1GR-FE ENGINE CONTROL SFI SYSTEM DATA LIST / ACTIVE TEST

DATA LIST

HINT:

Using the GTS to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save 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 deciding whether a part is faulty or not.

a. Warm up the engine.

b. Turn the ignition switch off.

c. Connect the GTS to the DLC3.

d. Turn the ignition switch to ON.

e. Turn the GTS on.

f. Enter the following menus: Powertrain / Engine and ECT / Data List / All Data.

g. Check the values by referring to the table below.

Various Vehicle Conditions 1 (All Data)

Powertrain > Engine and ECT

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Vehicle Speed	Vehicle speed	Min.: 0 km/h, Max.: 255 km/h	Actual vehicle speed	The speed indicated on the speedometer.
Engine Speed	Engine speed	Min.: 0 rpm, Max.: 16383 rpm	650 to 750 rpm: Idling	-
Calculate Load	Load calculated by ECM	Min.: 0%, Max.: 100%	· 11.4 to 16.4%: Idling · 13.1 to 18.9%: Running without load (2000 rpm)	-
Vehicle Load	Vehicle load	Min.: 0%, Max.: 25700%	Actual vehicle load	The load percentage in terms of the maximum intake airflow amount.
MAF	Airflow rate from MAF meter	Min.: 0 gm/sec., Max.: 655.35 gm/sec.	· 3.2 to 4.7 gm/sec.: Idling · 13.1 to 18.9 gm/sec.: 2000 rpm	If the value is approximately 0.0 gm/sec.: · The mass air flow meter power source circuit is open or shorted. · The VG circuit is open or shorted. If the value is 160.0 gm/sec. or more: · The E2G circuit is open.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Atmosphere Pressure	Atmospheric pressure	Min.: 0 kPa, Max.: 255 kPa	Equivalent to atmospheric pressure (absolute pressure)	· Standard atmospheric pressure: 101 kPa(abs) [758 mmHg(abs)] · For every 100 m (328 ft) increase in altitude, pressure drops by 1 kPa (7.5 mmHg). This varies by weather.
Coolant Temp	Engine coolant temperature	Min.: -40°C, Max.: 140°C	80 to 100°C (176 to 212°F): After warming up	· If the value is -40°C (-40°F), the sensor circuit is open. · If the value is 140°C (284°F) or higher, the sensor circuit is shorted.
Intake Air	Intake air temperature	Min.: -40°C, Max.: 140°C	Equivalent to ambient air temperature	· If the value is -40°C (-40°F), the sensor circuit is open. · If the value is 140°C (284°F) or higher, the sensor circuit is shorted.
Engine Run Time	Engine run time	Min.: 0 s, Max.: 65535 s	Time after engine start	This is the time elapsed since the engine started. **HINT:** The time is counted only while the engine is running.
Initial Engine Coolant Temp	Initial engine coolant temperature	Min.: -40°C, Max.: 120°C	Coolant temperature when engine started	This is the coolant temperature stored when the ignition switch is turned to on.
Initial Intake Air Temp	Initial intake air temperature	Min.: -40°C, Max.: 120°C	Intake air temperature when engine started	This is the intake air temperature stored when the ignition switch is turned to on.
Battery Voltage	Battery voltage	Min.: 0, Max.: 65.5 V	11 to 14 V: Idling	If 11 V or less, characteristics of some electrical components may change.

HINT:

· Normal Condition: If no idling conditions are specified, the shift lever should be in neutral, and the A/C switch and all accessory switches should be off.

Throttle Control 1 (Ptrl Throttle)

Powertrain > Engine and ECT > Data List

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Accel Sens. No.1 Volt %	Accelerator Pedal Position (APP) No. 1	Min.: 0%, Max.: 100%	· 10 to 22%: Accelerator pedal released · 52 to 90%: Accelerator pedal fully depressed	The accelerator pedal position sensor NO.1 output is converted using 5 V = 100%. **HINT:** If there are no accelerator pedal position sensor DTCs stored, it is possible to conclude that the accelerator pedal position sensor system is normal.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Accel Sens. No.2 Volt %	Accelerator Pedal Position (APP) No. 2	Min.: 0%, Max.: 100%	· 24 to 40%: Accelerator pedal released · 68 to 95%: Accelerator pedal fully depressed	The accelerator pedal position sensor NO.2 output is converted using 5 V = 100%.

HINT:

- Normal Condition: If no idling conditions are specified, the shift lever should be in neutral, and the A/C switch and all accessory switches should be off.

Throttle Control 2 (All Data)

Powertrain > Engine and ECT > Data List

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Accel Sensor Out No.1	APP sensor No. 1 voltage	Min.: 0 V, Max.: 4.9 V	· 0.5 to 1.1 V: Accelerator pedal released · 2.6 to 4.5 V: Accelerator pedal fully depressed	This is the raw voltage from the accelerator pedal position sensor NO.1.
Accel Sensor Out No.2	APP sensor No. 2 voltage	Min.: 0 V, Max.: 4.9 V	· 1.2 to 2.0 V: Accelerator pedal released · 3.4 to 4.75 V: Accelerator pedal fully depressed	This is the raw voltage from the accelerator pedal position sensor NO.2. Accelerator pedal position sensor No. 2 is used to monitor accelerator pedal position sensor No. 1. When there is a malfunction in sensor No. 1, the ECM uses sensor No. 2 to control the engine.

HINT:

- Normal Condition: If no idling conditions are specified, the shift lever should be in neutral, and the A/C switch and all accessory switches should be off.

Throttle Control 3 (Ptrl Throttle)

