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|---|---------------------------|--------------------------------------|
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| Model Year Start: 2023 | Model: Prius Prime | Prod Date Range: [12/2022 -] |
| Title: HYBRID / BATTERY CONTROL: MOTOR GENERATOR CONTROL SYSTEM (for M20A-FXS): P0A949E,P0D3319; DC/DC Converter Stuck On; 2023 - 2024 MY Prius Prius Prime [12/2022 -] | | |

| | | |
|------------|----------------|---------------------------------|
| DTC | P0A949E | DC/DC Converter Stuck On |
|------------|----------------|---------------------------------|

| | | |
|------------|----------------|--|
| DTC | P0D3319 | DC/DC Converter Circuit Current Above Threshold |
|------------|----------------|--|

DTC SUMMARY

MALFUNCTION DESCRIPTION

This DTC indicates that a large current flowed in the boost converter. The cause of this malfunction may be one of the following:

| AREA | MAIN MALFUNCTION DESCRIPTION |
|-----------------------------------|---|
| Hybrid vehicle transaxle assembly | <ul style="list-style-type: none"> Open or short circuit in the motor or generator coils Motor (MG2) or generator (MG1) internal malfunction (iron particles or damage from foreign objects) |
| Resolver | Open or short circuit in the motor resolver or generator resolver |
| Inverter | <ul style="list-style-type: none"> Inverter internal circuit malfunction Malfunction in ECU that controls the inverter Malfunction in sensor for inverter control (current sensor, VH sensor, VL sensor) |
| Inverter cooling system | <ul style="list-style-type: none"> Inverter water pump assembly malfunction Coolant leak Frozen Blockage |

DESCRIPTION

For a description of the boost converter.

Click here [INFO](#)

| DTC NO. | DETECTION ITEM | DTC DETECTION CONDITION | TROUBLE AREA | MIL | WARNING INDICATE | DTC OUTPUT FROM | PRIORITY | NOTE |
|---------|--------------------------|--|---|----------|--------------------------|-----------------|----------|-----------------|
| P0A949E | DC/DC Converter Stuck On | Boost converter fail signal detected (circuit malfunction) | <ul style="list-style-type: none"> Inverter cooling system Cooling fan system | Comes on | Master Warning: Comes on | Motor Generator | A | SAE Code: P0A94 |

| DTC NO. | DETECTION ITEM | DTC DETECTION CONDITION | TROUBLE AREA | MIL | WARNING INDICATE | DTC OUTPUT FROM | PRIORITY | NOTE |
|---------|---|---|--|----------|-----------------------------|-----------------|----------|--------------------|
| | | (1 trip detection logic) | <ul style="list-style-type: none"> • Wire harness or connector • Motor cable • Hybrid vehicle transaxle assembly • PCU NO. 1 fuse • Inverter with converter assembly • Hybrid vehicle control ECU • No. 1 traction battery device box • HV floor under wire (rear traction motor cable)* • Rear traction motor with transaxle assembly* | | | | | |
| P0D3319 | DC/DC Converter Circuit Current Above Threshold | <p>Boost converter fail signal detected:</p> <p>A malfunction is detected in any of the boost converter components (inverter, hybrid vehicle transaxle, motor generator control ECU, etc.).</p> <p>(1 trip detection logic)</p> | <ul style="list-style-type: none"> • Inverter cooling system • Cooling fan system • Wire harness or connector • Motor cable • Hybrid vehicle transaxle assembly • PCU NO. 1 fuse • Inverter with | Comes on | Master Warning: Comes on | Motor Generator | A | SAE Code: P0D33 |

| DTC NO. | DETECTION ITEM | DTC DETECTION CONDITION | TROUBLE AREA | MIL | WARNING INDICATE | DTC OUTPUT FROM | PRIORITY | NOTE |
|---------|----------------|-------------------------|---|-----|------------------|-----------------|----------|------|
| | | | converter assembly • Hybrid vehicle control ECU • No. 1 traction battery device box • HV floor under wire (rear traction motor cable)* • Rear traction motor with transaxle assembly* | | | | | |

*: for 4WD

MONITOR DESCRIPTION

If excessive amperage flows through the boost converter, the boost converter will transmit a boost converter fail signal to the motor generator control ECU. Upon receiving this signal, the ECU will illuminate the MIL and store a DTC.

MONITOR STRATEGY

| | |
|-----------------------------|---|
| Related DTCs | P0A94 (INF P0A949E): FCV detection (Circuit malfunction) P0D33 (INF P0D3319): FCV detection (Over current malfunction) |
| Required sensors/components | Boost converter |
| Frequency of operation | Continuous |
| Duration | TMC's intellectual property |
| MIL operation | 1 driving cycle |
| Sequence of operation | None |

TYPICAL ENABLING CONDITIONS

| | |
|---|-----------------------------|
| The monitor will run whenever the following DTCs are not stored | TMC's intellectual property |
| Other conditions belong to TMC's intellectual property | - |

TYPICAL MALFUNCTION THRESHOLDS

TMC's intellectual property

-

COMPONENT OPERATING RANGE

Motor generator control ECU

DTC P0A94 (INF P0A949E) is not detected
DTC P0D33 (INF P0D3319) is not detected

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](#)

- Clear the DTCs (even if no DTCs are stored, perform the clear DTC procedure).
- Turn the ignition switch off and wait for 2 minutes or more.
- Turn the ignition switch to ON and wait for 5 seconds or more. [*1]
- Turn the ignition switch to ON (READY) and wait for 5 seconds or more. [*2]
- Press the HV EV CHG HOLD mode switch to enter HV drive mode. [*3]
- Depress the accelerator pedal of the vehicle with the engine stopped and the shift lever in P to start the engine. [*4]

NOTICE:

As the state of charge of the HV battery may be low after driving in fail-safe mode, it will automatically be charged for 5 to 10 minutes with ignition switch ON (READY) after repairs have been performed.

