

TECHNICAL INSTRUCTIONS

FOR

SAFETY RECALL H0U

INVERTER ASSEMBLY REPLACEMENT

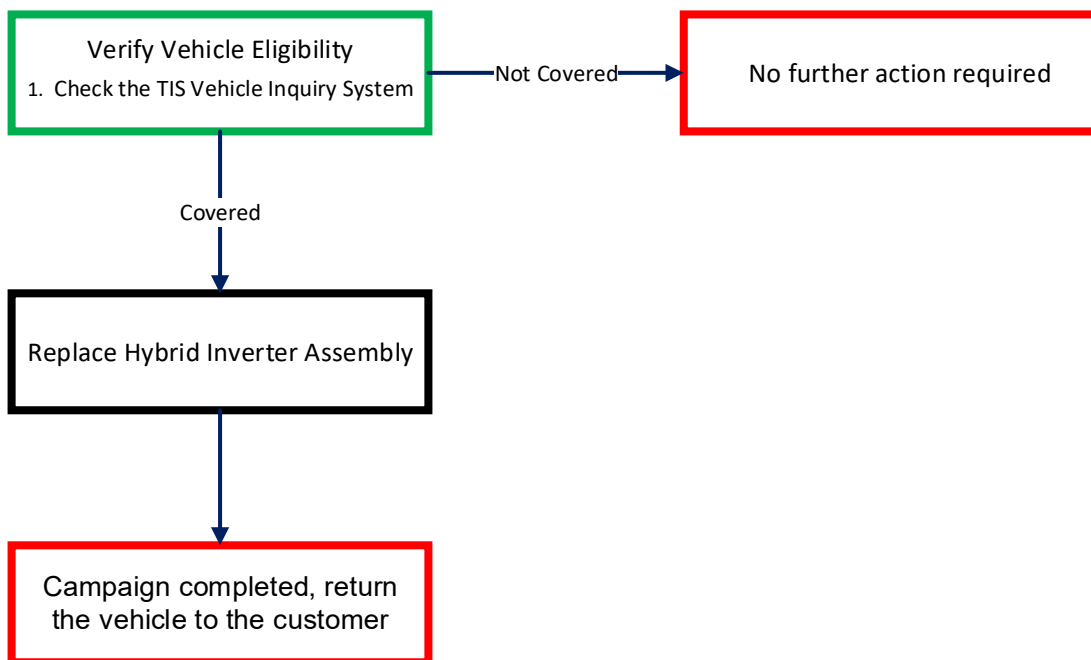
CERTAIN 2016 PRIUS

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 the VIN is involved in this Safety Recall, and that the Campaign has not already been completed prior to dealer shipment or by another dealer.
- TMS warranty will not reimburse dealers for repairs completed on vehicles that are not affected or were completed by another dealer.

III. PREPARATION

A. PARTS

NOTE: The original inverter removed from the car will be on Parts Recovery. Please insure that the inverter is properly packaged, as detailed on p. 23, and returned to the parts department.

To obtain the **NEW** remedy part (inverter with converter assembly) for an involved vehicle, email pqss_mac@toyota.com.

Upon receipt of your email, pqss_mac@toyota.com will order the remedy part for the involved vehicle. The part will then be delivered to your dealership via regular parts delivery method, or it will be directly shipped to your dealership via a 3rd party shipping carrier (FedEx or UPS). Your dealership **does not** need to place a parts-order.

Pqss_mac@toyota.com will provide your dealership with the name of the shipping carrier (regular parts delivery method, UPS, or FedEx), the order reference number, and a shipment tracking number (for UPS and FedEx only).

(continued on next page)

Your email to pqss_mac@toyota.com should contain the following information:

Email Subject: ■ Safety Recall H0U – Request for remedy part.

Email Body: ■ Involved vehicle's VIN.
■ Reason for replacement. Example: My dealership requires a remedy part to perform Safety Recall H0U.
■ Dealer number.
■ Ship-to information (dealership name, address, attention, phone number).

Email Attachment: ■ Photograph of the involved vehicle's certification label (vinyl label installed on the driver's door or door post). The photograph should be clear, legible, and capture the entire certification label.

B. TOOLS & EQUIPMENT

- Techstream
- Standard Hand Tools
- Torque Wrench
- Safety Glasses
- DVOM CAT III rated
- TORX T25

C. SPECIAL SERVICE TOOLS

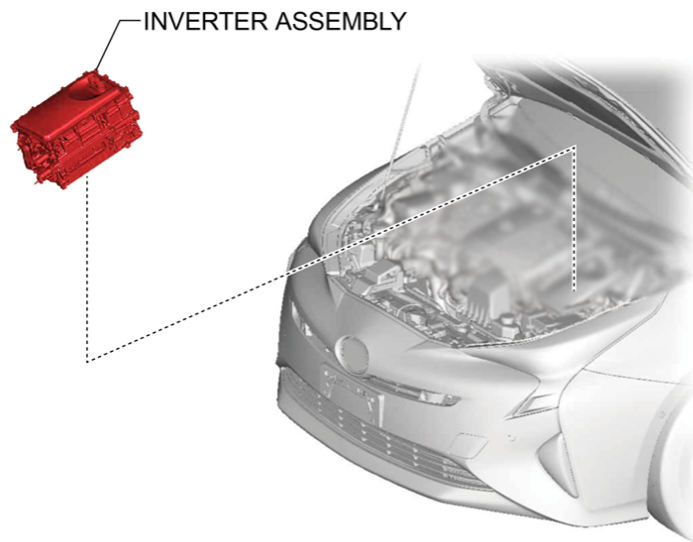
- High Voltage Gloves
- Glove Inflator
- Insulated ¼" Torque Wrench

D. MATERIALS

- Toyota Super Long Life Coolant

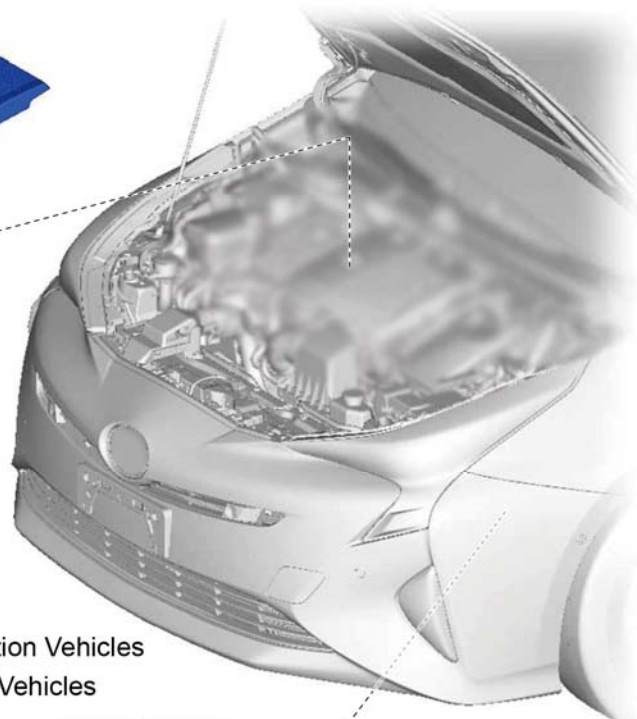
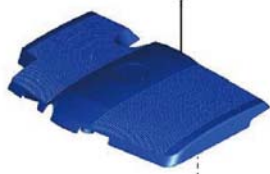
IV. BACKGROUND

The hybrid system in the involved vehicles contains an inverter assembly that may not have been properly assembled. This may cause components in the inverter assembly to become damaged during normal vehicle operation. Under certain conditions, this can lead to a hybrid system shut down. While power steering and braking assist will function normally, a hybrid system shutdown while driving at higher speeds could increase the risk of a crash.



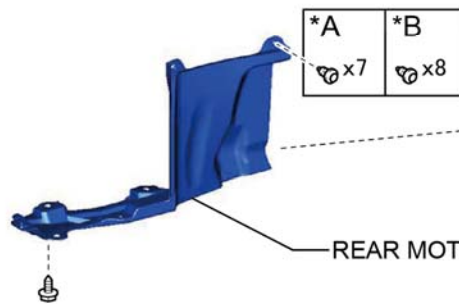
V. COMPONENTS

No. 1 ENGINE COVER ASSEMBLY



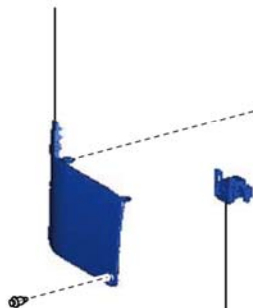
*A: except Rough Road Area Specification Vehicles

*B: for Rough Road Area Specification Vehicles

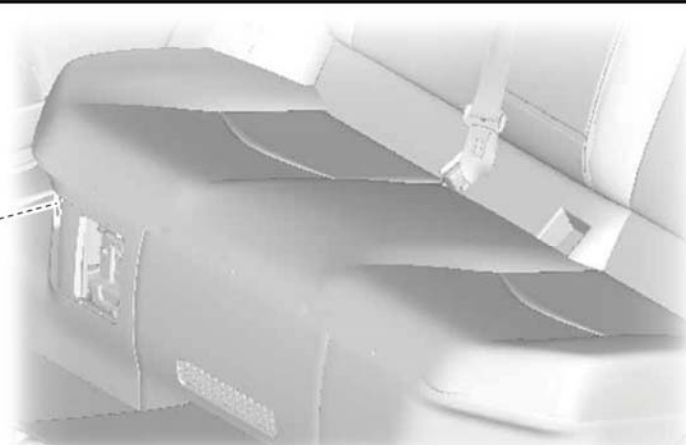


REAR MOTOR UNDER COVER LH

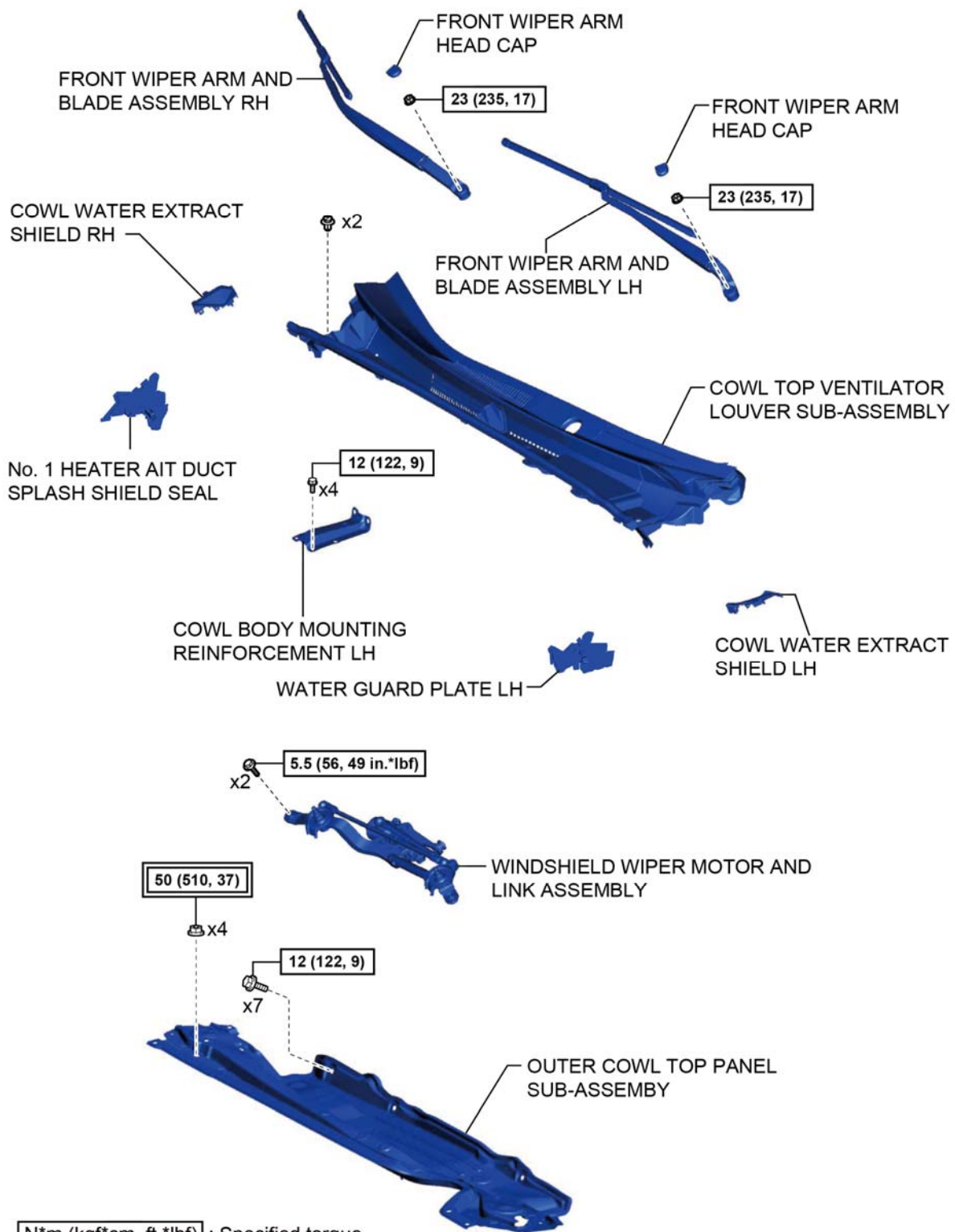
BATTERY SERVICE HOLE COVER



SERVICE PLUG GRIP



S88108aS



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

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

S88111aS

VI. SAFETY PRECAUTIONS

CAUTION:

This vehicle has a hybrid control system that operates at voltages of up to 650 V. An organic electrolyte containing carbonic acid esters as its main component is used as the electrolyte for the HV battery. Be sure to follow the instructions in this manual to handle the system correctly. Failure to do so may result in serious injury or electrocution.

