05IHH–01

DATA LIST/ACTIVE TEST

1. DATA LIST

NOTICE:

- **The values of DATA LIST could vary significantly with slight differences in measurement, differences in the environment in which the measurements are obtained, or the aging of the vehicle. Thus, definite standards or judgment values are unavailable. Therefore, there may be a malfunction even if a measured value is within the reference range.**
- **In case of intricate symptoms, collect sample data from another vehicle of the same model operating under identical conditions, in order to reach an overall judgment by comparing all the items of DATA LIST.**

HINT:

Using DATA LIST displayed by the intelligent tester II, you can read the value of the switches, sensors, actuators and so on without parts removal. Reading DATA LIST as a first step of troubleshooting is one method to shorten diagnostic time.

(a) Connect the intelligent tester II to the DLC3.
(b) Turn the power switch ON (IG).
(c) Turn the intelligent tester II ON.
(d) On the System Select screen, enter the following menus: Powertrain / Hybrid Control / Data List.
(e) According to the display on the tester, read DATA LIST.

Intelligent Tester II Display (abbreviation)	Measurement Item/Range (Display)	Reference Range	Diagnostic Note
Engine Coolant Temp (Coolant Temp)	Engine coolant temperature/ Min.: –40°C, Max.: 140°C	After warming up: 80 to 100°C (176 to 212°F)	• If the value is –40°C (–40°F): Open in sensor circuit • If the value is 140°C (284°F): Short in sensor circuit
Vehicle Spd (Vehicle Spd)	Vehicle speed/ Min.: 0 km/h, Max.: 255 km/h	Vehicle stopped: 0 km/h (0 mph)	—
Engine Run Time (Eng Run Time)	Elapsed time after starting engine Min.: 0 s, Max.: 65,535 s	—	—
+B (+B)	Auxiliary battery voltage/ Min.: 0 V, Max.: 65.535 V	Constant: Auxiliary battery voltage ±3 V	—
Accel Pedal Pos #1 (Accel Pos #1)	Accelerator pedal position sensor No. 1/ Min.: 0 %, Max.: 100 %	Accelerator pedal depressed: Changes with accelerator pedal pressure	—
Accel Pedal Pos #2 (Accel Pos #2)	Accelerator pedal position sensor No. 2/ Min.: 0 %, Max.: 100 %	Accelerator pedal depressed: Changes with accelerator pedal pressure	—
Ambient Temperature (Ambient Temp)	Ambient air temperature/ Min.: –40°C, Max.: 215°C	Power switch ON (IG): Same as ambient air temperature	—
Intake Air Temperature (Intake Air Temp)	Intake air temperature/ Min.: –40°C, Max.: 140°C	Constant: Same as ambient air temperature	—
DTC Clear Warm Up (DTC Clear Warm)	The number of times engine is warmed up after clearing DTCs/ Min.: 0, Max.: 255	CHK ENG OFF, engine coolant temperature increases from below 22°C (71.6°F) before starting the engine to above 70°C (158°F) after starting the engine: Increases once	—
DTC Clear Run Distance (DTC Clear Run)	Drive distance after clearing DTCs/ Min.: 0 km, Max.: 65,535 km	—	—
DTC Clear Min (DTC Clear Min)	Elapsed time after clearing DTCs/ Min.: 0 min, Max.: 65,535 min	—	—
MIL on Run Distance (MIL on Run Dist)	Drive distance after malfunction occurrence/ Min.: 0 km, Max.: 65,535 km	—	—

