

Subaru Select Monitor

ENGINE (DIAGNOSTICS)

9. Subaru Select Monitor

A: OPERATION

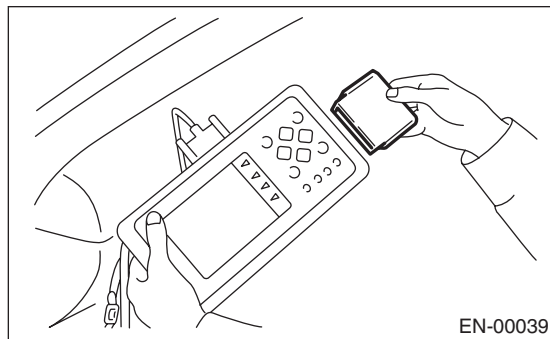
1. HOW TO USE THE SUBARU SELECT MONITOR

1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4DOTC)(diag)-7, PREPARATION TOOL, General Description.>



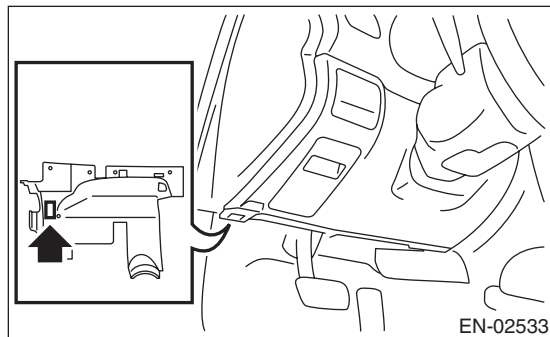
2) Connect the diagnosis cable to the Subaru Select Monitor.

3) Insert the cartridge to the Subaru Select Monitor. <Ref. to EN(H4DOTC)(diag)-7, PREPARATION TOOL, General Description.>



4) 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).

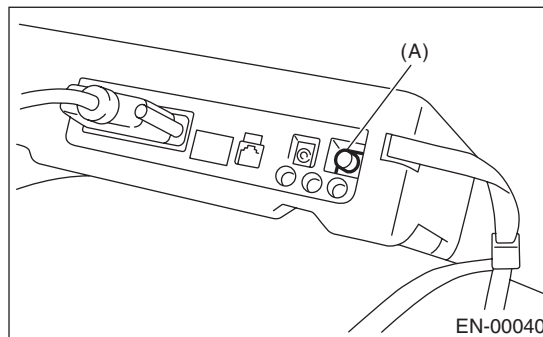


(2) Connect the diagnosis cable to the data link connector.

CAUTION:

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

5) Turn the ignition switch to ON (engine OFF) and Subaru Select Monitor switch to ON.



(A) Power switch

6) 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)-32, 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)-32, Read Diagnostic Trouble Code (DTC).>

4. READ CURRENT DATA FOR ENGINE (NORMAL MODE)

- 1) On the «Main Menu» display screen, select {Each System Check} and press the [YES] key.
 - 2) On the «System Selection Menu» display screen, select {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 {Current Data Display/Save}, and then press the [YES] key.
 - 5) On the «Display Menu» screen, select the {Data Display} and press the [YES] key.
 - 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 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
Intake air amount	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 correction	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

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Remarks	Display	Unit of measure	Note (at idling)
Fuel temperature signal	Fuel Temp.	°C or °F	+28°C or 82°F
Main accelerator sensor voltage	Main-accelerator Sensor	V	1.0 V
Atmospheric pressure	Atmospheric Pressure	mmHg, kPa, inHg or psig	—
Intake manifold relative pressure	Mani. Relative Pressure	mmHg, kPa, inHg or psig	(Intake manifold absolute pressure — atmospheric pressure)
Memory vehicle speed	Memorized Cruise Speed	km/h or MPH	—
Odd Meter	Estimated Cumulative Driv- ing Distance	km	—
Fuel level signal	Fuel Level	V	5.10
Tumble generator valve RH opening signal	TGV Position Sensor R	V	0.34
Tumble generator valve LH opening signal	TGV Position Sensor L	V	0.32
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	—	ON/OFF
Test mode terminal	Test Mode Signal	—	U-check
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)
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)

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Remarks	Display	Unit of measure	Note (at idling)
Brake switch signal	Brake Switch	—	OFF (At OFF)
Main switch signal	Main Switch	—	OFF (At OFF)
Integrated 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”.

