

DATA LIST / ACTIVE TEST

1. DATA LIST

HINT:

By reading the DATA LIST displayed on the intelligent tester, values can be checked, 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 for reference only. Do not depend solely on these values when determining whether or not a part is faulty.

- (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 tester ON.
- (f) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST.
- (g) Check the values by referring to the table below.

ECM:

Tester Display	Measurement Item/Range	Normal Condition*	Diagnostic Note
INJECTOR	Injection period of No. 1 cylinder: Min.: 0 ms, Max.: 32.64 ms	1.2 to 2.4 ms: Idling	-
IGN ADVANCE	Ignition timing advance for No. 1 cylinder: Min.: -64 deg, Max.: 63.5 deg	BTDC 7 to 24 deg: Idling	-
CALC LOAD	Load calculated by ECM: Min.: 0%, Max.: 100%	<ul style="list-style-type: none"> • 10 to 20%: Idling • 10 to 20%: Running without load at 2,500 rpm 	Load value
VEHICLE LOAD	Vehicle load: Min.: 0%, Max.: 25,700%	Actual vehicle load	Load percentage in terms of maximum intake air flow amount
MAF	Air flow rate from MAF meter: Min.: 0 g/sec., Max.: 655.35 g/sec.	2 to 5 g/sec.: Idling 8 to 19 g/sec.: Running without load at 2,500 rpm	If value approximately 0.0 g/sec.: <ul style="list-style-type: none"> • Mass air flow meter power source circuit open • VG circuit open or short If value 160.0 g/sec. or more: <ul style="list-style-type: none"> • E2G circuit open
ENGINE SPD	Engine speed: Min.: 0 rpm, Max.: 16,383.75 rpm	600 to 700 rpm: Idling	-
VEHICLE SPD	Vehicle speed: Min.: 0 km/h, Max.: 255 km/h	Actual vehicle speed	Speed indicated on speedometer
COOLANT TEMP	Engine coolant temperature: Min.: -40°C, Max.: 140°C	80 to 100°C (176 to 212°F): After warming up	<ul style="list-style-type: none"> • If -40°C (-40°F): sensor circuit open • If 140°C (284°F) or more: sensor circuit shorted
INTAKE AIR	Intake air temperature: Min.: -40°C, Max.: 140°C	Equivalent to ambient air temperature	<ul style="list-style-type: none"> • If -40°C (-40°F): sensor circuit open • If 140°C (284°F) or more: sensor circuit shorted
AIR-FUEL RATIO	Ratio compared to stoichiometric level: Min.: 0, Max.: 1.999	0.8 to 1.2: Idling	-
PURGE DENSITY	Learning value of purge density: Min.: -50, Max.: 350	-40 to 0: Idling	Service data