HINT:

- Check that there are no abnormalities (abnormal sounds, coolant leaks, etc.).
- [*1] to [*4]: Normal judgment procedure.

The normal judgment procedure is used to complete DTC judgment and also used when clearing permanent DTCs.

- Enter the following menus: Powertrain / Motor Generator / Utility / All Readiness.
- Check the DTC judgment result.

HINT:

- If the judgment result shows NORMAL, the system is normal.
- If the judgment result shows ABNORMAL, the system has a malfunction.
- If the judgment result shows INCOMPLETE, perform the normal judgment procedure again.

WIRING DIAGRAM

Refer to the wiring diagram for the Generator Resolver Circuit.

Click here [INFO](#)

Refer to the wiring diagram for the Motor Resolver Circuit.

Click here [INFO](#)

Refer to the wiring diagram for the Rear Motor Resolver Circuit.

Click here [INFO](#)

Refer to the wiring diagram for the Generator High-voltage Circuit.

Click here [INFO](#)

Refer to the wiring diagram for the Motor High-voltage Circuit.

Click here [INFO](#)

Refer to the wiring diagram for the Rear Motor High-voltage Circuit.

Click here [INFO](#)

Refer to the wiring diagram for the Inverter Low-voltage Circuit.

Click here [INFO](#)

Refer to the wiring diagram for the Cooling System.

Click here [INFO](#)

CAUTION / NOTICE / HINT

CAUTION:

Refer to the precautions before inspecting high voltage circuit.

Click here [INFO](#)

NOTICE:

- After the ignition switch is turned off, there may be a waiting time before disconnecting the negative (-) auxiliary battery terminal.

Click here [INFO](#)

- When disconnecting and reconnecting the auxiliary battery.

HINT:

When disconnecting and reconnecting the auxiliary battery, there is an automatic learning function that completes learning when the respective system is used.

Click here [INFO](#)

- After troubleshooting and repairing all output DTCs, be sure to replace the inverter with converter assembly. (The inverter with converter assembly may have been broken or damaged due to overheating.)

HINT:

- P0A949E or P0D3319 may be output as a result of the malfunction indicated by the DTCs in table below.
 - The chart above is listed in inspection order of priority.
 - Check DTCs that are output at the same time by following the listed order. (The main cause of the malfunction can be determined without performing unnecessary inspections.)
- If DTC P0A949E is output, replace the inverter with converter assembly after completing repairs.

Table 1

| MALFUNCTION CONTENT | SYSTEM | RELEVANT DTC | |
|------------------------|-----------------------|--------------|---|
| Insulation malfunction | Hybrid control system | P1C7C49 | Hybrid/EV Battery Voltage System Isolation (A/C Area) Internal Electronic Failure |
| | | P1C7D49 | Hybrid/EV Battery Voltage System Isolation (Hybrid/EV Battery Area) Internal Electronic Failure |

| MALFUNCTION CONTENT | SYSTEM | RELEVANT DTC | |
|---|-----------------------|--------------|---|
| | | P1C7E49 | Hybrid/EV Battery Voltage System Isolation (Transaxle Area) Internal Electronic Failure |
| | | P1C7F49 | Hybrid/EV Battery Voltage System Isolation (Direct Current Area) Internal Electronic Failure |
| | | P1C8049 | Hybrid/EV Battery Voltage System Isolation (Rear Motor Area) Internal Electronic Failure |
| System main relay or high voltage circuit malfunction | Hybrid control system | P0AD911 | Hybrid/EV Battery Positive Contactor Circuit Short to Ground |
| | | P0AD915 | Hybrid/EV Battery Positive Contactor Circuit Short to Auxiliary Battery or Open |
| | | P0ADD11 | Hybrid/EV Battery Negative Contactor Circuit Short to Ground |
| | | P0ADD15 | Hybrid/EV Battery Negative Contactor Circuit Short to Auxiliary Battery or Open |
| | | P1C8449 | High Voltage Power Resource Circuit Short during Ready ON |
| HV battery malfunction | Hybrid control system | P0A1F94 | Hybrid/EV Battery Energy Control Module Unexpected Operation |
| | | P0ABF00 | Hybrid/EV Battery Current Sensor "A" Circuit Range/Performance |
| | | P0B231C | Hybrid/EV Battery "A" Voltage Sensor Voltage Out of Range |
| | | P31B300 | Hybrid/EV Battery Voltage High |
| | | U011187 | Lost Communication with Hybrid/EV Battery Energy Control Module "A" Missing Message |
| | Hybrid battery system | P056014 | System Voltage (BATT) Circuit Short to Ground or Open |
| | | P060629 | Hybrid/EV Battery Energy Control Module Processor to Monitoring Processor Signal Invalid |
| | | P060687 | Hybrid/EV Battery Energy Control Module Processor to Monitoring Processor Missing Message |
| | | P060A47 | Hybrid/EV Battery Energy Control Module Monitoring Processor Watchdog / Safety MCU Failure |
| | | P060A87 | Hybrid/EV Battery Energy Control Module Processor from Monitoring Processor Missing Message |
| | | P060B49 | Hybrid/EV Battery Energy Control Module A/D Processing Internal Electronic Failure |
| | | P0ABF11 | Hybrid/EV Battery Current Sensor "A" Circuit Short to Ground |
| | | P0ABF15 | Hybrid/EV Battery Current Sensor "A" Circuit Short to Auxiliary Battery or Open |
| | | P0ABF28 | Hybrid/EV Battery Current Sensor "A" Signal Bias Level Out of Range / Zero Adjustment Failure |

