DATA LIST / ACTIVE TEST

1. DATA LIST

HINT:

By reading the DATA LIST displayed on an intelligent tester, values can be checked, including those of the switches, sensors, and actuators, without removing any parts. Reading the DATA LIST as the first step of troubleshooting is one method of shortening diagnostic time.

NOTICE:

In the table below, the values listed under Normal Condition are for reference only. Do not depend solely on these values when determining whether or not a part is faulty.

(a) Warm up the engine.
(b) Turn the ignition switch OFF.
(c) Connect the intelligent tester to the DLC3.
(d) Turn the ignition switch ON.
(e) Turn the tester ON.
(f) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST.
(g) Check the values by referring to the table below.

ECM:

Intelligent Tester Display	Measurement: Range (Display)	Normal Condition*1	Diagnostic Note
INJECTOR	Injection period of No. 1 cylinder: Min.: 0 ms, Max.: 32.64 ms	1.0 to 3.0 ms: Idling	-
IGN ADVANCE	Ignition timing advance for No. 1 cylinder: Min.: -64 deg, Max.: 63.5 deg	BTDC 0 to 14 deg: Idling	-
CALC LOAD	Calculated load by ECM: Min.: 0 %, Max.: 100 %	• 10 to 30 %: Idling • 10 to 30 %: Running without load at 2,500 rpm	Load value
VEHICLE LOAD	Vehicle load: Min.: 0 %, Max.: 25,700 %	Actual vehicle load	Load percentage in terms of maximum intake air flow amount
MAF	Air flow rate from Mass Air Flow (MAF) meter: Min.: 0 g/sec., Max.: 655.35 g/sec.	1 to 3 g/sec.: Idling 2 to 6 g/sec.: Running without load at 2,500 rpm	If value approximately 0.0 g/sec.: • MAF meter power source circuit open • VG circuit open or short If value 160.0 g/sec. or more: • E2G circuit open
ENGINE SPD	Engine speed: Min.: 0 rpm, Max.: 16,383.75 rpm	650 to 750 rpm: Idling	-
VEHICLE SPD	Vehicle speed: Min.: 0 km/h, Max.: 255 km/h	Actual vehicle speed	Speed indicated on speedometer
COOLANT TEMP	Engine coolant temperature: Min.: -40°C, Max.: 140°C	80 to 100°C (176 to 212°F): After warming up	• If -40°C (-40°F): sensor circuit open • If 140°C (284°F) or more: sensor circuit shorted
INTAKE AIR	Intake air temperature: Min.: -40°C, Max.: 140°C	Equivalent to ambient air temperature	• If -40°C (-40°F): sensor circuit open • If 140°C (284°F) or more: sensor circuit shorted
AIR-FUEL RATIO	Ratio compared to stoichiometric level: Min.: 0, Max.: 1.999	0.8 to 1.2: Idling	• Less than 1 (0 to 0.999) = Lean • Stoichiometric air-fuel ratio = 1 • Greater than 1 (1.001 to 1.999) = Rich

