HOW TO USE THIS MANUAL

GENERAL INFORMATION

1. GENERAL DESCRIPTION

(a) This manual is written in accordance with SAE J2008.
  (1) Diagnosis
  (2) Removing / Installing, Replacing, Disassembling / Reassembling, Checking and Adjusting
  (3) Final Inspection

(b) The following procedures are omitted from this manual. However, these procedures must be performed.
  (1) Use a jack or lift to perform operations.
  (2) Clean all removed parts.
  (3) Perform a visual check.

2. INDEX

(a) An alphabetical INDEX section is provided at the end of the manual as a reference to help you find the item to be repaired.

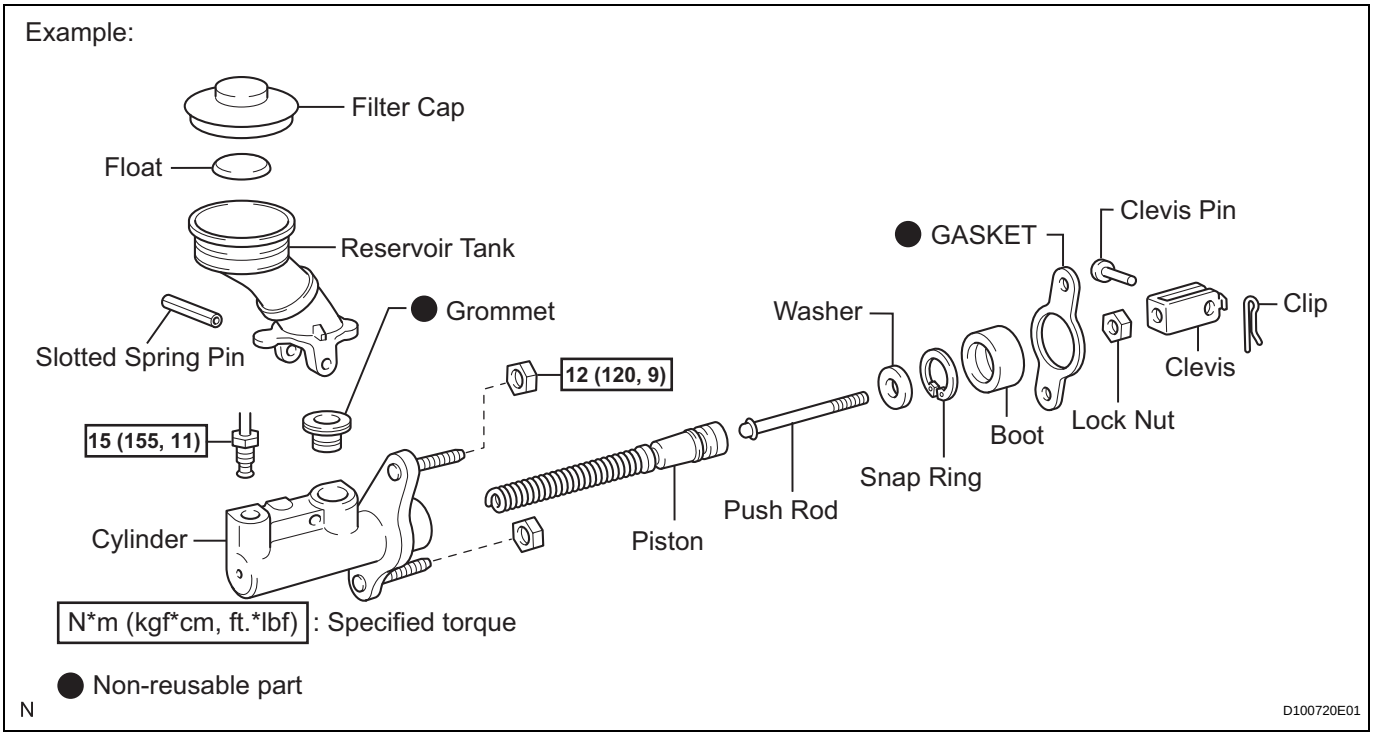
3. PREPARATION

(a) Use of Special Service Tools (SST) and Special Service Materials (SSM) may be required, depending on the repair procedure. Be sure to use SST and SSM when they are required and follow the working procedures properly. A list of SST and SSM is in the "Preparation" section of this manual.

4. REPAIR PROCEDURES

(a) A component illustration is placed under the title where necessary.

(b) Non-reusable parts, grease application areas, precoated parts and torque specifications are noted in the component illustrations.
The following illustration is an example.



(c) Torque specifications, grease application areas and non-reusable parts are emphasized in the procedures.
HINT:
There are cases where such information can only be explained by using an illustration. In these cases, torque, oil and other information are described in the illustration.

(d) Only items with key points are described in the text. What to do and other details are explained using illustrations next to the text. Both the text and illustrations are accompanied by standard values and notices.

Illustration	What to do and where to do it
Task heading	What work will be performed
Explanation text	• How to perform the task • Information such as specifications and warnings, which are written in boldface text

(e) Illustrations of similar vehicle models are sometimes used. In these cases, minor details may be different from the actual vehicle.

(f) Procedures are presented in a step-by-step format.

5. SERVICE SPECIFICATIONS

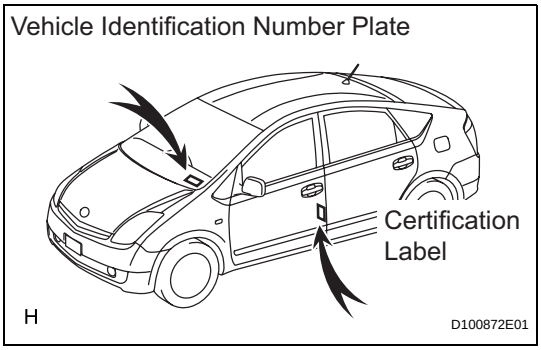
(a) SPECIFICATIONS are presented in boldface text throughout the manual. The specifications are also found in the "Service Specifications" section for reference.

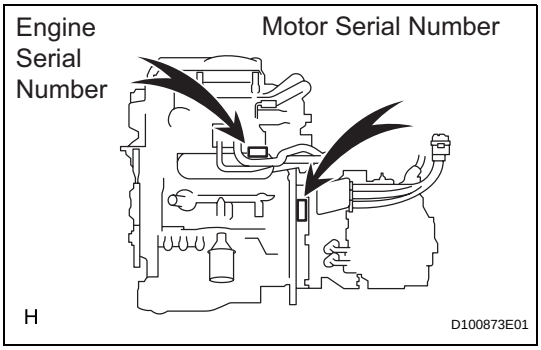
6. TERM DEFINITIONS

CAUTION	Possibility of injury to you or other people.
NOTICE	Possibility of damage to components being repaired.
HINT	Provides additional information to help you perform repairs.

7. INTERNATIONAL SYSTEM OF UNITS

(a) The units used in this manual comply with the International System of Units (SI) standard. Units from the metric system and English system are also provided.
Example:
Torque: 30 N*m (310 kgf*cm, 22 ft.*lbf)





IDENTIFICATION INFORMATION

VEHICLE IDENTIFICATION AND SERIAL NUMBERS

1. VEHICLE IDENTIFICATION NUMBER

(a) The vehicle identification number is stamped on the vehicle identification number plate and on the certification label, as shown in the illustration.
(1) Vehicle Identification Number Plate
(2) Certification Label

2. ENGINE SERIAL NUMBER AND TRANSMISSION SERIAL NUMBER

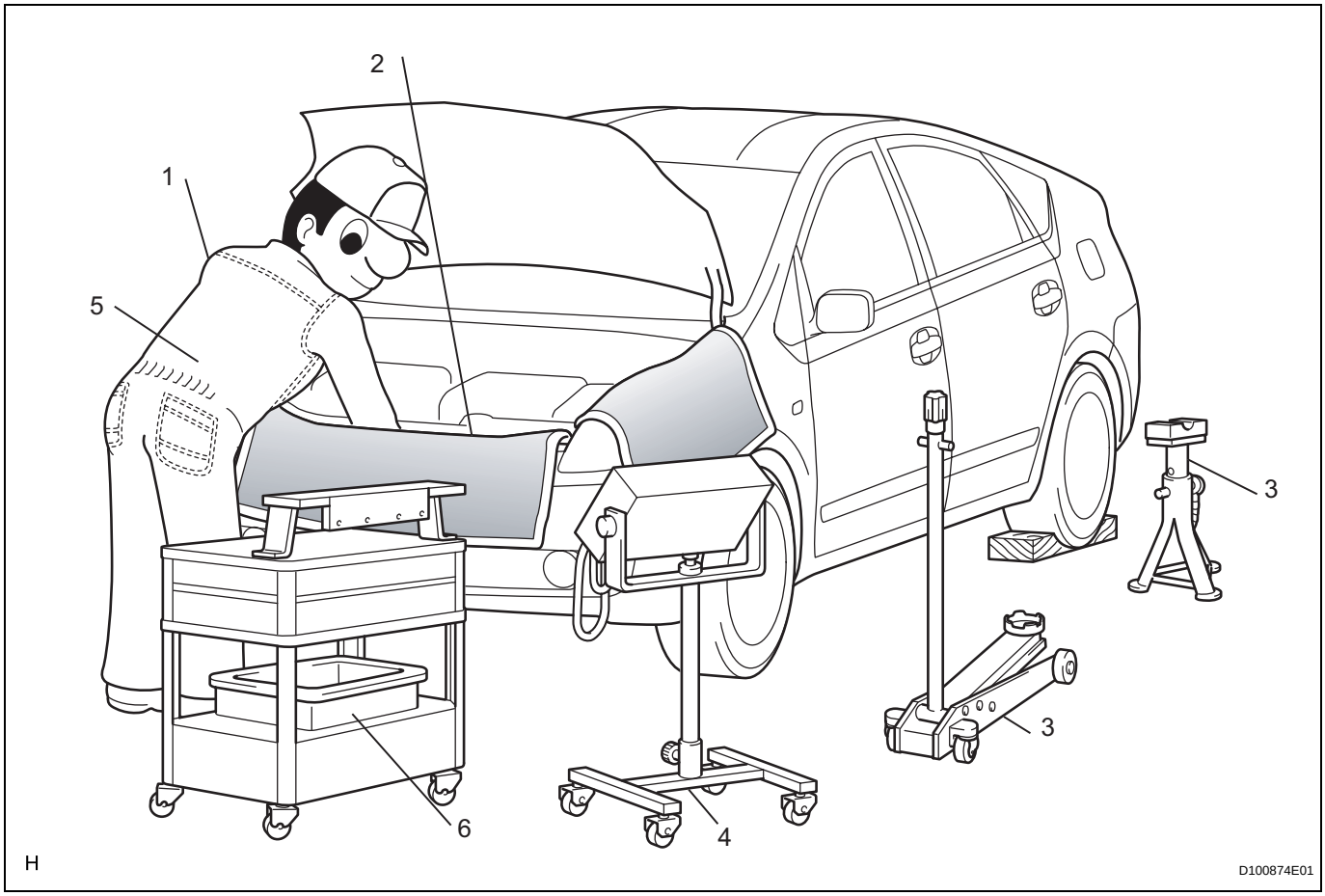
(a) The engine serial number is stamped on the cylinder block of the engine and the motor serial number is stamped on the motor as shown in the illustration.
(1) Engine serial number is stamped on the cylinder block of the engine.
(2) Motor serial number is stamped on the motor.

REPAIR INSTRUCTION

PRECAUTION

1. BASIC REPAIR HINT

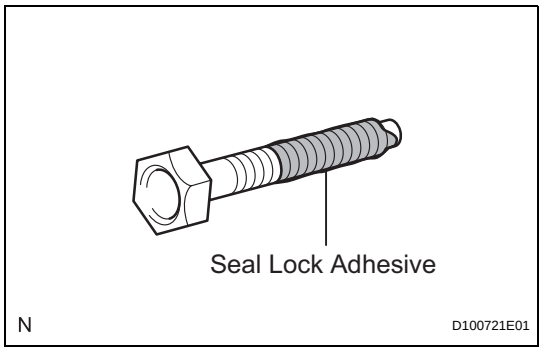
(a) HINTS ON OPERATIONS



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 the operation.
3	Safe operation	• 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	Before starting the operation, prepare a tool stand, SST, gauge, oil and parts for replacement.
5	Removal and installation, disassembly and assembly operations	• Diagnose with a thorough understanding of proper procedures and of the reported problem. • Before removing 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 ensure reassembly of components to their 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 removed parts in a separate box to avoid mixing them up with new parts or contaminating 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.

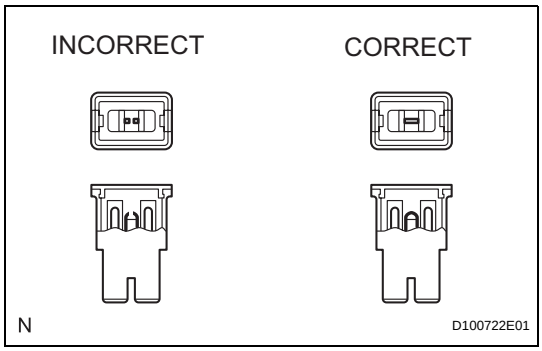
(b) JACKING UP AND SUPPORTING VEHICLE
(1) Care must be taken when jacking up and supporting the vehicle. Be sure to lift and support the vehicle at the proper locations.



(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 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 appropriate 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 torques. Always use a torque wrench.



(f) FUSES
(1) When inspecting a fuse, check that the wire of the fuse is not broken.
(2) 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.