- (a) Technicians must undergo special training to be able to service and inspect the high-voltage system.
- (b) All high-voltage wire harnesses and connectors are colored orange. Do not carelessly touch these wires or components.
- (c) When there is a problem with the wire harness or connector of a high-voltage circuit, repairs to the harness or connector should not be attempted. Replace damaged or malfunctioning high voltage cables or connectors.
- (d) Before inspecting or servicing the high-voltage system, be sure to follow all safety measures, such as wearing insulated gloves and removing the service plug to prevent electrocution. Carry the removed service plug in your pocket to prevent other technicians from accidentally reconnecting it while you are servicing the vehicle.

NOTICE:

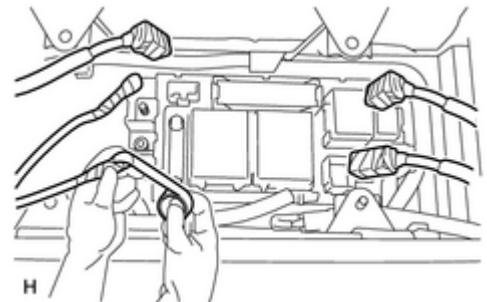
After removing the service plug grip, do not turn the power switch on (READY), unless instructed by the repair manual because this may cause a malfunction.

- (e) After removing the service plug grip, wait 10 minutes before touching any of the high-voltage connectors and terminals.

HINT:

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

- (f) Before using insulated gloves, be sure to check them for cracks, tears and other types of damage by following the manufactures recommendations.
- (g) When servicing the vehicle, do not carry metal objects like mechanical pencils or rulers that can be dropped accidentally and cause a short circuit.
- (h) Before touching a bare high-voltage terminal, wear insulated gloves and use a tester to make sure that the terminal voltage is 0 V.



- (i) After disconnecting or exposing a high-voltage connector or terminal, insulate it immediately using insulating tape.

- (j) Bolts and nuts for high-voltage terminals should be tightened firmly to the specified torque. Both insufficient and excessive torque can cause failure.
- (k) Use the "CAUTION: HIGH VOLTAGE DO NOT TOUCH" sign to notify other technicians that the high-voltage system is being inspected and/or repaired.

- (l) After servicing the high-voltage system and before reinstalling the service plug, check again that you have not left a part or tool inside, that the high-voltage terminals are firmly tightened, and that the connectors are correctly connected.
- (m) When performing work involving high-voltage wires, use either a tool wrapped with vinyl insulation tape or an insulated tool.
- (n) When installing hybrid control system components such as the HV battery, make sure that the polarity of all connections is correct.

CAUTION:

- Do not touch any bare cables that may have high-voltage. If a cable must be touched or if accidental contact is possible, wear insulated gloves and insulate the cable using insulating tape.
 - Visually check the HV battery and the immediate area for any electrolyte leakage. Do not touch any leaked liquid because it could be organic electrolyte that contains carbonic acid esters.
 - The electrolyte is flammable. Keep all ignition sources such as open flame and hot objects away from the electrolyte.
 - Electrolyte leaks may cause acute poisoning if a high concentration of the vapor from the organic solvent is inhaled. In case of inhalation, move the affected person to a place with ample fresh air and let them lie quietly. Seek medical care.
 - In case of skin contact with the electrolyte, wash the area thoroughly with soap and plenty of water, and seek medical care. Immediately remove any contaminated clothing. Prolonged contact with the electrolyte may cause skin irritation.
 - If the electrolyte comes in contact with your eyes, call out loudly for help. Do not rub your eyes. Immediately flush them with a large amount of water for at least 15 minutes and seek medical care.
 - If electrolyte is swallowed, seek medical care immediately. Do not induce vomiting, unless instructed by the doctor.
- (1) Wear insulated or rubber gloves, goggles, and safety shoes.
 - (2) Check the HV battery and immediate area for any electrolyte leakage.

CAUTION:

- Do not touch any leaked liquid because it could be the organic electrolyte that contains carbonic acid esters. If contact is unavoidable, wipe the fluid off using a cloth while wearing rubber gloves, goggles and an organic solvent mask. Do not leave electrolyte-contaminated cloths unattended. Place contaminated cloths in an appropriate airtight container and dispose of them according to local regulations.
- (3) Do not touch any bare cables that could be high voltage cables. If a cable must be touched or if accidental contact is possible, follow the following instructions: 1) wear insulated gloves and goggles, 2) measure the voltage between the cable and body ground using an electrical tester, and 3) insulate the cable using insulating tape.
 - (4) If damage to any of the high-voltage components and cables is suspected, cut the high-voltage circuit using the procedure below.

CAUTION:

Do not touch any bare cables that may have high-voltage. If a cable must be touched or if accidental contact is possible, wear insulated gloves and insulate the cable using insulating tape.

CAUTION:

- Before returning the HV battery, make sure to perform recovery inspection.
- Before returning the hybrid vehicle supply stack sub-assembly, make sure to perform recovery inspection.
- Accidents such as electric shock may result if the HV battery or a hybrid vehicle supply stack sub-assembly is disposed of improperly or abandoned. Therefore, make sure to return all HV batteries or hybrid vehicle supply stack assemblies through an authorized collection agent.
- To reduce the risk of fire, the HV battery or hybrid vehicle supply stack assembly must not be stored in an area where it will be exposed to fire or high temperatures.

VII. DISASSEMBLY

CAUTION:

- Before inspecting the high-voltage system or disconnecting the low voltage connector of the inverter with converter assembly or electric vehicle charger assembly, take safety precautions such as wearing insulated gloves and removing the service plug grip to prevent electrical shocks. After removing the service plug grip, put it in your pocket to prevent other technicians from accidentally reconnecting it while you are working on the high-voltage system.
- After removing the service plug grip, wait for at least 10 minutes before touching any of the high voltage connectors or terminals. After waiting for 10 minutes, check the voltage at the terminals in the inspection point in the inverter with converter assembly. The voltage should be 0 V before beginning work.

HINT:

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



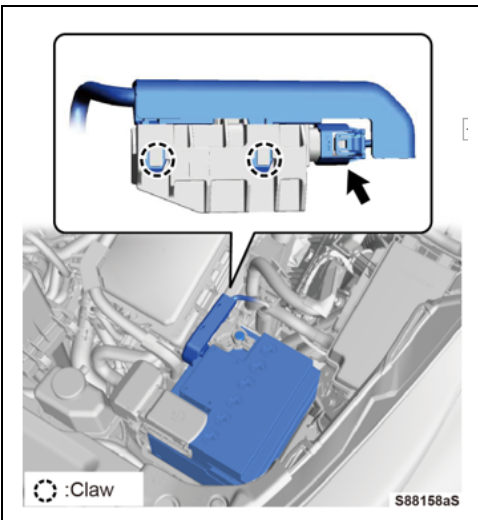
1. CHECK FOR DTC'S

- a. Using a Techstream, check for Diagnostic Trouble Codes.



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 only covers the replacement of the Hybrid inverter assembly, as detailed in these instructions. It does not cover the diagnosis or replacement of any other parts on the vehicle, including the hybrid system.



2. REMOVE AUXILIARY BATTERY

- a. Disconnect the negative battery cable.
- b. Disconnect the positive battery cable.
- c. Unplug the wire from the battery current sensor.
- d. Remove the bolt and hold down clamp.



3. CHECK HIGH VOLTAGE SERVICE GLOVES

a. Obtain the proper size (M, L, XL) High Voltage Service Gloves (left & right) from drawer #6 of the TOYOTA HEV WORKSTATION. Slide the drawer (release in the lower right) out to access the gloves located behind the HV Battery Charger.

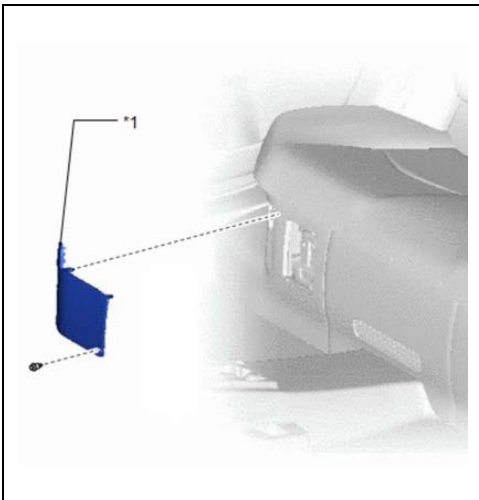


b. Remove the leather outer protective glove (left and right) to expose the rubber High Voltage Service Gloves.
c. Check the Date of Test stamped on the gloves. This indicates the date of the gloves most recent **Certified electrical inspection**. If the date on the gloves is more than 6 months ago, do not use these gloves. They will either need to be replaced or sent to a Certified Testing Facility for recertification to comply with [OSHA standard 1910.137](#) using the procedure defined in [ASTM F496](#). An internet search for [High Voltage Glove Testing](#) should assist in finding a company to recertify your gloves. For replacement gloves, contact Bosch/OTC at 1-800-933-8335:

Insulated Glove Set, Size M	01413-00072
Insulated Glove Set, Size L	01413-00073
Insulated Glove Set, Size XL	01413-00074

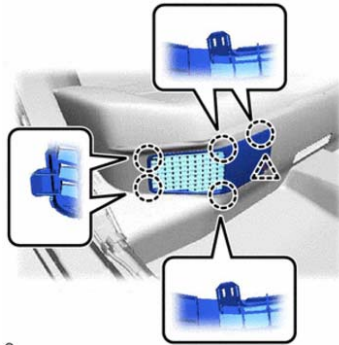


d. Before each use, the gloves must be checked for damage. Using the Glove Inflator found in drawer #2 of the TOYOTA HEV WORKSTATION, inflate each glove and inspect for holes, tears, punctures or cuts, ozone cutting or ozone checking, embedded foreign objects, texture changes, including swelling, softening, hardening, or becoming sticky or inelastic, and any other defect that damages the insulating properties.
e. Reinstall the outer protective leather covers (gloves) over the rubber High Voltage glove to prevent damage.

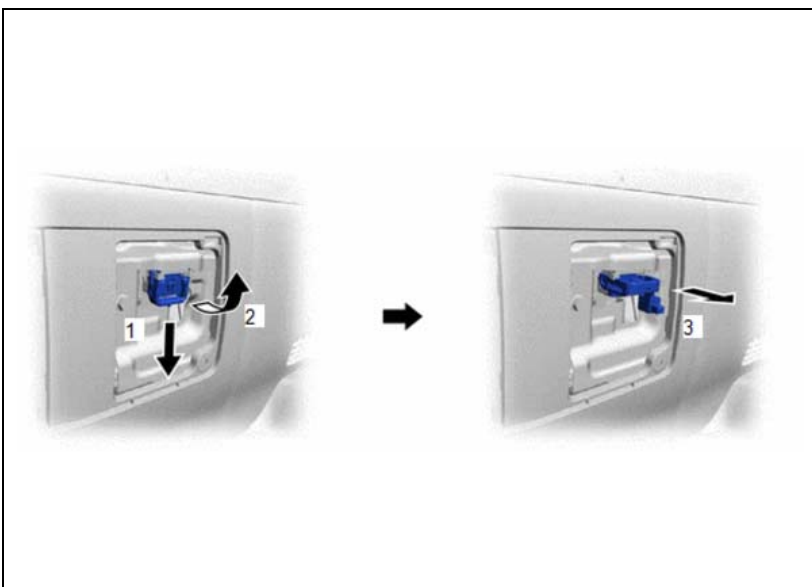


4. REMOVE BATTERY SERVICE COVER

- a. From the RH back seat, remove the clip and then disengage the 5 claws.



You are about to remove the High Voltage Service Plug. There is a potential for electrical shock and arc flash. Make sure to wear safety glasses and the properly inspected High Voltage Service Gloves with the leather outer covers.



5. REMOVE SERVICE PLUG

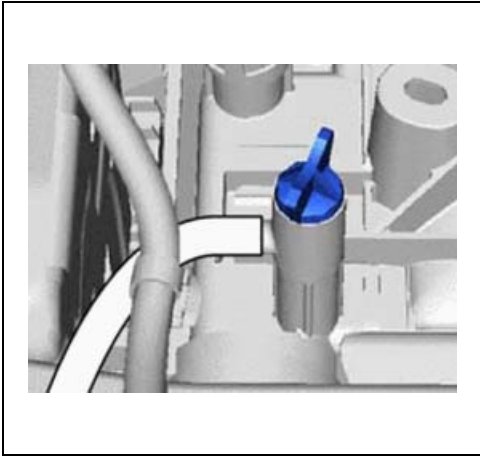


Be sure to wear safety glasses and properly inspected High Voltage Safety Gloves.

- a. Unlock the handle by pushing down (1).
- b. Rotate the handle upward (2).
- c. Pull straight out on the handle to remove the Service Plug (3).
- d. After removing the Service Plug, **wait at least 10 minutes** before proceeding with any high voltage service work.

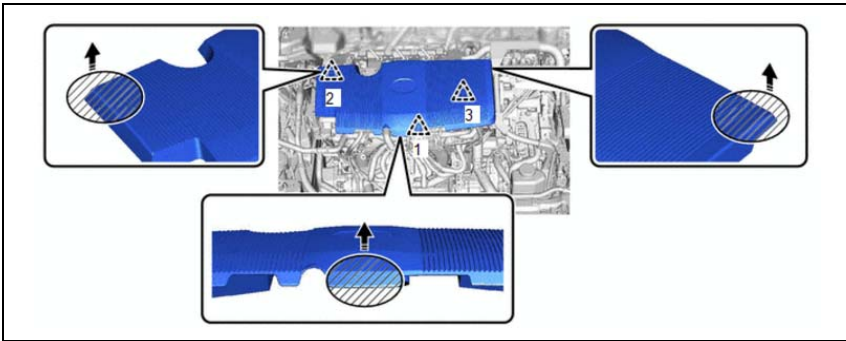


Wait for at least 10 minutes before proceeding with any high voltage service work. This is required to discharge the high-voltage capacitor inside the inverter assembly so that it can safely be serviced.



