Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BLUC
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: M20A-FXS (ENGINE CONTROL): SFI SYSTEM: P006900; Manifold Absolute Pressure - Barometric Pressure Correlation; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

DTC	**P006900**	**Manifold Absolute Pressure - Barometric Pressure Correlation**

DESCRIPTION

The manifold absolute pressure sensor installed to the intake manifold detects the intake manifold pressure using a built-in sensor.

An atmospheric pressure sensor is built into the ECM. When the engine is stopped, the value of the manifold absolute pressure sensor and atmospheric pressure sensor will be approximately the same as the atmospheric pressure.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	DTC OUTPUT FROM	PRIORITY	NOTE
P006900	Manifold Absolute Pressure - Barometric Pressure Correlation	Difference between atmospheric pressure value of the absolute pressure sensor and atmospheric pressure sensor is higher than threshold value (2 trip detection logic).	• Manifold absolute pressure sensor • ECM	Comes on	Engine	B	SAE Code: P0069

MONITOR DESCRIPTION

Approximately 50 minutes after the ignition switch is turned off, the soak timer is activated and the values of the manifold absolute pressure sensor and atmospheric pressure sensor are compared. If the difference between the values of the manifold absolute pressure sensor and atmospheric pressure sensor is higher than a threshold value in consecutive driving cycles, the ECM will store this DTC.

MONITOR STRATEGY

Related DTCs	P0069: Manifold absolute pressure sensor/Atmospheric pressure sensor correlation
Required Sensors/Components (Main)	Manifold absolute pressure sensor ECM
Required Sensors/Components (Related)	Mass air flow meter sub-assembly Engine coolant temperature sensor
Frequency of Operation	Once per driving cycle
Duration	3 times
MIL Operation	2 driving cycles
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

All of the following conditions are met	-
Engine coolant temperature	-10°C (14°F) or higher
Intake air temperature	-10°C (14°F) or higher
Atmospheric pressure sensor circuit fail (P2228, P2229)	Not detected
Manifold absolute pressure sensor circuit fail (P0107, P0108)	Not detected
Engine coolant temperature sensor circuit fail (P0117, P0118)	Not detected
Intake air temperature sensor circuit fail (P0112, P0113)	Not detected
Engine	Stall
Ignition switch	Off
Soak time	50 minutes
Time after ECM power on	60 to 65.625 seconds
Auxiliary battery voltage	8 V or higher

TYPICAL MALFUNCTION THRESHOLDS

Atmospheric pressure and manifold absolute pressure deviation	Higher than 15.297 kPa (2.218 psi)

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 55 minutes [A].
3. Turn the ignition switch to ON [B].
4. Enter the following menus: Powertrain / Engine / Trouble Codes [C].
5. 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.
6. Enter the following menus: Powertrain / Engine / Utility / All Readiness.
7. Input the DTC: P006900.
8. Check the DTC judgment result.

   HINT:

   - If the judgment result shows NORMAL, the system is normal.
   - If the judgment result shows ABNORMAL, the system is malfunctioning.
   - [A] to [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.

CAUTION / NOTICE / HINT

NOTICE:

- 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

PROCEDURE

1.	**CHECK ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P006900)**

(a) Read the DTCs.

Powertrain > Engine > Trouble Codes

RESULT	PROCEED TO
P006900 and other DTCs are output	A
P006900 is output	B

HINT:

If any DTCs other than P006900 are output, troubleshoot those DTCs first.

A ▶ **GO TO DTC CHART**

B ▼

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

Pre-procedure1

(a) Turn the ignition switch off and wait for at least 50 minutes.

(b) Using the following table, determine the normal atmospheric pressure for the current altitude and temperature.

