble Code (DTC).>

3. READ DIAGNOSTIC TROUBLE CODE (DTC) FOR ENGINE (OBD MODE)

Refer to "Read Diagnostic Trouble Code" for information about how to indicate DTC. <Ref. to EN(H4SO U5)(diag)-35, Read Diagnostic Trouble Code (DTC).>

4. READ CURRENT DATA FOR ENGINE (NORMAL MODE)

1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
2) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
3) Press the [YES] key after the information of engine type has been displayed.
4) On the «Engine Diagnosis» display screen, select the {Current Data Display/Save}, and then press the [YES] key.
5) On the «Data Display Menu» screen, select the {Data Display} and press the [YES] key.
6) Using the scroll key, scroll the display screen up or down until the desired data is shown.
A list of the support data is shown in the following table.

Remarks	Display	Unit of measure	Note (at idling)
Engine load	Engine Load	%	21.0%
Engine coolant temperature signal	Coolant Temp.	°C or °F	94°C or 201°F
A/F correction 1	A/F Correction #1	%	–0.8%
A/F learning 1	A/F Learning #1	%	0.0%
Intake manifold absolute pressure	Mani. Absolute Pressure	mmHg, kPa, inHg or psig	200 — 300 mmHg, 26.7 — 40 kPa, 7.8 — 11.8 inHg or 3.8 — 5.8 psig
Engine speed signal	Engine speed	rpm	700 rpm (Agree with the tachometer indication)
Meter vehicle speed signal	Vehicle Speed	km/h or MPH	0 km/h or 0 MPH (at parking)
Ignition timing signal	Ignition Timing	deg	14 — 16 deg
Intake air temperature signal	Intake Air Temp.	°C or °F	(Ambient air temperature)
Amount of intake air	Mass Air Flow	g/s or lb/m	2.5 g/s or 0.33 lb/m
Throttle opening angle signal	Throttle Opening Angle	%	2.0%
Rear oxygen sensor voltage	Rear O2 Sensor	V	0.1 — 0.7 V
Battery voltage	Battery Voltage	V	12 — 14 V
Mass air flow voltage	Air Flow Sensor Voltage	V	1.26 V
Injection 1 pulse width	Fuel Injection #1 Pulse	ms	2.82 ms
Knock sensor correction	Knocking Correction	deg	0.0 deg
Atmospheric pressure signal	Atmosphere Pressure	mmHg, kPa, inHg or psig	(Atmosphere pressure)
Intake manifold relative pressure	Mani. Relative Pressure	mmHg, kPa, inHg or psig	(Air intake absolute pressure – atmosphere pressure)
Fuel tank pressure signal	Fuel Tank Pressure	mmHg, kPa, inHg or psig	+7.9 mmHg, +1.1 kPa, +0.31 inHg or +0.15 psig
Acceleration opening angle signal	Accel. Opening Angle	%	0.0%
Fuel temperature signal	Fuel Temp.	°C or °F	+20°C or +68°F
Fuel level signal	Fuel Level	V	0 — 5 V
Purge control solenoid duty ratio	CPC Valve Duty Ratio	%	0 — 3%
EGR steps	No. of EGR Steps	STEP	0 STEP
A/F sensor current value 1	A/F Sensor #1 Current	mA	–0.2 — 0.2 mA
A/F sensor resistance value 1	A/F Sensor #1 Resistance	Ω	32 Ω
A/F sensor output lambda 1	A/F sensor output lambda 1	—	1.0
A/F correction 3	A/F Correction #3	%	0.3%
A/F learning 3	A/F Learning #3	%	0.00%
Throttle motor duty	Throttle Motor Duty	%	–15%
Throttle power supply voltage	Throttle Motor Voltage	V	(Battery voltage)
Sub throttle sensor voltage	Sub-throttle Sensor	V	1.52 V
Main throttle sensor voltage	Main-throttle Sensor	V	0.66 V

