

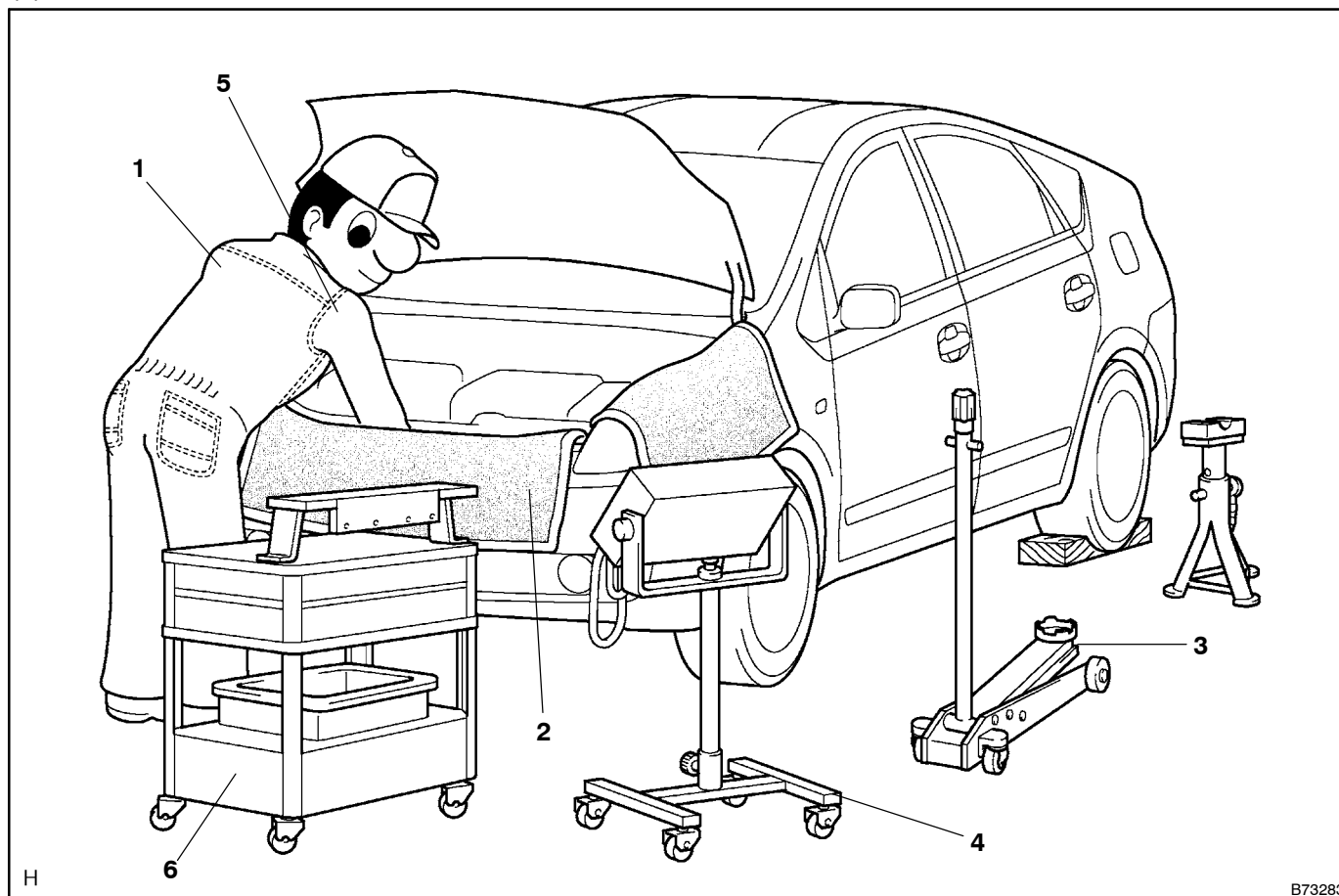
REPAIR INSTRUCTION

PRECAUTION

010R7-01

1. BASIC REPAIR HINT

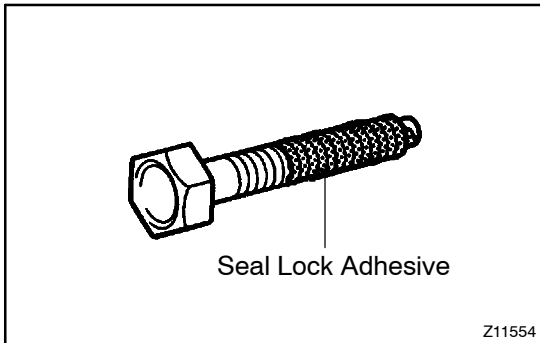
(a) HINTS ON OPERATIONS



1	Looks	<ul style="list-style-type: none"> • Always wear a clean uniform. • A hat and safety shoes must be worn.
2	Vehicle protection	<ul style="list-style-type: none"> • Prepare a grille cover, fender cover, seat cover and floor mat before starting repairs.
3	Safe operation	<ul style="list-style-type: none"> • When working with 2 or more persons, be sure to check safety for one another. • When working with the engine running, make sure to provide ventilation for exhaust fumes in the workshop. • 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 location with a safety stand. • When lifting up the vehicle, use appropriate safety equipment.
4	Preparation of tools and measuring gauge	<ul style="list-style-type: none"> • Before starting operation, prepare a tool stand, SST, gauge, oil, shop rag and parts for replacement.
5	Removal and installation, disassembly and assembly operations	<ul style="list-style-type: none"> • Diagnose with a thorough understanding of proper procedures and of the reported problem. • Before removing the parts, check the general condition of the assembly and for deformation and damage. • When the assembly is complicated, take notes. For example, note the total number of electrical connections, bolts, or hoses removed. Add matchmarks to insure re-assembly 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	<ul style="list-style-type: none"> • Place the removed parts in a separate box to avoid mixing them up with the new parts or contaminating the new parts. • For non-reusable parts such as a gasket, O-ring, and self-locking nut, replace them with new ones following the instructions in this manual. • Retain the removed parts for customer inspection, if requested.

