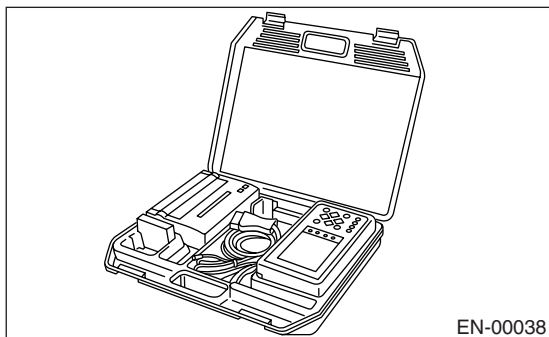


## 9. Subaru Select Monitor

### A: OPERATION

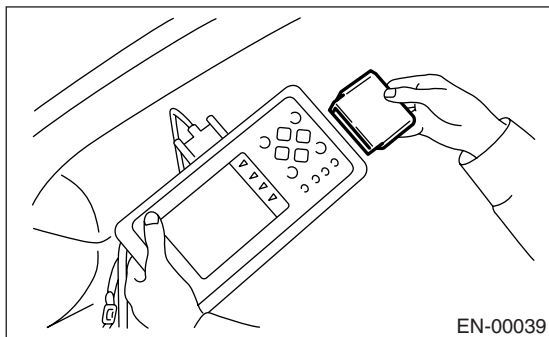
#### 1. HOW TO USE SUBARU SELECT MONITOR

1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H6DO)(diag)-7, PREPARATION TOOL, General Description.>

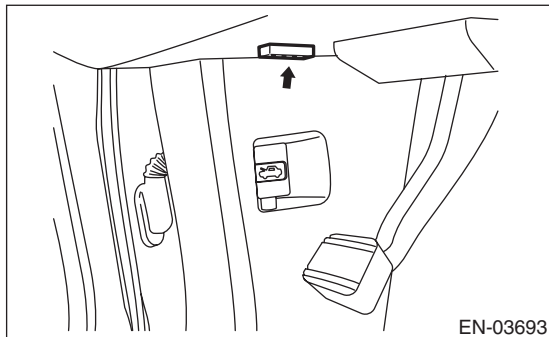


2) Connect the diagnosis cable to Subaru Select Monitor.

3) Insert the cartridge to Subaru Select Monitor. <Ref. to EN(H6DO)(diag)-7, PREPARATION TOOL, General Description.>



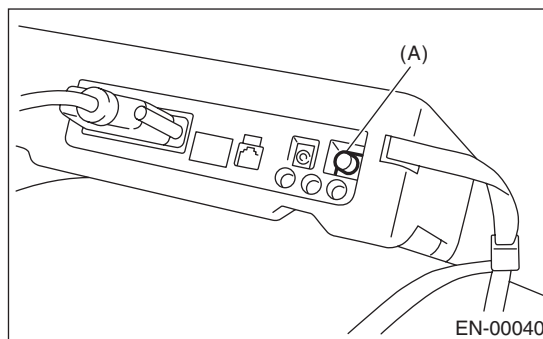
4) Connect the Subaru Select Monitor to the data link connector at the lower portion of instrument panel (on the driver's side).



#### CAUTION:

Do not connect any scan tools except Subaru Select Monitor or 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 DTCs 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(H6DO)(diag)-34, 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(H6DO)(diag)-34, Read Diagnostic Trouble Code (DTC).>

**4. READ CURRENT DATA FOR ENGINE (NORMAL MODE)**

- 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} 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 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.

