2009 GENERAL INFORMATION

Introduction - Highlander

HOW TO USE THIS INFORMATION

GENERAL INFORMATION

1. **GENERAL DESCRIPTION**
   a. This information is written in accordance with SAE J2008.
   b. Repair operations can be separated mainly in the following 3 processes:
      1. Diagnosis
      2. Removing/Installing, Replacing, Disassembling/Reassembling, Checking and Adjusting
      3. Final Inspection
   c. The following procedures are omitted from this information. 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 before and after performing any work.
2. **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** article of this manual.
3. **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.

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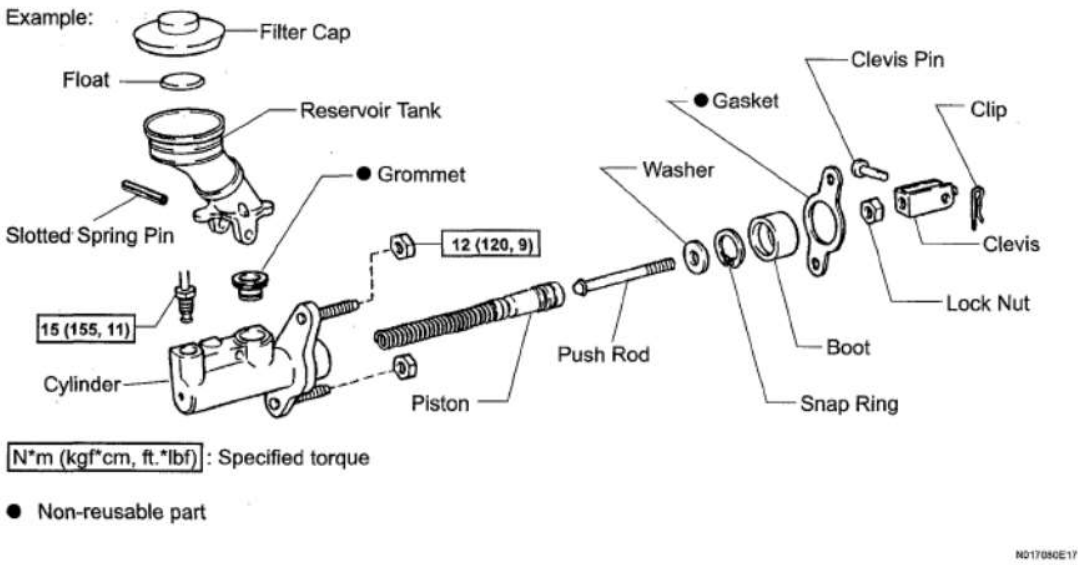


Fig. 1: Identifying Master Cylinder Components With Torque Specification (Example)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.

PROCEDURE REFERENCE

Illustration	What to do and where to do it
Task heading	What work will be performed
Explanation text	How to perform the task 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.

4. **SERVICE SPECIFICATIONS**

a. SPECIFICATIONS are presented in boldface text throughout the information. The specifications are also found in the **SERVICE SPECIFICATIONS** article for reference.

5. **TERM DEFINITIONS**

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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.

6. **INTERNATIONAL SYSTEM OF UNITS**
   a. The units used in this information 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)

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

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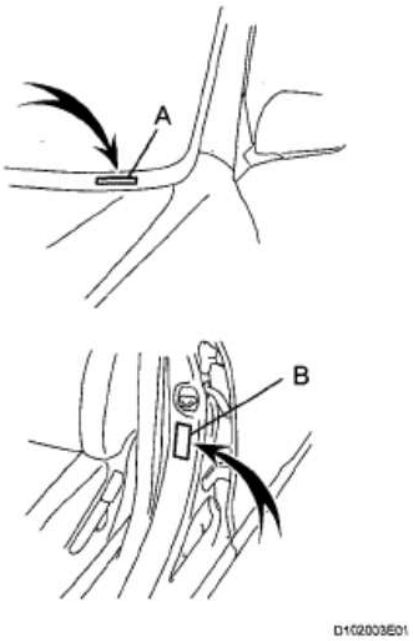


Fig. 2: Identifying Vehicle Identification Number And Certification Label Location
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.

   A:

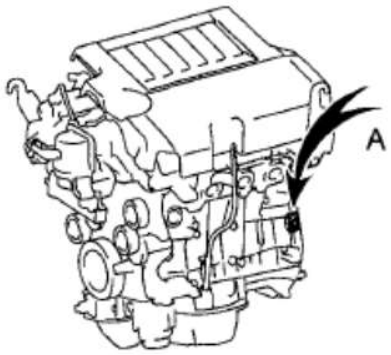
   2GR-FE Engine Serial Number

   B:

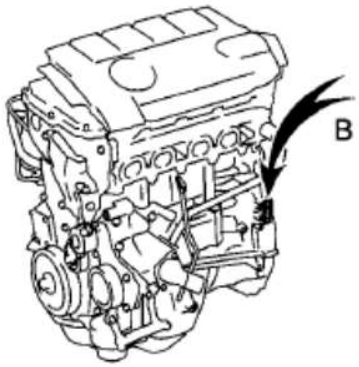
   1AR-FE Engine Serial Number

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for 2GR-FE Engine:



for 1AR-FE Engine:



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Fig. 3: Identifying 2GR-FE Engine Serial Number And 1AR-FE Engine Serial Number Location
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b. The transaxle serial number is stamped on the case as shown in the illustration.

A:

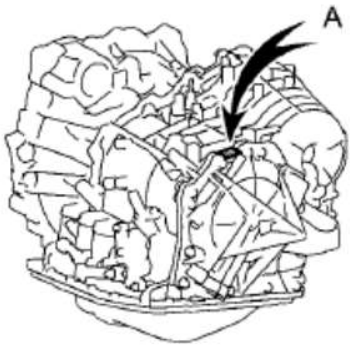
U151E, E151F Transaxle Serial Number

B:

U760E Transaxle Serial Number

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for U151E, U151F Transaxle:



for U760E Transaxle:

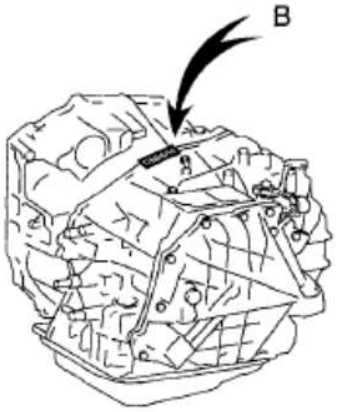


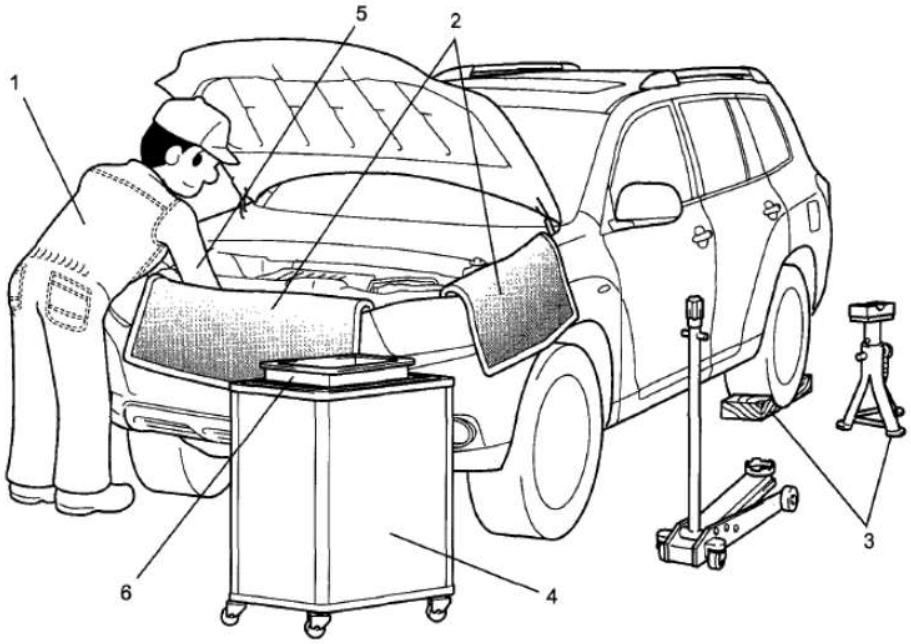
Fig. 4: Identifying U151E, E151F Transaxle Serial Number And U760E Transaxle Serial Number Location
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REPAIR INSTRUCTION

PRECAUTION

1. **BASIC REPAIR HINT**
   a. HINTS ON OPERATIONS

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1	Attire	• Always wear a clean uniform. • 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. • When working with the engine running, make sure to provide ventilation for exhaust fumes in the workshop. • If working on high temperature, high pressure, rotating, moving, or vibrating parts, wear appropriate safety equipment and take extra care not to injure yourself or others. • When jacking up the vehicle, be sure to support the specified location with a safety stand. • When lifting up the vehicle, use appropriate safety equipment.
4	Preparation of tools and measuring gauge	Before starting an operation, prepare a tool stand, SST, gauge, oil and parts for replacement.
5	Removal and installation, disassembly and assembly operations	• Diagnose with a thorough understanding of proper procedures and of the reported problem. • Before removing any parts, check the general condition of the assembly and for deformation and damage. • If the procedure is complicated, take notes. For example, note the total number of electrical connections, bolts, or hoses removed. Add matchmarks to insure reassembly of components in the original positions. Temporarily mark hoses and their fittings if needed. • Clean and wash the removed parts if necessary and assemble them after a thorough check.
6	Removed parts	• Place the removed parts in a separate box to avoid mixing them up with new parts or contaminating the new parts. • For non-reusable parts such as gaskets, O-rings, and self-locking nuts, replace them with new ones as instructed in this manual. • Retain the removed parts for customer inspection, if requested.

Fig. 5: Identifying Basic Repair Operations Procedure
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

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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 appropriately to that part.
4. Some seal lock agents harden slowly. You may have to wait for the seal lock adhesive to harden.



Fig. 6: Identifying Seal Lock Adhesive
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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. If the wire of a fuse is broken, confirm that there are no shorts in its circuit.
   3. When a fuse is replaced, a fuse with the same amperage rating must be used.

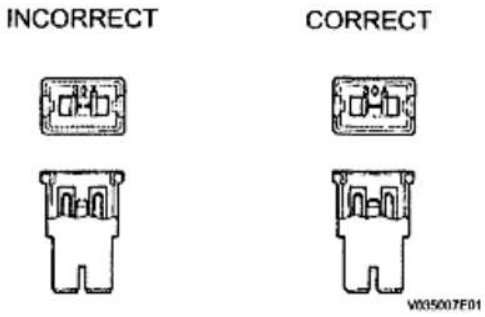
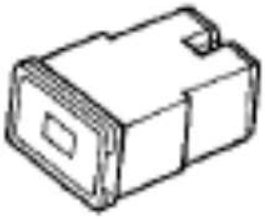
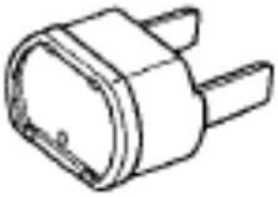


Fig. 7: Precaution For Fuse
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PART NAME REFERENCE

Illustration	Symbol	Part Name	Abbreviation

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 N	 N	FUSE	FUSE
 N	 N	MEDIUM CURRENT FUSE	M-FUSE
 N	 N	HIGH CURRENT FUSE	H-FUSE
 N	 N	FUSIBLE LINK	FL
 N	 N	CIRCUIT BREAKER	CB

g. CLIPS

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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 clips with new ones.

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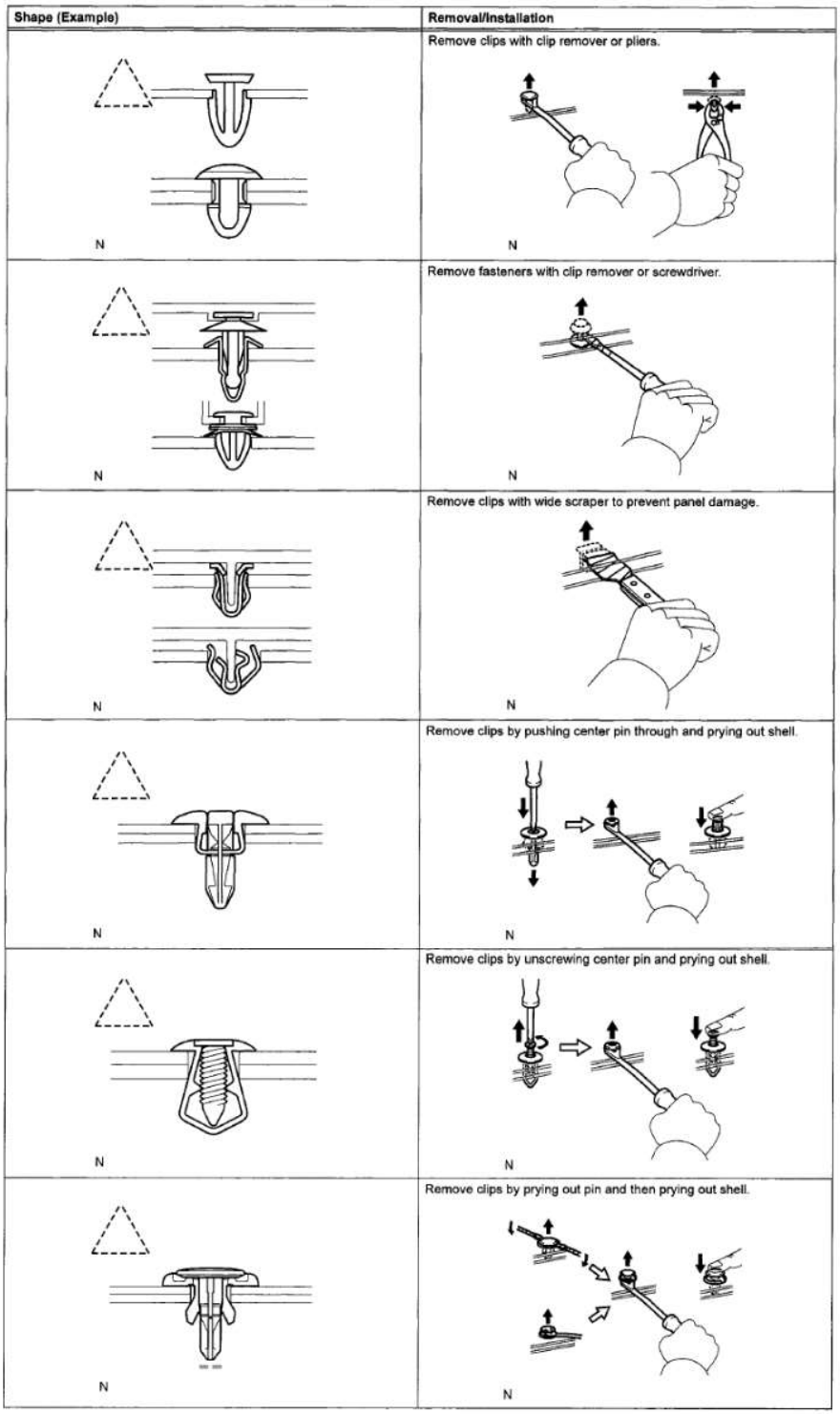


Fig. 8: Identifying Removal And Installation Methods Of Clips Used For Vehicle Body Parts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

h. CLAWS

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

   HINT:

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

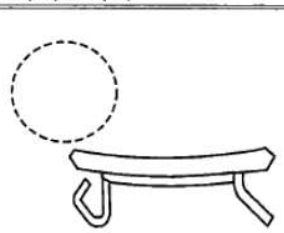
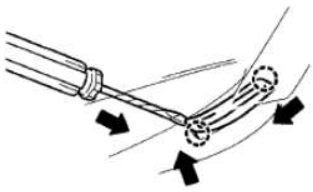
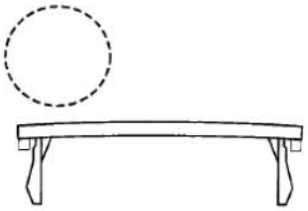
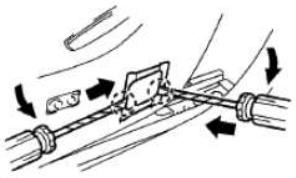
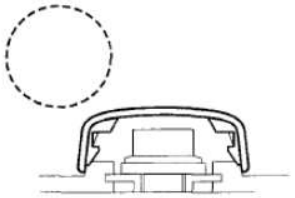
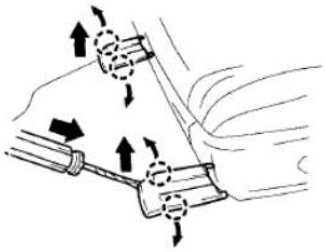
Shape (Example)	Illustration	Procedures
		1. Using a screwdriver, detach the claws and remove the cap or cover.
	 H	1. Using a screwdriver, detach the claws and remove the cap or cover.
		1. Using a screwdriver, detach the claws and remove the cap or cover.

Fig. 9: Identifying Removal And Installation Methods Of Claws
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

i. HINGE, GUIDE, CLAMP AND PIN ETC.

1. The removal and installation methods of typical hinge, guide, clamp and pin used for vehicle body parts are shown in the table below.

   HINT:

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

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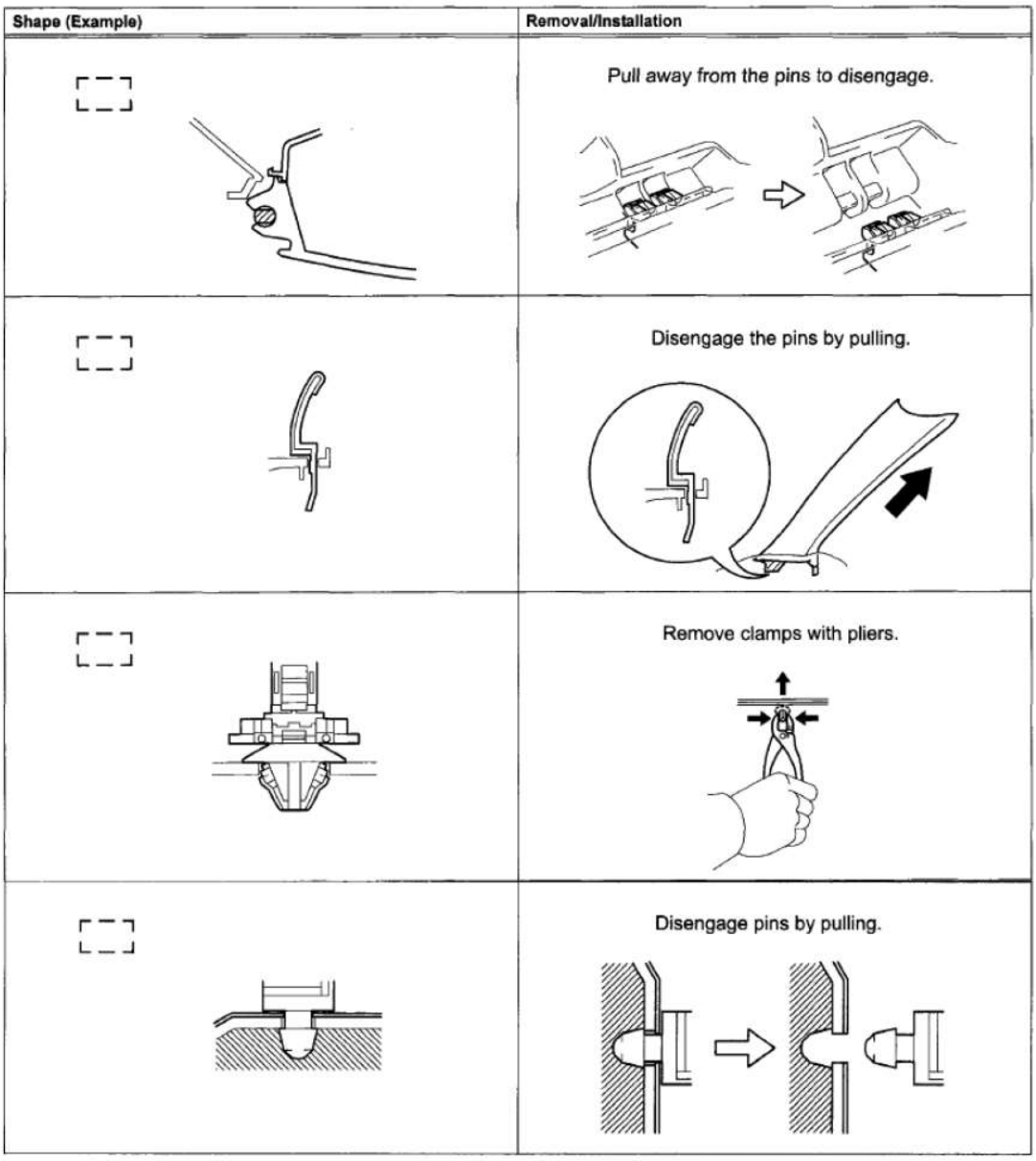


Fig. 10: Identifying Removal And Installation Methods Of Hinge, Guide, Clamp And Pin
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

j. 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.

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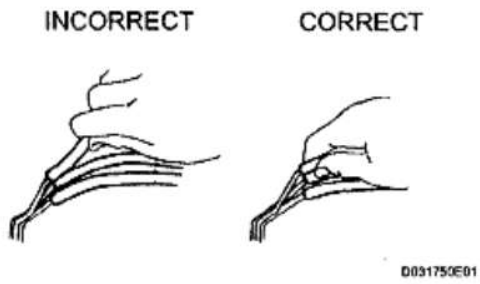


Fig. 11: Precaution For Vacuum Hose
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2. When disconnecting vacuum hoses, use tags to identify where they should be reconnected.
3. After completing any hose related repairs, double check that the vacuum hoses are properly connected. The label under 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.

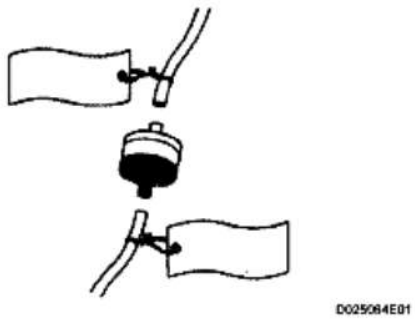


Fig. 12: Identifying Tag On Vacuum Hoses
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

k. TORQUE WHEN USING TORQUE WRENCH WITH EXTENSION TOOL

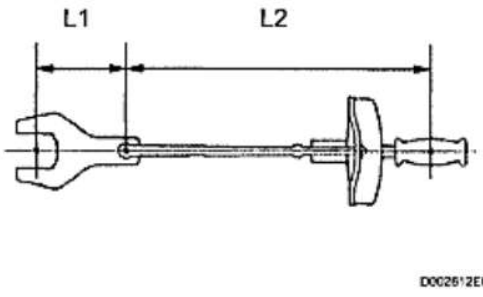


Fig. 13: Identifying Torque Wrench Dimension
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

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Formula:

T1 = L2/(L1 + L2) * T

DIMENSION REFERENCE

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.)}

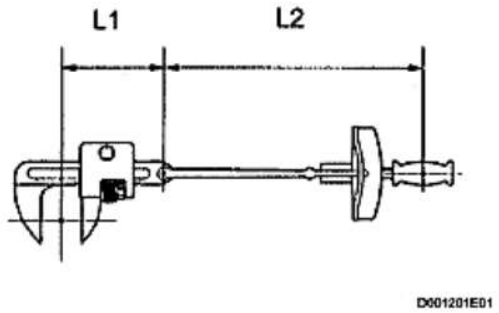


Fig. 14: Identifying SST Dimension
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: **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 information, the actual torque will be excessive and parts will be damaged.**

2. **FOR VEHICLES EQUIPPED WITH SRS AIRBAG AND SEAT BELT PRETENSIONER**

This vehicle is equipped with a Supplemental Restraint System (SRS).

