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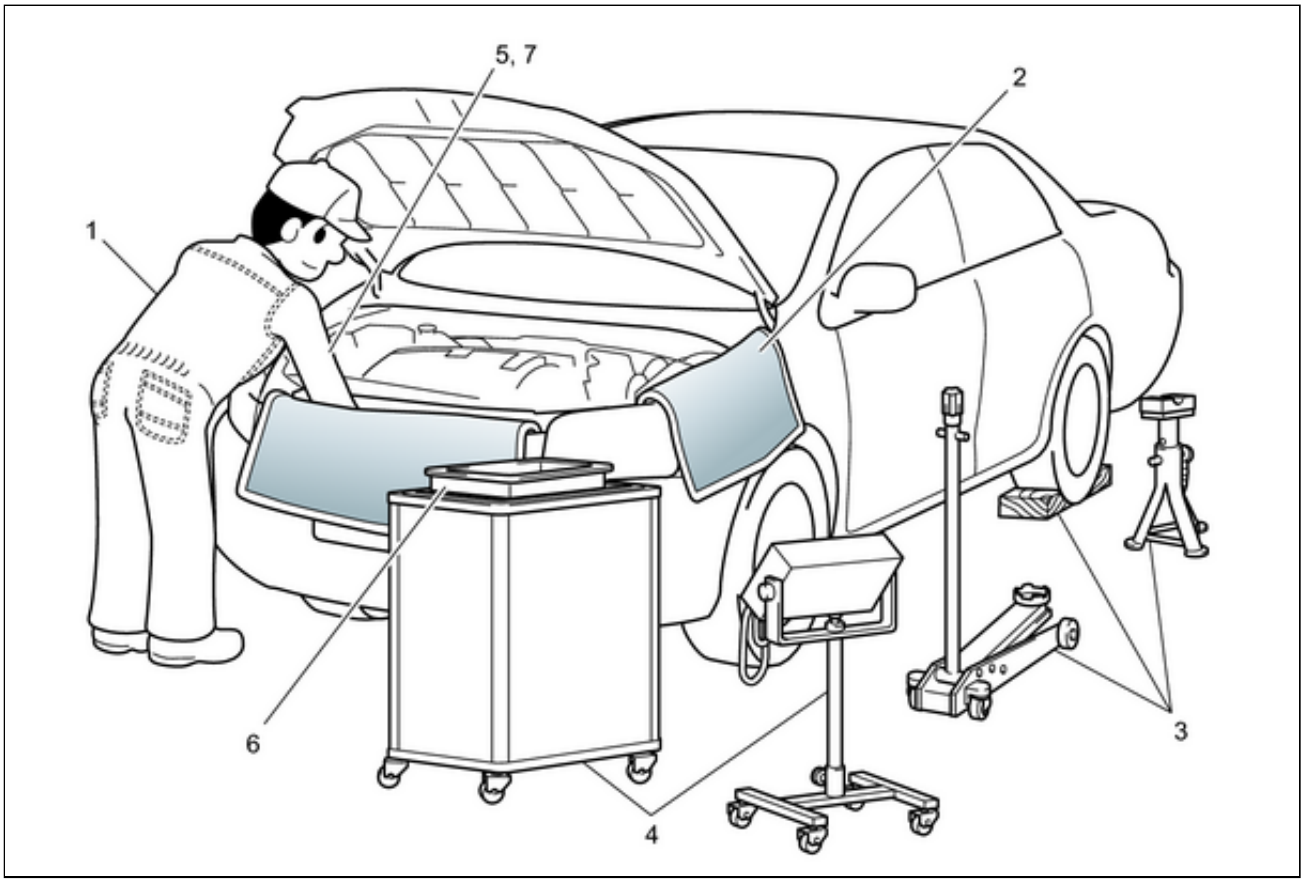
Model Year Start: 2013	**Model:** RAV4 EV	**Prod Date Range:** [12/2012 -]
Title: INTRODUCTION: REPAIR INSTRUCTION: PRECAUTION; 2013 MY RAV4 EV [12/2012 -]		

PRECAUTION

1. BASIC REPAIR HINT

(a) HINTS ON OPERATIONS



1	Attire	• Always wear a clean uniform. • A hat and safety shoes must be worn.
2	Vehicle protection	Prepare a grille cover, fender cover, seat cover and floor mat before starting work.
3	Safety procedures	• When working with 2 or more persons, be sure to check the safety of one another. • If working on high temperature, high pressure, rotating, moving or vibrating parts, wear appropriate safety equipment and take extra care not to injure yourself or others. • When jacking up the vehicle, be sure to support the specified locations with safety stands. • When lifting up the vehicle, use appropriate safety equipment.
4	Preparation of tools and measuring equipment	Before starting work, prepare a tool stand, SST, measuring equipment, oil, and any replacement parts required.

5	Removal and installation, disassembly and assembly operations	• Diagnose with a thorough understanding of proper procedures and of the reported problem. • Before removing any parts, check the general condition of the assembly and for deformation and damage. • If the procedure is complicated, take notes. For example, note the total number of electrical connections, bolts or hoses removed. Add matchmarks to ensure reassembly of components in the original positions. Temporarily mark hoses and their fittings if needed. • Clean and wash the removed parts if necessary and assemble them after a thorough check.
6	Removed parts	• Place the removed parts in a separate box to avoid mixing them up with new parts or contaminating the new parts. • For non-reusable parts such as gaskets, O-rings and self-locking nuts, replace them with new ones as instructed in this manual. • Retain the removed parts for customer inspection, if requested.
7*	Checks to perform after work is finished	• Make sure that removed and installed parts (floor mat, etc.) are properly installed/tightened. • Make sure that none of the cloths or tools that were used have been left in the motor compartment or within the vehicle. • Check that there are no oil leaks.

CAUTION:

*: Be sure to perform these checks properly, Not performing these checks properly after finishing work can lead to serious accident or injury.

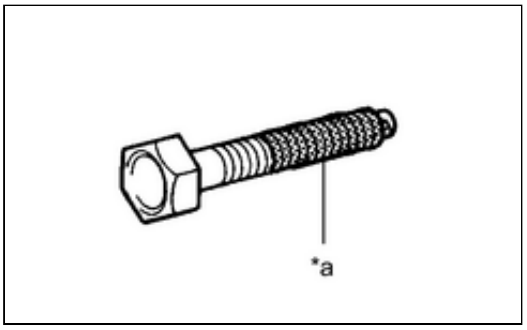
(b) JACKING UP AND SUPPORTING THE VEHICLE

(1) Care must be taken when jacking up and supporting the vehicle. Be sure to lift and support the vehicle at the proper locations.

(c) PRECOATED PARTS

Text in Illustration

*a	Seal Lock Adhesive



(1) Precoated parts are bolts and nuts that are coated with seal lock adhesive at the factory.

(2) If a precoated part is retightened, loosened or moved in any way, it must be recoated with the specified adhesive.

(3) When reusing a precoated part, clean off the old adhesive and dry the part with compressed air. Then apply new seal lock adhesive appropriately to that part.

(4) Some seal lock agents harden slowly. You may have to wait for the seal lock adhesive to harden.

(d) GASKETS

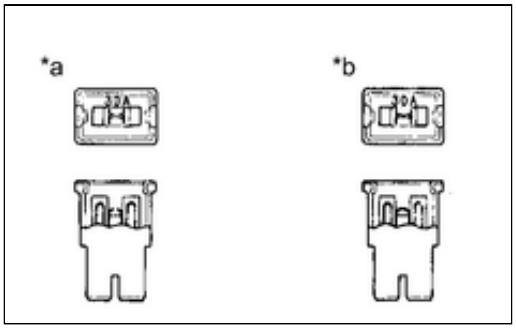
(1) When necessary, use a sealer on gaskets to prevent leaks.

(e) BOLTS, NUTS AND SCREWS

(1) Carefully follow all the specifications for tightening torque. Always use a torque wrench.

(2) Make sure that no foreign matter (burrs, paint, etc.) gets trapped under the heads of the bolts and nuts when tightening them.

(f) FUSES



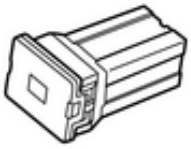
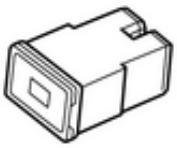
Text in Illustration

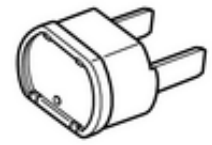
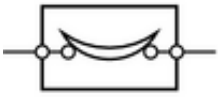
*a	INCORRECT
*b	CORRECT

(1) When inspecting a fuse, check that the wire of the fuse is not broken.

(2) If the wire of a fuse is broken, confirm that there are no shorts in its circuit.

(3) When a fuse is replaced, a fuse with the same amperage rating must be used.

