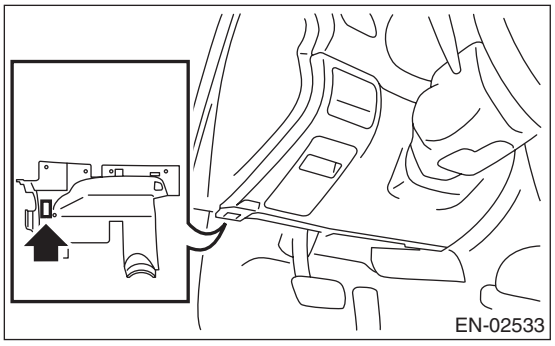
9. Subaru Select Monitor

A: OPERATION

1. HOW TO USE THE SUBARU SELECT MONITOR

1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H6DO)(diag)-7, 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 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(H6DO)(diag)-42, 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(H6DO)(diag)-42, 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	%	2.4%
Engine coolant temperature signal	Engine coolant temperature	°C or °F	≥ 85°C or 185°F (After engine is warmed-up.)
A/F correction 1	A/F Compensation 1	%	–10% — +10%
A/F learning 1	A/F learning 1	%	–10% — +10%
A/F correction 2	A/F Compensation 2	%	–10% — +10%
A/F learning 2	A/F learning 2	%	–10% — +10%
Intake manifold absolute pressure	Intake manifold absolute pressure	mmHg, kPa, inHg or psig	210 mmHg, 28 kPa, 8.3 inHg or 4.1 psig
Engine speed signal	Engine speed	rpm	600 — 800 rpm (After engine is warmed-up.)
Meter vehicle speed signal	Meter vehicle speed	km/h or MPH	0 km/h or 0 MPH
Ignition timing signal	Ignition timing	deg	13 — 15 deg
Intake air temperature signal	Intake air temperature	°C or °F	(Ambient air temperature)
Amount of intake air	Amount of intake air	g/s or lb/m	2.5 g/s — 5.0 g/s or 0.31 lb/m — 0.71 lb/m
Throttle opening angle signal	Throttle valve angle	%	2%
Front oxygen sensor voltage value 1	Front oxygen sensor voltage value 1	V	0.900 V
Front oxygen sensor voltage value 2	Front oxygen sensor voltage value 2	V	0.900 V
Battery voltage	Battery Voltage	V	12 — 13 V
Mass air flow voltage	Mass air flow voltage	V	1.2 — 1.3 V
Injection 1 pulse width	Injection 1 pulse width	ms	2.5 ms — 3.5 ms
Injection 2 pulse width	Injection 2 pulse width	ms	2.5 ms — 3.5 ms
Atmospheric pressure signal	Atmosphere Pressure	mmHg, kPa, inHg or psig	(Atmosphere pressure)
Intake manifold relative pressure	Intake manifold relative pressure	mmHg, kPa, inHg or psig	(Intake manifold absolute pressure — atmosphere pressure)
Ignition learning value	Learned Ignition Timming	deg	+0.0 deg
Acceleration opening angle signal	Acceleration opening angle	%	0%
Fuel temperature signal	Fuel Temp.	°C or °F	+28°C or +82°F
Radiator fan output	Radiator fan output	%	0% (Water temperature 90°C (194°F) when air conditioner is OFF)
Purge control solenoid valve duty ratio	CPC duty	%	18%
Fuel pump duty	Fuel pump duty	%	33%
Variable valve timing advance angle amount R	VVT advance angle amount R	deg	+0 deg — +1 deg
Variable valve timing advance angle amount L	VVT advance angle amount L	deg	+0 deg — +1 deg