Powertrain > Engine and ECT > Data List

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Accelerator Idle Position	Whether or not accelerator pedal position sensor detecting idle	ON or OFF	ON: Idling	This is a parameter calculated by the ECM which indicates whether the accelerator pedal is in the learned idle position.
Accel Fully Close #1 (AD)	Accelerator fully closed value No. 1 (AD)	Min.: 0 V, Max.: 4.9 V	-	The ETCS service data.
Accel Fully Close Learn #1	Accelerator fully closed learning value No. 1	Min.: 0 deg, Max.: 124.5 deg	-	This is the value of accelerator pedal position sensor No. 1 learned when the accelerator pedal is released.
Accel Fully Close Learn #2	Accelerator fully closed learning value No. 2	Min.: 0 deg, Max.: 124.5 deg	-	This is the value of accelerator pedal position sensor No. 2 learned when the accelerator pedal is released.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Throttle Sensor Volt %	Throttle valve opening percentage according to throttle position sensor	Min.: 0%, Max.: 100%	· 10 to 22%: Accelerator pedal released · 64 to 96%: Accelerator pedal fully depressed	The throttle position sensor No. 1 output is converted using 5 V = 100%. **HINT:** If there are no throttle position sensor DTCs stored, it is possible to conclude that the throttle position sensor system is normal.
Throttl Sensor #2 Volt %	Throttle valve opening percentage according to throttle position sensor No. 2	Min.: 0%, Max.: 100%	· 42 to 62%: Accelerator pedal released · 92 to 100%: Accelerator pedal fully depressed	The throttle position sensor No. 2 output is converted using 5 V = 100%.
ST1	Brake pedal signal	ON or OFF	ON: Brake pedal released	This is the stop light switch assembly signal (ST1- terminal).
System Guard	System guard	ON or OFF	-	· When there is a difference between the target and actual throttle valve opening angles, system guard turns off and stops the electronic throttle control system function. · OFF: Electronic throttle control is stopped.
Open Side Malfunction	Open side malfunction	ON or OFF	-	This parameter indicates a malfunction in the electronic throttle when the throttle valve is open.
Throttle Idle Position	Whether or not throttle position sensor detecting idling	ON or OFF	· ON: Accelerator pedal released · OFF: Accelerator pedal fully depressed	· This is a parameter calculated by the ECM. · The value is ON when the throttle is at the idle position and OFF when the throttle is open.
Throttle Require Position	Throttle requirement position	Min.: 0 V, Max.: 4.9 V	0.5 to 1.1 V: Idling	This is a value calculated by the ECM showing the voltage for the target throttle valve position. It is almost an exact match of the Throttle Position No.1 value except during very rapid throttle valve movement, such as that used during wheelspin control.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Throttle Sensor Position	Throttle position sensor	Min.: 0%, Max.: 100%	· 0%: Accelerator pedal released · 50 to 80%: Accelerator pedal fully depressed	· This is the throttle valve opening amount used for engine control. (100% signifies 125° of throttle valve rotation. This does not include the amount the throttle valve is opened to maintain the idle speed during idling.) · This value has no meaning when the ignition switch ON and the engine is stopped. · The throttle valve opening amount during idling is indicated by 0%. When the throttle valve is fully open, the value is 68%.
Throttle Position No.1	Throttle position sensor No. 1 output voltage	Min.: 0 V, Max.: 4.9 V	· 0.5 to 1.1 V: Accelerator pedal released · 3.2 to 4.8 V: Accelerator pedal fully depressed · 0.6 to 1.4 V: Fail-safe operating	This is the throttle position sensor No. 1 output voltage.
Throttle Position No.2	Throttle position sensor No. 2 output voltage	Min.: 0 V, Max.: 4.9 V	· 2.1 to 3.1 V: Accelerator pedal released · 4.6 to 5.0 V: Accelerator pedal fully depressed · 2.1 to 3.1 V: Fail-safe operating	This is the throttle position sensor No. 2 output voltage.
Throttle Position Command	Throttle position command value	Min.: 0 V, Max.: 4.9 V	0.5 to 4.8 V	Throttle Position Command is the same value as Throttle Require Position.
Throttle Sens Open Pos #1	Throttle sensor opener position No. 1	Min.: 0 V, Max.: 4.9 V	0.6 to 1.4 V	This is the throttle position sensor No. 1 output voltage when there is no current supplied to the electronic throttle actuator. The accelerator pedal is released but the throttle valve is kept open by the throttle valve opener with the ignition switch ON.
Throttle Sens Open Pos #2	Throttle sensor opener position No. 2	Min.: 0 V, Max.: 4.9 V	1.7 to 2.5 V	This is the throttle position sensor NO.2 output voltage when there is no current supplied to the electronic throttle actuator. The accelerator pedal is released but the throttle valve is kept open by the throttle valve opener with the ignition switch ON.
Throttle Sens Open #1(AD)	Throttle position sensor No. 1 output voltage (AD)	Min.: 0 V, Max.: 4.9 V	0.5 to 4.8 V	-
Throttle Motor	Whether or not throttle actuator control permitted	ON or OFF	ON: Ignition switch ON OFF: ETCS has failed	Read the value with the ignition switch ON (Do not start engine)

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Throttle Motor Current	Throttle actuator current	Min.: 0 A, Max.: 19.9 A	0 to 3.0 A: Idling	· When this value is large but the actual opening angle (Throttle Position No.1) does not reach the target opening angle (Throttle Require Position), there is an "unable to open" malfunction. · This value normally fluctuates around 1 A.
Throttle Motor DUTY	Throttle actuator	Min.: 0%, Max.: 100%	10 to 22%: Idling after engine warmed up	This is the output duty ratio of the throttle actuator drive circuit.
Throttle Motor Duty (Open)	Throttle actuator duty ratio (open)	Min.: 0%, Max.: 100%	-	· This is the duty ratio used to drive the throttle actuator and open the throttle valve. It is an ECM command signal. · When the throttle valve is being opened, Throttle Motor Duty (Open) is 10 to 50%.
Throttle Motor Duty (Close)	Throttle actuator duty ratio (close)	Min.: 0%, Max.: 100%	-	This is the duty ratio used to drive the throttle actuator and close the throttle valve. It is an ECM command signal. **HINT:** During idling, the throttle valve opening angle is usually controlled using a duty ratio drive signal which closes the throttle valve. However, when carbon deposits build up, it may be necessary to open the throttle valve more than the throttle valve opener does. In that case, the opening angle is controlled using a "Throttle Motor Duty (Open)" signal which opens the throttle valve.
Throttle Fully Close Learn	Throttle valve fully closed (learned value)	Min.: 0 V, Max.: 4.9 V	0.4 to 1.0 V (Accelerator pedal released)	· The ECM uses this learned value to determine the fully closed (and fully open) position of the throttle valve. This learned value is calculated by the ECM with the throttle valve opener angle (approximately 4 to 7°, the position when the ignition switch ON, the accelerator pedal is released and the throttle actuator is off). · Learning is performed immediately after the ignition switch is turned to ON.
ETCS Actuator Power	ETCS power supply	ON or OFF	ON: Ignition switch ON and system normal OFF: ETCS has failed	-

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
+BM Voltage	+BM voltage	Min.: 0, Max.: 19.9	1 to 14: Ignition switch ON and system normal	This is the power supply for the electronic throttle actuator. When the power supply is interrupted for approximately 1 second, DTCs P2118 (open circuit) and P0657 (short circuit, ECU malfunction) are stored and the electronic throttle control system enters fail-safe mode (normal operation is not restored until the ignition switch is turned OFF).
Actuator Power Supply	Actuator power supply	ON or OFF	ON: Idling	-
Fail Safe Drive	Whether or not fail-safe function executed	ON or OFF	ON: ETCS has failed OFF: ETCS normal	The ETCS service data.
Fail Safe Drive (Main CPU)	Whether or not fail-safe function executed	ON or OFF	ON: ETCS has failed OFF: ETCS normal	The ETCS service data.
Throttle Position	Throttle valve opening angle	Min.: 0 deg, Max.: 499.99 deg	-	This value has no meaning when the ignition switch is on (IG) and the engine is stopped.

