

9. Subaru Select Monitor

A: OPERATION

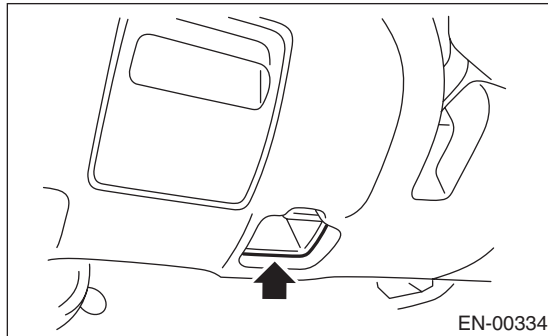
1. HOW TO USE SUBARU SELECT MONITOR

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 any scan tools except the Subaru Select Monitor or the 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 (DTC)" for information about how to display a DTC. <Ref. to EN(H4DOTC)(diag)-37, 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(H4DOTC)(diag)-37, Read Diagnostic Trouble Code (DTC).>

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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 {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.

Content	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	700 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	+17.0 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	3.6 g/s or 0.48 lb/m
Throttle opening angle signal	Throttle Opening Angle	%	3.0 — 3.2%
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
Atmospheric pressure	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)
Ignition timing 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	+21°C or 70°F
Fuel level signal	Fuel Level	V	0 — 5 V
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	0.44 V
Tumble generator valve LH opening signal	TGV Position Sensor L	V	0.48 V
Fuel pump duty ratio	Fuel Pump Duty	%	33%
AVCS advance angle amount RH	VVT Adv. Ang. Amount R	deg	0 deg
AVCS advance angle amount LH	VVT Adv. Ang. Amount L	deg	0 deg
Oil flow control solenoid valve duty RH (AVCS)	OCV Duty R	%	9.4%
Oil flow control solenoid valve duty LH (AVCS)	OCV Duty L	%	9.4%
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 Ω
A/F sensor output lambda 1	A/F Sensor #1	—	1.00
A/F correction 3	A/F Correction #3	%	0.00%
A/F learning 3	A/F Learning #3	%	0.00%

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Content	Display	Unit of measure	Note (at idling)
Throttle motor duty	Throttle Motor Duty	%	-10%
Throttle motor voltage	Throttle Motor Voltage	V	12 — 15 V
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	0.66 V
Secondary air supply piping pressure signal	Secondary air supply piping pressure	mmHg, kPa, inHg or psig	765 mmHg, 102 kPa, 30.1 inHg or 14.8 psig
Secondary airflow signal	Secondary airflow amount	g/s or lb/m	0.00 g/s or 0.00 lb/m
Memory vehicle speed	Memory Vehicle Speed	km/h or MPH	0 km/h or 0 MPH
Odd Meter	Estimated Cumulative Driving Distance	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 correction	Knock 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	—	ON/OFF
Test mode terminal	Test Mode Signal	—	U-check
D check request flag	D check request flag	—	OFF
Delivery mode connector	Delivery mode connector	—	OFF
Neutral position switch signal	Neutral position switch	—	Neutral
Soft idle switch signal	Soft Idle Switch Signal	—	Idling
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	—	Opening direction
Drain valve signal	Vent Control Solenoid	—	OFF output (At OFF)
Purge control solenoid valve 2 signal	CPC Solenoid 2	—	OFF (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

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Content	Display	Unit of measure	Note (at idling)
Vehicle dynamics control (VDC) torque down prohibition output	Ban of Torque Down	—	Allow
Vehicle dynamics control (VDC) torque down demand	VDC torque down demand	—	None
Torque control permission signal	AT Cooperative Control Request Signal	—	Allow
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)
Secondary air combination valve relay 2 signal	Secondary Air Combination Valve Relay 2	—	OFF (At OFF)
Secondary air pump relay signal	Secondary Air Pump Relay	—	OFF (At OFF)
Secondary air combination valve relay 1 signal	Secondary Air Combination Valve Relay 1	—	OFF (At OFF)
Cruise control cancel switch signal	CC Cancel SW	—	OFF (At OFF)
Malfunction indicator light signal	MIL Lit Flag	—	OFF (when light is 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 {OBD System}.
 - 5) On the «OBD Menu» screen, select {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.

