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2015 Lexus RC F Service and Repair Manual

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Last Modified: 10-07-2024	6.11:8.1.0	**Doc ID:** RM100000002HZGR
Model Year Start: 2024	**Model:** GX550	**Prod Date Range:** [12/2023 -]
Title: V35A-FTS (ENGINE CONTROL): SFI SYSTEM (w/ Canister Pump Module): P01052A; Manifold Absolute Pressure / Barometric Pressure Sensor Signal Stuck in Range; 2024 MY GX550 [12/2023 -]		

DTC	**P01052A**	**Manifold Absolute Pressure / Barometric Pressure Sensor Signal Stuck in Range**

DESCRIPTION

Refer to DTC P010511.

Click here INFO

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
P01052A	Manifold Absolute Pressure / Barometric Pressure Sensor Signal Stuck in Range	Intake manifold pressure measured after engine start drops by less than 3 kPa [0.44 psi] compared to the intake manifold pressure (atmospheric pressure) measured before engine start (2 trip detection logic).	• Intake system • No. 2 turbo pressure sensor	Comes on	Engine	B	SAE: P0106

MONITOR DESCRIPTION

When the intake manifold pressure measured after engine start drops by less than 3 kPa [0.44 psi] compared to the intake manifold pressure (atmospheric pressure) measured before engine start, the ECM interprets this as a malfunction of the No. 2 turbo pressure sensor and stores DTC P01052A.

MONITOR STRATEGY

Related DTCs	P0106: No. 2 turbo pressure sensor stuck monitoring
Required Sensors/Components (Main)	No. 2 turbo pressure sensor
Required Sensors/Components (Related)	-
Frequency of Operation	Continuous
Duration	6 seconds
MIL Operation	2 driving cycles
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

Monitor runs whenever the following DTCs are not stored	P2088, P2089, P2092, P2093 (VVT oil control solenoid) P0011, P0021 (VVT system - advance) P0012, P0022 (VVT system - retard) P0014, P0024 (Exhaust VVT system - advance) P0015, P0025 (Exhaust VVT system - retard) P0016, P0018 (VVT system - misalignment) P0017, P0019 (Exhaust VVT system - misalignment) P00AC, P00AD, P0112, P0113 (Intake air temperature sensor) P0107, P0108 (Manifold absolute pressure) P0117, P0118 (Engine coolant temperature sensor)

PROCEDURE

1.	CHECK ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P01052A)

(a) Read the DTCs.

Powertrain > Engine > Trouble Codes

RESULT	PROCEED TO
P01052A and other DTCs are output	A
P01052A is output	B

HINT:

If any DTCs other than P01052A are output, troubleshoot those DTCs first.

A ▶ **GO TO DTC CHART**

B ▼

2.	READ VALUE USING GTS (INTAKE MANIFOLD ABSOLUTE PRESSURE)

(a) According to the display on the GTS, read the Data List.

Powertrain > Engine > Data List

TESTER DISPLAY
Intake Manifold Absolute Pressure

(b) According to the display on the GTS, read the Data List.

RESULT	PROCEED TO
The value of Intake Manifold Absolute Pressure is between 80 and 110 kPa(abs)	A
None of the above conditions are met	B

HINT:

80 and 110 kPa (11.6 and 15.95 psi)

A ▶ **CHECK FOR INTERMITTENT PROBLEMS**

B ▼

3.	READ VALUE USING GTS (INTAKE MANIFOLD ABSOLUTE PRESSURE)

(a) According to the display on the GTS, read the Data List.

Powertrain > Engine > Data List

Last Modified: 10-07-2024	6.11:8.1.0	**Doc ID:** RM100000002HZGS
Model Year Start: 2024	**Model:** GX550	**Prod Date Range:** [12/2023 -]
Title: V35A-FTS (ENGINE CONTROL): SFI SYSTEM (w/ Canister Pump Module): P013616,P013A7C,P013C7C,P015616; A/F (O2) Sensor Circuit Bank 1 Sensor 2 Circuit Current (Voltage) Below Threshold; 2024 MY GX550 [12/2023 -]		

DTC	**P013616**	**A/F (O2) Sensor Circuit Bank 1 Sensor 2 Circuit Current (Voltage) Below Threshold**

DTC	**P013A7C**	**A/F Sensor - Rich to Lean Bank 1 Sensor 2 Slow Response**

DTC	**P013C7C**	**A/F Sensor - Rich to Lean Bank 2 Sensor 2 Slow Response**

DTC	**P015616**	**A/F (O2) Sensor Circuit Bank 2 Sensor 2 Circuit Current (Voltage) Below Threshold**

DESCRIPTION

Refer to DTC P003612.