ILLUSTRATION	SYMBOL	PART NAME	ABBREVIATION
 N	 N	FUSE	FUSE
 N	 N	MEDIUM CURRENT FUSE	M-FUSE
 N	 N	HIGH CURRENT FUSE	H-FUSE

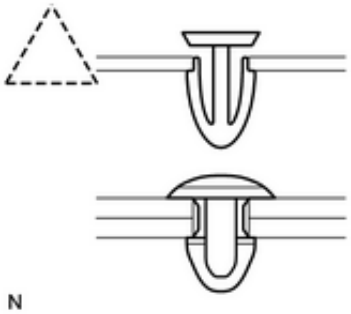
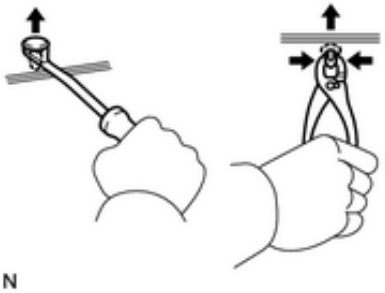
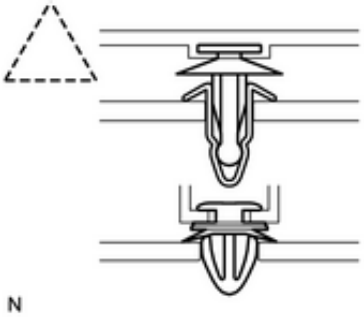
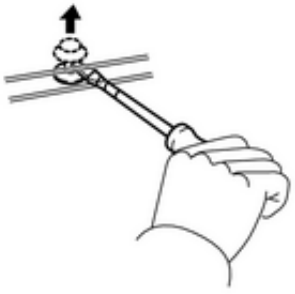
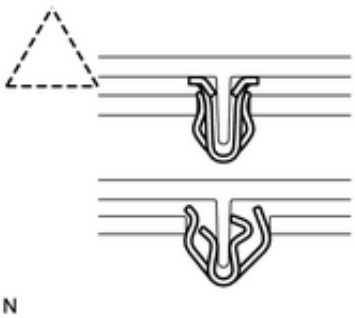
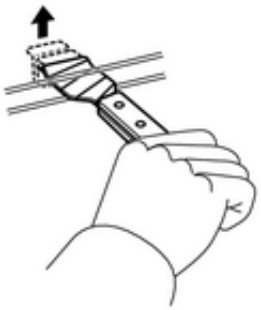
 N	 N	FUSIBLE LINK	FL
 N	 N	CIRCUIT BREAKER	CB

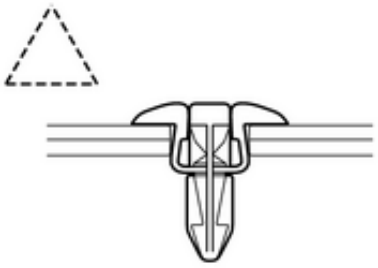
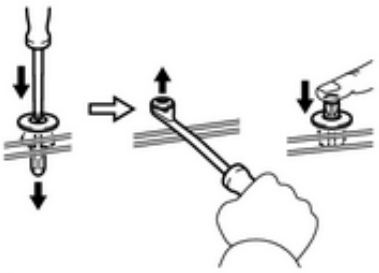
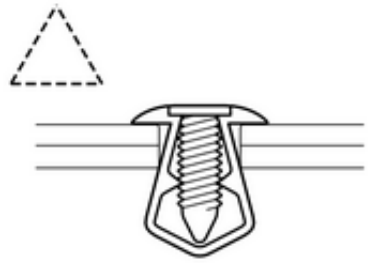
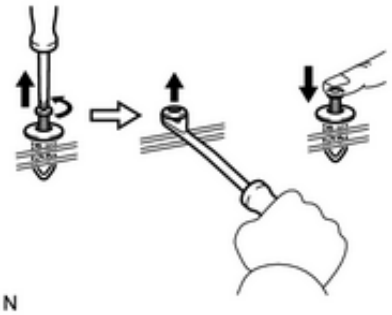
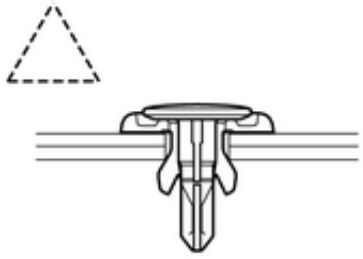
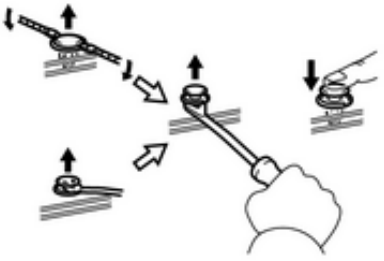
(g) CLIPS

(1) The removal and installation methods of typical clips used for vehicle body parts are shown in the table below.

HINT:

If clips are damaged during a procedure, always replace the damaged clips with new ones.

SHAPE (EXAMPLE)	REMOVAL/INSTALLATION
 N	 N Remove the clips with a clip remover or pliers.
 N	 N Remove the clips with a clip remover or screwdriver.
 N	 N Remove the clips with a wide scraper to prevent panel damage.

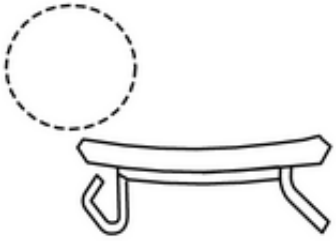
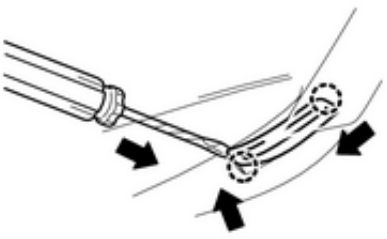
 N	 N Remove the clips by pushing the center pin through and prying out the shell.
 N	 N Remove the clips by unscrewing the center pin and prying out the shell.
 N	 N Remove the clips by prying out the pin and then prying out the shell.

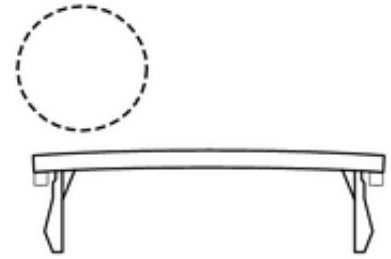
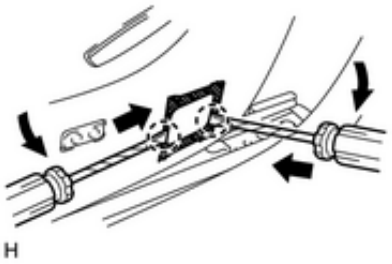
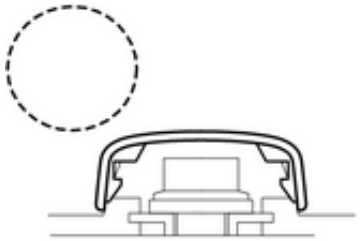
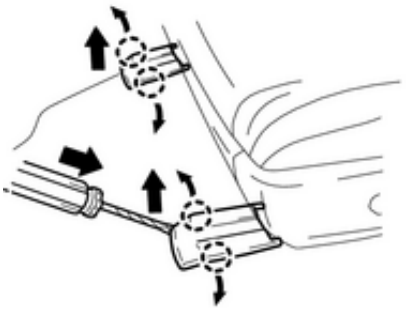
(h) CLAWS

(1) The removal and installation methods of typical claws used for vehicle body parts are shown in the table below.

HINT:

If claws are damaged during a procedure, always replace the cap or cover that has damaged claws with a new one.

SHAPE (EXAMPLE)	ILLUSTRATION	PROCEDURE
		Using a screwdriver, disengage the claws and remove the cap or cover.

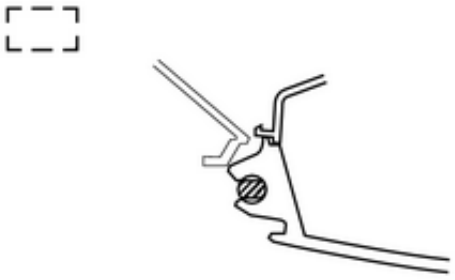
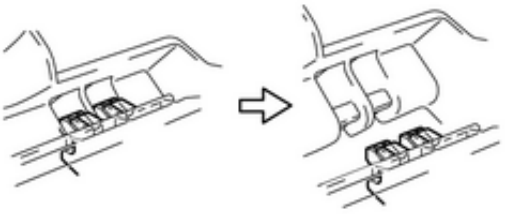
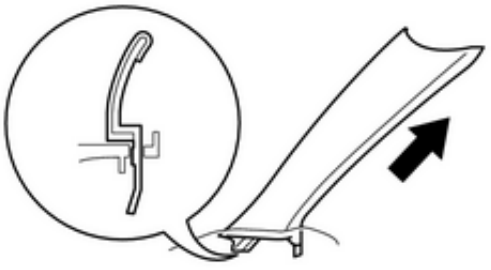
		Using a screwdriver, disengage the claws and remove the cap or cover.
		Using a screwdriver, disengage the claws and remove the cap or cover.

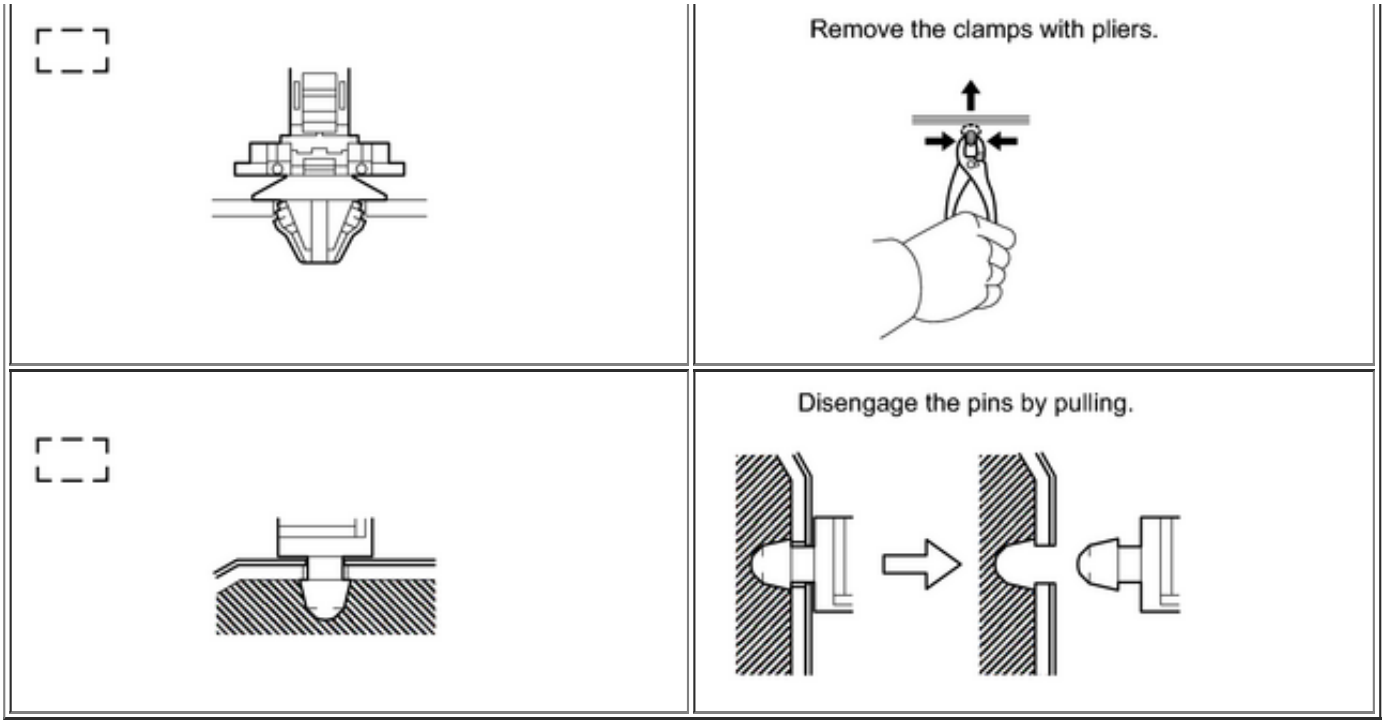
(i) HINGES, GUIDES, CLAMPS, PINS, ETC.