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5. READ CURRENT DATA FOR ENGINE (OBD MODE)

- 1) On the «Main Menu» display screen, select {Each System Check} and press the [YES] key.
 - 2) On the «System Selection Menu» display screen, select {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 {OBD System} and press the [YES] key.
 - 5) On the «OBD Menu» display screen, select the {Current Data Display/Save}, and then press the [YES] key.
 - 6) On the «Display Menu» screen, select the {Data Display} and press the [YES] key.
 - 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	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	—	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	—	No support
Air fuel ratio control system for bank 1	Fuel System for Bank 1	—	CLOSE normal
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
Intake air amount	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
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	2.712V
A/F lambda signal #11	A/F sensor #11	—	0.992
A/F sensor current #11	A/F sensor #11	mA	-0.03 mA

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} and press the [YES] key.
 - 2) On the «System Selection Menu» display screen, select {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 {OBD System} and press the [YES] key.
 - 5) On the «OBD Menu» display screen, select the {Freeze Frame Data} and press the [YES] key.
- 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	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 adv.#1	Ignition timing adv. #1	°
Intake air temperature	Intake Air Temp.	°C
Amount of intake air	Mass Air Flow	g/s
Throttle valve angle	Throttle Opening Angle	%

NOTE:

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

7. LED OPERATION MODE FOR ENGINE

- 1) On the «Main Menu» display screen, select {Each System Check} and press the [YES] key.
 - 2) On the «System Selection Menu» display screen, select {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 {Current Data Display/Save}, and then press the [YES] key.
 - 5) On the «Data Display» screen, select the {Data LED Display} and press the [YES] key.
 - 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	Message	LED “ON” requirements
AT/MT identification signal	AT Vehicle ID Signal	ON or OFF	Illuminate (AT model)
Test mode signal	Test Mode Signal	ON or OFF	Test mode connector connected
Neutral position switch signal	Neutral Position Switch	ON or OFF	When neutral position signal is input.
Idle switch signal	Idle Switch Signal	ON or OFF	When idle switch signal is input.
Ignition switch signal	Ignition Switch	ON or OFF	When ignition switch is turned ON.
Power steering switch signal	P/S Switch	ON or OFF	When power steering switch is entered.
Starter switch signal	Starter Switch	ON or OFF	When starter switch is input.
Air conditioning switch signal	A/C Switch	ON or OFF	When air conditioning switch is input.
Rear oxygen sensor rich signal	Rear O2 Rich Signal	Lean or Rich	When rear oxygen sensor mixture ratio is rich.
Knocking signal	Knocking Signal	Provided or None	When knocking signal is input.
Crankshaft position sensor signal	Crankshaft Position Signal	Provided or None	When crankshaft position sensor signal is input.

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Remarks	Display	Message	LED "ON" requirements
Camshaft position sensor signal	Camshaft Position Signal	Provided or None	When camshaft position sensor signal is input.
Rear defogger switch signal	Rear Defogger Switch	ON or OFF	When rear defogger switch is turned to ON.
Blower fan switch signal	Blower Fan Switch	ON or OFF	When blower fan switch is turned to ON.
Small light switch signal	Light Switch	ON or OFF	When small light switch is turned to ON.
A/C middle pressure switch signal	A/C Mid Pressure Switch	ON or OFF	When A/C middle pressure switch is turned to ON.
Air conditioning relay signal	A/C Compressor Signal	ON or OFF	When air conditioning relay is in function.
Radiator fan relay 1 signal	Radiator Fan Relay #1	ON or OFF	When radiator fan relay 1 is in function.
Radiator fan relay 2 signal	Radiator Fan Relay #2	ON or OFF	When radiator fan relay 2 is in function.
PCV hose assembly diagnosis signal	Blow-by Leak Connector	Connect or Unconnect	PCV hose assembly connected
Pressure control solenoid valve signal	PCV Solenoid	ON or OFF	When pressure control valve is ON.
Tumble generator valve signal	TGV Output	Provided or None	Tumble generator valve signal is input.
Tumble generator valve drive signal	TGV Drive	Open or Close	Tumble generator valve open
Drain valve signal	Vent Control Solenoid	ON or OFF	When drain valve is ON.
AT retard angle demand signal	Retard Signal	Provided or None	When AT retard angle demand signal is input.
AT fuel cut signal	Fuel Cut	Provided or None	When AT fuel cut signal is input.
AT cooperative permission signal	Torque Control Permission	Provided or None	When AT coordinate permission signal is input.
Electronic throttle control motor relay signal	ETC Motor Relay	ON or OFF	When electronic throttle control motor relay is in function.
Clutch switch signal	Clutch Switch	ON or OFF	When clutch switch is turned to ON.
Stop light switch signal	Stop Light Switch	ON or OFF	When stop light switch is turned ON.
SET/COAST switch signal	SET/COAST Switch	ON or OFF	When SET/COAST switch is turned to ON.
RES/ACC switch signal	RESUME/ACCEL Switch	ON or OFF	When RES/ACC switch is turned to ON.
Brake switch signal	Brake Switch	ON or OFF	When brake switch is turned to ON.
Main switch signal	Main Switch	ON or OFF	When main switch is turned to ON.
Cancel switch signal	Cancel Switch	ON or OFF	When cancel switch is turned to ON.
data reception signal	Body Int. Unit Data	Provided or None	Data reception signal input
Counter update signal	Body Int. Unit Count	Provided or None	Counter update signal input

NOTE:

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

8. V.I.N. REGISTRATION

- 1) On the «Main Menu» display screen, select {Each System Check} and press the [YES] key.
- 2) On the «System Selection Menu» display screen, select {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 {VIN 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”.