


TECHNICAL INSTRUCTIONS

FOR

SAFETY RECALL FOR

SOFTWARE UPDATE FOR MOTOR GENERATOR ECU AND POWER MANAGEMENT ECU

CERTAIN: 2012-2014 PRIUS V

| | |
|---|--|
|  | <p><u>2 SET's of CALIBRATION UPDATES ARE REQUIRED</u></p> <p>These instructions will direct you through installation and/or verification of four (4) Calibration ID's.</p> <p>Installation 1 of 2 will install 2 CID's Installation 2 of 2 will install 2 CID's</p> |
|---|--|

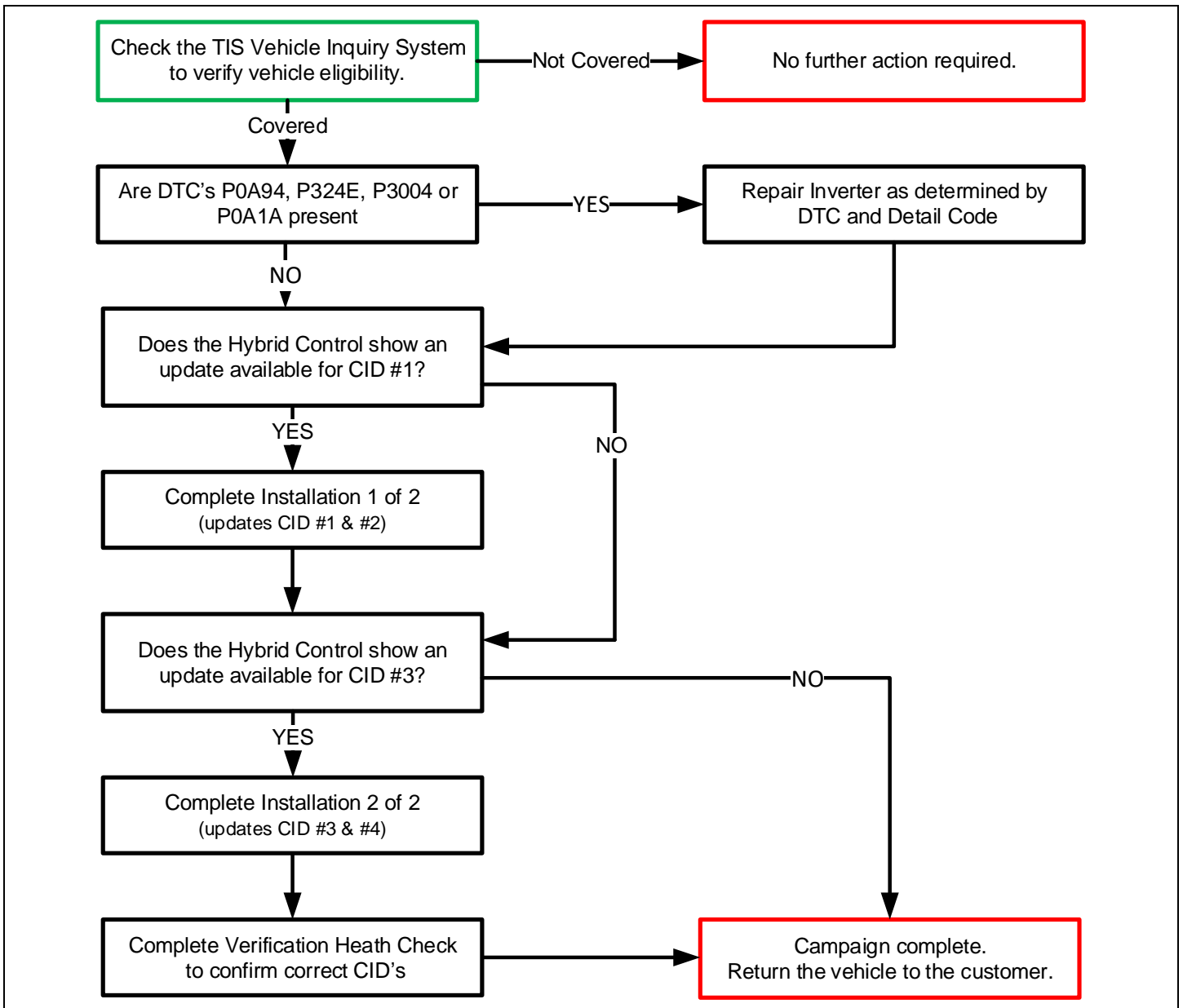
UPDATE: 10/10/18 - TI has been updated to “clarify” the requirement to update two (2) Calibrations in the Hybrid Control system

The repair quality of covered vehicles is extremely important to Toyota. All dealership technicians performing this recall are required to successfully complete the most current version of the E-Learning course “Safety Recall and Service Campaign Essentials”. To ensure that all vehicles have the repair performed correctly; technicians performing this recall repair are required to currently hold at least one of the following certification levels:

- Expert Technician (Hybrid)
- Master Technician
- Master Diagnostic Technician

It is the dealership's responsibility to select technicians with the above certification level or greater to perform this recall repair. Carefully review your resources, the technician skill level, and ability before assigning technicians to this repair. It is important to consider technician days off and vacation schedules to ensure there are properly trained technicians available to perform this repair at all times.

