



LS500h

Gasoline-Electric

Lexus Hybrid Drive

HYBRID VEHICLE DISMANTLING MANUAL



Foreword

This guide was developed to educate and assist dismantlers in the safe handling of Lexus LS500h gasoline-electric hybrid vehicles. LS500h dismantling procedures are similar to other non-hybrid Lexus 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 Lexus LS500h, as they may not be familiar to dismantlers.

High voltage electricity powers the A/C compressor, electric motor, generator, and inverter/converter. All other conventional automotive electrical devices such as the head lights, radio, and gauges are powered from a separate 12 V auxiliary battery. Numerous safeguards have been designed into the LS500h to help ensure the high voltage, approximately 310.8 V, Lithium-ion battery pack is kept safe and secure in an accident.

The Lithium-ion 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. If the electrolyte is leaking, do not touch any leaked liquid because it could be the organic electrolyte that contains carbonate ester-based. If contact is unavoidable, wipe up the liquid using a cloth while wearing rubber gloves, goggles and an organic solvent mask. Do not leave electrolyte-contaminated cloths unattended. Please contaminated cloths in an appropriate airtight container and dispose of them according to local regulations.

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:

- Lexus LS500h identification.
- Major hybrid component locations and descriptions.

By following the information in this guide, dismantlers will be able to handle LS500h hybrid-electric vehicles as safely as the dismantling of a conventional gasoline engine automobile.

© 2017 Toyota Motor Corporation

All rights reserved. This book may not be reproduced or copied, in whole or in part, without the written permission of Toyota Motor Corporation.

Table of Contents

<u>About the LC500h</u>	<u>1</u>
<u>LC500h Identification</u>	<u>2</u>
<u>Exterior</u>	<u>3</u>
<u>Interior</u>	<u>4</u>
<u>Engine Compartment</u>	<u>5</u>
<u>Hybrid Component Locations & Descriptions</u>	<u>6</u>
<u>Specifications</u>	<u>7</u>
<u>Lexus Hybrid Drive Operation</u>	<u>8</u>
<u>Vehicle Operation</u>	<u>8</u>
<u>Hybrid Vehicle (HV) Battery Pack and Auxiliary Battery</u>	<u>9</u>
<u>HV Battery Pack</u>	<u>9</u>
<u>Components Powered by the HV Battery Pack</u>	<u>9</u>
<u>HV Battery Pack Recycling</u>	<u>10</u>
<u>Auxiliary Battery</u>	<u>10</u>
<u>High Voltage Safety</u>	<u>11</u>
<u>High Voltage Safety System</u>	<u>11</u>
<u>Service Plug Grip</u>	<u>12</u>
<u>Precaution to be observed when dismantling the vehicle</u>	<u>13</u>
<u>Necessary Items</u>	<u>13</u>
<u>Spills</u>	<u>14</u>
<u>Dismantling the vehicle</u>	<u>15</u>
<u>Removal of HV battery</u>	<u>20</u>

About the LS500h

The LS500h 4-door sedan joins the hybrid model for Lexus. Lexus Hybrid Drive means that the vehicle contains a gasoline engine and electric motor for power.

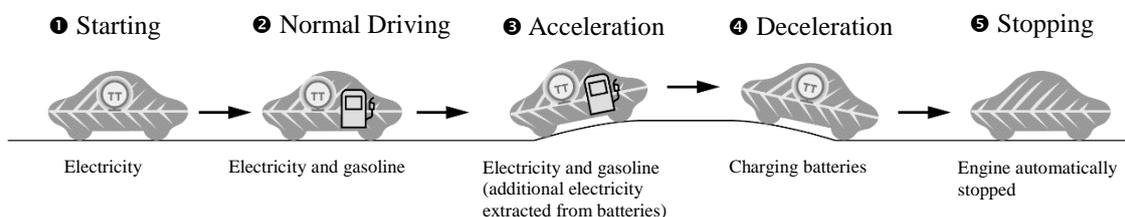
The two hybrid power sources are stored on board the vehicle:

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 motor.

The result of combining these two power sources is improved fuel economy and reduced emissions. The gasoline engine also powers a generator to recharge the battery pack; unlike a pure all electric vehicle, the LS500h 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 LS500h operates in various driving modes.

- ❶ During light acceleration at low speeds, the vehicle is powered by the electric motor. 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 motor.
- ❸ During full acceleration, such as climbing a hill, both the gasoline engine and the electric motor power the vehicle.
- ❹ During deceleration, such as when braking, the vehicle regenerates the kinetic energy from the rear wheels to produce electricity that recharges the battery pack.
- ❺ While the vehicle is stopped, the gasoline engine and electric motor are off, however the vehicle remains on and operational.



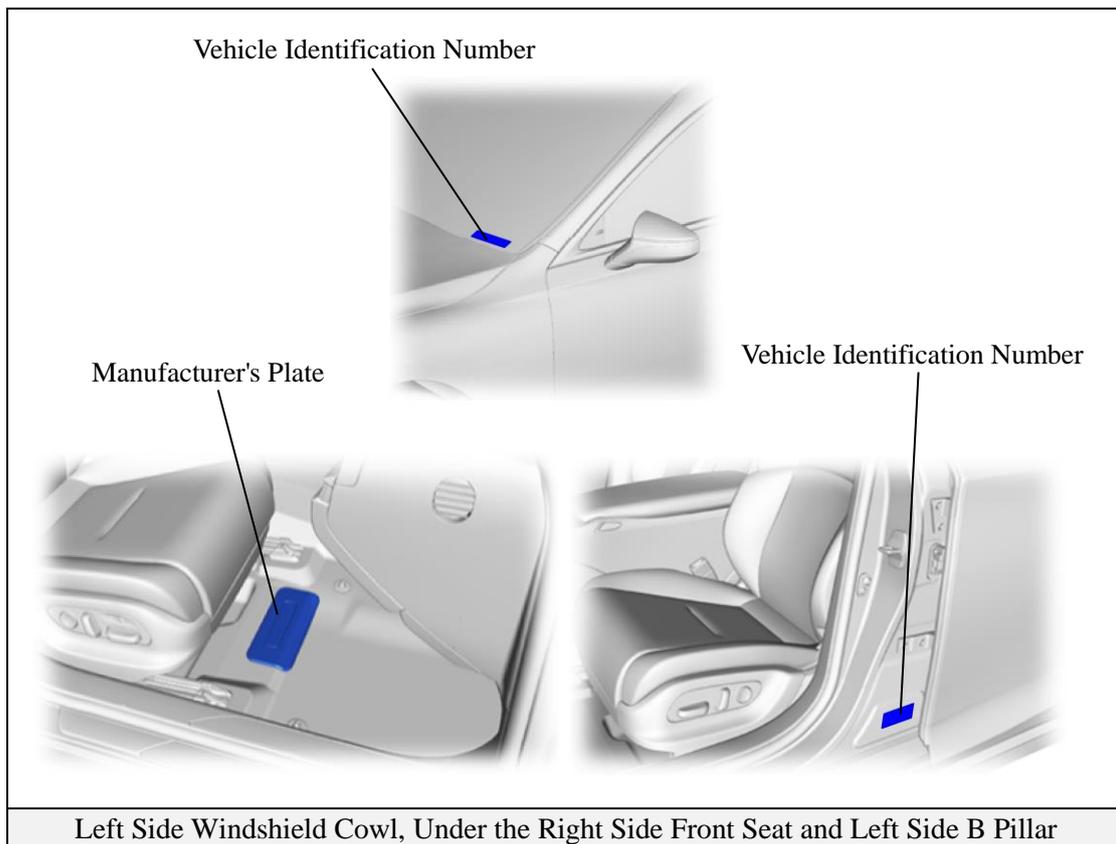
LS500h Identification

In appearance, the LS500h is nearly identical to the conventional, non-hybrid Lexus LS500. The LS500h is a 4-door sedan. Exterior, interior, and engine compartment illustrations are provided to assist in identification.

The alphanumeric 15 character Vehicle Identification Number (VIN) is provided on the left side windshield cowl, floor under the right side front seat and left side B pillar.

Example VIN: JTHBY1FF5000101 (2WD Models)
JTHBYLFF5000101 (2WD Models)
JTHCY1FF5000101 (AWD Models)
JTHCYLFF5000101 (AWD Models)

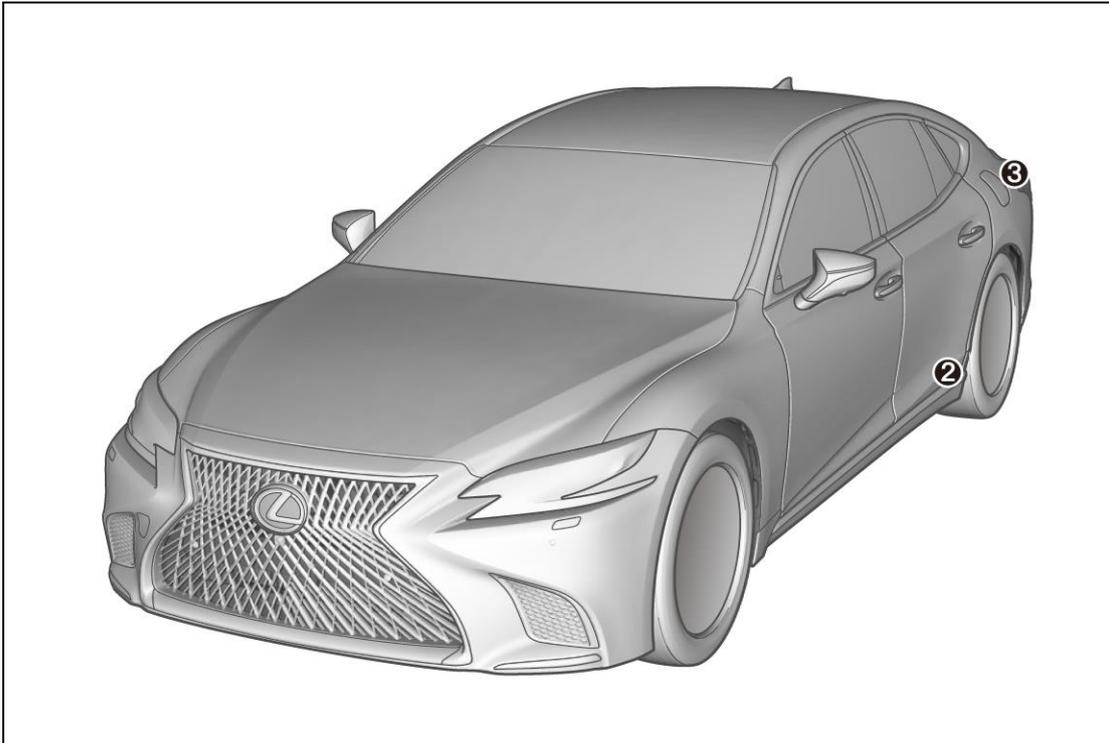
An LS500h is identified by the first 8 alphanumeric characters **JTHBY1FF**, **JTHBYLFF**, **JTHCY1FF** or **JTHCYLFF**.



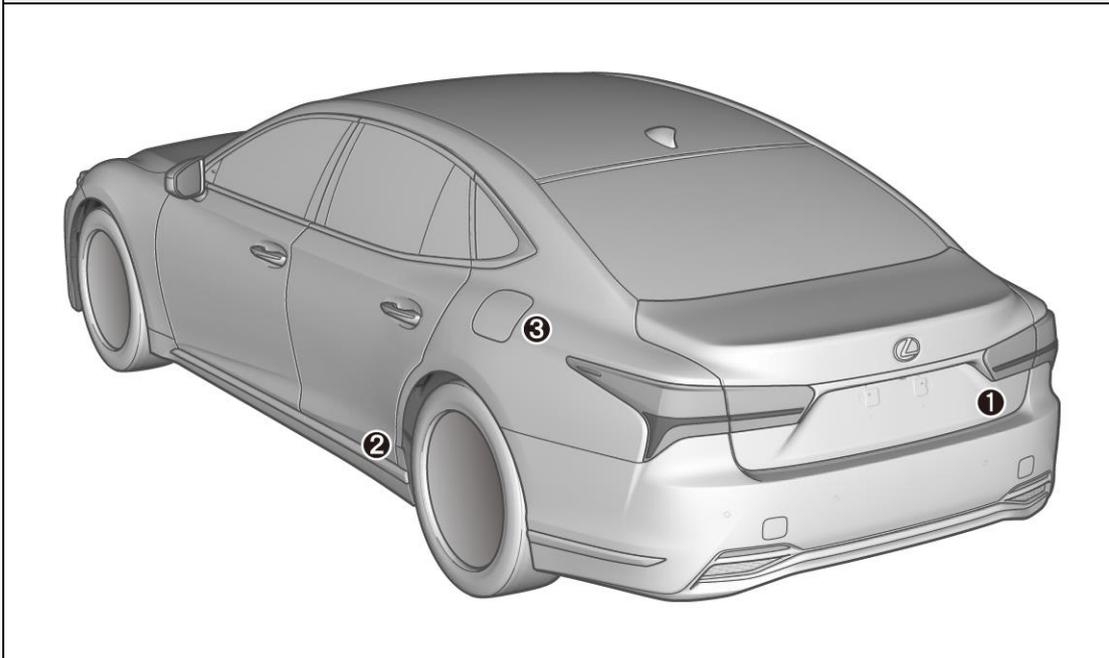
LS500h Identification (Continued)

Exterior

- ❶ **LS500h** logo on the trunk.
- ❷ **HYBRID** logos on the rear door moldings.
- ❸ Gasoline fuel filler door located on the left side rear quarter panel.



Exterior Front and Left Side View



Exterior Rear and Left Side View

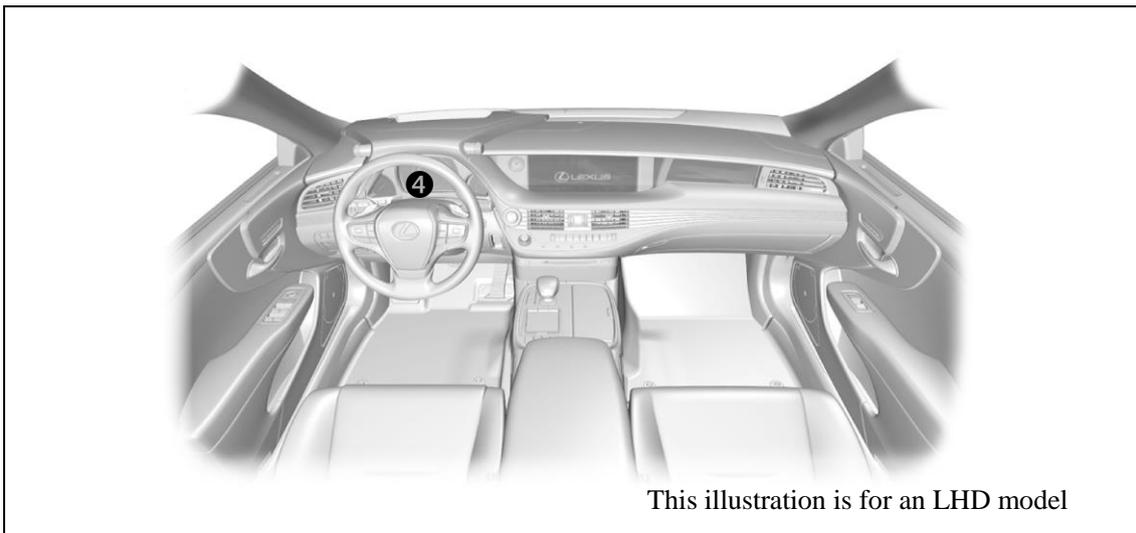
LS500h Identification (Continued)

Interior

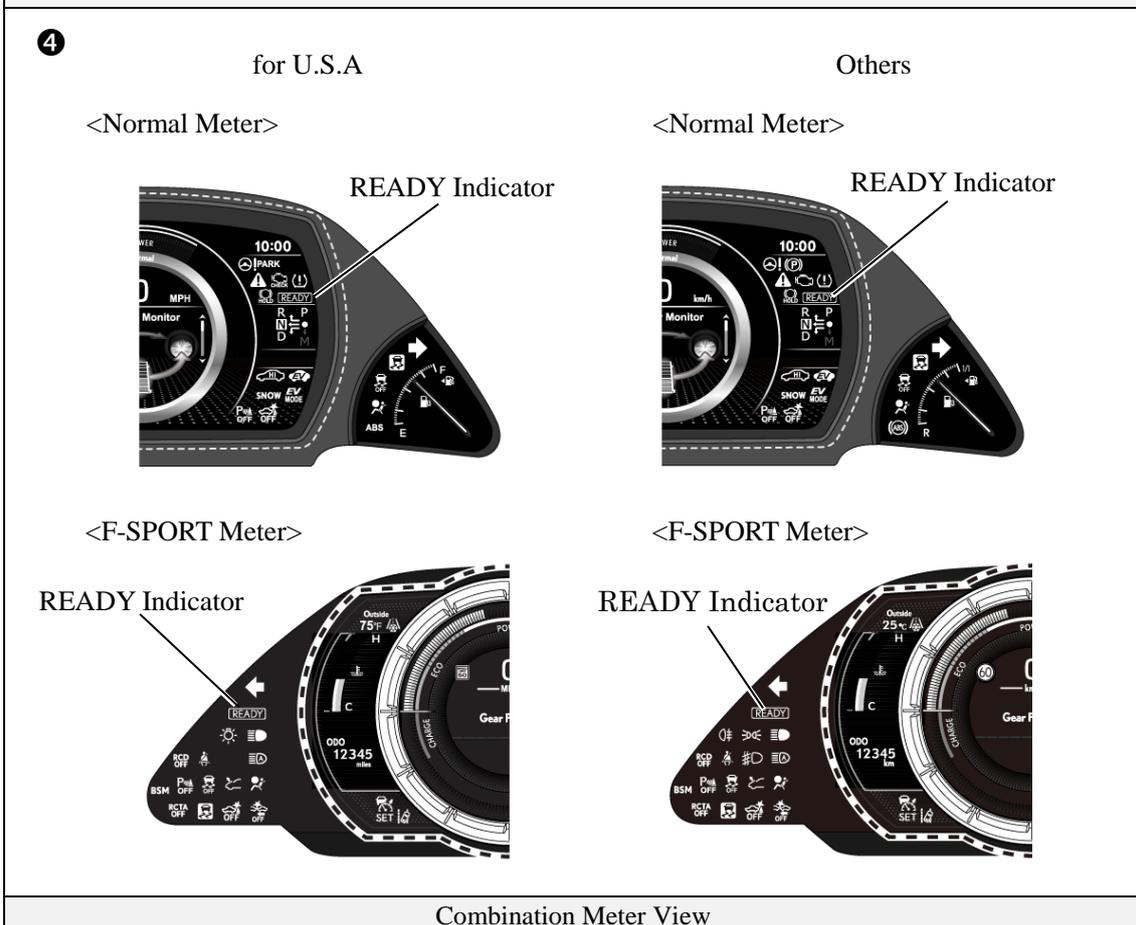
- ④ The instrument cluster (hybrid system indicator, **READY** indicator and warning lights) located in the dash behind the steering wheel, is different than the one on the conventional, non-hybrid LS500.

Notice:

If the vehicle is shut off, the combination meter gauges will be "blacked out", not illuminated.