| MALFUNCTION CONTENT | SYSTEM | RELEVANT DTC |
|---------------------|--------|---|
| | | P0ABF2A Hybrid/EV Battery Current Sensor "A" Signal Stuck In Range |
| | | P0B0E11 Hybrid/EV Battery Current Sensor "B" Circuit Short to Ground |
| | | P0B0E15 Hybrid/EV Battery Current Sensor "B" Circuit Short to Auxiliary Battery or Open |
| | | P0B1362 Hybrid/EV Battery Current Sensor "A"/"B" Signal Compare Failure |
| | | P0E2D00 Hybrid/EV Battery Energy Control Module Hybrid/EV Battery Monitor Performance |
| | | P1A001C Hybrid Battery Stack 2 Cell Voltage Detection Voltage Out of Range |
| | | P1A6017 Hybrid/EV Battery Stack 2 Cell Circuit Voltage Above Threshold |
| | | P1A6116 Hybrid/EV Battery Stack 2 Cell Circuit Voltage Below Threshold |
| | | P1A8100 Hybrid/EV Battery Stack 1 Delta SOC High (Extreme) |
| | | P1A8600 Hybrid/EV Battery Stack 2 Delta SOC High (Extreme) |
| | | P1AFD00 Flying Capacitor Circuit Voltage Out of Range |
| | | P1AFD1C Flying Capacitor/Internal Control Module Hybrid/EV Battery Monitor Voltage Out of Range |
| | | P1CBB12 Hybrid/EV Battery Current Sensor Power Supply Circuit Short to Auxiliary Battery |
| | | P1CBB14 Hybrid/EV Battery Current Sensor Power Supply Circuit Short to Ground or Open |
| | | P1CC81E Hybrid/EV Battery Stack 1 Voltage Difference Out of Range |
| | | P1CC91E Hybrid/EV Battery Stack 2 Voltage Difference Out of Range |
| | | P301A1C Hybrid Battery Stack 1 Cell Voltage Detection Voltage Out of Range |
| | | P31AA17 Hybrid/EV Battery Stack 1 Cell Circuit Voltage Above Threshold |
| | | P31AB16 Hybrid/EV Battery Stack 1 Cell Circuit Voltage Below Threshold |
| | | P33DA1E Hybrid/EV Battery Stack 1 Circuit Resistance Out of Range |
| | | P33DB1E Hybrid/EV Battery Stack 2 Circuit Resistance Out of Range |
| | | P33E01B Hybrid/EV Battery Stack 1 Circuit Resistance Above Threshold |

| MALFUNCTION CONTENT | SYSTEM | RELEVANT DTC | |
|---------------------|--------|--------------|--|
| | | P33E11B | Hybrid/EV Battery Stack 2 Circuit Resistance Above Threshold |
| | | P33EC16 | (Extreme) Hybrid/EV Battery Stack 1 Cell Circuit Voltage Below Threshold |
| | | P33ED16 | (Extreme) Hybrid/EV Battery Stack 2 Cell Circuit Voltage Below Threshold |
| | | U029387 | Lost Communication with Hybrid/EV Powertrain Control Module Missing Message |
| | | U115087 | Lost Communication with Hybrid Powertrain Control Module (Hybrid/EV Battery Local Bus) Missing Message |