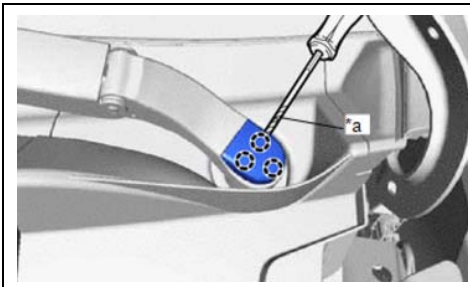
6. DRAIN INVERTER COOLANT

- a. Remove the engine under cover.
- b. Remove the reservoir tank cap from the inverter reservoir tank.
- c. Connect a hose with an inside diameter of 9mm (0.354") to the hybrid radiator drain cock (the lower of the two drain cocks) as shown.
- d. Loosen the drain cock plug and drain the coolant into an approved container.
- e. Tighten the drain cock plug.
- f. Remove the hose from the drain cock.
- g. Reinstall the engine under cover.



7. REMOVE ENGINE COVER

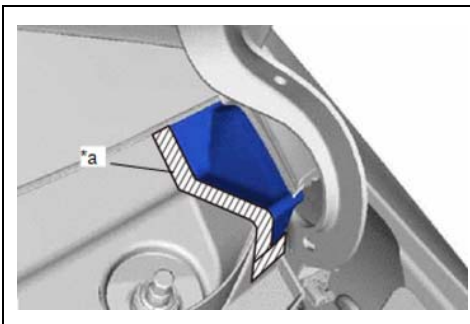
- a. Disengage the 3 clips by pulling up at the points indicated.



8. REMOVE WIPER ARMS LH & RH

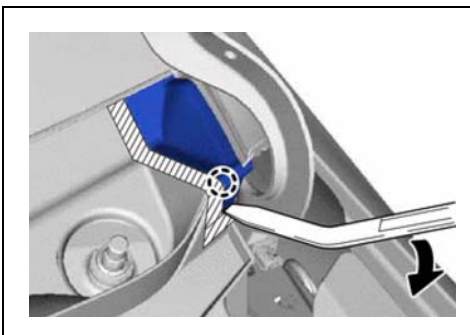
- a. Using a small screwdriver, disengage the 3 claws to remove the front wiper arm head cap.
- b. Remove the nuts.
- c. Remove the front wiper arm assembly's.

*a	Protective Tape
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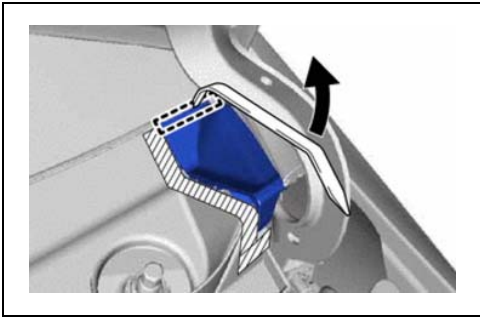


9. REMOVE COWL WATER SHIELD LH & RH

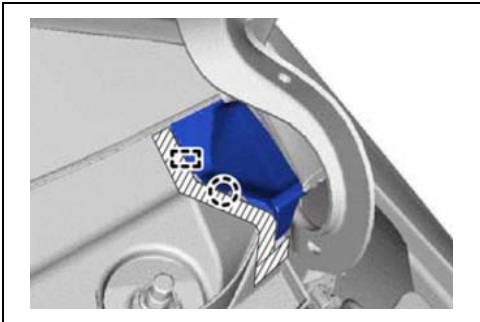
- a. Apply protective tape around the cowl water shield.



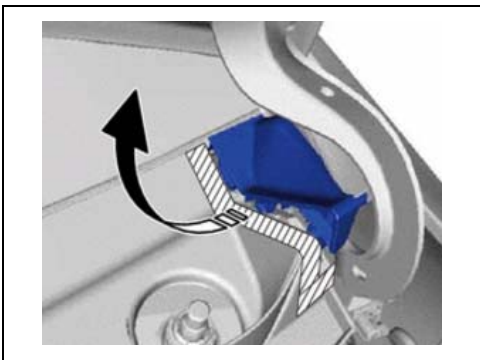
- b. Using a trim tool, disengage the claw as shown in the illustration.



c. Using a trim tool, disengage the clips on the top edge.



d. Disengage the claw and guide.



e. Remove the cowl water shield as shown.

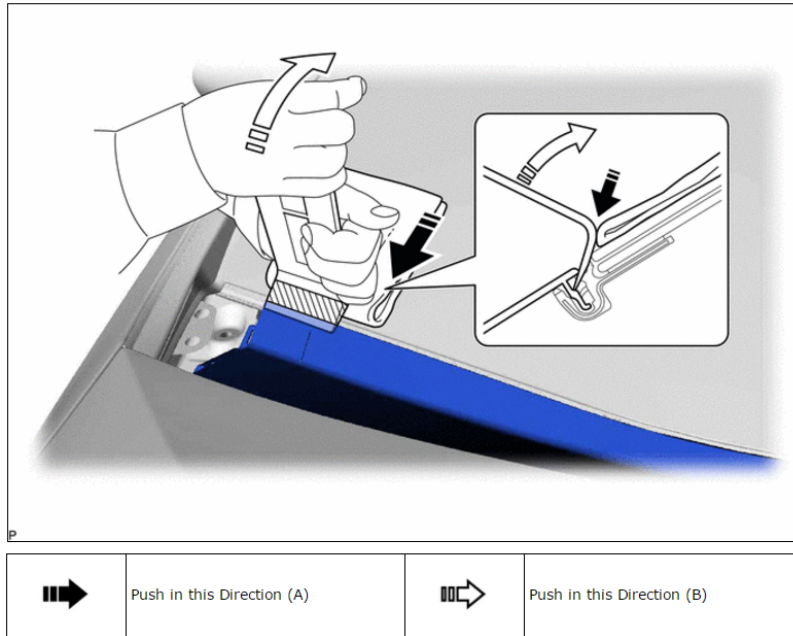
10. REMOVE COWL TOP VENTILATOR LOUVER

a. Remove the 2 clips



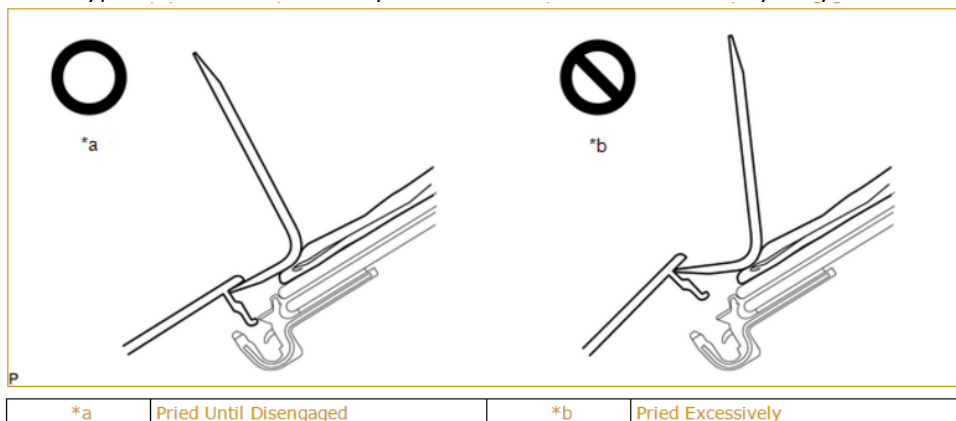
NOTICE: To prevent damage to the windshield glass, remove any foreign matter (sand, dust, etc.) from around the contacting surfaces of the cowl top ventilator louver sub-assembly and windshield glass.

- b. Close the hood.
- c. Insert the trim tool with the edge covered in protective tape at the starting position until the edge is aligned with the cowl top ventilator as shown in the illustration.
- d. While pushing the trim tool in the direction indicated by the arrow (A), push the trim tool in the direction indicated by arrow (B). Once at the center, repeat the same process from the other side.



NOTICE:

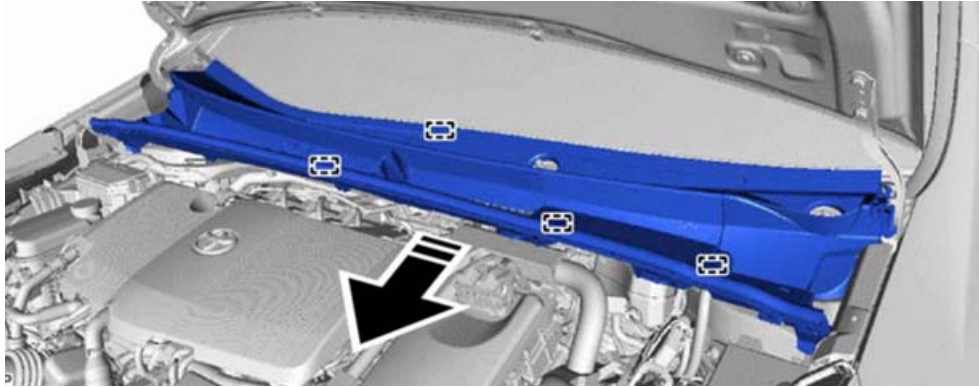
- Make sure to repeat this procedure to disengage the entire cowl top ventilator louver sub-assembly.
- Make sure to perform this procedure while pushing the trim tool in the direction indicated by the arrow (A), otherwise the cowl top ventilator louver sub-assembly may be deformed or damaged.
- DO NOT use a metal trim tool. Only use plastic as the chances of damage to the windshield will be reduced.
- To prevent damage to the windshield glass, set a piece of cloth between the trim tool and windshield glass.
- Make sure to insert the trim tool until the edge of protective tape is aligned with the cowl top ventilator louver sub-assembly, otherwise the cowl top ventilator louver sub-assembly may be deformed or damaged.



NOTICE:

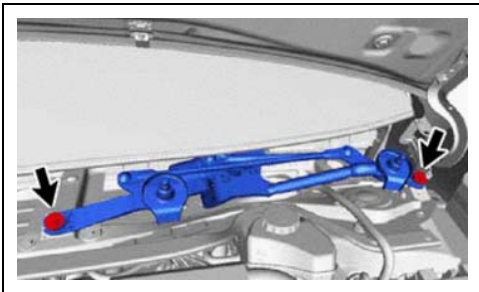
Make sure not to pry the cowl top ventilator louver sub-assembly more than necessary to disengage it, otherwise it may be deformed or damaged.

- e. Open the hood.
- f. Disengage the 4 guides and remove the cowl top ventilator as shown.



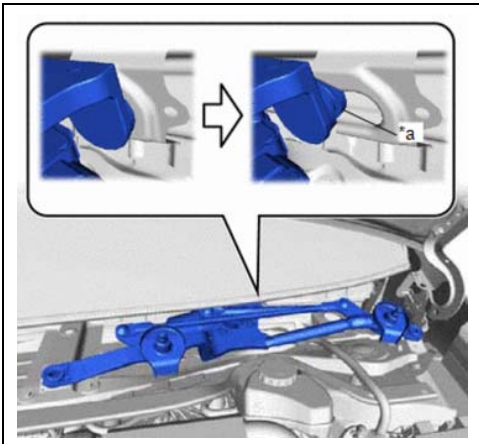
NOTICE:

When removing the cowl top ventilator louver sub-assembly, it may contact the brake master cylinder reservoir filler cap assembly and cause it to fall off. Check the installation condition of the brake master cylinder reservoir filler cap assembly after removing the cowl top ventilator louver sub-assembly.



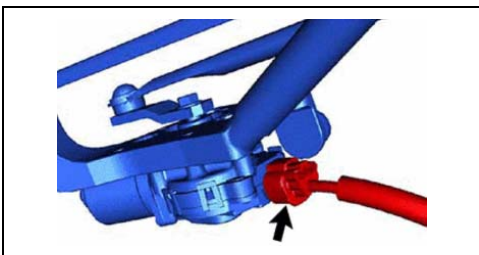
11. REMOVE WINDSHIELD WIPER MOTOR ASSEMBLY

- a. Remove the 2 bolts.

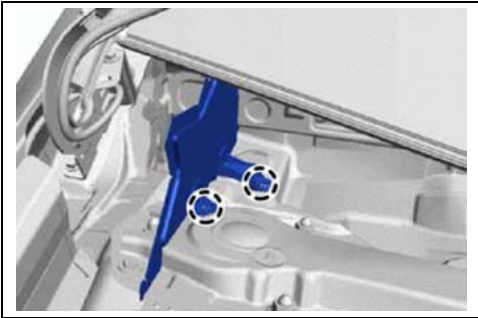


- b. Disengage the motor grommet as shown in the illustration.

*a	Motor Grommet
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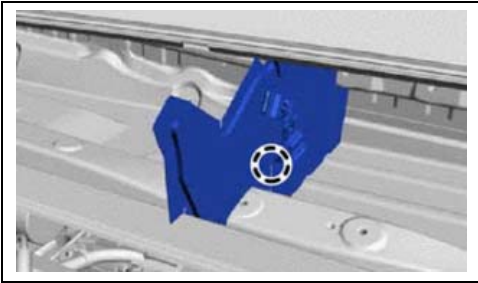


- c. Disconnect the electrical connector.