Interior View

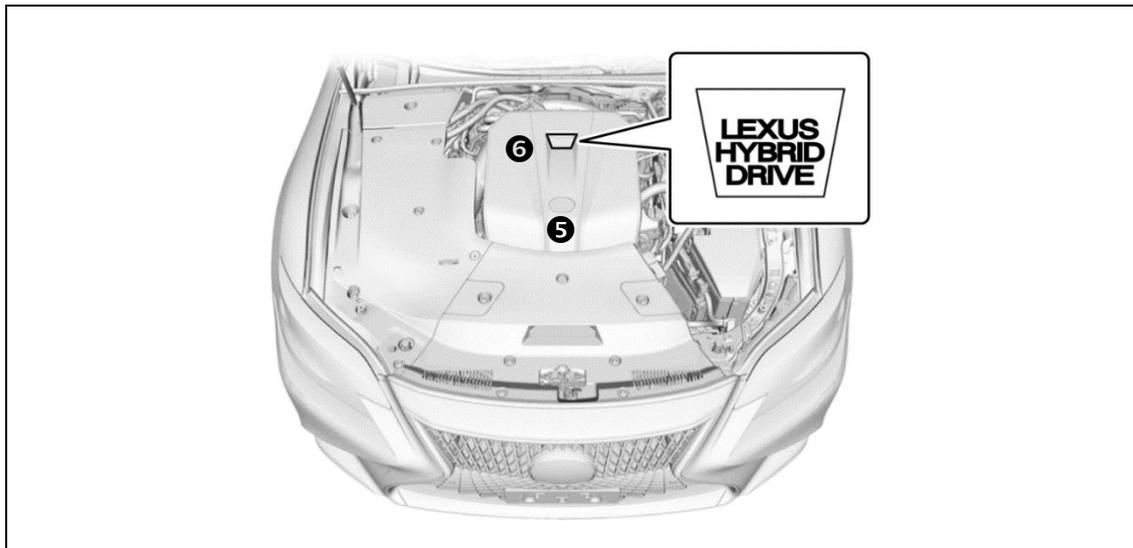


Combination Meter View

LS500h Identification (Continued)

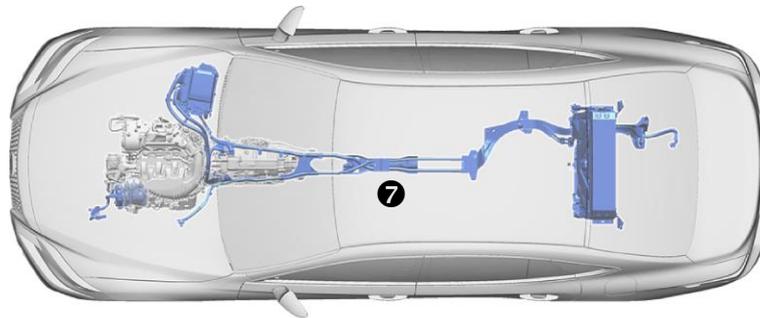
Engine Compartment

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

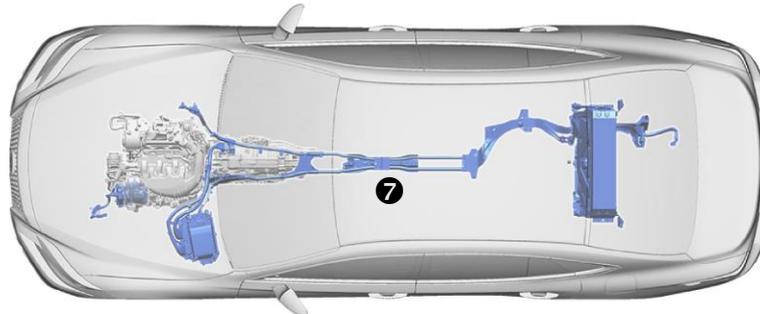


Engine Compartment View

for LHD



for RHD



Power Cables

Hybrid Component Locations & Descriptions

Component		Description
12 Volts Auxiliary Battery ❶		When the power switch (push start switch) is on (ACC) or on (IG), the auxiliary battery supplies power to the electrical equipment and ECUs.
Hybrid Vehicle (HV) Battery Pack ❷		<ul style="list-style-type: none"> · Supplies electrical power to MG1, MG2 and compressor with motor assembly in accordance with the driving conditions of the vehicle. · Charged by MG1 and MG2 in accordance with the State Of Charge (SOC) of the HV battery (HV supply battery assembly) and the driving conditions of the vehicle. · Has a nominal (approximate) voltage of DC 310.8 Volts (actual voltage will vary depending on various conditions such as temperature, charge or discharge).
Power Cables ❸		Connects the HV battery (HV supply battery assembly) to the inverter with converter assembly, the inverter with converter assembly to MG1 and MG2, and the inverter with converter assembly to the compressor with motor assembly.
Inverter/ Converter ❹	Hybrid Vehicle Converter Assembly ❺ (DC-DC Converter)	Reduces the HV battery (HV supply battery assembly) voltage from DC 310.8 Volts to approximately DC 14 Volts in order to supply electricity to body electrical components, as well as to recharge the auxiliary battery.
	Motor Generator ECU (MG ECU)	Controls the boost converter and inverter in accordance with signals received from the hybrid vehicle control ECU assembly, operating MG1 or MG2 as either a generator or motor.
	Boost Converter	Boosts the voltage of the HV battery (HV supply battery assembly) from DC 310.8 Volts to a maximum of DC 650 Volts and vice versa (reduces from DC 650 Volts to DC 310.8 Volts).
	Inverter	Converts high-voltage DC (HV battery (HV supply battery assembly)) into AC (MG1 and MG2) and vice versa (converts AC into DC).
Gasoline Engine ❻		The 8GR-FXS engine is a high-expansion ratio Atkinson cycle engine which is compatible with the hybrid system and which generates drive force for driving and energy for electricity generation.
Electric Motor ❼		<ul style="list-style-type: none"> · Driven by electrical power from MG1 and/or the HV battery (HV supply battery assembly) and generates motive force for the rear wheels. · Generates electricity to recharge the HV battery (HV supply battery assembly) (regenerative braking) during braking or when the accelerator pedal is not depressed.
Generator ❸		<ul style="list-style-type: none"> · Driven by the engine and generates high-voltage electricity in order to operate MG2 and/or to charge the HV battery (HV supply battery assembly). Also, MG1 functions as a starter to start the engine. · Operated to allow the gear ratio of the power split device unit to optimally suit the driving conditions of the vehicle.
A/C Compressor (with inverter) ❾		Driven at a speed calculated by the air conditioning amplifier assembly, receives drive requests from the hybrid vehicle control ECU and takes in, compresses and discharges refrigerant.
Fuel Tank and Fuel Line ❿		The fuel tank provides gasoline via a fuel line to the engine. The fuel line is routed along the left and right side under the floor pan.

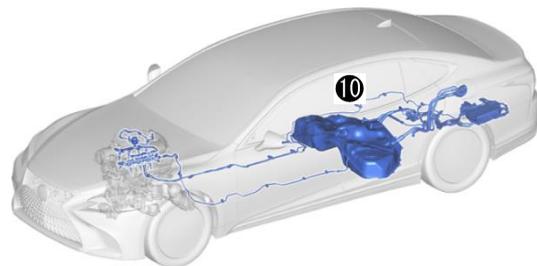
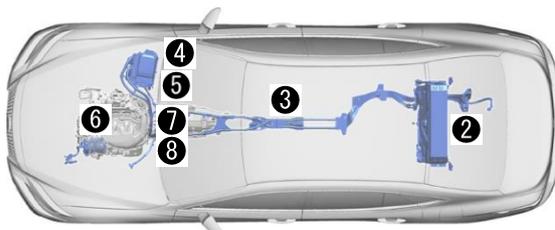
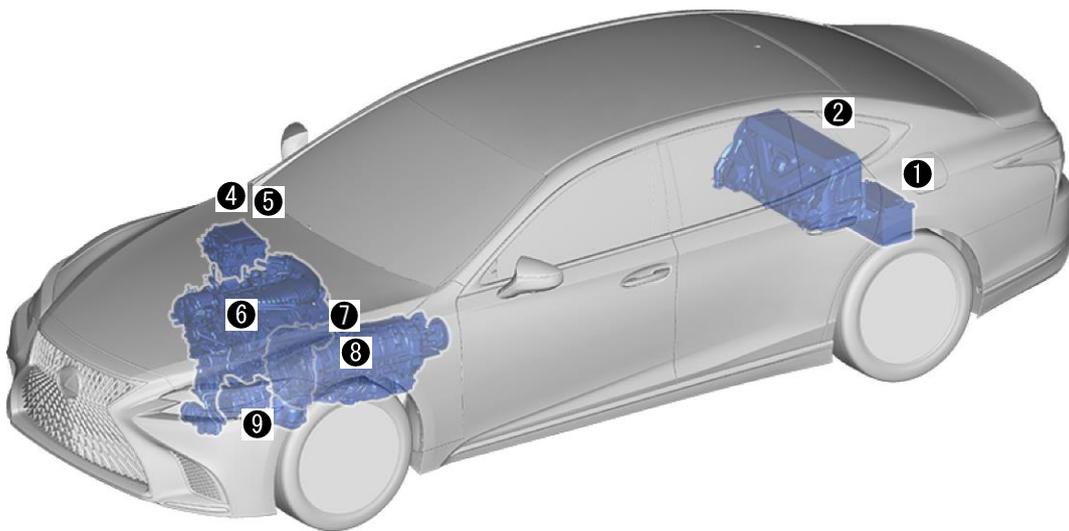
*Numbers in the component column apply to the illustrations on the following page.

Hybrid Component Locations & Descriptions (Continued)

Specifications

- Gasoline Engine: 295 hp (220 kW), 3.5-liter Aluminum Alloy Engine
Electric Motor: 177 hp (132 kW), Permanent Magnet Motor
Transmission: Automatic Only
HV Battery: 310.8 Volts Sealed Lithium-ion Battery
Curb Weight: 4,795-5,346 lbs / 2,175-2,425 kg
Fuel Tank: 18.5 gals / 84 liters (for North America, South Korea)
18.0 gals / 82 liters (except North America, South Korea)
Frame Material: Steel Unibody
Body Material: Steel Panels
Seating Capacity: 5 passenger

This illustration is for an LHD model



Lexus Hybrid Drive Operation

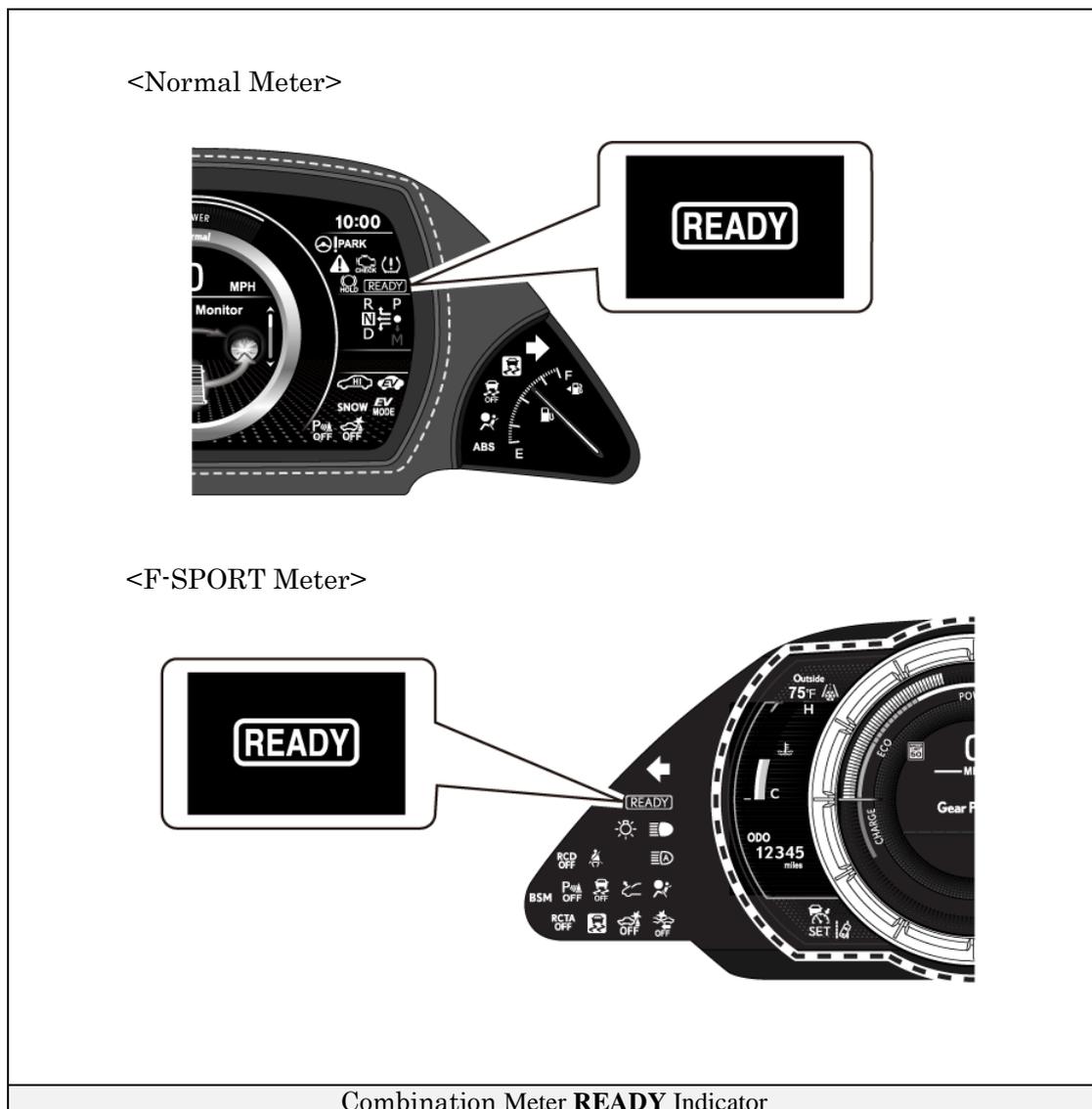
Once the **READY** indicator is illuminated in the combination meter, the vehicle may be driven. However, the gasoline engine does not idle like a typical automobile and will start and stop automatically. It is important to recognize and understand the **READY** indicator provided in the instrument cluster. When illuminated, 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 LS500h, 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 motor only.
2. A combination of both the electric motor and the gasoline engine.



Hybrid Vehicle (HV) Battery Pack and Auxiliary Battery

The LS500h features a high voltage Hybrid Vehicle (HV) battery pack that contains sealed Lithium-ion battery modules.

HV Battery Pack

- The HV battery pack is enclosed in a metal case and is rigidly mounted in the trunk area behind the rear seat. The metal case is isolated from high voltage and concealed by fabric covers in the cabin area.
- The HV battery pack consists of 84 low voltage (3.7 Volts) Lithium-ion battery cells connected in series to produce approximately 310.8 Volts. Each Li-ion battery cell is non-spillable and in a sealed case.
- The electrolyte used in the Li-ion battery cells is a flammable organic electrolyte. The electrolyte is absorbed into the battery cell separator and will not normally leak, even in a collision.

HV Battery Pack	
Battery pack voltage	310.8 Volts
Number of Lithium-ion battery modules in the pack	84
Lithium-ion battery module voltage	3.7 Volts

Components Powered by the HV Battery Pack

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

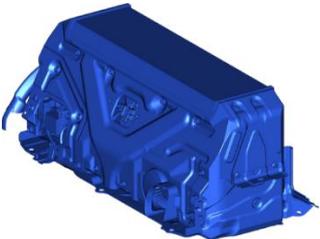
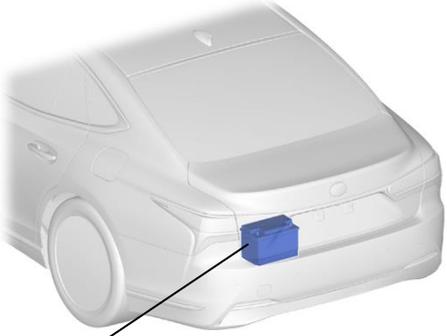
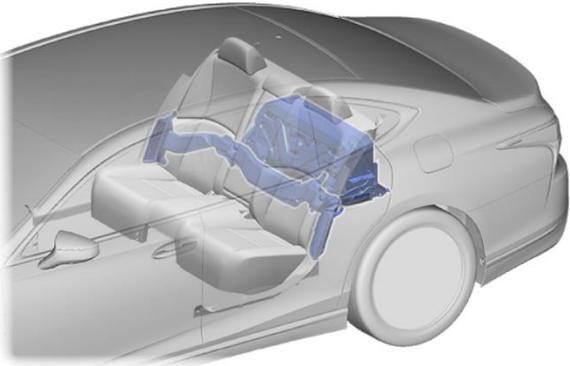
Hybrid Vehicle (HV) Battery Pack and Auxiliary Battery (Continued)

HV Battery Pack Recycling

- The HV battery pack is recyclable. Contact either your Lexus distributor as mentioned on HV battery Caution Label or the nearest Lexus dealer.

Auxiliary Battery

- The LS500h also contains a sealed lead-acid 12 Volts battery. This 12 Volts auxiliary battery powers the vehicle electrical system similar to a conventional vehicle. As with other conventional vehicles, 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 center in the trunk

	 <p>Auxiliary Battery</p>
310.8 Volts HV Battery Pack	12 Volts Auxiliary Battery Mounted in the Trunk
	
HV Battery Pack Mounted in the Trunk	

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 310.8 to 650 Volts DC. The inverter/converter creates 3-phase AC to power the motor. Power cables are routed from the inverter/converter to each high voltage motor (electric motor, 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 electricity 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.***

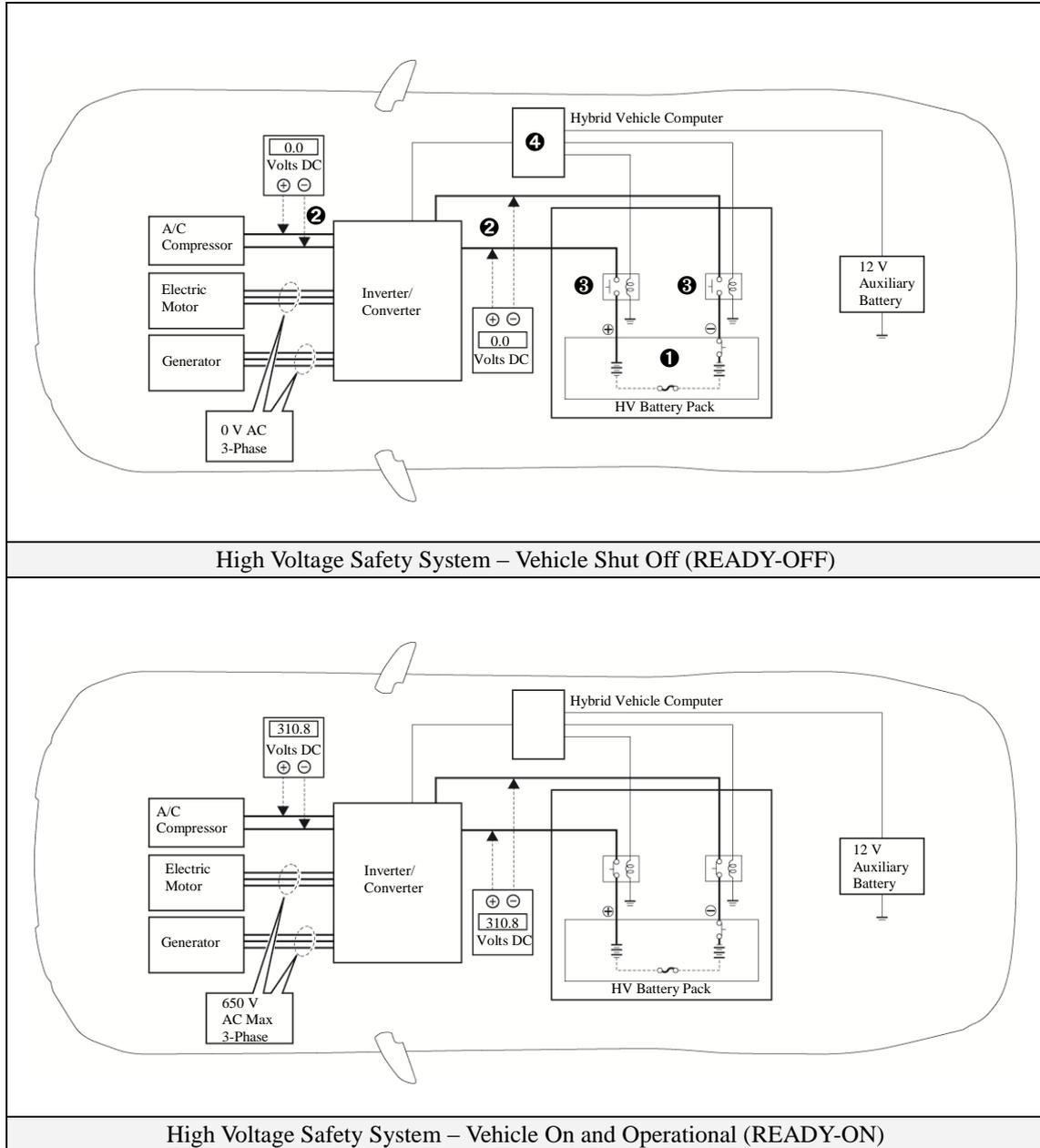
- Both positive and negative power cables ❷* are insulated from the metal body. High voltage electricity flows through these cables and not through the metal vehicle body. The metal vehicle body is safe to touch because it is insulated from the high voltage components.
- A ground fault monitor ❹* continuously 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 a message indicating that the hybrid system is malfunctioning will be displayed 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 LS500h contains the same common automotive fluids used in other non-hybrid Lexus vehicles, with the exception of the Li-ion electrolyte used in the HV battery pack. The electrolyte used in the Li-ion battery cells is a flammable organic electrolyte. The electrolyte is absorbed into the battery cell separators, even if the battery cells are crushed or cracked, it is unlikely that liquid electrolyte will leak. Any liquid electrolyte that leaks from a Li-ion battery cell quickly evaporates.