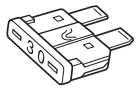
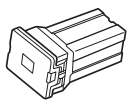
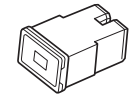
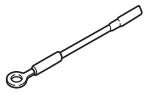
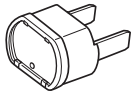
Illustration	Symbol	Part Name	Abbreviation
 N	N	FUSE	FUSE
 N	 N	MEDIUM CURRENT FUSE	M-FUSE

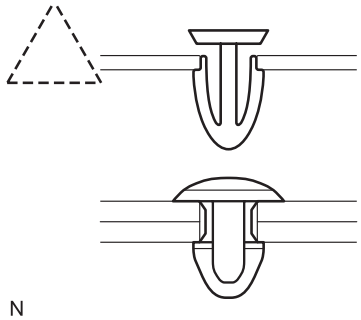
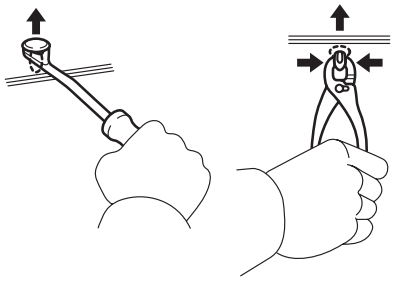
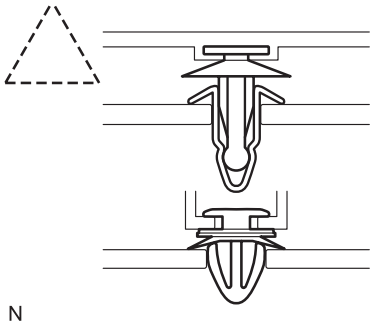
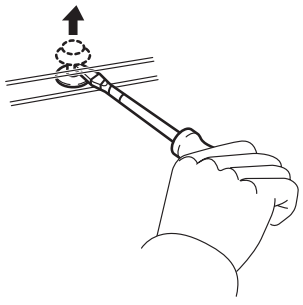
Illustration	Symbol	Part Name	Abbreviation
 N	 N	HIGH CURRENT FUSE	H-FUSE
 N	 N	FUSIBLE LINK	FL
 N	 N	CIRCUIT BREAKER	CB

(g) CLIPS

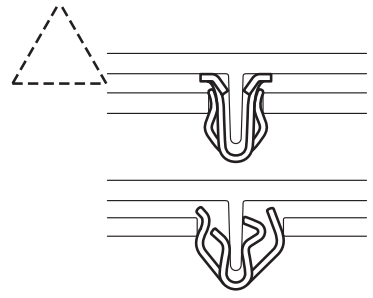
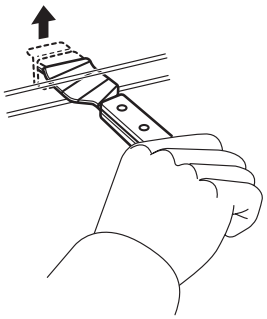
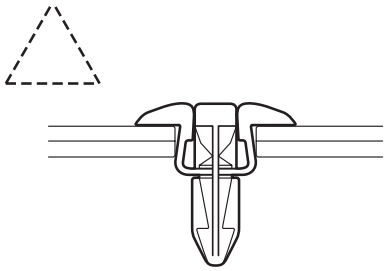
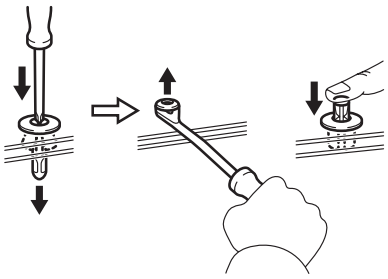
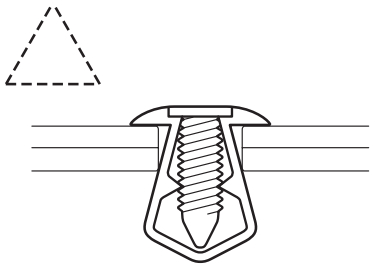
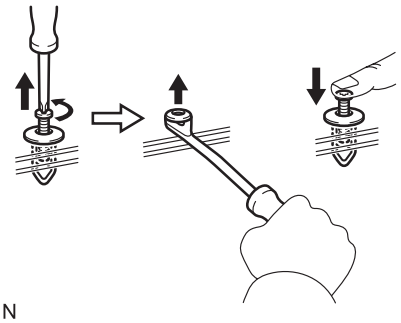
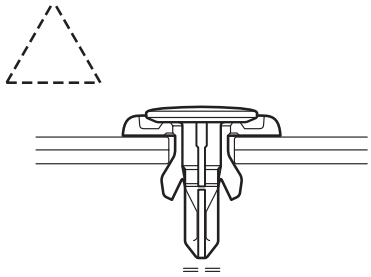
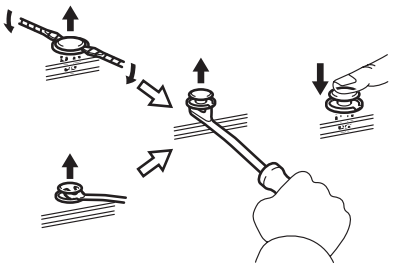
(1) The removal and installation methods of typical clips used for vehicle body parts are shown in the table below.

HINT:

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

Shape (Example)	Illustration	Procedures
 N	 N	1. Remove the clips with a clip remover or pliers.
 N	 N	1. Remove the clips with a clip remover or screwdriver.

IN

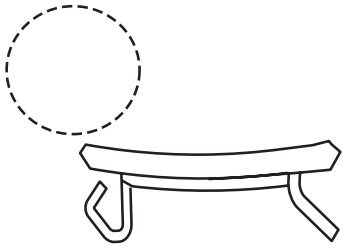
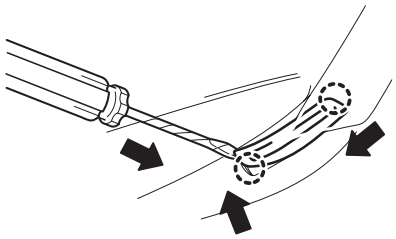
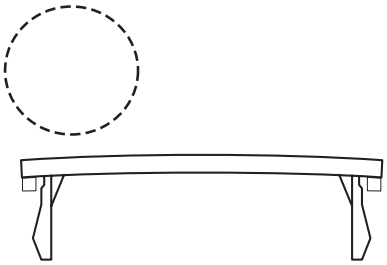
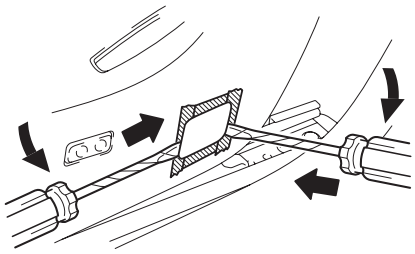
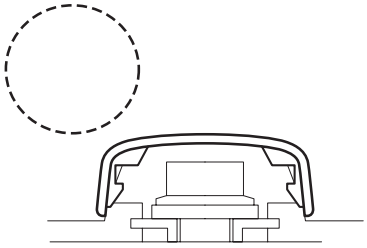
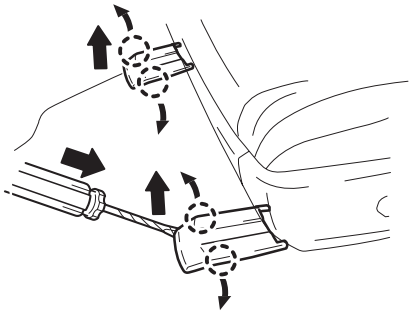
Shape (Example)	Illustration	Procedures
 N	 N	1. Remove the clips with a wide scraper to prevent panel damage.
 N	 N	1. Remove the clips by pushing center pin through and prying out the shell.
 N	 N	1. Remove the clips by unscrewing the center pin and prying out the shell.
 N	 N	1. Remove the clips by prying out the pin and then prying out the shell.

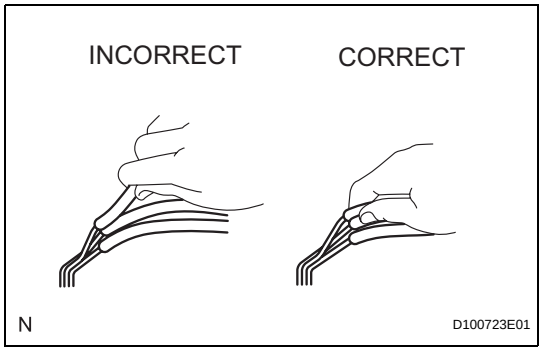
(h) CLAWS

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

HINT:

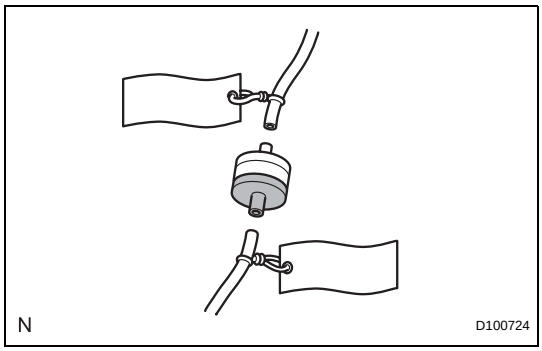
If claws of caps or covers are damaged during a procedure, always replace the caps or covers with new ones.

Shape (Example)	Illustration	Procedures
		1. Using a screwdriver, detach the claws and remove the cap or cover.
		1. Using a screwdriver, detach the claws and remove the cap or cover.
		1. Using a screwdriver, detach the claws and remove the cap or cover.



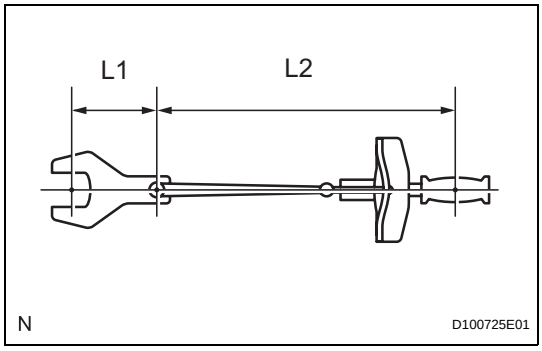
(i) REMOVAL AND INSTALLATION OF VACUUM HOSES

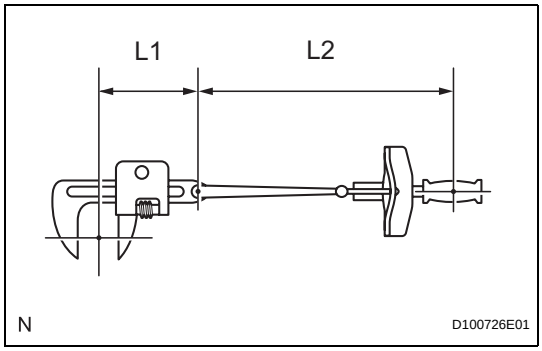
(1) To disconnect a vacuum hose, pull and twist from the end of the hose. Do not pull from the middle of the hose as this may cause damage.



(2) When disconnecting vacuum hoses, use tags to identify where they should be reconnected.
(3) After completing any hose related repairs, 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. If a hose has been stretched, it may leak air. Use a step-down adapter if necessary.

(j) TORQUE WHEN USING TORQUE WRENCH WITH EXTENSION TOOL





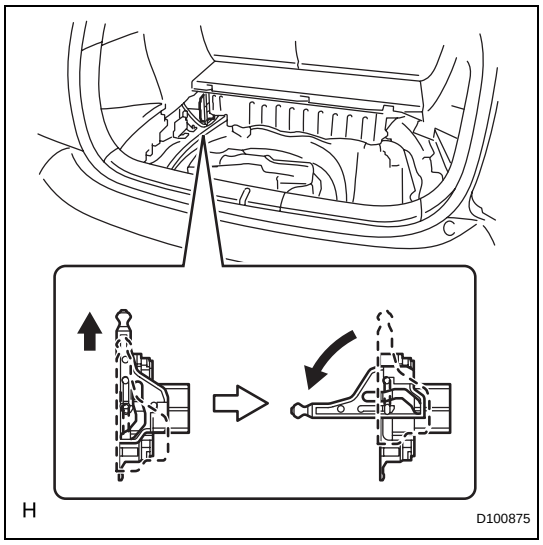
(1) Use the formula below to calculate special torque values for situations where SST or an extension tool is combined with the torque wrench.
Formula:
T' = L2 / (L1 + L2) * T

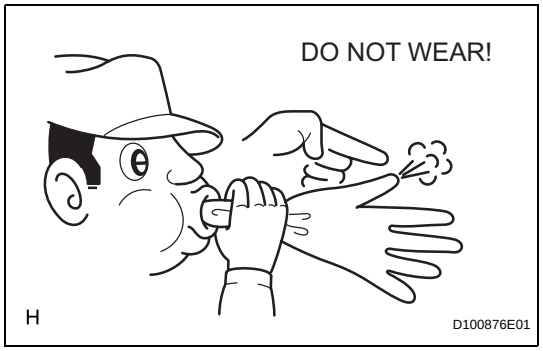
T'	**Reading of torque wrench {N*m (kgf*cm, ft.*lbf)}**
T	**Torque {N*m (kgf*cm, ft.*lbf)}**
L1	**Length of SST or extension tool {cm (in.)}**
L2	**Length of torque wrench {cm (in.)}**

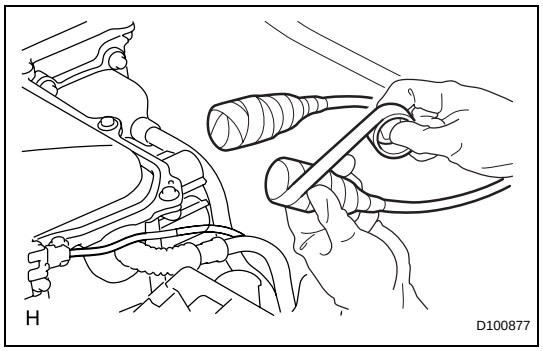
NOTICE:
If an extension tool or SST is combined with a torque wrench and the wrench is used to tighten to a torque specification in this manual, the actual torque will be excessive and parts will be damaged.

2. PRECAUTIONS FOR HIGH-VOLTAGE CIRCUIT INSPECTION AND SERVICE

(a) Engineers 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 servicing the 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.

IN

CAUTION:
HIGH VOLTAGE. DO NOT
TOUCH DURING OPERATION.

Person in charge: _____

CAUTION:
HIGH VOLTAGE. DO NOT
TOUCH DURING OPERATION.

Person in charge: _____

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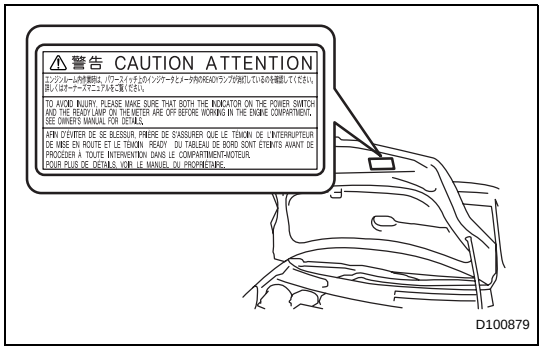

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3. PRECAUTIONS TO BE OBSERVED WHEN INSPECTING OR SERVICING ENGINE COMPARTMENT

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:

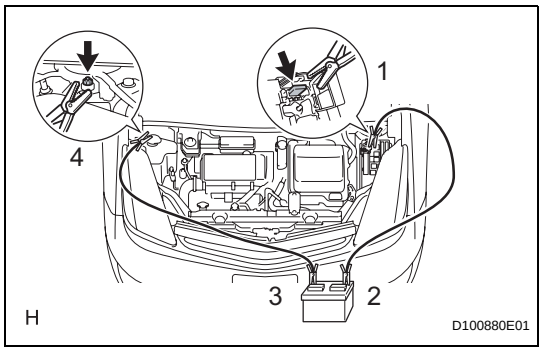
- No display appears on the instrument panel when the power switch's power mode is set to ON (IG).
- The hybrid system does not start.
- The headlights are dim.
- The sound from the horn is weak.

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.



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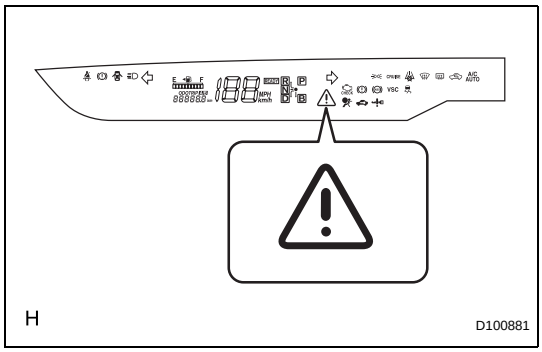
(3) Using a booster cable, connect the rescue vehicle's 12 V battery positive (+) lead to the stalled vehicle's relay block positive (+) terminal and the negative (-) lead to the suspension support's nut on the right side.

(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.