I. OPERATION FLOW CHART



II. IDENTIFICATION OF AFFECTED VEHICLES

- Check the TIS Vehicle Inquiry System to confirm that each VIN is eligible for this Safety Recall, and that it has not already been completed prior to dealer shipment or by another dealer.

Note: TMNA warranty will not reimburse dealers for repairs completed on vehicles that are not affected or were completed by another dealer.

III. PREPARATION

1. PARTS

| Part Number | Part Description | Quantity |
|------------------|-------------------------------|----------|
| 00451-00001-LBL* | Authorized Modification Label | 1 |

*Labels can be ordered in packs of 25 from the MDC through the Dealer Daily Website

2. TOOLS, SUPPLIES & EQUIPMENT

- Standard Hand Tools
- Techstream 2.0 / TIS Techstream / Techstream Lite
- GR8 Battery Diagnostic Station
- T-SB-0134-16

SST – These Special Service Tools required for this repair:

| Part Number | Tool Name | Quantity |
|-------------|-------------------------|----------|
| 09891-47020 | Inverter Case Separator | 1 |

IV. BACKGROUND

Inside the Hybrid Inverter Assembly is an Intelligent Power Module (IPM) which contains a control board equipped with transistors. In certain Model Year 2010-2014 Prius and Prius V vehicles, the current software settings for the motor generator ECU and power management ECU could result in higher thermal stress in certain transistors, potentially causing them to become damaged. If this happens, various warning lights will illuminate and the vehicle can enter a failsafe mode. In rare circumstances, the hybrid system might shut down while the vehicle is being driven, resulting in the loss of power and the vehicle coming to a stop, increasing the risk of a crash.



2 SET'S OF UPDATES ARE REQUIRED

The following instructions will direct you through the installation of four (4) Calibration ID's (CID's) in the Hybrid Control System.

CID Installation **1 of 2** will install CID's #1 & #2

CID Installation **2 of 2** will install CID's #3 & #4

**BOTH
INSTALLATIONS MUST
BE COMPLETED!!!**

CID Installation **1 of 2**
(updates line #1 & #2)

CID Installation **2 of 2**
(updates line #3 & #4)

Line #1
(CID #1)

Line #2
(CID #2)

Line #3
(CID #3)

Line #4
(CID #4)

V. INSPECT INVERTER CONDITION



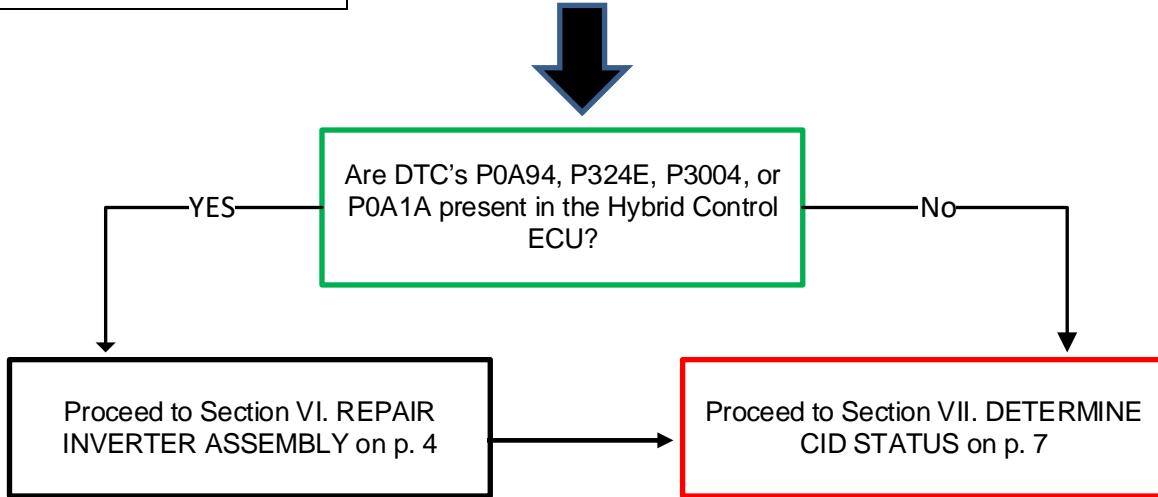
1. PERFORM HEALTH CHECK

- a. Using a Techstream, perform a Health Check.



If any hybrid DTC's are found that indicate a safety risk at performing this repair, do not proceed until they have been resolved.

Note: This Safety Recall covers only the specified ECU updates and Inverter repairs, as detailed in these instructions. It does not cover the diagnosis or replacement of any other parts on the vehicle, including the hybrid system.