Tester Display	Measurement Item/Range	Normal Condition*	Diagnostic Note
EVAP PURGE FLOW	Ratio of evaporative purge flow to intake air volume: Min.: 0%, Max.: 102.4%	0 to 8%: Idling	-
EVAP PURGE VSV	EVAP (PURGE) VSV control duty: Min.: 0%, Max.: 100%	0 to 100%: Idling	Order signal from ECM
VAPOR PRES PUMP	Vapor pressure: Min.: 33.853 kPa, Max.: 125.596 kPa	0 kPa: Fuel tank cap removed	EVAP system pressure monitored by canister pressure sensor
VAPOR PRES CALC	Vapor pressure (calculated): Min.: -5.632 kPa, Max.: 715.264 kPa	0 kPa: Fuel tank cap removed	EVAP system pressure monitored by canister pressure sensor
KNOCK CRRT VAL	Correction learning value of knocking: Min: -64°C, Max.: 1,984°C	0 to 22°C: Driving at 70 km/h (44 mph)	Service data
KNOCK FB VAL	Feedback value of knocking: Min: -64°C, Max.: 1,984°C	-22 to 0°C: Driving at 70 km/h (44 mph)	Service data
CLUTCH	Clutch current: Min.: 0 A, Max.: 2.49 A	-	-
ACCEL POS #1	Absolute Accelerator Pedal Position (APP) No. 1: Min.: 0%, Max.: 100%	10 to 22%: Accelerator pedal released 54 to 86%: Accelerator pedal fully depressed	Read value with ignition switch ON (Do not start engine)
ACCEL POS #2	Absolute APP No. 2: Min.: 0%, Max.: 100%	12 to 42%: Accelerator pedal released 66 to 98%: Accelerator pedal fully depressed	Read value with ignition switch ON (Do not start engine)
ACCEL POS #1	APP sensor No. 1 voltage: Min.: 0 V, Max.: 4.98 V	-	ETCS freeze data
ACCEL POS #2	APP sensor No. 2 voltage: Min.: 0 V, Max.: 4.98 V	-	ETCS freeze data
ACCEL POS #1	APP sensor No. 1 voltage: Min.: 0 V, Max.: 5 V	0.5 to 1.1 V: Accelerator pedal released 2.6 to 4.5 V: Accelerator pedal fully depressed	Read value with ignition switch ON (Do not start engine)
ACCEL POS #2	APP sensor No. 2 voltage: Min.: 0 V, Max.: 5 V	1.2 to 2.0 V: Accelerator pedal released 3.4 to 5.0 V: Accelerator pedal fully depressed	Read value with ignition switch ON (Do not start engine)
ACCEL IDL POS	Whether or not accelerator pedal position sensor detecting idle: ON or OFF	ON: Idling	-
THRTL LEARN VAL	Throttle valve fully closed (learned value): Min.: 0 V, Max.: 5 V	0.4 to 0.8 V	-
ACCEL SSR #1 AD	Accelerator fully closed value No. 1 (AD): Min.: 0 V, Max.: 4.98 V	-	ETCS service data
ACCEL LRN VAL#1	Accelerator fully closed learning value No. 1: Min.: 0 deg, Max.: 124.512 deg	-	ETCS service data
ACCEL LRN VAL#2	Accelerator fully closed learning value No. 2: Min.: 0 deg, Max.: 124.512 deg	-	ETCS service data
FAIL #1	Whether or not fail safe function executed: ON or OFF	ON: ETCS has failed	-
FAIL #2	Whether or not fail safe function executed: ON or OFF	ON: ETCS has failed	-
ST1	Starter signal: ON or OFF	ON: Cranking	-

Tester Display	Measurement Item/Range	Normal Condition*	Diagnostic Note
SYS GUARD JUDGE	System guard: ON or OFF	-	ETCS service data
OPN MALFUNCTION	Open side malfunction: ON or OFF	-	ETCS service data
THROTTLE POS	Absolute throttle position sensor: Min.: 0%, Max.: 100%	<ul style="list-style-type: none"> 10 to 24%: Throttle fully closed 64 to 96%: Throttle fully open 	<ul style="list-style-type: none"> Calculated value based on VTA1 Read value with ignition switch ON (Do not start engine)
THROTTL IDL POS	Whether or not throttle position sensor detecting idle: ON or OFF	ON: Idling	-
THRTL REQ POS	Throttle requirement position: Min.: 0 V, Max.: 5 V	0.5 to 1.0 V: Idling	-
THROTTLE POS	Throttle position: Min.: 0%, Max.: 100%	0 to 18%: Idling	Calculated value based on VTA1
THROTTLE POS #2	Absolute throttle position sensor No. 2: Min.: 0%, Max.: 100%	-	Calculated value based on VTA2
THROTTLE POS #1	Throttle position sensor No. 1 output voltage: Min.: 0 V, Max.: 4.98 V	-	ETCS freeze data
THROTTLE POS #2	Throttle position sensor No. 2 output voltage: Min.: 0 V, Max.: 4.98 V	-	ETCS freeze data
THROTTLE POS #1	Throttle position sensor No. 1 output voltage: Min.: 0 V, Max.: 5 V	<ul style="list-style-type: none"> 0.5 to 1.2 V: Throttle fully closed 3.2 to 4.8 V: Throttle fully open 	-
THROTTLE POS #2	Throttle position sensor No. 2 output voltage: Min.: 0 V, Max.: 5 V	<ul style="list-style-type: none"> 2.0 to 2.9 V: Throttle fully closed 4.6 to 5.0 V: Throttle fully open 	Read value with ignition switch ON (Do not start engine)
THRTL COMND VAL	Throttle position command value: Min.: 0 V, Max.: 4.9804 V	0.5 to 4.8 V	Read value with ignition switch ON (Do not start engine)
THROTTLE SSR #1	Throttle sensor opener position No. 1: Min.: 0 V, Max.: 4.9804 V	0.6 to 0.9 V	ETCS service data
THROTTLE SSR #2	Throttle sensor opener position No. 2: Min.: 0 V, Max.: 4.9804 V	2.2 to 2.6 V	ETCS service data
THRTL SSR #1 AD	Throttle position sensor No. 1 output voltage (AD): Min.: 0 V, Max.: 4.9804 V	0.6 to 0.9 V	ETCS service data
THROTTLE MOT	Whether or not throttle actuator control permitted: ON or OFF	ON: Idling	Read value with ignition switch ON (Do not start engine)
THROTTLE MOT	Throttle actuator current: Min.: 0 A, Max.: 80 A	0 to 3.0 A: Idling	-
THROTTLE MOT	Throttle actuator: Min.: 0%, Max.: 100%	0.5 to 40%: Idling	-
THROTTLE MOT	Throttle actuator current: Min.: 0 A, Max.: 19.92 A	0 to 3.0 A: Idling	-
THROTL OPN DUTY	Throttle actuator opening duty ratio: Min.: 0%, Max.: 100%	0 to 40%: Idling	<ul style="list-style-type: none"> When accelerator pedal depressed, duty ratio increased Read value with ignition switch ON (Do not start engine)

