



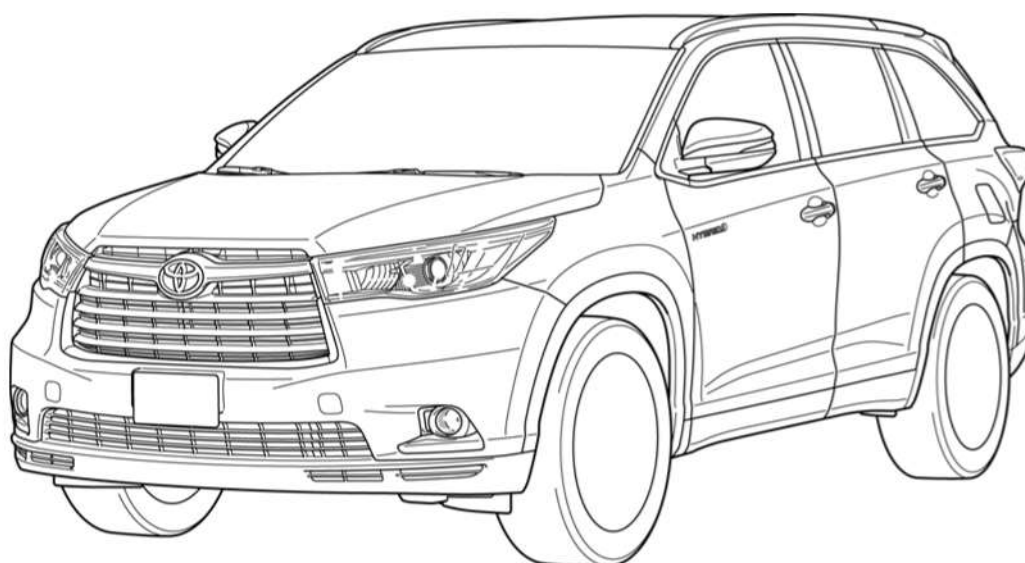
HIGHLANDER

Hybrid

Gasoline-Electric

Hybrid Synergy Drive

HYBRID VEHICLE DISMANTLING MANUAL



GVU58 Series

Foreword

This guide was developed to educate and assist dismantlers in the safe handling of Toyota HIGHLANDER Hybrid gasoline-electric hybrid vehicles. HIGHLANDER Hybrid dismantling procedures are similar to other non-hybrid Toyota vehicles with the exception of the high voltage electrical system. It is important to recognize and understand the high voltage electrical system features and specifications of the Toyota HIGHLANDER Hybrid, as they may not be familiar to dismantlers.

High voltage electricity powers the electric motors, generator, air conditioning (A/C) compressor and inverter/converter. All other automotive electrical devices such as the headlights, radio and gauges are powered from a separate 12 Volts auxiliary battery. Numerous safeguards have been designed into the HIGHLANDER Hybrid to help ensure the high voltage, approximately 288 Volts, Nickel Metal Hydride (NiMH) Hybrid Vehicle (HV) battery pack is kept safe and secure in an accident.

The NiMH HV battery pack contains sealed batteries that are similar to rechargeable batteries used in some battery operated power tools and other consumer products. The electrolyte is absorbed in the cell plates and will not normally leak out even if the battery is cracked. In the unlikely event the electrolyte does leak, it can be easily neutralized with a dilute boric acid solution or vinegar. High voltage cables, identifiable by orange insulation and connectors, are isolated from the metal chassis of the vehicle.

Additional topics contained in the guide include:

- Toyota HIGHLANDER Hybrid identification.
- Major hybrid component locations and descriptions.

By following the information in this guide, dismantlers will be able to handle HIGHLANDER Hybrid hybrid-electric vehicles as safely as the dismantling of a conventional non-hybrid automobile.

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About the HIGHLANDER Hybrid

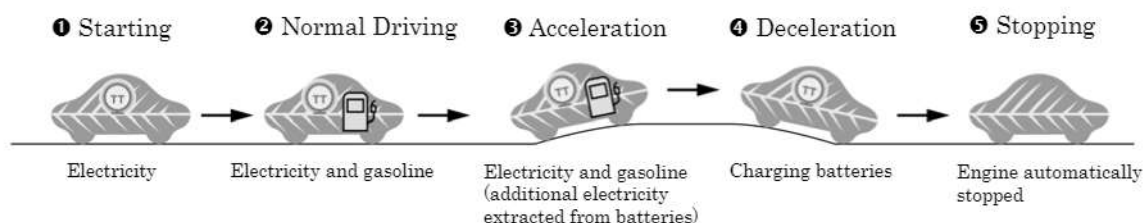
The HIGHLANDER Hybrid continues into its 3rd generation as a gasoline-electric hybrid vehicle. Hybrid Synergy Drive means that the vehicle contains a gasoline engine and two electric motors for power. The two hybrid power sources are stored on board the vehicle:

1. Gasoline stored in the fuel tank for the gasoline engine.
2. Electricity stored in a high voltage Hybrid Vehicle (HV) battery pack for the electric motors.

The result of combining these two power sources is improved fuel economy and reduced emissions. The gasoline engine also powers an electric generator to recharge the battery pack; unlike a pure all electric vehicle, the HIGHLANDER Hybrid never needs to be recharged from an external electric power source.

Depending on the driving conditions one or both sources are used to power the vehicle. The following illustration demonstrates how the HIGHLANDER Hybrid operates in various driving modes.

- ❶ During light acceleration at low speeds, the vehicle is powered by the electric motors. The gasoline engine is shut off.
- ❷ During normal driving, the vehicle is powered mainly by the gasoline engine. The gasoline engine also powers the generator to recharge the battery pack and to drive the motors.
- ❸ During full acceleration, such as climbing a hill, both the gasoline engine and the electric motors power the vehicle.
- ❹ During deceleration, such as when braking, the vehicle regenerates kinetic energy from the front wheels and rear wheels to produce electricity that recharges the battery pack.
- ❺ While the vehicle is stopped, the gasoline engine and electric motors are off, however the vehicle remains on and operational.



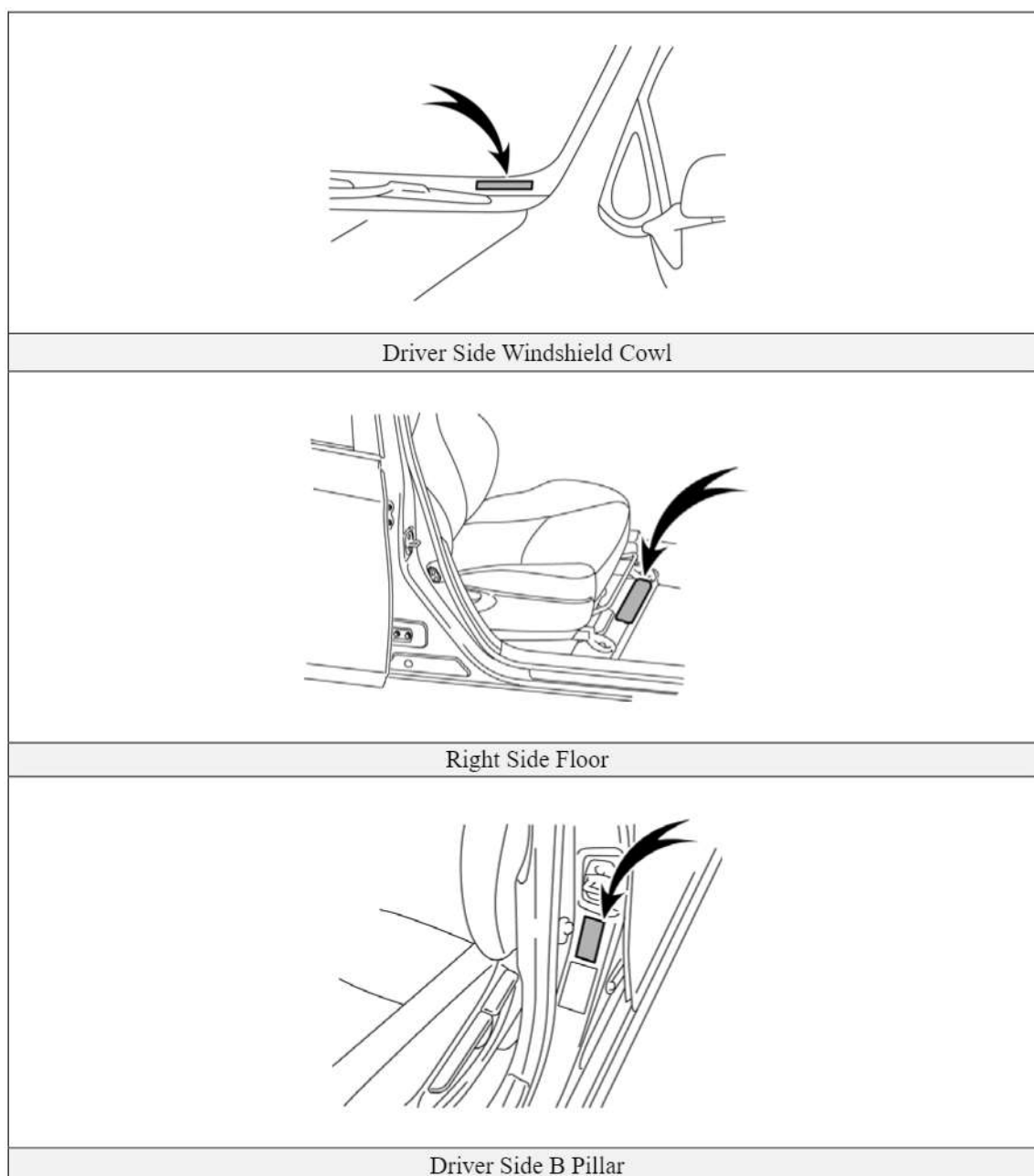
HIGHLANDER Hybrid Identification

In appearance, the 2014 model year HIGHLANDER Hybrid is nearly identical to the conventional, non-hybrid Toyota HIGHLANDER. The HIGHLANDER Hybrid is a 5-door SUV. Exterior, interior, and engine compartment illustrations are provided to assist in identification.

The alphanumeric 17 character Vehicle Identification Number (VIN) is provided in the front windshield cowl, right side floor and on the driver side B pillar.

Example VIN: 5TDDCRFH0E2000101, 5TDJCRFH0E2000101 or 5TDBC RFH0E2000101

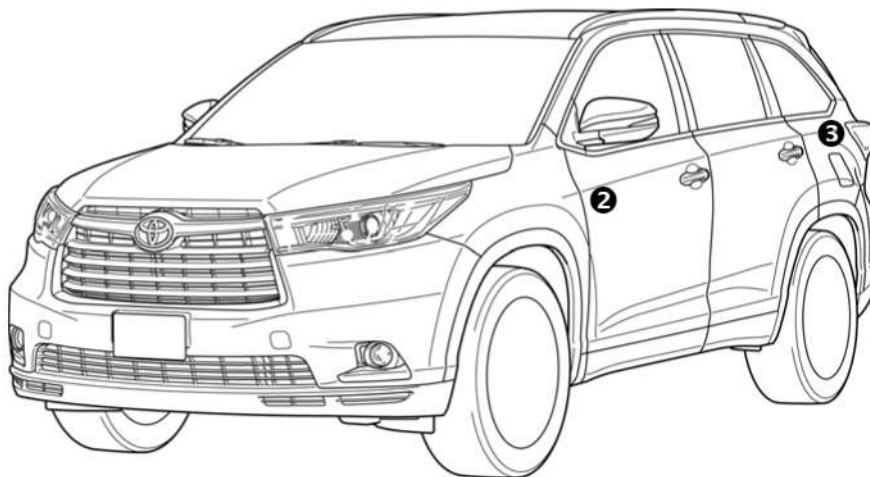
A HIGHLANDER Hybrid is identified by the first 8 alphanumeric characters **5TDDCRFH**, **5TDJCRFH** or **5TDBC RFH**.



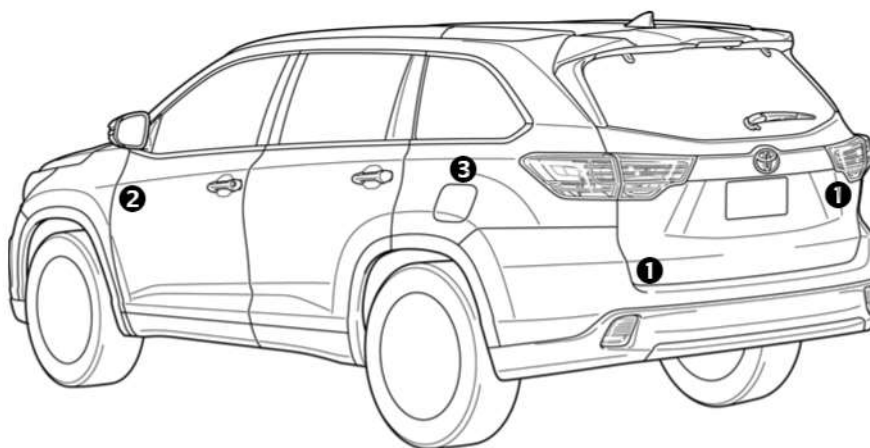
HIGHLANDER Hybrid Identification (Continued)

Exterior

- ❶  and *HIGHLANDER* logos on the back door.
- ❷  logo on the driver and front passenger door.
- ❸ Gasoline fuel filler door located on the driver side rear quarter panel.



