

## 9. Subaru Select Monitor

### A: OPERATION

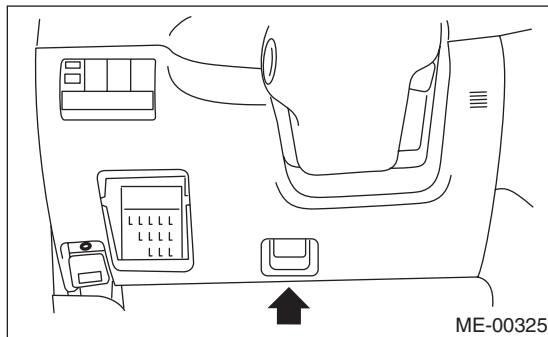
#### 1. HOW TO USE SUBARU SELECT MONITOR

1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4SO)(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 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 DTCs and various data, then record them.

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

Refer to "Read Diagnostic Trouble Code (DTC)" for information about how to display a DTC. <Ref. to EN(H4SO)(diag)-34, Read Diagnostic Trouble Code (DTC).>

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

Refer to "Read Diagnostic Trouble Code (DTC)" for information about how to display a DTC. <Ref. to EN(H4SO)(diag)-34, Read Diagnostic Trouble Code (DTC).>

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## ENGINE (DIAGNOSTICS)

### 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 «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.

Contents	Display	Unit of measure	Note (at idling)
Engine load	Engine Load	%	21.0%
Engine coolant temperature signal	Coolant Temp.	°C or °F	92°C or 198°F (After warming 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	600 — 800 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	14 — 16 deg
Intake air temperature signal	Intake Air Temp.	°C or °F	(Ambient air temperature)
Intake air amount	Mass Air Flow	g/s or lb/m	2.8 — 3.2 g/s or 0.37 — 0.42 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 absolute pressure signal	Atmospheric 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
Fuel temperature signal	Fuel Temp.	°C or °F	+20°C or +68°F
Fuel level signal	Fuel Level	V	0 — 5 V
Acceleration opening angle signal	Acceleration Opening Angle	%	0.0%
Purge control solenoid duty ratio	CPC Valve Duty Ratio	%	0 — 3%
No. of EGR steps	No. of EGR Step	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
Ignition timing learning	Learned Ignition Timing	deg	—
A/F correction #3	A/F Correction #3	%	0.3%
A/F learning #3	A/F Learning #3	%	0.00%

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Contents	Display	Unit of measure	Note (at idling)
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
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
Engine oil temperature	Engine Oil Temperature	°C	≥ 85°C (After engine 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 Model ID Signal	—	AT model / MT model
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 O <sub>2</sub> 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
Pressure control solenoid valve signal	PCV Solenoid Valve	—	OFF output
PCV hose assembly diagnosis signal	Blow-by Leak Diagnosis Connector	—	Connect
D check request flag	D Check Request	—	OFF
Delivery mode connector	Delivery Mode	—	OFF
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

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Contents	Display	Unit of measure	Note (at idling)
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)
Brake switch signal	Brake Switch	—	OFF (At OFF)
Main switch signal	Main Switch	—	OFF (At OFF)
Cruise control cancel switch signal	Cruise Control Cancel Switch	—	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 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 «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.

Contents	Display	Unit of measure	Note (at idling)
Number of diagnosis code	Number of DTC	—	0
Condition of malfunction indicator light	MI (MIL)	—	ON or OFF
Monitoring test of misfire	Misfire monitoring	—	Finish or incomplete
Monitoring test of fuel system	Fuel system monitoring	—	Finish or incomplete
Monitoring test of comprehensive component	Component monitoring	—	Finish or incomplete
Test of catalyst	Catalyst Diagnosis	—	Finish or incomplete
Test of heated catalyst	Heated catalyst	—	No support
Test of evaporative emission purge control system	Evaporative purge system	—	Finish or incomplete
Secondary air system test	Secondary air system	—	No support
Test of air conditioning system refrigerant	A/C system refrigerant	—	No support
Oxygen sensor test	Oxygen sensor	—	Finish or incomplete
Oxygen sensor heater test	O2 Heater Diagnosis	—	Finish or incomplete
Test of EGR system	EGR system	—	Finish or incomplete
Air fuel ratio control system for bank 1	A/F Control #1	—	Normal CLOSE
Engine load data	Load	%	23.0%
Engine coolant temperature signal	Coolant Temp.	°C or °F	92°C or 198°F
Short term fuel trim by front oxygen (A/F) sensor	A/F Correction Value #1	%	-0.8%
Long term fuel trim by front oxygen (A/F) sensor	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
#1 Cylinder ignition timing	Ignition timing #1	°	+16.0°
Intake air temperature signal	Intake Air Temp.	°C or °F	36°C or 97°F

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Contents	Display	Unit of measure	Note (at idling)
Intake air amount	Mass Air Flow	g/s or lb/m	2.7 g/s or 0.36 lb/m
Throttle position signal	Throttle Opening Angle	%	13%
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	V	0.7 V
Air fuel ratio correction by rear oxygen sensor	A/F Correction #12	%	0.0%
On-board diagnostic 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
Elapsed time after starting engine	Time Since Engine Start	sec	—
Travel distance after malfunction indicator light illuminating	Lighted MI lamp history	km or miles	—
Target EGR	Target EGR	%	—
EGR deviation	EGR deviation	%	—
Evaporative purge	Commanded Evap Purge	%	0%
Fuel level signal	Fuel Level	%	—
Engine speed for warm up 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	+7.9 mmHg, +1.1 kPa, +0.31 inHg or +0.15 psig
Atmospheric absolute pressure signal	Atomosphere Pressure	mmHg, kPa, inHg or psig	(Atmosphere pressure)
Catalytic temperature #1	Catalyst Temperature #1	°C or °F	—
Diagnostic monitor of each drive cycle	Diagnostic monitor of each DC	—	—
ECM power voltage	Control module voltage	V	13.789 V
Absolute load	Absolute Load Value	%	22%
Air fuel ratio target lambda	Target Equivalence Ratio	—	0.976
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 during MIL illuminates	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 Accelerator Pos.	%	0%

**NOTE:**

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

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## ENGINE (DIAGNOSTICS)

### 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.

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 Bank 1	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 psi
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/sec
Intake air temperature signal	Intake Air Temp.	°C or °F
Throttle position signal	Throttle Opening Angle	%
Oxygen sensor #12	Oxygen sensor #12	V
A/F Correction #12	A/F Correction #12	%
Oxygen sensor #11	Oxygen sensor #11	Support
Oxygen sensor #12	Oxygen sensor #12	Support
Supporting OBD	Supporting OBD	OBD2(CARB)
Target EGR	Target EGR	%
EGR deviation	EGR deviation	%
Evaporative purge	Commanded Evap Purge	%
Fuel level	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	%
Air fuel ratio target lambda	Target Equivalence Ratio	—
Relative throttle position	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.	%
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	Front oxygen (A/F) sensor (B1S1)	Support
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor (B1S2)	Support

#### 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 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 {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”.