Tester Display	Measurement Item/Range	Normal Condition*	Diagnostic Note
THROTL CLS DUTY	Throttle actuator closed duty ratio: Min.: 0%, Max.: 100%	0 to 40%: Idling	<ul style="list-style-type: none"> When accelerator pedal released quickly, duty ratio increased Read value with ignition switch ON (Do not start engine)
THRTL MOT (OPN)	Throttle actuator duty ratio (open): Min.: 0%, Max.: 100%	-	ETCS service data
THRTL MOT (CLS)	Throttle actuator duty ratio (closed): Min.: 0%, Max.: 100%	-	ETCS service data
O2S B1 S2	Heated oxygen sensor output voltage for bank 1 sensor 2: Min.: 0 V Max.: 1.275 V	0.1 to 0.9 V: Driving at 70 km/h (44 mph)	Performing INJ VOL or A/F CONTROL function of ACTIVE TEST enables technician to check output voltage of sensor
O2S B2 S2	Heated oxygen sensor output voltage for bank 2 sensor 2: Min.: 0 V Max.: 1.275 V	0.1 to 0.9 V: Driving at 70 km/h (44 mph)	Performing INJ VOL or A/F CONTROL function of ACTIVE TEST enables technician to check output voltage of sensor
AFS B1 S1	A/F sensor output voltage for bank 1 sensor 1: Min.: 0 V Max.: 7.999 V	2.8 to 3.8 V: Idling	Performing INJ VOL or A/F CONTROL function of ACTIVE TEST enables technician to check output voltage of sensor
AFS B2 S1	A/F sensor output voltage for bank 2 sensor 1: Min.: 0 V Max.: 7.999 V	2.8 to 3.8 V: Idling	Performing INJ VOL or A/F CONTROL function of ACTIVE TEST enables technician to check output voltage of sensor
TOTAL FT #1	Total fuel trim of bank 1 Average value for fuel system system of bank 1: Min.: -0.5, Max.: 0.496	-0.2 to 0.2: Idling	-
TOTAL FT #2	Total fuel trim of bank 2 Average value for fuel system system of bank 2: Min.: -0.5, Max.: 0.496	-0.2 to 0.2: Idling	-
SHORT FT #1	Short-term fuel trim of bank 1: Min.: -100%, Max.: 99.2%	-20 to 20%	Short-term fuel compensation used to maintain air-fuel ratio at stoichiometric air-fuel ratio
SHORT FT #2	Short-term fuel trim of bank 2: Min.: -100%, Max.: 99.2%	-20 to 20%	Short-term fuel compensation used to maintain air-fuel ratio at stoichiometric air-fuel ratio
LONG FT #1	Long-term fuel trim of bank 1: Min.: -100%, Max.: 99.2%	-20 to 20%	Overall fuel compensation carried out in long-term to compensate for continual deviation of short-term fuel trim from central value
LONG FT #2	Long-term fuel trim of bank 2: Min.: -100%, Max.: 99.2%	-20 to 20%	Overall fuel compensation carried out in long-term to compensate for continual deviation of short-term fuel trim from central value
FUEL SYS #1	Fuel system status (Bank 1): OL or CL or OL DRIVE or OL FAULT or CL FAULT	CL: Idling after warming up	<ul style="list-style-type: none"> OL (Open Loop): Has not yet satisfied conditions to go closed loop CL (Closed Loop): Using A/F sensor as feedback 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 A/F sensor, which used for fuel control malfunctioning