WARNING:

- ***The Li-ion battery contains organic electrolyte. Only a small amount may leak from the batteries which may irritate the eyes, nose, throat, and skin.***
- ***Contact with the vapor produced by the electrolyte may irritate the nose and throat.***
- ***To avoid injury by coming in contact with the electrolyte or vapor, wear personal protective equipment for organic electrolyte including SCBA or protective mask for organic gases.***

- Handle Lithium-ion 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 gloves or gloves suitable for organic solvents.
 - Apron suitable for organic solvents.
 - Rubber boots or boots suitable for organic solvents.
 - Protective mask for organic gases or SCBA.

Dismantling the vehicle

The following 5 pages contain general instructions for use when working on an LS500h.

Read these instructions before proceeding to the HV battery removal instructions on page 20.

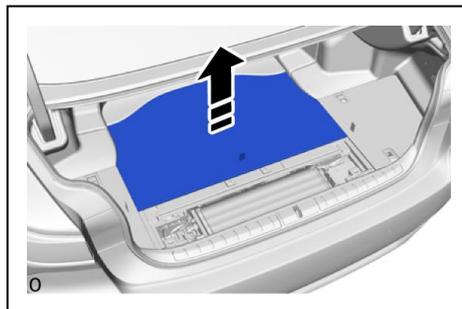


WARNING:

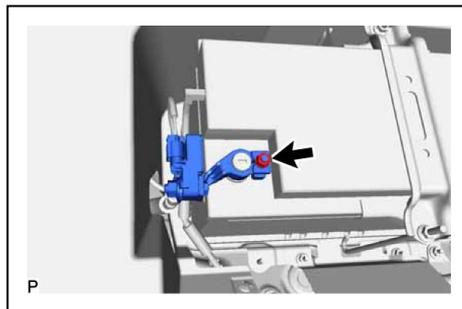
- ***The high voltage system may remain powered for up to 10 minutes after the vehicle is shut off or disabled. To prevent serious injury or death from severe burns or electric shock, avoid touching, cutting, or opening any orange high voltage power cable or any high voltage component.***

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

- (1) Holding the strap, lift the luggage compartment mat sub-assembly in the direction indicated by the arrow shown in the illustration and remove it.

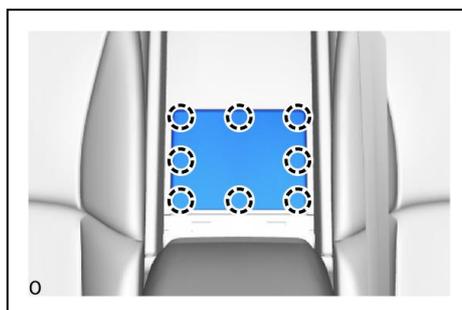


- (2) Loosen the nut, and disconnect the cable from the negative (-) auxiliary battery terminal.



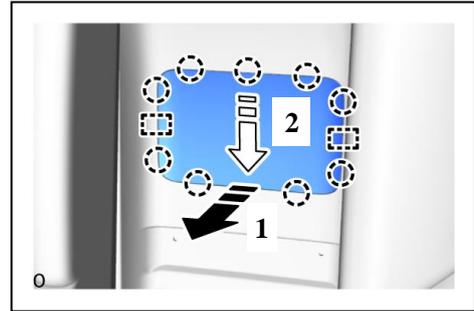
2. Remove the service plug grip.

- (1) for Power Seat:
- a) Detach the 8 claws to remove the No. 1 room partition cover.

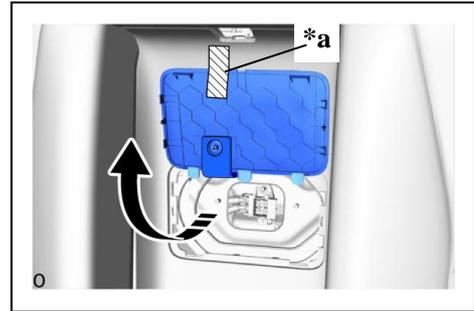


(2) for Fixed Seat Type:

- a) Pull in the direction indicated by the arrow shown in the illustration to detach the 9 claws and 2 guides.

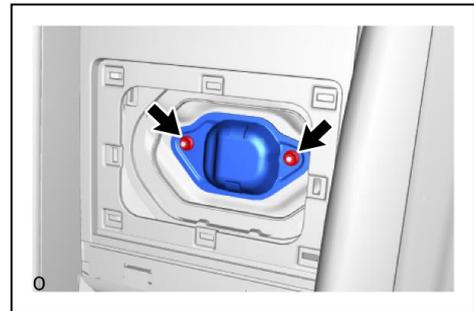


- b) Lift the door armrest cap in the direction indicated by the arrow shown in the illustration to disconnect it, and then secure it with adhesive tape.



*a Adhesive Tape

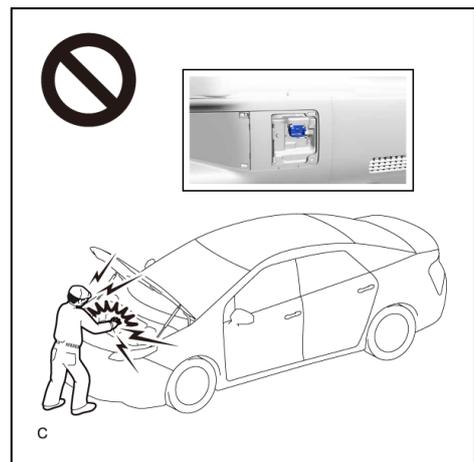
(3) Remove the 2 nuts and No. 8 HV battery shield panel.



(4) Remove the service plug grip.

Caution:

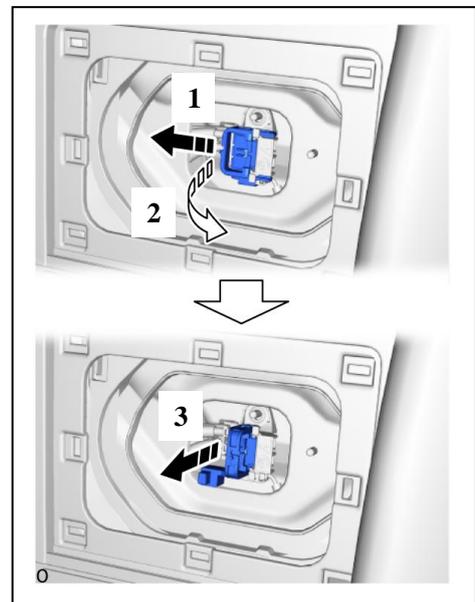
- **Wear insulated gloves.**
- **Do not inspect or service the high voltage system with the service plug grip installed.**
- **To reduce the risk of electric shock, make sure to remove the service plug grip to cut off the high voltage circuit before servicing the vehicle.**



- To reduce the risk of electric shock, make sure to wait at least 10 minutes after removing the service plug grip to fully discharge the high voltage capacitor inside the inverter with converter assembly.
- Keep the removed service plug grip in your pocket to prevent other technicians from accidentally installing it while you are servicing the vehicle.



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

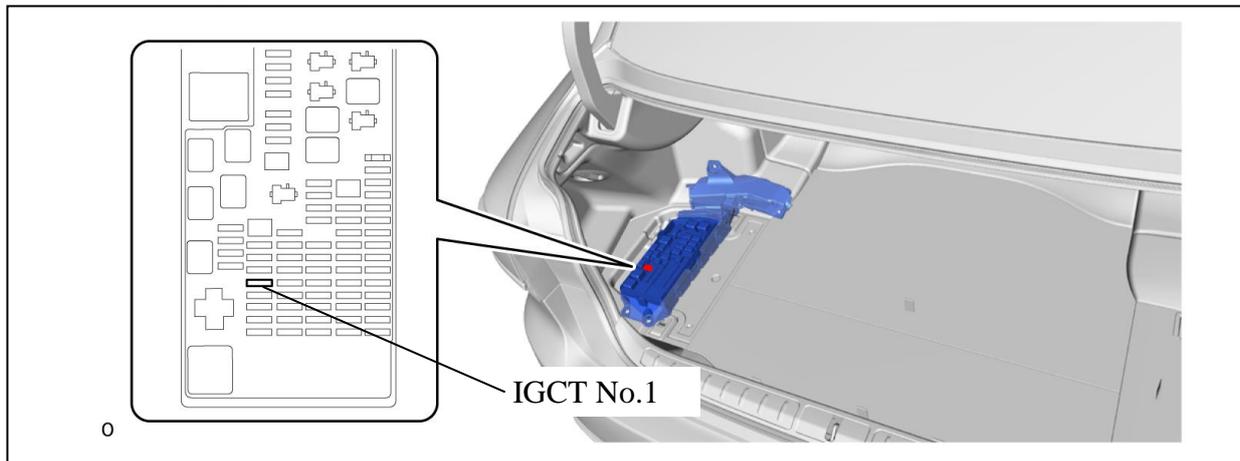


3. Carry the removed service plug grip in your pocket to prevent other staff from accidentally reinstalling it while you are dismantling the vehicle.
4. Make other staff aware that a high-voltage system is being dismantled by using the following sign: CAUTION: HIGH-VOLTAGE. DO NOT TOUCH (see page 19).

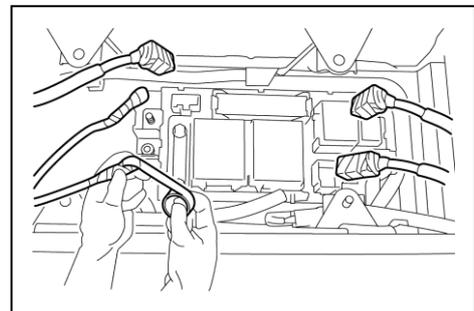
5. If the service plug grip cannot be removed due to damage to the vehicle, remove the IGCT No.1 (30 A).

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, wear rubber gloves and goggles, and 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 Lexus 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



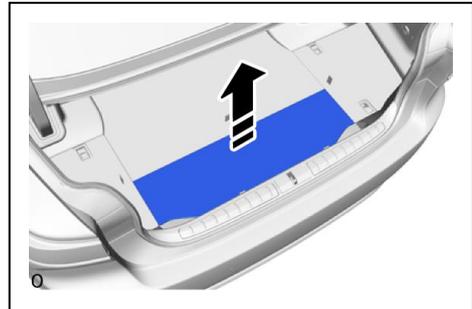
WARNING:

- *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 THE IGNITION(**READY** indicator is off)

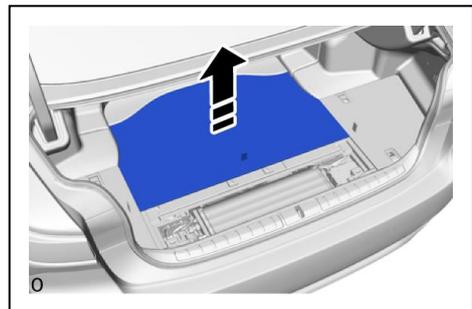
2. REMOVE LUGGAGE COMPARTMENT FLOOR MAT

- (1) Holding the strap, lift the luggage compartment floor mat in the direction indicated by the arrow shown in the illustration and remove it.



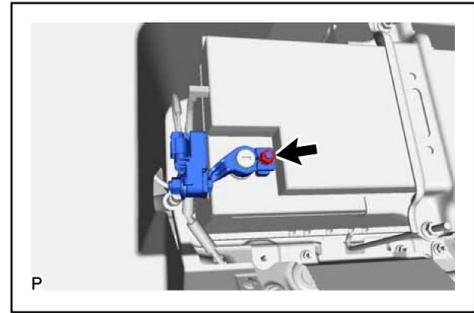
3. REMOVE LUGGAGE COMPARTMENT MAT SUB-ASSEMBLY

- (1) Holding the strap, lift the luggage compartment mat sub-assembly in the direction indicated by the arrow shown in the illustration and remove it.



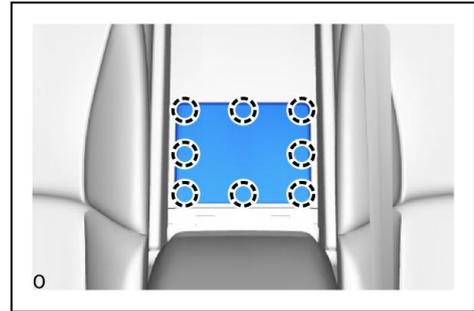
4. DISCONNECT CABLE FROM NEGATIVE AUXILIARY BATTERY TERMINAL

- (1) Loosen the nut, and disconnect the cable from the negative (-) auxiliary battery terminal.



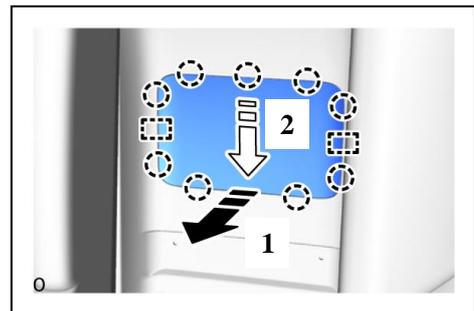
5. REMOVE NO. 1 ROOM PARTITION COVER (For Power Seat)

- (1) Detach the 8 claws to remove the No. 1 room partition cover.

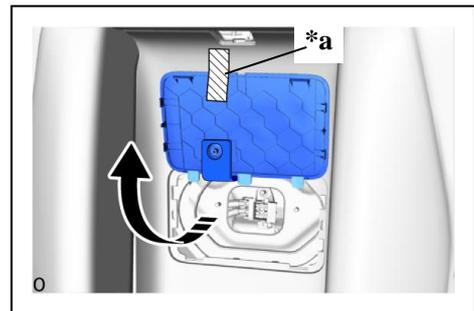


6. DISCONNECT DOOR ARMREST CAP (for Fixed Seat Type)

- (1) Pull in the direction indicated by the arrow shown in the illustration to detach the 9 claws and 2 guides.



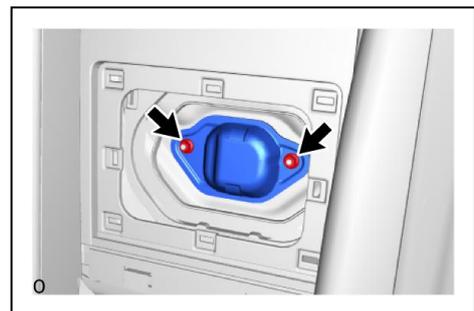
- (2) Lift the door armrest cap in the direction indicated by the arrow shown in the illustration to disconnect it, and then secure it with adhesive tape.



*a	Adhesive Tape
----	---------------

7. REMOVE NO. 8 HV BATTERY SHIELD PANEL

- (1) Remove the 2 nuts and No. 8 HV battery shield panel.



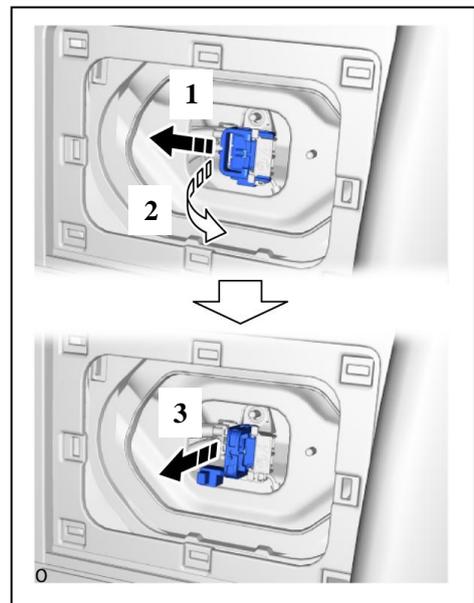
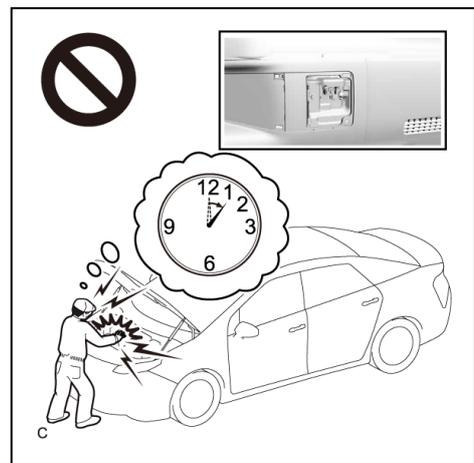
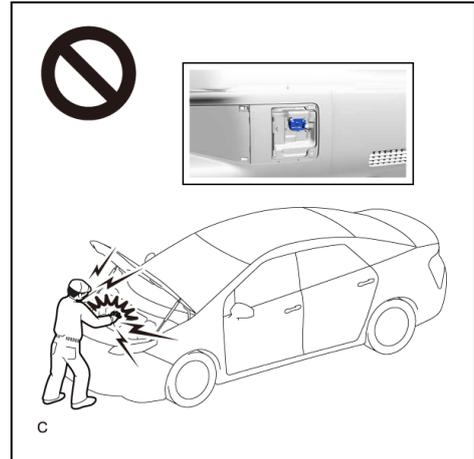
8. REMOVE SERVICE PLUG GRIP

Caution:

- **Wear insulated gloves.**
- **Do not inspect or service the high voltage system with the service plug grip installed.**
- **To reduce the risk of electric shock, make sure to remove the service plug grip to cut off the high voltage circuit before servicing the vehicle.**

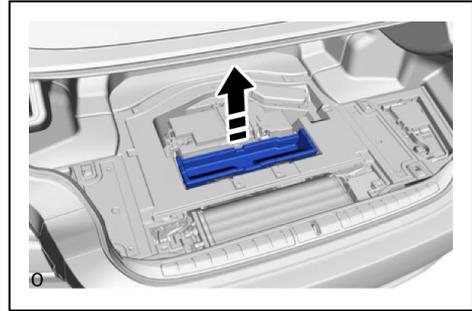
- **To reduce the risk of electric shock, make sure to wait at least 10 minutes after removing the service plug grip to fully discharge the high voltage capacitor inside the inverter with converter assembly.**
- **Keep the removed service plug grip in your pocket to prevent other technicians from accidentally installing it while you are servicing the vehicle.**

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



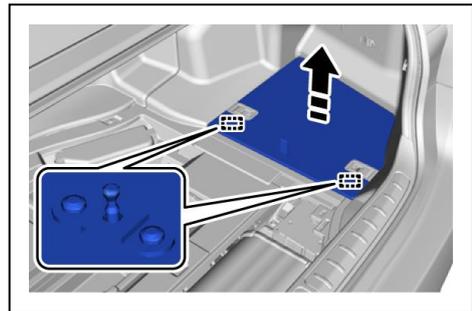
9. REMOVE TOOL BOX

- (1) Remove the tool box.



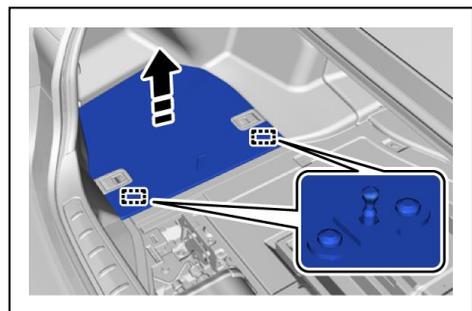
10. REMOVE LUGGAGE COMPARTMENT TRIM COVER RH

- (1) Holding the strap, lift the luggage compartment trim cover RH in the direction indicated by the arrow shown in the illustration, detach the pin and remove it.