CAUTION:

- **Before performing pre-disposal deployment of any SRS component, review and closely follow all applicable environmental and hazardous material regulations. Pre-disposal deployment may be considered hazardous material treatment.**
- **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

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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.
4. Never use the 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 assemblies or airbag assemblies to hot air or flames.
9. Use a voltmeter/ohmmeter with high impedance (minimum = 10 kohms) 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

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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 **INSTALLATION**).

c. STEERING PAD

1. Always place a removed or new steering pad surface upward as shown in the illustration. Placing the steering pad of the pad surface facing down could cause a serious accident if the airbag deploys. Also, do not place anything on top of the steering pad.

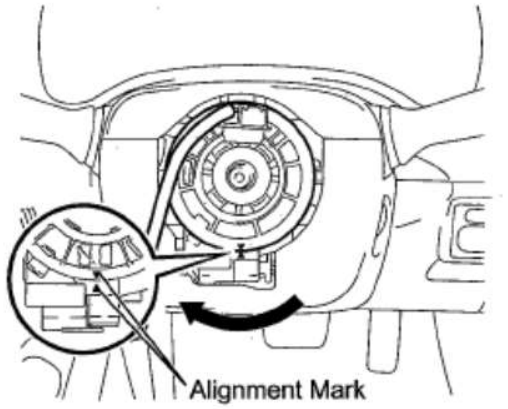


Fig. 15: Installing Steering Wheel To Steering Column With Spiral Cable
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

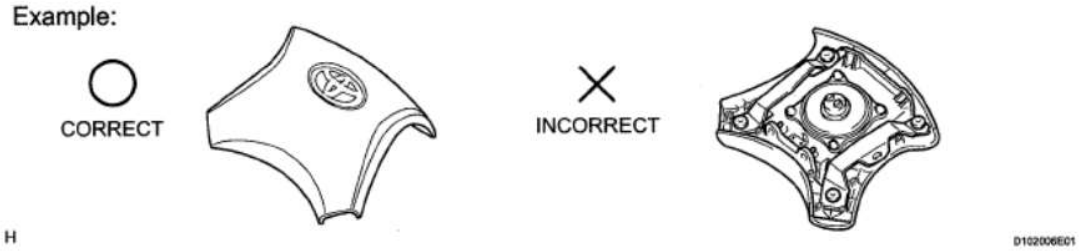


Fig. 16: Identifying Steering Pad Correct And Incorrect Position
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

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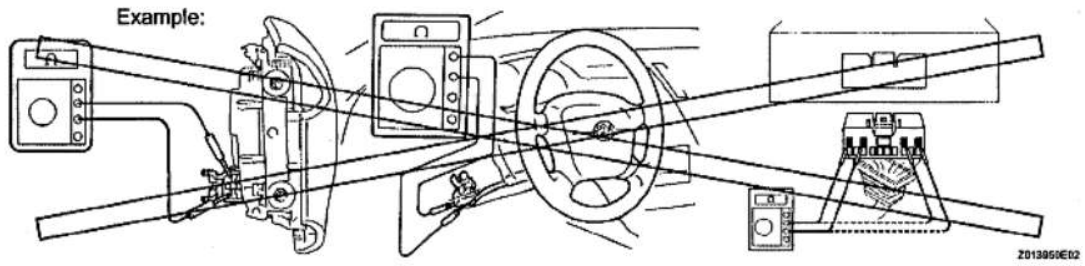


Fig. 17: Precaution For Measuring Resistance Of Airbag Squib
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Grease or detergents of any kind should not be applied to the steering pad.
4. Store the steering pad 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 center airbag sensor assembly connectors. 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 steering pad by itself, the airbag should be deployed using SST before disposal (See **DISPOSAL**). Deploy 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 deployment direction facing down could cause a serious accident if the airbag deploys.

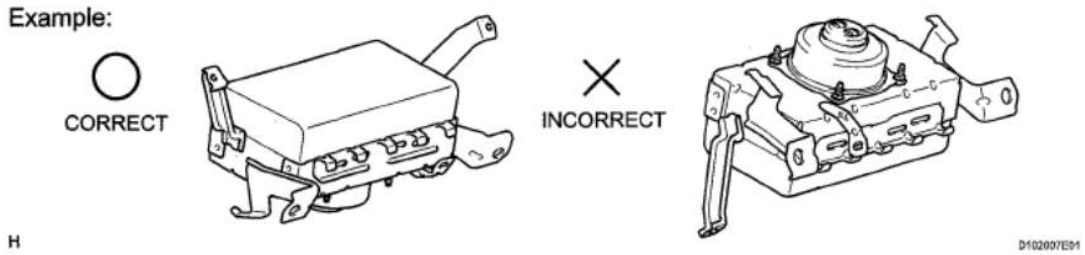


Fig. 18: Identifying Front Passenger Airbag Assembly Correct And Incorrect Position
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

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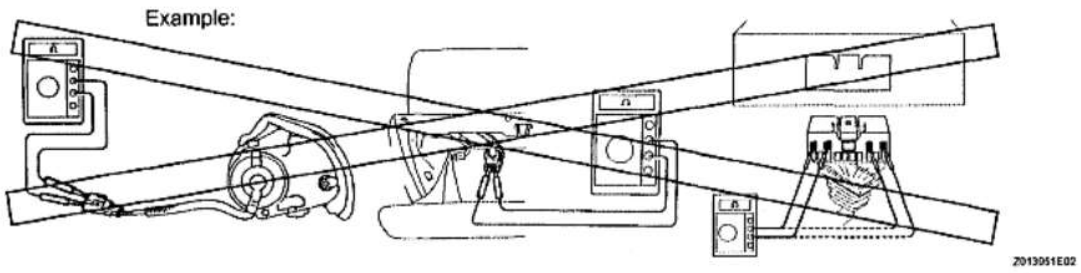


Fig. 19: Precaution For Measuring Resistance Of Airbag Squib
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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 center airbag sensor assembly connectors. 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 **DISPOSAL**). Deploy the airbag in a safe place away from electrical noise.

e. DRIVER SIDE KNEE AIRBAG ASSEMBLY

1. Always place a removed or new driver side knee airbag assembly with the airbag deployment direction facing upward. Placing the airbag assembly with the airbag deployment direction facing downward could cause a serious accident if the airbag deploys.

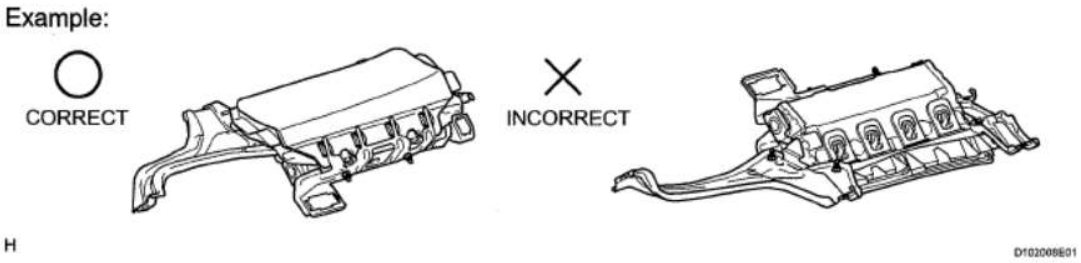


Fig. 20: Identifying Driver Side Knee Airbag Assembly Correct And Incorrect Positions
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

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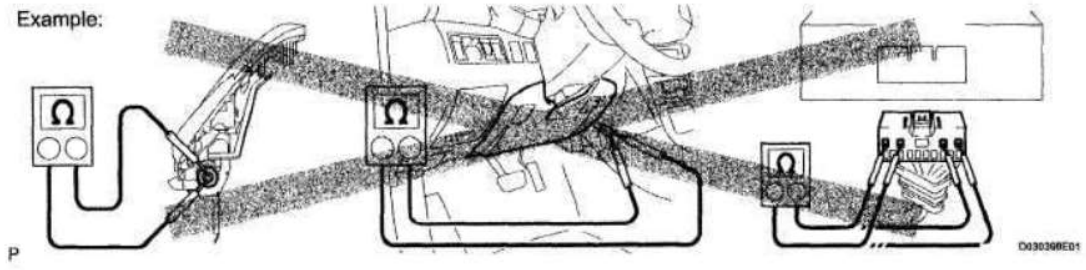


Fig. 21: Precaution For Measuring Resistance Of Airbag Squib
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Grease or detergents of any kind should not be applied to the driver side knee airbag assembly.
4. Store the driver side 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 center airbag sensor assembly connectors. 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 driver side knee airbag assembly unit by itself, the airbag should be deployed using SST before disposal (See **DISPOSAL**). Deploy 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 deployment direction facing up.
2. Never measure the resistance of the airbag squib. This may cause the airbag to deploy, which could cause serious injury.

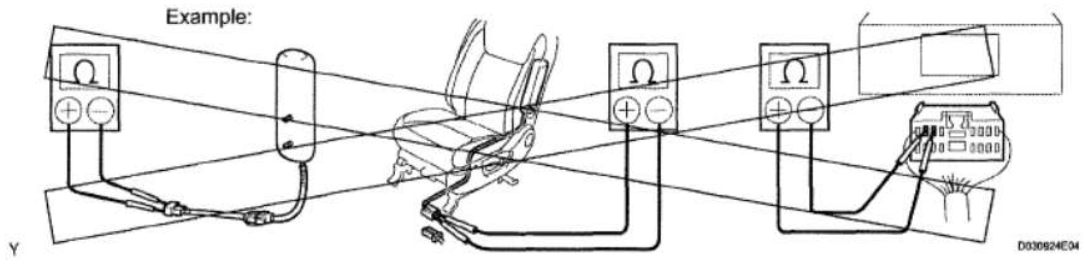


Fig. 22: Precaution For Resistance Of Airbag Squib
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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 center airbag sensor assembly connectors. 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

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deployed using SST before disposal (See **FRONT SEAT SIDE AIRBAG ASSEMBLY**). Deploy 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.

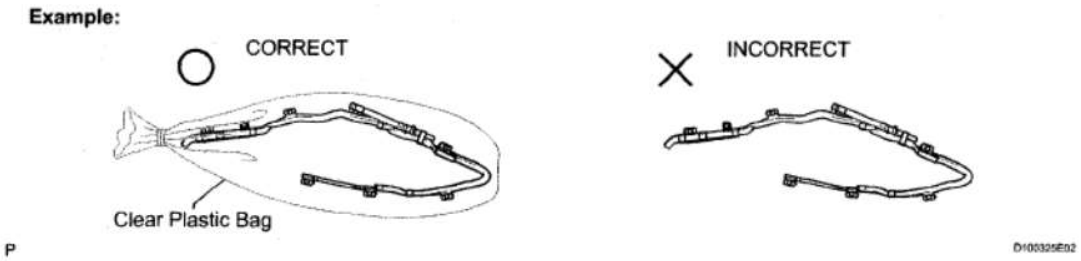


Fig. 23: Precaution For Curtain Shield Airbag Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

CAUTION: The plastic bag is not reusable.

NOTE: Never disassemble the curtain shield airbag assembly.

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

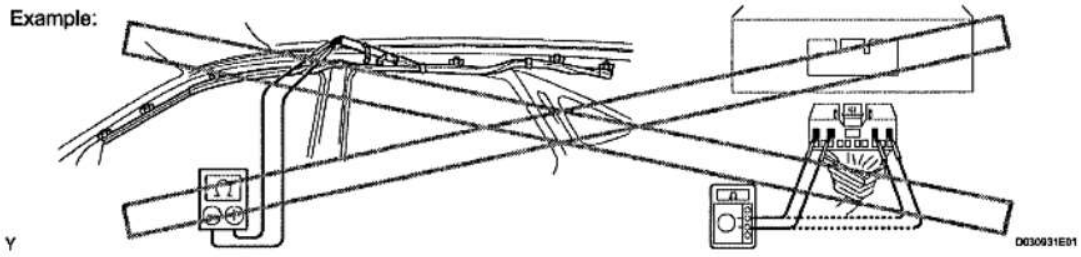


Fig. 24: Precaution For Measuring Resistance Of Airbag Squib
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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 center airbag sensor assembly connectors. 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 **DISPOSAL**). Deploy the airbag in a safe place away from electrical noise.

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h. FRONT SEAT OUTER BELT ASSEMBLY (SEAT BELT PRETENSIONER)

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

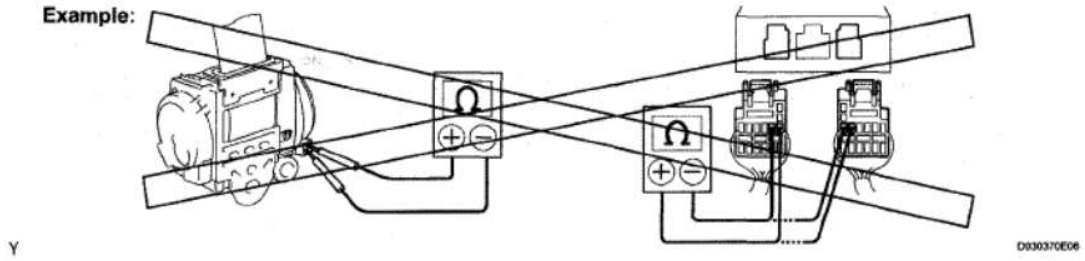


Fig. 25: Precaution For Never Measuring Resistance Of Seat Belt Pretensioner
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Never disassemble the front seat outer belt assembly.
3. Never install the front seat outer belt assembly on another vehicle.
4. Store the front seat outer belt assembly 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 center airbag sensor assembly connectors. 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 front seat outer belt assembly unit by itself, the front seat outer belt assembly should be activated before disposal (See **DISPOSAL**). Activate the front seat outer belt assembly in a safe place away from electrical noise.
7. As the front seat outer belt assembly is hot after being activated, allow some time for it to cool down sufficiently before disposal. Never apply water to cool down the front seat outer belt assembly.
8. Grease, detergents, oil or water should not be applied to the front seat outer belt assembly.

i. CENTER AIRBAG SENSOR ASSEMBLY

1. Never reuse a center airbag sensor assembly that has been involved in a collision where the SRS has deployed.
2. The connectors to the center airbag sensor assembly should be connected or disconnected with the sensor placed on the floor. If the connectors are connected or disconnected while the center 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 center airbag sensor assembly.

j. WIRE HARNESS AND CONNECTOR

1. 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**

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a. REMOVAL AND INSTALLATION OF BATTERY TERMINAL

NOTE: Certain systems need to be initialized after reconnecting the cable to the negative (-) battery terminal.

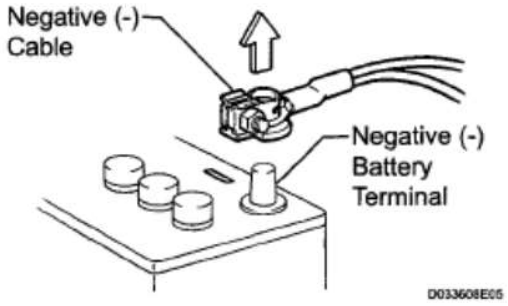


Fig. 26: Disconnecting Cable From Negative (-) Battery Terminal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.

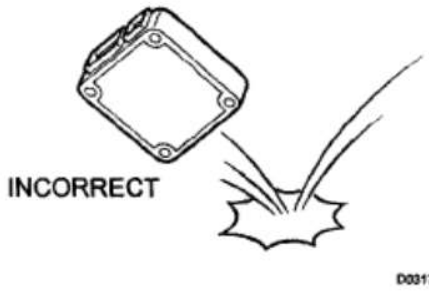


Fig. 27: Precaution For Handling Of Electronic Parts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

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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, and do not spray the surrounding area with water. Be careful when performing work in this area, as the work surface will become slippery. Do not clean up gasoline spills with water, as this may cause the gasoline to spread, and possibly create a fire hazard.
      3. Avoid using electric motors, working lights and other electric 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.
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 adhesive tape or other suitable materials.
   c. When installing inlet system parts, check that no metal particles have entered the engine or installed parts.

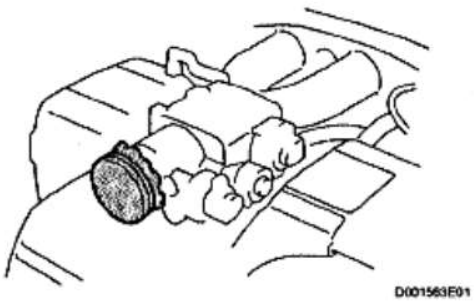


Fig. 28: Covering Openings Of Removed Parts And Engine Openings
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

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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.

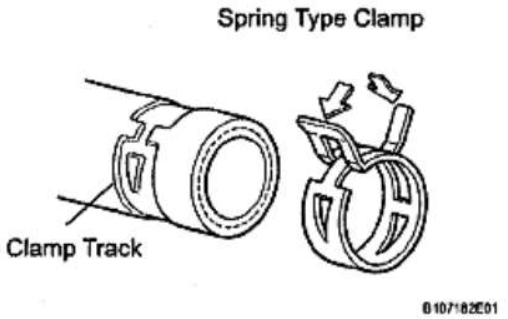


Fig. 29: Identifying Clamp Track And Spring Type Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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 sensor 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.

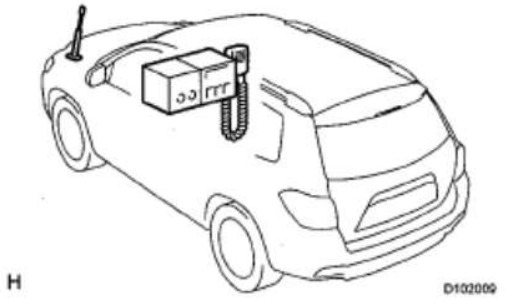


Fig. 30: Identifying Mobile Communication Systems
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

   d. Check that the antenna and feeder are correctly adjusted.
   e. Do not install any high-powered mobile communication system.
8. **WHEN SERVICING FULL-TIME 4WD VEHICLES**
   a. MEASURING POINTS FOR SPEEDOMETER TESTER

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NOTE:

- **Tester with a function of load setting for only two wheels cannot be used.**
- **Inspection should be done in the front wheels.**
- **Do not start, accelerate nor decelerate the vehicle suddenly.**
- **Maximum vehicle speed must be below 60 km/h (37 mph) (when using free roller, it must be below 50 km/h (31 mph)).**
- **Driving time should be within 1 minute.**

1. Place the front wheels onto the rollers.
2. Set the rear wheels free by free rollers or rigid racks.
3. Fasten the vehicle with the lock chain.
4. Enter inspection mode to disable TRAC and VSC control.
5. Start the engine, and then measure the vehicle speed by increasing the speed gradually in the D range.
6. After the measurement completion, decrease the vehicle speed by braking gradually, and then stop the vehicle.

b. MEASURING POINTS FOR BRAKE TESTER

NOTE:

- **Tester with a function of load measurement cannot be used.**
- **High-speed braking cannot be performed.**

1. Place the wheels to be measured (front or rear) onto the rollers.
2. Enter inspection mode to disable TRAC and VSC control.
3. Shift the lever into neutral.
4. Perform the measurement by driving the tester rollers.

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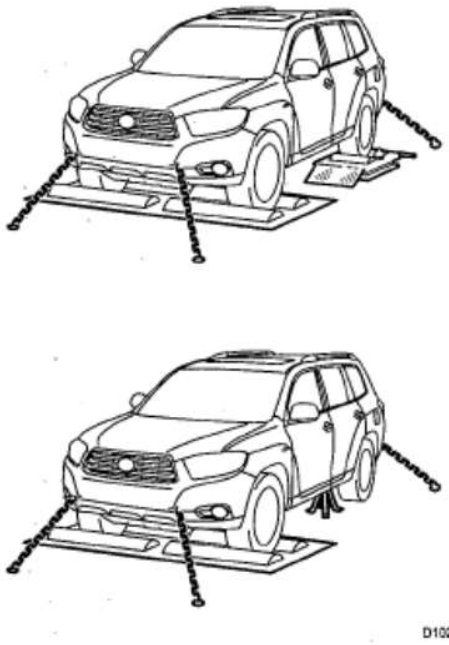


Fig. 31: Placing Front Wheels Onto Rollers
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

c. MEASURING POINTS FOR ON-VEHICLE BALANCER

1. Jack up all 4 wheels with 2 post lifts.
2. Fasten the vehicle by setting 2 pick-up stands in the bottom of suspension arm's tip of the front wheels or rear wheels to be measured.
3. Support the vehicle with rigid racks so that vehicle will not lean in any direction.
4. Release the parking brake.
5. Check that there is no dragging force exists when turning each wheel by hand.
6. Set the wheel balancers.
7. Measurement should be done by using both of engine drive and wheel balancer roller drive.

NOTE:

- **Start the engine, and then increase the vehicle speed gradually in the D range.**
- **Do not accelerate nor decelerate suddenly.**
- **Deceleration should be done by braking gradually.**
- **Take special care that the vehicle does not move.**
- **Measurement should be done quickly.**

9. **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

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wheels, perform the following procedure to enter the inspection mode and stop the TRAC and VSC systems. Enter inspection mode to disable TRAC and VSC control when using a chassis dynamometer.

HINT:

- The vehicle may move unexpectedly out of the dynamometer because of TRAC and VSC operations.
- Pressing the VSC OFF switch does not disable TRAC and VSC operation completely.

NOTE:

- **Make sure that the SLIP indicator light is blinking.**
- **Secure the vehicle with the lock chain for safety.**

a. Activating inspection mode (Not using Techstream)

HINT:

- Perform steps "D" to "H" within 30 seconds.
- Perform steps "F" and "G" within 15 seconds each.

1. Ensure that the ignition switch is off and the engine is stopped (Step "A").
2. Make sure that the shift lever is in the P position (Step "B").
3. Start the engine (Step "C").
4. Apply the parking brake by pulling the parking brake lever (Step "D").
5. Depress and release the brake pedal twice (Step "E").
6. While holding the brake pedal down, release and apply the parking brake twice (Step "F").
7. With the parking brake applied, depress and release the brake pedal twice (Step "G").
8. Check if the SLIP indicator light comes on (Step "H").

HINT:

- If the SLIP indicator light does not come on in step "H", repeat the steps from "A" to "H".
- Turning the ignition switch off ends inspection mode.

b. Activating inspection mode (Using Techstream)

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

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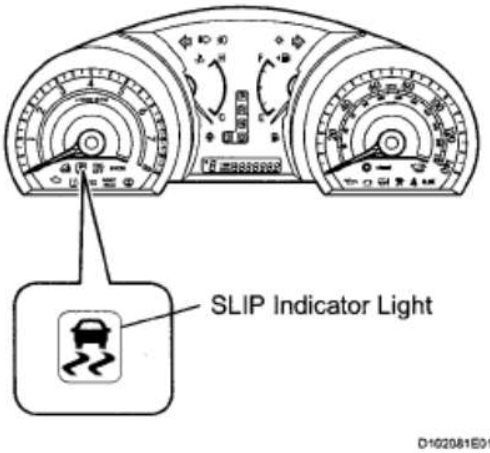


Fig. 32: Identifying SLIP Indicator Light
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. Check that the SLIP indicator light come on (Step "G").

   HINT:

   - If the SLIP indicator light does not come on in step "G", repeat the steps from "A" to "G".
   - Turning the ignition switch off ends inspection mode.

10. **WHEN TOWING FULL-TIME 4WD VEHICLES**
    a. Use one of the following methods to tow the vehicle.
    b. If the vehicle has trouble with the chassis or drive train, use method 1 (flat bed truck).

