# TECHNICAL INSTRUCTIONS

# FOR

# 26TE03

# ELECTRIC HEATER SUB-ASSEMBLY REPLACEMENT

# CERTAIN 2021 - 2024

# MIRAI

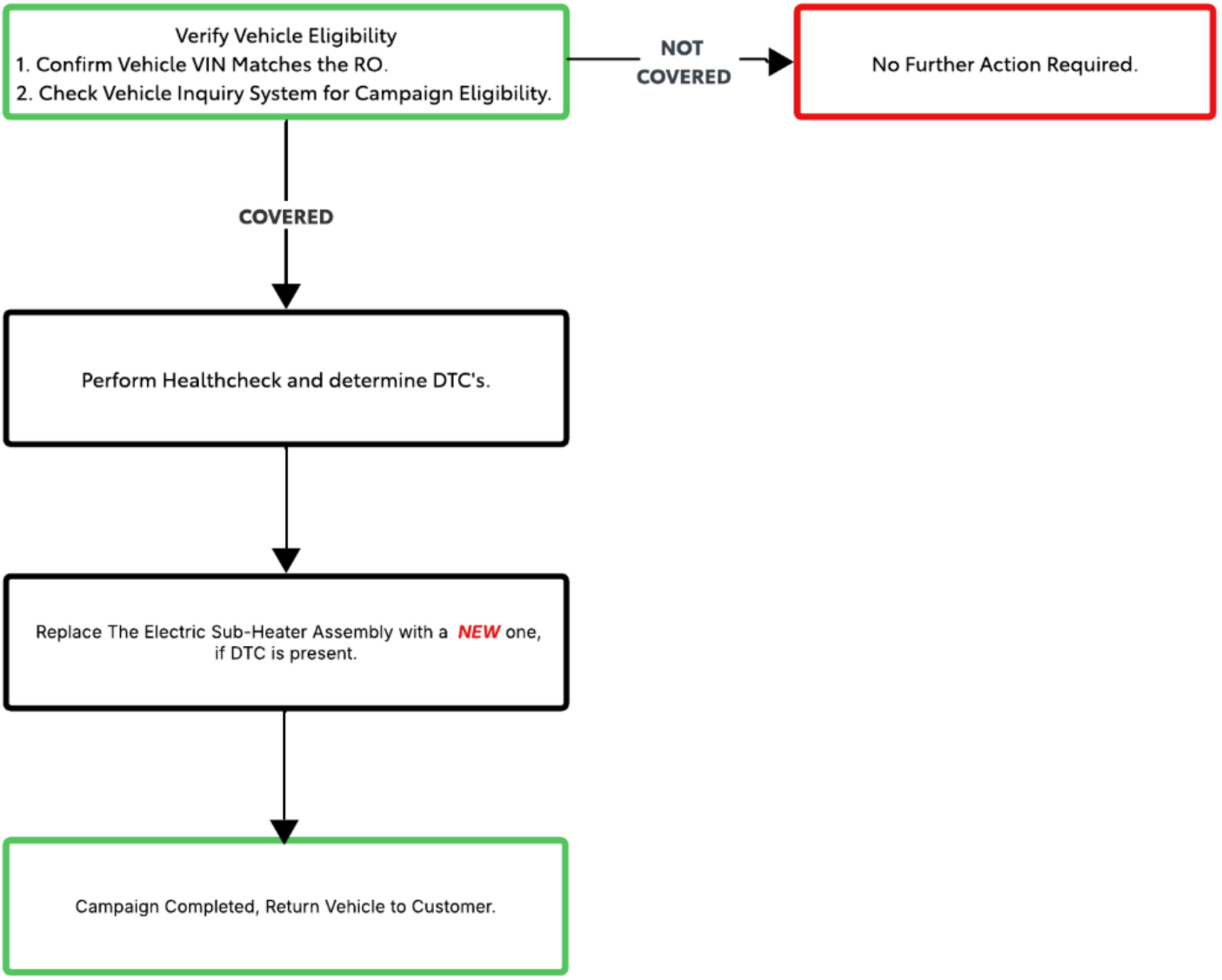
The repair quality of covered vehicles is extremely important to Toyota. All dealership technicians performing this repair are required to successfully complete the most current version of the E-Learning course “Safety Recall and Service Campaign Essentials”. To ensure that all vehicles have the repair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

**TIC309A - EPV Repair**
**TEN021B - Mirai**

**It is the dealership’s responsibility to select technicians who have completed the above course to perform this 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 always perform this repair.**

# I. OPERATION FLOW CHART

**The flow chart is for reference only. *DO NOT* use it in place of the full technical instructions. Follow *ALL* steps as outlined in the full technical instructions to confirm the campaign is completed correctly.**




# II. IDENTIFICATION OF AFFECTED VEHICLES

## 1. CHECK VEHICLE FOR CAMPAIGN ELIGIBILITY

a) Compare the vehicles VIN to the VIN listed in the Repair Order to ensure they match.

b) Check the TIS Vehicle Inquiry System to confirm the VIN is involved in this CSP, HINT:
TMNA warranty will not reimburse dealers for repairs completed on vehicles that are not affected or were previously completed, even by another dealer.

# III. PREPARATION

## A. PARTS

| Part Number | | Part Name | Quantity |
|---|---|---|---|
| 1 | 04004-73162 | HEATER SUB-ASSY, ELECTRIC | 1 |

*The set above includes the following parts.

| Part Number | Part Name | Quantity |
|---|---|---|
| 87101-62021 | Electric Heater Sub-assembly | 1 |

## B. TOOLS, SUPPLIES & EQUIPMENT

- GTS+
- Insulated Tool Set
- Radiator Cap Tester Adapter Set C
- Standard Hand Tools
- Toyota Electrical Tester Set
- Torque wrench
- Radiator Cap Tester

## C. MATERIALS

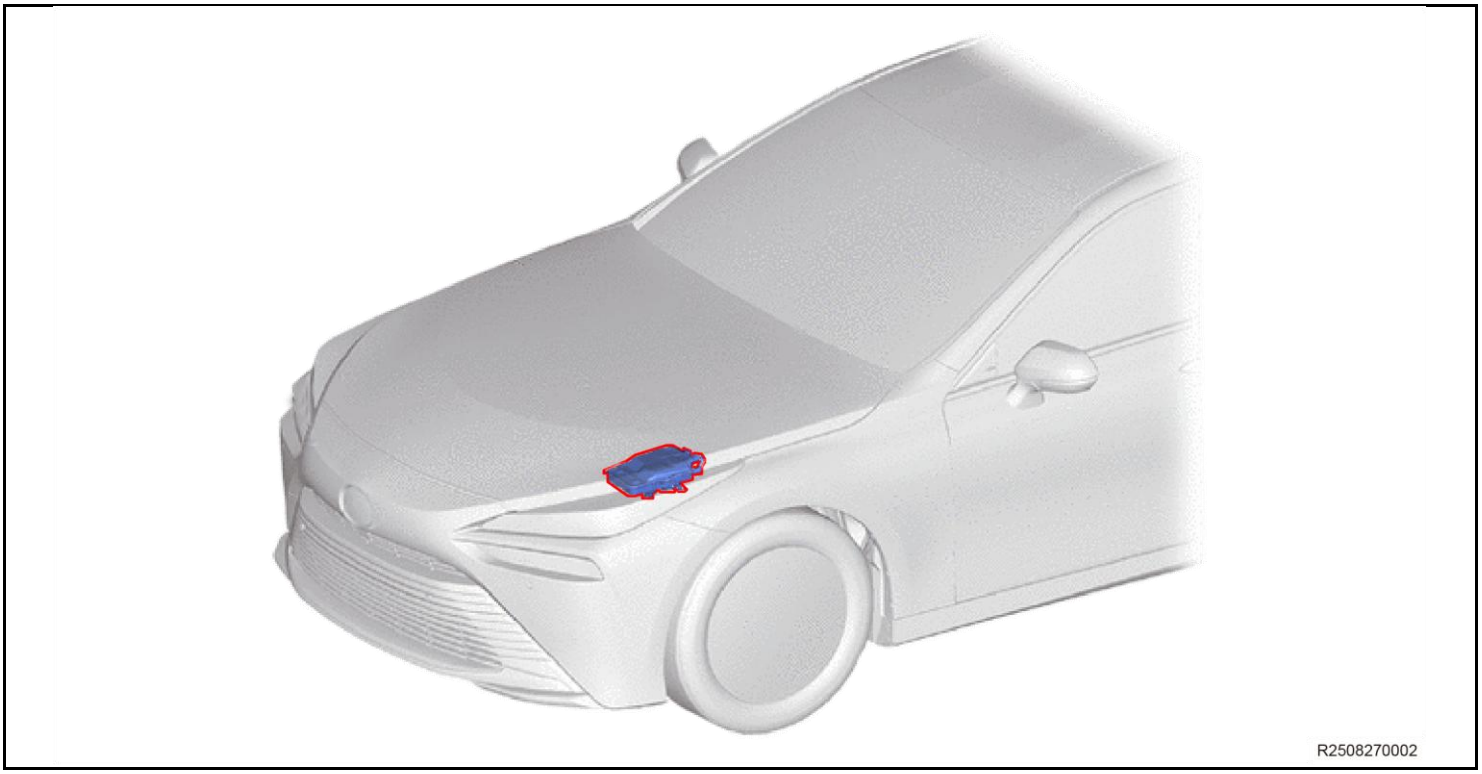
| Part Number | Part Name | Quantity |
|---|---|---|
| 04005-15162 | COOLANT, FC STACK 0.3L | 1 bottle |

