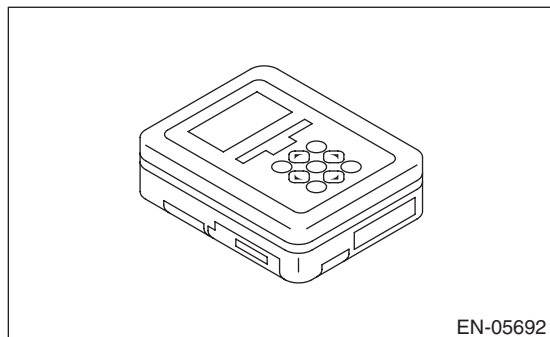


## 9. Subaru Select Monitor

### A: OPERATION

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

1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H6DO)(diag)-8, PREPARATION TOOL, General Description.>



2) Prepare PC with Subaru Select Monitor installed.

3) Connect the USB cable to SDI (Subaru Diagnosis Interface) and USB port on the personal computer (dedicated port for the Subaru Select Monitor).

#### NOTE:

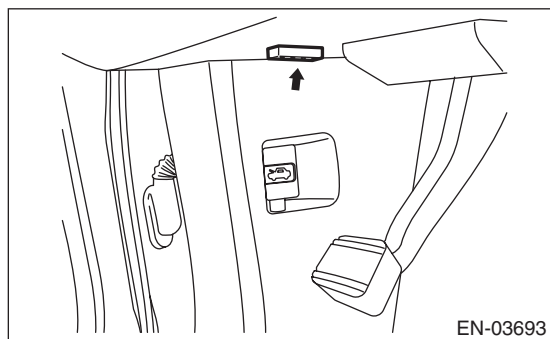
The dedicated port for the Subaru Select Monitor means the USB port which was used to install the Subaru Select Monitor.

4) Connect the diagnosis cable to SDI.

5) Connect SDI to data link connector located in the lower portion of the instrument panel (on the driver's side).

#### CAUTION:

**Do not connect any scan tools except Subaru Select Monitor or general scan tool.**



6) Start the PC.

7) Turn the ignition switch to ON (engine OFF) and run the "PC application for Subaru Select Monitor".

8) Call up DTC and data, then record them.

#### NOTE:

For detailed operation procedures, refer to "PC application help for Subaru Select Monitor".

# Subaru Select Monitor

## ENGINE (DIAGNOSTICS)

### 2. READ CURRENT DATA FOR ENGINE (NORMAL MODE)

- 1) On «Main Menu» display, select {Each System Check}.
- 2) On «System Selection Menu» display, select {Engine Control System}.
- 3) Click the [OK] button after the information of engine type has been displayed.
- 4) On «Engine Diagnosis» display, select {Current Data Display & Save}.
- 5) On «Current Data Display & Save» display, select {Normal sampling}.
- 6) Using the scroll key, scroll the display screen up or down until the desired data is shown.

#### NOTE:

- For detailed operation procedures, refer to “PC application help for Subaru Select Monitor”.
- A list of the support data is shown in the following table.

