05JOC–07

DATA LIST/ACTIVE TEST

1. DATA LIST

HINT:

By reading the Data List displayed on the intelligent tester II, you can check values, 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 reference values. Do not depend solely on these reference values when determining whether or not a part is faulty.

(a) Warm up the engine.
(b) Turn the ignition switch to OFF.
(c) Connect the intelligent tester II to the DLC3.
(d) Turn the ignition switch to ON.
(e) Turn the intelligent tester II ON.
(f) Select the following menu items: Powertrain / Engine and ECT / Data List.
(g) Check the values by referring to the table below.

Intelligent Tester II Display	Measurement Item/ Range	Normal Condition	Diagnostic Note
Fuel System Status (Bank 1) (Fuel Sys #1)	Fuel system status (bank 1)/ OL: Open Loop CL: Closed Loop OL DRIVE: OL due to driving conditions (for example: during fuel enrichment) OL FAULT: OL due to detected system fault CL FAULT: CL is controlled by only one front HO2S (Other front HO2S malfunctions)	CL: Idling after warmed–up	–
Calculated Load (Calc Load)	Engine load/ 0 to 100 % (100 % means fully open throttle)	11 to 26 %: idle (A/C OFF and shift position N) 12 to 27 %: 2,500 rpm (A/C OFF and shift position N)	–
Coolant Temp (Coolant Temp)	Engine coolant temperature (ECT)/ –40 to 140°C (–40 to 284°F)	80 to 95°C (176 to 203°F): engine warmed–up	–40°C (–40°F) : ECT sensor circuit open 140°C (284°F) or more: ECT sensor circuit shorted
Short FT #1 (Short FT #1)	Short–term fuel trim (FT) (bank 1)/ –100 to 0 %: injection volume decreased 0 to 99.2 %: injection volume increased	0 ± 20 %	–
Long FT #1 (Long FT #1)	Long–term fuel trim (FT) (bank 1) (learning value of fuel trim)/ –100 to 0 %: compensate to Lean 0 to 99.2 %: compensate to Rich 0 %: stoichiometric	0 ± 20 %	–
Engine Speed (Engine Spd)	Engine RPM/ 0 to 16383.75 rpm	600 to 700 rpm: idle after engine warmed–up	–
Vehicle Speed (Vehicle Spd)	Vehicle speed/ 0 to 255 km/h	Actual vehicle speed	Same as speedometer indication
IGN Advance (Ign Advance)	Ignition advanced timing (cylinder #1) /–64 to 63.5°	3 to 13°: Idle (A/C OFF Shift position N)	–
Intake Air (Intake Air)	Intake Air Temperature (IAT)/ –40 to 140°C (–40 to 284°F)	Same as ambient temperature	–40°C (–40°F) : IAT sensor circuit open 140°C (284°F) or more: IAT sensor circuit shorted