(b) JACKING UP AND SUPPORTING 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 (see page 01-33).



(c) PRECOATED PARTS

- (1) Precoated parts are bolts and nuts that are coated with a seal lock adhesive at the factory.
- (2) If a precoated part is retightened, loosened or moved in anyway, it must be recoated with the specified adhesive.
- (3) When reusing precoated parts, clean off the old adhesive and dry the part with compressed air. Then apply new seal lock adhesive appropriate to the bolts and nuts.

NOTICE:

Perform the torque with the lower limit value of the torque tolerance.

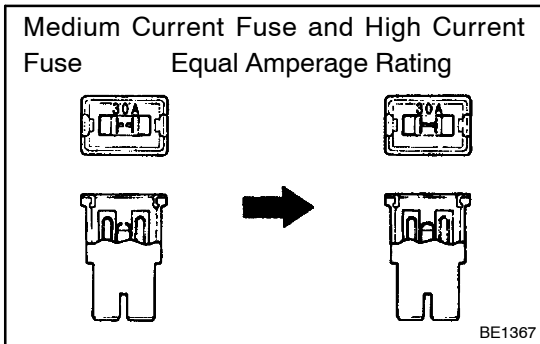
- (4) Some seal lock agents harden slowly. You may have to wait for the seal lock agent to harden.

(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 torques. Always use a torque wrench.



(f) FUSES

- (1) When replacing fuses, be sure that the new fuse has the correct amperage rating. DO NOT exceed the rating or use one with a lower rating.

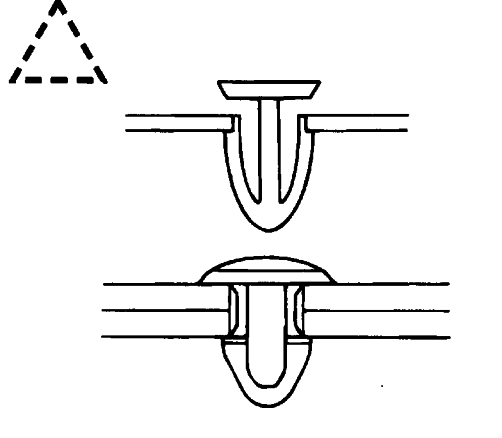
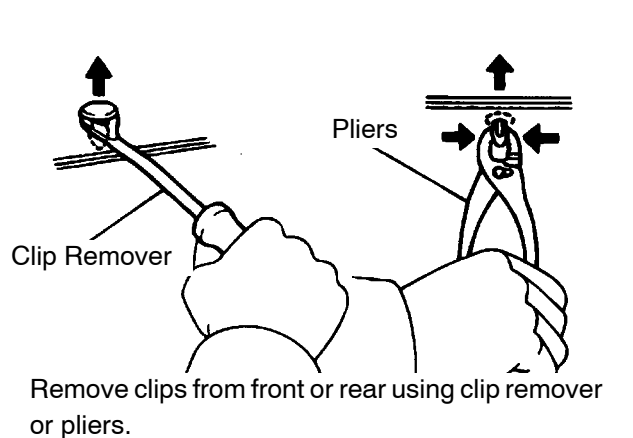
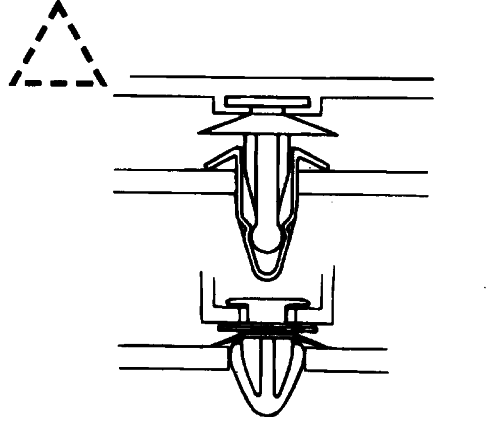
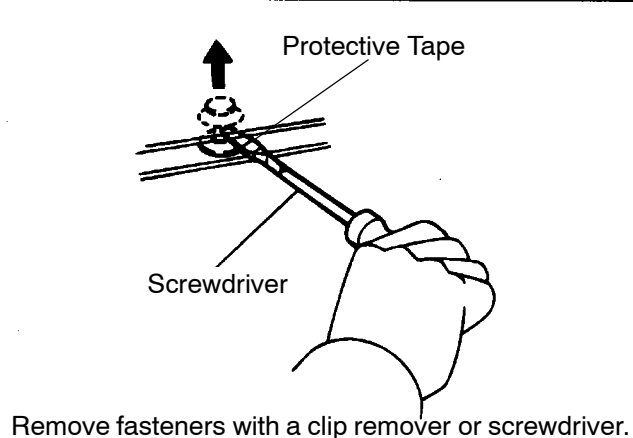
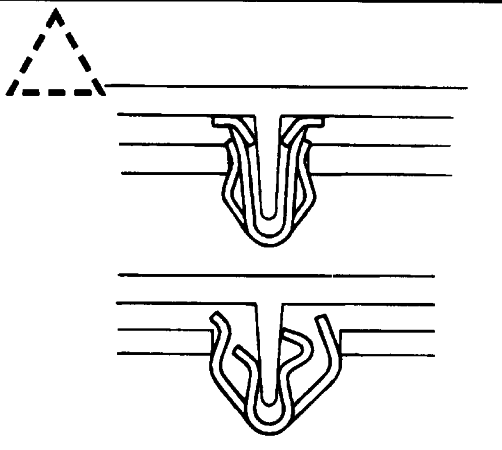
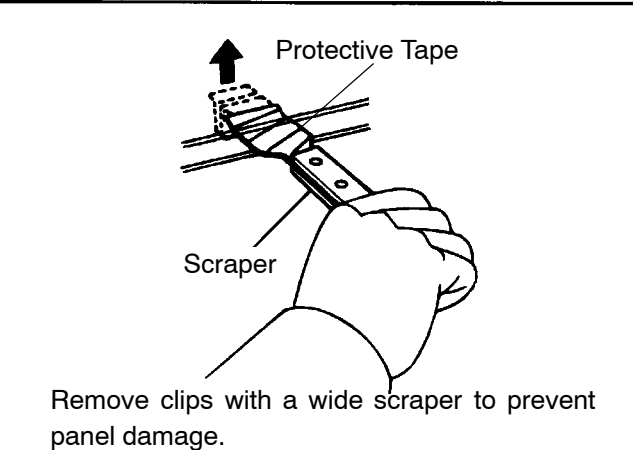
Illustration	Symbol	Part Name	Abbreviation
<p style="text-align: right;">BE5594</p>	<p style="text-align: right;">IN0365</p>	FUSE	FUSE
<p style="text-align: right;">BE5595</p>	<p style="text-align: right;">IN0366</p>	MEDIUM CURRENT FUSE	M-FUSE
<p style="text-align: right;">D27353</p>	<p style="text-align: right;">IN0367</p>	HIGH CURRENT FUSE	H-FUSE

