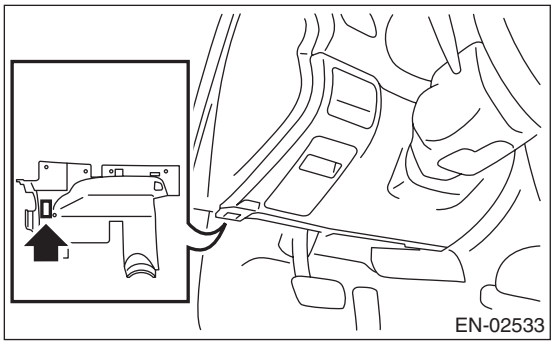
9. Subaru Select Monitor

A: OPERATION

1. HOW TO USE THE SUBARU SELECT MONITOR

1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4SO)(diag)-8, PREPARATION TOOL, General Description.>
2) Connect the diagnosis cable to the Subaru Select Monitor.
3) 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 the data link connector.

CAUTION:
Do not connect the scan tools except for the Subaru Select Monitor or general scan tool.
4) Turn the ignition switch to ON (engine OFF) and run the Subaru Select Monitor.
5) Using the Subaru Select Monitor, call up DTC 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)(diag)-43, 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)(diag)-43, Read Diagnostic Trouble Code (DTC).>

4. READ CURRENT DATA FOR ENGINE (NORMAL MODE)

1) On the «Main Menu» display screen, select {Each System Check}.
2) On the «System Selection Menu» display screen, select {Engine Control System}.
3) Select the [OK] after the information of engine type has been displayed.
4) On the «Engine Diagnosis» display screen, select the {Current Data Display/Save}.
5) On the «Data Display Menu» screen, select {Data Display}.
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.

Contents	Display	Unit of measure	Note (at idling)
Engine load	Engine Load	%	21.0%
Engine coolant temperature signal	Coolant Temp.	°C or °F	85°C or 185°F or more (after warm-up)
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 compensation	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	+7.7 mmHg, +1.1 kPa, +0.31 inHg or +0.15 psig
Ignition learning value	Learned Ignition Timming	deg	0 deg
Acceleration opening angle signal	Accel. Opening Angle	%	0.0%
Fuel temperature signal	Fuel Temp.	°C or °F	+20°C or +68°F
Purge control solenoid duty ratio	CPC Valve Duty Ratio	%	0 — 3%
No. of 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)

Contents	Display	Unit of measure	Note (at idling)
Sub throttle sensor voltage	Sub-throttle Sensor	V	1.52 V
Main throttle sensor voltage	Main-throttle Sensor	V	0.66 V
Sub accelerator sensor voltage	Sub-accelerator Sensor	V	0.68 V
Main accelerator 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	2 — 96 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 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
D check request flag	D Check Request	—	OFF
Delivery mode terminal	Delivery Mode	—	OFF
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 (when OFF)
Air conditioning switch signal	A/C Switch	—	OFF input (when 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 (when OFF)
Blower fan switch signal	Blower Fan Switch	—	OFF input (when OFF)
Light switch signal	Light Switch	—	OFF input (when OFF)
A/C middle pressure switch signal	A/C Mid Pressure Switch	—	OFF input (when OFF)
Air conditioner compressor relay output signal	A/C Compressor Signal	—	OFF output (when OFF)
Radiator fan relay 1 signal	Radiator Fan Relay #1	—	OFF output (when OFF)
Radiator fan relay 2 signal	Radiator Fan Relay #2	—	OFF output (when 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

Contents	Display	Unit of measure	Note (at idling)
AT coordinate permission signal	Torque Control Permission Signal	—	Allowed (prohibited on MT vehicles)
Electronic throttle control motor relay signal	ETC Motor Relay	—	ON
Clutch switch signal	Clutch Switch	—	OFF (when OFF)
Stop light switch signal	Stop Light Switch	—	OFF (when OFF)
SET/COAST switch signal	SET/COAST Switch	—	OFF (when OFF)
RES/ACC switch signal	RESUME/ACCEL Switch	—	OFF (when OFF)
Brake switch signal	Brake Switch	—	OFF input (when OFF)
Main switch signal	Main Switch	—	OFF input (when OFF)
Body integrated unit data reception	Body Int. Unit Data	—	ON
Body integrated unit counter update	Body Int. Unit Count	—	ON
Cruise control cancel switch signal	Cruise Control Cancel Switch	—	OFF input (when OFF)
Malfunction indicator light signal	MIL Lit Flag	—	Off (when unlit)

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 {Each System Check}.
2) On the «System Selection Menu» display screen, select {Engine Control System}.
3) Select the [OK] after the information of engine type has been displayed.
4) On the «Engine Diagnosis» display screen, select the {OBD System}.
5) On the «OBD Menu» display screen, select the {Current Data Display/Save}.
6) On the «Data Display Menu» screen, select {Data Display}.
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.