Description	Display	Unit of measure	Note (at idling)
Engine load	Engine load	%	3.5%
Engine coolant temperature signal	Coolant Temp.	°C or °F	≥ 75°C or 167°F (After engine is warmed-up.)
A/F compensation 1	A/F Compensation 1	%	3.1%
A/F learning 1	A/F learning 1	%	0.0%
A/F compensation 2	A/F Compensation 2	%	4.7%
A/F learning 2	A/F learning 2	%	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
Meter vehicle speed signal	Meter vehicle speed	km/h or MPH	0 km/h or 0 MPH
Ignition timing signal	Ignition timing	deg	13 — 15 deg
Intake air temperature signal	Intake air temperature	°C or °F	(Ambient air temperature)
Amount of intake air	Mass Air Flow	g/s or lb/m	3.8 g/s or 0.5 lb/m
Throttle opening angle signal	Throttle valve angle	%	1.2 — 1.6%
Front oxygen sensor voltage value 1	Front oxygen sensor voltage value 1	V	0.035 V
Front oxygen sensor voltage value 2	Front oxygen sensor voltage value 2	V	0.020 V
Battery voltage	Battery Voltage	V	12 — 14 V
Mass air flow voltage	Mass air flow voltage	V	1.1 — 1.2 V
Injection 1 pulse width	Injection 1 pulse width	ms	2.82 ms
Injection 2 pulse width	Injection 2 pulse width	ms	2.82 ms
Knock sensor compensation	Knock correction	deg	0 deg
Atmospheric pressure signal	Atmospheric pressure	mmHg, kPa, inHg or psig	(Atmospheric pressure)
Intake manifold relative pressure	Intake manifold relative pressure	mmHg, kPa, inHg or psig	(Intake manifold absolute pressure — atmospheric pressure)
Acceleration opening angle signal	Acceleration opening angle	%	0%
Radiator fan output	Radiator fan output	%	0%
Purge control solenoid valve duty ratio	CPC Duty	%	0 — 3%
Generator duty	ALT duty	%	0%
Fuel pump duty	Fuel pump duty	%	33%
Variable valve timing advance angle amount R	VVT advance angle amount R	deg	0 deg
Variable valve timing advance angle amount L	VVT advance angle amount L	deg	0 deg
Oil flow control solenoid valve duty R	OCV duty R	%	9.4%
Oil flow control solenoid valve duty L	OCV duty L	%	9.4%
Oil flow control solenoid valve current R	OCV current R	mA	64 mA
Oil flow control solenoid valve current L	OCV current L	mA	64 mA
Front oxygen (A/F) sensor current value 1	A/F sensor current value 1	mA	0.0 mA
Front oxygen (A/F) sensor current value 2	A/F sensor current value 2	mA	0.0 mA
Front oxygen (A/F) sensor resistance value 1	A/F sensor resistance value 1	Ω	31 Ω

# Subaru Select Monitor

## ENGINE (DIAGNOSTICS)

Description	Display	Unit of measure	Note (at idling)
Front oxygen (A/F) sensor resistance value 2	A/F sensor resistance value 2	Ω	31 Ω
Front oxygen (A/F) sensor output lambda 1	A/F sensor output lambda 1	—	1.00
Front oxygen (A/F) sensor output lambda 2	A/F sensor output lambda 2	—	1.00
Fuel tank pressure signal	Fuel Tank Pressure	mmHg, kPa, inHg or psig	+8.8 mmHg, +1.2 kPa, +0.4 inHg or +0.17 psig
Fuel temperature signal	Fuel Temp.	°C or °F	+28°C or +82°F
A/F compensation 3	A/F Compensation 3	%	-0.16%
A/F learning 3	A/F learning 3	%	0.0%
Throttle motor duty	Throttle motor duty	%	-27%
Throttle power supply voltage	Throttle power supply voltage	V	(Battery voltage)
Sub throttle sensor voltage	Sub throttle sensor voltage	V	1.50 V
Main throttle sensor voltage	Main throttle sensor voltage	V	0.64 V
Sub acceleration sensor voltage	Sub acceleration sensor voltage	V	0.7 V
Main acceleration sensor voltage	Main acceleration sensor voltage	V	0.7 V
Memory vehicle speed	Memory vehicle speed	km/h or MPH	0 km/h or 0 MPH
A/F compensation 4	A/F Compensation 4	%	0.31%
A/F learning 4	A/F learning 4	%	0.0%
Fuel level sensor resistance	Fuel level resistance	Ω	4 — 96 Ω
Oil temperature	Oil Temperature	°C	≥ 85°C (After engine is warmed-up.)
Oil switching solenoid valve duty R	OSV duty R	%	17.3%
Oil switching solenoid valve duty L	OSV duty L	%	17.3%
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 mode	VVL Lift Mode	—	1
#1 cylinder roughness monitor	#1 cylinder roughness monitor	—	0
#2 cylinder roughness monitor	#2 cylinder roughness monitor	—	0
#3 cylinder roughness monitor	#3 cylinder roughness monitor	—	0
#4 cylinder roughness monitor	#4 cylinder roughness monitor	—	0
#5 cylinder roughness monitor	#5 cylinder roughness monitor	—	0
#6 cylinder roughness monitor	#6 cylinder roughness monitor	—	0
Test mode terminal	Test mode terminal	—	U check
Neutral position switch signal	Neutral SW	—	Neutral
Idle switch signal	Soft idle SW	—	In idle
Ignition switch signal	Ignition SW	—	ON input
Power steering switch signal	Power steering SW input signal	—	OFF input (when OFF)
Air conditioning switch signal	A/C SW	—	OFF input (when OFF)
Starter switch signal	Starter SW	—	OFF input
Front oxygen monitor 1	Front oxygen monitor 1	—	Rich
Front oxygen monitor 2	Front oxygen monitor 2	—	Rich
Knocking signal	Knock signal	—	OFF
Crankshaft position sensor signal	Crankshaft angle signal	—	Yes
Camshaft position sensor signal	Camshaft angle signal	—	Yes
Drain valve signal	Vent. Solenoid Valve	—	OFF output (when OFF)
Rear defogger switch signal	Rear defogger SW	—	OFF input (when OFF)
Blower fan switch signal	Blower fan SW	—	OFF input (when OFF)
Light switch signal	Light SW	—	OFF input (when OFF)
Wiper switch signal	Wiper SW	—	OFF input (when OFF)
A/C middle pressure switch signal	A/C middle pressure SW	—	OFF input
A/C compressor relay signal	A/C compressor relay output	—	OFF output
AT coordinate retard angle demand signal	AT coordinate retard angle demand	—	Yes