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(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 light 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. ACTIONS TO BE TAKEN FOR VEHICLE DAMAGED BY IMPACT

(a) Items to be prepared for 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 accident site

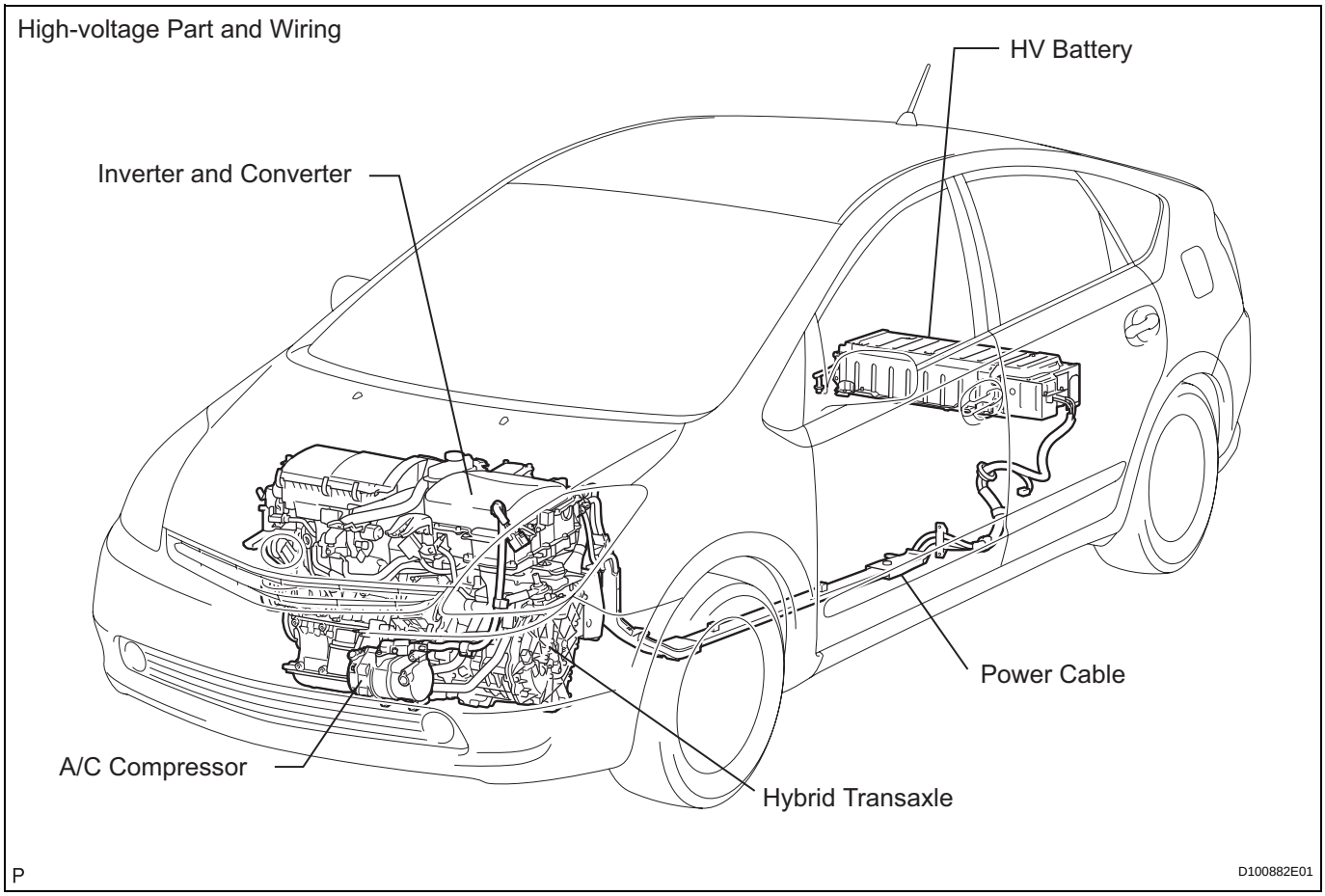
(1) Wear insulated or rubber gloves, goggles and safety shoes.

(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.

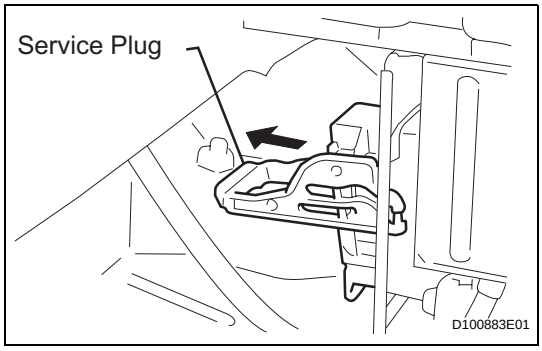
(4) Visually check the HV battery and immediate area for any electrolyte leakage. Do not touch any leaked liquid because it could be a highly alkaline electrolyte. Wear rubber gloves and goggles, and then apply red litmus paper to the leak. If the paper turns blue, the liquid must be neutralized before 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.

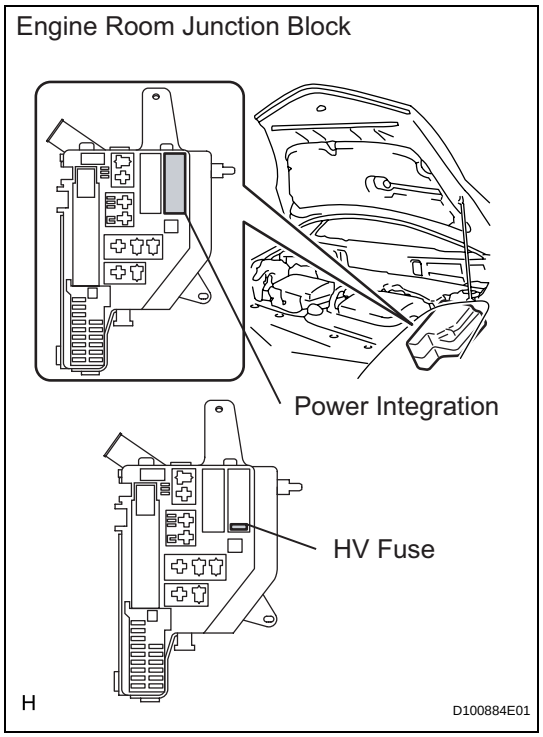
(5) If damage to any of the high-voltage components and cables is suspected, cut the high-voltage circuit using the procedure below.



1. Push the "P" position switch and engage the parking brake.
2. Remove the key from the key slot. Then disconnect the negative (-) terminal of the auxiliary battery.
3. Remove the service plug while wearing insulated gloves.

CAUTION:
Do not turn the power switch on while removing the service plug.

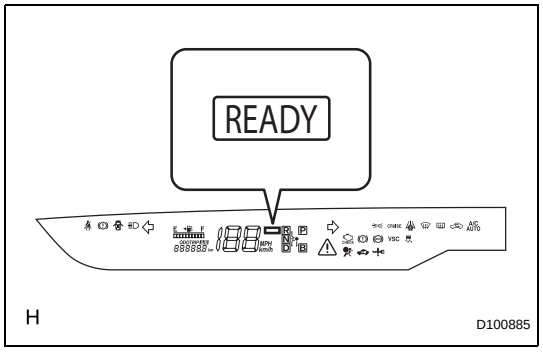




NOTICE:
If the service plug cannot be removed due to damage to the rear portion of the vehicle, remove the HV fuse or power integration (IGCT relay) instead.

(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 light is not illuminated when you start the engine.

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 accident site to a safe place nearby.**
- **Perform the procedure below if the READY light turns off, or there are abnormal noises, unusual smells, or strong vibrations while driving:**
  (a) Park the vehicle in a safe place.
  (b) Push the "P" position switch and engage the parking brake.
  (c) Disconnect the power cable from the negative (-) terminal of the auxiliary battery.
  (d) 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 a 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) 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.

(e) Items to be prepared (when repairing damaged vehicles)
- 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
- Shop rags (for wiping off the electrolyte)
- Vinyl tape (for insulating cable)
- Electrical tester

(f) Precautions to be observed when servicing the damaged vehicle
(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 unavailable, 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) Check the HV battery and immediate area for any electrolyte leakage. Do not touch any leaked liquid because it could be a 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.
(4) If the electrolyte adheres to your skin, wash the skin immediately using saturated boric acid solution or a large amount of water. If the electrolyte adheres to an article of clothing, take the clothing off immediately.

(5) If the electrolyte comes in contact with your eyes, call out loudly for help. Do not rub your eyes. Wash them with a large amount of water and seek medical care immediately.

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

1. Push the "P" position switch and engage the parking brake.
2. Remove the key from the key slot. Then disconnect the power cable from the negative (-) terminal of the auxiliary battery.
3. Wear insulated gloves, and then remove the service plug.

NOTICE:

If you cannot remove the service plug due to damage to the rear portion of the vehicle, remove the HV fuse or IGCT relay instead.

(g) Precautions to be taken when disposing of the vehicle

When scrapping the vehicle, remove the HV battery from the vehicle and return it to the location specified by the manufacturer. The same applies to any damaged HV battery.

(h) After removing the battery, keep it away from water. Water may heat the battery, which results in fire.

(i) Precautions to be observed when towing

Tow the damaged vehicle with its front wheels or its front and rear wheels lifted off the ground.

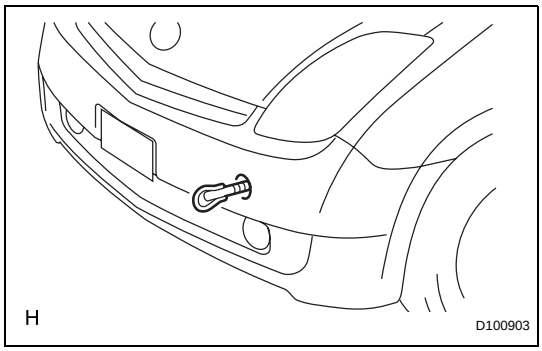
NOTICE:

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

(j) Towing with 4 wheels on the ground

NOTICE:

- **If the damaged vehicle needs to be towed using a rope, do not exceed 30 km/h and tow only for very short distances. For example, towing from the accident site to a nearby tow truck is permissible.**
- **Change the power switch's power mode to ON (IG) and shift the selector lever to the N position.**
- **If any abnormality is present in the damaged vehicle during towing, stop towing immediately.**



(k) Towing eyelet
(1) Install the hook.
(2) Hook a rope on to the illustrated area for towing.

6. FOR VEHICLES WITH SUPPLEMENTAL RESTRAINT SYSTEM

The PRIUS is equipped with a Supplemental Restraint System (SRS). The SRS of this vehicle consists of the following:

1. Steering pad
2. Front passenger airbag assembly
3. Curtain shield airbag assembly
4. Front seat side airbag assembly
5. Front seat outer belt assembly with pretensioner
6. Front airbag sensor assembly
7. Side airbag sensor assembly
8. Rear airbag sensor assembly

CAUTION:

- **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 of the negative (-) battery terminal is disconnected. (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 (-) battery terminal, SRS parts may deploy.)**
- **Do not expose SRS parts directly to hot air or flames.**

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 (-) battery terminal.**
- **For minor collisions where SRS parts do not deploy, always inspect the SRS parts.**
- **Before performing repairs, remove airbag sensors as necessary 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 SRS parts is completed, perform the SRS warning light check.**
- **When the cable is disconnected from the negative (-) battery terminal, the memory settings of each system will be 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 erasing the memory in a system.**

(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 (200°F), the humidity is not high and there is no electrical noise.

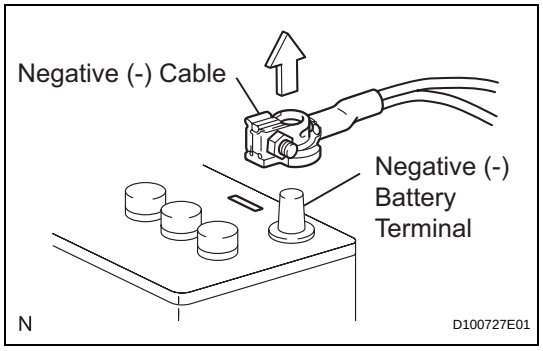
(5) When using electric welding anywhere on the vehicle, disconnect the airbag ECU connectors. These connectors contain shorting springs. This feature reduces the possibility of the airbag deploying due to currents entering the squib wiring.

(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 airbag ECU connectors. 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 (-) 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.



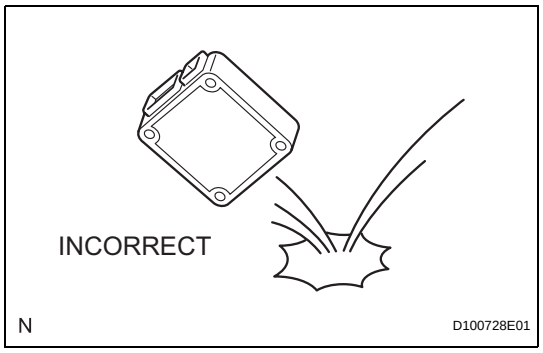
7. ELECTRONIC CONTROL

(a) REMOVAL AND INSTALLATION OF BATTERY TERMINAL

NOTICE:

Certain systems need to be initialized after disconnecting and reconnecting the cable from the negative (-) battery terminal.

(1) Before performing electronic work, disconnect the cable from the negative (-) battery terminal to prevent component and wire damage caused by accidental short circuits.
(2) When disconnecting the cable, turn the power switch OFF and headlight dimmer 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 are erased when the cable is disconnected from the negative (-) battery terminal. Write down any necessary data before disconnecting the cable.

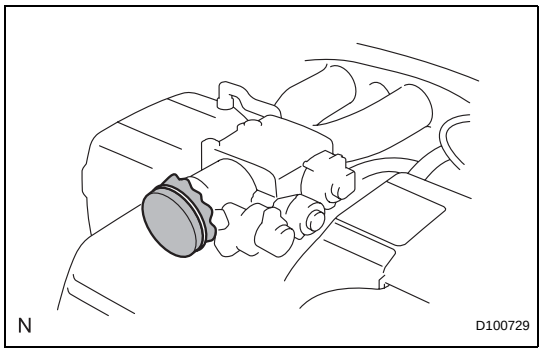


(b) HANDLING OF ELECTRONIC PARTS
(1) Do not open the cover or case of the ECU unless absolutely necessary. If the IC terminals are touched, the IC may be rendered inoperative by static electricity.
(2) Do not pull the wires when disconnecting electronic connectors. Pull the connector.
(3) Be careful not to drop electronic components, such as sensors or relays. If they are dropped on a hard surface, they should be replaced.
(4) When cleaning the engine 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 of a wire connector, insert the tester probe carefully to prevent terminals from bending.

8. REMOVAL AND INSTALLATION OF FUEL CONTROL PARTS

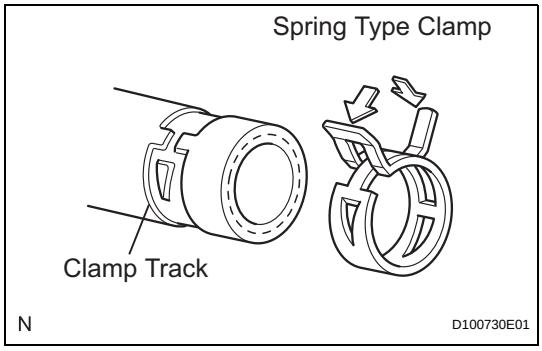
(a) PLACE FOR REMOVING AND INSTALLING FUEL SYSTEM PARTS
(1) Work in a location with good air ventilation that does not have welders, grinders, drills, electric motors, stoves, or any other ignition sources.
(2) Never work in a pit or near a pit as vaporized fuel will collect in those places.