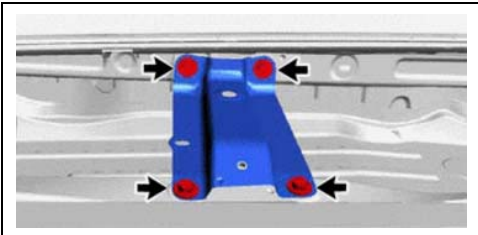
12. REMOVE SPLASH SHIELD

- a. Disengage the 2 claws.



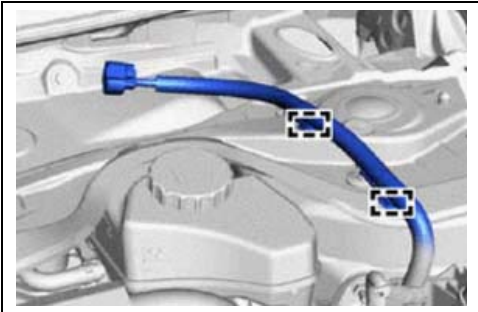
13. REMOVE WATER GUARD PLATE

- a. Disengage the claw.



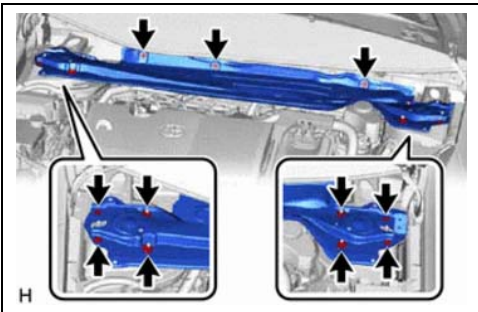
14. REMOVE COWL BODY REINFORCEMENT LH

- a. Remove the 4 bolts.

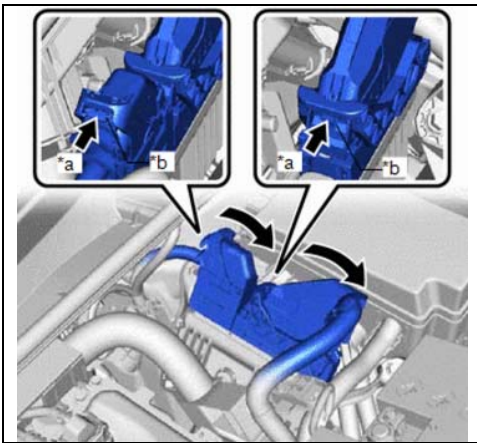


15. REMOVE OUTER COWL TOP PANEL

- a. Disengage the 2 clamps and separate the wire harness from the outer cowl top panel.



- b. Remove the 7 bolts and 4 nuts.



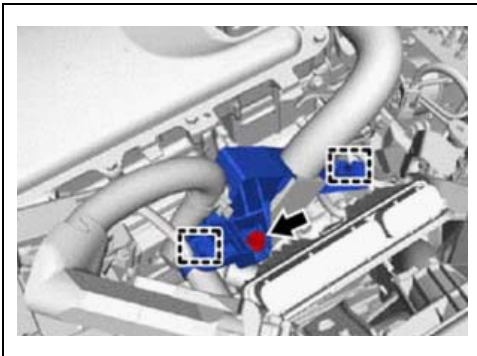
16. REMOVE ECM

- a. Raise the 2 levers while pushing the locks on the levers to disconnect the harness connectors.

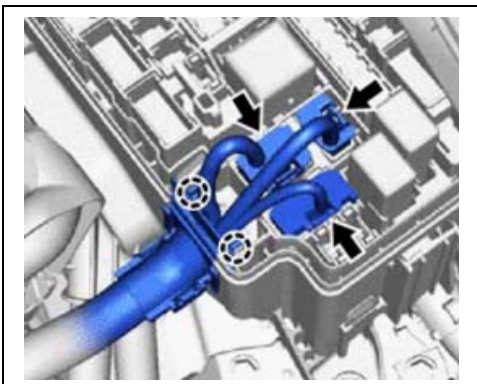
NOTICE:

After disconnecting the ECM connectors, make sure that dirt, water or other foreign matter does not contact the connecting parts of the ECM connectors.

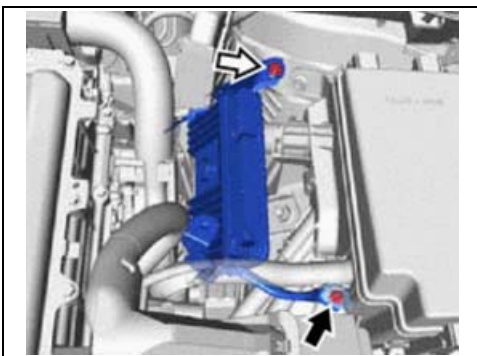
*a	Push
*b	Lock



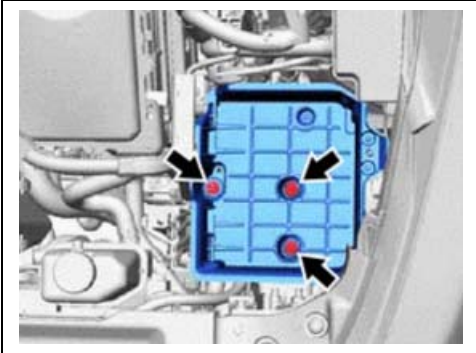
- b. Remove the bolt.
- c. Disengage the 2 clamps.



- d. Remove the relay block cover.
- e. Disengage the 2 claws and slide the deal upward.
- f. Disconnect the 3 connectors.

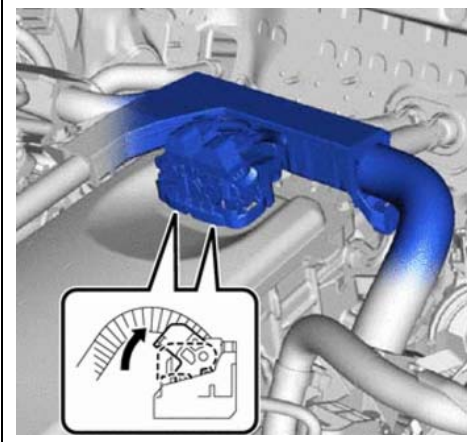


- g. Remove the bolt & nut.
- h. Remove the ECM.



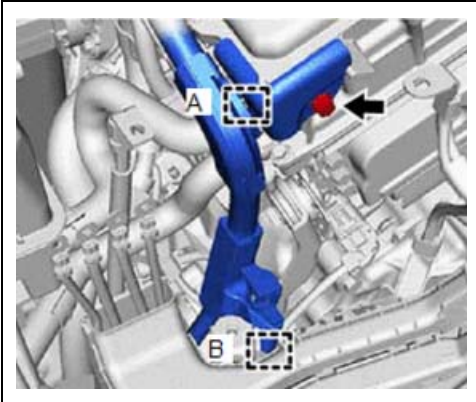
17. REMOVE BATTERY TRAY

- a. Remove the 3 bolts.

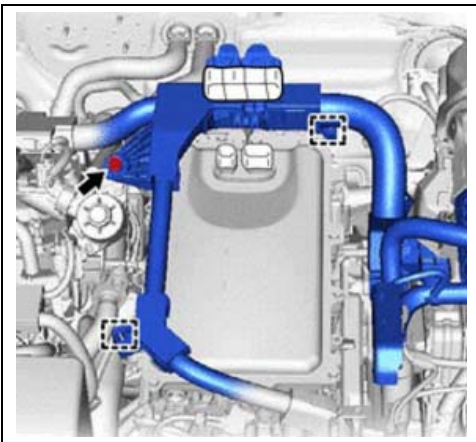


18. DISCONNECT ENGINE WIRE

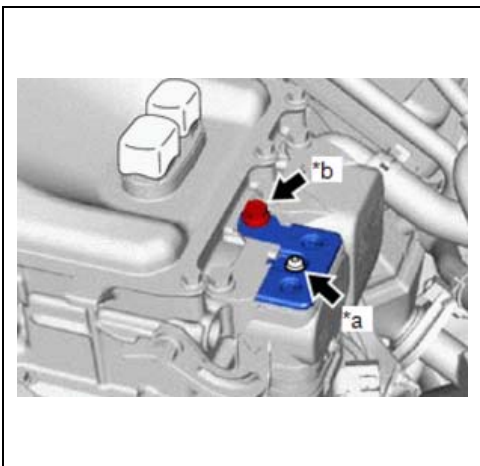
- a. Move each lever lock as shown in the illustration and disconnect the 2 inverter connectors.



- b. Remove the bolt.
- c. Disengage clamp (A) and remove the protector.
- d. Disengage clamp (B).



- e. Remove the bolt.
- f. Disengage the 2 clamps and disconnect the engine wire.
- g. Lay the engine wire on top the engine to allow clearer access to the inverter.



19. REMOVE TERMINAL INSPECTION COVER



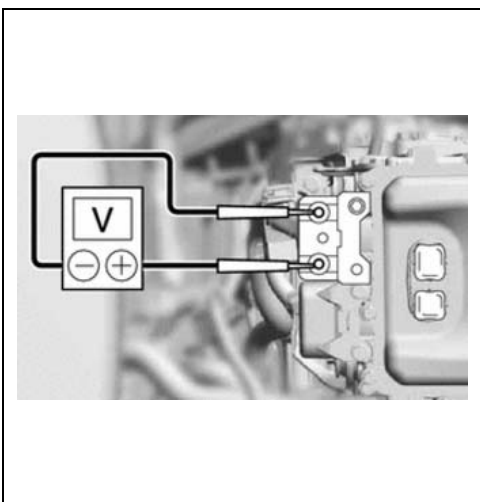
Before proceeding with removing the inspection cover, be sure that the 10-minute waiting time has expired from removing the Service Plug.

- a. Remove bolt *a (T25 TORX) and *b as shown in the diagram.



Be sure to wear safety glasses and properly inspected High Voltage Safety Gloves.

- b. Pull straight up on the Inspection Cover.



20. VERIFY TERMINAL VOLTAGE



Be sure to wear safety glasses and properly inspected High Voltage Safety Gloves.

- a. Using a DVOM set to DC voltage (750v minimum), measure the voltage between the terminals of the 2 phase connectors (the cable that comes from the HV battery).

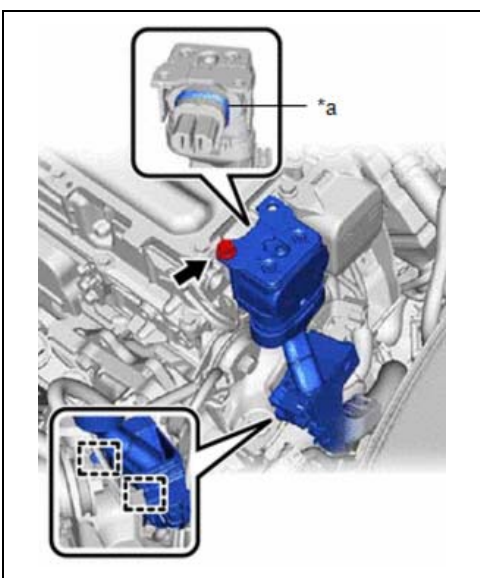
Standard Voltage: 0v

- b. Reinstall the terminal inspection cover and install bolt *a.
Torque: 40 in.lbs {4.5 N·m, 46 kgf·cm}

DVOM = Digital Volt Ohm Meter approved for CAT III (1000v)

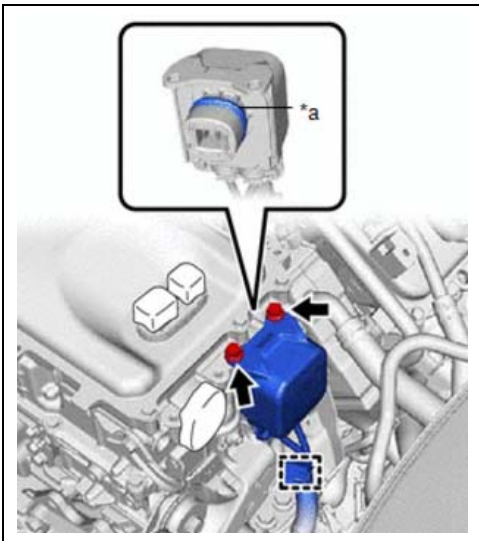


IF voltage other than 0 is found, do not proceed!! The vehicle is not properly shut down or the high voltage capacitor in the inverter has not bled down. Determine the source of the voltage before continuing.



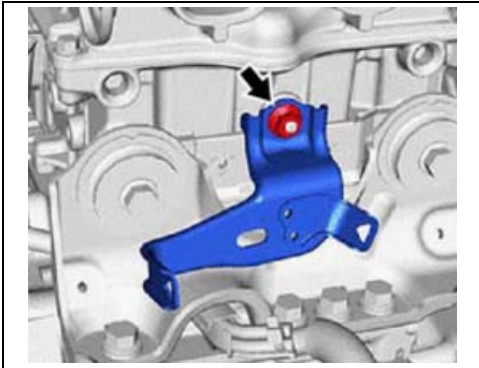
21. DISCONNECT HV FLOOR WIRE

- a. Remove the bolt and unplug the connector.
- b. Disengage the 2 clamps.



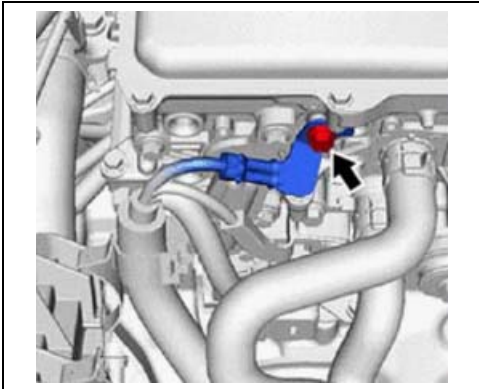
22. DISCONNECT AIR CONDITIONING WIRE

- a. Remove the 2 bolts and unplug the connector.
- b. Disengage the clamp.