Contents	Display	Unit of measure	Note (at idling)
Oil flow control solenoid valve duty R	OCV duty R	%	9.4%
Oil flow control solenoid valve duty L	OCV duty L	%	9.4%
Oil flow control solenoid valve current R	OCV current R	mA	64 mA
Oil flow control solenoid valve current L	OCV current L	mA	64 mA
Front oxygen (A/F) sensor current value 1	A/F sensor current value 1	mA	0.0 mA
Front oxygen (A/F) sensor current value 2	A/F sensor current value 2	mA	0.0 mA
Front oxygen (A/F) sensor resistance value 1	A/F sensor resistance value 1	Ω	31 Ω
Front oxygen (A/F) sensor resistance value 2	A/F sensor resistance value 2	Ω	31 Ω
Front oxygen (A/F) sensor output lambda 1	A/F sensor output lambda 1	—	1.01
Front oxygen (A/F) sensor output lambda 2	A/F sensor output lambda 2	—	1.01
A/F correction 3	A/F Compensation 3	%	0% — 1%
A/F learning 3	A/F learning 3	%	0.0%
Throttle motor duty	Throttle motor duty	%	–20% — +20%
Throttle power supply voltage	Throttle power supply voltage	V	(Battery voltage)
Sub throttle sensor voltage	Sub throttle sensor voltage	V	1.4 V — 1.5 V
Main throttle sensor voltage	Main throttle sensor voltage	V	0.62 V — 0.70 V
Sub accelerator sensor voltage	Sub acceleration sensor voltage	V	1.0 V — 1.2 V
Main accelerator sensor voltage	Main acceleration sensor voltage	V	0.9 V — 1.1 V
Memory vehicle speed	Memory vehicle speed	km/h or MPH	0 km/h or 0 MPH
A/F correction 4	A/F Compensation 4	%	–1% — 1%
A/F learning 4	A/F learning 4	%	0.0%
Fuel level sensor resistance	Fuel level resistance	Ω	4 — 96 Ω
Engine oil temperature	Oil Temperature	°C or °F	≥ 85°C or 185°F (After engine is warmed-up.)
Oil switching solenoid valve duty R	OSV duty R	%	18.4%
Oil switching solenoid valve duty L	OSV duty L	%	18.8%
Oil switching solenoid valve current R	OSV current R	mA	192 mA
Oil switching solenoid valve current L	OSV current L	mA	192 mA
Lift mode of variable valve lift	VVL Lift Mode	—	1
#1 cylinder roughness monitor	#1 cylinder roughness monitor	—	0
#2 cylinder roughness monitor	#2 cylinder roughness monitor	—	0
#3 cylinder roughness monitor	#3 cylinder roughness monitor	—	0
#4 cylinder roughness monitor	#4 cylinder roughness monitor	—	0
#5 cylinder roughness monitor	#5 cylinder roughness monitor	—	0
#6 cylinder roughness monitor	#6 cylinder roughness monitor	—	0
Knock sensor correction	Knock correction	deg	0 deg
Fuel tank pressure signal	Fuel Tank Pressure	mmHg, kPa, inHg or psig	0 mmHg, 0 kPa, 0 inHg or 0 psig
AT/MT identification	AT Vehicle ID Signal	—	OFF
Test mode terminal	Test mode terminal	—	U check

Contents	Display	Unit of measure	Note (at idling)
System operation check mode	D-check Require Flag	—	OFF
Test mode terminal	Delivery Mode Connector	—	OFF
Neutral position switch signal	Neutral SW	—	Neutral
Idle switch signal	Soft Idle SW	—	At idle
Ignition switch signal	Ignition SW	—	ON input
Power steering switch signal	Power steering SW input signal	—	OFF input (when OFF)
Air conditioning switch signal	A/C SW	—	OFF input (when OFF)
Starter switch signal	Starter SW	—	OFF input
Front oxygen monitor 1	Front oxygen monitor 1	—	Rich, Lean
Front oxygen monitor 2	Front oxygen monitor 2	—	Rich, Lean
Knocking signal	Knock signal	—	None
Crankshaft position sensor signal	Crankshaft angle signal	—	Provided
Camshaft position sensor signal	Camshaft angle signal	—	Provided
Rear defogger switch signal	Rear Defogger SW	—	OFF input (when OFF)
Blower fan switch signal	Blower fan SW	—	OFF input (when OFF)
Light switch signal	Light SW	—	OFF input (when OFF)
A/C lock signal	A/C lock signal	—	OFF input
A/C middle pressure switch signal	A/C middle pressure SW	—	OFF input (when air conditioner is OFF)
A/C compressor relay signal	A/C compressor relay output	—	OFF output (when air conditioner is OFF)
Pressure control solenoid valve signal	PCV Solenoid	—	OFF output (when OFF)
Drain valve signal	Vent Control Solenoid	—	OFF output (when OFF)
Variable valve lift diagnosis oil pressure switch signal 1	Oil Temperature SW1	—	ON
Variable valve lift diagnosis oil pressure switch signal 2	Oil Temperature SW2	—	ON
AT coordinate retard angle demand signal	AT coordinate retard angle demand	—	None
AT coordinate fuel cut demand signal	AT coordinate fuel cut demand	—	None
Vehicle dynamics control (VDC) torque down prohibition output	VDC torque down prohibition output	—	Permission
Vehicle dynamics control (VDC) torque down demand	VDC torque down demand	—	None
AT cooperative permission signal	AT coordinate permission signal	—	Permission
Electronic throttle control motor relay signal	ETC motor relay	—	ON
Clutch switch signal	Clutch Switch	—	OFF (when clutch is OFF)
Stop light switch signal	Stop light SW	—	OFF (when brake is OFF)
SET/COAST switch signal	SET/COAST SW	—	OFF (when levers are not operated)
RESUME/ACCEL switch signal	RESUME/ACCEL SW	—	OFF (when levers are not operated)
Brake switch signal	Brake SW	—	OFF (when brake is OFF)
Main switch signal	Main SW	—	OFF (when levers are not operated)
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	CC Cancel SW	—	OFF (when levers are not operated)
Malfunction indicator light flag	MIL Lit Flag	—	Light OFF