Remarks	Display	Unit of measure	Note (at idling)
Sub acceleration sensor voltage	Sub-accelerator Sensor	V	0.68 V
Main acceleration sensor voltage	Main-accelerator Sensor	V	0.68 V
Memory vehicle speed	Memorized Cruise Speed	km/h or MPH	0 km/h or 0 MPH
Fuel level sensor signal	Fuel Level Resistance	Ω	69.6 Ω
Engine oil temperature	Engine Oil Temperature	°C	≥ 85°C (After engine is warmed-up.)
Oil switching solenoid valve duty R	OSV Duty R	%	16.9%
Oil switching solenoid valve duty L	OSV Duty L	%	16.9%
Oil switching solenoid valve current R	OSV Current R	mA	192 mA
Oil switching solenoid valve current L	OSV Current L	mA	192 mA
Variable valve lift lift mode	VVL Lift Mode	—	1
#1 cylinder roughness monitor	Roughness Monitor #1	—	0
#2 cylinder roughness monitor	Roughness Monitor #2	—	0
#3 cylinder roughness monitor	Roughness Monitor #3	—	0
#4 cylinder roughness monitor	Roughness Monitor #4	—	0
AT/MT identification terminal	AT Vehicle ID Signal	—	AT vehicle/MT vehicle
Test mode terminal	Test Mode Terminal	—	U-check
Neutral position switch signal	Neutral Position Switch	—	Neutral
Soft idle switch signal	Idle Switch Signal	—	At idle
Ignition switch signal	Ignition Switch	—	ON input
Power steering switch signal	P/S Switch	—	OFF input (At OFF)
Air conditioning switch signal	A/C Switch	—	OFF input (At OFF)
Starter switch signal	Starter Switch	—	OFF input
Rear oxygen monitor	Rear O2 Rich Signal	—	Rich/Lean
Knocking signal	Knocking Signal	—	None
Crankshaft position sensor signal	Crankshaft Position Signal	—	Provided
Camshaft position sensor signal	Camshaft Position Signal	—	Provided
Rear defogger switch signal	Rear Defogger Switch	—	OFF input (At OFF)
Blower fan switch signal	Blower Fan Switch	—	OFF input (At OFF)
Light switch signal	Light Switch	—	OFF input (At OFF)
A/C middle pressure switch signal	A/C Mid Pressure Switch	—	OFF input (At OFF)
Air conditioner compressor relay output signal	A/C Compressor Signal	—	OFF output (At OFF)
Radiator fan relay 1 signal	Radiator Fan Relay #1	—	OFF output (At OFF)
Radiator fan relay 2 signal	Radiator Fan Relay #2	—	OFF output (At OFF)
Fuel pump relay signal	Fuel Pump Relay	—	ON output
PCV hose assembly diagnosis signal	Blow-by Leak Diagnosis Connector	—	Connected
Pressure control solenoid valve signal	PCV Solenoid Valve	—	OFF output
Drain valve signal	Vent. Solenoid Valve	—	OFF output
Variable valve lift diagnosis oil pressure switch signal 1	Eng. Oil Press. SW 1	—	ON
Variable valve lift diagnosis oil pressure switch signal 2	Eng. Oil Press. SW 2	—	ON
AT coordinate retard angle demand signal	Retard Signal from AT	—	None
AT coordinate fuel cut demand signal	Fuel Cut Signal from AT	—	None
AT cooperative permission signal	Torque Control Permission Signal	—	ON
Electronic throttle control motor relay signal	ETC Motor Relay	—	ON
Clutch switch signal	Clutch Switch	—	OFF (At OFF)
Stop light switch signal	Stop Light Switch	—	OFF (At OFF)
SET/COAST switch signal	SET/COAST Switch	—	OFF (At OFF)
RES/ACC switch signal	RESUME/ACCEL Switch	—	OFF (At OFF)

Remarks	Display	Unit of measure	Note (at idling)
Brake switch signal	Brake Switch	—	OFF input (At OFF)
Main switch signal	Main Switch	—	OFF input (At OFF)
Integrated unit data reception	Body Int. Unit Data	—	Provided
Body integrated unit counter update	Body Int. Unit Count	—	Provided
Cruise control cancel switch signal	Cruise Control Cancel Switch	—	OFF input (At OFF)

NOTE:
For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.

5. READ CURRENT DATA FOR ENGINE (OBD MODE)

1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
2) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
3) Press the [YES] key after the information of engine type has been displayed.
4) On the «Engine Diagnosis» display screen, select the {OBD System} and press the [YES] key.
5) On the «OBD Menu» display screen, select the {Current Data Display/Save}, and then press the [YES] key.
6) On the «Data Display Menu» screen, select the {Data Display} and press the [YES] key.
7) Using the scroll key, scroll the display screen up or down until the desired data is shown.
A list of the support data is shown in the following table.