Intelligent Tester II Display	Measurement Item/ Range	Normal Condition	Diagnostic Note
MAF (MAF)	Air flow rate from Mass Air Flow (MAF) sensor/ 0 to 655.35 g/s	2.0 to 4.5 g/s: Idle	0 g/s: MAF sensor power source circuit is open or VG circuit is open/shorted 160 g/s or more: E2G circuit is open
Throttle Position (Throttle Pos)	Absolute throttle position sensor/ 0 to 100 %	10 to 24 %: throttle fully closed 64 to 96 %: throttle fully open	–
O2S B1 S2 (O2S B1 S2)	HO2S voltage (bank 1 sensor 2)/ 0 to 1.275 V	0.1 to 0.9 V	–
O2FT B1 S2 (O2FT B1 S2)	Short–term fuel trim associated with the bank 1 sensor 1: –100 to 99.2 %	0 ± 20 %	–
Engine Run Time (Eng Run Time)	Time after engine start/ 0 to 65,535 sec	–	–
MIL ON Run Distance (MIL On Run Dist)	Distance after MIL ON/ 0 to 65,535 km	0 km	–
AF FT B1 S1 (AF FT B1 S1)	Short–term fuel trim associated with the bank 1 sensor 1: MIN.: 0, MAX.: 1.999	• Value less than 1 (0.000 to 0.999) = Lean • Value greater than 1 (1.001 to 1.999) = Rich	–
AFS B1 S1 (AFS B1 S1)	A/F sensor output voltage for bank 1 sensor 1: Min.: 0V, Max.: 7.999 V	2.8 to 3.8 V: Idling	–
Warm–up Cycle Cleared DTC (Wu Cyc DTC Clear)	Distance after DTC clear/ 0 to 255	–	–
Distance from DTC Cleared (Dist DTC Clear)	Distance after DTC clear/ 0 to 65,535 km	–	–
Battery Voltage (BATT)	Battery voltage	11 to 14 V	–
Vehicle Load (Vehicle Load)	Vehicle load/ 0 to 25700 %	–	–
Air–Fuel Ratio (Air–Fuel Ratio)	Air–fuel ratio (A/F)/ 0 to 1.999 (1.0: stoichiometric [A/F = 14.5])	Approximately 1.0 at idling after engine warmed–up	Ex.: If ”1.2” is indicated, A/F can be calculated as the follow A/F = 14.5 x 1.2 =17.4 (Lean)
Throttle Sensor Position (Throttle Pos)	Throttle sensor positioning/ 0 to100 %	10 to 24 %: throttle fully closed 64 to 96 %: throttle fully open	–
Throttle Sensor Position #2 (Throttle Pos #2)	Absolute throttle position No. 2/ 100 %	–	–
Accelerator Position No.1 (Accel Pos #1)	Absolute accelerator pedal position No. 1 /100 %	10 to 22 %: accelerator pedal is released 54 to 86 %: accelerator pedal is fully depressed	–
Accelerator Position No.2 (Accel Pos #2)	Absolute accelerator pedal position No. 2 /100 %	12 to 42 %: accelerator pedal is released 66 to 98 %: accelerator pedal is fully depressed	–
Throttle Motor (Throttle Mot)	Throttle actuator output/ 0 to 100 %	–	–
Running Time From MIL ON (MIL On Run Time)	Engine running time after MIL ON/0 to 65,535 min	0 min	–
Time After DTC Cleared (Time DTC Clear)	Time after DTC clear/ 0 to 65,535 min	–	–
Knock Correction Learning Value (Knock Corrt Val)	Knock correction learning value/ –64 to 1,984 °Crankshaft Angle (CA)	–	–

Intelligent Tester II Display	Measurement Item/ Range	Normal Condition	Diagnostic Note
Knock Feedback Value (Knock FB Val)	Knock feedback value/ –64 to 1,984 °CA	–	–
Purge Density Learning Value (Purge Density)	Reducing injection volume during EVAP purge/ –50 to 350 %	–	–
Purge Flow (Purge Flow)	Rate with purge volume to MAF/ 0 to 102.4 %	–	–
Model Code (Model Code)	Model code:	–	Identifying the model code: RZJ12##
Engine Type (Engine Type)	Engine type:	–	Identifying the engine type: 2TRFE
Cylinder Number (Cylinder Number)	Cylinder number: Min.: 0 Max.: 255	–	Identifying the cylinder number: 4
Throttle Position No.1 (Throttle POS #1)	Throttle position sensor No.1 voltage/ 0 to 4.98 V	–	ETCS freeze data
Throttle Position No.2 (Throttle POS #2)	Throttle position sensor No.2 voltage/ 0 to 4.98 V	–	ETCS freeze data
Throttle Position No.1 (Throttle POS #1)	Throttle position No.1: Min.: 0 V, Max.: 5 V	• 0.5 to 1.2 V: Throttle fully closed • 3.2 to 4.8 V: Throttle fully opened	–
Throttle Position No.2 (Throttle POS #2)	Throttle position No.2: Min.: 0 V, Max.: 5 V	• 2.0 to 2.9 V: Throttle fully closed • 4.6 to 5.0 V: Throttle fully open	–
Accelerator Position No.1 (Accel Pos #1)	Accelerator pedal position No.1 voltage/ 0 to 4.98 V	–	ETCS freeze data
Accelerator Position No.2 (Accel Pos #2)	Accelerator pedal position No.1 voltage/ 0 to 4.98 V	–	ETCS freeze data
Throttle Motor Current (Throttle Mot)	Throttle actuator current/ 0 to 19.92A	–	ETCS freeze data
Throttle Motor Open Duty (Thrtl Mot (Open))	Duty ratio to open throttle valve/ 0 to 100 %	–	ETCS freeze data
Throttle Motor Close Duty (Thrtl Mot (Close))	Duty ratio to close throttle valve/ 0 to 100 %	–	ETCS freeze data
Throttle Sens Open Pos #1 (Throttle Ssr #1)	Throttle sensor opener position No.1 / 0 to 4.98 V	–	ETCS service data
Throttle Sens Open Pos #2 (Throttle Ssr #2)	Throttle sensor opener position No.2/ 0 to 4.98 V	–	ETCS service data
Accel Fully Close Lean #1 (Accel Lrn Val#1)	Accelerator fully closed learning value No.1 / 0 to 124.512	–	ETCS service data
Accel Fully Close Lean #2 (Accel Lrn Val#2)	Accelerator fully closed learning value No.1 / 0 to 124.512	–	ETCS service data
Throttle Position Commanded (Thrtl Comnd Val)	Commanded throttle position/ 0 to 4.9804 V	–	ETCS service data
Throttle Sens Open #1 (AD) (Thrtl Ssr #1 AD)	Throttle sensor opener position No.1 AD/ 0 to 4.9804 V	–	ETCS service data
Accel Fully Close #1 (AD) (accel Ssr #1 AD)	Accelerator fully close value No.1 AD/ 0 to 4.9804 V	–	ETCS service data
ST1 (ST1)	Brake pedal/ ON/OFF	ON: released OFF: depressed	–
Actuator Power Supply (Actuator Power)	Throttle actuator power supply/ ON/OFF	ON: ignition switch ON	–
Open Side Malfunction (OPN Malfunction)	Throttle valve open malfunction/ ON/OFF	OFF	–