Click here INFO

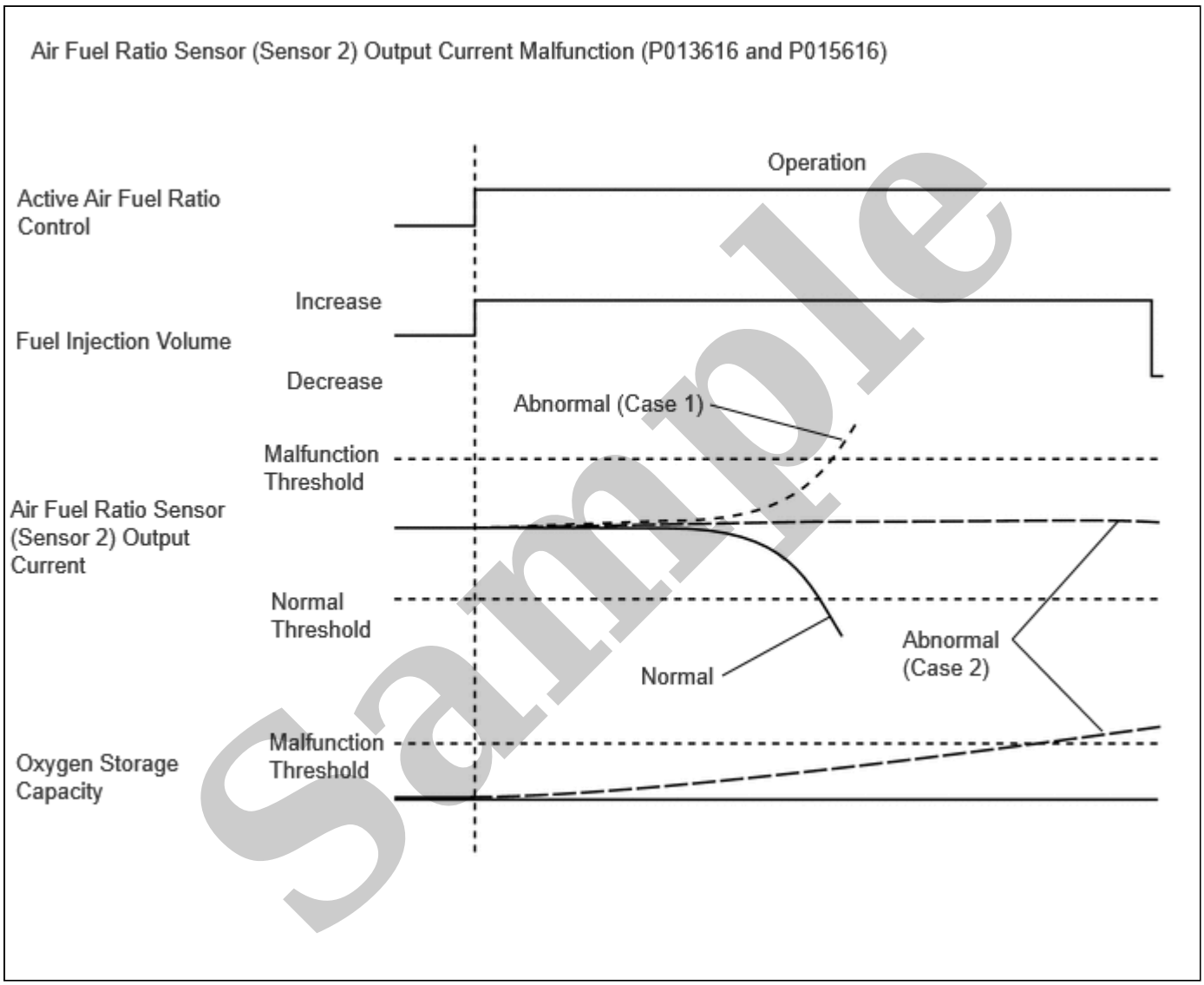
DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
P013616	A/F (O2) Sensor Circuit Bank 1 Sensor 2 Circuit Current (Voltage) Below Threshold	Either of the following conditions is met (2 trip detection logic). • During active rich air-fuel ratio control, the air fuel ratio sensor (bank 1 sensor 2) current is 6 mA or more • During active rich air-fuel ratio control, the oxygen storage capacity of the catalyst is more than 1.272 g when the air fuel ratio sensor (bank 1 sensor 2) current is -0.25757 mA or higher	• Air fuel ratio sensor (bank 1 sensor 2) • Air fuel ratio sensor (bank 1 sensor 1) • Gas leak from exhaust system • Fuel system • Intake system • Ignition system • Wire harness or connector • ECM	Comes on	Engine	B	SAE: P0136
P013A7C	A/F Sensor - Rich to Lean Bank 1 Sensor	During a fuel cut, the amount of time it takes for the current of the air fuel ratio sensor (bank 1 sensor	• Air fuel ratio sensor	Comes on	Engine	B	SAE: P013A