- Brake Cleaner
- light
- Protective Gloves
- Shop Cloth
- Protective Tape
- Insulated Gloves
- Container
- Protective Eyewear
- Insulating Tape

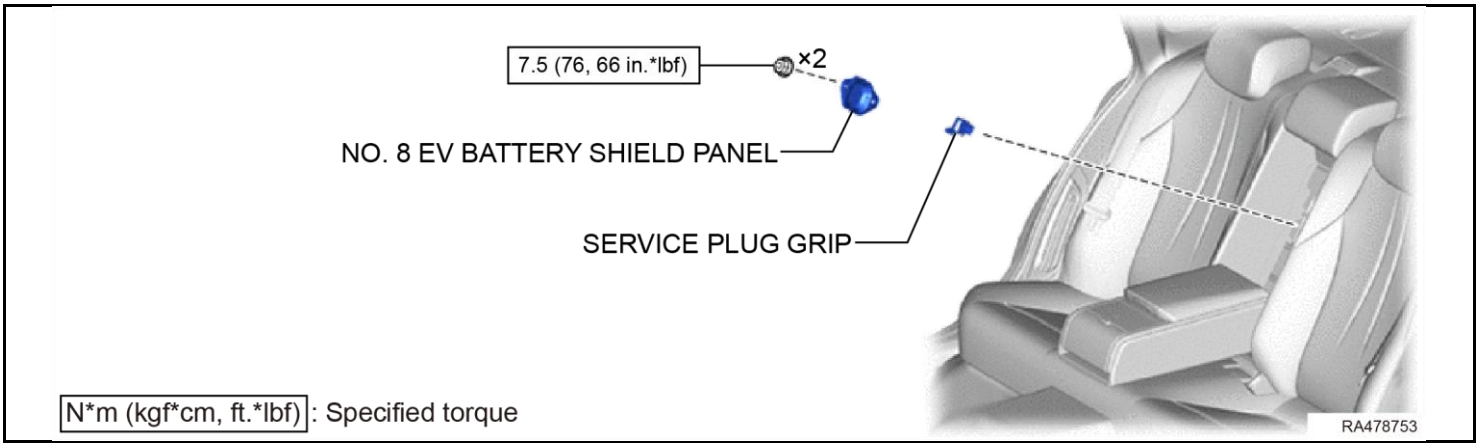
## IV. WORK PROCEDURE TABLE OF CONTENTS



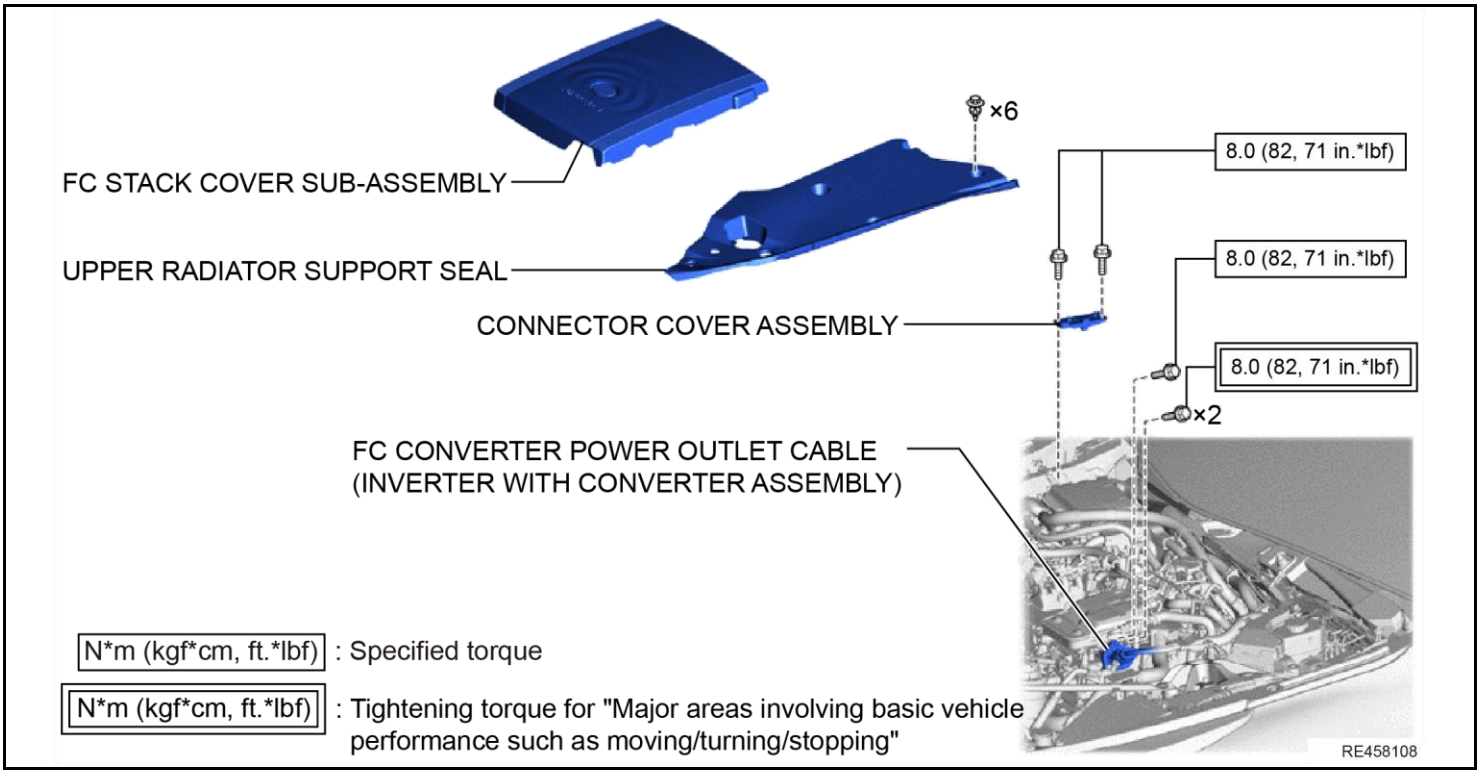
## V. BACKGROUND



## VI. COMPONENTS

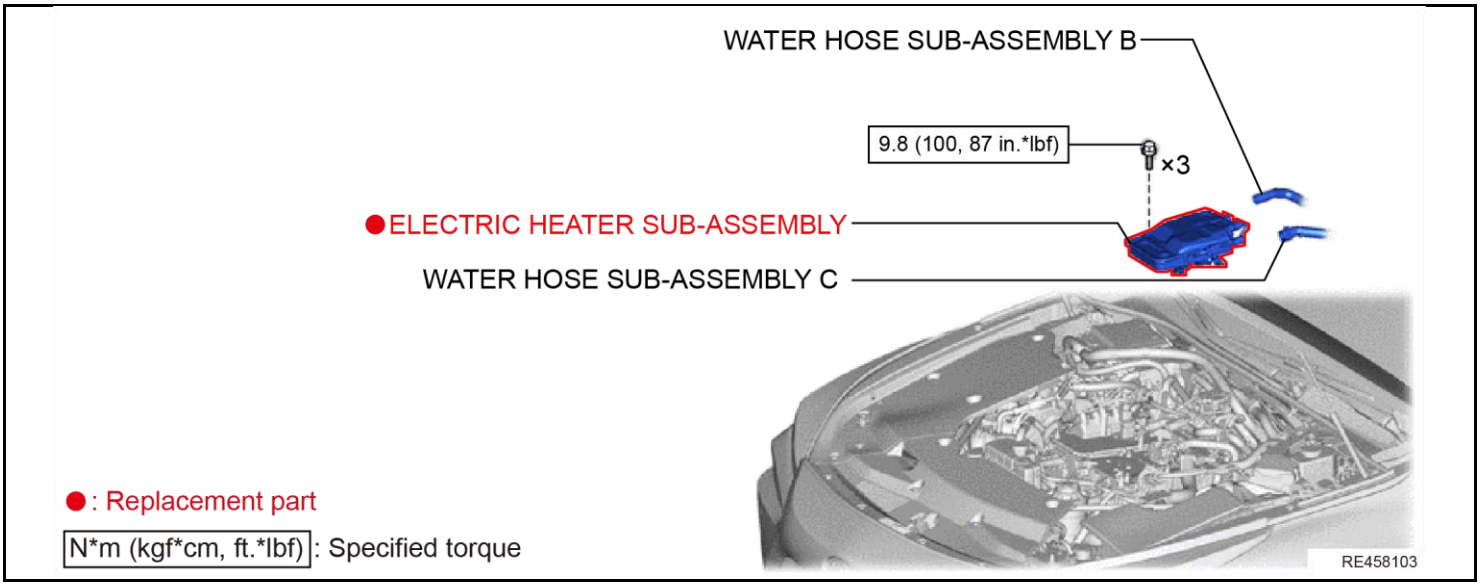



N*m (kgf*cm, ft.*lbf): Specified torque




N*m (kgf*cm, ft.*lbf) : Specified torque

N*m (kgf*cm, ft.*lbf) : Tightening torque for "Major areas involving basic vehicle performance such as moving/turning/stopping"




● : Replacement part

N*m (kgf*cm, ft.*lbf): Specified torque

## VII. REMOVE THE ELECTRIC HEATER SUB-ASSEMBLY

| | |
|---|---|
| Critical | **Always remember "*SAFETY FIRST*".** |

### 1. CHECK FOR DTCs

| | |
|---|---|
| Critical | **If the DTC is output, perform troubleshooting first.**<br>**If you troubleshoot without checking the diagnostic code, there is a risk of electric shock due to electric leakage.** |

a) Be sure to check the diagnostic code before removing and installing parts of high-voltage systems.

**DTC:**

- DTC P0AA649 (Hybrid/EV Battery Voltage System Isolation Internal Electronic Failure)
- 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)
- 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)
- P1EEC49 (Hybrid/EV Battery Voltage System Isolation (FC Air Compressor Area) Internal Electronic Failure)
- P1EED49 (Hybrid/EV Battery Voltage System Isolation (FC Area) Internal Electronic Failure)
- P1EEE49 (Hybrid/EV Battery Voltage System Isolation (Hydrogen Pump Area) Internal Electronic Failure)
- P1EEF49 (Hybrid/EV Battery Voltage System Isolation (FC Coolant Pump Area) Internal Electronic Failure) is not output