Intelligent Tester II Display	Measurement Item/ Range	Normal Condition	Diagnostic Note
Fail Safe Drive (Main CPU) (Fail #1)	Whether or not fail safe function executed: ON or OFF	ON: ETCS has failed	—
Fail Safe Drive (Fail #2)	Whether or not fail safe function executed: ON or OFF	ON: ETCS has failed	—
Throttle Idle Position (Throttl Idl Pos)	Whether or not throttle position sensor detecting idle: ON or OFF	ON: Idling	—
Accelerator Idle Position (Accel Idl Pos)	Whether or not accelerator pedal position sensor detecting idle: ON or OFF	ON: Idling	—
ETCS Actuator Power (+BM)	ETCS power supply/ ON/OFF	ON	–
Throttle Motor (Throttle Mot)	Current is sent to throttle actuator (ON/OFF)	–	–
Throttle Fully Close Lean #1 (Thrl Learn Val)	Throttle fully closed learning value No.1 / 0 to 5 V	–	–
Throttle Motor Current (Throttle Mot)	Throttle actuator current/ 0 to 80 A	0 to 20 A	–
+BM Voltage (+BM Voltage)	ETCS power supply voltage/ 0 to 20 V	–	–
Starter Signal (Starter Sig)	Starter signal/ ON/OFF	ON: Cranking	–
Closed Throttle Position Switch (Ctp SW)	Closed throttle position switch (idle switch)/ ON/OFF	ON: throttle valve is closed	–
A/C Signal (A/C Signal)	A/C signal/ ON/OFF	ON: A/C switch is turned ON	–
Electrical Load Signal (Elect Load Sig)	Electrical load signal	ON: headlights or defogger is turned ON	–
Stop Light Switch (Stop Light SW)	Stop lamp switch	ON: brake pedal is depressed	–
Power Steering Switch (PS SW)	Power steering signal: ON or OFF	ON: Power steering operation	–
Power Steering Switch (PS Signal)	Power steering signal: ON or OFF	ON: When steering wheel first turned after ignition switch turned to ON	–
VVT Aim Angle (Bank1) (VVT Aim Angl #1)	VVT aim angle (bank 1)/ Min.: 0 %, Max.: 100 %	0 %: Idling	VVT duty signal value during intrusive operation
VVT Change Angle (Bank1) (VVT Chng Angl #1)	VVT Actual Angle (Bank 1)/ 0 to 60°CA (Crankshaft Angle)	–	–
VVT OCV Duty (Bank1) (VVT OCV Duty B1)	VVT OCV Operating Duty (Bank 1)/ 0 to 100 %	–	–
Idle Fuel Cut (FC Idl)	Fuel cut on decelerating	ON: accelerator pedal is released at 3,000 rpm	–
FC TAU (FC TAU)	Fuel cut on low load	ON: going down on a long slope	–
EVAP Purge VSV (Evap (Parge) VSV)	EVAP VSV/ ON (open)/OFF (close)	–	–
Fuel Pump/Speed Status (Fuel Pump/Spd)	Fuel pump ON/OFF	ON: ignition switch ON	–
TC and TE1 (TC/E1)	Connection of TC and TE1 on DLC3/ ON (connected)/OFF (disconnected	–	–
Initial Engine Coolant Temp (Ini Cool Temp)	ECT when engine starts	–	–

