9. Subaru Select Monitor

A: OPERATION

1. HOW TO USE SUBARU SELECT MONITOR

NOTE:
For detailed operation procedures, refer to “PC application help for Subaru Select Monitor”.

2. DISPLAY CURRENT ENGINE DATA

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.
- *: For models without cruise control, the brake switch signal does not change.

Display	Contents	Note (at idling)	Remarks
Engine Speed	Calculated from crankshaft position sensor signal.	650 rpm	rpm
Mass Air Flow	Amount of intake air calculated from air flow sensor output value.	2.0 g/s	g/s or lb/m
Vehicle speed	Value calculated from vehicle speed sensor output value.	0 km/h	km/h or MPH
Throttle Opening Angle	Throttle valve opening angle (in percentage) calculated from throttle position sensor output value.	13%	%
Accel opening angle	Accelerator pedal opening angle (in percentage) calculated from accelerator pedal position sensor output value.	0.0%	%
A/F Sensor #1	Actual lambda value calculated from front A/F sensor output value. (Bank 1)	1.00	—
Ignition timing adv. #1	Ignition timing control value for No. 1 cylinder. Calculated from rotation speed, intake manifold pressure, intake air temperature, water temperature, and data from knock sensor etc.	7°	°
Coolant Temperature	Value calculated from engine coolant temperature sensor output value.	96°C	°C or °F
Fuel Injection #1 Pulse	Control value of fuel injection time by engine control module. (RH bank)	2.56 ms	ms
Short term fuel trim B1	Air fuel ratio correction control value for the RH bank front side.	0.0%	%
Long term fuel trim B1	Air fuel ratio learning control value for the RH bank front side.	0.0%	%
Learned Ignition Timing	Ignition timing learning value. Advance or retard angle amount when knocking occurs.	0.0 deg	deg
Mani. Absolute Pressure	Value after subtracting atmospheric pressure from intake manifold absolute pressure. [(Intake manifold absolute pressure) – (atmospheric pressure)]	29 kPa	kPa, mmHg, inHg or psig
Oxygen sensor #12	Rear oxygen sensor output voltage for the RH bank.	—	V
VVT Adv. Ang. Amount R	Intake AVCS advance angle amount. (RH bank)	0 deg	deg
VVT Adv. Ang. Amount L	Intake AVCS advance angle amount. (Bank 2)	0 deg	deg
Exh. VVT Retard Ang. R	AVCS actual retard angle amount for the RH bank on the exhaust side.	0 deg	deg
Exh. VVT Retard Ang. L	AVCS actual retard angle amount for the RH bank on the exhaust side.	0 deg	deg
VVT Initial Position Learning Value #1	AVCS initial position learning value for the RH bank on the intake side. Controls the angle against a standard angle. Deviation learning is performed based on this standard value.	60°CA	°CA

Display	Contents	Note (at idling)	Remarks
VVT Initial Position Learning Value #2	AVCS initial position learning value for the LH bank on the intake side. Controls the angle against a standard angle. Deviation learning is performed based on this standard value.	60°CA	°CA
VVT Ex Initial Position Learning Value #1	AVCS initial position learning value for the RH bank on the intake side. Controls the angle against a standard angle. Deviation learning is performed based on this standard value.	90°CA	°CA
VVT Ex Initial Position Learning Value #2	AVCS initial position learning value for the LH bank on the intake side. Controls the angle against a standard angle. Deviation learning is performed based on this standard value.	90°CA	°CA
ECU ACC	ECM input power supply voltage.	13.3 V	V
Target engine speed	TCM target engine speed.	650 rpm	rpm
Target Equivalence Ratio	Target air fuel ratio. (Lambda) It usually becomes 1.0 aiming at a theoretical air fuel ratio.	0.996	—
Oil Temperature	Value calculated from the VVL system engine oil temperature and the oil temperature sensor output.	96°C	°C or °F
Intake Air Temp.	Intake air temperature calculated from the intake air temperature sensor output value.	50°C	°C or °F
Ambient Temperature	Ambient temperature that ECM estimates by input values from the engine coolant temperature sensor or the intake air temperature sensor etc.	—	°C or °F
Ambient Temperature Sensor Signal	Data value of the ambient sensor input from the combination meter via CAN. Ambient temperature used for diagnosis.	—	°C or °F
Ambient Temperature for Control	Data value of the ambient sensor input from the combination meter via CAN. Ambient temperature used for control.	—	°C or °F
Calculated load value	Current rate of air amount. Value assuming that the air amount at the current engine speed with the throttle fully open is 100%.	19%	%
Absolute Load Value	Percentage of current intake air amount against the maximum air intake amount of the engine. For non-turbo engine, the value can be close to 95%, but will never be 100%. For turbo engine, this value may be close to 300% due to a boost pressure.	14%	%
Atmospheric pressure	Atmospheric pressure calculated from atmospheric pressure sensor output value.	—	kPa, mmHg, inHg or psig
Mani. Relative Pressure	Pressure value calculated from manifold pressure sensor output value. (Absolute value) (Air intake absolute pressure – Atmospheric pressure)	—	kPa, mmHg, inHg or psig
Target Throttle Opening Angle	Target throttle opening angle calculated by ECM.	16 deg	deg
Actual Throttle Opening Angle	Actual throttle opening angle. Calculated by ECM based on the throttle sensor input value.	16 deg	deg
Target Throttle Opening Angle	Control value of the target throttle opening angle calculated by ECM. Shows the target value of opening angle in percentage when 0% means fully closed and 100% means fully open.	0.0%	%