Description	Display	Unit of measure	Note (at idling)
AT coordinate fuel cut demand signal	AT coordinate fuel cut demand	—	OFF
Vehicle dynamics control (VDC) torque down prohibition output	Ban of Torque Down	—	Permission
Vehicle dynamics control (VDC) torque down demand	VDC torque down demand	—	OFF
AT coordinate permission signal	AT coordinate permission signal	—	Permission
Electronic throttle control motor relay signal	ETC motor relay	—	ON
Stop light switch signal	Stop Light Switch	—	OFF
SET/COAST switch signal	SET/COAST SW	—	OFF
RESUME/ACCEL switch signal	RESUME/ACCEL SW	—	OFF
Brake switch signal	Brake SW	—	OFF
Main switch signal	Main SW	—	OFF
Body integrated unit data reception	Body Int. Unit Data	—	Yes
Body integrated unit counter update	Body Int. Unit Count	—	Yes
Cruise control cancel switch signal	CC Cancel SW	—	OFF
Variable valve lift diagnosis oil pressure switch signal 1	Oil Temperature SW1	—	ON
Variable valve lift diagnosis oil pressure switch signal 2	Oil Temperature SW2	—	ON

### 5. READ CURRENT DATA FOR ENGINE (OBD MODE)

- 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} 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 «Data 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
Number of diagnosis code	Number of Diag. Codes:	0
Condition of malfunction indicator light	MI (MIL)	ON or OFF
Monitoring test of misfire	Misfire monitoring	Finish
Monitoring test of fuel system	Fuel system monitoring	Finish
Monitoring test of comprehensive component	Component monitoring	Finish
Test of catalyst	Catalyst Diagnosis	Finish or incomplete
Test of heating-type catalyst	Heated catalyst	No
Test of evaporative emission purge control system	Evaporative purge system	Finish or incomplete
Test of secondary air system	Secondary air system	No
Test of air conditioning system refrigerant	A/C system refrigerant	No
Test of oxygen sensor	Oxygen sensor	Finish or incomplete
Test of oxygen sensor heater	Oxygen sensor heater	Finish
Test of EGR system	EGR system	No support
A/F control #1	Fuel system for Bank 1	OPEN early period
A/F control #2	Fuel system for Bank 2	OPEN early period
Calculated load valve	Calculated load valve	%
Engine coolant temperature	Coolant Temp.	°C
A/F compensation #1	Short term fuel trim B1	%
A/F learning #1	Long term fuel trim B1	%
A/F compensation #2	Short term fuel trim #2	%
A/F learning #2	Long term fuel trim B2	%