| Content                                       | Display                 | Unit of measure         | Note (at idling)   |
|---|-------------------------|-------------------------|--|
| Engine load                                   | Engine Load             | %                       | 2.4%   |
| Engine coolant temperature signal             | Coolant Temp.           | °C or °F                | ≥ 85°C or 185°F (after warm-up)                                    |
| A/F correction #1                             | A/F Correction #1       | %                       | -10% — +10%  |
| A/F learning #1                               | A/F Learning #1         | %                       | -10% — +10%  |
| A/F correction #2                             | A/F Correction #2       | %                       | -10% — +10%  |
| A/F learning #2                               | A/F Learning #2         | %                       | -10% — +10%  |
| Intake manifold absolute pressure             | Mani. Absolute Pressure | mmHg, kPa, inHg or psig | 210 mmHg, 28 kPa, 8.3 inHg or 4.1 psig                             |
| Engine speed signal                           | Engine Speed            | rpm                     | 600 — 800 rpm (after warm-up)                                      |
| Meter vehicle speed signal                    | 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 Temp.        | °C or °F                | (Ambient air temperature)  |
| Intake air amount                             | Mass Air Flow           | g/s or lb/m             | 2.5 g/s — 5.0 g/s or 0.31 lb/m — 0.71 lb/m                         |
| Throttle opening angle signal                 | Throttle Opening Angle  | %                       | 2%   |
| Front oxygen sensor voltage value 1           | Front O2 Sensor #1      | V                       | 0.900 V  |
| Front oxygen sensor voltage value 2           | Front O2 Sensor #2      | V                       | 0.900 V  |
| Battery voltage                               | Battery Voltage         | V                       | 12 — 13 V  |
| Mass air flow voltage                         | Air Flow Sensor Voltage | V                       | 1.2 — 1.3 V  |
| Injection 1 pulse width                       | Fuel Injection #1 Pulse | ms                      | 2.5 ms — 3.5 ms  |
| Injection 2 pulse width                       | Fuel Injection #2 Pulse | ms                      | 2.5 ms — 3.5 ms  |
| Atmospheric pressure signal                   | Atmosphere Pressure     | mmHg, kPa, inHg or psig | (Atmospheric pressure)   |
| Intake manifold relative pressure             | Mani. Relative Pressure | mmHg, kPa, inHg or psig | (Air intake absolute pressure — Atmospheric pressure)              |
| Learned ignition timing                       | Learned Ignition Timing | deg                     | +0.0 deg   |
| Acceleration opening angle signal             | Accel. Opening Angle    | %                       | 0%   |
| Fuel temperature signal                       | Fuel Temp.              | °C or °F                | +28°C or +82°F   |
| Radiator fan output                           | Radiator Fan Control    | %                       | 0%<br>(Water temperature 90°C (194°F) when air conditioner is OFF) |
| Purge control solenoid valve duty ratio       | CPC Valve Duty Ratio    | %                       | 18%  |
| Number of EGR steps                           | No. of EGR steps        | STEP                    | 0 STEP   |
| Fuel pump duty ratio                          | Fuel Pump Duty          | %                       | 33%  |
| AVCS advance angle amount RH                  | VVT Adv. Ang. Amount R  | deg                     | 0 deg — +1 deg   |
| AVCS advance angle amount LH                  | VVT Adv. Ang. Amount L  | deg                     | 0 deg — +1 deg   |
| Oil flow control solenoid valve duty ratio RH | OCV Duty R              | %                       | 9.4%   |
| Oil flow control solenoid valve duty ratio LH | OCV Duty L              | %                       | 9.4%   |