Exterior Front and Driver Side View



Exterior Rear and Driver Side View

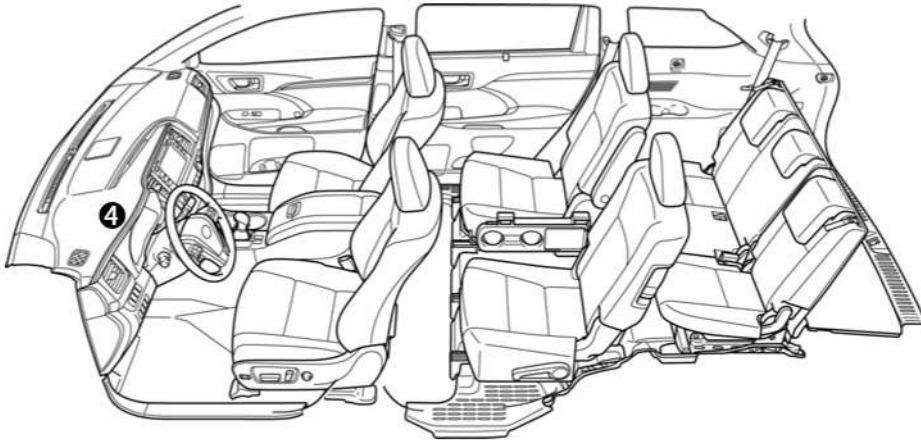
HIGHLANDER Hybrid Identification (Continued)

Interior

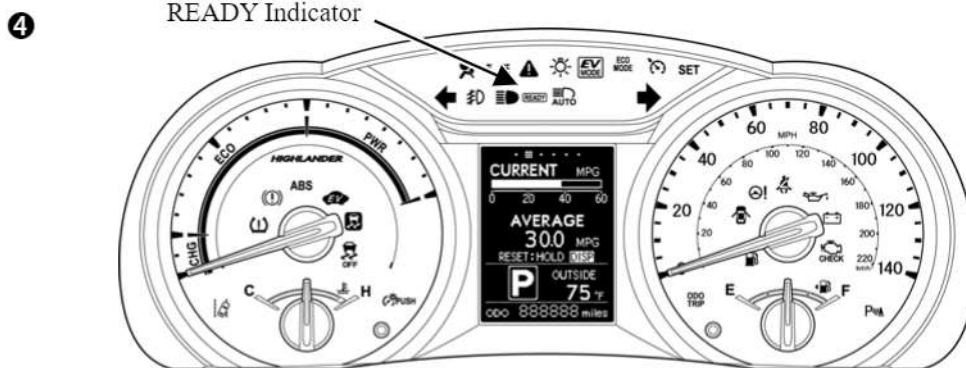
- ④ The instrument cluster (**READY** indicator, and warning lights) located in the dash behind the steering wheel, is different than the one on the conventional, non-hybrid HIGHLANDER.

Hint:

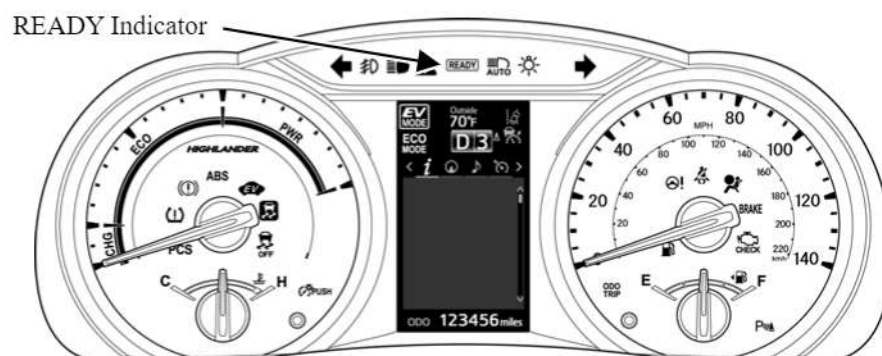
If the vehicle is shut off, the instrument cluster gauges will be “blacked out”, not illuminated.



Interior View



Monochrome Type Multi-information Display



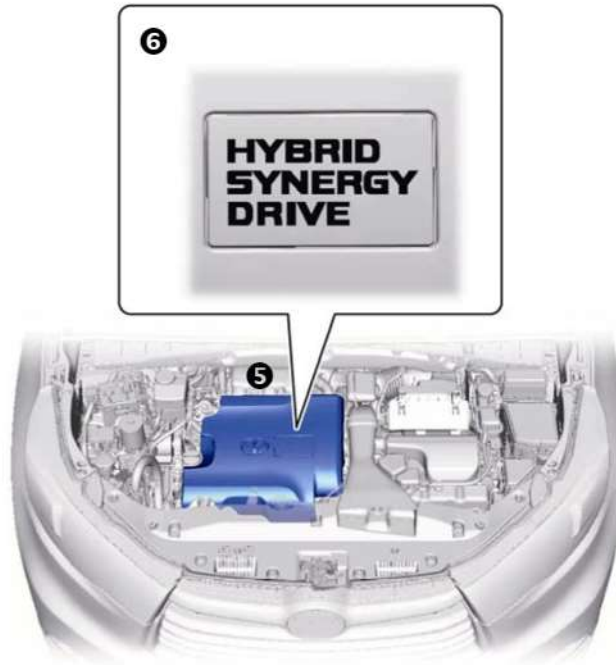
Color Type Multi-information Display

Instrument Cluster View

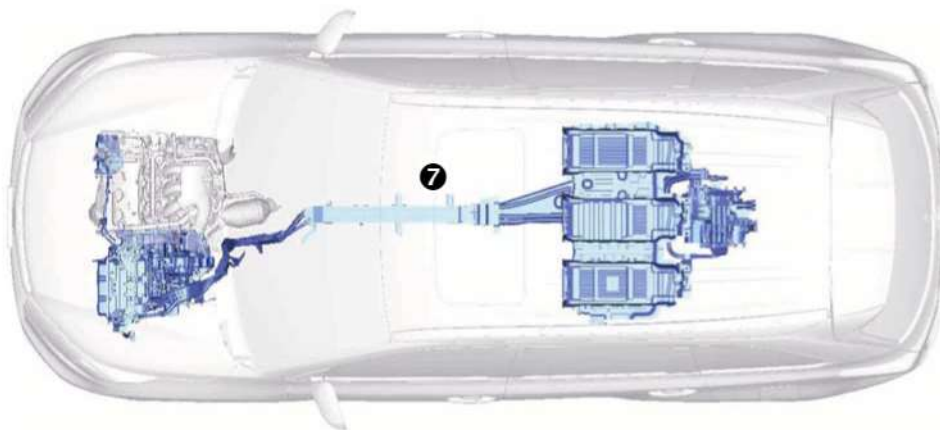
HIGHLANDER Hybrid Identification (Continued)

Engine Compartment

- ⑤ 3.5-liter aluminum alloy gasoline engine.
- ⑥ Logo on the plastic engine cover.
- ⑦ Orange colored high voltage power cables.



Engine Compartment View



Power Cables

Hybrid Component Locations & Descriptions

Component	Location	Description
12 Volts Auxiliary Battery ❶	Left Side of Trunk	A lead-acid battery that supplies power to the low voltage devices.
Hybrid Vehicle (HV) Battery Pack ❷	Cabin Area, Mounted to Cross Member under Second Row Seat	288 Volts Nickel Metal Hydride (NiMH) battery pack consisting of 30 low voltage (9.6 Volts) modules connected in series.
Power Cables ❸	Undercarriage and Engine Compartment	Orange colored power cables carry high voltage Direct Current (DC) between the HV battery pack, inverter/converter, and A/C compressor. These cables also carry 3-phase Alternating Current (AC) between the inverter/converter, electric motors, and generator.
Inverter/Converter ❹	Engine Compartment	Boosts and inverts the high voltage electricity from the HV battery pack to 3-phase AC electricity that drives the electric motors. The inverter/converter also converts AC electricity from the electric generator and electric motors (regenerative braking) to DC that recharges the HV battery pack.
DC-DC Converter for 12 Volts Auxiliary Battery ❺	Inverter/Converter	Converts 288 Volts from the HV battery pack to 12 Volts for low voltage vehicle power.
Gasoline Engine ❻	Engine Compartment	Provides two functions: 1) Powers the vehicle. 2) Powers the generator to recharge the HV battery pack. The engine is started and stopped under control of the vehicle computer.
Front Electric Motor ❼	Engine Compartment	3-phase high voltage AC permanent magnet electric motor contained in the front transaxle. It is used to power the front wheels.
Electric Generator ❸	Engine Compartment	3-phase high voltage AC generator that is contained in the transaxle and recharges the HV battery pack.
A/C Compressor (with Inverter) ❾	Engine Compartment	3-phase high voltage AC electrically driven motor compressor.
Fuel Tank and Fuel Line ❿	Undercarriage, Driver Side and Center	The fuel tank provides gasoline via a fuel line to the engine. The fuel line is routed along the driver side and center tunnel under the floor pan.
Rear Electric Motor ⓫	Rear Sub-Frame	3-phase high voltage AC permanent magnet electric motor contained in the rear transaxle. It is used to power the rear wheels.

*Numbers in the component column apply to the illustrations on the following page.

Hybrid Component Locations & Descriptions (Continued)

Specifications

Gasoline Engine:	231 hp (172.3 kW), 3.5-liter Aluminum Alloy Engine
Electric Motors	
Front:	165 hp (123 kW), Permanent Magnet Motor
Rear:	67 hp (50 kW), Permanent Magnet Motor
Transmission:	Automatic Only (Electrically Controlled Continuously Variable Transaxle)
HV Battery:	288 V Sealed NiMH-Battery
Curb Weight:	4,784 - 4,861 lbs/2,170 - 2,205 kg
Fuel Tank:	17.2 gals/65 liters
Frame Material:	Steel Unibody
Body Material:	Steel Panels
Seating Capacity:	7 - 8 passenger

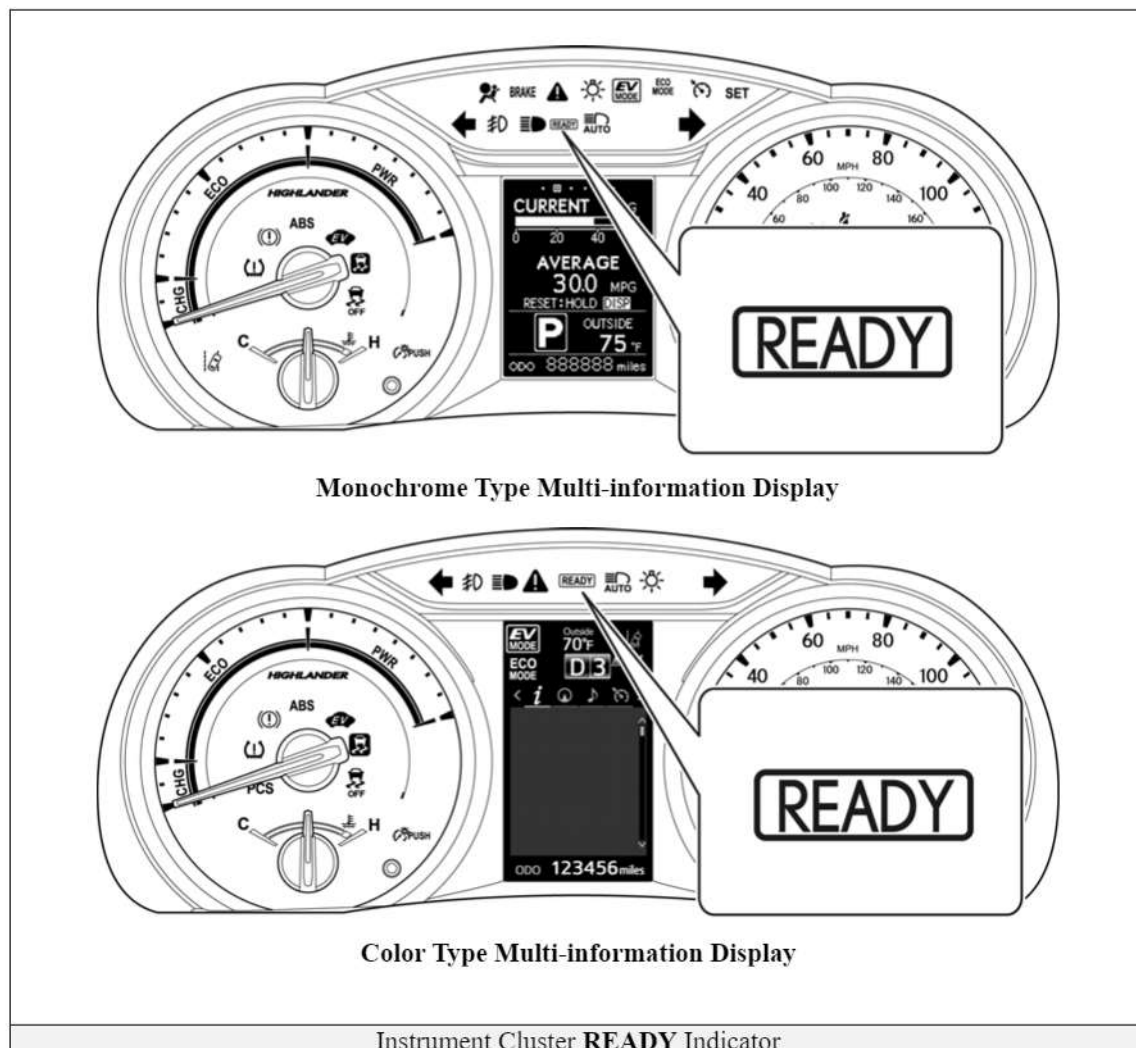


Hybrid Synergy Drive Operation

Once the **READY** indicator is illuminated in the instrument cluster, the vehicle may be driven. However, the gasoline engine does not idle like a typical automobile and will start and stop automatically. It is important to recognize and understand the **READY** indicator provided in the instrument cluster. When lit, it informs the driver that the vehicle is on and operational even though the gasoline engine may be off and the engine compartment is silent.

Vehicle Operation

- With the HIGHLANDER Hybrid, the gasoline engine may stop and start at any time while the **READY** indicator is on.
- Never assume that the vehicle is shut off just because the engine is off. Always look for the **READY** indicator status. The vehicle is shut off when the **READY** indicator is off.
- The vehicle may be powered by:
 1. The electric motors only.
 2. A combination of both the electric motors and the gasoline engine.



Hybrid Vehicle (HV) Battery Pack and Auxiliary Battery

The HIGHLANDER Hybrid features a high voltage Hybrid Vehicle (HV) battery pack that contains sealed Nickel Metal Hydride (NiMH) battery modules.

