Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BLXM
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: M20A-FXS (ENGINE CONTROL): SFI SYSTEM: P050B00; Cold Start Ignition Timing Performance; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

DTC	**P050B00**	**Cold Start Ignition Timing Performance**

MONITOR DESCRIPTION

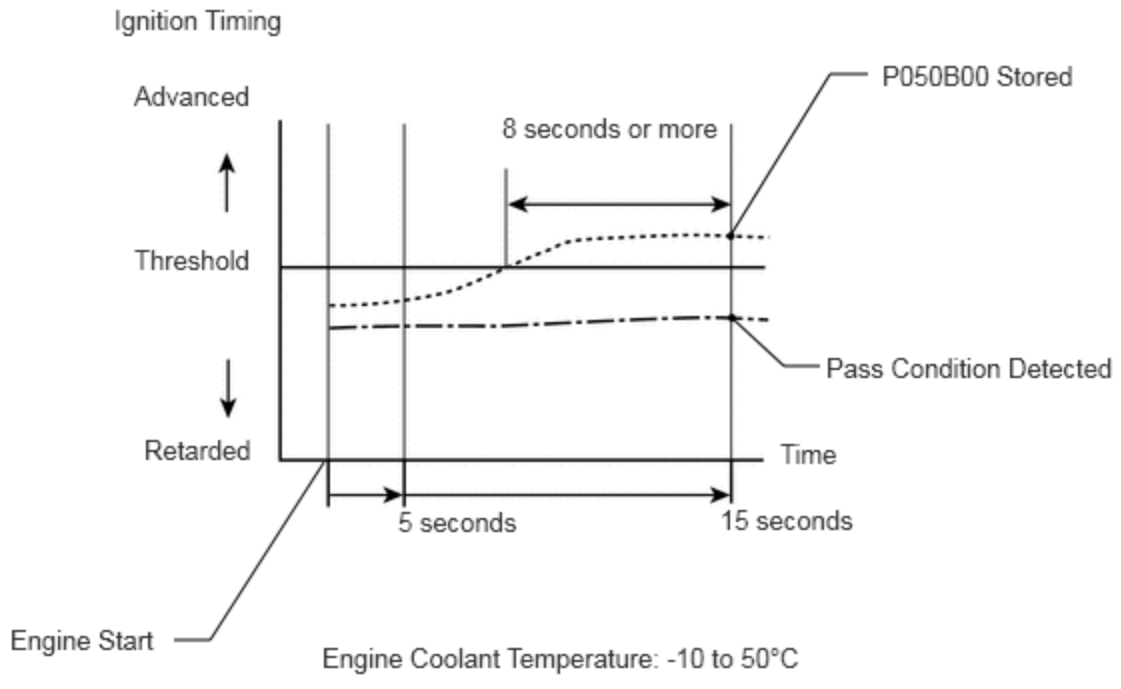
A monitor will run when the engine is started at an engine coolant temperature of -10 (14°F) or higher, and less than 50°C (122°F). If certain conditions are met, a DTC is stored after the engine idles for 15 seconds (2 trip detection logic).

This DTC is designed to monitor the ignition timing at cold start. When the engine is started at an engine coolant temperature of less than 50°C (122°F), the ECM checks the ignition timing during engine idling. If the ignition timing advances beyond the specified level within 10 seconds, the ECM interprets this as a malfunction, illuminates the MIL and stores this DTC.

NOTICE:

The idle speed control learned values are cleared by performing learning value reset. Idle speed control learning needs to be performed before this DTC can be stored.