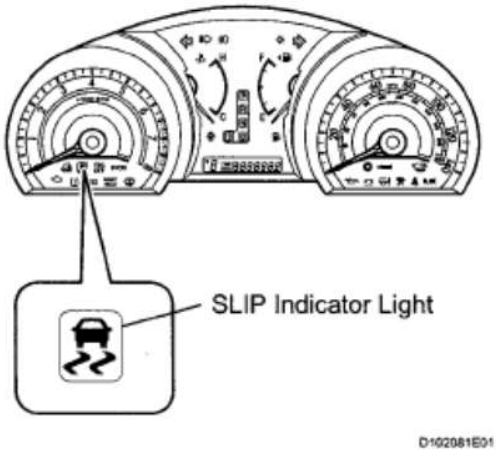
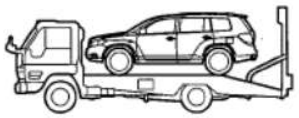
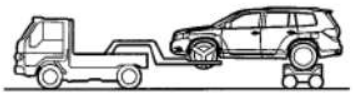
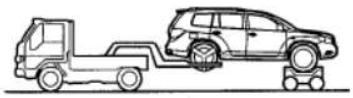


Fig. 33: Identifying SLIP Indicator Light
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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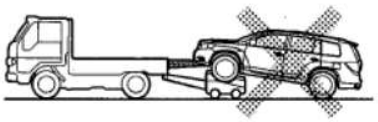
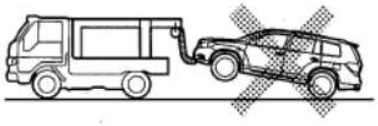
Towing Method \ Conditions	Parking Brake	Transaxle Shift Lever Position
1. Flat Bed Truck 	Applied	Any Position
2. Wheel Lift Type Truck From Front  From Rear 	Applied	Any Position

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Fig. 34: Vehicle Towing Procedure Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

c. The following towing methods shown are dangerous and can damage the vehicle, so do not use them.

NO 	•Do not tow your vehicle only with two wheels on the ground. •Do not use a sling-type towing method either from the front or rear. •If these towing methods are used either from the front or rear:
NO 	(a) The drive train may overheat and be damaged and the wheels may fly off the dolly. (b) In addition, if the vehicle is equipped with the VSC system, the system will apply the brakes to the rotating wheels.

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Fig. 35: Precaution For Vehicle Towing
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11. **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.

12. **EXPRESSIONS OF IGNITION SWITCH**

a. The type of ignition switch used on this model differs according to the specifications of the vehicle. The expressions listed in the following table are used in this section.

IGNITION SWITCH EXPRESSIONS CHART

Switch Type		Ignition Switch (position)	Engine Switch (condition)
Expression	Ignition switch off	LOCK	Off
	Ignition switch on (IG)	ON	On (IG)
	Ignition switch on (ACC)	ACC	On (ACC)
	Engine start	START	Start

13. **INSPECTION AND ADJUSTMENT OF JOINT ANGLE DURING REMOVAL AND INSTALLATION OF PROPELLER SHAFT (4WD)**

a. When performing operations which involve the removal and installation of the propeller shaft, always check the joint angle. Make adjustments if necessary (See **INSTALLATION**).

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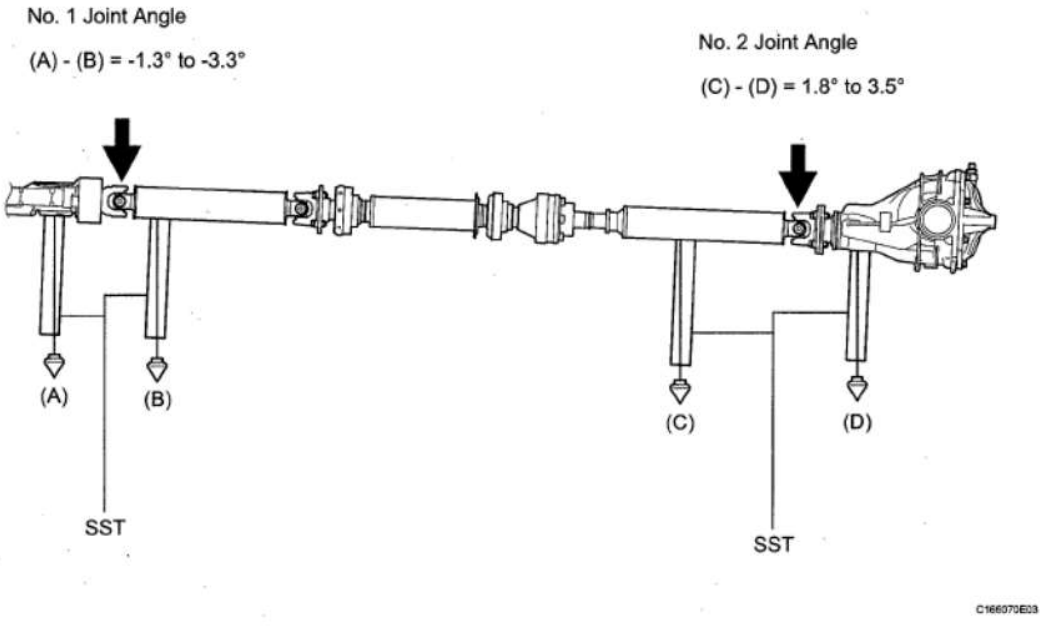


Fig. 36: Checking Joint Angle During Removal And Installation Of Propeller Shaft (4WD)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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 heavyweight items.
   b. When removing any heavyweight components like the engine or transaxle, the center of gravity of the vehicle moves. Place a balance weight so as to keep the vehicle from rolling, or support the jack position using the transmission jack.
2. **NOTICE FOR USING 4 POST LIFT**
   a. Follow the instruction manual for safe operation.
   b. Do not damage tires or wheels with a free wheel beam.
   c. Using wheel stoppers, secure the vehicle.
3. **NOTICE FOR USING JACK AND SAFETY STAND**
   a. Work in a flat place using wheel stoppers at all times.
   b. Use safety stands with a rubber attachments, as shown in the illustration.
   c. Securely support the specified locations with a jack and safety stands.
   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.

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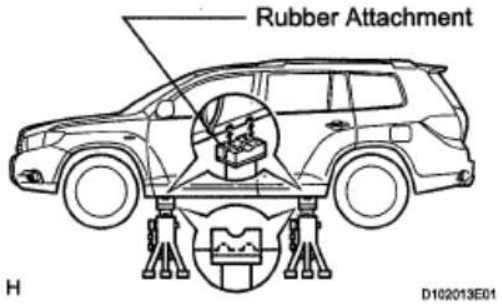


Fig. 37: Jacking Vehicle Using Rubber Attachments And Safety Stand
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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 on both sides of the wheels that contact ground.
g. When lowering the vehicle with its front wheels jacked up, release the parking brake and place wheel stoppers only in front of the rear wheels. When lowering the vehicle with its rear wheels jacked up, place wheel stoppers only behind the front wheels.

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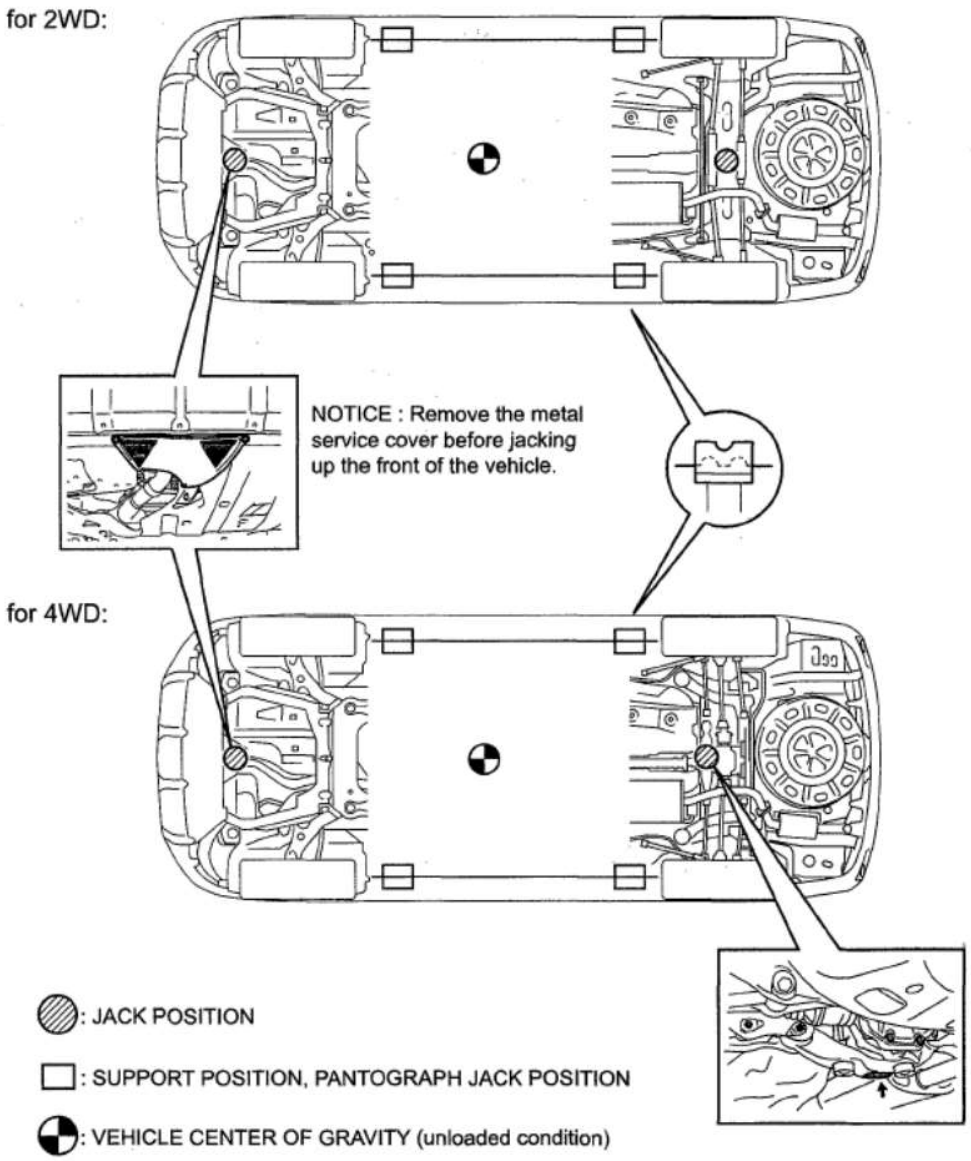


Fig. 38: Identifying Jack Position, Support Position And Pantograph Position
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. **NOTICE FOR USING SWING ARM TYPE LIFT**
   a. Follow the instruction manual of the lift for safe 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.

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f. Lift the vehicle up until the tires are off the ground, 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 safe operation.
   b. Use a plate lift attachment.
   c. Be sure to set the vehicle to the specified position.

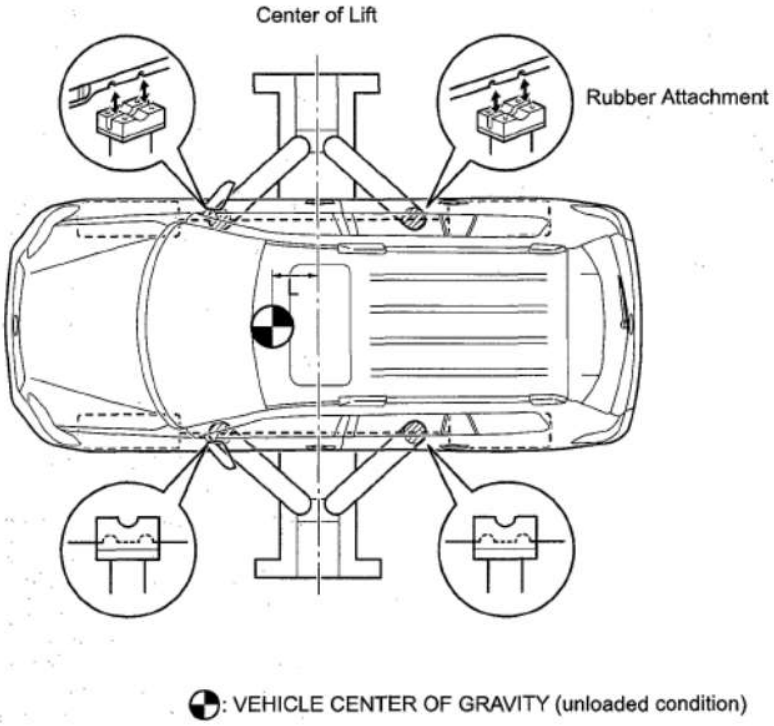
PLATE TYPE LIFT USING REFERENCE

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

   d. Lift the vehicle up until the tires are slightly off the ground a bit, and shake the vehicle to make sure that the vehicle is stable.

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for Swing Arm Type Lift:



for Plate Type Lift:

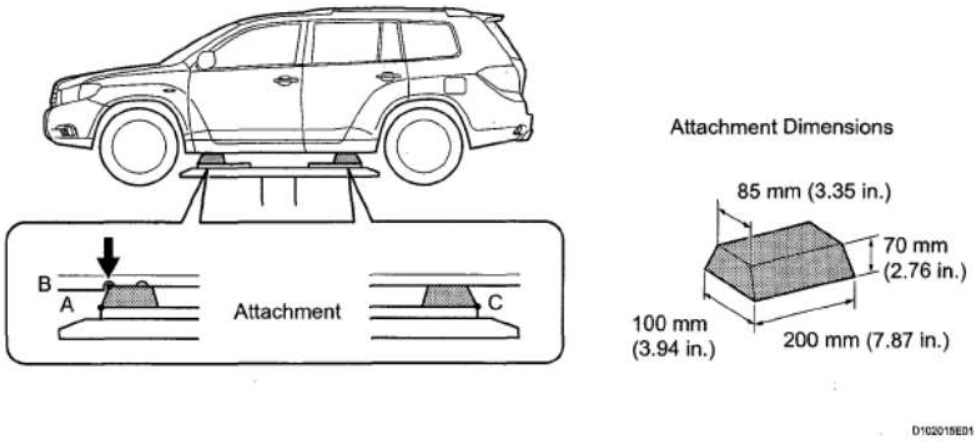


Fig. 39: Lifting Vehicle Up Using Plate Type Lift And Swing Arm Type Lift
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

CUSTOMIZE PARAMETERS

HINT:

The following items can be customized.

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NOTE:

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

1. **AIR CONDITIONING SYSTEM (for Automatic Air Conditioning System)**

Air conditioning system:

AIR CONDITIONING SYSTEM CUSTOMIZE PARAMETERS

Display (Item)	Default	Contents	Setting
Set Temperature Shift	NORMAL	To control with shifted temperature against displayed temperature	+2 C/+1 C/ NORMAL/-1 C/-2 C
Ambient Temperature Shift	NORMAL	To control with shifted temperature against displayed temperature	+3 C/ +2 C /+1 C/ NORMAL /-1 C/-2 C/-3 C
Air Inlet Mode	AUTO	Function to shift from INLET mode to RECIRCULATION mode when A/C is turned ON	MANUAL/AUTO
Compressor Mode	AUTO	Function to automatically turn A/C ON by pressing AUTO button when blower is ON and A/C is OFF	MANUAL/AUTO
Compressor/Air Inlet DEF Operation	LINK	Function to automatically turn A/C ON linked with FRONT DEF button when A/C is OFF	NORMAL/LINK
Evaporator Control	AUTO	Function to set evaporator control to AUTOMATIC position (AUTO) to save power, or to coldest position (MANUAL) to dehumidify air and to prevent windows from fogging up	MANUAL/AUTO
Foot/DEF Auto Mode	ON	Function to automatically turn airflow from FOOT/DEF ON when AUTO MODE is ON	OFF/ON
Foot/DEF Automatic Blow Up Function	ON	Function to automatically increase blower level when defroster is ON	OFF/ON

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

Security:

THEFT DETERRENT SYSTEM CUSTOMIZE PARAMETERS

Display (Item)	Default	Contents	Setting
		Passive Mode is a function that switches the theft deterrent system from the arming preparation state to the armed state 30 seconds after the key is	

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Passive Mode (Security System)	OFF	removed from the actuation area and all doors, glass hatch* and engine hood are closed, even if the doors are not locked by wireless or door key lock operation. In Passive Mode, if the following operations are not performed within 14 seconds after a door is opened during armed state, the theft deterrent system will judge that condition as a theft and switch to the alarm sounding state. o Unlock any door by key or wireless operation o Turn the engine switch on (IG)	ON/OFF
Warning by Horn	ON	Function that allows the vehicle horn and theft deterrent horn to be used as warning devices.	ON/OFF
Entry Delay	14 s	Function that changes entry delay time (time before warning starts) for Passive Mode	0 s/14 s/30 s
HINT: *: w/ Glass Hatch Opener System			

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

Security:

THEFT DETERRENT SYSTEM CUSTOMIZE PARAMETERS

Display (Item)	Default	Contents	Setting
Passive Mode (Security System)	OFF	Passive Mode is a function that switches the theft deterrent system from the arming preparation state to the armed state 30 seconds after the key is removed from the key cylinder and all doors, engine hood and luggage compartment door are closed, even if the doors are not locked by wireless or door key lock operation. In Passive Mode, if the following operations are not performed within 14 seconds after a door is opened during armed state, the theft deterrent system will judge that condition as a theft and switch to the alarm sounding state. o Unlock any door by key or wireless operation o Turn the ignition switch to the ON position o Open the luggage compartment door by key or wireless operation	ON/OFF
Warning by Horn	ON	Function that allows the vehicle horn and theft deterrent horn to be used as warning devices	ON/OFF
Entry Delay	14 s	Function that changes entry delay time (time before warning starts) for Passive Mode	0s/14s/30s
Warning by Glass Broken Sensor	ON	Function that turns the glass breakage sensor on/off. This function is only effective for vehicles with glass breakage sensor.	ON/OFF

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4. LIGHTING SYSTEM

Illuminated Entry:

ILLUMINATED ENTRY CUSTOMIZE PARAMETERS

Display	Default	Contents	Setting
Lighting Time	15s	Changes the lighting time of the personal light, interior lights and ignition key cylinder light*1 /engine switch illumination*2 after closing all of the doors. (It will quickly fade out when the ignition switch is turned on (IG))	7.5 s/15 s/30 s
I/L when ACC OFF	ON	Lights up the personal light, interior lights and ignition key cylinder light*1 /engine switch illumination*2 when the ignition switch is turned from on (ACC or IG) to off.	ON/OFF
I/L ON W/Door Key Unlock	ON	Lights up the personal light, interior lights and ignition key cylinder light*1 /engine switch illumination*2 when the doors are unlocked using the mechanical key.	ON/OFF
Mirr-Foot-Lgt Approached	ON	Lights up the door mirror foot lights when the key enters actuation area around the doors.	ON/OFF
Mirr-Foot-Lgt Unlocked	ON	Lights up the door mirror foot lights when the doors are unlocked using door control transmitter or mechanical key.	ON/OFF
Mirr-Foot-Lgt w/Master SW	ON	Lights up the door mirror foot lights when the doors are unlocked with the door control switch.	ON/OFF
Mirror Foot Light Time	15 s	Changes the lighting time of the door mirror foot lights.	0 s/7.5 s/1.5 s/ 30 s
HINT: • *1: w/o Smart Key System • *2: w/ Smart Key System			

Light Control:

LIGHT CONTROL CUSTOMIZE PARAMETERS

Display	Default	Contents	Setting
Disp Ex ON Sen	Normal	Changes the ambient brightness level required to dim the lights such as the indicator lights of the combination meter, A/C indicator light, and clock.	Light2/Light1/Normal/Dark1/Dark 2
Disp Ex OFF Sen	Normal	Changes the ambient brightness level required to cancel the dimming of the combination meter indicator lights, A/C indicator light, and clock.	Light 2/Light1/Normal/Dark1/Dark2
Light Auto	30 s	Keeps the headlights on for a certain period of time after turning the ignition switch off	OFF/30 s/60 s/90s

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OFF Delay		and closing all the doors with the headlights on.	
Sensitivity	Normal	Adjusts the sensitivity of the automatic light control function.	Light2/Light1/Normal/Dark1/Dark2
DRL Function	ON	ON/OFF of the DRL function.	ON/OFF

5. **POWER DOOR LOCK CONTROL SYSTEM**

Main Body (Main Body ECU):

MAIN BODY CUSTOMIZE PARAMETERS

Display	Default	Contents	Setting
Unlock Key Twice	ON	Function that unlocks only driver side door when driver side door key cylinder is turned to UNLOCK once, and unlock all doors when it is turned to UNLOCK twice. For OFF setting, turning it once unlocks all doors.	ON/OFF
Auto Lock/Shift	ON	Function that locks all doors when shift lever is shifted to P from any other position with engine running and all doors closed	ON/OFF
Auto Unlock/Shift	ON	Function that unlocks all doors when shift lever is shifted to P from any other position while the ignition switch is on (IG)	ON/OFF
All Unlock/Open-Close	OFF	Function that unlocks all doors when opening driver door within 10 seconds after turning the ignition switch on (IG)	ON/OFF
Auto Lock	OFF	Function that locks all doors when the vehicle reaches a certain speed	ON/OFF

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

Wireless Door Lock

WIRELESS DOOR LOCK CUSTOMIZE PARAMETERS

Display (Item)	Default	Contents	Setting
Wireless Control	ON	ON/OFF of wireless door lock function	ON/OFF
Hazard Answer Back	ON	When LOCK switch on transmitter pressed, all hazard warning lights illuminate once. When UNLOCK switch pressed, all hazard warning lights illuminate twice	ON/OFF
Wireless Buzzer Resp	ON	Function that makes wireless buzzer sound for answer-back when transmitter LOCK/UNLOCK switch pressed	ON/OFF
Wireless Auto Lock	ON	Function to control automatic relocking of doors after unlocking with wireless door lock function.	ON/OFF
Open Door Warning	ON	If door is not completely closed and transmitter LOCK switch is pressed, this function sounds a buzzer for 10 seconds	ON/OFF
		Function that unlocks driver side door when unlock switch on	

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Unlock 2 Operation	ON	transmitter is pressed once, and unlocks all doors when pressed twice. If setting is OFF, pressing unlock switch once makes all doors unlock.	ON/OFF
Auto Lock Time	60s	This function controls amount of time from unlocking doors to automatic re-locking function	30s/60s/120s
Panic Alarm Function	ON	Function to operate theft deterrent system by continuously pressing panic switch on transmitter for 0.8 seconds	ON/OFF

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

Wireless Door Lock

WIRELESS DOOR LOCK CUSTOMIZE PARAMETERS

Display (Item)	Default	Contents	Setting
Wireless Control	ON	ON/OFF of wireless door lock function	ON/OFF
Hazard Answer Back	ON	When LOCK switch on transmitter pressed, all hazard warning lights illuminate once. When UNLOCK switch pressed, all hazard warning lights illuminate twice	ON/OFF
Wireless Buzzer Resp	ON	Function that makes wireless buzzer sound for answer-back when transmitter LOCK/UNLOCK switch pressed	ON/OFF
Wireless Auto Lock	ON	Function to control automatic relocking of doors after unlocking with wireless door lock function.	ON/OFF
Open Door Warning	ON	If door is not completely closed and transmitter LOCK switch is pressed, this function sounds a buzzer for 10 seconds	ON/OFF
Unlock 2 Operation	ON	Function that unlocks driver side door when unlock switch on transmitter is pressed once, and unlocks all doors when pressed twice. If setting is OFF, pressing unlock switch once makes all doors unlock.	ON/OFF
Panic Function	ON	This function operates the theft deterrent system when PANIC is pressed and held for 0.8 second or more.	ON/OFF
Auto Lock Time	60s	This function controls amount of time from unlocking doors to automatic re-locking function.	30s/60s/120s
Wireless Glass Hatch Open*	Long 1	This function changes operation method of transmitter to glass hatch.	1 tim ON: Push once 2 tim ON: Push twice Long 1: Push and hold for 0.6 seconds Long 2: Push and hold for 0.8 seconds Prohibit: Does not operate

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HINT:
*: w/ Glass Hatch Opener System

8. **SMART KEY SYSTEM**

Smart Key (Certification ECU (Smart Key ECU Assembly) (SMART)):

SMART KEY CUSTOMIZE PARAMETERS

Display (Item)	Default	Contents	Setting
Ignition Available Area	ALL	Function to choose the available area for electrical key to start engine and release the steering lock.	FRONT/ALL
Park Wait Time	2.5s	Function that sets waiting time to permit opening door after door is locked with entry lock function.	0.5 s/1.5 s/2.5 s/5.0 s
Glass Hatch Open Operation	ON	Function to open the glass hatch when the driver has the electrical key and presses glass hatch opener switch.	ON/OFF
Back Door Opening Operation	LONG	Function to open the back door when the driver has the electrical key and presses back door opener switch.	LONG/TWICE/OFF

Smart Key (Certification ECU (Smart Key ECU Assembly) (WARNING)):

SMART KEY CUSTOMIZE PARAMETERS

Display (Item)	Default	Contents	Setting
Passenger Take Key	ON	Function to warn that the electrical key is taken out by passengers (It means that the key is taken out from except the driver's door) when engine is running.	ON/OFF
Key Out Range Warning	ON	Function to set a warning function for trying to start the engine before key is still out of its range.	ON/OFF
Key Low Battery Warning	ON	Function to set a warning function for the time when a key battery becomes weak.	ON/OFF

9. **ENTRY UNLOCK MODE SWITCHING FUNCTION (Smart Key System)**

HINT:

The function only changes the entry unlock mode of the smart key system. This function is not for the wireless door lock control.

a. To change the vehicle to entry unlock mode switching function:

- 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:

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When any touch sensor is touched, all doors unlock.