Intelligent Tester Display	Measurement: Range (Display)	Normal Condition*1	Diagnostic Note
PURGE DENSITY	Learning value of purge density: Min.: -50, Max.: 350	-40 to 10: Idling	-
EVAP PURGE FLOW	Ratio of evaporative purge flow to intake air volume: Min.: 0 %, Max.: 102.4 %	0 to 10 %: Idling	-
EVAP PURGE VSV	EVAP (PURGE) VSV control duty: Min.: 0 %, Max.: 100 %	10 to 50 %: Idling	Order signal from ECM
VAPOR PRES PUMP	Vapor pressure: Min.: 33.853 kPa, Max.: 125.596 kPa	Approximately 100 kPa: Ignition switch ON	EVAP system pressure monitored by canister pressure sensor
VAPOR PRES CALC	Vapor pressure (calculated): Min.: -5.632 kPa, Max.: 715.264 kPa	Approximately 100 kPa: Ignition switch ON	EVAP system pressure monitored by canister pressure sensor
KNOCK CRRT VAL	Knock correction learning value: Min: -64°CA, Max.: 1,984°CA	0 to 20°CA: Driving at 70 km/h (44 mph)	Service data
KNOCK FB VAL	Knock feedback value: Min: -64°CA, Max.: 1,984°CA	-20 to 0°CA: Driving at 70 km/h (44 mph)	Service data
CLUTCH	Clutch current: Min.: 0 A, Max.: 2.49 A	-	-
EVAP VAPOR PRES	EVAP vapor pressure: Min.: 0 kPa, Max.: 327.675 kPa	Approximately 100 kPa: Ignition switch ON	EVAP system pressure monitored by canister pressure sensor
ACCEL POS #1	Absolute Accelerator Pedal Position (APP) No. 1: Min.: 0 %, Max.: 100 %	10 to 22 %: Accelerator pedal released 52 to 90 %: Accelerator pedal fully depressed	Read value with ignition switch ON (Do not start engine)
ACCEL POS #2	Absolute APP No. 2: Min.: 0 %, Max.: 100 %	24 to 40 %: Accelerator pedal released 68 to 100 %: Accelerator pedal fully depressed	Read value with ignition switch ON (Do not start engine)
ACCEL POS #1	APP sensor No. 1 voltage: Min.: 0 V, Max.: 4.98 V	-	ETCS freeze data
ACCEL POS #2	APP sensor No. 2 voltage: Min.: 0 V, Max.: 4.98 V	-	ETCS freeze data
ACCEL POS #1	APP sensor No. 1 voltage: Min.: 0 V, Max.: 5 V	0.5 to 1.1 V: Accelerator pedal released 2.6 to 4.5 V: Accelerator pedal fully depressed	Read value with ignition switch ON (Do not start engine)
ACCEL POS #2	APP sensor No. 2 voltage: Min.: 0 V, Max.: 5 V	1.2 to 2.0 V: Accelerator pedal released 3.4 to 5.0 V: Accelerator pedal fully depressed	Read value with ignition switch ON (Do not start engine)
ACCEL IDL POS	Whether or not accelerator pedal position sensor detecting idle: ON or OFF	ON: Idling	-
THRTL LEARN VAL	Throttle valve fully closed (learned value): Min.: 0 V, Max.: 5 V	0.4 to 0.8 V	-
ACCEL SSR #1 AD	APP sensor No. 1 voltage (AD): Min.: 0 V, Max.: 4.98 V	-	ETCS service data
ACCEL LRN VAL#1	Accelerator fully closed learning value No. 1: Min.: 0 deg, Max.: 124.512 deg	-	ETCS service data
ACCEL LRN VAL#2	Accelerator fully closed learning value No. 2: Min.: 0 deg, Max.: 124.512 deg	-	ETCS service data
FAIL #1	Whether or not fail safe function executed: ON or OFF	ON: ETCS has failed	-
FAIL #2	Whether or not fail safe function executed: ON or OFF	ON: ETCS has failed	-