- P1F0A (High Voltage Electric Heater Circuit (A/C Area)

- **If DTC is present: Proceed with replacing electric heater assembly.**

### 2. CHECK THE SOC

b) Using the GTS+, check if the SOC is 40% or higher.

**Powertrain > EV > Data List**

**HINT:**

If the SOC is lower than 40%, READY ON and wait until the SOC becomes 40% or higher.

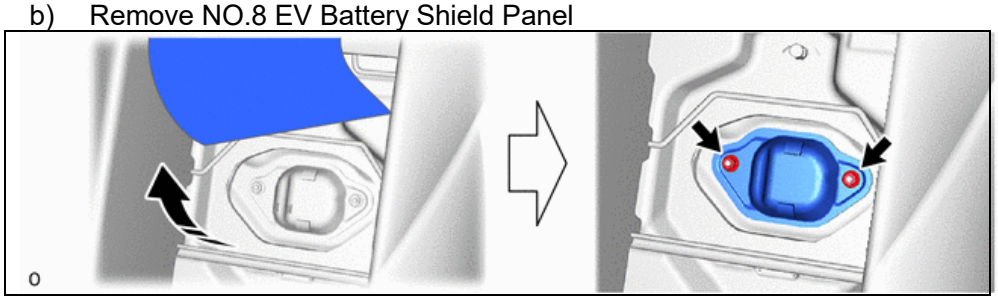
### 3. REMOVE SERVICE PLUG GRIP

**PRECAUTION**

| | |
|---|---|
| ⚠ | **NOTICE:**<br>After turning the ignition switch is turned off, wait 2 minutes before disconnecting the negative (-) auxiliary battery terminal. |

a) Disconnect cable from negative Auxiliary Battery Terminal

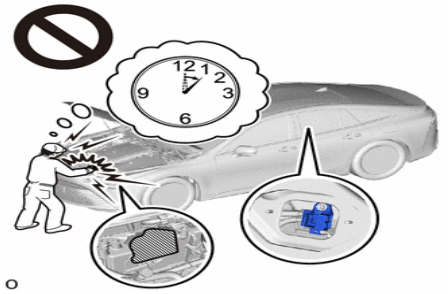
b) Remove NO.8 EV Battery Shield Panel



**CAUTION:**

- Be sure to wear insulated gloves.
- Do not inspect or service the high voltage system with the service plug grip and FC converter power outlet cable (inverter with converter assembly) installed.

- To reduce the risk of electric shock, make sure to remove the service plug grip and FC converter power outlet cable (inverter with converter assembly) to cut off the high voltage circuit before servicing the vehicle.
- Make sure to remove the service plug grip first and then remove the FC converter power outlet cable (inverter with converter assembly).
- To reduce the risk of electric shock, make sure to wait at least 10 minutes after removing the service plug grip and FC converter power outlet cable (inverter with converter assembly) to fully discharge the high voltage capacitor inside the inverter with converter assembly.



- Keep the removed service plug grip in your pocket to prevent other technicians from accidentally installing it while you are servicing the vehicle.

