05F7K−02

DATA LIST/ACTIVE TEST

1. DATA LIST

HINT:

Using the hand−held tester 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 shorten labor time.

NOTICE:

In the table below, the values listed under ”Normal Condition” are reference values. Do not depend solely on the 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 hand−held tester or the OBD II scan tool to the DLC3.
(d) Turn the ignition switch ON.
(e) Turn ON the hand−held tester or the OBD II scan tool.
(f) Enter the following menus: DIAGNOSIS/ENHANCED OBD II/DATA LIST.
(g) According to the display on tester, read the ”DATA LIST”.

Hand−held Tester Display	Measurement Item/Range (Display)	Normal Condition*	Diagnostic Note
INJECTOR	Injection period of the No. 1 cylinder/ Minimum: 0 ms, Maximum: 32.64 ms	Idling: 1.92 to 3.37 ms	—
IGN ADVANCE	Ignition timing advance for No. 1 cylinder/ Minimum: −64 deg., Maximum: 63.5 deg.	Idling: BTDC 5 to 15 deg.	—
CALC LOAD	Calculated load by ECM/ Minimum: 0 %, Maximum: 100 %	• Idling: 3.3 to 26.7 % • Running without load (2,500 rpm): 12.0 to 14.7 %	—
MAF	Air flow rate from MAF sensor/ Minimum: 0 gm/s, Maximum: 655 gm/s	• Idling: 0.58 to 4.67 gm/s • Running without load (2,500 rpm): 3.33 to 9.17 gm/s	If the value is Approximately 0.0 gm/s: • Mass air flow meter power source circuit open • VG circuit open or short If the value is 160.0 gm/s or more: • E2G circuit open
ENGINE SPD	Engine speed/ Minimum: 0 rpm, Maximum: 16,383 rpm	Idling: 550 to 750 rpm	—
COOLANT TEMP	Coolant temperature/ Minimum: −40°C, Maximum: 140°C	After warming up: 80 to 95˚C (176 to 203˚F)	• If the value is −40°C (−40°F): sensor circuit is open • If the value is 140°C (284°F): sensor circuit is shorted
INTAKE AIR	Intake air temperature/ Minimum: −40°C, Maximum: 140°C	Equivalent to Ambient temperature	• If the value is −40°C (−40°F): sensor circuit is open • If the value is 140°C (284°F): sensor circuit is shorted
THROTTLE POS	Absolute throttle position sensor/ Minimum: 0 %, Maximum: 100 %	• Throttle fully closed: 6 to 16 % • Throttle fully open: 64 to 98 %	Read the value with ignition switch ON (do not start engine)
CTP SW	Closed throttle position switch/ ON or OFF	• Throttle fully closed: ON • Throttle open: OFF	—
VEHICLE SPD	Vehicle speed/ Minimum: 0 km/h, Maximum: 255 km/h	Actual vehicle speed	Speed indicated on speedometer
ACCEL POS #1	Accelerator pedal position sensor No.1 output voltage/ Minimum: 0 V, Maximum: 5 V	• Accelerator pedal released: 0.5 to 1.1 V • Accelerator pedal depressed: 2.5 to 4.6 V	Read the value with ignition switch ON (do not start engine)
ACCEL POS #2	Accelerator pedal position sensor No.2 output voltage/ Minimum: 0 V, Maximum: 5 V	• Accelerator pedal released: 1.5 to 2.9 V • Accelerator pedal depressed: 3.5 to 5.5 V	Read the value with ignition switch ON (do not start engine)

