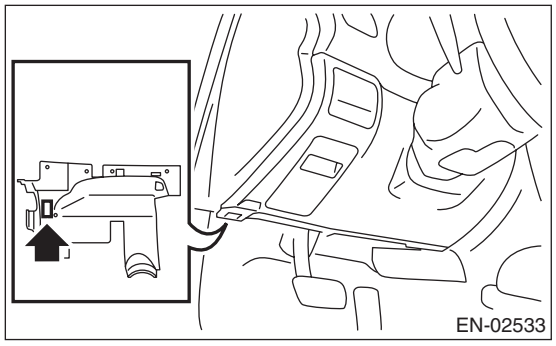
9. Subaru Select Monitor

A: OPERATION

1. HOW TO USE THE SUBARU SELECT MONITOR

1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4DOTC)(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 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(H4DOTC)(diag)-44, 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(H4DOTC)(diag)-44, 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 coolant temperature signal	Coolant Temp.	°C or °F	80 — 100°C or 176 — 212°F
A/F correction 1	A/F Correction #1	%	–10 — +10%
A/F learning 1	A/F Learning #1	%	–15 — +15%
Intake manifold absolute pressure	Mani. Absolute Pressure	mmHg, kPa, inHg or psig	220 — 275 mmHg, 29.5 — 37 kPa, 8.7 — 10 inHg or 4.2 — 5.3 psig
Engine speed signal	Engine Speed	rpm	630 — 770 rpm (Agree with the tachometer indication)
Meter vehicle speed signal	Meter Vehicle Speed	km/h or MPH	0 km/h or 0 MPH (at parking)
Ignition timing signal	Ignition Timing	deg	10 — 15 deg
Intake air temperature signal	Intake Air Temp.	°C or °F	20 — 50°C or 68 — 122°F
Amount of intake air	Mass Air Flow	g/s or lb/m	2.1 — 3.1 g/s or 0.35 — 0.40 lb/m
Throttle opening angle signal	Throttle Opening Angle	%	2.0 — 2.4%
Rear oxygen sensor voltage	Rear O2 Sensor	V	0 — 1.0 V
Battery voltage	Battery Voltage	V	12 — 15 V
Mass air flow voltage	Air Flow Sensor Voltage	V	1.0 — 1.7 V
Injection 1 pulse width	Fuel Injection #1 Pulse	ms	1.2 — 2.2 ms
Knock sensor compensation	Knock Correction	deg	0.0 deg
Acceleration opening angle signal	Accel. Opening Angle	%	0.0%
Primary supercharged pressure control signal	Primary Control	%	0.0%
Purge control solenoid duty ratio	CPC Valve Duty Ratio	%	0 — 25%
Generator duty ratio	ALT Duty	%	0 — 100%
Fuel pump duty ratio	Fuel Pump Duty	%	30 — 40%
AVCS advance angle amount RH	VVT Adv. Ang. Amount R	deg	5 deg
AVCS advance angle amount LH	VVT Adv. Ang. Amount L	deg	5 deg
Oil flow control solenoid valve duty RH (AVCS)	OCV Duty R	%	0 — 20%
Oil flow control solenoid valve duty LH (AVCS)	OCV Duty L	%	0 — 20%
Oil flow control solenoid valve current RH	OCV Current R	mA	40 — 100 mA
Oil flow control solenoid valve current LH	OCV Current L	mA	40 — 100 mA
A/F sensor current value 1	A/F Sensor #1 Current	mA	–20 — 20 mA
A/F sensor resistance value 1	A/F Sensor #1 Resistance	Ω	27 — 35 mA
A/F sensor output lambda 1	A/F Sensor #1	—	1.0
A/F correction 3	A/F Correction #3	%	0.00%
Throttle motor duty	Throttle Motor Duty	%	–5%
Throttle power supply voltage	Throttle Motor Voltage	V	12 — 15 V
Sub throttle sensor voltage	Sub-throttle Sensor	V	1.5 V
Main throttle sensor voltage	Main-throttle Sensor	V	0.6 V
Sub accelerator sensor voltage	Sub-accelerator Sensor	V	1.1 V
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
Fuel temperature signal	Fuel Temp.	°C or °F	+28°C or 82°F
Main accelerator sensor voltage	Main-accelerator Sensor	V	1.0 V