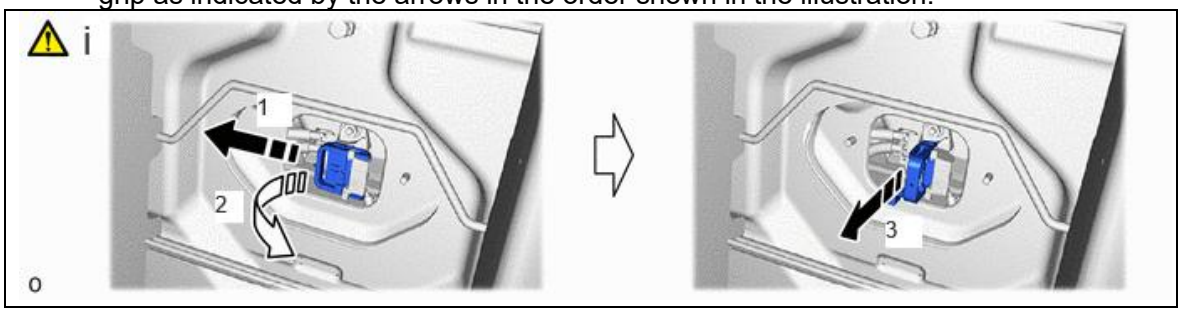
**NOTICE:**

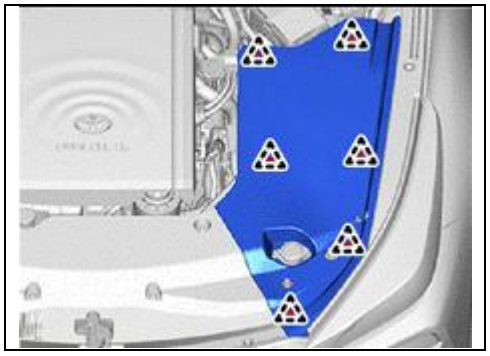
- After removing the service plug grip and FC converter power outlet cable (inverter with converter assembly), turning the ignition switch to ON (READY) may cause a malfunction. Do not turn the ignition switch to ON (READY) unless instructed by the repair manual.
- Do not touch the terminals of the service plug grip and FC converter power outlet cable (inverter with converter assembly).
- If the service plug grip has been struck or dropped, replace it.

**HINT:**

Waiting for at least 10 minutes is required to discharge the high voltage capacitor inside the inverter with converter assembly.

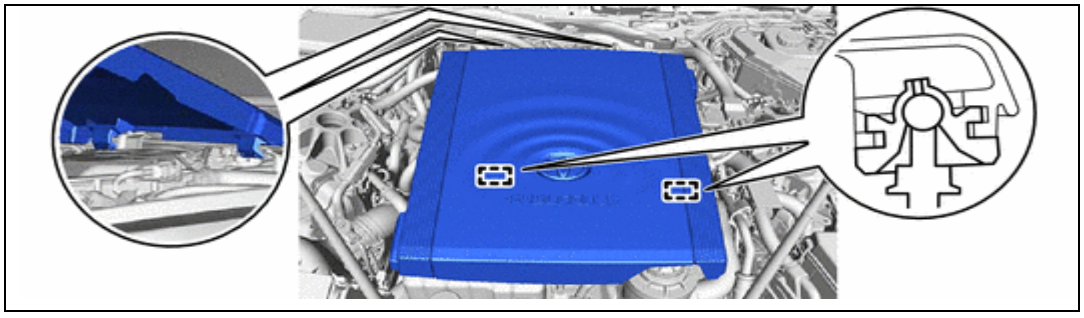
c) While wearing insulated PPE gloves, rotate the handle of the service plug grip and remove the service plug grip as indicated by the arrows in the order shown in the illustration.



## 4. REMOVE UPPER RADIATOR SUPPORT SEAL

## 5. REMOVE FC STACK COVER SUB-ASSEMBLY



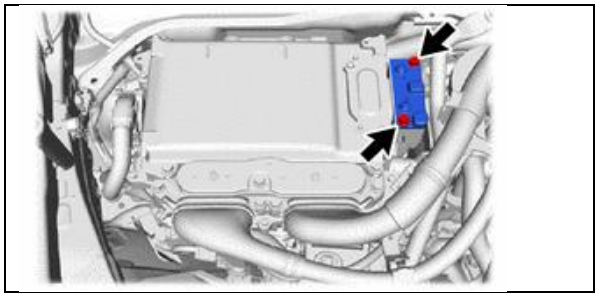
## 6. REMOVE CONNECTOR COVER ASSEMBLY

**CAUTION:**

Wear insulated gloves.

**NOTICE:**

- Make sure to pull the connector cover assembly straight up, as a connector is connected to the bottom of the cover.
- Do not touch the connector cover assembly waterproofing rubber.
- Do not allow any foreign matter or water to enter the inverter with converter assembly.



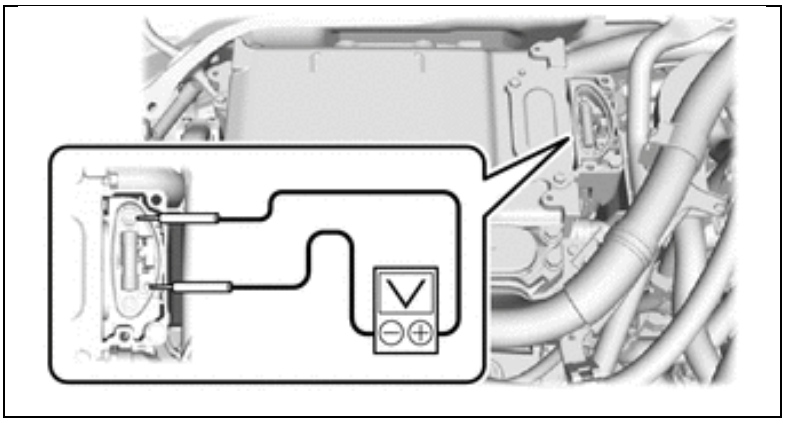
## 7. CHECK TERMINAL VOLTAGE

**CAUTION:**

Wear insulated gloves.

**NOTICE:**

Do not allow any foreign matter or water to enter the inverter with converter assembly.



a) Using a voltmeter, measure the voltage between the terminals of the 2 phase connectors.

***Standard Voltage***:
0 V

**HINT:**

Use a measuring range of DC 750 V or more on the voltmeter.

## 8. TEMPORARILY INSTALL CONNECTOR COVER ASSEMBLY

## 9. DISCONNECT FC CONVERTER POWER OUTLET CABLE (INVERTER WITH CONVERTER ASSEMBLY)

Refer to TIS for instructions on Engine / Hybrid System> HYBRID / BATTERY CONTROL>INVERTER WITH CONVERTER>REMOVAL


## 10. REMOVE RESERVE TANK CAP

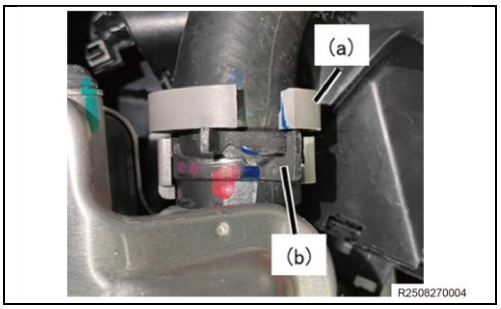
a) Cover the reserve tank cap with shop cloth and remove the reserve tank cap.

**CAUTION:**

Slowly open the cap since fluid and steam may spray out due to high pressure, possibly resulting in burns.

**HINT:**

If the reserve tank cap is not removed, coolant may leak from the water hoses when disconnecting them.