HINT:

- Normal Condition: If no idling conditions are specified, the shift lever should be in neutral, and the A/C switch and all accessory switches should be off.

Idle Speed Control (Ptrl Rough Idle)

Powertrain > Engine and ECT

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
ISC Flow	Flow rate calculated using information from mass air flow meter sub-assembly	Min.: 0 L/s, Max.: 79.99 L/s	-	This is the total ISC airflow amount (the amount of intake air necessary to maintain idling). **HINT:** ISC Flow (total ISC airflow amount) = ISC Learning Value + ISC Feedback Value + each compensation amount
ISC Position	Requested throttle opening amount calculated using ISC control	Min.: 0 deg, Max.: 499.99 deg	-	This is the throttle valve opening amount while the engine is idling (the throttle valve opening amount necessary to maintain ISC air flow).
ISC Feedback Value	ISC feedback amount	Min.: -40 L/s, Max.: 39.99 L/s	-	This is the feedback amount necessary to adjust the airflow amount to maintain the target idle speed. **HINT:** When the idle speed differs from the target, the feedback amount is adjusted. If the feedback amount becomes more than a certain value, this will be reflected in the ISC learned airflow value.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
ISC Learning Value	ISC learned airflow value	Min.: -40 L/s, Max.: 39.99 L/s	-	This is the learned value of the airflow amount necessary for engine idling. **HINT:** · If ISC Feedback Value becomes more than a certain value, this will be reflected in ISC Learning Value. · ISC Flow (total ISC airflow amount) = ISC Learning Value + ISC Feedback Value + each compensation amount
Electric Load Feedback Val	Compensation flow rate according to electrical load	Min.: -40 L/s, Max.: 39.99 L/s	-	This is the ISC compensation amount determined according to the electrical load.
Air Conditioner FB Val	Compensation flow rate according to air conditioner load	Min.: -40 L/s, Max.: 39.99 L/s	-	This is the ISC compensation amount determined according to the air conditioner load.
PS Feedback Val	Compensation flow rate according to power steering load	Min.: -40 L/s, Max.: 39.99 L/s	-	This is the ISC compensation amount determined according to the power steering load. Low Revolution Control
N Range Status	Shift lever N status	ON or OFF	-	-

Fuel System (Ptrl General)

Powertrain > Engine and ECT > Data List

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Injector (Port)	Injection period of No. 1 cylinder	Min.: 0 ms, Max.: 32.64 ms	1.6 to 2.4 msec.: Idling	This is the injection period of the No. 1 cylinder (the command value from the ECM).
Injection Volum (Cylinder1)	Injection volume (Cylinder 1)	Min.: 0 ml, Max.: 2.047 ml	0.005 to 0.015 ml: Idling	The quantity of fuel injection volume for 10 times.
Fuel Pump Speed Control	Fuel pump speed control status	ON or OFF	Idling: ON	Active Test support data.
Fuel Pump/Speed Status	Fuel pump/status	ON or OFF	ON: Cranking	Active Test support data.

HINT:

- Normal Condition: If no idling conditions are specified, the shift lever should be in neutral, and the A/C switch and all accessory switches should be off.

EVAP System (Ptrl Evaporative)

Powertrain > Engine and ECT

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
EVAP (Purge) VSV	EVAP (Purge) VSV control duty	Min.: 0%, Max.: 100%	0 to 100%: Idling	· This is the command signal from the ECM. · This is the purge VSV control duty ratio. When EVAP (Purge) VSV is any value except 0%, EVAP purge* is being performed. *: Gasoline vapor from the fuel tank is being introduced into the intake system via the purge VSV. · When the engine is cold or immediately after the engine is started, EVAP (Purge) VSV is 0%.
Evap Purge Flow	Purge flow	Min.: 0%, Max.: 102.3%	0 to 100%: Idling	· This is the percentage of total engine airflow contributed by EVAP purge operation. (Evap Purge Flow = Purge flow / Engine airflow x 100 (%)) · It is based on MAF and a stored value for airflow and controlled by adjusting the duty cycle for the purge VSV.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Purge Density Learn Value	Learning value of purge density	Min.: -50, Max.: 344.99	-35 to 1: Idling	· Purge Density Learn Value is the proportion of the decrease in injection volume (based on the change in the air fuel ratio feedback compensation value) related to a 1% purge flow rate. · When Purge Density Learn Value is a large negative value, the purge effect is large. · The purge density is determined from the change in the air fuel ratio feedback compensation value when purge flow is introduced. · Purge density learning is performed so that the feedback compensation value is 0 +/-2%. **HINT:** · Usually, the value is approximately +/-1%. · 1%: The concentration of HC in the purge gas is relatively low. · 0%: The concentration of HC in the purge gas is approximately equal to the stoichiometric air fuel ratio. · Large negative values indicate that the concentration of HC in the purge gas is relatively high.
EVAP Purge VSV	VSV status for EVAP control	ON or OFF	-	This parameter displays ON when EVAP (Purge) VSV is approximately 30% or higher, and displays OFF when the VSV duty ratio is less than 30%.

HINT:

· Normal Condition: If no idling conditions are specified, the shift lever should be in neutral, and the A/C switch and all accessory switches should be off.

Air Fuel Ratio Control 1 (All Data)

Powertrain > Engine and ECT > Data List

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Target Air-Fuel Ratio	Air fuel ratio	Min.: 0, Max.: 1.998	0.8 to 1.2: Idling	· This is the target air fuel ratio used by the ECM. · 1.0 is the stoichiometric air fuel ratio. Values that are more than 1 indicate the system attempting to make the air fuel ratio leaner. Values that are less than 1 indicate the system attempting to make the air fuel ratio richer. · Target Air-Fuel Ratio and AF Lambda B1S1 are related.

HINT:

- Normal Condition: If no idling conditions are specified, the shift lever should be in neutral, and the A/C switch and all accessory switches should be off.