(g) CLIPS

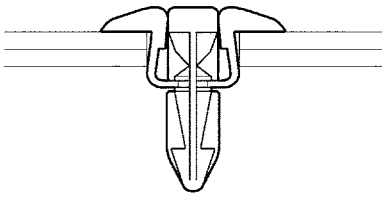
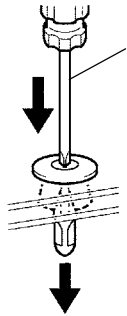
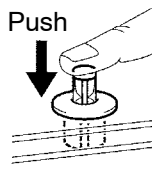
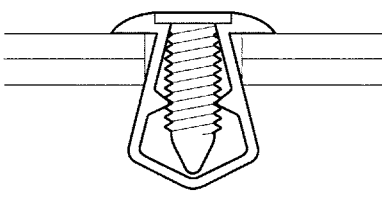
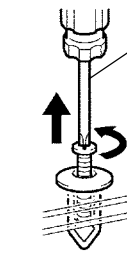
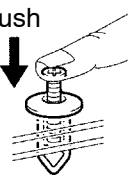
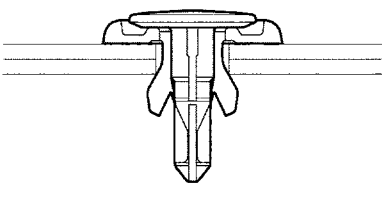
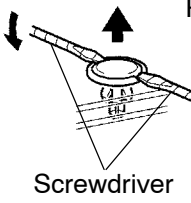
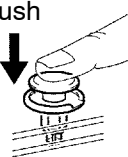
(1) The removal and installation methods of typical clips used in body parts are shown in the table below.

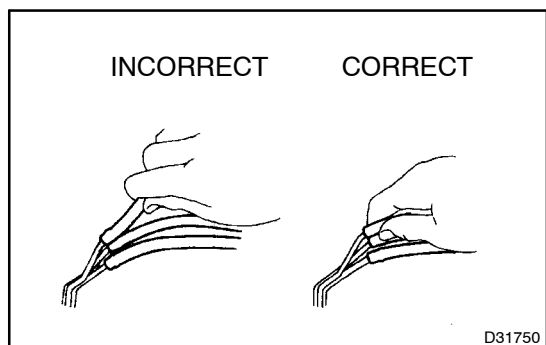
HINT:

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

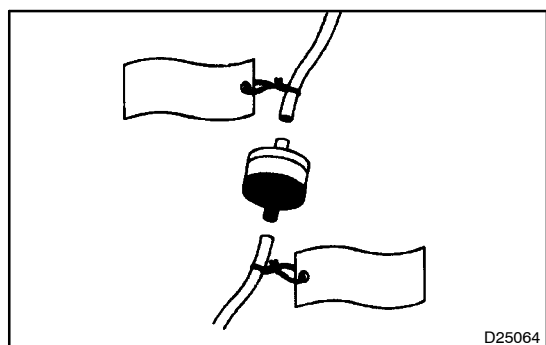
Shape (Example)	Removal/Installation
	 <p>Remove clips from front or rear using clip remover or pliers.</p>
	 <p>Remove fasteners with a clip remover or screwdriver.</p>
	 <p>Remove clips with a wide scraper to prevent panel damage.</p>