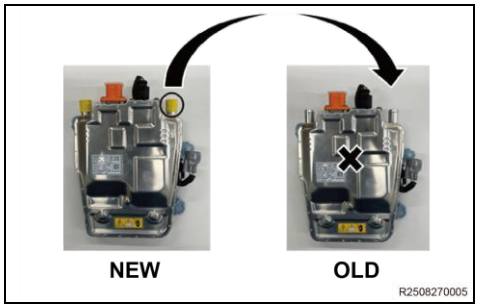

## 11. DISCONNECT WATER HOSE SUB-ASSEMBLY C

a) Remove the water hose set No. 2.

b) Using pliers, grip the claws of the clip and slide the clip to disconnect the water hose sub-assembly C.

**NOTICE:**

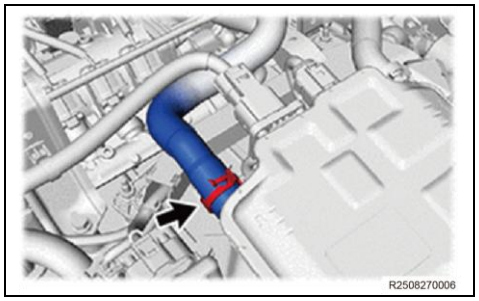
- ***DO NOT*** apply excessive force to the water hose sub-assembly C.
- Prepare a container or cloth in case the coolant leaks.




c) Remove a cap from the new electric heater and install the cap to the water hose B port of the old electric heater to prevent coolant from leaking when removing the electric heater.

**HINT:**

Either cap can be installed since the cap size is the same for both hoses.

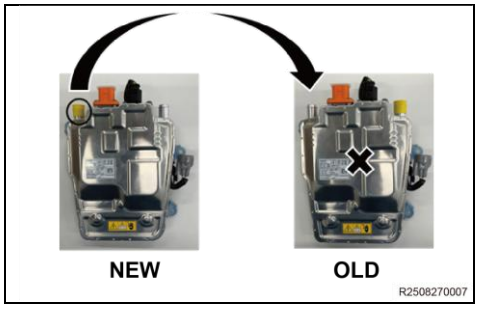



**12. DISCONNECT WATER HOSE SUB-ASSEMBLY B**

a) Using pliers, grip the claws of the clip and slide the clip to disconnect the water hose sub-assembly B.

**NOTICE:**

- ***DO NOT*** apply excessive force to the water hose sub-assembly B.
- Prepare a container or cloth in case the coolant leaks.




b) Remove a cap from the new electric heater and install the cap to the water hose C port of the old electric heater to prevent coolant from leaking when removing the electric heater.

**HINT:**

Either cap can be installed since the cap size is the same for both hoses.

**13. REMOVE ELECTRIC HEATER SUB-ASSEMBLY**

a) Slide the green-colored lock of the connector (A) as shown in the illustration to release it and disconnect the connector.

**CAUTION:**

Make sure to wear insulating gloves.

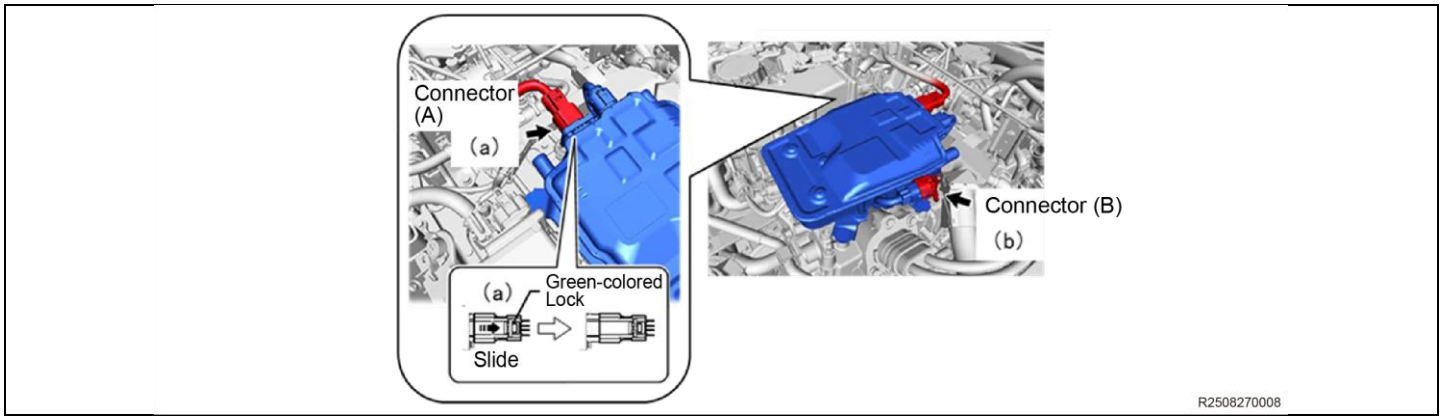
**NOTICE:**

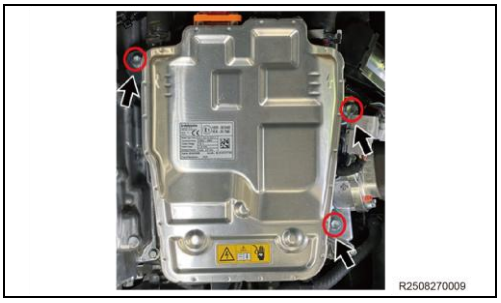
Insulate the disconnected terminals and connector (A) with Insulating tape.

b) Disconnect the connector (B).

**NOTICE:**

Cover the disconnected terminals and connector (B) with protective tape to prevent coolant from entering.



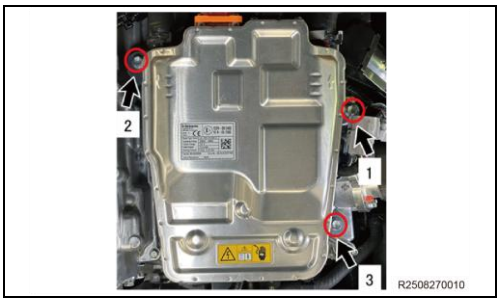



c) Remove the 3 bolts and electric heater sub-assembly.

## VIII. INSTALL THE *NEW* ELECTRIC HEATER SUB-ASSEMBLY

**Critical**

- **Always remember "*SAFETY FIRST*".**




### 1. INSTALL ELECTRIC HEATER SUB-ASSEMBLY

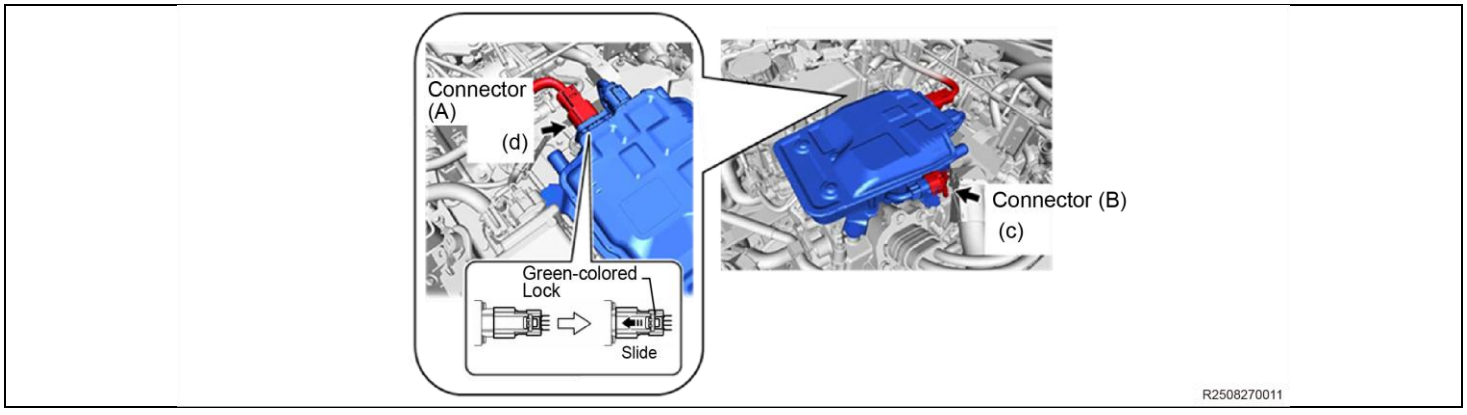
a) Temporarily install the electric heater subassembly with 3 bolts.
b) Install the electric heater sub-assembly with the 3 bolts in the order shown in the illustration.