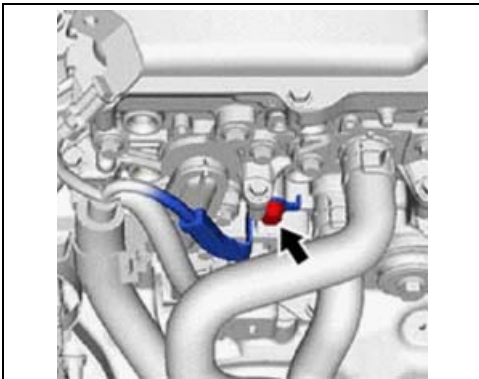
23. REMOVE WIRE HARNESS CLAMP BRACKET

- a. Remove the nut.

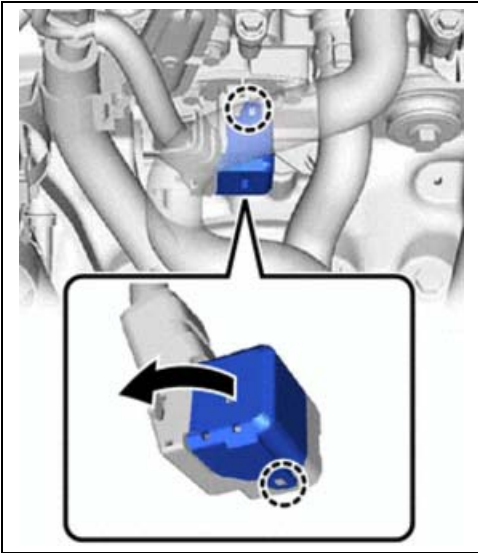


24. DISCONNECT NO. 3 ENGINE WIRE

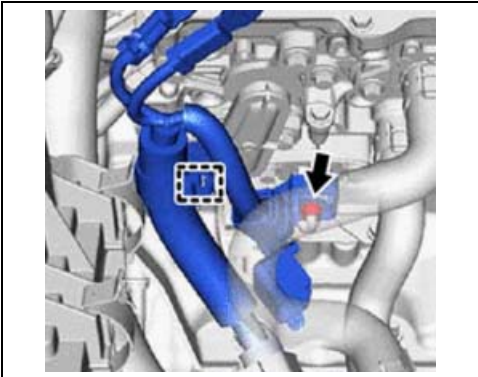
- a. Remove the bolt.



- b. Remove the bolt.

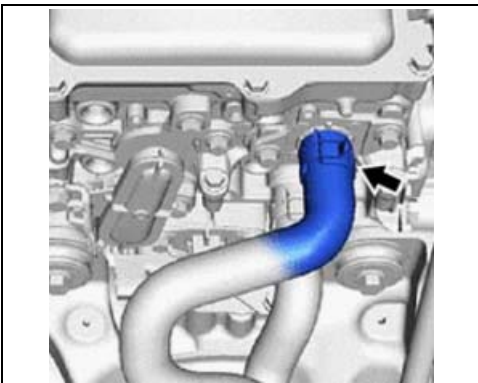


c. Disengage the 2 claws and open the No. 3 engine wire terminal cover.



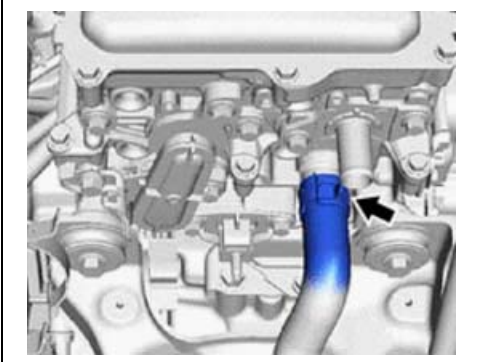
d. Remove the nut.

e. Disengage the clamp and disconnect the No. 3 engine wire from the inverter with converter assembly.



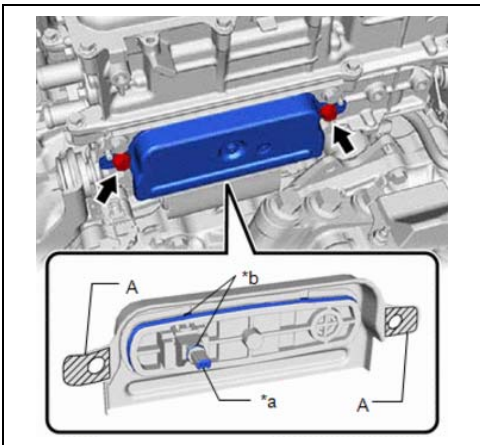
25. DISCONNECT OUTLET COOLING HOSE

a. Slide the clip and remove the hose.



26. DISCONNECT INLET COOLING HOSE

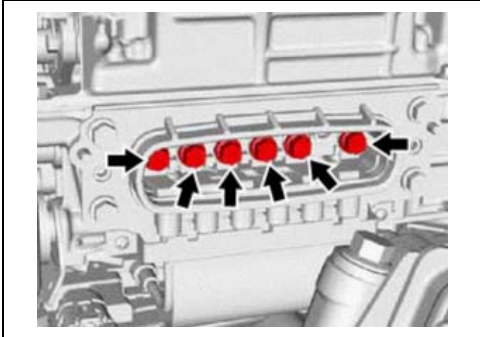
a. Slide the clip and remove the hose.



27. REMOVE INVERTER COVER

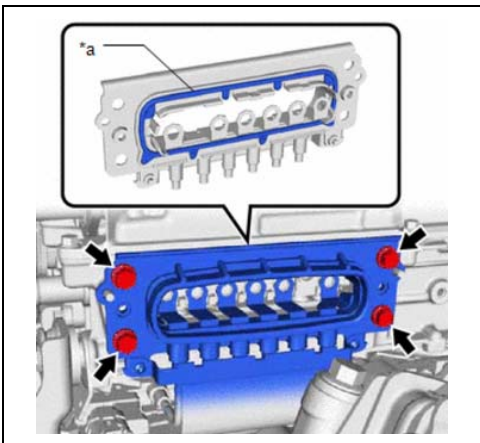
- a. Remove the 2 bolts (the middle bolts on each side).
- b. Slide the cover directly outward to clear the safety interlock connector (*a) under the cover.

Note: DO NOT remove the TORX bolt in the center of the inverter cover.



28. DISCONNECT MOTOR CABLE

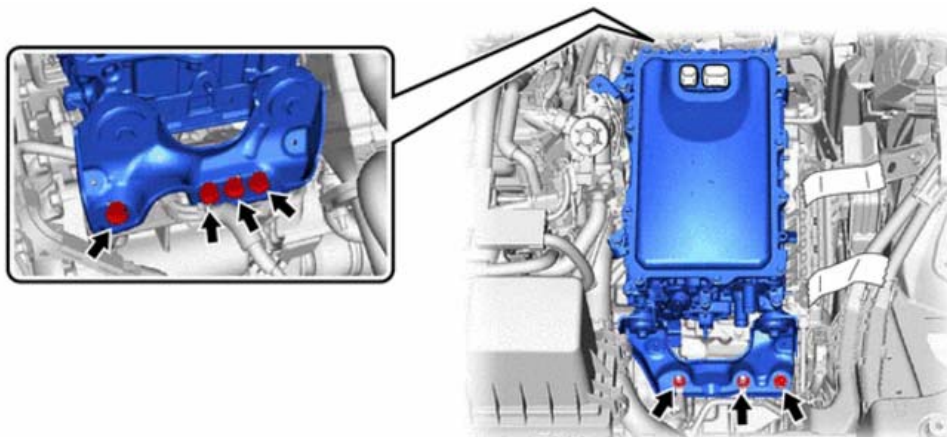
- a. Remove the 6 bolts.



- b. Remove the 4 bolts and disconnect the cable from the inverter.

29. REMOVE INVERTER

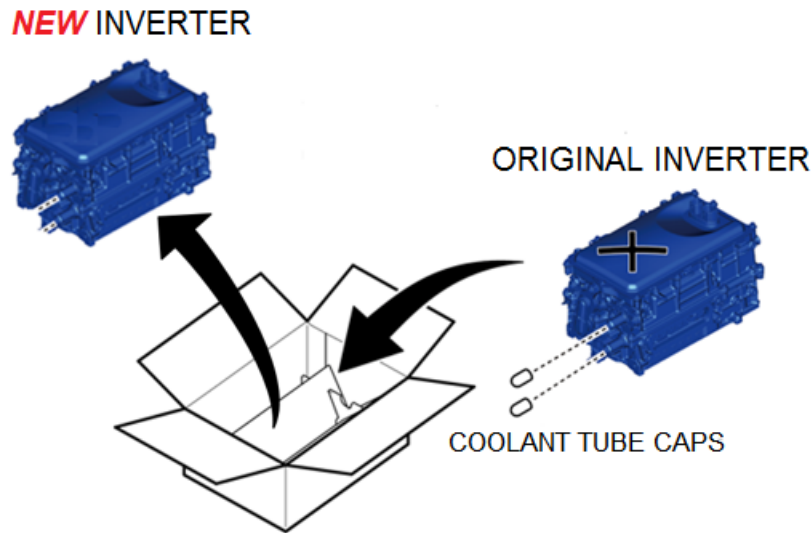
- a. Remove the 5 bolts and 2 nuts.



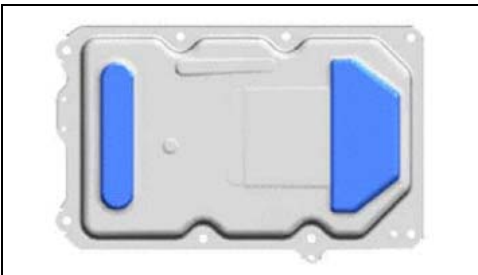
30. REPACKAGE INVERTER

The original inverter from car is on mandatory parts recovery. Please follow the directions below to ensure that the part is returned correctly.

- a. Remove the **NEW** inverter from the box, being careful not to damage the box as it will be reused.
- b. Remove the two rubber caps on the coolant tubes of the **NEW** inverter.
- c. Tilt the original inverter to thoroughly drain the coolant from the lines.
- d. Install the two rubber caps on the coolant lines of the original inverter.
- e. Place the original inverter into the box using the original packaging.
- f. Return the box to the parts department and indicate that this part will be recovered.

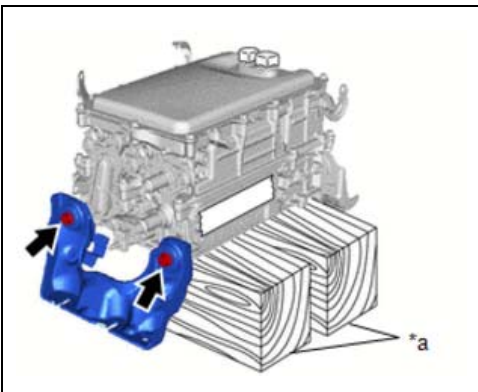


VIII. INSTALL **NEW** INVERTER



1. SUPPORT **NEW** INVERTER

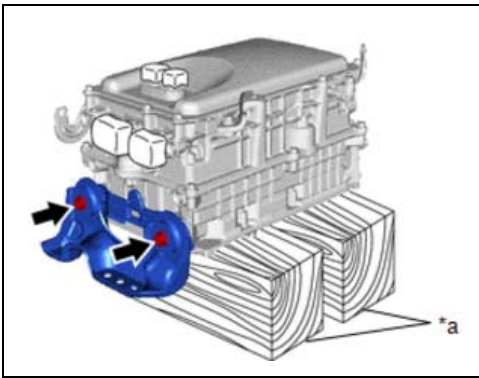
- a. When working on the Inverter out of the car, be sure to support it only at the points indicated on the lower pan.