1. When the engine switch is off, press the LOCK button and one of the other buttons on the key at the same time for approximately 5 seconds while the key is in the actuation area.
2. The certification ECU (smart key ECU assembly) receives this signal from the door control receiver and switches the entry unlock mode.
3. The certification ECU (smart key ECU assembly) sounds the wireless door lock buzzer and the buzzer in the combination meter to inform the user that the mode has been switched.
4. If the entry unlock mode needs to be switched again, press the LOCK button and one of the other three buttons on the key at the same time for approximately 5 seconds after the LED of the key goes off.

NOTE: After pressing and holding the switches for 4.5 seconds, wait 5 seconds before performing the same procedure again.

b. The certification ECU (smart key ECU assembly) receives this signal from the door control receiver and changes the smart key system to the entry unlock mode.
c. The certification ECU (smart key ECU assembly) sounds the wireless door lock buzzer and the buzzer of the combination meter to inform the user that the mode has been switched.

Mode	Wireless Door Lock Buzzer	Multi-information Display		Combination Meter
				Buzzer
Driver Door (Default)	ON / OFF — Sounds 3 times	Displayed for 4 sec.	Driver door "OPEN" indication	Sounds once
All Doors (Customized)	ON / OFF — Sounds 2 times	Displayed for 4 sec.	All doors "OPEN" indication	Sounds once

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Fig. 40: Certification ECU (Smart Key ECU Assembly) Sounds Wireless Door Lock Buzzer And Combination Meter Chart
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10. **ELECTRICAL KEY CANCEL (Smart Key System)**

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The electrical key cancel operation disables the following functions:

- Entry Unlock/Lock
- Entry Back Door Open
- Entry Glass Hatch Open
- Electrical Key Lock-in Prevention
- Warning

a. 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. Close and open the driver door twice within 30 seconds.

   (Driver Door: Close --> Open --> Close --> Open)

5. Unlock the driver side door twice with the UNLOCK switch of the electrical key within 5 seconds.
6. Close and open the driver door within 30 seconds.

   (Driver Door: 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.

11. METER/GAUGE SYSTEM

Combination Meter:

COMBINATION METER CUSTOMIZE PARAMETERS

Tester Display	Default	Contents	Setting
Key Remind Volume	Large	Function to change the volume of the key reminder buzzer.	Large, Medium, Small
Key Remind Sound	Slow	Function to change the frequency of the key reminder buzzer.	Fast, Normal, Slow
Driver Side Seatbelt Warning Buzzer (*)	On	Function to change the seat belt warning buzzer.	On, Off
Front Passenger Side Seatbelt	On	Function to change the seat belt warning	On, Off

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Warning Buzzer (*)		buzzer.	

HINT:
*: This setting is only valid for the buzzer which sounds at the 20 km/h (12 mph) or more.

12. **POWER WINDOW CONTROL SYSTEM**

Power Window (Main Body ECU):

POWER WINDOW CUSTOMIZE PARAMETERS

Tester Display	Default	Contents	Setting
Door Key P/W Up	ON	Function that raises all power windows when, with engine switch off, key is used to hold driver door key cylinder to lock position for more than 2.3 seconds	ON/OFF
Door Key P/W Down	ON	Function that lowers all power windows when, with engine switch off, key is used to hold driver door key cylinder to unlock position for more than 2.3 seconds	ON/OFF
P/W Down W/ Transmit	ON	Function that lowers all power windows when, with engine switch off, unlock switch on transmitter is pressed and held for more than 3.0 seconds	ON/OFF

13. **POWER BACK DOOR SYSTEM**

Power back door system

POWER BACK DOOR SYSTEM CUSTOMIZE PARAMETERS

Display (Item)	Default	Function	Setting
PBD SW Operation	0.8 s	Function that turns power back door closer switch ON when switch is pushed once or held down for 0.8 sec.	0.8s/ON
PBD Buzzer	ON	This function makes the power back door buzzer sound when power back door is operating	ON/OFF
Wireless PBD SW Operation	0.8 s	Function that operates power back door when transmitter switch is pressed in specified way	ON/2 times/0.8 s/OFF

INITIALIZATION

1. **PROCEDURES NECESSARY WHEN BATTERY TERMINAL IS DISCONNECTED/RECONNECTED**

INITIALIZATION PROCEDURES REFERENCE

Necessary Procedure	Procedure Detail	Effect/Inoperative Function When Necessary Procedure is not Performed	Note
Reset back door close	Fully close the back door to turn off the	Power back door function	If the back door is closed when disconnecting the cable from the

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position	courtesy switch.		battery terminal, it is not necessary to reset it.

NOTE: **It may not be possible to release the steering lock or start the engine when the battery voltage is low. If this occurs, initialization of the steering lock system is required. (See INITIALIZATION)**

2. **PROCEDURES NECESSARY WHEN ECU OR OTHER PARTS ARE REPLACED**

INITIALIZATION PROCEDURES REFERENCE

Replacement Part	Necessary Procedure	Effect/Inoperative Function when Necessary Procedure are not Performed	Note
for 2GR Engine: • ECM	Reset memory	• Large shift shock • The deterioration of fuel efficiency	Using Techstream.
	ECU communication ID registration	Engine start	-
	Vehicle Identification Number (VIN) registration	MIL comes on	Using Techstream.
for 1AR Engine: • ECM	ECU communication ID registration	Engine start	-
	Vehicle Identification Number (VIN) registration	MIL comes on	Using Techstream.
for U151E, U151F Transaxle: • Automatic transaxle assembly • Engine assembly	Reset memory	• Large shift shock • The deterioration of fuel efficiency	Using Techstream.
for U760E Transaxle: • Automatic transaxle assembly	1. Reset memory 2. Transaxle Compensation Code Input 3. Perform road test to allow TCM to Learn	• Large shift shock • The deterioration of fuel efficiency	Using Techstream.
for U760E Transaxle: • Valve Body Assembly	1. Reset memory 2. Reset transaxle Compensation Code	• Large shift shock • The deterioration of	Using Techstream.

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• Shift Solenoid Valve SL3 and/or SL4		3. Perform road test to allow TCM to Learn	fuel efficiency	
for U760E Transaxle: • Shift Solenoid Valve SL1 and/or SL2		Perform road test to allow TCM to Learn	• Large shift shock • The deterioration of fuel efficiency	-
for U760E Transaxle: • TCM (If possible, read the transaxle compensation code from the previous TCM)	Possible	1. Reset memory 2. Transaxle Compensation Code Input (Into new TCM) 3. Perform road test to allow TCM to Learn	• Large shift shock • The deterioration of fuel efficiency	Using Techstream.
	Impossible	1. Reset memory 2. Reset transaxle Compensation Code 3. Perform road test to allow TCM to Learn	• Large shift shock • The deterioration of fuel efficiency	Using Techstream.
Tire pressure warning ECU		1. Register transmitter IDs 2. Initialize tire pressure warning system	• When DTC detection conditions of "transmitter ID not received" DTC are met, TPWS indicator blinks for 1 minute, and then illuminates. • Tire pressure monitoring function	-
Tire pressure warning valve and transmitter		1. Register transmitter IDs 2. Initialize tire pressure warning system	• When DTC detection conditions of "transmitter ID not received" DTC are met, TPWS indicator blinks for 1 minute, and then illuminates. • Tire pressure monitoring function	Even if only one wheel is replaced, IDs for all 4 or 5 wheels must be registered.

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		of replaced wheel	
• Yaw rate and acceleration sensor • Brake actuator	1. Clear zero point calibration data 2. Perform yaw rate and acceleration sensor zero point calibration	• Slip indicator light comes on • VSC disabled or malfunctioning	Perform yaw rate and acceleration sensor zero point calibration with the ignition switch ON (engine stopped).
Steering lock actuator (Steering lock ECU) *1	ECU code registration	Engine start	-
• Occupant Classification ECU • Front seat assembly	• Perform zero point calibration • Sensitivity check	• Occupant classification system • Passenger airbag ON/OFF indicator • Airbag system (Front passenger side) • Seat belt warning system (Front passenger side)	-
• Certification ECU *1 • Electrical key transmitter *1	Key ID registration	• Wireless door lock control system • Smart key System • Engine start	-
ID code box *1	1. ECU code registration 2. ECU communication ID registration	• Wireless door lock control system • Smart key System • Engine start	-
Transponder key ECU *2	1. Key code registration 2. ECU communication ID registration	Engine start	-
Door control transmitter *2	Key code registration	Engine start	-
	Refer to wireless door lock control system (w/o Smart key System) "Registration" procedures	Wireless door lock control system	-
	Refer to wireless door lock control system	Wireless door lock	

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Door control receiver *2	(w/o Smart key System) "Registration" procedures	control system	-
• Power window regulator motor (Driver door) • Front door window regulator (Driver door)	Perform power reset (initialization of pulse sensor)	• Automatic door glass open/close function • Jam protection function • Operation function after ignition switch off • Operation of each passenger window using power window switch at the driver door	Necessary when removed and installed.
Back door lock motor	Reset back door close position	Power back door function	-
• Sliding roof drive gear sub-assembly (Sliding roof ECU) • Sliding roof housing • Sliding roof drive cable	Perform sliding roof drive gear reset	• Automatic open/close function of roof glass • Jam protection function • Operation function after ignition switch off	Necessary when removed and installed (Not necessary when the sliding roof drive gear (sliding roof ECU) is removed and installed together with the sliding roof housing).
HINT: • *1: w/ Smart key System • *2: w/o Smart key System			

3. **RESET MEMORY (U151E, U151F Automatic Transaxle System)**

NOTE:

- **Perform the RESET MEMORY (AT initialization) when replacing the automatic transaxle assembly, engine assembly or ECM.**
- **The RESET MEMORY can be performed only with Techstream.**

HINT:

The ECM memorizes the condition that the ECT controls the automatic transaxle assembly and engine assembly according to those characteristics. Therefore, when the automatic transaxle assembly, engine assembly, or ECM has been replaced, it is necessary to reset the memory so that the ECM can memorize

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the new information. Reset procedure is as follows.

a. Turn the ignition switch off.
b. Connect Techstream to the DLC3.
c. Turn the ignition switch on (IG) and push the Techstream main switch on.
d. Enter the following menu: Powertrain/Engine and ECT/Utility/Reset Memory. Then, press "Next".
e. Perform the reset memory procedure from the main menu.

CAUTION: After performing the RESET MEMORY, be sure to perform the ROAD TEST (See ROAD TEST) described earlier.

HINT:

The ECM is learned by performing the ROAD TEST.

4. **RESET TRANSAXLE COMPENSATION CODE (U760E Automatic Transaxle System)**

NOTE:

- **If the following parts have been replaced, initialize the TCM and perform the following "Reset Memory" and "Perform Road Test to Allow TCM to learn" steps.**
  - **Valve body assembly**
  - **Shift solenoid valve SL3**
  - **Shift solenoid valve SL4**
  - **TCM**
- **The transaxle compensation code can only be initialize with the Techstream.**

HINT:

The TCM memorizes the condition that the ECT controls the automatic transaxle assembly according to those characteristics. Therefore, when the automatic transaxle assembly, or TCM has been replaced, it is necessary to reset the memory so that the TCM can memorize the new information. Reset procedure is as follows:

a. Move the shift lever to N or P.
b. Turn the ignition switch off.
c. Connect the Techstream to the DLC3.
d. Turn the ignition switch to ON.
e. Turn the Techstream on.
f. Enter the following menus: Powertrain/ECT/Utility/A/T Code Reset.
g. Press "Next" again to proceed.

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NOTE: After the transaxle compensation code is initialized, perform the following "Reset Memory" and "Perform Road Test to Allow TCM to learn" steps.

h. Press "Exit".

5. **PERFORM ROAD TEST TO ALLOW TCM TO LEARN (U760E Automatic Transaxle System)**

NOTE: Perform the following procedure while strictly observing all traffic laws and speed limits.

a. Warm up the engine.
b. Turn the ignition switch off.
c. Connect the Techstream to the DLC3.
d. Turn the ignition switch to ON.
e. Turn the Techstream on.
f. Enter the following menus: Powertrain/ECT/Data List/Throttle Position from EFI.
g. From a standstill, achieve highest possible speed with the accelerator pedal opened 15% or less. Keep the accelerator pedal angle steady while driving the vehicle.

HINT:

"Throttle Position from EFI": 15% or less

h. Repeat the previous step until shift shock no longer occurs.
i. From a standstill, achieve highest possible speed with the accelerator pedal opened 25% to 35%. Keep the accelerator pedal angle steady while driving the vehicle.

HINT:

"Throttle Position from EFI": 25% to 35%

j. Repeat the previous step until shift shock no longer occurs.

6. **RESET MEMORY (U760E Automatic Transaxle System)**

NOTE: Reset Memory can be performed only with the Techstream.

HINT:

The TCM (ECT) memorizes the vehicle conditions when controlling the automatic transaxle assembly and engine assembly.

Therefore, when the automatic transaxle assembly, valve body assembly, shift solenoid valve SL3, shift solenoid valve SL4, or TCM has been replaced, it is necessary to reset the memory so that the TCM can memorize the new information.

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a. Reset procedure is as follows.
   1. Turn the ignition switch off.
   2. Connect the Techstream to the DLC3.
   3. Turn the ignition switch to ON.
   4. Turn the Techstream on.
   5. Enter the following menus: "Powertrain/ECT/Utility/Reset Memory". Then, press "Next".

NOTE: After performing Reset Memory, be sure to perform "Perform Road Test to Allow TCM to Learn" described earlier.

7. **TRANSAXLE COMPENSATION CODE INPUT (U760E Automatic Transaxle System)**

NOTE: Transaxle compensation codes are unique, 60-digit alphanumeric values printed on a QR label on the transaxle. If an incorrect transaxle compensation code is input into the TCM, shift shock may occur.

a. Record the transaxle compensation code specified on the QR label.

   HINT:

   The transaxle compensation code is imprinted on the QR label.

b. Move the shift lever to N or P.
c. Connect the Techstream to the DLC3.
d. Turn the ignition switch to ON.
e. Turn the Techstream on.

NOTE: Do not start the engine.

f. Enter the following menus: Powertrain/ECT/Utility/A/T Code Registration.
g. Select "Set Compensation Code".
h. Register the compensation code.
   1. Press "Input".
   2. Manually input the transaxle compensation code. The code is a 60-digit alphanumeric value printed on the QR label. After inputting the code, press "OK".

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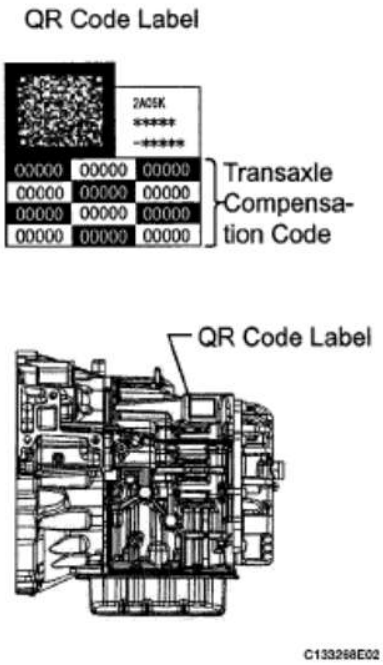


Fig. 41: Identifying QR Code Label Location
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

i. Check that the compensation code displayed on the screen is correct by comparing it with the 60-digit alphanumeric value on the QR label.

NOTE: If an incorrect transaxle compensation code is input into the TCM, shift shock will occur.

j. Press "NEXT" to set the compensation code to the TCM.

HINT:

- If the registration process fails, the compensation code may be incorrect. Check the compensation code again.
- If the attempted compensation code is correct, a problem with the wire harness or a bad connection with the DLC3 may cause a registration failure. Check the wire harness and the DLC3 connection. If no problem is found, the TCM may be malfunctioning. Check the TCM and repeat this operation.

k. Press "EXIT".

8. **TRANSAXLE COMPENSATION CODE INPUT (into new TCM)(U760E Automatic Transaxle System)**

NOTE: Transaxle compensation codes are 60-digit alphanumeric values imprinted on a QR label on the transaxle. If an incorrect transaxle compensation code is input into the TCM, shift shock may occur.

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HINT:

The following operation is available for use with TCMs that can transmit the registered transaxle compensation code to Techstream.

a. Move the shift lever to N or P.
b. Connect the Techstream to the DLC3.
c. Turn the ignition switch to ON.
d. Turn the Techstream on.

NOTE: Do not start the engine.

HINT:

The transaxle compensation code is imprinted on the QR label.

e. Read the transaxle compensation code.
   1. Enter the following menus: Powertrain/ECT/Utility/A/T Code Registration.
   2. Select "Read Compensation Code".
   3. Press "Save".
   4. Press "Save" or "Overwrite".

      HINT:

      Press "Overwrite".

      NOTE: Do not use the code specified on the transaxle QR label even if the transaxle compensation code cannot be read using the Techstream. The code printed on an in-service transaxle may not match its current characteristics. Replace the TCM with a new one and perform a road test to allow the TCM to learn.

   5. Press "EXIT".
   6. Turn the ignition switch off.
f. Replace the TCM.
g. Set the transaxle compensation code.
   1. Turn the ignition switch to ON.
   2. Turn the Techstream on.
   3. Enter the following menus: Powertrain/ECT/Utility/A/T Code Registration.
   4. Select "Set Compensation Code".
   5. Press "Open".
   6. Press "Open" again to proceed.

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7. Press "Exit".

9. **DESCRIPTION OF CODE REGISTRATION (Engine Immobilizer System (w/ Smart Key System))**

HINT:

- The ID codes are the same as recognition codes for the wireless transmitter and the engine immobilizer function. Registering an ID code enables the smart key system, the wireless door lock control function and the engine immobilizer function to be operated.
- Code registration is necessary when the certification ECU (smart key ECU assembly), ID code box (immobilizer code ECU), steering lock ECU, or key is replaced with a new one.

a. Vehicles with the smart key system do not have a key slot. Therefore, hold the key close to the engine switch to register the key, as shown in the illustration below.

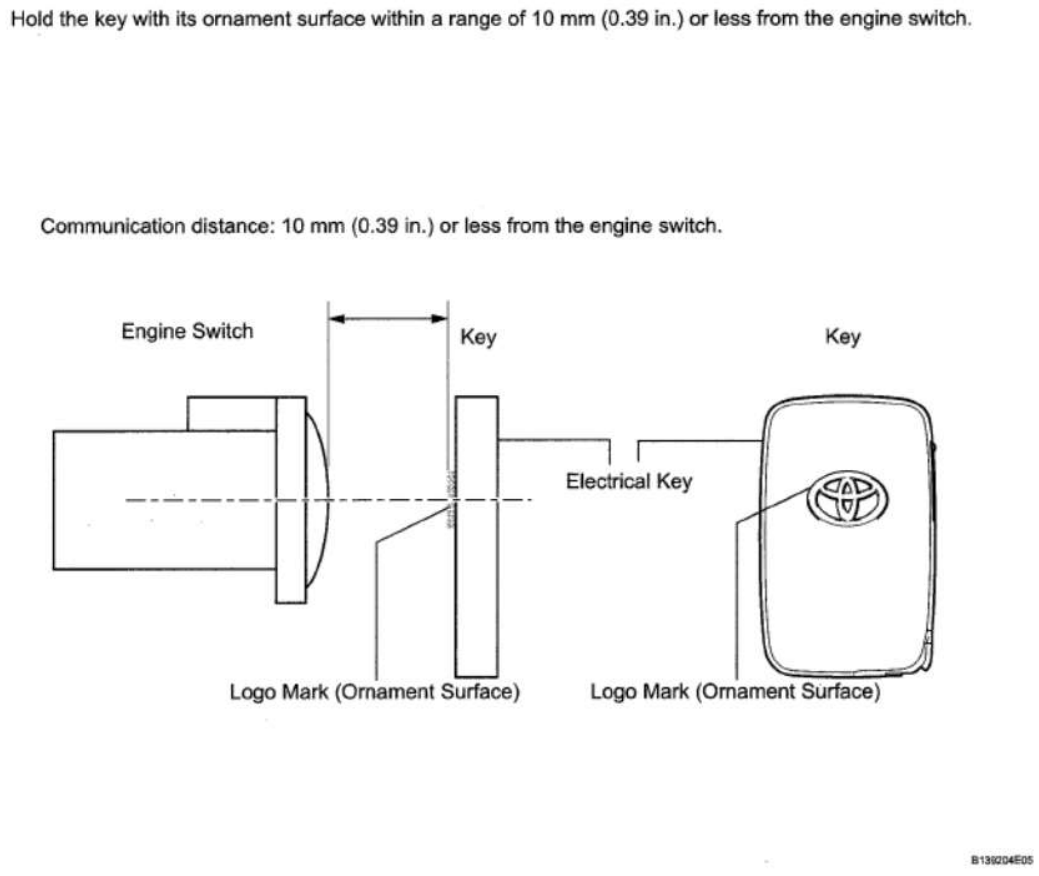


Fig. 42: Identifying Communication Distance Between Engine Switch And Key
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

10. **PART REPLACEMENT AND KEY REGISTRATION (Engine Immobilizer System (w/ Smart Key System))**

a. The following table shows ECU replacement and key registration procedures for cases in which a malfunctioning ECU has been identified through the troubleshooting of the smart key system.

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HINT:

- The following procedures can be performed:

  New key ID registration

  Additional key ID registration

  Key ID erasure

  All key ID erasure

  ECU code registration

- If the customer has not brought all the registered keys, replacement of the ID code box (immobilizer code ECU) is also required.
- A maximum of 7 keys can be registered.