HV Battery Pack

- The HV battery pack is enclosed in a metal case and is rigidly mounted to the cabin area floor pan cross member under the second row seats. The metal case is isolated from high voltage and concealed by fabric covers in the cabin area.
- The HV battery pack consists of 30 low voltage (9.6 Volts) NiMH battery modules connected in series to produce approximately 288 Volts. Each NiMH battery module is non-spillable and sealed in a metal case.
- The electrolyte used in the NiMH battery module is an alkaline mixture of potassium and sodium hydroxide. The electrolyte is absorbed into the battery cell plates and will not normally leak, even in a collision.

HV Battery Pack	
Battery pack voltage	288 V
Number of NiMH battery modules in the pack	30
NiMH battery module voltage	9.6 V
NiMH battery module dimensions (Width x Length x Height)	14.5 x 3.8 x 0.6 in (368 x 95.8 x 15.6 mm)
NiMH module weight	3.3 lbs (1.5 kg)
NiMH battery pack dimensions (Width x Length x Height)	40.1 x 25.3 x 6.3 in (1018 x 643 x 160 mm)
NiMH battery pack weight	151.7 lbs (68.8 kg)

Note: Values in inches have been rounded

Components Powered by the HV Battery Pack

- Front Electric Motor
- Power Cables
- Inverter/Converter
- Rear Electric Motor
- A/C Compressor
- Electric Generator
- DC-DC Converter for 12 Volts Auxiliary Battery

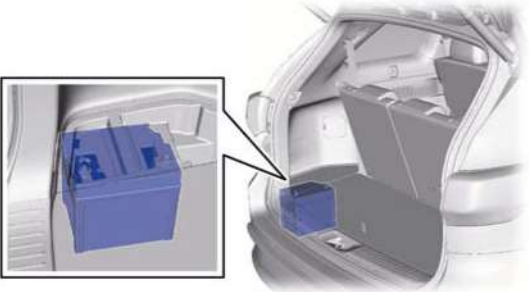
Hybrid Vehicle (HV) Battery Pack and Auxiliary Battery (Continued)

HV Battery Pack Recycling

- The HV battery pack is recyclable. Contact either your Toyota Distributor as mentioned on HV battery Caution Label (see page 29) or the nearest Toyota dealer.

Auxiliary Battery

- The HIGHLANDER Hybrid contains a sealed lead-acid 12 Volts auxiliary battery. This 12 Volts auxiliary battery powers the vehicle electrical system similar to a conventional vehicle. As with other conventional vehicles, the negative terminal of the auxiliary battery is grounded to the metal chassis of the vehicle.
- The auxiliary battery is located in the trunk area. It is concealed by a plastic resin cover on the driver side in the rear quarter panel well.

	
288 Volts HV Battery Pack	12 Volts Auxiliary Battery Mounted in the Trunk Area (Driver Side)
	
HV Battery Pack Mounted in Cabin Area	

High Voltage Safety

The HV battery pack powers the high voltage electrical system with DC electricity. Positive and negative orange colored high voltage power cables are routed from the battery pack, under the vehicle floor pan, to the inverter/converter. The inverter/converter contains a circuit that boosts the HV battery voltage from 288 to 650 Volts DC. The inverter/converter creates 3-phase AC to power the motors. Power cables are routed from the inverter/converter to each high voltage motors (electric motors, electric generator and A/C compressor). The following systems are intended to help keep occupants in the vehicle and emergency responders safe from high voltage electricity:

High Voltage Safety System

- A high voltage fuse ❶* provides short circuit protection in the HV battery pack.
- Positive and negative high voltage power cables ❷* connected to the HV battery pack are controlled by 12 Volts normally open relays ❸*. When the vehicle is shut off, the relays stop electrical flow from leaving the HV battery pack.



WARNING:

The high voltage system may remain powered for up to 10 minutes after the vehicle is shut off or disabled. To prevent serious injury or death from severe burns or electric shock, avoid touching, cutting, or opening any orange high voltage power cable or high voltage component.

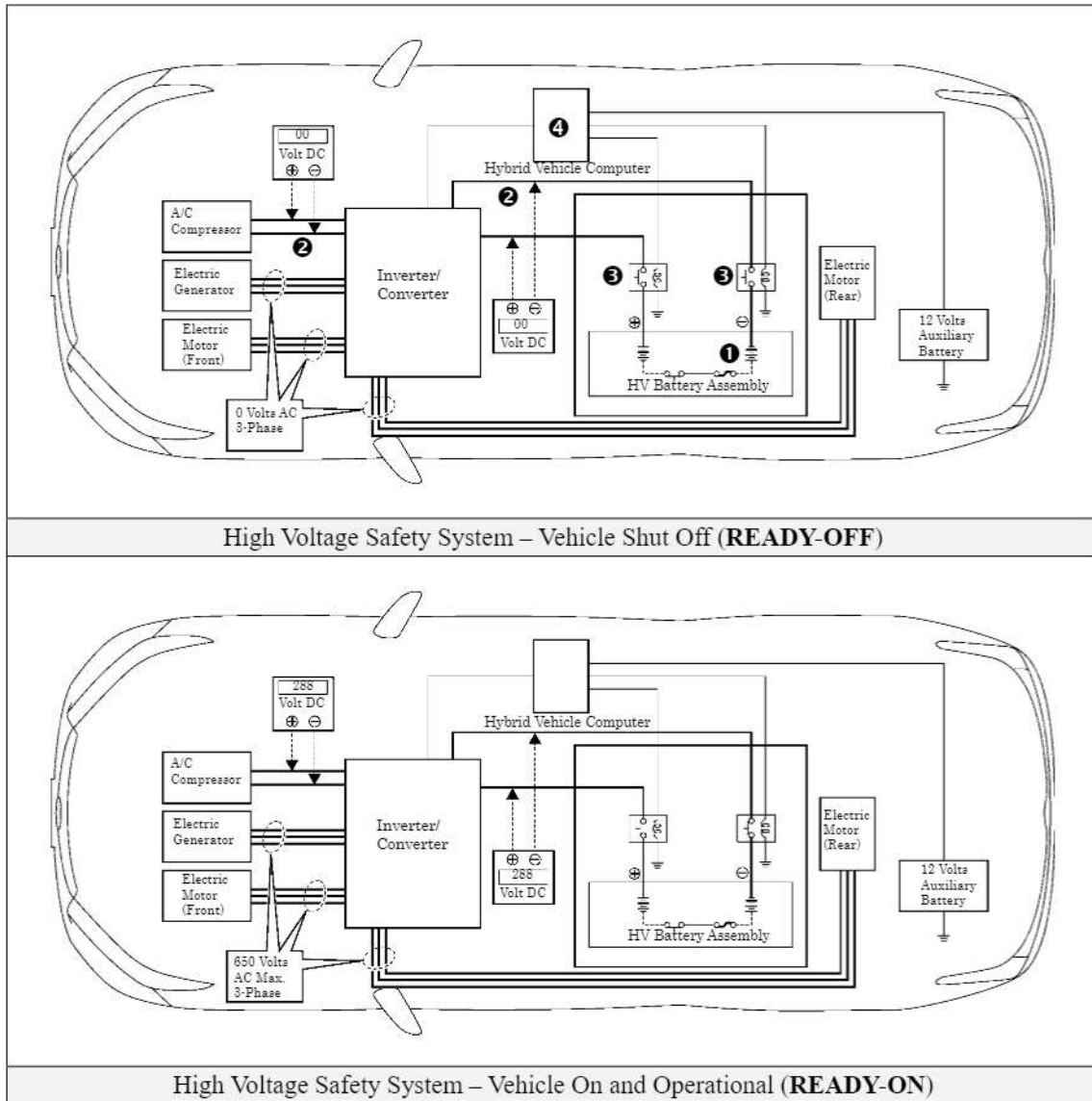
- Both positive and negative power cables ❷* are insulated from the metal body. High voltage electricity flows through these cables and not through the metal vehicle body. The metal vehicle body is safe to touch because it is insulated from the high voltage components.
- A ground fault monitor in the hybrid vehicle computer ❹* continuously monitors for high voltage leakage to the metal chassis while the vehicle is running. If a malfunction is detected, the hybrid vehicle computer ❹* will illuminate the master warning light  in the instrument cluster and indicate "Check Hybrid System" on the multi-information display.
- The HV battery pack relays will automatically open to stop electricity flow in a collision sufficient to activate the SRS.

*Numbers apply to the illustration on the following page.

High Voltage Safety (Continued)

Service Plug Grip

- The high-voltage circuit is cut by removing the service plug grip (see page 15).



Precaution to be observed when dismantling the vehicle



WARNING:

The high voltage system may remain powered for up to 10 minutes after the vehicle is shut off or disabled. To prevent serious injury or death from severe burns or electric shock, avoid touching, cutting, or opening any orange high voltage power cable or high voltage component.

Necessary Items

- Protective clothing such as insulated gloves (electrically insulated), rubber gloves, safety goggles, and safety shoes.
- Insulating tape such as electrical tape that has a suitable electrical insulation rating.
- Before wearing insulated gloves, make sure that they are not cracked, ruptured, torn, or damaged in any way. Do not wear wet insulated gloves.
- An electrical tester that is capable of measuring DC 750 Volts or more.

Spills

The HIGHLANDER Hybrid contains the same common automotive fluids used in other non-hybrid Toyota vehicles, with the exception of the NiMH electrolyte used in the HV battery pack. The NiMH battery electrolyte is a caustic alkaline (pH 13.5) that is damaging to human tissues. The electrolyte, however, is absorbed in the cell plates and will not normally spill or leak out even if a battery module is cracked. A catastrophic crash that would breach both the metal battery pack case and a metal battery module would be a rare occurrence.

A caustic alkaline is at the opposite end of the pH scale from a strong acid. A safe (neutral) substance is approximately in the middle of this scale. Adding a weak acidic mixture, such as a dilute boric acid solution or vinegar, to the caustic alkaline electrolyte will cause the electrolyte to be neutralized. This is similar but opposite to the use of baking soda to neutralize a lead-acid battery electrolyte spill.

A Toyota Product Safety Data Sheets (PSDS) is attached to this document.

- Handle NiMH electrolyte spills using the following Personal Protective Equipment (PPE):
 - Splash shield or safety goggles. A fold down face shield is not acceptable for acid or electrolyte spills.
 - Rubber, latex or nitrile gloves.
 - Apron suitable for alkaline.
 - Rubber boots.
- Neutralize NiMH electrolyte.
 - Use a boric acid solution or vinegar.
 - Boric acid solution - 800 grams boric acid to 20 liters water or 5.5 ounces boric acid to 1 gallon of water.

Dismantling the vehicle

The following 3 pages contain general instructions for use when working on a HIGHLANDER Hybrid. Read these instructions before proceeding to the HV battery removal instructions on page 19.

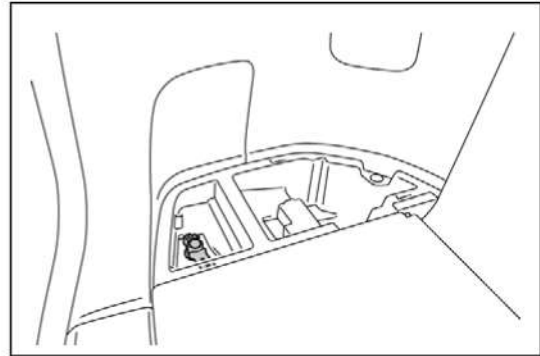


WARNING:

The high voltage system may remain powered for up to 10 minutes after the vehicle is shut off or disabled. To prevent serious injury or death from severe burns or electric shock, avoid touching, cutting, or opening any orange high voltage power cable or any high voltage component.

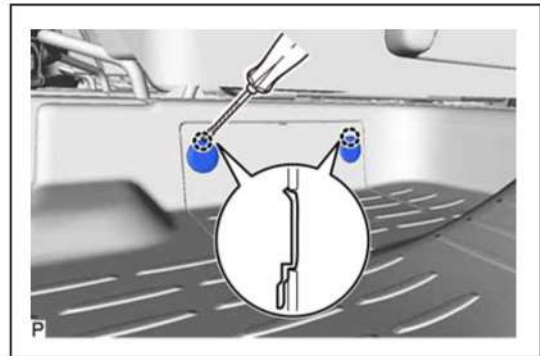
1. Shut off the ignition (**READY** indicator is off).
Then disconnect the cable from the auxiliary battery negative (-) terminal.

- (1) Remove the 2 deck boards.
- (2) Disconnect the battery negative terminal.

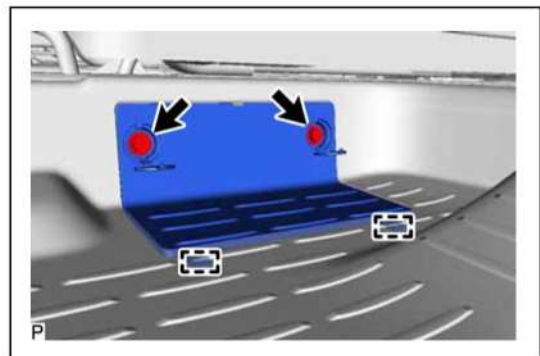


2. Remove the rear door scuff panel LH.

- (1) Using a screwdriver, disengage the 2 claws to open the 2 caps.



- (2) Remove the 2 bolts.
- (3) Disengage the 2 guides to remove the rear door scuff panel LH.