Hand−held Tester Display	Measurement Item/Range (Display)	Normal Condition*	Diagnostic Note
THROTTLE POS #2	Throttle position sensor No.2 output voltage/ Minimum: 0 V, Maximum: 5 V	• Throttle fully closed: 2.0 to 2.9 V • Throttle fully open: 4.6 to 5.5 V	Read the value with ignition switch ON (do not start engine)
THROTTLE TARGT	Target position of throttle valve/ Minimum: 0 V, Maximum: 5 V	Idling: 0.4 to 1.0 V	—
THROTTLE OPN DUTY	Throttle motor opening duty ratio/ Minimum: 0 %, Maximum: 100 %	Throttle fully closed: 0 %	• When accelerator pedal is depressed, duty ratio is increased • Read the value with ignition switch ON (do not start engine)
THROTTLE CLS DUTY	Throttle motor closed duty ratio/ Minimum: 0 %, Maximum: 100 %	Throttle fully closed: 0 to 20 %	• When accelerator pedal is released quickly, duty ratio is increased • Read the value with ignition switch ON (do not start engine)
THROTTLE MOT	Whether or not throttle motor control is permitted/ ON or OFF	Idling: ON	Read the value with ignition switch ON (do not start engine)
+BM	Whether or not electric throttle control system power is inputted/ON or OFF	Idling: ON	—
ACCEL IDL POS	Whether or not accelerator pedal position sensor is detecting idle/ON or OFF	Idling: ON	—
THROTTLE IDL POS	Whether or not throttle position sensor is detecting idle/ ON or OFF	Idling: ON	—
FAIL #1	Whether or not fail safe function is executed/ ON or OFF	ETCS has failed: ON	—
FAIL #2	Whether or not fail safe function is executed/ ON or OFF	ETCS has failed: ON	—
THROTTLE INITIAL	Throttle fully closed (learned value) Minimum: 0 V, Maximum: 5 V	0.5 to 0.9 V	—
ACCEL LEARN VAL	Accelerator fully closed (learned value) Minimum: 0 deg, Maximum: 125deg	0.4 to 0.8 V	—
THROTTLE MOT	Throttle motor current Minimum: 0 A, Maximum: 20 A	Idling: 0 to 3.0 A	—
O2S B1 S2	Heated oxygen sensor output voltage for bank 1 sensor 2/ Minimum: 0 V, Maximum: 1.275 V	Driving (31 mph, 50 km/h): 0.1 to 0.9 V	Performing the INJ VOL or A/F CONTROL function of the ACTIVE TEST enables the user to check the voltage output of each sensor
O2S B1 S3	Heated oxygen sensor output voltage for bank 1 sensor 3/ Minimum: 0 V, Maximum: 1.275 V	Driving (31 mph, 50 km/h): 0.1 to 0.9 V	Performing the INJ VOL or A/F CONTROL function of the ACTIVE TEST enables the user to check the voltage output of each sensor
AFS B1 S1	A/F sensor output voltage for bank 1 sensor 1/ Minimum: 0 V, Maximum: 7.999 V	Idling: 2.8 to 3.8 V	Performing the INJ VOL or A/F CONTROL function of the ACTIVE TEST enables the user to check the voltage output of each sensor
VAPOR PRESS	Vapor Pressure/ Minimum: −4.125 kPa, Maximum: 2.125 kPa	Fuel tank cap removed: 0 kPa	Pressure inside of fuel tank as read by the vapor pressure sensor
SHORT FT #1	Short−term fuel trim of bank 1/ Minimum: −100 %, Maximum: 100%	0 ± 20 %	This item is the short−term fuel compensation used to maintain the air−fuel ratio at stoichiometric air−fuel ratio
LONG FT #1	Long−term fuel trim of bank 1/ Minimum: −100 %, Maximum: 100 %	0 ± 20 %	This item is the overall fuel compensation carried out in long−term to compensate for a continual deviation of the short−term fuel trim from the central value

Hand−held Tester Display	Measurement Item/Range (Display)	Normal Condition*	Diagnostic Note
TOTAL FT #1	Total fuel trim of bank 1: Average value for fuel trim system of bank 1/ Minimum: 0.5, Maximum: 1.496	Idling: 0.5 to 1.4	—
AF FT B1 S1	Short−term fuel trim associated with the bank 1 sensor 1/ Minimum: 0, Maximum: 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	—
FUEL SYS #1	Fuel system status (Bank 1) / OL or CL or OL DRIVE or OL FAULT or CL FAULT	Idling after warming up: CL	• OL (Open Loop): Has not yet satisfied conditions to go closed loop • CL (Closed Loop) Using heated oxygen sensor(s) as feed back 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 one of heated oxygen sensors, which is used for fuel control, is functioning
FC IDL	Fuel cut idle/ ON or OFF	Fuel cut operation: ON	FC IDL= ”ON” when throttle valve fully closed and engine speed is over 1,500 rpm
STARTER SIG	Starter signal/ ON or OFF	Cranking: ON	—
A/C SIG	A/C signal/ ON or OFF	A/C ON: ON	—
PNP SW [NSW]	PNP switch signal/ ON or OFF	P or N position: ON	—
ELECT LOAD SIG	Electrical load signal/ ON or OFF	• Tail light switch ON: ON • Defogger switch ON: ON	—
STOP LIGHT SW	Stop light switch/ ON or OFF	• Brake pedal depressed: ON • Brake pedal released: OFF	—
PS OIL PRESS SW	Power steering oil pressure switch signal/ ON or OFF	• While turning the steering wheel: ON • While not turning the steering wheel: OFF	The idle−up control is performed when PS is ON
PS SIGNAL	Power steering signal/ ON or OFF	When the steering wheel is turned: ON	This signal is usually ON status until the IG switch is turned OFF
FUEL PUMP / SPD	Fuel pump/speed status/ ON/H or OFF/M,L	Idling: ON	—
A/C MAG CLUTCH	A/C magnet clutch status/ ON or OFF	A/C magnet clutch ON: ON	—
EVAP VSV	EVAP VSV status control/ ON or OFF	VSV operating: ON	EVAP VSV is controlled by the ECM (ground side duty control)
VVT CTRL B1	VVT control status (bank 1)/ ON or OFF	VVT system operation: ON	—
IGNITION	Ignition counter/ Minimum: 0, Maximum: 400	0 to 400	—
CYL #1, #2, #3, #4	Misfire ratio of the cylinder 1 to 4/ Minimum: 0 %, Maximum: 50 %	0 %	This item is displayed in only idling
MISFIRE LOAD	Engine load for first misfire range/ Minimum: 0 g/rev, Maximum: 3.98 g/rev	Misfire 0: 0 g/rev	—
MISFIRE RPM	Engine RPM for first misfire range/ Minimum: 0 rpm, Maximum: 6,375 rpm	Misfire 0: 0 rpm	—

