Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BLOJ
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: M20A-FXS (ENGINE CONTROL): SFI SYSTEM: FREEZE FRAME DATA; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

FREEZE FRAME DATA

DESCRIPTION

The ECM records vehicle and driving condition information as Freeze Frame Data the moment a DTC is stored. When troubleshooting, Freeze Frame Data can be helpful in determining whether the vehicle was moving or stationary, whether the engine was warmed up or not, whether the air fuel ratio was lean or rich, as well as other data recorded at the time of a malfunction.

HINT:

- If it is impossible to replicate the problem even though a DTC is detected, confirm the Freeze Frame Data.
- Freeze Frame Data is available in long and short forms.

PENDING FREEZE FRAME DATA

HINT:

Pending Freeze Frame Data is stored when a 2 trip detection logic DTC is first detected during the first trip.

(a) Enter the following menus: Powertrain / Engine / Trouble Codes.

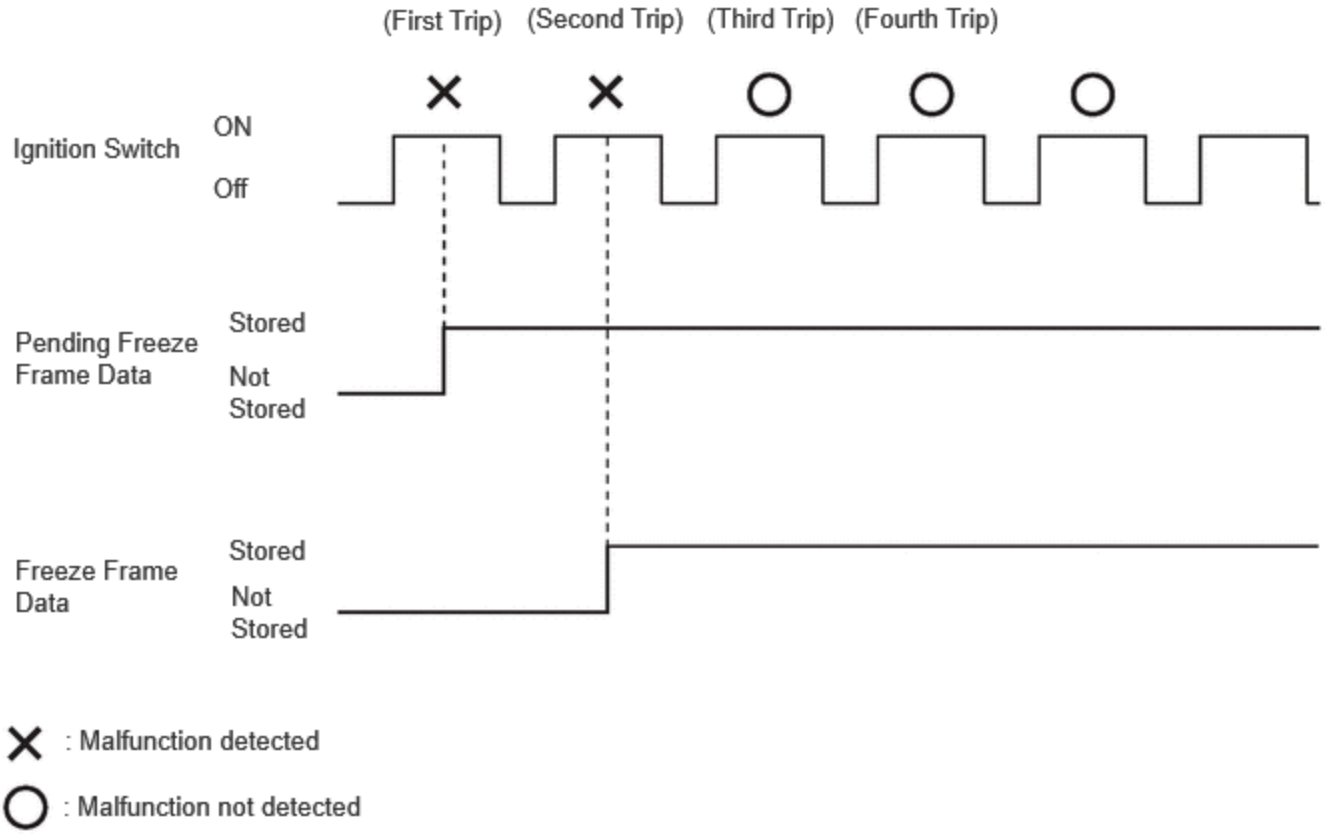
(b) Select a DTC in order to display its pending Freeze Frame Data.