PART REPLACEMENT AND KEY REGISTRATION PROCEDURE REFERENCE

Part to be replaced	Condition		Procedure	Reference
Certification	Customer has brought all keys		1. Replace certification ECU (smart key ECU assembly)	-
			2. Reregister all keys (New key ID registration)	PROCEDURE "B"
	Some keys are lost	Key ID codes can be registered and erased	1. Erase key codes (Key ID erasure)	PROCEDURE "D"
			2. Perform additional key registration procedure (Additional key ID registration)	PROCEDURE "C"
			3. Replace certification ECU (smart key ECU assembly)	-
			4. Reregister all keys (New key ID registration) HINT: If some keys are not registered during the above steps, they will be disabled because they cannot be registered later.	PROCEDURE "B"
		Key ID codes cannot	1. Replace certification ECU (smart key ECU assembly)	-
			2. Replace ID code box (immobilizer code ECU)	-
			3. Reregister all keys (New key ID registration) HINT: If key codes cannot be erased or additional keys cannot be registered due to a	

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ECU (Smart key ECU assembly)		be either registered or erased	malfunction in the certification ECU (smart key ECU assembly), replace the ID code box (immobilizer code ECU) and certification ECU (smart key ECU assembly). If some keys are not registered during the above steps, they will be disabled because they cannot be registered later.	PROCEDURE "A"
			4. ECU communication ID registration	PROCEDURE "G"
	All keys are lost		1. Replace certification ECU (smart key ECU assembly)	-
			2. Replace ID code box (immobilizer code ECU)	-
			3. Reregister all keys (New key ID registration) HINT: If key codes cannot be erased or additional keys cannot be registered due to a malfunction in the certification ECU (smart key ECU assembly), replace the ID code box (immobilizer code ECU) and certification ECU (smart key ECU assembly). If some keys are not registered during the above steps, they will be disabled because they cannot be registered later.	PROCEDURE "A"
			4. ECU communication ID registration	PROCEDURE "G"
ID code box (Immobilizer code ECU)	Customer has brought at least 1 key		1. Replace ID code box (immobilizer code ECU)	-
			2. Register recognition codes in ECUs (ECU code registration)	PROCEDURE "F"
			3. ECU communication ID registration	PROCEDURE "G"
	All keys are lost		1. Replace ID code box (immobilizer code ECU)	-
			2. Replace certification ECU (smart key ECU assembly)	-
			3. Reregister all keys (New key ID registration) HINT: If some keys are not registered during the above steps, they will be disabled because they cannot be registered later.	PROCEDURE "A"
			4. ECU communication ID registration	PROCEDURE "G"
	Customer has		1. Replace steering lock ECU	-

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Steering lock ECU	brought at least 1 key	2. Register recognition codes in ECUs (ECU code registration)	PROCEDURE "F"
	All keys are lost	1. Replace steering lock ECU	-
		2. Replace certification ECU (smart key ECU assembly)	-
		3. Replace ID code box (immobilizer code ECU)	-
		4. Reregister all keys (New key ID registration) HINT: If some keys are not registered during the above steps, they will be disabled because they cannot be registered later.	PROCEDURE "A"
		5. ECU communication ID registration	PROCEDURE "G"
Main body ECU (Instrument panel junction block)	No condition required	Replace main body ECU (instrument panel junction block)	-
ECM	No condition required	1. Replace ECM	-
		2. ECU communication ID registration	PROCEDURE "H"
Key (for replacement)	Customer has brought at least 1 key	1. Using remaining key, erase lost key code (Key ID erasure)	PROCEDURE "D"
		2. Register additional keys as necessary (Additional key ID registration)	PROCEDURE "C"
	All keys are lost	1. Erase all key codes (All key ID erasure)	PROCEDURE "E"
		2. Register all keys (New key ID registration) HINT: If the customer brings lost keys at a later date, they can be registered using the additional key ID registration function.	PROCEDURE "A"
Key (for addition)	Customer has brought at least 1 key HINT: When adding keys (Additional registration)	1. Register additional keys as necessary (Additional key ID registration)	PROCEDURE "C"

11. **KEY REGISTRATION (Engine Immobilizer System (w/ Smart Key System))**
    a. PROCEDURE "A"

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New key ID registration (when replacing the certification ECU (smart key ECU assembly) and ID code box (immobilizer code ECU), or when replacing the certification ECU (smart key ECU assembly), ID code box (immobilizer code ECU) and steering lock ECU)

KEY REGISTRATION PROCEDURE REFERENCE

Process	Procedure
1. Start of registration	1. Connect Techstream to DLC3 2. Turn engine switch on (IG) 3. Select "Body Electrical/Smart Key/Utility/Smart Code Registration" from the Techstream menu HINT: The engine switch cannot be turned on (IG) more than 10 times. After connecting Techstream, turn Techstream on while turning the driver's side door courtesy light switch on and off repeatedly at 1.5-second intervals or less to continue key registration procedure.
2. Confirmation of ECU code	Perform operation according to prompts on the Techstream screen HINT: Mode is automatically selected by Techstream (new registration mode or add mode).
3. Verification of unregistered key (1)	1. Hold unregistered key close to engine switch (For details, refer to "12 DESCRIPTION OF CODE REGISTRATION") 2. Confirm that wireless door lock buzzer sounds once (short beep) 3. Place unregistered key on driver's seat 4. Confirm that wireless door lock buzzer sounds once (short beep)
4. Registration of ID code	Perform operation according to prompts on the Techstream screen
5. End of registration	Finish new key ID code registration
(1) Repeat this process for each key which is to be registered for the vehicle. Finish the procedure for each key within 30 seconds. If the procedure for any of the keys has not been finished within the specified time, perform the registration procedures again from process 1. Make sure that only 1 key is in the cabin during the registration procedures. If 2 or more keys are in the cabin simultaneously, electric waves will interfere with each other, preventing normal registration.	

b. PROCEDURE "B"

New key ID registration (when replacing the certification ECU (smart key ECU assembly))

KEY ID REGISTRATION PROCEDURE REFERENCE

Process	Procedure
	1. Connect Techstream to DLC3

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1. Start of registration	2. Turn engine switch on (IG) 3. Select "Body Electrical/Smart Key/Utility/Smart Code Registration" from the Techstream menu HINT: The engine switch cannot be turned on (IG) more than 10 times. After connecting Techstream, turn Techstream on while turning the driver's side door courtesy light switch on and off repeatedly at 1.5-second intervals or less to continue key registration procedure.
2. Confirmation of ECU code	Perform operation according to prompts on the Techstream screen HINT: Mode is automatically selected by Techstream (new registration mode or add mode).
3. Confirmation of all registered keys (1)	1. Hold unregistered key close to engine switch (For details, refer to "12 DESCRIPTION OF CODE REGISTRATION") 2. Confirm that wireless door lock buzzer sounds once (short beep)
4. Confirmation of ECU code	Perform operation according to prompts on the Techstream screen
5. Verification of unregistered key (2)	1. Hold unregistered key close to engine switch (For details, refer to "12 DESCRIPTION OF CODE REGISTRATION") 2. Confirm that wireless door lock buzzer sounds once (short beep) 3. Place unregistered key on driver's seat 4. Confirm that wireless door lock buzzer sounds once (short beep)
5. Registration of ID code	Perform operation according to prompts on the Techstream screen
6. End of registration	Finish new key ID code registration

(1) Repeat this process for each key registered for the vehicle. Finish the procedure for each key within 30 seconds. If the procedure for any of the keys has not been finished within the specified time, perform the registration procedures again from process 1. If the key confirmation procedure for a key is performed, the security indicator light comes on and remains on until all the keys are confirmed.

(2) Repeat this process for each key which is to be registered for the vehicle. Finish the procedure for each key within 30 seconds. If the procedure for any of the keys is not finished within the specified time, perform the registration procedures again from 1. Make sure that only 1 key is in the cabin during the registration procedures. If 2 or more keys are in the cabin simultaneously, electric waves will interfere with each other, preventing normal registration.

c. PROCEDURE "C"

Additional key ID registration

ADDITIONAL KEY ID REGISTRATION PROCEDURE REFERENCE

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Process	Procedure
1. Start of registration	1. Connect Techstream to DLC3 2. Turn engine switch on (IG) 3. Select "Body Electrical/Smart Key/Utility/Smart Code Registration" from the Techstream menu
2. Confirmation of registered key (1)	1. Perform operation according to prompts on the Techstream screen HINT: Mode is automatically selected by Techstream (new registration mode or add mode) 2. Hold unregistered key close to engine switch (For details, refer to "12 DESCRIPTION OF CODE REGISTRATION") 3. Confirm that wireless door lock buzzer sounds once (short beep)
3. Confirmation of ECU code	Perform operation according to prompts on the Techstream screen
4. Verification of unregistered key (2)	1. Hold unregistered key close to engine switch (For details, refer to "12 DESCRIPTION OF CODE REGISTRATION") 2. Confirm that wireless door lock buzzer sounds once (short beep) 3. Place unregistered key on driver's seat 4. Confirm that wireless door lock buzzer sounds once (short beep)
5. Registration of ID code	Perform operation according to prompts on the Techstream screen
6. End of registration	Finish additional key ID code registration

(1) Perform this process for one of the keys registered for the vehicle. Finish the procedure within 30 seconds. If the procedure has not been finished within the specified time, perform the registration procedures again from process 1.

(2) Repeat this process for each key which is to be registered for the vehicle. Finish the procedure for each key within 30 seconds. If the procedure for any of the keys is not finished within the specified time, perform the registration procedures again from 1. Make sure that only 1 key is in the cabin during the registration procedures. If 2 or more keys are in the cabin simultaneously, electric waves will interfere with each other, preventing normal registration.

d. PROCEDURE "D"

Key ID erasure

HINT:

Erase all registered key codes except one.

KEY ID ERASURE PROCEDURE REFERENCE

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Process	Procedure
1. Start of erasure	1. Connect Techstream to DLC3 2. Turn engine switch on (IG) 3. Select "Body Electrical/Smart Key/Utility/Smart Code Erasure" from the Techstream menu
2. Confirmation of registered key (1) HINT: Select the key that will not be erased.	1. Perform operation according to prompts on the Techstream screen 2. Hold registered key close to engine switch (For details, refer to "12 DESCRIPTION OF CODE REGISTRATION") 3. Confirm that wireless door lock buzzer sounds once (short beep)
3. Confirmation of ECU code	Perform operation according to prompts on the Techstream screen
4. Erasure of ID code	Perform operation according to prompts on the Techstream screen
5. End of erasure	Finish key ID code erasure
(1) Perform this process for one of the keys registered for the vehicle. Finish the procedure within 30 seconds. If the procedure has not been finished within the specified time, perform the erasure procedures again from process 1.	

e. PROCEDURE "E"

All key ID erasure

HINT:

All the key codes registered in the vehicle are erased.

ALL KEY ID ERASURE PROCEDURE REFERENCE

Process	Procedure
1. Start of erasure	1. Connect Techstream to DLC3 2. Turn engine switch on (IG) 3. Turn Techstream on while turning driver side door courtesy light switch on and off repeatedly at 1.5-second intervals or less 4. Select "Body Electrical/Smart Key/Utility/Smart Code Erasure" from the Techstream menu
3. Confirmation of ECU code	Perform operation according to prompts on the Techstream screen
4. Erasure of ID code	Perform operation according to prompts on the Techstream screen
5. End of erasure	Finish key ID code erasure

f. PROCEDURE "F"

ECU code registration

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ECU CODE REGISTRATION PROCEDURE REFERENCE

Process	Procedure
1. Start of registration	1. Connect Techstream to DLC3 2. Turn engine switch on (IG) 3. Select "Body Electrical/Smart Key/Utility/ECU Communication ID Registration" from the Techstream menu
2. Confirmation of registered key (1)	1. Hold registered key close to engine switch (For details, refer to "12 DESCRIPTION OF CODE REGISTRATION") 2. Confirm that wireless door lock buzzer sounds once (short beep)
3. Registration of ECU code	Perform operation according to prompts on the Techstream screen
4. End of registration	Finish ECU code registration
(1) Perform this process for one of the keys registered for the vehicle. Finish the procedure within 30 seconds. If the procedure has not been finished within the specified time, perform the erasure procedures again from process 1.	

g. PROCEDURE "G"

ECU communication ID registration

NOTE:

- **The ECU communication ID should be registered when the ID code box (immobilizer code ECU) is replaced in order to match these ECU communication IDs.**
- **The engine cannot be started unless the ECU communication IDs match.**
- **After the registration, pressing the engine switch may not start the engine on the first try. If so, press the engine switch again.**
- **Erase DTC B2799 (code for ECM's immobilizer communication error) by either of the following:**
  - **Use Techstream.**
  - **Disconnect the battery for 30 seconds.**

1. Using SST, connect terminals TC and CG of the DLC3.

   SST 09843-18040

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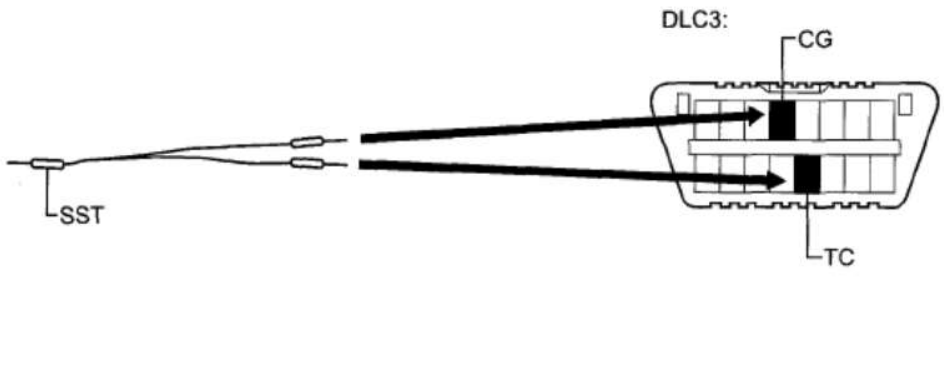


Fig. 43: Connecting Terminals TC And CG Of DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Turn the engine switch on (IG) and leave it as is for 30 minutes.

   HINT:

   Do not start the engine.

3. Turn the engine switch off and disconnect terminals TC and CG.
4. Check that the engine starts and stays on for more than 3 seconds.

h. PROCEDURE "H"

ECU communication ID registration

NOTE: The ECU communication ID should be registered when the ECM is replaced in order to match the ECU communication IDs.

ECU COMMUNICATION ID REGISTRATION PROCEDURE REFERENCE

Procedure	Security Indicator Light Condition
1. Start	OFF
2. Hold an already registered key close to the engine switch and turn the engine switch on (IG) with the brake pedal depressed	
3. Check that the engine starts and stays on for more than 3 seconds	
4. Next	
5. End	

12. **DESCRIPTION OF CODE REGISTRATION (Engine immobilizer System (w/o Smart Key System))**

HINT:

The key has 2 codes: the key code (immobilizer code) and the wireless code. Both of these codes need to

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be registered. Refer to the page for the wireless code registration procedures.

a. When adding master keys or sub keys (Additional registration):
   1. Register the key code (immobilizer code) in the transponder key ECU.

TRANSPONDER KEY ECU REFERENCE

Target ECU	Refer to
Transponder key ECU	Procedure "B"

b. When replacing the transponder key ECU (New registration):
   1. Register the key code (immobilizer code) in the transponder key ECU.

TRANSPONDER KEY ECU REFERENCE

Target ECU	Refer to
Transponder key ECU	Procedure "A"

   2. Register the ECU communication ID between the new transponder key ECU and the ECM.

TRANSPONDER KEY ECU REFERENCE

Target ECU	Refer to
ECM	Procedure "D"

c. When replacing the ECM:
   1. Reregister the ECU communication ID between the transponder key ECU and the new ECM.

TRANSPONDER KEY ECU REFERENCE

Target ECU	Refer to
Transponder key ECU	Procedure "E"

d. When replacing the transponder key ECU and the ECM:
   1. Register the key codes (immobilizer codes) in the new transponder key ECU.

TRANSPONDER KEY ECU REFERENCE

Target ECU	Refer to
Transponder key ECU	Procedure "A"

   2. Reregister the ECU communication ID between the new transponder key ECU and the new ECM.

TRANSPONDER KEY ECU REFERENCE

Target ECU	Refer to
Transponder key ECU	Procedure "E"

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e. When erasing the key code(s):

1. Erase the key code(s) of lost key(s).

TRANSPONDER KEY ECU REFERENCE

Target ECU	Refer to
Transponder key ECU	Procedure "C"

13. **KEY REGISTRATION (Engine Immobilizer System (w/o Smart Key System))**

a. New key code registration (Procedure "A"):

NOTE: No key codes are registered in the transponder key ECU.

HINT:

- In this mode, a maximum of 3 key codes for 2 master keys and 1 sub-key can be registered. The master keys and sub-key can be registered in any order because the transponder key ECU can distinguish between different types of keys.
- New key codes must be registered with the battery connected. The ignition switch can be either on or off.
- When a new transponder key ECU is installed, key codes must be registered in the transponder key ECU.

Automatic Key Code Registration (New Registration):

AUTOMATIC KEY CODE REGISTRATION PROCEDURE REFERENCE

Procedure	Security Indicator Light Condition
1. Start	Blinking HINT: Until first key is inserted
2. Insert the master key into the ignition key cylinder.	ON
3. Techstream operation 1. Select Body Electrical 2. Select Immobilizer 3. Select Utility 4. Select Key Registration HINT: After completing the above operation, proceed to the next step in accordance with the prompts on the Techstream screen.	OFF for 1 second and then ON
4. Remove the key and then push the Next button on the tester.	ON

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5. Insert the master key to be registered and then push the Next button on the tester.	OFF for 1 second and then ON
6. Remove the key and then push the Next button on the tester.	ON
5. Insert the sub-key to be registered and then push the Next button on the tester.	OFF for 1 second and then ON for 0.5 seconds and then OFF
8. Remove the key.	Blinking
7. End (Procedure "E")	

HINT:

- When the engine immobilizer system is operating normally and the key is pulled out, the security indicator light blinks continuously.
- If the new key code registration fails, code 2-1 will be output through the security indicator light. Trying to re-register an already registered key will cause code 2-2 to be output when the key is inserted. If the number of registered key codes exceeds the maximum limit, code 2-3 will be output through the security indicator light. The output details are shown below.

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Security Indicator Light:

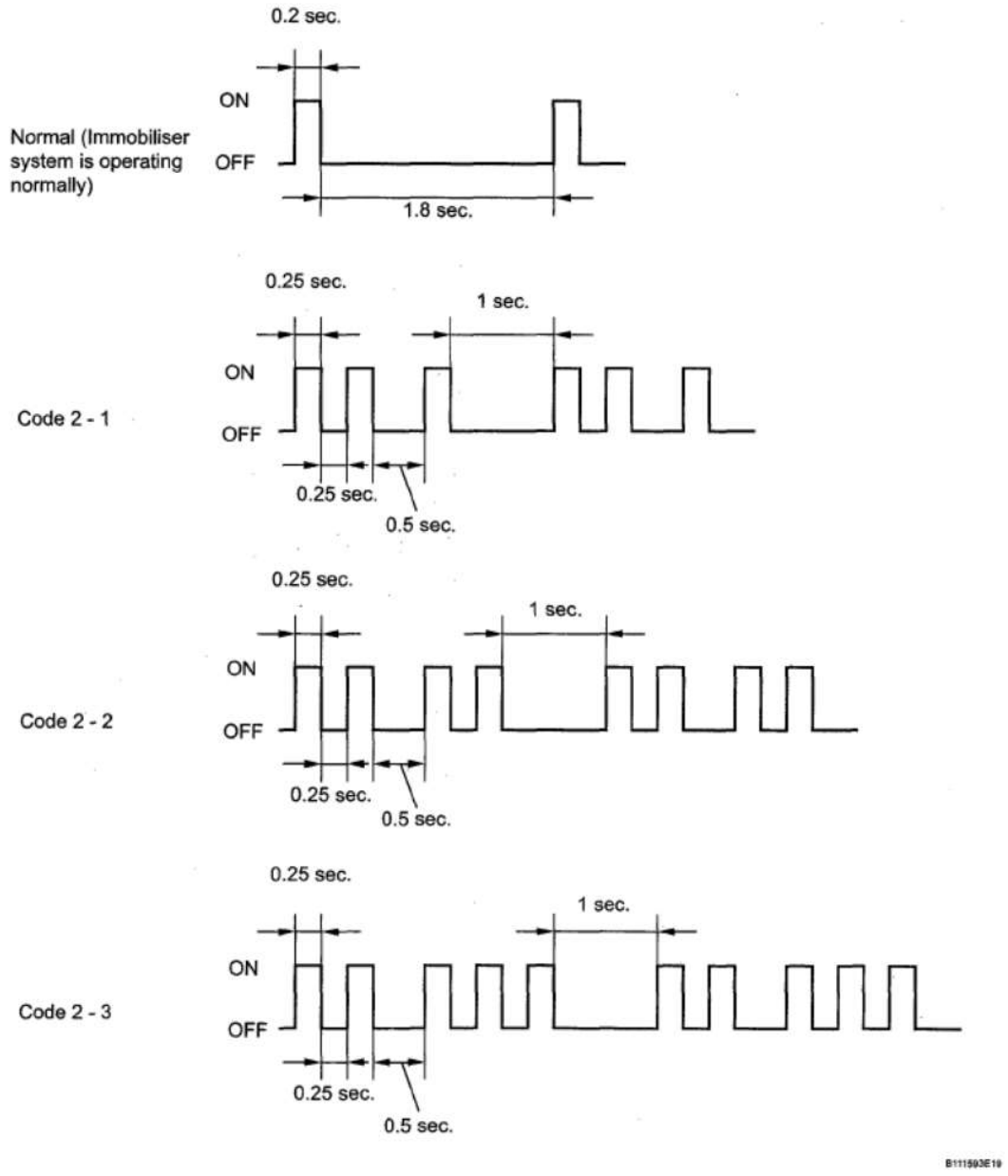


Fig. 44: Security Indicator Light Blinking Pattern
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Finish the automatic key code registration mode. The automatic key code registration mode can be forced to end when at least 1 key code (immobilizer code) for the master key has been registered.

HINT:

- w/o Techstream:

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Turn the ignition switch on and off 5 times within 10 seconds using the master key that has already been registered.

- w/ Techstream:

  Follow the instruction on the Techstream screen to end new key code registration mode.

14. **REGISTRATION OF ADDITIONAL KEY (Engine Immobilizer System (w/o Smart Key System))**

a. Additional registration (Procedure "B"):

HINT:

- A maximum of 5 key codes and 3 sub-key codes can be registered.
- Registration mode will end if any step is not completed within the specified time.
- When the ignition cylinder or the key cylinder set is replaced, remove the transmitter module from the original master key. Then install this transmitter module to a new key and use the new key as the master key. If necessary, use this master key to register other keys.

NOTE: When the ignition key cylinder has been replaced, locking and unlocking doors is possible with the new master key's transmitter module (removed from the original master key). However, the new master key will not be able to lock and unlock doors through the door key cylinder. Keep the original master key. If the battery in the new master key's transmitter module fails, the original master key can be used to lock and unlock doors through the door key cylinder.

Additional Registration:

ADDITIONAL REGISTRATION PROCEDURE REFERENCE

Procedure	Time to Complete Operation	Security Indicator Light Condition
1. Start	-	Blinking HINT: Until first key is inserted
2. Insert the already registered master key into the ignition key cylinder and turn the ignition switch on.	-	OFF
3. Techstream operation 1. Select Body Electrical 2. Select Immobilizer 3. Select Utility 4. Select Key Registration	Within 120 sec.	ON

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HINT: After completing the above operation, proceed to the next step in accordance with the prompts on the Techstream screen.		
4. Remove the master key.	Within 20 sec. HINT: After tester instruction	ON
5. Insert the key to be registered in the ignition key cylinder.	Within 10 sec.	Blinking
6. Wait for 60 sec. after the key is registered. HINT: The security indicator light goes off.	-	OFF
7. Remove the key.	-	Blinking
8. End		

HINT:

- A brief outline of key code registration procedures is shown above. For detailed information, refer to the Techstream screen.
- When the engine immobilizer system is operating normally and the key is pulled out, the security indicator light blinks continuously.
- If the key code registration has failed in automatic key code registration mode, code 2-1 will be output through the security indicator light. Trying to re-register an already registered key will cause code 2-2 to be output when the key is inserted. If the number of registered key codes exceeds the maximum limit, code 2-3 will be output through the security indicator light. The details are shown in procedure "A".

15. **ERASURE OF KEY CODE (Engine Immobilizer System (w/o Smart Key System))**

a. Erase key codes (Procedure "C").

HINT:

- Performing this procedure will erase all key codes except for the master key, which is used for erasing the key codes. In order to use a key whose code has been erased, a new key code must be registered.
- This procedure will be canceled if each step is not completed within the specified time.

Erasing Key Code:

ERASING KEY CODE PROCEDURE REFERENCE

Procedure	Time to Complete Operation	Security Indicator Light Condition
		Blinking

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1. Start	-	HINT: Until first key is inserted
2. Insert the already registered master key in the ignition key cylinder and turn the ignition switch on.	-	OFF
3. Techstream operation 1. Select Body Electrical 2. Select Immobilizer 3. Select Utility 4. Select Transponder Code Erasure HINT: After completing the above operation, proceed to the next step in accordance with the prompts on the Techstream screen.	Within 120 sec.	ON for 1 sec. then OFF
4. Remove the master key.	Within 10 sec. HINT: After tester instruction	ON
5. End		

HINT:

- A brief outline of key code registration procedures is shown above. For detailed information, refer to the Techstream screen.
- When the engine immobilizer system is operating normally and the key is pulled out, the security indicator light blinks continuously.