(b) REMOVING AND INSTALLING FUEL SYSTEM PARTS
(1) Prepare a fire extinguisher before starting the operation.
(2) To prevent static electricity, install a ground wire to the fuel changer, vehicle and fuel tank, and do not spray the surrounding area with water. Be careful when performing work in this area, as the work surface will become slippery. Do not clean up gasoline spills with water, as this may cause the gasoline to spread, and possibly create a fire hazard.
(3) Avoid using electric motors, working lights and other electric equipment that can cause sparks or high temperatures.
(4) Avoid using iron hammers as they may create sparks.
(5) Dispose of fuel-contaminated cloth separately using a fire resistant container.



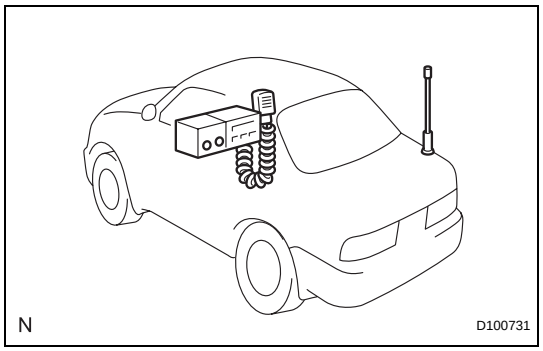
9. REMOVAL AND INSTALLATION OF ENGINE INTAKE PARTS
(a) If any metal particles enter inlet system parts, they may damage the engine.
(b) When removing and installing inlet system parts, cover the openings of the removed parts and engine openings. Use gummed tape or other suitable materials.
(c) When installing inlet system parts, check that no metal particles have entered the engine or the installed parts.

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

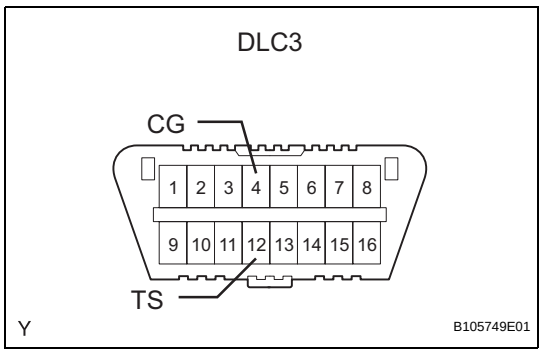


(b) Replace any deformed or dented clamps with new ones.
(c) When reusing a hose, attach the clamp on the clamp track portion of the hose.
(d) For a spring type clamp, you may want to spread the tabs slightly after installation by pushing in the direction of the arrows as shown in the illustration.

11. 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 an antenna 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 of the applicable components.
(c) Keep the antenna and feeder separate from other wiring as much as possible. This will prevent signals 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.



12. FOR VEHICLES EQUIPPED WITH VEHICLE STABILITY (VSC) SYSTEM

(a) NOTICES WHEN USING DRUM TESTER
(1) Before beginning testing, disable the VSC. To disable the VSC, turn the power switch OFF and connect SST to terminals 12 (TS) and 4 (CG) of the DLC3.
SST 09843-18040
NOTICE:
- **Confirm that the VSC warning light blinks.**
- **The VSC system will be reset when the engine is started.**
- **For safety, secure the vehicle with restraint chains while using a wheel dynamometer.**

(b) NOTICES OF RELATED OPERATIONS TO VSC
(1) Do not carry out unnecessary installation and removal as it might affect the adjustment of VSC related parts.
(2) Be sure to follow the instructions for work preparation and final confirmation of proper operation of the VSC system.

13. FOR VEHICLES EQUIPPED WITH CATALYTIC CONVERTER
CAUTION:
If a large amount of unburned gasoline or gasoline vapors flow into the converter, it may cause overheating and create a fire hazard. To prevent this, observe the following precautions.
(a) Use only unleaded gasoline.
(b) Avoid idling the engine for more than 20 minutes.
(c) Avoid performing unnecessary spark jump tests.
(1) Perform a spark jump test only when absolutely necessary. Perform this test as rapidly as possible.
(2) While testing, never race the engine.
(d) Avoid a prolonged engine compression measurement. Engine compression measurements must be performed as rapidly as possible.

(e) Do not run the engine when the fuel tank is nearly empty. This may cause the engine to misfire and create an extra load on the converter.

VEHICLE LIFT AND SUPPORT LOCATIONS

1. NOTICE ABOUT VEHICLE CONDITION WHEN JACKING UP VEHICLE

(a) The vehicle must be unloaded before jacking up / lifting up the vehicle. Never jack up / lift up a heavily loaded vehicle.

(b) When removing heavy parts such as the engine and transmission, the center of gravity of the vehicle may shift. To stabilize the vehicle, place a balance weight in a location where it will not roll or shift, or use a mission jack to hold the jacking support.

2. NOTICE FOR USING 4 POST LIFT

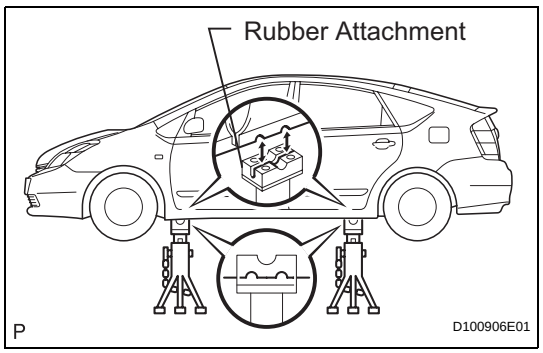
(a) Follow the safety procedures outlined in the lift instruction manual.

(b) Use precautionary measures to prevent the free wheel beam from damaging tires or wheels.

(c) Use wheel chocks to secure the vehicle.

3. NOTICE FOR USING JACK AND SAFETY STAND

(a) Work on a level surface. Use wheel chocks at all times.



(b) Use safety stands with rubber attachments as shown in the illustration.

(c) Set the jack and safety stands to the specified locations of the vehicle accurately.

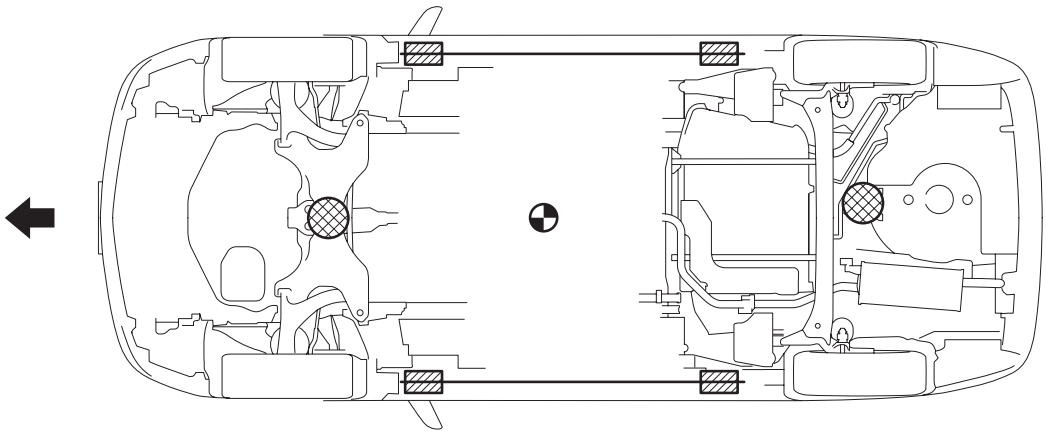
(d) When jacking up the vehicle, first release the parking brake and move the shift lever to N.

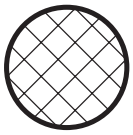
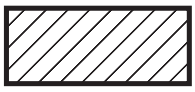
(e) When jacking up the entire vehicle:
- When jacking up the front wheels first, make sure wheel chocks are behind the rear wheels.
- When jacking up the rear wheels first, make sure wheel chocks are in front of the front wheels.

(f) When jacking up only the front or rear wheels of the vehicle:
- Before jacking up the front wheels, place wheel chocks on both sides of the rear wheels.
- Before jacking up the rear wheels, place wheel chocks on both sides of the front wheels.

(g) When lowering a vehicle that only has its front or rear wheels jacked up:
- Before lowering the front wheels, make sure wheel chocks are in front of the rear wheels.
- Before lowering the rear wheels, make sure wheel chocks are behind the front wheels.

IN



	JACK POSITION Front: Engine under cover Rear: Differential carrier	**CAUTION:** **When jacking-up the vehicle, make sure the vehicle is not carrying any extra weight.**
	SUPPORT POSITION Safety stand and swing arm type lift	-

(h) It is extremely dangerous to perform any work on a vehicle raised on a jack alone, even for work that can be finished quickly. Safety stands must be used to support it.

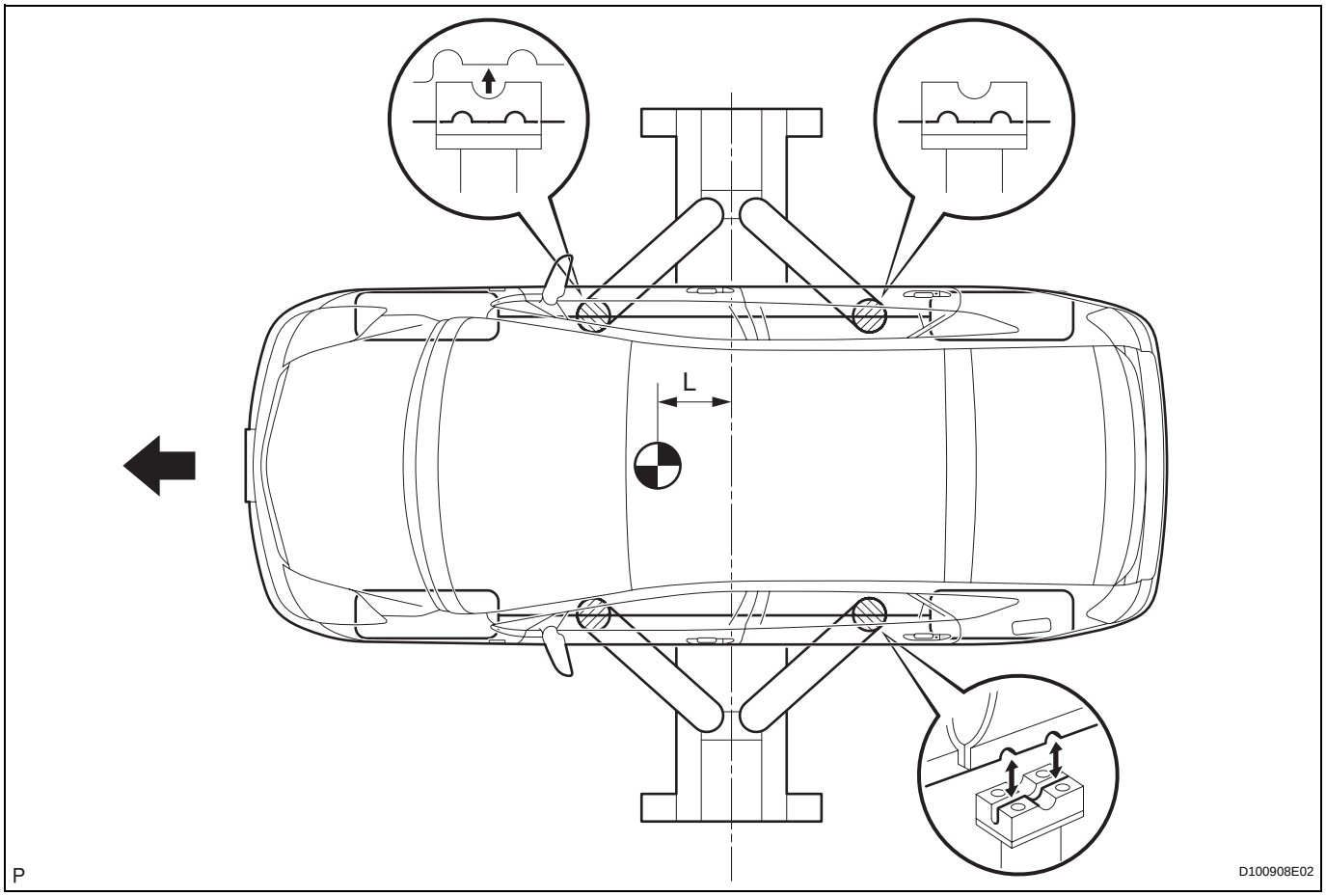
4. NOTICE FOR USING SWING ARM TYPE LIFT

(a) Follow the safety procedures outlined in its instruction manual.

(b) Use a swing arm equipped with a rubber attachment, as shown in the illustration.

(c) When using the lift, make sure that the vehicle is stabilized so that it will not tilt while work is being performed. Stabilize the vehicle by adjusting the lift arm's length and vehicle's position.

(d) When using the lift, its center should be as close to the vehicle's center of gravity as possible (length of "L" in the illustration should be as short as possible).



(e) Set the vehicle on the lift as level as possible. Then match the groove of the cradle to the rigid rack support location.

(f) Be sure to lock the swing arms before lifting and during work (if equipped with arm locks).