Active air fuel ratio control is performed for approximately 30 seconds while driving with a warm engine. During active air fuel ratio control, the air fuel ratio is forcibly regulated to become lean or rich by the ECM. If the ECM detects a malfunction, a DTC is stored.

Abnormal Air Fuel Ratio Sensor (Sensor 2) Output Current (DTC P013616 and P015616)

Case 1: The ECM illuminates the MIL and stores a DTC when active rich air-fuel ratio control is being performed and the air fuel ratio sensor (sensor 2) current is 6 mA or more.

Case 2: The ECM illuminates the MIL and stores a DTC when active rich air-fuel ratio control is being performed, the oxygen storage capacity of the catalyst is more than 1.272 g and the air fuel ratio sensor (sensor 2) current is -0.25757 mA or more.



Abnormal Air Fuel Ratio Sensor (Sensor 2) Output Current During Fuel-cut from Rich Condition (DTC P013A7C and P013C7C)

During a fuel cut, if the amount of time it takes for the current of the air fuel ratio sensor (sensor 2) to increase to a certain amount is equal to or greater than the threshold, the responsiveness of the air fuel ratio sensor (sensor 2) is judged as degraded, the ECM illuminates the MIL and stores a DTC.

MONITOR STRATEGY

Related DTCs	P0136: Air fuel ratio sensor (bank 1 sensor 2) output current malfunction P013A: Air fuel ratio sensor (bank 1 sensor 2) response rate during fuel cut from rich condition

	P2228, P2229 (Atmospheric pressure sensor)

P0136 and P0156: Air Fuel Ratio Sensor (Sensor 2) Output Current Malfunction

Battery voltage	11 V or higher
Intake air temperature (mass air flow meter sub-assembly)	-10°C (14°F) or higher
Engine coolant temperature	75°C (167°F) or higher
Atmospheric pressure	76 kPa(abs) [11.02 psi(abs)] or higher
Idling	Off
Engine speed	Less than 3500 rpm
Air fuel ratio sensor (sensor 1) status	Activated
Fuel system status	Closed loop
Engine load	10% or higher, and less than 140%

P013A: Air Fuel Ratio Sensor (Sensor 2) Response Rate During Fuel Cut from Rich Condition

Battery voltage	11 V or higher
Engine coolant temperature	75°C (167°F) or higher
Catalyst temperature	400°C (752°F) or higher
Fuel cut	On
Air fuel ratio sensor (sensor 2) control circuit fail (P22AB, P22AC, P22AD, P22B3, P22B4)	Not detected

P013C: Air Fuel Ratio Sensor (Sensor 2) Response Rate During Fuel Cut from Rich Condition

Battery voltage	11 V or higher
Engine coolant temperature	75°C (167°F) or higher
Catalyst temperature	400°C (752°F) or higher
Fuel cut	On
Air fuel ratio sensor (sensor 2) control circuit fail (P22B8, P22B9, P22BA, P22C0, P22C1)	Not detected