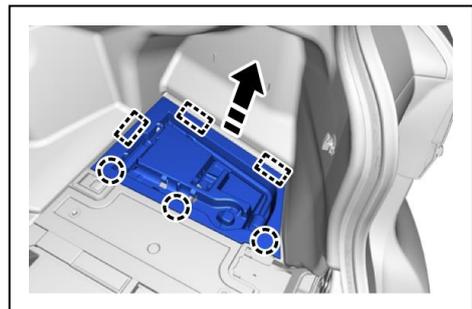
11. REMOVE LUGGAGE COMPARTMENT TRIM COVER LH

- (1) Holding the strap, lift the luggage compartment trim cover LH in the direction indicated by the arrow shown in the illustration, detach the pin and remove it.



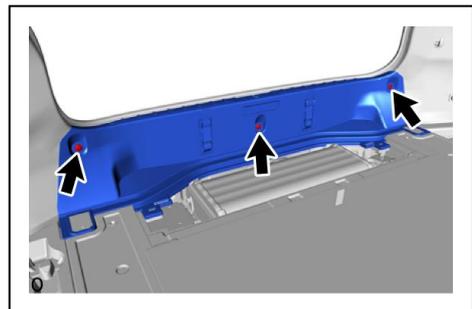
12. REMOVE SIDE TRIM BOX

- (1) Detach the claw and guide and remove the side trim box as shown in the illustration.

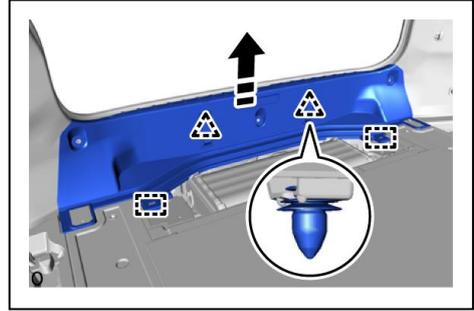


13. REMOVE REAR FLOOR FINISH PLATE

- (1) Using a clip remover, remove the 3 clips.

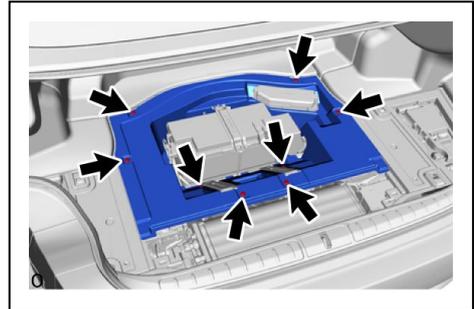


- (2) Detach the clip and guide and remove the rear floor finish plate.



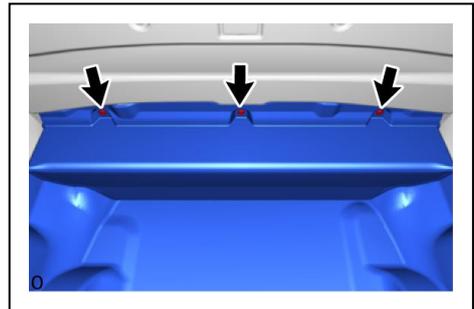
14. REMOVE LOWER INNER LUGGAGE COMPARTMENT TRIM COVER

- (1) Using a clip remover, detach the 8 clips and remove the lower inner luggage compartment trim cover.

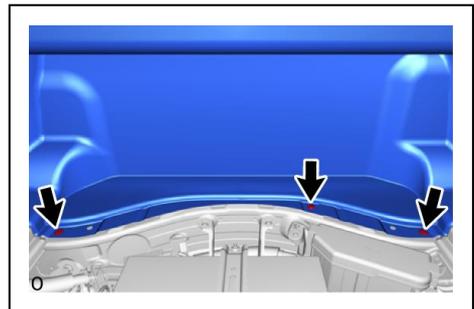


15. REMOVE FRONT LUGGAGE COMPARTMENT TRIM COVER

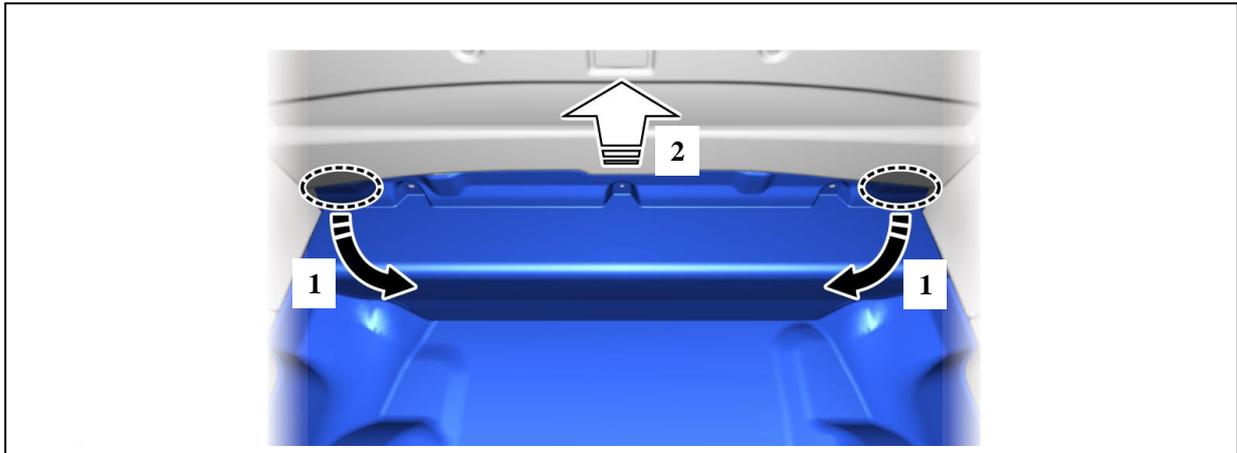
- (1) Using a clip remover, remove the 3 clips.



- (2) Using a clip remover, remove the 3 clips



- (3) Place your hands at the positions shown in the illustration and bend the front luggage compartment trim cover down.

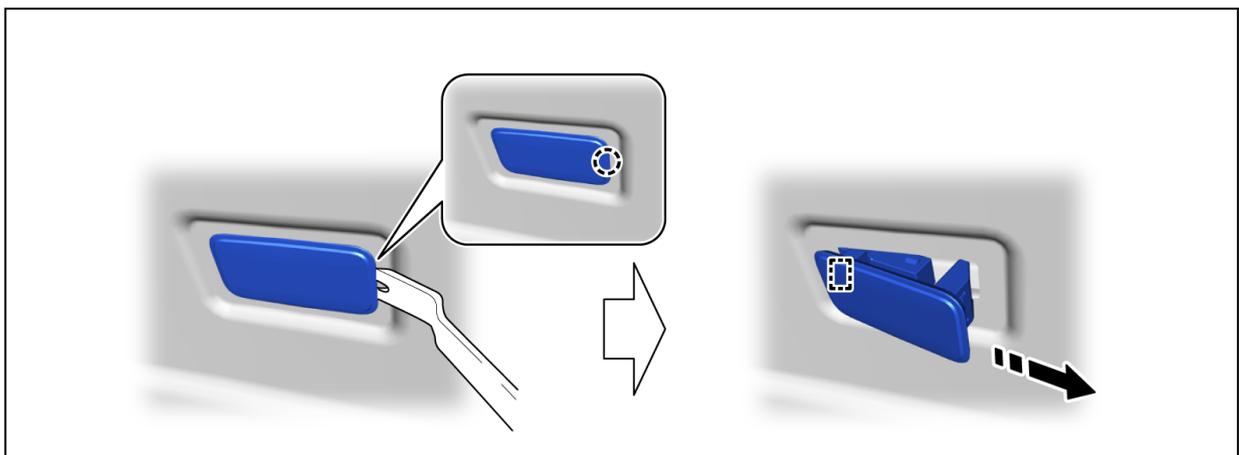


	Place Hands Here	-	-
-----------------------------------------------------------------------------------	------------------	---	---

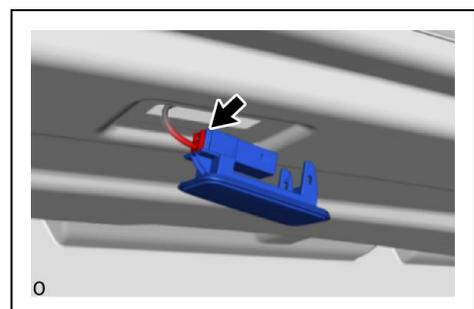
- (4) While bending the front luggage compartment trim cover toward the inside, pull it out in the direction indicated by the arrow shown in the illustration to remove it.

16. REMOVE LUGGAGE COMPARTMENT LIGHT ASSEMBLY

- (1) Using moulding remover B, insert it between the luggage compartment light assembly and front luggage compartment trim cover to detach the claw.
- (2) Pull out the luggage compartment light assembly to detach the hook.

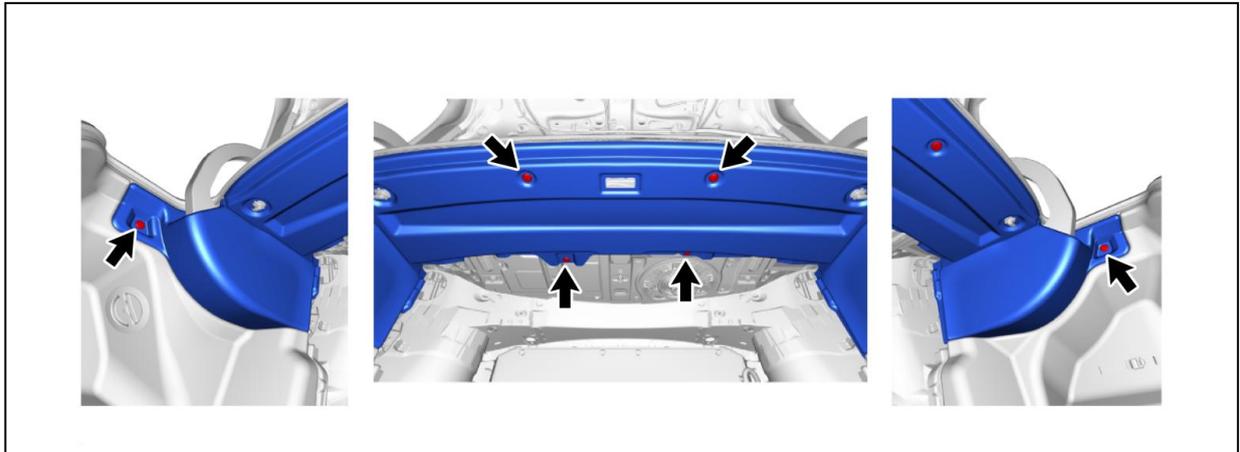


- (3) Disconnect the connector and remove the luggage compartment light assembly.



17. REMOVE REAR LUGGAGE COMPARTMENT TRIM COVER

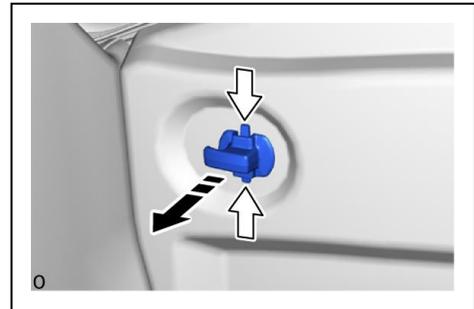
- (1) Using a clip remover, remove the 6 clips.



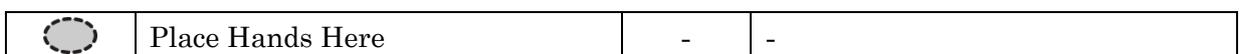
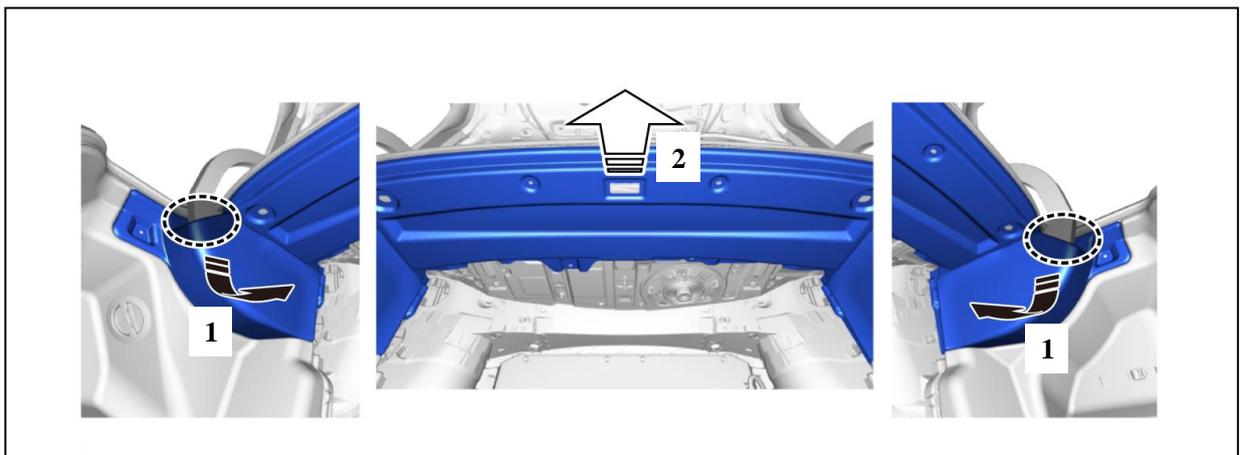
- (2) Push the lever in the direction of the arrow shown in the illustration and remove the rope hook.

HINT:

Use the same procedure for the opposite.

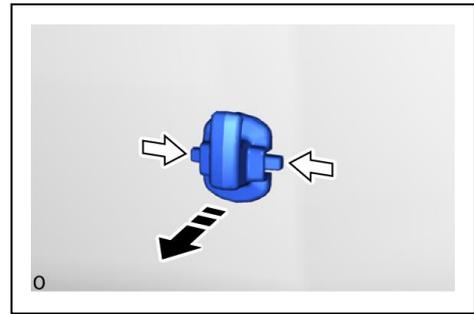


- (3) Place your hands at the positions shown in the illustration, and while bending the rear luggage compartment trim cover toward the inside of the vehicle, pull it out to remove it.



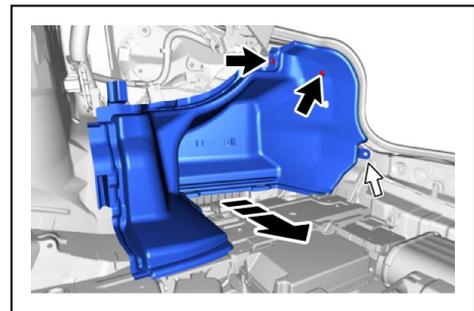
18. REMOVE LUGGAGE COMPARTMENT TRIM COVER ASSEMBLY RH

- (1) Push the lever in the direction of the arrow shown in the illustration and remove the rope hook.



⇨	Push
---	------

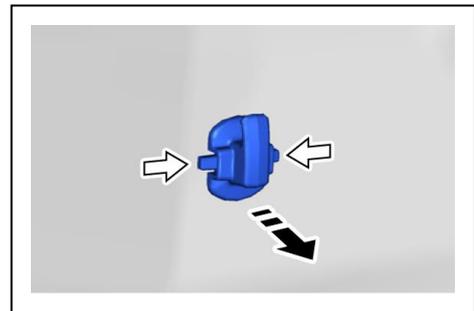
- (2) Remove the grommet.
- (3) Using a clip remover, remove the 2 clips and luggage compartment trim cover assembly RH.



⇨	Clip
⇨	Grommet

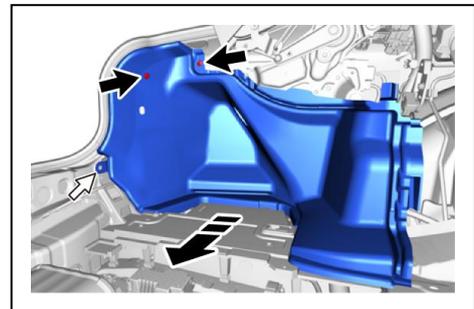
19. REMOVE LUGGAGE COMPARTMENT TRIM COVER ASSEMBLY LH

- (1) Push the lever in the direction of the arrow shown in the illustration and remove the rope hook.



⇨	Push
---	------

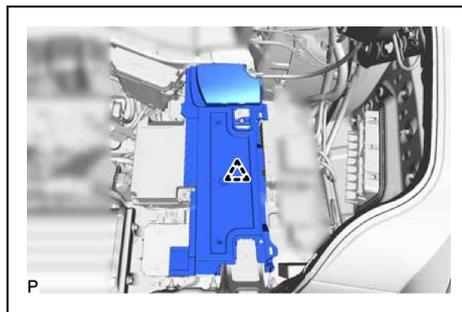
- (2) Remove the grommet.
- (3) Using a clip remover, detach the 2 clips and remove the luggage compartment trim cover assembly LH.



⇨	Clip
⇨	Grommet

20. REMOVE REAR LUGGAGE COMPARTMENT TRAY BRACKET RH

- (1) Detach the claw and open the cap.
- (2) Remove the bolt and rope hook assembly.
- (3) Detach the clip and remove the rear luggage compartment tray bracket RH.



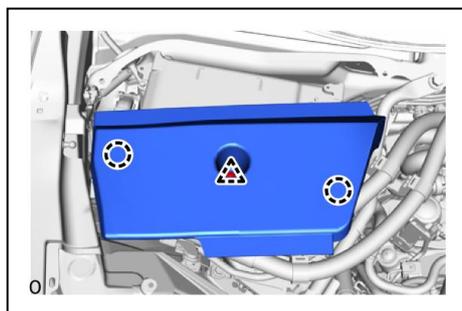
21. REMOVE REAR LUGGAGE COMPARTMENT TRAY BRACKET LH

HINT:

Use the same procedure for the RH side.

22. REMOVE INVERTER COVER ASSEMBLY RH

- (1) Disengage the 2 claws and clip to remove the inverter cover assembly RH.



23. REMOVE CONNECTOR COVER ASSEMBLY

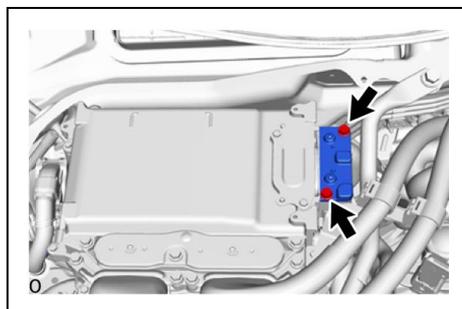
Caution:

Wear insulated gloves.

- (1) Remove the 2 bolts and connector cover assembly.

Notice:

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



24. CHECK TERMINAL VOLTAGE

Caution:

Wear insulated gloves.

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

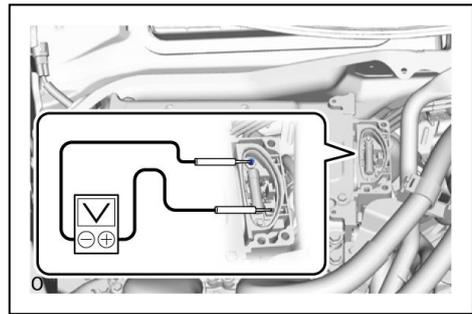
Standard voltage: 0 V

Notice:

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

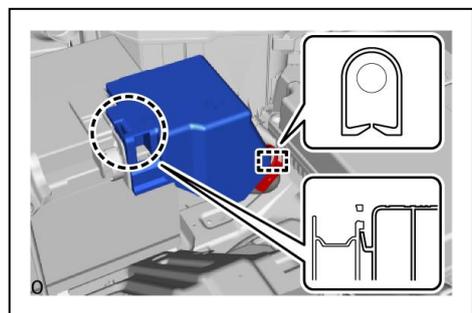
Hint:

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

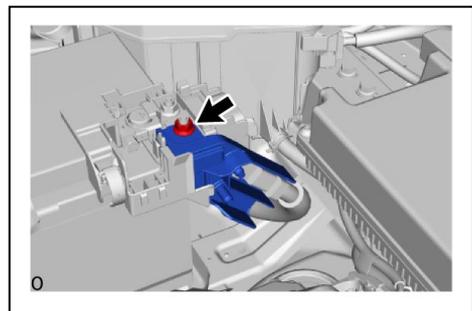


25. DISCONNECT HV FLOOR UNDER WIRE

- (1) Detach the claw and Remove the battery terminal connector cover.

