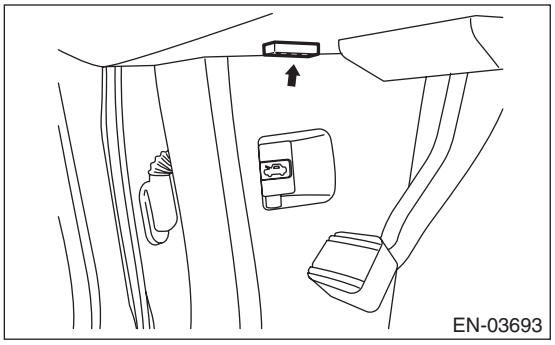
9. Subaru Select Monitor

A: OPERATION

1. HOW TO USE 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 at the lower portion of instrument panel (on the driver's side).



CAUTION:
Do not connect the scan tools except for Subaru Select Monitor and 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 display a DTC. <Ref. to EN(H6DO)(diag)-37, 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 display a DTC. <Ref. to EN(H6DO)(diag)-37, 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}.
2) On the «System Selection Menu» display screen, select the {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 the {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.

Description	Display	Unit of measure	Note (at idling)
Engine load	Engine load	%	3.5%
Engine coolant temperature signal	Coolant Temp.	°C or °F	≥ 75°C or 167°F (After engine is warmed-up.)
A/F compensation 1	A/F Compensation 1	%	3.1%
A/F learning 1	A/F learning 1	%	0.0%
A/F compensation 2	A/F Compensation 2	%	4.7%
A/F learning 2	A/F learning 2	%	0.0%
Intake manifold absolute pressure	Mani. Absolute Pressure	mmHg, kPa, inHg or psig	200 — 300 mmHg, 26.7 — 40 kPa, 7.9 — 11.8 inHg or 3.8— 5.8 psig
Engine speed signal	Engine speed	rpm	600 — 800 rpm
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	Mass Air Flow	g/s or lb/m	3.8 g/s or 0.5 lb/m
Throttle opening angle signal	Throttle valve angle	%	1.2 — 1.6%
Front oxygen sensor voltage value 1	Front oxygen sensor voltage value 1	V	0.035 V
Front oxygen sensor voltage value 2	Front oxygen sensor voltage value 2	V	0.020 V
Battery voltage	Battery Voltage	V	12 — 14 V
Mass air flow voltage	Mass air flow voltage	V	1.1 — 1.2 V
Injection 1 pulse width	Injection 1 pulse width	ms	2.82 ms
Injection 2 pulse width	Injection 2 pulse width	ms	2.82 ms
Atmospheric pressure signal	Atmospheric pressure	mmHg, kPa, inHg or psig	(Atmospheric pressure)
Intake manifold relative pressure	Intake manifold relative pressure	mmHg, kPa, inHg or psig	(Intake manifold absolute pressure — atmospheric pressure)
Ignition learning value	Ignition learning value	deg	0 — 5 deg
Fuel temperature signal	Fuel Temp.	°C or °F	+28°C or +82°F
Acceleration opening angle signal	Acceleration opening angle	%	0%
Purge control solenoid valve duty ratio	CPC Duty	%	0 — 3%
Fuel pump duty	Fuel pump duty	%	33%
Variable valve timing advance angle amount R	VVT advance angle amount R	deg	0 deg
Variable valve timing advance angle amount L	VVT advance angle amount L	deg	0 deg
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

Description	Display	Unit of measure	Note (at idling)
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	—	1.00
Front oxygen (A/F) sensor output lambda 2	A/F sensor output lambda 2	—	1.00
A/F compensation 3	A/F Compensation 3	%	–0.16%
A/F learning 3	A/F learning 3	%	0.0%
Throttle motor duty	Throttle motor duty	%	–27%
Throttle power supply voltage	Throttle power supply voltage	V	(Battery voltage)
Sub throttle sensor voltage	Sub throttle sensor voltage	V	1.50 V
Main throttle sensor voltage	Main throttle sensor voltage	V	0.64 V
Sub acceleration sensor voltage	Sub acceleration sensor voltage	V	0.7 V
Main acceleration sensor voltage	Main acceleration sensor voltage	V	0.7 V
Memory vehicle speed	Memory vehicle speed	km/h or MPH	0 km/h or 0 MPH
A/F compensation 4	A/F Compensation 4	%	0.31%
A/F learning 4	A/F learning 4	%	0.0%
Fuel level sensor resistance	Fuel level resistance	Ω	4 — 96 Ω
Oil temperature	Oil Temperature	°C	≥ 85°C (After engine is warmed-up.)
Oil switching solenoid valve duty R	OSV duty R	%	17.3%
Oil switching solenoid valve duty L	OSV duty L	%	17.3%
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	#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
Fuel tank pressure signal	Fuel Tank Pressure	mmHg, kPa, inHg or psig	+8.8 mmHg, +1.2 kPa, +0.4 inHg or +0.17 psig
AT/MT identification	AT/MT identification terminal	—	AT model
Test mode terminal	Test mode terminal	—	U check
System operation check mode	D check request flag	—	ON input after D check connection
Test mode terminal	Test mode terminal	—	ON input after D check connection