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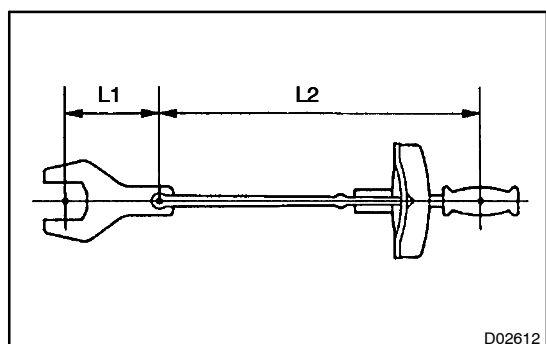
Shape (Example)	Removal/Installation	
	<p>Removal</p> 	<p>Installation</p>  <p>Remove rivet by pushing the center pin through and prying out the rivet shell.</p>
	<p>Removal</p> 	<p>Installation</p>  <p>Remove rivet by unscrewing the center pin and prying out the rivet shell.</p>
	<p>Removal</p> 	<p>Installation</p>  <p>Remove rivet by prying out the pin and then prying out the rivet shell.</p>



- (h) REMOVAL AND INSTALLATION OF VACUUM HOSES
- (1) To disconnect vacuum hoses, pull and twist from the end of the hose. Do not pull from the middle of the hose as this may cause damage.



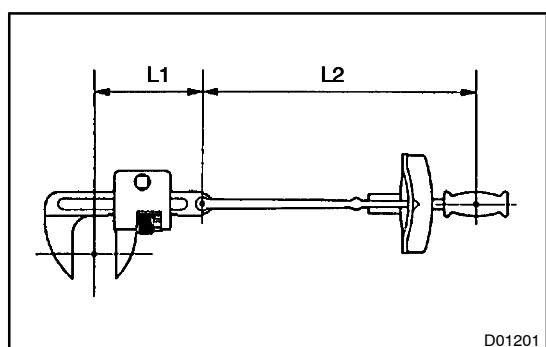
- (2) When disconnecting vacuum hoses, use tags to identify where they should be reconnected.
- (3) After completing the job, double check that the vacuum hoses are properly connected. The label under the hood shows the proper layout.
- (4) When using a vacuum gauge, never force the hose onto a connector that is too large. Use a step-down adapter for adjustment. Once a hose has been stretched, it may leak air.



- (i) TORQUE WHEN USING TORQUE WRENCH WITH EXTENSION TOOL

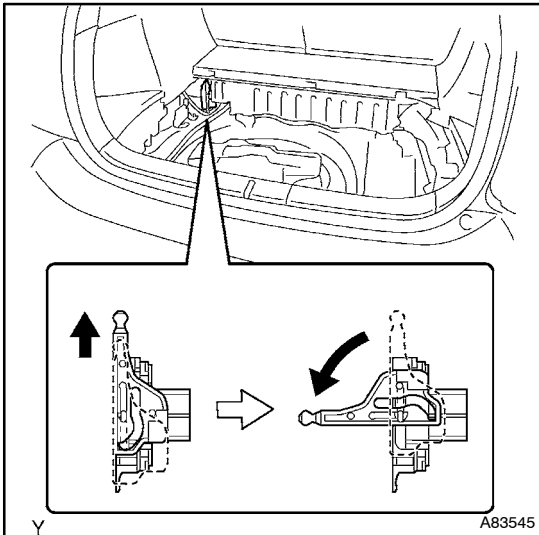
- (1) If SST or an extension tool is combined with the torque wrench to extend its length, do not tighten the torque wrench to the specified torque values in this manual. The resulting torque will be excessive.
- (2) Use the formula below to calculate special torque values for situations where SST or an extension tool is combined with the torque wrench.
- (3) Formula: $T' = T \times L2 / (L1 + L2)$

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)
L2	Length of torque wrench (cm)



2. PRECAUTIONS FOR HIGH-VOLTAGE CIRCUIT INSPECTION AND SERVICE

- (a) Engineer must undergo special training to be able to perform high-voltage system inspection and servicing.
- (b) All high-voltage wire harness connectors are colored orange. The HV battery and other high-voltage components have "High Voltage" caution labels. Do not carelessly touch these wires and components.

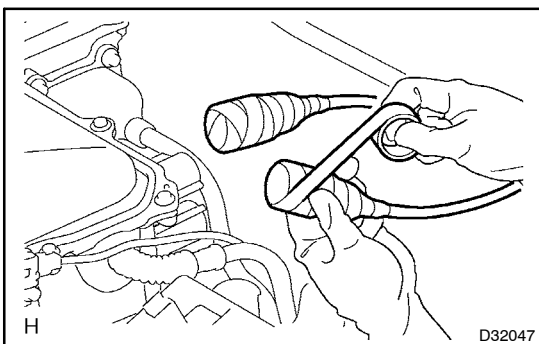
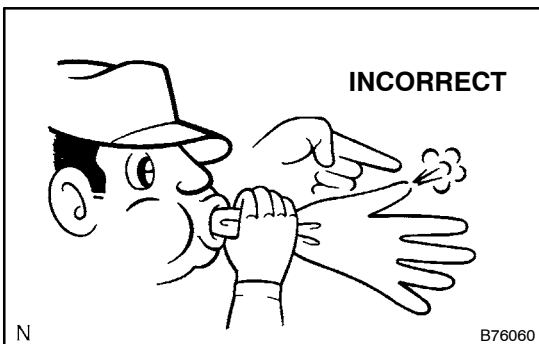