3. Remove the service plug grip.

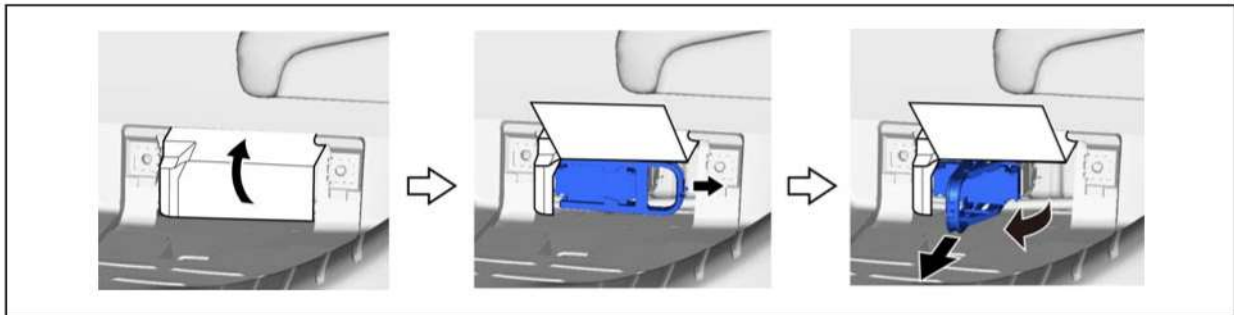
Caution:

- **Wear insulated gloves.**
- **Remove the service plug grip to interrupt the high voltage circuit.**
- **Keep the removed service plug grip in your pocket to prevent other staff from accidentally reinstalling it while you are dismantling the vehicle.**
- **All the high voltage wiring connectors are orange.**
- **After removing the service plug grip, do not touch the high voltage connectors or terminals for 10 minutes.**

Hint:

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

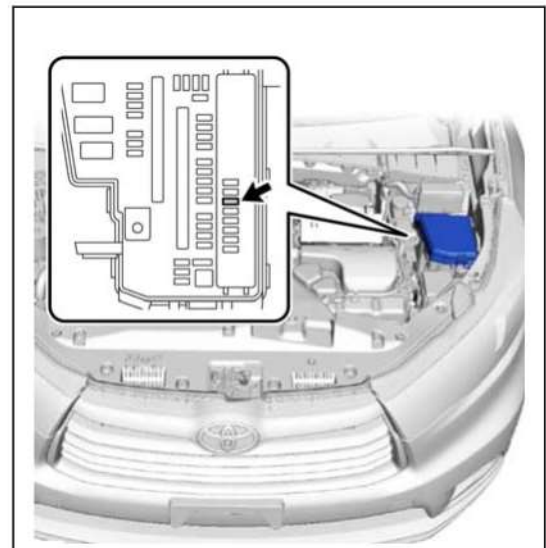
- (1) Wear insulated gloves and remove the service plug grip after sliding the lever of the service plug grip as shown in the illustration.



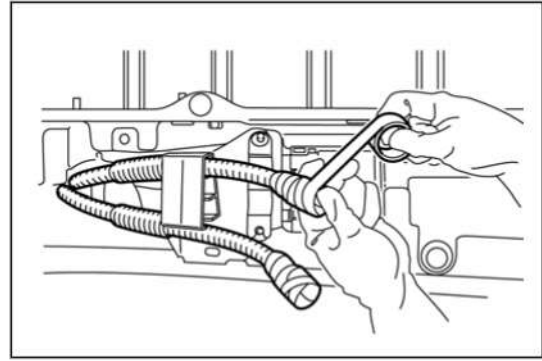
4. Make other staff aware that a high-voltage system is being dismantled by using the following sign: CAUTION: HIGH-VOLTAGE. DO NOT TOUCH. (see page 18).
5. If the service plug grip cannot be removed due to damage to the vehicle, remove the **IG2-MAIN** fuse (25A).

Caution:

This operation shuts off the HV system. Be sure to wear insulated gloves because high voltage is not shut off inside the HV battery. When it is possible to remove the service plug grip, remove it and continue the procedure.



6. After disconnecting or exposing a high-voltage connector or terminal, insulate it immediately using insulating tape. Before disconnecting or touching a bare high-voltage terminal, wear insulated gloves.
7. Check the HV battery and nearby area for leakage. If you find any liquid, it may be strong alkaline electrolyte. Wear rubber gloves and goggles and neutralize the liquid using a saturated boric acid solution or vinegar. Then wipe up the liquid using waste rags etc.
8. If the electrolyte comes into contact with your skin, wash the skin immediately using a saturated boric acid solution or a large amount of water. If the electrolyte adheres to any article of clothing, take the clothing off immediately.
9. If the electrolyte comes into contact with your eye(s), call out loudly for help. Do not rub your eye(s). Instead, wash the eye(s) with a dilute boric acid solution or a large amount of water and seek medical care.
10. With the exception of the HV battery, remove parts by following procedures which are similar to conventional Toyota vehicles. For the removal of the HV battery, refer to the following pages.



Person in charge: _____

CAUTION:
HIGH-VOLTAGE.
DO NOT TOUCH.

CAUTION:
HIGH-VOLTAGE.
DO NOT TOUCH.

Person in charge: _____

When performing work on the HV system, fold this sign and
put it on the roof of the vehicle.

Removal of HV battery



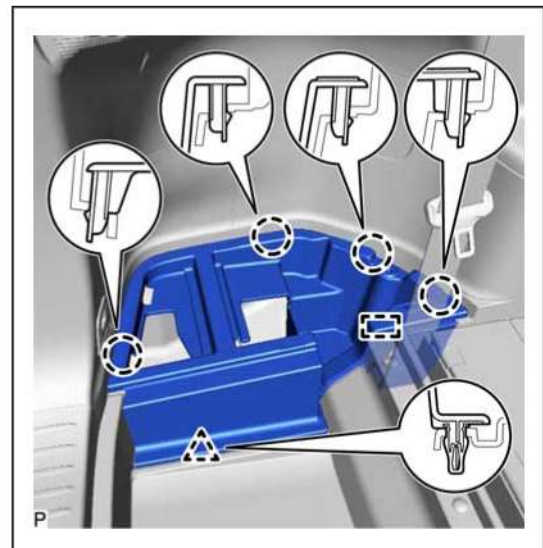
WARNING:

- *Be sure to wear insulated gloves when handling high-voltage parts.*
- *Even if the vehicle is shut off and the relays are off, be sure to remove the service plug grip before performing any further work.*
- *Power remains in the high voltage electrical system for 10 minutes even after the HV battery pack is shut off because the circuit has a condenser that stores power.*
- *Make sure that the tester reading is 0 V before touching any high-voltage terminals which are not insulated.*
- *The SRS may remain powered for up to 90 seconds after the vehicle is shut off or disabled. To prevent serious injury or death from unintentional SRS deployment, avoid cutting the SRS components.*

1. SHUT OFF IGNITION (READY indicator is off)

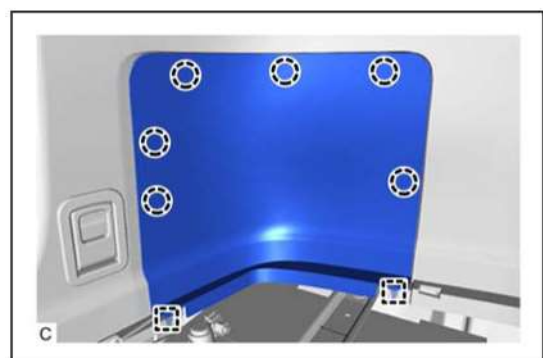
2. REMOVE DECK SIDE TRIM BOX LH

- (1) Fold the rear No. 2 seatback assembly LH forward.
- (2) Disengage the 4 claws, clip and guide to remove the deck side trim box LH.



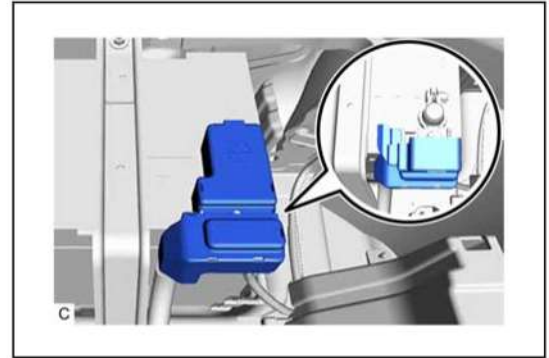
3. REMOVE BATTERY SERVICE HOLE COVER

- (1) Disengage the 6 claws and 2 guides to remove the battery service hole cover.

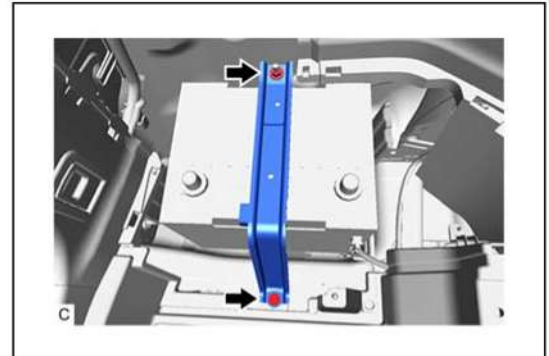


4. REMOVE AUXILIARY BATTERY

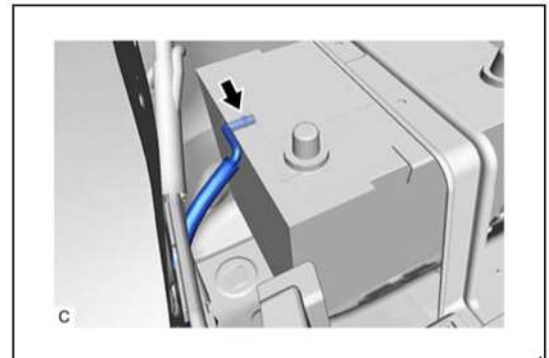
- (1) Open the auxiliary battery terminal cap.
- (2) Loosen the nut and disconnect the cable from the positive (+) auxiliary battery terminal.



- (3) Remove the nut and bolt.
- (4) Remove the battery clamp sub-assembly from the auxiliary battery.



- (5) Disconnect the battery hose from the auxiliary battery.
- (6) Remove the auxiliary battery.
- (7) Remove the battery insulator from the auxiliary battery.



5. REMOVE SERVICE PLUG GRIP

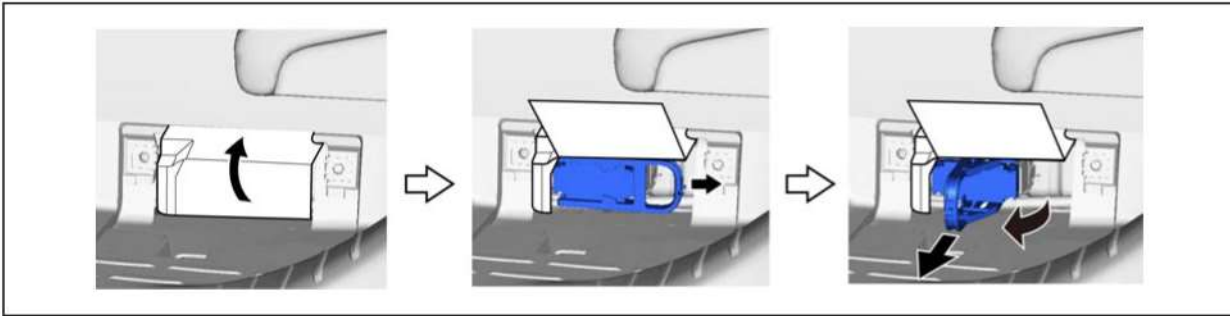
Caution:

- **Wear insulated gloves.**
- **Remove the service plug grip to interrupt the high voltage circuit.**
- **Keep the removed service plug grip in your pocket to prevent other staff from accidentally reinstalling it while you are dismantling the vehicle.**
- **All the high voltage wiring connectors are orange.**
- **After removing the service plug grip, do not touch the high voltage connectors or terminals for 10 minutes.**

Hint:

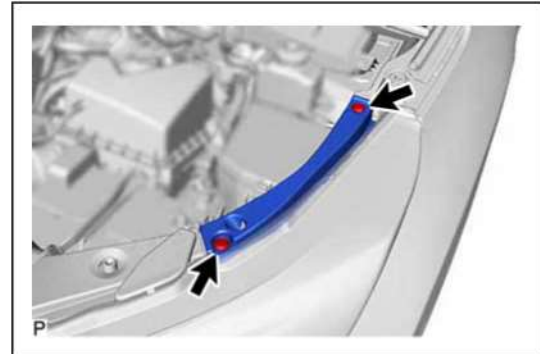
Waiting for at least 10 minutes is required to discharge the high voltage capacitor inside the inverter with converter assembly.

- (1) Wear insulated gloves and remove the service plug grip after sliding the lever of the service plug grip as shown in the illustration.



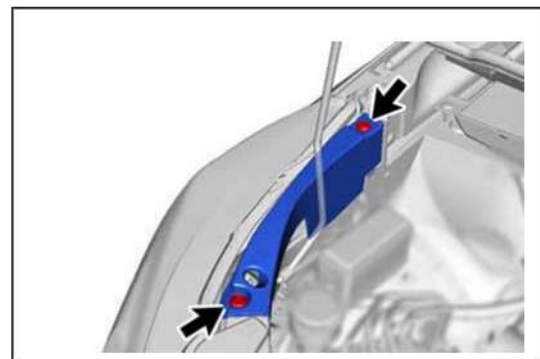
6. REMOVE RADIATOR SIDE DEFLECTOR SEAL LH

- (1) Remove the 2 clips and radiator side deflector seal LH.



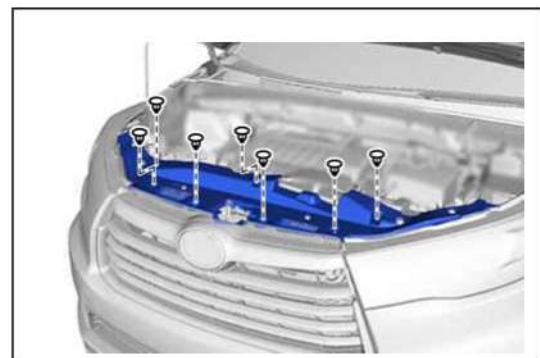
7. REMOVE RADIATOR SIDE SEAL RH

- (1) Remove the 2 clips and radiator side seal RH.



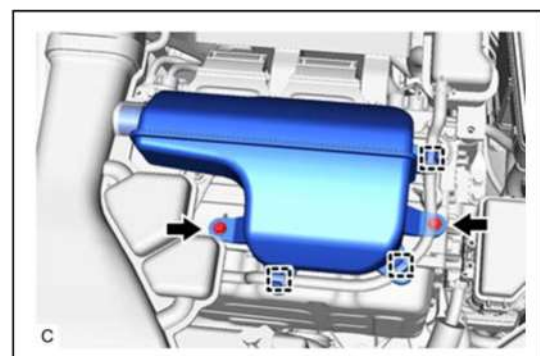
8. REMOVE COOL AIR INTAKE DUCT SEAL

- (1) Remove the 7 clips and cool air intake duct seal.