Intelligent Tester II Display (abbreviation)	Measurement Item/Range (Display)	Reference Range	Diagnostic Note
MIL on Engine Run Time (MIL On Eng Time)	Elapsed time after starting engine with CHK ENG ON/ Min.: 0 min, Max.: 65,535 min	—	—
MIL Status (MIL Status)	CHK ENG status/ ON or OFF	CHK ENG ON: ON	Constant ON: Repair in accordance with detected DTCs
Motor (MG2) Revolution (MG2 Rev)	MG2 revolution/ Min.: –16,383 rpm, Max.: 16,383 rpm	—	—
Motor (MG2) Torq (MG2 Torq)	MG2 torque/ Min.: –500 Nm, Max.: 500 Nm	—	—
M (MG2) Trq Exec Val (MG2 Trq Exc Val)	MG2 torque execution value/ Min.: –512 Nm, Max.: 508 Nm	After full–load acceleration with READY lamp ON and engine stopped: Less than ±20 % of MG2 TORQ	—
Generator (MG1) Rev (MG1 Rev)	MG1 revolution/ Min.: –16,383 rpm, Max.: 16,383 rpm	—	—
Generator (MG1) Torq (MG1 Torq)	MG1 torque/ Min.: –500 Nm, Max.: 500 Nm	—	—
G (MG1) Trq Exec Val (MG1 Trq Exc Val)	MG1 torque execution value/ Min.: –512 Nm, Max.: 508 Nm	1 second has elapsed after the engine was started automatically with READY lamp ON, engine stopped, A/C fan Hi, head lamp ON and the P position: Less than ±20 % of MG1 TORQ	—
Regenerative Brake Torq (Regen Exec Torq)	Regenerative brake execution torque/ Min.: 0 Nm, Max.: 186 Nm	—	—
Rqst Regen Brake Torq (Regen Rqst Torq)	Regenerative brake request torque/ Min.: 0 Nm, Max.: 186 Nm	Vehicle speed 30 km/h (19 mph) and master cylinder hydraulic pressure –200 Nm: Changes with brake pedal pressure	—
Inverter Temp–(MG1) (MG1 Invert Temp)	MG1 inverter temperature/ Min.: –50°C, Max.: 205°C	• Undisturbed for 1 day at 25°C (77°F): 25°C (77°F) • Street driving: 25 to 80°C (77 to 176°F)	• If the value is –50°C (–58°F): +B short in sensor circuit • If the value is 205°C (401°F): Open or GND short in sensor circuit
Inverter Temp–(MG2) (MG2 Invert Temp)	MG2 inverter temperature/ Min.: –50°C, Max.: 205°C	• Undisturbed for 1 day at 25°C (77°F): 25°C (77°F) • Street driving: 25 to 80°C (77 to 176°F)	• If the value is –50°C (–58°F): +B short in sensor circuit • If the value is 205°C (401°F): Open or GND short in sensor circuit
Motor Temp No2 (Motor2 Temp)	Transaxle fluid temperature/ Min.: –50°C, Max.: 205°C	• Undisturbed for 1 day at 25°C (77°F): 25°C (77°F) • Street driving: 25 to 80°C (77 to 176°F)	• If the value is –50°C (–58°F): Open or +B short in sensor circuit • If the value is 205°C (401°F): GND short in sensor circuit
Motor Temp No1 (Motor1 Temp)	MG2 motor temperature/ Min.: –50°C, Max.: 205°C	• Undisturbed for 1 day at 25°C (77°F): 25°C (77°F) • Street driving: 25 to 80°C (77 to 176°F)	• If the value is –50°C (–58°F): Open or +B short in sensor circuit • If the value is 205°C (401°F): GND short in sensor circuit

Intelligent Tester II Display (abbreviation)	Measurement Item/Range (Display)	Reference Range	Diagnostic Note
Converter Temperature (Converter Temp)	Boost converter temperature/ Min.: –50°C, Max.: 205°C	• Undisturbed for 1 day at 25°C (77°F): 25°C (77°F) • Street driving: 25 to 60°C (77 to 140°F)	• If the value is –50°C (–58°F): +B short in sensor circuit • If the value is 205°C (401°F): Open or GND short in sensor circuit
Accelerator Degree (Accelerator)	Accelerator pedal depressed angle/ Min.: 0 %, Max.: 100 %	Accelerator pedal depressed: Changes with accelerator pedal pressure	—
Request Power (Power Rqst)	Engine power output request value/ Min.: 0 W, Max.: 320,000 W	—	—
Target Engine Rev (Target Eng Spd)	Target engine speed/ Min.: 0 rpm, Max.: 8,000 rpm	—	—
Engine Spd (Engine Spd)	Engine speed/ Min.: 0 rpm, Max.: 8,000 rpm	Idling*: 950 to 1,050 rpm	—
Vehicle Spd (Vehicle Spd)	Resolver vehicle speed/ Min.: –256 km/h, Max.: 254 km/h	Driving at 40 km/h (25 mph): 40 km/h (25 mph)	—
Master Cylinder Ctrl Trq (Mcyl Ctrl Power)	Braking torque that is equivalent to the master cylinder hydraulic pressure/ Min.: –512 Nm, Max.: 508 Nm	Brake pedal depressed: Changes with brake pedal pressure	—
Status of Charge (SOC)	Battery state of charge/ Min.: 0 %, Max.: 100 %	Constant: 0 to 100 %	—
WOUT Control Power (WOUT Ctrl Power)	Discharge control power value/ Min.: 0 W, Max.: 81,600 W	21,000 W or less	—
WIN Control Power (WIN Ctrl Power)	Charge control power value/ Min.: –40,800 W, Max.: 0 W	–25,000 W or more	—
Discharge Rqst to SOC (Dchg Rqst SOC)	Discharge request to adjust SOC/ Min.: –20,480 W, Max.: 20,320 W	• Uniform on–board charging: –4,400 W • Usually: 0 W	—
Power Resource VB (Pwr Resource VB)	HV battery voltage/ Min.: 0 V, Max.: 510 V	READY lamp ON and P position: 150 to 300 V	—
Power Resource IB (Pwr Resource IB)	HV battery current/ Min.: –256 A, Max.: 254 A	—	—
VL–Voltage before Raise (VL)	High voltage before it is boosted/ Min.: 0 V, Max.: 510 V	Power switch ON (READY): Practically the same as the HV battery voltage	• If the value is 0 V: Open or GND short in sensor circuit • If the value is 510 V: +B short in sensor circuit
VH–Voltage after Raise (VH)	High voltage after it is boosted/ Min.: 0 V, Max.: 765 V	Engine revved up in P position: HV battery voltage to 500 V	• If the value is 0 V: Open or GND short in sensor circuit • If the value is 765 V: +B short in sensor circuit
Raising Pressure Ratio (Rais Pres Ratio)	Boost ratio/ Min.: 0 %, Max.: 100 %	The pre–boost voltage and the post–boost voltage are equal: 0 to 10 %	—
Drive Condition ID (Drive Condition)	Drive condition ID/ Min.: 0, Max.: 6	• Engine stopped: 0 • Engine about to be stopped: 1 • Engine about to be started: 2 • Engine operated or operating: 3 • Generating or loading movement: 4 • Revving up with P position: 6	—

