05IHD–01

FREEZE FRAME DATA

DESCRIPTION

The freeze frame data records the engine condition (fuel system, calculated load, engine coolant temperature, fuel trim, engine speed, vehicle speed, etc.) when malfunction is detected. When troubleshooting, it can help determine if the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich and other data. at the time of the malfunction occurred.

HINT:

If it is impossible to replicate the problem even though a DTC is detected, confirm the freeze frame data.

LIST OF FREEZE FRAME DATA

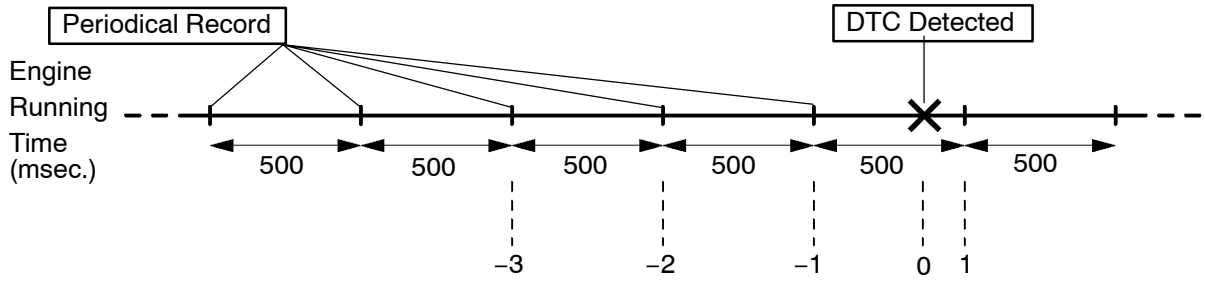
Intelligent Tester II Display (Abbreviation)	Measure Item/Range	Diagnostic Note
Calculate Load (Cal Load)	Calculated load	Calculate load by ECM
Coolant Temp	Engine coolant temperature	If the value is –40°C, sensor circuit is open If the value is 140°C, sensor circuit is shorted
Short FT#1	Short–term fuel trim	Short–term fuel compensation used to maintain the air–fuel ratio at stoichiometric air–fuel ratio
Long FT#1	Long–term fuel trim	Overall fuel compensation carried out in long–term to compensate a continual deviation of the short–term fuel trim from the central valve
Engine Speed (Engine Spd)	Engine speed	—
Vehicle Speed (Vehicle Spd)	Vehicle speed	Speed indicated on speedometer
IGN Advance (Ign Advance)	Ignition advance	—
Intake Air	Intake air temperature	If the value is –40°C, sensor circuit is open If the value is 140°C, sensor circuit is shorted
MAF	Mass air flow volume	If the value is approximately 0.0 g/s: • Mass air flow meter power source circuit • VG circuit open or short If the value is 160.0 g/s or more: • E2G circuit open
Throttle Position (Throttle Pos)	Throttle position	Read the value with power switch ON (Do not start engine)
O2S B1 S2	Heated oxygen sensor output	Performing the INJ VOL or A/F CONTROL function of the ACTIVE TEST enables the technician to check voltage output of the sensor
O2FT B1 S2	Fuel trim at Heated oxygen sensor	Same as SHORT FT #1
Engine Run Time (Eng Run Time)	Cumulative engine running time	—
AF FT B1 S1	Fuel trim at sensor	—
AFS B1 S1	Sensor output	Performing the INJ VOL or A/F CONTROL function of the ACTIVE TEST enables the technician to check voltage output of the sensor
Warm–up Cycle Cleared DTC (Wu Cyc DTC Dist)	Warm–up cycle after DTC cleared	—
Distance from DTC Cleared (Dist DTC Clear)	Accumulated distance from DTC cleared	—
Battery Voltage (BATT)	Battery voltage	—
Air–Fuel Ratio	Air–fuel ratio	—