TYPICAL MALFUNCTION THRESHOLDS

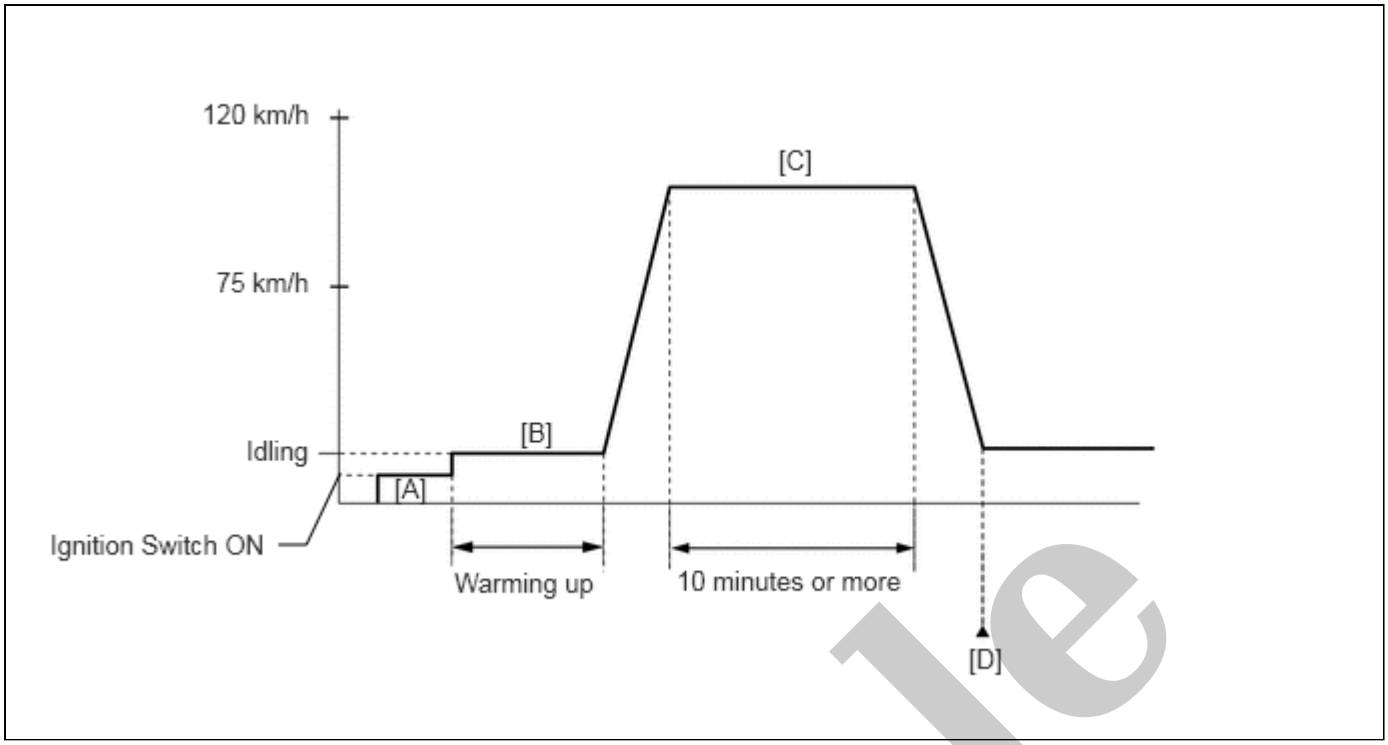
P0136 and P0156: Air Fuel Ratio Sensor (Sensor 2) Output Current Malfunction

Both of the following conditions are met	A and B
A. Continuous time of active rich air fuel ratio control*1	0.5 seconds or more
*1: Target air fuel ratio	14.3 or less
B. Either of the following conditions is met	(a) or (b)
(a) Air fuel ratio sensor (sensor 2) current	6 mA or more
(b) OSC (Oxygen Storage Capacity) of catalyst	More than 1.272 g

P013A and P013C: Air Fuel Ratio Sensor (Sensor 2) Response Rate during Fuel Cut from Rich Condition

The amount of time it takes for the current of the air fuel ratio sensor (sensor 2) to increase to a certain amount during a fuel cut	0.24 seconds or more

MONITOR RESULT



1. Clear the DTCs (even if no DTCs are stored, perform the clear DTC procedure).
2. Turn the ignition switch off and wait for at least 30 seconds.
3. Turn the ignition switch to ON [A].
4. Start the engine and warm it up until the engine coolant temperature is 75°C (167°F) or higher [B].
5. Drive the vehicle at 75 to 120 km/h (46 to 75 mph) for 10 minutes or more [C].