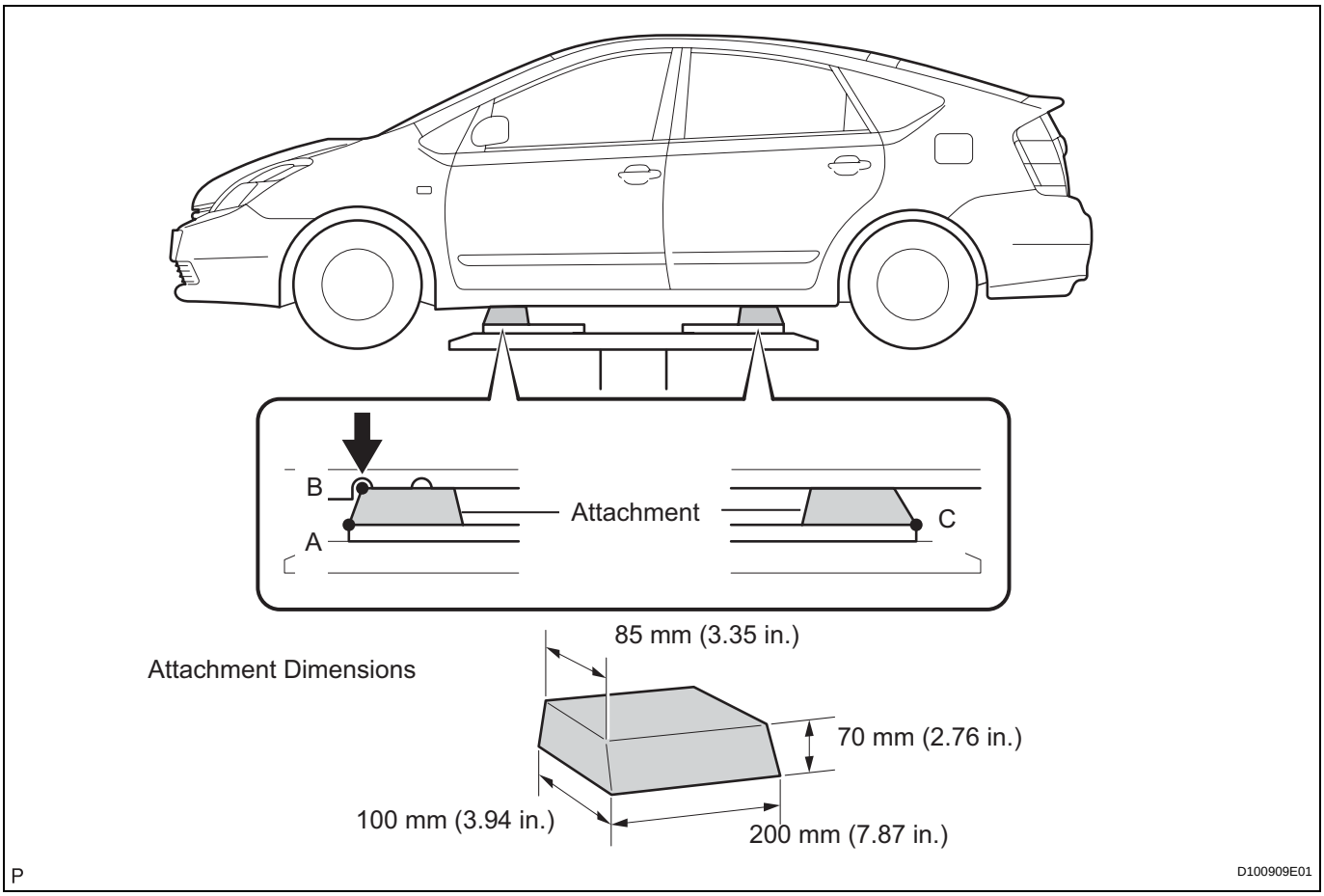
(g) Lift the vehicle up off the ground. Stand at a safe distance and shake the vehicle to check its stability.

5. NOTICE FOR USING PLATE TYPE LIFT

(a) Follow safety procedures outlined in its instruction manual.

(b) Use plate lift attachments (rubber lifting blocks) on top of the plate surface.

(c) Refer to the illustration below to determine how to properly set the vehicle.



HINT:

Right and left set position	Place the vehicle over the center of the lift.
Front and rear set position	Place the attachments at the ends of the rubber plate surface, under the vehicle lift pad (A and C in the illustration). Raise the plate slightly and reposition the vehicle so the top of the attachment (B in the illustration) is aligned with the front side notch in the vehicle rocker flange.

(d) Use the lift to raise the vehicle up off the ground, and shake the vehicle to make sure that it is stable.

CUSTOMIZE PARAMETERS

HINT:
The following items can be customized.
NOTICE:

- **When the customer requests a change in a function, first make sure that the function can be customized.**
- **Be sure to make a note of the current settings before customizing.**
- **When troubleshooting a function, first make sure that the function is set to the default setting.**

1. Air conditioning amplifier

Display (Item)	Default	Contents	Setting
SET TEMP SHIFT (Set Temperature Shift)	NORMAL	To control with the shifted temperature against the display temperature.	+2C / +1C / NORMAL / -1C / -2C
AIR INLET MODE (Air Inlet Mode)	AUTO	In case of turning the A/C ON when you desire to make the compartment cool down quickly, this is the function to change the mode automatically to RECIRCULATED mode.	MANUAL / AUTO
COMPRESSOR MODE (Compressor Mode)	AUTO	Function to turn the A/C ON automatically by pressing the AUTO button when the blower is ON and the A/C is OFF.	MANUAL / AUTO
COMPRS/DEF OPER (Compressor/Air inlet DEF operation)	LINK	Function to turn the A/C ON automatically linking with the FRONT DEF button when the A/C is OFF.	NORMAL / LINK
FOOT/DEF MODE (Foot/DEF auto mode)	ON	Function to turn the air flow from FOOT/DEF to ON automatically when AUTO MODE is ON.	OFF / ON
AUTO BLOW UP (Foot/DEF automatic blow up function)	ON	Function to switch the blower level automatically when the defroster is ON.	OFF / ON
FOOT AIR LEAK (Foot air leak)	ON	Function to cut off the airstream felt underfoot while the vehicle is moving.	OFF / ON
AMBINT TMP SFT (Ambient Temperature Shift)	NORMAL	To control with the shifted ambient temperature against the display ambient temperature.	+3C / +2C / +1C / NORMAL / -1C / -2C / -3C

2. Illuminated entry

Display (Item)	Default	Contents	Setting
LIGHTING TIME	15 s	Changes lighting time after closing doors (light quickly fades out when power switch is turned ON (IG)	7.5 s / 15 s / 30 s
I/L AUTO OFF	ON	Illumination AUTO OFF ON function to turn off interior light automatically after specified time for prevent the battery loss when the interior light switch is "DOOR" position and the door is open	ON / OFF
I/L ON/UNLOCK	ON	Function to light interior light, etc. when the door is unlocked with a transmitter, door key or door lock control switch	ON / OFF

Display (Item)	Default	Contents	Setting
I/L ON/ACC OFF	ON	Illuminates interior light when power switch is turned from the ON (ACC) to ON (IG) position	ON / OFF

3. Smart key system

Display (Item)	Default	Contents	Setting
SMART WARN 1 (Warns if key is taken from D-door with P position)	ON	Function that warns driver that key is taken out from driver's door when shift position is P and power switch is not OFF	ON / OFF
SMART WARN 2 (Warns if key is taken from D-door without P position)	ON	Function that warns driver that key is taken out from driver's door when shift position is not P and power switch is not OFF	ON / OFF
SMART WARN 3 (Warns if key is taken out by other passengers)	ON	Function that warns driver that key is taken out from front passenger's door by passenger when power switch is not OFF	ON / OFF
SMART BUZ NUM (Sets number of warning buzzer sounds)	3 TIMES	Function that sets number of warning buzzer sounds when key is taken out of vehicle	OFF / 3TIMES / 5TIMES / 7TIMES
SMART WARN 4 (Warning time for locking door when engine is idling)	2s	Function that sets warning time for locking doors while engine is idling	OFF / 1s / 2s
SMART WARN 5 (Warning when key is left in vehicle)	2s	Function that sets warning time for locking doors while key is inside vehicle	OFF / 1s/ 2s
SMART WARN 6 (Warning if starting engine when key is out of detection range)	ON	Function that warns driver that entry ignition control is being attempted to be activated while key is out of detection range	ON / OFF
KEY LOW-BATT WRN (Warning when key battery becomes weak)	ON	Function that warns driver that key's battery power is low	ON / OFF
SMART UNLOCK (Entry door unlock mode)	EACH	Function that makes entry unlock operation available.	ALL / EACH / D-door
TRANSMIT INTVAL (Transmission interval)	0.3s	Function that sets entry signal transmission intervals when vehicle is stopped and key is outside vehicle	0.15s / 0.3s / 0.45s / 0.6s
PARK WAIT TIME (Waiting time to permit door opening of door after locking)	3.0s	Function that sets waiting time to permit opening door after door is locked with entry lock function	0.5s / 1.5s / 2.5s / 5s
SMART BACK DOOR (Back door opening operation when vehicle is locked)	LONG	Function that enables back door to open when key is inside luggage room	LONG / TWICE / OFF

4. Wireless door lock control system

Display (Items)	Default	Contents	Setting
OPEN DOOR WARN (Door ajar warning function	ON	If door is not completely closed and transmitter LOCK switch is pressed, this function sounds buzzer for 10 seconds	ON / OFF
WIRLS BUZZ OPER (Buzzer answer-back for wireless door lock operation)	ON	Function that makes wireless buzzer sound for answer-back when transmitter LOCK/UNLOCK switch is pressed	ON / OFF
ALARM FUNCTION (Panic function)	ON	Function that operates theft deterrent alarm when transmitter PANIC switch transmitter is held 0.8 seconds.	ON / OFF

Display (Items)	Default	Contents	Setting
UNLOCK/2OPER (Wireless unlock operated twice)	ON	Function that unlocks driver side door when UNLOCK switch on transmitter is pressed once, and unlocks all doors when pressed twice. If set to OFF, pressing UNLOCK switch once unlocks all doors.	ON / OFF
AUTO LOCK DELAY (Auto lock time)	30s	This function controls amount of time from unlocking doors to automatic re-locking function	30s / 60s
HAZARD ANS BACK (Hazard answer-back for wireless door lock operation)	ON	When LOCK switch on transmitter is pressed, this function illuminates all hazard warning lights once. When UNLOCK switch is pressed, all hazard warning lights illuminate twice	ON / OFF

5. Theft deterrent system

Display (Item)	Default	Contents	Setting
PASSIVE MODE (Passive arming mode)	OFF	PASSIVE MODE is a function that switches theft deterrent system from arming preparation state to armed state 30 seconds after key is removed from key slot and all doors is closed, even if doors are not locked by wireless or door key lock operation. In PASSIVE MODE, theft deterrent system will judge that a theft is taking place and switch to alarm sounding state if one of the following operations are not performed within 14 seconds (see ENTRY DELAY below) after door is opened: • Unlock any door by key or wireless operation • Reconnect battery • Insert key into key slot and turn power switch ON (IG)	ON / OFF
WARN BY HORN (Warning by horn)	ON	Function that allows vehicle horn and theft deterrent horn to be able to be used and a warning device	ON / OFF
ENTRY DELAY (Entry delay time)	14 s	Function that changes entry delay time (time before warning states)	0 s/14 s/ 30 s
WARN BY GLS SEN (Warning by glass broken sensor)	ON	Function that turns glass broken sensor ON/OFF	ON / OFF

INITIALIZATION

System Name
Power Window Control System

1. RESET (INITIALIZE) POWER WINDOW REGULATOR MOTOR (DRIVER SIDE)

NOTICE:

- **Resetting the power window regulator motor (initializing the pulse sensor) is necessary if one of the following occurs: 1) the battery cable is disconnected; 2) the power window regulator master switch, wire harness, power window regulator switch, power window regulator or power window regulator motor is replaced or removed / installed; or 3) the Power fuse, FR Door fuse, GAUGE fuse and ECU-IG fuse are replaced. If resetting is not performed, the master switch will not be able to operate the AUTO UP / DOWN function, jam protection function and remote operation function.**
- **Whenever disconnecting the cable from the negative (-) battery terminal, reset all the other systems besides the power window control system.**

(a) Change the power mode to ON (IG) by pushing the power switch.

(b) Open the power window halfway by pressing the power window switch.

(c) Fully pull up on the switch until the power window is fully closed and continue to hold the switch for at least 1 second.

(d) Check that the AUTO UP / DOWN function operates normally.
If the AUTO UP / DOWN function operates normally, reset operations are complete. If abnormal, follow the 3 steps below.

(e) Disconnect the cable from the negative (-) battery terminal for 10 seconds.

(f) Connect the cable to the negative (-) battery terminal.

(g) Perform the first 4 steps again.
If the AUTO UP / DOWN function operates normally, reset operations have been completed at this time. If abnormal, follow the 4 steps below.

(h) Change the power mode to ON (IG) by pushing the power switch.

(i) Open the power window halfway by pressing the power window switch.

(j) Fully pull up on the switch until the power window is fully closed and continue to hold the switch for approximately 12 seconds after the power window is fully closed.

(k) Check that the AUTO UP / DOWN function operates normally.

INSPECTION MODE PROCEDURE

1. 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 TRAC function. When the wheel speed of the front wheels exceeds that of the rear wheels, the wheel speed of the front wheels is restrained. It is necessary to activate inspection mode and deactivate the motor TRAC 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
Vehicle straight traveling test (side slip inspection)	D	ON or OFF
Breaking force test	N	ON or OFF
Speedometer test	D	ON
Exhaust gas test (idling)	P	ON
Headlight test	P	ON or OFF

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

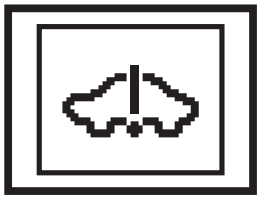
(1) Depress the accelerator pedal slowly and gradually accelerate the vehicle. Make a measurement.

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

(c) Special note for using the chassis dynamometer

Always set an appropriate load before starting the test.

Multi-information Display:

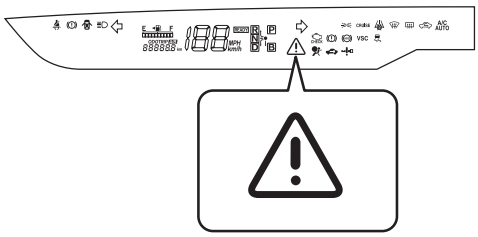


HV System Warning

H

D100904E01

Combination Meter:



Master Warning Light

H

D100905E01

(d) Activating inspection mode
(1) Connect the intelligent tester to the DLC3.
(2) Turn the power switch ON (IG).
(3) Turn the intelligent tester ON.
(4) Select from the tester menus: Powertrain, Hybrid Control, Active Test, Inspection Mode - 2WD Inspection.

(5) Check that the HV system warning light flashes on the multi-information display and the master warning light is illuminated in the combination meter.

(e) Deactivating inspection mode
(1) Turn the power switch OFF.

NOTICE:

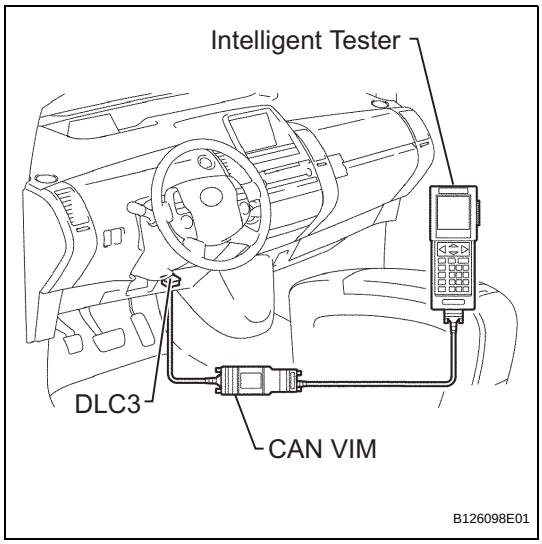
- **The idling speed in inspection mode is approximately 1,000 rpm. The engine speed increases to 1,500 rpm if the accelerator pedal is depressed by less than 60%. If the accelerator pedal is depressed by more than 60%, the engine speed increases to 2,500 rpm.**
- **If a DTC is set during inspection mode, the master warning light and the error warning light illuminate on the multi-information display.**
- **When the master warning light illuminates during inspection mode, deactivate inspection mode, and check for DTC(s).**
- **Driving the vehicle without deactivating inspection mode may damage the transaxle.**

IN

HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

GENERAL INFORMATION

A large number of ECU controlled systems are used in the PRIUS. In general, ECU controlled systems are considered to be very intricate, requiring a high level of technical knowledge to troubleshoot. However, most problem checking procedures only involve inspecting the ECU controlled system's circuits one by one. An adequate understanding of the system and a basic knowledge of electricity is enough to perform effective troubleshooting, accurate diagnoses and necessary repairs.



FOR USING INTELLIGENT TESTER

Connect the cable of the intelligent tester to the DLC3, turn the power switch ON (IG) and attempt to use the tester. If the display indicates that a communication error has occurred, there is a problem either with the vehicle or with the tester.