16. **ECU COMMUNICATION ID REGISTRATION (Engine Immobilizer System (w/o Smart Key System))**
    a. ECU communication ID registration (Procedure "D"):

NOTE:

- **When the transponder key ECU is replaced, the ECU communication ID of the ECM must be registered into the transponder key ECU to match their ECU communication IDs.**
- **The engine cannot be started unless the ECU communication IDs match.**
- **Do not turn the ignition switch from on to off 20 times or more before setting the ECU communication ID. If this operation is likely to be performed 20 times or more, disconnect the cable from the negative battery terminal in order to avoid disabling engine start. Failure to do so will result in the engine not starting unless the transponder key ECU is replaced with a new**

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one.

- **After the registration, turning the ignition switch to the START position may not start the engine on the first try. If so, turn the ignition switch to the START position again.**
- **After the engine is started, erase DTC B2799 (code for ECM's immobilizer communication error) by either of the following:**
  - **Using Techstream.**
  - **Disconnecting the battery for 30 seconds.**

1. Using SST, connect terminals TC and CG of the DLC3.

   SST 09843-18040

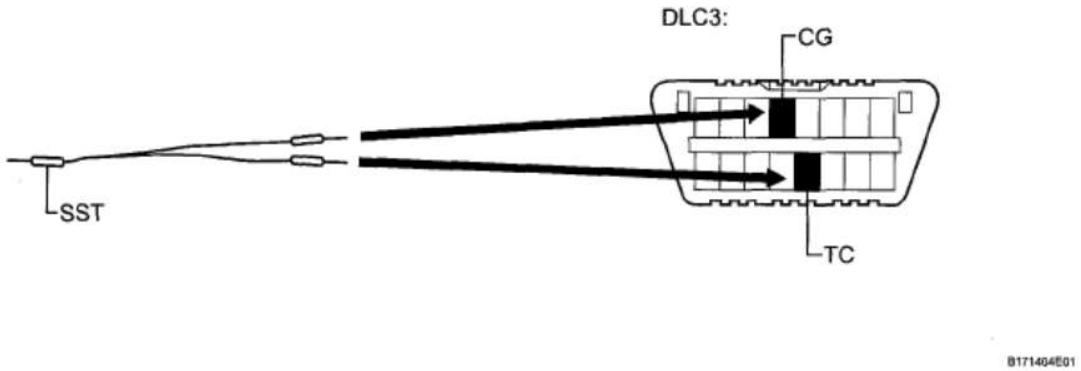


Fig. 45: Connecting Terminals TC And CG Of DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Turn the ignition switch to the ON position and leave the vehicle as is for 30 minutes.

   HINT:

   Do not start the engine.

3. Check that the engine starts.

b. ECU communication ID registration (Procedure "E"):

NOTE: The ECU communication ID should be registered when the ECM and transponder key ECU are replaced or when the ECM only is replaced in order to match the ECU communication ID.

SECURITY INDICATOR LIGHT PROCEDURE REFERENCE

Procedure	Security Indicator Light Condition
1. Start	

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2. Insert an already registered key into the ignition key cylinder.	
3. Engine start	
4. Check that the engine starts and stays on for more than 3 seconds.	OFF
5. Next	
6. End	

17. **VEHICLE IDENTIFICATION NUMBER (VIN) REGISTRATION**

NOTE: The Vehicle Identification Number (VIN) must be input into the replacement ECM.

HINT:

The VIN is in the form of a 17-digit alphanumeric vehicle identification number. The Techstream is required to register the VIN.

a. DESCRIPTION (Using the Techstream)

HINT:

This registration section consists of two parts: Read VIN and Write VIN.

1. Read VIN: Explains the VIN reading process in a flowchart. This process allows the VIN stored in the ECM to be read in order to confirm that the two VINs, provided with the vehicle and stored in the vehicle ECM, are the same.
2. Write VIN: Explains the VIN writing process in a flowchart. This process allows the VIN to be input into the ECM. If the ECM is replaced, or the ECM VIN and vehicle VIN do not match, the VIN can be registered, or overwritten in the ECM by following this procedure.

b. READ VIN
1. Confirm the vehicle VIN.
2. Connect the Techstream to the DLC3.
3. Turn the ignition switch to ON.
4. Turn the Techstream on.
5. Enter the following menus: Powertrain/Engine/Utility/ VIN/VIN Read.

c. WRITE VIN
1. Confirm the vehicle VIN.
2. Connect the Techstream to the DLC3.
3. Turn the ignition switch to ON.
4. Turn the Techstream on.
5. Enter the following menus: Powertrain/Engine/Utility/ VIN/VIN Write.

18. **DESCRIPTION OF CODE REGISTRATION (Tire Pressure Warning System)**

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It is necessary to register the transmitter IDs in the tire pressure warning ECU when replacing a tire pressure warning valve and transmitter and/or tire pressure warning ECU.

Prepare all transmitter ID data before starting registration.

a. Before registration
   1. When replacing the tire pressure:
      - Read the registered transmitter IDs that are stored in the old ECU using Techstream and note them down.
      - If reading stored transmitter IDs is impossible due to malfunctions of components such as the tire pressure warning antenna and receiver, remove the tires from the wheels and check the IDs located on the tire pressure warning valves and transmitters (See **TIRE PRESSURE WARNING SYSTEM**).
   2. When replacing a tire pressure warning valve and transmitter:
      - Take note of the 7-digit number (transmitter ID) written on the tire pressure warning valve and transmitter.

Tire Pressure Warning Valve and Transmitter:

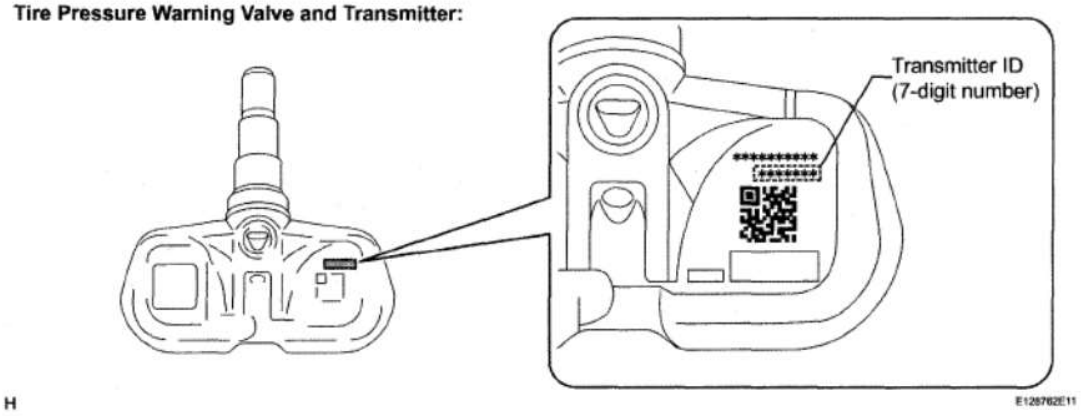


Fig. 46: Identifying Transmitter ID Number On Tire Pressure Warning Valve
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: The transmitter ID is written on the tire pressure warning valve and transmitter. It will be unable to be read after installing the tire onto the wheel. Therefore, take note of the transmitter ID before installing the tire onto the wheel.

19. **REGISTER TRANSMITTER ID (USING TECHSTREAM) (Tire Pressure Warning System)**
    a. Set the air pressure of all tires to the specified value (See **TIRE PRESSURE WARNING SYSTEM**).
    b. Turn the ignition switch off.
    c. Connect Techstream to the DLC3.
    d. Turn the ignition switch on (IG) and turn the tester ON.
    e. Enter the menu items in this order: Chassis/Tire Pressure Monitor/Utility/ID Registration.

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f. Perform the following procedures displayed on the screen.
g. Confirmation of transmitter ID registration.
   1. Enter the menu items in this order: Chassis/Tire Pressure Monitor/Data List.
   2. Read the "ID Tire Inflation Pressure" values.
   3. Confirm that the data of tire pressure of all tires are displayed on the screen.

NOTE:

- **It may take up to about 2 or 3 minutes to update the tire pressure data. If the values are not displayed after a few minutes, perform troubleshooting according to the inspection procedure for DTCs C2121/21 to C2125/25 (See DTC C2121/21 NO SIGNAL FROM TRANSMITTER ID1; DTC C2122/22 NO SIGNAL FROM TRANSMITTER ID2; DTC C2123/23 NO SIGNAL FROM TRANSMITTER ID3; DTC C2124/24 NO SIGNAL FROM TRANSMITTER ID4; DTC C2125/25 NO SIGNAL FROM TRANSMITTER ID5; DTC C2181/81 TRANSMITTER ID1 NOT RECEIVED (TEST MODE DTC); DTC C2182/82 TRANSMITTER ID2 NOT RECEIVED (TEST MODE DTC); DTC C2183/83 TRANSMITTER ID3 NOT RECEIVED (TEST MODE DTC); DTC C2184/84 TRANSMITTER ID4 NOT RECEIVED (TEST MODE DTC); DTC C2185/85 TRANSMITTER ID5 NOT RECEIVED (TEST MODE DTC)).**
- **If the IDs have not been registered, DTC C2171/71 is set in the tire pressure warning ECU after 3 minutes or more.**
- **If normal pressure values are displayed, the IDs have been registered correctly.**
- **If the tire pressure values are not displayed after several minutes, the IDs may be incorrect or the system may have a malfunction.**
- **After all IDs are registered, DTC C2126/26 (Transmitter ID not Received in Main Mode) is set in the tire pressure warning ECU and the tire pressure warning light blinks for 1 minute and then comes on. When the tire pressure warning ECU successfully receives radio waves from all the transmitters whose IDs are stored in the ECU, DTC C2126/26 is deleted and the tire pressure warning light goes off.**

20. **INITIALIZATION PROCEDURE (Tire Pressure Warning System)**
    a. Turn the ignition switch on (IG).
    b. Press and hold the tire pressure warning reset switch for 3 seconds or more so that the tire pressure warning light blinks 3 times.

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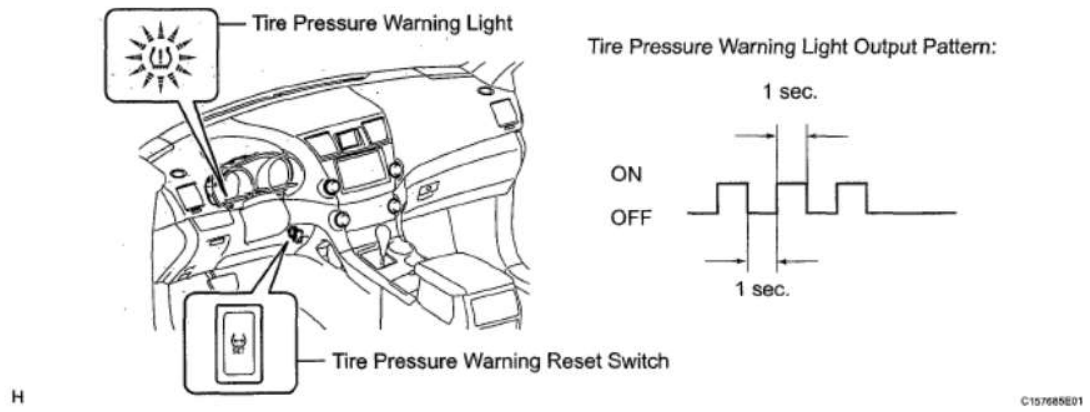


Fig. 47: Tire Pressure Warning Light Blinking Pattern
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

c. Turn the ignition switch off.
d. Connect Techstream to the DLC3.
e. Enter the following menus: Chassis/Tire Pressure Monitor/Data List.
f. Check that the initialization has been completed.
g. Confirm that the tire pressure data of all tires are displayed on the tester screen.

NOTE:

- **The initialization is normally completed within 2 to 3 minutes.**
- **If the initialization has not been completed successfully, DTC C2177/77 will be set after the vehicle is driven for 20 minutes or more.**
- **The initialization can be terminated by connecting terminals TC and CG of the DLC3.**

Tire Pressure Monitor

TIRE PRESSURE MONITOR DATA LIST REFERENCE

Tester Display	Measurement Item/Range	Normal Condition	Diagnostic Note
ID1 Tire Inflation Pressure	ID1 tire inflation pressure/ min.: Absolute pressure/0 kPa (0 kgf/cm^2 , 0 psi), Relative pressure/-100 kPa (-1.0kgf/cm^2 , -14 psi) max.: Absolute pressure/637.5 kPa (6.5 kgf/cm^2 , 92.5 psi), Relative pressure/537.5 kPa (5.4 kgf/cm^2 , 78 psi)	Actual tire inflation pressure	If 0 kPa (0 kgf/cm^2 , 0 psi) is displayed for absolute pressure or -100 kPa (-1.0 kgf/cm^2 , -14 psi) is displayed for relative pressure, data has not been received.*
ID2 Tire Inflation	ID2 tire inflation pressure/min.: Absolute pressure/0 kPa (0 kgf/cm^2 , 0 psi), Relative pressure/-100 kPa (-1.0 kgf/cm^2 ,-14 psi) max.: Absolute	Actual tire inflation	If 0 kPa (0 kgf/cm^2 , 0 psi) is displayed for absolute pressure or -100 kPa (-1.0

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Pressure	pressure /637.5 kPa (6.5 kgf/cm^2 , 92.5 psi), Relative pressure/537.5 kPa (5.4 kgf/cm^2 , 78 psi)	pressure	kgf/cm^2 , -14 psi) is displayed for relative pressure, data has not been received.*
ID3 Tire Inflation Pressure	ID3 tire inflation pressure/min.: Absolute pressure/0 kPa (0 kgf/cm^2 , 0 psi), Relative pressure/-100 kPa (-1.0 kgf/cm^2 ,-14 psi) max.: Absolute pressure /637.5 kPa (6.5 kgf/cm^2 , 92.5 psi), Relative pressure/537.5 kPa (5.4 kgf/cm^2 , 78 psi)	Actual tire inflation pressure	If 0 kPa (0 kgf/cm^2 , 0 psi) is displayed for absolute pressure or -100 kPa (-1.0 kgf/cm^2 , -14 psi) is displayed for relative pressure, data has not been received.*
ID4 Tire Inflation Pressure	ID4 tire inflation pressure/min.: Absolute pressure/0 kPa (0 kgf/cm^2 , 0 psi), Relative pressure/-100 kPa (-1.0 kgf/cm^2 , -14 psi) max.: Absolute pressure/637.5 kPa (6.5 kgf/cm^2 , 92.5 psi), Relative pressure/537,5 kPa (5.4 kgf/cm^2 , 78 psi)	Actual tire inflation pressure	If 0 kPa (0 kgf/cm^2 , 0 psi) is displayed for absolute pressure or -100 kPa (-1.0 kgf/cm^2 , -14 psi) is displayed for relative pressure, data has not been received.*
ID5 Tire Inflation Pressure	ID5 tire inflation pressure/min.: Absolute pressure/0 kPa (0 kgf/cm^2 , 0 psi), Relative pressure/-100 kPa (-1.0 kgf/cm^2 ,-14 psi) max.: Absolute pressure/637.5 kPa (6.5 kgf/cm^2 , 92.5 psi), Relative pressure/537.5 kPa (5.4 kgf/cm^2 , 78 psi)	Actual tire inflation pressure	If 0 kPa (0 kgf/cm^2 , 0 psi) is displayed for absolute pressure or -100 kPa (-1.0 kgf/cm^2 , -14 psi) is displayed for relative pressure, data has not been received.*

HINT:

- The initialization is complete when the DATA LIST "ID Tire Inflation Pressure" display shows the correct pressures.
- *: It may take about 2 or 3 minutes until the values are displayed. If the values are not displayed after a few minutes, perform troubleshooting according to the inspection procedure for DTCs C2121/21 to C2125/25 (See **DTC C2121/21 NO SIGNAL FROM TRANSMITTER ID1; DTC C2122/22 NO SIGNAL FROM TRANSMITTER ID2; DTC C2123/23 NO SIGNAL FROM TRANSMITTER ID3; DTC C2124/24 NO SIGNAL FROM TRANSMITTER ID4; DTC C2125/25 NO SIGNAL FROM TRANSMITTER ID5; DTC C2181/81 TRANSMITTER ID1 NOT RECEIVED (TEST MODE DTC); DTC C2182/82 TRANSMITTER ID2 NOT RECEIVED (TEST MODE DTC); DTC C2183/83 TRANSMITTER ID3 NOT RECEIVED (TEST MODE DTC); DTC C2184/84 TRANSMITTER ID4 NOT RECEIVED (TEST MODE DTC); DTC C2185/85 TRANSMITTER ID5 NOT RECEIVED (TEST MODE DTC)**).

21. **OBTAIN ZERO POINT OF YAW RATE AND ACCELERATION SENSOR (When Using Techstream) (Vehicle Stability Control System)**

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NOTE:

- **While obtaining the zero points, keep the vehicle stationary and do not vibrate, tilt, move, or shake it. (Do not start the engine.)**
- **Be sure to perform this procedure on a level surface (with an inclination of less than 1 degree).**

a. Clear the zero point calibration data.

1. Turn the ignition switch off.
2. Check that the steering wheel is in the straight-ahead position.
3. Check that the shift lever is in the P position.
4. Connect Techstream to the DLC3.
5. Turn the ignition switch on (IG).
6. Turn Techstream on.
7. Select the skid control ECU to clear the zero point calibration data using Techstream. Enter the following menus: Chassis/ABS/VSC/TRAC/Utility/Reset Memory.
8. Turn the ignition switch off.

NOTE: **If the ignition switch is turned on (IG) for more than 15 seconds with the shift lever in the P position after the zero points of the yaw rate and acceleration sensor have been cleared, only the zero point of the yaw rate sensor will be stored. If the vehicle is driven under these conditions, the skid control ECU will store the zero point calibration for the acceleration sensor as not being completed. The skid control ECU will then also indicate this as a malfunction of the VSC system using the indicator lights.**

b. Perform the zero point calibration of the yaw rate and acceleration sensor.

1. Turn the ignition switch off.
2. Check that the steering wheel is in the straight-ahead position.
3. Check that the shift lever is in the P position.

NOTE: **DTCs C1210 (zero point calibration of yaw rate sensor undone) and C1336 (zero point calibration of acceleration sensor undone) will be recorded if the shift lever is not in the P position.**

4. Connect Techstream to the DLC3.
5. Turn the ignition switch on (IG).
6. Turn Techstream on.
7. Switch the skid control ECU to Test Mode using Techstream. Enter the following menus: Chassis/ABS/VSC/TRAC/Utility/Test Mode.
8. After Test Mode has been entered, keep the vehicle stationary on a level surface for 2

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seconds or more.

9. Check that the slip indicator light comes on for several seconds and then blinks in Test Mode.

   HINT:

   - The TRAC OFF indicator light remains on during Test Mode because TRAC is prohibited.
   - If the slip indicator light does not blink, perform zero point calibration again.
   - The zero point calibration is performed only once after the system enters Test Mode.
   - Calibration cannot be performed again until the stored data is cleared.

10. Turn the ignition switch off and disconnect Techstream.

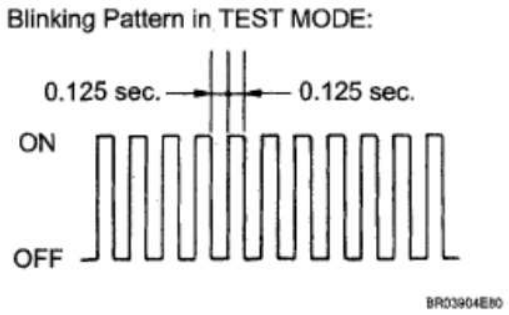


Fig. 48: Slip Indicator Light Blinking Pattern In Test Mode
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

22. **OBTAIN ZERO POINT OF YAW RATE AND ACCELERATION SENSOR (When not Using Techstream) (Vehicle Stability Control System)**

NOTE:

- **While obtaining the zero points, keep the vehicle stationary and do not vibrate, tilt, move, or shake it. (Do not start the engine.)**
- **Be sure to perform this procedure on a level surface (with an inclination of less than 1 degree).**

a. Clear the zero point calibration data.
   1. Turn the ignition switch off.
   2. Check that the steering wheel is in the straight-ahead position.
   3. Check that the shift lever is in the P position.
   4. Turn the ignition switch on (IG).
   5. The warning light and indicator light come on for 3 seconds to indicate that the initial check is completed.
   6. Using SST, connect and disconnect terminals TS and CG of the DLC3 4 times or more within 8 seconds.

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7. Check that the slip indicator light comes on.

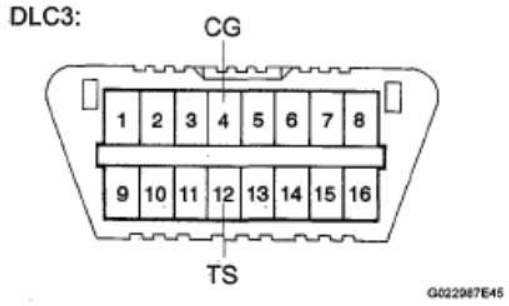


Fig. 49: Identifying Terminals TS And CG Of DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: If the ignition switch is turned on (IG) for more than 15 seconds with the shift lever in the P position after the zero points of the yaw rate and acceleration sensor have been cleared, only the zero point of the yaw rate sensor will be stored. If the vehicle is driven under these conditions, the skid control ECU will store the zero point calibration for the acceleration sensor as not being completed. The skid control ECU will then also indicate this as a malfunction of the VSC system using the indicator lights.

b. Perform the zero point calibration of the yaw rate and acceleration sensor.
   1. Turn the ignition switch off.
   2. Check that the steering wheel is in the straight-ahead position.
   3. Check that the shift lever is in the P position.

NOTE: DTCs 36 (zero point calibration of yaw rate sensor undone) and 39 (zero point calibration of acceleration sensor undone) will be recorded if the shift lever is not in the P position.

   4. Using SST, connect terminals TS and CG of the DLC3.

SST 09843-18040

   5. Turn the ignition switch on (IG).
   6. After Test Mode has been entered, keep the vehicle stationary on a level surface for 2 seconds or more.

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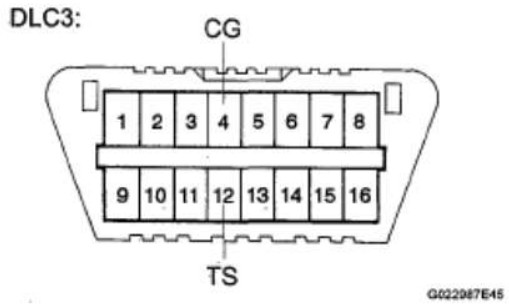


Fig. 50: Identifying Terminals TS And CG Of DLC3
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. Check that the slip indicator light comes on for several seconds and then blinks in Test Mode.

   HINT:

   - The TRAC OFF indicator light remains on during Test Mode because TRAC is prohibited.
   - If the slip indicator light does not blink, perform zero point calibration again.
   - The zero point calibration is performed only once after the system enters Test Mode.
   - Calibration cannot be performed again until the stored data is cleared.

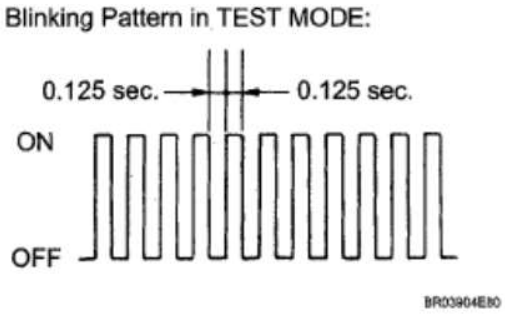


Fig. 51: Slip Indicator Light Blinking Pattern In Test Mode
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. Turn the ignition switch off and disconnect SST from the DLC3.

23. **ZERO POINT CALIBRATION (Occupant Classification System)**
    a. Zero point calibration procedures

    HINT:

    Make sure that the zero point calibration has finished normally, and then perform the sensitivity check.