Altitude, Temperature and Atmospheric Pressure Correlation Table

Altitude (m (ft.))	Temperature (°C (°F))	Atmospheric Pressure (kPa (psi))
0	−20 (−4)	101. 3 (14. 7)
	−10 (14)	101. 3 (14. 7)
	0 (32)	101. 3 (14. 7)
	10 (50)	101. 3 (14. 7)
	20 (68)	101. 3 (14. 7)
	30 (86)	101. 3 (14. 7)
200 (656)	−20 (−4)	98. 6 (14. 3)
	−10 (14)	98. 7 (14. 3)
	0 (32)	98. 8 (14. 3)
	10 (50)	98. 9 (14. 3)
	20 (68)	99. 0 (14. 4)
	30 (86)	99. 1 (14. 4)
400 (1312)	−20 (−4)	96. 0 (13. 9)
	−10 (14)	96. 2 (14. 0)
	0 (32)	96. 4 (14. 0)
	10 (50)	96. 6 (14. 0)
	20 (68)	96. 7 (14. 0)
	30 (86)	96. 9 (14. 1)
600 (1969)	−20 (−4)	93. 5 (13. 6)
	−10 (14)	93. 8 (13. 6)
	0 (32)	94. 0 (13. 6)
	10 (50)	94. 3 (13. 7)
	20 (68)	94. 5 (13. 7)
	30 (86)	94. 7 (13. 7)
800 (2625)	−20 (−4)	91. 1 (13. 2)
	−10 (14)	91. 4 (13. 3)
	0 (32)	91. 8 (13. 3)
	10 (50)	92. 1 (13. 4)
	20 (68)	92. 4 (13. 4)
	30 (86)	92. 7 (13. 4)
1000 (3281)	−20 (−4)	88. 7 (12. 9)
	−10 (14)	89. 1 (12. 9)
	0 (32)	89. 5 (13. 0)
	10 (50)	89. 9 (13. 0)
	20 (68)	90. 3 (13. 1)
	30 (86)	90. 6 (13. 1)
1200 (3937)	−20 (−4)	86. 4 (12. 5)
	−10 (14)	86. 9 (12. 6)
	0 (32)	87. 4 (12. 7)
	10 (50)	87. 8 (12. 7)
	20 (68)	88. 3 (12. 8)
	30 (86)	88. 7 (12. 9)
1400 (4593)	−20 (−4)	84. 2 (12. 2)
	−10 (14)	84. 7 (12. 3)
	0 (32)	85. 3 (12. 4)
	10 (50)	85. 8 (12. 4)
	20 (68)	86. 3 (12. 5)
	30 (86)	86. 7 (12. 6)
1600 (5250)	−20 (−4)	82. 0 (11. 9)
	−10 (14)	82. 6 (12. 0)
	0 (32)	83. 3 (12. 1)
	10 (50)	83. 8 (12. 2)
	20 (68)	84. 4 (12. 2)
	30 (86)	84. 9 (12. 3)

Altitude (m (ft.))	Temperature (°C (°F))	Atmospheric Pressure (kPa (psi))
1800 (5906)	−20 (−4)	79. 9 (11. 6)
	−10 (14)	80. 6 (11. 7)
	0 (32)	81. 3 (11. 8)
	10 (50)	81. 9 (11. 9)
	20 (68)	82. 5 (12. 0)
	30 (86)	83. 0 (12. 0)
2000 (6592)	−20 (−4)	77. 9 (11. 3)
	−10 (14)	78. 6 (11. 4)
	0 (32)	79. 4 (11. 5)
	10 (50)	80. 0 (11. 6)
	20 (68)	80. 7 (11. 7)
	30 (86)	81. 3 (11. 8)
2200 (7218)	−20 (−4)	75. 9 (11. 0)
	−10 (14)	76. 7 (11. 1)
	0 (32)	77. 5 (11. 2)
	10 (50)	78. 2 (11. 3)
	20 (68)	78. 9 (11. 4)
	30 (86)	79. 5 (11. 5)
2400 (7874)	−20 (−4)	74. 0 (10. 7)
	−10 (14)	74. 9 (10. 9)
	0 (32)	75. 7 (11. 0)
	10 (50)	76. 4 (11. 1)
	20 (68)	77. 2 (11. 2)
	30 (86)	77. 8 (11. 3)
2600 (8531)	−20 (−4)	72. 1 (10. 5)
	−10 (14)	73. 0 (10. 6)
	0 (32)	73. 9 (10. 7)
	10 (50)	74. 7 (10. 8)
	20 (68)	75. 5 (11. 0)
	30 (86)	76. 2 (11. 1)
2800 (9187)	−20 (−4)	70. 3 (10. 2)
	−10 (14)	71. 3 (10. 3)
	0 (32)	72. 2 (10. 5)
	10 (50)	73. 0 (10. 6)
	20 (68)	73. 8 (10. 7)
	30 (86)	74. 6 (10. 8)
3000 (9843)	−20 (−4)	68. 6 (9. 95)
	−10 (14)	69. 6 (10. 1)
	0 (32)	70. 5 (10. 2)
	10 (50)	71. 4 (10. 4)
	20 (68)	72. 2 (10. 5)
	30 (86)	73. 0 (10. 6)
3200 (10499)	−20 (−4)	66. 9 (9. 70)
	−10 (14)	67. 9 (9. 85)
	0 (32)	68. 9 (9. 99)
	10 (50)	69. 8 (10. 1)
	20 (68)	70. 7 (10. 3)
	30 (86)	71. 5 (10. 4)
3400 (11155)	−20 (−4)	65. 3 (9. 47)
	−10 (14)	66. 3 (9. 62)
	0 (32)	67. 3 (9. 76)
	10 (50)	68. 3 (9. 91)
	20 (68)	69. 1 (10. 0)
	30 (86)	70. 0 (10. 2)

