# 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.

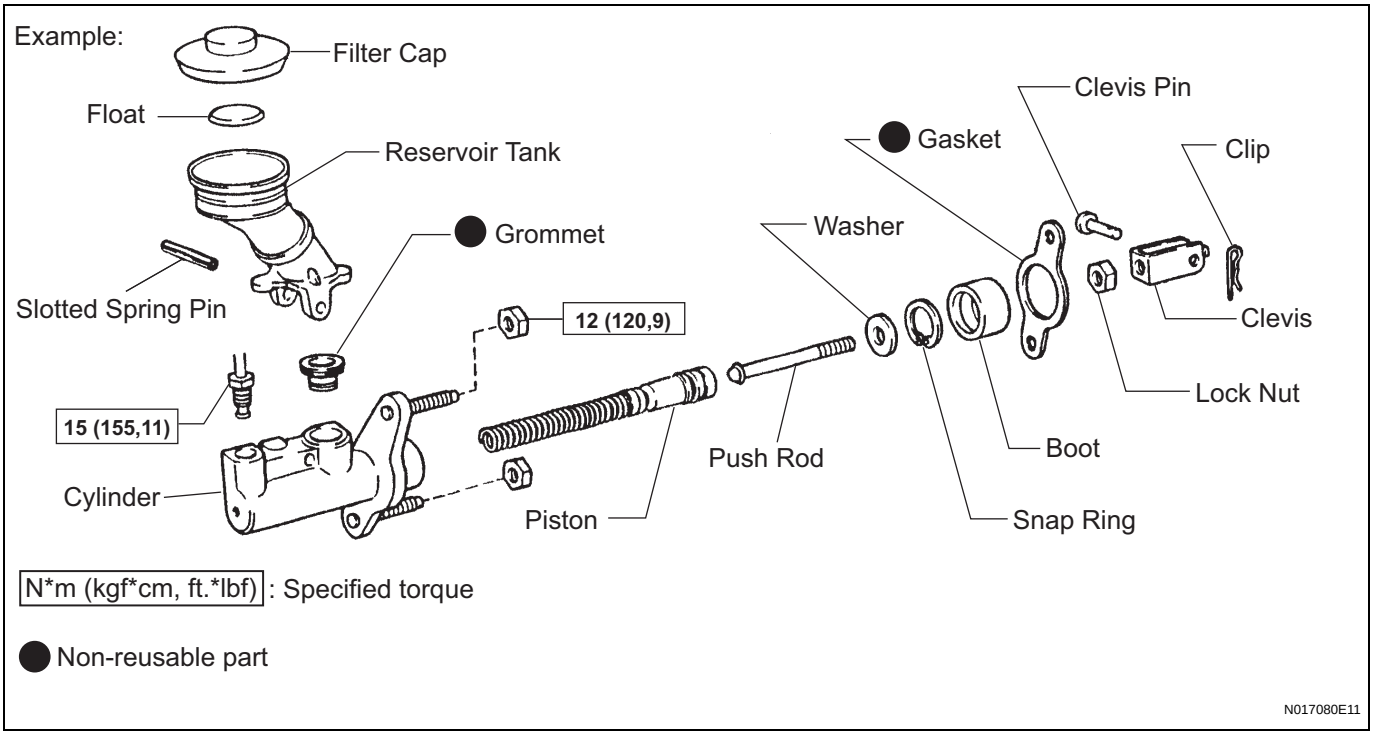
**3. PREPARATION**

(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 procedure 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<br>Also has 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. |

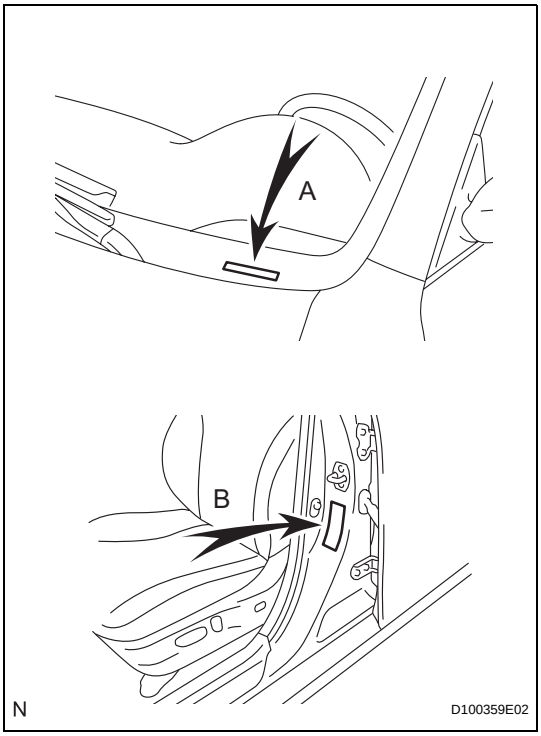
**7. INTERNATIONAL SYSTEM OF UNITS**

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

IN

# IDENTIFICATION INFORMATION

## VEHICLE IDENTIFICATION AND SERIAL NUMBERS

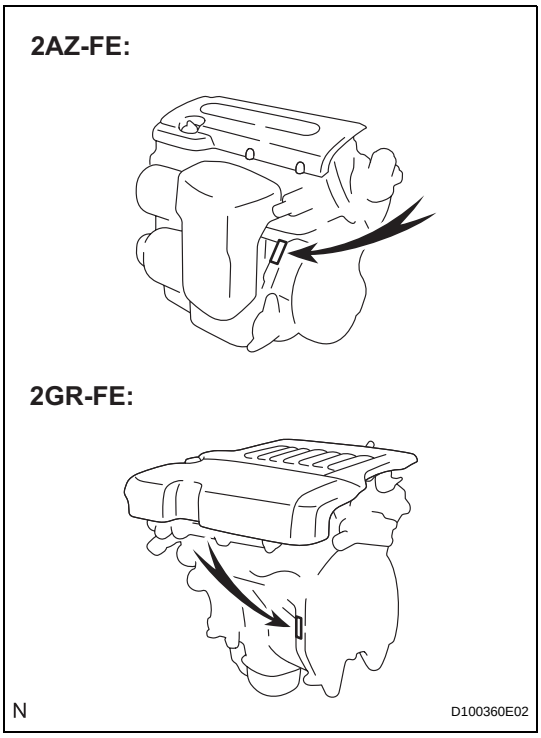



### 1. VEHICLE IDENTIFICATION NUMBER

(a) The vehicle identification number is stamped on the vehicle body and on the certification label, as shown in the illustration.

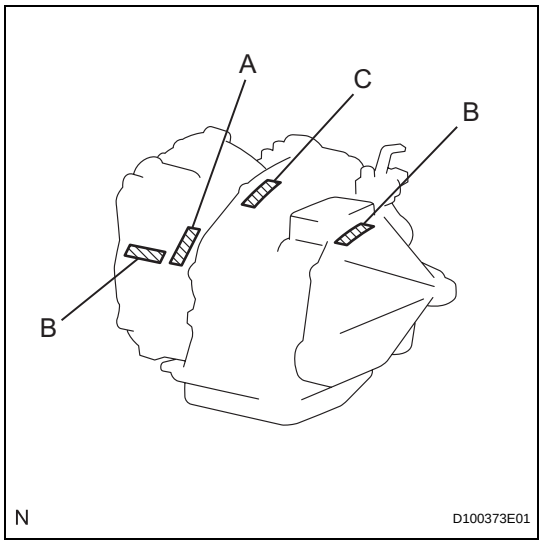
**A:**
**Vehicle Identification Number**

**B:**
**Certification Label**




### 2. ENGINE SERIAL NUMBER AND TRANSAXLE SERIAL NUMBER

(a) The engine serial number is stamped on the cylinder block of the engine as shown in the illustration.




(b) The transaxle serial number is stamped on the housing as shown in the illustration.

**A:**
**E351E Transaxle Serial Number**

**B:**
**U250E Transaxle Serial Number**

**C:**
**U660E Transaxle Serial Number**

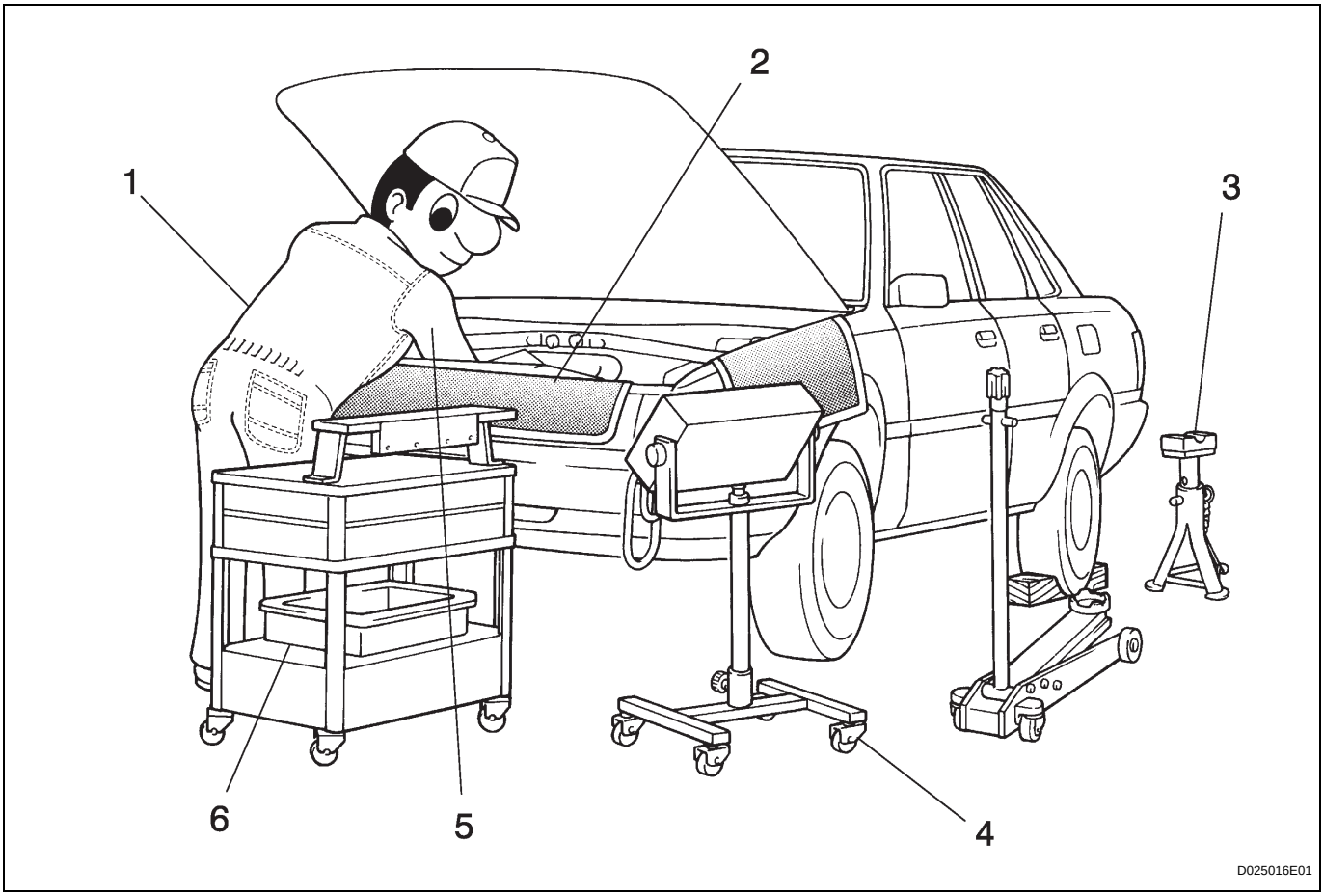
# REPAIR INSTRUCTION

## PRECAUTION

### 1. BASIC REPAIR HINT

(a) HINTS ON OPERATIONS

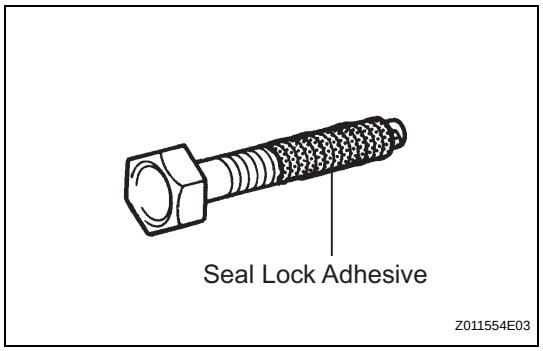





| | | |
|---|---|---|
| 1 | Attire | • Always wear a clean uniform.<br>• Hat and safety shoes must be worn. |
| 2 | Vehicle protection | Prepare a grille cover, fender cover, seat cover and floor mat before starting the operation. |
| 3 | Safety operation | • When working with 2 or more persons, be sure to check safety for one another.<br>• When working with the engine running, make sure to provide ventilation for exhaust fumes in the workshop.<br>• 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.<br>• When jacking up the vehicle, be sure to support the specified location with a safety stand.<br>• When lifting up the vehicle, use appropriate safety equipment. |
| 4 | Preparation of tools and measuring gauge | Before starting 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.<br>• Before removing the parts, check the general condition of the assembly and for deformation and damage.<br>• When the assembly is complicated, take notes. For example, note the total number of electrical connections, bolts, or hoses removed. Add matchmarks to insure reassembly of components in the original positions. Temporarily mark hoses and their fittings if needed.<br>• Clean and wash the removed parts if necessary and assemble them after a thorough check. |

| | | |
|---|---|---|
| 6 | Removed parts | • Place the removed parts in a separate box to avoid mixing them up with the new parts or contaminating the new parts.<br>• For non-reusable parts such as gaskets, O-rings, and self-locking nuts, replace them with new ones as instructed in this manual.<br>• Retain the removed parts for customer inspection, if requested. |

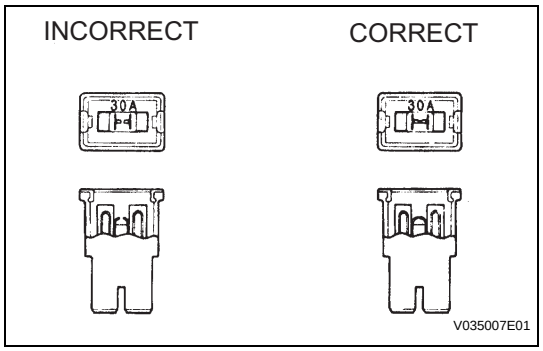
(b) JACKING UP AND SUPPORTING VEHICLE
(1) Care must be taken when jacking up and supporting the vehicle. Be sure to lift and support the vehicle at the proper locations.



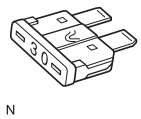

(c) PRECOATED PARTS
(1) Precoated parts are bolts and nuts that are coated with a seal lock adhesive at the factory.
(2) If a precoated part is retightened, loosened or moved in any way, it must be recoated with the specified adhesive.
(3) When reusing a precoated part, clean off the old adhesive and 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.

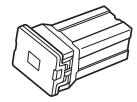
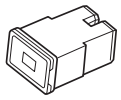
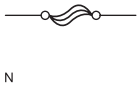
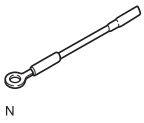
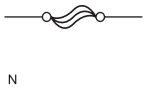
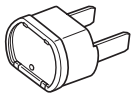
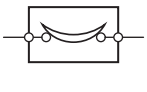
(d) GASKETS
(1) When necessary, use a sealer on gaskets to prevent leaks.