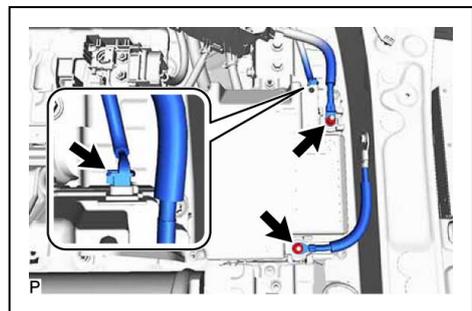


- (2) Remove the nut and disconnect the HV floor under wire.

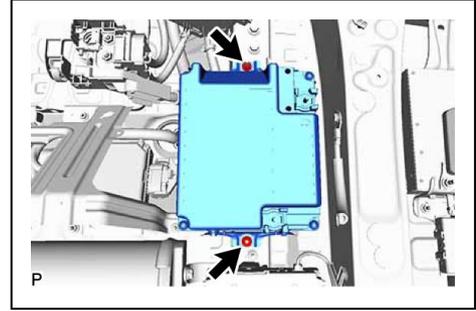


26. REMOVE SUB-BATTERY MODULE ASSEMBLY

- (1) Loosen the 2 nuts and disconnect the 2 sub-battery terminals from the sub-battery module assembly.
- (2) Disconnect the connector from the sub-battery module assembly.

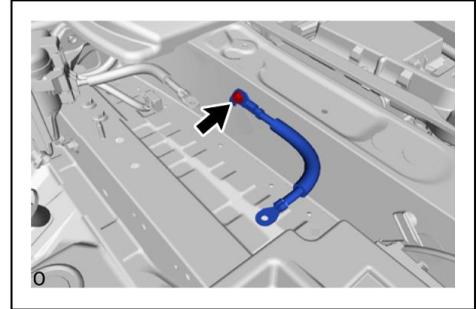


- (3) Loosen the 2 nuts and disconnect the connector from the sub-battery module assembly.



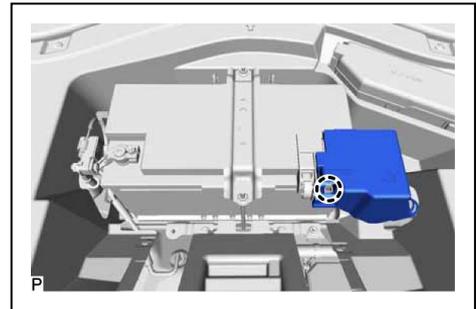
27. REMOVE NO. 3 EARTH WIRE

- (1) Remove the bolt and No. 3 earth wire.

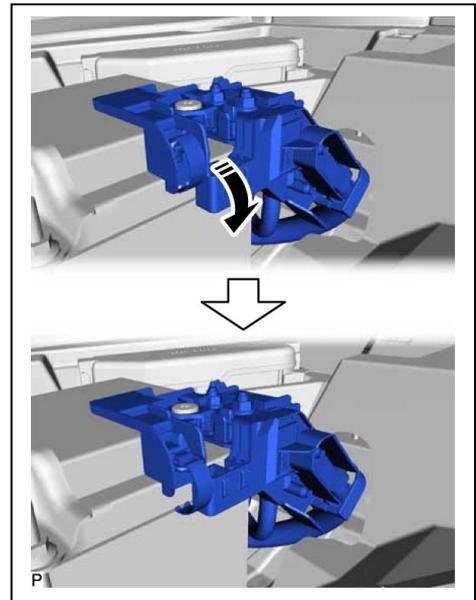


28. REMOVE AUXILIARY BATTERY

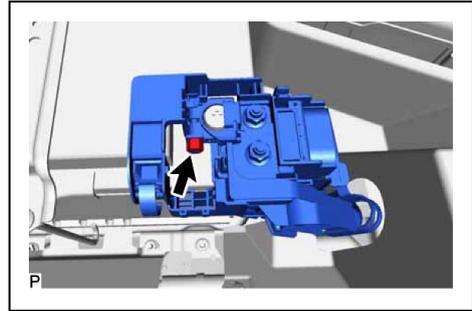
- (1) Disengage the claw and disconnect the auxiliary battery terminal cap.



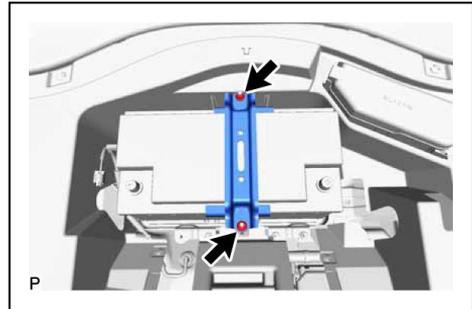
- (2) Disconnect the clamp spring assembly of the positive (+) auxiliary battery terminal from the auxiliary battery.



- (3) Loosen the nut and disconnect the cable from the positive (+) auxiliary battery terminal.

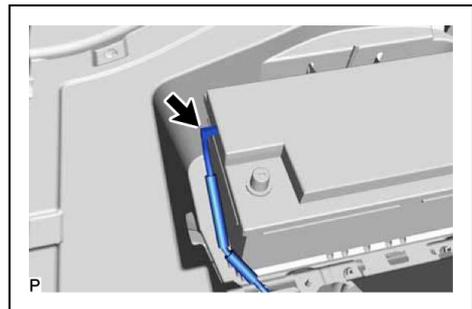


- (4) Remove the 2 nuts and battery clamp sub-assembly.



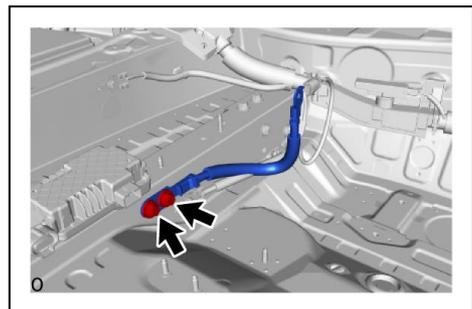
- (5) Disconnect the battery exhaust hose from the auxiliary battery.

- (6) Remove the auxiliary battery.



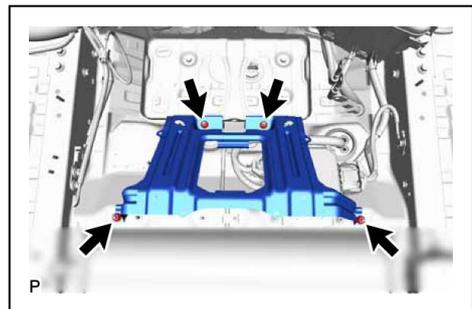
29. REMOVE EARTH WIRE

- (1) Remove the 2 bolts and earth wire.



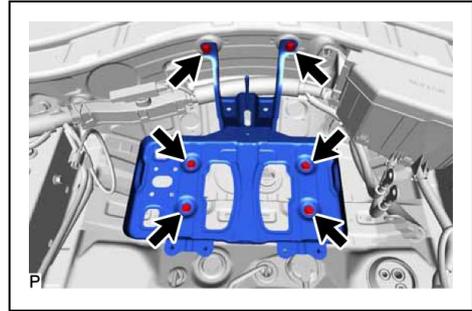
30. REMOVE BATTERY CARRIER CATCH BRACKET SUB-ASSEMBLY

- (1) Remove the 4 nuts and the battery carrier catch bracket sub-assembly.



31. REMOVE BATTERY CARRIER ASSEMBLY

- (1) Remove the 6 bolts and battery carrier assembly.



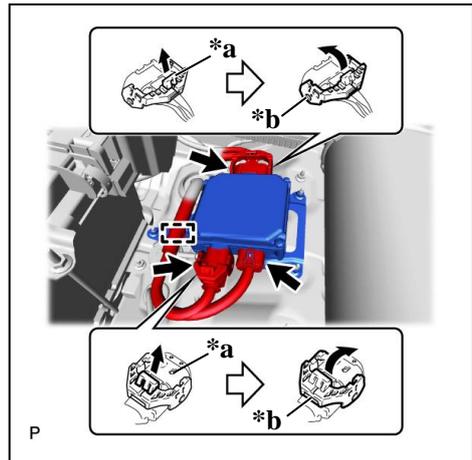
32. REMOVE REAR STEERING CONTROL ECU (w/ Dynamic Rear Steering)

- (1) Disconnect the 3 connectors from the rear steering control ECU.

HINT:

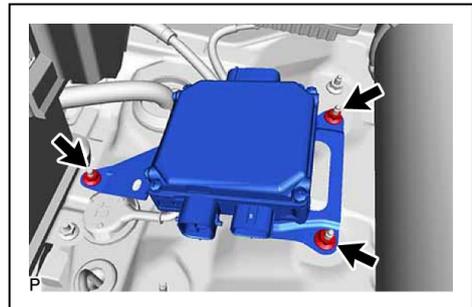
When disconnecting the connector with lock lever, pull out the lock of the lock lever and turn the lock lever as shown in the illustration.

- (2) Disengage the clamp.



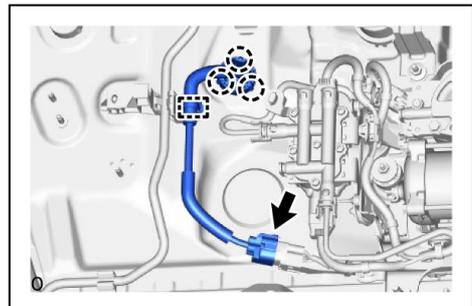
*a	Lock of the Lock Lever
*b	Lock Lever

- (3) Remove the 3 nuts and rear steering control ECU.

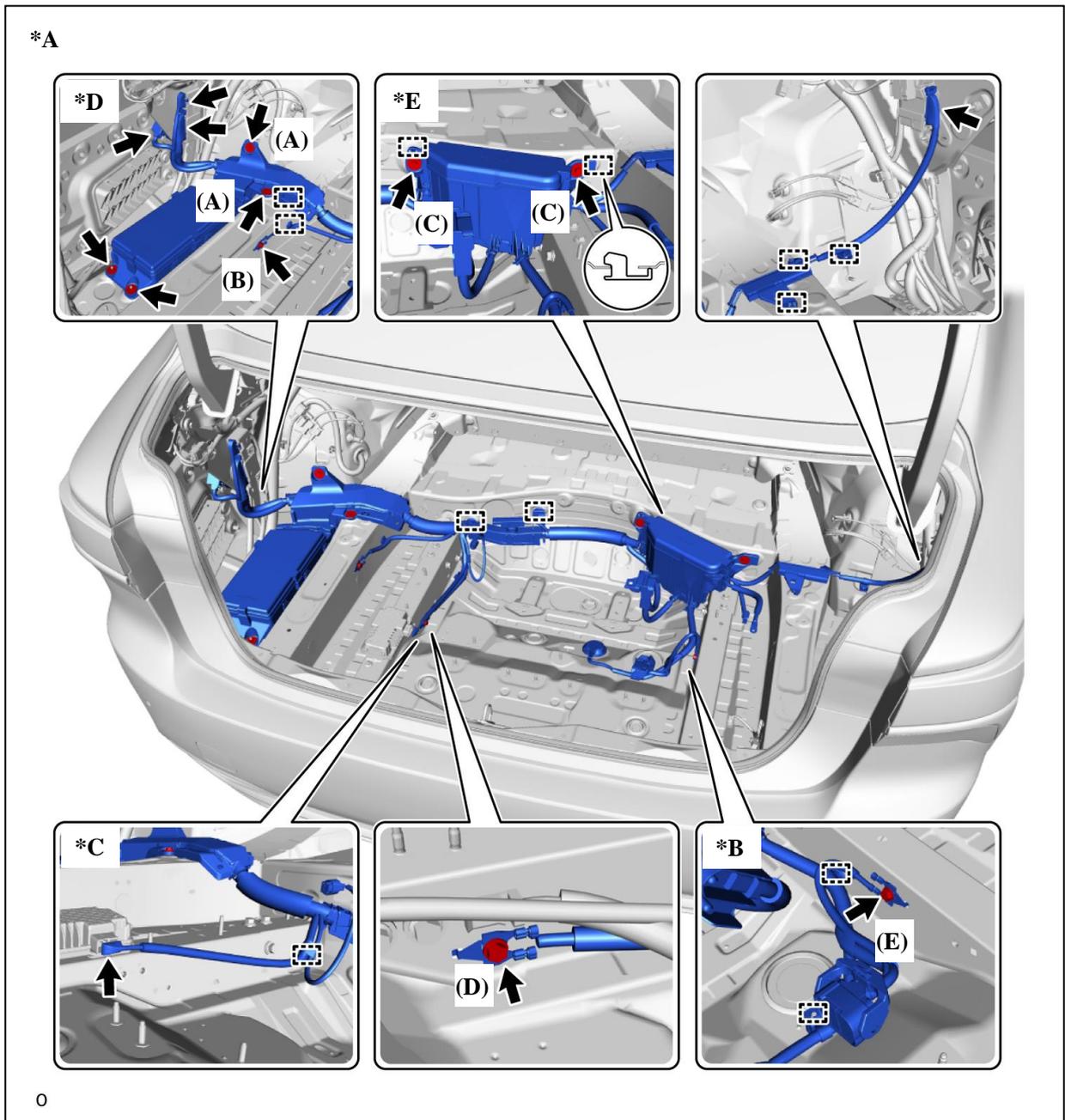


33. REMOVE NO. 1 LUGGAGE ROOM WIRE

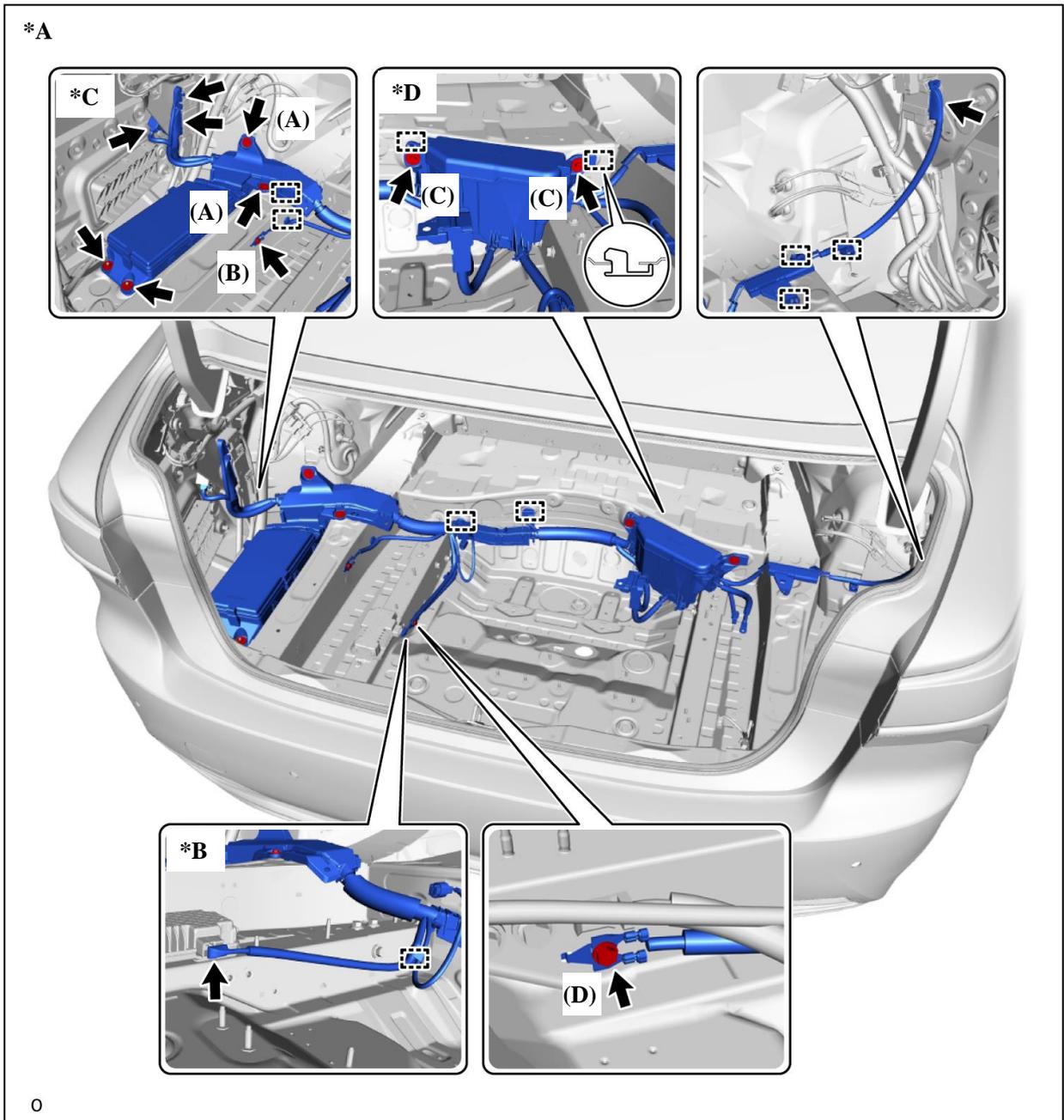
- (1) w/ Air Suspension System:
 - a) Disconnect the connector from the height control compressor.
 - b) Disengage clamp and 3 claws.



(2) Disconnect the connectors.



*A	w/ Air Suspension System	*B	w/ Dynamic Rear Steering
*C	w/ 100 W Voltage Inverter	*D	Relay Block A
*E	Relay Block B	-	-



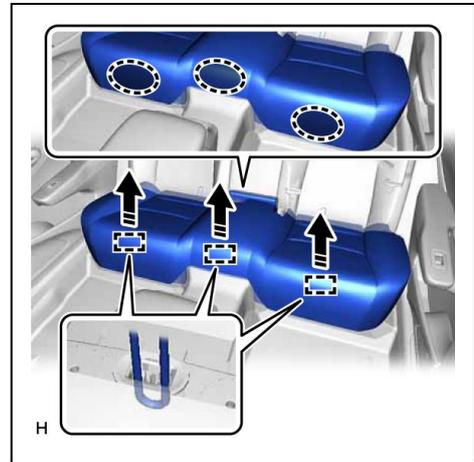
*A	w/o Air Suspension System	*B	w/ 100 W Voltage Inverter
*C	Relay Block A	*D	Relay Block B

- (3) w/ Dynamic Rear Steering:
 - a) Detach the 2 clamps.
 - b) Remove the bolt (E).
- (4) w/ 100 W Voltage Inverter:
 - a) Detach the clamp.
 - b) Disconnect the connector.
- (5) Relay block A:
 - a) Remove the 2 bolts (A), bolt (B) and 2 nuts.

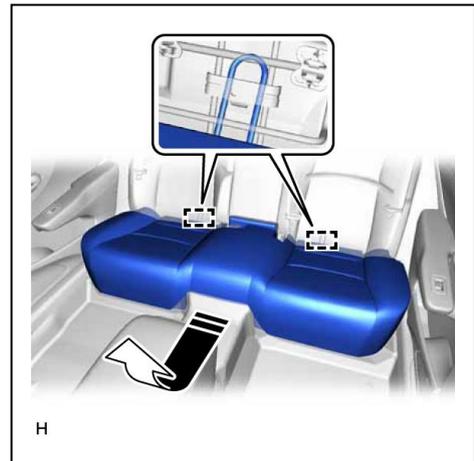
- (6) Relay block B:
 - a) Remove the 2 bolts (C).
- (7) Remove the bolt (D).
- (8) Detach the each clamps and remove the No. 1 luggage room wire.

