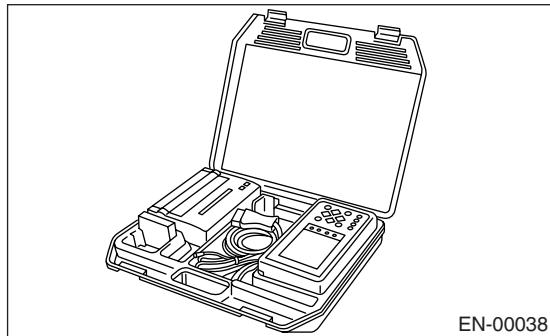


9. Subaru Select Monitor

A: OPERATION

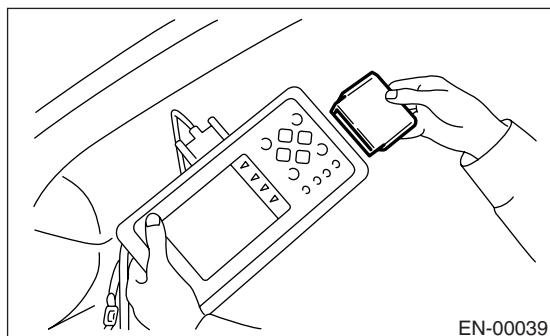
1. HOW TO USE SUBARU SELECT MONITOR

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



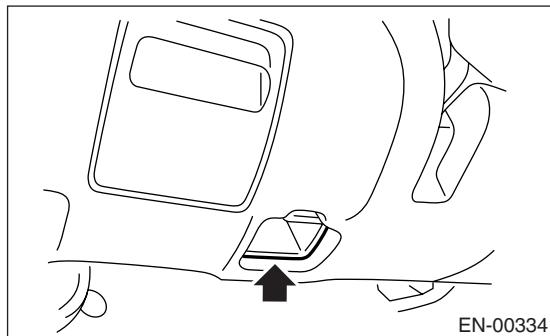
2) Connect the diagnosis cable to Subaru Select Monitor.

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



4) Connect the Subaru Select Monitor to data link connector.

(1) Data link connector is located in the lower portion of instrument panel (on the driver's side).

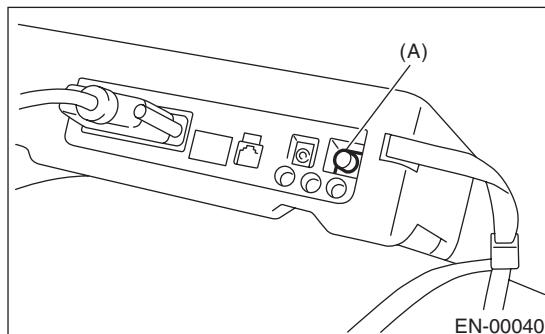


(2) Connect the diagnosis cable to data link connector.

CAUTION:

Do not connect any scan tools except the Subaru Select Monitor or the 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 indicate DTC. <Ref. to EN(H4DOTC)(diag)-35, 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 indicate DTC. <Ref. to EN(H4DOTC)(diag)-35, Read Diagnostic Trouble Code (DTC).>

Subaru Select Monitor

ENGINE (DIAGNOSTICS)

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 {Current Data Display/Save}, and then press the [YES] key.
- 5) On the «Data Display Menu» screen, select {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.

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 — 10.8 inHg or 4.2 — 5.3 psig
Engine speed signal	Engine Speed	rpm	700 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	+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
Knock sensor correction	Knock Correction	deg	0.0 deg
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)
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
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 Duty	%	0 — 25%
Tumble generator valve RH opening signal	TGV Position Sensor R	V	0.44
Tumble generator valve LH opening signal	TGV Position Sensor L	V	0.48
Fuel pump duty ratio	Fuel Pump Duty	%	33%
AVCS advance angle amount RH	VVT advance angle amount R	deg	0 deg
AVCS advance angle amount LH	VVT advance angle 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

Subaru Select Monitor

ENGINE (DIAGNOSTICS)

Content	Display	Unit of measure	Note (at idling)
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 output lambda 1	—	1.00
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	%	-10%
Throttle Motor Voltage	Throttle Motor Voltage	V	12 — 15 V
Sub throttle sensor voltage	Sub throttle sensor voltage	V	1.52 V
Main throttle sensor voltage	Main throttle sensor voltage	V	0.66 V
Sub accelerator sensor voltage	Sub acceleration sensor voltage	V	0.68 V
Main accelerator sensor voltage	Main acceleration sensor voltage	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 kg/m
Memory vehicle speed	Memorized Cruise Speed	km/h or MPH	0 km/h or 0 MPH
Odd Meter	Odd Meter	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
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	Idle Switch Signal	—	In idle
Ignition switch signal	Ignition Switch	—	ON input
Power steering switch signal	P/S Switch	—	OFF (At OFF)
Air conditioning switch signal	A/C Switch	—	OFF (At OFF)
Starter switch signal	Starter Switch	—	OFF
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 (At OFF)
Blower fan switch signal	Blower Fan SW	—	OFF (At OFF)
Light switch signal	Light Switch	—	OFF (At OFF)
A/C middle pressure switch signal	A/C Mid Pressure Switch	—	OFF (At OFF)
Air conditioner compressor relay output signal	A/C compressor relay output	—	OFF output (when OFF)
Radiator fan relay 1 signal	Radiator Fan Relay #1	—	OFF output (when OFF)
Radiator fan relay 2 signal	Radiator Fan Relay #2	—	OFF output (when OFF)
PCV hose assembly diagnosis signal	Blow-by leak Connector	—	Connected
Pressure control solenoid valve signal	PCV Solenoid Valve	—	OFF output (when OFF)
Tumble generator valve output signal	TGV Output	—	None
Tumble generator valve drive signal	TGV Drive	—	Opening direction
Drain valve signal	Vent. Solenoid Valve	—	OFF output (when OFF)
AT coordinate retard angle demand signal	Retard Signal from AT	—	None
AT coordinate fuel cut demand signal	Fuel Cut Signal from AT	—	None
Vehicle dynamics control (VDC) torque down prohibition output	VDC torque down prohibited output	—	Allow
Vehicle dynamics control (VDC) torque down demand	Request Torque Down VDC	—	None
AT Cooperative Control Request Signal	AT Cooperative Control Request Signal	—	Allow