(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 |

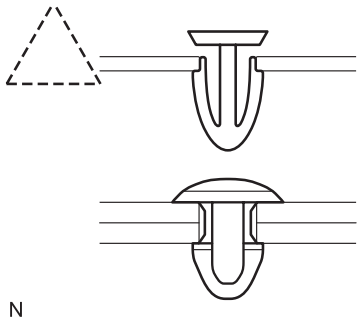
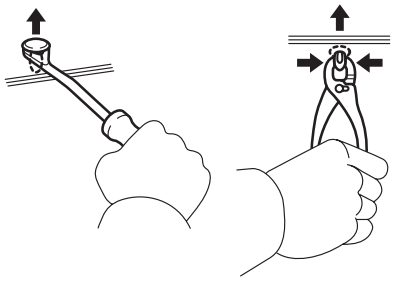
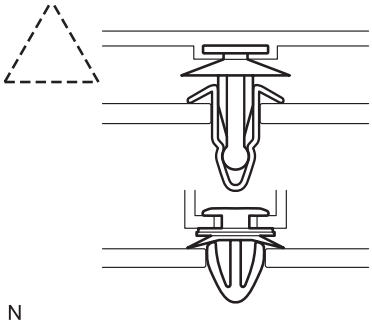
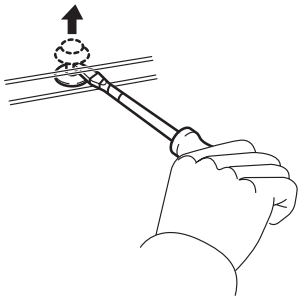
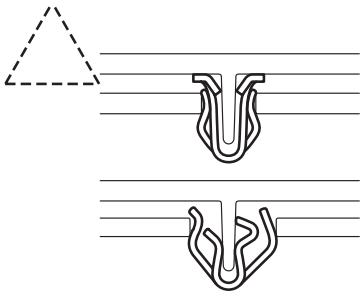
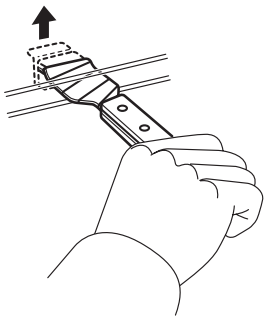
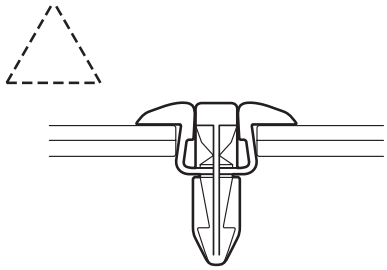
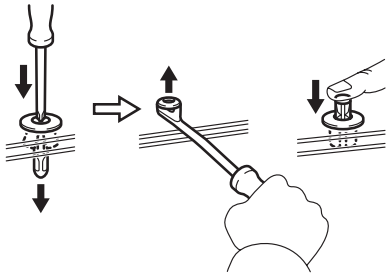
| Illustration | Symbol | Part Name | Abbreviation |
|---|---|---|---|
|  N |  N | MEDIUM CURRENT FUSE | M-FUSE |
|  N |  N | HIGH CURRENT FUSE | H-FUSE |
|  N |  N | FUSIBLE LINK | FL |
|  N |  N | CIRCUIT BREAKER | CB |

(g) CLIPS

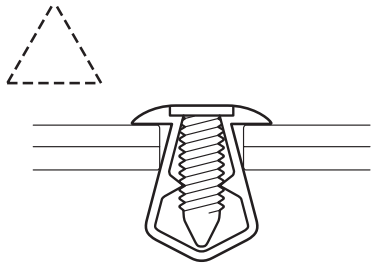
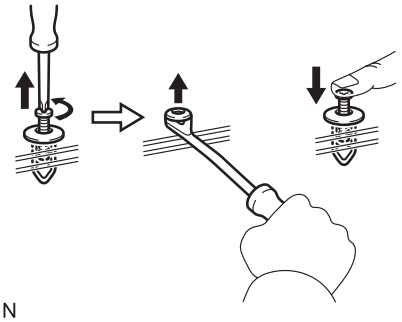
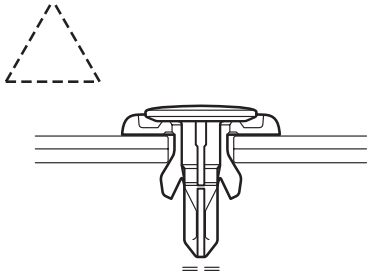
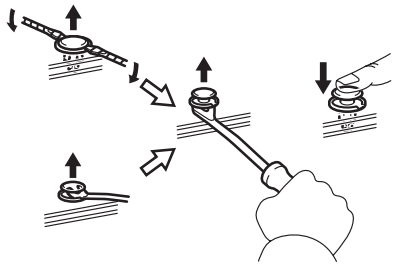
(1) The removal and installation methods of typical clips used for vehicle body parts are shown in the table below.

HINT:

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

| Shape (Example) | Removal/Installation |
|---|---|
|  N | Remove clips with clip remover or pliers.  N |
|  N | Remove fasteners with clip remover or screwdriver.  N |
|  N | Remove clips with wide scraper to prevent panel damage.  N |
|  N | Remove clips by pushing center pin through and prying out shell.  N |

IN

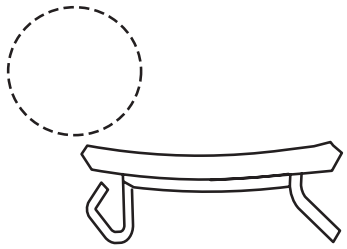
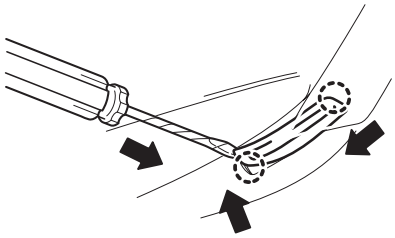
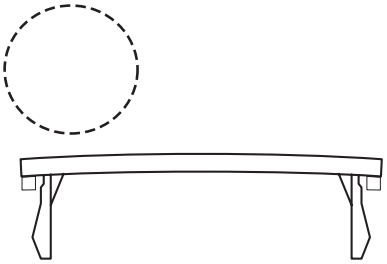
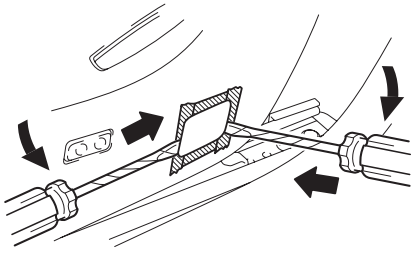
| Shape (Example) | Removal/Installation |
|---|---|
|  N | Remove clips by unscrewing center pin and prying out shell.  N |
|  N | Remove clips by prying out pin and then prying out shell.  N |

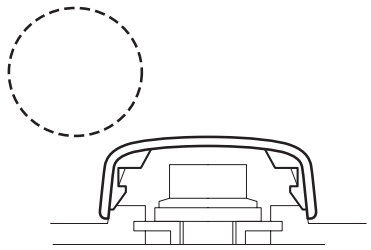
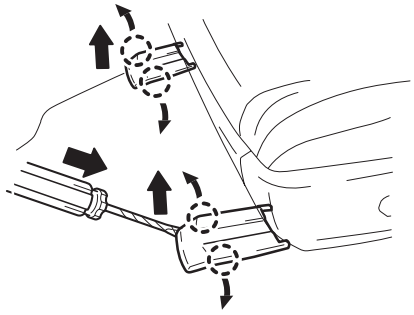
(h) CLAWS

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

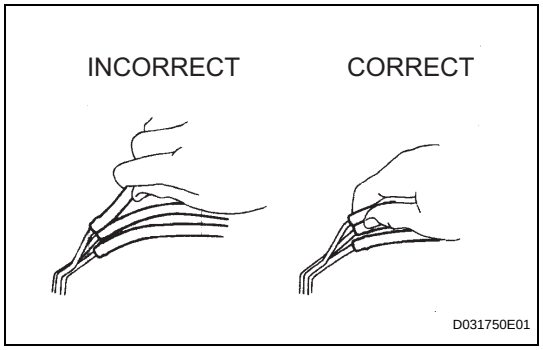
HINT:

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

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

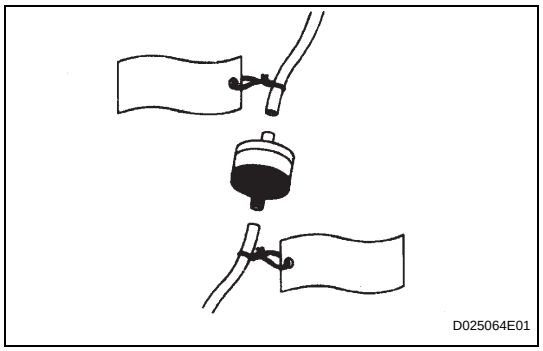
| Shape (Example) | Illustration | Procedures |
|---|---|---|
|  |  | 1. Using a screwdriver, detach the claws and remove the cap or covers. |






(i) REMOVAL AND INSTALLATION OF VACUUM HOSES

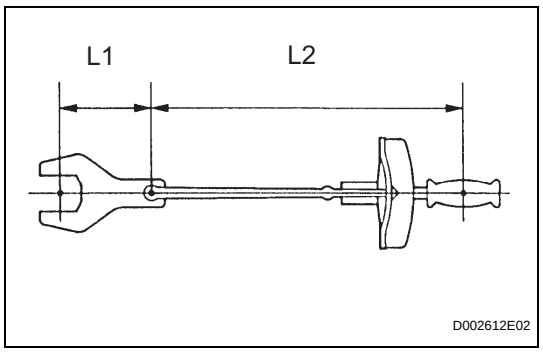
(1) To disconnect a vacuum hose, pull and twist from the end of the hose. Do not pull from the middle of the hose as this may damage the hose.



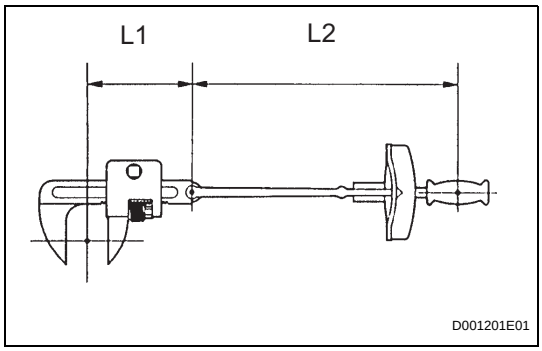

(2) When disconnecting vacuum hoses, use tags to identify where they should be reconnected.

(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, air may leak. 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. FOR VEHICLES EQUIPPED WITH SRS AIRBAG AND SEAT BELT PRETENSIONER**

The CAMRY is equipped with a Supplemental Restraint System (SRS).

**CAUTION:**

**Failure to carry out the service operations in the correct sequence could cause the SRS to unexpectedly deploy during servicing and lead to serious injury. Furthermore, if a mistake is made when servicing SRS, it is possible that the SRS may fail to operate properly. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the following section carefully.**

(a) GENERAL NOTICE

(1) As malfunctions of the SRS are difficult to confirm, the Diagnostic Trouble Codes (DTCs) become the most important source of information when troubleshooting. When troubleshooting the SRS, always check the DTCs before disconnecting the battery.

(2) Work must be started at least 90 seconds after the ignition switch is turned off and after the cable is disconnected from the negative (-) battery terminal.
The SRS is equipped with a back-up power source. If work is started within 90 seconds after turning the ignition switch off and disconnecting the cable from the negative (-) battery terminal, the SRS may deploy.
When the cable is disconnected from the negative (-) battery terminal, clock and audio system memory is erased. Before starting work, make a note of the settings of each memory system. When work is finished, reset the clock and audio system as before.
**CAUTION:**
**Never use a back-up power source (battery or other) to avoid erasing the system memory. The back-up power source may inadvertently power the SRS and cause it to deploy.**

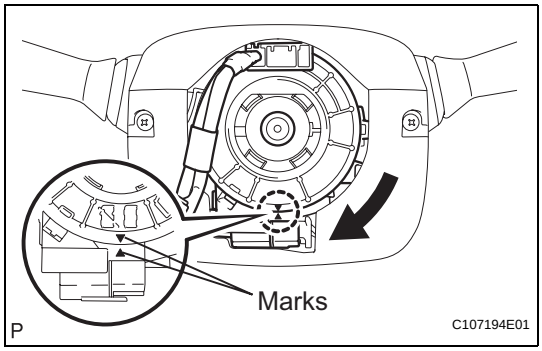
(3) In minor collisions where the SRS does not deploy, the steering pad, front passenger airbag assembly, driver side knee airbag assembly, front seat side airbag assembly, curtain shield airbag assembly and front seat outer belt assembly should be inspected before further use of the vehicle.
(See page RS-352 for steering pad)
(See page RS-399 for front passenger airbag assembly)
(See page RS-371 for driver side knee airbag assembly)
(See page RS-432 for front seat side airbag assembly)
(See page RS-426 for curtain shield airbag assembly)
(See page SB-23 for front seat outer belt assembly)

(4) Never use SRS parts from another vehicle. When replacing parts, use new parts.

(5) Before repairs, remove the airbag sensor assemblies if impacts are likely to be applied to the sensor during repairs.

(6) Never disassemble and attempt to repair all airbag sensor assemblies and all airbag assemblies.
1. Steering pad
2. Front passenger airbag assembly
3. Driver side knee airbag assembly
4. Front seat side airbag assembly
5. Curtain shield airbag assembly
6. Front seat outer belt assembly

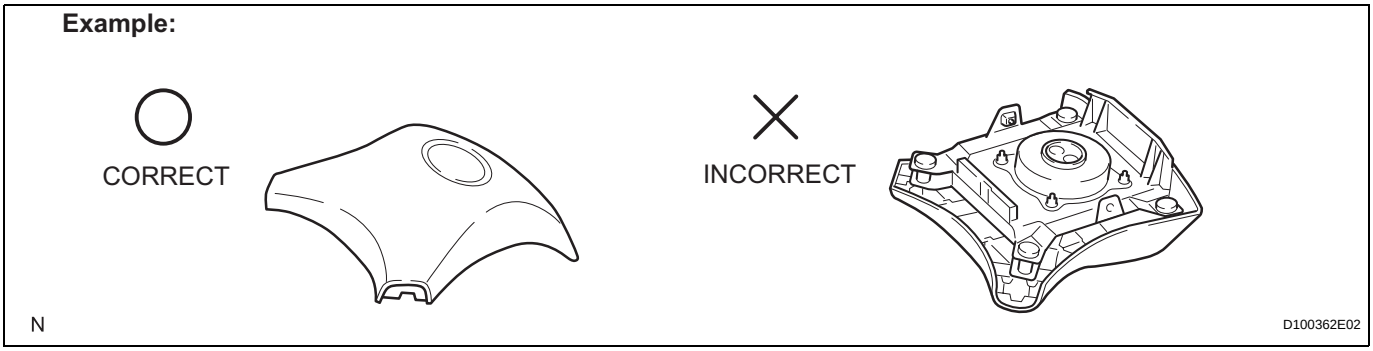
(7) Replace the airbag sensor assemblies and the airbag assemblies if: 1) damage has occurred from being dropped, or 2) cracks, dents or other defects in the case, bracket or connector are present.
(8) Do not directly expose the airbag sensor assembly or airbag assembly to hot air or flames.
(9) Use a voltmeter/ohmmeter with high impedance (minimum=10 kΩ) for troubleshooting electrical circuits.
(10) Information labels are attached to the SRS components. Follow the instructions on the labels.
(11) After work on the SRS is completed, check the SRS warning light.