(1) The removal and installation methods of typical hinges, guides, clamps and pins used for vehicle body parts are shown in the table below.

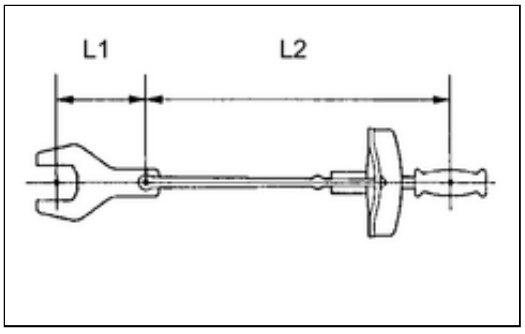
HINT:

If clamps are damaged during a procedure, always replace the cap or cover that has damaged clamps with a new one.

SHAPE (EXAMPLE)	REMOVAL/INSTALLATION
	Pull away from the pins to disengage. 
	Disengage the pins by pulling. 



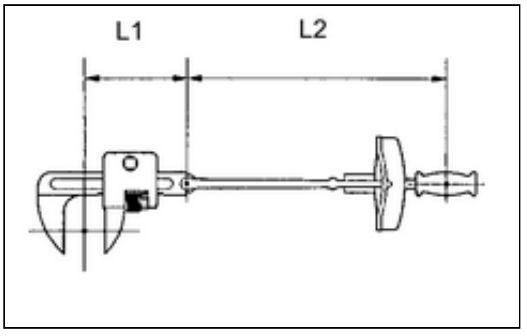
(j) TORQUE WHEN USING TORQUE WRENCH WITH EXTENSION TOOL



(1) Use the formula below to calculate special torque values for situations where SST or an extension tool is combined with a torque wrench.

Formula

$$T' = (L2/(L1 + L2))*T$$



T'	Reading of torque wrench {N*m (kgf*cm, ft.*lbf)}
T	Torque {N*m (kgf*cm, ft.*lbf)}
L1	Length of SST or extension tool {cm (in.)}
L2	Length of torque wrench {cm (in.)}

NOTICE:

If an extension tool or SST is combined with a torque wrench and used to tighten to a torque specification in this manual, the actual torque will be excessive and parts will be damaged.

2. PRECAUTIONS FOR HIGH-VOLTAGE CIRCUIT INSPECTION AND SERVICE

(a) Technicians must undergo special training to be able to service and inspect the high-voltage system.

(b) All high-voltage wire harnesses and connectors are colored orange. The EV battery and other high-voltage components have "High Voltage" caution labels. Do not carelessly touch these wires or components.

(c) When there is a problem with the wire harness or connector of a high-voltage circuit, repairs to the harness or connector should not be attempted. Replace damaged or malfunctioning high voltage cables or connectors.

(d) Before inspecting or servicing the high-voltage system, be sure to follow all safety measures, such as wearing insulated gloves and removing the service plug to prevent electrocution. Carry the removed service plug in your pocket to prevent other technicians from accidentally reconnecting it while you are servicing the vehicle INFO .

NOTICE:

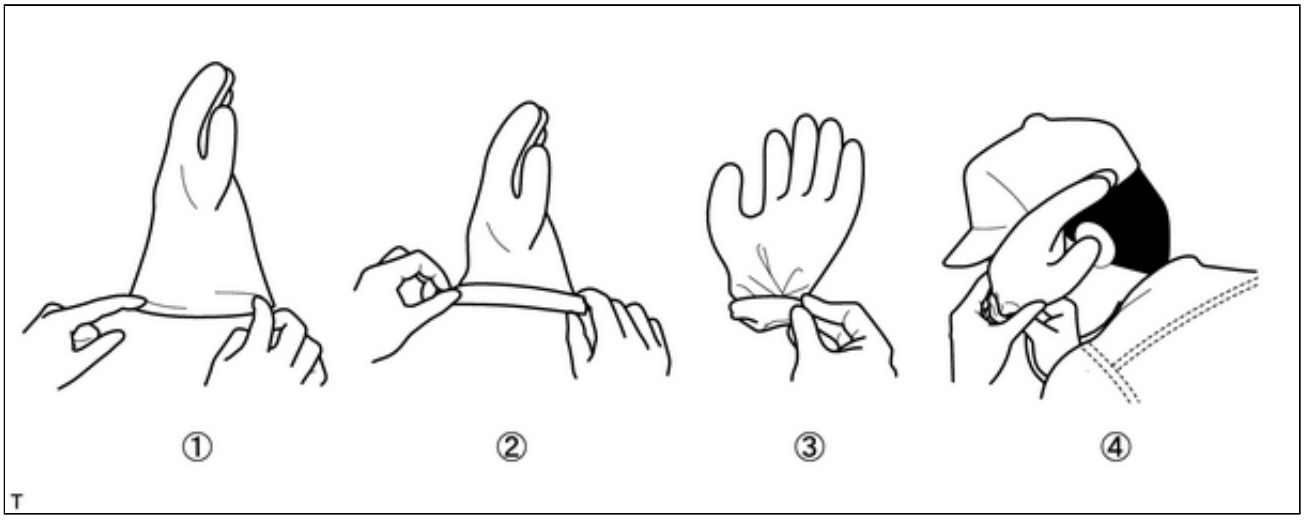
After removing the service plug grip, do not turn the power switch on (READY), unless instructed by the repair manual because this may cause a malfunction.

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

HINT:

Waiting for at least 10 minutes is required to discharge the high-voltage capacitor inside the electric vehicle traction motor assembly, electric vehicle charger assembly, electric vehicle battery assembly and DC/DC converter assembly.

(f) Before using insulated gloves, be sure to check them for cracks, tears and other types of damage by performing the following procedure.

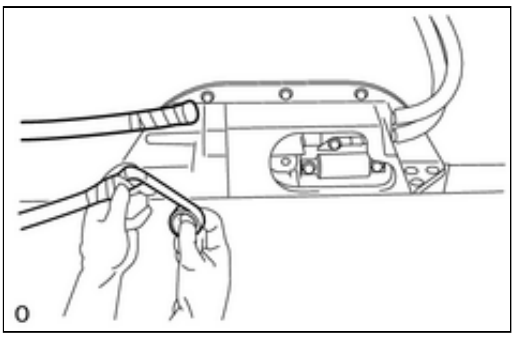


1. Place the glove on its side.
2. Roll the opening up 2 or 3 times.
3. Fold the opening in half to close it.
4. Confirm that there are no air leaks.

(g) When servicing the vehicle, do not carry metal objects like mechanical pencils or rulers that can be dropped accidentally and cause a short circuit.

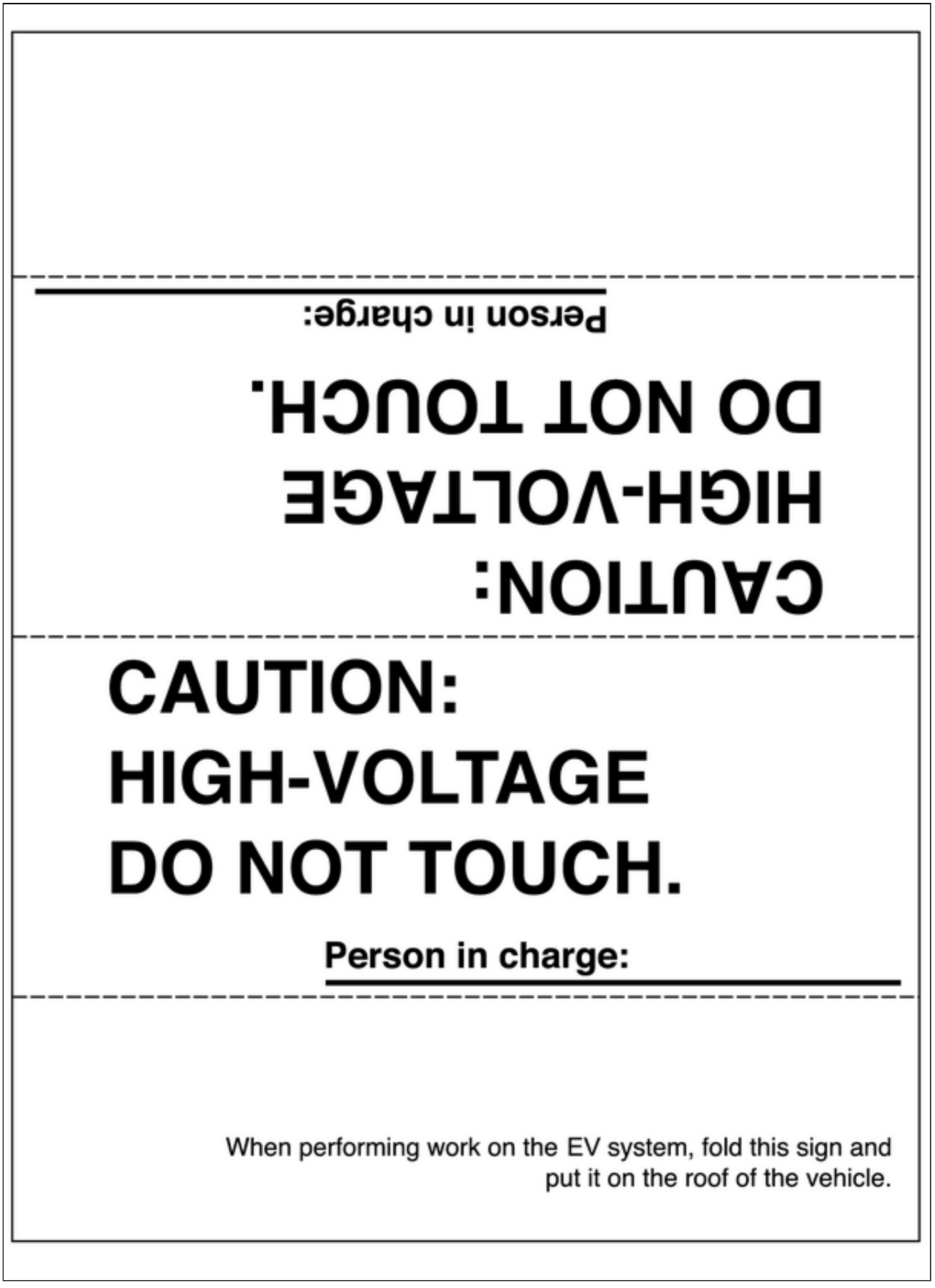
(h) Before touching a bare high-voltage terminal, wear insulated gloves and use a tester to make sure that the terminal voltage is 0 V INFO .