Intelligent Tester II Display (abbreviation)	Measurement Item/Range (Display)	Reference Range	Diagnostic Note
Shift Sensor Main (M Shift Sensor)	Output voltage of the shift position sensor (main)/ Min.: 0 V, Max.: 5 V	• Selector lever in home position: 2.0 to 3.0 V • Shifting into R position: LHD: 4.0 to 4.8 V RHD: 0.2 to 1.0 V • Shifting into B or D position: LHD: 0.2 to 1.0 V RHD: 4.0 to 4.8 V	—
Shift Sensor Sub (S Shift Sensor)	Output voltage of the shift position sensor (sub)/ Min.: 0 V, Max.: 5 V	• Selector lever in home position: 2.0 to 3.0 V • Shifting into R position: LHD: 4.0 to 4.8 V RHD: 0.2 to 1.0 V • Shifting into B or D position: LHD: 0.2 to 1.0 V RHD: 4.0 to 4.8 V	—
Shift Sensor Select Main (Sm Shift Sensor)	Output voltage of the select position sensor (main)/ Min.: 0 V, Max.: 5 V	• Selector lever in home position: LHD: 0.5 to 2.0 V RHD: 3.0 to 4.85 V • Shifting into R, N or D position: LHD: 3.0 to 4.85 V RHD: 0.5 to 2.0 V	—
Shift Sensor Select Sub (Ss Shift Sensor)	Output voltage of the select position sensor (sub)/ Min.: 0 V, Max.: 5 V	• Selector lever in home position: LHD: 0.5 to 2.0 V RHD: 3.0 to 4.85 V • Shifting into R, N or D position: LHD: 3.0 to 4.85 V RHD: 0.5 to 2.0 V	—
Shift Sensor Shift Pos (Shift Position)	Shift position	P, R, N, D or B	—
A/C Consumption Pwr (A/C Consmpt Pwr)	A/C consumption power/ Min.: 0 kW, Max.: 5 kW	—	—
Driving Condition (Drive Condition)	Driving condition	• MG1 load: MG1 • MG2 load: MG2	—
Short Wave Highest Val (Short Wave High)	Waveform voltage in leak detection circuit in battery ECU/ Min.: 0 V, Max.: 5 V	READY lamp is left ON for 2 minutes, and the pre–boost voltage and the post–boost voltage are equal: 4 V or more	—
Type of ECU (ECU Type)	Type of ECU	HV ECU	—
Num of Current Code (Current DTCs)	The number of current DTCs/ Min.: 0, Max.: 255	—	—
Num of History Code (History DTCs)	The number of history DTCs/ Min.: 0, Max.: 255	—	—
Check Mode (Check Mode)	Check mode/ ON or OFF	—	—
Engine Stop Request (Eng Stop Rqst)	Engine stop request/ NO or RQST	Requesting engine stop: RQST	—
Engine Idling Request (Idling Request)	Engine idling request/ NO or RQST	Requesting idle: RQST	—
Main Batt Charging Rqst (HV Batt Ch Rqst)	HV battery charging request/ NO or RQST	Requesting HV battery charging: RQST	—
Engine Stop Inhibit Rqst (Eng Stp Inhibit)	Engine stop inhibit request/ NO or RQST	Requesting engine intermittent prohibition: RQST	—