Subaru Select Monitor

ENGINE (DIAGNOSTICS)

Content	Display	Unit of measure	Note (at idling)
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)
Secondary Air Combination Valve Relay 2 signal	Secondary Air Combination Valve Relay 2	—	OFF (when OFF)
Secondary air pump relay signal	Secondary air pump relay	—	OFF (when OFF)
Secondary Air Combination Valve Relay 1 signal	Secondary Air Combination Valve Relay 1	—	OFF (when OFF)
Cruise control cancel switch signal	CC Cancel SW	—	OFF (when 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} 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 {OBD System} and press the [YES] key.
- 5) On the «OBD Menu» screen, select {Current Data Display/Save}, and then press the [YES] key.
- 6) On the «Data Display Menu» screen, select {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.

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
Secondary air system test	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	Oxygen sensor heater	—	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	A/F correction value #1	%	+0.8%
Long term fuel trim by front oxygen (A/F) sensor	A/F Learning #1	%	+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
Amount of intake air	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	A/F Correction #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

NOTE:

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

Subaru Select Monitor

ENGINE (DIAGNOSTICS)

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 {OBD System} and press the [YES] key.
- 5) On the «Menu» screen, select {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
Freeze frame data DTC code	Freeze frame data	DTC
Air fuel ratio control system for bank 1	Bank 1 fuel system	Close normal or open initial
Oxygen sensor output voltage	Oxygen sensor #12	V
Short term fuel trim by oxygen sensor	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	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 psig
Engine speed signal	Engine Speed	rpm
Vehicle speed signal	Vehicle Speed	km/h or MPH
Ignition timing advance for #1 cylinder	Ignition advance #1	°
Intake air temperature signal	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

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 {Current Data Display/Save}, and then press the [YES] key.
- 5) On the «Data Display» screen, select {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.

Content	Display	Message	When LED "ON" is required
AT/MT identification signal	AT Vehicle ID Signal	ON or OFF	Illuminate (AT model)
Test mode signal	Test Mode Terminal	U Check or D check	D check
Neutral position switch signal	Neutral SW	ON or OFF	When neutral position signal is input.
Idle switch signal	Soft Idle SW	ON or OFF	When idle switch signal is input.
Ignition switch signal	Ignition SW	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.
Air conditioning switch signal	A/C Switch	ON or OFF	When air conditioning switch is input.
Starter switch signal	Starter Switch	ON or OFF	When starter switch is input.
Rear oxygen sensor rich signal	Rear O2 Rich Signal	Rich or Lean	When rear oxygen sensor mixture ratio is rich.
Knocking signal	Knock Signal	Provided or None	When knocking signal is input.
Crankshaft position sensor signal	Crankshaft Position Sig.	Provided or None	When crankshaft position sensor signal is input.
Camshaft position sensor signal	Camshaft Position Sig.	Provided or None	When camshaft position sensor signal is input.
Rear defogger switch signal	Rear Defogger SW	ON or OFF	When rear defogger switch is turned to ON.
Blower fan switch signal	Blower Fan SW	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	Compressor relay	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	ON or OFF	PCV hose assembly connected
Pressure control solenoid valve signal	PCV Solenoid Valve	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 direction or close direction	Tumble generator valve open
Drain valve signal	Vent. Solenoid Valve	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.

Subaru Select Monitor

ENGINE (DIAGNOSTICS)

Content	Display	Message	When LED "ON" is required
AT fuel cut signal	Fuel Cut	Provided or None	When AT fuel cut signal is input.
VDC torque down prohibited output	Ban of Torque Down	ON or OFF	Prohibition
Request Torque Down VDC	Request Torque Down VDC	Provided or None	Provided
AT Cooperative Control Request Signal	AT Cooperative Control Request Signal	ON or OFF	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.
Secondary Air Combination Valve 2 signal	Combination valve 2	ON or OFF	Secondary air combination valve 2 is ON
Secondary air pump relay signal	Air pump relay	ON or OFF	Secondary air pump relay function
Secondary Air Combination Valve 1 signal	Combination valve 1	ON or OFF	Secondary air combination valve 2 is ON
Cancel switch signal	Cancel Switch	ON or OFF	When cancel switch is turned to ON.

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 procedure shown on display screen.

NOTE:

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