Intelligent Tester Display	Measurement: Range (Display)	Normal Condition*1	Diagnostic Note
ST1	Brake pedal signal: ON or OFF	ON: Brake pedal depressed	-
SYS GUARD JUDGE	System guard: ON or OFF	-	ETCS service data
OPN MALFUNCTION	Open side malfunction: ON or OFF	-	ETCS service data
THROTTLE POS	Throttle position sensor: Min.: 0%, Max.: 100 %	• 10 to 22 %: Throttle fully closed • 66 to 98 %: Throttle fully open	• Calculated value based on VTA1 • Read value with ignition switch ON (Do not start engine)
THROTTL IDL POS	Whether or not throttle position sensor detecting idle: ON or OFF	ON: Idling	-
THRTL REQ POS	Throttle requirement position: Min.: 0 V, Max.: 5 V	0.5 to 1.0 V: Idling	-
THROTTLE POS	Throttle position: Min.: 0 %, Max.: 100 %	• 0 %: Throttle fully closed • 50 to 80 %: Throttle fully open	• Recognition value for throttle opening angle on ECM • Read value with ignition switch ON (Do not start engine)
THROTTLE POS #2	Throttle position No. 2 sensor: Min.: 0 %, Max.: 100 %	• 42 to 62 %: Throttle fully closed • 92 to 100 %: Throttle fully open	• Calculated value based on VTA2 • Read value with ignition switch ON (Do not start engine)
THROTTLE POS #1	Throttle position sensor No. 1 output voltage: Min.: 0 V, Max.: 4.98 V	-	ETCS freeze data
THROTTLE POS #2	Throttle position sensor No. 2 output voltage: Min.: 0 V, Max.: 4.98 V	-	ETCS freeze data
THROTTLE POS #1	Throttle position sensor No. 1 output voltage: Min.: 0 V, Max.: 5 V	• 0.5 to 1.1 V: Throttle fully closed • 3.3 to 4.9 V: Throttle fully open	Read value with ignition switch ON (Do not start engine)
THROTTLE POS #2	Throttle position sensor No. 2 output voltage: Min.: 0 V, Max.: 5 V	• 2.1 to 3.1 V: Throttle fully closed • 4.6 to 5.0 V: Throttle fully open	Read value with ignition switch ON (Do not start engine)
THRTL COMND VAL	Throttle position command value: Min.: 0 V, Max.: 4.9804 V	0.5 to 4.9 V	Read value with ignition switch ON (Do not start engine)
THROTTLE SSR #1	Throttle sensor opener position No. 1: Min.: 0 V, Max.: 4.9804 V	-	ETCS service data
THROTTLE SSR #2	Throttle sensor opener position No. 2: Min.: 0 V, Max.: 4.9804 V	-	ETCS service data
THRTL SSR #1 AD	Throttle position sensor No. 1 output voltage (AD): Min.: 0 V, Max.: 4.9804 V	0.5 to 4.9 V	Read value with ignition switch ON (Do not start engine)
THROTTLE MOT	Whether or not throttle actuator control permitted: ON or OFF	ON: Idling	Read value with ignition switch ON (Do not start engine)
THROTTLE MOT	Throttle actuator current: Min.: 0 A, Max.: 80 A	0 to 3.0 A: Idling	-
THROTTLE MOT	Throttle actuator: Min.: 0 %, Max.: 100 %	0.5 to 40 %: Idling	-
THROTTLE MOT	Throttle actuator current: Min.: 0 A, Max.: 19.92 A	0 to 3.0 A: Idling	-

Intelligent Tester Display	Measurement: Range (Display)	Normal Condition*1	Diagnostic Note
THROTL OPN DUTY	Throttle actuator opening duty ratio: Min.: 0 %, Max.: 100 %	0 to 40 %: During idling	• When accelerator pedal depressed, duty ratio increased • Read value with ignition switch ON (Do not start engine)
THROTL CLS DUTY	Throttle actuator closed duty ratio: Min.: 0 %, Max.: 100 %	0 to 40 %: During idling	• When accelerator pedal released quickly, duty ratio increased • Read value with ignition switch ON (Do not start engine)
THRTL MOT (OPN)	Throttle actuator duty ratio (open): Min.: 0 %, Max.: 100 %	0 to 40 %: During idling	ETCS service data
THRTL MOT (CLS)	Throttle actuator duty ratio (closed): Min.: 0 %, Max.: 100 %	0 to 40 %: During idling	ETCS service data
O2S B1 S2	Heated oxygen sensor output voltage for sensor 2: Min.: 0 V Max.: 1.275 V	0.1 to 0.9 V: Driving at 70 km/h (44 mph)	Performing INJ VOL or A/F CONTROL function of ACTIVE TEST enables technician to check output voltage of sensor
AFS B1 S1	A/F sensor output voltage for sensor 1: Min.: 0 V Max.: 7.999 V	2.8 to 3.8 V: Idling	Performing INJ VOL or A/F CONTROL function of ACTIVE TEST enables technician to check output voltage of sensor
TOTAL FT #1	Total fuel trim value for fuel system: Min.: -0.5, Max.: 0.496	-0.2 to 0.2	-
SHORT FT #1	Short-term fuel trim: Min.: -100 %, Max.: 99.2 %	-20 to 20 %	Short-term fuel compensation used to maintain air-fuel ratio at stoichiometric air-fuel ratio
LONG FT #1	Long-term fuel trim: Min.: -100 %, Max.: 99.2 %	-20 to 20 %	Overall fuel compensation carried out in long-term to compensate continual deviation of short-term fuel trim from central value
FUEL SYS #1	Fuel system status: OL or CL or OL DRIVE or OL FAULT or CL FAULT	CL: Idling after warming up	• OL (Open Loop): Has not yet satisfied conditions to go closed loop • CL (Closed Loop): Using A/F sensor as feedback for fuel control • OL DRIVE: Open loop due to driving conditions (fuel enrichment) • OL FAULT: Open loop due to detected system fault • CL FAULT: Closed loop but A/F sensor, which used for fuel control malfunctioning
O2FT B1 S2	Short-term fuel trim associated with sensor 2: Min.: -100 %, Max.: 99.2 %	-	-
AF FT B1 S1	Short-term fuel trim associated with sensor 1: Min.: 0, Max.: 1.999	• Value less than 1 (0.000 to 0.999) =Lean • Stoichiometric air-fuel ratio=1 • Value greater than 1 (1.001 to 1.999) = Rich	-
AFS B1 S1	A/F sensor current: Min.: -128 mA, Max.: 127.99 mA	-	-
CAT TEMP B1S1	Estimated catalyst temperature (sensor 1): Min.: -40°C, Max.: 6,513.5°C	-	-