Tester Display	Measurement Item/Range	Normal Condition*	Diagnostic Note
FUEL SYS #2	Fuel system status (Bank 2): OL or CL or OL DRIVE or OL FAULT or CL FAULT	CL: Idling after warming up	<ul style="list-style-type: none"> OL (Open Loop): Has not yet satisfied conditions to go closed loop CL (Closed Loop): Using A/F sensor as feedback 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 A/F sensor, which used for fuel control malfunctioning
O2FT B1 S2	Short-term fuel trim associated with bank 1 sensor 2: Min.: -100%, Max.: 99.2%	-20 to 20%	Same as SHORT FT #1
O2FT B2 S2	Short-term fuel trim associated with bank 2 sensor 2: Min.: -100%, Max.: 99.2%	-20 to 20%	Same as SHORT FT #2
AF FT B1 S1	Short-term fuel trim associated with bank 1 sensor 1: Min.: 0, Max.: 1.999	<ul style="list-style-type: none"> 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 	-
AF FT B2 S1	Short-term fuel trim associated with bank 2 sensor 1: Min.: 0, Max.: 1.999	<ul style="list-style-type: none"> 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 	-
AFS B1 S1	A/F sensor current: Min.: -128 mA, Max.: 127.99 mA	-	-
AFS B2 S1	A/F sensor current: Min.: -128 mA, Max.: 127.99 mA	-	-
CAT TEMP B1S1	Estimated catalyst temperature (bank 1 sensor 1): Min.: -40°C, Max.: 6,513.5°C	-	-
CAT TEMP B1S2	Estimated catalyst temperature (bank 1 sensor 2): Min.: -40°C, Max.: 6,513.5°C	-	-
CAT TEMP B2S1	Estimated catalyst temperature (bank 2 sensor 1): Min.: -40°C, Max.: 6,513.5°C	-	-
CAT TEMP B2S2	Estimated catalyst temperature (bank 2 sensor 2): Min.: -40°C, Max.: 6,513.5°C	-	-
S O2S B1S2	Sub heated oxygen sensor impedance (bank 1 sensor2): Min.: 0 Ω, Max.: 21247.68 Ω	-	-
S O2S B2S2	Sub heated oxygen sensor impedance (bank 2 sensor2): Min.: 0 Ω, Max.: 21247.68 Ω	-	-
INI COOL TEMP	Engine coolant temperature at engine start: Min.: -40°C, Max.: 120°C	Close to ambient air temperature	-
INI INTAKE TEMP	Intake air temperature at engine start: Min.: -40°C, Max.: 120°C	Close to ambient air temperature	-
INJ VOL	Injection volume (cylinder 1): Min.: 0 ml, Max.: 2.048 ml	Max.: 0.5 ml	Quantity of fuel injected over 10 injections

Tester Display	Measurement Item/Range	Normal Condition*	Diagnostic Note
STARTER SIG	Starter signal: ON or OFF	ON: Cranking	-
PS SW	Power steering signal: ON or OFF	ON: Power steering operation	-
PS SIGNAL	Power steering signal (history): ON or OFF	ON: When steering wheel first turned after battery terminals connected	Signal status usually ON until battery terminals disconnected
CTP SW	Closed throttle position switch: ON or OFF	<ul style="list-style-type: none"> • ON: Throttle fully closed • OFF: Throttle open 	-
A/C SIGNAL	A/C signal: ON or OFF	ON: A/C ON	-
PNP SW [NSW]	PNP switch status: ON or OFF	ON: P or N position	-
ELECT LOAD SIG	Electrical load signal: ON or OFF	ON: Headlights or defogger turned ON	-
STOP LIGHT SW	Stop light switch: ON or OFF	ON: Brake pedal depressed	-
+BM	Whether or not electric throttle control system power input: ON or OFF	ON: Idling	-
+BM VOLTAGE	+BM voltage: Min.: 0, Max.: 19.922	10 to 15 V: Idling	ETCS service data
BATTERY VOLTAGE	Battery voltage: Min.: 0 V, Max.: 65.535 V	9 to 14 V: Idling	-
ACTUATOR POWER	Actuator power supply: ON or OFF	ON: Idling	ETCS service data
ATM PRESSURE	Atmospheric pressure: Min.: 0 kPa, Max.: 255 kPa	Equivalent to atmospheric pressure (absolute pressure)	-
BATTERY CURRENT	Battery current: Min.: -100 A, Max.: 100 A	-	-
BATTERY TEMP	Battery temperature: Min.: -45 °C, Max.: 156.4 °C	-	-
ALT OUTPUT DUTY	Generator output duty ratio: Min.: 0%, Max.: 100%	-	During charge control
ALT V NORMAL	Request output voltage: Min.: 0 V, Max.: 20 V	9 to 14 V	Not during alternator forced activation
ALT V ACT TST	Request output voltage: Min.: 0 V, Max.: 20 V	-	During alternator forced activation
FUEL PMP SP CTL	Fuel pump speed control status: ON or OFF	Idling: ON	Active Test support data
ACIS VSV	VSV for Acoustic Control Induction System Status: ON or OFF	-	ON: Open OFF: Closed
EVAP (Purge) VSV	Purge VSV status: ON or OFF	-	Active Test support data
FUEL PUMP / SPD	Fuel pump status: ON or OFF	-	Active Test support data
VVT CTRL B1	VVT control (bank 1) status: ON or OFF	-	Active Test support data
VVT CTRL B2	VVT control (bank 2) status: ON or OFF	-	Active Test support data
VACUUM PUMP	Key-off EVAP system leak detection pump status: ON or OFF	-	Active Test support data
EVAP VENT VAL	Key-off EVAP system vent valve status: ON or OFF	-	Active Test support data
FAN MOTOR	Electric fan motor: ON or OFF	ON: Electric fan motor operating	Active Test support data