- (c) Before inspecting or servicing the high-voltage system, be sure to follow safety measures, such as wearing insulated gloves and removing the service plug to prevent electrocution. Carry the removed service plug in your pocket to prevent other technicians from reinstalling it while you are the servicing vehicle.
- (d) After removing the service plug, wait 5 minutes before touching any of the high-voltage connectors and terminals.

HINT:

5 minutes are required to discharge the high-voltage condenser inside the inverter.

- (e) Be sure to install the service plug before starting the hybrid system. Starting the hybrid system with the service plug removed may damage the vehicle.
- (f) Before wearing insulated gloves, make sure that they are not cracked, ruptured, torn, or damaged in any way. Do not wear wet insulated gloves.
- (g) When servicing the vehicle, do not carry metal objects like mechanical pencils or scales that can be dropped accidentally and cause a short circuit.
- (h) Before touching a bare high-voltage terminal, wear insulated gloves and use an electrical tester to ensure that the terminal is not charged with electricity (approximately 0 V).
- (i) After disconnecting or exposing a high-voltage connector or terminal, insulate it immediately using insulation tape.
- (j) The screw of a high-voltage terminal 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 DURING OPERATION" sign to notify other engineers that a high-voltage system is being inspected and/or repaired.
- (l) Do not place the battery upside down while removing and installing it.



- (m) 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 terminal screws are firmly tightened, and that the connectors are correctly connected.

Person in charge: _____

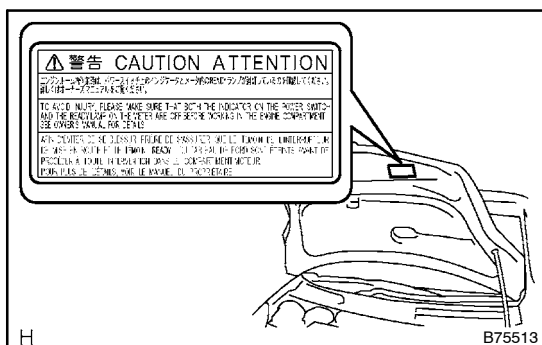
**CAUTION:
HIGH VOLTAGE. DO
NOT TOUCH DURING
OPERATION.**

**CAUTION:
HIGH VOLTAGE. DO
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OPERATION.**

Person in charge: _____

Copy this page and put it after folding on the roof of the vehicle in service.

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

The PRIUS automatically turns the engine ON and OFF when the READY light on the instrument panel is ON. To avoid injury, remove the key from the key slot before inspecting or servicing the engine compartment.

4. ACTIONS TO BE TAKEN WHEN BATTERIES ARE DEPLETED

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

HINT:

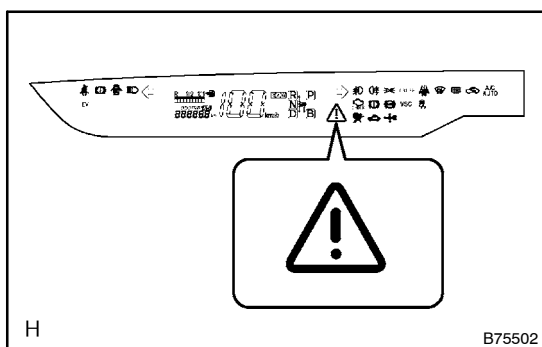
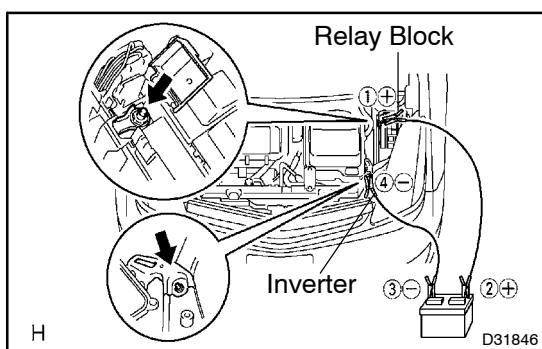
The following problems indicate that the auxiliary battery is depleted:

- No display appears on the instrument panel when.
- The hybrid system does not start.
- The headlights are dim.
- The sound from the horn is weak.

NOTICE:

Never use a quick charger.

- (1) Push the "P" position switch, and engage the parking brake.
- (2) Remove the key from the key slot.
- (3) Using a booster cable, connect the 12 V battery of the rescue vehicle and auxiliary battery of the stalled vehicle, as shown in the illustration.
- (4) Start the engine of the rescue vehicle and run the engine at a speed slightly higher than the idling speed for 5 minutes to charge the auxiliary battery of the stalled vehicle.
- (5) Depress the brake pedal and push the power switch to start the hybrid system.



If the hybrid system fails to start and the master lamp turns ON, the HV battery may be depleted.

- (6) Disconnect the booster cable in the reverse order of the connection procedure.