CAUTION:

When performing the confirmation driving pattern, obey all speed limits and traffic laws.

6. Enter the following menus: Powertrain / Engine / Trouble Codes [D].
7. Read the pending DTCs.

HINT:

- If a pending DTC is output, the system is malfunctioning.
- If a pending DTC is not output, perform the following procedure.

8. Enter the following menus: Powertrain / Engine / Utility / All Readiness.
9. Input the DTC: P013616 or P015616.
10. Check the DTC judgment result.

HINT:

- If the judgment result is NORMAL, the system is normal.
- If the judgment result is ABNORMAL, the system is malfunctioning.
- If the judgment result is INCOMPLETE, perform steps [C] through [D] again.
- [B] to [D]: Normal judgment procedure.

  The normal judgment procedure is used to complete DTC judgment and also used when clearing permanent DTCs.
- When clearing the permanent DTCs, do not disconnect the cable from the battery terminal or attempt to clear the DTCs during this procedure, as doing so will clear the universal trip and normal judgment histories.

P013A7C and P013C7C

- If the judgment result is NORMAL, the system is normal.
- If the judgment result is ABNORMAL, the system is malfunctioning.
- If the judgment result is INCOMPLETE, drive the vehicle With the shift lever in M, and then perform step [C] again.
- [A] to [E]: Normal judgment procedure.

  The normal judgment procedure is used to complete DTC judgment and also used when clearing permanent DTCs.
- When clearing the permanent DTCs, do not disconnect the cable from the battery terminal or attempt to clear the DTCs during this procedure, as doing so will clear the universal trip and normal judgment histories.

WIRING DIAGRAM

Refer to DTC P003612.

Click here INFO

CAUTION / NOTICE / HINT

HINT:

Malfunctioning areas can be identified by performing the Active Test "Control the Injection Volume for A/F Sensor". This Active Test can help to determine whether the air fuel ratio sensors (sensor 1 and sensor 2) and other potential trouble areas are malfunctioning.

The following procedure describes how to perform the Active Test "Control the Injection Volume for A/F Sensor" using the GTS.

1. Start the engine and warm it up until the engine coolant temperature is 75°C (167°F) or higher.
2. Warm up the air fuel ratio sensors at an engine speed of 2500 rpm for 90 seconds.
3. Enter the following menus: Powertrain / Engine / Active Test / Control the Injection Volume for A/F Sensor / Data List / A/F (O2) Sensor Current B1S1 and A/F (O2) Sensor Current B1S2 or A/F (O2) Sensor Current B2S1 and A/F (O2) Sensor Current B2S2.
4. Perform the Active Test with the engine idling (change the fuel injection volume).
5. Monitor the output current of the air fuel ratio sensor (sensor 1) (A/F (O2) Sensor Current B1S1 or A/F (O2) Sensor Current B2S1) and air fuel ratio sensor (sensor 2) (A/F (O2) Sensor Current B1S2 or A/F (O2) Sensor Current B2S2) displayed on the GTS.

HINT:

- The Active Test "Control the Injection Volume for A/F Sensor" can be used to lower the fuel injection volume by 12.5% or increase the injection volume by 12.5%.
- Each sensor reacts in accordance with the increase and decrease in the fuel injection volume.

Standard

GTS DISPLAY (SENSOR)	INJECTION VOLUME	STATUS	CURRENT
A/F (O2) Sensor Current B1S1 A/F (O2) Sensor Current B2S1 (Air fuel ratio sensor (sensor 1))	12.5%	Rich	Below -0.075 mA
	-12.5%	Lean	More than 0.037 mA
A/F (O2) Sensor Current B1S2 A/F (O2) Sensor Current B2S2 (Air fuel ratio sensor (sensor 2))	12.5%	Rich	Below -0.86 mA
	-12.5%	Lean	More than 0.33 mA

NOTICE:

The air fuel ratio sensor (sensor 1) has an output delay of a few seconds and the air fuel ratio sensor (sensor 2) has a maximum output delay of approximately 20 seconds.