Tester Display	Measurement Item/Range	Normal Condition*	Diagnostic Note
AICV VSV	VSV for Air Intake Control System Status: ON or OFF	-	-
TC/TE1	TC and CG (TE1) terminal of DLC3: ON or OFF	-	Active Test support data
VVTL AIM ANGL#1	VVT aim angle bank 1 Intake side): Min.: 0%, Max.: 100%	-	Target angle during intrusive operation
VVT CHNG ANGL#1	VVT change angle (bank 1 Intake side): Min.: 0°FR, Max.: 60°FR	0 to 5°FR: Idling	Displacement angle during intrusive operation
VVT OCV DUTY B1	VVT OCV operation duty (bank 1 Intake side): Min.: 0%, Max.: 100%	0 to 100%	Requested duty value for intrusive operation
VVT EX HOLD B1	VVT exhaust hold duty ratio learning value (bank 1 Exhaust side): Min.: 0%, Max.: 100%	10 to 50%: Idling	Requested duty value for intrusive operation
VVT EX CHG ANG1	VVT change angle (bank 1 Exhaust side): Min.: 0° FR, Max.: 60° FR	0 to 5° FR: Idling	Displacement angle during intrusive operation
VVT EX OCV D B1	VVT OCV operation duty (bank 1 Exhaust side): Min.: 0%, Max.: 100%	0 to 100%	Requested duty value for intrusive operation
VVTL AIM ANGL #2	VVT aim angle (bank 2 Intake side): Min.: 0%, Max.: 100%	-	Target angle during intrusive operation
VVT CHNG ANGL #2	VVT change angle (bank 2 Intake side): Min.: 0° FR, Max.: 60° FR	0 to 5° FR: Idling	Displacement angle during intrusive operation
VVT OCV DUTY B2	VVT OCV operation duty (bank 2 Intake side): Min.: 0%, Max.: 100%	0 to 100%	Requested duty value for intrusive operation
VVT EX HOLD B2	VVT exhaust hold duty ratio learning value (bank 2 Exhaust side): Min.: 0%, Max.: 100%	10 to 50%: Idling	Requested duty value for intrusive operation
VVT EX CHG ANG2	VVT change angle (bank 2 Exhaust side): Min.: 0° FR, Max.: 60° FR	0 to 5° FR: Idling	Displacement angle during intrusive operation
VVT EX OCV D B2	VVT exhaust operation duty (bank 2 Exhaust side): Min.: 0%, Max.: 100%	0 to 100%	Requested duty value for intrusive operation
FC IDL	Fuel cut idle: ON or OFF	ON: Fuel cut operation	FC IDL = "ON" when throttle valve fully closed and engine speed over 2,800 rpm
FC TAU	Fuel cut TAU (Fuel cut during very light load): ON or OFF	ON: Fuel cut operating	Fuel cut being performed under very light load to prevent engine combustion from becoming incomplete
IGNITION	Ignition counter: Min.: 0, Max.: 800	0 to 800	-
CYL #1	Misfire ratio of cylinder 1: Min.: 0, Max.: 255	0	This item displayed only during idling
CYL #2	Misfire ratio of cylinder 2: Min.: 0, Max.: 255	0	This item displayed only during idling
CYL #3	Misfire ratio of cylinder 3: Min.: 0, Max.: 255	0	This item displayed only during idling
CYL #4	Misfire ratio of cylinder 4: Min.: 0, Max.: 255	0	This item displayed only during idling