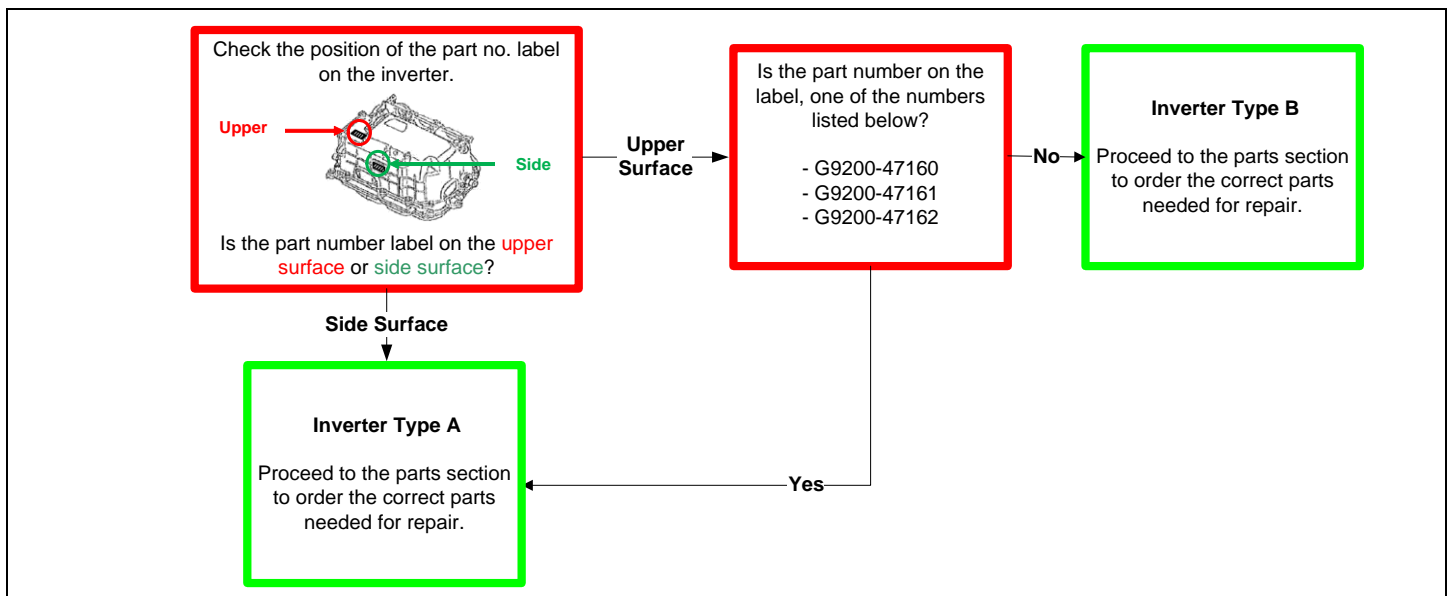


VI. REPAIR INVERTER ASSEMBLY

Note: Repairing the inverter is required only if DTC's P0A94, P324E, P3004 or P0A1A is present. If these DTC's are not present, skip to section VII. Determine Calibration Status on p.8.

1. DETERMINE INVERTER ASSEMBLY TYPE

- a. Using the flowchart below determine the inverter type (A or B).



2. DETERMINE REPAIR COMPONENTS BASED ON DTC DETAIL CODE AND INVERTER TYPE

- If multiple DTCs are present save the freeze frame data.
- After saving the freeze frame data, clear codes and confirm what DTCs reset.
- If multiple codes return, follow the repair manual diagnosis procedure for the DTC with Freeze Frame Data Occurrence Order value of "1".
- Use the correct table below to identify the parts required for repair, the correct parts are listed in the bottom row of each table.

TYPE A

| DTC | DTC DETAIL CODE | IPM REPLACEMENT | <ul style="list-style-type: none"> • MG-ECU • CURRENT SENSOR • IPM • INVERTER WIRE HARNESS | INVERTER ASSY |
|------------------------------|-----------------------|---|--|---------------|
| P0A94 | 127 | | X | |
| | 172 | X | | |
| | 442 | | X | |
| | 547 | | | |
| | 548 | | X | |
| | 549 | | | |
| | 550 | | X | |
| | 553 | X | | |
| | 554 | | | |
| | 555 | | X | |
| | 556 | | | |
| | 557 | X | | |
| | 564 | | X | |
| | 585 | | X | |
| | 587 | | X | |
| 589 | | X | | |
| 590 | | X | | |
| P324E | 788 | | X | |
| P0A1A | 151 | | X | |
| | 155 | | | |
| | 156 | | | |
| | 166 | | | |
| | 200 | | | |
| | 658 | | | |
| | 659 | | | |
| P3004 | 791 | | | |
| | 131 | | | X |
| | 132 | | | X |
| | 800 | X | | |
| | 801 | X | | |
| PARTS & QUANTITY (QTY) | | 04899-47021 (1) 08887-02809 (2) 04899-47060 (1) 08826-00100 (1) 90430-18008 (1) | G920H-47040 (1) G920J-52010 (1) 04899-47021 (1) 08887-02809 (2) G9208-47090 (1) 04899-47060 (1) 08826-00100 (1) 90430-18008 (1) | ORDER BY VIN |



Thermal grease for IPM replacement is NOT interchangeable. Only grease specified for the Prius V inverter can be used. Grease for the Highlander IPM replacement will result in inverter failure if used.