NOTICE:

If the auxiliary battery needs to be replaced, replace it only with a 12 V battery specially designed for use with the PRIUS.

- (b) Perform this procedure when the HV battery is depleted.

NOTICE:

Leaving the vehicle untouched for 2 to 3 months may deplete the HV battery. If the battery is fully depleted, replace the HV battery.

5. INSPECTION MODE

HINT:

- The PRIUS' engine automatically stops if the vehicle is stopped, the engine is warmed up, the battery is well charged, and A/C compressor operation is not being used. Activate inspection mode when continuous operation of the engine is required.
- The PRIUS has a motor TRC function. When the wheel speed of the front wheels exceeds that of rear wheels, the wheel speed of the front wheels is restrained. It is necessary to activate inspection mode and deactivate the motor TRC function when turning only the front wheels using a speedometer tester.

(a) Vehicle conditions

- (1) Before activating inspection mode, turn the air conditioning off, start the engine with the selector lever in the P position, and check that the engine stops within several seconds after starting (engine warm up check).
- (2) Activate inspection mode and inspect the vehicle. The shift position for each test is as follows:

Test item	Shift position	Inspection mode
1. Vehicle straight travelling test (side slip inspection)	D	ON or OFF
2. Breaking force test	N	ON or OFF
3. Speed meter test	D	ON
4. Exhaust gas test (idling)	P	ON
5. Headlight test	P	ON or OFF

- (3) Reset inspection mode immediately after completion of inspection.

NOTICE:

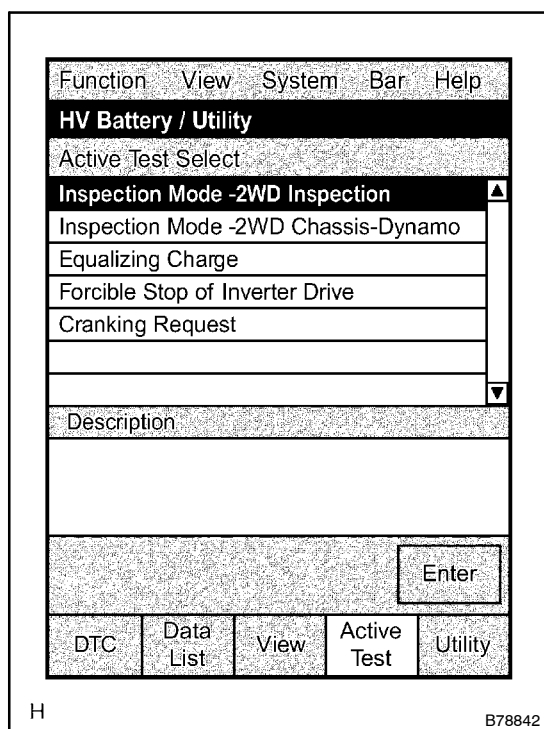
Driving the vehicle without resetting inspection mode may damage the transaxle.

- (b) Special notes for speedometer test

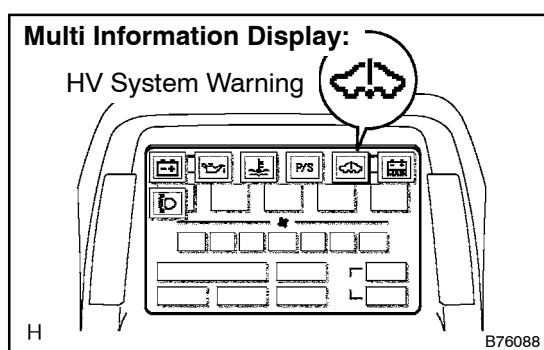
NOTICE:

Do not use the speedometer tester to perform rapid starting or quick acceleration/deceleration without first setting the proper load on the vehicle. Failing to set the load may damage the transaxle.

- (1) Depress the accelerator pedal slowly and gradually accelerate the vehicle. Make a measurement.
 - (2) After the measurement, use the brake to gradually decelerate the vehicle.
- (c) Special note for using the chassis dynamometer
Always set an appropriate load before starting the test.



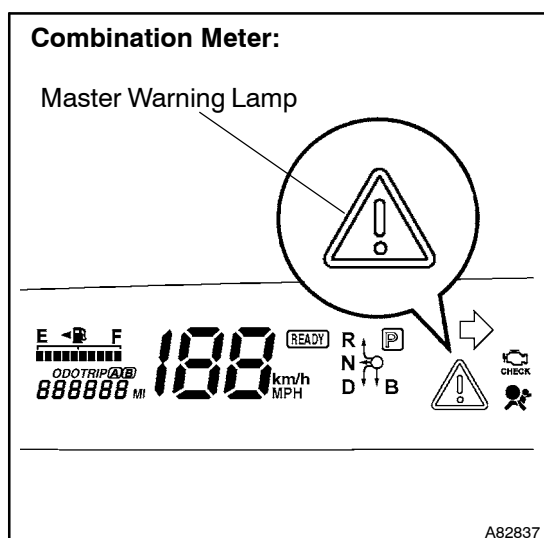
- (d) Activation of inspection mode (using an intelligent tester II)
- (1) Connect the intelligent tester II to the DLC3.
 - (2) Push the power switch twice without depressing the brake pedal and change the power mode to ON (IG).
 - (3) Turn the intelligent tester II ON.
 - (4) On the intelligent tester II, select these menu items: Powertrain / Hybrid Control / Active Test / Inspection mode -2WD inspection / ON.