P050B00 Detection Logic:



DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
P050B00	Cold Start Ignition Timing Performance	Ignition timing insufficiently retarded at cold start (2 trip detection logic).	• Throttle body with motor assembly • Mass air flow meter sub-assembly • PCV system • Air cleaner filter element sub-assembly • Intake system • VVT system • EGR valve assembly • Wire harness or connector • ECM	Comes on	Engine	B	SAE Code: P050B

MONITOR STRATEGY

Related DTCs	P050B: Cold start ignition timing performance
Required Sensors/Components (Main)	Throttle body with motor assembly
Required Sensors/Components (Related)	Engine coolant temperature sensor Mass air flow meter sub-assembly
Frequency of Operation	Once per driving cycle
Duration	10 seconds
MIL Operation	2 driving cycles
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

Monitor runs whenever the following DTCs are not stored	P0010, P1360, P1362, P1364, P1366, P2614 (Motor drive VVT system control module) P0011 (VVT system - advance) P0012 (VVT system - retard) P0013 (Exhaust VVT oil control solenoid) P0014 (Exhaust VVT system - advance) P0015 (Exhaust VVT system - retard) P0016 (VVT system - misalignment) P0017 (Exhaust VVT system - misalignment) P0087, P0088, P0191, P0192, P0193 (Fuel pressure sensor (for high pressure side)) P0101, P0102, P0103 (Mass air flow meter) P0107, P0108 (Manifold absolute pressure)

	P0116, P0117, P0118 (Engine coolant temperature sensor) P0121, P0122, P0123, P0222, P0223, P2135 (Throttle position sensor) P0125 (Insufficient coolant temperature for closed loop fuel control) P014C, P014D, P015A, P015B, P2195, P2196, P2237, P2238, P2239, P2252, P2253 (Air fuel ratio sensor (sensor 1)) P0171, P0172 (Fuel system) P0201, P0202, P0203, P0204, P062D, P21CF, P21D0, P21D1, P21D2 (Fuel injector) P0300, P0301, P0302, P0303, P0304 (Misfire) P0335, P0337, P0338 (Crankshaft position sensor) P0340, P0342, P0343 (Camshaft position sensor) P0365, P0367, P0368 (Exhaust camshaft position sensor) P0401 (EGR system (closed)) P0657, P0658, P2102, P2103, P2111, P2112, P2119 (Throttle actuator) P107B, P107C, P107D (Fuel pressure sensor (for low pressure side)) P11EA, P11EC, P11ED, P11EE, P11EF, P219A, P219C, P219D, P219E, P219F (Air-fuel ratio imbalance) P1235 (High pressure fuel pump circuit) P2228, P2229 (Atmospheric pressure sensor)
Auxiliary battery voltage	8 V or higher
Time after engine start	5 seconds or more
Starter	Off
Engine coolant temperature at engine start	-10°C (14°F) or higher
Engine coolant temperature	-10°C (14°F) or higher, and less than 50°C (122°F)
Fuel-cut	Off
Atmospheric pressure	76 kPa(abs) [11 psi(abs)] or higher

TYPICAL MALFUNCTION THRESHOLDS

Accumulated time when ignition timing retard is cut off	8 seconds or more

CONFIRMATION DRIVING PATTERN

HINT:

- After repair has been completed, clear the DTC and then check that the vehicle has returned to normal by performing the following All Readiness check procedure.

  Click here INFO
- When clearing the permanent DTCs, refer to the "CLEAR PERMANENT DTC" procedure.

  Click here INFO

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. Put the engine in Inspection Mode (Maintenance Mode).

   Click here INFO
4. Start the engine and warm it up for 5 minutes or more.
5. Stop the engine.

6. Leave the vehicle outside overnight.
7. Turn the ignition switch to ON [A].
8. Enter the following menus: Powertrain / Engine / Data List / Coolant Temperature.
9. Check that the value of the Data List item Coolant Temperature is between -10 and 50°C (14 and 122°F).
10. Put the engine in Inspection Mode (Maintenance Mode).

    Click here INFO
11. Start the engine and warm it up until the engine coolant temperature is the same as the coolant temperature in the Freeze Frame Data.
12. Idle the engine for 1 minute or more [B].
13. Enter the following menus: Powertrain / Engine / Trouble Codes [C].
14. Read the pending DTC.

    HINT:

    - If a pending DTC is output, the system is malfunctioning.
    - If a pending DTC is not output, perform the following procedure.
15. Enter the following menus: Powertrain / Engine / Utility / All Readiness.
16. Input the DTC: P050B00.
17. 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, idle the engine for 3 minutes, let the engine cool down, and then perform steps [A] through [B] again.
    - Idle the engine for 3 minutes, let the engine cool down, and then perform steps [A] through [C]: 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 auxiliary 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 P010012.