Altitude (m (ft.))	Temperature (°C (°F))	Atmospheric Pressure (kPa (psi))
3600 (11812)	−20 (−4)	63. 7 (9. 24)
	−10 (14)	64. 7 (9. 38)
	0 (32)	65. 8 (9. 54)
	10 (50)	66. 7 (9. 67)
	20 (68)	67. 7 (9. 82)
	30 (86)	68. 5 (9. 94)
3800 (12468)	−20 (−4)	62. 1 (9. 01)
	−10 (14)	63. 2 (9. 17)
	0 (32)	64. 3 (9. 33)
	10 (50)	65. 3 (9. 47)
	20 (68)	66. 2 (9. 60)
	30 (86)	67. 1 (9. 73)
4000 (13124)	−20 (−4)	60. 6 (8. 79)
	−10 (14)	61. 7 (8. 95)
	0 (32)	62. 8 (9. 11)
	10 (50)	63. 8 (9. 25)
	20 (68)	64. 8 (9. 40)
	30 (86)	65. 7 (9. 53)
4200 (13780)	−20 (−4)	59. 1 (8. 57)
	−10 (14)	60. 3 (8. 75)
	0 (32)	61. 4 (8. 91)
	10 (50)	62. 5 (9. 07)
	20 (68)	63. 4 (9. 20)
	30 (86)	64. 4 (9. 34)
4400 (14436)	−20 (−4)	57. 7 (8. 37)
	−10 (14)	58. 9 (8. 54)
	0 (32)	60. 0 (8. 70)
	10 (50)	61. 1 (8. 86)
	20 (68)	62. 1 (9. 01)
	30 (86)	63. 1 (9. 15)
4600 (15093)	−20 (−4)	56. 3 (8. 17)
	−10 (14)	57. 5 (8. 34)
	0 (32)	58. 7 (8. 51)
	10 (50)	59. 8 (8. 67)
	20 (68)	60. 8 (8. 82)
	30 (86)	61. 8 (8. 96)
4800 (15749)	−20 (−4)	55. 0 (7. 98)
	−10 (14)	56. 2 (8. 15)
	0 (32)	57. 4 (8. 33)
	10 (50)	58. 5 (8. 49)
	20 (68)	59. 5 (8. 63)
	30 (86)	60. 5 (8. 78)
5000 (16405)	−20 (−4)	53. 7 (7. 79)
	−10 (14)	54. 9 (7. 96)
	0 (32)	56. 1 (8. 14)
	10 (50)	57. 2 (8. 30)
	20 (68)	58. 3 (8. 46)
	30 (86)	59. 3 (8. 60)

HINT:

- Standard atmospheric pressure is approximately 101 kPa(abs) [15 psi(abs)].
- For every 100 m (328 ft.) increase in altitude, atmospheric pressure drops by approximately 1 kPa (0.1 psi). This varies depending on the weather.

Procedure1

(c) Compare the value of the Data List item Intake Manifold Absolute Pressure with the actual atmospheric pressure.

Powertrain > Engine > Data List

TESTER DISPLAY
Intake Manifold Absolute Pressure

RESULT	PROCEED TO
Approximately the same as the actual atmospheric pressure	A
Not approximately the same as the actual atmospheric pressure	B

Post-procedure1

(d) None

B ▶ **REPLACE MANIFOLD ABSOLUTE PRESSURE SENSOR**

A ▼

3.	**READ VALUE USING GTS (ATMOSPHERIC PRESSURE)**

Pre-procedure1

(a) Using the following table, determine the normal atmospheric pressure for the current altitude and temperature.