2. TRANSFER NO. 1 BRACKET

- a. Remove 2 bolts and remove bracket from original inverter.
- b. Install bracket on **NEW** inverter.
Torque: 11 ft.lbs {15 N·m, 153 kgf·cm}

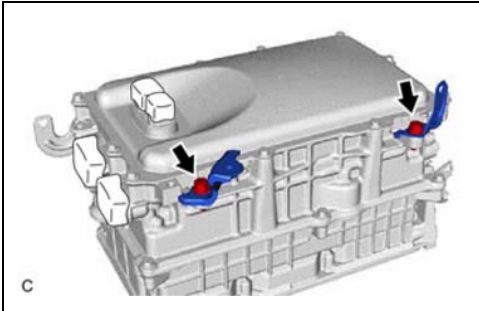
*a	Wooden Block
----	--------------



3. TRANSFER NO. 2 BRACKET

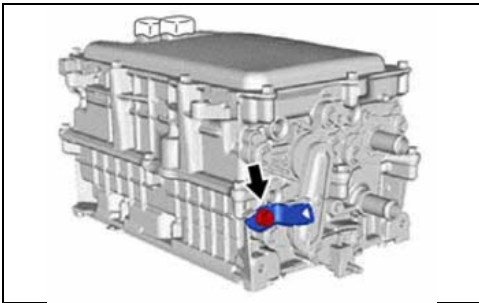
- a. Remove 2 bolts and remove bracket from original inverter.
- b. Install bracket on **NEW** inverter.
Torque: 11 ft.lbs {15 N·m, 153 kgf·cm}

*a	Wooden Block
----	--------------

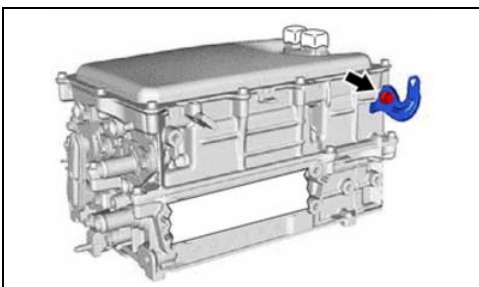


4. TRANSFER WIRE HARNESS CLAMP BRACKETS

- a. Remove the 2 bolts and remove the two brackets from the original inverter.
- b. Install the 2 brackets on the **NEW** inverter.
Torque: 71 in.lbs {8.0 N·m, 82 kgf·cm}



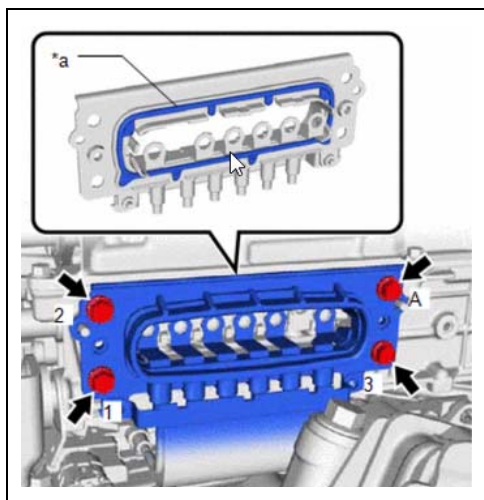
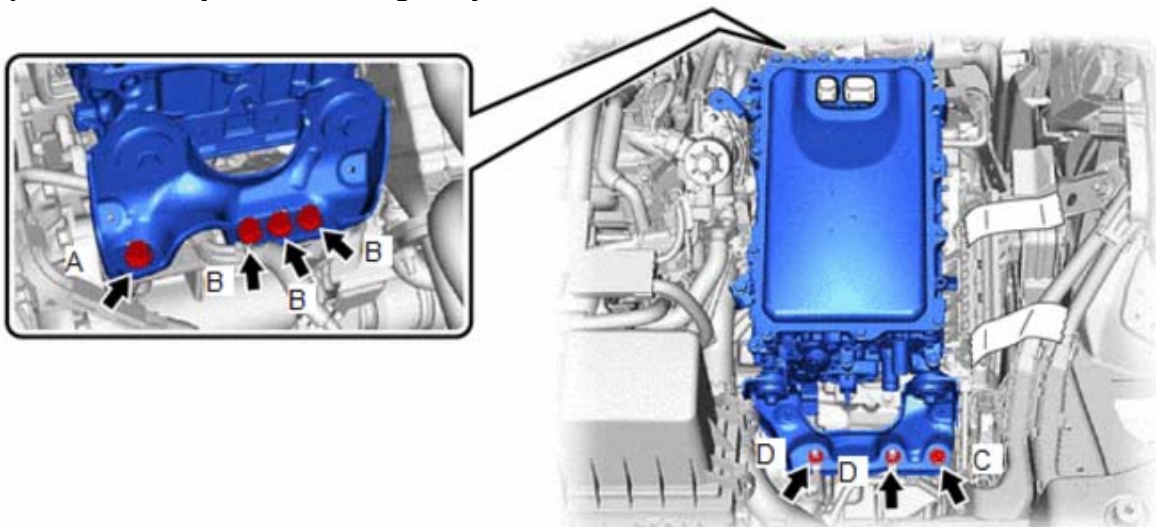
- c. Remove the bolt and the bracket from the original inverter.
- d. Install the bracket on the **NEW** inverter.
Torque: 71 in.lbs {8.0 N·m, 82 kgf·cm}



- e. Remove the bolt and the bracket from the original inverter.
- f. Install the bracket on the **NEW** inverter.
Torque: 71 in.lbs {8.0 N·m, 82 kgf·cm}

5. INSTALL THE **NEW** INVERTER

- a. Install the 5 bolts and 2 nuts loosely.
- b. Fully tighten bolt (A)
Torque: 18 ft.lbs {25 N·m, 255 kgf·cm}
- c. Fully tighten the 3 bolts (B)
Torque: 18 ft.lbs {25 N·m, 255 kgf·cm}
- d. Fully tighten bolt (C)
Torque: 18 ft.lbs {25 N·m, 255 kgf·cm}
- e. Fully tighten the 2 nuts (D)
Torque: 18 ft.lbs {25 N·m, 255 kgf·cm}

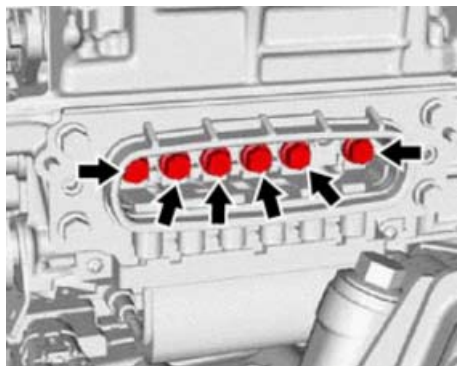
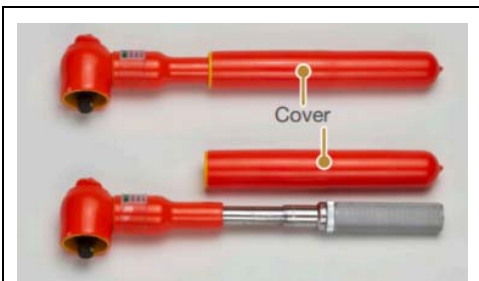


6. INSTALL MOTOR CABLE

- a. Temporarily install the motor cable.
- b. Loosely install the 4 bolts.
- c. Fully tighten bolt (A).
Torque: 71 in.lbs {8.0 N·m, 82 kgf·cm}
- d. Fully tighten the 3 bolts in the order shown
Torque: 71 in.lbs {8.0 N·m, 82 kgf·cm}

Note:

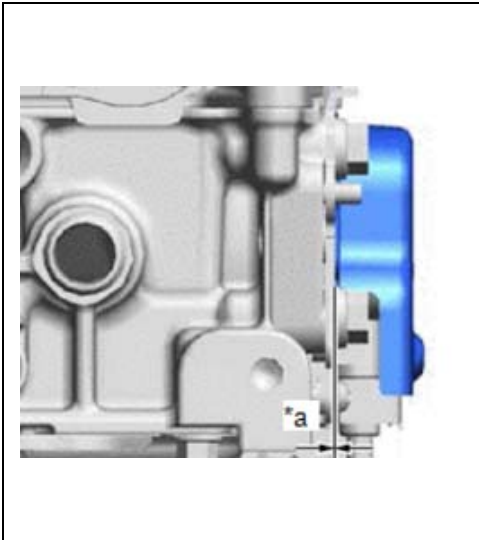
- Do not touch the waterproof seal (*a) or terminals of the connector.
- Be sure to use a torque wrench to tighten the bolts.



- e. Install the 6 bolts loosely.
- f. Using an HV insulated tool, tighten the 6 bolts. It is critical that these bolts be accurately torqued!!
Torque 71 in.lbs {8.0 N·m, 82 kgf·cm}

Note: The proper ¼” insulated torque wrench can be found in Drawer #1 of the HEV Workstation. Slide the outer insulated cover off to adjust the torque setting. Be sure to replace the insulated cover once the wrench has been adjusted to the correct setting.

When torquing HV fasteners, it is critical to torque to the exact value specified. DO NOT use any other tool than a properly calibrated torque wrench set to the specified value. The HEV Workstation has the proper ¼” drive torque wrench for this task.

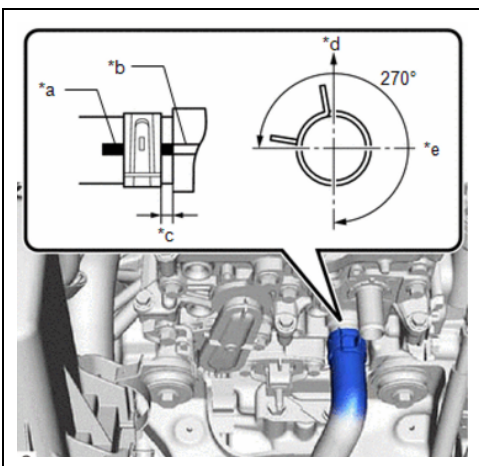


7. INSTALL INVERTER COVER

- a. Push the cover into place until it contacts the inverter housing (*a).
- b. Install the 2 bolts.
Torque: 71 in.lbs {8.0 N·m, 82 kgf·cm}

Note:

- Visually confirm that the inverter cover waterproof seal is securely installed before installing the inverter cover.
- Do not touch the waterproof seal of the inverter cover.
- Make sure that the interlock is fully engaged.
- Do not allow any foreign matter or water to enter the inverter with converter assembly.
- Do not remove or excessively tighten the screw of the inverter cover.



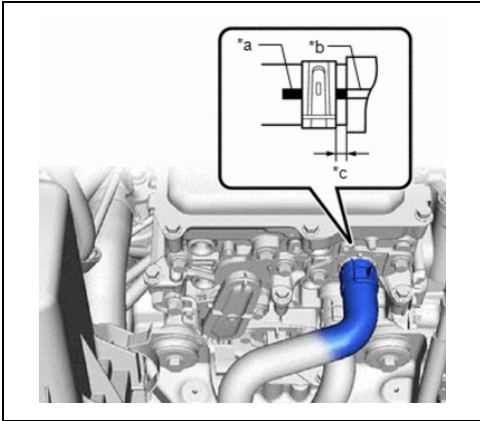
8. INSTALL INLET COOLING HOSE

- a. Connect the inlet cooling hose to the inverter assembly and slide the clip to secure it.

Note:

- Make sure that the clip is positioned as shown in the illustration.
- Make sure to align the alignment mark of the hose with the rib of the inverter assembly.

*a	Alignment Mark (Light Blue)
*b	Rib
*c	2 to 11 mm (0.0787 to 0.433 in.)
*d	Up
*e	LH Side



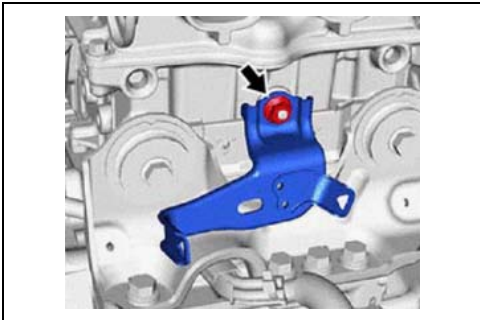
9. INSTALL OUTLET COOLING HOSE

- a. Connect the outlet cooling hose to the inverter assembly and slide the clip to secure it

Note:

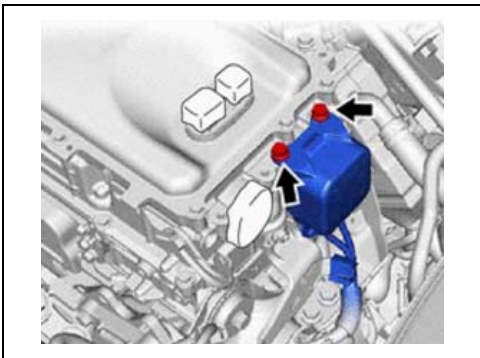
- Make sure that the clip is positioned as shown in the illustration.
- Make sure to align the alignment mark of the hose with the rib of the inverter assembly.

*a	Alignment Mark (Pink)
*b	Rib
*c	2 to 11 mm (0.0787 to 0.433 in.)



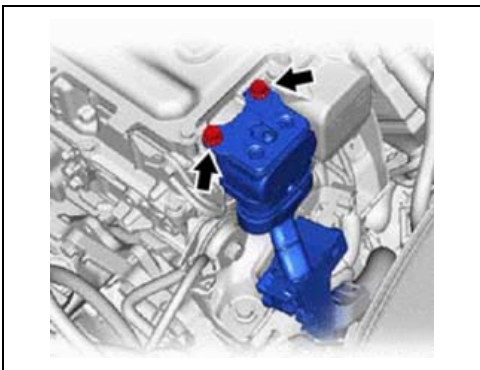
10. INSTALL WIRE HARNESS CLAMP BRACKET

- a. Install the wire harness clamp bracket to the inverter.
Torque: 71 in.lbs {8.0 N·m, 82 kgf·cm}



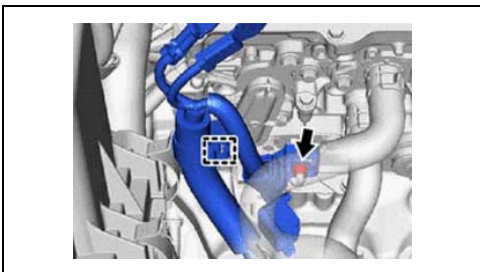
11. CONNECT AIR CONDITIONER HARNESS

- a. Plug in the air conditioning wire harness into the inverter and install the 2 bolts.
Torque: 71 in.lbs {8.0 N·m, 82 kgf·cm}



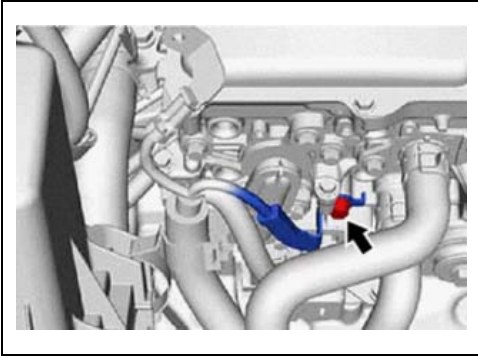
12. CONNECT HV FLOOR WIRE

- a. Plug the HV Floor wire harness into the inverter and install the 2 bolts.
Torque: 71 in.lbs {8.0 N·m, 82 kgf·cm}

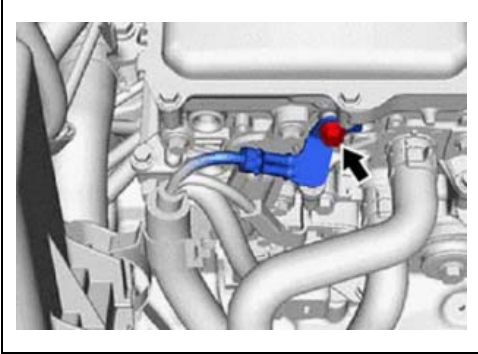


13. CONNECT NO. 3 ENGINE WIRE

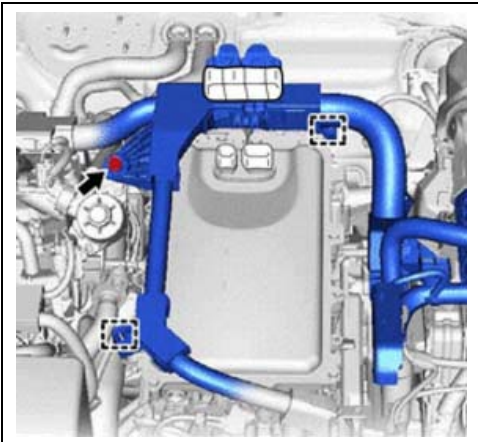
- a. Engage the clamp and connect the No. 3 engine wire to the inverter.
- b. Install the nut.
Torque: 71 in.lbs {8.0 N·m, 82 kgf·cm}
- c. Engage the 2 claws to close the No. 3 engine wire terminal cover.