Table 2

| MALFUNCTION CONTENT | SYSTEM | RELEVANT DTC | |
|---------------------------|--------------------------------|--------------|--|
| Microcomputer malfunction | Motor generator control system | P0A1A47 | Generator Control Module Watchdog / Safety MC Failure |
| | | P0A1A49 | Generator Control Module Internal Electronic Failure |
| | | P0A1B1F | Generator Control Module Circuit Intermittent |
| | | P0A1C47 | Drive Motor "B" Control Module Watchdog / Safety MCU Failure |
| | | P0A1C49 | Drive Motor "B" Control Module Internal Electronic Failure |
| | | P1C2A1C | Generator A/D Converter Circuit Circuit Voltage Out of Range |
| | | P1C2A49 | Generator A/D Converter Circuit Internal Electronic Failure |
| | | P1C2A71 | Generator A/D Converter Circuit Actuator Stuck |
| | | P1C2B1C | Drive Motor "A" Control Module A/D Converter Circuit Voltage Out of Range |
| | | P1C2B49 | Drive Motor "A" Control Module A/D Converter Circuit Internal Electronic Failure |
| | | P1C2B71 | Drive Motor "A" Control Module A/D Converter Circuit Actuator Stuck |
| | | P1C2C1C | Drive Motor "B" Control Module AD Converter Circuit Voltage Out of Range |
| | | P1C2C49 | Drive Motor "B" Control Module AD Converter Internal Electronic Failure |
| | | P1C2C71 | Drive Motor "B" Control Module A/D Converter Circuit Actuator Stuck |
| | | P310A83 | Communication Error from Drive Motor "B" to Drive Motor "A" Value of Signal Protection Calculation Incorrect |
| | | P310A86 | Communication Error from Drive Motor "B" to Drive Motor "A" Signal (Some Circuit Quantity, Reported via Serial Data) Invalid |

| MALFUNCTION CONTENT | SYSTEM | RELEVANT DTC | | | |
|---------------------|--------|----------------------------------|---|---------|--|
| | | P310A87 | Communication Error from Drive Motor "B" to Drive Motor "A" Missing Message | | |
| | | P310B83 | Communication Error from Drive Motor "A" to Drive Motor "B" Value of Signal Protection Calculation Incorrect | | |
| | | P310B86 | Communication Error from Drive Motor "A" to Drive Motor "B" Signal (Some Circuit Quantity, Reported via Serial Data) Invalid | | |
| | | P310B87 | Communication Error from Drive Motor "A" to Drive Motor "B" Missing Message | | |
| | | P313383 | Communication Error from Generator to Drive Motor "A" Value of Signal Protection Calculation Incorrect | | |
| | | P313386 | Communication Error from Generator to Drive Motor "A" Signal Invalid | | |
| | | P313387 | Communication Error from Generator to Drive Motor "A" Missing Message | | |
| | | P313483 | Communication Error from Drive Motor "A" to Generator Value of Signal Protection Calculation Incorrect | | |
| | | P313486 | Communication Error from Drive Motor "A" to Generator Signal Invalid | | |
| | | P313487 | Communication Error from Drive Motor "A" to Generator Missing Message | | |
| | | P32BF83 | Lost Communication between Drive Motor "A" and "B" (Drive Motor "A") Value of Signal Protection Calculation Incorrect | | |
| | | P32BF86 | Lost Communication between Drive Motor "A" and "B" (Drive Motor "A") Signal (Some Circuit Quantity, Reported via Serial Data) Invalid | | |
| | | P32BF87 | Lost Communication between Drive Motor "A" and "B" (Drive Motor "A") Missing Message | | |
| | | P32CF83 | Lost Communication between Drive Motor "A" and "B" (Drive Motor "B") Value of Signal Protection Calculation Incorrect | | |
| | | P32CF86 | Lost Communication between Drive Motor "A" and "B" (Drive Motor "B") Signal (Some Circuit Quantity, Reported via Serial Data) Invalid | | |
| | | P32CF87 | Lost Communication between Drive Motor "A" and "B" (Drive Motor "B") Missing Message | | |
| | | | Hybrid control system | P0A1B49 | Drive Motor "A" Control Module Internal Electronic Failure |
| | | Power source circuit malfunction | Motor generator control system | P06B01C | Generator Control Module Position Sensor REF Power Source Circuit Voltage Out of Range |

| MALFUNCTION CONTENT | SYSTEM | RELEVANT DTC | |
|---|--|--------------|--|
| | | P06B31C | Drive Motor "B" Control Module Position Sensor REF Power Source Circuit Voltage Out of Range |
| | | P06D61C | Generator Control Module Offset Power Circuit Voltage Out of Range |
| | | P19F81C | Generator Control Module Offset Power Circuit Voltage Out of Range |
| | | P19F91C | Drive Motor "B" Control Module Offset Power Circuit Voltage Out of Range |
| | | P26DF1C | Generator Control Module Position Sensor REF Power Source Circuit Voltage Out of Range |
| | | | |
| Communication malfunction | Motor generator control system | U11B387 | Lost Communication with Hybrid/EV Powertrain Control Module (ch5) Missing Message |
| | Hybrid control system | U117E87 | Lost Communication with Drive MotorControl Module "A" (ch4) Missing Message |
| Sensor and actuator circuit malfunction | Motor generator control system | P0A3F16 | Drive Motor "A" Position Sensor Circuit Voltage Below Threshold |
| | | P0A3F21 | Drive Motor "A" Position Sensor Signal Amplitude < Minimum |
| | | P0A3F22 | Drive Motor "A" Position Sensor Signal Amplitude > Maximum |
| | | P0A4516 | Drive Motor "B" Position Sensor Circuit Voltage Below Threshold |
| | | P0A4521 | Drive Motor "B" Position Sensor Signal Amplitude < Minimum |
| | | P0A4522 | Drive Motor "B" Position Sensor Signal Amplitude > Maximum |
| | | P0A4B16 | Generator Position Sensor Circuit Voltage Below Threshold |
| | | P0A4B21 | Generator Position Sensor Signal Amplitude < Minimum |
| | | P0A4B22 | Generator Position Sensor Signal Amplitude > Maximum |
| | | P0A6012 | Drive Motor "A" Phase V Current (High Resolution) Circuit Short to Battery |
| | | P0A6014 | Drive Motor "A" Phase V Current (High Resolution) Circuit Short to Ground or Open |
| | | P0A601C | Drive Motor "A" Phase V Current (High Resolution) Circuit Voltage Out of Range |
| | | P0A6312 | Drive Motor "A" Phase W Current (High Resolution) Circuit Short to Battery |
| | | P0A6314 | Drive Motor "A" Phase W Current (High Resolution) Circuit Short to Ground or Open |
| P0A631C | Drive Motor "A" Phase W Current (High Resolution) Circuit Voltage Out of Range | | |