Air Fuel Ratio Control 2 (Ptrl AF O2 Sensor)

Powertrain > Engine and ECT > Data List

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
AF Lambda B1S1	Short-term fuel trim associated with bank 1 sensor 1	Min.: 0, Max.: 1.99	· Value less than 1 (0.000 to 0.999) = Rich · Stoichiometric air fuel ratio = 1 · Value more than 1 (1.001 to 1.999) = Lean	· This is the actual air fuel ratio calculated based on the air fuel ratio sensor output. · Performing the "Control the Injection Volume" or "Control the Injection Volume for A/F Sensor" function of the Active Test enables the technician to check the voltage output of the sensor.
AF Lambda B2S1	Short-term fuel trim associated with bank 2 sensor 1	Min.: 0, Max.: 1.99	· Value less than 1 (0.000 to 0.999) = Rich · Stoichiometric air fuel ratio = 1 · Value more than 1 (1.001 to 1.999) = Lean	· This is the actual air fuel ratio calculated based on the air fuel ratio sensor output. · Performing the "Control the Injection Volume" or "Control the Injection Volume for A/F Sensor" function of the Active Test enables the technician to check the voltage output of the sensor.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
AFS Voltage B1S1	A/F sensor output voltage bank 1 sensor 1	Min.: 0 V, Max.: 7.99 V	2.8 to 3.8 V: Idling	· This is the voltage output of the air fuel ratio sensor (the voltage cannot be measured at the terminals of the sensor). This value is calculated by the ECM based on the current output of the air fuel ratio sensor (refer to AFS Current below for the actual sensor output). · Performing the Control the Injection Volume or Control the Injection Volume for A/F Sensor function of the Active Test enables the technician to check the output voltage of the sensor.
AFS Voltage B2S1	A/F sensor output voltage bank 2 sensor 1	Min.: 0 V, Max.: 7.99 V	2.8 to 3.8 V: Idling	· This is the voltage output of the air fuel ratio sensor (the voltage cannot be measured at the terminals of the sensor). This value is calculated by the ECM based on the current output of the air fuel ratio sensor (refer to AFS Current below for the actual sensor output). · Performing the Control the Injection Volume or Control the Injection Volume for A/F Sensor function of the Active Test enables the technician to check the output voltage of the sensor.
AFS Current B1S1	A/F sensor output current bank 1 sensor 1	Min.: -128 mA, Max.: 127.99 mA	-0.5 to 0.5 mA: Idling	-
AFS Current B2S1	A/F sensor output current bank 2 sensor 1	Min.: -128 mA, Max.: 127.99 mA	-0.5 to 0.5 mA: Idling	-

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
O2S B1S2	Heated oxygen sensor output voltage bank 1 sensor 2	Min.: 0 V, Max.: 1.27 V	0.1 to 0.9 V: Driving at 70 km/h (44 mph)	· This is the output voltage of the heated oxygen sensor. · Values close to 0 V indicate an air fuel ratio leaner than the stoichiometric ratio. · Values close to 1 V indicate an air fuel ratio richer than the stoichiometric ratio. · During air fuel ratio feedback control, the value moves back and forth in the range of 0 to 1 V. · Performing the "Control the Injection Volume" or "Control the Injection Volume for A/F Sensor" function of the Active Test enables the technician to check voltage output of the sensor.
O2S B2S2	Heated oxygen sensor output voltage bank 2 sensor 2	Min.: 0 V, Max.: 1.27 V	0.1 to 0.9 V: Driving at 70 km/h (44 mph)	· This is the output voltage of the heated oxygen sensor. · Values close to 0 V indicate an air fuel ratio leaner than the stoichiometric ratio. · Values close to 1 V indicate an air fuel ratio richer than the stoichiometric ratio. · During air fuel ratio feedback control, the value moves back and forth in the range of 0 to 1 V. · Performing the "Control the Injection Volume" or "Control the Injection Volume for A/F Sensor" function of the Active Test enables the technician to check voltage output of the sensor.
Short FT #1	Short-term fuel trim of bank 1	Min.: -100%, Max.: 99.2%	-20 to 20%	This item is the "short-term fuel injection volume compensation ratio" used to maintain the air fuel ratio at the stoichiometric ratio using the air fuel ratio sensor for feedback.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Long FT #1	Long-term fuel trim of bank 1	Min.: -100%, Max.: 99.2%	-30 to 30%	· The ECM will learn the Long FT values based on Short FT. The goal is to keep Short FT at 0% to keep the air fuel ratio mixture at the stoichiometric ratio. · This value is used to determine whether the system related to air fuel ratio control is malfunctioning. · The condition of the system is determined based on the sum of Short FT and Long FT (excluding times when the system is in transition). · 30% or higher: There may be a lean air fuel ratio. · -30 to 30%: The air fuel ratio can be determined to be normal. · -30% or less: There may be a rich air fuel ratio.
Short FT #2	Short-term fuel trim of bank 2	Min.: -100%, Max.: 99.2%	-20 to 20%	This item is the "short-term fuel injection volume compensation ratio" used to maintain the air fuel ratio at the stoichiometric ratio using the air fuel ratio sensor for feedback.
Long FT #2	Long-term fuel trim of bank 2	Min.: -100%, Max.: 99.2%	-30 to 30%	· The ECM will learn the Long FT values based on Short FT. The goal is to keep Short FT at 0% to keep the air fuel ratio mixture at the stoichiometric ratio. · This value is used to determine whether the system related to air fuel ratio control is malfunctioning. · The condition of the system is determined based on the sum of Short FT and Long FT (excluding times when the system is in transition). · 30% or higher: There may be a lean air fuel ratio. · -30 to 30%: The air fuel ratio can be determined to be normal. · -30% or less: There may be a rich air fuel ratio.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Fuel System Status #1	Fuel system status (bank 1)	OL or CL or OLDrive or OLFault or CLFault	CL: Idling after warming up	· OL (Open Loop): Has not yet satisfied the conditions to go to closed loop. · CL (Closed Loop): Using the heated oxygen sensor as feedback for fuel control. · OLDrive: Open loop due to driving conditions (fuel enrichment). · OLFault: Open loop due to a detected system fault. · CLFault: Closed loop but the heated oxygen sensor, which is used for fuel control, is malfunctioning.
Fuel System Status #2	Fuel system status (bank 2)	OL or CL or OLDrive or OLFault or CLFault	CL: Idling after warming up	· OL (Open Loop): Has not yet satisfied the conditions to go to closed loop. · CL (Closed Loop): Using the heated oxygen sensor as feedback for fuel control. · OLDrive: Open loop due to driving conditions (fuel enrichment). · OLFault: Open loop due to a detected system fault. · CLFault: Closed loop but the heated oxygen sensor, which is used for fuel control, is malfunctioning.