# Subaru Select Monitor

## ENGINE (DIAGNOSTICS)

| Content   | Display                                       | Unit of measure                          | Note (at idling)   |
|---|---|--|--|
| Oil flow control solenoid valve current RH            | OCV Current R                                 | mA                                       | 64 mA  |
| Oil flow control solenoid valve current LH            | OCV Current L                                 | mA                                       | 64 mA  |
| Front oxygen (A/F) sensor current value 1             | A/F Sensor #1 Current                         | mA                                       | 0.0 mA   |
| Front oxygen (A/F) sensor current value 2             | A/F Sensor #2 Current                         | mA                                       | 0.0 mA   |
| Front oxygen (A/F) sensor resistance value 1          | A/F Sensor #1 Resistance                      | $\Omega$                                 | 31 $\Omega$  |
| Front oxygen (A/F) sensor resistance value 2          | A/F Sensor #2 Resistance                      | $\Omega$                                 | 31 $\Omega$  |
| Front oxygen (A/F) sensor output lambda 1             | A/F Sensor #1                                 | —  | 1.01   |
| Front oxygen (A/F) sensor output lambda 2             | A/F Sensor #2                                 | —  | 1.01   |
| A/F correction #3                                     | A/F Correction #3                             | %  | 0% — 1%  |
| A/F learning #3                                       | A/F Learning #3                               | %  | 0.0%   |
| Throttle motor duty                                   | Throttle Motor Duty                           | %  | –20% — +20%  |
| Throttle motor voltage                                | Throttle Motor Voltage                        | V  | (Battery voltage)  |
| Sub throttle sensor voltage                           | Sub-Throttle Sensor                           | V  | 1.4 V — 1.5 V  |
| Main throttle sensor voltage                          | Main-Throttle Sensor                          | V  | 0.62 V — 0.70 V  |
| Sub accelerator sensor voltage                        | Sub-Accelerator Sensor                        | V  | 1.0 V — 1.2 V  |
| Main acceleration sensor voltage                      | Main-Accelerator Sensor                       | V  | 0.9 V — 1.1 V  |
| Memory vehicle speed                                  | Memorized Cruise Speed                        | km/h or MPH                              | 0 km/h or 0 MPH  |
| A/F correction #4                                     | A/F Correction #4                             | %  | –1% — 1%   |
| A/F learning #4                                       | A/F Learning #4                               | %  | 0.0%   |
| Fuel level sensor resistance                          | Fuel level resistance                         | $\Omega$                                 | 4 — 96 $\Omega$  |
| Engine oil temperature                                | Oil Temperature                               | $^{\circ}\text{C}$ or $^{\circ}\text{F}$ | $\geq 85^{\circ}\text{C}$ or $185^{\circ}\text{F}$ (after warm-up) |
| Exhaust AVCS retard angle amount RH                   | Exh. VVT Retard Ang. R                        | deg                                      | 0 deg — +1 deg   |
| Exhaust AVCS retard angle amount LH                   | Exh. VVT Retard Ang. L                        | deg                                      | 0 deg — +1 deg   |
| Exhaust oil flow control solenoid valve duty ratio RH | Exh. OCV Duty R                               | %  | 9.4%   |
| Exhaust oil flow control solenoid valve duty ratio LH | Exh. OCV Duty L                               | %  | 9.4%   |
| Exhaust oil flow control solenoid valve current RH    | Exh. OCV Current R                            | mA                                       | 64 mA  |
| Exhaust oil flow control solenoid valve current LH    | Exh. OCV Current L                            | mA                                       | 64 mA  |
| #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  |
| #5 cylinder roughness monitor                         | Roughness Monitor #5                          | —  | 0  |
| #6 cylinder roughness monitor                         | Roughness Monitor #6                          | —  | 0  |
| Knock sensor correction                               | Knocking Correction                           | deg                                      | 0 deg  |
| Fuel tank pressure signal                             | Fuel Tank Pressure                            | mmHg, kPa, inHg or psig                  | 7.5 mmHg, 1 kPa, 0.3 inHg or 0.14 psi                              |
| AT/MT identification                                  | AT Vehicle ID Signal                          | —  | AT vehicle   |
| D-check require Flag                                  | D-check Require Flag                          | —  | OFF  |
| Delivery (test) mode terminal                         | Delivery Mode Connector (Test Mode Connector) | —  | OFF  |
| Neutral position switch signal                        | Neutral Position Switch                       | —  | ON   |
| Idle switch signal                                    | Idle Switch Signal                            | —  | ON   |
| Ignition switch signal                                | Ignition Switch                               | —  | ON   |
| Power steering switch signal                          | P/S Switch                                    | —  | OFF (when OFF)   |
| Air conditioning switch signal                        | A/C Switch                                    | —  | OFF (when OFF)   |
| Starter switch signal                                 | Starter Switch                                | —  | OFF  |