Contents	Display	Unit of measure	Note (at idling)
Atmospheric pressure	Atmosphere Pressure	mmHg, kPa, inHg or psig	—
Intake manifold relative pressure	Mani. Relative Pressure	mmHg, kPa, inHg or psig	(Intake manifold absolute pressure — atmosphere pressure)
Memory vehicle speed	Memorized Cruise Speed	km/h or MPH	—
Odd Meter	Estimated Cumulative Driving Distance	km	—
Fuel level signal	Fuel Level	V	5.10
Tumble generator valve RH opening signal	TGV Position Sensor R	V	0.81 V
Tumble generator valve LH opening signal	TGV Position Sensor L	V	0.81 V
Exhaust temperature signal	Exhaust Gas Temperature	°C or °F	385°C or 725°F
#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/MT
Test mode terminal	Test Mode Signal	—	U check
Neutral position switch signal	Neutral Position Switch	—	Neutral
Soft idle switch signal	Soft 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	Knock Signal	—	None
Crankshaft position sensor signal	Crankshaft Position Sig.	—	Provided
Camshaft position sensor signal	Camshaft Position Sig.	—	Provided
Rear defogger switch signal	Rear Defogger SW	—	OFF input (At OFF)
Blower fan switch signal	Blower Fan SW	—	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)
PCV hose assembly diagnosis signal	Blow-by Leak Connector	—	Connected
Pressure control solenoid valve signal	PCV Solenoid	—	OFF output (At OFF)
Tumble generator valve output signal	TGV Output	—	None
Tumble generator valve drive signal	TGV Drive	—	Closing direction
Drain valve signal	Vent Control Solenoid	—	OFF output (At OFF)
AT coordinate retard angle demand signal	Retard Signal from AT	—	None
AT coordinate fuel cut demand signal	Fuel Cut Signal from AT	—	None
AT coordinate permission signal	Torque Permission Signal	—	ON/OFF
ETC 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)
Brake switch signal	Brake Switch	—	OFF (At OFF)
Main switch signal	Main Switch	—	OFF (At OFF)

Contents	Display	Unit of measure	Note (at idling)
Body int. unit data reception	Body Int. Unit Data	—	Provided
Integrated unit data update	Body Int. Unit Count	—	Provided
Cruise control cancel switch signal	CC Cancel SW	—	OFF (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 {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 Diag. Code:	—	—
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/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
Test of secondary air system	Secondary air system	—	Supp YES
Test of secondary air system	Secondary air system	—	Rdy YES/Rdy NO
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 NO
Test of EGR system	EGR system	—	Rdy N/A
Air fuel ratio control system for bank 1	Fuel System for Bank 1	—	Normal CLOSE
Engine load data	Calculated load value	%	1.6%
Engine coolant temperature signal	Coolant Temp.	°C or °F	+91°C or 196°F
Short term fuel trim by front oxygen (A/F) sensor	Short term fuel trim B1	%	+0.0 %
Long term fuel trim by front oxygen (A/F) sensor	Long term fuel trim B1	%	+1.6 %
Intake manifold absolute pressure signal	Mani. Absolute Pressure	mmHg, kPa, inHg or psig	256 mmHg
Engine speed signal	Engine Speed	rpm	693 rpm
Vehicle speed signal	Vehicle Speed	km/h or MPH	0 km/h
#1 Cylinder ignition timing	Ignition timing adv. #1	°	+16.0°
Intake air temperature signal	Intake Air Temp.	°C or °F	54°C or 129°F
Amount of intake air	Mass Air Flow	g/s or lb/m	3.1 g/s
Throttle position signal	Throttle Opening Angle	%	13%
Oxygen sensor #12	Oxygen Sensor #12	V	+ 0.800 V