HINT:

- Normal Condition: If no idling conditions are specified, the shift lever should be in neutral, and the A/C switch and all accessory switches should be off.

Ignition System (Ignition)

Powertrain > Engine and ECT

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
IGN Advance	Ignition timing advance for No. 1 cylinder	Min.: -64 deg, Max.: 63.5 deg	BTDC 7 to 24 deg: Idling	-

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Knock Feedback Value	Feedback value of knocking	Min: -64 deg(CA), Max.: 1983.9 deg(CA)	-22 to 0 deg(CA): Driving at 70 km/h (44 mph)	This is the ignition timing retard compensation amount determined by the presence or absence of knocking. Ignition timing = Most retarded timing value*1 + Knock Correct Learn Value*2 + Knock Feedback Value*3 + each compensation amount Example: 21 deg(CA) = 10 deg(CA) + 14 deg(CA) - 3 deg(CA) *1: The most retarded timing value is a constant determined by the engine speed and engine load. *2: The knock correction learned value is calculated as shown below in order to keep Knock Feedback Value as close to -3 deg(CA) as possible. When Knock Feedback Value is less than -4 deg(CA), Knock Correct Learn Value is slowly decreased. When Knock Feedback Value is higher than -2 deg(CA), Knock Correct Learn Value is slowly increased. *3: The base value is -3 deg(CA) and is adjusted based on the presence or absence of knocking. When there is no knocking, the value is increased, and when knocking is present, the value is decreased. -1 deg(CA): There is no knocking and ignition timing is advanced. -6 deg(CA): Knocking is present and the ignition timing is being retarded. **HINT:** If Knock Feedback Value does not change around the time when knocking occurs even though knocking continues (for example, stays at -3 deg(CA)), it can be determined that knocking is not being detected. **Possible Causes:** · There is a problem with the knock control sensor sensitivity. · The knock control sensor is improperly installed. · There is a problem with a wire harness.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note

Knock Correct Learn Value	Correction learning value of knocking	Min: -64 deg(CA), Max.: 1983.9 deg(CA)	0 to 22 deg(CA): Driving at 70 km/h (44 mph)	· Refer to "Knock Feedback Value".
				· When there is knocking or a lack of power, compare the following values to another vehicle of the same model.
				  · Engine Speed
				  · Calculate Load
				  · IGN Advance
				  · Knock Feedback Value
				  · Knock Correct Learn Value
				· Knock Correct Learn Value is large: There is no knocking and the ignition timing is advanced.
				· Knock Correct Learn Value is small: Knocking is present and the ignition timing is being retarded.
				HINT:
				When knocking continues even though Knock Correct Learn Value is less than that of the vehicle being used for comparison (in other words, the ignition timing is being retarded but the knocking is not stopping), there may be a buildup of deposits or other such problems due to deterioration over time (oil entering the cylinders, poor quality fuel, etc.).

HINT:

- Normal Condition: If no idling conditions are specified, the shift lever should be in neutral, and the A/C switch and all accessory switches should be off.

Intake Control (Ptrl Intake Control)

Powertrain > Engine and ECT

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
ACIS VSV	VSV status for ACIS control	ON or OFF	-	Active Test support data.

VVT Control (Ptrl Valve Control)

Powertrain > Engine and ECT > Data List

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
VVT Control Status #1	VVT control (bank 1) status	ON or OFF	-	· ON: The ECM is sending commands to change the timing (even when the timing is advanced, when the timing is being maintained and not being retarded or advanced any further, the value changes to OFF). · OFF: The system is commanding the timing to change to the most retarded timing.
VVT Control Status #2	VVT control (bank 2) status	ON or OFF	-	· ON: The ECM is sending commands to change the timing (even when the timing is advanced, when the timing is being maintained and not being retarded or advanced any further, the value changes to OFF). · OFF: The system is commanding the timing to change to the most retarded timing.
VVT Advance Fail	VVT control failure status	ON or OFF	-	ON: There is an intake VVT timing advance malfunction.
VVT Aim Angle #1	VVT aim angle (bank 1)	Min.: 0%, Max.: 100%	0 to 100%: Idling	· This value represents the duty ratio necessary to operate the camshaft timing oil control valve assembly in order to block the camshaft timing oil control valve assembly path and maintain the advanced or retarded state of the VVT controller. This is only available during the Active Test.
VVT Change Angle #1	VVT change angle (bank 1)	Min.: 0 degFR, Max.: 60 degFR	0 to 56 degFR: Idling	· This is the VVT displacement angle during forced operation. · This is only available during the Active Test. · By checking VVT Change Angle during the Active Test, it is also possible to determine whether or not the VVT sensor signal is being output.
VVT OCV Duty #1	VVT OCV operation duty (bank 1)	Min.: 0%, Max.: 100%	0 to 100%: Idling	· This is the requested duty value for forced operation. · This is only available during the Active Test.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
VVT Aim Angle #2	VVT aim angle (bank 2)	Min.: 0%, Max.: 100%	0 to 100%: Idling	· This value represents the duty ratio necessary to operate the camshaft timing oil control valve assembly in order to block the camshaft timing oil control valve assembly path and maintain the advanced or retarded state of the VVT controller. This is only available during the Active Test.
VVT Change Angle #2	VVT change angle (bank 2)	Min.: 0 degFR, Max.: 60 degFR	0 to 56 degFR: Idling	· This is the VVT displacement angle during forced operation. · This is only available during the Active Test. · By checking VVT Change Angle during the Active Test, it is also possible to determine whether or not the VVT sensor signal is being output.
VVT OCV Duty #2	VVT OCV operation duty (bank 2)	Min.: 0%, Max.: 100%	0 to 100%: Idling	· This is the requested duty value for forced operation. · This is only available during the Active Test.

HINT:

- Normal Condition: If no idling conditions are specified, the shift lever should be in neutral, and the A/C switch and all accessory switches should be off.

Catalyst (Ptrl CAT Converter)

Powertrain > Engine and ECT

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Catalyst Temp B1S1	Catalyst temperature (bank 1 sensor 1)	Min.: -40°C, Max.: 6513.5°C	-	· This is the temperature of the front catalyst estimated by the ECM.
Catalyst Temp B2S1	Catalyst temperature (bank 2 sensor 1)	Min.: -40°C, Max.: 6513.5°C	-	This is the temperature of the rear catalyst estimated by the ECM.
Catalyst Temp B1S2	Catalyst temperature (bank 1 sensor 2)	Min.: -40°C, Max.: 6513.5°C	-	· This is the temperature of the front catalyst estimated by the ECM.
Catalyst Temp B2S2	Catalyst temperature (bank 2 sensor 2)	Min.: -40°C, Max.: 6513.5°C	-	This is the temperature of the rear catalyst estimated by the ECM.