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



(j) Bolts and nuts for high-voltage terminals should be tightened firmly to the specified torque. Both insufficient and excessive torque can cause failure.

(k) Use the "CAUTION: HIGH VOLTAGE DO NOT TOUCH" sign to notify other technicians that the high-voltage system is being inspected and/or repaired.



(l) After servicing the high-voltage system and before reinstalling the service plug, check again that you have not left a part or tool inside, that the high-voltage terminals are firmly tightened, and that the connectors are correctly connected.

(m) When performing work involving high-voltage wires, use either a tool wrapped with vinyl insulation tape or an insulated tool.

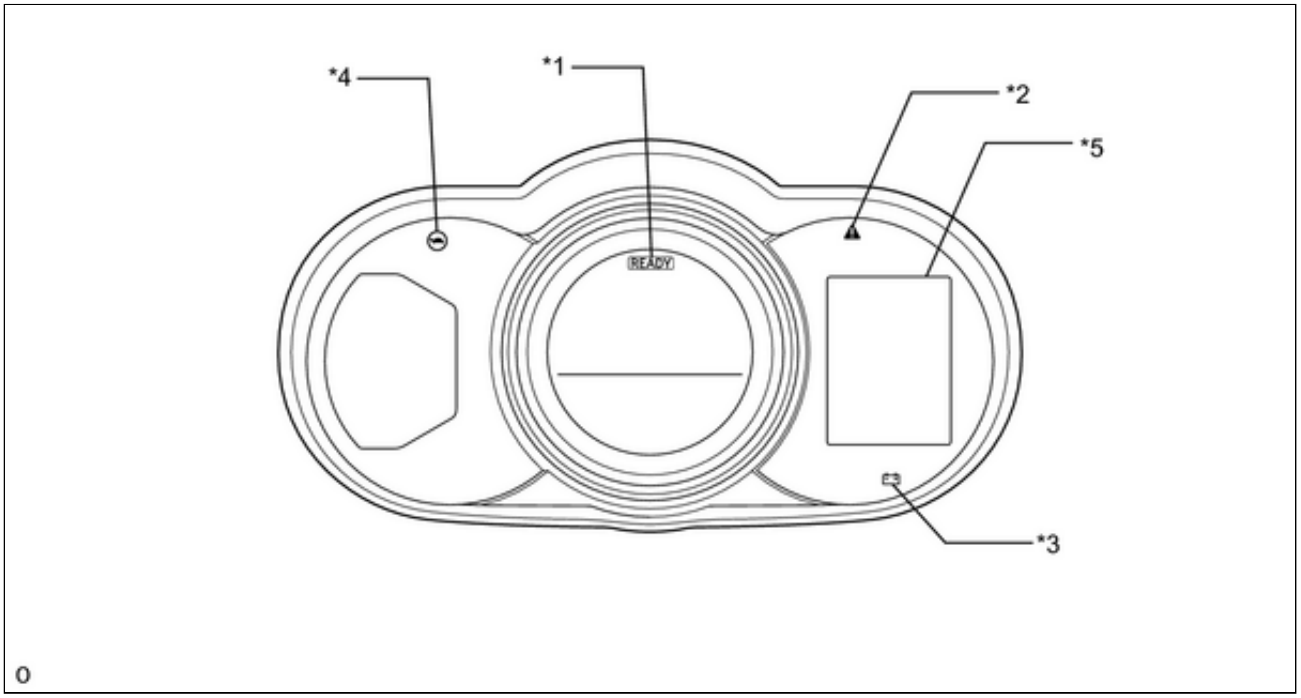
(n) When installing EV control system components such as the EV battery, make sure that the

polarity of all connections is correct.

3. PRECAUTIONS TO BE OBSERVED WHEN INSPECTING OR SERVICING MOTOR COMPARTMENT

(a) If the READY light on the instrument panel is illuminated, make sure to turn the power switch off (IG) (the indicator above the power switch and the READY light on the instrument panel are turned off) before inspecting and maintaining the motor compartment to ensure that the vehicle can be driven.

4. ACTIONS TO BE TAKEN WHEN A WARNING LIGHT IS ILLUMINATED



Text in Illustration

*1	READY Light	*2	Master Warning Light
*3	Charge Warning Light	*4	Output control warning light
*5	Multi-information Display	-	-

(a) If one of the warning lights (2) to (4) illuminates, connect the Techstream to the DLC3 to check the DTCs (Diagnostic Trouble Codes). Then, refer to the applicable troubleshooting steps in this manual to inspect and repair the affected area. The foregoing actions are also required if the READY light does not illuminate when attempting to turn the power switch on (READY).

INDICATOR LIGHT	VEHICLE CONDITION
(1) READY (TO DRIVE)	Illuminates when the power switch is turned on (READY), indicating that the vehicle is ready to be driven.
(2) Master Warning Light	Depending on the warning, the master warning light comes on or flashes to indicate that a warning is currently being displayed on the multi-information display. Depending on the warning, the buzzer may also sound. When any malfunction occurs in the EV system or EV battery system, the master warning light comes on or flashes along with a buzzer, and a warning, "CHECK EV SYSTEM", is displayed on the multi-information display
(3) Charge	Illuminates when there is a malfunction in the charging system.

Warning Light	(Be sure to check the DTC (Diagnostic Trouble Code) if this light illuminates together with the master warning light.)
(4) Output control warning light	Illuminates when output from the traction battery is restricted or stopped in accordance with the EV system control.

5. ACTIONS TO BE TAKEN WHEN BATTERIES ARE DISCHARGED

HINT:

This vehicle uses a 12 V auxiliary and a EV battery. Therefore, there are 2 recharging methods when the batteries are discharged.

(a) Perform this procedure when the auxiliary battery is fully discharged.

HINT:

The following problems indicate that the auxiliary battery is discharged:

- No display appears on the instrument panel when the power switch is turned on (IG).
- The EV system does not start.
- The headlights are dim.
- The sound from the horn is weak.
- Park (P) cannot be disengaged.

NOTICE:

Never use a quick charger.

(1) Engage the parking brake.

(2) Turn the power switch off and remove the key from the interior detection area.

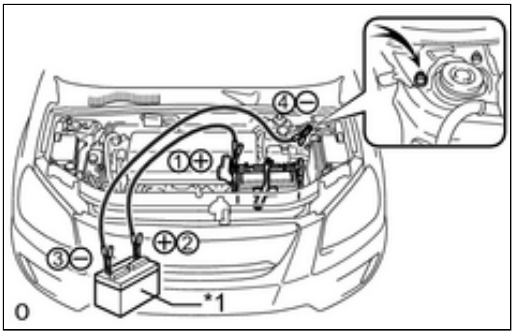
(3) Using booster cables, connect the 12 V battery of the rescue vehicle and the auxiliary battery of the stalled vehicle as shown in the illustration.

HINT:

Use the booster terminal in the motor compartment.

Text in Illustration

*1	Battery of rescue vehicle



CONNECTING SEQUENCE	CONNECTING LOCATION
1	Positive auxiliary battery of stalled vehicle
2	Positive 12 V battery terminal of rescue vehicle
3	Negative 12 V battery terminal of rescue vehicle
4	Position shown in the illustration on stalled vehicle

(4) Start the engine of the rescue vehicle and run the engine at a speed slightly higher than

usual.

(5) Turn the power switch on (READY).

NOTICE:

Immediately disconnect the booster cables in the reverse order of connection after the EV system has started. Do not leave the booster cables connected because they are not designed for recharging purposes.

If the EV system fails to start and the EV battery warning is displayed, the EV battery may be discharged.

(b) When the EV battery is discharged:

(1) Using the electric vehicle charger cable assembly, charge the EV battery.

A buzzer sounds and a warning message is shown on the multi-information display.

HINT:

Perform this operation when the EV battery is discharged or low, or if "Very Low Battery Charge Immediately" is displayed.

6. ACTIONS TO BE TAKEN FOR VEHICLES DAMAGED BY IMPACT

CAUTION:

This vehicle has an EV control system that operates at voltages of 386 V. An organic electrolyte containing carbonic acid esters as its main component is used as the electrolyte for the EV battery. Be sure to follow the instructions in this manual to handle the system correctly. Failure to do so may result in serious injury or electrocution.