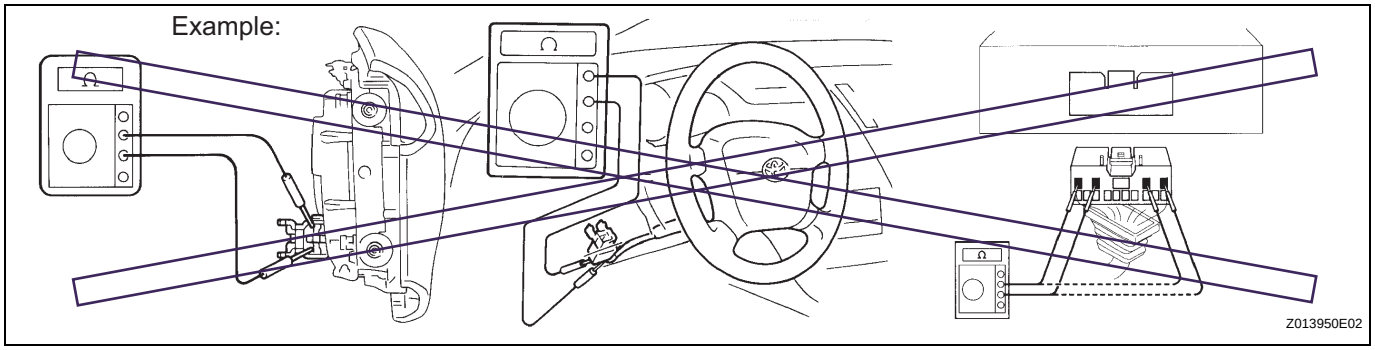

(b) SPIRAL CABLE
(1) The steering wheel must be fitted correctly to the steering column with the spiral cable at the neutral position, as cable disconnection and other problems may occur. Refer to the information about correct installation of the steering wheel (See page RS-366).

(c) STEERING PAD
(1) Always place a removed or new steering pad surface upward as shown in the illustration. Placing the horn button with the pad surface facing down could cause a serious accident if the airbag inflates. Also, do not place anything on top of the horn button.

**Example:**



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




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

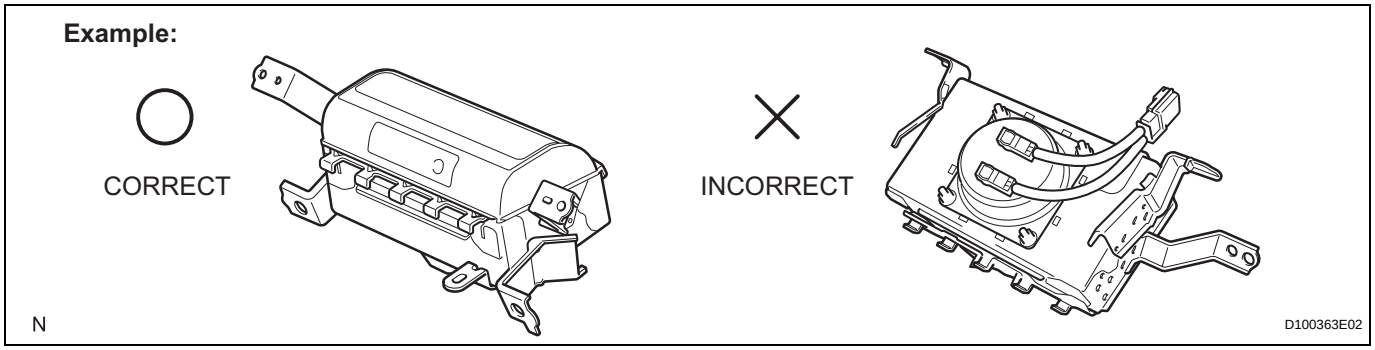
(4) Store the horn button assembly in an area where the ambient temperature is below 93°C (200°F), the humidity is not high and there is no electrical noise.

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

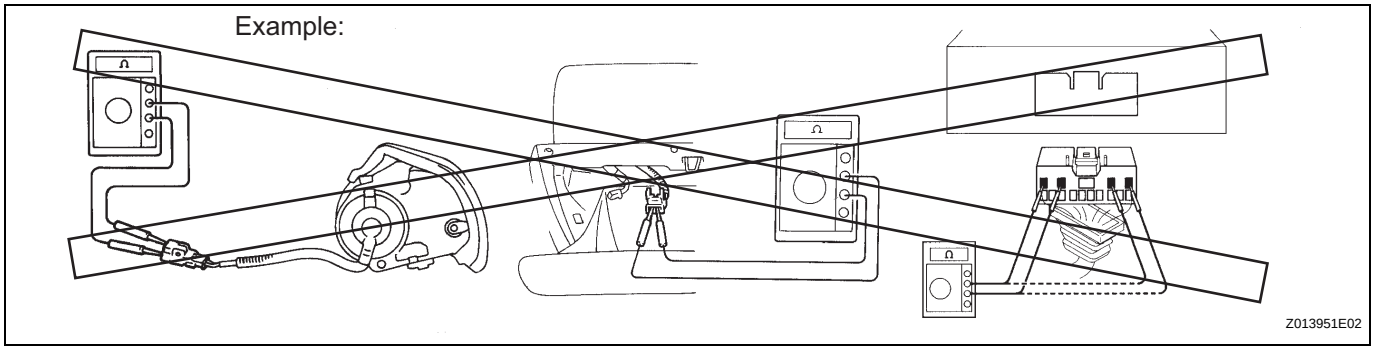
(6) When disposing of the vehicle or the horn button assembly by itself, the airbag should be deployed using SST before disposal (See page RS-352). Activate the airbag in a safe place away from electrical noise.

(d) FRONT PASSENGER AIRBAG ASSEMBLY

(1) Always place a removed or new front passenger airbag assembly with the pad surface facing upward as shown in the illustration. Placing the airbag assembly with the airbag inflation direction facing down could cause a serious accident if the airbag inflates.

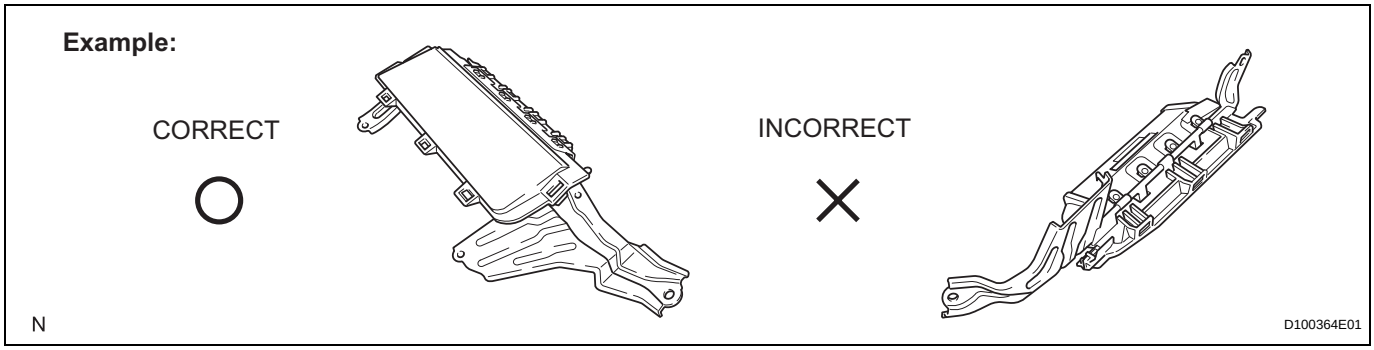


(2) Never measure the resistance of the airbag squib. This may cause the airbag to inflate, which could cause serious injury.

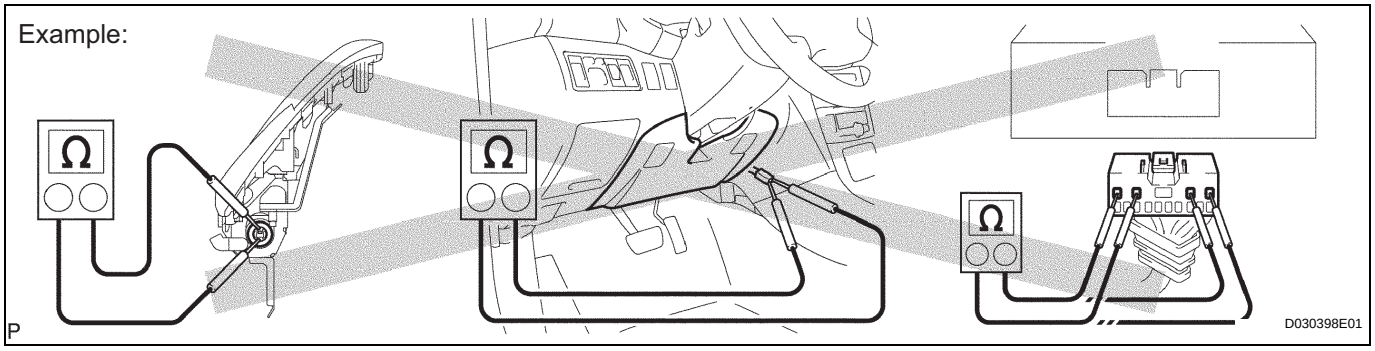



(3) Grease or detergents of any kind should not be applied to the front passenger airbag assembly.
(4) Store the airbag assembly in an area where the ambient temperature is below 93°C (200°F), the humidity is not high and there is no electrical noise.
(5) When using electric welding anywhere on the vehicle, disconnect the airbag ECU connectors (4 pins). These connectors contain shorting springs. This feature reduces the possibility of the airbag deploying due to current entering the squib wiring.
(6) When disposing of the vehicle or the airbag assembly unit by itself, the airbag should be deployed using SST before disposal (See page RS-399). Activate the airbag in a safe place away from electrical noise.

(e) DRIVER SIDE KNEE AIRBAG ASSEMBLY
(1) Always place a removed or new knee airbag assembly with the airbag inflation direction facing upward. Placing the airbag assembly with the airbag inflation direction facing downward could cause a serious accident if the airbag inflates.

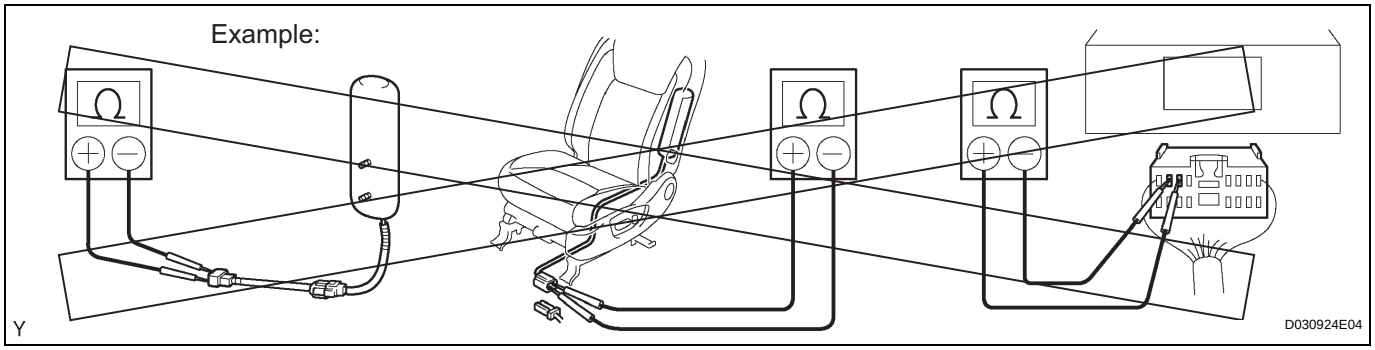


(2) Never measure the resistance of the airbag squib. This may cause the airbag to inflate, which could cause serious injury.




(3) Grease or detergents of any kind should not be applied to the knee airbag assembly.
(4) Store the knee airbag assembly 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 (2 pins). These connectors contain shorting springs. This feature reduces the possibility of the airbag deploying due to current entering the squib wiring.
(6) When disposing of a vehicle or knee airbag assembly unit by itself, the airbag should be inflated using SST before disposal (See page RS-371). Activate the airbag in a safe place away from electrical noise.

(f) FRONT SEAT SIDE AIRBAG ASSEMBLY
(1) Always place a removed or new front seat side airbag assembly with the airbag inflation direction facing up.
(2) Never measure the resistance of the airbag squib. This may cause the airbag to inflate, which could cause serious injury.



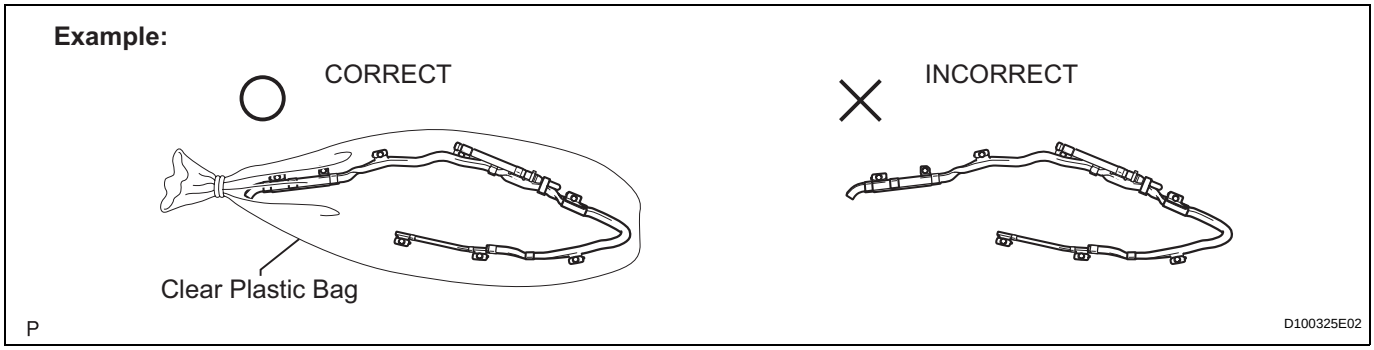

(3) Grease or detergents of any kind should not be applied to the front seat side airbag assembly.
(4) Store the airbag assembly in an area where the ambient temperature is below 93°C (200°F), the humidity is not high and there is no electrical noise.

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

(6) When disposing of a vehicle or the airbag assembly unit by itself, the airbag should be deployed using SST before disposal (See page RS-432). Activate the airbag in a safe place away from electrical noise.