| MALFUNCTION CONTENT | SYSTEM | RELEVANT DTC | |
|---------------------|--------|--------------|---|
| | | P0A6912 | Drive Motor "B" Phase V Current(High Resolution) Circuit Short to Battery |
| | | P0A6914 | Drive Motor "B" Phase V Current(High Resolution) Circuit Short to Ground or Open |
| | | P0A691C | Drive Motor "B" Phase V Current(High Resolution) Circuit Voltage Out of Range |
| | | P0A6C12 | Drive Motor "B" Phase W Current(High Resolution) Circuit Short to Battery |
| | | P0A6C14 | Drive Motor "B" Phase W Current(High Resolution) Circuit Short to Ground or Open |
| | | P0A6C1C | Drive Motor "B" Phase W Current(High Resolution) Circuit Voltage Out of Range |
| | | P0BE512 | Drive Motor "A" Phase U Current Sensor Circuit Short to Battery |
| | | P0BE514 | Drive Motor "A" Phase U Current Sensor Circuit Short to Ground or Open |
| | | P0BE528 | Drive Motor "A" Phase U Current Sensor Signal Bias Level Out of Range / Zero Adjustment Failure |
| | | P0BE912 | Drive Motor "A" Phase V Current Sensor Circuit Short to Battery |
| | | P0BE914 | Drive Motor "A" Phase V Current Sensor Circuit Short to Ground or Open |
| | | P0BE928 | Drive Motor "A" Phase V Current Sensor Signal Bias Level Out of Range / Zero Adjustment Failure |
| | | P0BED12 | Drive Motor "A" Phase W Current Sensor Circuit Short to Battery |
| | | P0BED14 | Drive Motor "A" Phase W Current Sensor Circuit Short to Ground or Open |
| | | P0BED28 | Drive Motor "A" Phase W Current Sensor Signal Bias Level Out of Range / Zero Adjustment Failure |
| | | P0BF112 | Drive Motor "B" Phase U Current Sensor Circuit Short to Battery |
| | | P0BF114 | Drive Motor "B" Phase U Current Sensor Circuit Short to Ground or Open |
| | | P0BF128 | Drive Motor "B" Phase U Current Sensor Signal Bias Level Out of Range / Zero Adjustment Failure |
| | | P0BF512 | Drive Motor "B" Phase V Current Sensor Circuit Short to Battery |
| | | P0BF514 | Drive Motor "B" Phase V Current Sensor Circuit Short to Ground or Open |

| MALFUNCTION CONTENT | SYSTEM | RELEVANT DTC | |
|---------------------|--------|--------------|---|
| | | P0BF528 | Drive Motor "B" Phase V Current Sensor Signal Bias Level Out of Range / Zero Adjustment Failure |
| | | P0BF912 | Drive Motor "B" Phase W Current Sensor Circuit Short to Battery |
| | | P0BF914 | Drive Motor "B" Phase W Current Sensor Circuit Short to Ground or Open |
| | | P0BF928 | Drive Motor "B" Phase W Current Sensor Signal Bias Level Out of Range / Zero Adjustment Failure |
| | | P0BFD62 | Drive Motor "A" Phase U-V-W Current Sensor Signal Compare Failure |
| | | P0BFE62 | Drive Motor "B" Phase U-V-W Current Sensor Signal Compare Failure |
| | | P0C5013 | Drive Motor "A" Position Sensor Circuit "A" Circuit Open |
| | | P0C5016 | Drive Motor "A" Position Sensor Circuit "A" Circuit Voltage Below Threshold |
| | | P0C5017 | Drive Motor "A" Position Sensor Circuit "A" Circuit Voltage Above Threshold |
| | | P0C5513 | Drive Motor "B" Position Sensor Circuit "A" Circuit Open |
| | | P0C5516 | Drive Motor "B" Position Sensor Circuit "A" Circuit Voltage Below Threshold |
| | | P0C5517 | Drive Motor "B" Position Sensor Circuit "A" Circuit Voltage Above Threshold |
| | | P0C5A13 | Drive Motor "A" Position Sensor Circuit "B" Circuit Open |
| | | P0C5A16 | Drive Motor "A" Position Sensor Circuit "B" Circuit Voltage Below Threshold |
| | | P0C5A17 | Drive Motor "A" Position Sensor Circuit "B" Circuit Voltage Above Threshold |
| | | P0C5F13 | Drive Motor "B" Position Sensor Circuit "B" Circuit Open |
| | | P0C5F16 | Drive Motor "B" Position Sensor Circuit "B" Circuit Voltage Below Threshold |
| | | P0C5F17 | Drive Motor "B" Position Sensor Circuit "B" Circuit Voltage Above Threshold |
| | | P0C6413 | Generator Position Sensor Circuit "A" Circuit Open |
| | | P0C6416 | Generator Position Sensor Circuit "A" Circuit Voltage Below Threshold |
| | | P0C6417 | Generator Position Sensor Circuit "A" Circuit Voltage Above Threshold |
| | | P0C6913 | Generator Position Sensor Circuit "B" Circuit Open |
| | | P0C6916 | Generator Position Sensor Circuit "B" Circuit Voltage Below Threshold |