Description	Display	Unit of measure	Note (at idling)
Neutral position switch signal	Neutral SW	—	Neutral
Idle switch signal	Soft idle SW	—	In 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
Front oxygen monitor 2	Front oxygen monitor 2	—	Rich
Knocking signal	Knock signal	—	OFF
Crankshaft position sensor signal	Crankshaft angle signal	—	Yes
Camshaft position sensor signal	Camshaft angle signal	—	Yes
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)
Wiper switch signal	Wiper SW	—	OFF input (when OFF)
A/C middle pressure switch signal	A/C middle pressure SW	—	OFF input
A/C compressor relay signal	A/C compressor relay output	—	OFF output
Radiator fan relay signal 1	Radiator fan relay 1	—	Engine coolant temperature ≥ 98°C (208°F): ON ≤ 97°C (207°F) :OFF
Radiator fan relay signal 2	Radiator fan relay 2	—	Engine coolant temperature ≥ 101°C (214°F): ON ≤ 100°C (212°F) :OFF
Drain valve signal	Vent. Solenoid Valve	—	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	—	Yes
AT coordinate fuel cut demand signal	AT coordinate fuel cut demand	—	OFF
Vehicle dynamics control (VDC) torque down prohibition output	Ban of Torque Down	—	Permission
Vehicle dynamics control (VDC) torque down demand	VDC torque down demand	—	OFF
AT coordinate permission signal	AT coordinate permission signal	—	Permission
Electronic throttle control motor relay signal	ETC motor relay	—	ON
Stop light switch signal	Stop Light Switch	—	OFF
SET/COAST switch signal	SET/COAST SW	—	OFF
RESUME/ACCEL switch signal	RESUME/ACCEL SW	—	OFF
Brake switch signal	Brake SW	—	OFF
Main switch signal	Main SW	—	OFF
Body integrated unit data reception	Body Int. Unit Data	—	Yes
Body integrated unit counter update	Body Int. Unit Count	—	Yes
Cruise control cancel switch signal	CC Cancel SW	—	OFF

5. READ CURRENT DATA FOR ENGINE (OBD MODE)

1) On the «Main Menu» display screen, select the {Each System Check}.
2) On the «System Selection Menu» display screen, select the {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 the {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.

Description	Display	Unit of measure
Number of diagnosis code	Number of Diag. Codes:	—
Condition of malfunction indicator light	MI (MIL)	ON or 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 sensor	Supp YES
Test of oxygen sensor	Oxygen sensor	Rdy NO
Test of oxygen sensor heater	O2 Heater Diagnosis	Supp YES
Test of oxygen sensor heater	O2 Heater Diagnosis	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 or OPEN early period
A/F control #2	Fuel system for Bank 2	Normal CLOSE or OPEN early period
Calculated load valve	Calculated load valve	%
Engine coolant temperature	Coolant Temp.	°C
A/F compensation #1	Short term fuel trim B1	%
A/F learning #1	Long term fuel trim B1	%
A/F compensation #2	Short term fuel trim #2	%
A/F learning #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 valve angle	Throttle Opening Angle	%
Oxygen sensor #12	Oxygen sensor #12	V
A/F compensation #12	Short term fuel trim #12	%