Intelligent Tester Display	Measurement: Range (Display)	Normal Condition*1	Diagnostic Note
CAT TEMP B1S2	Estimated catalyst temperature (sensor 2): Min.: -40°C, Max.: 6,513.5°C	-	-
S O2S B1S2	Sub heated oxygen sensor impedance (sensor2): Min.: 0 Ω, Max.: 21247.68 Ω	-	-
INI COOL TEMP	Engine coolant temperature at engine start: Min.: -40°C, Max.: 120°C	Close to ambient air temperature	-
INI INTAKE TEMP	Intake air temperature at engine start: Min.: -40°C, Max.: 120°C	Close to ambient air temperature	-
INJ VOL	Injection volume (Cylinder 1): Min.: 0 ml, Max.: 2.048 ml	0 to 0.15 ml: Idling	Quantity of fuel injection volume for 10 times
STARTER SIG	Starter switch (STSW) signal: ON or OFF	ON: Cranking	-
PS SW	Power steering signal: ON or OFF	ON: Power steering operation	-
PS SIGNAL	Power steering signal (history): ON or OFF	ON: When steering wheel first turned after battery terminals connected	Signal status usually ON until battery terminals disconnected
CTP SW	Closed throttle position switch: ON or OFF	• ON: Throttle fully closed • OFF: Throttle open	-
A/C SIGNAL	A/C signal: ON or OFF	ON: A/C ON	-
PNP SW [NSW]	PNP switch status: ON or OFF	ON: P or N position	-
ELECT LOAD SIG	Electrical load signal: ON or OFF	ON: Headlights or defogger turned ON	-
STOP LIGHT SW	Stop light switch: ON or OFF	ON: Brake pedal depressed	-
+BM	Whether or not electric throttle control system power inputted: ON or OFF	ON: Ignition switch ON and system normal	-
+BM VOLTAGE	+BM voltage: Min.: 0, Max.: 19.922	9 to 14 (V): Ignition switch ON and system normal	ETCS service data
BATTERY VOLTAGE	Battery voltage: Min.: 0 V, Max.: 65.535 V	9 to 14 V: Ignition switch ON	-
ACTUATOR POWER	Actuator power supply: ON or OFF	ON: Idling	ETCS service data
ATM PRESSURE	Atmospheric pressure: Min.: 0 kPa, Max.: 255 kPa	Approximately 100 kPa: Ignition switch ON	-
BATTERY CURRENT	Battery current: Min.: -100 A, Max.: 100 A	-	-
BATTERY TEMP	Battery temperature: Min.: -45 °C, Max.: 156.4 °F	-	-
ALT OUTPUT DUTY	Generator output duty ratio: Min.: 0 %, Max.: 100 %	-	During charge control
ALT V NORMAL	Request voltage when regulator not under forced activation: Min.: 0 V, Max.: 20 V	Battery electrolyte temperature varies (12.5 to 14.8 V) while driving: After engine start	Alternator regulator output voltage is out put When performing Active Test, value is 0V
ALT V TST	Request voltage when regulator under forced activation: Min.: 0 V, Max.: 20 V	Request instruction voltage value: After engine start	Charging control service data When not performing Active Test, value is 0V
EVAP (Purge) VSV	Purge VSV status: ON or OFF	-	-
FUEL PUMP / SPD	Fuel pump status: ON or OFF	ON: Engine running	Active Test support data