Altitude, Temperature and Atmospheric Pressure Correlation Table

Altitude (m (ft.))	Temperature (°C (°F))	Atmospheric Pressure (kPa (psi))
0	-20 (-4)	101. 3 (14. 7)
	-10 (14)	101. 3 (14. 7)
	0 (32)	101. 3 (14. 7)
	10 (50)	101. 3 (14. 7)
	20 (68)	101. 3 (14. 7)
	30 (86)	101. 3 (14. 7)
200 (656)	-20 (-4)	98. 6 (14. 3)
	-10 (14)	98. 7 (14. 3)
	0 (32)	98. 8 (14. 3)
	10 (50)	98. 9 (14. 3)
	20 (68)	99. 0 (14. 4)
	30 (86)	99. 1 (14. 4)
400 (1312)	-20 (-4)	96. 0 (13. 9)
	-10 (14)	96. 2 (14. 0)
	0 (32)	96. 4 (14. 0)
	10 (50)	96. 6 (14. 0)
	20 (68)	96. 7 (14. 0)
	30 (86)	96. 9 (14. 1)
600 (1969)	-20 (-4)	93. 5 (13. 6)
	-10 (14)	93. 8 (13. 6)
	0 (32)	94. 0 (13. 6)
	10 (50)	94. 3 (13. 7)
	20 (68)	94. 5 (13. 7)
	30 (86)	94. 7 (13. 7)
800 (2625)	-20 (-4)	91. 1 (13. 2)
	-10 (14)	91. 4 (13. 3)
	0 (32)	91. 8 (13. 3)
	10 (50)	92. 1 (13. 4)
	20 (68)	92. 4 (13. 4)
	30 (86)	92. 7 (13. 4)
1000 (3281)	-20 (-4)	88. 7 (12. 9)
	-10 (14)	89. 1 (12. 9)
	0 (32)	89. 5 (13. 0)
	10 (50)	89. 9 (13. 0)
	20 (68)	90. 3 (13. 1)
	30 (86)	90. 6 (13. 1)
1200 (3937)	-20 (-4)	86. 4 (12. 5)
	-10 (14)	86. 9 (12. 6)
	0 (32)	87. 4 (12. 7)
	10 (50)	87. 8 (12. 7)
	20 (68)	88. 3 (12. 8)
	30 (86)	88. 7 (12. 9)
1400 (4593)	-20 (-4)	84. 2 (12. 2)
	-10 (14)	84. 7 (12. 3)
	0 (32)	85. 3 (12. 4)
	10 (50)	85. 8 (12. 4)
	20 (68)	86. 3 (12. 5)
	30 (86)	86. 7 (12. 6)
1600 (5250)	-20 (-4)	82. 0 (11. 9)
	-10 (14)	82. 6 (12. 0)
	0 (32)	83. 3 (12. 1)
	10 (50)	83. 8 (12. 2)
	20 (68)	84. 4 (12. 2)
	30 (86)	84. 9 (12. 3)
1800 (5906)	-20 (-4)	79. 9 (11. 6)
	-10 (14)	80. 6 (11. 7)
	0 (32)	81. 3 (11. 8)
	10 (50)	81. 9 (11. 9)
	20 (68)	82. 5 (12. 0)
	30 (86)	83. 0 (12. 0)
2000 (6592)	-20 (-4)	77. 9 (11. 3)
	-10 (14)	78. 6 (11. 4)
	0 (32)	79. 4 (11. 5)
	10 (50)	80. 0 (11. 6)
	20 (68)	80. 7 (11. 7)
	30 (86)	81. 3 (11. 8)
2200 (7218)	-20 (-4)	75. 9 (11. 0)
	-10 (14)	76. 7 (11. 1)
	0 (32)	77. 5 (11. 2)
	10 (50)	78. 2 (11. 3)
	20 (68)	78. 9 (11. 4)
	30 (86)	79. 5 (11. 5)
2400 (7874)	-20 (-4)	74. 0 (10. 7)
	-10 (14)	74. 9 (10. 9)
	0 (32)	75. 7 (11. 0)
	10 (50)	76. 4 (11. 1)
	20 (68)	77. 2 (11. 2)
	30 (86)	77. 8 (11. 3)
2600 (8531)	-20 (-4)	72. 1 (10. 5)
	-10 (14)	73. 0 (10. 6)
	0 (32)	73. 9 (10. 7)
	10 (50)	74. 7 (10. 8)
	20 (68)	75. 5 (11. 0)
	30 (86)	76. 2 (11. 1)
2800 (9187)	-20 (-4)	70. 3 (10. 2)
	-10 (14)	71. 3 (10. 3)
	0 (32)	72. 2 (10. 5)
	10 (50)	73. 0 (10. 6)