Description	Display	Unit of measure
Oxygen sensor #22	Oxygen sensor #22	%
A/F compensation #22	Short term fuel trim #22	%
OBD system	OBD system	—
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
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
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
Elapsed time after starting the engine	Elapsed time after starting the engine	sec
Elapsed time after MIL illuminating	Elapsed time after MIL illuminating	km
Evaporative purge	Evaporative purge	%
Fuel level	Fuel level	%
Number of warm ups after DTC clear	Number of warm ups after DTC clear	—
Travel distance after DTC clear	Travel distance after DTC clear	km or M
Fuel tank pressure	Tank pressure	mmHg, kPa, inHg or psig
Atmospheric pressure	Atmospheric pressure	mmHg, kPa, inHg or psig
Catalyst temperature #1	Catalyst Temperature #1	°C or °F
Catalyst temperature #2	Catalyst Temperature #2	°C or °F
Misfire monitoring	Misfire monitoring	Enable NO
Misfire monitoring	Misfire monitoring	Comp YES
Fuel system monitoring	Fuel system monitoring	Enable YES
Fuel system monitoring	Fuel system monitoring	Comp NO
Component monitoring	Component monitoring	Enable YES
Component monitoring	Component monitoring	Comp NO
Catalyst diagnosis	Catalyst Diagnosis	Enable YES
Catalyst diagnosis	Catalyst Diagnosis	Comp NO
Heated catalyst monitoring	Heated catalyst	Enable N/A
Heated catalyst monitoring	Heated catalyst	Comp N/A
Evaporative purge system monitoring	Evaporative purge system	Enable YES
Evaporative purge system monitoring	Evaporative purge system	Comp NO
Secondary air system monitoring	Secondary air system	Enable N/A
Secondary air system monitoring	Secondary air system	Comp N/A
A/C system refrigerant monitoring	A/C system refrigerant	Enable N/A
A/C system refrigerant monitoring	A/C system refrigerant	Comp N/A
Oxygen sensor monitoring	Oxygen sensor	Enable YES
Oxygen sensor monitoring	Oxygen sensor	Comp NO
Oxygen heater monitoring	O2 Heater Diagnosis	Enable YES
Oxygen heater monitoring	O2 Heater Diagnosis	Comp YES
EGR system monitoring	EGR system	Enable N/A
EGR system monitoring	EGR system	Comp N/A
ECM power voltage	ECM power voltage	V
Absolute load	Absolute load	%
A/F target lambda value	A/F target lambda value	—

Description	Display	Unit of measure
Relative throttle opening angle	Relative throttle opening angle	%
Ambient temperature	Ambient temperature	°C or °F
Absolute throttle opening angle 2	Absolute throttle opening angle 2	%
Absolute accelerator opening angle 1	Absolute accelerator opening angle 1	%
Absolute accelerator opening angle 2	Absolute accelerator opening angle 2	%
Target throttle opening angle	Target throttle opening angle	%
Engine operation time during MIL on	Engine operation time during MIL on	min
Elapsed time after DTC clear	Elapsed time after DTC clear	min.
Used fuel	Used fuel	—

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}.
2) On the «System Selection Menu» display screen, select the {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 {Freeze Frame Data}.

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

Description	Display	Unit of measure
DTC of freeze frame data	Freeze frame data	DTC
Air fuel ratio control system for bank 1	Fuel system for Bank 1	—
Air fuel ratio control system for bank 2	Fuel system for Bank 2	—
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 valve angle	Throttle Opening Angle	%
Oxygen sensor #12	Oxygen sensor #12	V
A/F compensation #12	Short term fuel trim #12	%
Oxygen sensor #22	Oxygen sensor #22	V
A/F compensation #12	Short term fuel trim #22	%
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
On-board diagnostic system	On-board diagnostic system	—
Elapsed time after starting the engine	Elapsed time after starting the engine	sec
Evaporative purge	Evaporative purge	%
Fuel level	Fuel level	%
Fuel Tank Pressure	Tank pressure	mmHg
Atmospheric pressure	Atmospheric pressure	mmHg
ECM power voltage	ECM power voltage	V
Absolute load	Absolute load	%
A/F target lambda value	A/F target lambda value	—
Relative throttle opening angle	Relative throttle opening angle	%
Ambient temperature	Ambient temperature	°C or °F
Absolute throttle opening angle 2	Absolute throttle opening angle 2	%
Absolute accelerator opening angle 1	Absolute accelerator opening angle 1	%
Absolute accelerator opening angle 2	Absolute accelerator opening angle 2	%
Target throttle opening angle	Target throttle opening angle	%

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

7. VIN REGISTRATION

1) On the «Main Menu» display screen, select the {Each System Check}.
2) On the «System Selection Menu» display screen, select the {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 {VIN Registration}.
5) Perform the procedure shown on display screen.

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