Display	Contents	Note (at idling)	Remarks
Relative Throttle Pos.	Current throttle opening angle in percentage against the throttle voltage (full range) that has reflected the full close point learning value. The value will be approx. 70% at full open.	1.2%	%
Throttle Motor Voltage	Power supply voltage of the throttle motor. ECM input value.	13.4 V	V
Main-Throttle Sensor	Voltage value of the main throttle position sensor. ECM input value.	0.63 V	V
Sub-Throttle Sensor	Voltage value of the sub throttle position sensor. ECM input value.	1.52 V	V
Throttle Motor Duty	Throttle motor control duty ratio. ECM output value.	–12.5%	%
Main-Accelerator Sensor	Voltage value of the main accelerator pedal position sensor. ECM input value.	0.68 V	V
Sub-Accelerator Sensor	Voltage value of the sub accelerator pedal position sensor. ECM input value.	0.68 V	V
Air Flow Sensor Voltage	Air flow sensor output value. Input value to ECM.	1.2 V	V
Fuel Level	Fuel level sensor output value. ECM input value. Total value of main and sub.	—	%
Fuel level resistance	Fuel level sensor resistance value. ECM input value.	—	Ω
Evap Purge	Evaporative purge rate displayed by the OBD.	0%	%
CPC Valve Duty Ratio	Purge control solenoid valve control duty ratio. ECM output value.	0%	%
Knocking Correction	Retard angle amount when knocking occurs. Partially learning value of ignition timing learning value.	0.0 deg	deg
Fuel system for Bank 1	Feedback status of air fuel ratio for the RH bank. Open: Feedback is stopped Closed: Feedback control is being performed	Cl_normal	—
A/F Sensor #1 Current	Front A/F sensor output current value. (Bank 1) ECM input value.	0.00 mA	mA
A/F Sensor #1 Resistance	Front A/F sensor resistance value calculated from the front A/F sensor output value. (Bank 1)	50 Ω	Ω
A/F Correction #3	Sub correction value of A/F feedback control.	0.00%	%
No. of EGR steps	Number of EGR valve steps. Number of stepping motor steps. ECM output value.	0 STEP	STEP
Commanded EGR	EGR setting value is calculated by ECM and the target value is displayed.	0%	%
EGR Error	Displays a difference (%) between the target EGR steps and the actual EGR steps. When the value is positive, it opens more than the target value. When the value is negative, it does not reach to the target value.	0%	%
TGV Position SW1	Shows an open/close status of the TGV opening angle SW for RH bank. Input value from the TGV opening angle SW for RH bank to the ECM.	Close	—
TGV Position SW2	Shows an open/close status of the TGV opening angle SW for RH bank. Input value from the TGV opening angle SW for LH bank to the ECM.	Close	—

Display	Contents	Note (at idling)	Remarks
TGV Output	Drive signal to TGV motor. Set to “ON” when the TGV is activated (when the duty output is other than 0%). ECM output value.	OFF	—
TGV Drive	Display of TGV drive status. Set to “Open” when the TGV is open. ECM control status.	Close	—
OCV Duty R	OCV control duty ratio. (Bank 1) ECM output value.	60%	%
OCV Duty L	OCV control duty ratio. (Bank 2) ECM output value.	63%	%
OCV Current R	OCV actual current value. (Bank 1) ECM input value.	703 mA	mA
OCV Current L	OCV actual current value. (Bank 2) ECM input value.	735 mA	mA
Exh. OCV Duty R	Exhaust side OCV control duty ratio on the RH bank. ECM output value.	49%	%
Exh. OCV Duty L	Exhaust side OCV control duty ratio on the LH bank. ECM output value.	49%	%
Exh. OCV Current R	Actual current value of the exhaust side OCV on the RH bank, and engine input value.	570 mA	mA
Exh. OCV Current L	Actual current value of the exhaust side OCV on the LH bank, and engine input value.	570 mA	mA
Roughness Monitor #1	#1 cylinder roughness monitor count value.	0	—
Roughness Monitor #2	#2 cylinder roughness monitor count value.	0	—
Roughness Monitor #3	#3 cylinder roughness monitor count value.	0	—
Roughness Monitor #4	#4 cylinder roughness monitor count value.	0	—
Active Grille Shutter Position	Displays the active grille shutter position. Counts the pulse and displays as 100% at full open and 0% at fully closed.	—	—
Active Grille Shutter Mechanical Break Status	Displays mechanical error status of the active grille shutter. During the calibration procedure, if a linkage of the active grille shutter is off, calibration is not performed. Judgment is done by the active grille shutter and the status is sent to ECM.	Normal	—
Active Grille Shutter Sensor Error Status	Judges a malfunction of the active grille shutter opening angle sensor. Judges the sensor malfunction on the pulse counter. Judgment is done by the active grille shutter and the status is sent to ECM.	Normal	—
Active Grille Shutter Voltage Error Status	Judges a malfunction of the power source voltage supplied to the active grille shutter. Judgment is done by the active grille shutter and the status is sent to ECM.	Normal	—
Active Grille Shutter Control Circuit Error Status	Judges a malfunction of the active grille shutter internal circuit (drive motor). Judgment is done by the active grille shutter and the status is sent to ECM.	Normal	—
Active Grille Shutter Stuck Error Status	Judges an abnormal stuck of the active grille shutter. Active grille shutter detects the status where the operation failed because of any foreign matter or ice clogging.	Normal	—
Active Grille Shutter Temperature Error Status	Detects internal temperature of the active grille shutter. Shows the status where the judgment is performed to check if the temperature is excessively high. Judgment is done by the active grille shutter and the status is sent to ECM.	Normal	—

