

## ECD SYSTEM > DATA LIST / ACTIVE TEST

### READ DATA LIST

**HINT:**

Using the intelligent tester's Data List allows switch, sensor, actuator, and other item values to be read without removing any parts. Reading the Data List early in troubleshooting is one way to save time.

**NOTICE:**

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

- 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 intelligent tester ON.
- f. Enter the following menus: Powertrain / Engine / Data List.
- g. Read the Data List.

Intelligent Tester Display	Measurement Item/Range (Display)	Normal Conditions*	Diagnostic Notes
Calculate Load	Calculated load by ECM/ Min.: 0%, Max.: 100%	Idling: 18 to 33% Running without load (2,500 rpm): 13 to 25%	-
MAP	Absolute pressure inside intake manifold/ Min.: 0 kPa, Max.: 255 kPa	<ul style="list-style-type: none"> <li>• Idling: 93 to 101 kPa</li> <li>• Engine running at 2,500 rpm: 108 to 120 kPa</li> <li>• Engine running at 3,000 rpm: 109 to 125 kPa</li> </ul>	-
MAF (MAF)	Air flow rate from Mass Air Flow (MAF) sensor/ Min.: 0 gm/s, Max.: 655.35 gm/s	Idling: 4.5 to 7.5 gm/s Running without load (2,500 rpm): 26.5 to 31.5 gm/s	0 gm/s: Mass air flow sensor power source circuit is open or VG circuit is open/shorted 160 gm/s or more: E2G circuit is open
Engine Speed	Engine speed/ Min.: 0 rpm, Max.: 16383.75 rpm	Idling: 750 to 950 rpm	After warming-up engine

Coolant Temp	Engine coolant temperature/ Min.: -40°C, Max.: 140°C	After warming up engine: 80 to 95°C (176 to 203°F)	If value is -40°C (-40°F) or 140°C (284°F), sensor circuit open or shorted
Intake Air	Intake air temperature/ Min.: -40°C, Max.: 140°C	Equivalent to temperature at intake manifold	If value is -40°C (-40°F) or 140°C (284°F), sensor circuit open or shorted
Fuel Temperature (Fuel Temp)	Fuel temperature/ Min.: -40°C, Max.: 140°C	Idling after engine warmed up: 0 to 70°C	-
Intake Air Temp (Turbo) (Intake Air 2)	Intake Air temperature (Turbo)/ Min.: -40 °C to 140°C	25 to 35°C	-
Vehicle Speed	Vehicle speed/ Min.: 0 km/h, Max.: 255 km/h	Actual vehicle speed	Speed indicated on speedometer
Fuel Press	Fuel pressure/ Min.: 0 MPa, Max.: 655.350 MPa	Idling: 27 to 37 MPa	-
EGR Position	EGR position/ Min: 0%, Max: 100%	Level surface, engine warmed up and idling: 20 to 40%	-
Accelerator Position No. 1	Accelerator position No. 1/ Min.: 0%, Max.: 100%	<ul style="list-style-type: none"> <li>Accelerator pedal released: 12 to 20%</li> <li>Accelerator pedal depressed: 68 to 76%</li> </ul>	-
Accelerator Position No. 2	Accelerator position No. 2/ Min.: 0%, Max.: 100%	<ul style="list-style-type: none"> <li>Accelerator pedal released: 28 to 36%</li> <li>Accelerator pedal depressed: 84 to 92%</li> </ul>	-
Throttle Motor (Throttle Mot)	Throttle actuator output/ Min.: 0%, Max.: 100%	Idling after engine warmed up: 30 to 50%	-
Initial Engine Coolant Temp	Initial engine coolant temperature/	ECT when engine starts	-