Click here INFO

CAUTION / NOTICE / HINT

NOTICE:

- Inspect the fuses for circuits related to this system before performing the following procedure.
- Vehicle Control History may be stored in the hybrid vehicle control ECU if the engine is malfunctioning. Certain vehicle condition information is recorded when Vehicle Control History is stored. Reading the vehicle conditions recorded in both the Freeze Frame Data and Vehicle Control History can be useful for troubleshooting.

  for HEV Model: Click here INFO

  for PHEV Model: Click here INFO

  (Select Powertrain in Health Check and then check the time stamp data.)
- If any "Engine Malfunction" Vehicle Control History item has been stored in the hybrid vehicle control ECU, make sure to clear it. However, as all Vehicle Control History items are cleared simultaneously, if any Vehicle Control History items other than "Engine Malfunction" are stored, make sure to perform any troubleshooting for them before clearing Vehicle Control History.

  for HEV Model: Click here INFO

for PHEV Model: Click here INFO

HINT:

DTC P050B00 may be set when the engine has the symptoms listed below. If necessary, check the trouble areas listed below.

SYMPTOMS	FACTOR	TROUBLE AREA
Low idle speed when engine is cold (immediately after engine start)	Excessive engine friction	Engine oil deterioration
Rough idle when engine is cold (immediately after engine start)	Abnormal combustion	Fuel quality

PROCEDURE

1.	**CHECK ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P050B00)**

(a) Read the DTCs.

Powertrain > Engine > Trouble Codes

RESULT	PROCEED TO
P050B00 and other DTCs are output	A
P050B00 is output	B

HINT:

If any DTCs other than P050B00 are output, troubleshoot those DTCs first.

A ▶ **GO TO DTC CHART**

B ▼

2.	**READ VALUE USING GTS (FUEL TRIM)**

HINT:

Calculate the total fuel trim values to check the characteristic deviation of the mass air flow meter sub-assembly.

Pre-procedure1

(a) Put the engine in Inspection Mode (Maintenance Mode).

Powertrain > Hybrid Control > Utility

TESTER DISPLAY
Inspection Mode

(b) Start the engine.

Procedure1

(c) Read the values displayed on the GTS at engine idle.

Powertrain > Engine > Data List

TESTER DISPLAY
Short FT B1S1
Long FT B1S1

(d) Add the Short FT B1S1 and Long FT B1S1 values to obtain the total fuel trim.

RESULT	PROCEED TO
The sum of the value of Short FT B1S1 and Long FT B1S1 is -20 % or more, and less than 20 %	A
None of the above conditions are met	B

Post-procedure1

(e) None.

B ▶ **GO TO STEP 7**

A

3.	**INSPECT THROTTLE BODY WITH MOTOR ASSEMBLY (VISUALLY CHECK THROTTLE VALVE)**

(a) Check for foreign matter between the throttle valve and housing. If necessary, clean the throttle body with motor assembly. Also, check that the throttle valve moves smoothly.

OK:

Throttle valve is not contaminated with foreign matter and moves smoothly.

NG ▶ **GO TO STEP 6**

OK

4.	**PERFORM ACTIVE TEST USING GTS (CONTROL THE EGR STEP POSITION)**

Pre-procedure1

(a) Put the engine in Inspection Mode (Maintenance Mode).

Powertrain > Hybrid Control > Utility

TESTER DISPLAY
Inspection Mode

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

Powertrain > Engine > Data List

TESTER DISPLAY
Coolant Temperature

HINT:

The A/C switch and all accessories should be off.

Procedure1

(c) Confirm that the value of Data List item Engine Independent is "Operate" then check the value of Intake Manifold Absolute Pressure while performing the Active Test.

Powertrain > Engine > Active Test

ACTIVE TEST DISPLAY
Control the EGR Step Position

DATA LIST DISPLAY
Intake Manifold Absolute Pressure
Engine Independent

NOTICE:

- Make sure that the value of Data List item Engine Independent is "Operate" while performing the Active Test.
- Do not leave the EGR valve open for 10 seconds or more during the Active Test.
- Be sure to return the EGR valve to step 0 when the Active Test is completed.
- Do not open the EGR valve 30 steps or more during the Active Test.