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Intelligent Tester Display	Measurement: Range (Display)	Normal Condition*1	Diagnostic Note
VVT CTRL B1	VVT control (bank 1) status: ON or OFF	-	-
VACUUM PUMP	Key-off EVAP system leak detection pump status: ON or OFF	-	Active Test support data
EVAP VENT VAL	Key-off EVAP system vent valve status: ON or OFF	-	Active Test support data
FAN MOTOR	Electric fan motor: ON or OFF	ON: Electric fan motor operating	-
TC/TE1	TC and CG (TE1) terminal of DLC3: ON or OFF	-	Active Test support data
ENG SPEED #1	Engine rpm during No. 1 cylinder fuel cut: Min.: 0 rpm, Max.: 25,600 rpm	-	Output only when FUEL CUT #1 is performed using ACTIVE TEST
ENG SPEED #2	Engine rpm during No. 2 cylinder fuel cut: Min.: 0 rpm, Max.: 25,600 rpm	-	Output only when FUEL CUT #2 is performed using ACTIVE TEST
ENG SPEED #3	Engine rpm during No. 3 cylinder fuel cut: Min.: 0 rpm, Max.: 25,600 rpm	-	Output only when FUEL CUT #3 is performed using ACTIVE TEST
ENG SPEED #4	Engine rpm during No. 4 cylinder fuel cut: Min.: 0 rpm, Max.: 25,600 rpm	-	Output only when FUEL CUT #4 is performed using ACTIVE TEST
ENG SPEED ALL	Average of engine rpm values during fuel cut of No. 1 to No. 4 cylinders: Min.: 0 rpm, Max.: 25,600 rpm	-	Output only when ACTIVE TEST is performed
VVTL AIM ANGL#1*2	VVT aim angle: Min.: 0 %, Max.: 100 %	0 to 100 %	VVT duty signal value during intrusive operation
VVT CHNG ANGL#1*2	VVT angle: Min.: 0°FR, Max.: 60°FR	0 to 56°FR	Displacement angle during intrusive operation
VVT OCV DUTY B1*2	VVT OCV operation duty: Min.: 0 %, Max.: 100 %	0 to 100 %	Requested duty value for intrusive operation
FC IDL	Fuel cut idle: ON or OFF	ON: Fuel cut operation	FC IDL = "ON" when throttle valve fully closed and engine speed over 3,500 rpm
FC TAU	Fuel cut TAU (Fuel cut during very light load): ON or OFF	ON: Fuel cut operating	Fuel cut being performed under very light load to prevent engine combustion from becoming incomplete
IGNITION	Ignition counter: Min.: 0, Max.: 800	0 to 800	-
CYL #1, #2, #3, #4	Misfire of cylinder 1 to 4: Min.: 0, Max.: 255	0	-
CYL ALL	All cylinders misfire: Min.: 0, Max.: 255	0	-
MISFIRE RPM	Engine speed when misfire occur: Min.: 0 rpm, Max.: 6,375 rpm	-	-
MISFIRE LOAD	Engine load when misfire occur: Min.: 0 g/rev, Max.: 3.98 g/rev	-	-
MISFIRE MARGIN	Margin to detect engine misfire: Min.: -100 %, Max.: 99.22 %	-100 to 99.22 %	Misfire detecting margin
#CODES	Number of codes: Min.: 0, Max.: 255	-	Number of detected DTCs
CHECK MODE	Check mode: ON or OFF	ON: Check mode ON	(see page ES-38)