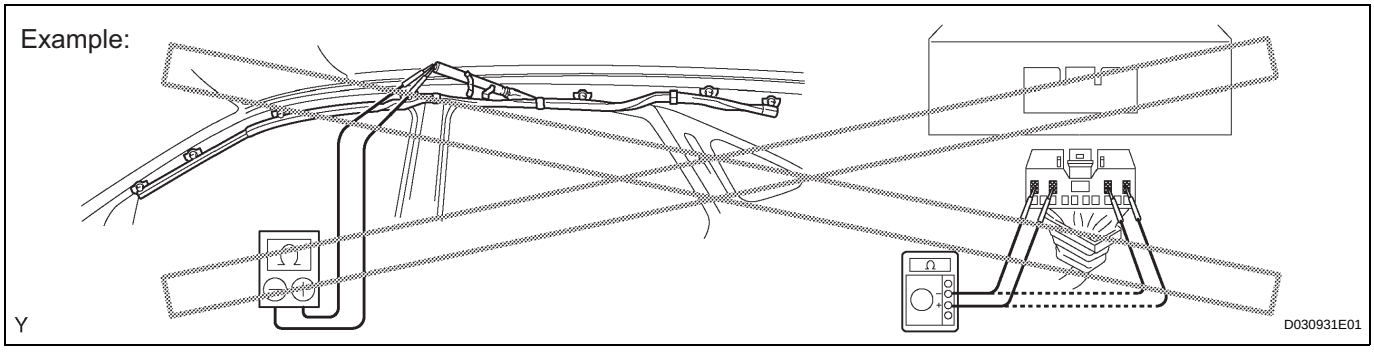
(g) CURTAIN SHIELD AIRBAG ASSEMBLY

(1) Always place a removed or new curtain shield airbag assembly in a clear plastic bag, and keep it in a safe place.




**CAUTION:**
**The plastic bag is not reusable.**
**NOTICE:**
**Never disassemble the curtain shield airbag assembly.**

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




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

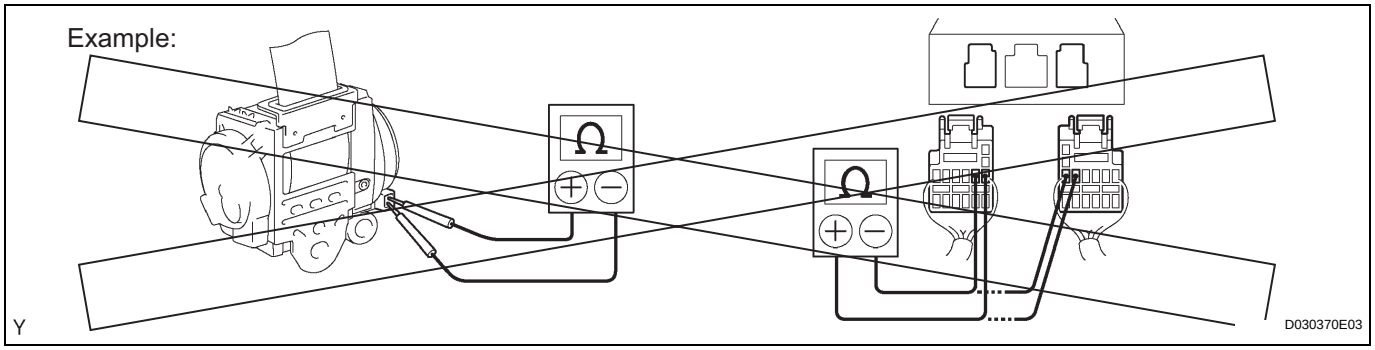
(4) Store the airbag assembly in an area where the ambient temperature is below 93°C (200°F), the humidity is not high and there is no electrical noise.

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

(6) When disposing of a vehicle or the airbag assembly unit by itself, the airbag should be deployed using SST before disposal (See page RS-426). Activate the airbag in a safe place away from electrical noise.

(h) FRONT SEAT OUTER BELT ASSEMBLY AND REAR SEAT OUTER BELT ASSEMBLY (SEAT BELT PRETENSIONER)

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




(2) Never disassemble the seat outer belt.

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

(4) 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.

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

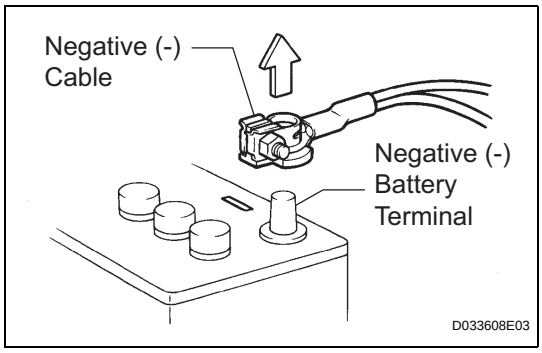
(6) When disposing of a vehicle or the seat outer belt unit by itself, the seat outer belt should be activated before disposal (See page SB-23). Activate the seat outer belt in a safe place away from electrical noise.

(7) As the seat outer belt is hot after being activated, allow some time for it to cool down sufficiently before disposal. Never apply water to cool down the seat outer belt.

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

(i) 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 ignition 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.

(j) 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 a standard yellow color. If the SRS wire harness becomes disconnected or the connector becomes broken, repair or replace it.



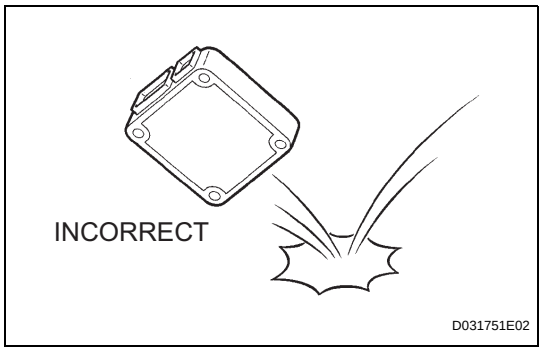

**3. ELECTRONIC CONTROL**

(a) REMOVAL AND INSTALLATION OF BATTERY TERMINAL

**NOTICE:**

**Certain systems need to be initialized after reconnecting the cable to 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 ignition switch 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.

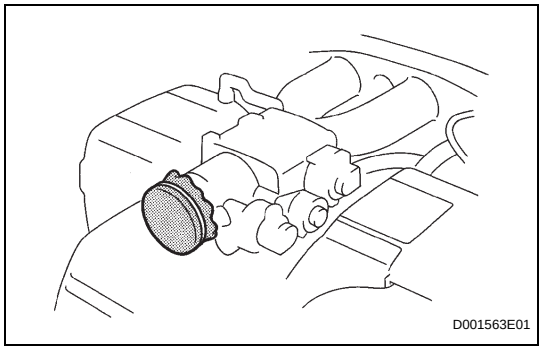



(b) HANDLING OF ELECTRONIC PARTS
(1) Do not open the cover or case of the ECU unless absolutely necessary. If the IC terminals are touched, the IC may be rendered inoperative by static electricity.
(2) Do not pull the wires when disconnecting electronic connectors. Pull the connector itself.
(3) Do not drop electronic components, such as sensors or relays. If they are dropped on a hard surface, they should be replaced.

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

**4. 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, 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 equipments 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.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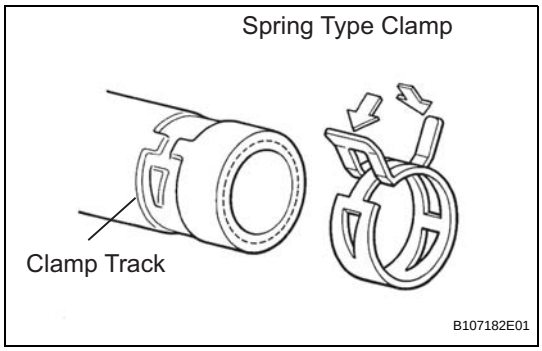
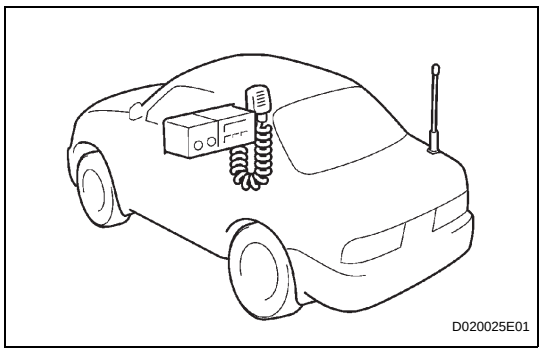
**5. REMOVAL AND INSTALLATION OF ENGINE INTAKE PARTS**

(a) If any metal particles enter inlet system parts, this 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.




**6. 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.




**7. FOR VEHICLES EQUIPPED WITH MOBILE COMMUNICATION SYSTEMS**

(a) Install the antenna 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 sensors locations, refer to the section on the applicable components.
(c) Keep the antenna and feeder separate from other wirings as much as possible. This will prevent signals sent from the communication equipment from affecting vehicle equipment and vice-versa.
(d) Check that the antenna and feeder are correctly adjusted.
(e) Do not install any high-powered mobile communication system.

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

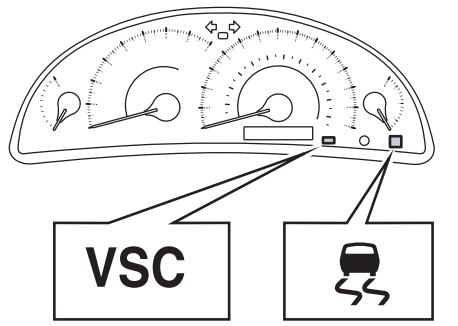
When testing with a 2-wheel drum tester such as a speedometer tester, a combination tester for the speedometer and brake, a chassis dynamometer, or when jacking up the front wheels and turning the wheels, perform the following procedure to enter the inspection mode and stop the TRAC and VSC systems.

(a) Activating inspection mode (Not using the intelligent tester)
HINT:
- Perform procedures "D" to "J" within 30 seconds.
- Perform procedures "G" and "H" within 15 seconds each.

(1) Ensure that the ignition switch is off and the engine is stopped (Procedure "A").
(2) Make sure that the shift lever is in the P position (Procedure "B").
(3) Start the engine (Procedure "C").
(4) Parking Brake Lever Type:
Apply the parking brake by pulling the parking brake lever (Procedure "D").

(5) Parking Brake Pedal Type:
Apply the parking brake by depressing the parking brake pedal (Procedure "E").
(6) Depress and release the brake pedal twice (Procedure "F").
(7) While holding the brake pedal down, release and apply the parking brake twice (Procedure "G").
(8) With the parking brake applied, depress and release the brake pedal twice (Procedure "H").
(9) without Multi-information Display:
Check that the VSC warning light and SLIP indicator light come on (Procedure "I").
HINT:
- If the VSC warning light and SLIP indicator light do not come on in procedure "I", repeat the procedures from "A" to "I".
- Turning the ignition switch off ends inspection mode.

**without Multi-information Display:**

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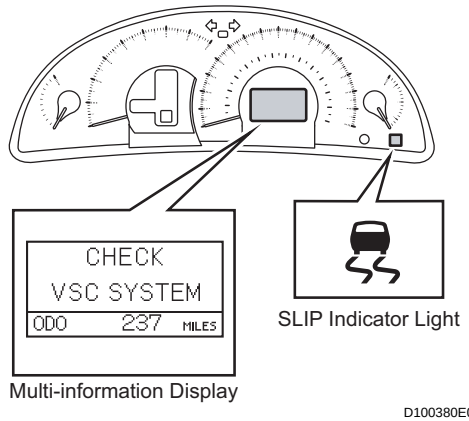
**with Multi-information Display:**

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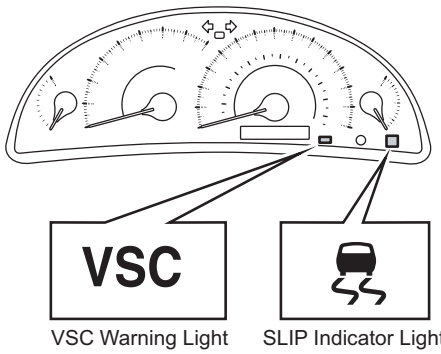
(10) with Multi-information Display:
Check that the "CHECK VSC SYSTEM" message appears on the multi-information display and SLIP indicator light come on (Procedure "J").
HINT:
- If the "CHECK VSC SYSTEM" message appears on the multi-information display and SLIP indicator light do not come on in procedure "J", repeat the procedures from "A" to "J".
- Turning the ignition switch off ends inspection mode.

(b) Activating inspection mode (Using the intelligent tester)
(1) Ensure that the ignition switch is off and the engine is stopped (Procedure "A").
(2) Make sure that the shift lever is in the P position (Procedure "B").
(3) Connect the intelligent tester to the DLC3 (Procedure "C").
(4) Start the engine (Procedure "D").
(5) Turn the intelligent tester main switch on (Procedure "E").
(6) Select the following menu items: ABS/ INSPECTION MODE (Procedure "F").

**without Multi-information Display:**




H

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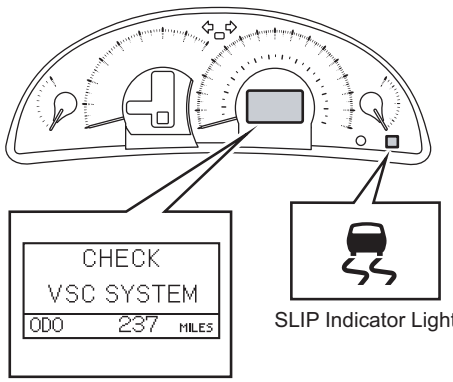
(7) without Multi-information Display:
Check that the VSC warning light and SLIP indicator light come on (Procedure "G").
HINT:
- If the VSC warning light and SLIP indicator light do not come on in procedure "G", repeat the procedures from "A" to "G".
- Turning the ignition switch off ends inspection mode.

**with Multi-information Display:**




H

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(8) with Multi-information Display:
Check that the "CHECK VSC SYSTEM" message appears on the multi-information display and SLIP indicator light come on (Procedure "H").
HINT:
- If the "CHECK VSC SYSTEM" message appears on the multi-information display and SLIP indicator light do not come on in procedure "H", repeat the procedures from "A" to "H".
- Turning the ignition switch off ends inspection mode.

**9. 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**

(a) As a rule, the vehicle must be unloaded when jacking up. Never jack up or lift up the vehicle loaded with things of heavy weight.

(b) When removing any parts of heavy weight like the engine and transaxle, the center of gravity of the vehicle moves. Place a balance weight so as to keep it from rolling, or hold the jacking support location using the mission jack.

**2. NOTICE FOR USING 4 POST LIFT**

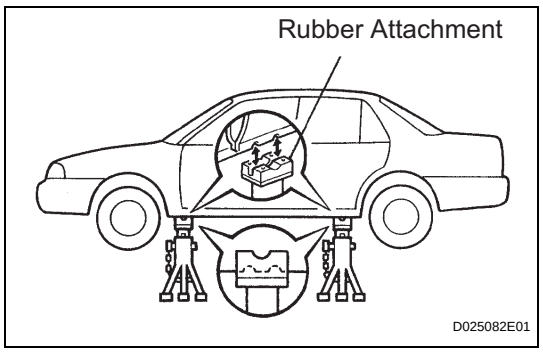
(a) Follow the instruction manual for a safety operation.