Powertrain > Engine > Trouble Codes

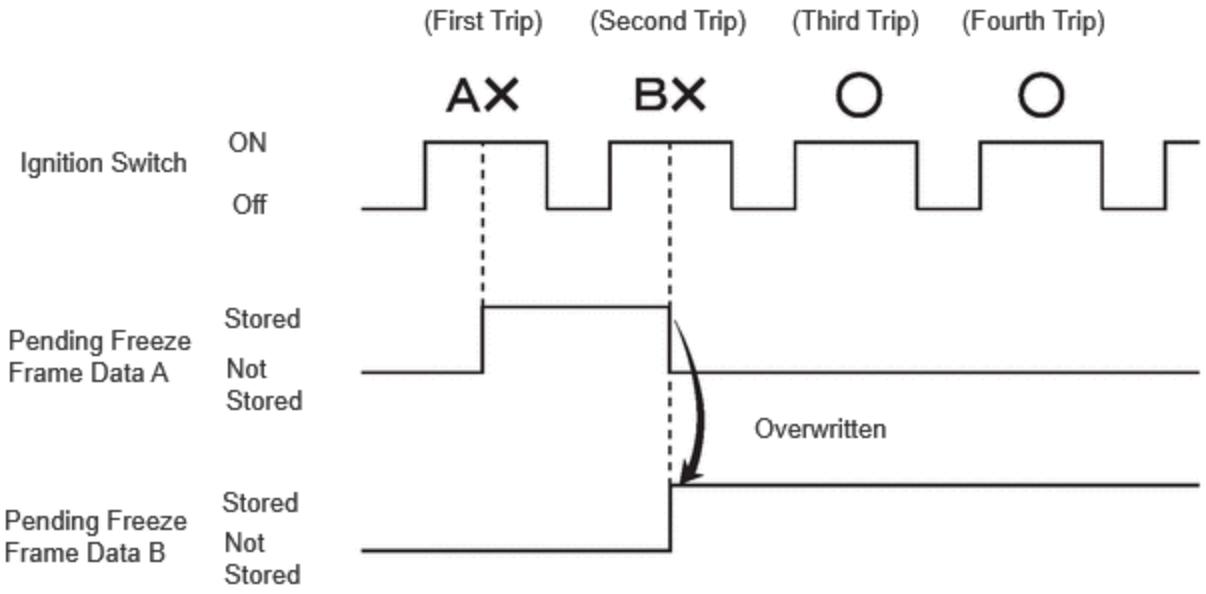
HINT:

- Pending Freeze Frame Data is cleared when any of the following occurs.
  - Using the GTS, the DTCs are cleared.
  - The cable is disconnected from the negative (-) auxiliary battery terminal.
  - 40 trips with the engine fully warmed up have been performed after returning to normal. (Pending Freeze Frame Data will not be cleared by only returning the system to normal.)
- With previous pending Freeze Frame Data stored, if pending Freeze Frame Data is newly stored when a 2 trip detection logic DTC is detected in the first trip, the old Freeze Frame Data will be replaced with the new data of the newly detected DTC in the next trip.

When a DTC is detected in both the first and second trips but the system returns to normal from the third trip (2 trip detection logic DTC):



When a 2 trip detection logic DTC is first detected in the first trip and another 2 trip detection logic DTC is first detected in the second trip:



AX : Pending malfunction A detected

BX : Pending malfunction B detected

○ : No malfunction detected

LIST OF FREEZE FRAME DATA

Powertrain > Engine

TESTER DISPLAY
Total Distance Traveled
Total Distance Traveled - Unit
Key Cycle
Elapsed Time
Vehicle Speed
Engine Speed

TESTER DISPLAY
Calculate Load
Vehicle Load
Mass Air Flow Sensor
Atmospheric Pressure
Intake Manifold Absolute Pressure
Intake Manifold Absolute Pressure Supported
Engine Oil Temperature Sensor
Coolant Temperature
Intake Air Temperature
Ambient Temperature
Engine Run Time
Radiator Coolant Temperature
IG-ON Coolant Temperature
Initial Engine Coolant Temperature
IG-ON Intake Air Temperature
Initial Engine Intake Air Temperature
Battery Voltage
BATT Voltage
IG2 / IGP