TYPE B

| DTC | DTC DETAIL CODE | IPM REPLACEMENT | • MG-ECU • IPM | • MG-ECU • CURRENT SENSOR • IPM | INVERTER ASSY |
|------------------------------|-----------------------|---|--|---|---------------|
| P0A94 | 127 | | X | | |
| | 172 | X | | | |
| | 442 | | X | | |
| | 547 | | | | |
| | 548 | | | X | |
| | 549 | | | | |
| | 550 | | X | | |
| | 553 | X | | | |
| | 554 | | | | |
| | 555 | | | X | |
| | 556 | | | | |
| | 557 | X | | | |
| | 564 | | | X | |
| | 585 | | | X | |
| | 587 | | | X | |
| 589 | | | X | | |
| 590 | | | X | | |
| P324E | 788 | | | X | |
| P0A1A | 151 | | | X | |
| | 155 | | | | |
| | 156 | | | | |
| | 166 | | | | |
| | 200 | | | | |
| | 658 | | | | |
| | 659 | | | | |
| | 791 | | | | |
| | 792 | | | | |
| 793 | | | | | |
| P3004 | 131 | | | | X |
| | 132 | | | | X |
| | 800 | X | | | |
| | 801 | X | | | |
| PARTS & QUANTITY (QTY) | | 04899-47021 (1) 08887-02809 (2) 04899-47060 (1) 08826-00100 (1) 90430-18008 (1) | G920H-47040 (1) 04899-47021 (1) 08887-02809 (2) 04899-47060 (1) 08826-00100 (1) 90430-18008 (1) | G920H-47040 (1) G920J-52010 (1) 04899-47021 (1) 08887-02809 (2) 04899-47060 (1) 08826-00100 (1) 90430-18008 (1) | ORDER BY VIN |



Thermal grease for IPM replacement is NOT interchangeable. Only grease specified for the Prius V inverter can be used. Grease for the Highlander IPM replacement will result in inverter failure if used.

3. TO REPAIR THE INVERTER, CLICK ON THE RELEVANT LINK BELOW:

- [2012 Prius V: Intelligent Power Module Transistor Removal](#)
- [2013 Prius V: Intelligent Power Module Transistor Removal](#)
- [2014 Prius V: Intelligent Power Module Transistor Removal](#)

4. CONTINUE TO THE NEXT SECTION TO CONFIRM CID'S

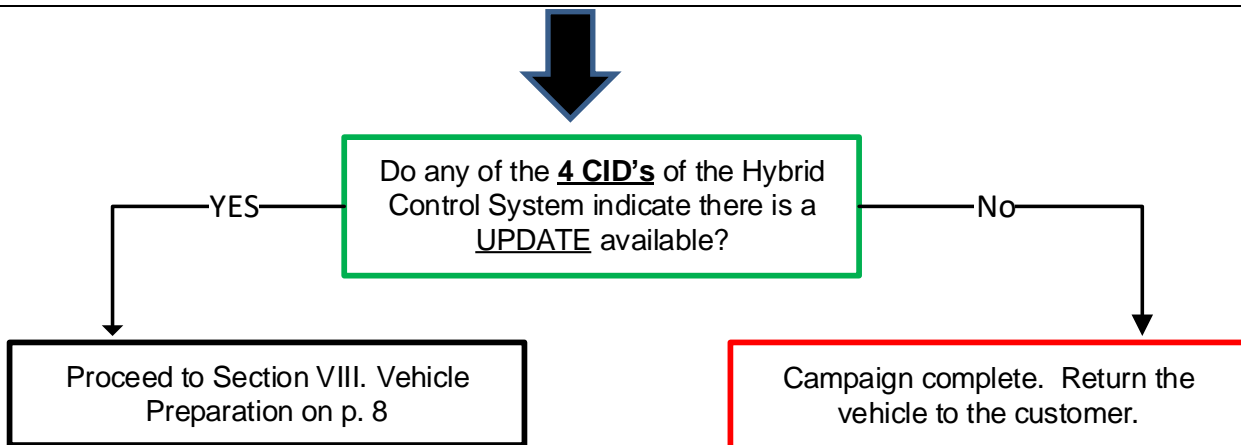
VII. DETERMINE CID STATUS

1. DETERMINE STATUS of HYBRID CONTROL SYSTEM CID's

- Locate the Update column for the Hybrid Control System in the Stored Data tab.
- Determine the status of the **4 CID's** for the Hybrid Control ECU; indicated by a **YES** or **NO** in the Update column.

The screenshot shows the Techstream interface for a 2014 Prius. The 'Stored Data' tab is active. The 'Hybrid Control' system is selected in the left-hand menu. A table displays the update status for four CID's. The 'Update' column shows 'No' for the first two CID's and 'Yes' for the last two. Red circles and arrows highlight these elements.

| System | RoB | Calibration | Update |
|-----------------------|-----|--------------|--------|
| Engine and ECT | - | 34754000 | No |
| | - | A4701000 | No |
| | - | 896B34747100 | Yes |
| | - | 896B57602000 | Yes |
| | - | 898844708200 | Yes |
| | - | 898844709200 | Yes |
| Cruise Control | - | - | - |
| Tire Pressure Monitor | - | - | - |
| ABS/VSC/TRAC | - | F152647216 | No |
| EMPS | - | JCU315F0 | No |
| Transmission Control | - | - | - |



Note: If the Hybrid Control System does not need any of the 4 CID's updated (indicated with "No" in the Update column), the campaign is complete. No further action is required. Submit the warranty claim to complete this vehicle.