* If communication is normal when the tester is connected to another vehicle, inspect the DLC3 of the original vehicle.
* If communication is still not possible when the tester is connected to another vehicle, the problem may be in the tester itself. Consult the Service Department listed in the tester's instruction manual.

HOW TO PROCEED WITH TROUBLESHOOTING

1. OPERATION FLOW

HINT:

Perform troubleshooting in accordance with the procedures below. The following is an outline of basic troubleshooting procedures. Confirm the troubleshooting procedures for the circuit you are working on before beginning troubleshooting.

1	VEHICLE BROUGHT TO WORKSHOP

NEXT

2	CUSTOMER PROBLEM ANALYSIS

(a) Ask the customer about the conditions and environment when the problem occurred.

NEXT

3	INSPECT BATTERY VOLTAGE

Standard voltage:

11 to 14 V

If the voltage is below 11 V, recharge or replace the battery before proceeding.

NEXT

4	SYMPTOM CONFIRMATION AND DTC (AND FREEZE FRAME DATA) CHECK

(a) Visually check the wire harnesses, connectors and fuses for open and short circuits.

(b) Warm up the engine to the normal operating temperature.

(c) Confirm the problem symptoms and conditions, and check for DTCs.

Result

Result	Proceed to
DTC is output	A
DTC is not output	B

B → **Go to step 6**

A

IN

5	DTC CHART

(a) Check the results obtained in the DTC check. Then find the output DTC in the DTC chart. Look at the "Trouble Area" column for a list of potentially malfunctioning circuits and / or parts.

NEXT → **Go to step 7**

6	PROBLEM SYMPTOMS TABLE

(a) Check the results obtained in the symptom confirmation. Then find the problem symptoms in the problem symptoms table. Look at the "Suspected Area" column for a list of potentially malfunctioning circuits and / or parts.

NEXT

7	CIRCUIT INSPECTION OR PARTS INSPECTION

(a) Confirm the malfunctioning circuit or part.

NEXT

8	ADJUST, REPAIR OR REPLACE

(a) Adjust, repair or replace the malfunctioning circuit or parts.

NEXT

9	CONFIRMATION TEST

(a) After the adjustment, repairs or replacement, confirm that the malfunction no longer exists. If the malfunction does not reoccur, perform a confirmation test under the same conditions and in the same environment as when the malfunction occurred the first time.

NEXT

END

2. CUSTOMER PROBLEM ANALYSIS

HINT:

- In troubleshooting, confirm that the problem symptoms have been accurately identified. Preconceptions should be discarded in order to make an accurate judgment. To clearly understand what the problem symptoms are, it is extremely important to ask the customer about the problem and the conditions at the time the malfunction occurred.
- Gather as much information as possible for reference. Past problems that seem unrelated may also help in some cases.
- The following 5 items are important points in the problem analysis:

What	Vehicle model, system name
When	Date, time, occurrence frequency
Where	Road conditions
Under what conditions?	Running conditions, driving conditions, weather conditions
How did it happen?	Problem symptoms

3. SYMPTOM CONFIRMATION AND DIAGNOSTIC TROUBLE CODE

HINT:

The diagnostic system in the PRIUS has various functions.

- The first function is the Diagnostic Trouble Code (DTC) check. A DTC is a code stored in the ECU memory whenever a malfunction in the signal circuits to the ECU occurs. In a DTC check, a previous malfunction's DTC can be checked by a technician during troubleshooting.
- Another function is the Input Signal Check, which checks if the signals from various switches are sent to the ECU correctly.

  By using these functions, the problem areas can be narrowed down and troubleshooting is more effective. Diagnostic functions are incorporated in the following system in the PRIUS.

System	**DTC Check (Normal Mode)**	**DTC Check (Check Mode)**	**Freeze Frame Data**	**Sensor Check / Test Mode (Input Signal Check)**	**Data List**	**Active Test**	**Customize Parameter**
SFI System	○	○	○		○	○	
Hybrid Control System	○	○	○		○	○	
Hybrid Battery System	○		○		○	○	
Electronically Controlled Brake System	○		○	○	○	○	
Smart Key System (for Starting)	○				○	○	
Airbag System	○	○		○	○		
Occupant Classification System	○				○		

System	DTC Check (Normal Mode)	DTC Check (Check Mode)	Freeze Frame Data	Sensor Check / Test Mode (Input Signal Check)	Data List	Active Test	Customize Parameter
Air Conditioning System	○				○	○	○
Electronic Shift Lever System	○		○		○		
Electronic Power Steering System	○		○		○		
Tire Pressure Warning System	○			○	○		
Lighting System	○				○	○	○
Meter / Gauge System					○	○	
Power Door Lock Control System	○				○	○	○
Smart Key System (for Door Lock)					○	○	○
Wireless Door Lock Control System (w/ Smart Key)	○				○	○	○
Wireless Door Lock Control System (w/o Smart Key)	○				○	○	○
Key Reminder Warning System					○		
Power Window Control System					○		
Cruise Control System	○				○	○	
Engine Immobiliser System (w/ Smart Key System)	○				○	○	
Engine Immobiliser System (w/o Smart Key System)	○				○	○	
Theft Deterrent System					○	○	○
Audio and Visual System	○						
Navigation System	○						
Rear View Monitor System	○						
Multiplex Communication System	○						

System	DTC Check (Normal Mode)	DTC Check (Check Mode)	Freeze Frame Data	Sensor Check / Test Mode (Input Signal Check)	Data List	Active Test	Customize Parameter
CAN Communication System	○	○					

- In the DTC check, it is very important to determine whether the problem indicated by the DTC is either: 1) still occurring, or 2) occurred in the past but has since returned to normal. In addition, the DTC should be compared to the problem symptom to see if they are related. For this reason, DTCs should be checked before and after confirmation of symptoms (i.e., whether or not problem symptoms exist) to determine current system conditions, as shown in the flowchart below.
- Never skip the DTC check. Failing to check DTCs may, depending on the case, result in unnecessary troubleshooting for systems operating normally or lead to repairs not related to the problem. Follow the procedures listed in the flowchart in the correct order.
- The following flowchart shows how to proceed with troubleshooting using the DTC check. Directions from the flowchart will indicate how to proceed either to DTC troubleshooting or to the troubleshooting of each problem symptom.

1 **DTC CHECK**

NEXT

2 **MAKE A NOTE OF DTCS DISPLAYED AND THEN CLEAR MEMORY**

NEXT

3 **SYMPTOM CONFIRMATION**

Result

Result	Proceed to
No symptoms exist	A
Symptoms exist	B

B → **Go to step 5**

A

4	SIMULATION TEST USING SYMPTOM SIMULATION METHODS

NEXT

IN

5	DTC CHECK

Result

Result	Proceed to
DTC is not output	A
DTC is output	B

B → **TROUBLESHOOTING OF PROBLEM INDICATED BY DTC**

A

6	SYMPTOM CONFIRMATION

Result

Result	Proceed to
Symptoms exist	A
No symptoms exist	B

If a DTC was displayed in the initial DTC check, the problem may have occurred in a wire harness or connector in that circuit in the past. Check the wire harness and connectors.

B → **SYSTEM NORMAL**

A

TROUBLESHOOTING OF EACH PROBLEM SYMPTOM

The problem is still occurring in a place other than the diagnostic circuit (the DTC displayed first is either for a past problem or a secondary problem).

4. SYMPTOM SIMULATION

HINT:

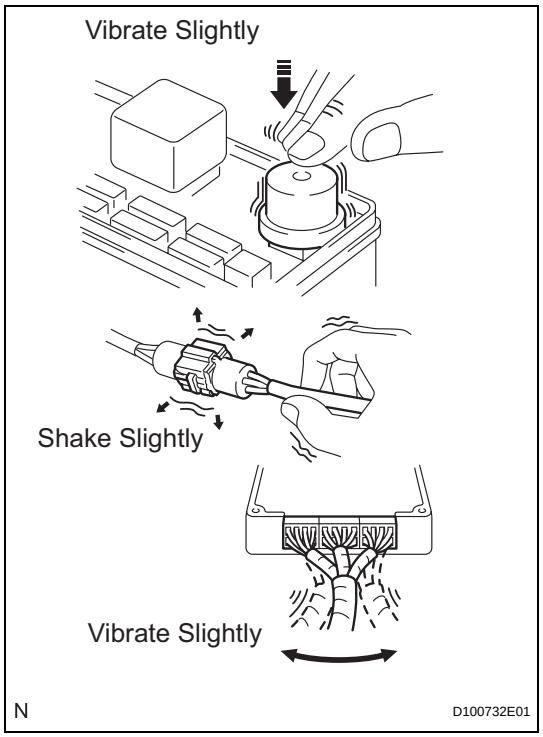
The most difficult case in troubleshooting is when no problem symptoms occur. In such a case, a thorough problem analysis must be carried out. A simulation of the same or similar conditions and environment in which the problem occurred in the customer's vehicle should be carried out. No matter how much skill or experience a technician has, troubleshooting without confirming the problem symptoms will lead to important repairs being overlooked and mistakes or delays.

For example:

With a problem that only occurs when the engine is cold or as a result of vibration caused by the road during driving, the problem can never be determined if the symptoms are being checked on a stationary vehicle or on a vehicle with a warmed-up engine. Vibration, heat or water penetration (moisture) is difficult to reproduce. The symptom simulation tests below are effective substitutes for the conditions and can be applied on a stationary vehicle.

Important points in the symptom simulation test:

In the symptom simulation test, the problem symptoms as well as the problem area or parts must be confirmed. First, narrow down the possible problem circuits according to the symptoms. Then, connect the tester and carry out the symptom simulation test, judging whether the circuit being tested is defective or normal. Also, confirm the problem symptoms at the same time. Refer to the problem symptoms table for each system to narrow down the possible causes.



(a) VIBRATION METHOD:

When a malfunction seems to occur as a result of vibration.

(1) PART AND SENSOR

Apply slight vibration with a finger to the part of the sensor suspected to be the cause of the problem, and check whether or not the malfunction occurs.

NOTICE:

Applying strong vibration to relays may open them.

(2) CONNECTORS

Slightly shake the connector vertically and horizontally.

(3) WIRE HARNESS

Slightly shake the wire harness vertically and horizontally.

HINT:

The connector joint and fulcrum of the vibration are the major areas that should be checked thoroughly.

(b) HEAT METHOD:

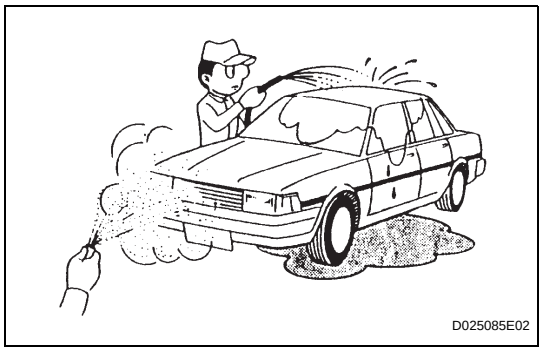
When a malfunction seems to occur when the area in question is heated.

(1) Heat the component that is the possible cause of the malfunction with a hair dryer or similar device. Check if the malfunction occurs.

NOTICE:

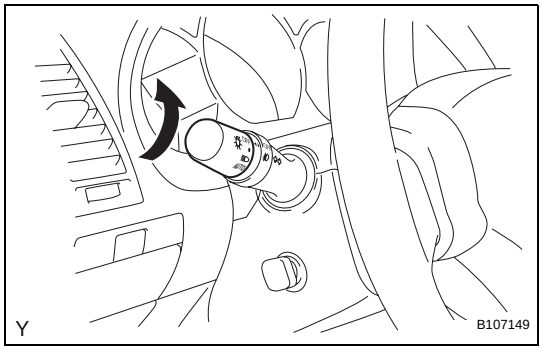
- **Do not heat to more than 60°C (140°F). Exceeding this temperature may damage components.**

- **Do not apply heat directly to the parts in the ECU.**



(c) WATER SPRINKLING METHOD:
When a malfunction seems to occur on a rainy day or in high-humidity.
(1) Sprinkle water onto the vehicle and check if the malfunction occurs.
NOTICE:
- **Never sprinkle water directly into the engine compartment. Indirectly change the temperature and humidity by spraying water onto the front of the radiator.**
- **Never apply water directly onto the electronic components.**

HINT:
If the vehicle has or had a water leakage problem, the leakage may have damaged the ECU or connections. Look for evidence of corrosion or short circuits. Proceed with caution during water tests.



(d) HIGH ELECTRICAL LOAD METHOD:
When a malfunction seems to occur when the electrical load is excessive.
(1) Turn on the heater blower, headlight, rear window defogger and all other electrical loads. Check if the malfunction reoccurs.

5. DIAGNOSTIC TROUBLE CODE CHART

Look for output Diagnostic Trouble Codes (DTCs) (from the DTC checks) in the appropriate section's Diagnostic Trouble Code Chart. Use the chart to determine the trouble area and the proper inspection procedure. A description of each of the chart's columns is below.

Item	Description
DTC No.	Indicates the diagnostic trouble code
Detection Item	Indicates the system or details of the problem
Trouble Area	Indicates the suspected areas of the problem
See Page	Indicates the page where the inspection procedures for each circuit are to be found, or gives instruction for checking and repairs

6. PROBLEM SYMPTOMS TABLE

When a "Normal" code is output during a DTC check but the problem is still occurring, use the Problem Symptoms Table. The suspected areas (circuits or parts) for each problem symptom are in the table. The suspected areas are listed in order of probability. A description of each of the chart's columns is below.

HINT:
In some cases, the problem is not detected by the diagnostic system even though a problem symptom is present. It is possible that the problem is occurring outside the detection range of the diagnostic system, or that the problem is occurring in a completely different system.

Item	Description
Symptom	-
Suspected Area	Indicates the circuit or part which needs to be checked
See Page	Indicates the page where the flowchart for each circuit is located

7. CIRCUIT INSPECTION

A description of the main areas of each circuit inspection is below.

Item	Description
Description	The major role, operation of the circuit and its component parts are explained.
DTC No. DTC Detection Condition, Trouble Area	Indicates the diagnostic trouble codes, diagnostic trouble code detection conditions, and trouble areas of a problem.
Wiring Diagram	This shows a wiring diagram of the circuit. Use this diagram together with ELECTRICAL WIRING DIAGRAM to thoroughly understand the circuit. Wire colors are indicated by an alphabetical code: • B = Black • L = Blue • R = Red • BR = Brown • LG = Light Green • V = Violet • G = Green • O = Orange • W = White • GR = Gray • P = Pink • Y = Yellow • SB = Sky Blue The first letter indicates the basic wire color and the second letter indicates the color of the stripe.
Inspection Procedures	Use the inspection procedures to determine if the circuit is normal or abnormal. If abnormal, use the inspection procedures to determine whether the problem is located in the sensors, actuators, wire harnesses or ECU.
Indicates the condition of the connector of the ECU during the check	Connector being checked is connected. Connections of tester are indicated by (+) or (-) after the terminal name. Connector being checked is disconnected. For illustrations of inspections between a connector and body ground, information about the body ground is not shown in the illustration.