Content	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	—	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 heating-type catalyst	Heated catalyst	—	no support
Test of evaporative emission purge control system	Evaporative purge system	—	Finish or incomplete
Test of Secondary air system	Secondary air system	—	Finish or incomplete
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	—	no support
Air fuel ratio control system for bank 1	Fuel System for Bank 1	—	CLOSE NORMAL
Engine load data	Calculated load valve	%	21.0%
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	%	+0.8%
Long term fuel trim by front oxygen (A/F) sensor	Long term fuel trim B1	%	+3.9%
Intake manifold absolute pressure signal	Mani. Absolute Pressure	mmHg, kPa, inHg or psig	233 mmHg, 31 kPa, 9.2 inHg or 4.5 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 adv.#1	°	+16.5°
Intake air temperature signal	Intake Air Temp.	°C or °F	54°C or 129°F
Intake air amount	Mass Air Flow	g/s or lb/m	2.8 g/s or 0.37 lb/m
Throttle position signal	Throttle Opening Angle	%	13%
Secondary air system	Secondary air system	—	Stop
Oxygen sensor #12	Oxygen Sensor #12	V	0.1 — 0.7 V
Air fuel ratio correction by rear oxygen sensor	Short term fuel trim #12	%	+0.0%
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	—	1.001
A/F sensor output signal	A/F sensor #11	V	2.805 V
A/F lambda signal #11	A/F sensor #11	—	0.999
A/F sensor current #11	A/F sensor #11	mA	0.02 mA
Elapsed time after starting engine	Elapsed Time After Starting Engine	sec	—

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Content	Display	Unit of measure	Note (at idling)
Travel distance after malfunction indicator light illuminating	Elapsed Time After MIL Illuminates	km or miles	—
Evaporative purge	Evaporative purge	%	0%
Fuel level signal	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 signal	Fuel Tank Pressure	mmHg, kPa, inHg or psig	+8.8 mmHg, +1.2 kPa, +0.4 inHg or 0.2 psig
Atmospheric absolute pressure signal	Atmospheric Pressure	mmHg, kPa, inHg or psig	Atmospheric pressure
Catalyzer temperature #1	Catalyzer temperature #1	°C or °F	—
Diagnostic monitor of each drive cycle	Diagnostic monitor of each DC	—	—
ECM power voltage	ECM power voltage	V	13.789 V
Absolute load	Absolute load	%	22%
Air fuel ratio target lambda	A/F target lambda	—	0.976
Relative throttle position	Relative throttle position	%	2%
Ambient temperature	Ambient temperature	°C or °F	(Ambient air temperature)
Absolute throttle opening angle 2	Absolute throttle opening angle 2	%	32%
Absolute accelerator opening angle 1	Absolute accelerator opening angle 1	%	13%
Absolute accelerator opening angle 2	Absolute accelerator opening angle 2	%	13%
Target throttle opening angle	Target throttle opening angle	%	0%
Engine operating time during malfunction indicator illuminates	Engine operating time during MIL illuminates	min	—
Elapsed time after DTC clear	Elapsed time after DTC clear	min	—
Fuel used	Fuel used	—	GAS
Relative accelerator opening angle	Relative accelerator opening angle	%	0%

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 {OBD System}.
 - 5) On the «Menu» screen, select {Freeze Frame Data}.
- A list of the support data is shown in the following table.

Content	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	Close normal or open initial
Oxygen sensor #12	Oxygen sensor #12	V
Short term fuel trim by oxygen (A/F) sensor (Bank 1)	Short term fuel trim B1	%
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 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 position signal	Throttle Opening Angle	%
Secondary air system	Secondary air system	—
Oxygen sensor #11	Oxygen sensor #11	Support
Oxygen sensor #12	Oxygen sensor #12	Support
On-board diagnostic system	OBD System	—
Elapsed time after starting engine	Elapsed Time After Starting Engine	sec
Evaporative purge	Evaporative purge	%
Fuel level signal	Fuel level	%
Fuel tank pressure signal	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	%
Air fuel ratio target lambda	A/F target lambda	—
Relative throttle position	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”.

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7. V.I.N. REGISTRATION

- 1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
- 2) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
- 3) Press the [YES] key after the information of engine type has been displayed.
- 4) On the «Engine Diagnosis» display screen, select the {V.I.N. Registration} and press the [YES] key.
- 5) Perform the procedures shown on the display screen.

NOTE:

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