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
Number of diagnosis code	Number of Diag. Code:	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
Monitoring test of fuel system	Fuel system monitoring	Supp YES
Monitoring test of fuel system	Fuel system monitoring	Rdy YES
Monitoring test of comprehensive component	Component monitoring	Supp YES
Monitoring test of comprehensive component	Component monitoring	Rdy YES
Test of catalyst	Catalyst Diagnosis	Supp YES
Test of catalyst	Catalyst Diagnosis	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 NO
Test of secondary air system	Secondary air system	Supp NO
Test of secondary air system	Secondary air system	Rdy N/A
Test of air conditioning system refrigerant	A/C system refrigerant	Supp NO
Test of air conditioning system refrigerant	A/C system refrigerant	Rdy N/A
Test of oxygen sensor	Oxygen senor	Supp YES
Test of oxygen sensor	Oxygen senor	Rdy NO
Test of oxygen sensor heater	Oxygen sensor heater	Supp YES
Test of oxygen sensor heater	Oxygen sensor heater	Rdy YES
Test of EGR system	EGR system	Supp NO
Test of EGR system	EGR system	Rdy N/A
A/F control #1	Fuel system for Bank 1	Normal CLOSE
A/F control #2	Fuel system for Bank 2	Normal CLOSE
Load	Calculated load value	%
Engine coolant temperature	Coolant Temp.	°C or °F
A/F correction value #1	Short term fuel trim B1	%
A/F learning value #1	Long term fuel trim B1	%
A/F correction value #2	Short term fuel trim B2	%
A/F learning value #2	Long term fuel trim B2	%
Intake manifold absolute pressure	Mani. Absolute Pressure	mmHg, kPa, inHg or psig
Engine speed	Engine Speed	rpm
Vehicle speed	Vehicle speed	km/h or MPH
Ignition timing #1	Ignition timing adv.#1	°
Intake air temperature	Intake Air Temp.	°C or °F
Amount of intake air	Mass Air Flow	g/s or lb/m
Throttle opening angle	Throttle Opening Angle	%
Oxygen sensor #12	Oxygen sensor #12	V
A/F correction value #12	Short term fuel trim #12	%