Display	Contents	Note (at idling)	Remarks
Active Grille Shutter Communication Error Status	Communication is performed between the active grille shutter and ECM, and judges the abnormality of the communication status.	Normal	—
Active Grille Shutter Position Commanded Status	Shutter open/close command is sent from ECM to the active grille shutter, and the status of that command is displayed.	—	—
Active Grille Shutter Calibration in progress	Displays the calibration status of the active grille shutter. Active grille shutter performs the calibration when the ignition is ON. Set to ON when the calibration was performed.	OFF	—
Active Grille Shutter Calibration Commanded Status	Displays commands from ECM to the active grille shutter.	OFF	—
Active Grille Shutter Calibration Status	Shows the status where the calibration of the active grille shutter has completed or not completed. Always completed when there is no abnormality in the active grille shutter.	Complete	—
Active Grille Shutter Warning Status	Warning signal of the active grille shutter. When the active grille shutter has a malfunction, signal is sent to the combination meter to illuminate the warning light.	OFF	—
Active Grille Shutter Control Status 1	Shows the status such as operating factors (air conditioner, radiator fan etc.) or frozen judgment of the active grille shutter controlled by the ECM.	—	—
Ignition SW ON Count	Time stamp information. Number of times the ignition is ON since the vehicle was manufactured. The number of ignition ON is also recorded when a trouble code is recorded, so the comparison with that number will show you how many times the ignition has turned on since the diagnostic code was recorded.	—	times
Count	Time stamp information. Each unit individually counts the elapsed time since the ignition is turned ON. Master integrated unit and ECM synchronize with the master time. When synchronized: “Common” When not synchronized: “Originally” is displayed.	Common	—
Time Count	Time stamp information. Elapsed time after ignition ON. When a trouble code is recorded, the elapsed time after ignition ON is also recorded.	—	ms
Time Since Engine Start	Elapsed time after starting the engine. Displays the elapsed time after engine start based on the OBD regulations.	—	sec
Elapsed Time After Engine Run	Elapsed time after starting the engine. This value is used for control.	—	sec
Accumulation Time After Engine Run	Cumulative time after starting the engine. For models with Auto Start Stop, cumulative time after the first engine start. Time is not accumulated while the engine stops due to the Auto Start Stop system.	—	sec
Meter since DTC cleared	Travel distance after DTC clear.	—	km/mile
Time while MIL lighted	Engine operating time from when the malfunction indicator light illuminated till when it went off.	—	min
Time since DTC cleared	Elapsed time after DTC clear.	—	min