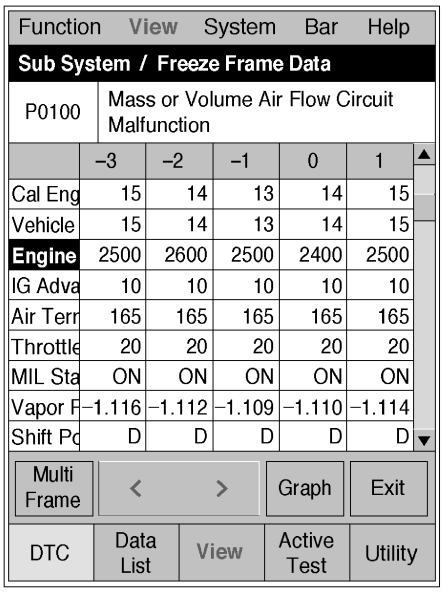
Intelligent Tester II Display (Abbreviation)	Measure Item/Range	Diagnostic Note
Throttle Sensor Position (Throttle Pos)	Throttle sensor positioning	Read the value with the power switch ON (Do not start engine)
Ambient Temperature (Ambient Temp)	Ambient air temperature	If the value is −40°C, sensor circuit is open If the value is 140°C, sensor circuit is shorted
Throttle Sensor Position #2 (Throttle Pos #2)	Throttle sensor positioning #2	—
Throttle Motor (Throttle Mot)	Throttle motor	—
Time after DTC Cleared (Time DTC Clear)	Cumulative time after DTC cleared	—
Knock Correct Learn Value (Knock Crrt Val)	Correction learning value of knocking	—
Knock Feedback Value (Knock FB Val)	Feedback value of knocking	—
Purge Flow	Purge flow	—
Idle Fuel Cut (FC Idl)	Idle fuel cut	ON: when throttle valve fully closed and engine speed is over 1,500 rpm
FC TAU	FC TAU: Fuel cut during very light load	The fuel cut is being performed under very light load to prevent the engine combustion from becoming incomplete
VVTL Aim Angle (Bank 1) (VVTL Aim Angle #1)	VVT aim angle	—
VVT Change Angle (Bank 1) (VVT Chng Angl #1)	VVT change angle	—
VVT OCV Duty (Bank 1) (VVT OCV Duty B1)	VVT OCV operation duty	—
EVAP Purge VSV (Evap (Purge) VSV)	EVAP purge VSV	VSV for EVAP is controlled by the ECM (ground side duty control)
Fuel Pump/Speed Status (Fuel Pump/Speed)	Fuel pump speed status	—
VVT Control Status (VVT Ctrl B1)	VVT control status	—
Electric Fan Motor (Fan Motor)	Electric fan motor	—
Initial Engine Coolant Temp (Ini Cool Temp)	Initial engine coolant temperature	—
Initial Intake Air Temp (Ini Intake Temp)	Initial intake air temperature	—
Injection Volume (Cylinder 1) (Inj Vol)	Injection volume	—
Injector	Injector	Cumulative fuel injection amount for last 10 times
Total FT#1	Total fuel trim	—
Misfire RPM	Misfire RPM	—
Misfire Load	Misfire load	—
Cylinder #1,#2,#3,#4 Misfire Rate (Cyl #1, #2, #3, #4)	Misfire ratio of the cylinder 1 to 4	Displayed in only idling
All Cylinders Misfire Rate (Cyl All)	All cylinder misfire rate	Displayed in only idling
Ignition	Ignition	Misfire count
Misfire Margin	Misfire monitoring	—
Engine Oil Pressure SW (Eng Oil Pres SW)	Engine oil pressure switch signal	Always ON while engine is running

”Multi–Frame” Freeze Frame Data

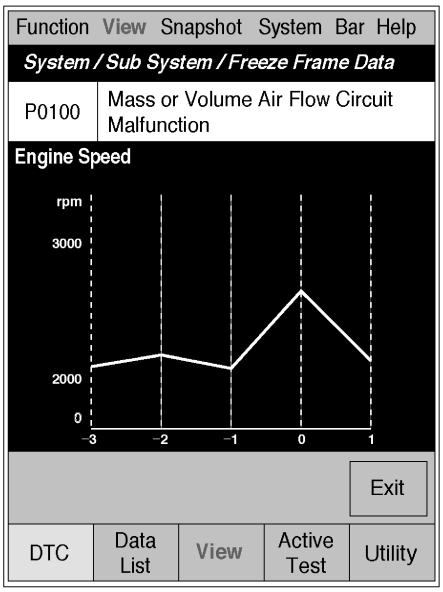
The ECM actually records the engine condition inside its memory every 500 milliseconds (msec) while the system is ON. On the intelligent tester II, multi–frame freeze frame data can be displayed. Thus, not only the list but also the graph of multi–frame freeze frame data is displayed in order that the technicians may investigate the malfunction condition more easily. In addition, 5 periodic records of the engine condition including a record the time the DTC was set can be displayed as shown, while the conventional hand–held tester could display only 1 periodic record.

Multi–Frame Freeze Frame Data:





List



Line Graph

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Intelligent Tester II Display

Tester Display	Description
1	First periodical record data after DTC detection
0	Data of the time DTC was detected
–1	Periodical record data of 500 milliseconds before record ”1”
–2	Periodical record data of 500 milliseconds before record ”–1”
–3	Periodical record data of 500 milliseconds before record ”–2”