(b) Do not damage tires or wheels with a free wheel beam.

(c) Using a wheel stopper, fix the vehicle.

**3. NOTICE FOR USING JACK AND SAFETY STAND**

(a) Work in the flat place using a wheel stopper at all times.




(b) Use a safety stand with a rubber attachment, as shown in the illustration.

(c) Support the specified location with a jack and safety stand accurately.

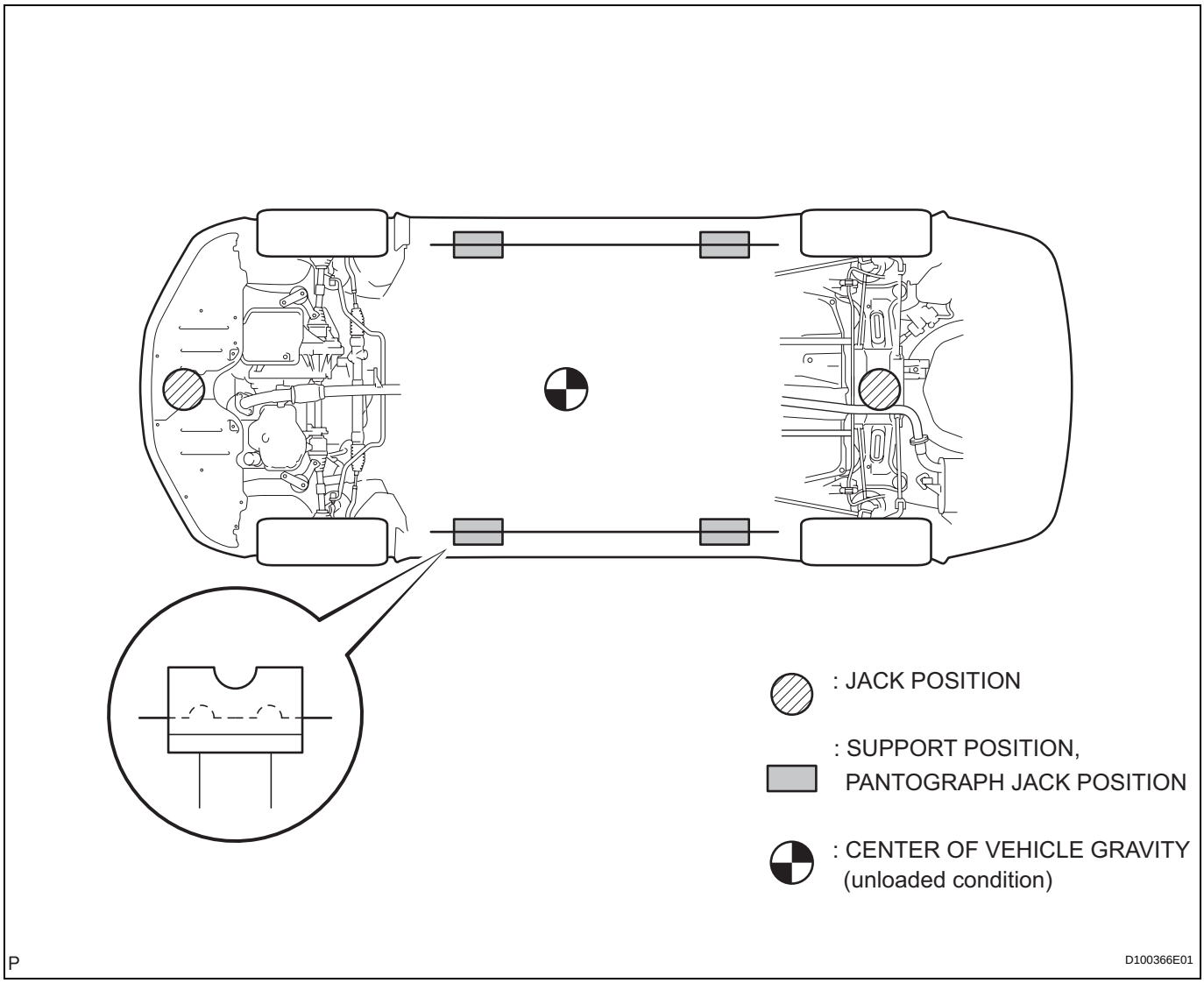
(d) When jacking up the front wheels, release the parking brake and place wheel stoppers only behind the rear wheels. When jacking up the rear wheels, place wheel stoppers only in front of the front wheels.

(e) Do not work or leave the vehicle supported only by a jack. Be sure to support the vehicle with a safety stand.

(f) When jacking up only the front wheels or only the rear wheels, place wheel stoppers to both sides of the wheels that contact ground.

(g) When jacking down the vehicle with its front wheels jacked up, release the parking brake and place wheel stoppers only in front of the rear wheels. When jacking down the vehicle with its rear wheels jacked up, place wheel stoppers only behind the front wheels.






**4. NOTICE FOR USING SWING ARM TYPE LIFT**

(a) Follow the instruction manual of the lift for a safety operation.
(b) Use a cradle with a rubber attachment, as shown in the illustration.
(c) Set in the vehicle so as to make its center of gravity as close as possible to the center of the lift.
(d) Place the vehicle horizontally by adjusting the height of the cradle, and match the groove of the cradle and the safety stand support location accurately.
(e) Be sure to lock the swing arm during the operation.
(f) Lift the vehicle up until the tires float, and shake the vehicle to make sure that the vehicle is stable.

**5. NOTICE FOR USING PLATE TYPE LIFT**

(a) Follow the instruction manual of the lift for a safety operation.

(b) Use a plate lift attachment.

(c) Be sure to set the vehicle to the specified position.

| | |
|---|---|
| Right and left set position | • Place the vehicle over the center of the lift. |
| Front and rear set position | • Align the cushion gum ends of the plate with the attachment lower ends (A and C).<br>• Align the attachment upper end (B) with the rocker flange front side notch. |

(d) Lift the vehicle up until the tires float a bit, and shake the vehicle to make sure that the vehicle is stable.

IN

**Swing Arm Type Lift:**

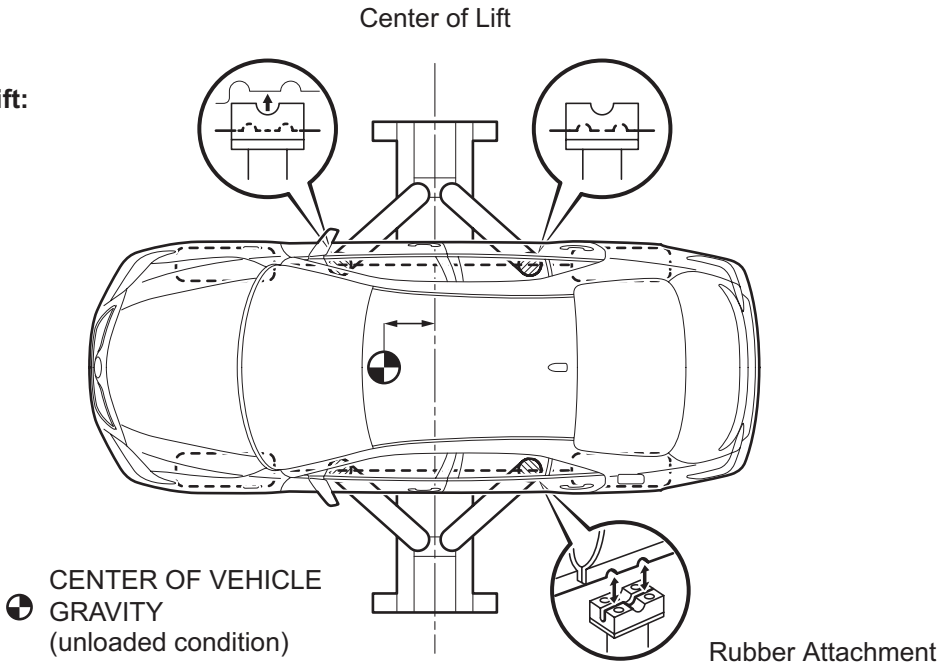
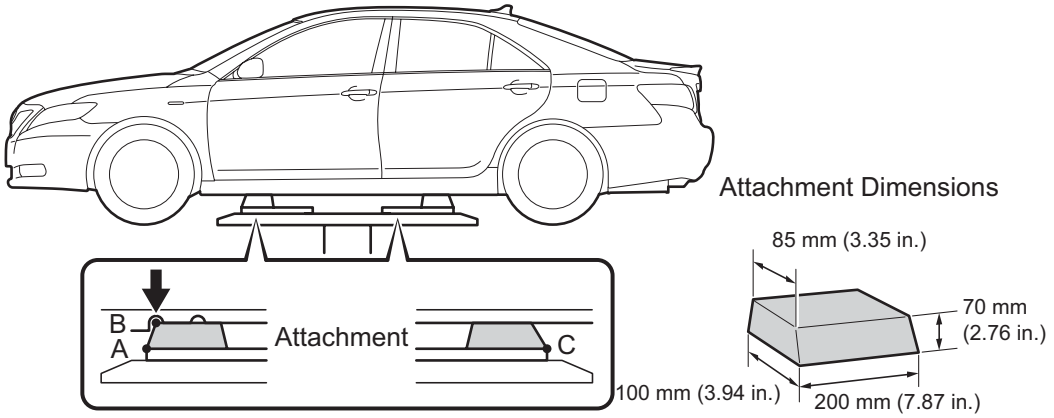



**Plate Type Lift:**

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# CUSTOMIZE PARAMETERS

## 1. AIR CONDITIONING SYSTEM

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.**



### AIR CONDITIONER (AUTO A/C)

| DISPLAY (ITEM) | DEFAULT | CONTENTS | SETTING |
|---|---|---|---|
| SET TEMP SHIFT (Set Temperature Shift) | NORMAL | To shift the temperature against the displayed temperature | +2 C / +1 C / NORMAL / -1 C / -2 C |
| 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 RECIRCULATION 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 linked with the FRONT DEF button when the A/C is OFF | NORMAL / LINK |
| EVAP CTRL (Evaporator Control) | AUTO | Function to set the evaporator control to the AUTOMATIC position (AUTO) to save power, or to the coldest position (MANUAL) to dehumidify the air and to prevent the windows from fogging up | MANUAL / AUTO |
| FOOT / DEF MODE (Foot / DEF auto mode) | ON | Function to turn the airflow from FOOT / DEF ON automatically when AUTO MODE is ON | OFF / ON |
| AUTO BLOW UP (Foot / DEF automatic blower up function) | ON | Function to change the blower level automatically when the defroster is ON | OFF / ON |
| AMBIENT TMP SFT (Ambient Temperature Shift) | NORMAL | Function to shift the ambient temperature against the displayed ambient temperature | +3 C / +2 C / +1 C / NORMAL / -1 C / -2 C / -3 C |

## 2. THEFT DETERRENT SYSTEM (w/o Smart Key System)

HINT:

The following items can be customized.

**NOTICE:**

- **After confirming whether the items requested by the customer are applicable or not for customization, perform customizing operations.**
- **Be sure to record the current settings before customization.**
- **When troubleshooting, make sure that the item in question is not set to "OFF" as a result of customization (Example: For the system, "the wireless function does not operate", first check that the wireless function is not set to "OFF", then perform troubleshooting).**

**THEFT DETERRENT SYSTEM**

| DISPLAY (ITEM) | DEFAULT | CONTENTS | SETTING |
|---|---|---|---|
| PASSIVE MODE<br>(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 not in the key cylinder and all doors, engine hood and luggage compartment door are closed, even if doors are not locked by wireless or door key lock operation<br>In PASSIVE MODE, if you do not perform following operations within 14 seconds after door is opened during armed state, theft deterrent system will judge that condition as a theft and switch to alarm sounding state<br>– Unlock any door by key or wireless operation<br>– Turn the ignition switch ON<br>– Open luggage compartment door by key or wireless operation | ON/OFF |
| WARN BY HORN<br>(Warning by horn) | ON | Function that makes vehicle horn and theft deterrent horn be able to be used as a warning device | ON/OFF |
| ENTRY DELAY<br>(Entry delay time) | 14 s | Function that changes entry delay time (time before warning starts) for PASSIVE MODE | 0 s/14 s/30 s |

**3. THEFT DETERRENT SYSTEM (w/ Smart Key System)**

HINT:

The following items can be customized.

**NOTICE:**

- **After confirming whether the items requested by the customer are applicable or not for customization, perform customizing operations.**
- **Be sure to record the current settings before customization.**
- **When troubleshooting, make sure that the item in question is not set to "OFF" as a result of customization (Example: For the system, "the wireless function does not operate", first check that the wireless function is not set to "OFF", then perform troubleshooting).**

**THEFT DETERRENT SYSTEM**

| DISPLAY (ITEM) | DEFAULT | CONTENTS | SETTING |
|---|---|---|---|
| PASSIVE MODE<br>(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 not in the actuation area and all doors, engine hood and luggage compartment door are closed, even if doors are not locked by wireless or door key lock operation<br>In PASSIVE MODE, if you do not perform following operations within 14 seconds after door is opened during armed state, theft deterrent system will judge that condition as a theft and switch to alarm sounding state<br>– Unlock any door by key or wireless operation<br>– Turn the engine switch on (IG)<br>– Open luggage compartment door by key or wireless operation | ON/OFF |
| WARN BY HORN<br>(Warning by horn) | ON | Function that makes vehicle horn and theft deterrent horn be able to be used as a warning device | ON/OFF |
| ENTRY DELAY<br>(Entry delay time) | 14 s | Function that changes entry delay time (time before warning starts) for PASSIVE MODE | 0 s/14 s/30 s |

**4. LIGHTING SYSTEM**

HINT:

The followings are the possible items to be customized.

**NOTICE:**

- **Before attempting to customize vehicle settings, confirm whether it is possible to make the change that the customer has requested.**
- **Be sure to record the current value before customizing.**
- **In case of performing the troubleshooting, pay attention because there is a possibility that the function has been disabled by customizing. (Example: In case of the symptom in which "The wireless operation does not function", check that the wireless operation has not been disabled by customizing, then perform the troubleshooting.)**



**ILLUMINATED ENTRY:**

| Display | Default | Contents | Setting |
|---|---|---|---|
| LIGHTING TIME | 15 s | Changes the lighting time of the interior light and ignition key cylinder light. | 7.5 s / 15 s / 30 s |
| I/L ON / UNLOCK | ON | Lights up the interior light and ignition key cylinder light when a door is unlocked. | ON / OFF |
| I/L ON / ACC OFF | ON | Lights up the interior light and ignition key cylinder light when the ignition switch is turned from on (ACC) to off | ON / OFF |

**LIGHT CONTROL:**

| Display | Default | Contents | Setting |
|---|---|---|---|
| LIGHT OFF DELAY | 30 s | Keeps the headlights on for a certain period of time after turning the ignition switch off and closing all the doors with the headlights on. | OFF / 30 s / 60 s / 90 s |
| SENSITIVITY | NORMAL | Adjusts the sensitivity of the automatic light control system. *1 | LIGHT 2 / LIGHT 1 / NORMAL / DARK 1 / DARK 2 |
| DISP EX ON SEN | NORMAL | Changes the ambient brightness level required to dim the clock display illumination. *1 | LIGHT 2 / LIGHT 1 / NORMAL / DARK 1 / DARK 2 |
| DISP EX OFF SEN | NORMAL | Changes the ambient brightness level required to cancel the dimming of the clock display illumination. | LIGHT 2 / LIGHT 1 / NORMAL / DARK 1 / DARK 2 |

HINT:
Sensitivity adjustment can hardly be confirmed. Check by driving the customer's vehicle.