Display	Contents	Note (at idling)	Remarks
Number of warm-ups	Number of warm ups after DTC clear. Shows the number of cycle, considering that 1 cycle is the time from when starting and warming the engine till when stopping the engine.	—	times
Lighted MI lamp history	Travel distance after the warning light illuminated.	—	km/mile
Odometer	ECM calculates the total cumulative travel distance from the vehicle speed, separately from the odometer in the combination meter. Small difference from the odometer will be possible, but if there is a big difference, ECM or the combination meter may need to be replaced.	—	km
Catalyst Temperature #11	Estimated temperature of the front catalytic converter for RH bank.	—	°C or °F
AT drive status	Neutral condition. Information input from the inhibitor SW. (CVT model)	NEUT	—
Absolute Evap System Vapor Pressure	Measured value of the evaporative emission system pressure. Pressure sensor input value.	101 kPa	kPa
Neutral switch	Neutral switch signal. Signal when in neutral (MT) or in P or N range (AT). Value input to ECM.	Neutral	—
ETC Motor Relay	Drive signal to the electronic throttle motor relay. Set to ON when drive signal is output. ECM output value.	ON	—
Stop light SW	Stop light switch signal. Set to ON when the stop light illuminates. ECM input value.	OFF (when OFF)	—
Brake Switch*	Brake switch signal. Set to ON when the brake pedal is depressed. ECM input value.	OFF (when OFF)	—
Idle Switch Signal	Idle signal. Set to “Idle” while idling.	Idle	—
Ignition switch	Ignition switch signal. Set to ON when the ignition switch is ON.	ON	—
A/C Mid Pressure Switch	Air conditioner middle pressure SW signal. Set to “ON” when the switch is ON. ECM input value.	OFF (when OFF)	—
A/C Compressor Signal	A/C compressor drive signal. Set to “ON” when the drive signal is output. ECM output value.	OFF (when OFF)	—
Radiator Fan Relay #1	Radiator fan relay drive signal. Set to ON when the drive signal is output. ECM output value.	OFF (when OFF)	—
Radiator Fan Relay #2	Radiator fan relay drive signal. Set to ON when the drive signal is output. ECM output value.	OFF (when OFF)	—
A/C Switch	Air conditioner switch signal. Set to ON when the air conditioner switch of the heater control is ON. ECM input value.	OFF (when OFF)	—
Starter SW	Starter switch signal. Set to ON when the starter is ON. ECM input value.	OFF	—
Rear Defogger SW	Rear defogger switch input signal. Set to “ON” when the switch is ON. ECM input value.	OFF (when OFF)	—

Display	Contents	Note (at idling)	Remarks
Blower Fan SW	Blower fan switch input signal. Set to “ON” when the switch is ON. ECM input value.	OFF (when OFF)	—
Light Switch	Light switch input signal. Set to “ON” when the switch is ON. ECM input value.	OFF (when OFF)	—
Wiper Switch	Wiper switch input signal. Set to “ON” when the switch is ON. ECM input value.	OFF (when OFF)	—
Delivery Mode Connector	Delivery mode terminal fuse installation status.	OFF	—
Rear O2 Rich Signal	Rear oxygen sensor output value. Displays “Rich” when the air fuel ratio of rear oxygen sensor is rich, and displays “Lean” when lean.	—	—
Knocking Signal	Knock sensor output signal. Judges if a knocking occurs or not.	OFF	—
Crankshaft Position Sig.	Crankshaft position sensor output signal. Set to “ON” when the engine is running. ECM input signal.	ON	—
Camshaft Position Sig.	Camshaft position sensor output signal. Set to “ON” when the engine is running. ECM input signal.	ON	—
Ban of Torque Down	Torque down prohibition notification signal to the vehicle dynamics control (VDC) module. Set to “OFF” when the prohibition signal is output. ECM output value.	ON	—
Request Torque Down VDC	Torque down request signal transmitted from the vehicle dynamics control (VDC) module. Set to “ON” when the request signal is sent. ECM input signal.	OFF	—
Torque Permission Signal	Torque down permission notification signal to the transmission control module. (CVT model) Set to “ON” when the permission signal is output. ECM output value.	ON	—
SET/COAST SW	Cruise control system SET/COAST SW signal. Set to ON when the switch is operated. ECM input signal.	OFF (when OFF)	—
RESUME/ACCEL SW	Cruise control system RESUME/ACCEL SW signal. Set to ON when the switch is operated. ECM input signal.	OFF (when OFF)	—
Main switch	Cruise control system main switch signal. Set to ON when the switch is operated. ECM input signal.	OFF (when OFF)	—
Cruise Control Cancel Switch Signal	Cruise control cancel switch signal of the cruise control system. Set to ON when the switch is operated. ECM input signal.	OFF (when OFF)	—
Fuel Pump Relay	Fuel pump relay drive signal. Set to “ON” when the drive signal is output. ECM output value.	ON	—
All Cylinders Fuel cut	Status under the fuel injection amount control where the fuel injection is cut off in all cylinders.	OFF	—
Shift Pattern Demand for Low Water Temperature	Shift pattern request sent from ECM to the transmission CM. When the water temperature is low, shift pattern change to the low speed side is requested to raise the catalyst temperature faster.	OFF	—