- (5) Activate inspection mode. Check that the HV system warning on the multi-information display starts blinking and master warning lamp on the combination meter is illuminated.
- (6) Depress and hold the brake pedal, and then push the power switch. The vehicle's engine should run continuously without stopping.

Deactivating inspection mode

- (1) Change the power switch's power mode to OFF. Inspection mode and the main system (HV system) are turned off simultaneously.



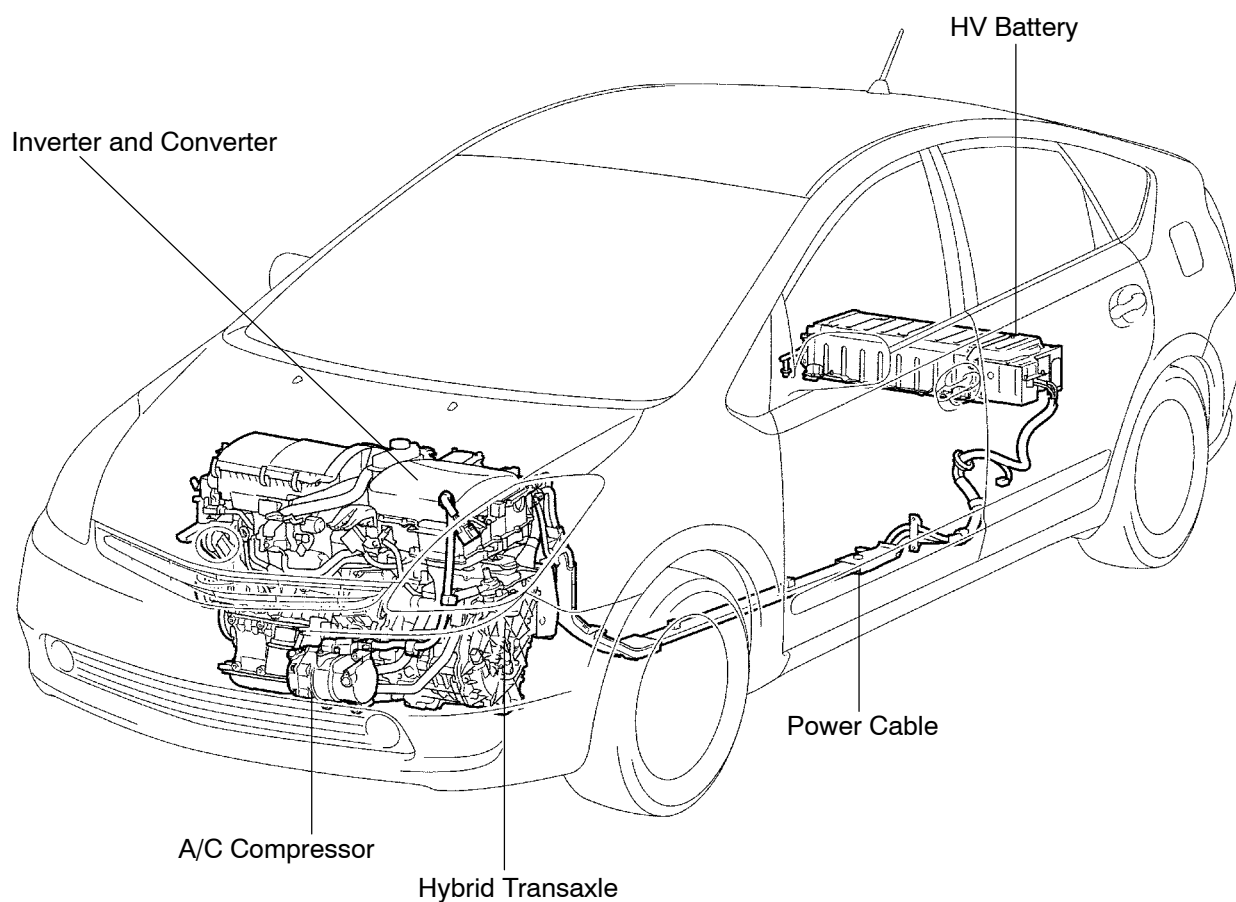
NOTICE:

- **The idling speed in inspection mode is approximately 1,000 rpm. The number of revolutions will increase to: 1) 1,500 rpm if the accelerator pedal is less than 60%depressed, and 2) 2,500 rpm if the pedal is more than 60% depressed.**
- **If a diagnosis code is recorded when entering inspection mode, the master lamp and the error warning lamp on the multi-information display are illuminated.**
- **When the master warning lamp is illuminated during operation in inspection mode, deactivate inspection mode and inspect the diagnosed area.**