VIII. VEHICLE PREPERATION

The ECU reprograming procedure is detailed in [T-SB-0134-16](#). Reference this Bulletin for additional detailed procedures and information.

1. VEHICLE BASICS

a. Confirm the following conditions:

- Vehicle in the IG position (engine off).
- Transaxle in Park.
- Parking brake engaged.
- Turn off all electrical accessories(i.e. Headlights, wipers, climate control, audio system, etc.)

2. CONNECT THE 12v BATTERY TO A POWER SUPPLY (GR8)

- a. Connect the GR8 or other type of a power supply (not a battery charger) to the 12v battery.
b. Select the Power Supply Mode from the Charge Menu of the GR8.



A power supply *MUST* be used during reprogramming. ECU damage will occur if the battery voltage is not properly maintained during this re-flash procedure.

Note: A power supply must be connected directly to the 12v battery terminals and NOT the remote jump posts under the hood (if equipped).

3. VERIFY TECHSTREAM SETUP

a. Verify that the Techstream meets the following conditions:

- The latest version of software is loaded.
- The Techstream battery is fully charged. If not, connect the Techstream to a 120v source.
- The DLCIII cable is in good condition.

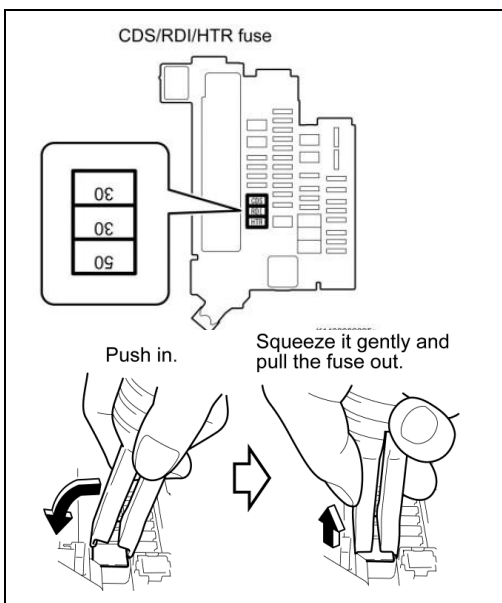


The Techstream battery must be maintained during the update procedure. If necessary, plug the Techstream into a 120v outlet to ensure that a failure does not occur.

Note: If the Techstream communication with the vehicle fails during the re-flash procedure, the ECU will be damaged and must be replaced.

4. MAINTAIN BRAKE SYSTEM PRESSURE

- a. Depress the brake pedal fully 2 times within 2 seconds.



5. REMOVE JOINT FUSE FROM ENGINE ROOM FUSE BOX

- a. Confirm the joint fuse orientation before removal because the fuse can be installed in either direction.
b. Using the fuse puller remove the joint fuse that encases the CDS (30A), RDI (30A) and HTR (50A).



Permanent damage to the ECU's can happen if these fuses are not removed.



Removing these fuses will stop the vehicle from performing onboard diagnostic tests during the update, which could cause the update to fail and damage the ECU.

IX. INSTALLATION 1 OF 2

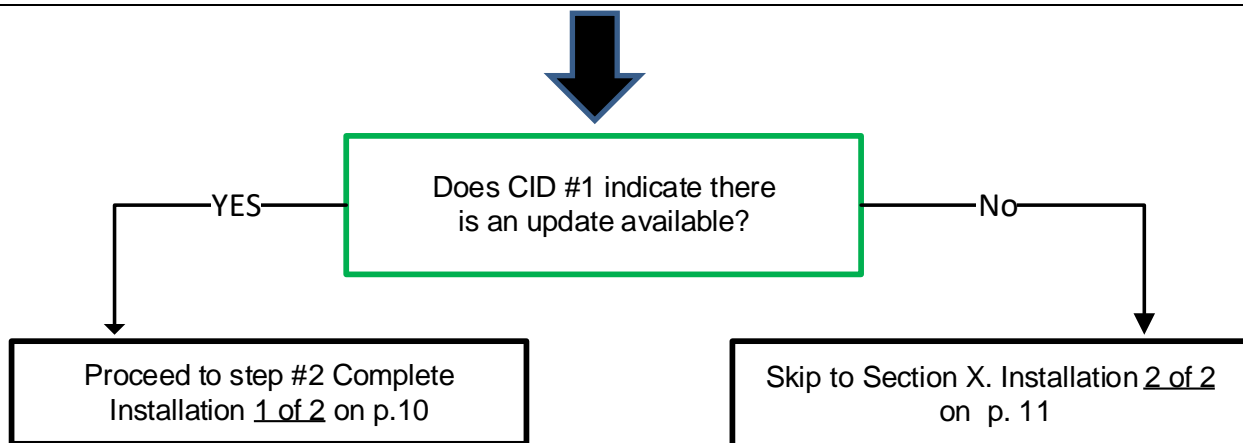
1. CHECK FOR AN AVAILABLE UPDATE FOR CID #1

- a. Check the Update status of CID #1; indicated as a **Yes** or **No**.