OK:

The value of Intake Manifold Absolute Pressure changes in response to the EGR step position when the value of Engine Independent is "Operate".

Standard:

-	CONTROL THE EGR STEP POSITION (ACTIVE TEST)	
	0 STEPS	0 TO 30 STEPS
Intake Manifold Absolute Pressure (Data List)	(EGR valve is fully closed)	Intake Manifold Absolute Pressure value is at least +10 kPa (1.45 psi) higher than when EGR valve is fully closed

HINT:

- If the value of Data List item Engine Independent is "Not Opr" when the engine is idling, charge control is being performed. Perform the Active Test after charge control is complete ("Operate" is displayed).
- While performing the Active Test, if the increase in the value of Intake Manifold Absolute Pressure is small, the EGR valve assembly may be malfunctioning.
- Even if the EGR valve assembly is malfunctioning, rough idling or an increase in the value of Intake Manifold Absolute Pressure may occur while performing the Active Test. However, the amount that the value of Intake Manifold Absolute Pressure increases will be smaller than normal.

RESULT	PROCEED TO
Intake Manifold Absolute Pressure value is at least +10 kPa (1.45 psi) higher than when EGR valve is fully closed	A
None of the above conditions are met	B

Post-procedure1

(d) None.

A ▶ **GO TO STEP 15**

B ▼

5.	**INSPECT EGR VALVE ASSEMBLY**

Pre-procedure1

(a) Remove the EGR valve assembly.

HINT:

Click here INFO

Procedure1

(b) Check if the EGR valve is stuck open.

OK:

EGR valve is tightly closed.

Post-procedure1

(c) None.

OK ▶ **GO TO STEP 15**

NG ▶ **GO TO STEP 27**

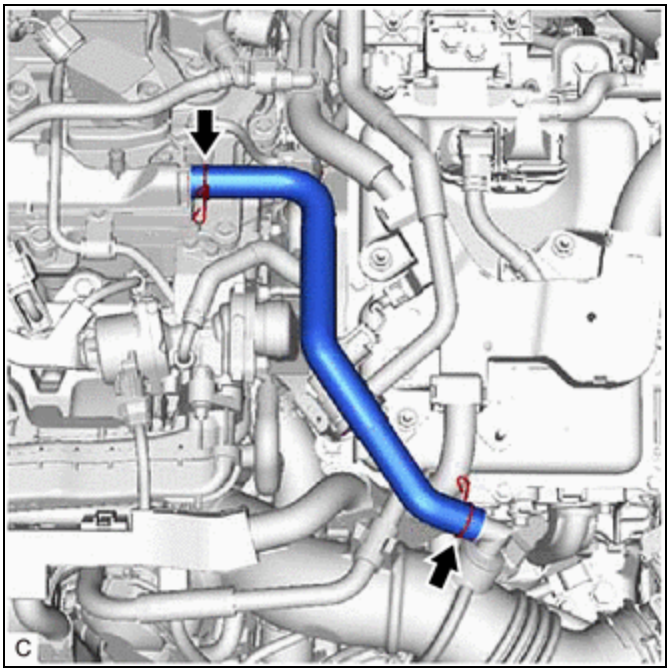
6.	**REPLACE THROTTLE BODY WITH MOTOR ASSEMBLY**

HINT:

Click here INFO

NEXT ▶ **GO TO STEP 32**

7.	**CHECK PCV VALVE AND HOSE CONNECTIONS**



(a) Check the PCV hose connections.

(b) Check the PCV valve.

Click here INFO

OK:

PCV hose and PCV valve are connected correctly and are not damaged.

NG ▶ **GO TO STEP 31**

OK

8.	**CHECK INTAKE SYSTEM**

(a) Check the intake system for vacuum leaks.

Click here INFO

OK:

No leaks from intake system.

NG **GO TO STEP 30**

OK

9.	**CHECK AIR CLEANER FILTER ELEMENT SUB-ASSEMBLY**

(a) Visually check that the air cleaner filter element sub-assembly is not excessively contaminated with dirt or oil.