# Subaru Select Monitor

## ENGINE (DIAGNOSTICS)

Description	Display	Unit of measure
Intake manifold absolute pressure	Mani. Absolute Pressure	mmHg, kPa, inHg or psig
Engine speed	Engine speed	rpm
Vehicle speed	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 or lb/m
Throttle valve angle	Throttle Opening Angle	%
Oxygen sensor #12	Oxygen sensor #12	V
A/F compensation #12	Short term fuel trim #12	%
Oxygen sensor #22	Oxygen sensor #22	%
A/F compensation #22	Short term fuel trim #22	%
OBD system	OBD System	—
Oxygen sensor #11	Oxygen sensor #11	support
Oxygen sensor #12	Oxygen sensor #12	support
Oxygen sensor #21	Oxygen sensor #21	support
Oxygen sensor #22	Oxygen sensor #22	support
A/F sensor #11	A/F sensor #11	—
A/F sensor #11	A/F sensor #11	V
A/F sensor #21	A/F sensor #21	—
A/F sensor #21	A/F sensor #21	V
A/F sensor #11	A/F sensor #11	—
A/F sensor #11	A/F sensor #11	mA
A/F sensor #21	A/F sensor #21	—
A/F sensor #21	A/F sensor #21	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 the {Each System Check} and press the [YES] key.
  - 2) On the «System Selection Menu» display screen, select the {Engine} 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	DTC
Air fuel ratio control system for bank 1	Fuel system for Bank1	—
Air fuel ratio control system for bank 2	Fuel system for Bank2	—
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	%
Short term fuel trim by front oxygen (A/F) sensor (Bank 2)	Short term fuel trim B2	%
Long term fuel trim by front oxygen (A/F) sensor (Bank 2)	Long term fuel trim B2	%
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
Amount of intake air	Mass Air Flow	g/s
Throttle valve angle	Throttle Opening Angle	%
Oxygen sensor #12	Oxygen sensor #12	V
A/F compensation #12	Short term fuel trim #12	%
Oxygen sensor #22	Oxygen sensor #22	V
A/F compensation #22	Short term fuel trim #22	%
Oxygen sensor #11	Oxygen sensor #11	support
Oxygen sensor #12	Oxygen sensor #12	support
Oxygen sensor #21	Oxygen sensor #21	support
Oxygen sensor #22	Oxygen sensor #22	support

**NOTE:**

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

# Subaru Select Monitor

## ENGINE (DIAGNOSTICS)

### 7. LED OPERATION MODE FOR ENGINE

- 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} 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.

Description	Display	Message	When LED "ON" required
Test mode signal	Test mode terminal	D check/U check	D check
Neutral position switch signal	Neutral SW	Neutral/Other than neutral	Neutral
Idle switch signal	Soft idle SW	Idle/Other than idle	In idle
Ignition switch signal	Ignition SW	ON Input/OFF Input	ON input
Power steering switch signal	Power steering SW	ON Input/OFF Input	ON input
Air conditioning switch signal	A/C SW	ON Input/OFF Input	ON input
Starter switch signal	Starter SW	ON Input/OFF Input	ON input
Front oxygen monitor 1	FtO2 monitor 1	Lean/Rich	Rich
Front oxygen monitor 2	FtO2 monitor 2	Lean/Rich	Rich
Knocking signal	Knock signal	Yes/No	Yes
Crankshaft position sensor signal	Crankshaft angle signal	Yes/No	Yes
Camshaft position sensor signal	Camshaft angle signal	Yes/No	Yes
Rear defogger switch signal	Rear defogger SW	ON Input/OFF Input	ON input
Blower fan switch signal	Blower fan SW	ON Input/OFF Input	ON input
Light switch signal	Light SW	ON Input/OFF Input	ON input
Wiper switch signal	Wiper SW	ON Input/OFF Input	ON input
A/C middle pressure switch signal	A/C middle pressure SW	ON Input/OFF Input	ON input
Air conditioner compressor relay signal	Compressor relay	ON output/OFF output	ON output
Drain valve signal	Vent. Solenoid Valve	ON or OFF	When drain valve is ON.
AT retard angle demand signal	AT retard angle demand	Yes/No	Yes
AT fuel cut signal	AT fuel cut	Yes/No	Yes
VDC torque down prohibition output	Torque down output	ON/OFF	Prohibition
VDC torque down demand	Torque down demand	Yes/No	Yes
AT coordinate permission signal	AT coordinate permission signal	ON/OFF	Permission
Electronic throttle control motor relay signal	ETC motor relay	ON/OFF	ON
Stop light switch signal	Stop SW	ON Input/OFF Input	ON input
SET/COAST switch signal	SET/CST SW	ON Input/OFF Input	ON input
RESUME/ACCEL switch signal	RES/ACC SW	ON Input/OFF Input	ON input
Brake switch signal	Brake SW	ON Input/OFF Input	ON input
Main switch signal	Main SW	ON Input/OFF Input	ON input
Body integrated unit data reception	Body Int. Unit Data	Yes/No	Yes
Body integrated unit counter update	Body Int. Unit Count	Yes/No	Yes
Cruise control cancel switch signal	CC Cancel SW	ON Input/OFF Input	ON input
Variable valve lift diagnosis oil pressure switch signal 1	Oil Temperature SW1	ON/OFF	ON
Variable valve lift diagnosis oil pressure switch signal 2	Oil Temperature SW2	ON/OFF	ON

#### NOTE:

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

## 8. VIN 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} 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 {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”.