The screenshot shows the Techstream interface for a 2014 Prius 2ZR-FXE. The 'Stored Data' tab is selected. The 'Health Check Results' section indicates that the health check does not display live data and that changes in vehicle condition will not update until the refresh button is clicked. The 'Campaign Status' is 'Y' and 'PERMANENT' is 'NO'. A table lists various systems and their update status:

| System | RoB | Calibration | Update |
|-----------------------|-----|--------------|--------|
| Engine and ECT | - | 34754000 | No |
| | - | A4701000 | No |
| Hybrid Control | - | 896B34747100 | Yes |
| | - | 896B57602000 | Yes |
| | - | 898844708200 | Yes |
| | - | 898844709200 | Yes |
| Cruise Control | - | - | - |
| Tire Pressure Monitor | - | - | - |
| ABS/VSC/TRAC | - | F152647216 | No |
| EMPS | - | JCU315F0 | No |
| Transmission Control | - | - | - |

Red annotations highlight the 'Stored Data' tab, the 'Hybrid Control' system, and the 'Yes' update status for the Hybrid Control CID #1. A red arrow points to the 'Yes' status with the text 'Status of available Update'. Another red arrow points to the 'Yes' status with the text 'CID #1 & #2'.



2. COMPLETE INSTALLATION 1 of 2

a. Locate CID #1 in the chart below.

NOTE: CID #1 “271” is used for 3 different NEW CID packages. If CID #1 is “271” you must also match CID #2 to ensure you pick the correct NEW CID.

b. Select the corresponding New CID link to load the Calibration update.

c. Follow the on-screen instructions to complete the update procedure.

Note: Updating CID#1 will automatically update CID #2



Be extremely careful to select the correct NEW CID that corresponds to the Current CID's of the vehicle.

| INSTALLATION 1 of 2 | | | |
|---------------------|---------------|-----------------------|-------------------------------------|
| Model | CURRENT CID's | | NEW CID |
| Prius V | CID #1 | 896B347 <u>110</u> 00 | <u>896B34764000</u> |
| | | 896B347 <u>111</u> 00 | |
| | | 896B347 <u>271</u> 00 | |
| | CID #2 | 896B547 <u>050</u> 00 | |
| | | 896B547 <u>051</u> 00 | |
| | | 896B347 <u>270</u> 00 | |
| | CID #1 | 896B347 <u>271</u> 00 | |
| | CID #2 | 896B547 <u>090</u> 00 | |
| | CID #1 | 896B347 <u>271</u> 00 | <u>896B34727300</u> |
| | | 896B347 <u>272</u> 00 | |
| CID #2 | | 896B547 <u>120</u> 00 | |

CID #1 “271” is used for 3 different NEW CID packages. If CID #1 is “271” you must also match CID #2 to ensure you pick the correct NEW CID.

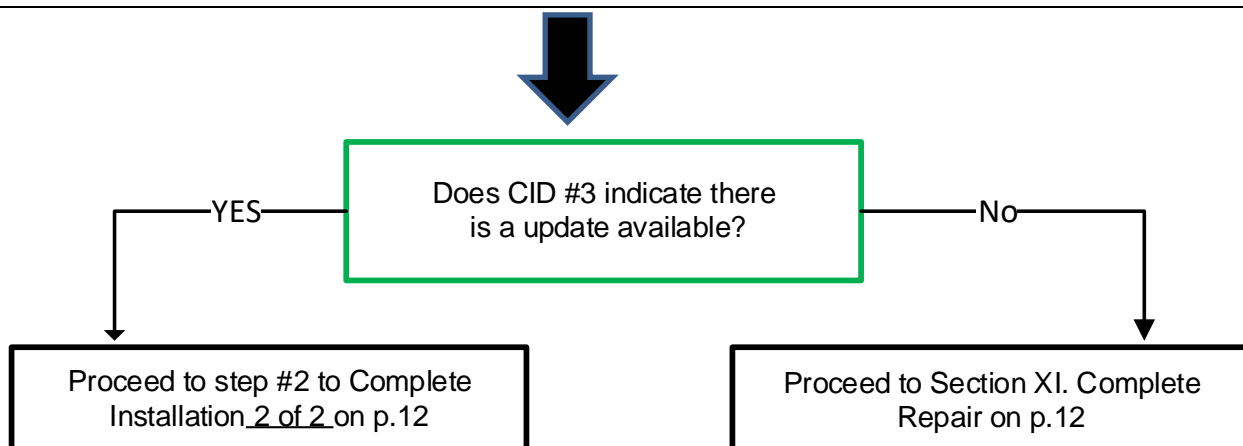
X. INSTALLATION 2 OF 2

1. CHECK FOR AN AVAILABLE UPDATE FOR CID #3

a. Check the Update status of CID #3; indicated as a **Yes** or **No**.