# Subaru Select Monitor

## ENGINE (DIAGNOSTICS)

| Content   | Display                  | Unit of measure | Note (at idling)                   |
|---|--------------------------|-----------------|------------------------------------|
| Front oxygen monitor 1  | Front O2 #1 Rich Signal  | —               | Rich, Lean                         |
| Front oxygen monitor 2  | Front O2 #2 Rich Signal  | —               | Rich, Lean                         |
| Knocking signal   | Knocking Signal          | —               | OFF                                |
| Crankshaft position sensor signal                             | Crankshaft Position Sig. | —               | ON                                 |
| Camshaft position sensor signal                               | Camshaft Position Sig.   | —               | ON                                 |
| Rear defogger switch signal                                   | Rear Defogger SW         | —               | OFF (when OFF)                     |
| Blower fan switch signal                                      | Blower Fan SW            | —               | OFF (when OFF)                     |
| Light switch signal   | Light Switch             | —               | OFF (when OFF)                     |
| A/C middle pressure switch signal                             | A/C Mid Pressure Switch  | —               | OFF (when A/C OFF)                 |
| A/C compressor relay signal                                   | A/C Compressor Signal    | —               | OFF (when A/C OFF)                 |
| Drain valve signal  | Vent. Solenoid Valve     | —               | OFF (when OFF)                     |
| AT coordinate retard angle demand signal                      | Retard Signal from AT    | —               | OFF                                |
| AT coordinate fuel cut demand signal                          | Fuel Cut signal from AT  | —               | OFF                                |
| Vehicle dynamics control (VDC) torque down prohibition output | Ban of Torque Down       | —               | ON                                 |
| Vehicle dynamics control (VDC) torque down demand             | Request Torque Down VDC  | —               | OFF                                |
| AT coordinate permission signal                               | Torque permission signal | —               | ON                                 |
| Electronic throttle control motor relay signal                | ETC Motor Relay          | —               | ON                                 |
| Stop light switch signal                                      | Stop Light Switch        | —               | OFF (when brake is OFF)            |
| SET/COAST switch signal                                       | SET/COAST Switch         | —               | OFF (when levers are not operated) |
| RESUME/ACCEL switch signal                                    | RESUME/ACCEL Switch      | —               | OFF (when levers are not operated) |
| Brake switch signal   | Brake Switch             | —               | OFF (when brake is OFF)            |
| Main switch signal  | Main Switch              | —               | OFF (when levers are not operated) |
| Cruise control cancel switch signal                           | CC Cancel SW             | —               | OFF (when levers are not operated) |
| Malfunction indicator light on flag                           | MIL On Flag              | —               | Light OFF                          |

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

- 1) On «Main Menu» display, select {Each System Check}.
- 2) On «System Selection Menu» display, select {Engine Control System}.
- 3) Click the [OK] button after the information of engine type has been displayed.
- 4) On «Engine Diagnosis» display, select {OBD System}.
- 5) On «OBD Menu» display, select {Current Data Display & Save}.
- 6) On «Current Data Display & Save» display, select {All data display}.
- 7) Using the scroll key, scroll the display screen up or down until the desired data is shown.

#### NOTE:

- For detailed operation procedures, refer to “PC application help for Subaru Select Monitor”.
- A list of the support data is shown in the following table.

| Content   | Display                         | Note (at idling) | Unit of measure |
|---|---------------------------------|------------------|-----------------|
| Number of diagnosis code                          | Number of Diag. Code:           | 0                | —               |
| Condition of malfunction indicator light          | MI(MIL)                         | OFF              | —               |
| Monitoring test of misfire                        | Misfire monitoring (Supp)       | YES              | —               |
| Monitoring test of misfire                        | Misfire monitoring (Rdy)        | YES              | —               |
| Monitoring test of fuel system                    | Fuel system monitoring (Supp)   | YES              | —               |
| Monitoring test of fuel system                    | Fuel system monitoring (Rdy)    | YES              | —               |
| Monitoring test of comprehensive component        | Component monitoring (Supp)     | YES              | —               |
| Monitoring test of comprehensive component        | Component monitoring (Rdy)      | YES              | —               |
| Test of catalyst                                  | Catalyst Diagnosis (Supp)       | YES              | —               |
| Test of catalyst                                  | Catalyst Diagnosis (Rdy)        | NO               | —               |
| Test of heating-type catalyst                     | Heated catalyst (Supp)          | NO               | —               |
| Test of heating-type catalyst                     | Heated catalyst (Rdy)           | N/A              | —               |
| Test of evaporative emission purge control system | Evaporative purge system (Supp) | YES              | —               |
| Test of evaporative emission purge control system | Evaporative purge system (Rdy)  | NO               | —               |
| Secondary air system test                         | Secondary air system (Supp)     | NO               | —               |
| Secondary air system test                         | Secondary air system (Rdy)      | N/A              | —               |
| Test of air conditioning system refrigerant       | A/C system refrigerant (Supp)   | NO               | —               |
| Test of air conditioning system refrigerant       | A/C system refrigerant (Rdy)    | N/A              | —               |
| Test of oxygen sensor                             | Oxygen sensor (Supp)            | YES              | —               |
| Test of oxygen sensor                             | Oxygen sensor (Rdy)             | NO               | —               |
| Test of oxygen sensor heater                      | O2 Heater Diagnosis (Supp)      | YES              | —               |
| Test of oxygen sensor heater                      | O2 Heater Diagnosis (Rdy)       | NO               | —               |
| Test of EGR system                                | EGR system (Supp)               | YES              | —               |
| Test of EGR system                                | EGR system (Rdy)                | NO               | —               |
| Air fuel ratio control system for bank 1          | Fuel system for Bank 1          | CI_normal        | —               |
| Air fuel ratio control system for bank 2          | Fuel system for Bank 2          | CI_normal        | —               |
| Engine load data                                  | Calculated load value           | 21.0             | %               |