OK:

The air cleaner filter element sub-assembly is not excessively contaminated with dirt or oil.

NG **GO TO STEP 29**

OK

10.	**PERFORM ACTIVE TEST USING GTS (CONTROL THE EGR STEP POSITION)**

Pre-procedure1

(a) Put the engine in Inspection Mode (Maintenance Mode).

Powertrain > Hybrid Control > Utility

TESTER DISPLAY
Inspection Mode

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

Powertrain > Engine > Data List

TESTER DISPLAY
Coolant Temperature

HINT:

The A/C switch and all accessories should be off.

Procedure1

(c) Confirm that the value of Data List item Engine Independent is "Operate" then check the value of Intake Manifold Absolute Pressure while performing the Active Test.

Powertrain > Engine > Active Test

ACTIVE TEST DISPLAY
Control the EGR Step Position

DATA LIST DISPLAY
Intake Manifold Absolute Pressure
Engine Independent

NOTICE:

- Make sure that the value of Data List item Engine Independent is "Operate" while performing the Active Test.
- Do not leave the EGR valve open for 10 seconds or more during the Active Test.
- Be sure to return the EGR valve to step 0 when the Active Test is completed.
- Do not open the EGR valve 30 steps or more during the Active Test.

OK:

The value of Intake Manifold Absolute Pressure changes in response to the EGR step position when the value of Engine Independent is "Operate".

Standard:

-	CONTROL THE EGR STEP POSITION (ACTIVE TEST)	
	0 STEPS	0 TO 30 STEPS
Intake Manifold Absolute Pressure (Data List)	(EGR valve is fully closed)	Intake Manifold Absolute Pressure value is at least +10 kPa (1.45 psi) higher than when EGR valve is fully closed

HINT:

- If the value of Data List item Engine Independent is "Not Opr" when the engine is idling, charge control is being performed. Perform the Active Test after charge control is complete ("Operate" is displayed).
- While performing the Active Test, if the increase in the value of Intake Manifold Absolute Pressure is small, the EGR valve assembly may be malfunctioning.
- Even if the EGR valve assembly is malfunctioning, rough idling or an increase in the value of Intake Manifold Absolute Pressure may occur while performing the Active Test. However, the amount that the value of Intake Manifold Absolute Pressure increases will be smaller than normal.

RESULT	PROCEED TO
Intake Manifold Absolute Pressure value is at least +10 kPa (1.45 psi) higher than when EGR valve is fully closed	A
None of the above conditions are met	B

Post-procedure1

(d) None.

A ▶ **GO TO STEP 12**

B ▼

11.	INSPECT EGR VALVE ASSEMBLY

Pre-procedure1

(a) Remove the EGR valve assembly.

HINT:

Click here INFO

Procedure1

(b) Check if the EGR valve is stuck open.

OK:

EGR valve is tightly closed.

Post-procedure1

(c) None.

NG ▶ **GO TO STEP 27**

OK ▼

12.	PERFORM ACTIVE TEST USING GTS (CHECK VVT-IE SYSTEM FOR INTAKE CAMSHAFT)

Pre-procedure1

(a) Remove the EFI NO. 1 fuse from the No. 1 engine room relay block and No. 1 junction block assembly and wait for at least 60 seconds.

HINT:

Clear the DTC without using the GTS.

(b) Reinstall the EFI NO. 1 fuse.

(c) Put the engine in Inspection Mode (Maintenance Mode).

Powertrain > Hybrid Control > Utility

TESTER DISPLAY
Inspection Mode

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

Powertrain > Engine > Data List

TESTER DISPLAY
Coolant Temperature

HINT:

The A/C switch and all accessories should be off.

Procedure1

(e) Read the Data List while performing the Active Test with the engine idling.