Display	Contents	Note (at idling)	Remarks
Emphasized idle stop request	Request signal to prohibit Auto Start Stop cooperation control. Output signal from ECM to Auto Start Stop CM. Displayed only for models with Auto Start Stop.	ON	—
Oil level switch	Oil level switch signal. Set to “LOW level” when the amount of engine oil decreases. ECM input signal.	HIGH level	—
ELCM switching valve	ELCM switching valve drive signal. Set to “Close” when closing the switching valve. ECM output value.	Open	—
ELCM pump	ELCM pump drive signal. Set to “ON” when ELCM decompression pump is activated. ECM output value.	OFF	—
HPCM Current Control Mode	Shows current HPCM control mode for hybrid models.	—	—
Engine Control Status	Shows current engine control mode for hybrid models.	—	—
ISG Load Torque	Shows load torque of ISG equipped with hybrid models. Value calculated by ECM.	—	Nm
Primary Rev Speed	CVT primary pulley speed. Information received from HEV-CM.	—	rpm
12V Battery Relay Target Mode	Commanded status for the connection relay between the battery for starting engine and the battery for DCDC convert and for other load related to vehicle body. Information received from HEV-CM.	—	—
Start Control Check	Shows control mode when starting engine.	—	—
Input Clutch Open Request	Commanded status of drive request from HEV-CM to input clutch (which connects engine and primary axis).	—	—
ISG Cranking Status	Drive command status from HEV-CM to ISG.	OFF	—
Idle Stop Fuel Cut Request	Auto Start Stop fuel cut request status from HEV-CM to ECM.	No Request	—
Starter Relay Drive Permission Status	Starter relay operation permission status from HEV-CM to ECM.	—	—
Engine Torque Check 1	Engine torque information is transmitted from engine ECM to HPCM. And this is the engine torque related information.	—	Nm
Engine Torque Check 2	Engine torque information is transmitted from engine ECM to HPCM. And this is the engine torque related information.	—	Nm
Engine Torque Check 3	Engine torque information is transmitted from engine ECM to HPCM. And this is the engine torque related information.	—	Nm
Engine Torque Check 4	Engine torque information is transmitted from engine ECM to HPCM. And this is the engine torque related information.	—	Nm
Engine Torque Check 5	Engine torque information is transmitted from engine ECM to HPCM. And this is the engine torque related information.	—	Nm
Ignition Control Check 1	Detailed status of the engine ignition control information.	—	—
Ignition Control Check 2	Detailed status of the engine ignition control information.	—	—
MI(MIL)	Malfunction indicator light illumination status. When judged as abnormal, an illumination command signal is sent from ECM to the combination meter.	OFF	—
Number of Diag. Code:	The number of trouble codes recorded in the ECM.	0	—
(Oxygen sensor #11)	Installation status of the front oxygen sensor for RH bank.	Support	—

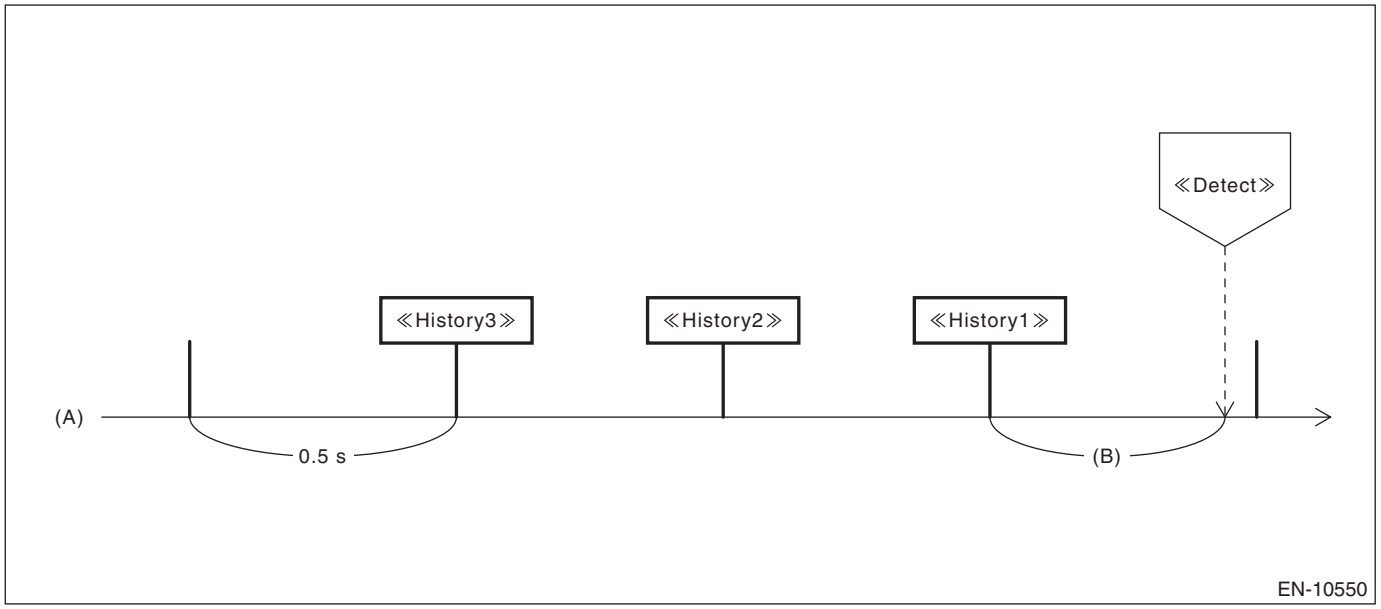
Display	Contents	Note (at idling)	Remarks
(Oxygen sensor #12)	Installation status of the rear oxygen sensor for RH bank.	Support	—
Short term fuel trim #12	Air fuel ratio correction control value for the RH bank rear side.	0.0%	%
A/F Sensor #11	Air fuel ratio calculated from the output value of RH bank front A/F sensor. (Lambda)	1.001	—
A/F Sensor #11	Output voltage of the RH bank front A/F sensor.	2.193 V	V
A/F Sensor #11	Air fuel ratio calculated from the output value of RH bank front A/F sensor. (Lambda)	1.001	—
A/F Sensor #11	Front A/F sensor output current on the RH side.	0.00	mA
Absolute Throttle Pos.#2	Shows the sub throttle sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	30.2%	%
Accelerator Pedal Pos.#1	Shows the main accelerator sensor voltage value in % against the full-range 5 V.	13.3%	%
Accelerator Pedal Pos.#2	Shows the sub accelerator sensor voltage value in % against the full-range 5 V.	13.3%	%
Relative Accelerator Pos.	Shows the accelerator opening angle with a full close point learning value taken into consideration.	0%	%
Misfire monitoring(Supp)	Shows the support status of misfire diagnosis.	YES	—
Misfire monitoring(Rdy)	Status of the misfire diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Fuel system monitoring(Supp)	Shows the support status of fuel system diagnosis.	YES	—
Fuel system monitoring(Rdy)	Status of the fuel system diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Component monitoring(Supp)	Shows the support status of component diagnosis.	YES	—
Component monitoring(Rdy)	Status of the component diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Catalyst Diagnosis(Supp)	Shows the support status of catalyst diagnosis.	YES	—
Catalyst Diagnosis(Rdy)	Status of the catalyst diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Heated catalyst(Supp)	Shows the support status of heated catalyst diagnosis.	NO	—
Heated catalyst(Rdy)	Status of the heated catalyst diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Evaporative purge system(Supp)	Shows the support status of evaporative purge system diagnosis.	NO	—
Evaporative purge system(Rdy)	Status of the evaporative purge system diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Secondary air system(Supp)	Shows the support status of the secondary air system diagnosis.	NO	—
Secondary air system(Rdy)	Status of the secondary air system diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
A/C system refrigerant(Supp)	Shows the support status of A/C system refrigerant diagnosis.	NO	—
A/C system refrigerant(Rdy)	Status of the A/C system refrigerant diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—