34. REMOVE REAR SEAT CUSHION ASSEMBLY
(for Fixed Seat Type)

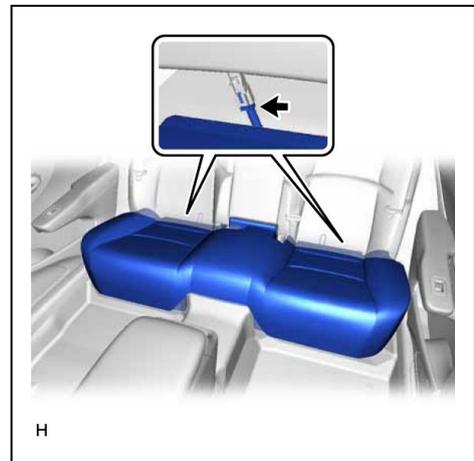
- (1) Place your hand in the position shown in the illustration and lift the front end of the rear seat cushion assembly in the removal direction shown in the illustration. Detach the hooks at the front of the rear seat cushion assembly from the rear seat cushion lock hooks.



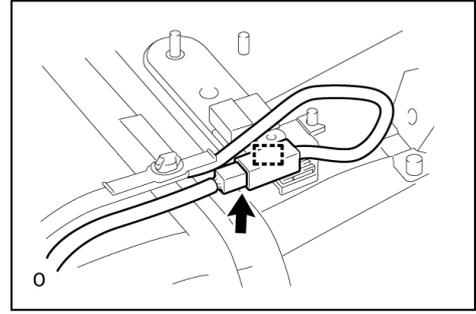
- (2) Detach the hooks at the rear end of the rear seat cushion assembly from the rear seatback assembly.



- (3) w/ Seat Heater System:
 - a) Disconnect the 2 seat heater connectors.
- (4) Remove the rear seat cushion assembly.

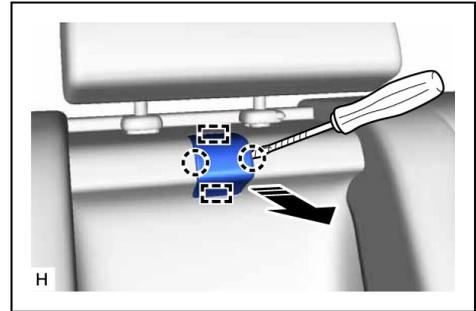


- (5) W/ Seat Belt Warning System:
 - a) Disconnect the connector.
 - b) Detach the clamp.



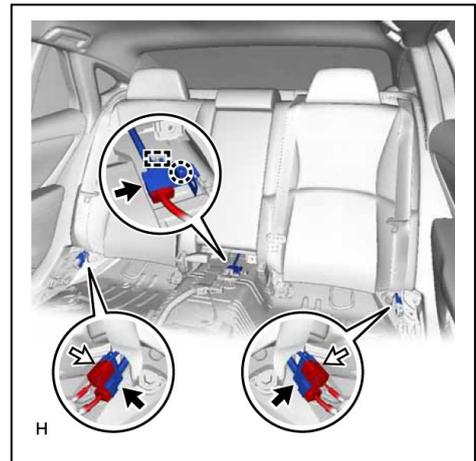
35. REMOVE NO. 1 SEAT ARMREST CAP (for Fixed Seat Type)

- (1) Lift up the center headrest assembly so that the No. 1 seat armrest cap is visible.



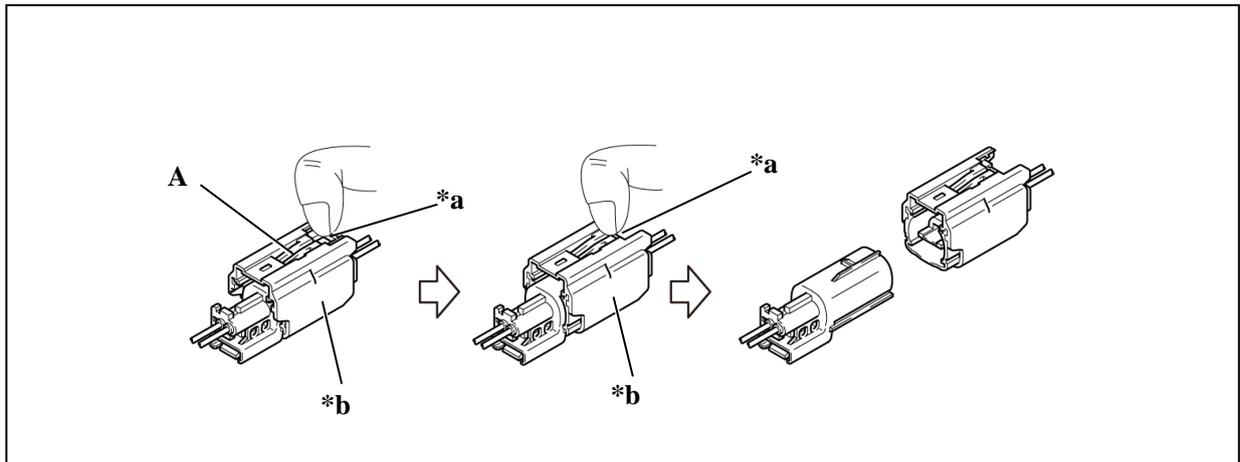
36. REMOVE REAR SEATBACK ASSEMBLY (for Fixed Seat Type)

- (1) Disconnect the rear seat center armrest assembly connector.
- (2) Detach the guide and claw of the connector holder.
- (3) Disconnect the 2 connectors of the seat wire.



➔	Rear Seat Airbag Assembly connector
---	-------------------------------------

- (4) Disconnect the 2 connectors of the rear seat airbag assembly.
- a) Push down the white housing lock and slide the yellow CPA.



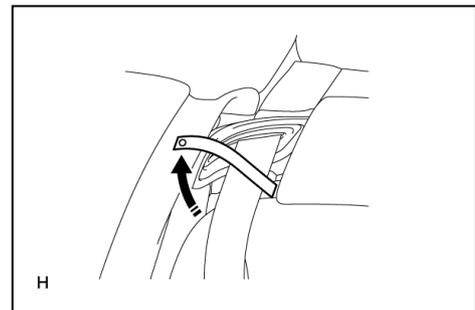
*a	Housing Lock	*b	CPA
----	--------------	----	-----

Notice:

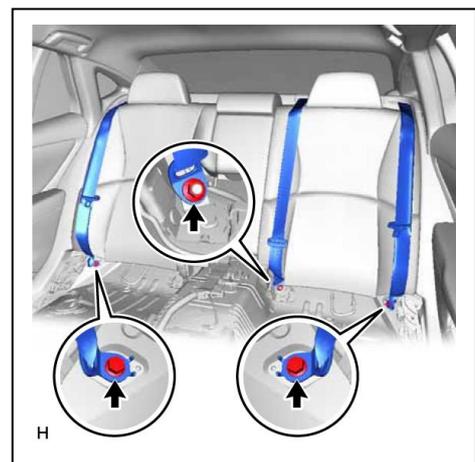
- Do not pull while holding the wire harness.
- Do not try to release the lock while holding down the top of the CPA (A in the illustration), as this prevents the lock from being released.

- b) Slide the yellow CPA while pushing down the white housing lock again, and disconnect the connector.

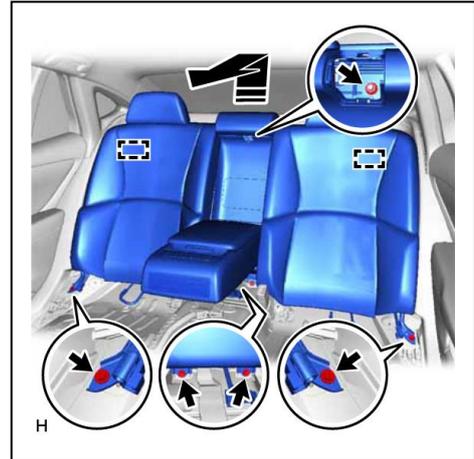
- (5) Detach the button and remove the belt band.



- (6) Remove the 2 bolts and floor anchor of rear seat outer belt assembly RH and rear seat outer belt LH.
- (7) Remove the nut and disconnect the floor anchor of the rear center seat outer belt assembly.

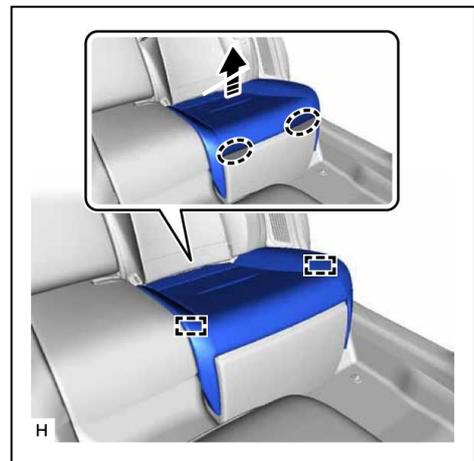


- (8) Remove the 4 bolts and nut.
- (9) Detach the hooks and remove the rear seatback assembly.



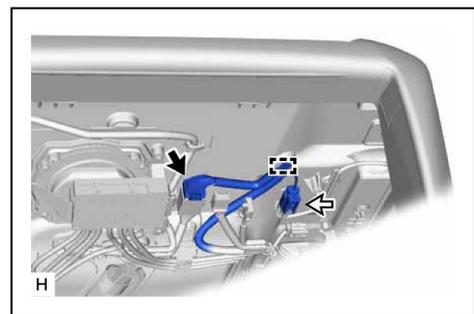
**37. REMOVE REAR SEAT CUSHION ASSEMBLY
LH (for Power Seat)**

- (1) Place your hand in the position shown in the illustration and lift the rear seat cushion assembly LH in the removal direction and detach the hook.



	Place Hand Here
--	-----------------

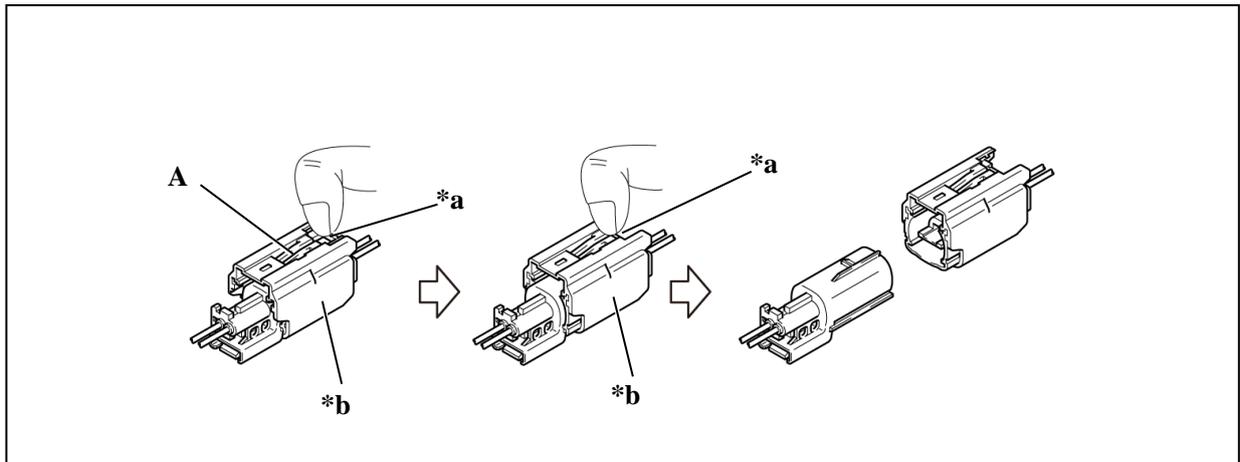
- (2) Detach the wire harness clamp and disconnect the connector.



	Rear Seat Cushion Airbag Assembly LH Connector
--	---------------------------------------------------

(3) Disconnect the connector of the rear seat cushion airbag assembly LH.

a) Push down the white housing lock and slide the yellow CPA.



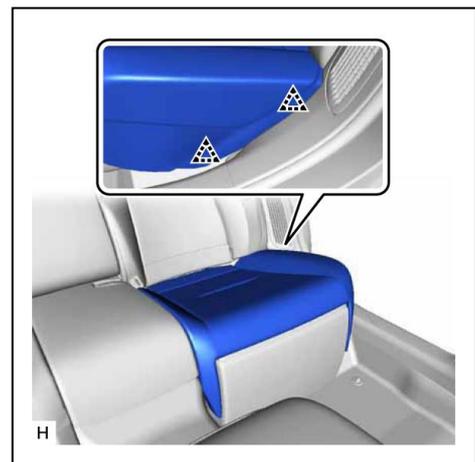
*a	Housing Lock	*b	CPA
----	--------------	----	-----

Notice:

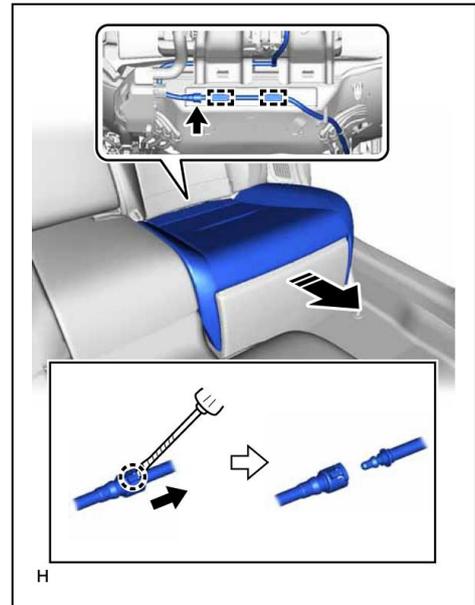
- Do not pull while holding the wire harness.
- Do not try to release the lock while holding down the top of the CPA (A in the illustration), as this prevents the lock from being released.

b) Slide the yellow CPA while pushing down the white housing lock again, and disconnect the connector.

(4) Using a clip remover, detach the clips.



- (5) w/ Refresh Seat:
 - a) Using a thin-bladed screwdriver with its tip wrapped with protective tape, detach the claw and disconnect the joint.
- (6) Remove the rear seat cushion assembly LH.



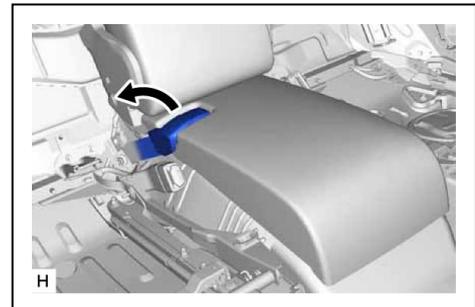
38. REMOVE REAR SEAT CUSHION ASSEMBLY RH (for Power Seat)

HINT:

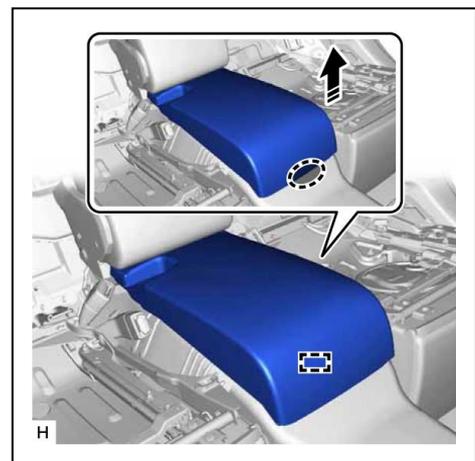
Use the same procedure described for the LH side.

39. REMOVE REAR CENTER SEAT CUSHION ASSEMBLY (for Power Seat)

- (1) Slide the rear center seat lap type belt assembly RH.

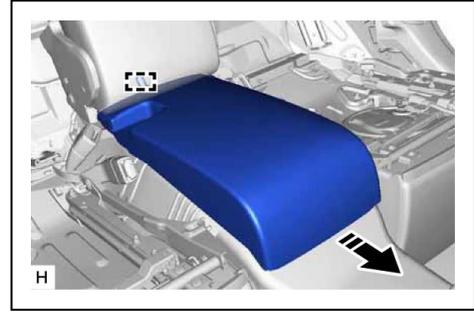


- (2) Place your hand in the position shown in the illustration and lift the rear center seat cushion assembly in the removal direction and detach the hook.

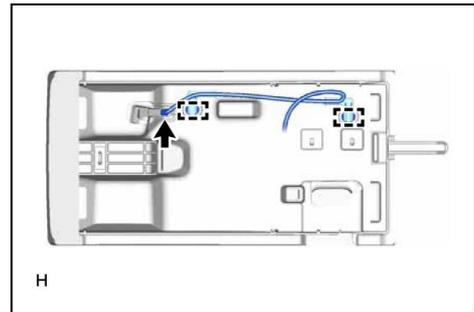


	Place Hand Here
--	-----------------

- (3) Pull in the removal direction shown in the illustration to detach the hook.

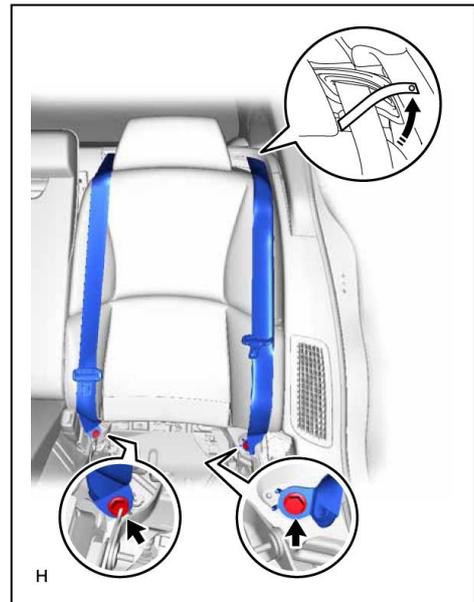


- (4) w/ Occupant Detection Sensor:
 - a) Detach the wire harness clamp and disconnect the connector.
- (5) Remove the rear center seat cushion assembly.

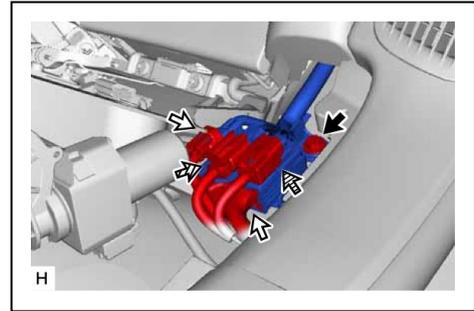


40. REMOVE REAR SEATBACK ASSEMBLY LH (for Power Seat)

- (1) Remove the bolt and floor anchor of the rear seat outer belt assembly LH.
- (2) Remove the nut and floor anchor of the rear center seat outer belt assembly.
- (3) Detach the belt band.

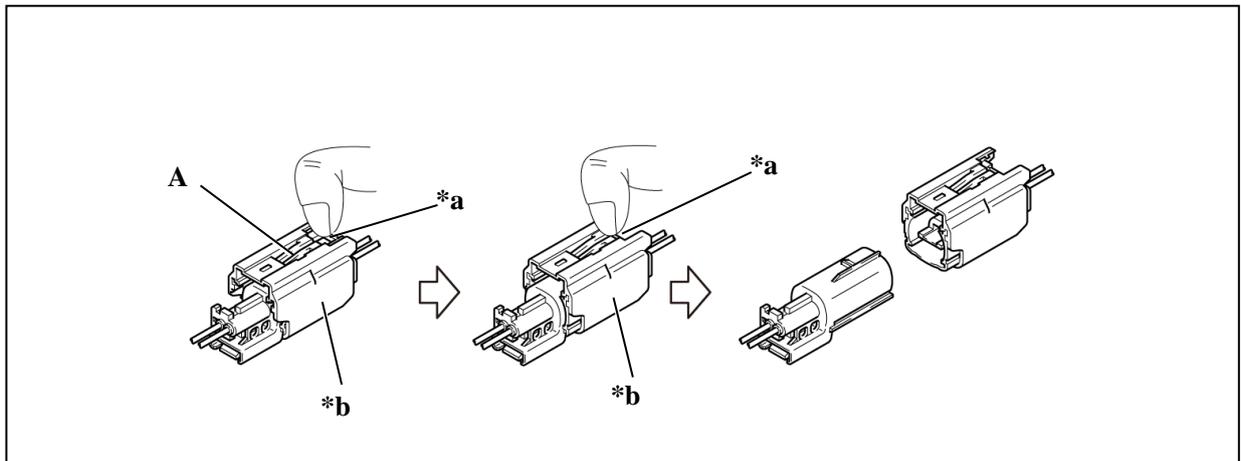


- (4) Remove the bolt and lift the connector holder.
- (5) Disconnect the 2 connectors.