Various Vehicle Conditions 3 (All Data)

Powertrain > Engine and ECT > Data List

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Starter Signal	Starter signal	ON or OFF	ON: Cranking	-
Power Steering Signal	Power steering switch	ON or OFF	ON: Power steering operation	-
Power Steer. Sig. Record	Power steering signal (history)	ON or OFF	ON: When steering wheel first turned after battery terminals connected	This signal status is usually on until the cables are disconnected from the battery terminals.
Stop Light Switch	Stop light switch status	ON or OFF	ON: Brake pedal depressed	-
A/C Signal	A/C switch status	ON or OFF	ON: A/C ON	-
Closed Throttle Position SW	Closed throttle position switch	ON or OFF	· ON: Throttle valve fully closed · OFF: Throttle valve open	-
Fuel Cut Condition	Fuel cut condition	ON or OFF	ON: Fuel cut operating	-
Immobiliser Communication	Immobiliser communication	ON or OFF	ON: Normal	-
Electrical Load Signal	Electrical load signal	ON or OFF	-	-

HINT:

- Normal Condition: If no idling conditions are specified, the shift lever should be in neutral, and the A/C switch and all accessory switches should be off.

Check Mode (Check Mode)

Powertrain > Engine and ECT > Data List

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Check Mode	Check mode	ON or OFF	ON: Check mode on	*1
SPD Test Result	Check mode result for vehicle speed sensor	Compl or Incmpl	-	-
OXS1 Test Result	Check mode result for HO2 sensor (bank 1)	Compl or Incmpl	-	-
OXS2 Test Result	Check mode result for HO2 sensor (bank 2)	Compl or Incmpl	-	-
A/F Test Results #2	Check mode result for air fuel ratio sensor (bank 2):	Compl or Incmpl	-	-
A/F Test Results #1	Check mode result for air fuel ratio sensor (bank 1):	Compl or Incmpl	-	-

*1:Click hereEngine / Hybrid System>1GR-FE ENGINE CONTROL>SFI SYSTEM>CHECK MODE PROCEDURE

HINT:

- Normal Condition: If no idling conditions are specified, the shift lever should be in neutral, and the A/C switch and all accessory switches should be off.

Test Result (Monitor Status)

Powertrain > Engine and ECT > Data List

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Complete Parts Monitor	Comprehensive component monitor:	Not Avl or Avail	-	-
Fuel System Monitor	Fuel system monitor:	Not Avl or Avail	-	-
Misfire Monitor	Misfire monitor:	Not Avl or Avail	-	-
EGR/VVT Monitor	EGR/VVT monitor:	Not Avl or Avail	-	-
EGR/VVT Monitor	EGR/VVT monitor:	Compl or Incmpl	-	-
O2S(A/FS) Heater Monitor	O2S (A/FS) heater monitor	Not Avl or Avail	-	-
O2S(A/FS) Heater Monitor	O2S (A/FS) heater monitor	Compl or Incmpl	-	-
O2S(A/FS) Monitor	O2S (A/FS) monitor	Not Avl or Avail	-	-
O2S(A/FS) Monitor	O2S (A/FS) monitor	Compl or Incmpl	-	-
A/C Monitor	A/C monitor	Not Avl or Avail	-	-
A/C Monitor	A/C monitor	Compl or Incmpl	-	-
2nd Air Monitor	2nd Air monitor	Not Avl or Avail	-	-
2nd Air Monitor	2nd Air monitor	Compl or Incmpl	-	-
EVAP Monitor	EVAP monitor	Not Avl or Avail	-	-
EVAP Monitor	EVAP monitor	Compl or Incmpl	-	-
Heated Catalyst Monitor	Heated catalyst monitor	Not Avl or Avail	-	-
Heated Catalyst Monitor	Heated catalyst monitor	Compl or Incmpl	-	-
Catalyst Monitor	Catalyst monitor	Not Avl or Avail	-	-
Catalyst Monitor	Catalyst monitor	Compl or Incmpl	-	-

Various Vehicle Conditions 4 (All Data)

Powertrain > Engine and ECT > Data List

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
# Codes(Include History)	Number of emission related DTCs	-	0: No emission related DTC stored	This is the number of DTCs stored.
MIL	MIL status	ON or OFF	ON: MIL on	-
MIL ON Run Distance	MIL on run distance	Min.: 0 km, Max.: 65535 km	Distance after DTC stored	This is the distance driven after a DTC is stored.
Running Time from MIL ON	Running time from MIL on	Min.: 0 min, Max.: 65535 min	Equivalent to running time after MIL on	-
Time after DTC Cleared	Time after DTC cleared	Min.: 0 min, Max.: 65535 min	Equivalent to time after DTCs cleared	This is the time elapsed after DTCs were cleared (or after the vehicle left the factory). Time elapsed after the ignition switch is turned off is not counted.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Distance from DTC Cleared	Distance after DTC cleared	Min.: 0 km, Max.: 65535 km	Equivalent to drive distance after DTCs cleared	This is the distance driven after DTCs were cleared (or after the vehicle left the factory).
Warmup Cycle Cleared DTC	Warm-up cycle after DTC cleared	Min.: 0, Max.: 255	-	· This is the number of warmup cycles after the DTCs were cleared. · This is the number of times the engine was warmed up* after DTCs were cleared (or after the vehicle left the factory). *: An engine warmup is defined as the engine coolant temperature rising 20°C (36°F) or higher and reaching a temperature of 70°C (158°F) or higher after the engine is started.
OBD Requirements	OBD requirement	-	E-OBD	-
Number of Emission DTC	Emission related DTCs	-	-	The number of emission related DTCs.
TC and TE1	TC and CG (TE1) terminals of DLC3	ON or OFF	-	Active Test support data.

HINT:

· Normal Condition: If no idling conditions are specified, the shift lever should be in neutral, and the A/C switch and all accessory switches should be off.