Display	Contents	Note (at idling)	Remarks
Oxygen sensor(Supp)	Shows the support status of oxygen sensor diagnosis.	YES	—
Oxygen sensor(Rdy)	Status of the oxygen sensor diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
O2 Heater Diagnosis(Supp)	Shows the support status of oxygen sensor heater diagnosis.	YES	—
O2 Heater Diagnosis(Rdy)	Status of the oxygen sensor heater diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
EGR system(Supp)	Shows the support status of EGR diagnosis.	YES	—
EGR system(Rdy)	Status of the EGR diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Misfire monitoring(Enable)	Shows whether or not the execution condition of misfire diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Misfire monitoring(Comp)	Shows whether or not the continuous misfire diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Fuel system monitoring(Enable)	Shows whether or not the execution condition of fuel system diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Fuel system monitoring(Comp)	Shows whether or not the fuel system diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Component monitoring(Enable)	Shows whether or not the execution condition of component diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Component monitoring(Comp)	Shows whether or not the component diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Catalyst Diagnosis(Enable)	Shows whether or not the execution condition of catalyst diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Catalyst Diagnosis(Comp)	Shows whether or not the catalyst diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Heated catalyst(Enable)	Shows whether or not the execution condition of heated catalyst diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
Heated catalyst(Comp)	Shows whether or not the heated catalyst diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—

Display	Contents	Note (at idling)	Remarks
Evaporative purge system(Enable)	Shows whether or not the execution condition of evaporative purge system diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
Evaporative purge system(Comp)	Shows whether or not the evaporative purge system diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Secondary air system(Enable)	Shows whether or not the execution condition of the secondary air system diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
Secondary air system(Comp)	Shows whether or not the secondary air system diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
A/C system refrigerant(Enable)	Shows whether or not the execution condition of A/C system refrigerant diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
A/C system refrigerant(Comp)	Shows whether or not the A/C system refrigerant diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Oxygen sensor(Enable)	Shows whether or not the execution condition of oxygen sensor diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Oxygen sensor(Comp)	Shows whether or not the oxygen sensor diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
O2 Heater Diagnosis(Enable)	Shows whether or not the execution condition of oxygen heater diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
O2 Heater Diagnosis(Comp)	Shows whether or not the oxygen heater diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
EGR system(Enable)	Shows whether or not the execution condition of EGR diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
EGR system(Comp)	Shows whether or not the EGR diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
OBD System	Shows the OBD regulation to be followed. This is the information recorded in the ECM, and it does not mean that the unit automatically judges the compliance to the OBD regulations.	OBD/OBD2	—