Intelligent Tester Display	Measurement: Range (Display)	Normal Condition*1	Diagnostic Note
SPD TEST	Check mode result for vehicle speed sensor: COMPL or INCMPL	-	-
MISFIRE TEST	Check mode result for misfire monitor: COMPL or INCMPL	-	-
OXS1 TEST	Check mode result for HO2 sensor: COMPL or INCMPL	-	-
A/F SSR TEST B1	Check mode result for air-fuel ratio sensor: COMPL or INCMPL	-	-
MIL	MIL status: ON or OFF	ON: MIL ON	-
MIL ON RUN DIST	MIL ON run distance: Min.: 0 km, Max.: 65,535 km	Distance after DTC detected	-
MIL ON RUN TIME	Running time from MIL ON: Min.: 0 minutes, Max.: 65,535 minutes	Equivalent to running time after MIL ON	-
ENG RUN TIME	Engine run time: Min.: 0 seconds, Max.: 65,535 seconds	Time after engine start	-
TIME DTC CLEAR	Time after DTC cleared: Min.: 0 minutes, Max.: 65,535 minutes	Equivalent to time after DTCs erased	-
DIST DTC CLEAR	Distance after DTC cleared: Min.: 0 km, Max.: 65,535 km	Equivalent to drive distance after DTCs erased	-
WU CYC DTC CLEAR	Warm-up cycle after DTC cleared: Min.: 0, Max.: 255	-	Number of warm-up cycles after DTC cleared
OBD CERT	OBD requirement	OBD2	-
#CARB CODES	Emission related DTCs	-	Number of emission related DTCs
COMP MON	Comprehensive component monitor: NOT AVL or AVAIL	-	-
FUEL MON	Fuel system monitor: NOT AVL or AVAIL	-	-
MISFIRE MON	Misfire monitor: NOT AVL or AVAIL	-	-
O2S (A/FS) HTR	O2S (A/FS) heater monitor: NOT AVL or AVAIL	-	-
O2S (A/FS) HTR	O2S (A/FS) heater monitor: COMPL or INCMPL	-	-
O2S (A/FS) MON	O2S (A/FS) monitor: NOT AVL or AVAIL	-	-
O2S (A/FS) MON	O2S (A/FS) monitor: COMPL or INCMPL	-	-
EVAP MON	EVAP monitor: NOT AVL or AVAIL	-	-
EVAP MON	EVAP monitor: COMPL or INCMPL	-	-
CAT MON	Catalyst monitor: NOT AVL or AVAIL	-	-
CAT MON	Catalyst monitor: COMPL or INCMPL	-	-
CCM ENA	Comprehensive component monitor: UNABLE or ENABLE	-	-

Intelligent Tester Display	Measurement: Range (Display)	Normal Condition*1	Diagnostic Note
CCM CMPL	Comprehensive component monitor: COMPL or INCMPL	-	-
FUEL ENA	Fuel system monitor: UNABLE or ENABLE	-	-
FUEL CMPL	Fuel system monitor: COMPL or INCMPL	-	-
MISFIRE ENA	Misfire monitor: UNABLE or ENABLE	-	-
MISFIRE CMPL	Misfire monitor: COMPL or INCMPL	-	-
HTR ENA	O2S (A/FS) heater monitor: UNABLE or ENABLE	-	-
HTR CMPL	O2S (A/FS) heater monitor: COMPL or INCMPL	-	-
O2S (A/FS) ENA	O2S (A/FS) monitor: UNABLE or ENABLE	-	-
O2S (A/FS) CMPL	O2S (A/FS) monitor: COMPL or INCMPL	-	-
EVAP ENA	EVAP monitor: UNABLE or ENABLE	-	-
EVAP CMPL	EVAP monitor: COMPL or INCMPL	-	-
CAT ENA	Catalyst monitor: UNABLE or ENABLE	-	-
CAT CMPL	Catalyst monitor: COMPL or INCMPL	-	-
MODEL CODE	Identifying model code	ACA3#	-
ENGINE TYPE	Identifying engine type	2AZFE	-
CYLINDER NUMBER	Identifying cylinder number: Min.: 0, Max.: 255	4	-
TRANSMISSION	Identifying transmission type	4AT	-
DESTINATION	Identifying destination	A (America)	-
MODEL YEAR	Identifying model year: Min.: 1900, Max.: 2155	200#	-
SYSTEM	Identifying engine system	GASLIN (gasoline engine)	-

HINT:

- *1: If no idling conditions are specified, the transmission gear selector lever should be in the N or P position, and the A/C switch and all accessory switches should be OFF.
- *2: DATA LIST values are only displayed when performing the following ACTIVE TEST: VVT B1. For other ACTIVE TESTs, the DATA LIST value will be 0.