**Torque: 9.8 N*m (100 kgf*cm, 87 in.*lbf)**

c) Remove the protective tape from the connector (B) and then connect the connector (B).
d) Remove the insulating tape from the connector (A) and then connect the connector (A) and slide the green-colored lock as shown in the illustration to securely lock it.

**CAUTION:**
Make sure to wear insulating gloves.

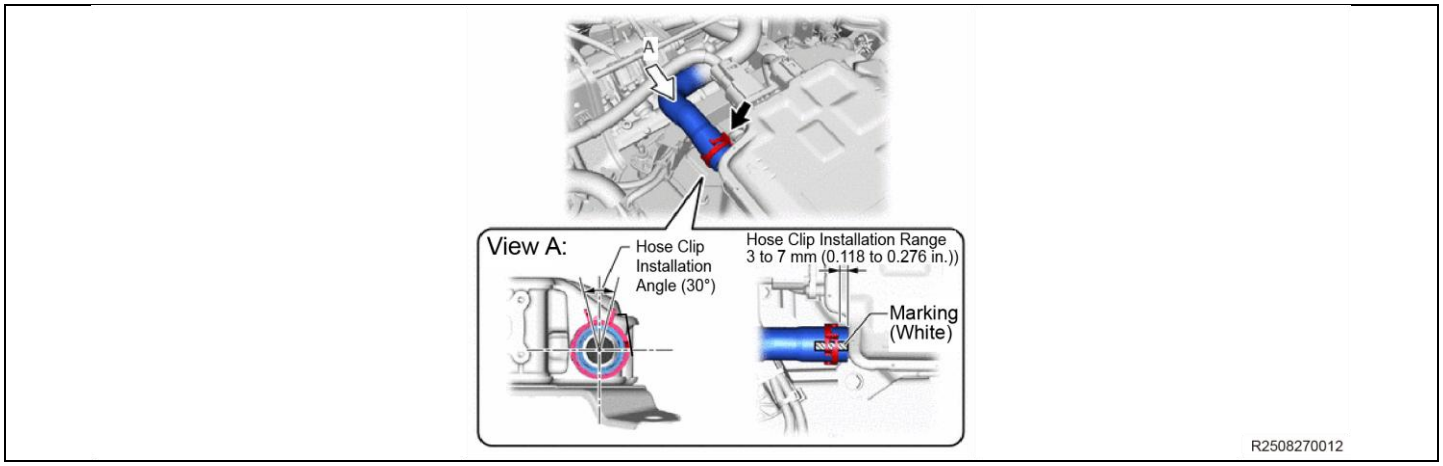
**NOTICE:**
Make sure that the connector is connected securely.




### 2. CONNECT WATER HOSE SUB-ASSEMBLY B

a) Connect the water hose with its marking facing upward and install the hose sub-assembly B clip within the range shown in the illustration.

**NOTICE:**
***DO NOT*** apply excessive force to the water hose sub-assembly B.



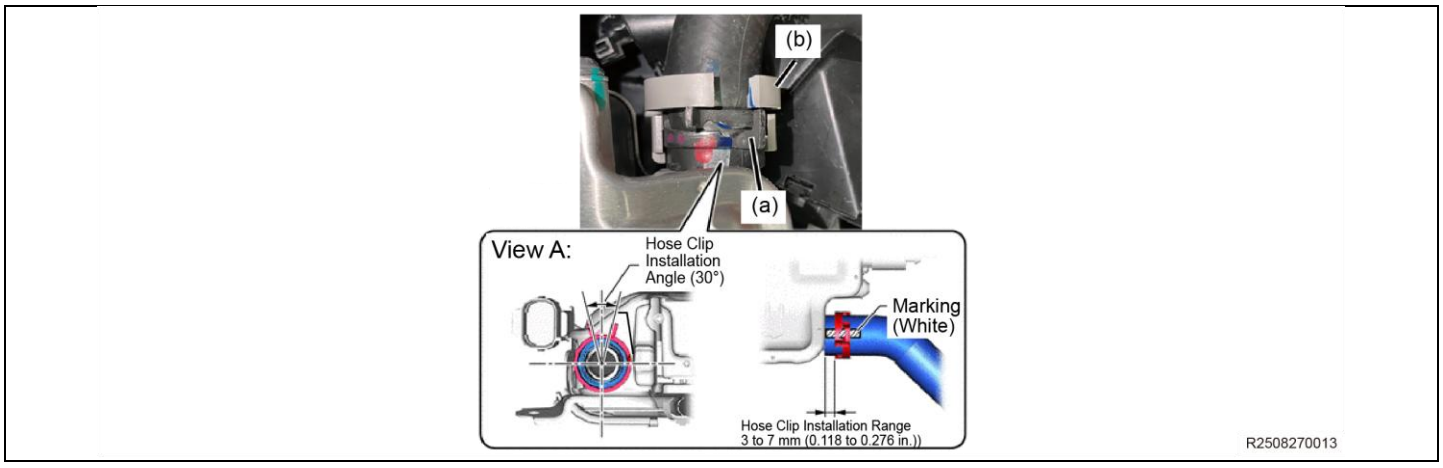

**3. CONNECT WATER HOSE SUB-ASSEMBLY C**

a) Connect the water hose with its marking facing upward and install the hose sub-assembly C clip within the range shown in the illustration.

b) Install the water hose set No. 2.

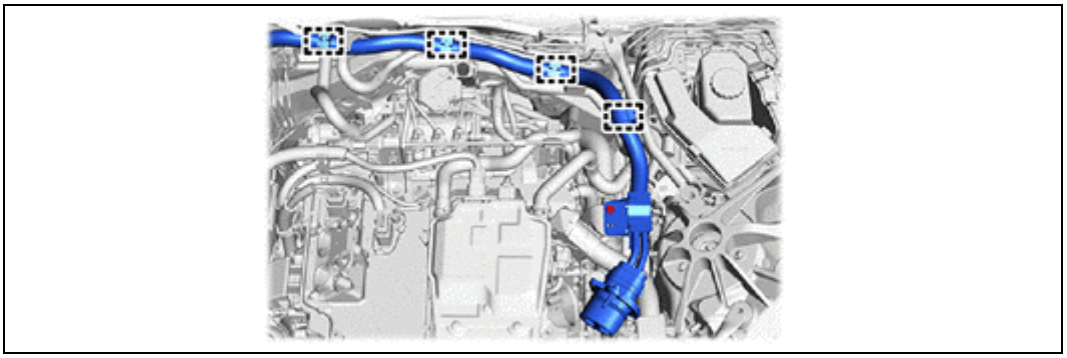
**NOTICE:**

***DO NOT*** apply excessive force to the water hose sub-assembly C.



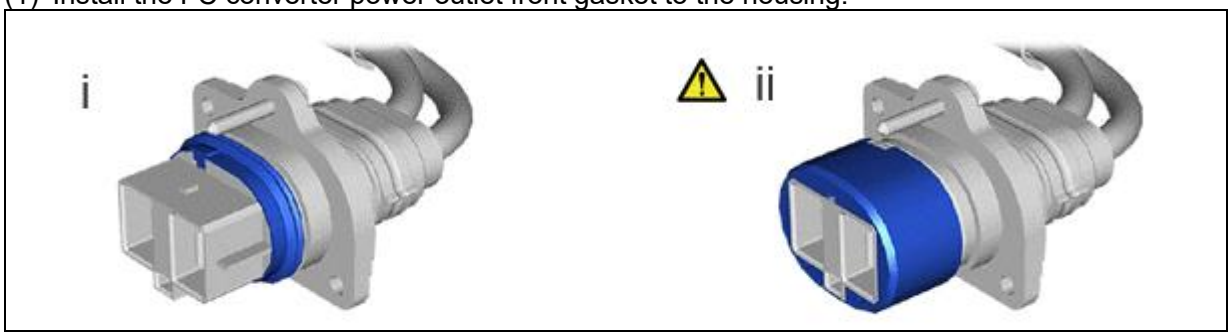

**4. CONNECT FC CONVERTER POWER OUTLET CABLE (INVERTER WITH CONVERTER ASSEMBLY)**

| | |
|---|---|
|  | **CAUTION:**<br>Wear insulated gloves.<br><br>**NOTICE:**<br>Before installing the service plug grip, check that no parts or tools remain and that the high voltage terminals and connectors are connected securely. |