3. DISPLAY OF ENGINE FREEZE FRAME DATA

NOTE:
• ECM updates the freeze frame data every 0.5 seconds, and always keeps the last three records. Time-series freeze frame data includes the last three freeze frame data and the freeze frame data when the DTC is detected.
• In the time-series freeze frame data, the following freeze frame data are displayed: «Detect», «History1», «History2», and «History3».
• Time lag between the freeze frame data of «Detect» and the freeze frame data of «History1» changes within the range of 0 — 0.5 seconds. This is because the freeze frame data of «Detect» is recorded when the DTC is actually detected, while the freeze frame data of «History1» is updated every 0.5 seconds.



(A) 0.5 seconds timer
(B) Changes within the range of 0 — 0.5 seconds, depending on the timing of DTC detection.

• When more than one DTCs are recorded, the time-series freeze frame data is recorded only for the first-detected DTC, and for the next DTC, just the freeze frame data of «Detect» is recorded. And for the subsequent DTCs, no freeze frame data is recorded.
• When performing diagnosis, you can utilize the time-series freeze frame data to guess the vehicle status when the DTC was detected.
• 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.

Display	Contents	Unit of measure
Engine Speed	Calculated from crankshaft position sensor signal.	rpm
Mass Air Flow	Amount of intake air calculated from air flow sensor output value.	g/s or lb/m
Vehicle speed	Value calculated from vehicle speed sensor output value.	km/h or MPH
Throttle Opening Angle	Throttle valve opening angle (in percentage) calculated from throttle position sensor output value.	%
Ignition timing adv. #1	No. 1 cylinder ignition timing control value calculated from rotation speed, intake manifold pressure, intake air temperature, water temperature, and data from knock sensor etc.	°
Coolant Temperature	Value calculated from engine coolant temperature sensor output value.	°C or °F
Short term fuel trim B1	Main correction value of A/F feedback control. (Bank 1)	%
Long term fuel trim B1	Main learning value of A/F feedback control. (Bank 1)	%
Mani. Absolute Pressure	Value after subtracting atmospheric pressure from intake manifold absolute pressure [(intake manifold absolute pressure) – (atmospheric pressure)].	kPa, mmHg, inHg or psig
Oxygen sensor #12	Rear oxygen sensor voltage value on the front RH side.	V
ECU ACC	ECM input power supply voltage.	V
Target Equivalence Ratio	Target air fuel ratio. (Lambda) It usually becomes 1.0 aiming at a theoretical air fuel ratio.	—
Intake Air Temp.	Intake air temperature calculated from the intake air temperature sensor output value.	°C or °F
Ambient Temperature	Ambient temperature that ECM estimates by input values from the engine coolant temperature sensor or the intake air temperature sensor etc.	°C or °F
Ambient Temperature Sensor Signal	Data value of the ambient sensor input from the combination meter via CAN. Ambient temperature used for diagnosis.	°C or °F
Ambient Temperature for Control	Data value of the ambient sensor input from the combination meter via CAN. Ambient temperature used for control.	°C or °F
Calculated load value	Current rate of air amount assuming that the air amount at the current engine speed with the throttle fully open is 100%	%
Absolute Load Value	Shows a percentage of current intake air amount against the maximum air intake amount of the engine. For non-turbo engine, the value can be close to 95%, but will never be 100%. For turbo engine, this value may be close to 300% due to a boost pressure.	%
Atmospheric pressure	Atmospheric pressure calculated from atmospheric pressure sensor output value.	kPa, mmHg, inHg or psig
Actual Throttle Opening Angle	Actual throttle opening angle calculated by ECM based on the throttle sensor input value.	deg
Target Throttle Opening Angle	Control value of the target throttle opening angle calculated by ECM. Shows the target value of opening angle in percentage when 0% means fully closed and 100% means fully open.	%
Relative Throttle Pos.	Shoes the current throttle opening angle in percentage against the throttle voltage (full range) that has reflected the full close point learning value. The value will be approx. 70% at full open.	%
Fuel Level	Fuel level sensor output value. ECM input value. Total value of main and sub.	%