2. ACTIVE TEST

HINT:

Performing an ACTIVE TEST enables components including the relays, VSV (Vacuum Switching Valve) and actuators, to be operated without removing any parts. The ACTIVE TEST can be performed with the intelligent tester. Performing the ACTIVE TEST as the first step of troubleshooting is one method of shortening diagnostic time.

DATA LIST can be displayed during ACTIVE TEST.

(a) Connect the intelligent tester to the DLC3.

(b) Turn the ignition switch ON.

(c) Turn the tester ON.
(d) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST.
(e) Perform the ACTIVE TEST by referring to the table below.

ECM:

Intelligent Tester Displays	Test Details	Control Ranges	Diagnostic Notes
INJ VOL	Change injection volume	Between -12.5 and 24.8 %	• All injectors tested at same time • Perform test at less than 3,000 rpm • Injection volume can be changed in 0.1 % graduations within control range
A/F CONTROL	Change injection volume	Decrease by 12.5 % or increase by 24.8 %	• Perform test at less than 3,000 rpm • A/F CONTROL enables checking and graphing of A/F (Air-Fuel Ratio) sensor and Heated Oxygen (HO2) sensor voltage outputs • To conduct test, select following menu items: ACTIVE TEST / A/F CONTROL / USER DATA / AFS B1S1 and O2S B1S2; then press YES and ENTER followed by F4.
EVAP VSV (ALONE)	Activate purge VSV control	ON/OFF	-
VVT B1	Control VVT (bank 1)	-128 to 127 % This value added to present OCV control duty 100 %: Maximum advance -100 %: Maximum retard	Engine stall or rough idle when VVT actuator operated by 100 %. Test possible while vehicle stopped and engine idling
VVT CTRL B1	Turn on and off OCV (Oil Control Valve)	ON/OFF	• Engine stalls or idles roughly when OCV turned ON • Normal engine running or idling when OCV OFF • Test possible while vehicle stopped and engine idling
FUEL PUMP / SPD	Activate fuel pump (C/OPN Relay)	ON/OFF	Test possible when engine stopped
TC/TE1	Turn on and off TC and TE1 connection	ON/OFF	• ON: TC and TE1 connected • OFF: TC and TE1 disconnected
FC IDL PROHBT	Prohibit idling fuel cut control	ON/OFF	-
COOLING FAN	Control electric cooling fan	ON/OFF	-
ETCS OPEN SLOW	Throttle actuator	ON: Throttle valve opens slowly	Test possible when following conditions met: • Engine stopped • Shift position in P • Fully depressing accelerator pedal (APP: 59° or more)
ETCS CLOSE SLOW	Throttle actuator	ON: Throttle valve closes slowly	
ETCS OPEN FAST	Throttle actuator	ON: Throttle valve opens fast	
ETCS CLOSE FAST	Throttle actuator	ON: Throttle valve closes fast	
FUEL CUT #1	Cylinder #1 injector fuel cut	ON/OFF	Test possible during vehicle stopping and engine idling ON: All cylinder injector fuel cut and ignition stop
FUEL CUT #2	Cylinder #2 injector fuel cut	ON/OFF	
FUEL CUT #3	Cylinder #3 injector fuel cut	ON/OFF	
FUEL CUT #4	Cylinder #4 injector fuel cut	ON/OFF	
FUEL CUT ALL	All cylinder injector fuel cut	ON/OFF	ON: All cylinder injector fuel cut
VACUUM PUMP	Leak detection pump	ON/OFF	-
VENT VALVE	Vent valve	ON/OFF	-