Various Vehicle Conditions 5 (All Data)

Powertrain > Engine and ECT > Data List

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Previous Trip Coolant Temp	Engine coolant temperature during previous trip	Min.: -40°C (-40°F), Max.: 215°C (419°F)	-	Before 120 seconds elapse after starting the engine, this parameter indicates the engine coolant temperature at the end of the previous trip. After 120 seconds elapse after starting the engine, this parameter indicates the engine coolant temperature during the current trip.
Previous Trip Intake Temp	Intake air temperature during previous trip	Min.: -40°C (-40°F), Max.: 215°C (419°F)	-	Before 120 seconds elapse after starting the engine, this parameter indicates the intake air temperature at the end of the previous trip. After 120 seconds elapse after starting the engine, this parameter indicates the intake air temperature during the current trip.
Fuel Cut Elps Time	Time elapsed after engine runs athigh speed	Min.: 0 sec, Max.: 68746 sec	-	The time elapsed after a fuel cutafter high engine speed hasoccurred (more than the enginespeed at which fuel cut occurs +500 rpm).
ACT VSV	A/C cut status for Active Test:	ON or OFF	-	Active Test support data.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Idle Fuel Cut	Fuel cut idle	ON or OFF	ON: Fuel cut operating	Idle Fuel Cut is "ON" when the throttle valve is fully closed and the engine speed is more than 2800 rpm.
FC TAU	Fuel cut TAU (Fuel cut during very light load):	ON or OFF	ON: Fuel cut operating	Fuel cut is being performed under a very light load to prevent the engine combustion from becoming incomplete.
Immobiliser Fuel Cut	Status of immobiliser fuel cut	ON or OFF	-	-

Various Vehicle Conditions 6 (Vehicle Information)

Powertrain > Engine and ECT > Data List

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Model Code	Model code	-	-	The identifying model code: GRJ7#
Engine Type	Engine type	-	-	The identifying engine type: 1GRFE
Cylinder Number	Cylinder number	Min.: 0, Max.: 255	-	The identifying cylinder number: 6
Transmission Type	Transmission type	-	-	The identifying transmission type: M/T
Destination	Destination	-	-	Destination W
Model Year	Model year	Min.: 1900, Max.: 2155	-	The identifying model year: 20##

Compression (Compression)

Powertrain > Engine and ECT > Data List

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Engine Speed of Cyl #1	Engine speed for cylinder 1	Min.: 0 rpm, Max.: 51199 rpm	-	· This is output only when Check the Cylinder Compression is performed using the Active Test. · This is the engine speed for each cylinder measured during the fuel-cut with the engine cranking. · When there is compression loss, the engine speed for that cylinder increases. **HINT:** When multiple cylinders have compression loss, the engine speeds for multiple cylinders increase and it is not possible to determine which cylinders have compression loss. At this time, it is necessary to actually perform a compression measurement.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Engine Speed of Cyl #2	Engine speed for cylinder 2	Min.: 0 rpm, Max.: 51199 rpm	-	· This is output only when Check the Cylinder Compression is performed using the Active Test. · This is the engine speed for each cylinder measured during the fuel-cut with the engine cranking. · When there is compression loss, the engine speed for that cylinder increases. **HINT:** When multiple cylinders have compression loss, the engine speeds for multiple cylinders increase and it is not possible to determine which cylinders have compression loss. At this time, it is necessary to actually perform a compression measurement.
Engine Speed of Cyl #3	Engine speed for cylinder 3	Min.: 0 rpm, Max.: 51199 rpm	-	· This is output only when Check the Cylinder Compression is performed using the Active Test. · This is the engine speed for each cylinder measured during the fuel-cut with the engine cranking. · When there is compression loss, the engine speed for that cylinder increases. **HINT:** When multiple cylinders have compression loss, the engine speeds for multiple cylinders increase and it is not possible to determine which cylinders have compression loss. At this time, it is necessary to actually perform a compression measurement.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Engine Speed of Cyl #4	Engine speed for cylinder 4	Min.: 0 rpm, Max.: 51199 rpm	-	· This is output only when Check the Cylinder Compression is performed using the Active Test. · This is the engine speed for each cylinder measured during the fuel-cut with the engine cranking. · When there is compression loss, the engine speed for that cylinder increases. **HINT:** When multiple cylinders have compression loss, the engine speeds for multiple cylinders increase and it is not possible to determine which cylinders have compression loss. At this time, it is necessary to actually perform a compression measurement.
Engine Speed of Cyl #5	Engine speed for cylinder 5	Min.: 0 rpm, Max.: 51199 rpm	-	· This is output only when Check the Cylinder Compression is performed using the Active Test. · This is the engine speed for each cylinder measured during the fuel-cut with the engine cranking. · When there is compression loss, the engine speed for that cylinder increases. **HINT:** When multiple cylinders have compression loss, the engine speeds for multiple cylinders increase and it is not possible to determine which cylinders have compression loss. At this time, it is necessary to actually perform a compression measurement.

Tester Display	Measurement Item	Range	Normal Condition	Diagnostic Note
Engine Speed of Cyl #6	Engine speed for cylinder 6	Min.: 0 rpm, Max.: 51199 rpm	-	· This is output only when Check the Cylinder Compression is performed using the Active Test. · This is the engine speed for each cylinder measured during the fuel-cut with the engine cranking. · When there is compression loss, the engine speed for that cylinder increases. **HINT:** When multiple cylinders have compression loss, the engine speeds for multiple cylinders increase and it is not possible to determine which cylinders have compression loss. At this time, it is necessary to actually perform a compression measurement.
Av Engine Speed of All Cyl	Engine speed for all cylinders	Min.: 0 rpm, Max.: 51199 rpm	-	This is output only when Check the Cylinder Compression is performed using the Active Test.

ACTIVE TEST

HINT:

Using the GTS to perform the Active Tests allows relays, VSVs and actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Tests early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Tests.

a. Connect the GTS to the DLC3.

b. Turn the ignition switch to ON.

c. Turn the GTS on.

d. Enter the following menus: Powertrain / Engine and ECT / Active Test.

e. According to the display on the GTS, perform the "Active Test".

Powertrain > Engine and ECT > Active Test

Tester Display	Measurement Item	Control Range	Diagnostic Note

Tester Display	Measurement Item	Control Range	Diagnostic Note
Control the Injection Volume	Change injection volume	-12.5 to 24.8%	· All fuel injector assemblies are tested at the same time. · Perform the test at 3000 rpm or less. · Injection volume can be changed in fine gradations within the control range. · Control the Injection Volume enables the checking and graphing of the air fuel ratio sensor and heated oxygen sensor voltage outputs. · To conduct the test, enter the following menus: Powertrain / Engine and ECT / Active Test / Control the Injection Volume / All Data / AFS Voltage B1S1 and O2S B1S2.
Control the Injection Volume for A/F Sensor	Change injection volume	-12.5%/0%/12.5%	· All fuel injector assemblies are tested at the same time. · Perform the test at 3000 rpm or less. · Control the Injection Volume for A/F Sensor enables the checking and graphing of the air fuel ratio sensor and heated oxygen sensor voltage outputs. · To conduct the test, enter the following menus: Powertrain / Engine and ECT / Active Test / Control the Injection Volume for A/F Sensor / All Data / AFS Voltage B1S1 and O2S B1S2.
Activate the Fuel Pump Speed Control	Fuel pump speed control	ON (low speed) /OFF (high speed)	-
Activate the VSV for Intake Control	Activate VSV for intake control	ON/OFF	-
Activate the VSV for Evap Control	Activate purge VSV control	ON/OFF	-
Control the A/C Cut Signal	Control the A/C cut signal	ON/OFF	-