Display	Contents	Unit of measure
Evap Purge	Evaporative purge rate displayed by the OBD.	%
Fuel system for Bank 1	Displays the feedback status of air fuel ratio for the RH bank. Open: Feedback is stopped Closed: Feedback control is being performed	—
Commanded EGR	EGR setting value is calculated by ECM and the target value is displayed.	%
EGR Error	Displays a difference (%) between the target EGR steps and the actual EGR steps. When the value is negative, it does not reach to the target value. When the value is negative, it does not reach to the target value.	%
Active Grille Shutter Position	Counts the pulse of active grille shutter position, and displays as 100% at full open and 0% at fully closed.	—
Active Grille Shutter Mechanical Break Status	During the calibration procedure, if a linkage of the active grille shutter is off, calibration is not performed. Judgment is done by the active grille shutter and the status is sent to ECM.	—
Active Grille Shutter Sensor Error Status	Counts the pulse of active grille shutter opening angle position. Judges the sensor malfunction on the pulse counter. Judgment is done by the active grille shutter and the status is sent to ECM.	—
Active Grille Shutter Voltage Error Status	Judges whether the power source voltage supplied to the active grille shutter is abnormal. Judgment is done by the active grille shutter and the status is sent to ECM.	—
Active Grille Shutter Control Circuit Error Status	Shows the status where the judgment is performed to check if there is any abnormality in the internal circuit (drive motor) of the active grille shutter. Judgment is done by the active grille shutter and the status is sent to ECM.	—
Active Grille Shutter Stuck Error Status	Active grille shutter detects the status where the operation failed because of any foreign matter or ice clogging.	—
Active Grille Shutter Temperature Error Status	Detects internal temperature of the active grille shutter. Shows the status where the judgment is performed to check if the temperature is excessively high. Judgment is done by the active grille shutter and the status is sent to ECM.	—
Active Grille Shutter Communication Error Status	Communication is performed between the active grille shutter and ECM, and shows whether the communication status is abnormal.	—
Active Grille Shutter Position Commanded Status	Shutter open/close command is sent from ECM to the active grille shutter, and the status of that command is displayed.	—
Active Grille Shutter Calibration in progress	Active grille shutter performs the calibration when the ignition is ON, and displays the calibration status. Set to ON when the calibration was performed.	—
Active Grille Shutter Calibration Commanded Status	Status where the shutter open/close command is sent from ECM to the active grille shutter.	—
Active Grille Shutter Calibration Status	Shows the status where the calibration of the active grille shutter has completed or not completed, and is always completed when there is no abnormality in the active grille shutter.	—
Active Grille Shutter Warning Status	Shows warning signals of the active grille shutter. When the active grille shutter has a malfunction, signal is sent to the meter CM to illuminate the warning light.	—
Active Grille Shutter Control Status 1	Shows the status such as factors of the active grille operation (air conditioner, radiator fan etc.) or frozen judgment which is controlled by the ECM.	—
IGN Counter	Shows the number of times the ignition is turned ON since the vehicle was manufactured. The number of ignition ON is also recorded when a trouble code is recorded, so the comparison with that number will show you how many times the ignition has turned on since the diagnostic code was recorded.	times
Count	Shows the number of times the ignition is turned ON since the vehicle was manufactured. The number of ignition ON is also recorded when a trouble code is recorded, so the comparison with that number will show you how many times the ignition has turned on since the diagnostic code was recorded.	—

Display	Contents	Unit of measure
past time after IG on	Elapsed time after ignition ON. When a trouble code is recorded, the elapsed time after ignition ON is also recorded.	ms
Time Since Engine Start	Elapsed time after starting the engine. Displays the elapsed time after engine start based on the OBD regulations.	sec
AT drive status	Neutral condition. (CVT model) Information input from the inhibitor SW. (CVT model)	—
Engine Control Status	On hybrid system, engine torque information is transmitted from engine ECM to HPCM. And this is the engine torque related information.	—
Idle Stop Fuel Cut Request	On hybrid system, engine torque information is transmitted from engine ECM to hybrid powertrain control module. And this is the engine torque related information.	—
Engine Torque Check 1	On hybrid system, engine torque information is transmitted from engine ECM to hybrid powertrain control module. And this is the engine torque related information.	Nm
Engine Torque Check 2	On hybrid system, engine torque information is transmitted from engine ECM to hybrid powertrain control module. And this is the engine torque related information.	Nm
Engine Torque Check 3	On hybrid system, engine torque information is transmitted from engine ECM to hybrid powertrain control module. And this is the engine torque related information.	Nm
(Oxygen sensor #11)	Installation status of the front oxygen sensor for RH bank.	—
(Oxygen sensor #12)	Installation status of the rear oxygen sensor for RH bank.	—
Short term fuel trim #12	Air fuel ratio correction control value on the RH side rear.	%
Absolute Throttle Pos.#2	Shows the sub throttle sensor voltage value in % against the full-range 5V throttle sensor output voltage.	%
Accelerator Pedal Pos.#1	Absolute means to show the main accelerator sensor voltage value in % against the full-range 5V.	%
Accelerator Pedal Pos.#2	Absolute means to show the sub accelerator sensor voltage value in % against the full-range 5V.	%
OBD System	Shows the OBD regulation to be followed. This information is recorded in the ECU, and it does not mean that the unit automatically judges the compliance to the OBD regulations.	—

4. 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 {Work Support}.
5) On «Work Support» display, select {Entry VIN}.
6) Perform the procedures shown on the display screen.