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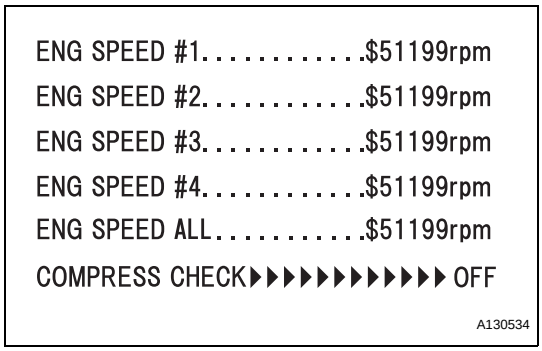
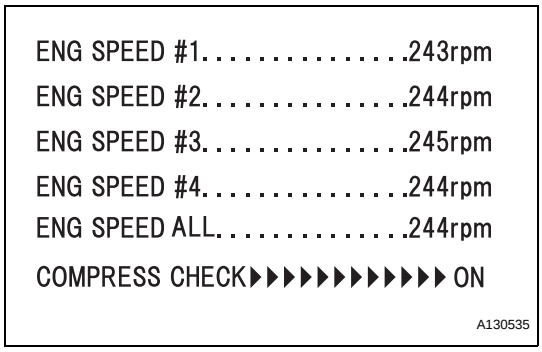
Intelligent Tester Displays	Test Details	Control Ranges	Diagnostic Notes
ALT VOL	Request output voltage of generator regulator during forced activation	Between 12.5 and 14.8 V	Engine running
COMPRESS CHECK	All cylinder injector fuel cut and ignition stop	ON/OFF	*

HINT:
*: When cranking the engine, each cylinder measures the engine rpm.
In this ACTIVE TEST, the fuel and ignition of all cylinders is cut, and cranking occurs for approximately 10 seconds. Then, each cylinder measures the engine rpm. If a cylinder's engine rpm is higher than the others, that cylinder's compression pressure is compared to the others, and whether or not the compression pressure is low can be determined.

1. Warm up the engine.
2. Turn the ignition switch OFF.
3. Connect the intelligent tester to the DLC3.
4. Turn the ignition switch ON and turn the intelligent tester ON.
5. Select the following menu items: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / COMPRESS CHECK.
   HINT:
   If the results are not displayed normally, select the display items from the DATA LIST before performing the ACTIVE TEST. Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / USER DATA / ENG SPEED #1 and ENG SPEED #2, ENG SPEED #3, ENG SPEED #4 (Press the YES button to change the ENG SPEED #1 to #4 is YES) and then press the ENTER button.



6. While the engine is not running, press the RIGHT or LEFT button to change the COMPRESS CHECK to ON.
   HINT:
   After performing the above procedure, the ACTIVE TEST's COMPRESS CHECK will start. Fuel injection for all cylinders is prohibited, and the each cylinder's engine rpm measurement will enter standby.
7. Fully open the throttle.
8. Crank the engine for about 10 seconds.
9. Monitor the engine speed (ENG SPEED #1 to #4) displayed on the tester.
   HINT:
   At first, the tester's display will show each cylinder's engine rpm measurement to be extremely high. After approximately 10 seconds of engine cranking, each cylinder's engine rpm measurement will change to the actual engine rpm.
   NOTICE:
   - **After the ACTIVE TEST's COMPRESS CHECK is turned ON, it will automatically turn off after 255 seconds.**



- **When the COMPRESS CHECK test is OFF and the engine is cranked, the engine will start.**
- **If the COMPRESS CHECK test needs to be performed after it is turned ON and performed once, press EXIT to return to the ACTIVE TEST menu screen. Then perform the COMPRESS CHECK test again.**
- **Use a fully-charged battery.**

3. SYSTEM CHECK

HINT:

Performing a SYSTEM CHECK enables the system, which consists of multiple actuators, to be operated without removing any parts. In addition, it can show whether or not any DTCs are set, and can detect potential malfunctions in the system. The SYSTEM CHECK can be performed with the intelligent tester.

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch ON.
(c) Turn the tester ON.
(d) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / SYSTEM CHECK.
(e) Perform the SYSTEM CHECK by referring to the table below.

ECM:

Intelligent Tester Display	Test Detail	Recommended Fuel Temperature	Diagnostic Note
EVAP SYS CHECK (AUTO OPERATION)	Perform 5 steps in order to operate EVAP key-off monitor automatically	35°C (95°F) or less	• If no DTCs in PENDING CODE after performing this test, system functioning normally • Refer to EVAP system
EVAP SYS CHECK (MANUAL OPERATION)	Perform 5 steps in order to operate EVAP key-off monitor manually	35°C (95°F) or less	• Used to detect malfunctioning parts • Refer to EVAP system