Hand−held Tester Display	Measurement Item/Range (Display)	Normal Condition*	Diagnostic Note
FC TAU	Fuel Cut TAU: Fuel cut during very light load/ ON or OFF	Fuel cut operating: ON	Fuel cut is being performed under very light load to prevent engine combustion from becoming incomplete
CHECK MODE	Check mode/ ON or OFF	Check mode ON: ON	See page 05−381
IACV POSITION *2	Intake manifold runner valve (IMRV) position/ Minimum: 0 V, Maximum: 4.98 V	• IMRV fully closed: 0.2 to 1.0 V • IMRV fully open: 3.2 to 4.8 V	If the value is 0.2 V or less: • IACA circuit short • VC circuit open If the value is 4.8 V or more: • VC and IACA circuit short−circuited • IACA circuit open • E2 circuit open

*1: If no conditions are specifically stated for ”ldling”, the shift lever in at the N or P position, the A/C switch is OFF and all accessory switches are OFF.
*2: The IMRV position sensor is indicated as ”IACV POSITION” on the hand−held tester or the OBD II scan tool.

2. ACTIVE TEST

HINT:
Performing the hand−held tester ACTIVE LIST allows relay, VSV, actuator and other items to be operated without removing any parts. Performing the ACTIVE LIST early in troubleshooting is one way to shorten labor time. The DATA LIST can be displayed during the ACTIVE TEST.

(a) Warm up the engine.
(b) Turn the ignition switch OFF.
(c) Connect the hand−held tester or the OBD II scan tool to the DLC3.
(d) Turn the ignition switch ON.
(e) Turn ON the hand−held tester or the OBD II scan tool.
(f) Enter the following menus: DIAGNOSIS/ENHANCED OBD II/ACTIVE TEST.
(g) According to the display on tester, perform the ”ACTIVE TEST.

Hand−held Tester Display	Test Details	Diagnostic Note
INJ VOL	[Test Details] Control the injection volume Minimum: −12.5 %, Maximum: 25 % [Vehicle Condition] Engine speed: 3,000 rpm or less	• All injectors are tested at once • Injection volume is gradually changed between −12.5 and 25 %
A/F CONTROL	[Test Details] Control the injection volume −12.5 or 25 % (Change the injection volume −12.5 % or 25 %.) [Vehicle Condition] Engine speed: 3,000 rpm or less	The following procedure of A/F CONTROL enables the user to check its output (show its graph indication) of A/F sensor and heated oxygen sensor 2: For displaying the graph indication, enter ”ACTIVE TEST / A/F CONTROL / USER DATA”, then select ”AFS B1 S1 and O2S B1 S2” by pressing ”YES” button and push ”ENTER” button before pressing ”F4” button
CAN CTRL VSV	[Test Details] Activate the VSV for canister control ON or OFF	—
EVAP VSV (ALONE)	[Test Details] Activate the EVAP VSV control ON or OFF	—

A/C MAG CLUTCH	[Test Details] Control the A/C magnet clutch ON or OFF	—
FUEL PUMP / SPD	[Test Details] Control the fuel pump ON or OFF	—
VVT CTRL B1	[Test Details] Active the VVT system (Bank 1) ON or OFF	• ON: Rough idle or engine stall • OFF: Normal engine speed
TC/TE1	[Test Details] Connect the TC and TE1 ON or OFF	—
FC IDL PROHBT	[Test Details] Control the idle fuel cut prohibit ON or OFF	—
IACV MOTOR *3	[Test Details] Activate the intake manifold runner valve (IMRV) motor −100 or 100 % (Change the IMRV motor duty ratio −100 % or 100 %) [Vehicle Condition] Engine speed: 3,000 rpm or less	• When the duty ratio is −100 %: IMRV closes • When the duty ratio is 100 %: IMRV opens

*3: The IMRV motor is indicated as ”IACV MOTOR” on the hand−held tester.