Description	Display	Unit of measure	Note (at idling)
Number of diagnosis code	Number of DTC	—	0
Condition of malfunction indicator light	MI (MIL)	—	OFF
Misfire monitoring	Misfire monitoring	—	Complete
Fuel system monitoring	Fuel system monitoring	—	Complete
Component monitoring	Component monitoring	—	Complete
Test of catalyst	Catalyst Diagnosis	—	Incomplete
Test of heating-type catalyst	Heated catalyst	—	No
Test of evaporative purge system	Evaporative purge system	—	Incomplete
Test of secondary air system	Secondary air system	—	No
Test of A/C system refrigerant	A/C system refrigerant	—	No
Test of oxygen sensor	Oxygen sensor	—	Incomplete
Test of oxygen sensor heater	O2 Heater Diagnosis	—	Complete
Test of EGR system	EGR system	—	Incomplete
A/F control #1	Fuel system for BANK 1	—	Normal CLOSE
Load	Calculated load valve	%	23.0%
Engine coolant temperature signal	Coolant Temp.	°C or °F	+92°C
A/F correction value #1	A/F Correction Value #1	%	–0.8%
A/F learning value #1	A/F Learning Value #1	%	+0.0%
Intake manifold absolute pressure	Mani. Absolute Pressure	mmHg, kPa, inHg or psig	211 mmHg, 28.1 kPa, 8.31 inHg or 4.08 psig
Engine speed signal	Engine Speed	rpm	700 rpm
Vehicle speed signal	Vehicle Speed	km/h or MPH	0 km/h or 0 MPH
Ignition timing #1	Ignition timing adv.#1	°	+16.0°
Intake air temperature signal	Intake Air Temp.	°C or °F	36°C or 97°F
Intake air amount	Mass Air Flow	g/s or lb/m	2.7 g/s or 0.36 lb/m
Throttle opening angle signal	Throttle Opening Angle	%	13%
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	V	0.7 V
A/F correction (Bank 1 Sensor 2)	A/F Correction #12	%	+0.0%
OBD system	OBD system	—	CARB–OBD2
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	Oxygen sensor #11	—	Support
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	—	Support
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	A/F sensor #11	—	1.001
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	A/F sensor #11	V	2.79 V
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	A/F sensor #11	—	1.001
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	A/F sensor #11	mA	0.00 mA

NOTE:
For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.

6. READ FREEZE FRAME DATA FOR ENGINE (OBD MODE)

1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
2) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
3) Press the [YES] key after the information of engine type has been displayed.
4) On the «Engine Diagnosis» display screen, select the {OBD System} and press the [YES] key.
5) On the »OBD Menu» display screen, select the {Freeze Frame Data} and press the [YES] key.
A list of the support data is shown in the following table.

Contents	Display	Unit of measure
DTC of freeze frame data	Freeze frame data	DTC
Air fuel ratio control system for bank 1	Fuel system for Bank1	Normal CLOSE or initial OPEN
Engine load data	Engine Load	%
Engine coolant temperature signal	Coolant Temp.	°C or °F
Short term fuel trim by front oxygen (A/F) sensor	Short term fuel trim B1	%
Long term fuel trim by front oxygen (A/F) sensor	Long term fuel trim B1	%
Intake manifold absolute pressure signal	Mani.Absolute Pressure	mmHg, kPa, inHg or psig
Engine speed signal	Engine Speed	rpm
Vehicle speed signal	Vehicle Speed	km/h or MPH
Ignition timing signal	Ignition Timing	°
Intake air amount	Mass Air Flow	g/s or lb/m
Intake air temperature signal	Intake Air Temp.	°C
Throttle position signal	Throttle Opening Angle	%
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	V
A/F correction (Bank 1 Sensor 2)	Short term fuel trim #11	%
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	Oxygen sensor #11	Support
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	Support

NOTE:
For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.

7. LED OPERATION MODE FOR ENGINE

1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
2) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
3) Press the [YES] key after the information of engine type has been displayed.
4) On the «Engine Diagnosis» display screen, select the {Current Data Display/Save}, and then press the [YES] key.
5) On the «Data Display» screen, select the {Data LED Display} and press the [YES] key.
6) Using the scroll key, scroll the display screen up or down until the desired data is shown.
A list of the support data is shown in the following table.