Powertrain > Engine > Active Test

ACTIVE TEST DISPLAY
Control the VVT-iE Opening Angle Bank 1

DATA LIST DISPLAY
Intake VVT Change Angle Bank 1
Intake VVT Target Angle Bank 1

Standard:

ACTIVE TEST MOVEMENT ORDER	DIFFERENCE BETWEEN "INTAKE VVT CHANGE ANGLE BANK 1" AND "INTAKE VVT TARGET ANGLE BANK 1"
0 deg → 10 deg → 20 deg → 40 deg → 0 deg → 10 deg → END	Within 4 DegFR

Post-procedure1

(f) None

NG ▶ **GO TO STEP 24**

OK

13.	**PERFORM ACTIVE TEST USING GTS (CONTROL THE EXHAUST VVT OCV DUTY RATIO BANK 1)**

Click here INFO

NG **GO TO STEP 17**

OK

14.	**READ VALUE USING GTS (MASS AIR FLOW SENSOR)**

Pre-procedure1

(a) Put the engine in Inspection Mode (Maintenance Mode).

Powertrain > Hybrid Control > Utility

TESTER DISPLAY
Inspection Mode

(b) Start the engine.

(c) Allow the engine to idle until Coolant Temperature is 75°C (167°F) or higher.

Powertrain > Engine > Data List

TESTER DISPLAY
Coolant Temperature

Procedure1

(d) Read Mass Air Flow Sensor while maintaining an engine speed of 2500 rpm.

Powertrain > Engine > Data List

TESTER DISPLAY
Engine Speed

TESTER DISPLAY
Mass Air Flow Sensor

HINT:

During charge control, the engine speed is set at idle. Therefore, the engine speed will not increase when the accelerator pedal is depressed. In this case, read the Data List after charge control has completed.

Standard:

GTS DISPLAY	CONDITION	SPECIFIED CONDITION
Mass Air Flow Sensor	• Engine warmed up • Shift position: P • A/C: Off • Engine Speed: 2500 rpm	Between 5.5 and 18.6 gm/sec

RESULT	PROCEED TO
The value of Mass Air Flow Sensor is between 5.5 and 18.6 gm/sec	A
None of the above conditions are met	B

Post-procedure1

(e) None.

B ▶ **GO TO STEP 34**

A ▼

15.	CLEAR DTC

Pre-procedure1

(a) None.

Procedure1

(b) Clear the DTCs.

Powertrain > Engine > Clear DTCs

Post-procedure1

(c) Turn the ignition switch off and wait for at least 30 seconds.

NEXT

16.	**CHECK WHETHER DTC OUTPUT RECURS (DTC P050B00)**

NOTICE:

In this operation, the engine must be cold (approximately the same as the engine coolant temperature recorded in the Freeze Frame Data).

Pre-procedure1

(a) Check that the engine coolant temperature is between -10 and 50°C (14 and 122°F).

Powertrain > Engine > Data List

TESTER DISPLAY
Coolant Temperature

(b) Put the engine in Inspection Mode (Maintenance Mode).

Powertrain > Hybrid Control > Utility

TESTER DISPLAY
Inspection Mode

(c) Start the engine and warm it up until the engine coolant temperature is the same as the engine coolant temperature in the Freeze Frame Data.

(d) Drive the vehicle in accordance with the driving pattern described in Confirmation Driving Pattern.

Procedure1

(e) Check the DTC judgment result.

Powertrain > Engine > Utility

TESTER DISPLAY
All Readiness

(f) Input the DTC: P050B00.

RESULT	PROCEED TO
NORMAL (DTCs are not output)	A
ABNORMAL (DTC P050B00 is output)	B

Post-procedure1

(g) None.

A ▶ **CHECK FOR INTERMITTENT PROBLEMS**

B ▶ **GO TO STEP 34**

17.	**INSPECT CAM TIMING OIL CONTROL SOLENOID ASSEMBLY**

Click here INFO

NG ▶ **GO TO STEP 22**

OK ▼

18.	**INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY (EXHAUST CAMSHAFT TIMING GEAR BOLT ASSEMBLY)**

Click here INFO

NG ▶ **GO TO STEP 25**

OK ▼

19.	**CHECK VALVE TIMING (CHECK FOR LOOSE AND JUMPED TEETH ON TIMING CHAIN)**

Click here INFO

OK ▶ **GO TO STEP 28**

NG ▼

20.	**CHECK ENGINE MECHANICAL SYSTEM**

Click here INFO

OK ▶ **GO TO STEP 32**

NG
▼

21.	**REPAIR OR REPLACE MALFUNCTIONING PARTS, COMPONENT AND AREA**

(a) Repair or replace malfunctioning parts, component and area.