Tester Display	Measurement Item	Control Range	Diagnostic Note
Control the Fuel Pump / Speed	Activate fuel pump (C/OPN Relay)	ON/OFF	The test is possible when the following conditions are met: · The ignition switch is ON. · The engine is stopped.
Connect the TC and TE1	Turn on and off TC and CG (TE1) connection	ON/OFF	· ON: TC and CG (TE1) are connected. · OFF: TC and CG (TE1) are disconnected. · Perform this test when the following conditions are met: · ignition switch is ON. · Engine is stopped. · Shift lever in neutral.
Control the Idle Fuel Cut Prohibit	Prohibit idling fuel cut control	ON/OFF	Perform this test when the following conditions are met: · ignition switch is on. · Engine is stopped. · Shift lever in neutral.
Prohibit the Catalyst OT Misfire prevent F/C	Prohibit catalyst overheatmalfunction prevention fuel cutoperation during misfire	ON: Fuel cut prohibited	Confirm that the vehicle isstopped and the engine speed is3000 rpm or less.
Control the ETCS Open/Close Slow Speed	Throttle actuator	Close/Open	The test is possible when the following conditions are met: · The ignition switch is ON. · The engine is stopped. · The accelerator pedal is fully depressed (APP: 58 degrees or more).
Control the ETCS Open/Close Fast Speed	Throttle actuator	Close/Open	The test is possible when the following conditions are met: · The ignition switch is ON. · The engine is stopped. · The accelerator pedal is fully depressed (APP: 58 degrees or more).

Tester Display	Measurement Item	Control Range	Diagnostic Note
Control the VVT Linear (Bank1)	Control VVT (bank 1)	Between -128 and 127%	· Engine stalls or idles roughly when the camshaft timing oil control valve assembly is operated by 100%. · Perform this test when the following conditions are met: · Engine is idling. · Shift lever in neutral. · DTCs related to the VVT system may be stored due to Active Test operation, but this does not indicate a malfunction.
Control the VVT System (Bank1)	Turn on and off OCV (Oil Control Valve)	ON/OFF	· Engine stalls or idles roughly when the camshaft timing oil control valve assembly is turned on. · Engine runs and idles normally when the camshaft timing oil control valve assembly is off. · Perform this test when the following conditions are met: · Engine is idling. · Shift lever in neutral. · DTCs related to the VVT system may be stored due to Active Test operation, but this does not indicate a malfunction.
Control the VVT Linear (Bank2)	Control VVT (bank 2)	Between -128 and 127%	· The engine stalls or idles roughly when the VVT actuator is operated by 100%. · The test is possible during idle.
Control the VVT System (Bank2)	Turn on and off OCV (Oil Control Valve)	ON/OFF	· The engine stalls or idles roughly when the OCV is turned on. · The engine runs or idles normally when the OCV is off.
Control the Select Cylinder Fuel Cut	Selected cylinder (cylinder #1 to#6) injector fuel cut	#1/#2/#3/#4/#5/#6ON/OFF	Test is possible while the vehicleis stopped and the engine isidling.*1

Tester Display	Measurement Item	Control Range	Diagnostic Note
Control the All Cylinders Fuel Cut	All cylinder fuel cut	ON/OFF	Perform this test when the following conditions are met: · Vehicle is stopped. · Engine is idling. · Shift lever in neutral.
Check the Cylinder Compression	Check the cylinder compression pressure	ON/OFF	The fuel injection and ignition stop in all the cylinders.

NOTICE:

*1:

- If the display of the Data List item Catalyst OTMF F/C item is Not Avl, perform this ActiveTest with the vehicle stopped and the engineidling.
- If the display of the Data List item Catalyst OTMF F/C item is Avail, perform this Active Testas described below.

1. Stop the engine, turn the ignition switch toON.
2. Enter the Control the Select Cylinder FuelCut.
3. Select the cylinder for fuel cut (cylinder #1to #6) and turn the Active Test ON (pressthe RIGHT or LEFT button).
4. Start the engine.

HINT:

*: When cranking the engine, the Active Test measures the speed of each cylinder.
In this Active Test, the fuel of all cylinders is cut, and cranking occurs for approximately 10 seconds. At this time, the speed of each cylinder is measured. If the speed of one cylinder is higher than the other cylinders, the compression pressure of that cylinder is determined to be lower than the other cylinders.

1. Warm up the engine.
2. Turn the ignition switch off.
3. Connect the GTS to the DLC3.
4. Turn the ignition switch to ON and turn the GTS on.
5. Enter the following menus: Powertrain / Engine and ECT / Active Test / Check the Cylinder Compression.

   HINT:

   If the results are not displayed normally, select the display items from the Data List before performing the Active Test. Enter the following menus: Powertrain / Engine and ECT / Data List / Compression / Engine Speed of Cyl #1, Engine Speed of Cyl #2, Engine Speed of Cyl #3, Engine Speed of Cyl #4, Engine Speed of Cyl #5, Engine Speed of Cyl #6 and Av Engine Speed of All Cyl.

6. While the engine is not running, press the RIGHT or LEFT button to change the Check the Cylinder Compression to on.

   HINT:

   After performing the above procedure, Check the Cylinder Compression will start. Fuel injection for all cylinders is prohibited, and each cylinder engine speed measurement will enter standby mode.

7. Crank the engine for about 10 seconds.
8. Monitor the engine speed (Engine Speed of Cyl #1 to #6, Av Engine Speed of All Cyl) displayed on the GTS.

   HINT:

   At first, the GTS display will show each cylinder engine speed measurement to be extremely high. After approximately 10 seconds of engine cranking, each cylinder engine speed measurement will change to the actual engine speed.

   NOTICE:

   - After the Check the Cylinder Compression is turned on, it will automatically turn off after 255 seconds.
   - When the Check the Cylinder Compression test is off and the engine is cranked, the engine will start.
   - If the Check the Cylinder Compression test needs to be performed after it is turned on and performed once, press EXIT to return to the Active Test menu screen. Then perform the Check the Cylinder Compression test again.
   - Use a fully-charged battery.