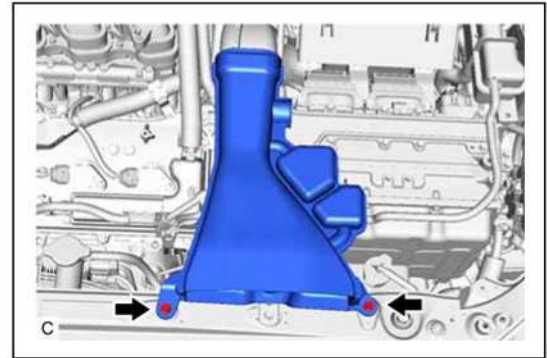
9. REMOVE INTAKE AIR RESONATOR SUB-ASSEMBLY

- (1) Disengage the 3 hose clamps from the intake air resonator sub-assembly.
(2) Remove the 2 bolts.
(3) Remove the intake air resonator sub-assembly from the inlet No. 2 air cleaner.



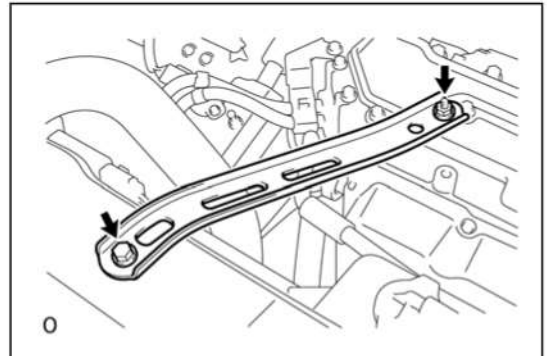
10. REMOVE INLET NO. 2 AIR CLEANER

- (1) Remove the 2 bolts.
- (2) Remove the inlet No. 2 air cleaner from the inlet No. 1 air cleaner.



11. REMOVE NO. 3 INVERTER BRACKET

- (1) Remove the bolt, nut and No. 3 inverter bracket.



12. REMOVE INVERTER TERMINAL COVER

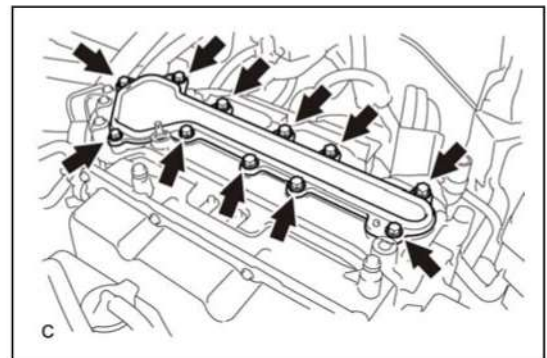
Caution:

Wear insulated gloves.

- (1) Remove the 11 bolts and inverter terminal cover from the inverter with converter assembly.

Notice:

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



13. CHECK TERMINAL VOLTAGE

Caution:

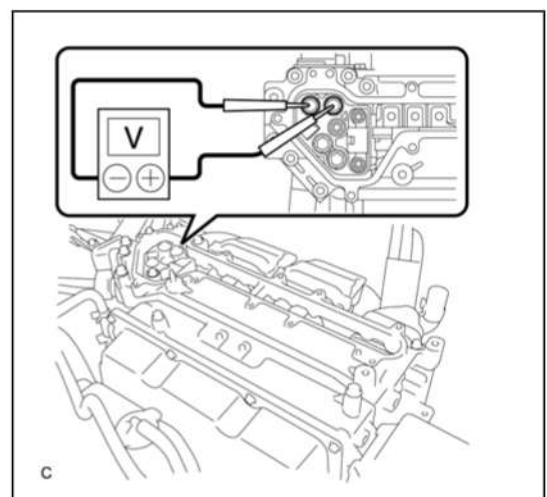
Wear insulated gloves.

Notice:

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

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

Standard Voltage: 0 V



Hint:

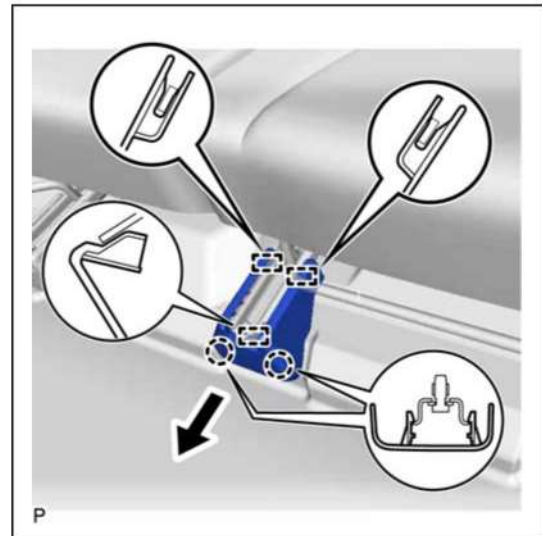
Use a measuring range of DC 750 V or more on the voltmeter.

14. REMOVE REAR NO. 1 SEAT ASSEMBLY
(for Captain Seat Type and 60/40 Split Seat
Type LH Side)

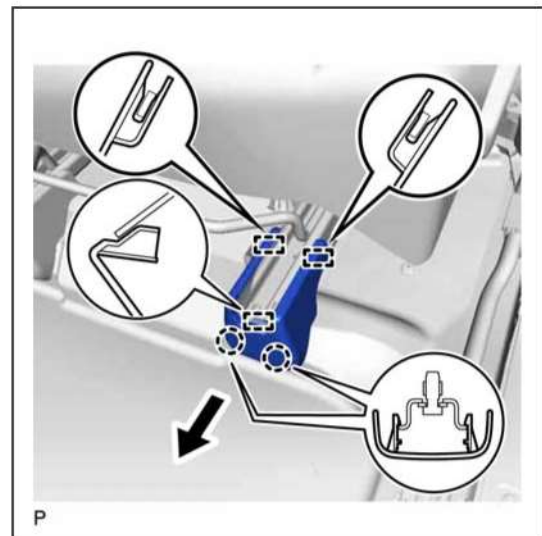
Hint:

Use the same procedure for the RH side and LH
side (for captain seat type).

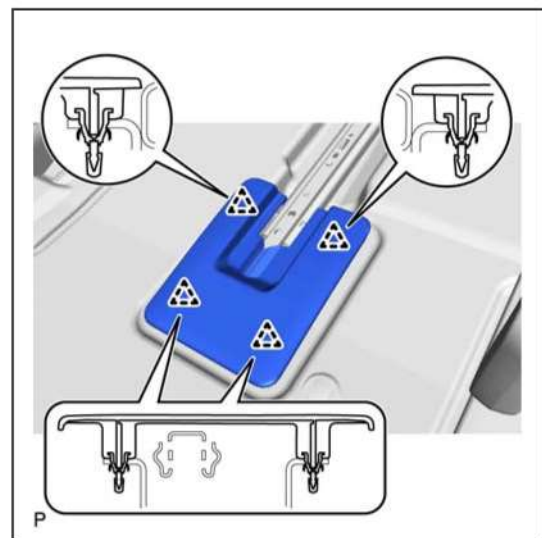
- (1) Disengage the 3 guides and 2 claws to remove
the front inner seat track bracket cover as
shown in the illustration.



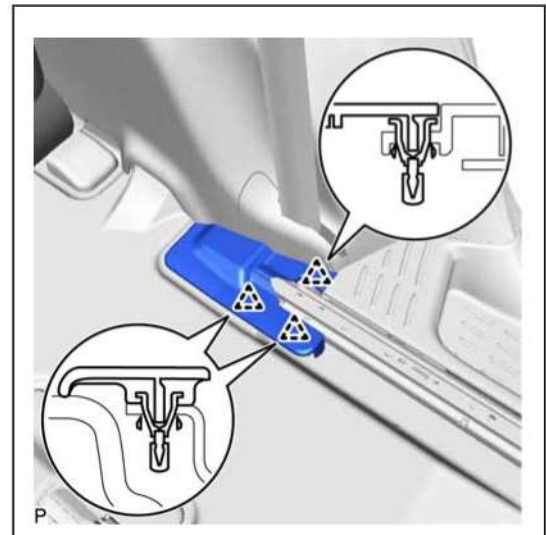
- (2) Disengage the 3 guides and 2 claws to remove
the front outer seat track bracket cover as
shown in the illustration.



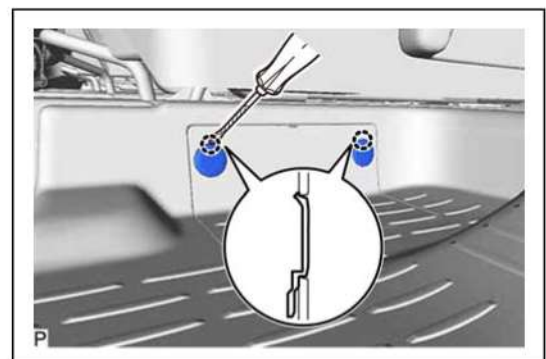
- (3) Disengage the 4 clips and remove the rear
inner seat track bracket cover.



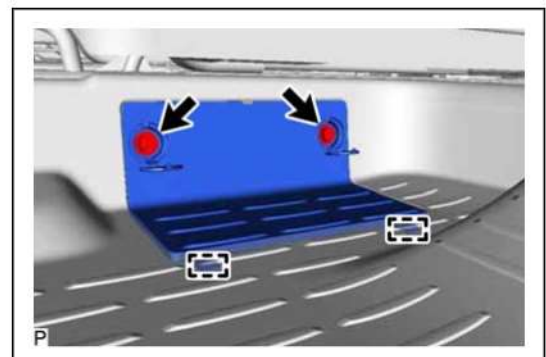
- (4) Disengage the 3 clips and remove the rear outer seat track bracket cover.



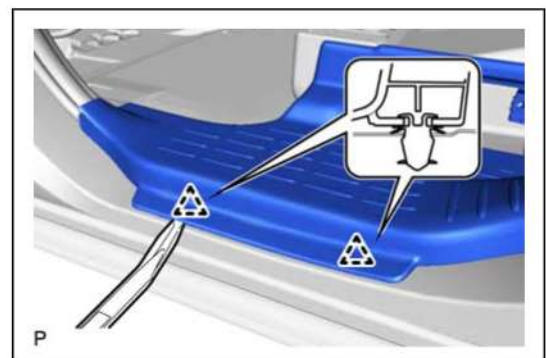
- (5) Using a screwdriver, disengage the 2 claws to open the 2 caps for the rear door scuff panel LH.



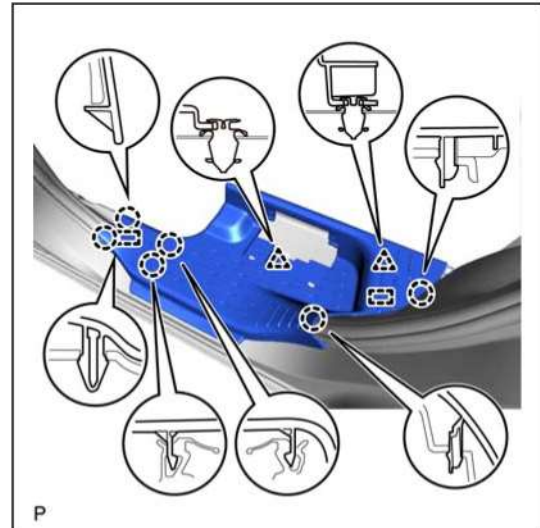
- (6) Remove the 2 bolts and disengage the 2 guides to remove the rear door scuff panel LH.
- (7) Lift up the rear seat adjusting handle and move the rear No. 1 seat assembly LH to the foremost position.



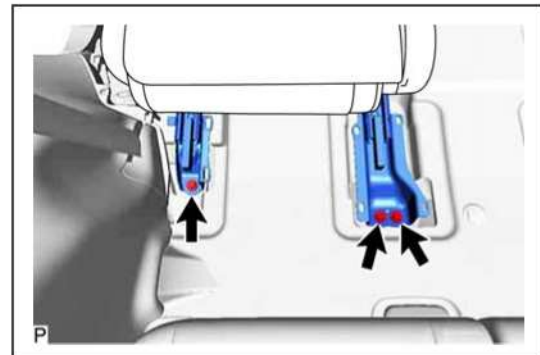
- (8) Using a moulding remover, disengage the 2 clips.



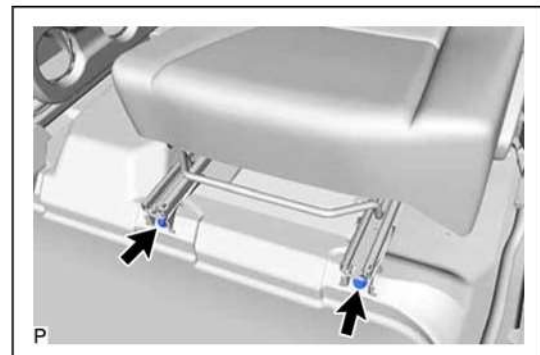
- (9) Disengage the 6 claws, 2 clips and 2 guides to remove the rear door scuff plate LH.
- (10) Remove the rear seat headrest assembly.
- (11) Disconnect the connector (w/ seat heater system).



- (12) Remove the 3 bolts on the rear side of the rear No. 1 seat assembly.



- (13) Remove the 2 bolts on the front side of the rear No. 1 seat assembly.
- (14) Remove the rear No. 1 seat assembly.