(b) If the FC converter power outlet front holder and FC converter power outlet front gasket are removed, install them using the following procedure.

(1) Install the FC converter power outlet front gasket to the housing.



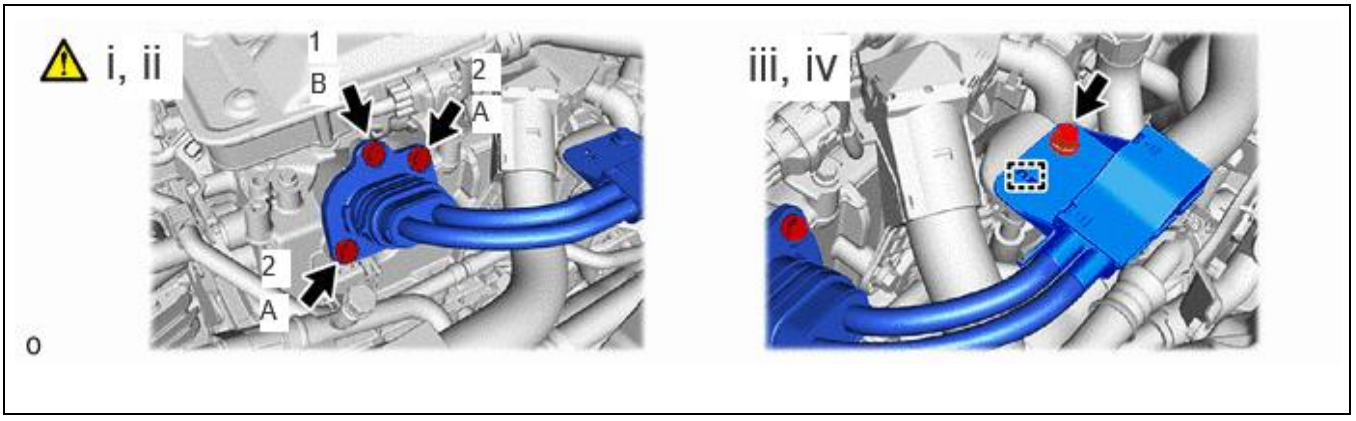

***HINT:***

Install by aligning the protrusion of the FC converter power outlet front gasket with the housing groove.

(2) Install the FC converter power outlet front holder to the housing.

**NOTICE:**

c) Push in the FC converter power outlet front holder until a "click" sound is heard. After pushing it in, check that it is not removed.




(1) Connect the FC converter power outlet cable (inverter with converter assembly) to the FC stack assembly.

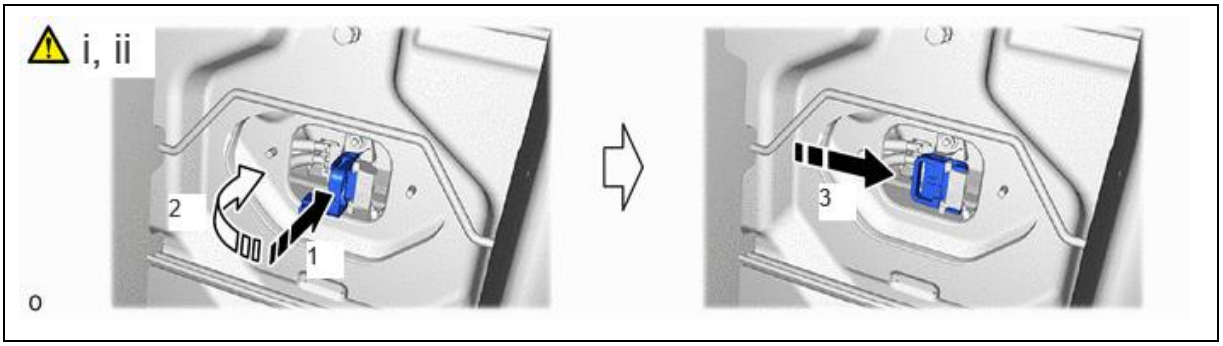
(2) Tighten the 2 bolts (A) and bolt (B) in the order shown in the illustration.

**Torque:**

**8.0 N·m {82 kgf·cm, 71 in·lbf}**

## 5. INSTALL SERVICE PLUG GRIP

| | |
|---|---|
| ⚠ | **CAUTION:**<br>Wear insulated gloves.<br><br>**NOTICE:**<br>Before installing the service plug grip, check that no parts or tools remain and that the high voltage terminals and connectors are connected securely. |



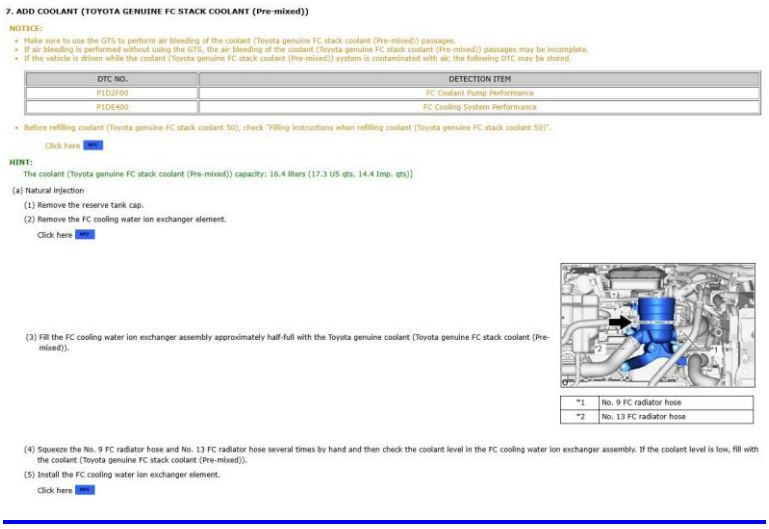

(1) While wearing insulated gloves, temporarily install the service plug grip as indicated by the arrow (1) shown in the illustration.
(2) Rotate the handle of the service plug grip 90° toward the HV battery and slide it in the direction indicated by the arrow (3) shown in the illustration until a click sound is heard to install the service plug grip.

**2. INSTALL NO. 8 EV BATTERY SHIELD PANEL**

**Torque:**
**7.5 N·m {76 kgf·cm, 66 in·lbf}**

## 6. ADD COOLANT (TOYOTA GENUINE FC STACK COOLANT (Pre-mixed))

- COOLING: COOLANT: REPLACEMENT (Step 7 Only)



7. ADD COOLANT (TOYOTA GENUINE FC STACK COOLANT (Pre-mixed))

NOTICE:
- Make sure to use the GTS to perform air bleeding of the coolant (Toyota genuine FC stack coolant (Pre-mixed)) passages.
- If air bleeding is performed without using the GTS, the air bleeding of the coolant (Toyota genuine FC stack coolant (Pre-mixed)) passages may be incomplete.
- If the vehicle is driven while the coolant (Toyota genuine FC stack coolant (Pre-mixed)) system is contaminated with air, the following DTC may be stored.

| DTC NO. | DETECTION ITEM |
|---|---|
| P1D2F00 | FC Coolant Pump Performance |
| P1DE400 | FC Cooling System Performance |

- Before refilling coolant (Toyota genuine FC stack coolant 50), check "Filling Instructions when refilling coolant (Toyota genuine FC stack coolant 50)".