# Subaru Select Monitor

## ENGINE (DIAGNOSTICS)

| Content   | Display                         | Note (at idling)     | Unit of measure |
|---|---------------------------------|----------------------|-----------------|
| Engine coolant temperature signal                                 | Coolant Temp.                   | 91                   | °C              |
| Short term fuel trim by front oxygen (A/F) sensor (Bank 1)        | Short term fuel trim B1         | 17.2                 | %               |
| Long term fuel trim by front oxygen (A/F) sensor (Bank 1)         | Long term fuel trim B1          | 5.5                  | %               |
| Short term fuel trim by front oxygen (A/F) sensor (Bank 2)        | Short term fuel trim B2         | 17.2                 | %               |
| Long term fuel trim by front oxygen (A/F) sensor (Bank 2)         | Long term fuel trim B2          | 5.5                  | %               |
| Intake manifold absolute pressure signal                          | Mani. Absolute Pressure         | 233                  | mmHg            |
| Engine speed signal   | Engine Speed                    | 700                  | rpm             |
| Vehicle speed signal  | Vehicle Speed                   | 0                    | km/h            |
| #1 Cylinder ignition timing                                       | Ignition timing adv. #1         | 16.5                 | °               |
| Intake air temperature signal                                     | Intake Air Temp.                | 54                   | °C              |
| Intake air amount   | Mass Air Flow                   | 2.8                  | g/s             |
| Throttle position signal  | Throttle Opening Angle          | 13                   | %               |
| Oxygen sensor (Bank 1 Sensor 2)                                   | Oxygen sensor #12               | 0.1 — 0.7            | V               |
| A/F correction (Bank 1 Sensor 2)                                  | Short term fuel trim #12        | 0.0                  | %               |
| Oxygen sensor (Bank 2 Sensor 2)                                   | Oxygen sensor #22               | 0.1 — 0.7            | V               |
| A/F correction (Bank 2 Sensor 2)                                  | Short term fuel trim #22        | 0.0                  | %               |
| On-board diagnostic system  | OBD System                      | OBD/OBD2             | —               |
| Front oxygen (A/F) sensor (Bank 1 Sensor 1)                       | Oxygen sensor #11               | Supported            | —               |
| Oxygen sensor (Bank 1 Sensor 2)                                   | Oxygen sensor #12               | Supported            | —               |
| Front oxygen (A/F) sensor (Bank 2 Sensor 1)                       | Oxygen sensor #21               | Supported            | —               |
| Oxygen sensor (Bank 2 Sensor 2)                                   | Oxygen sensor #22               | Supported            | —               |
| Elapsed time after engine start                                   | Time Since Engine Start         | —                    | sec             |
| Travel distance after the malfunction indicator light illuminates | Lighted MI lamp history         | —                    | km              |
| A/F lambda signal (Bank 1 Sensor 1)                               | A/F Sensor #11                  | 1.001                | —               |
| A/F sensor output signal (Bank 1 Sensor 1)                        | A/F Sensor #11                  | 2.805                | V               |
| A/F lambda signal (Bank 2 Sensor 1)                               | A/F Sensor #21                  | 1.001                | —               |
| A/F sensor output signal (Bank 2 Sensor 1)                        | A/F Sensor #21                  | 2.805                | V               |
| Target EGR  | Commanded EGR                   | 0                    | %               |
| EGR deviation   | EGR Error                       | 0.0                  | %               |
| Evaporative purge   | Commanded Evap Purge            | 0                    | %               |
| Fuel level signal   | Fuel Level                      | —                    | %               |
| Number of warm ups after DTC clear                                | Number of warm-ups              | —                    | —               |
| Travel distance after DTC clear                                   | Meter since DTC cleared         | —                    | km              |
| Fuel tank pressure signal   | Fuel Tank Pressure              | 8.8                  | mmHg            |
| Atmospheric pressure signal                                       | Atmosphere Pressure             | Atmospheric pressure | mmHg            |
| A/F lambda signal (Bank 1 Sensor 1)                               | A/F Sensor #11                  | 0.999                | —               |
| A/F sensor current (Bank 1 Sensor 1)                              | A/F Sensor #11                  | 0.02                 | mA              |
| A/F lambda signal (Bank 2 Sensor 1)                               | A/F Sensor #21                  | 0.999                | —               |
| A/F sensor current (Bank 2 Sensor 1)                              | A/F Sensor #21                  | 0.02                 | mA              |
| Catalyst temperature #1   | Catalyst Temperature #11        | —                    | °C              |
| Catalyst temperature #2   | Catalyst Temperature #21        | —                    | °C              |
| Monitoring test of misfire  | Misfire monitoring (Enable)     | YES                  | —               |
| Monitoring test of misfire  | Misfire monitoring (Comp)       | NO                   | —               |
| Monitoring test of fuel system                                    | Fuel system monitoring (Enable) | YES                  | —               |