- d. Connect the No. 3 engine wire lower ground to the inverter and install the bolt.
Torque: 75 in.lbs {8.5 N·m, 87 kgf·cm}

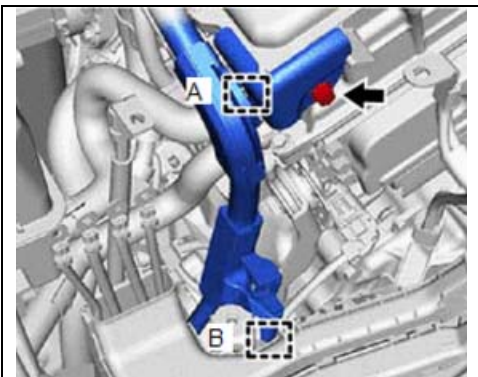


- e. Connect the No. 3 engine wire upper ground to the inverter and install the bolt.
Torque: 75 in.lbs {8.5 N·m, 87 kgf·cm}

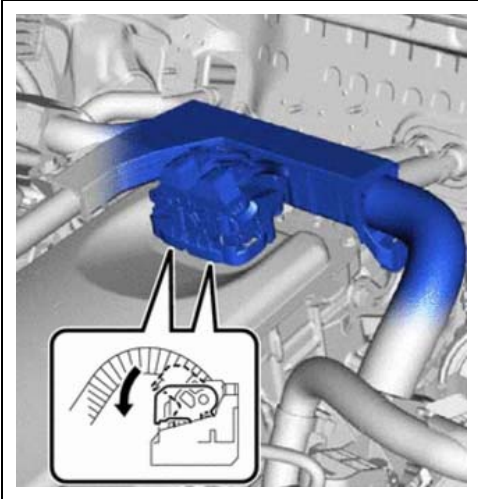


14. CONNECT ENGINE WIRE

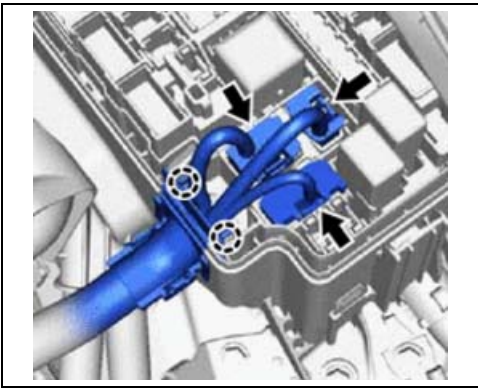
- a. Engage the 2 clamps to connect the engine wire.
b. Install the bolt.
Torque: 71 in.lbs {8.0 N·m, 82 kgf·cm}



- c. Engage clamp (B).
d. Engage clamp (A).
e. Install the bolt.
Torque: 84 ft.lbs {9.5 N·m, 97 kgf·cm}



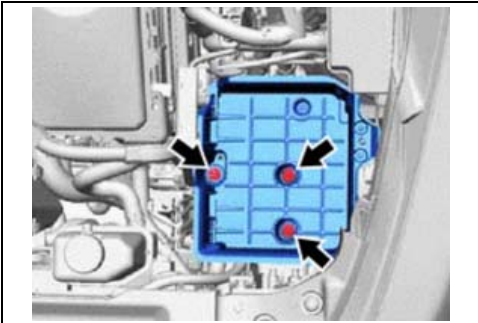
f. Connect the 2 inverter connectors and lock each lever.



g. Engage the two claws of the seal.

h. Connect the 3 No. 1 engine room relay block connectors.

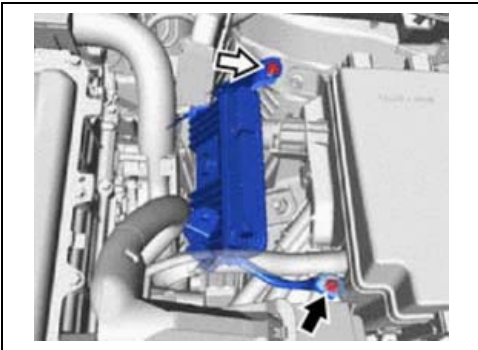
i. Install the relay block cover.



15. INSTALL BATTERY TRAY

a. Install the 3 bolts.

Torque 11 ft.lbs {15.4 N·m, 157 kgf·cm}



16. INSTALL ECM

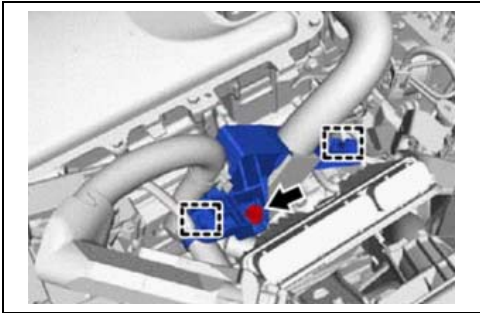
a. Slide the ECM into place.

b. Install the bolt.

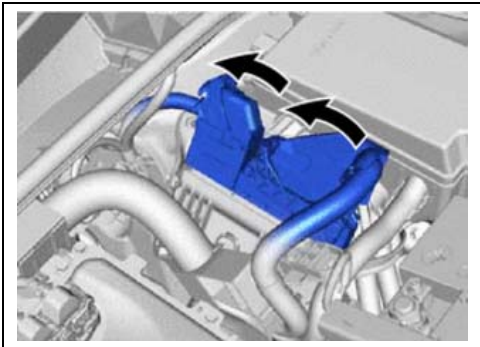
Torque: 10 ft.lbs {13 N·m, kgf·cm}

c. Install the nut:

Torque: 71 in.lbs {8.0 N·m, 82 kgf·cm}

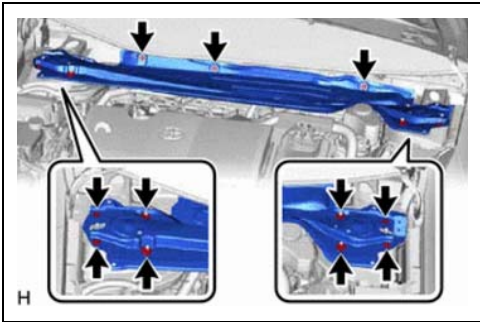


- d. Engage the 2 clamps of the No.1 ECM bracket.
- e. Install the bolt.
Torque: 71 in.lbs {8.0 N·m, 82 kgf·cm}

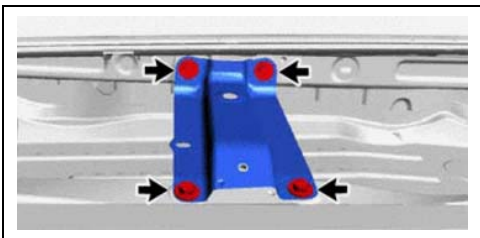


- f. Connect the 2 ECM connectors and lower the locking levers.

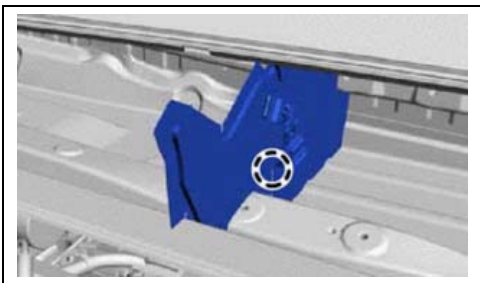
IX. FINAL INSTALLATIONS



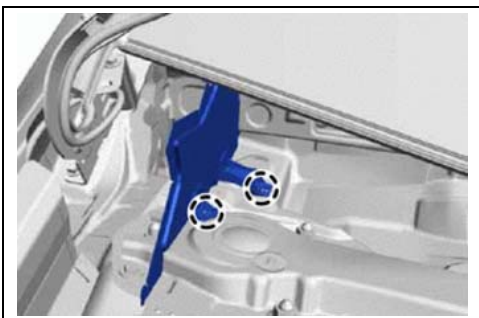
1. **INSTALL OUTER COWL PANEL**
 - a. Install the outer cowl panel top with 7 bolts and 4 nuts.
Torque: Bolt: 9 ft.lbs {12 N·m, 122 kgf·cm}
Nut: 37 ft.lbs {50 N·m, 510 kgf·cm}



2. **INSTALL COWL BODY REINFORCEMENT LH**
 - a. Install the 4 bolts.
Torque: 9 ft.lbs {12 N·m, 122 kgf·cm}

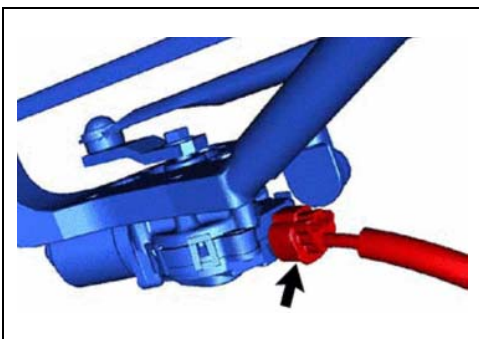


3. **INSTALL WATER GUARD PLATE**
 - a. Engage the claw.



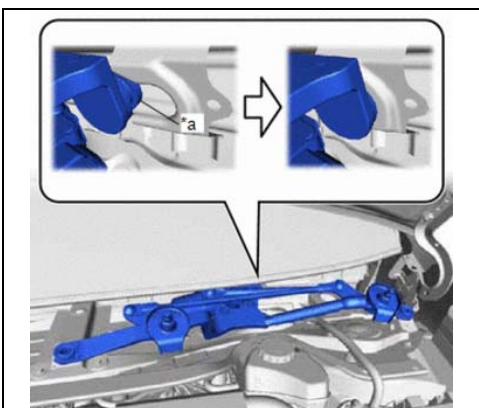
4. INSTALL SPLASH SHIELD

- a. Engage the 2 claws.



5. INSTALL WINDSHIELD WIPER MOTOR ASSEMBLY

- a. Connect the electrical connector.

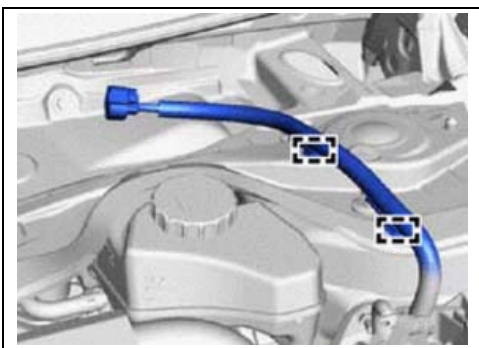


- b. Engage the motor grommet.

- c. Install 2 bolts.

Torque: 49 in.lbs {5.5 N·m, 56 kgf·cm}

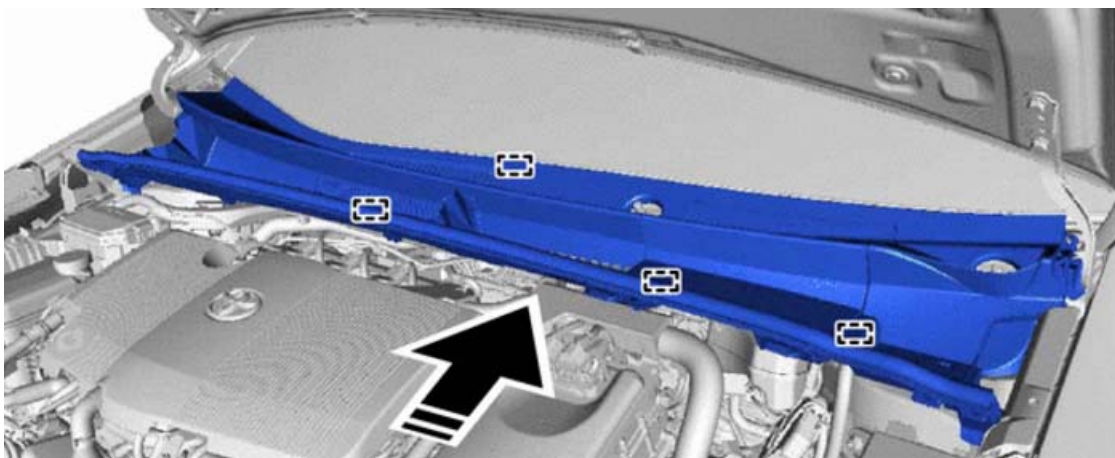
*a	Motor Grommet
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- d. Engage the 2 clamps of the wire harness to the outer cowl panel.