	20 (68)	73. 8 (10. 7)
	30 (86)	74. 6 (10. 8)
3000 (9843)	-20 (-4)	68. 6 (9. 95)
	-10 (14)	69. 6 (10. 1)
	0 (32)	70. 5 (10. 2)
	10 (50)	71. 4 (10. 4)
	20 (68)	72. 2 (10. 5)
	30 (86)	73. 0 (10. 6)
3200 (10499)	-20 (-4)	66. 9 (9. 70)
	-10 (14)	67. 9 (9. 85)
	0 (32)	68. 9 (9. 99)
	10 (50)	69. 8 (10. 1)
	20 (68)	70. 7 (10. 3)
	30 (86)	71. 5 (10. 4)
3400 (11155)	-20 (-4)	65. 3 (9. 47)
	-10 (14)	66. 3 (9. 62)
	0 (32)	67. 3 (9. 76)
	10 (50)	68. 3 (9. 91)
	20 (68)	69. 1 (10. 0)
	30 (86)	70. 0 (10. 2)
3600 (11812)	-20 (-4)	63. 7 (9. 24)
	-10 (14)	64. 7 (9. 38)
	0 (32)	65. 8 (9. 54)
	10 (50)	66. 7 (9. 67)
	20 (68)	67. 7 (9. 82)
	30 (86)	68. 5 (9. 94)
3800 (12468)	-20 (-4)	62. 1 (9. 01)
	-10 (14)	63. 2 (9. 17)
	0 (32)	64. 3 (9. 33)
	10 (50)	65. 3 (9. 47)
	20 (68)	66. 2 (9. 60)
	30 (86)	67. 1 (9. 73)
4000 (13124)	-20 (-4)	60. 6 (8. 79)
	-10 (14)	61. 7 (8. 95)
	0 (32)	62. 8 (9. 11)
	10 (50)	63. 8 (9. 25)
	20 (68)	64. 8 (9. 40)
	30 (86)	65. 7 (9. 53)
4200 (13780)	-20 (-4)	59. 1 (8. 57)
	-10 (14)	60. 3 (8. 75)
	0 (32)	61. 4 (8. 91)
	10 (50)	62. 5 (9. 07)
	20 (68)	63. 4 (9. 20)
	30 (86)	64. 4 (9. 34)
4400 (14436)	-20 (-4)	57. 7 (8. 37)
	-10 (14)	58. 9 (8. 54)
	0 (32)	60. 0 (8. 70)
	10 (50)	61. 1 (8. 86)
	20 (68)	62. 1 (9. 01)
	30 (86)	63. 1 (9. 15)
4600 (15093)	-20 (-4)	56. 3 (8. 17)
	-10 (14)	57. 5 (8. 34)
	0 (32)	58. 7 (8. 51)
	10 (50)	59. 8 (8. 67)
	20 (68)	60. 8 (8. 82)
	30 (86)	61. 8 (8. 96)
4800 (15749)	-20 (-4)	55. 0 (7. 98)
	-10 (14)	56. 2 (8. 15)
	0 (32)	57. 4 (8. 33)
	10 (50)	58. 5 (8. 49)
	20 (68)	59. 5 (8. 63)
	30 (86)	60. 5 (8. 78)
5000 (16405)	-20 (-4)	53. 7 (7. 79)
	-10 (14)	54. 9 (7. 96)
	0 (32)	56. 1 (8. 14)
	10 (50)	57. 2 (8. 30)
	20 (68)	58. 3 (8. 46)
	30 (86)	59. 3 (8. 60)

HINT:

- Standard atmospheric pressure is approximately 101 kPa(abs) [15 psi(abs)].
- For every 100 m (328 ft.) increase in altitude, atmospheric pressure drops by approximately 1 kPa (0.1 psi). This varies depending on the weather.

Procedure1

(b) Compare the value of the Data List item Atmospheric Pressure with the actual atmospheric pressure.

Powertrain > Engine > Data List

TESTER DISPLAY
Atmospheric Pressure

RESULT	PROCEED TO
Approximately the same as the actual atmospheric pressure	A
Not approximately the same as the actual atmospheric pressure	B

Post-procedure1

(c) None

A ▶ **CHECK FOR INTERMITTENT PROBLEMS**

B ▶ **REPLACE ECM**