Tester Display	Measurement Item/Range	Normal Condition*	Diagnostic Note
CYL #5	Misfire ratio of cylinder 5: Min.: 0, Max.: 255	0	This item displayed only during idling
CYL #6	Misfire ratio of cylinder 6: Min.: 0, Max.: 255	0	This item displayed only during idling
CYL ALL	All cylinders misfire rate: Min.: 0, Max.: 255	0 to 35	-
MISFIRE RPM	Engine RPM for first misfire range: Min.: 0 rpm, Max.: 6,375 rpm	0 rpm: Misfire 0	-
MISFIRE LOAD	Engine load for first misfire range: Min.: 0 g/rev, Max.: 3.98 g/rev	0 g/rev: Misfire 0	-
MISFIRE MARGIN	Misfire monitoring: Min.: -100%, Max.: 99.22%	-100 to 99.22%	Misfire detecting margin
#CODES	#Codes: Min.: 0, Max.: 255	-	Number of detected DTCs
CHECK MODE	Check mode: ON or OFF	ON: Check mode ON	(see page ES-42)
SPD TEST	Check mode result for vehicle speed sensor: COMPL or INCMPL	-	-
MISFIRE TEST	Check mode result for misfire monitor: COMPL or INCMPL	-	-
OXS1 TEST	Check mode result for HO2 sensor (bank 1): COMPL or INCMPL	-	-
OXS2 TEST	Check mode result for HO2 sensor (bank 2): COMPL or INCMPL	-	-
A/F SSR TEST B1	Check mode result for air-fuel ratio sensor (bank 1): COMPL or INCMPL	-	-
A/F SSR TEST B2	Check mode result for air-fuel ratio sensor (bank 2): COMPL or INCMPL	-	-
MIL	MIL status: ON or OFF	ON: MIL ON	-
MIL ON RUN DIST	MIL ON run distance: Min.: 0 km, Max.: 65,535 km	Distance driven after DTC detected	-
MIL ON RUN TIME	Running time from MIL ON: Min.: 0 minutes, Max.: 65,535 minutes	Running time after MIL ON	-
ENG RUN TIME	Engine run time: Min.: 0 seconds, Max.: 65,535 seconds	Time after engine start	-
TIME DTC CLEAR	Time after DTC cleared: Min.: 0 minutes, Max.: 65,535 minutes	Time after DTCs erased	-
DIST DTC CLEAR	Distance after DTC cleared: Min.: 0 km, Max.: 65,535 km	Distance driven after DTCs erased	-
WU CYC DTC CLEAR	Warm-up cycle after DTC cleared: Min.: 0, Max.: 255	-	Number of warm-up cycles after DTC cleared
OBD CERT	OBD requirement	OBD2	-
#CARB CODES	Number of emission related DTCs	-	-
COMP MON	Comprehensive component monitor: NOT AVL or AVAIL	-	-
FUEL MON	Fuel system monitor: NOT AVL or AVAIL	-	-