| MALFUNCTION CONTENT | SYSTEM | RELEVANT DTC | |
|---------------------|--------|--------------|---|
| | | P0C6917 | Generator Position Sensor Circuit "B" Circuit Voltage Above Threshold |
| | | P0D2D16 | Drive Motor "A" Inverter Voltage Sensor (VH) Circuit Voltage Below Threshold |
| | | P0D2D17 | Drive Motor "A" Inverter Voltage Sensor (VH) Circuit Voltage Above Threshold |
| | | P0DFA62 | Generator Phase U-V-W Current Sensor Signal Compare Failure |
| | | P0E0012 | Generator Phase U Current Sensor Circuit Short to Battery |
| | | P0E0014 | Generator Phase U Current Sensor Circuit Short to Ground or Open |
| | | P0E0028 | Generator Phase U Current Sensor Signal Bias Level Out of Range / Zero Adjustment Failure |
| | | P0E0412 | Generator Phase V Current Sensor Circuit Short to Battery |
| | | P0E0414 | Generator Phase V Current Sensor Circuit Short to Ground or Open |
| | | P0E0428 | Generator Phase V Current Sensor Signal Bias Level Out of Range / Zero Adjustment Failure |
| | | P0E0812 | Generator Phase W Current Sensor Circuit Short to Battery |
| | | P0E0814 | Generator Phase W Current Sensor Circuit Short to Ground or Open |
| | | P0E0828 | Generator Phase W Current Sensor Signal Bias Level Out of Range / Zero Adjustment Failure |
| | | P0E3116 | DC/DC Converter Voltage Sensor "A" (VL) Circuit Voltage Below Threshold |
| | | P0E3117 | DC/DC Converter Voltage Sensor "A" (VL) Circuit Voltage Above Threshold |
| | | P0E5111 | DC/DC Converter Current Sensor Circuit Short to Ground |
| | | P0E5115 | DC/DC Converter Current Sensor Circuit Short to Battery or Open |
| | | P0E5128 | DC/DC Converter Current Sensor Signal Bias Level Out of Range / Zero Adjustment Failure |
| | | P0E512A | DC/DC Converter Current Sensor Signal Stuck In Range |
| | | P1CAC49 | Generator Position Sensor Internal Electronic Failure |
| | | P1CAD49 | Drive Motor "A" Position Sensor Internal Electronic Failure |
| | | P1CAE49 | Drive Motor "B" Position Sensor Internal Electronic Failure |
| | | P1CAF38 | Generator Position Sensor REF Signal Cycle Malfunction Signal Frequency Incorrect |
| | | P1CB038 | Drive Motor "A" Position Sensor REF Signal Frequency Incorrect |

| MALFUNCTION CONTENT | SYSTEM | RELEVANT DTC | |
|---------------------|--------------------------------|-----------------------|--|
| | | P1CB138 | Drive Motor "B" Position Sensor REF Signal Frequency Incorrect |
| | | P1CFF62 | Hybrid/EV Battery Current/DC/DC Converter Current Signal Compare Failure |
| | Hybrid control system | P0C7600 | Hybrid/EV Battery System Discharge Time Too Long |
| | | P0D2D1C | Drive Motor "A" Inverter Voltage Sensor Voltage Out of Range |
| | | P0E311C | Boosting Converter Voltage Sensor "A" Voltage Out of Range |
| System malfunction | Motor generator control system | P0A9000 | Drive Motor "A" Performance |
| | | P0A9100 | Drive Motor "B" Performance |
| | | P0A9200 | Hybrid/EV Generator Performance |
| | | P0BFF1D | Drive Motor "A" Circuit Current Out of Range |
| | | P0C021D | Drive Motor "B" System Circuit Current Out of Range |
| | | P0C1900 | Drive Motor "A" Execution Torque Performance |
| | | P0C1A00 | Drive Motor "B" Execution Torque Performance |
| | | P0CA300 | DC/DC Converter Step Up Voltage Performance |
| | | P0E7100 | Generator Execution Torque Performance |
| | | P1CA51D | Hybrid/EV Generator Circuit Current Out of Range |
| | | P314F1F | DC/DC Converter Voltage Sensor "A" (VL) Circuit Intermittent |
| | | P31531D | DC/DC Converter Current Sensor Circuit Current Out of Range |
| | | Hybrid control system | P0A9300 |
| | P0AA649 | | Hybrid/EV Battery Voltage System Isolation Internal Electronic Failure |
| | P0C7396 | | Motor Electronics Coolant Pump "A" Component Internal Failure |
| | P314A31 | | Motor Electronics Coolant Pump "A" No Signal |