**Illustration *1**

| Ambient Brightness Level | Dark ◄——————————► Bright | | | | |
|---|---|---|---|---|---|
| Setting | DARK2 | DARK1 | NORMAL | LIGHT1 | LIGHT2 |

**5. POWER DOOR LOCK CONTROL SYSTEM**

CUSTOMIZING FUNCTION WITH INTELLIGENT TESTER

HINT:
The following items can be customized.

**NOTICE:**

- **Before attempting to customize vehicle settings, confirm whether it is possible to make the change that the customer has requested.**
- **Be sure to record the current settings before customizing.**
- **When troubleshooting, make sure that the item in question has not been disabled using the customizing function.**

**DOOR LOCK:**

| Display (Item) | Default | Contents | Setting |
|---|---|---|---|
| UNLOCK/PARK (Unlock w/ engine switch on (IG), shift P, speed 0 km/h (0 mph)) | A/T: ON M/T: OFF (Cannot be changed) | Function that unlocks doors when the shift lever is moved to the P position from any other position while the ignition switch is on (IG) | ON/OFF |
| ALL UNLK/OPN-CL (All unlock w/ D door open-close) | A/T: OFF M/T: ON | Function that unlocks all other doors when opening driver side door within 10 seconds after turning the ignition switch off from on (IG) | ON/OFF |
| UNLK/KEY TWICE (Unlock w/ 2 times D key operation) | ON | • Function that unlocks only the driver side door when the driver side door key cylinder is turned to unlock once and unlocks all the doors when it is turned to unlock twice<br>• In the OFF setting, turning it once unlocks all doors | ON/OFF |
| AUTO LOCK/SHIFT (Auto lock/shift not P) | A/T: ON M/T: OFF (Cannot be changed) | Function that locks doors when the shift lever is moved from the P position to any other position | ON/OFF |
| AUTO LOCK | OFF | Function that locks doors when vehicle reaches a vehicle speed 20 km/h (13 mph) | ON/OFF |

**WIRELESS D LOCK:**

| Display (Item) | Default | Contents | Setting |
|---|---|---|---|
| AUTO LOCK DELAY | 60s | Function that selects AUTO LOCK time (30 sec. or 60 sec.) | 30s/60s |

**6. WIRELESS DOOR LOCK CONTROL SYSTEM (w/ Smart Key System)**

HINT:

The following items can be customized.

**NOTICE:**

- **When the customer requests a change in a function, first make sure that customization of the function(s) is possible.**
- **Be sure to record the current settings before customizing.**
- **When troubleshooting a function, first make sure that the function is not set to OFF.**

**WIRELESS DOOR LOCK CONTROL SYSTEM**

| Display (item) | Default | Function | Setting |
|---|---|---|---|
| WIRELESS OPER (Wireless door lock control function) | ON | Function that turns wireless door lock function ON/OFF | ON/OFF |

| Display (item) | Default | Function | Setting |
|---|---|---|---|
| HAZARD ANS BACK<br>(Hazard answer-back for wireless door lock control) | ON | • When the doors are locked by wireless operation, the hazard warning lights flash once.<br>• When the doors are unlocked by wireless operation, the hazard warning lights flash twice. | ON/OFF |
| OPEN DOOR WARN<br>(Door ajar warning) | ON | The buzzer sounds when LOCK is pressed when any of the doors are ajar. | ON/OFF |
| AUTO LOCK DELAY<br>(Auto lock time) | 60 s | This function regulates the interval between unlocking and automatic relocking of doors. | 30 s/60 s |
| UNLOCK /2OPER<br>(Wireless unlock operated twice) | ON | This function unlocks the driver's door when the UNLOCK switch is pressed once, and unlocks all doors when pressed twice within 3 seconds.<br>If set to OFF, pressing UNLOCK once unlocks all doors. | ON/OFF |
| ALARM FUNCTION<br>(Panic function) | ON | This function operates the theft deterrent system when PANIC is pressed and held for 0.8 seconds. | ON/OFF |
| WIRLS BUZZ RESP<br>(Wireless buzzer answer-back) | ON | Wireless door lock buzzer response/ON or OFF | ON/OFF |
| TRUNK LID OPER<br>(Wireless trunk opener function setting) | 0.6 s PR ON | This function changes operation method of transmitter to open luggage compartment door.<br>1 TIME: Push 1 time<br>2 TIMES: Push 2 times<br>0.6 s PR: Push 0.6 seconds<br>OFF: Does not operate | 1 TIME/2 TIMES/0.6 s PR/ OFF |

### 7. WIRELESS DOOR LOCK CONTROL SYSTEM (w/o Smart Key System)

HINT:

The following items can be customized.

**NOTICE:**

- **When the customer requests a change in a function, first make sure that customization of the function(s) is possible.**
- **Be sure to record the current settings before customizing.**
- **When troubleshooting a function, first make sure that the function is not set to OFF.**

**WIRELESS DOOR LOCK CONTROL SYSTEM:**

| Display (item) | Default | Function | Setting |
|---|---|---|---|
| WIRELESS OPER<br>(Wireless door lock control function) | ON | Function that turns wireless door lock function ON/OFF | ON/OFF |
| HAZARD ANS BACK<br>(Hazard answer-back for wireless door lock control) | ON | • When the doors are locked by wireless operation, the hazard warning lights flash once.<br>• When the doors are unlocked by wireless operation, the hazard warning lights flash twice. | ON/OFF |
| OPEN DOOR WARN<br>(Door ajar warning) | ON | The buzzer sounds when LOCK is pressed when any of the doors are ajar. | ON/OFF |
| AUTO LOCK DELAY<br>(Auto lock time) | 60 s | This function regulates the interval between unlocking and automatic relocking of doors. | 30 s/60 s |

| Display (item) | Default | Function | Setting |
|---|---|---|---|
| UNLOCK /2OPER<br>(Wireless unlock operated twice) | ON | This function unlocks the driver's door when the UNLOCK switch is pressed once, and unlocks all doors when pressed twice within 3 seconds.<br>If set to OFF, pressing UNLOCK once unlocks all doors. | ON/OFF |
| ALARM FUNCTION<br>(Panic function) | ON | This function operates the theft deterrent system when PANIC is pressed and held for 0.8 seconds. | ON/OFF |
| WIRLS BUZZ RESP<br>(Wireless buzzer answer-back) | ON | Wireless door lock buzzer response/ON or OFF | ON/OFF |
| TRUNK LID OPER<br>(Wireless trunk opener function setting) | 0.6 s ON | This function changes operation method of transmitter to open luggage compartment door.<br>1 TIME: Push 1 time<br>2 TIMES: Push 2 times<br>0.6 s PR: Push 0.6 seconds<br>OFF: Does not operate | 1 TIME/2 TIMES/0.6 s PR/ OFF |

### 8. SMART KEY SYSTEM (Door Lock)

(a) CUSTOMIZING FUNCTION WITH INTELLIGENT TESTER

HINT:

The items in the table below 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 setting before customizing.**
- **When troubleshooting a function, first make sure that the function is set to the default setting.**

HINT:

The following functions' default settings are ON.

Part of these functions can be customized.

**SMART:**

| Display (Item) | Default | Contents | Setting |
|---|---|---|---|
| PARK WAIT TIME (Wait time to permit opening door after locking) | 2.5s | Function that sets waiting time to permit opening door after door is locked with entry lock function. | 0.5s / 1.5s / 2.5s / 5.0s |
| SMART UNLOCK | D_DOOR | Function that switches the entry unlock detection area. | ALL / D_DOOR |
| SMART IGNITION (SMART ignition available area) | ALL | Function to choose the available area for electrical key to start E/G and cancel the steering lock. | FRONT / ALL |
| SMART TRUNK (Luggage compartment opening operation) | ON | Function to open a luggage compartment when the driver has the electrical key and presses the luggage open button. | ON / OFF |

**WIRELESS DOOR LOCK:**

| Display (Item) | Default | Contents | Setting |
|---|---|---|---|
| ALARM FUNCTION (Panic function) | ON | Function to operate the theft deterrent system by keeping pressing the lock button of the transmitter for 2.5 seconds. If there is a panic button, press the panic button instead of the lock button. | ON / OFF |

**WARNING:**

| Display (Item) | Default | Contents | Setting |
|---|---|---|---|
| KEY LOW-BATT WRN | ON | Function to set a warning function for the time when a key battery becomes weak. | ON / OFF |

(b) Entry Unlock Mode Switching Function

(1) To change the vehicle to entry unlock mode switching function, make sure the vehicle power is off and simultaneously press and hold the electrical key's LOCK switch and another electrical key switch for 4.5 seconds.
When the switches are pressed and held for 4.5seconds, the entry door unlock mode changes in the following order: driver door mode, all door mode.
**NOTICE:**
**After pressing and holding the switches for 4.5 seconds, wait 5 seconds before performing the same procedure again.**
- Driver door unlock mode:
  When the driver door's touch sensor is touched, only the driver door unlocks. When another touch sensor is touched, all doors unlock.
- All door unlock mode:
  When the touch sensor is touched, all doors unlock.

(2) The certification ECU receives this signal from the entry door control receiver and changes the smart key system to the entry unlock mode.

(3) The certification ECU sounds the buzzers of the wireless door lock buzzer and combination meter to inform the user that the mode has been switched.

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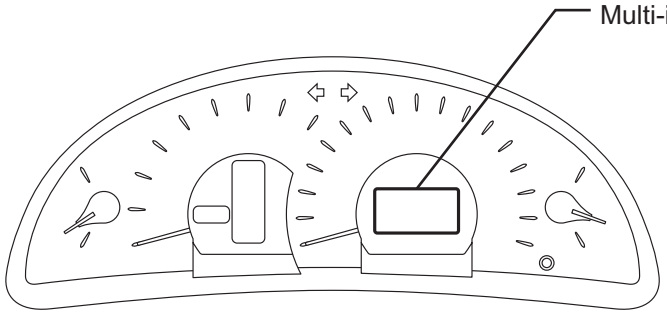
| Mode | Wireless Door Lock Buzzer | Combination Meter | | |
|---|---|---|---|---|
| | | Multi-information Display | | Buzzer |
| Driver Door (Default) | ON<br>OFF<br>  <br>Sounds 3 times |  <br>Displayed for 5 sec. | Passenger, rear LH and RH door “open” indication | Sounds once |
| All Doors (Customized) | ON<br>OFF<br>  <br>Sounds 2 times |  <br>Displayed for 5 sec. | All door “open” indication | Sounds once |

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HINT:
The function only changes the entry unlock mode of the smart key system. It does not switch the unlocking of the wireless door lock control.

(c) Electrical Key Cancel
The electrical key cancel operation disables the following functions:
- Entry Ignition
- Entry Unlock/Lock
- Entry Luggage Compartment Open
- Electrical Key Lock-in Prevention
- Warning

- Memory Call

(1) The operation procedures are as follows:
Precondition:
Engine switch off, driver side door closed and unlocked.
1. Unlock the driver side door once with the UNLOCK switch of the electrical key.
2. Open the driver door within 5 seconds.
3. Unlock the driver side door twice with the UNLOCK switch of the electrical key within 5 seconds.
4. Repeat open → close twice for the driver door within 30 seconds, and open again.
(Driver door: Open → Close → Open → Close → Open)
5. Unlock the driver side door twice with the UNLOCK switch of the electrical key within 5 seconds.
6. Repeat open → close once for the driver door within 30 seconds, and open again.
(Driver door: Open → Close → Open)
7. Close the driver door within 5 seconds.
When electrical key cancel is activated, the wireless door lock buzzer sounds twice.
To return to the original condition, perform the procedures again. When the original condition is returned, the wireless door lock buzzer sounds once.

**9. KEY REMINDER WARNING SYSTEM**

PARAMETERS (USING INTELLIGENT TESTER)
HINT:
The following items can be customized.
**NOTICE:**
- **Be sure to record current values before customizing.**
- **When performing troubleshooting, be aware that the functions may be set to OFF by customizing. (Example: In case of the symptom in which "The wireless operation does not function", check that the wireless operation is not set to OFF by customizing, then perform the troubleshooting.)**

**METER:**

| Display (Item) | Default | Contents | Setting |
|---|---|---|---|
| KEY REMND VOLUM | LARGE | Function to change volume of the key reminder warning buzzer. | LARGE/MEDIUM/SMALL |
| KEY REMND SOUND | NORMAL | Function to change cycle of the key reminder warning buzzer. | FAST/NORMAL/SLOW |

**10. METER/GAUGE SYSTEM**

COMBINATION METER ASSEMBLY
**NOTICE:**
**Be sure to record the current value before customizing.**

HINT:
The following items can be customized using intelligent tester.

**METER:**

| Display (Item) | Default | Contents | Setting |
|---|---|---|---|
| KEY REMND VOLUM | LARGE | Function to change the volume of the key remind warning buzzer | LARGE, MEDIUM, SMALL |
| KEY REMND SOUND | NORMAL | Function to change the cycle of the key remind warning buzzer | FAST, NORMAL, SLOW |
| SEAT-BELT WARN | D/P ON | Function to change the setting of the seat belt buzzer. | D/P on, D ON, P on, D/P off |

HINT:
This setting is only valid for the buzzer which sounds at the 5 km/h (3 mph) or more.

(a) SEAT BELT BUZZER ON/OFF SETTING (Procedure "A")
The seat belt buzzer ON/OFF setting, which is a setting of the buzzer function of the combination meter, can disable the driver and front passenger side seat belt buzzers.

**NOTICE:**

- **These buzzers should be on for safe driving. Perform these procedures only if it is necessary to set the buzzer off (disabled).**
- **When either the battery cable or the combination meter connector is disconnected, these buzzers are set on (enabled).**
- **Odometer returns to 0 after starting this procedure, although it is not displayed.**

HINT:
"b-oFF" indicates that the buzzer is OFF. "b-on" indicates that the buzzer is ON. The seat belt buzzer ON/OFF setting will be finished (the odometer will display "ODO") if the ODO/TRIP switch is not operated for 10 seconds or more. In this case, perform step 11 to check that the buzzer ON/OFF setting is complete. If it is not complete, start from step 1 again.

(1) Driver and front passenger side seat belt buzzers
1. Turn the ignition switch on (IG).
2. Press the ODO/TRIP switch until the odometer displays "ODO".
3. Ignition switch off.
4. Turn the ignition switch on (IG).
5. Press the ODO/TRIP switch immediately (within 6 seconds) and hold it down for 10 seconds or more.
6. Continue holding down the ODO/TRIP switch and fasten the driver side seat belt.
7. Check that the odometer displays either "b-on" or "b-oFF".
8. Press the ODO/TRIP switch to change the display to "b-oFF".