Intelligent Tester II Display	Measurement Item/ Range	Normal Condition	Diagnostic Note
Initial Intake Air Temperature (Ini Intake Temp)	IAT when engine starts	–	–
Injection Volume (Cylinder 1) (Inj Vol)	Injection volume of cylinder #1	–	–
Injector (Injector)	Injection period	1.8 to 3.8 ms: at idle, engine warmed–up, A/C OFF and shift position N	–

*1: If no conditions are specifically stated for ”ldling,” the shift lever is in the N or P position, the A/C switch is OFF and all accessory switches are OFF.

2. ACTIVE TEST

HINT:

Performing an Active Test using the intelligent tester II enables components including the relay, VSV, and actuator to be operated without removing any parts. Performing the Active Test as the first step of trouble-shooting is one method of shortening diagnostic time.

Data List is displayed during an Active Test.

(a) Warm up the engine.
(b) Turn the ignition switch to OFF.
(c) Connect the intelligent tester II to the DLC3.
(d) Turn the ignition switch to ON.
(e) Turn the intelligent tester II ON.
(f) Select the following menu items: Powertrain / Engine and ECT / Active Test.
(g) Perform the Active Test by referring to the table below.

Intelligent Tester II Display	Test Part	Control Range	Diagnostic Note
Control the injection volume (Inj Vol)	Injection volume	–12.5 to 24.8 %	Perform the test within 3,000 rpm. Injection volume is gradually changed between –12.5 and 25 %.
Control the injection volume for A/F sensor (A/F Control)	Injection volume	Switching –12.5 or 25 %	Perform the test within 3,000 rpm. Following A/F CONTROL procedure enables to check and graph voltage outputs of HO2S.
Control the Fuel Pump/ Speed (Fuel Pump/Spd)	Fuel pump	ON/OFF	–
Activate the VVT System (bank 1) (VVT Ctrl B1)	VVT OCV (bank 1)	ON/OFF	Engine stall or rough idle when the VVT OCV is turned ON.
Control the VVT (bank 1) (VVT B1)	VVT actuator (bank 1)	–128 to 127 % This valve added to present OCV control duty 100 %: maximum advance –100 %: maximum retard	Engine stall or rough idle when the VVT actuator is operated by 100 %. This test is possible during idle.
Connect the TC and TE1 (TC/E1)	Connection of TC and TE1	ON: TC and TE1 connected OFF: TC and TE1 disconnected	–
Control the Idle Fuel Cut Prohibit (FC Idl Prohibit)	Deceleration fuel cut prohibit	ON/OFF	–
Activate the VSV for EVAP Control (Evap VSV (Alone))	EVAP VSV	ON/OFF	–
Control the ETCS Open/Close Slow Speed (ETCS slow)	Throttle actuator	ON: throttle valve opens slowly	This test is possible when the following conditions are met: • Ignition switch ON • Engine does not start • Fully depressing accelerator pedal (APP: 58 degrees or more)
Control the ETCS Open/Close Fast Speed (ETCS Fast)	Throttle actuator	ON: throttle valve opens fast	Same as above
Control the Cylinder #1 Fuel Cut (Fuel Cut #1)	Cylinder #1 injector fuel cut	ON/OFF	This test is possible during vehicle stopping and engine idling.
Control the Cylinder #2 Fuel Cut (Fuel Cut #2)	Cylinder #2 injector fuel cut	ON/OFF	Same as above
Control the Cylinder #3 Fuel Cut (Fuel Cut #3)	Cylinder #3 injector fuel cut	ON/OFF	Same as above
Control the Cylinder #4 Fuel Cut (Fuel Cut #4)	Cylinder #4 injector fuel cut	ON/OFF	Same as above