6. ACTIONS TO BE TAKEN FOR VEHICLE DAMAGED BY IMPACT

- (a) Items to be prepared or operation at the site of the accident
- Protective clothing (insulated gloves, rubber gloves, goggles, and safety shoes)
 - Saturated boric acid solution 20 L (obtain 800 g of boric acid powder, put it into a container, and dissolve it in water)
 - Red litmus paper
 - ABC fire extinguisher (effective against both oil flames and electrical flames)
 - Shop rags (for wiping off the electrolyte)
 - Vinyl tape (for insulating cable)
 - Electrical tester
- (b) Actions to be taken at the place of accident
- (1) Wear insulated or rubber gloves, goggles and safety shoes.
 - (2) Do not touch a bare cable that could be a high voltage cable. If the cable must be touched or if accidental contact is unavoidable, follow these instructions: 1) wear insulated or rubber gloves and goggles, 2) measure the voltage between the cable and the body ground using an electrical tester, and 3) insulate the cable using vinyl tape.
 - (3) 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.
 - (4) Visually check the HV battery and immediate area for any electrolyte leakage. Do not touch any leaked liquid because it could be highly alkaline electrolyte. Wear rubber gloves and goggles, and then apply red litmus paper to the leak. If the paper turns blue, the liquid must be neutralized before wiping. Neutralize the liquid using the following procedures: 1) apply saturated boric acid solution to the liquid, and 2) reapply red litmus paper and make sure it does not turn blue. Repeat steps 1 and 2 above until the paper does not turn blue. Then, wipe the neutralized liquid with a shop rag.
 - (5) If damage to any of the high-voltage components and cables is suspected, cut the high-voltage circuit using the procedure on the following pages.

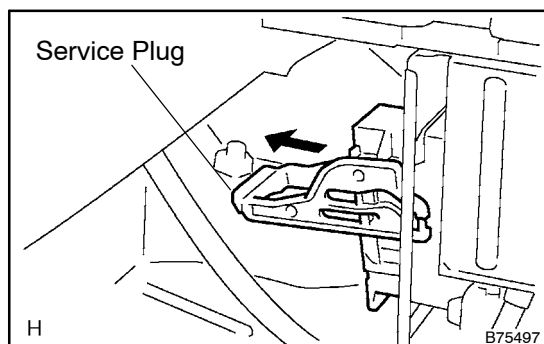
High-voltage Part and Wiring

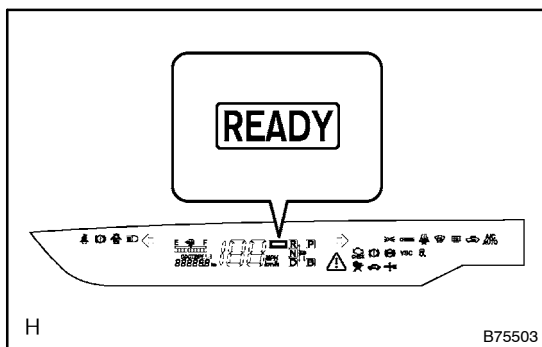
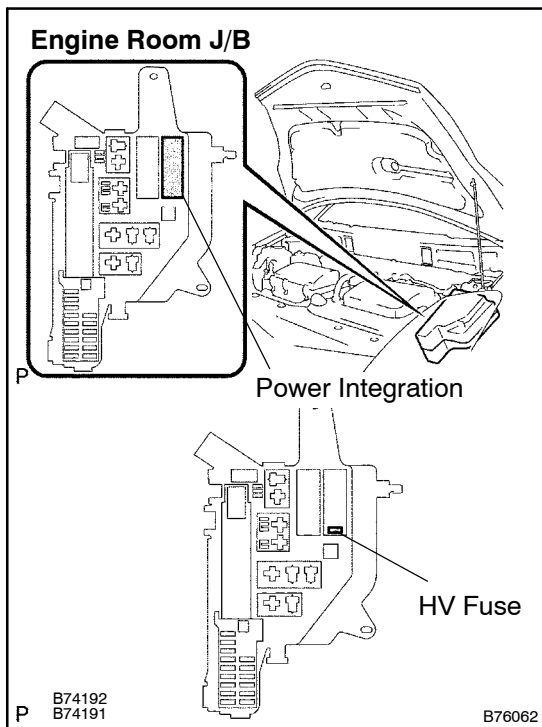


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- Push the the "P" position switch and engage the parking brake.
- Remove the key from the key slot. Then disconnect the negative (-) terminal of the auxiliary battery.
- Remove the service plug while wearing insulated gloves.
- Do not turn the power switch on while removing the service plug.





- If the service plug cannot be removed due to damage to the rear portion of the vehicle, remove the HV fuse instead.

(c) Moving the damaged vehicle.

HINT:

If any of the following applies, tow the vehicle away using a tow truck.

- One or more of the high-voltage components and cables are damaged.
- The driving, traction, or fuel system is damaged.

- The READY lamp is not illuminated when you turn.

NOTICE:

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

Only if none of the above applies and there are no problems that might affect driving, drive the vehicle away from the place of accident to a safe, nearby place.

- **Perform the procedure below if the READY lamp turns off, or there are abnormal noises, unusual smells, or strong vibrations while driving:**

- (1) Park the vehicle in a safe place.
- (2) Push the "P" position switch and engage the parking brake.
- (3) Disconnect the power cable from the negative (-) terminal of the auxiliary battery.
- (4) Remove the service plug while wearing insulated gloves.

(d) Actions required after moving the damaged vehicle

If you see any liquid on the road surface, it could be highly alkaline electrolyte leakage.

Wear rubber gloves and goggles, and apply red litmus paper to the leak. If the paper turns blue, the liquid must be neutralized before wiping. Neutralize the liquid using the following procedures: 1) apply saturated boric acid solution to the liquid, and 2) replay red litmus paper and make sure it does not turn blue. Repeat steps 1 and 2 above until the paper does not turn blue. Then wipe the neutralized liquid with a shop rag.