Contents	Display	Unit of measure
Oxygen sensor #22	Oxygen sensor #22	V
A/F correction value #22	Short term fuel trim #22	%
OBD system	OBD System	OBD/OBD2
Oxygen sensor #11	Oxygen sensor #11	Support
Oxygen sensor #12	Oxygen sensor #12	Support
Oxygen sensor #21	Oxygen sensor #21	Support
Oxygen sensor #22	Oxygen sensor #22	Support
Elapsed time after engine start	Time Since Engine Start	sec
Travel distance after the malfunction indicator light illuminates	Lighted MI lamp history	km or miles
A/F sensor #11	A/F sensor #11	—
A/F sensor #11	A/F sensor #11	V
A/F sensor #21	A/F sensor #21	—
A/F sensor #21	A/F sensor #21	V
Evaporative purge	Commanded Evap Purge	%
Fuel level signal	Fuel Level	%
Number of warm ups after DTC clear	Number of warm-ups	—
Travel distance after DTC clear	Meter since DTC cleared	km or miles
Fuel tank pressure signal	Fuel Tank Pressure	mmHg, kPa, inHg or psig
Atmospheric pressure	Atmospheric pressure	mmHg, kPa, inHg or psig
A/F sensor #11	A/F sensor #11	—
A/F sensor #11	A/F sensor #11	mA
A/F sensor #21	A/F sensor #21	—
A/F sensor #21	A/F sensor #21	mA
Catalyst temperature #1	Catalyst Temperature #1	°C or °F
Catalyst temperature #2	Catalyst Temperature #2	°C or °F
Monitoring test of misfire	Misfire monitoring	Enable YES or NO
Monitoring test of misfire	Misfire monitoring	Comp YES or NO
Monitoring test of fuel system	Fuel system monitoring	Enable YES or NO
Monitoring test of fuel system	Fuel system monitoring	Comp YES or NO
Monitoring test of comprehensive component	Component monitoring	Enable YES or NO
Monitoring test of comprehensive component	Component monitoring	Comp YES or NO
Test of catalyst	Catalyst Diagnosis	Enable YES or NO
Test of catalyst	Catalyst Diagnosis	Comp YES or 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 or NO
Test of evaporative emission purge control system	Evaporative purge system	Comp YES or NO
Test of secondary air system	Secondary air system	Enable N/A
Test of secondary air system	Secondary air system	Comp N/A
Test of air conditioning system refrigerant	A/C system refrigerant	Enable N/A
Test of air conditioning system refrigerant	A/C system refrigerant	Comp N/A
Test of oxygen sensor	Oxygen senor	Enable YES or NO
Test of oxygen sensor	Oxygen senor	Comp YES or NO
Test of oxygen sensor heater	Oxygen sensor heater	Enable YES or NO
Test of oxygen sensor heater	Oxygen sensor heater	Comp YES or NO
Test of EGR system	EGR system	Enable N/A
Test of EGR system	EGR system	Comp N/A
ECM power voltage	Control module voltage	V
Absolute load	Absolute Load Value	%
A/F target lambda	Target Equivalence Ratio	—

Contents	Display	Unit of measure
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.	%
Engine operating time while malfunction indicator light lit	Time while MIL lighted	min
Elapsed time after DTC clear	Time since DTC cleared	min
Fuel used	Type of fuel	GAS
Relative accelerator opening angle	Relative Accelera. Pos.	%

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
DTC of freeze frame data	Freeze frame data	DTC
Air fuel ratio control system for bank 1	Fuel system for Bank1	—
Air fuel ratio control system for bank 2	Fuel system for Bank2	—
Engine load data	Engine Load	%
Engine coolant temperature signal	Coolant Temp.	°C or °F
Short term fuel trim by front oxygen (A/F) sensor (Bank 1)	Short term fuel trim B1	%
Long term fuel trim by front oxygen (A/F) sensor (Bank 1)	Long term fuel trim B1	%
Short term fuel trim by front oxygen (A/F) sensor (Bank 2)	Short term fuel trim B2	%
Long term fuel trim by front oxygen (A/F) sensor (Bank 2)	Long term fuel trim B2	%
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 #1	Ignition timing adv. #1	°
Intake air temperature	Intake Air Temp.	°C or °F
Amount of intake air	Mass Air Flow	g/s
Throttle opening angle	Throttle Opening Angle	%
Oxygen sensor #11	Oxygen sensor #11	Support
Oxygen sensor #12	Oxygen sensor #12	Support
Oxygen sensor #21	Oxygen sensor #21	Support
Oxygen sensor #22	Oxygen sensor #22	Support
Oxygen sensor #12	Oxygen sensor #12	V
A/F correction value #12	Short term fuel trim #12	%
Oxygen sensor #22	Oxygen sensor #22	V
A/F correction value #22	Short term fuel trim #22	%
On-board diagnostic system	OBD System	—
Elapsed time after engine start	Time Since Engine Start	sec
Evaporative purge	Commanded Evap Purge	%
Fuel level signal	Fuel Level	%
Fuel tank pressure signal	Fuel Tank Pressure	mmHg, kPa, inHg or psig
Atmospheric pressure	Atmospheric pressure	mmHg, kPa, inHg or psig
ECM power voltage	Control module voltage	V
Absolute load	Absolute Load Value	%
A/F 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”.