Intelligent Tester II Display (abbreviation)	Measurement Item/Range (Display)	Reference Range	Diagnostic Note
Aircon Request (Aircon Request)	Engine starting request from A/C amplifier/ NO or RQST	Requesting engine start from A/C amplifier: RQST	—
Engine Warming Up Rqst (Eng Warm Up Rqt)	Engine warm–up request/ NO or RQST	Requesting engine warm–up: RQST	—
Sys Main Rly – Cont1 (Smr Cont1)	Operating condition of system main relay No. 1/ ON or OFF	Power switch ON (READY): OFF	—
Sys Main Rly – Cont2 (Smr Cont2)	Operating condition of system main relay No. 2/ ON or OFF	Power switch ON (READY): ON	—
Sys Main Rly – Cont3 (Smr Cont3)	Operating condition of system main relay No. 3/ ON or OFF	Power switch ON (READY): ON	—
MG1 Gate Status (MG1 Gate)	MG1 gate status/ ON or OFF	Shutting down generator inverter: ON	—
MG2 Gate Status (MG2 Gate)	MG2 gate status/ ON or OFF	Shutting down motor inverter: ON	—
Converter Gate Status (Cnv Gate)	Boost converter gate status/ ON or OFF	Shutting down boost converter: ON	—
Aircon Gate Status (A/C Gate)	A/C gate status/ ON or OFF	Shutting down A/C inverter: ON	—
Smart Key Status (Smart Key)	Electronic key ID code check status/ ON or OFF	When electronic key ID code corresponds to ID code registered in ECU: ON	—

*: If no conditions are specifically stated for "Idling", it means the engine for inspection mode, the shift position is in P, the A/C switch is OFF, and accelerator pedal is not depressed.

2. ACTIVE TEST

NOTICE:

Beware that if the connector to the intelligent tester II becomes disconnected or a communication error occurs during ACTIVE TEST, the vehicle could become inoperative (READY lamp OFF).

HINT:

Performing ACTIVE TEST using the intelligent tester II allows the relay, VSV, actuator and so on to operate without parts removal. Performing ACTIVE TEST as a first step of troubleshooting is one method to shorten diagnostic time.

It is possible to display items in DATA LIST during ACTIVE TEST.

(a) Connect the intelligent tester II to the DLC3.
(b) Turn the power switch ON (IG).
(c) Turn the intelligent tester II ON.
(d) On the System Select screen, enter the following menus: Powertrain / Hybrid Control / Active Test.
(e) According to the display on the tester, perform ACTIVE TEST.

Intelligent tester II Display (abbreviation)	Purpose	Test Details	Test Condition
Inspection Mode – 2WD Inspection * (Inspection Mod1)	• To check its operation while the engine is running • To disable traction control while performing a speedometer test or the like	• Runs the engine continuously with the P position • Cancels the traction control that is effected when the rotational difference between the front and rear wheels is excessive other than the P position	Power switch ON (IG), HV system normal, not in inspection mode, and other active tests not being executed
Inspection Mode – 2WD Chassis–Dynamo * (Inspection Mod2)	To disable traction control while performing a speedometer test or the like	Cancels the traction control that is effected when the rotational difference between the front and rear wheels is excessive other than the P position	Power switch ON (IG), HV system normal, not in inspection mode, and other active tests not being executed
Forcible Stop of Inverter Drive * (Inverter Stop)	To determine if there is an internal leak in the inverter or the HV control ECU	Keeps the inverter power transistor actuation signal ON	Power switch ON (IG), P position, HV system normal, inverter actuation not being disabled, shutting down inverter, and other active tests not being executed
Cranking Request * (Cranking Rqst)	To crank the engine continuously in order to measure the compression	Allows the engine to continue cranking by activating the generator continuously	Power switch ON (IG), HV system normal, not in cranking mode, and other active tests not being executed

NOTICE:

***: The intelligent tester II results in a communication error and the vehicle's READY lamp turns OFF upon the completion of ACTIVE TEST. Therefore, in order to use the tester again, turn the power switch OFF, and restart by turn it ON.**