TESTER DISPLAY
IGR
Engine Oil Pressure
Target Engine Oil Pressure
Engine Oil Pressure Control Valve
Intake Camshaft Position Sensor Voltage
Intake Camshaft Position Sensor Speed Bank 1
Exhaust Camshaft Position Sensor Voltage
Exhaust Camshaft Position Sensor Speed Bank 1
Crankshaft Position Sensor Voltage
Throttle Position Sensor No.1 Voltage %
Throttle Position Sensor No.2 Voltage %
System Guard
Open Side Malfunction
Throttle Request Position
Throttle Sensor Position
Throttle Position Sensor No.1 Voltage
Throttle Position Sensor No.2 Voltage
Throttle Position Command
Throttle Position Sensor Open Position No.1

TESTER DISPLAY
Throttle Position Sensor Open Position No.2
Throttle Motor Current
Throttle Motor Duty Ratio
Throttle Motor Duty Ratio (Open)
Throttle Motor Duty Ratio (Close)
Throttle Position Sensor Fully Closed Learn Value
+BM Voltage
Actuator Power Supply
Throttle Air Flow Learn Value (Area 1)
Throttle Air Flow Learn Value (Area 2)
Throttle Air Flow Learn Value (Area 3)
Throttle Air Flow Learn Value (Calculated Value)
Throttle Air Flow Learn Value (Atmosphere Pressure Offset Value)
Low Revolution Control
Engine Stall Control F/B Flow
Target Fuel Pressure (High)
Target Fuel Pressure (High) Supported
Target Fuel Pressure (Low) / Target Fuel Pressure 2
Target Fuel Pressure (Low) / Target Fuel Pressure 2 Supported

TESTER DISPLAY
Fuel Pressure (High)
Fuel Pressure (High) Supported
Fuel Pressure (Low) / Fuel Pressure 2
Fuel Pressure (Low) / Fuel Pressure 2 Supported
VSV for Vent Valve
Vacuum Pump
Fuel Pump Target Speed
Fuel Pump F/B Offset
Fuel Pump Control Duty Ratio
Low Pressure Fuel Delivery Internal Temperature
Injector Cylinder #1 (Port)
Injection Volume Cylinder #1
Target Fuel Pressure Offset
Injection Volume
Low Fuel Pressure Sensor
High Fuel Pressure Sensor
High Pressure Fuel Pump Duty Ratio (D4)
High Pressure Fuel Pump Discharge Rate
High Pressure Fuel Pump Internal Temperature

TESTER DISPLAY
Injection Mode
Injection Switching Status
Injection Timing Cylinder #1 (D4)
Injection Time Cylinder #1 (D4)
Current Fuel Type
EVAP (Purge) VSV
Fuel Filler Opener
Fuel Vapor-Containment Valve
Fuel Lid SW
Fuel Lid Sensor SW
Fuel Tank Internal Pressure
Vapor Pressure when Fuel Tank Leak Check Finished
Fuel Tank Leak Check Time Required
Vapor Pressure 1 during Fuel Tank Side Pressure Applied
Vapor Pressure 2 during Fuel Tank Side Pressure Applied
EVAP System Vapor Pressure 1 Supported
EVAP System Vapor Pressure 2 Supported
EVAP System Vapor Pressure 1 (Wide Range)
EVAP System Vapor Pressure 1 (Wide Range) Supported

TESTER DISPLAY
EVAP System Vapor Pressure 2 (Wide Range) Supported
Target Air-Fuel Ratio
A/F (O2) Lambda Sensor B1S1
A/F (O2) Lambda Sensor B1S2
A/F (O2) Sensor Current B1S1
A/F (O2) Sensor Current B1S2
A/F (O2) Sensor Heater Duty Ratio B1S1
A/F Sensor Heater Current Value B1S2
A/F Sensor Heater Duty B1S2
A/F Sensor Impedance B1S1
A/F Sensor Impedance B1S2
A/F (O2) Sensor +Terminal Voltage Bank 1
A/F (O2) Sensor -Terminal Voltage Bank 1
A/F (O2) Sensor Heater Control Duty Ratio Bank1
A/F (O2) Sensor Heater Output Duty Ratio Bank1
A/F (O2) Sensor Heater ON Current Value Bank1
A/F (O2) Sensor Heater Current-Carrying Status Bank1 (at Heater OFF)
A/F (O2) Sensor Heater Overcurrent Bank1
A/F (O2) Sensor Heater Control Run Time Bank1