	Min.: -40°C, Max.: 120°C		
Initial Intake Air Temp	Initial intake air temperature/ Min.: -40°C, Max.: 120°C	IAT when engine starts	-
EGR Position	EGR position/ Min.: 0%, Max.: 100%	Idling after engine warmed-up and vehicle is under normal atmospheric pressure: 20 to 40%	-
EGR Close Learning Value	EGR close learning value/ Min.: 0 V, Max.: 5 V	3.5 to 4.5 V	-
Throttle Valve Fully Closed	Throttle valve fully closed/ Min.: 0 deg, Max.: 84 deg	0.645 to 0.775 deg	-
Target Common Rail Pressure	Target common rail pressure/ Min.: 0 kPa, Max.: 655350 kPa	Idling: 30 to 34 MPa	-
Injection Pressure Correction	Injection pressure correction/ Min.: -500 mm <sup>3</sup> /st, Max.: 780 mm <sup>3</sup> /st	-10 to 10 mm <sup>3</sup> /st	-
Alternate Duty Ratio	Alternate duty ratio/ Min.: 0%, Max.: 100%	All accessories are OFF: 30 to 40%	-
Accel Position 1	Accelerator pedal position sensor No. 1 voltage/ Min.: 0 V, Max.: 5 V	<ul style="list-style-type: none"> <li>Accelerator pedal released: 0.6 to 1.0 V</li> <li>Accelerator pedal depressed: 3.4 to 3.8 V</li> </ul>	Read value with ignition switch ON (do not start engine)
Accel Position 2	Accelerator pedal position sensor No. 2 voltage/ Min.: 0 V, Max.: 5 V	<ul style="list-style-type: none"> <li>Accelerator pedal released: 1.4 to 1.8 V</li> <li>Accelerator pedal depressed: 4.2 to 4.6 V</li> </ul>	Read value with ignition switch ON (do not start engine)
Accel Position	Accelerator position status/ Min.: 0%, Max.: 100%	<ul style="list-style-type: none"> <li>Accelerator pedal released: 12 to 20%</li> <li>Accelerator pedal</li> </ul>	Read value with ignition switch ON (do not start engine)

		depressed: 68 to 76%	
Diesel Throttle Angle (Diesel Thrtl Ang)	Diesel throttle angle/ Min.: 0%, Max.: 100%	Throttle fully closed: 98% Throttle fully open: 0%	-
Pump VCM Angle	Pump VCM angle/ Min.: 0 mA, Max.: 4000 mA	-	ECD Freeze Data
IDL Stable Control	IDL stable control/ Min.: -80 mm <sup>3</sup> /st, Max.: 79 mm <sup>3</sup> /st	-10 to 10 mm <sup>3</sup> /st	ECD Freeze Data
Pilot 1 Injection	Pilot 1 Injection/ Min.: 0 μs, Max.: 65,535 μs	Idling: 410 to 510 μs	-
Pilot 2 Injection	Pilot 2 Injection/ Min.: 0 μs, Max.: 65,535 μs	Idling: 410 to 510 μs	-
Main Injection	Main Injection/ Min.: 0 μs, Max.: 65,535 μs	Idling: 545 to 645 μs	-
After Injection	After Injection/ Min.: 0 μs, Max.: 65,535 μs	-	-
Pilot 1 Injection	Pilot 1 Injection/ Min.: -70°CA, Max.: 20°CA	-9.5 to -8.5° CA	-
Pilot 2 Injection	Pilot 2 Injection/ Min.: -50°CA, Max.: 20°CA	-3.5 to -2.5° CA	-
Main Injection	Main Injection/ Min.: -90°CA, Max.: 90°CA	2.5 to 3.5° CA	-
After Injection	After Injection/ Min.: -10°CA, Max.: 50°CA	-	-
Injection Feedback Value	Injection volume feedback learning value/ Min.: -10 mm <sup>3</sup> , Max.: 9.92 mm <sup>3</sup>	Idling: -2.0 to 2.0 mm <sup>3</sup>	-
Injection Feedback Val #1	Injection volume correction for cylinder 1/ Min.: -10 mm <sup>3</sup> , Max.: 10 mm <sup>3</sup>	Idling: -3.5 to 3.5 mm <sup>3</sup>	-
Injection Feedback Val #2	Injection volume correction for cylinder 2/ Min.: -10 mm <sup>3</sup> , Max.: 10 mm <sup>3</sup>	Idling: -3.5 to 3.5 mm <sup>3</sup>	-