    1. Check that all of the following conditions are met:

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- The vehicle is parked on a level surface.
- No objects are placed on the front passenger seat.
- The front passenger seat belt buckle switch is OFF.

2. Adjust the seat position according to the table below.

SEAT POSITION REFERENCE

Adjustment Item	Position
Slide Direction	Rearmost position
Reclining Angle	Upright position
Headrest Height	Lowest position
Lifter Height	Lowest position

3. Turn the ignition switch off.
4. Connect Techstream to the DLC3.
5. Turn the ignition switch on (IG) and turn the Techstream on.
6. Enter the following menus: Body Electrical/Occupant Detection/Utility/Zero Point Calibration.
7. Perform the zero point calibration by following the prompts on the Techstream screen.

HINT:

- Refer to the Techstream operator's manual for further details.
- If the zero point calibration does not complete, replace the front seat assembly RH.

OK:

"Zero Point calibration is complete." is displayed.

24. **SENSITIVITY CHECK (Occupant Classification System)**

a. Sensitivity check procedures

1. Turn the ignition switch off.
2. Connect Techstream to the DLC3.
3. Turn the ignition switch on (IG) and turn the Techstream on.
4. Enter the following menus: Body Electrical/Occupant Detection/Utility/Sensitivity Check.
5. Perform the sensitivity check by following the prompts on the Techstream screen.

HINT:

Refer to the Techstream operator's manual for further details.

6. Confirm that the initial sensor reading is within the specified range.

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Standard:

-3.2 to 3.2 kg (-7 to 7 lb)

7. Place a 30 kg (66.14 lb) weight (eg. a 30 kg (66.14 lb) of lead mass) onto the front passenger seat.
8. Confirm that the sensitivity is within the specified range.

Standard:

27 to 33 kg (59.52 to 72.75 lb)

HINT:

- When performing the sensitivity check, use a solid metal weight (the check result may not appear properly if a liquid weight made from liquid is used).
- If the sensitivity deviates from the specified range, retighten the bolts of the front passenger seat without deforming the seat rail. After performing this procedure, if the sensitivity is not within the specified range, replace the front seat assembly RH.

25. **REGISTRATION OF RECOGNITION CODE (USING TECHSTREAM) (Wireless Door Lock Control System (w/o Smart key System))**

HINT:

For detailed procedures, refer to the prompts on the tester screen. The number of currently registered codes can be checked out on the first screen of the WIRELESS REGIST.

a. Turn the ignition switch to the ON position.
b. Enter the following menus: Body Electrical/Main Body/Wireless Registration.
c. Press both LOCK and UNLOCK switches within 1 to 1.5 seconds.
d. Press either switch for more than 1 second within 3 seconds.
e. Check the response to the registration completion.

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Response to registration completion:

Main body ECU automatically performs power door LOCK-UNLOCK operation to show whether registration has been completed correctly or not.

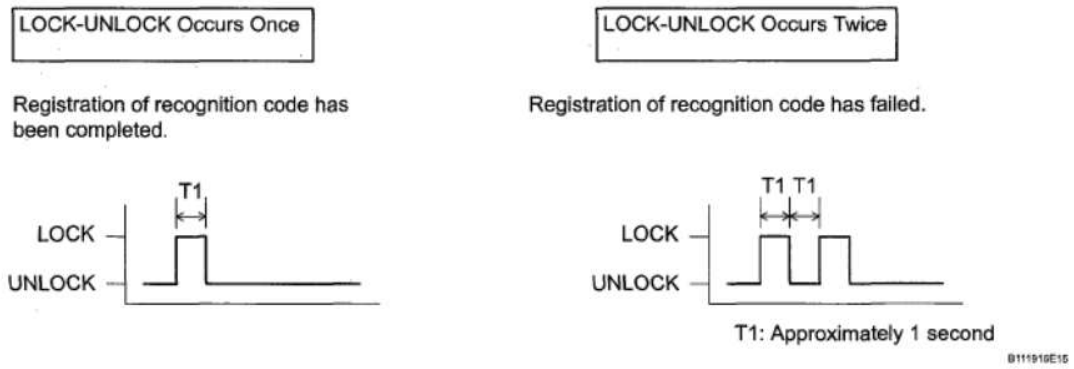


Fig. 52: Response To Registration Completion Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

- If the LOCK-UNLOCK operation occurs twice, the registration of recognition code has failed. Perform the registration procedures again from the beginning.
- If registering another transmitter, repeat the procedures after the tester operation. All 6 recognition codes can be registered consecutively.

f. Perform either of the following to complete the registration of recognition codes:
- Use Techstream to send completion command.
- Disconnect Techstream.

26. **REGISTER RECOGNITION CODE (USING SWITCH OPERATION) (Wireless Door Lock Control System (w/o Smart key System))**

a. The following conditions should be met.
- No key in the ignition key cylinder.
- The driver side door is open (the other doors are closed).
- The driver side door is unlocked.

b. Insert and remove the key into/from the ignition key cylinder twice (Insert --> Remove --> Insert --> Remove) within 5 seconds.

HINT:

The procedure should end with the key removed.

c. Perform the following operations within 40 seconds.
1. Close and open the driver side door twice (Close --> Open --> Close --> Open).

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HINT:

The procedure should end with the door open.

2. Insert and remove the key into/from the ignition key cylinder (Insert --> Remove).

HINT:

The procedure should end with the key removed.

3. Close and open the driver side door twice (Close --> Open --> Close --> Open).

HINT:

The procedure should end with the door open.

4. Insert the key into the ignition key cylinder and close all doors.

d. Perform the following operations within 40 seconds.

1. Turn the ignition switch from ON to OFF at approximately 1 second intervals, operate the ignition switch according to the number of times shown below.

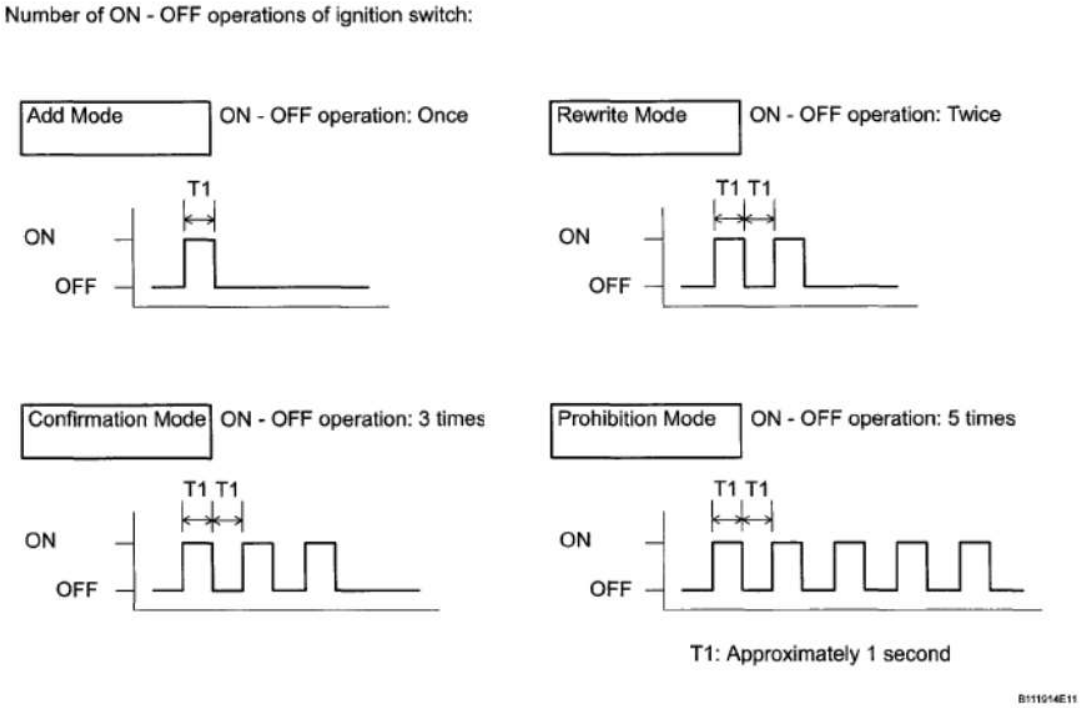


Fig. 53: Ignition Switch Timing Pattern
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

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If the number of ignition switch ON - OFF operations is 0, 4, 6 or more, there will be no response (the power door lock and unlock operation) to show which mode has been selected.

2. Remove the key from the ignition key cylinder.

e. Check the response of the selected mode within 5 seconds.

Response to selected mode (power door lock operation):

Main body ECU automatically performs power door LOCK-UNLOCK operations to indicate which mode has been selected.

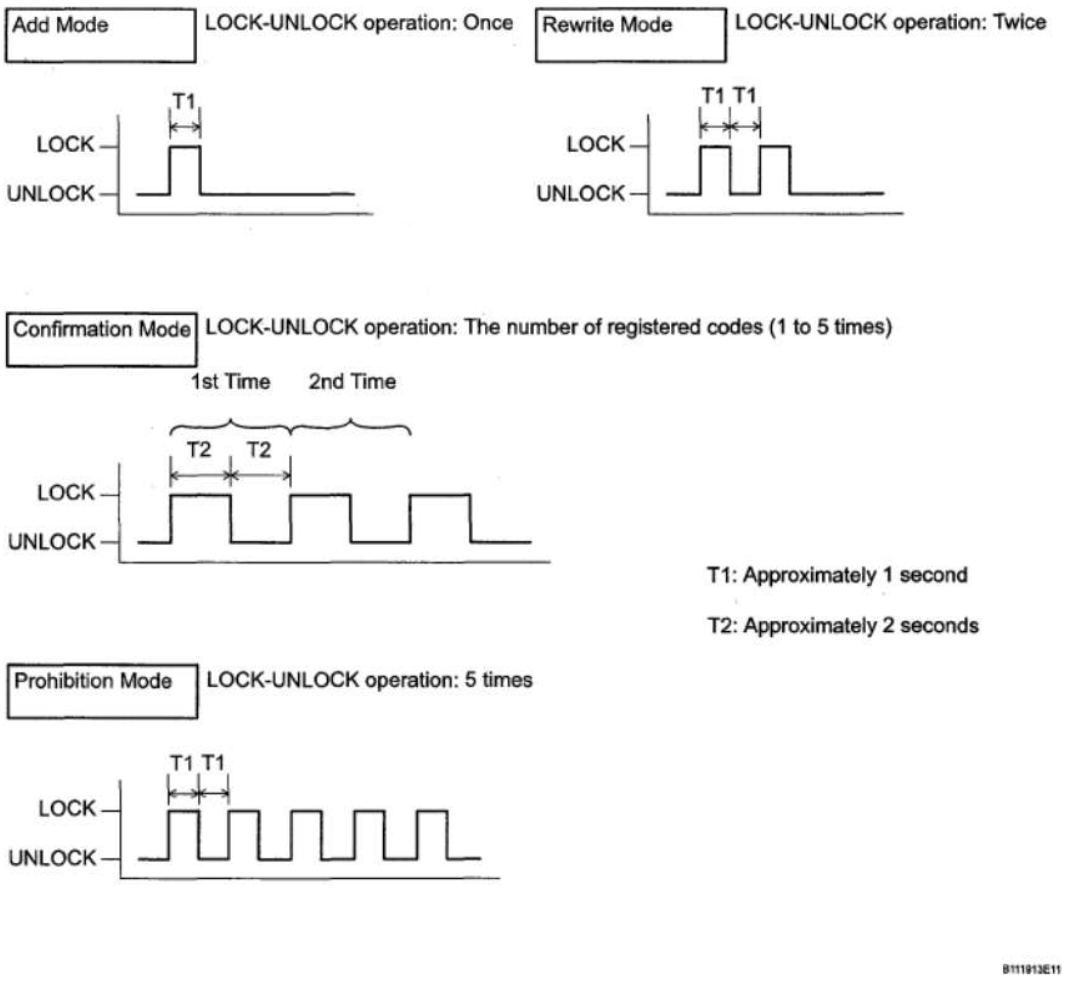


Fig. 54: Power Door LOCK-UNLOCK Operations Pattern (Response Of Selected Mode)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: After the system has been set to the prohibition mode, enter the confirmation mode and check that the number of registered keys is 0.

HINT:

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- In the confirmation mode, LOCK-UNLOCK operation will occur once for each recognition code that has been registered. For example, if 2 recognition codes have been registered, LOCK-UNLOCK operation will occur twice.
- In the confirmation mode, if no recognition codes have been registered, LOCK-UNLOCK operation will occur 5 times.
- If confirmation mode or prohibition mode is selected, the operation ends after the response to the selected mode completes.

f. Within 40 seconds of completing the confirmation mode operation, press the LOCK and UNLOCK switches on the transmitter simultaneously.

g. After completing the above step, press a single switch (LOCK or UNLOCK) within 5 seconds.

h. After completing the above step, check the response to the registration completion within 3 seconds.

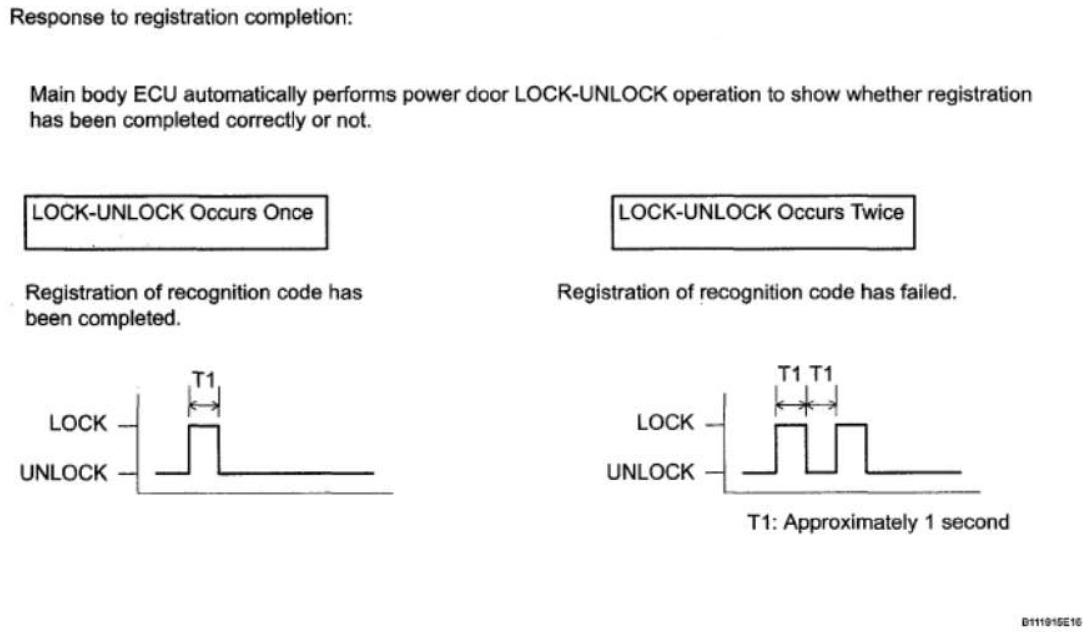


Fig. 55: Power Door Lock-Unlock Operations Pattern (Registration Completion)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

- If the LOCK-UNLOCK operation occurs twice, the registration of recognition code has failed. Perform registration procedures again from the beginning.
- If registering another transmitter, repeat the procedures after the response to the selected mode confirmation. All 6 recognition codes can be registered consecutively.

i. Perform either of the following to complete the registration of recognition codes:
- Open the door.
- Insert the key into the ignition key cylinder.

27. **INITIALIZE POWER WINDOW CONTROL SYSTEM (POWER WINDOW REGULATOR**

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MOTOR ASSEMBLY (ON DRIVER SIDE)) (Power Window Control System)

NOTE:

- **DTC B2313 will be set if the driver side power window regulator motor assembly is replaced with a new assembly. Clear the DTC after initializing the power window motor.**
- **Initialization should be made when the vehicle is stationary.**
- **Be sure to initialize the door glass position memory (pulse sensor) after replacing the driver side power window regulator motor assembly. Without the initialization, the driver door auto up-and-down function, jam protection function and key-off operation will not work.**
- **Be sure not to tap or give any shock or force to the door glasses during the initialization procedure as the vehicle is learning the door glasses' sliding resistance during initialization.**
- **After replacing the driver side power window regulator, door glass, or glass adhesive dams, be sure to initialize the door glass position memory (pulse sensor). Otherwise, the jam protection function may work when unnecessary.**

If the initialization procedure cannot be completed normally, there may be a malfunction in the Local Interconnect Network (LIN) communication. Check the body multiplex (LIN, Local Interconnect Network) communication system.

a. Inspection procedure

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Procedure	Door glass position	Master switch indicator status	Purpose
1. Connect the battery. 2. IG ON (The door glass lock switch is off.)	Any position	Off ⇩ Blinking	Initialization preparation procedures
3. Opening operation: Push the power window switch down for at least 1 second after the door glass is fully opened. The window switch may be operated in either automatic opening or manual opening modes.	Any position (*1) ⇩ Fully opened	Blinking ⇩ On	
4. Pull the power window switch up completely and then release it for automatic operation. Then pull the switch for at least 1 second after the door glass is fully closed. (*4) 5. The initialization process is completed.	Fully opened ⇩ Fully closed	On → blinking (*2) ⇩ On (*3)	Both the door glass position initialization and door glass sliding resistance learning process are performed simultaneously.

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Fig. 56: Initialization Inspection Procedure Chart
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

- *1: Even if the door glass has been fully opened before procedure No. 3, it is necessary to press the power window switch down for at least 1 second.
- *2: As soon as the switch is pulled completely up (Automatic Closing), the master switch indicator starts to blink.
- *3: If the master switch indicator does not come on after procedure No. 4, restart from procedure No. 3.
- *4: Allow the automatic operation to continue without stopping until the door glass is fully closed.

Check the body multiplex (LIN, Local Interconnect Network) system (See **SYSTEM DESCRIPTION**).

28. **TO RETURN THE SYSTEM TO THE PRE-INITIALIZED CONDITION (Power Window**

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Control System)

NOTE: After replacing or reinstalling the driver side power window regulator, door glass, or door glass adhesive dams, be sure to initialize the door glass position memory (pulse sensor). Otherwise, the jam protection function may work when unnecessary.

a. Procedure

Procedure	Door glass position	Master switch indicator status	Purpose
1. Connect the battery. 2. IG ON (The door glass lock switch is off.)	Any position	On	
3. Pull the power window switch up completely and then release it for automatic operation. Then pull the switch for at least 6 seconds after the door glass is fully closed.	Any position → Fully opened (*1)		Reset preparation
4. Opening operation: Push the power window switch down for at least 1 second after the door glass is fully opened. The window switch may be operated in either automatic opening or manual opening mode.	Fully closed → Fully opened		Resetting the door glass position memory
5. Completely push the power window switch down and then release it for automatic operation. (*2) Then keep pushing the switch for at least 4 seconds at the fully closed position.	Fully closed → Fully opened		
6. Pull the power window switch up completely and then release it for automatic operation. Then pull the switch for at least 1 second after the door glass is fully closed. 7. The initialization process is completed. (*3)	Fully opened → Fully closed ⇩ Fully closed		Door glass sliding resistance learning process

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Fig. 57: Pre-Initialized Condition Inspection Procedure Chart (Power Window Control System)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

- *1: Even if the door glass has been fully closed before procedure No. 3, it is necessary to pull the power window switch up for at least 6 seconds while the door glass is fully closed.
- *2: After completing procedure No. 4, return the door glass switch to its neutral position, then perform automatic opening operation.
- *3: After completing the whole initialization process, make sure that the door glass fully closes with the automatic closing operation.
- If the initialization procedure cannot be completed normally, there may be a malfunction in the Local Interconnect Network (LIN) communication. Check the body multiplex (LIN, Local Interconnect Network) communication system (See **SYSTEM DESCRIPTION**).

29. **RESET BACK DOOR CLOSE POSITION (Power Back Door System)**
    a. When disconnecting the cable from the battery terminal, fully close the back door to turn off the courtesy switch.

    HINT:

    If the back door is closed when disconnecting the cable from the battery terminal, it is not necessary to reset it.

30. **INITIALIZE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (Sliding Roof System)**

NOTE: Be sure to initialize the sliding roof drive gear (pulse sensor) after adjusting the sliding roof glass position or removing and installing components. Without initialization, there may be a malfunction in the sliding roof auto operation, or key-off operation. If any of the following conditions occurs during initialization procedure, initialization will fail.

- **The ignition switch is turned off.**
- **Communication is cut off.**
- **Another switch is turned on during initialization.**
- **Vehicle speed is 5 km/h (3 mph) or more.**
- **The vehicle experiences a strong vibration during initialization, such as the slamming of a door.**

    a. Initialization

    HINT:

    According to the following chart, proceed to the appropriate initialization procedure.

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APPROPRIATE INITIALIZATION PROCEDURE REFERENCE

Sliding Roof Condition	Proceed to
The sliding roof AUTO function does not operate.	[A]
The sliding roof AUTO function	[B]
Although the sliding roof AUTO function operates, the roof glass stops moving or starts moving in the opposite direction while tilting downward.	[B]
Although the sliding roof AUTO function operates, the roof glass stops moving or starts moving in the opposite direction while sliding closed.	[C]

1. [A] The sliding roof AUTO function does not operate.
    1. Turn the ignition switch on (IG). *1
    2. Fully close the sliding roof.
    3. Press and hold the sliding roof switch (TILT UP side) until the following movement finishes: Tilt up --> stationary state for at least 1 second --> tilt down --> slide open --> slide close.

        NOTE: Press and hold the sliding roof switch (TILT UP side) until step *2 is complete. If the switch is released before step *2 is complete, restart from step *1.

    4. Confirm that the roof glass is stopped at the fully closed position and initialization is completed. *2
2. [B] Although the sliding roof AUTO function operates, the roof glass stops moving or starts moving in the opposite direction while tilting downward.
    1. Turn the ignition switch on (IG). *1
    2. Press and hold the sliding roof switch (TILT UP side) until the sliding roof stops.
    3. After the sliding roof stops, release the switch.
    4. Press and hold the sliding roof switch (TILT UP side) for more than 10 seconds until the following movement finishes: Tilt up --> stationary state for at least 1 second --> tilt down --> slide open --> slide close.

        NOTE: Press and hold the sliding roof switch (TILT UP side) until step *2 is complete. If the switch is released before step *2 is complete, restart from step *1.

    5. Confirm that the roof glass is stopped at the fully closed position and initialization is complete. *2
    6. Confirm that the sliding roof can be normally operated with the AUTO function.
3. [C] Although the sliding roof AUTO function operates, the roof glass stops moving or starts moving in the opposite direction while sliding closed.
    1. Turn the ignition switch on (IG). *1
    2. Press and hold sliding roof switch (TILT UP side) until the following movement

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finishes: Slide close --> roof glass stops moving or starts moving in the opposite direction --> stationary for at least 10 seconds --> slide close.

NOTE: Press and hold sliding roof switch (TILT UP side) until step *2 is complete. If the switch is released before step *2 is complete, restart from step *1.

3. After the sliding roof has stopped at the fully closed position, release the switch. *2
4. Follow the initialization procedure described in [A] (The sliding roof AUTO function does not function.)

HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

GENERAL INFORMATION

A large number of ECU controlled systems are used in this vehicle. 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 Techstream*

HINT:

*: Techstream is the name for the diagnostic tester in North America.

- Before using Techstream, read the operator's manual thoroughly.
- If Techstream cannot communicate with the ECU controlled systems when Techstream is connected to the DLC3 with the ignition switch on (IG) and Techstream turned on, there is a problem on the vehicle side or Techstream side.
  1. If communication is normal when Techstream 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 Techstream is connected to another vehicle, the problem is probably in Techstream itself. Perform the Self Test procedures outlined in the Techstream operator's manual.

1. TROUBLESHOOTING PROCEDURES

- The troubleshooting procedures consist of diagnosis procedures for when a DTC is stored and diagnosis procedures for when no DTC is stored. The basic idea is explained in the following table.