NEXT ▶ **GO TO STEP 32**

22.	**REPLACE CAM TIMING OIL CONTROL SOLENOID ASSEMBLY**

Click here INFO

NEXT
▼

23.	**INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY (EXHAUST CAMSHAFT TIMING GEAR BOLT ASSEMBLY)**

Click here INFO

OK ▶ **GO TO STEP 26**

NG ▶ **GO TO STEP 25**

24.	**REPLACE CAMSHAFT TIMING GEAR ASSEMBLY**

Click here INFO

NEXT ▶ **GO TO STEP 32**

25.	**REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY (EXHAUST CAMSHAFT TIMING GEAR BOLT ASSEMBLY)**

Click here INFO

NEXT

26.	**PERFORM ACTIVE TEST USING GTS (CONTROL THE EXHAUST VVT OCV DUTY RATIO BANK 1)**

Click here INFO

OK ▶ **GO TO STEP 32**

NG ▶ **GO TO STEP 28**

27.	**REPLACE EGR VALVE ASSEMBLY**

HINT:

Click here INFO

NEXT ▶ **GO TO STEP 32**

28.	**REPLACE CAMSHAFT TIMING EXHAUST GEAR ASSEMBLY**

Click here INFO

NEXT ▶ **GO TO STEP 32**

29.	**REPLACE AIR CLEANER FILTER ELEMENT SUB-ASSEMBLY**

(a) Replace the air cleaner filter element sub-assembly.

NEXT ▶ **GO TO STEP 32**

30.	**REPAIR OR REPLACE INTAKE SYSTEM**

(a) Repair or replace the intake system.

HINT:

Perform "Inspection After Repair" after repairing or replacing the intake system.

Click here INFO

NEXT ▶ **GO TO STEP 32**

31.	**REPAIR OR REPLACE PCV VALVE OR HOSE**

(a) Repair or replace the PCV valve or hose.

NEXT

32.	**CLEAR DTC**

Pre-procedure1

(a) None.

Procedure1

(b) Clear the DTCs.

Powertrain > Engine > Clear DTCs

Post-procedure1

(c) Turn the ignition switch off and wait for at least 30 seconds.

NEXT

33.	**CHECK WHETHER DTC OUTPUT RECURS (DTC P050B00)**

NOTICE:

In this operation, the engine must be cold (approximately the same as the engine coolant temperature recorded in the Freeze Frame Data).

Pre-procedure1

(a) Check that the engine coolant temperature is between -10 and 50°C (14 and 122°F).

Powertrain > Engine > Data List

TESTER DISPLAY
Coolant Temperature

(b) Put the engine in Inspection Mode (Maintenance Mode).

Powertrain > Hybrid Control > Utility

TESTER DISPLAY
Inspection Mode

(c) Start the engine and warm it up until the engine coolant temperature is the same as the engine coolant temperature in the Freeze Frame Data.

(d) Drive the vehicle in accordance with the driving pattern described in Confirmation Driving Pattern.

Procedure1

(e) Check the DTC judgment result.

Powertrain > Engine > Utility

TESTER DISPLAY
All Readiness

(f) Input the DTC: P050B00.

RESULT	PROCEED TO
NORMAL (DTCs are not output)	A
ABNORMAL (DTC P050B00 is output)	B

Post-procedure1

(g) None.

A ▶ **END**

B ▼

34.	**CHECK HARNESS AND CONNECTOR (MASS AIR FLOW METER SUB-ASSEMBLY CONNECTOR CONNECTION)**

(a) Check the connection and terminal contact pressure of connectors and wire harnesses between the mass air flow meter sub-assembly and ECM.

HINT:

- Click here INFO
- Repair any problems.

NEXT

35.	CLEAR DTC

Pre-procedure1

(a) None.

Procedure1

(b) Clear the DTCs.

Powertrain > Engine > Clear DTCs

Post-procedure1

(c) Turn the ignition switch off and wait for at least 30 seconds.