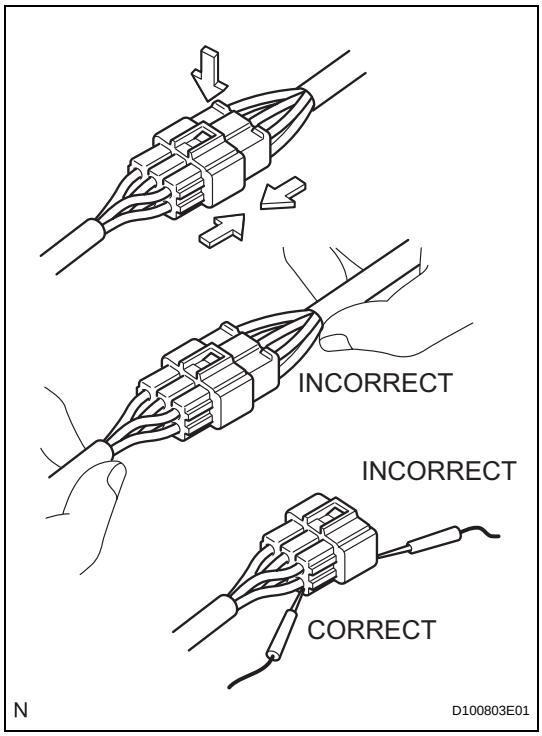
IN

ELECTRONIC CIRCUIT INSPECTION PROCEDURE

1. BASIC INSPECTION

(a) WHEN MEASURING RESISTANCE OF ELECTRONIC PARTS

(1) Unless otherwise stated, all resistance measurements should be made at an ambient temperature of 20°C (68°F). Resistance measurements may be inaccurate if measured at high temperatures, i.e. immediately after the vehicle has been running. Measurements should be made after the engine has cooled down.



(b) HANDLING CONNECTORS

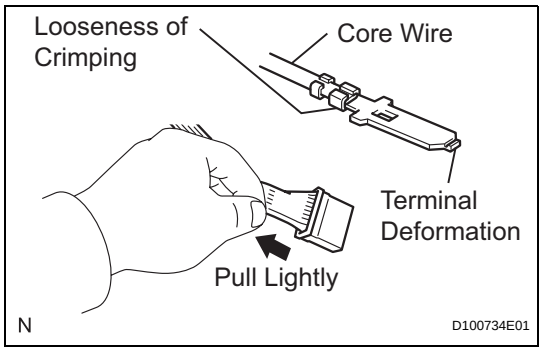
(1) When disconnecting a connector, first squeeze the mating halves tightly together to release the lock, and then press the lock claw and separate the connector.

(2) When disconnecting a connector, do not pull on the harnesses. Grasp the connector directly and separate it.

(3) Before connecting a connector, check that there are no deformed, damaged, loose or missing terminals.

(4) When connecting a connector, press firmly until it locks with a "click" sound.

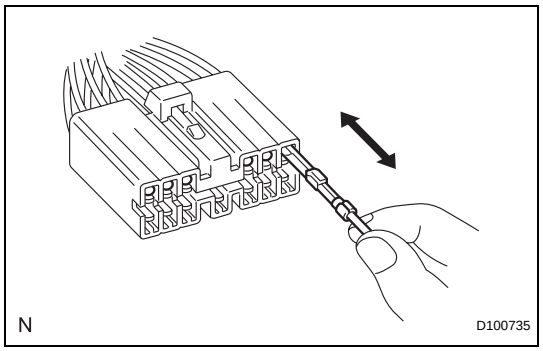
(5) If checking a connector with a TOYOTA electrical tester, check the connector from the backside (harness side) using a mini test lead.
NOTICE:
- **As a waterproof connector cannot be checked from the backside, check it by connecting a sub-harness.**
- **Do not damage the terminals by moving the inserted tester needle.**



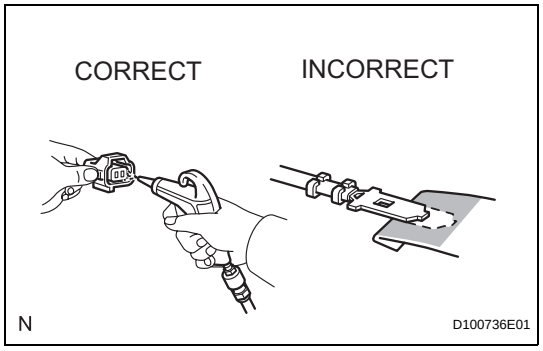
(c) CHECKING CONNECTORS

(1) Checking when a connector is connected: Squeeze the connector together to confirm that they are fully connected and locked.

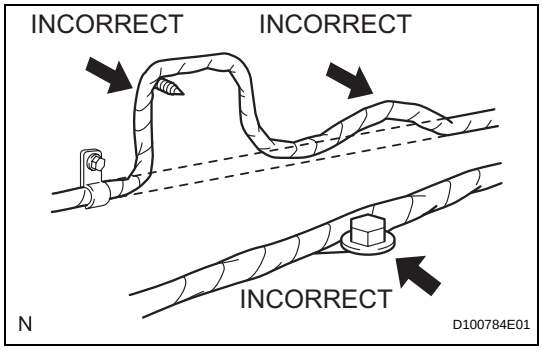
(2) Checking when a connector is disconnected: Check by pulling the wire harness lightly from the backside of the connector. Look for unlatched terminals, missing terminals, loose crimps or broken conductor wires. Check visually for corrosion, metallic or foreign matter and water, and bent, rusted, overheated, contaminated, or deformed terminals.



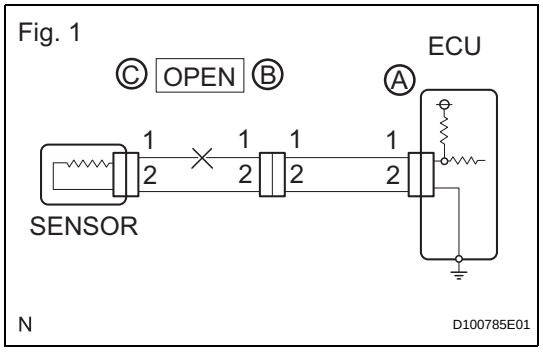
(3) Checking the contact pressure of the terminal:
Prepare a spare male terminal. Insert it into a female terminal, and check for ample tension when inserting and after full engagement.
NOTICE:
When testing a gold-plated female terminal, always use a gold-plated male terminal.



(d) REPAIR METHOD OF CONNECTOR TERMINAL
(1) If there is any foreign matter on the terminal, clean the contact point using an air gun or cloth. Never rub the contact point using sandpaper as the plating may come off.
(2) If there is abnormal contact pressure, replace the female terminal. If the male terminal is gold-plated (gold color), use a gold-plated female terminal; if it is silver-plated (silver color), use a silver-plated female terminal.
(3) Damaged, deformed, or corroded terminals should be replaced. If the terminal does not lock into the housing, the housing may have to be replaced.



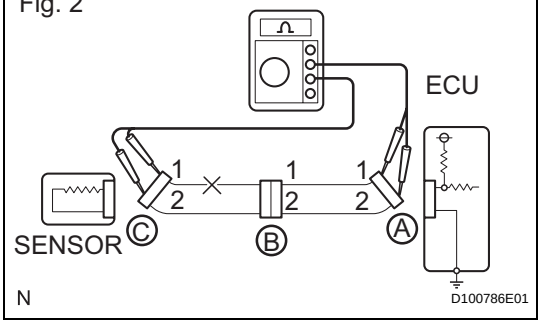
(e) HANDLING OF WIRE HARNESS
(1) If removing a wire harness, check the wiring and clamping before proceeding so that it can be restored in the same way.
(2) Never twist, pull or slacken the wire harness more than necessary.
(3) The wire harness should never come into contact with a high temperature part, or rotating, moving, vibrating or sharp-edged parts. Avoid contact with panel edges, screw tips and other sharp items.
(4) When installing parts, never pinch the wire harness.
(5) Never cut or break the cover of the wire harness. If it is cut or broken, replace it or repair it with vinyl tape.



2. CHECK FOR OPEN CIRCUIT

(a) For an open circuit in the wire harness in Fig. 1, check the resistance or voltage, as described below.

Fig. 2



(b) Check the resistance.

(1) Disconnect connectors A and C, and measure the resistance between them.

Standard resistance (Fig. 2)

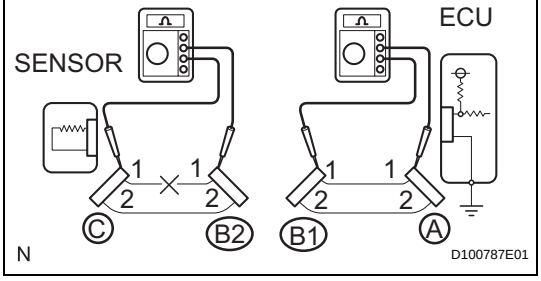
Tester Connection	Specified Condition
Connector A terminal 1 - Connector C terminal 1	10 kΩ or higher
Connector A terminal 2 - Connector C terminal 2	Below 1 Ω

HINT:

Measure the resistance while lightly shaking the wire harness vertically and horizontally.

If the results match the examples above, an open circuit exists between terminal 1 of connector A and terminal 1 of connector C.

Fig. 3



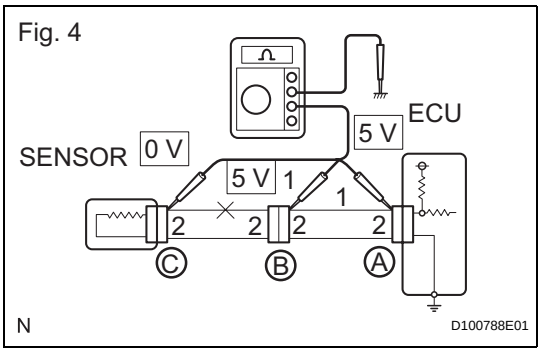
(2) Disconnect connector B and measure the resistance between the connectors.

Standard resistance (Fig. 3)

Tester Connection	Specified Condition
Connector A terminal 1 - Connector B1 terminal 1	Below 1 Ω
Connector B2 terminal 1 - Connector C terminal 1	10 kΩ or higher

If the results match the examples above, an open circuit exists between terminal 1 of connector B2 and terminal 1 of connector C.

Fig. 4



(c) Check the voltage.

(1) In a circuit in which voltage is applied to the ECU connector terminal, an open circuit can be checked by conducting a voltage check.

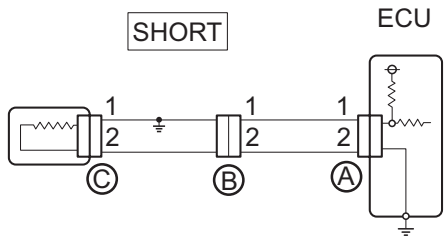
With each connector still connected, measure the voltage between the body ground and these terminals (in this order): 1) terminal 1 of connector A, 2) terminal 1 of connector B, and 3) terminal 1 of connector C.

Standard voltage (Fig. 4)

Tester Connection	Specified Condition
Connector A terminal 1 - Body ground	5 V
Connector B terminal 1 - Body ground	5 V
Connector C terminal 1 - Body ground	Below 1 V

If the results match the examples above, an open circuit exists in the wire harness between terminal 1 of connector B and terminal 1 of connector C.

Fig. 5



N D100789E01

Fig. 6

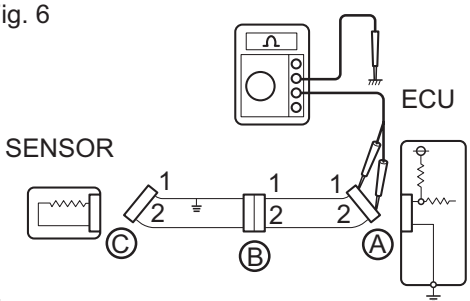


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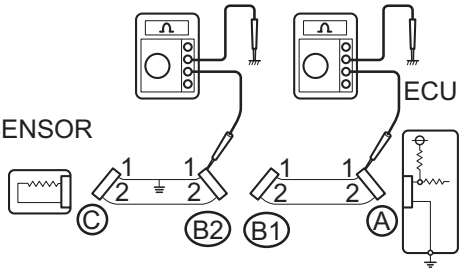
Fig. 7



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3. CHECK FOR SHORT CIRCUIT

(a) If the wire harness is ground shorted (Fig. 5), locate the section by conducting a resistance check with the body ground (below).

(b) Check the resistance with the body ground.

(1) Disconnect connectors A and C, and measure the resistance.

Standard resistance (Fig. 6)

Tester Connection	Specified Condition
Connector A terminal 1 - Body ground	Below 1 Ω
Connector A terminal 2 - Body ground	10 kΩ or higher

HINT:

Measure the resistance while lightly shaking the wire harness vertically and horizontally.

If the results match the examples above, a short circuit exists between terminal 1 of connector A and terminal 1 of connector C.

(2) Disconnect connector B and measure the resistance.

Standard resistance (Fig. 7)

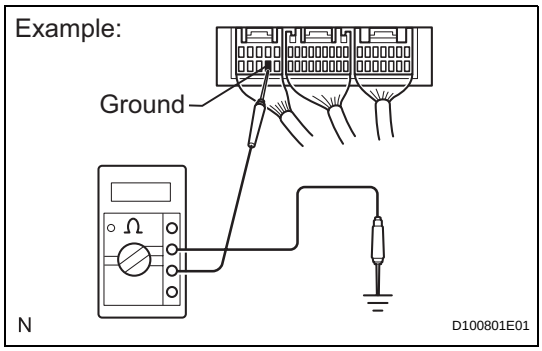
Tester Connection	Specified Condition
Connector A terminal 1 - Body ground	10 kΩ or higher
Connector B2 terminal 1 - Body ground	Below 1 Ω

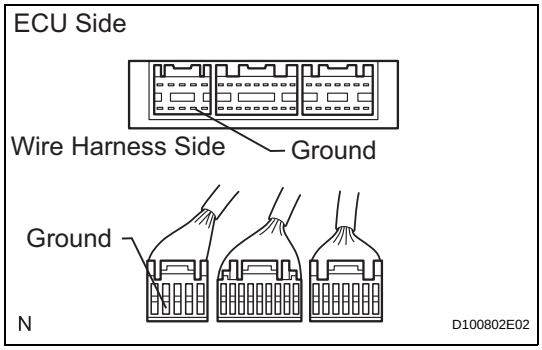
If the results match the examples above, a short circuit exists between terminal 1 of connector B2 and terminal 1 of connector C.

4. CHECK AND REPLACE ECU

NOTICE:

- **The connector should not be disconnected from the ECU. Perform the inspection from the backside of the connector on the wire harness side.**
- **When no measuring condition is specified, perform the inspection with the engine stopped and the power switch ON (IG).**
- **Check that the connectors are fully seated. Check for loose, corroded or broken wires.**





(a) First, check the ECU ground circuit. If it is faulty, repair it. If it is normal, the ECU could be faulty. Temporarily replace the ECU with a normally functioning one and check if the symptoms occur. If the trouble symptoms disappear, replace the original ECU.

(1) Measure the resistance between the ECU ground terminal and body ground.
Standard resistance:
Below 1 Ω

(2) Disconnect the ECU connector. Check the ground terminal on the ECU side and wire harness side for bending, corrosion or foreign matter. Lastly, check the contact pressure of the female terminals.