(a) Items to be prepared for the accident site

- Protective clothing (insulated gloves, rubber gloves, goggles, organic solvent mask, safety shoes and solvent resistant apron (for organic solvent))
- Soap
- ABC fire extinguisher (effective against both oil flames and electrical flames)
- A shop rag or piece of cloth (for wiping off the electrolyte)
- Insulating tape (for insulating cables)
- Electrical tester

(b) Actions to be taken at the accident site

CAUTION:

- Do not touch any bare cables that may have high-voltage. If a cable must be touched or if accidental contact is possible, wear insulated gloves and insulate the cable using insulating tape.
- If the vehicle catches on fire, use an ABC fire extinguisher to extinguish the fire. Trying to extinguish a fire using only a small amount of water can be more dangerous than effective. Use a substantial amount of water or wait for firefighters.
- Visually check the EV battery and the immediate area for any electrolyte leakage. Do not touch any leaked liquid because it could be organic electrolyte that contains carbonic acid esters.
- The electrolyte is flammable. Keep all ignition sources such as open flame and hot objects away from the electrolyte.
- Electrolyte leaks may cause acute poisoning if a high concentration of the vapor from the organic solvent is inhaled. In case of inhalation, move the affected person to a place with ample fresh air and let them lie quietly. Seek medical care.
- If the vehicle is immersed in water, do not touch any high-voltage components or cables including service plug grips. This is to prevent a shock hazard. Work on the vehicle only after the vehicle has been pulled out of the water.
- In case of skin contact with the electrolyte, wash the area thoroughly with soap and plenty of water, and seek medical care. Immediately remove any contaminated clothing. Prolonged contact with the electrolyte may cause skin irritation.
- If the electrolyte comes in contact with your eyes, call out loudly for help. Do not rub your eyes. Immediately flush them with a large amount of water for at least 15 minutes and seek medical

care.

- If electrolyte is swallowed, seek medical care immediately. Do not induce vomiting, unless instructed by the doctor.

(1) Check the vicinity of the EV battery for any leakage of the electrolyte.

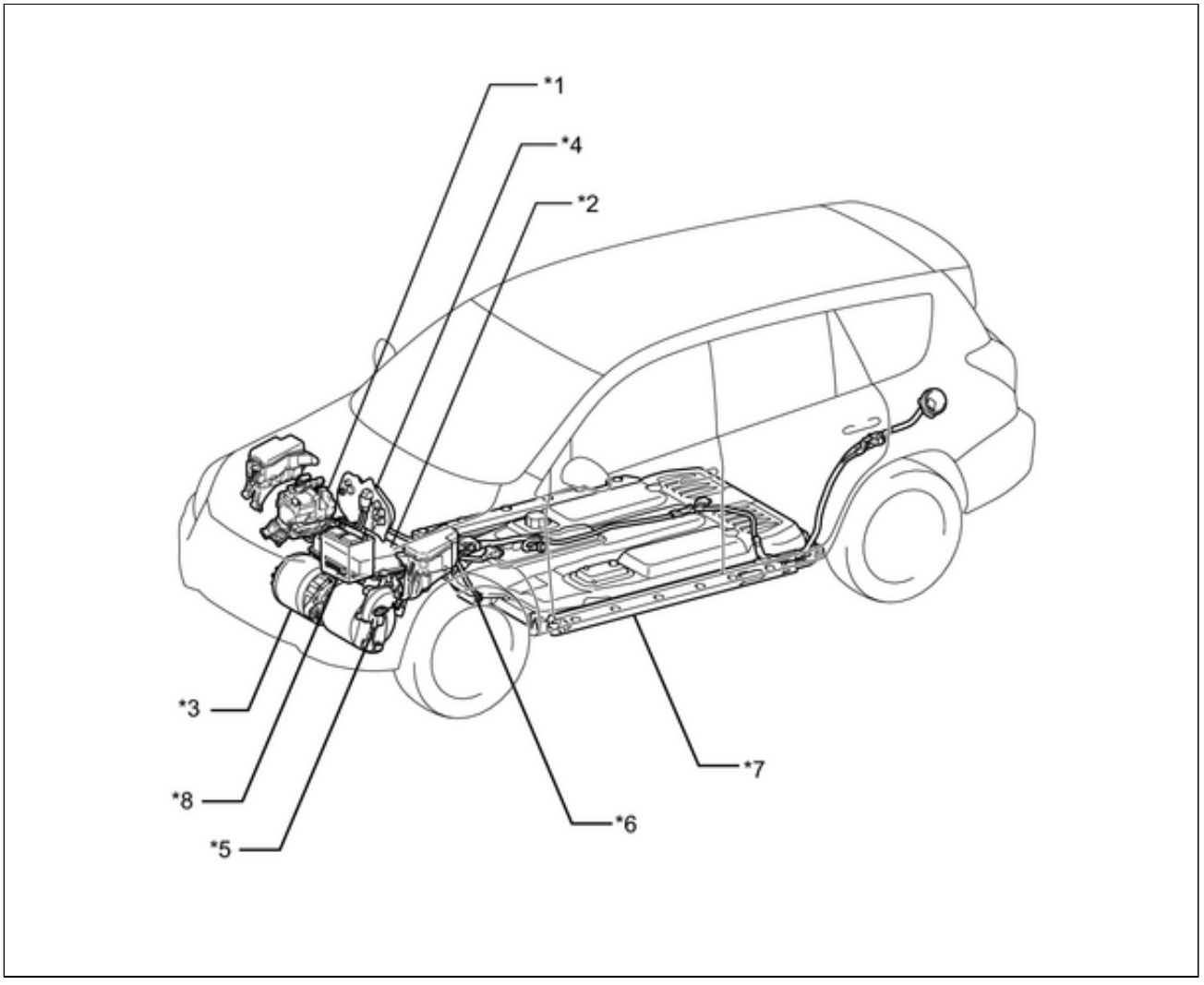
CAUTION:

Do not touch any leaked liquid because it could be the organic electrolyte that contains carbonic acid esters. If contact is unavoidable, wipe the fluid off using a cloth while wearing rubber gloves, goggles and an organic solvent mask. Do not leave electrolyte-contaminated cloths unattended. Place contaminated cloths in an appropriate airtight container and dispose of them according to local regulations.

(2) If damage to any of the high-voltage components and cables is suspected, cut the high-voltage circuit using the following procedure.

CAUTION:

Be sure to wear insulated gloves, goggles and safety shoes.



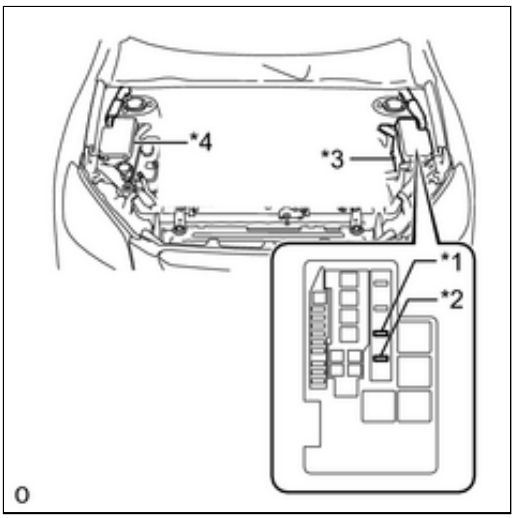
Text in Illustration

*1	Compressor Assembly With Bracket	*2	Electric Vehicle Charger Assembly
*3	Electric Vehicle Traction Motor assembly	*4	DC/DC Converter Assembly
*5	Motor Cable	*6	Charge cable
*7	Electric Vehicle Battery Assembly	*8	Auxiliary Battery

(3) Turn the power switch off.

HINT:

- If the power switch cannot be turned off, remove the IG2 fuse and CONTACTOR fuse from the No. 1 Motor Compartment Room Relay Block and Junction Block Assembly. Confirm that the READY light is off.
- If the READY light remains on even after conducting the above procedure, remove all the fuses of the No. 1 motor compartment room relay block and junction block assembly and the No. 2 motor compartment room relay block and junction block assembly.



Text in Illustration

*1	IG2 Fuse
*2	CONTACTOR Fuse
*3	No. 1 Motor Compartment Room Relay Block and Junction Block Assembly
*4	No. 2 Motor Compartment Room Relay Block and Junction Block Assembly

(4) Disconnect the cable from the negative (-) auxiliary battery terminal.

(5) Wear insulated gloves, and then remove the service plug grip.

NOTICE:

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

(c) Moving the damaged vehicle

If any of the following conditions is met, tow the vehicle away using a tow truck.

NOTICE:

When towing the vehicle, refer to the "PRECAUTIONS FOR TOWING FRONT WHEEL DRIVE VEHICLES".

- One or more of the high-voltage components and cables are damaged.
- Components related to driving, the transaxle, or the battery system are damaged.
- The master warning light is on.
- The READY light does not come on when attempting to turn the power switch on (READY).

CAUTION:

Before towing the vehicle away using a tow truck, disconnect the cable from the negative (-) auxiliary battery terminal and remove the service plug grip.

NOTICE:

Perform the procedure below if the master warning light turns on, or there are abnormal noises, unusual smells, or strong vibrations while driving:

(1) Park the vehicle in a safe place.

(2) Apply the parking brake, and then push the P position switch.

(3) Turn the power switch off, and disconnect the cable from the negative (-) auxiliary battery terminal.

(4) Remove the service plug grip while wearing insulated gloves.

(d) Actions required after moving the damaged vehicle

(1) Procedure

If there is liquid on the floor, it could be organic electrolyte containing carbonic acid esters. Wipe the liquid away while wearing rubber gloves, goggles and an organic solvent mask. Do not leave electrolyte-contaminated cloths unattended. Place contaminated cloths in an appropriate airtight container and dispose of them according to local regulations.