Contents	Display	Unit of measure	Note (at idling)
Number of diagnosis code	Number of DTC	—	0
Condition of malfunction indicator light	MI (MIL)	—	OFF
Monitoring test of misfire	Misfire monitoring	—	Supp YES
Monitoring test of misfire	Misfire monitoring	—	Rdy YES/Rdy NO
Monitoring test of fuel system	Fuel system monitoring	—	Supp YES
Monitoring test of fuel system	Fuel system monitoring	—	Rdy YES/Rdy NO
Monitoring test of comprehensive component	Component monitoring	—	Supp YES
Monitoring test of comprehensive component	Component monitoring	—	Rdy YES/Rdy NO
Test of catalyst	Catalyst Diagnosis	—	Supp YES
Test of catalyst	Catalyst Diagnosis	—	Rdy YES/Rdy NO
Test of heating-type catalyst	Heated catalyst	—	Supp NO
Test of heating-type catalyst	Heated catalyst	—	Rdy N/A
Test of evaporative emission purge control system	Evaporative purge system	—	Supp YES
Test of evaporative emission purge control system	Evaporative purge system	—	Rdy YES/Rdy NO
Secondary air system test	Secondary air system	—	Supp NO
Secondary air system test	Secondary air system	—	Rdy N/A
Test of air conditioning system	A/C system refrigerant	—	Supp NO
Test of air conditioning system	A/C system refrigerant	—	Rdy N/A
Test of oxygen sensor	Oxygen sensor	—	Supp YES
Test of oxygen sensor	Oxygen sensor	—	Rdy YES/Rdy NO
Test of oxygen sensor heater	O2 Heater Diagnosis	—	Supp YES
Test of oxygen sensor heater	O2 Heater Diagnosis	—	Rdy YES/Rdy NO
Test of EGR system	EGR system	—	Supp YES
Test of EGR system	EGR system	—	Rdy YES/Rdy NO
A/F control #1	Fuel system for BANK 1	—	Normal CLOSE
Calculated load value	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 #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 adv. #1	Ignition timing adv.#1	°	+16.0°
Intake air temperature signal	Intake Air Temp.	°C or °F	36°C or 97°F
Amount of intake air	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

Contents	Display	Unit of measure	Note (at idling)
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
Time elapsed after engine start	Time Since Engine Start	sec	—
Driving distance after the malfunction indicator light illuminates	Lighted MI lamp history	km or miles	—
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
Target EGR	Target EGR	%	—
EGR error	EGR deviation	%	—
Evaporative purge	Commanded Evap Purge	%	0%
Fuel level signal	Fuel Level	%	—
Warmup RPM after DTC clear	Number of warm-ups	—	—
Driving distance after DTC clear	Meter since DTC cleared	km or miles	—
Fuel tank pressure signal	Fuel Tank Pressure	mmHg, kPa, inHg or psig	8.8 mmHg, 1.2 kPa, 0.4 inHg or 0.2 psig
Atmospheric pressure signal	Atmosphere Pressure	mmHg, kPa, inHg or psig	Atmospheric pressure
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
Catalyzer temperature	Catalyst Temperature	°C or °F	—
Monitoring test of misfire	Misfire monitoring	—	Enable YES/NO
Monitoring test of misfire	Misfire monitoring	—	Comp YES/NO
Monitoring test of fuel system	Fuel system monitoring	—	Enable YES/NO
Monitoring test of fuel system	Fuel system monitoring	—	Comp YES/NO
Monitoring test of comprehensive component	Component monitoring	—	Enable YES/NO
Monitoring test of comprehensive component	Component monitoring	—	Comp YES/NO
Test of catalyst	Catalyst Diagnosis	—	Enable YES/NO
Test of catalyst	Catalyst Diagnosis	—	Comp YES/NO
Test of heating-type catalyst	Heated catalyst	—	Enable N/A
Test of heating-type catalyst	Heated catalyst	—	Comp N/A
Test of evaporative emission purge control system	Evaporative purge system	—	Enable YES/NO
Test of evaporative emission purge control system	Evaporative purge system	—	Comp YES/NO
Secondary air system test	Secondary air system	—	Enable N/A
Secondary air system test	Secondary air system	—	Comp N/A
Test of air conditioning system	A/C system refrigerant	—	Enable N/A
Test of air conditioning system	A/C system refrigerant	—	Comp N/A
Test of oxygen sensor	Oxygen sensor	—	Enable YES/NO
Test of oxygen sensor	Oxygen sensor	—	Comp YES/NO
Test of oxygen sensor heater	O2 Heater Diagnosis	—	Enable YES/NO
Test of oxygen sensor heater	O2 Heater Diagnosis	—	Comp YES/NO
Test of EGR system	EGR system	—	Enable YES/NO
Test of EGR system	EGR system	—	Comp YES/NO
ECM power voltage	Control module voltage	V	13.789 V
Absolute load	Absolute Load Value	%	22%
A/F ratio target lambda	Target Equivalence Ratio	—	0.976