TERMS

ABBREVIATIONS USED IN MANUAL

ABBREVIATIONS	MEANING
1st	First
2nd	Second
2WD	Two Wheel Drive Vehicle (4 x 2)
3rd	Third
4th	Fourth
4WD	Four Wheel Drive Vehicle (4 x 4)
4WS	Four Wheel Steering System
5th	Fifth
A.D.D.	Automatic Disconnecting Differential
A/C	Air Conditioner
A/F	Air-Fuel Ratio
A/T, ATM	Automatic Transmission (Transaxle)
ABS	Anti-Lock Brake System
AC	Alternating Current
ACC	Accessory
ACIS	Acoustic Control Induction System
ACM	Active Control Engine Mount
ACSD	Automatic Cold Start Device
AFS	Adaptive Front-Lighting System
AHC	Active Height Control Suspension
AID	Air Injection Control Driver
ALR	Automatic Locking Retractor
ALT	Alternator
AMP	Amplifier
ANT	Antenna
APPROX.	Approximately
ASSB	Assembly Services Sdn. Bhd.
ASSY	Assembly
ATF	Automatic Transmission Fluid
AUTO	Automatic
AUX	Auxiliary
AVG	Average
AVS	Adaptive Variable Suspension
B/L	Bi-Level
B/S	Bore-Stroke Ratio
B+	Battery Voltage
BA	Brake Assist
BACS	Boost Altitude Compensation System
BAT	Battery
BDC	Bottom Dead Center
BTDC	Before Top Dead Center
BVSV	Bimetallic Vacuum Switching Valve
C/V	Check Valve
Calif.	California
CAN	Controller Area Network
CB	Circuit Breaker

ABBREVIATIONS	MEANING
CCo	Catalytic Converter For Oxidation
CCV	Canister Closed Valve
CD	Compact Disc
CF	Cornering Force
CG	Center Of Gravity
CH	Channel
CKD	Complete Knock Down
COMB.	Combination
CPE	Coupe
CPS	Combustion Pressure Sensor
CPU	Central Processing Unit
CRS	Child Restraint System
CTR	Center
CV	Control Valve
CW	Curb Weight
D/INJ	Direct Injection
DC	Direct Current
DEF	Defogger
DFL	Deflector
DIFF.	Differential
DIFF. LOCK	Differential Lock
DLC	Data Link Connector
DLI	Distributorless Ignition
DOHC	Double Overhead Camshaft
DP	Dash Pot
DS	Dead Soak
DSP	Digital Signal Processor
DTC	Diagnostic Trouble Code
DVD	Digital Versatile Disc
E/G	Engine
EBD	Electronic Brake Force Distribution
EC	Electrochromic
ECAM	Engine Control And Measurement System
ECD	Electronically Controlled Diesel
ECDY	Eddy Current Dynamometer
ECT	Electronic Controlled Automatic Transmission/Transaxle
ECU	Electronic Control Unit
ED	Electro-Deposited Coating
EDIC	Electronic Diesel Injection Control
EDU	Electronic Driving Unit
EFI	Electronic Fuel Injection
EGR	Exhaust Gas Recirculation
EGR-VM	EGR-Vacuum Modulator
ELR	Emergency Locking Retractor
EMPS	Electric Motor Power Steering
ENG	Engine
ES	Easy & Smooth
ESA	Electronic Spark Advance
ETCS-i	Electronic Throttle Control System-intelligent

ABBREVIATIONS	MEANING
EVAP	Evaporative Emission Control
EVP	Evaporator
E-VRV	Electric Vacuum Regulating Valve
EX	Exhaust
F/G	Fuel Gauge
F/P	Fuel Pump
F/W	Flywheel
FE	Fuel Economy
FF	Front-Engine Front-Wheel-Drive
FIPG	Formed In Place Gasket
FL	Fusible Link
FPU	Fuel Pressure Up
FR / Fr	Front
FW/D	Flywheel Damper
FWD	Front-Wheel-Drive
GAS	Gasoline
GND	Ground
GPS	Global Positioning System
GSA	Gear Shift Actuator
H/B	Hatchback
H-FUSE	High Current Fuse
HI	High
HID	High Intensity Discharge (Headlight)
HPU	Hydraulic Power Unit
HSG	Housing
HT	Hard Top
HV	Hybrid Vehicle
HWS	Heated Windshield System
I/P	Instrument Panel
IC	Integrated Circuit
IDI	Indirect Diesel Injection
IFS	Independent Front Suspension
IG	Ignition
IIA	Integrated Ignition Assembly
IN	Intake (Manifold, Valve)
INT	Intermittent
IRS	Independent Rear Suspension
ISC	Idle Speed Control
J/B	Junction Block
J/C	Junction Connector
KD	Kick-Down
L/H/W	Length, Height, Width
LAN	Local Area Network
LB	Liftback
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LH	Left-Hand
LHD	Left-Hand Drive
LIN	Local Interconnect Network

ABBREVIATIONS	MEANING
LLC	Long-Life Coolant
LNG	Liquefied Natural Gas
LO	Low
LPG	Liquefied Petroleum Gas
LSD	Limited Slip Differential
LSP & BV	Load Sensing Proportioning and Bypass Valve
LSPV	Load Sensing Proportioning Valve
M/T, MTM	Manual Transmission (Transaxle)
MAP	Manifold Absolute Pressure
MAX.	Maximum
MG1	Motor Generator No. 1
MG2	Motor Generator No. 2
MIC	Microphone
MIL	Malfunction Indicator Lamp
MIN.	Minimum
MMT	Multi-mode Manual Transmission
MP	Multipurpose
MPI	Multipoint Electronic Injection
MPX	Multiplex Communication System
MT	Mount
MTG	Mounting
N	Neutral
NA	Natural Aspiration
NO. / No.	Number
O/D	Overdrive
O/S	Oversize
O2S	Oxygen Sensor
OC	Oxidation Catalyst
OCV	Oil Control Valve
OEM	Original Equipment Manufacturing
OHC	Overhead Camshaft
OHV	Overhead Valve
OPT	Option
ORVR	On-board Refueling Vapor Recovery
P & BV	Proportioning And Bypass Valve
P/W	Power Window
PBD	Power Back Door
PCS	Power Control System
PCV	Positive Crankcase Ventilation
PKB	Parking Brake
PPS	Progressive Power Steering
PROM	Programmable Read Only Memory
PS	Power Steering
PSD	Power Slide Door
PTC	Positive Temperature Coefficient
PTO	Power Take-Off
PZEV	Partial Zero Emission Vehicle
R & P	Rack and Pinion
R/B	Relay Block

ABBREVIATIONS	MEANING
R/F	Reinforcement
RAM	Random Access Memory
RBS	Recirculating Ball Type Steering
RFS	Rigid Front Suspension
RH	Right-Hand
RHD	Right-Hand Drive
RLY	Relay
ROM	Read Only Memory
RR / Rr	Rear
RRS	Rigid Rear Suspension
RSE	Rear Seat Entertainment
RWD	Rear-Wheel Drive
SC	Supercharger
SCV	Swirl Control Valve
SDN	Sedan
SEN	Sensor
SICS	Starting Injection Control System
SOC	State Of Charge
SOHC	Single Overhead Camshaft
SPEC	Specification
SPI	Single Point Injection
SRS	Supplemental Restraint System
SSM	Special Service Materials
SST	Special Service Tools
STD	Standard
STJ	Cold-Start Fuel Injection
SW	Switch
SYS	System
T/A	Transaxle
T/M	Transmission
TACH	Tachometer
TAM	P.T. TOYOTA-Astra Motor
TASA	TOYOTA Argentina S.A.
TAT	TOYOTA Motor Thailand Co. Ltd.
TAW	TOYOTA Auto Works Co. Ltd.
TBI	Throttle Body Electronic Fuel Injection
TC	Turbocharger
TCCS	TOYOTA Computer-Controlled System
TCV	Timing Control Valve
TDC	Top Dead Center
TDV	TOYOTA de Venezuela C.A.
TEMP.	Temperature
TEMS	TOYOTA Electronic Modulated Suspension
TFT	TOYOTA Free-Tronic
TIS	Total Information System For Vehicle Development
TKM	TOYOTA Kirloskar Motor Ltd.
TMC	TOYOTA Motor Corporation
TMMIN	P.T. TOYOTA Motor Manufacturing Indonesia
TMMK	TOYOTA Motor Manufacturing Kentucky, Inc.

ABBREVIATIONS	MEANING
TMP	TOYOTA Motor Philippines Corp.
TMT	TOYOTA Motor Thailand Co. Ltd.
TRAC	Traction Control System
TRC	Traction Control System
TSAM	TOYOTA South Africa Motors (Pty) Ltd.
TURBO	Turbocharge
TWC	Three-Way Catalyst
U/D	Underdrive
U/S	Undersize
VCV	Vacuum Control Valve
VDIM	Vehicle Dynamics Integrated Management
VENT	Ventilator
VGRS	Variable Gear Ratio Steering
VIM	Vehicle Interface Module
VIN	Vehicle Identification Number
VPS	Variable Power Steering
VSC	Vehicle Stability Control
VSV	Vacuum Switching Valve
VTV	Vacuum Transmitting Valve
VVT-i	Variable Valve Timing-intelligent
W/ / w/	With
W/H	Wire Harness
W/O / w/o	Without
WGN	Wagon

GLOSSARY OF SAE AND TOYOTA TERMS

This glossary lists all SAE-J1930 terms and abbreviations used in this manual in compliance with SAE recommendations, as well as their TOYOTA equivalents.

SAE ABBREVIATIONS	SAE TERMS	TOYOTA TERMS ( )-ABBREVIATIONS
3GR	Third Gear	-
4GR	Fourth Gear	-
A/C	Air Conditioning	Air Conditioner
ACL	Air Cleaner	Air Cleaner, A/CL
AIR	Secondary Air Injection	Air Injection (AI)
AP	Accelerator Pedal	-
B+	Battery Positive Voltage	+B, Battery Voltage
BARO	Barometric Pressure	HAC
CAC	Charge Air Cooler	Intercooler
CARB	Carburetor	Carburetor
CFI	Continuous Fuel Injection	-
CKP	Crankshaft Position	Crank Angle
CL	Closed Loop	Closed Loop
CMP	Camshaft Position	Cam Angle
CPP	Clutch Pedal Position	-
CTOX	Continuous Trap Oxidizer	-
CTP	Closed Throttle Position	LL ON, Idle ON
DFI	Direct Fuel Injection	Direct Injection (DI/INJ)
DI	Distributor Ignition	-
DLC3	Data Link Connector 3	OBD II Diagnostic Connector
DTC	Diagnostic Trouble Code	Diagnostic Trouble Code
DTM	Diagnostic Test Mode	-
ECL	Engine Coolant Level	-
ECM	Engine Control Module	Engine Electronic Control Unit (ECU)
ECT	Engine Coolant Temperature	Coolant Temperature, Water Temperature (THW)
EEPROM	Electrically Erasable Programmable Read Only Memory	Electrically Erasable Programmable Read Only Memory (EEPROM)
EFE	Early Fuel Evaporation	Cold Mixture Heater (CMH), Heat Control Valve (HCV)
EGR	Exhaust Gas Recirculation	Exhaust Gas Recirculation (EGR)
EI	Electronic Ignition	Distributorless Ignition (DLI)
EM	Engine Modification	Engine Modification (EM)
EPROM	Erasable Programmable Read Only Memory	Programmable Read Only Memory (PROM)
EVAP	Evaporative Emission	Evaporative Emission Control (EVAP)
FC	Fan Control	-
FEEPROM	Flash Electrically Erasable Programmable Read Only Memory	-
FEPROM	Flash Erasable Programmable Read Only Memory	-
FF	Flexible Fuel	-
FP	Fuel Pump	Fuel Pump
GEN	Generator	Alternator
GND	Ground	Ground (GND)
HO2S	Heated Oxygen Sensor	Heated Oxygen Sensor (HO2S)
IAC	Idle Air Control	Idle Speed Control (ISC)

SAE ABBREVIATIONS	SAE TERMS	TOYOTA TERMS ( )-ABBREVIATIONS
IAT	Intake Air Temperature	Intake or Inlet Air Temperature
ICM	Ignition Control Module	-
IFI	Indirect Fuel Injection	Indirect Injection (IDL)
IFS	Inertia Fuel-Shutoff	-
ISC	Idle Speed Control	-
KS	Knock Sensor	Knock Sensor
MAF	Mass Airflow	Air Flow Meter
MAP	Manifold Absolute Pressure	Manifold Pressure Intake Vacuum
MC	Mixture Control	Electric Bleed Air Control Valve (EBCV) Mixture Control Valve (MCV) Electric Air Control Valve (EACV)
MDP	Manifold Differential Pressure	-
MFI	Multiport Fuel Injection	Electronic Fuel Injection (EFI)
MIL	Malfunction Indicator Lamp	Check Engine Lamp
MST	Manifold Surface Temperature	-
MVZ	Manifold Vacuum Zone	-
NVRAM	Non-Volatile Random Access Memory	-
O2S	Oxygen Sensor	Oxygen Sensor, O2 Sensor (O2S)
OBD	On-Board Diagnostic	On-Board Diagnostic System (OBD)
OC	Oxidation Catalytic Converter	Oxidation Catalyst Converter (OC), CCo
OL	Open Loop	Open Loop
PAIR	Pulsed Secondary Air Injection	Air Suction (AS)
PCM	Powertrain Control Module	-
PNP	Park/Neutral Position	-
PROM	Programmable Read Only Memory	-
PSP	Power Steering Pressure	-
PTOX	Periodic Trap Oxidizer	Diesel Particulate Filter (DPF) Diesel Particulate Trap (DPT)
RAM	Random Access Memory	Random Access Memory (RAM)
RM	Relay Module	-
ROM	Read Only Memory	Read Only Memory (ROM)
RPM	Engine Speed	Engine Speed
SC	Supercharger	Supercharger
SCB	Supercharger Bypass	E-ABV
SFI	Sequential Multiport Fuel Injection	Electronic Fuel Injection (EFI), Sequential Injection
SPL	Smoke Puff Limiter	-
SRI	Service Reminder Indicator	-
SRT	System Readiness Test	-
ST	Scan Tool	-
TB	Throttle Body	Throttle Body
TBI	Throttle Body Fuel Injection	Single Point Injection Central Fuel Injection (Ci)
TC	Turbocharger	Turbocharger
TCC	Torque Converter Clutch	Torque Converter
TCM	Transmission Control Module	Transmission ECU, ECT ECU
TP	Throttle Position	Throttle Position
TR	Transmission Range	-
TVV	Thermal Vacuum Valve	Bimetallic Vacuum Switching Valve (BVSV) Thermostatic Vacuum Switching Valve (TVSV)

SAE ABBREVIATIONS	SAE TERMS	TOYOTA TERMS ( )-ABBREVIATIONS
TWC	Three-Way Catalytic Converter	Three-Way Catalytic (TWC) Manifold Converter CCRO
TWC+OC	Three-Way + Oxidation Catalytic Converter	CCR + CCo
VAF	Volume Airflow	Air Flow Meter
VR	Voltage Regulator	Voltage Regulator
VSS	Vehicle Speed Sensor	Vehicle Speed Sensor
WOT	Wide Open Throttle	Full Throttle
WU-OC	Warm Up Oxidation Catalytic Converter	-
WU-TWC	Warm Up Three-Way Catalytic Converter	-