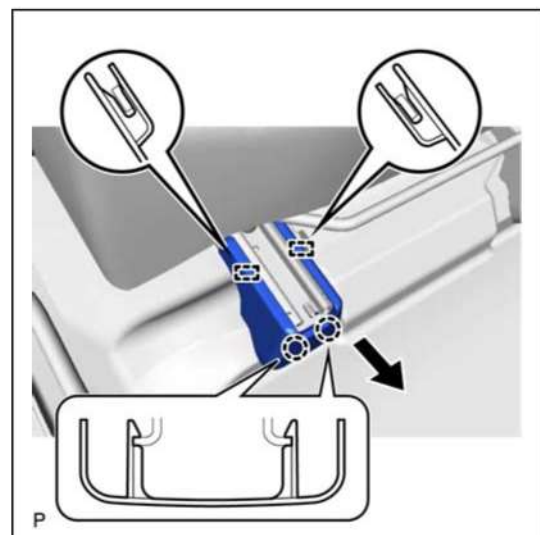


15. REMOVE REAR NO. 1 SEAT ASSEMBLY (for 60/40 Split Seat Type RH Side)

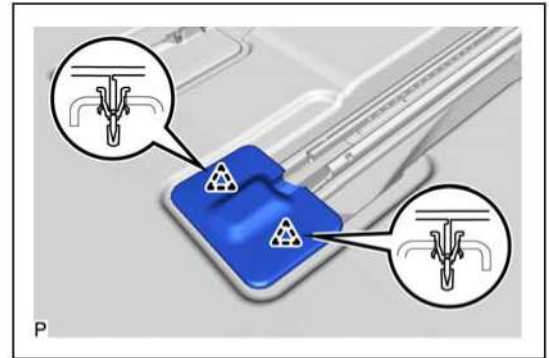
- (1) Disengage the 2 guides and 2 claws to remove the front outer seat track bracket cover as shown in the illustration.
- (2) Remove the front inner seat track bracket cover.

Hint:

Use the same procedure as for the front outer seat track bracket cover.



- (3) Disengage the 2 clips and remove the rear inner seat track bracket cover.



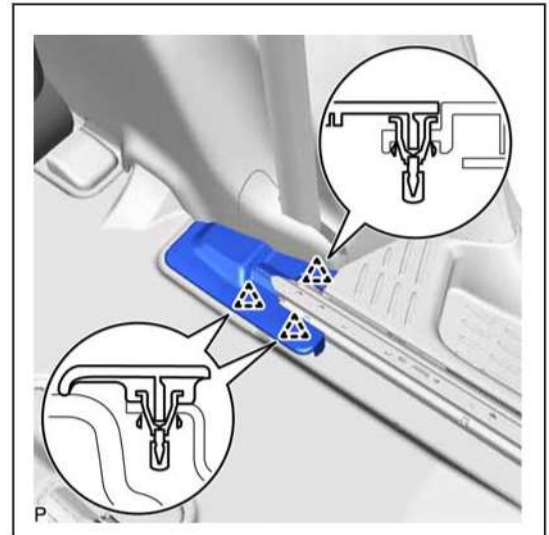
- (4) Disengage the 3 clips and remove the rear outer seat track bracket cover.

- (5) Remove the rear door scuff plate.

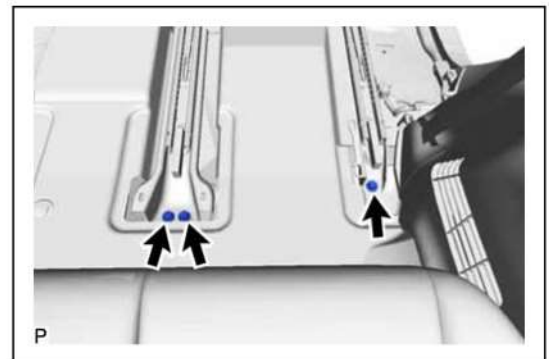
Hint:

Use the same procedure as for the LH side.

- (6) Remove the rear seat headrest assembly.
(7) Remove the rear seat center headrest assembly.

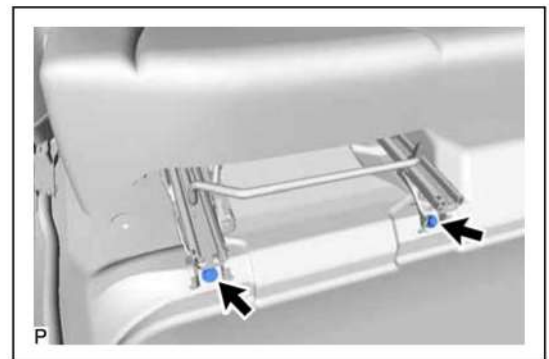


- (8) Remove the 3 bolts on the rear side of the rear No. 1 seat assembly.



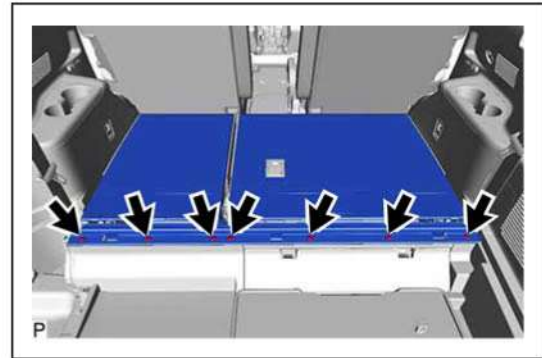
- (9) Remove the 2 bolts on the front side of the rear No. 1 seat assembly.

- (10) Remove the rear No. 1 seat assembly.

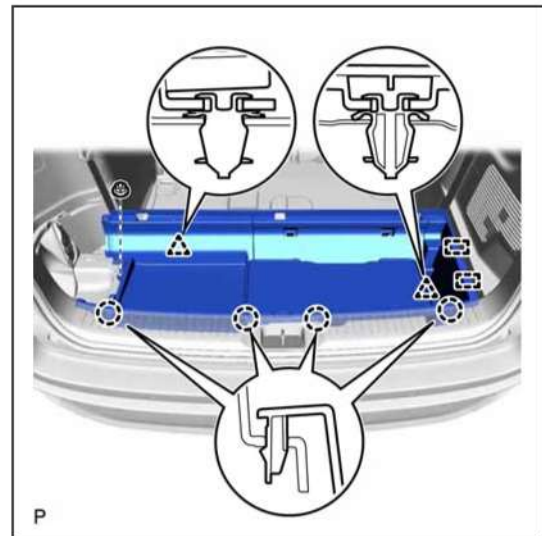


16. REMOVE REAR NO. 2 SEAT ASSEMBLY

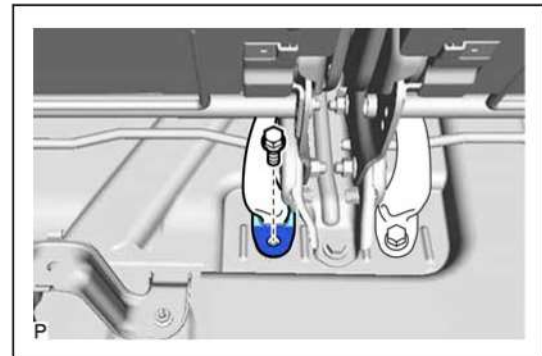
- (1) Fold the rear No. 2 seatback assembly RH forward.
- (2) Using a clip remover, remove the 7 clips.



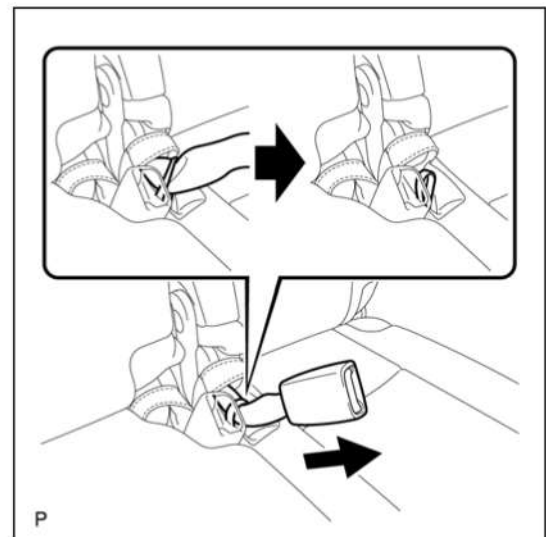
- (3) Remove the nut and disengage the 4 claws, 2 clips and 2 guides to remove the rear deck floor box.



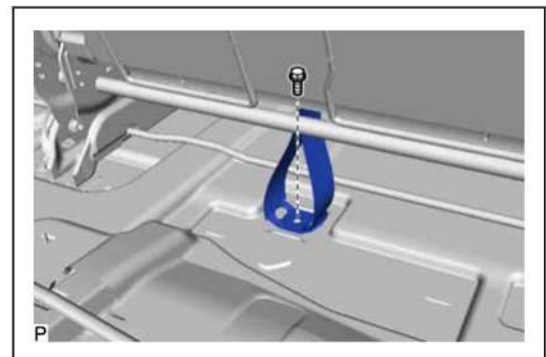
- (4) Remove the bolt to disconnect the floor anchor of the rear No. 2 seat inner belt sub-assembly.



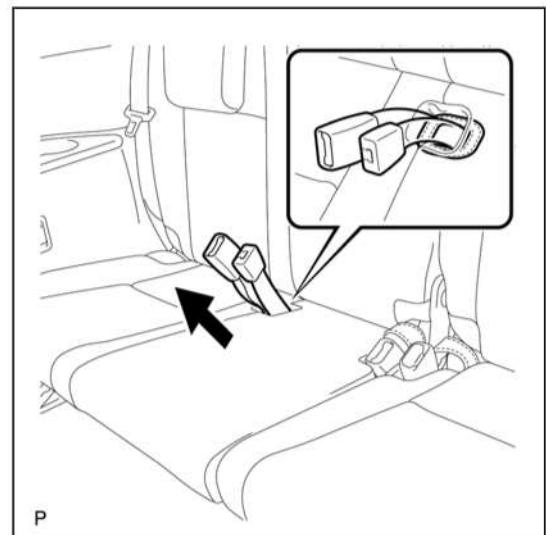
- (5) Remove the rear No. 2 seat inner belt sub-assembly from the rubber band of the rear seat cushion assembly as shown in the illustration.



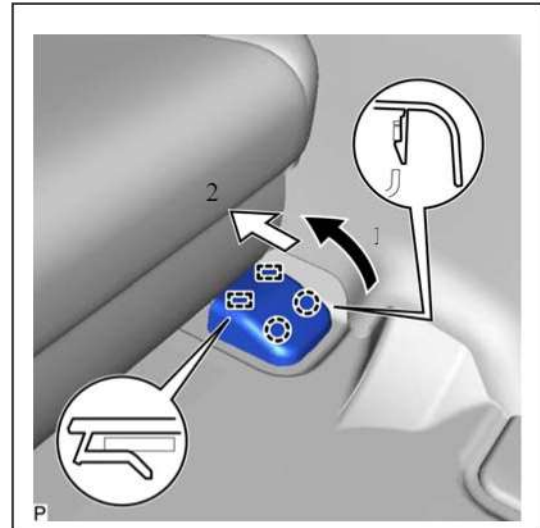
- (6) Remove the bolt to disconnect the floor anchor of the rear No. 2 seat inner belt assembly RH.



- (7) Remove the rear No. 2 seat inner belt assembly RH from the rear seat cushion assembly as shown in the illustration.



- (8) Disengage the 2 claws and 2 guides as indicated by the arrows, in the order shown in the illustration to remove the rear seat leg cover LH.

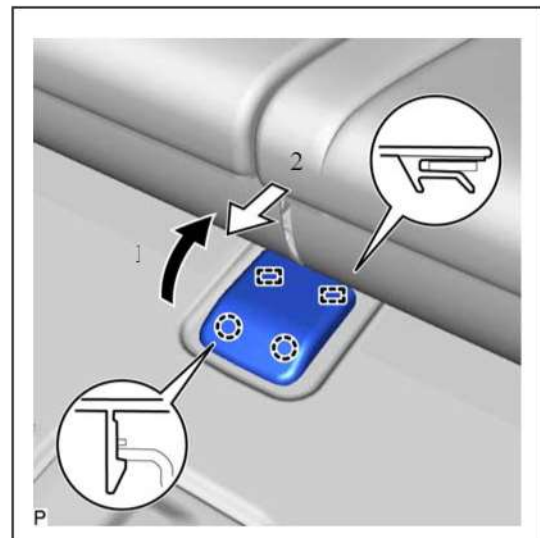


- (9) Disengage the 2 claws and 2 guides as indicated by the arrows, in the order shown in the illustration to remove the rear seat leg cover.

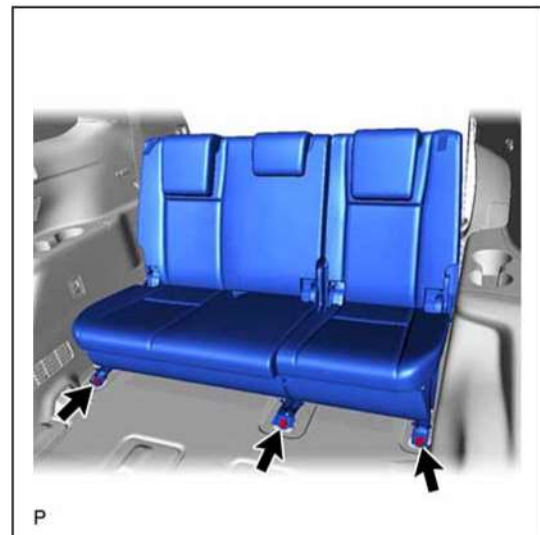
- (10) Remove the rear seat leg cover RH.

Hint:

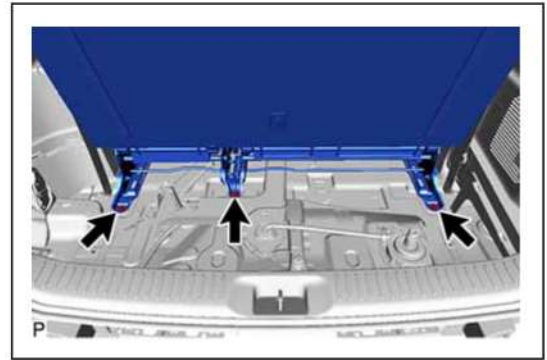
Use the same procedure as for the LH side.



- (11) Remove the 3 bolts on the front side of the rear No. 2 seat assembly.



- (12) Remove the 3 bolts on the rear side of the rear No. 2 seat assembly.
- (13) Remove the rear No. 2 seat assembly.