NEXT

36.	CHECK WHETHER DTC OUTPUT RECURS (DTC P050B00)

NOTICE:

In this operation, the engine must be cold (approximately the same as the engine coolant temperature recorded in the Freeze Frame Data).

Pre-procedure1

(a) Check that the engine coolant temperature is between -10 and 50°C (14 and 122°F).

Powertrain > Engine > Data List

TESTER DISPLAY
Coolant Temperature

(b) Put the engine in Inspection Mode (Maintenance Mode).

Powertrain > Hybrid Control > Utility

TESTER DISPLAY
Inspection Mode

(c) Start the engine and warm it up until the engine coolant temperature is the same as the engine coolant temperature in the Freeze Frame Data.

(d) Drive the vehicle in accordance with the driving pattern described in Confirmation Driving Pattern.

Procedure1

(e) Check the DTC judgment result.

Powertrain > Engine > Utility

TESTER DISPLAY
All Readiness

(f) Input the DTC: P050B00.

RESULT	PROCEED TO
NORMAL (DTCs are not output)	A
ABNORMAL (DTC P050B00 is output)	B

Post-procedure1

(g) None.

A ▶ **END**

B ▼

37.	CHECK HARNESS AND CONNECTOR (MASS AIR FLOW METER SUB-ASSEMBLY - ECM)

Pre-procedure1

(a) Disconnect the mass air flow meter sub-assembly connector.

(b) Disconnect the ECM connector.

Procedure1

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

EWD INFO

Click Location & Routing(C27,C52)
Click Connector(C27)
Click Connector(C52)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
C27-4 (VCC) - C52-78 (VCVG)	Always	Below 1 Ω	Ω

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
C27-3 (FG) - C52-101 (VG)	Always	Below 1 Ω	Ω
C27-2 (E2G) - C52-79 (E2G)	Always	Below 1 Ω	Ω
C27-4 (VCC) or C52-78 (VCVG) - Body ground and other terminals	Always	10 kΩ or higher	kΩ
C27-3 (FG) or C52-101 (VG) - Body ground and other terminals	Always	10 kΩ or higher	kΩ
C27-2 (E2G) or C52-79 (E2G) - Body ground and other terminals	Always	10 kΩ or higher	kΩ

Post-procedure1

(d) None.

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK
▼

38.	REPLACE MASS AIR FLOW METER SUB-ASSEMBLY

HINT:

- Click here INFO
- If the result of the inspection performed in step 14 (READ VALUE USING GTS (MASS AIR FLOW SENSOR)) indicated no problem, proceed to the next step without replacing the mass air flow meter sub-assembly.

NEXT
▼

39.	CLEAR DTC

Pre-procedure1

(a) None.

Procedure1

(b) Clear the DTCs.

Powertrain > Engine > Clear DTCs

Post-procedure1

(c) Turn the ignition switch off and wait for at least 30 seconds.

NEXT
▼

40.	CONFIRM WHETHER MALFUNCTION HAS BEEN SUCCESSFULLY REPAIRED

NOTICE:

In this operation, the engine must be cold (approximately the same as the engine coolant temperature recorded in the Freeze Frame Data).

Pre-procedure1

(a) Check that the engine coolant temperature is between -10 and 50°C (14 and 122°F).

Powertrain > Engine > Data List

TESTER DISPLAY
Coolant Temperature

(b) Put the engine in Inspection Mode (Maintenance Mode).

Powertrain > Hybrid Control > Utility

TESTER DISPLAY
Inspection Mode

(c) Start the engine and warm it up until the engine coolant temperature is the same as the engine coolant temperature in the Freeze Frame Data.

(d) Drive the vehicle in accordance with the driving pattern described in Confirmation Driving Pattern.

Procedure1

(e) Check the DTC judgment result.

Powertrain > Engine > Utility

TESTER DISPLAY
All Readiness

(f) Input the DTC: P050B00.

RESULT	PROCEED TO
NORMAL (DTCs are not output)	A
ABNORMAL (DTC P050B00 is output)	B

Post-procedure1

(g) None.

A ▶ END

B **REPLACE ECM**