9. Ignition switch off.
10. Turn the ignition switch on (IG).
11. Check that no buzzer sounds.

(2) Front passenger side seat belt buzzer

1. Turn the ignition switch on (IG).
2. Press the ODO/TRIP switch until the odometer displays "ODO".
3. Ignition switch off.
4. Turn the ignition switch on (IG).
5. Sit in the front passenger seat. Press the ODO/TRIP switch immediately (within 6 seconds) and hold it down for 10 seconds or more.
6. Sit in the front passenger seat. Continue holding down the ODO/TRIP switch and fasten the front passenger side seat belt.
7. Check that the odometer displays either "b-on" or "b-oFF".
8. Press the ODO/TRIP switch to change the display to "b-oFF".
9. Ignition switch off.
10. Turn the ignition switch on (IG).
11. Check that no buzzer sounds.

# HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

## GENERAL INFORMATION



A large number of ECU controlled systems are used in the CAMRY. 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

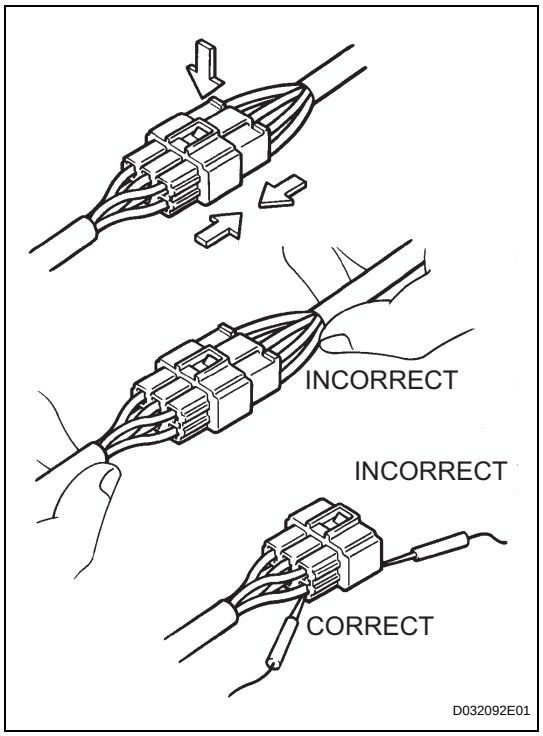
– Before using the intelligent tester, read the tester operator's manual thoroughly.
– If the tester cannot communicate with the ECU controlled systems when the tester is connected to the DLC3 with the ignition switch on and the tester turned on, there is a problem on the vehicle side or tester side.
  (1) If communication is normal when the tester is connected to another vehicle, inspect the diagnosis data link line (Bus (+) line) or ECU power circuit of the vehicle.
  (2) If communication is still not possible when the tester is connected to another vehicle, the problem is probably in the tester itself. Perform the Self Test procedures outlined in the tester operator's manual.

# 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

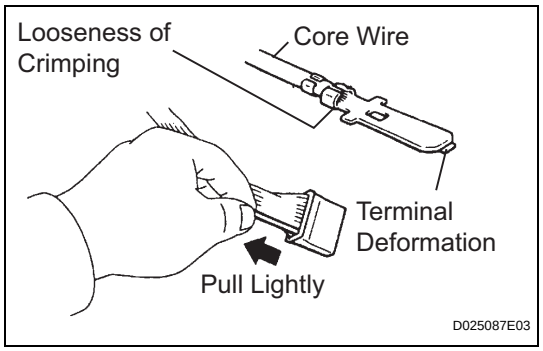
(1) When disconnecting a connector, first squeeze the mating connector housing halves tightly together to release the lock, and then press the lock claw and separate the connector.

(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 deformations, damage, looseness 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 disconnected: 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.

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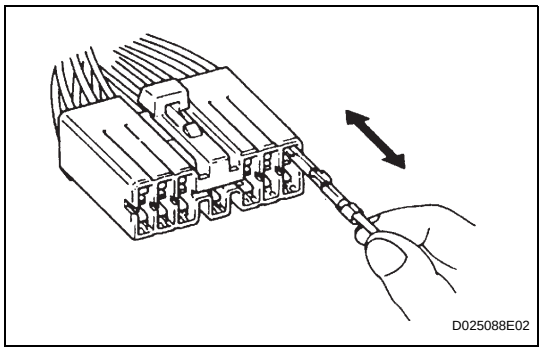
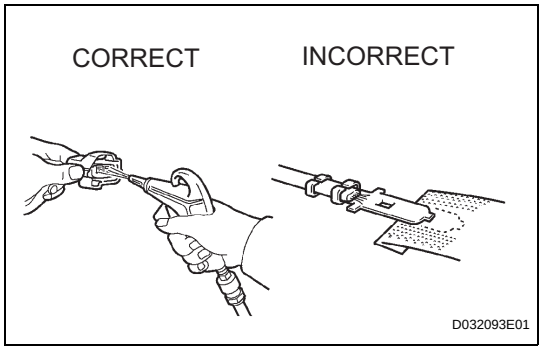
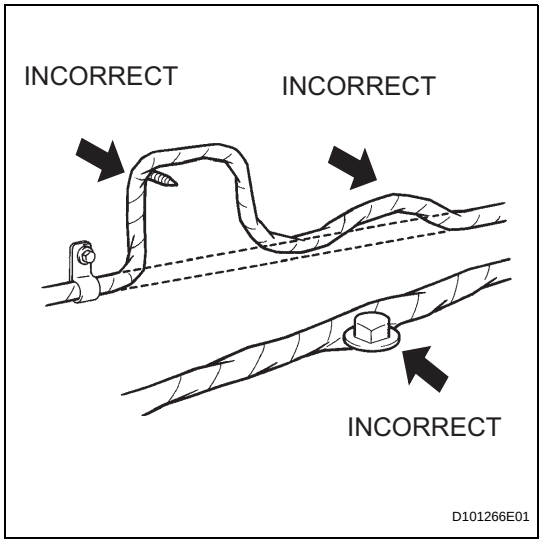


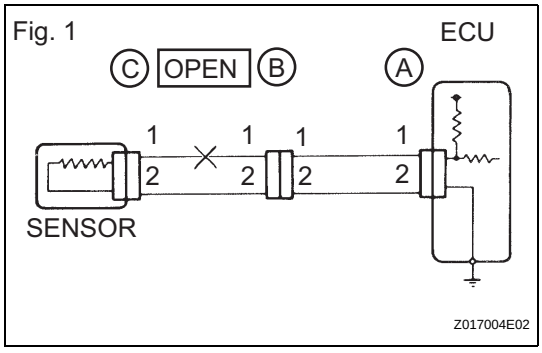

(3) Checking the contact pressure of the terminal:
Prepare a spare male terminal. Insert it into a female terminal, and check for ample tension when inserting and after full engagement.
**NOTICE:**
**When testing a gold-plated female terminal, always use a gold-plated male terminal.**




(d) REPAIR METHOD OF CONNECTOR TERMINAL
(1) If there is any foreign matter on the terminal, clean the contact point with compressed air or a 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.



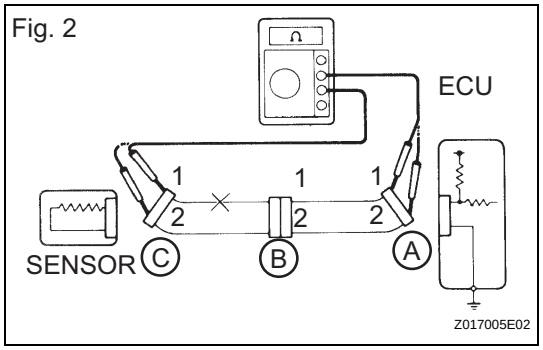

(e) HANDLING OF WIRE HARNESS
(1) If removing a wire harness, check the wiring and clamping before proceeding so that it can be restored in the same way.
(2) Never twist, pull or slacken the wire harness more than necessary.
(3) The wire harness should never come into contact with a high temperature part, 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, the resistance or voltage, as described below.

Fig. 2




(b) Check the resistance.

(1) Disconnect connectors A and C and measure the resistance between the terminals of the connectors.

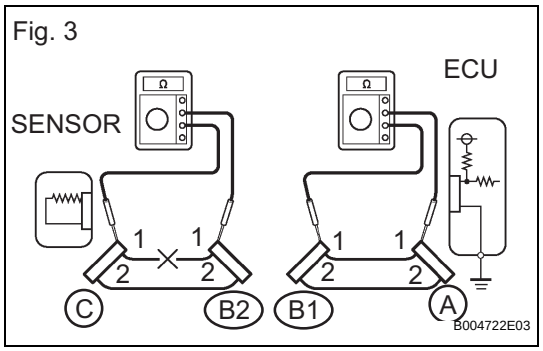
**Standard resistance (Fig. 2)**

| 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 terminals of the connectors.

**Standard resistance (Fig. 3)**

| Tester Connection | Specified Condition |
|---|---|
| Connector A terminal 1 - Connector B1 terminal 1 | Below 1 Ω |
| Connector B2 terminal 2 - Connector C terminal 2 | 10 kΩ or higher |

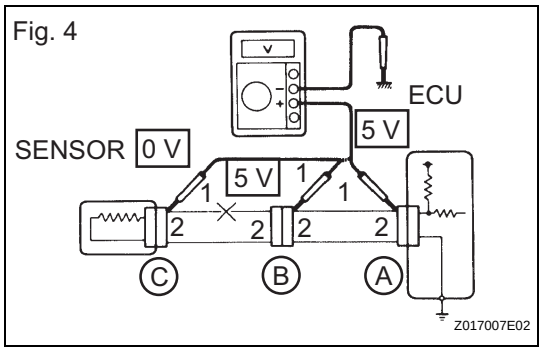
If the results match the examples above, an open circuit exists between terminal 1 of connector B2 and terminal 1 of connector C.

(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)**

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

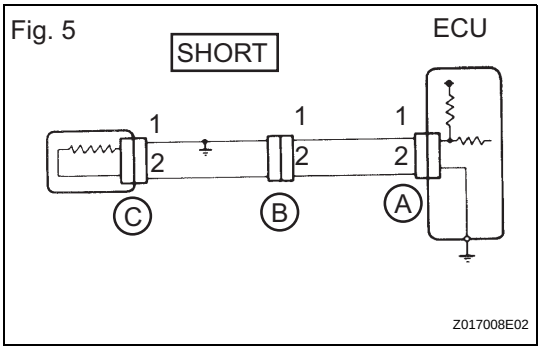



Fig. 6

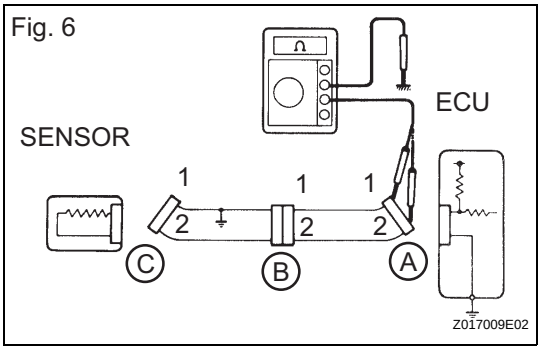
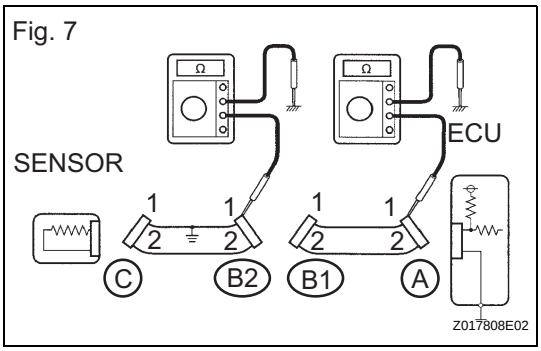



Fig. 7




**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 your results match the examples above, an open 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)**

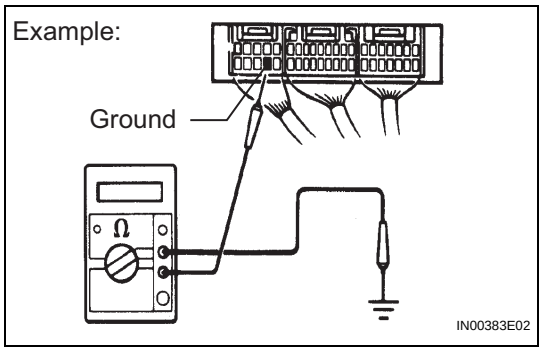
| Tester Connection | Specified Condition |
|---|---|
| Connector A terminal 1 - Body ground | 10 kΩ or higher |
| Connector B2 terminal 2 - Body ground | Below 1 Ω |

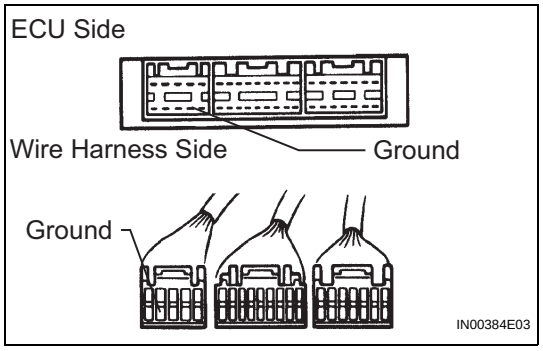
If the results match the examples above, a short circuit exists between terminal 1 of connector B2 and terminal 1 of connector C.

**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 ignition switch on.**
- **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.