	Rear Seat Airbag Assembly LH connector
	Rear Seat Cushion Airbag Assembly LH connector

- (6) Disconnect the connector of the rear seat airbag assembly LH.
 - a) Push down the while housing lock and slide the yellow CPA.



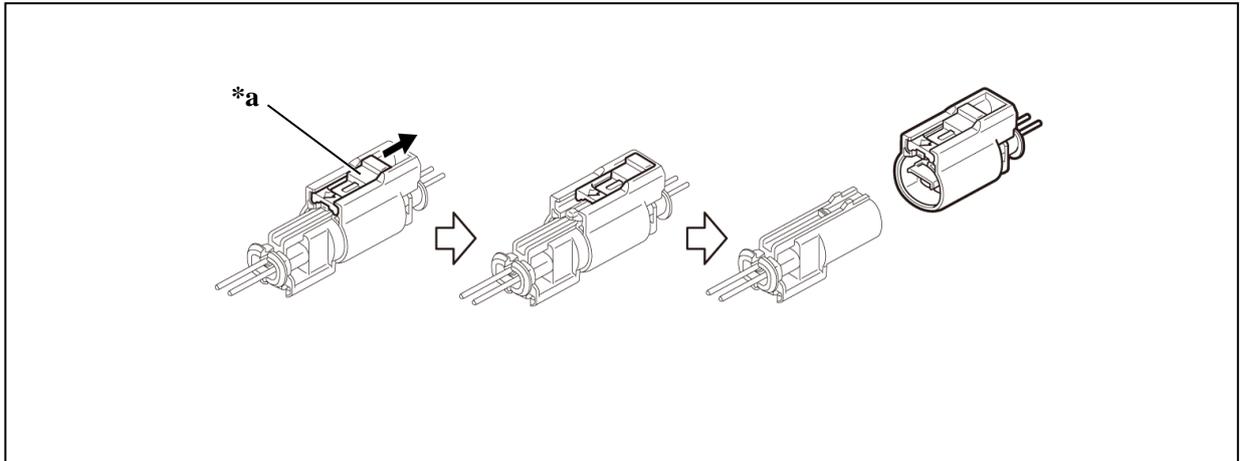
*a	Hosing Lock	*b	CPA
----	-------------	----	-----

Notice:

- Do not pull while holding the wire harness.
- Do not try to release the lock while holding down the top of the CPA (A in the illustration), as this prevents the lock from being released.

- b) Slide the yellow CPA while pushing down the while housing lock again, and disconnect the connector.

- (7) Disconnect the connector of the rear seat cushion airbag assembly LH.
- a) Slide the white slider and disconnect the connector.

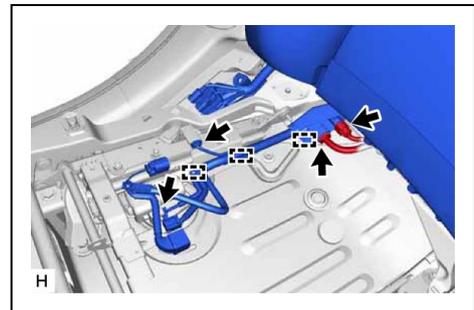


*a	Slider	-	-
----	--------	---	---

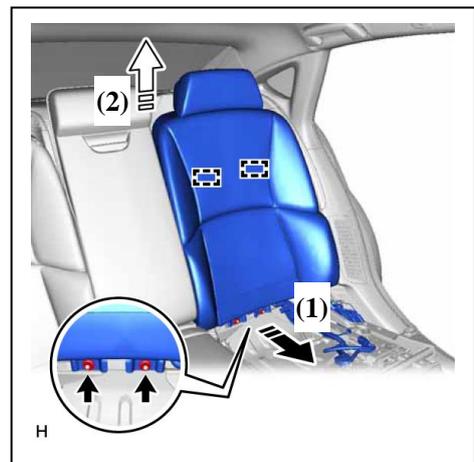
Notice:

- Do not pull while holding the wire harness.

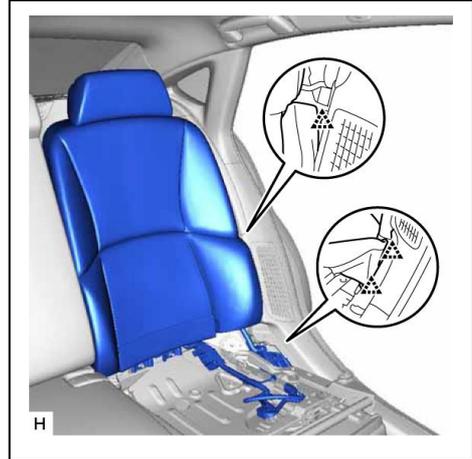
- (8) Disconnect the 4 connectors.
- (9) Detach the wire harness clamp.



- (10) Remove the 2 nuts.
- (11) Pull in the removal direction (1) shown in the illustration and disconnect the rear seatback assembly LH from the rear No. 2 seat adjuster assembly.
- (12) Lift in the removal direction (2) shown in the illustration and disconnect the rear seatback assembly LH from the No. 2 seat reclining adjuster assembly.

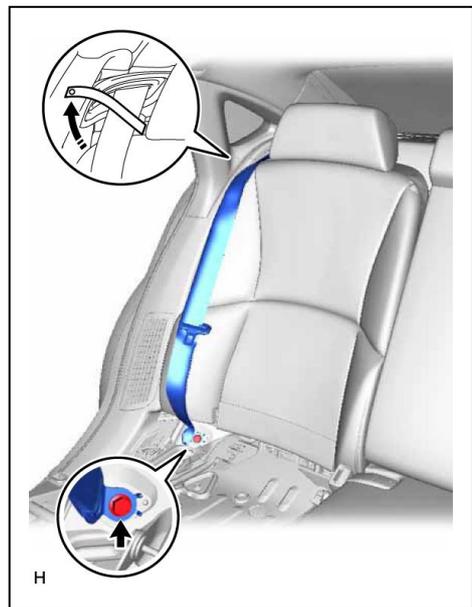


- (13) Using a clip remover, detach the clip and remove the rear seatback assembly LH.

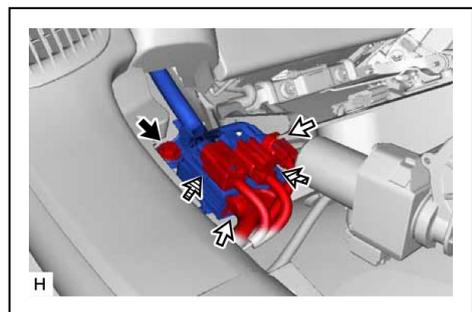


41. REMOVE REAR SEATBACK ASSEMBLY RH (for Power Seat)

- (1) Remove the bolt and floor anchor of the rear seat outer belt assembly RH.
- (2) Detach the belt band.

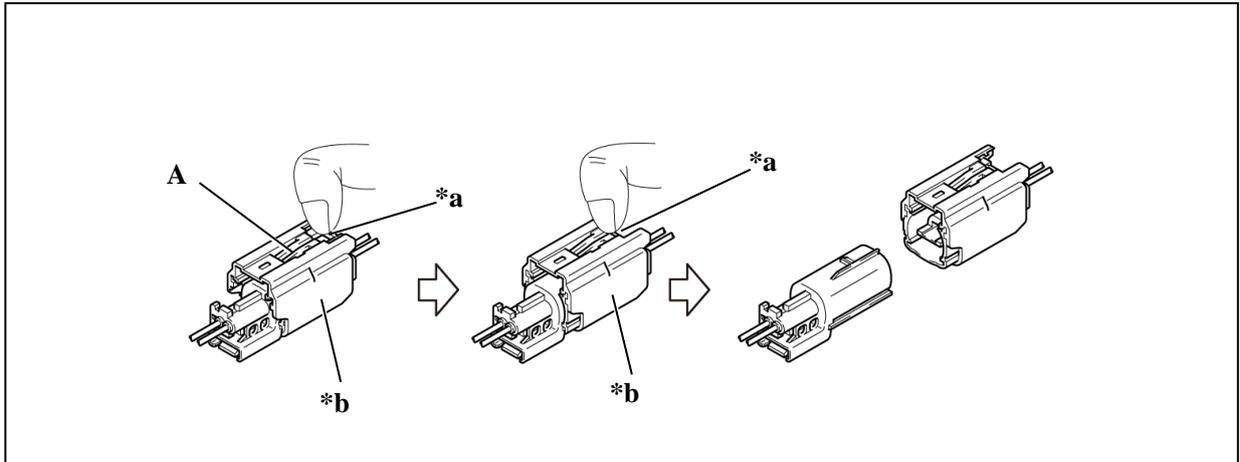


- (3) Remove the bolt and lift the connector holder.
- (4) Disconnect the 2 connectors.



	Rear Seat Airbag Assembly RH connector
	Rear Seat Cushion Airbag Assembly RH connector

- (5) Disconnect the connector of the rear seat airbag assembly RH.
- a) Push down the white housing lock and slide the yellow CPA.



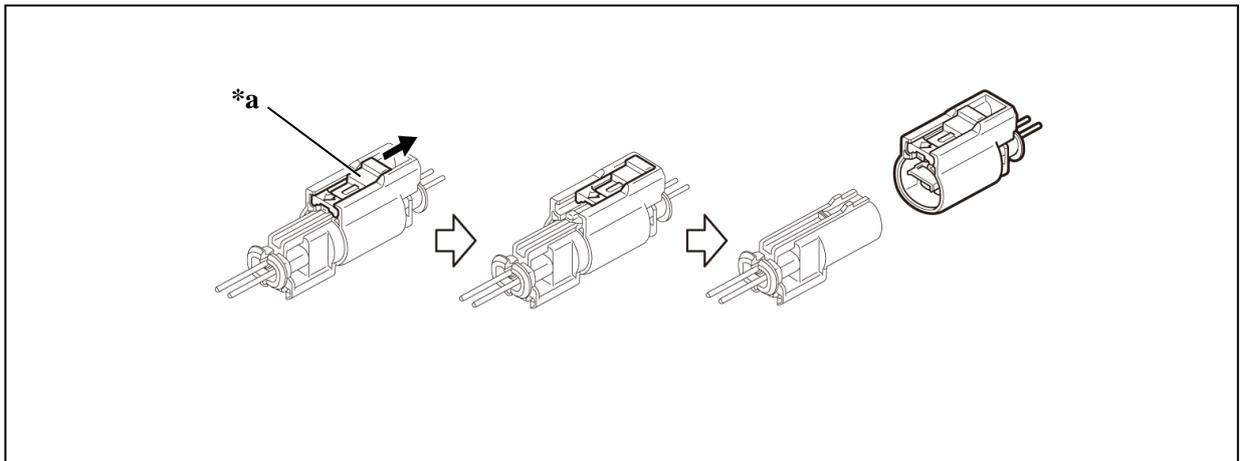
*a	Housing Lock	*b	CPA
----	--------------	----	-----

Notice:

- Do not pull while holding the wire harness.
- Do not try to release the lock while holding down the top of the CPA (A in the illustration), as this prevents the lock from being released.

- b) Slide the yellow CPA while pushing down the white housing lock again, and disconnect the connector.

- (6) Disconnect the connector of the rear seat cushion airbag assembly RH.
- a) Slide the white slider and disconnect the connector.

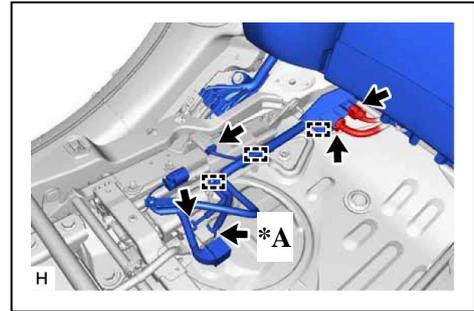


*a	Slider	-	-
----	--------	---	---

Notice:

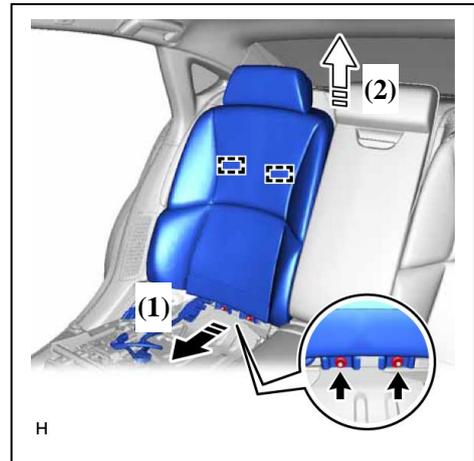
- Do not pull while holding the wire harness.

- (7) w/o Ottoman:
 - a) Disconnect the 4 connectors.
- (8) w/ Ottoman:
 - a) Disconnect the 5 connectors.
- (9) Detach the wire harness clamp.



*A	w/ Ottoman
----	------------

- (10) Remove the 2 nuts.
- (11) Pull in the removal direction (1) shown in the illustration and disconnect the rear seatback assembly RH from the No. 1 rear seat adjuster assembly.
- (12) Lift in the removal direction (2) shown in the illustration and disconnect the rear seatback assembly RH from the No. 1 seat reclining adjuster assembly.

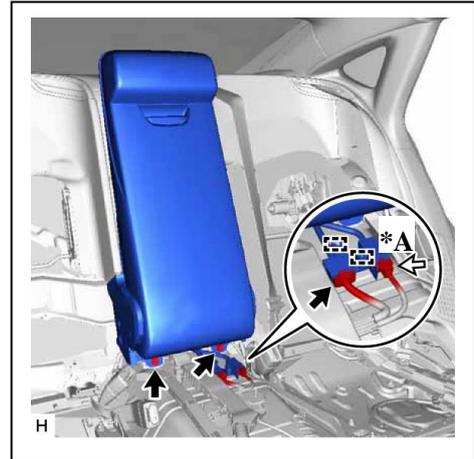


- (13) Using a clip remover, detach the clip and remove the rear seatback assembly RH.



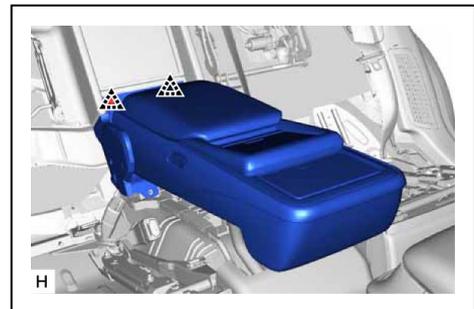
42. REMOVE REAR CENTER SEAT ARMREST ASSEMBLY (for Power Seat)

- (1) w/o Rear Seat Entertainment System:
 - a) Disconnect the connector.
- (2) w/ Rear Seat Entertainment System:
 - a) Disconnect the 2 connectors.
- (3) Detach the clamp and remove the connector holder.
- (4) Remove the 2 bolts.

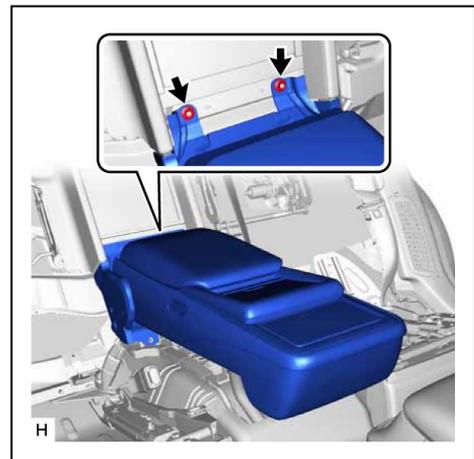


*A	w/ Rear Seat Entertainment System
----	-----------------------------------

- (5) Using a clip remover, detach the clip and fold back the armrest cover.



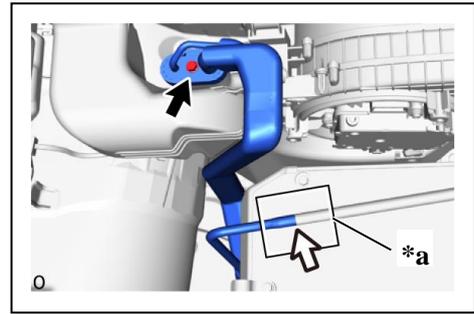
- (6) Remove the 2 nuts and rear center seat armrest assembly.



43. DRAIN REFRIGERANT LINE (w/ Rear Cooler)

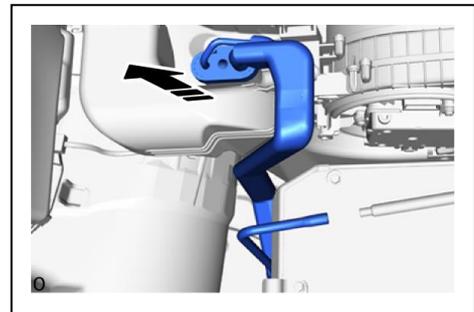
44. REMOVE AIR CONDITIONING TUBE AND ACCESSORY ASSEMBLY (w/ Rear Cooler)

- (1) Remove the packing and disconnect the drain hose connection.
- (2) Remove the bolt.



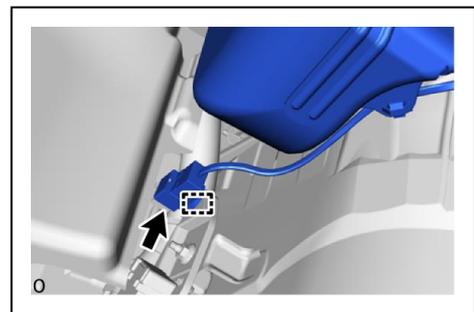
*a	Packing
	Drain Hose

- (3) Slightly moving the air conditioning tube and accessory assembly in the direction indicated by the arrow shown in the illustration, disconnect it from rear cooling unit.

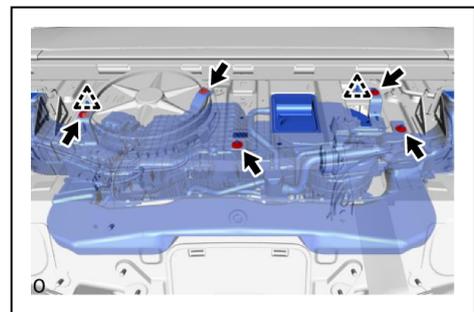


45. REMOVE REAR COOLING UNIT ASSEMBLY (w/ Rear Cooler)

- (1) Disconnect the connector and detach clamp.

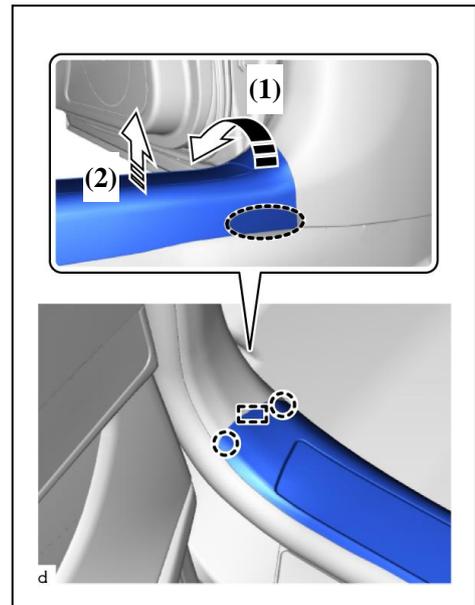


- (2) Remove the 5 nuts, detach the clip and remove the rear cooling unit.



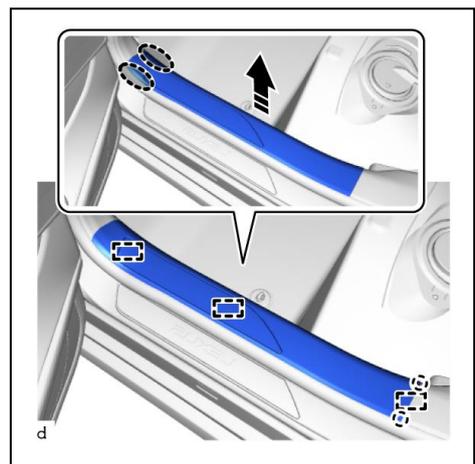
46. REMOVE REAR DOOR SCUFF PLATE LH

- (1) Place your hand at the position shown in the illustration and pull in the removal direction (1) to detach the claw.
- (2) Lift in the removal direction (2) to detach the clamp and claw.