Remarks	Display	Message	LED “ON” requirements
AT/MT identification signal	AT Vehicle ID Signal	ON or OFF	Illuminate (AT model)
Test mode signal	Test Mode Terminal	U check or D check	D check
Neutral position switch signal	Neutral Position Switch	ON or OFF	When neutral position signal is input.
Idle switch signal	Idle Switch Signal	ON or OFF	When idle switch signal is input.
Ignition switch signal	Ignition Switch	ON or OFF	When ignition switch is turned ON.
Power steering switch signal	P/S Switch	ON or OFF	When power steering switch is entered.
Air conditioning switch signal	A/C Switch	ON or OFF	When air conditioning switch is input.
Starter switch signal	Starter Switch	ON or OFF	When starter switch is input.
Rear oxygen sensor rich signal	Rear O2 Rich Signal	Rich or Lean	When rear oxygen sensor mixture ratio is rich.
Knocking signal	Knocking Signal	Provided or None	When knocking signal is input.
Crankshaft position sensor signal	Crankshaft Position Signal	Provided or None	When crankshaft position sensor signal is input.
Camshaft position sensor signal	Camshaft Position Signal	Provided or None	When camshaft position sensor signal is input.
Rear defogger switch signal	Rear Defogger Switch	ON or OFF	When rear defogger switch is turned to ON.
Blower fan switch signal	Blower Fan Switch	ON or OFF	When blower fan switch is turned to ON.
Light switch signal	Light Switch	ON or OFF	When light switch is turned ON.
A/C middle pressure switch signal	A/C Mid Pressure Switch	ON or OFF	When A/C middle pressure switch is turned to ON.
Air conditioning relay signal	A/C Compressor Signal	ON or OFF	When air conditioning relay is in function.
Radiator fan relay 1 signal	Radiator Fan Relay #1	ON or OFF	When radiator fan relay 1 is in function.
Radiator fan relay 2 signal	Radiator Fan Relay #2	ON or OFF	When radiator fan relay 2 is in function.
Fuel pump relay signal	Fuel Pump Relay	ON output or OFF output	ON output
PCV hose assembly diagnosis signal	Blow-by Leak Connector	Connected or Not connected	PVC hose assembly connected
Pressure control solenoid valve signal	PCV Solenoid Valve	ON or OFF	Pressure control solenoid valve is operated.
Drain valve signal	Vent Control Solenoid	ON or OFF	Drain valve is operated.
Variable valve lift diagnosis oil pressure switch signal 1	Oil Press. SW1	ON or OFF	When variable valve lift diagnosis oil pressure switch signal 1 is ON.
Variable valve lift diagnosis oil pressure switch signal 2	Oil Press. SW2	ON or OFF	When variable valve lift diagnosis oil pressure switch signal 2 is ON.
AT retard angle demand signal	Retard Signal	Provided or None	When AT retard angle demand signal is input.

Remarks	Display	Message	LED “ON” requirements
AT fuel cut signal	Fuel Cut	Provided or None	When AT fuel cut signal is input.
AT cooperative permission signal	Torque Control Permission	ON or OFF	When AT coordinate permission signal is input.
Electronic throttle control motor relay signal	ETC Motor Relay	ON or OFF	When electronic throttle control motor relay is in function.
Clutch switch signal	Clutch switch	ON or OFF	When clutch switch is turned to ON.
Stop light switch signal	Stop Light Switch	ON or OFF	When stop light switch is turned ON.
SET/COAST switch signal	SET/COAST Switch	ON or OFF	When SET/COAST switch is turned to ON.
RES/ACC switch signal	RESUME/ACCEL Switch	ON or OFF	When RES/ACC switch is turned to ON.
Brake switch signal	Brake Switch	ON or OFF	When brake switch is turned to ON.
Main switch signal	Main Switch	ON or OFF	When main switch is turned to ON.
Data reception signal	Body Int. Unit Data	Provided or None	Data reception signal input
Counter update signal	Body Int. Unit Count	Provided or None	Counter update signal input
Cancel switch signal	Cancel Switch	ON or OFF	When cancel switch is turned to ON.

NOTE:
For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.

8. V.I.N. REGISTRATION

1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
2) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
3) Press the [YES] key after the information of engine type has been displayed.
4) On the «Engine Diagnosis» display screen, select the {VIN Registration} and press the [YES] key.
5) Perform the procedure displayed on screen.

NOTE:
For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.