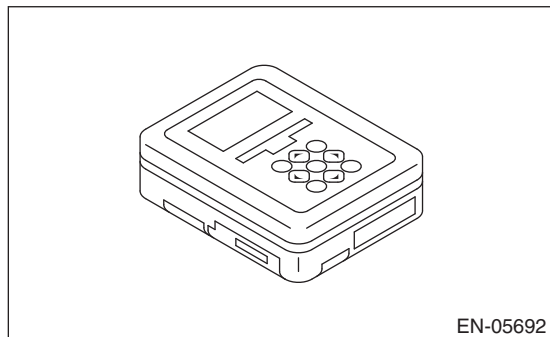


9. Subaru Select Monitor

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) Prepare the personal computer which has been installed the Subaru Select Monitor.

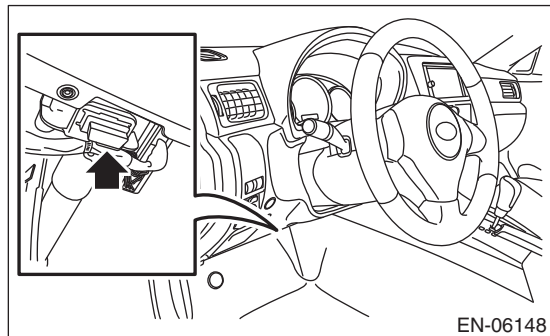
3) Connect the USB cable between SDI (Subaru Diagnosis Interface) and USB port on the personal computer (dedicated port for the Subaru Select Monitor).

NOTE:

The dedicated port for the Subaru Select Monitor means the USB port which was used to install the Subaru Select Monitor.

4) Connect the diagnosis cable to the SDI.

5) Connect the SDI to data link connector located in the lower portion of the instrument panel (on the driver's side).



CAUTION:

Do not connect the scan tools except for Subaru Select Monitor and general scan tool.

6) Start up the personal computer.

7) Turn the ignition switch to ON (engine OFF), and run the "PC application for Subaru Select Monitor".

8) Call up DTC and data, then record them.

NOTE:

For detailed operation procedure, refer to the "PC application help for Subaru Select Monitor".

2. 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) Click the [OK] button 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 «Current Data Display & Save» display screen, select the {Normal Sampling}.
 - 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.

Remarks	Display	Unit of measure	Note (at idling)
Engine Load	Engine Load	%	21.0%
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	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
Barometric 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)
Ignition learning value	Learned Ignition Timing	deg	0 deg
Acceleration opening angle signal	Accel. Opening Angle	%	0.0%
Fuel temperature signal	Fuel Temp.	°C or °F	+28°C or 82°F
Primary supercharged pressure control signal	Primary Control	%	0.0%
Purge control solenoid duty ratio	CPC Valve Duty Ratio	%	0 — 25%
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
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

Subaru Select Monitor

ENGINE (DIAGNOSTICS)