Tester Display	Measurement Item/Range	Normal Condition*	Diagnostic Note
MISFIRE MON	Misfire monitor: NOT AVL or AVAIL	-	-
O2S (A/FS) HTR	O2S (A/FS) heater monitor: NOT AVL or AVAIL	-	-
O2S (A/FS) HTR	O2S (A/FS) heater monitor: COMPL or INCMPL	-	-
O2S (A/FS) MON	O2S (A/FS) monitor: NOT AVL or AVAIL	-	-
O2S (A/FS) MON	O2S (A/FS) monitor: COMPL or INCMPL	-	-
EVAP MON	EVAP monitor: NOT AVL or AVAIL	-	-
EVAP MON	EVAP monitor: COMPL or INCMPL	-	-
CAT MON	Catalyst monitor: NOT AVL or AVAIL	-	-
CAT MON	Catalyst monitor: COMPL or INCMPL	-	-
CCM ENA	Comprehensive component monitor: UNABLE or ENABLE	-	-
CCM CMPL	Comprehensive component monitor: COMPL or INCMPL	-	-
FUEL ENA	Fuel system monitor: UNABLE or ENABLE	-	-
FUEL CMPL	Fuel system monitor: COMPL or INCMPL	-	-
MISFIRE ENA	Misfire monitor: UNABLE or ENABLE	-	-
MISFIRE CMPL	Misfire monitor: COMPL or INCMPL	-	-
EGR ENA	EGR monitor: UNABLE or ENABLE	-	-
EGR CMPL	EGR monitor: COMPL or INCMPL	-	-
HTR ENA	O2S (A/FS) heater monitor: UNABLE or ENABLE	-	-
HTR CMPL	O2S (A/FS) heater monitor: COMPL or INCMPL	-	-
O2S (A/FS) ENA	O2S (A/FS) monitor: UNABLE or ENABLE	-	-
O2S (A/FS) CMPL	O2S (A/FS) monitor: COMPL or INCMPL	-	-
ACRF ENA	A/C monitor: UNABLE or ENABLE	-	-
ACRF CMPL	A/C monitor: COMPL or INCMPL	-	-
AIR ENA	2nd Air monitor: UNABLE or ENABLE	-	-
AIR CMPL	2nd Air monitor: COMPL or INCMPL	-	-
EVAP ENA	EVAP monitor: UNABLE or ENABLE	-	-
EVAP CMPL	EVAP monitor: COMPL or INCMPL	-	-
HCAT ENA	Heated catalyst monitor: UNABLE or ENABLE	-	-

Tester Display	Measurement Item/Range	Normal Condition*	Diagnostic Note
HCAT CMPL	Heated catalyst monitor: COMPL or INCMPL	-	-
CAT ENA	Catalyst monitor: UNABLE or ENABLE	-	-
CAT CMPL	Catalyst monitor: COMPL or INCMPL	-	-
MODEL CODE	Model code information	-	Identifying model code: GSA3#
ENGINE TYPE	Engine type information	-	Identifying engine type: 2GRFE
CYLINDER NUMBER	Cylinder number: Min.: 0, Max.: 255	-	Identifying cylinder number: 6
TRANSMISSION	Transmission type information	-	Identifying transmission type: 5AT
DESTINATION	Destination information	-	Identifying destination: A (America)
MODEL YEAR	Model year: Min.: 1900, Max.: 2155	-	Identifying model year: 200#
SYSTEM	Engine system information	-	Identifying engine system: GASLIN (gasoline engine)

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HINT:

*: If no idling conditions are specified, the transmission gear selector lever should be in the N or P position, and the A/C switch and all accessory switches should be OFF.

2. ACTIVE TEST

HINT:

Performing the ACTIVE TEST enables components including the relays, VSV (Vacuum Switching Valve) and actuators, to be operated without removing any parts. The ACTIVE TEST can be performed with the intelligent tester. Performing the ACTIVE TEST as the first step of troubleshooting is one method of shortening diagnostic 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 tester ON.
- (d) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST.
- (e) Perform the ACTIVE TEST by referring to the table below.

ECM:

Tester Display	Test Part	Control Range	Diagnostic Note
INJ VOL	Change injection volume	-12.5 to 24.8%	<ul style="list-style-type: none"> • All injectors tested at same time • Perform test at less than 3,000 rpm • Injection volume can be changed in 0.2% graduations within control range