Injection Feedback Val #3	Injection volume correction for cylinder 3/ Min.: -10 mm <sup>3</sup> , Max.: 10 mm <sup>3</sup>	Idling: -3.5 to 3.5 mm <sup>3</sup>	-
Injection Feedback Val #4	Injection volume correction for cylinder 4/ Min.: -10 mm <sup>3</sup> , Max.: 10 mm <sup>3</sup>	Idling: -3.5 to 3.5 mm <sup>3</sup>	-
Injection Volume	Injection volume/ Min.: 0 mm <sup>3</sup> , Max.: 1279.98 mm <sup>3</sup>	Idling: 5.6 to 10.1 mm <sup>3</sup>	-
EGR Learning Status	EGR learning status/ OK or NG	OK	-
Starter Signal	Starter signal/ ON or OFF	ON: Cranking	-
A/C Signal	A/C signal/ ON or OFF	ON: A/C ON	-
Stop Light Switch	Stop light switch/ ON or OFF	<ul style="list-style-type: none"> <li>• ON: Brake pedal depressed</li> <li>• OFF: Brake pedal released</li> </ul>	-
Electric Fan Motor (Fan Motor)	Radiator cooling fan motor/ 0: OFF, 1: ON	ON: Active the radiator cooling fan motor	-
Diesel Throttle Learn Status (Diesel Thrtl Lrn)	Diesel throttle learning status/ 0: NG, 1: OK	OK	-
Battery Voltage	Battery voltage/ Min.: 0 V Max.: 65.535 V	Idling: 9 to 14 V	-
Atmosphere Pressure	Atmospheric pressure value/ Min.: 0 kPa (0 mmHg, 0 in.Hg), Max.: 255 kPa (1,912.6 mmHg, 75.3 in.Hg)	Actual atmospheric pressure	-
VNT Type (VNT Type)	VN turbo type/ 0: Not, 1: Commo, 2: Vacuum	2: Vacuum	-
VNT Command (VNT Command)	VN turbo command/ Min.: 0%, Max.: 100%	-	-
TC and TE1	TC and TE1 terminal of DLC3 ON or OFF	-	-

#Code	#Code/ Min.: 0, Max.: 255	-	Number of detected DTCs
Check Mode	Check mode/ ON or OFF	ON: Check mode ON	<a href="#">Click here</a>
Injector Memory Error (Inj Mem Error)	EEPROM malfunction for injector/ 0: No error, 1: Error	No error	-
Target Booster Pressure (Tag Boost Press)	Target boost pressure/ Min.: 0 kPa, Max.: 320 kPa	-	-
MIL ON Run Distance	MIL ON Run Distance/ Min.: 0 km Max.: 65,535 km	Distance after DTC detected	-
Running Time from MIL ON	Running Time from MIL ON/ Min.: 0 minute Max.: 65535 minutes	Equivalent running time after MIL was ON	-
Distance from DTC Cleared	Distance after DTC cleared/ Min.: 0 km/h Max.: 65,535 km/h	Equivalent to drive distance after DTCs were erased	-
Warm up Cycle Cleared DTC	Warm up cycle after DTC cleared/ Min.: 0 Max.: 255	-	Number of warm up cycles after DTC cleared
Engine Run Time	Engine run time/ Min.: 0 second Max.: 65,535 seconds	Time after engine started	Service data
Time After DTC Cleared	Time after DTC cleared/ Min.: 0 minute Max.: 65,535 minutes	Equivalent to time after DTCs were erased	-

**h. HINT:**

- i. \*: If no idling conditions are specified, the shift lever is in the neutral position, and the A/C switch and all accessory switches are OFF.

**PERFORM ACTIVE TEST**

**HINT:**

Performing Active Test using the intelligent tester allows relays, VSVs, actuators and other items to be operated without removing any parts. Performing the Active Test early in troubleshooting is one way to save time. The Data List can be displayed during the Active Test.

- a. Connect the intelligent tester to the DLC3.
- b. Turn the ignition switch ON.
- c. Turn the intelligent tester ON.
- d. Enter the following menus: Powertrain / Engine / Active Test.
- e. Perform the Active Test.

Intelligent Tester Display	Test Details	Control Range	Diagnostic Notes
Connect the TC and TE1	Turn on TC and TE1 connection	ON/OFF	-
Control the Electric Cooling Fan	Control the electric cooling fan operation	ON/OFF	Test possible when following conditions met: <ul style="list-style-type: none"> <li>• Ignition switch ON</li> <li>• Engine is stopped</li> </ul>
Control the Cylinder#1 Fuel Cut	Cut off fuel injection from No. 1 injector	ON/OFF	Fuel injection stopped while test is ON
Control the Cylinder#2 Fuel Cut	Cut off fuel injection from No.2 injector	ON/OFF	Fuel injection stopped while test is ON
Control the Cylinder#3 Fuel Cut	Cut off fuel injection from No.3 injector	ON/OFF	Fuel injection stopped while test is ON
Control the Cylinder#4 Fuel Cut	Cut off fuel injection from No.4 injector	ON/OFF	Fuel injection stopped while test is ON
Test the Turbo Charger Step Motro	Control the E-VRV for turbocharger control	0 to 100 %	-
Test the Fuel Leak	Pressurizes common rail internal fuel pressure, and checks for fuel leaks	Stop/Start	<ul style="list-style-type: none"> <li>• Fuel pressure inside common rail pressurized to specified value and engine speed increased to 2,000 rpm when ON is selected</li> <li>• Above conditions preserved while test is ON</li> </ul>
Control the EGR Step Position	Control the EGR valve position	1 to 100 %	-