(e) Items to be prepared (when repairing a damaged vehicle)

- Protective clothing (insulated gloves, rubber gloves, goggles, organic solvent mask, safety shoes and solvent resistant apron (for organic solvent))
- Soap
- ABC fire extinguisher (effective against both oil flames and electrical flames)
- A shop rag or piece of cloth (for wiping off the electrolyte)
- Insulating tape (for insulating cables)
- Electrical tester

(f) Precautions to be observed when servicing a damaged vehicle

CAUTION:

Always follow instructions to ensure safety.

CAUTION:

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

(1) Wear insulated or rubber gloves, goggles, and safety shoes.

(2) Check the EV battery and immediate area for any electrolyte leakage.

CAUTION:

Do not touch any leaked liquid because it could be the organic electrolyte that contains carbonic acid esters. If contact is unavoidable, wipe the fluid off using a cloth while wearing rubber gloves, goggles and an organic solvent mask. Do not leave electrolyte-contaminated cloths unattended. Place contaminated cloths in an appropriate airtight container and dispose of them according to local regulations.

(3) Do not touch any bare cables that could be high voltage cables. If a cable must be touched or if accidental contact is possible, follow the following instructions: 1) wear insulated gloves and goggles, 2) measure the voltage between the cable and body ground using an electrical tester, and 3) insulate the cable using insulating tape.

(4) If damage to any of the high-voltage components and cables is suspected, cut the high-voltage circuit using the procedure below.

CAUTION:

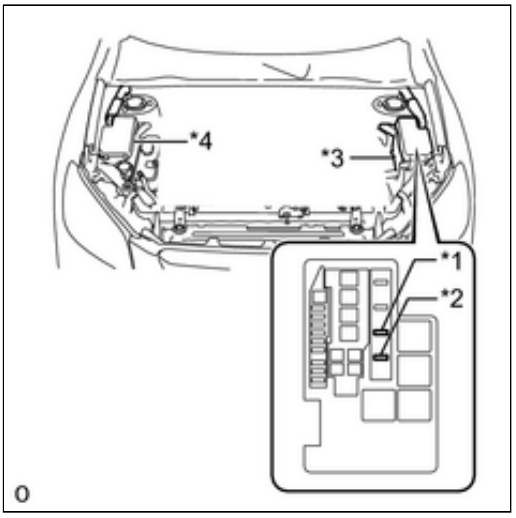
Do not touch any bare cables that may have high-voltage. If a cable must be touched or if

accidental contact is possible, wear insulated gloves and insulate the cable using insulating tape.

(5) Turn the power switch off.

HINT:

- If the power switch cannot be turned off, remove the IG2 fuse and CONTACTOR fuse from the No. 1 Motor Compartment Room Relay Block and Junction Block Assembly. Confirm that the READY light is off.
- If the READY light remains on even after conducting the above procedure, remove all the fuses of the No. 1 motor compartment room relay block and junction block assembly and the No. 2 motor compartment room relay block and junction block assembly.



Text in Illustration

*1	IG2 Fuse
*2	CONTACTOR Fuse
*3	No. 1 Motor Compartment Room Relay Block and Junction Block Assembly
*4	No. 2 Motor Compartment Room Relay Block and Junction Block Assembly

(6) Disconnect the cable from the negative (-) auxiliary battery terminal.

(7) Wear insulated gloves, and then remove the service plug.

NOTICE:

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

(g) Precautions to be taken when disposing of an EV battery

(1) When disposing of an EV battery, make sure to return it through an authorized collection agent who is capable of handling it safely. If the EV battery is returned via the manufacturer specified route, it will be returned properly and in a safe manner by an authorized collection agent.

CAUTION:

- Accidents such as electric shock may result if the EV battery is disposed of improperly or abandoned. Therefore, make sure to return all EV batteries through an authorized collection agent.
- After removing the EV battery, keep it away from water. Exposure to water may cause the EV battery to produce heat, resulting in a fire.

(h) Precautions to be observed when towing

(1) Tow the damaged vehicle with its front and rear wheels lifted off the ground.

CAUTION:

Towing the damaged vehicle with its front wheels on the ground will cause the motor to generate electricity. This electricity could, depending on the nature of the damage, leak and cause a fire.

(i) Towing with the 4 wheels on the ground

CAUTION:

- If the vehicle needs to be towed using a rope with all 4 wheels on the ground, do not exceed 30 km/h (19 mph) and tow only for a short distance and then have the vehicle towed by a truck.
- Turn the power switch on (IG), move the shift lever to N and confirm that neutral (N) has been selected.
- Make sure not to turn the power switch off while the vehicle is being towed. Park (P) may be selected, while being towed can result in damage or an accident.
- If any abnormality is present in the damaged vehicle while towing, stop towing immediately.

HINT:

- Neutral (N) cannot be selected if the auxiliary battery is disconnected.
- There is a possibility that neutral (N) cannot be selected when parts related to the transmission control ECU have a malfunction.

7. FOR VEHICLES EQUIPPED WITH SRS AIRBAG AND SEAT BELT PRETENSIONER

CAUTION:

- This vehicle is equipped with a Supplemental Restraint System (SRS), which consists of a horn button, instrument panel passenger airbag, curtain shield airbag, front seat airbag, front seat outer belt, No. 1 wiring circuit breaker, center airbag sensor assembly, front airbag sensor, side airbag sensor, rear airbag sensor, seat position airbag sensor and occupant detection ECU. Failure to carry out service procedures in the correct sequence could cause SRS parts to unexpectedly deploy and possibly lead to serious injuries. Furthermore, if a mistake is made when servicing SRS parts, they may fail to operate when required. Before performing servicing (including installation/removal, inspection and replacement of parts), be sure to read the following precautions.
- Before starting work, wait at least 90 seconds after the power switch is turned off and after the cable is disconnected from the negative (-) auxiliary battery terminal (SRS parts are equipped with a backup power source. If work is started within 90 seconds of turning the power switch off and disconnecting the cable from the negative (-) auxiliary battery terminal, SRS parts may deploy).
- Do not expose SRS parts directly to hot air or flames.
- Be sure to perform initialization of the occupant detection ECU under any of the following conditions. If initialization is not performed, the SRS may not operate properly.

    a. The occupant detection ECU is replaced.
    b. Accessories (seatback tray, seat cover, etc.) are installed to the vehicle.
    c. The passenger seat is removed from the vehicle, and then reinstalled or replaced.
    d. The passenger airbag ON/OFF indicator light (OFF) comes on when the passenger seat is not occupied.
    e. The vehicle is brought to a workshop for repair due to an accident or collision.

NOTICE:

- Malfunction symptoms of SRS parts are difficult to confirm. DTCs are the most important source of information when troubleshooting. During troubleshooting, always confirm DTCs before disconnecting the cable from the negative (-) auxiliary battery terminal.
- For minor collisions where SRS parts do not deploy, always inspect the SRS parts.
- Before performing repairs, remove the airbag sensors if any kind of impact is likely to occur to an airbag sensor during repairs.
- Never use SRS parts from another vehicle. When replacing SRS parts, replace them with new ones.
- Never disassemble or attempt to repair SRS parts.
- If an SRS part has been dropped, or if there are any cracks, dents or other defects in the case, bracket or connector, replace the SRS part with a new one.
- Use an ohmmeter/voltmeter with high impedance (10 kΩ/V minimum) for troubleshooting the electrical circuits.
- Information labels are attached to the periphery of SRS parts. Follow the cautions and instructions on the labels.
- After work on the SRS is completed, perform the SRS warning light check.
- When the cable is disconnected from the negative (-) auxiliary battery terminal, the memory settings of each system are cleared. Because of this, be sure to write down the settings of each system before starting work. When work is finished, reset the settings of each system as before. Never use a backup power supply from outside the vehicle to avoid clearing the memory in a system.
- If the vehicle is equipped with a mobile communication system, refer to the Precaution in the

Introduction section.

- After turning the power switch off, waiting time may be required before disconnecting the cable from the negative (-) auxiliary battery terminal. Therefore, make sure to read the disconnecting the cable from the negative (-) auxiliary battery terminal notices before proceeding with work.
- When disconnecting the cable from the negative (-) auxiliary battery terminal while performing repairs, some systems need to be initialized after the cable is reconnected.
- When airbags are deployed in an accident, the No. 1 wiring circuit breaker assembly activates to cut the EV battery connector power. Also, replace the No. 1 wiring circuit breaker assembly behind the navigation unit.

HINT:

- Inspect the connector holder (No. 1 wiring circuit breaker assembly), and replace it if there is any damage even if the vehicle has not been in an accident.
- In the airbag system, the center airbag sensor assembly, front airbag sensor LH and RH, side airbag sensor LH and RH and rear airbag sensor LH and RH are collectively referred to as the airbag sensors.

(a) SPIRAL CABLE

(1) The steering wheel must be fitted correctly to the steering column with the spiral cable at the neutral position, as cable disconnection and other problems may occur. Refer to the information about correct installation of the steering wheel.

(b) AIRBAG ASSEMBLY

(1) Airbag assembly with pad:

Always place a removed or new airbag assembly with the pad surface facing upward. Placing the airbag assembly with the airbag inflation direction facing downward could cause a serious accident if the airbag inflates. Also, do not place anything on top of the airbag assembly.

(2) Never measure the resistance of the airbag squib. This may cause the airbag to inflate, which could cause a serious injury.

(3) Grease or detergents of any kind should not be applied to the airbag assembly.

(4) Store the airbag assembly in an area where the ambient temperature is below 93°C (199°F), the humidity is not high and there is no electrical noise.

(5) When using electric welding anywhere on the vehicle, disconnect the center airbag sensor connectors. These connectors contain shorting springs. This feature reduces the possibility of the airbag deploying due to currents entering the squib wiring.

(6) When disposing of the vehicle or the airbag assembly by itself, the airbag should be deployed using SST before disposal. Activate the airbag in a safe place away from electrical noise.

(c) SEAT OUTER BELT ASSEMBLY WITH PRETENSIONER

(1) Never measure the resistance of the seat outer belt. This may cause the pretensioner of the seat outer belt to activate, which could cause a serious injury.