Table 3

| SYSTEM | RELEVANT DTC | |
|--------------------------------|--------------|--|
| Motor generator control system | P06B31F | Drive Motor "B" Control Module Position Sensor REF Power Source Circuit Intermittent |
| | P0A3F1F | Drive Motor "A" Position Sensor Circuit Intermittent |
| | P0A451F | Drive Motor "B" Position Sensor Circuit Intermittent |
| | P0A4B1F | Generator Position Sensor Circuit Intermittent |
| | P0A601F | Drive Motor "A" Phase V Current (High Resolution) Circuit Intermittent |

| SYSTEM | RELEVANT DTC | |
|--------|--------------|--|
| | P0A631F | Drive Motor "A" Phase W Current (High Resolution) Circuit Intermittent |
| | P0A691F | Drive Motor "B" Phase V Current(High Resolution) Circuit Intermittent |
| | P0A6C1F | Drive Motor "B" Phase W Current(High Resolution) Circuit Intermittent |
| | P0BF11F | Drive Motor "B" Phase U Current Sensor Circuit Intermittent |
| | P0BE51F | Drive Motor "A" Phase U Current Sensor Circuit Intermittent |
| | P0BE91F | Drive Motor "A" Phase V Current Sensor Circuit Intermittent |
| | P0BED1F | Drive Motor "A" Phase W Current Sensor Circuit Intermittent |
| | P0C501F | Drive Motor "A" Position Sensor Circuit "A" Circuit Intermittent |
| | P0C551F | Drive Motor "B" Position Sensor Circuit "A" Circuit Intermittent |
| | P0C5A1F | Drive Motor "A" Position Sensor Circuit "B" Circuit Intermittent |
| | P0C5F1F | Drive Motor "B" Position Sensor Circuit "B" Circuit Intermittent |
| | P0C641F | Generator Position Sensor Circuit "A" Circuit Intermittent |
| | P0C691F | Generator Position Sensor Circuit "B" Circuit Intermittent |
| | P0D2D1F | Drive Motor "A" Inverter Voltage Sensor (VH) Circuit Intermittent |
| | P0E001F | Generator Phase U Current Sensor Circuit Intermittent |
| | P0E041F | Generator Phase V Current Sensor Circuit Intermittent |
| | P0E081F | Generator Phase W Current Sensor Circuit Intermittent |
| | P0E311F | DC/DC Converter Voltage Sensor "A" (VL) Circuit Intermittent |
| | P0E511F | DC/DC Converter Current Sensor Circuit Intermittent |
| | P1C601F | Generator Control Module Position Sensor REF Power Source Circuit Intermittent |
| | P1C621F | Generator Control Module Offset Power Circuit Intermittent |
| | P1C641F | Generator Control Module Circuit Intermittent |
| | P1C651F | Generator Control Module Circuit Intermittent |
| | P1C661F | Drive Motor "B" Control Module Circuit Intermittent |
| | P1C671F | Drive Motor "A" Phase U-V-W Current Sensor Circuit Intermittent |
| | P1C681F | Drive Motor "B" Phase U-V-W Current Sensor Circuit Intermittent |
| | P1C691F | Generator Phase U-V-W Current Sensor Circuit Intermittent |
| | P26DF1F | Generator Control Module Position Sensor REF Power Source Circuit Intermittent |
| | P310A1F | Communication Error from Drive Motor "B" to Drive Motor "A" Circuit Intermittent |
| | P310B1F | Communication Error from Drive Motor "A" to Drive Motor "B" Circuit Intermittent |
| | P31241F | Lost Communication between Drive Motor "A" and HV/EV ECU Circuit Intermittent |

| SYSTEM | RELEVANT DTC | |
|--------|--------------|--|
| | P32BF1F | Lost Communication between Drive Motor "A" and "B" (Drive Motor "A") Circuit Intermittent |
| | P32CF1F | Lost Communication between Drive Motor "A" and "B" (Drive Motor "B") Circuit Intermittent |

PROCEDURE

1. CHECK FREEZE FRAME DATA AND DIAGNOSIS RELATED INFORMATION

Pre-procedure1

(a) None

Procedure1

(b) Read the diagnosis related information and freeze frame data of DTC P0A949E or P0D3319.

Powertrain > Motor Generator > Utility

| |
|-------------------------------|
| TESTER DISPLAY |
| Diagnosis Related Information |

Powertrain > Motor Generator > Trouble Codes

| RESULT | PROCEED TO |
|--|------------|
| DTC U11B300 or U11B387 is listed in Diagnosis Related Information. | A |
| DTC U11B300 or U11B387 is not listed in Diagnosis Related Information and the value of freeze frame data item Emergency Shutdown Signal is ON. | B |
| Other than above | C |

Post-procedure1

(c) Turn the ignition switch off.

A ► **GO TO DTC CHART (U11B300)**

B ► **GO TO DTC CHART (P321E9F)**

C



2. CHECK FREEZE FRAME DATA

Pre-procedure1

(a) None

Procedure1

(b) Read the freeze frame data of DTC P0A949E or P0D3319.