The screenshot shows the Techstream software interface for a 2014 Prius ZZR-FXE. The 'Stored Data' menu is open, and the 'Hybrid Control' system is selected. A table displays the update status for various systems. The 'Hybrid Control' system has a CID #3 of 898844708200 and an update status of 'Yes'. Red annotations highlight the 'Stored Data' menu, the 'Hybrid Control' system, the CID #3 value, and the 'Yes' update status. A red arrow points from the text 'CID #3' to the highlighted CID value, and another red arrow points from the text 'Status of available Update' to the highlighted 'Yes' status.

| System | RoB | Calibration | Update |
|-----------------------|-----|--------------|--------|
| Engine and ECT | - | 34754000 | No |
| | - | A4701000 | No |
| | - | 896B34747100 | Yes |
| | - | 896B57602000 | Yes |
| | - | 898844708200 | Yes |
| | - | 898844709200 | Yes |
| Cruise Control | - | - | - |
| Tire Pressure Monitor | - | - | - |
| ABS/VSC/TRAC | - | F152647216 | No |
| EMPS | - | JCU315F0 | No |
| Transmission Control | - | - | - |



2. COMPLETE INSTALLATION 2 OF 2

- Locate the CID #3 in the chart below.
- Select the corresponding New CID link to load the Calibration update.
- Follow the on-screen instructions to complete the update procedure.

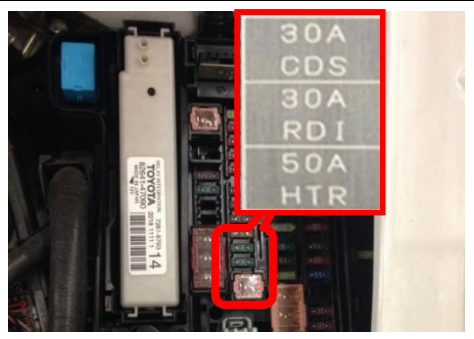
Note: Updating the CID #3 will automatically update CID #4



Be careful to select the correct New CID that corresponds to CID #3 of the Hybrid Control System.

| INSTALLATION 2 of 2 | | | | |
|---------------------|------------|--------|-----------------------|------------------------------|
| Model | Model Year | CID # | Current CID | New CID |
| Prius V | 2012 | CID #3 | 8988447 <u>061</u> 00 | 898844706400 |
| | | | 8988447 <u>062</u> 00 | |
| | | | 8988447 <u>063</u> 00 | |
| | 2012-2014 | CID #3 | 8988447 <u>120</u> 00 | 898844712300 |
| | | | 8988447 <u>121</u> 00 | |
| | | | 8988447 <u>122</u> 00 | |

XI. COMPLETE REPAIR



1. REINSTALL JOINT FUSE INTO ENGINE ROOM FUSE BOX

- Confirm the joint fuse orientation before reinstalling because the joint fuse can be installed in either direction.
- Reinstall the joint fuse that encases the CDS (30A), RDI (30A) and HTR (50A).



2. PERFORM VERIFICATION HEALTH CHECK

- Using a Techstream, perform a Health Check.
- Clear DTC's that may have set during the re-flash procedure.
- Re-run the Health Check to confirm that no DTC's reappear.

3. CONFIRM CID UPDATE

a. On the Stored Data tab, confirm the following for the Hybrid Control System:

- The Update column lists “No” for all 4 Hybrid Control System CID’s

The screenshot shows the Techstream interface for a 2014 Prius. The 'Stored Data' tab is selected. The 'Hybrid Control' system is highlighted in the left sidebar. A table displays the following data:

| System | RoB | Calibration | Update |
|-----------------------|-----|--------------|--------|
| Engine and ECT | - | 34754000 | No |
| | | A4701000 | No |
| | | 896B34747100 | No |
| | | 896B57602000 | No |
| | | 898844708200 | No |
| | | 898844709200 | No |
| Cruise Control | - | - | - |
| Tire Pressure Monitor | - | - | - |
| ABS/VSC/TRAC | - | F152647216 | No |
| EMPS | - | JCU315F0 | No |
| Transmission Control | - | - | - |

Annotations in the image include: 'Stored Data' circled in red; 'Hybrid Control' circled in red; a red box around the four CID entries; and a red circle around the 'No' values in the 'Update' column. Red arrows point from text annotations to these elements.

4 CID's for the Hybrid Control System

MUST say "NO"

Note: If you receive the following message after the final Health Check, you have not properly completed the Required Calibration Updates!!

312-01

! Critical Message

! Important Calibration Update Required

Please reference the [TECHNICAL INSTRUCTIONS](#) of campaign EOE on TIS. After completing calibration update, an **on-network health check must** be performed to satisfy campaign completion requirements.

4. PRINT CUSTOMER HEALTH CHECK REPORT


- a. From the Stored Data tab, select the Customer Health Check Report button (TIS will launch when button is pressed).