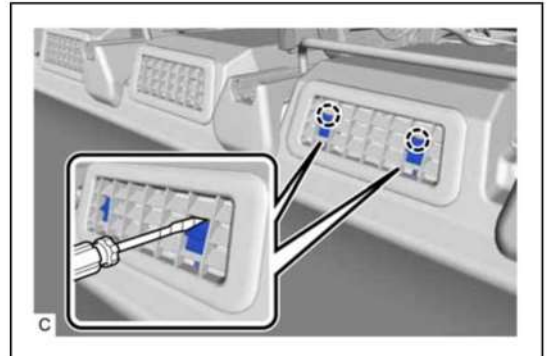


17. REMOVE AIR INTAKE COVER

Hint:

- Use the same procedure as for the center and RH side.
- The following procedure is for the LH side.

- (1) Using a screwdriver, disengage the 2 claws and open the 2 hole covers.
- (2) Remove the 2 screws.
- (3) Disengage the 2 claws and remove the air intake cover.

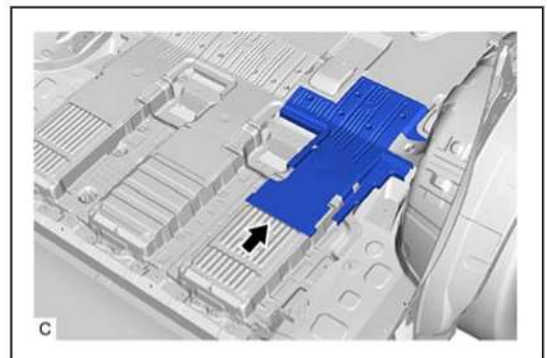


18. SEPARATE FRONT FLOOR CARPET ASSEMBLY

- (1) Turn back the front floor carpet assembly.

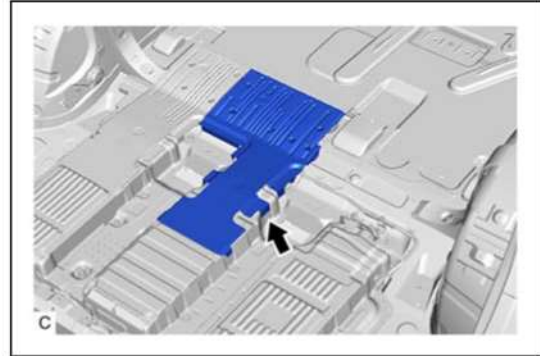
19. REMOVE NO. 1 FLOOR BOARD

- (1) Remove the No. 1 floor board.



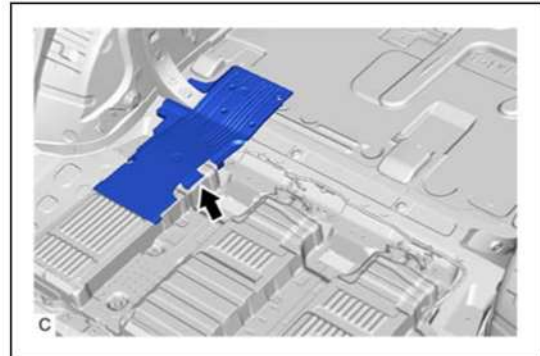
20. REMOVE NO. 2 FLOOR BOARD

- (1) Remove the No. 2 floor board.



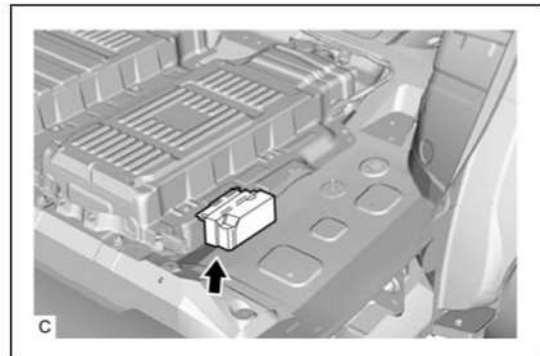
21. REMOVE NO. 3 FLOOR BOARD

- (1) Remove the No. 3 floor board.



22. REMOVE HYBRID BATTERY COVER SHEET

- (1) Remove the hybrid battery cover sheet from the HV battery.

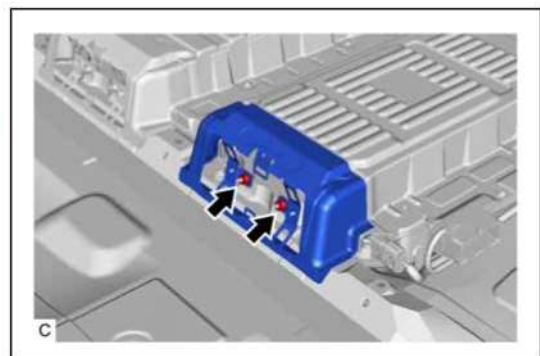


23. REMOVE BATTERY CARRIER DUCT

Hint:

- Use the same procedure as for the center and RH side.
- The following procedure is for the LH side.

- (1) Remove the 2 nuts and battery carrier duct from the HV battery.



24. REMOVE NO. 8 HYBRID VEHICLE BATTERY SHIELD PANEL

Caution:

Wear insulated gloves.

- (1) Using the service plug grip, remove the battery cover lock striker from the No. 8 hybrid vehicle battery shield panel.

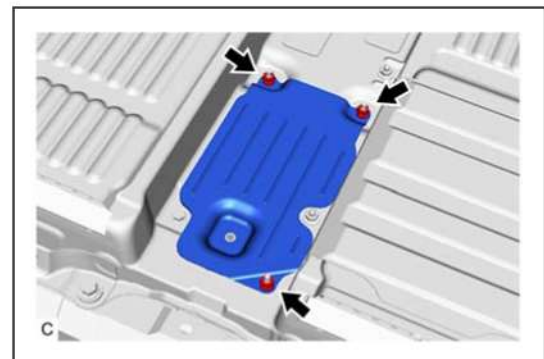
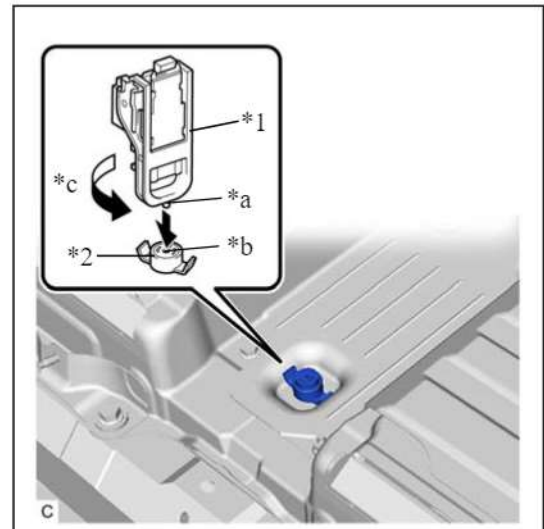
Text in Illustration

*1	Service Plug Grip
*2	Battery Cover Lock Striker
*a	Projection
*b	Button
*c	Turn

Hint:

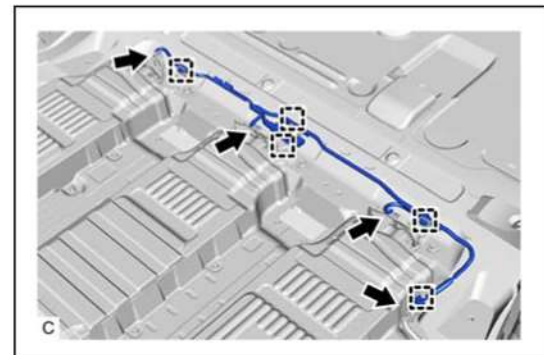
Insert the projection of the service plug grip, turn the button of the battery cover lock striker counterclockwise, and release the lock.

- (2) Remove the 3 nuts and No. 8 hybrid vehicle battery shield panel from the upper hybrid vehicle battery cover sub-assembly.



25. REMOVE REAR BODY WIRE

- (1) Disconnect the 4 rear body wire connectors.
- (2) Disengage the 5 clamps and remove the rear body wire from the upper hybrid vehicle battery cover sub-assembly.

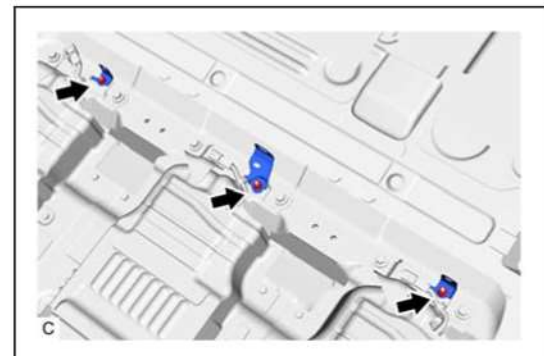


26. REMOVE UPPER HYBRID VEHICLE BATTERY COVER SUB-ASSEMBLY

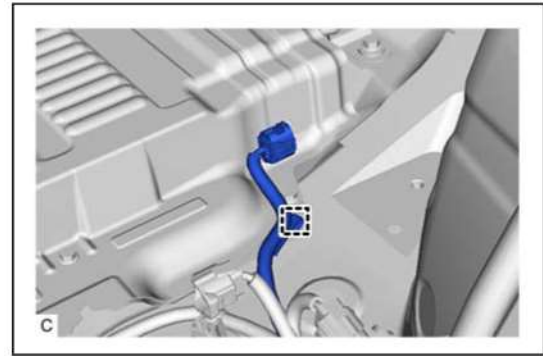
Caution:

Be sure to wear insulated gloves and protective goggles.

- (1) Remove the 3 nuts and 3 wire harness clamp brackets from the upper hybrid vehicle battery cover sub-assembly.



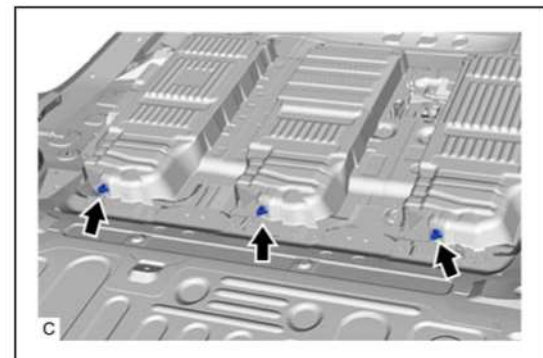
- (2) Disengage the clamp from the upper hybrid vehicle battery cover sub-assembly.



- (3) Disengage the 6 clamps.



- (4) Remove the 3 wire harness clamps from the upper hybrid vehicle battery cover sub-assembly.



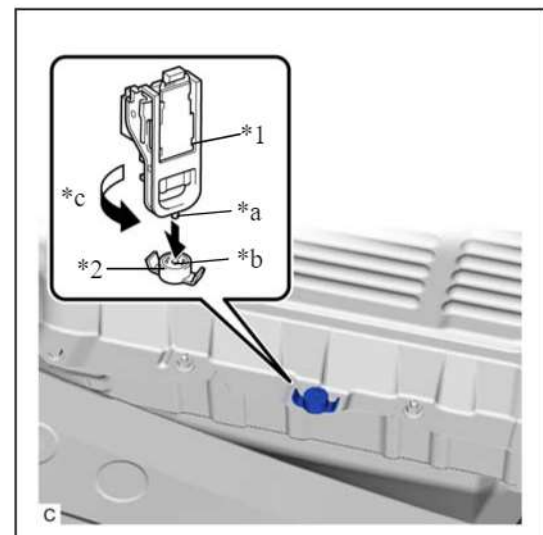
- (5) Using the service plug grip, remove the battery cover lock striker from the upper hybrid vehicle battery cover sub-assembly.

Text in Illustration

*1	Service Plug Grip
*2	Battery Cover Lock Striker
*a	Projection
*b	Button
*c	Turn

Hint:

Insert the projection of the service plug grip, turn the button of the battery cover lock striker counterclockwise, and release the lock.



- (6) Remove the 25 bolts, 6 nuts and upper hybrid vehicle battery cover sub-assembly.



27. REMOVE BATTERY VOLTAGE SENSOR CONNECTOR

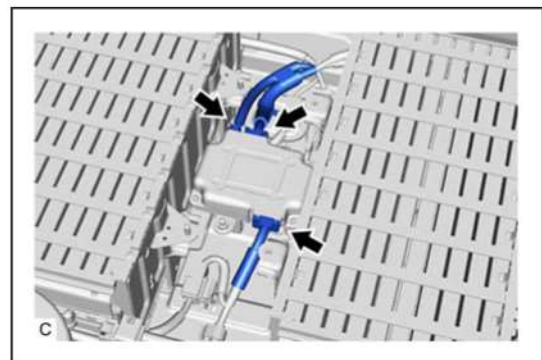
Caution:

Be sure to wear insulated gloves and protective goggles.

- (1) Disconnect the 3 battery voltage sensor connectors.

Notice:

Insulate the disconnected high voltage connectors with insulating tape.



28. REMOVE HV BATTERY

Caution:

Be sure to wear insulated gloves and protective goggles.

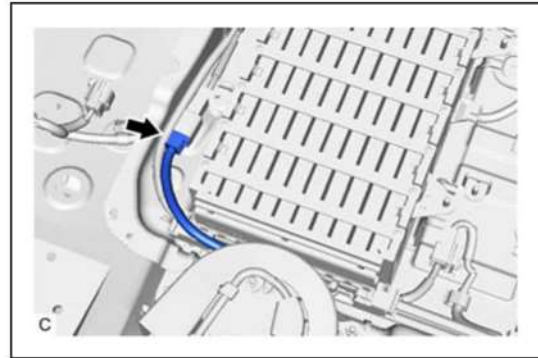
Notice:

- To prevent the wire harness from being caught, make sure to bundle the wire harness using insulating tape or equivalent.
- Use cardboard or other similar material to protect the HV battery module from damage.
- When removing an HV battery module from the vehicle, do not allow it to contact the vehicle.
- When removing/moving an HV battery module, make sure not to tilt it more than 80° .
- When moving an HV battery module, make sure to use an engine lifter.
- Insulate the disconnected terminals or connectors with insulating tape.

- (1) Remove the HV battery module (for LH side).
- a) Disconnect the No. 2 hybrid vehicle battery pack cable connector.

Notice:

Insulate the disconnected connectors with insulating tape.