Powertrain > Motor Generator > Trouble Codes

| RESULT | PROCEED TO |
|---|------------|
| Boosting Converter Temperature (Upper) and Boosting Converter Temperature 1 (Lower) are 120°C or more | A |
| Other than above | B |

Post-procedure1

(c) Turn the ignition switch off.

B ► **GO TO STEP 4****A****3. CHECK COOLING SYSTEM**Click here [INFO](#)**NEXT** ► **GO TO STEP 4****4. CHECK CONNECTOR CONNECTION CONDITION (INVERTER WITH CONVERTER ASSEMBLY CONNECTOR)**Click here [INFO](#)

| RESULT | PROCEED TO |
|--------|------------|
| OK | A |

| RESULT | PROCEED TO |
|---|------------|
| NG (The connector is not connected securely.) | B |
| NG (The terminals are not making secure contact or are deformed, or water or foreign matter exists in the connector.) | C |

B ▶ **CONNECT SECURELY**

C ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

A



| | |
|-----------|---|
| 5. | CHECK GENERATOR RESOLVER CIRCUIT |
|-----------|---|

Click here [INFO](#)

NEXT



| | |
|-----------|-------------------------------------|
| 6. | CHECK MOTOR RESOLVER CIRCUIT |
|-----------|-------------------------------------|

Click here [INFO](#)

NEXT



| | |
|-----------|--------------------------------------|
| 7. | CONFIRM VEHICLE SPECIFICATION |
|-----------|--------------------------------------|

| RESULT | PROCEED TO |
|---------|------------|
| for 2WD | A |
| for 4WD | B |

B ▶ **GO TO STEP 12**

A**8. CHECK GENERATOR HIGH-VOLTAGE CIRCUIT**Click here [INFO](#)**NEXT****9. CHECK MOTOR HIGH-VOLTAGE CIRCUIT**Click here [INFO](#)**NEXT****10. CHECK INVERTER LOW-VOLTAGE CIRCUIT**Click here [INFO](#)**HINT:**

If the "Inverter Low-voltage Circuit" inspection results are normal, perform the next step.

NEXT**11. CHECK FREEZE FRAME DATA**

Pre-procedure1

(a) None

Procedure1

(b) Read the freeze frame data for DTC P0A949E or DTC P0D3319.

NOTICE:

As freeze frame data is stored immediately before and after a DTC is stored, make sure to only read the values for the moment the DTC was stored ("0(s)").

| RESULT | PROCEED TO |
|---|------------|
| The value of Inverter Input Current is less than 50 A | A |
| The value of Inverter Input Current is 50 A or more | B |

Post-procedure1

(c) Turn the ignition switch off.

A ► **REPLACE INVERTER WITH CONVERTER ASSEMBLY**

B ► **REPLACE INVERTER WITH CONVERTER ASSEMBLY,
NO.1 TRACTION BATTERY DEVICE BOX NO.1 and
SERVICE PLUG GRIP**

INVERTER WITH CONVERTER ASSEMBLY: Click here [INFO](#)

NO. 1 TRACTION BATTERY DEVICE BOX: Click here [INFO](#)

SERVICE PLUG GRIP: Click here [INFO](#)

| | |
|------------|--|
| 12. | CHECK REAR MOTOR RESOLVER CIRCUIT |
|------------|--|

Click here [INFO](#)

NEXT



| | |
|------------|---|
| 13. | CHECK GENERATOR HIGH-VOLTAGE CIRCUIT |
|------------|---|

Click here [INFO](#)

NEXT



| | |
|------------|---|
| 14. | CHECK MOTOR HIGH-VOLTAGE CIRCUIT |
|------------|---|

Click here [INFO](#)

NEXT



15. CHECK REAR MOTOR HIGH-VOLTAGE CIRCUIT

Click here [INFO](#)

NEXT



16. CHECK INVERTER LOW-VOLTAGE CIRCUIT

Click here [INFO](#)

HINT:

If the "Inverter Low-voltage Circuit" inspection results are normal, perform the next step.

NEXT



17. CHECK FREEZE FRAME DATA

Pre-procedure1

(a) None

Procedure1

(b) Read the freeze frame data for DTC P0A949E or DTC P0D3319.

NOTICE:

As freeze frame data is stored immediately before and after a DTC is stored, make sure to only read the values for the moment the DTC was stored ("0(s)").

| RESULT | PROCEED TO |
|---|------------|
| The value of Inverter Input Current is less than 50 A | A |
| The value of Inverter Input Current is 50 A or more | B |

Post-procedure1

(c) Turn the ignition switch off.

A ▶ REPLACE INVERTER WITH CONVERTER ASSEMBLY

**B ▶ REPLACE INVERTER WITH CONVERTER ASSEMBLY,
NO.1 TRACTION BATTERY DEVICE BOX NO.1 and
SERVICE PLUG GRIP**

INVERTER WITH CONVERTER ASSEMBLY: Click here [INFO](#)

NO. 1 TRACTION BATTERY DEVICE BOX: Click here [INFO](#)

SERVICE PLUG GRIP: Click here [INFO](#)