(2) Never install the seat outer belt on another vehicle.

(3) Store the seat outer belt in an area where the ambient temperature is below 80°C (176°F), the humidity is not high and there is no electrical noise.

(4) When using electric welding anywhere on the vehicle, disconnect the center airbag sensor connectors (2 pins). These connectors contain shorting springs. This feature reduces the possibility of the pretensioner deploying due to currents entering the squib wiring.

(5) When disposing of a vehicle or the seat outer belt by itself, the pretensioner should be activated before disposal. Activate the pretensioner in a safe place away from electrical noise.

(6) As the seat outer belt is hot after the pretensioner is activated, allow some time for it to

cool down sufficiently before disposal. Never apply water to try to cool down the seat outer belt.

(7) Grease, detergents, oil or water should not be applied to the seat outer belt.

(d) AIRBAG SENSOR ASSEMBLY

(1) Never reuse an airbag sensor assembly that has been involved in a collision where the SRS has deployed.

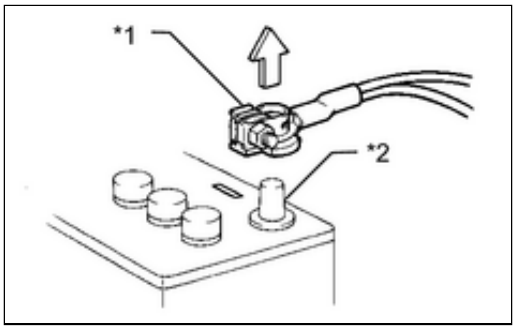
(2) The connectors to the airbag sensor assembly should be connected or disconnected with the sensor placed on the floor. If the connectors are connected or disconnected while the airbag sensor assembly is not placed on the floor, the SRS may activate.

(3) Work must be started at least 90 seconds after the power switch is turned off and the cable is disconnected from the negative (-) auxiliary battery terminal, even if only loosening the set bolts of the airbag sensor assembly.

(e) WIRE HARNESS AND CONNECTOR

(1) The SRS wire harness is integrated with the instrument panel wire harness assembly. All the connectors in the system are yellow. If the SRS wire harness becomes disconnected or the connector becomes broken, repair or replace it.

8. ELECTRONIC CONTROL



Text in Illustration

*1	Cable
*2	Negative (-) Auxiliary Battery Terminal

NOTICE:

- Certain systems need to be initialized after disconnecting and reconnecting the cable from the negative (-) auxiliary battery terminal.
- After the power switch is turned off, the navigation receiver assembly records various types of memory and settings. As a result, after turning the power switch off, be sure to wait for the time specified in the following table before disconnecting the cable from the negative (-) auxiliary battery terminal.

Waiting Time before Disconnecting Cable from Negative (-) Auxiliary Battery Terminal

CONDITION	WAITING TIME
Vehicle enrolled in safety connected system	6 minutes
Vehicle not enrolled in safety connected system	1 minute

- If the auxiliary battery has been disconnected, it is necessary to re-initialize XM Sports and XM Stocks services. Move the vehicle to an area with good GPS reception (open view of the sky, GPS icon shown on map screen), turn the power switch on (ACC) to initialize XM Sports and XM Stocks services (only available if XM Radio is active). Additionally, XM Sports and XM Stocks data services can take several minutes to update after each time the power switch is turned to ACC.

(a) DISCONNECTING AND RECONNECTING NEGATIVE AUXILIARY BATTERY CABLE

(1) Before performing work on electronic components, disconnect the cable from the negative (-) auxiliary battery terminal to prevent damage to the electrical system or components.

(2) When disconnecting the cable, turn the power switch and headlight switch off and loosen the cable nut completely. Perform these operations without twisting or prying the cable. Then disconnect the cable.

(3) Clock settings, radio settings, audio system memory, DTCs and other data will be cleared when the cable is disconnected from the negative (-) auxiliary battery terminal. Write down any necessary data before disconnecting the cable.

(b) HANDLING OF ELECTRONIC PARTS

Text in Illustration

*a	INCORRECT

(1) Do not open the cover or case of the ECU unless absolutely necessary. If the IC terminals are touched, the IC may be rendered inoperative by static electricity.

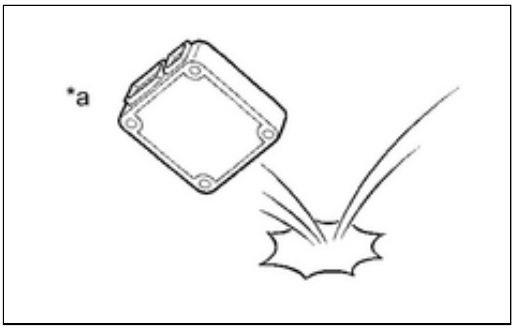
(2) Do not pull on the wires when disconnecting electronic connectors. Pull on the connector itself.

(3) Do not drop electronic components, such as sensors or relays. If they are dropped on a hard surface, they should be replaced.

(4) When cleaning the motor components with steam, protect the electronic components, air filter and emission-related components from water.

(5) Never use an impact wrench to remove or install temperature switches or temperature sensors.

(6) When measuring the resistance between terminals of a wire connector, insert the tester probe carefully to prevent the terminals from bending.



9. HANDLING OF HOSE CLAMPS

Text in Illustration

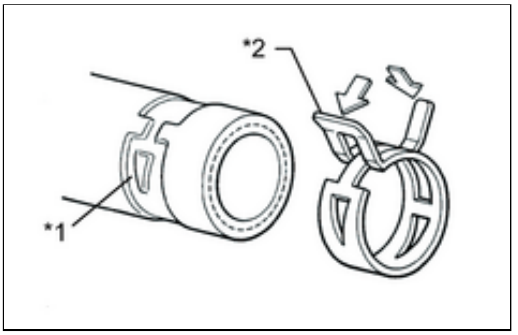
*1	Clamp Track
*2	Spring Type Clamp

(a) Before removing a hose, check the clamp position so that it can be reinstalled in the same position.

(b) Replace any deformed or dented clamps with new ones.

(c) When reusing a hose, attach the clamp on the clamp track portion of the hose.

(d) For a spring type clamp, it may be necessary to spread the tabs slightly after installation by pushing them in the direction of the arrows as shown in the illustration.



10. FOR VEHICLES EQUIPPED WITH MOBILE COMMUNICATION SYSTEMS

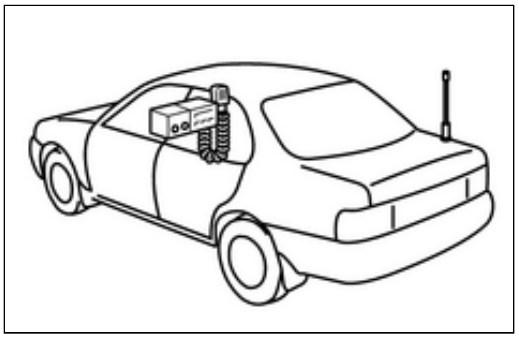
(a) Install the antenna as far away from the ECU and sensors of the vehicle electronic systems as possible.

(b) Install the antenna and feeder at least 20 cm (7.87 in.) away from the ECU and sensors of the vehicle electronic systems. For details about ECU and sensor locations, refer to the section on the applicable components.

(c) Keep the antenna and feeder separate from other wiring as much as possible. This will prevent signals sent from the communication equipment from affecting vehicle equipment and vice versa.

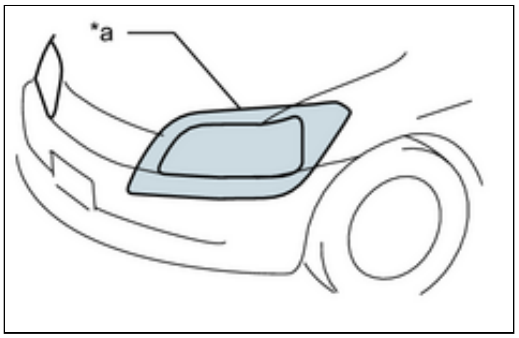
(d) Check that the antenna and feeder are correctly adjusted.

(e) Do not install a high-powered mobile communication system.



11. HEADLIGHT INSPECTION OR MAINTENANCE

(a) When the headlights are illuminated, do not cover the headlights for 3 minutes or more.



Text in Illustration

*a	Illumination for 3 minutes or more prohibited if covered

NOTICE:

As the headlight's outer lens is made of resin, the resulting heat created when covering the headlight for an extended period of time may deform the headlight.

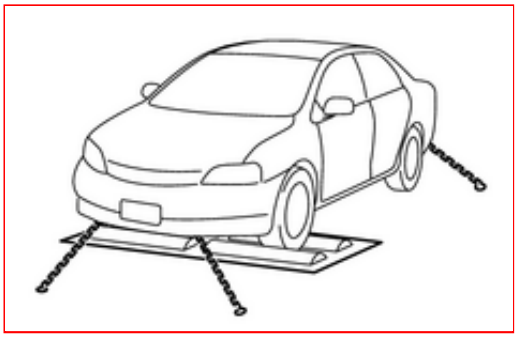
12. FOR VEHICLES EQUIPPED WITH TRACTION CONTROL (TRAC) AND VEHICLE STABILITY CONTROL (VSC) SYSTEMS

(a) NOTICES FOR WHEN TESTING WITH DRUM TESTER

(1) When testing with a drum tester such as a speedometer tester, a combination tester for the speedometer and brake or a chassis dynamometer, or when jacking up the front wheels and turning the wheels, perform the following procedure to enter Test Mode and stop the TRAC and VSC systems INFO .

CAUTION:

- If the vehicle is tested in normal mode on the tester, TRAC and VSC operation may cause the vehicle to jump off of the tester.



- Secure the vehicle with a lock chain for safety.
- The vehicle may move unexpectedly out of the dynamometer due to TRAC and VSC operations.

NOTICE:

After performing a check, never drive the vehicle without canceling test mode.