 Place Hand Here

- (3) Place both hands at the position shown in the illustration and lift in the direction indicated by the arrow to detach the clamp and claw and remove the front rear door scuff plate LH.



 Place Hand Here

47. REMOVE REAR DOOR SCUFF PLATE RH

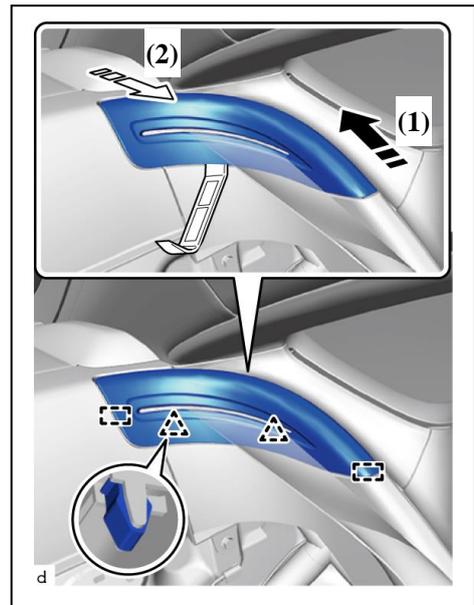
HINT:

Use the same procedure described for the LH side.

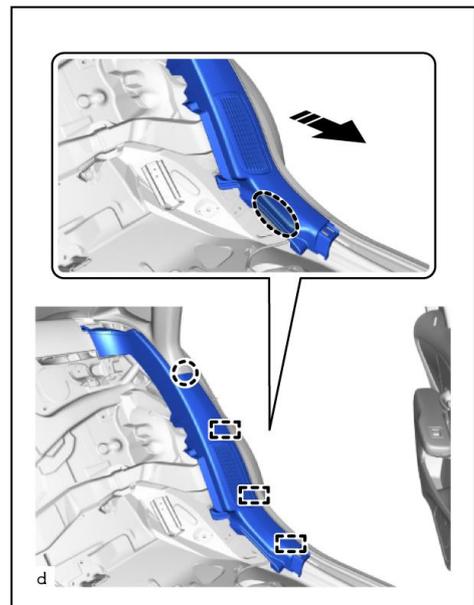
48. REMOVE REAR SEAT SIDE GARNISH LH

(1) for Fixed Seat Type:

- a) Insert moulding remove A at the position shown in the illustration to detach the clip.
- b) Pull in the removal direction (1) shown in the illustration to detach the guide.
- c) Detach the guide and remove the belt guide in the removal direction (2) shown in the illustration.

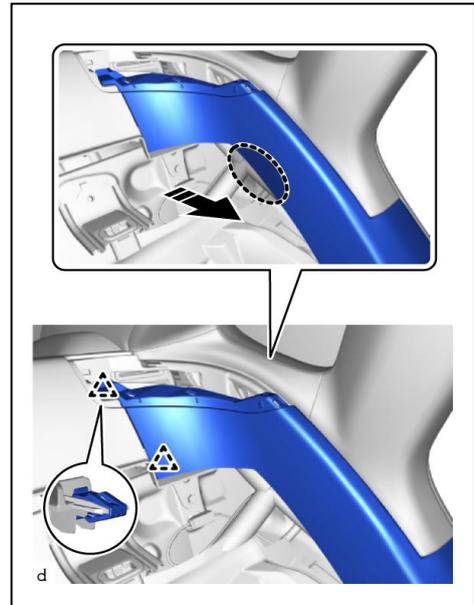


- d) Place your hand at the position shown in the illustration and pull in the direction indicated by the arrow to detach the clamp and claw.



 Place Hand Here

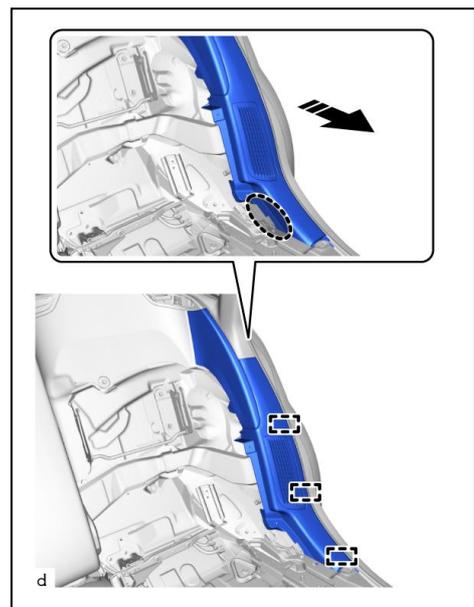
- e) Place your hand at the position shown in the illustration and pull in the direction indicated by the arrow to detach the clip and remove the rear seat side garnish LH.



	Place Hand Here
--	-----------------

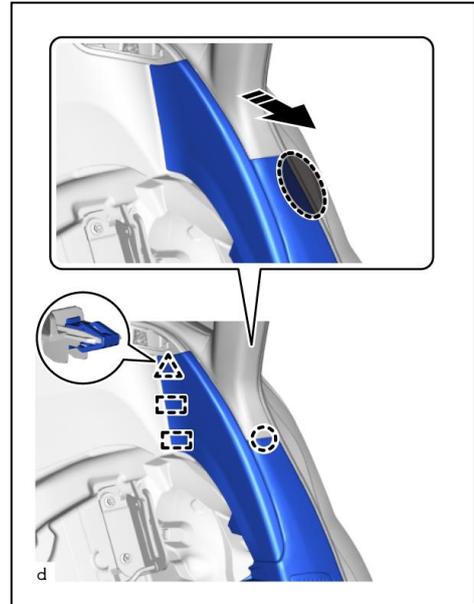
(2) for Power Seat:

- a) Place your hand at the position shown in the illustration and pull in the direction indicated by the arrow to detach the clamp.



	Place Hand Here
--	-----------------

- b) Place your hand at the position shown in the illustration and pull in the direction indicated by the arrow to detach the claw, clip and guide and remove the rear seat side garnish LH.



 Place Hand Here

49. REMOVE REAR SEAT SIDE GARNISH RH

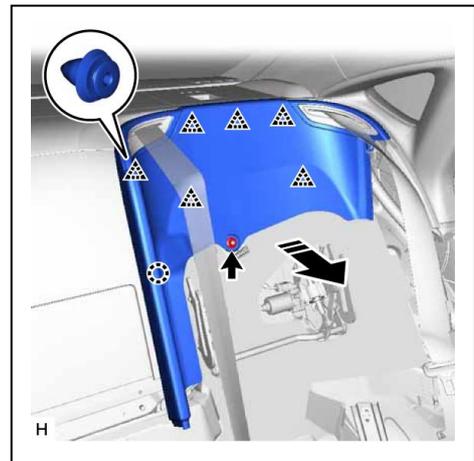
HINT:

Use the same procedure described for the LH side.

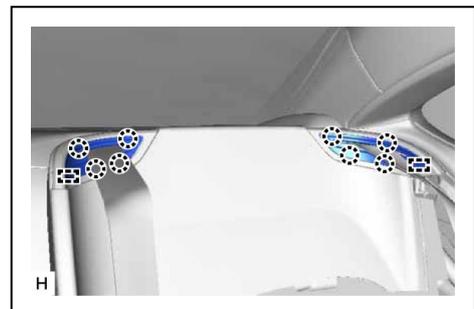
50. REMOVE ROOM PARTITION BOARD

ASSEMBLY LH (for Power Seat)

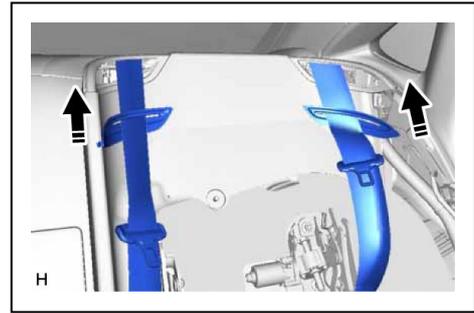
- (1) Remove the nut.
- (2) Pull in the removal direction shown in the illustration to detach the clips and claw.



- (3) Detach the claws and guide and remove the belt guide of the rear outer belt assembly LH and rear center seat outer belt assembly.

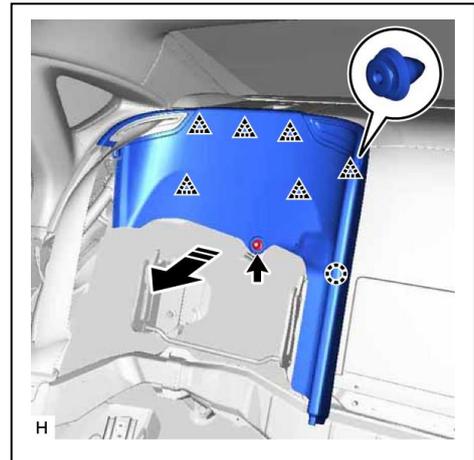


- (4) Pull the rear outer belt assembly LH and rear center seat outer belt assembly out of the room partition board assembly LH and remove the room partition board assembly LH.

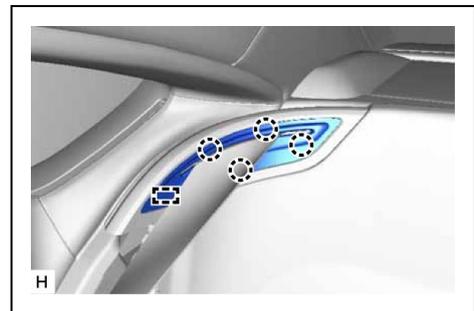


51. REMOVE ROOM PARTITION BOARD ASSEMBLY RH (for Power Seat)

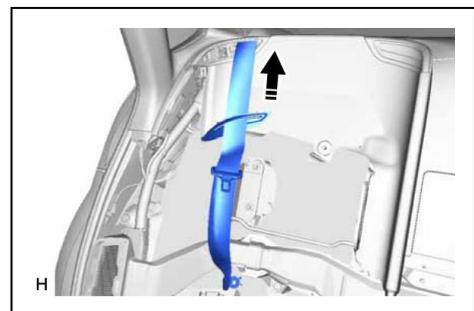
- (1) Remove the nut.
- (2) Pull in the removal direction shown in the illustration to detach the clips and claw.



- (3) Detach the claws and guide and remove the belt guide of the rear outer belt assembly RH.

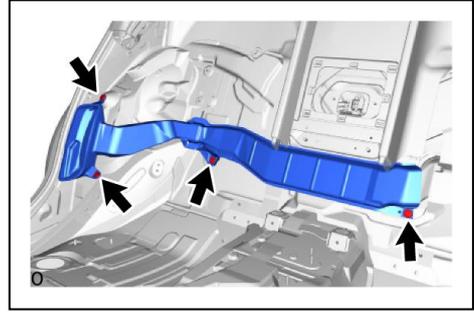


- (4) Pull the rear outer belt assembly RH out of the room partition board assembly RH and remove the room partition board assembly RH.



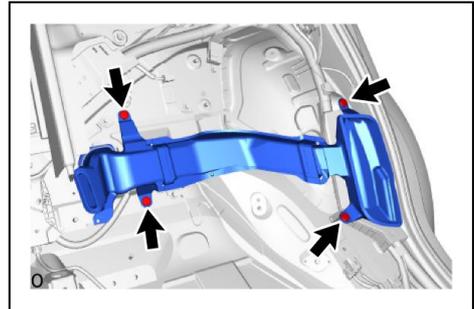
52. REMOVE NO. 2 EV BATTERY INTAKE DUCT

- (1) Remove the 4 clips and No. 2 EV battery intake duct.



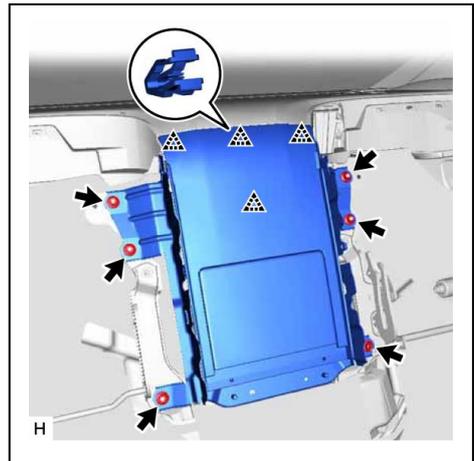
53. REMOVE NO. 4 HYBRID BATTERY INTAKE DUCT

- (1) Remove the 4 clips and No. 4 hybrid battery intake duct.



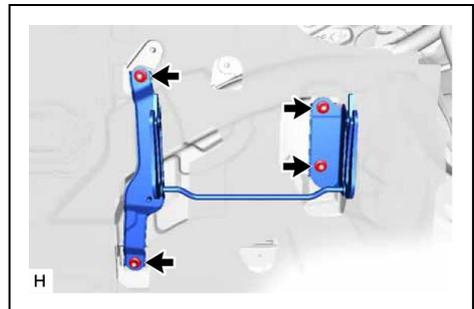
54. REMOVE CENTER ROOM PARTITION GARNISH ASSEMBLY (for Power Seat)

- (1) Remove the 6 nuts.
- (2) Detach the clips and remove the room partition center garnish assembly.



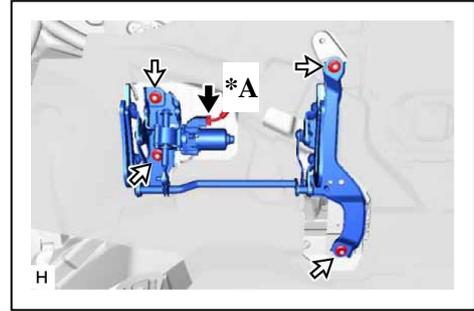
55. REMOVE NO. 1 SEAT RECLINING ADJUSTER ASSEMBLY LH (for Power Seat)

- (1) Remove the 4 nuts and No. 1 seat reclining adjuster assembly LH.



56. REMOVE NO. 1 SEAT RECLINING ADJUSTER ASSEMBLY RH (for Power Seat)

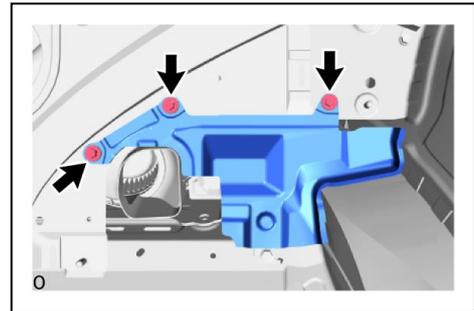
- (1) W/ Ottoman:
 - a) Disconnect the connector.
- (2) Remove the 4 nuts and No. 1 seat reclining adjuster assembly RH.



*A	w/ Ottoman
----	------------

57. REMOVE CENTER NO. 2 FLOOR TO BRACE EXTENSION

- (1) Remove the 3 bolts and center No. 2 floor to brace extension.

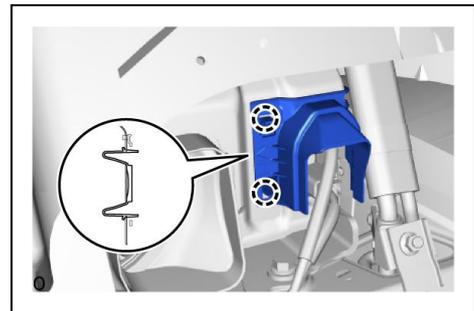


58. DISCONNECT FLOOR WIRE

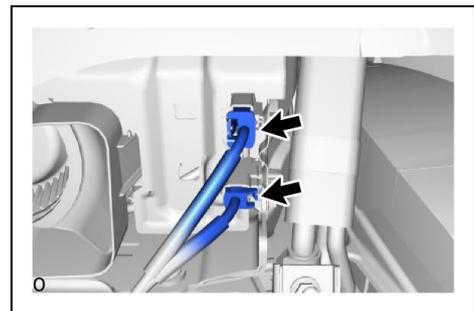
Caution

Wear insulated gloves.

- (1) Detach the 2 claws and Remove the connector cover.

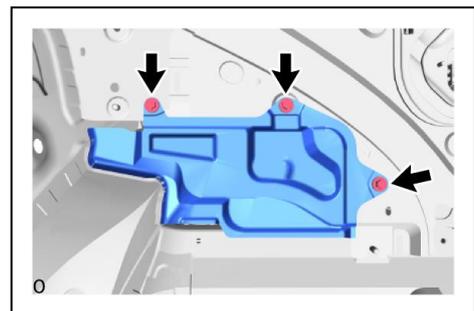


- (2) Disconnect the 2 connectors.



59. REMOVE CENTER NO. 1 FLOOR TO BLACE EXTENSION

- (1) Remove the 3 bolts and center No. 1 floor to brace extension.



60. REMOVE NO. 10 HV BATTERY SHIELD PANEL

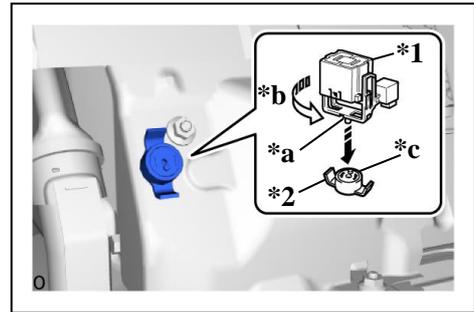
Caution

Wear insulated gloves.

- (1) Using the service plug grip, remove the battery cover lock striker.

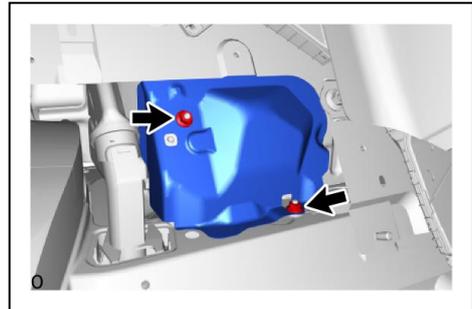
Hint:

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



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

- (2) Remove the 2 nuts and No. 10 HV battery shield panel.

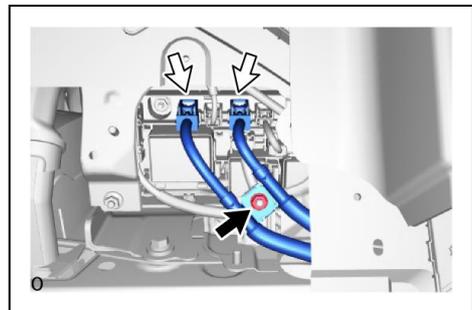


61. DISCONNECT HV FLOOR UNDER WIRE

Caution

Wear insulated gloves.

- (1) Remove the nut and disconnect the 2 connectors.

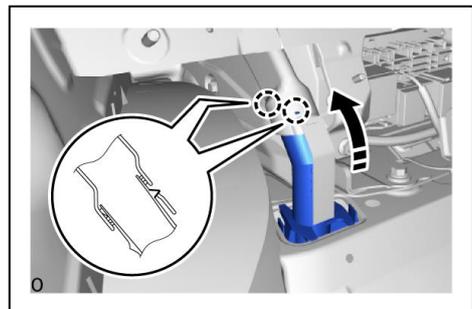


62. REMOVE NO. 4 HV BATTERY EXHAUST DUCT

Caution

Wear insulated gloves.

- (1) Detach the 2 claws as shown in the illustration.
- (2) Remove the No. 4 HV battery exhaust duct.



63. REMOVE HV BATTERY ASSEMBLY

Caution

Wear insulated gloves.

(1) Remove the 3 bolts, 2 nuts and HV battery assembly.

Notice:

- To prevent the wire harness from being caught, make sure to bundle the wire harness using insulating tape or equivalent.
- Use cardboard or another similar material to protect the HV battery and vehicle body from damage.
- Since the HV battery is very heavy, 2 people are needed to remove it.
- When removing the HV battery from the vehicle, do not allow it to contact the vehicle.
- When removing/ moving the HV battery, make sure not to tilt it more than 80°.
- Insulate the disconnected terminals or connectors with insulating tape.