TESTER DISPLAY
Short FT B1S1
Short FT B1S2
Long FT B1S1
Long FT B1S2
Total FT Bank 1
Fuel System Status Bank 1
Fuel System Status Bank 2
Ignition Timing Cylinder #1
Knock F/B Value
Knock Correct Learn Value
Idle Spark Advance Control Cylinder #1
Idle Spark Advance Control Cylinder #2
Idle Spark Advance Control Cylinder #3
Idle Spark Advance Control Cylinder #4
Mass Air Flow Circuit
Air Flow Meter Output Frequency
Target EGR Valve Position No.1
Target EGR Valve Position No.1 Supported
Actual EGR Valve Position No.1 Supported

TESTER DISPLAY
Target EGR Valve Position No.2 Supported
Actual EGR Valve Position No.2 Supported
EGR Step Position
VVT Advance Fail
Exhaust VVT Retarded Fail
Intake VVT Change Angle Bank 1
Exhaust VVT Hold Learn Value Bank 1
Exhaust VVT Change Angle Bank 1
Exhaust VVT OCV Control Duty Ratio Bank 1
Intake VVT Target Angle Bank 1
Exhaust VVT Target Angle Bank 1
Intake VVT Timing Most Over-Retarded Learn Value Bank 1
Exhaust VVT Timing Most Over-Advanced Learn Value Bank 1
VVT-iE Duty Ratio Bank 1
VVT-iE Motor Direction Bank 1
Catalyst Temperature B1S1
Catalyst Temperature B1S2
TC Terminal
MIL ON Run Distance

TESTER DISPLAY
Running Time from MIL ON
Time after DTC Cleared
Distance from DTC Cleared
Warmup Cycle Cleared DTC
Distance Traveled from Last Battery Cable Disconnect
IG OFF Elapsed Time
Soak IC Current Timer Value
Soak IC First Start Time
Soak Timer Start History
Ignition Trigger Count
Misfire Count Cylinder #1
Misfire Count Cylinder #2
Misfire Count Cylinder #3
Misfire Count Cylinder #4
All Cylinders Misfire Count
Misfire RPM
Misfire Load
Misfire Margin
Catalyst OT Misfire Fuel Cut

TESTER DISPLAY
Catalyst OT Misfire Fuel Cut History
Catalyst OT Misfire Fuel Cut Cylinder #1
Catalyst OT Misfire Fuel Cut Cylinder #2
Catalyst OT Misfire Fuel Cut Cylinder #3
Catalyst OT Misfire Fuel Cut Cylinder #4
A/F Learn Value Idle (Port) Bank 1
A/F Learn Value Low (Port) Bank 1
A/F Learn Value Mid No.1 (Port) Bank 1
A/F Learn Value Mid No.2 (Port) Bank 1
A/F Learn Value High (Port) Bank 1
IG ON Duration Time
IG OFF Duration Time
Engine Start Hesitation
Low Revolution for Engine Start
A/F Learn Value Idle Bank 1
A/F Learn Value Low Bank 1
A/F Learn Value Mid No.1 Bank 1
A/F Learn Value Mid No.2 Bank 1
A/F Learn Value High Bank 1

TESTER DISPLAY
Engine ECU Internal Temperature
Engine Cooling Fan
Cooling Fan Duty Ratio
Engine Speed Cylinder #1
Engine Speed Cylinder #2
Engine Speed Cylinder #3
Engine Speed Cylinder #4
Average Engine Speed of All Cylinder
A/F Sensor Determination (Worst Value) Bank 1
Engine Speed Fluctuation Average (Worst Value) Cylinder #1
Engine Speed Fluctuation Average (Worst Value) Cylinder #2
Engine Speed Fluctuation Average (Worst Value) Cylinder #3
Engine Speed Fluctuation Average (Worst Value) Cylinder #4
A/F Sensor Determination (Worst Value) (Port) Bank 1
Engine Speed Fluctuation Average (Worst Value) (Port) Cylinder #1
Engine Speed Fluctuation Average (Worst Value) (Port) Cylinder #2
Engine Speed Fluctuation Average (Worst Value) (Port) Cylinder #3
Engine Speed Fluctuation Average (Worst Value) (Port) Cylinder #4
Requested Engine Torque

TESTER DISPLAY
HV Target Engine Speed
Actual Engine Torque
Engine Driving Time
Request Engine Run Time
Judge Time Engine Ignition
Judge Time Engine Output
Fuel Level
ISC Learning Value
ISC Learning
F/C for Engine Stop Req
Engine Independent
Racing Operation
Request Warm-up
Engine Independent Control
Electric Water Pump Target Speed
Electric Water Pump Speed
Grille Shutter Position