Performing the Active Test "Control the Injection Volume for A/F Sensor" allows the output value of the air fuel ratio sensors (sensor 1 and sensor 2) to be checked and graphed.

NOTICE:

Inspect the fuses for circuits related to this system before performing the following procedure.

HINT:

- Sensor 1 refers to the sensor closest to the engine assembly.
- Sensor 2 refers to the sensor farthest away from the engine assembly.
- Bank 1 refers to the bank that includes the No. 1 cylinder*.

  *: The No. 1 cylinder is the cylinder which is farthest from the transmission.
- Bank 2 refers to the bank that does not include the No. 1 cylinder.

DTC	SUSPECTED AREA
P013616, P013A7C	Bank 1
P015616, P013C7C	Bank 2

PROCEDURE

1.	**READ OUTPUT DTC (DTC P013616, P013A7C, P013C7C OR P015616)**

(a) Read the DTCs.

Powertrain > Engine > Trouble Codes

RESULT	PROCEED TO
P013616, P013A7C, P013C7C or P015616 and other DTCs are output	A
P013616 or P015616 is output	B
P013A7C or P013C7C is output	C

HINT:

If any DTCs other than P013616, P013A7C, P013C7C or P015616 are output, troubleshoot those DTCs first.

A ▶ **GO TO DTC CHART**

C ▶ **GO TO STEP 43**

B ▼

2.	**PERFORM ACTIVE TEST USING GTS (CONTROL THE INJECTION VOLUME FOR A/F SENSOR)**

Pre-procedure1

(a) Start the engine and warm it up until the engine coolant temperature reaches 75°C (167°F) or higher.

(b) Warm up the air fuel ratio sensors at an engine speed of 2500 rpm for 90 seconds.

Procedure1

(c) Perform the Control the Injection Volume for A/F Sensor operation with the engine idling.

Powertrain > Engine > Active Test

STATUS OF A/F (O2) SENSOR CURRENT B1S1 OR A/F (O2) SENSOR CURRENT B2S1	STATUS OF A/F (O2) SENSOR CURRENT B1S2 OR A/F (O2) SENSOR CURRENT B2S2	SUSPECTED TROUBLE AREA	PROCEED TO
		ratio • Air fuel ratio sensor (sensor 2)	
Lean/Rich	Lean	• Air fuel ratio sensor (sensor 2) • Gas leak from exhaust system	C
Lean/Rich	Rich	• Air fuel ratio sensor (sensor 2) • Gas leak from exhaust system	
Lean	Lean/Rich	• Air fuel ratio sensor (sensor 1) • Air fuel ratio sensor (sensor 2)	D
Rich	Lean/Rich	• Air fuel ratio sensor (sensor 1) • Air fuel ratio sensor (sensor 2)	

Lean: During the Control the Injection Volume for A/F Sensor Active Test, the air fuel ratio sensor (sensor 1) output current (A/F (O2) Sensor Current B1S1 or A/F (O2) Sensor Current B2S1) is consistently more than 0.037 mA, and the air fuel ratio sensor (sensor 2) output current (A/F (O2) Sensor Current B1S2 or A/F (O2) Sensor Current B2S2) is consistently more than 0.33 mA.
Rich: During the Control the Injection Volume for A/F Sensor Active Test, the air fuel ratio sensor (sensor 1) output current (A/F (O2) Sensor Current B1S1 or A/F (O2) Sensor Current B2S1) is consistently below -0.075 mA, and the air fuel ratio sensor (sensor 2) output current (A/F (O2) Sensor Current B1S2 or A/F (O2) Sensor Current B2S2) is consistently below -0.86 mA.
Lean/Rich: During the Control the Injection Volume for A/F Sensor Active Test, the output current of the air fuel ratio sensor (sensor 1) or air fuel ratio sensor (sensor 2) alternate correctly.

HINT:

Refer to "Data List / Active Test" [A/F (O2) Sensor Current B1S1, A/F (O2) Sensor Current B2S1, A/F (O2) Sensor Current B1S2 and A/F (O2) Sensor Current B2S2].

Click here INFO

Post-procedure1

(e) None

A ▶ **REPLACE AIR FUEL RATIO SENSOR (SENSOR 2)**

C ▶ **GO TO STEP 39**

D ▶ **GO TO STEP 40**