Remarks	Display	Unit of measure	Note (at idling)
A/F sensor output lambda 1	A/F Sensor #1	—	1.0
A/F correction 3	A/F Correction #3	%	0.00%
A/F learning 3	A/F Learning #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
Main accelerator sensor voltage	Main-Accelerator Sensor	V	1.0 V
Secondary air supply piping pressure signal	Sec. Air Piping Pressure	mmHg, kPa, inHg or psig	765 mmHg, 102 kPa, 30.1 inHg or 14.8 psig
Secondary airflow signal	Sec. Air Flow	g/s or lb/m	0.00 g/s or 0.00 lb/m
Memory vehicle speed	Memorized Cruise Speed	km/h or MPH	—
Fuel level sensor resistance	Fuel level resistance	Ω	4 — 96 Ω
Odometer Estimated calculation of driving distance	Odometer	km	—
#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
Knock sensor compensation	Knocking Correction	deg	0.0 deg
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
AT/MT identification terminal	AT Vehicle ID Signal	—	AT/MT
Delivery (test) mode terminal	Test Mode Signal	—	OFF
D check request flag	D-check Require Flag	—	OFF
Delivery (test) mode terminal	Delivery Mode Connector (Test Mode Connector)	—	OFF
Neutral position switch signal	Neutral Position Switch	—	ON
Soft idle switch signal	Idle Switch Signal	—	ON
Ignition switch signal	Ignition Switch	—	ON input
Power steering switch signal	P/S Switch	—	OFF (when OFF)
Air conditioning switch signal	A/C Switch	—	OFF (when OFF)
Starter switch signal	Starter Switch	—	OFF
Rear oxygen monitor	Rear O2 Rich Signal	—	ON/OFF
Knocking signal	Knocking Signal	—	OFF
Crankshaft position sensor signal	Crankshaft Position Sig.	—	ON
Camshaft position sensor signal	Camshaft Position Sig.	—	ON
Rear defogger switch signal	Rear Defogger SW	—	OFF (when OFF)
Blower fan switch signal	Blower Fan SW	—	OFF (when OFF)
Light switch signal	Light Switch	—	OFF (when OFF)
A/C middle pressure switch signal	A/C Mid Pressure Switch	—	OFF (when OFF)
Air conditioner compressor relay output signal	A/C Compressor Signal	—	OFF (when OFF)
Radiator fan relay 1 signal	Radiator Fan Relay #1	—	OFF (when OFF)
Radiator fan relay 2 signal	Radiator Fan Relay #2	—	OFF (when OFF)
PCV hose assembly diagnosis signal	Blow-by leak Connector	—	Connected
Pressure control solenoid valve signal	PCV Solenoid Valve	—	OFF (when OFF)
Tumble generator valve output signal	TGV Output	—	OFF
Tumble generator valve drive signal	TGV Drive	—	Closing direction
Drain valve signal	Vent. Solenoid Valve	—	OFF (when OFF)
Purge control solenoid valve 2 signal	CPC Solenoid 2	—	OFF (when OFF)

Subaru Select Monitor

ENGINE (DIAGNOSTICS)

Remarks	Display	Unit of measure	Note (at idling)
AT coordinate retard angle demand signal	Retard Signal from AT	—	OFF
AT coordinate fuel cut demand signal	Fuel Cut signal from AT	—	OFF
Vehicle dynamics control (VDC) torque down prohibition output	Ban of Torque Down	—	ON
Vehicle dynamics control (VDC) torque down demand	Request Torque Down VDC	—	OFF
AT coordinate permission signal	Torque Permission Signal	—	ON/OFF
ETC 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 (when OFF)
Main switch signal	Main Switch	—	OFF (when OFF)
Body int. unit data reception	Body Int. Unit Data	—	ON
Body integrated unit counter update	Body Int. Unit Count	—	ON
Secondary air combination valve relay 2 signal	Sec. Air Combi V Relay 2	—	OFF (when OFF)
Secondary air pump relay signal	Secondary Air Pump Relay	—	OFF (when OFF)
Secondary air combination valve relay 1 signal	Sec. Air Combi V Relay 1	—	OFF (when OFF)
Cruise control cancel switch signal	CC Cancel SW	—	OFF (when OFF)
Malfunction indicator light signal	MIL On Flag	—	OFF (when unlit)

NOTE:

For detailed operation procedure, refer to the “PC application help for Subaru Select Monitor”.

Subaru Select Monitor

ENGINE (DIAGNOSTICS)

3. 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) Click the [OK] button 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 «Current Data Display & Save» display screen, select the {All 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.

Remarks	Display	Referential value (at idling)	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	—
Secondary air system test	Secondary air system (Supp)	YES	—
Secondary air system test	Secondary air system (Rdy)	NO	—
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	—
Air fuel ratio control system for bank 1	Fuel system for Bank 1	Cl_normal	—
Engine load data	Calculated load value	19.2	%
Engine coolant temperature signal	Coolant Temp.	96	°C
Short term fuel trim by front oxygen (A/F) sensor (Bank 1)	Short term fuel trim B1	17.2	%
Long term fuel trim by front oxygen (A/F) sensor (Bank 1)	Long term fuel trim B1	5.5	%
Intake manifold absolute pressure signal	Mani. Absolute Pressure	248	mmHg
Engine speed signal	Engine Speed	846	rpm
Vehicle speed signal	Vehicle Speed	0	km/h
#1 Cylinder ignition timing	Ignition timing adv. #1	13.5	°
Intake air temperature signal	Intake Air Temp.	44	°C
Amount of intake air	Mass Air Flow	3.6	g/s
Throttle position signal	Throttle Opening Angle	13	%
Secondary air control status	Secondary air system	Stop	—
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	0.1 — 0.7	V
A/F correction (Bank 1 Sensor 2)	Short term fuel trim #12	0.0	%
On-board diagnostic system	OBD System	OBD/OBD2	—
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	Oxygen sensor #11	Supported	—
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	Supported	—