Contents	Display	Unit of measure	Note (at idling)
Relative throttle opening angle	Relative Throttle Pos.	%	2%
Ambient temperature	Ambient Temperature	°C or °F	(Ambient air temperature)
Absolute throttle opening angle 2	Absolute Throttle Pos.#2	%	32%
Absolute accelerator opening angle 1	Accelerator Pedal Pos.#1	%	13%
Absolute accelerator opening angle 2	Accelerator Pedal Pos.#2	%	13%
Target throttle opening angle	Target Throt. Act. Cont.	%	0%
Engine operating time while malfunction indicator lit	Time while MIL lighted	min	—
Time elapsed after DTC clear	Time since DTC cleared	min	—
Fuel used	Type of fuel	—	GAS
Relative accelerator opening angle	Relative Accelera. Pos.	%	0%

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 {Each System Check}.
2) On the «System Selection Menu» display screen, select {Engine Control System}.
3) Select the [OK] after the information of engine type has been displayed.
4) On the «Engine Diagnosis» display screen, select the {OBD System}.
5) On the «OBD Menu» display screen, select {Freeze Frame Data}.

A list of the support data is shown in the following table.

Contents	Display	Unit of measure
Freeze frame data DTC code	Freeze frame data	DTC
Air fuel ratio control system for bank 1	Fuel system for Bank1	Normal CLOSE or OPEN early period
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 advance for #1 cylinder	Ignition Timing	°
Intake air temperature signal	Intake Air Temp.	°C or °F
Amount of intake air	Mass Air Flow	g/s or lb/m
Throttle position signal	Throttle Opening Angle	%
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	Oxygen sensor #11	Support
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	Support
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	V
A/F correction (Bank 1 Sensor 2)	Short term fuel trim #11	%
On-board diagnostic system	OBD system	—
Time elapsed after engine start	Time Since Engine Start	sec
Target EGR	Target EGR	%
EGR deviation	EGR deviation	%
Evaporative purge	Commanded Evap Purge	%
Fuel level signal	Fuel Level	%
Fuel tank pressure signal	Fuel Tank Pressure	mmHg, kPa, inHg or psig
Atmospheric pressure	Atmosphere Pressure	mmHg, kPa, inHg or psig
ECM power voltage	Control module voltage	V
Absolute load	Absolute Load Value	%
A/F ratio target lambda	Target Equivalence Ratio	—
Relative throttle opening angle	Relative Throttle Pos.	%
Ambient temperature	Ambient Temperature	°C or °F
Absolute throttle opening angle 2	Absolute Throttle Pos.#2	%
Absolute accelerator opening angle 1	Accelerator Pedal Pos.#1	%
Absolute accelerator opening angle 2	Accelerator Pedal Pos.#2	%
Target throttle opening angle	Target Throt. Act. Cont.	%

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

7. V.I.N REGISTRATION

1) On the «Main Menu» display screen, select {Each System Check}.
2) On the «System Selection Menu» display screen, select {Engine Control System}.
3) Select the [OK] after the information of engine type has been displayed.
4) On the «Engine Diagnosis» display screen, select {V.I.N. Registration}.
5) Perform the procedures shown on the display screen.

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