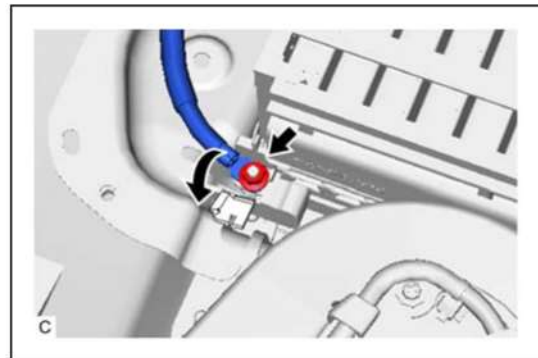


- b) Open the terminal cover.
- c) Using an insulated tool, remove the nut and disconnect the electric vehicle battery plug assembly cable from the HV battery module (for LH side).

Notice:

- **Do not use a universal joint with a socket extension. Using a universal joint may cause the socket extension to drop and create a short circuit.**
- **Insulate the disconnected terminal with insulating tape.**

- d) Close the terminal cover.



Notice:

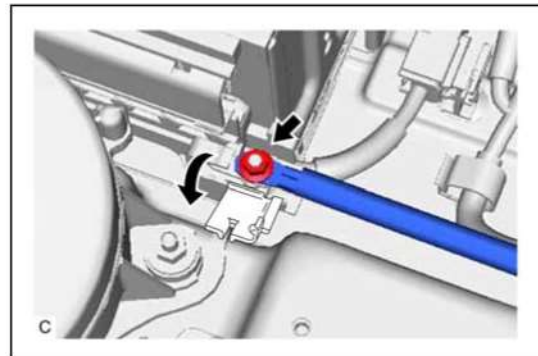
Make sure that the terminal cover is closed securely.

- e) Open the terminal cover.
- f) Using an insulated tool, remove the nut and disconnect the HV battery module (for center) cable from the HV battery module (for LH side).

Notice:

- **Do not use a universal joint with a socket extension. Using a universal joint may cause the socket extension to drop and create a short circuit.**
- **Insulate the disconnected terminal with insulating tape.**

- g) Close the terminal cover.



Notice:

Make sure that the terminal cover is closed securely.

- h) Disconnect the HV battery module (for LH side) cable connector.

Notice:

Insulate the disconnected connectors with insulating tape.

- i) Install the 2 battery clamps or ropes to the HV battery module (for LH side).
j) Remove the HV battery module (for LH side).

- (2) Remove the HV battery module (for center).

- a) Disengage the 2 clamps.

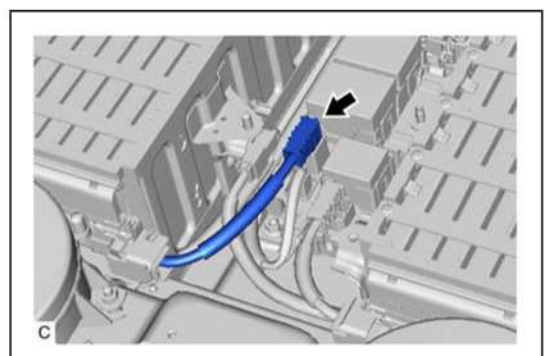
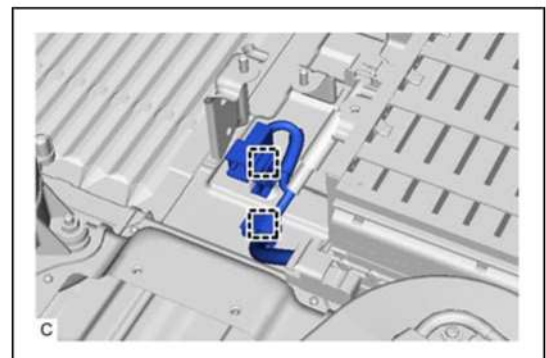
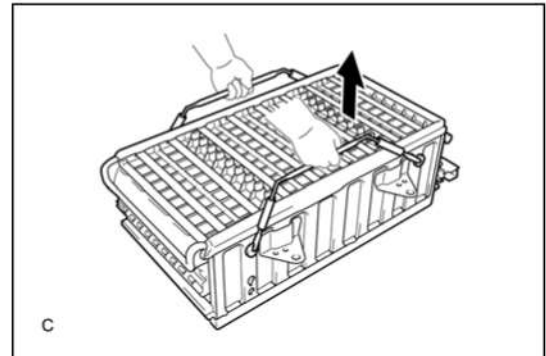
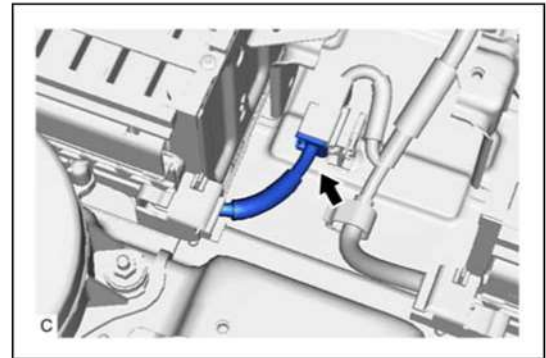
- b) Disconnect the No. 2 hybrid battery pack wire connector.

- c) Disengage the clamp.

- d) Disconnect the hybrid battery junction block assembly connector.

Notice:

Insulate the disconnected connectors with insulating tape.

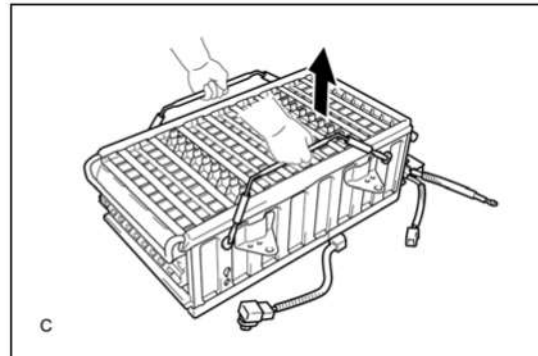


- e) Disconnect the HV battery module (for RH side) cable connector.

Notice:

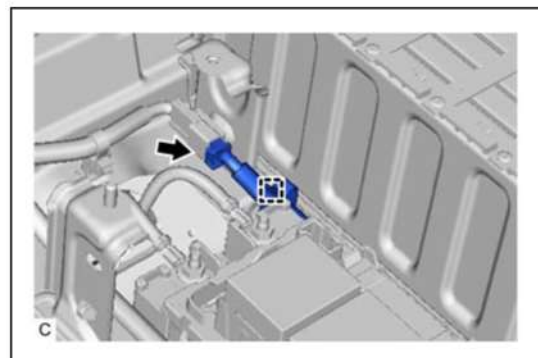
Insulate the disconnected connectors with insulating tape.

- f) Disengage the clamp.
- g) Install the 2 battery clamps or ropes to the HV battery module (for center).
- h) Remove the HV battery module (for center).



- (3) Remove the HV battery module (for RH side).

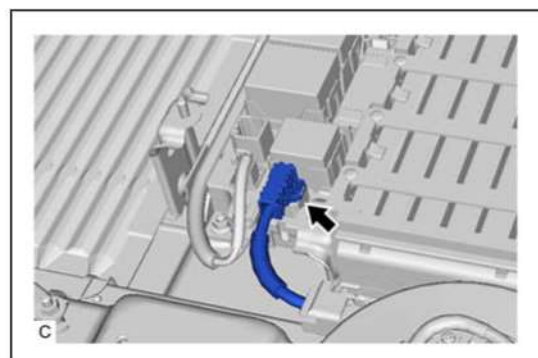
- a) Disconnect the HV battery module (for RH side) cable connector.
- b) Disengage the clamp.



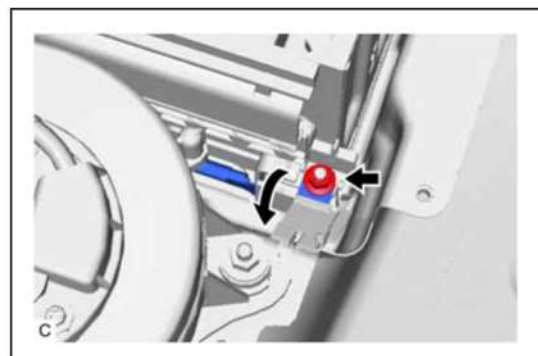
- c) Disconnect the hybrid battery junction block assembly connector.

Notice:

Insulate the disconnected connectors with insulating tape.



- d) Open the terminal cover.
- e) Using an insulated tool, remove the nut and disconnect the No. 2 hybrid vehicle battery pack cable from the HV battery module (for RH side).



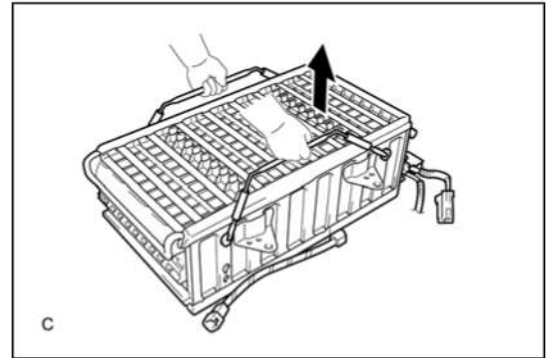
Notice:

- **Do not use a universal joint with a socket extension. Using a universal joint may cause the socket extension to drop and create a short circuit.**
 - **Insulate the disconnected terminal with insulating tape.**
- f) Close the terminal cover.

Notice:

Make sure that the terminal cover is closed securely.

- g) Install the 2 battery clamps or ropes to the HV battery module (for RH side).
- h) Remove the HV battery module (for RH side).



29. The HV battery pack is recyclable. Contact your Toyota distributor (if included on the HV battery caution label) or contact the nearest Toyota dealer (see next page for samples of the HV battery caution label).

Caution:

After removing the HV battery, do not reinstall the service plug grip to the HV battery.

U.S.A.:

 DANGER       		To Qualified Technicians, Haulers, Dismantlers Be sure to read the Repair Manual When servicing or replacing this unit. Please consult your dealer or your national distributor when hauling or dismantling this unit.
High Voltage Inside/Alkaline Electrolyte		Ni-MH
Observe the following precautions when you handle this battery unit. If you do not conform to those, it may result in a fire, an electrical shock and death in the worst case. Leakage of alkaline electrolyte may cause blindness or skin problems, if alkaline electrolyte comes into contact with your eyes, skins or clothes. In event of accident, flush with water and get medical help immediately. ●Never disassemble, convert or divert this battery unit or remove its covers. (Please have the battery serviced by your dealer or a Qualified Technician.) ●Do not dump this unit illegally. It may result in pollution, death or serious injury. ●Do not puncture or expose this unit to impact. ●Keep this unit away from a fire. ●Do not water this unit. ●Keep children away from this unit.		
HV Battery Recycling Information ● Please transport this unit in accordance with all applicable laws. ● Consultations about replacing and disposing this unit are accepted in your dealer or the following address.		
Residents in U.S.A. ●TOYOTA MOTOR SALES U.S.A., INC. TORRANCE, CAL. 90501 Phone: 1-800-331-4331 ●SERVCO PACIFIC INC. HONOLULU, HAWAII 96813 Phone: 808-839-2273		Residents in PUERTO RICO ●TOYOTA DE PUERTO RICO HATO REY, PUERTO RICO Phone: 787-751-1000
		

CANADA:

 DANGER       		High Voltage Inside / Alkaline Electrolyte Observe the following precautions when you handle this battery unit. If you do not conform to those, it may result in a fire, an electrical shock and death in the worst case. Leakage of alkaline electrolyte may cause blindness or skin problems, if alkaline electrolyte comes into contact with your eyes, skins or clothes. In event of accident, flush with water and get medical help immediately. ●Never disassemble, convert, or divert this battery unit or remove its covers. (Please have the battery serviced by your dealer or a Qualified Technician.) ●Do not dump this unit illegally. It may result in pollution, death or serious injury. ●Do not puncture or expose this unit to impact. ●Keep this unit away from a fire. ●Do not water this unit. ●Keep children away from this unit.
To Qualified Technicians, Haulers, Dismantlers Be sure to read the Repair Manual when servicing or replacing this unit. Please consult your dealer or your national distributor when hauling or dismantling this unit.		Haute tension à l'intérieur / Electrolyte alcalin Observe les précautions suivantes lors de la manipulation de cette batterie. Le défaut de s'y conformer pourrait entraîner un incendie, une décharge électrique et, dans le pire des cas, la mort. Une fuite d'électrolyte alcalin peut provoquer la cécité ou des problèmes de peau, en cas de contact avec les yeux, la peau ou les vêtements. En cas d'accident, rincez la partie touchée avec de l'eau et consultez immédiatement un médecin. ●Ne tentez pas de démonter, de transformer cette batterie, ni l'employer à un autre usage ou en retirer le couvercle. (En confier l'entretien à votre concessionnaire ou à un technicien qualifié.) ●Ne pas jeter cette batterie illégalement. Cela pourrait entraîner de la pollution, ou provoquer des blessures graves, voire mortelles. ●Ne pas percer cette batterie ni l'exposer à des chocs. ●Garder cette batterie à l'abri des flammes. ●Ne pas arroser cette batterie. ●Garder les enfants éloignés de cette batterie.
HV Battery Recycling Information ● Please transport this unit in accordance with all applicable laws. ● Consultations about replacing and disposing this unit are accepted in your dealer or the following address TOYOTA CANADA INC. ONE TOYOTA PLACE SCARBOROUGH, ONTARIO M1H 1H8 Phone 1-888-TOYOTA-8 (1-888-889-4828) URL: www.toyota.ca		Avis aux techniciens qualifiés, aux transporteurs et aux démonteurs S'assurer de lire le Manuel de réparation lors du rétrofit ou du remplacement de cette batterie. Prière de consulter votre concessionnaire ou votre distributeur national lors du transport ou du démontage de cette batterie.
Informations relatives au recyclage de la batterie HV (véhicules hybrides) ● Prière de se conformer à toutes les lois applicables lors du transport de cette batterie. ● Les demandes de consultation relatives au remplacement et à la mise au rebut de cette batterie sont acceptées chez votre concessionnaire ou à l'adresse suivante.		