6. INSTALL COWL TOP VENTILATOR LOUVER

a. Engage the 4 guides

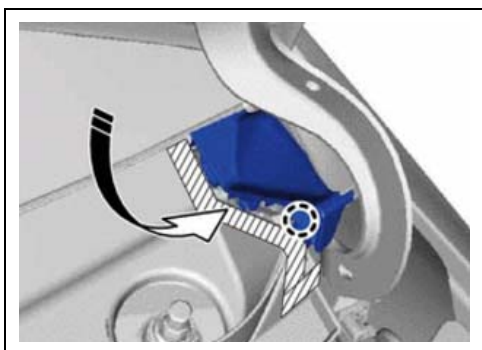
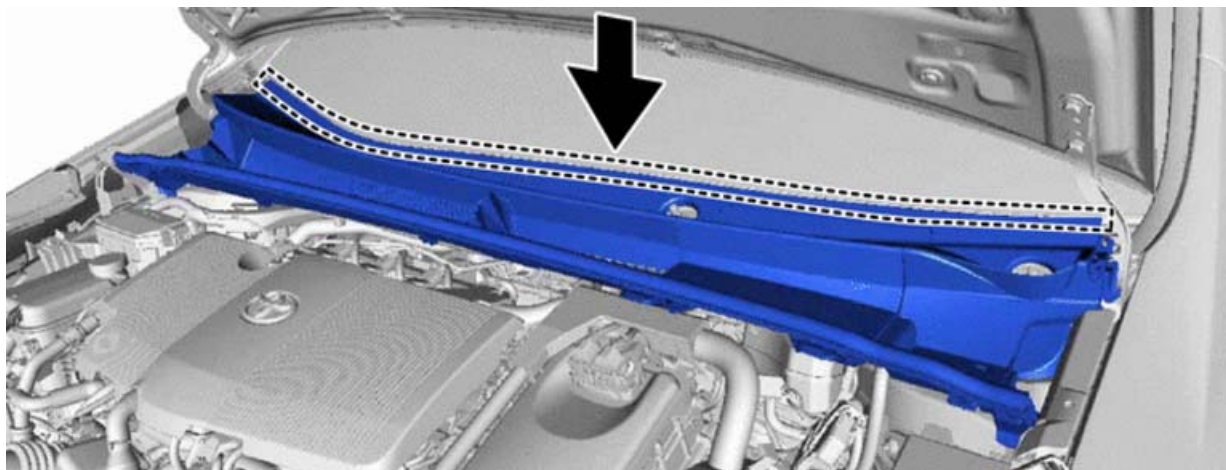


NOTICE:

- When installing the cowl top ventilator louver sub-assembly, it may contact the brake master cylinder reservoir filler cap assembly and cause it to fall off. Check the installation condition of the brake master cylinder reservoir filler cap assembly after installing the cowl top ventilator louver sub-assembly.
- Make sure to engage the guides securely, otherwise the cowl top ventilator louver sub-assembly may pop up when engaging it to the windshield glass.

b. Engage the cowl top ventilator to the windshield glass.

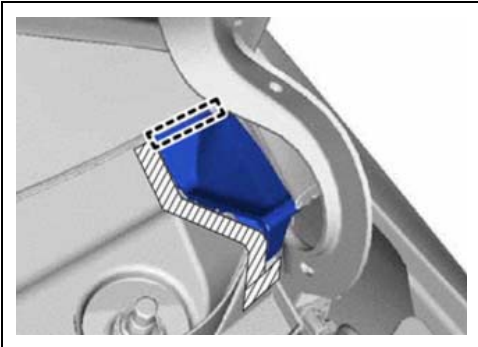
c. Install the 2 clips.



7. INSTALL COWL WATER SHIELD LH & RH

a. Slide the cowl water shield into place.

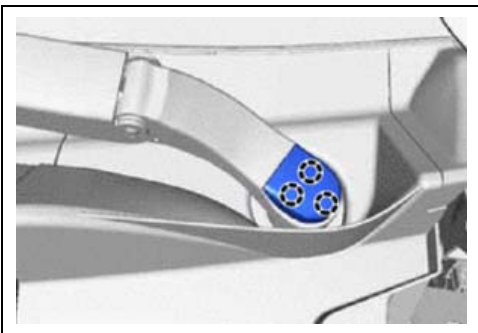
b. Engage the claw.



c. Engage the cowl water shield to the windshield glass.

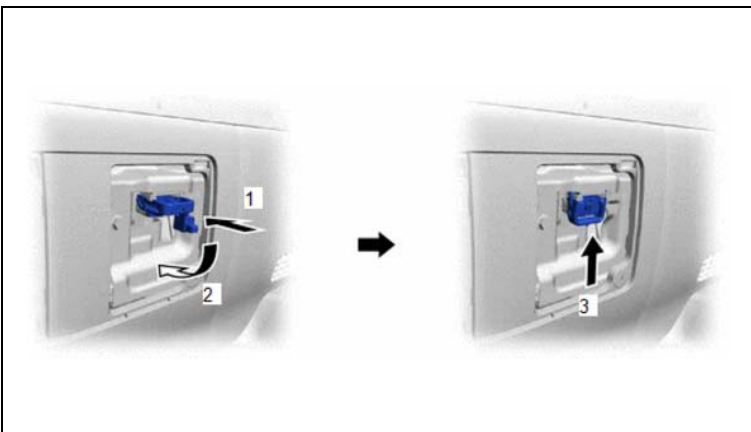


d. Engage the guide and 2 claws.



8. INSTALL FRONT WIPER ARM LH & RH

- When reusing the front wiper arm, be sure to clean the wiper arm serrations to remove any burrs, dirt, etc.
- Install the front wiper arms onto the serrations of the wiper motor.
- Adjust the position. Install the nuts.
Torque: 17 ft.lbs {23 N·m, 235 kgf·cm}
- Engage the 3 claws to install the wiper arm caps.



9. INSTALL SERVICE PLUG



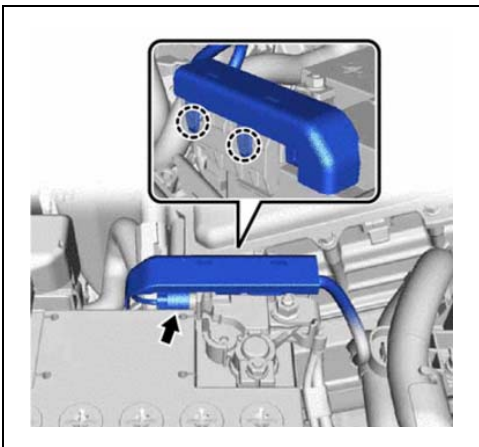
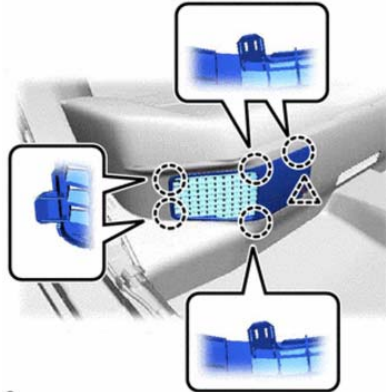
Be sure to wear safety glasses and properly inspected High Voltage Safety Gloves.

- Push the Service Plug into the connector housing (1).
- Rotate the handle 90° as indicated by the arrow (2).
- Lock the Service Plug by sliding the handle upward until a click is heard (3).



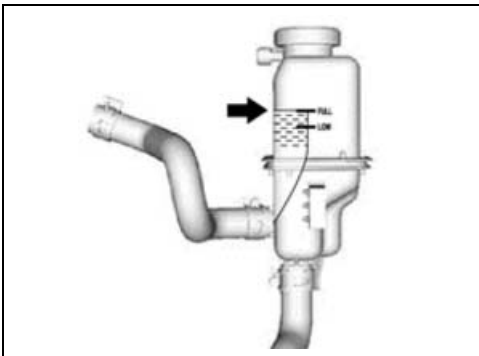
10. INSTALL BATTERY SERVICE HOLE COVER

- a. Engage the 5 claws.
- b. Install the clip.



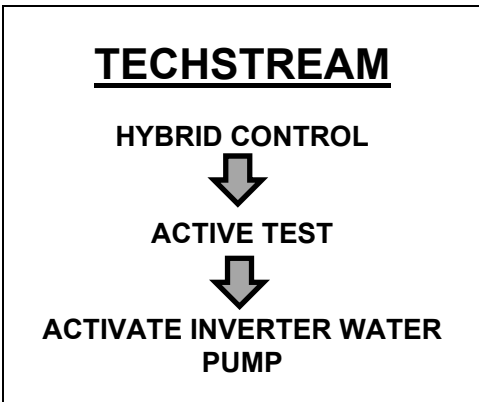
11. INSTALL AUXILIARY BATTERY

- a. Install the battery clamp and bolt.
Torque: 11 ft. lbs {15.4 N·m, 157 kgf·cm}
- b. Connect the positive terminal of the auxiliary battery.
Torque: 50 in.lbs {5.6 N·m, 57 kgf·cm}
- c. Connect the negative (-) cable to the negative (-) battery terminal of the auxiliary battery.
Torque: 48 in.lbs {5.4 N·m, 55 kgf·cm}
- d. Plug the connector into the battery current sensor and close the cover.



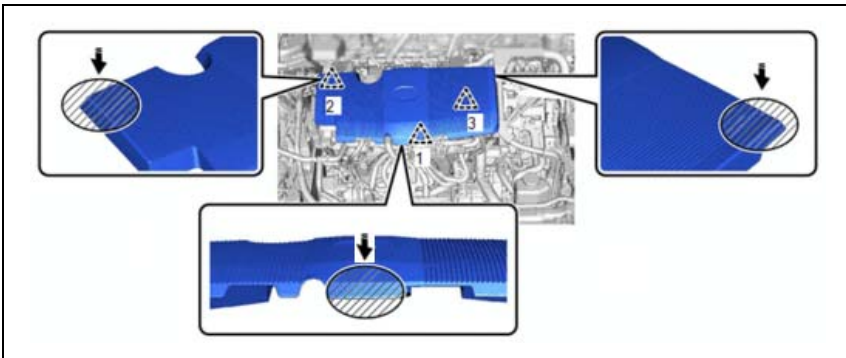
12. ADD INVERTER COOLANT

- a. Slowly pour coolant into the inverter (not the engine coolant) reserve tank until it reaches the full line.
Standard: Toyota Super Long Life Coolant



13. BLEED AIR FROM INVERTER COOLANT SYSTEM

- a. Turn the power switch to IG ON (not READY).
- b. Connect the Techstream to the DLC.
- c. Select the following menus: Hybrid Control / Active Test / Activate the Inverter Water Pump.
- d. Continue to add Coolant to the reserve tank to maintain the fluid level at the full line while the pump is running.
- e. While the active test is still running the pump, check the inverter hoses for signs of a coolant leak.



14. INSTALL ENGINE COVER

- a. Engage the 3 clips by pushing down at the points indicated.

15. PERFORM RESOLVER LEARNING

If resolver learning is not performed after the inverter with converter assembly or a part related to the hybrid transaxle assembly has been replaced, the following DTCs may be stored and the symptoms may occur:

- DTC output
 - P0BFF1D (Drive Motor "A" Circuit Current Out of Range)
 - P0C1900 (Drive Motor "A" Execution Torque Performance)
 - P0C7917 (Drive Motor "A" Inverter Voltage Sensor (VH) Circuit Voltage Above Threshold)
 - P0D3319 (DC/DC Converter Circuit Current Above Threshold)
 - P0E7100 (Generator Execution Torque Performance)
 - P1C5D19 (Drive Motor "A" Inverter Circuit Current Above Threshold)
 - P1C5F19 (Generator Inverter Circuit Current Above Threshold)
 - P1CA51D (Hybrid Generator Circuit Current Out of Range)
- Slight vibration at a vehicle speed of 5 km/h (3 mph) or less
- Shock or vibration during acceleration

- a. Connect the Techstream to the DLC3 connector.
- b. Turn the vehicle power switch to IG (not READY).
- c. Verify that the air conditioning system and all other electrical loads are turned off.
- d. Verify the Resolver 1 Not Adjusted message on the multi-display.
- e. Verify that no DTC's are present.
- f. Enter the following menu:
Hybrid / Utility / Resolver Learning & Initialization.
- g. Select "LEARNING" to perform Resolver Learning.
- h. Turn the vehicle power switch to READY.
- i. Wait until the READY indicator changes from blinking to solid (it could take 10 seconds).
Note: DO NOT operate the accelerator pedal, shift lever, or any electrical switches until the READY light is illuminated.
- j. Verify the Resolver 2 Not Adjusted message on the multi-display.
- k. Place the vehicle shifter into Drive.
- l. Accelerate the vehicle to 18 to 25mph (30 to 40 km/h).

- m. Fully release the accelerator pedal and allow the vehicle to coast for 3 seconds.
Note: DO NOT operate the accelerator pedal, brake pedal, shift lever or any switches while the vehicle is coasting.
- n. Stop the vehicle, turn the vehicle power switch to OFF.
- o. Wait 1 minute or longer.
- p. Turn the power switch to READY.
- q. Verify that the Resolver Learning Incomplete message on the multi-display is not present.

16. INITIALIZE STEERING ANGLE SENSOR

- a. During the test drive, be sure to drive the vehicle straight ahead at 22 mph or more for at least 5 seconds.

17. INITIALIZE BACK DOOR LOCK

- a. Press the unlock button on the door panel or key wireless remote.

◀ VERIFY REPAIR QUALITY ▶

- Confirm there are no DTC's present.
- Verify the original inverter was properly returned to the parts department for recovery.

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

10. 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