Tester Display	Test Part	Control Range	Diagnostic Note
A/F CONTROL	Change injection volume	Decrease by 12.5% or increase by 24.8%	<ul style="list-style-type: none"> Perform test at less than 3,000 rpm A/F CONTROL enables checking and graphing of A/F (Air-Fuel Ratio) sensor and Heated Oxygen (HO2) sensor voltage outputs To conduct test, select following menu items: ACTIVE TEST / A/F CONTROL / USER DATA / AFS B1S1 and O2S B1S2; then press YES and ENTER followed by F4.
FUEL PMP SP CTL	Fuel pump speed control	ON (low speed) / OFF (high speed)	Test possible when following conditions met: <ul style="list-style-type: none"> Ignition switch ON Engine is stopped
INTAKE CTL VSV1	Activate the VSV for Acoustic Control Induction System (ACIS)	ON/OFF	-
EVAP VSV (ALONE)	Activate purge VSV control	ON/OFF	-
VVT CTRL B1	Turn on and off OCV (Oil Control Valve) for VVT (Bank 1)	ON/OFF	<ul style="list-style-type: none"> Engine stalls or idles roughly when OCV turned ON Normal engine running or idling when OCV OFF Test possible while vehicle stopped and engine idling
VVT CTRL B2	Turn on and off OCV (Oil Control Valve) for VVT (Bank 2)	ON/OFF	<ul style="list-style-type: none"> Engine stalls or idles roughly when OCV turned ON Normal engine running or idling when OCV OFF Test possible while vehicle stopped and engine idling
FUEL PUMP / SPD	Activate fuel pump (C/OPN Relay)	ON/OFF	Test possible when engine stopped
TC/TE1	Turn on and off TC and TE1 connection	ON/OFF	<ul style="list-style-type: none"> ON: TC and TE1 connected OFF: TC and TE1 disconnected
FC IDL PROHBT	Prohibit idling fuel cut control	ON/OFF	-
COOLING FAN	Control electric cooling fan	ON/OFF	-
ETCS OPEN SLOW	Control the ETCS (throttle actuator)	ON: Throttle valve opens slowly	Test possible when following conditions met: <ul style="list-style-type: none"> Engine stopped Shift position in P Fully depressing accelerator pedal (APP: 59° or more)
ETCS CLOSE SLOW	Control the ETCS (throttle actuator)	ON: Throttle valve closes slowly	
ETCS OPEN FAST	Control the ETCS (throttle actuator)	ON: Throttle valve opens fast	
ETCS CLOSE FAST	Control the ETCS (throttle actuator)	ON: Throttle valve closes fast	
VVT B1	Control the VVT (bank 1 Intake Side)	-128 to 127% This valve added to present OCV control duty 100%: Maximum advance -100% : Maximum retard	-
VVT B2	Control the VVT (bank 2 Intake Side)	-128 to 127% This valve added to present OCV control duty 100%: Maximum advance -100% : Maximum retard	-
VVT EX B1	Control the VVT (bank 1 Exhaust Side)	-128 to 127% This valve added to present OCV control duty 100%: Maximum retard -100%: Maximum advance	-

Tester Display	Test Part	Control Range	Diagnostic Note
VVT EX B2	Control the VVT (bank 2 Exhaust Side)	-128 to 127% This valve added to present OCV control duty 100%: Maximum retard -100%: Maximum advance	-
VACUUM PUMP	Activate the leak detection pump	ON/OFF	-
VENT VALVE	Activate the vent valve	ON/OFF	-
AICV VSV	Activate the VSV for Air Intake Control System (AICS)	ON/OFF	-
ALT VOL	Request output voltage of generator regulator during forced activation	12.5 to 14.8 V	Engine running
FUEL CUT #1	Cylinder #1 injector fuel cut	ON/OFF	Test possible during vehicle stopping and engine idling ON: Injector fuel cut and ignition stop
FUEL CUT #2	Cylinder #2 injector fuel cut	ON/OFF	
FUEL CUT #3	Cylinder #3 injector fuel cut	ON/OFF	
FUEL CUT #4	Cylinder #4 injector fuel cut	ON/OFF	
FUEL CUT #5	Cylinder #5 injector fuel cut	ON/OFF	
FUEL CUT #6	Cylinder #6 injector fuel cut	ON/OFF	

3. SYSTEM CHECK

HINT:

Performing a SYSTEM CHECK enables the system, which consists of multiple actuators, to be operated without removing any parts. In addition, it can show whether or not any DTCs are set, and can detect potential malfunctions in the system. The SYSTEM CHECK can be performed with the intelligent tester.

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch ON.
- (c) Turn the tester ON.
- (d) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / SYSTEM CHECK.
- (e) Perform the SYSTEM CHECK by referring to the table below.

ECM:

Tester Display	Test Part	Control Range	Diagnostic Note
EVAP SYS CHECK (AUTO OPERATION)	Perform 5 steps in order to operate EVAP key-off monitor automatically	-	<ul style="list-style-type: none"> • If no DTCs in PENDING CODE after performing this test, system functioning normally • 35°C (95°F) or less • Refer to EVAP system
EVAP SYS CHECK (MANUAL OPERATION)	Perform 5 steps in order to operate EVAP key-off monitor manually	-	<ul style="list-style-type: none"> • Used to detect malfunctioning parts • 35°C (95°F) or less • Refer to EVAP system