Click here

HINT:
The coolant (Toyota genuine FC stack coolant (Pre-mixed)) capacity: 16.4 liters (17.3 US qts, 14.4 Imp. qts)]

(a) Natural injection
(1) Remove the reserve tank cap.
(2) Remove the FC cooling water ion exchanger element.
Click here

(3) Fill the FC cooling water ion exchanger assembly approximately half-full with the Toyota genuine coolant (Toyota genuine FC stack coolant (Pre-mixed)).

| | |
|---|---|
| *1 | No. 9 FC radiator hose |
| *2 | No. 13 FC radiator hose |

(4) Squeeze the No. 9 FC radiator hose and No. 13 FC radiator hose several times by hand and then check the coolant level in the FC cooling water ion exchanger assembly. If the coolant level is low, fill with the coolant (Toyota genuine FC stack coolant (Pre-mixed)).
(5) Install the FC cooling water ion exchanger element.
Click here

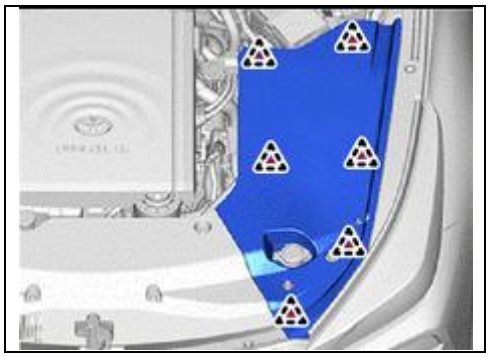
Critical

- **Since FC coolant is not removed, it is unnecessary to add coolant with FC cooling water ion exchanger element removed.**
- **DO NOT add coolant into the case of the ion exchanger, otherwise FC coolant will flow out.**

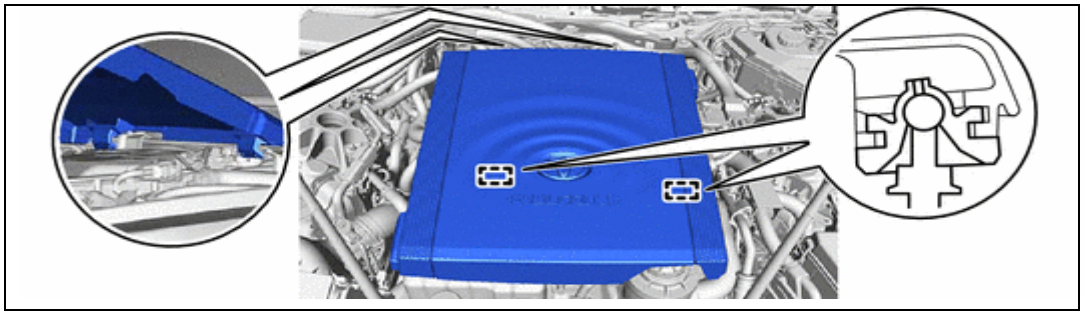
**7. INSPECT FOR COOLANT (TOYOTA GENUINE FC STACK COOLANT (Pre-mixed)) LEAK**

- COOLING: COOLING SYSTEM: ON-VEHICLE INSPECTION (Step 8 Only)

**8. INSTALL FC STACK COVER SUB-ASSEMBLY**



**9. INSTALL FC STACK COVER SUB-ASSEMBLY**



**10. CHECK AND CLEAR DTCs**

## IX. RESTORE VEHICLE

Critical

- **Always remember "*SAFETY FIRST*".**

a) Restore the vehicle to Original Condition.
b) Complete the Repair Quality Check Sheet.

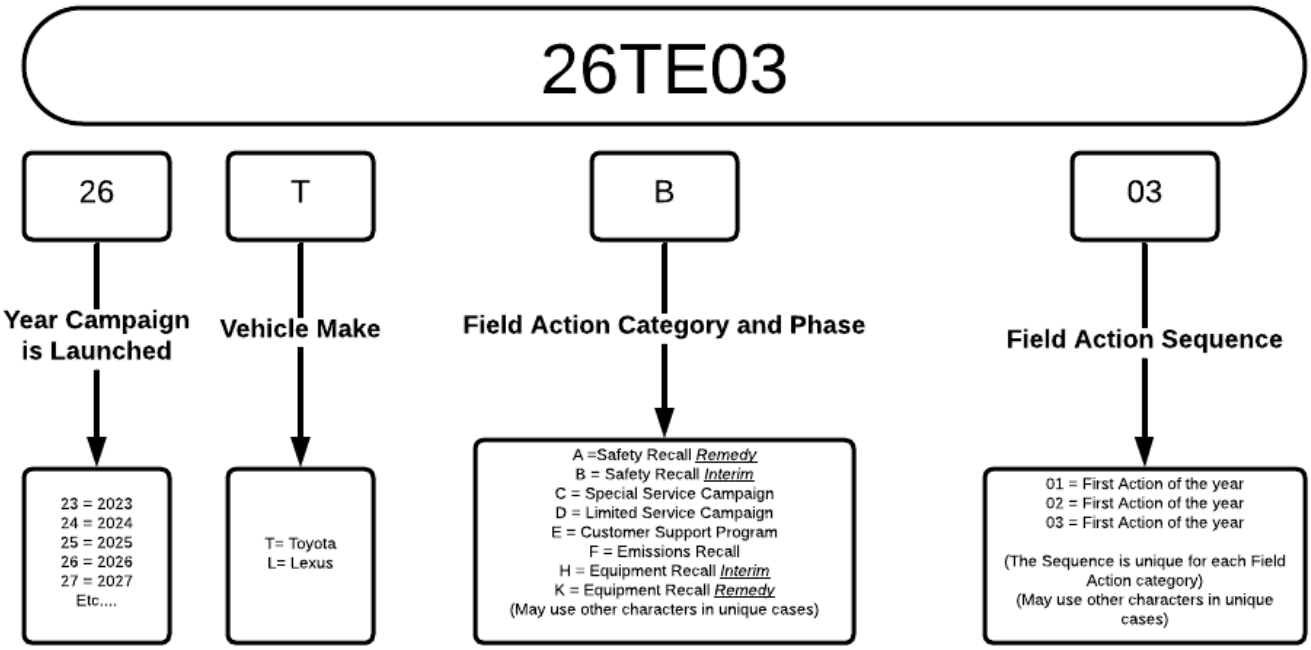
◄ VERIFY REPAIR QUALITY ►

- **No DTC's are present.**
- **Confirm Heater/ Defroster functions properly.**
- **Confirm coolant reservoir tank is full.**

**If you have any questions regarding this update, please contact your regional representative.**

# X. APPENDIX

## A. CAMPAIGN DESIGNATION DECODER




**Examples:**
**19TA01 = Launched in 2019, Toyota, Safety Recall Remedy Phase, 1st Safety Recall Launched in 2019**
**20TC02 = Launched in 2020, Special Service Campaign, 2nd Special Service Campaign Launched in 2020**
**21TE05 = Launched in 2021, Customer Support Program, 5th Customer Support Program Launched in 2021**

## B. CAMPAIGN PARTS DISPOSAL

As required by Federal Regulations, please make sure all campaign 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.**