# Subaru Select Monitor

## ENGINE (DIAGNOSTICS)

| Content   | Display                           | Note (at idling)        | Unit of measure |
|---|-----------------------------------|-------------------------|-----------------|
| Monitoring test of fuel system                              | Fuel system monitoring (Comp)     | NO                      | —               |
| Monitoring test of comprehensive component                  | Component monitoring (Enable)     | YES                     | —               |
| Monitoring test of comprehensive component                  | Component monitoring (Comp)       | NO                      | —               |
| Test of catalyst  | Catalyst Diagnosis (Enable)       | YES                     | —               |
| Test of catalyst  | Catalyst Diagnosis (Comp)         | NO                      | —               |
| Test of heating-type catalyst                               | Heated catalyst (Enable)          | N/A                     | —               |
| Test of heating-type catalyst                               | Heated catalyst (Comp)            | N/A                     | —               |
| Test of evaporative emission purge control system           | Evaporative purge system (Enable) | YES                     | —               |
| Test of evaporative emission purge control system           | Evaporative purge system (Comp)   | NO                      | —               |
| Secondary air system test                                   | Secondary air system (Enable)     | N/A                     | —               |
| Secondary air system test                                   | Secondary air system (Comp)       | N/A                     | —               |
| Test of air conditioning system refrigerant                 | A/C system refrigerant (Enable)   | N/A                     | —               |
| Test of air conditioning system refrigerant                 | A/C system refrigerant (Comp)     | N/A                     | —               |
| Test of oxygen sensor                                       | Oxygen sensor (Enable)            | YES                     | —               |
| Test of oxygen sensor                                       | Oxygen sensor (Comp)              | NO                      | —               |
| Test of oxygen sensor heater                                | O2 Heater Diagnosis (Enable)      | YES                     | —               |
| Test of oxygen sensor heater                                | O2 Heater Diagnosis (Comp)        | NO                      | —               |
| Test of EGR system  | EGR system (Enable)               | YES                     | —               |
| Test of EGR system  | EGR system (Comp)                 | NO                      | —               |
| ECM power supply voltage                                    | Control module voltage            | 13.789                  | V               |
| Absolute load   | Absolute Load Value               | 22                      | %               |
| A/F target lambda   | Target Equivalence Ratio          | 0.976                   | —               |
| Relative throttle opening angle                             | Relative Throttle Pos.            | 2                       | %               |
| Ambient temperature   | Ambient Temperature               | Ambient air temperature | °C              |
| Absolute throttle opening angle 2                           | Absolute Throttle Pos.#2          | 32                      | %               |
| Absolute accelerator opening angle 1                        | Accelerator Pedal Pos.#1          | 13                      | %               |
| Absolute accelerator opening angle 2                        | Accelerator Pedal Pos.#2          | 13                      | %               |
| Target throttle opening angle                               | Target Throt. Act. Cont.          | 0                       | %               |
| Engine operating time while malfunction indicator light lit | Time while MIL lighted            | —                       | min             |
| Elapsed time after DTC clear                                | Time since DTC cleared            | —                       | min             |
| Type of fuel  | Type of fuel                      | GAS                     | —               |
| Relative acceleration opening angle                         | Relative Accelera. Pos.           | 0                       | %               |
| Neutral condition   | AT drive status                   | NEUT                    | —               |