Contents	Display	Unit of measure	Note (at idling)
Air fuel ratio correction by rear oxygen sensor	Short term fuel trim #12	%	+0.8%
On-board diagnostic system	OBD System	—	CARB-OBD2
Oxygen sensor #11	Oxygen Sensor #11	—	Support
Rear oxygen sensor output signal	Oxygen Sensor #12	—	Support
A/F lambda signal	A/F sensor #11	—	0.984
A/F sensor output signal	A/F sensor #11	V	2.712 V
A/F lambda signal #11	A/F sensor #11	—	0.992
A/F sensor current #11	A/F sensor #11	mA	–0.03 mA
Secondary air control status	Secondary air system	—	—
Time elapsed after engine start	Elapsed Time After Starting Engine	sec	—
Elapsed time after MIL illuminating	Elapsed Time After MIL Illuminates	km or miles	—
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 miles	—
Fuel tank pressure	Fuel Tank Pressure	mmHg, kPa, inHg or psig	—
Atmospheric pressure	Atmospheric Pressure	mmHg, kPa, inHg or psig	—
Catalyst temperature #1	Catalyzer temperature #1	°C or °F	—
Misfire monitoring	Misfire Monitoring	Enable	YES or NO
		Comp	YES or NO
Fuel system diagnosis	Fuel system monitoring	Enable	YES or NO
		Comp	YES or NO
Component monitoring	Component monitoring	Enable	YES or NO
		Comp	YES or NO
Catalyst diagnosis	Catalyst Diagnosis	Enable	YES or NO
		Comp	YES or NO
Heated catalyst diagnosis	Heated catalyst	Enable	N/A
		Comp	N/A
Evaporative purge system diagnosis	Evaporative purge system	Enable	YES or NO
		Comp	YES or NO
Secondary air system	Secondary air system	Enable	YES or NO
		Comp	YES or NO
A/C system refrigerant diagnosis	A/C system refrigerant	Enable	N/A
		Comp	N/A
Oxygen sensor diagnosis	Oxygen sensor	Enable	YES or NO
		Comp	YES or NO
Oxygen heater diagnosis	O2 Heater Diagnosis	Enable	YES or NO
		Comp	YES or NO
EGR diagnosis	EGR system	Enable	N/A
		Comp	N/A
ECM power voltage	ECM power voltage	V	—
Absolute load	Absolute load	%	—
A/F target lambda	A/F target lambda	—	—
Relative throttle opening angle	Relative throttle position	%	—

Contents	Display	Unit of measure	Note (at idling)
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 operating time during MIL illuminates	min	—
Elapsed time after DTC clear	Elapsed time after DTC clear	min	—
Fuel used	Fuel used	—	—
Relative accelerator opening angle	Relative accelerator opening angle	%	—

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	Diagnostic code
Air fuel ratio control system for bank 1	Fuel system for Bank1	—
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	%
Intake manifold absolute pressure signal	Mani.Absolute Pressure	mmHg, kPa, inHg or psi
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
Amount of intake air	Mass Air Flow	g/s
Throttle opening angle	Throttle Opening Angle	%
Secondary air control status	Secondary air system	—
O2 sensor #11	Oxygen sensor #11	—
O2 sensor #12	Oxygen sensor #12	—
A/F correction 12	A/F correction #12	—
OBD system	OBD System	—
Elapsed time after starting the engine	Elapsed Time After Starting Engine	sec
Evaporative purge	Evaporative purge	%
Fuel level	Fuel level	%
Fuel tank pressure	Tank pressure	mmHg, kPa, inHg or psig
Atmospheric pressure	Atmospheric Pressure	mmHg, kPa, inHg or psig
ECM power voltage	ECM power voltage	V
Absolute load	Absolute load	%
A/F target lambda	A/F target lambda	—
Relative throttle opening angle	Relative throttle position	%
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. 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”.