IN

# 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

| 5 | DTC CHART |
|---|---|

(a) Check the results obtained in step 4. 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 CHART |
|---|---|

(a) Check the results obtained in step 4. 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) Identify 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 CAMRY 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 CAMRY.

| System | DTC Check (Normal Mode) | DTC Check (Check Mode) | Sensor Check/Test Mode (Input Signal Check) | Data List | Active Test |
|---|---|---|---|---|---|
| 2AZ-FE SFI System | ○ | ○ | | ○ | ○ |
| 2GR-FE SFI System | ○ | ○ | | ○ | ○ |
| Smart Key System (Starting) | ○ | | | ○ | ○ |
| U250E Automatic Transaxle System | ○ | ○ | | ○ | ○ |
| U660E Automatic Transaxle System | ○ | ○ | | ○ | ○ |
| Tire Pressure Warning System | ○ | | ○ | ○ | |
| Anti-lock Brake System | ○ | | ○ | ○ | ○ |
| Vehicle Stability Control System (for BOSCH made) | ○ | | ○ | ○ | ○ |

| System | DTC Check (Normal Mode) | DTC Check (Check Mode) | Sensor Check/Test Mode (Input Signal Check) | Data List | Active Test |
|---|---|---|---|---|---|
| Vehicle Stability Control System (for ADVICS made) | ○ | | ○ | ○ | ○ |
| Electric Steering Lock | ○ | | | ○ | ○ |
| Air Conditioning System | ○ | | | ○ | ○ |
| Airbag System | ○ | ○ | | ○ | |
| Occupant Classification System | ○ | | | ○ | |
| Seat Belt Warning System | | | | | ○ |
| Theft Deterrent System (w/ Smart Key System) | | | | ○ | ○ |
| Theft Deterrent System (w/o Smart Key System) | | | | ○ | ○ |
| Engine Immobilizer System (w/ Smart Key System) | ○ | | | ○ | ○ |
| Engine Immobilizer System (w/o Smart Key System) | ○ | | | ○ | ○ |
| Cruise Control System | ○ | | | ○ | |
| Lighting System | ○ | | | ○ | ○ |
| Power Door Lock Control System | ○ | | | ○ | ○ |
| Wireless Door Lock Control System (w/ Smart Key System) | ○ | | | ○ | ○ |
| Wireless Door Lock Control System (w/o Smart Key System) | ○ | | | ○ | ○ |
| Smart Key System (Door Lock) | ○ | | | ○ | ○ |
| Key Reminder Warning System | | | | ○ | ○ |
| Meter/Gauge System | ○ | | | ○ | ○ |
| Audio and Visual System | ○ | | | | |
| Navigation System | ○ | | | | |
| Power Window Control System | ○ | | | ○ | ○ |
| Window Defogger System | | | | | ○ |
| Sliding Roof System | ○ | | | ○ | ○ |

- In the DTC check, it is very important to determine whether the problem indicated by the DTC either: 1) still occurs, or 2) occurred in the past but has 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**

**5** **DTC CHECK**

**Result**

| Result | Proceed to |
|---|---|
| DTC is not output | A |

| Result | Proceed to |
|---|---|
| DTC is output | B |

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

A

IN

**6 SYMPTOM CONFIRMATION**

**Result**

| Result | Proceed to |
|---|---|
| No symptoms exist | A |
| 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 still occurs 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 a vehicle with a warmed-up engine. Vibration, heat or water penetration (moisture) are difficult to reproduce. The symptom simulation tests below are effective substitutes for the conditions and can be applied to a stationary vehicle. Important points in the symptom simulation test:**

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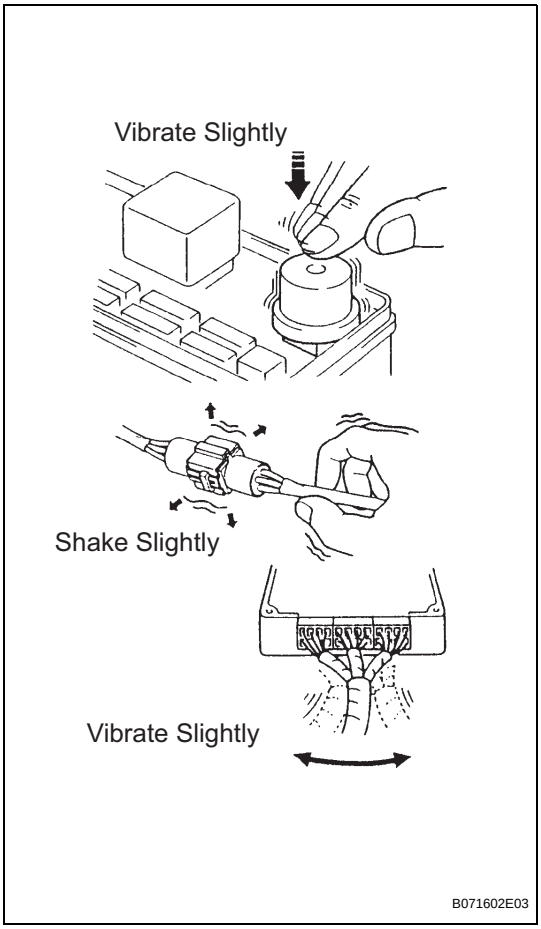
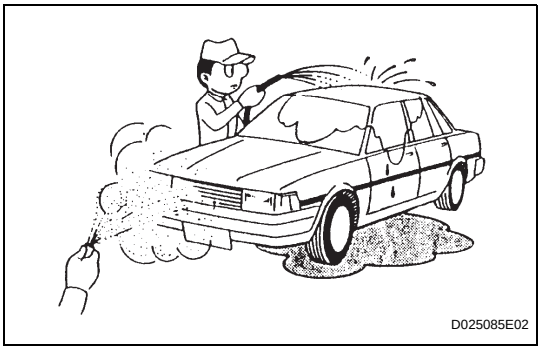
**In the symptom simulation test, the problem symptoms as well as the problem area or parts must be confirmed. First, narrow down the possible problem circuits according to the symptoms. Then, connect the tester and carry out the symptom simulation test, judging whether the circuit being tested is defective 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 the malfunction occurs.
  **NOTICE:**
  **Applying strong vibration to relays may open relays.**
  (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.

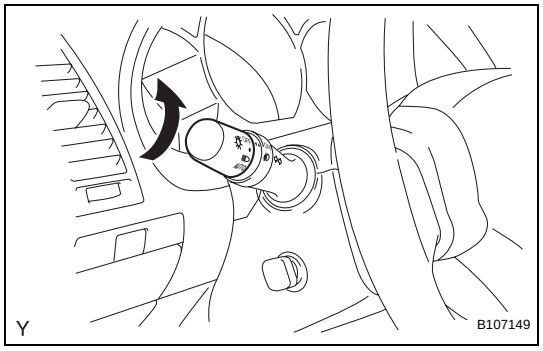
(b) HEAT METHOD: When a malfunction seems to occur when the area in question is heated.
  (1) Heat the component that is the possible cause of the malfunction with a hair dryer or similar device. Check if the malfunction occurs.
  **NOTICE:**
  - **Do not heat to more than 60°C (140°F). Exceeding this temperature may damage the 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 an 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 shown in the table 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 is 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 still occurs, use the Problem Symptoms Table. The suspected areas (circuits or parts) for each problem symptoms are in the table. The suspected areas are listed in order of probability. A description of each of the chart's columns is shown in the table below.

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

| Item | Description |
|---|---|
| Problem Symptom | - |
| Circuit Inspection, Inspection Order | Indicates the order in which the circuits need to be checked |
| Circuit or Part Name | 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 shown in the table below.

| Item | Description |
|---|---|
| Circuit Description | The major role, operation of the circuit and its component parts are explained. |
| Diagnostic Trouble Code No. and Detection Item | Indicates the diagnostic trouble codes, diagnostic trouble code settings and suspected areas for a problem |

| Item | Description |
|---|---|
| Wiring Diagram | This shows a wiring diagram of the circuit.<br>Use this diagram together with ELECTRICAL WIRING DIAGRAM to thoroughly understand the circuit.<br>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<br>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.<br>Connections of tester are indicated by (+) or (-) after the terminal name.<br>Connector being checked is disconnected.<br>The inspections between a connector and body ground, information about the body ground is not shown in the illustration. |

# TERMS

## ABBREVIATIONS USED IN MANUAL



| Abbreviations | Meaning |
|---|---|
| ABS | Anti-Lock Brake System |
| A/C | Air Conditioner |
| AC | Alternating Current |
| ACC | Accessory |
| ACIS | Acoustic Control Induction System |
| ACM | Active Control Engine Mount |
| ACSD | Automatic Cold Start Device |
| A.D.D | Automatic Disconnecting Differential |
| A/F | Air-Fuel Ratio |
| AHC | Active Height Control Suspension |
| ALR | Automatic Locking Retractor |
| ALT | Alternator |
| AMP | Amplifier |
| ANT | Antenna |
| APPROX. | Approximately |
| ASSY | Assembly |
| A/T, ATM | Automatic Transmission (Transaxle) |
| ATF | Automatic Transmission Fluid |
| AUTO | Automatic |
| AUX | Auxiliary |
| AVG | Average |
| AVS | Adaptive Variable Suspension |
| AWD | All Wheel Drive Vehicle |
| B+ | Battery Voltage |
| BA | Brake Assist |
| BACS | Boost Altitude Compensation System |
| BAT | Battery |
| BDC | Bottom Dead Center |
| B/L | Bi-Level |
| B/S | Bore-Stroke Ratio |
| BTDC | Before Top Dead Center |
| BVSV | Bimetallic Vacuum Switching Valve |
| CAN | Controller Area Network |
| CB | Circuit Breaker |
| 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 |

| Abbreviations | Meaning |
|---|---|
| CTR | Center |
| C/V | Check Valve |
| CV | Control Valve |
| CW | Curb Weight |
| DC | Direct Current |
| DEF | Defogger |
| DFL | Deflector |
| DIFF. | Differential |
| DIFF. LOCK | Differential Lock |
| D/INJ | Direct Injection |
| 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 |
| EBD | Electric Brake Force Distribution |
| EC | Electrochromic |
| ECAM | Engine Control And Measurement System |
| ECD | Electronically Controlled Diesel |
| ECDY | Eddy Current Dynamometer |
| ECT | Electronic Controlled Automatic Transmission |
| ECU | Electronic Control Unit |
| ED | Electro-Deposited Coating |
| EDU | Electronic Driving Unit |
| EDIC | Electric Diesel Injection Control |
| EFI | Electronic Fuel Injection |
| E/G | Engine |
| EGR | Exhaust Gas Recirculation |
| EGR-VM | EGR-Vacuum Modulator |
| ELR | Emergency Locking Retractor |
| EPS | Electric Power Steering |
| ENG | Engine |
| ES | Easy & Smooth |
| ESA | Electronic Spark Advance |
| ETCS-i | Electronic Throttle Control System-intelligent |
| EVAP | Evaporative Emission Control |
| EVP | Evaporator |
| E-VRV | Electric Vacuum Regulating Valve |
| EX | Exhaust |
| FE | Fuel Economy |
| FF | Front-Engine-Front-Wheel-Drive |
| F/G | Fuel Gauge |
| FIPG | Formed In Place Gasket |
| FL | Fusible Link |
| F/P | Fuel Pump |
| FPU | Fuel Pressure Up |

IN

| Abbreviations | Meaning |
|---|---|
| FR | Front |
| F/W | Flywheel |
| FW/D | Flywheel Damper |
| FWD | Front-Wheel-Drive |
| GAS | Gasoline |
| GND | Ground |
| GPS | Global Positioning System |
| GSA | Gear Shift Actuator |
| HAC | High Altitude Compensator |
| 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 |
| IC | Integrated Circuit |
| IDI | Indirect Diesel Injection |
| IFS | Independent Front Suspension |
| IG | Ignition |
| IIA | Integrated Ignition Assembly |
| IN | Intake (Manifold, Valve) |
| INT | Intermittent |
| I/P | Instrument Panel |
| IRS | Independent Rear Suspension |
| ISC | Idle Speed Control |
| J/B | Junction Block |
| J/C | Junction Connector |
| KD | Kick-Down |
| 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 |
| L/H/W | Length, Height, Width |
| 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 |
| MAP | Manifold Absolute Pressure |
| MAX. | Maximum |
| MIC | Microphone |

| Abbreviations | Meaning |
|---|---|
| MIL | Malfunction Indicator Lamp |
| MIN. | Minimum |
| MG1 | Motor Generator No. 1 |
| MG2 | Motor Generator No. 2 |
| MMT | Multi-mode Manual Transmission |
| MP | Multipurpose |
| MPI | Multipoint Electronic Injection |
| MPX | Multiplex Communication System |
| M/T, MTM | Manual Transmission (Transaxle) |
| MT | Mount |
| MTG | Mounting |
| N | Neutral |
| NA | Natural Aspiration |
| NO. | Number |
| O2S | Oxygen Sensor |
| OC | Oxidation Catalyst |
| OCV | Oil Control Valve |
| O/D | Overdrive |
| OEM | Original Equipment Manufacturing |
| OHC | Overhead Camshaft |
| OHV | Overhead Valve |
| OPT | Option |
| ORVR | On-board Refilling Vapor Recovery |
| O/S | Oversize |
| P & BV | Proportioning and Bypass Valve |
| 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 |
| P/W | Power Window |
| R & P | Rack and Pinion |
| RAM | Random Access Memory |
| R/B | Relay Block |
| RBS | Recirculating Ball Type Steering |
| R/F | Reinforcement |
| RFS | Rigid Front Suspension |
| RH | Right-Hand |
| RHD | Right-Hand Drive |
| RLY | Relay |
| ROM | Read Only Memory |
| RR | Rear |
| RRS | Rigid Rear Suspension |

| Abbreviations | Meaning |
|---|---|
| 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 |
| TACH | Tachometer |
| TBI | Throttle Body Electronic Fuel Injection |
| TC | Turbocharger |
| TCCS | TOYOTA Computer-Controlled System |
| TCM | Transmission Control Module |
| TCV | Timing Control Valve |
| TDC | Top Dead Center |
| TEMP. | Temperature |
| TFT | TOYOTA Free-Tronic |
| TIS | Total Information System for Vehicle Development |
| T/M | Transmission |
| TMC | TOYOTA Motor Corporation |
| TMMIN | PT. TOYOTA Motor Manufacturing Indonesia |
| TMMK | TOYOTA Motor Manufacturing Kentucky, Inc. |
| TMT | TOYOTA Motor Thailand Co. Ltd. |
| TRAC/TRC | Traction Control System |
| TURBO | Turbocharge |
| TVIP | TOYOTA Vehicle Instruction Protection |
| TWC | Three-Way Catalyst |
| U/D | Underdrive |
| U/S | Undersize |
| VCV | Vacuum Control Valve |
| VDIM | Vehicle Dynamics Integrated Management |
| VENT | Ventilator |
| VIM | Vehicle Interface Module |
| VGRS | Variable Gear Ratio Steering |
| VIN | Vehicle Identification Number |
| VPS | Variable Power Steering |
| VSC | Vehicle Skid Control |
| VSV | Vacuum Switching Valve |

| Abbreviations | Meaning |
|---|---|
| VTV | Vacuum Transmitting Valve |
| VVT-i | Variable Valve Timing-intelligent |
| W/ | With |
| WGN | Wagon |
| W/H | Wire Harness |
| W/O | Without |
| 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 |

IN

# 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 |
|---|---|---|
| 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), Erasable Programmable Read Only Memory (EPROM) |
| 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 ($HO_2S$) |
| IAC | Idle Air Control | Idle Speed Control (ISC) |
| IAT | Intake Air Temperature | Intake or Inlet Air Temperature |
| ICM | Ignition Control Module | - |

| SAE ABBREVIATIONS | SAE TERMS | TOYOTA TERMS ( )-ABBREVIATIONS |
|---|---|---|
| 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)<br>Mixture Control Valve (MCV)<br>Electric Air Control Valve (EACV) |
| MDP | Manifold Differential Pressure | - |
| MFI | Multiport Fuel Injection | Electronic Fuel Injection (EFI) |
| MIL | Malfunction Indicator Light | Check Engine Light |
| MST | Manifold Surface Temperature | - |
| MVZ | Manifold Vacuum Zone | - |
| NVRAM | Non-Volatile Random Access Memory | - |
| O2S | Oxygen Sensor | Oxygen Sensor, $O_2$ Sensor ($O_2S$) |
| OBD | On-Board Diagnostic | On-Board Diagnostic System (OBD) |
| OC | Oxidation Catalytic Converter | Oxidation Catalytic Convert (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)<br>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<br>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)<br>Thermostatic Vacuum Switching Valve (TVSV) |
| TWC | Three-Way Catalytic Converter | Three-Way Catalytic (TWC)<br>Manifold Converter<br>$CC_{RO}$ |

| SAE ABBREVIATIONS | SAE TERMS | TOYOTA TERMS ( )-ABBREVIATIONS |
|---|---|---|
| TWC+OC | Three-Way + Oxidation Catalytic Converter | $CC_R$ + 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 | - |
| 3GR | Third Gear | - |
| 4GR | Fourth Gear | - |