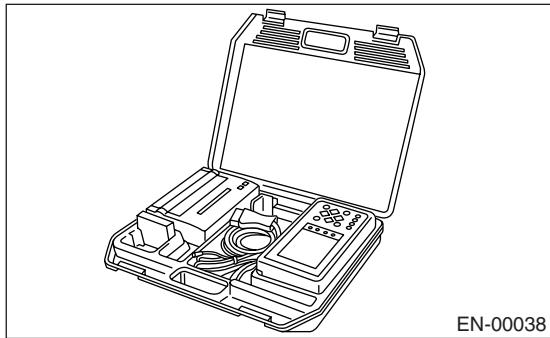


9. Subaru Select Monitor

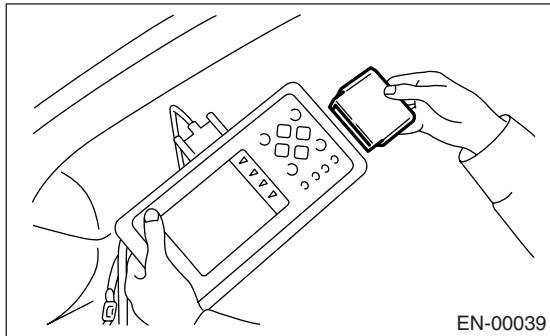
A: OPERATION

1. HOW TO USE SUBARU SELECT MONITOR

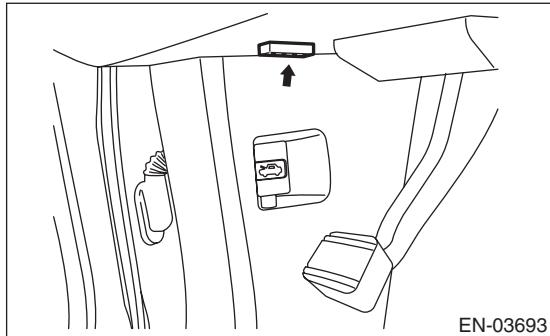
1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H6DO)(diag)-7, PREPARATION TOOL, General Description.>



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.>



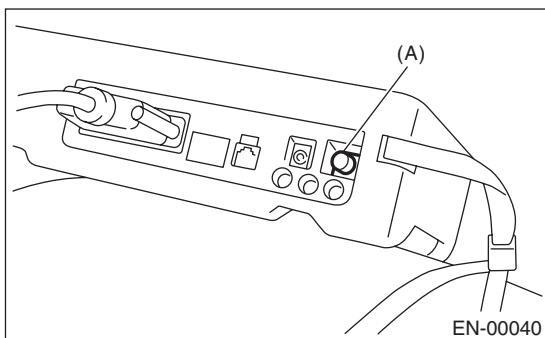
4) Connect the Subaru Select Monitor to the data link connector at the lower portion of instrument panel (on the driver's side).



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 #12 | 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”.

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”.