Subaru Select Monitor

ENGINE (DIAGNOSTICS)

Remarks	Display	Referential value (at idling)	Unit of measure
Time elapsed after engine start	Time Since Engine Start	—	sec
Driving distance after the malfunction indicator light illuminates	Lighted MI lamp history	—	km
A/F lambda signal (Bank 1 Sensor 1)	A/F Sensor #11	0.951	—
A/F sensor output signal (Bank 1 Sensor 1)	A/F Sensor #11	2.468	V
Evaporative purge	Commanded Evap Purge	0	%
Fuel level signal	Fuel Level	—	%
Number of warm ups after DTC clear	Number of warm ups	—	—
Driving distance after DTC clear	Meter since DTC cleared	—	km
Fuel tank pressure signal	Fuel Tank Pressure	9.664	mmHg
Barometric pressure signal	Atmosphere Pressure	Barometric pressure	mmHg
A/F lambda signal (Bank 1 Sensor 1)	A/F Sensor #11	0.957	—
A/F sensor output signal (Bank 1 Sensor 1)	A/F Sensor #11	−0.18	mA
Catalyst temperature #1	Catalyst Temperature #11	—	°C
Monitoring test of misfire	Misfire monitoring (Enable)	YES	—
Monitoring test of misfire	Misfire monitoring (Comp)	YES	—
Monitoring test of fuel system	Fuel system monitoring (Enable)	YES	—
Monitoring test of fuel system	Fuel system monitoring (Comp)	NO	—
Monitoring test of comprehensive component	Component monitoring (Enable)	NO	—
Monitoring test of comprehensive component	Component monitoring (Comp)	NO	—
Test of catalyst	Catalyst Diagnosis (Enable)	YES	—
Test of catalyst	Catalyst Diagnosis (Comp)	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	—
Test of evaporative emission purge control system	Evaporative purge system (Comp)	NO	—
Secondary air system test	Secondary air system (Enable)	YES	—
Secondary air system test	Secondary air system (Comp)	NO	—
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 sensor (Enable)	YES	—
Test of oxygen sensor	Oxygen sensor (Comp)	NO	—
Test of oxygen sensor heater	O2 Heater Diagnosis (Enable)	YES	—
Test of oxygen sensor heater	O2 Heater Diagnosis (Comp)	YES	—
Test of EGR system	EGR system (Enable)	N/A	—
Test of EGR system	EGR system (Comp)	N/A	—
ECM power voltage	Control module voltage	13.848	V
Absolute load	Absolute Load Value	21	%
A/F ratio target lambda	Target Equivalence Ratio	0.993	—
Relative throttle opening angle	Relative Throttle Pos.	2	%
Ambient temperature	Ambient Temperature	Ambient temperature	°C
Absolute throttle opening angle 2	Absolute Throttle Pos.#2	31	%
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 “PC application help for Subaru Select Monitor”.

Subaru Select Monitor

ENGINE (DIAGNOSTICS)

4. 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) Click the [OK] button 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 Display}.
- A list of the support data is shown in the following table.

Remarks	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 Bank 1	—
Engine load data	Calculated load value	%
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	—
Oxygen sensor #12	Oxygen sensor #12	V
A/F correction #12	Short term fuel trim #12	%
OBD system	OBD System	—
Oxygen sensor #11	Oxygen sensor #11	Supported
Oxygen sensor #12	Oxygen sensor #12	Supported
Elapsed time after starting the engine	Time Since Engine Start	sec
Evaporative purge	Commanded Evap Purge	%
Fuel level	Fuel Level	%
Fuel tank pressure	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 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 «PC application help for Subaru Select Monitor».

5. 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) Click the [OK] button after the information of engine type has been displayed.
- 4) On the «Engine Diagnosis» display screen, select the {Entry VIN}.
- 5) Perform the procedures shown on the display screen.

NOTE:

For detailed operation procedure, refer to the “PC application help for Subaru Select Monitor”.