The screenshot shows the TIS software interface. At the top, there's a menu bar with 'File', 'Function', 'Setup', 'TIS', 'User', and 'Help'. Below that, a 'System Select' dropdown is set to 'Stored Data'. The main area displays '2010 Prius ZZR-FXE' and 'Tire Pressure / Threshold Value [psi(gauge)]'. It lists four sensors with their current values and thresholds. Below this is a 'Health Check Results' table with columns for System, Monitor Status, DTC, Curt, Para, Hist, Para, SB, and Calibration. The 'Engine and ECT' row is highlighted in yellow. At the bottom left, there are buttons for 'TIS Search', 'Print', and 'Back'. A callout box with a blue icon of a person holding a document points to the 'Print' button, with the text 'Customer Health Check Button'.

- b. Log in to TIS.
- c. Input Vehicle Mileage and Repair Order number.
- d. Check the “Performed” campaign button for campaign E0E.
- e. Select the Report button.

The screenshot shows the 'Diagnostic Report' interface. At the top left are the Toyota and Lexus logos. The title 'Diagnostic Report' is on the right. Below the logos is a 'Vehicle Information' section with 'Mileage: 7787' and 'Repair Order: 77888'. A message states: 'Our systems show the following campaigns are outstanding. Have any of these campaigns been completed? (Check for SSC door label if unsure.)'. Below this message, there is a dropdown menu showing 'F0R' and a radio button for 'Performed' (which is selected) and 'Not Performed'. A 'Report' button is located below the radio buttons and is circled in red.

f. Confirm Customer Health Check Report information is correct.



Diagnostic Report

Vehicle Information

Vehicle: 2013 Prius VIN: JTDKN3DU7D1615492 Mileage: 13672
 Repair Order: 12345

Health Check Summary

| Checkpoints | Status | Comments |
|-------------------|--------------------|---------------|
| Powertrain | All systems OK | |
| Chassis | All systems OK | |
| Electrical | All systems OK | |
| Network Systems | All systems OK | |
| Service Campaigns | No Action Required | E0E Performed |

Performed: 02/20/14, 4:36 PM (PST)

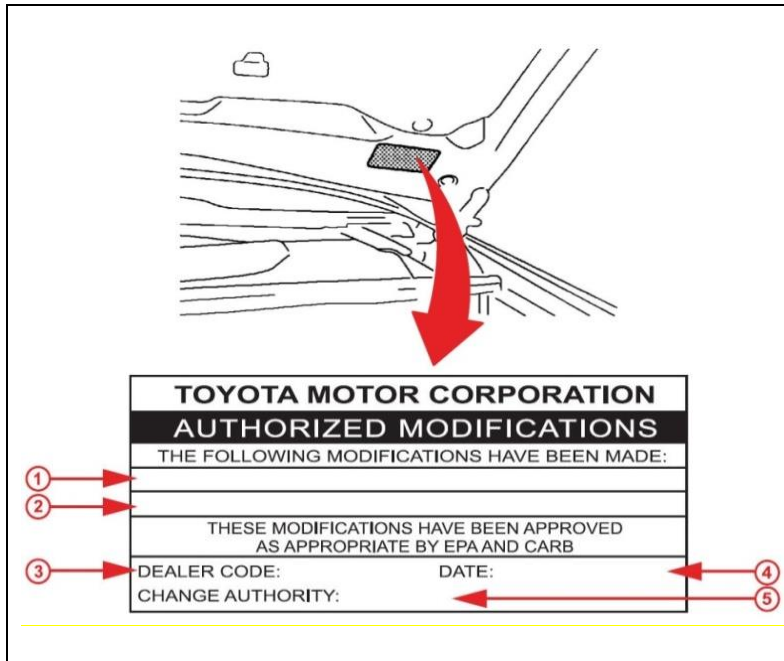
Technician Signature

Quality Inspector Signature

- g. Print Customer Health Check Report from TIS.
- h. Sign and provide to the customer.

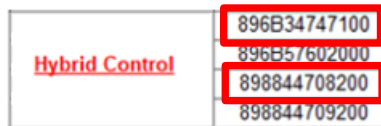
5. ATTACH THE AUTHORIZED VEHICLE MODIFICATION LABEL

- a. Fill out the label.
- b. Affix the label to the under-side of the hood.



| | |
|---|------------------------------|
| 1 | Hybrid Control System |
| 2 | (Calibration ID's) |
| 3 | (Dealer Code) |
| 4 | (Date Completed) |
| 5 | Safety Recall F0R |

Use CID #1 & CID #3
 Calibration ID's listed for the
 Hybrid Control System
 after completing the final
 Health Check.



◀ VERIFY REPAIR QUALITY ▶

- Confirm all ECM Calibration has been updated successfully to the NEW CID's.
- Confirm *that an* Authorized Modification Label has been installed
- If you have any questions regarding this Safety Recall, please contact your regional representative

XII. APPENDIX

A. PARTS DISPOSAL

As required by Federal Regulations, please make sure all recalled parts (original parts) removed from the vehicle are disposed of in a manner in which they will not be reused, ***unless requested for parts recovery return.***

B. CAMPAIGN DESIGNATION DECORDER