# Subaru Select Monitor

## ENGINE (DIAGNOSTICS)

### 4. READ FREEZE FRAME DATA FOR ENGINE (OBD MODE)

- 1) On «Main Menu» display, select {Each System Check}.
- 2) On «System Selection Menu» display, select {Engine Control System}.
- 3) Click the [OK] button after the information of engine type has been displayed.
- 4) On «Engine Diagnosis» display, select {OBD System}.
- 5) On «OBD Menu» display, select {Freeze Frame Data Display}.

#### NOTE:

- For detailed operation procedures, refer to “PC application help for Subaru Select Monitor”.
- A list of the support data is shown in the following table.

| Contents   | Display                  | Unit of measure         |
|--|--------------------------|-------------------------|
| DTC of freeze frame data                                   | Freeze frame data        | —                       |
| Air fuel ratio control system for bank 1                   | Fuel system for Bank 1   | —                       |
| Air fuel ratio control system for bank 2                   | Fuel system for Bank 2   | —                       |
| Engine load data   | Calculated load value    | %                       |
| 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 adv. #1                                    | Ignition timing adv. #1  | °                       |
| Intake air temperature                                     | Intake Air Temp.         | °C or °F                |
| Amount of intake air                                       | Mass Air Flow            | g/s                     |
| Throttle valve angle                                       | Throttle Opening Angle   | %                       |
| Oxygen sensor #12  | Oxygen sensor #12        | V                       |
| A/F correction value #12                                   | Short term fuel trim #12 | %                       |
| Oxygen sensor #22  | Oxygen sensor #22        | V                       |
| A/F correction value #22                                   | Short term fuel trim #22 | %                       |
| On-board diagnostic system                                 | OBD System               | —                       |
| Oxygen sensor #11  | Oxygen sensor #11        | —                       |
| Oxygen sensor #12  | Oxygen sensor #12        | —                       |
| Oxygen sensor #21  | Oxygen sensor #21        | —                       |
| Oxygen sensor #22  | Oxygen sensor #22        | —                       |
| Elapsed time after engine start                            | Time Since Engine Start  | sec                     |
| Target EGR   | Commanded EGR            | %                       |
| EGR deviation  | EGR Error                | %                       |
| Evaporative purge  | Commanded Evap Purge     | %                       |
| Fuel level signal  | Fuel Level               | %                       |
| Fuel tank pressure signal                                  | Fuel Tank Pressure       | mmHg, kPa, inHg or psig |
| Atmospheric pressure                                       | Atmosphere Pressure      | mmHg, kPa, inHg or psig |
| ECM power supply voltage                                   | Control module voltage   | V                       |
| Absolute load  | Absolute Load Value      | %                       |
| A/F target lambda  | Target Equivalence Ratio | —                       |
| Relative throttle opening angle                            | Relative Throttle Pos.   | %                       |
| Ambient temperature  | Ambient Temperature      | °C or °F                |
| Absolute throttle opening angle 2                          | Absolute Throttle Pos.#2 | %                       |
| Absolute accelerator opening angle 1                       | Accelerator Pedal Pos.#1 | %                       |
| Absolute accelerator opening angle 2                       | Accelerator Pedal Pos.#2 | %                       |
| Target throttle opening angle                              | Target Throt. Act. Cont. | %                       |
| Neutral condition  | AT drive status          | —                       |



## 5. V.I.N. REGISTRATION

- 1) On «Main Menu» display, select {Each System Check}.
- 2) On «System Selection Menu» display, select {Engine Control System}.
- 3) Click the [OK] button after the information of engine type has been displayed.
- 4) On «Engine Diagnosis» display, select {Entry VIN}.
- 5) Perform the procedures shown on the display screen.