HINT:

- During test mode, the TRAC and VSC systems are disabled and slip indicator light is illuminated.
- Test mode is canceled when the power switch is turned off. As a result, if it is necessary to perform an inspection after the power switch has been turned off, perform the procedure again to re-enter test mode.

(b) NOTICES FOR VSC RELATED PROCEDURES

(1) For VSC related parts, adjustments are required after removal and installation. Therefore, perform removal and installation only when necessary.

(2) When performing VSC related procedures, be sure to strictly follow the preparation and completion procedures.

(3) When performing removal and installation or replacement of VSC related parts, first disconnect the cable from the negative (-) auxiliary battery terminal.

13. ELECTRONIC SHIFT LEVER SYSTEM

(a) BASIC OPERATION

(1) This vehicle is equipped with an electronic shift lever system. This system electrically communicates the driver's intended shift state to the ECUs responsible for system control. The system also uses an electrically operated transaxle parking lock mechanism.

HINT:

The parking lock mechanism of the transaxle cannot be operated if the auxiliary battery is discharged or has been disconnected. There is no mechanical connection between the P position switch (transmission shift main switch), shift lever and the transaxle.

(2) This system allows the driver to select the reverse (R), neutral (N), drive (D) and brake (B)* shift states using the shift lever or select park (P) by pushing the P position switch (transmission shift main switch). Shift states are ECU controlled based on the actions of the driver and various conditions. Shift states can be verified using the shift position indicator in the combination meter or by using the Techstream.

*: For enhanced regenerative braking.

14. WHEN INSPECTING VEHICLES

NOTICE:

When the vehicle is run in test mode for an operation such as a speedometer test, a DTC may be set. Therefore, if the warning light comes on, after canceling test mode, check for DTCs using the Techstream and clear the DTCs.

(a) VEHICLE CONDITIONS

(1) Activate the appropriate test mode and inspect the vehicle INFO .

HINT:

The following table indicates the mode appropriate for each test item. The shift state for each test is as follows:

The shift state for each test is as follows:

TEST ITEM	MODE	SHIFT STATE
1. Vehicle straight travelling test (side slip inspection)	Test mode or normal mode	D
2. Braking force test	Test mode	N
3. Speedometer test	Test mode	D
4. Headlight test	Normal mode	P

(2) Cancel test mode immediately after completion of inspection.

NOTICE:

Driving the vehicle without canceling test mode may damage the transaxle.

(b) WHEN USING A BRAKE TESTER

CAUTION:

Be sure to perform the test in test mode.

NOTICE:

- A high-speed type brake tester cannot be used.
- Vehicle speed should be less than 0.5 km/h (0.3 mph).
- Follow all usage and safety procedures in the operator's manual for the brake tester.

(1) Place the wheels to be tested (front or rear) onto the rollers.

(2) Start the EV system to allow normal brake booster operation.

(3) Move the shift lever to N and confirm that neutral (N) has been selected.

(4) Operate the brakes to perform the test.

(c) WHEN USING A SPEEDOMETER TESTER

CAUTION:

Be sure to perform the test in test mode.

NOTICE:

Do not perform rapid starting or quick acceleration on a speedometer tester. If rapid starting or quick acceleration is performed on a speedometer tester, damage may occur to the transaxle.

(1) Depress the accelerator pedal slowly and gradually accelerate the vehicle. Make a measurement.

(2) After the measurement, use the brakes to gradually decelerate the vehicle.

(d) WHEN USING A CHASSIS DYNAMOMETER

(1) Always set an appropriate load before starting the test.

NOTICE:

Sudden acceleration or deceleration of the vehicle on a chassis dynamometer under minimal load may damage the transaxle.

(e) WHEN USING AN ON-VEHICLE BALANCER

(1) Raise the vehicle until all 4 wheels are off the ground.

(2) Support the vehicle with safety stands at an appropriate height. Make sure that the vehicle

does not lean in any direction, and that the tires are completely clear of the floor.

(3) Place the vibration pick-up unit into position for the wheel to be measured*1.

HINT:

*1: Different on-vehicle wheel balancers have different requirements for mounting the vibration pick-up unit(s). Refer to the operator's manual for the wheel balancer to confirm requirements for use.

(4) Release the parking brake.

(5) Check that no dragging force exists when turning each wheel by hand.

(6) Put the wheel balancer in position.

(7) Wheel balance measurement should be done by using both the motor and the wheel balancer drive roller to spin the wheels.

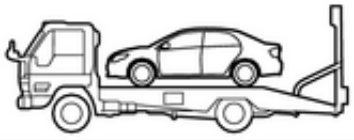
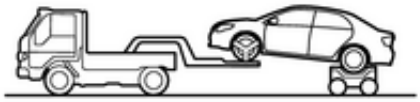
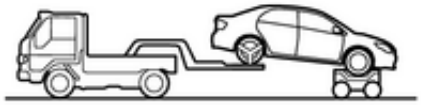
NOTICE:

- Be sure to perform the test in test mode.
- Start the EV system and then increase the vehicle speed gradually with drive (D) selected.
- Do not accelerate or decelerate suddenly.
- Deceleration should be done by braking gradually.
- Make sure that no one is standing in-line with the spinning wheels.
- Measurement should be done quickly.
- Confirm that the vehicle is securely immobilized.
- Follow all usage and safety procedures in the operator's manual for the wheel balancer.

15. PRECAUTIONS FOR TOWING FRONT WHEEL DRIVE VEHICLES

(a) Use one of the following methods to tow the vehicle.

(b) If the vehicle has trouble with the chassis or drivetrain, use method 1 (flatbed truck).

Towing Method \ Conditions	Parking Brake	Shift State
1. Flatbed Truck 	Applied	Any
2. Wheel Lift Type Truck From Front (using dollies)  From Rear (using dollies) 	Applied	Any
3. Wheel Lift Type Truck From Front (not using dollies) 	Released	P

NOTICE:

Do not use any towing method other than those shown above.

(c) If a tow truck is not available, in an emergency the vehicle may be temporarily towed using a cable or chain secured to the emergency towing eyelet(s). This should only be attempted on hard surfaced roads for short distances below 30 km/h (19 mph).

A driver must be in the vehicle to steer and operate the brakes. The vehicle's wheels, drivetrain, axles, steering and brakes must be in good condition.

NOTICE:

If the towing speed or distance exceeds the above limits, or the vehicle is towed in a backward direction with the front wheels on the ground, the transaxle may be damaged.

(1) Emergency towing procedure

1. Turn the power switch on (IG).
2. Depress the brake pedal, move the shift lever to N and confirm that neutral (N)

has been selected.

3. Release the parking brake.
4. Release the brake pedal slowly.

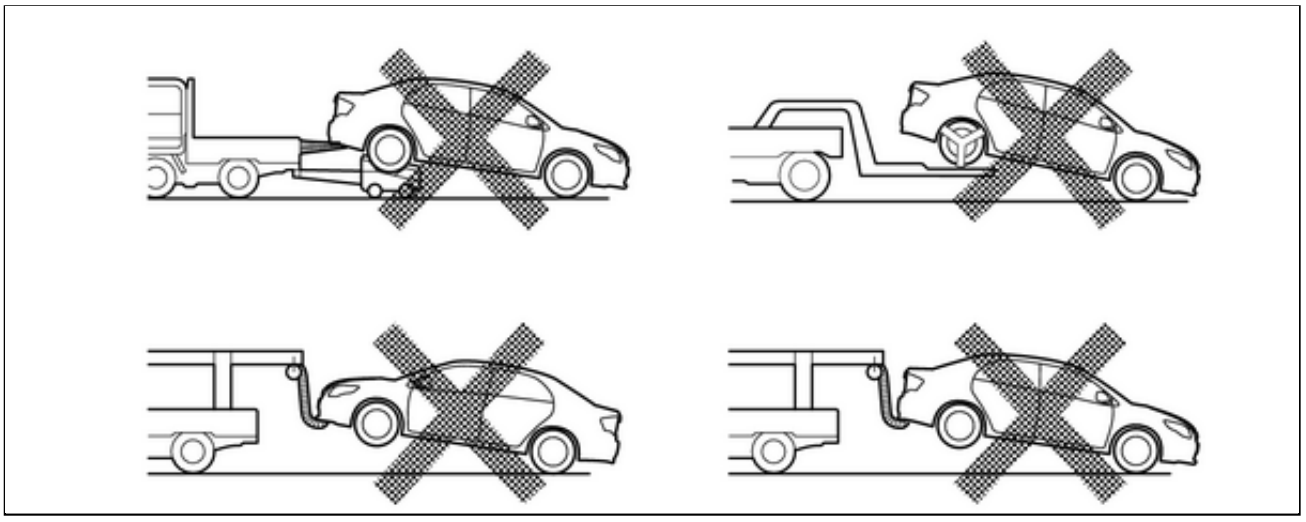
NOTICE:

- Use extreme caution when towing the vehicle. Avoid sudden starts or erratic driving maneuvers which place excessive stress on the emergency towing eyelet and the cables or chains.
- If the EV system is off, the power assist for the brakes and steering will not function, making steering and braking more difficult.
- Do not turn off the power switch. Turning off the power switch may result in engagement of the parking lock, resulting in a hazardous situation or accident.

HINT:

- Neutral (N) cannot be selected if the auxiliary battery is disconnected.
- There is a possibility that neutral (N) cannot be selected when parts related to the transmission control ECU have a malfunction.

(d) The towing methods shown below are dangerous and can damage the vehicle, so do not use them.



(1) Do not tow the vehicle facing rearward with the front wheels on the ground.

NOTICE:

- If the vehicle is towed facing rearward with the front wheels on the ground, the drivetrain may overheat and be damaged.
- In addition, if the vehicle is equipped with the VSC system, the system may apply the brakes to the rotating wheels.

(2) Do not use a sling-type towing method either from the front or rear.

NOTICE:

If a sling-type tow truck is used, damage may occur to the vehicle body.