TROUBLESHOOTING PROCEDURES CHART

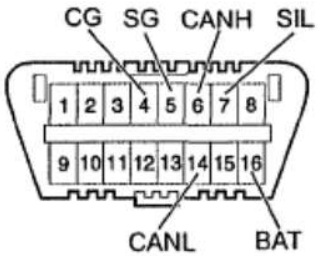
Procedure Type	Details	Troubleshooting Method
	The diagnosis procedure is	The malfunctioning part is identified based on the DTC detection conditions using a process of

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DTC Based Diagnosis	based on the DTC that is stored.	elimination. The possible trouble areas are eliminated one-by-one by use of the Techstream and inspection of related parts.
Symptom Based Diagnosis (No DTCs stored)	The diagnosis procedure is based on problem symptoms.	The malfunctioning part is identified based on the problem symptoms using a process of elimination. The possible trouble areas are eliminated one-by-one by use of the Techstream and inspection of related parts.

- Vehicle systems are complex and use many ECUs that are difficult to inspect independently. Therefore, a process of elimination is used, where components that can be inspected individually are inspected, and if no problems are found in these components, the related ECU is identified as the problem and replaced.
- It is extremely important to ask the customer about the environment and the conditions present when the problem occurred (Customer Problem Analysis). This makes it possible to simulate the conditions and confirm the symptom. If the symptom cannot be confirmed or the DTC does not recur, the malfunctioning part may not be identified using the troubleshooting procedure, and the ECU for the related system may be replaced even though it is not defective. If this happens, the original problem will not be solved.
- In order to prevent endless expansion of troubleshooting procedures, the troubleshooting procedures are written with the assumption that multiple malfunctions do not occur simultaneously for a single problem symptom.
- To identify the malfunctioning part, troubleshooting procedures narrow down the target by separating components, ECUs and wire harnesses during the inspection. If the wire harness is identified as the cause of the problem, it is necessary to inspect not only the connections to components and ECUs but also all of the wire harness connectors between the component and the ECU.

2. **DESCRIPTION**
   a. Each system data and the Diagnostic Trouble Codes (DTCs) can be read from the Data Link Connector 3 (DLC3) of the vehicle. When the system seems to be malfunctioning, use Techstream to check for malfunctions and perform repairs.
3. **CHECK DLC3**
   a. The vehicle's ECU uses the ISO 15765-4 communication protocol. The terminal arrangement of the DLC3 complies with SAE J1962 and matches the ISO 15765-4 format.



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Fig. 58: Identifying DLC3 Connector Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

CONNECTOR TERMINALS REFERENCE

Symbols	Terminal No.	Names	Reference Terminal	Results	Condition
SIL	7	Bus "+" line	5 - Signal ground	Pulse generation	During transmission
CG	4	Chassis ground	Body ground	1 ohms or less	Always
SG	5	Signal ground	Body ground	1 ohms or less	Always
BAT	16	Battery positive	Body ground	1 ohms or less	Always
CANH	6	CAN "High" line	14 - CANL	54 to 69 ohms	Ignition switch off
			Battery positive	6 kohms or higher	Ignition switch off (1)
			4 - CG	200 ohms or higher	Ignition switch off (1)
CANL	14	CAN "Low" line	Battery positive	6 kohms or higher	Ignition switch off (1)
			4 - CG	200 ohms or higher	Ignition switch off (1)

(1) Before measuring the resistance, leave the vehicle as is for at least 1 minute and do not operate the ignition switch, any other switches, or the doors.

If the result is not as specified, the DLC3 may have a malfunction. Repair or replace the harness and connector.

HINT:

- If communication is normal when Techstream is connected to another vehicle, inspect the DLC3 on the original vehicle.
- If communication is still not possible when Techstream is connected to another vehicle, the problem is probably in the tester itself. Consult the Service Department listed in Techstream's instruction manual.

ELECTRONIC CIRCUIT INSPECTION PROCEDURE

1. **BASIC INSPECTION**
   a. WHEN MEASURING RESISTANCE OF ELECTRONIC PARTS
      1. Unless otherwise stated, all resistance measurements are standard values measured 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.

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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.

NOTE:

- **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.**

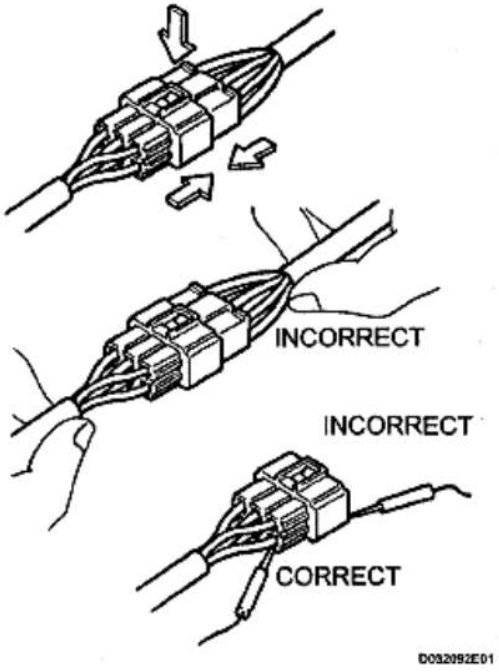


Fig. 59: Precaution For Handling Connectors
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

c. CHECKING CONNECTORS

1. Checking when a connector is connected: Squeeze the connector together to confirm that they are fully connected and locked.
2. Checking when a connector is disconnected: Check by pulling the wire harness lightly from the backside of the connector. Look for unlatched terminals, missing terminals, loose crimps or broken conductor wires. Check visually for corrosion, metallic or foreign matter and

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water, and bent, rusted, overheated, contaminated, or deformed terminals.

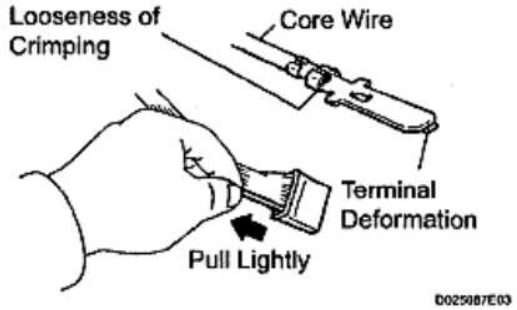


Fig. 60: Pulling Wire Harness Lightly From Backside Of Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.

NOTE: When testing a gold-plated female terminal, always use a gold-plated male terminal.

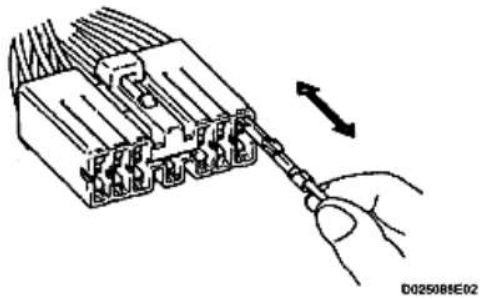


Fig. 61: Checking Contact Pressure Of Terminal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.

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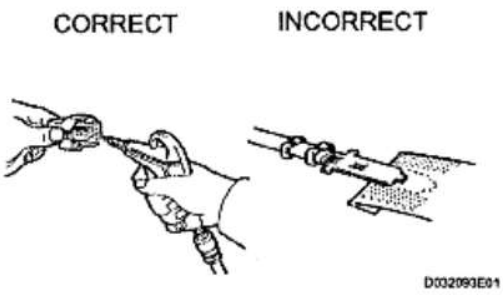


Fig. 62: Precaution For Repair Method Of Connector Terminal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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 any high temperature part, 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.

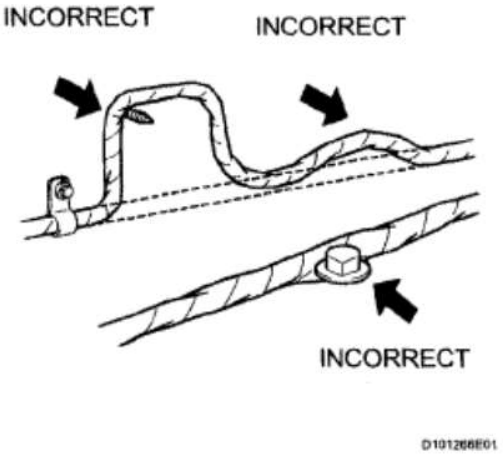


Fig. 63: Precaution For Handling Of Wire Harness
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **CHECK FOR OPEN CIRCUIT**
   a. For an open circuit in the wire harness in **Fig. 64**, measure the resistance and voltage as follows:

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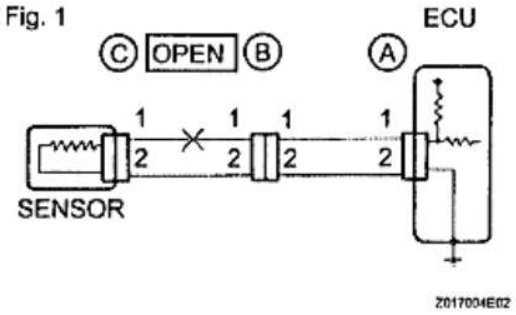


Fig. 64: ECU Circuit Diagram
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Check the resistance.
   1. Disconnect connectors A and C and measure the resistance between the terminals of the connectors.

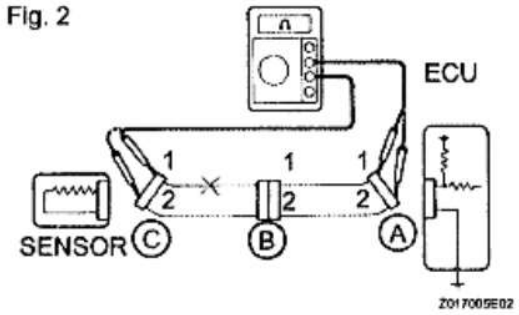


Fig. 65: Measuring Resistance Between Terminals Of Connectors
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance (Fig. 65)

RESISTANCE SPECIFICATION

Tester Connection	Specified Condition
Connector A terminal 1 - Connector C terminal 1	10 kohms or higher
Connector A terminal 2 - Connector C terminal 2	Below 1 ohms

HINT:

Measure the resistance while lightly shaking the wire harness vertically and horizontally. If the results match the preceding values, an open circuit exists between terminal 1 of connector A and terminal 1 of connector C.

   2. Disconnect connector B and measure the resistance between the terminals of the connectors.

Standard resistance (Fig. 66)

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RESISTANCE SPECIFICATION

Tester Connection	Specified Condition
Connector A terminal 1 - Connector B1 terminal 1	Below 1 ohms
Connector B2 terminal 2 - Connector C terminal 2	10 kohms or higher

Fig. 3

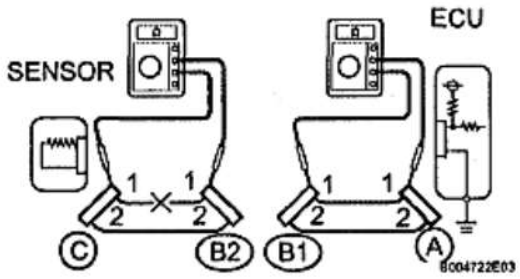


Fig. 66: Measuring Resistance Between Terminals Of Connectors
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If the results match the values specified 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.

Fig. 4

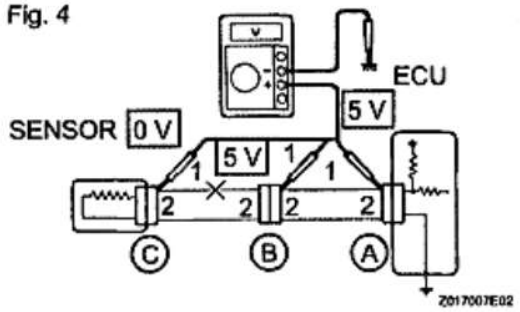


Fig. 67: Measuring Voltage Between Body Ground And Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard voltage (Fig. 67)

VOLTAGE SPECIFICATION

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

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Connector C terminal 1 - Body ground	Below 1 V

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

3. **CHECK FOR SHORT CIRCUIT**
   a. If the wire harness is shorted to ground (**Fig. 68**), locate the section by conducting the following resistance check with body ground.

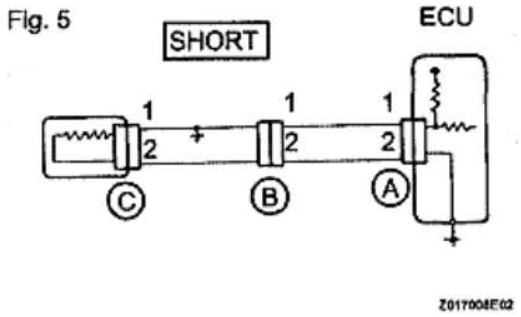


Fig. 68: ECU Circuit Diagram (Short)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

   b. Check the resistance with body ground.
      1. Disconnect connectors A and C and measure the resistance.

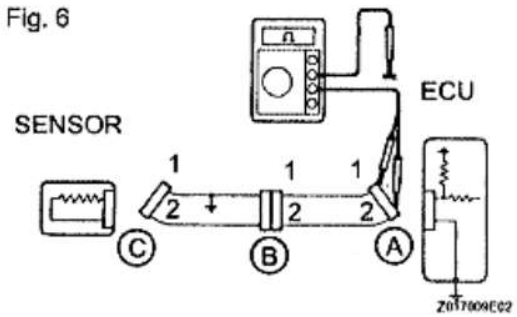


Fig. 69: Measuring Resistance Between Connectors A And C
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance (Fig. 69)

RESISTANCE SPECIFICATION

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

HINT:

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Measure the resistance while lightly shaking the wire harness vertically and horizontally. If the results match the values specified above, a short circuit exists between terminal 1 of connector A and terminal 1 of connector C.

2. Disconnect connector B and measure the resistance.

Fig. 7

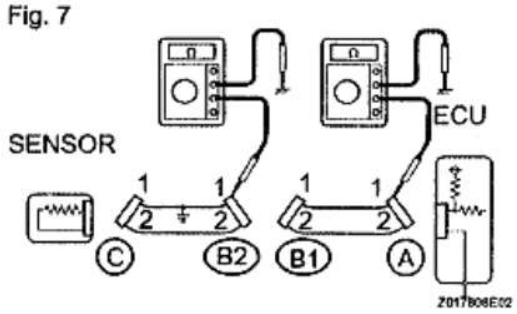


Fig. 70: Measuring Resistance Between Terminal 1 And Ground
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard resistance (Fig. 70)

RESISTANCE SPECIFICATION

Tester Connection	Specified Condition
Connector A terminal 1 - Body ground	10 kohms or higher
Connector B2 terminal 2 - Body ground	Below 1 ohms

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

4. **CHECK AND REPLACE ECU**

NOTE:

- **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 (IG).**
- **Check that the connectors are fully seated. Check for loose, corroded or broken wires.**

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

1. Measure the resistance between the ECU ground terminal and body ground.

Standard resistance:

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Below 1 ohms

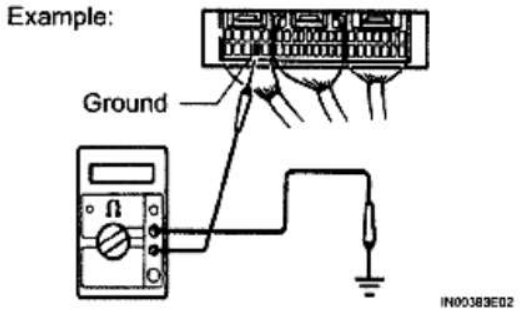


Fig. 71: Measuring Resistance Between ECU Ground Terminal And Body Ground
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.

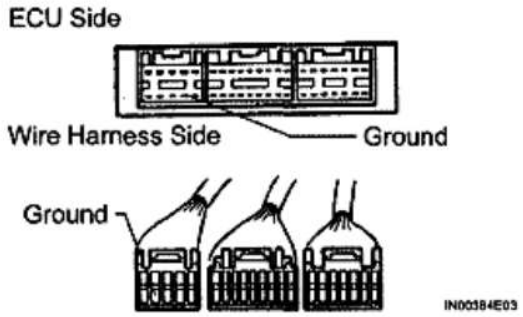


Fig. 72: Identifying ECU Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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**
2. **CUSTOMER PROBLEM ANALYSIS**
   a. Ask the customer about the conditions and environment when the problem occurred.
3. **INSPECT BATTERY VOLTAGE**

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Standard voltage:

11 to 14 V

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

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 CHART

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

   B: GO TO STEP 6

   A: Go to next step

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.
7. **CIRCUIT INSPECTION OR PARTS INSPECTION**
   a. Identify the malfunctioning circuit or part.
8. **ADJUST, REPAIR OR REPLACE**
   a. Adjust, repair or replace the malfunctioning circuit or parts.
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**

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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:

CUSTOMER PROBLEM ANALYSIS REFERENCE

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

3. **SYMPTOM CONFIRMATION AND DIAGNOSTIC TROUBLE CODE**

HINT:

The diagnostic system in this vehicle 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 can be more effective. Diagnostic functions are incorporated in the following system in this vehicle.

DIAGNOSTIC TROUBLE CODE CHART

System	Symptom Confirmation and Diagnostic Trouble Code				
	DTC Check (Normal Mode)	DTC Check (Check Mode)	Sensor Check/Test Mode (Input Signal Check)	Data List	Active Test
1AR-FE SFI System	o	o	-	o	o
2GR-FE SFI System	o	o	-	o	o
2GR-FE Smart Key System	o	-	-	o	o
U151E, U151F Automatic Transaxle System	o	o	-	o	o
U760E Automatic Transaxle System	o	o	-	o	o

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Tire Pressure Warning System	o	-	o	o	-
Vehicle Stability Control System	o	-	o	o	o
Steering Lock System	o	-	-	o	o
Power Steering System	o	-	-	o	-
Air Conditioning System (for Automatic Air Conditioning System)	o	-	-	o	o
Air Conditioning System (for Manual Air Conditioning System)	o	-	-	o	o
Airbag System	o	o	-	o	-
Occupant Classification System	o	-	-	o	-
Seat Belt Warning System	-	-	-	o	o
Theft Deterrent System (w/ Smart Key System)	-	-	-	o	o
Theft Deterrent System (w/o Smart Key System)	-	-	-	o	o
Engine Immobilizer System (w/ Smart Key System)	o	-	-	o	o
Engine Immobilizer System (w/o Smart Key System)	o	-	-	o	o
Cruise Control System	o	-	-	o	o
Lighting System	o	-	-	o	o
Power Door Lock Control System	-	-	-	o	o
Wireless Door Lock Control System (w/ Smart Key System)	o	-	-	o	o
Wireless Door Lock Control System (w/o Smart Key System)	o	-	-	o	o
Smart Key System (DOOR LOCK)	-	-	-	o	o
Key Reminder Warning System	-	-	-	o	-
Meter/Gauge System	o	-	-	o	o
Audio and Visual System	o	-	-	-	-
Navigation System	o	-	-	-	-
Power Window Control System	o	-	-	o	o
Windshield Deicer System	-	-	-	-	o
Window Defogger System	-	-	-	-	o

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Glass Hatch Opener System	-	-	-	o	o
Sliding Roof System	o	-	-	o	o
Back Door Closer System	o	-	-	o	o
Power Back Door System	o	-	-	o	o
LIN Communication System	o	-	-	o	-
CAN Communication System	o	-	-	-	-

- 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**
2. **MAKE A NOTE OF DTCS DISPLAYED AND THEN CLEAR MEMORY**
3. **SYMPTOM CONFIRMATION**

Result

RESULT CHART

Result	Proceed to
No symptoms exist	A
Symptoms exist	B

B: GO TO STEP 5

A: Go to next step

4. **SIMULATION TEST USING SYMPTOM SIMULATION METHODS**
5. **DTC CHECK**

Result

RESULT CHART

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

B: TROUBLESHOOTING OF PROBLEM INDICATED BY DTC

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A: Go to next step

6. **SYMPTOM CONFIRMATION**

Result

RESULT CHART

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) is 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:

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. To reproduce DTCs, it is necessary to satisfy the respective DTC detection conditions.

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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.

NOTE: Applying strong vibration to relays may open the 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.

NOTE:

- **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.**

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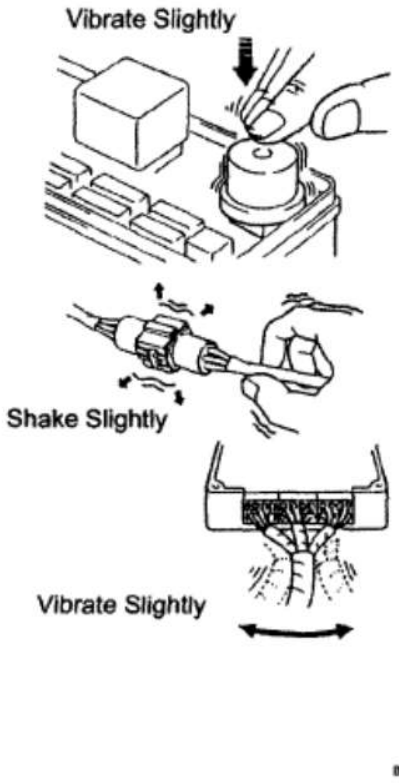


Fig. 73: Shaking Wire Harness Vertically And Horizontally
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.



Fig. 74: Sprinkling Water Onto Vehicle
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

- **Never sprinkle water directly into the engine compartment. Indirectly change the temperature and humidity by spraying water onto the front of the radiator.**

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- **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, headlights, rear window defogger and all other electrical loads. Check if the malfunction reoccurs.

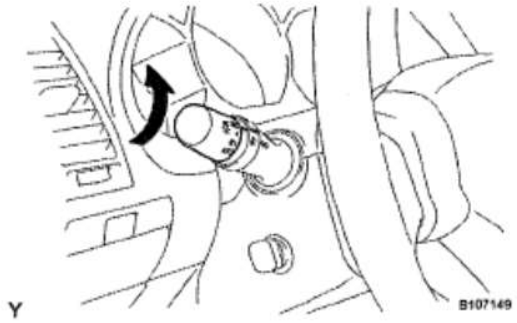


Fig. 75: Turning On Heater Blower, Headlight, Rear Window Defogger And All Other Electrical Loads
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.

DIAGNOSTIC TROUBLE CODE CHART

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 procedure for each circuit is to be found, or gives instruction for checking and repairs.

6. **PROBLEM SYMPTOMS TABLE**

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When no DTC is output but the problem still occurs, use the Problem Symptoms Table. The suspected areas (circuits or parts) for each problem symptom are shown in the table. The suspected areas are listed in order of probability. A description of each of the table columns is shown in the following table.

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.

SYMPTOM CHART

Item	Description
Symptom	-
Suspected Area	Indicates the circuit or part which needs to be checked.
See page	Indicates the page where the inspection procedure is located.

7. **INSPECTION**

A description of the main points for inspection of suspected areas is shown in the following table.

ITEM DESCRIPTION

Item	Description
Description	The major role and operation of the circuit or system and its component parts are explained.
DTC No., DTC Detection Condition and Trouble Area	Indicates the diagnostic trouble codes, DTC detection conditions and suspected areas for a problem.
Wiring Diagram	This is a wiring diagram for the circuit or system. This diagram can be used together with the Electrical Wiring Diagram to thoroughly understand the circuit. Wire colors are indicated by alphabetical codes. B = Black, L = Blue, R = Red, BR = Brown, LG = Light Green, V = Violet, G = Green, O = Orange, W = White, GR = Gray, P = Pink, Y = Yellow, SB = Sky Blue The first letter indicates the basic wire color and the second letter indicates the color of the stripe.
Inspection Procedure	This shows the procedure not only to determine whether the circuit is normal or abnormal, but also to determine whether the problem is located in the sensors, actuators, wire harness or ECU.
Illustration of the ECU connector during the check	The illustration shows whether the connector being checked is connected or disconnected. The connections for an electrical tester are indicated by (+) or (-) after the terminal name. For inspections between a connector and body ground, information about the ground is not shown in the illustration.

TERMS

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ABBREVIATIONS USED

ABBREVIATIONS REFERENCE

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

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CF	Cornering Force
CG	Center of Gravity
CH	Channel
CKD	Complete Knock Down
COMB.	Combination
CPE	Coupe
CPS	Combustion Pressure Sensor
CPU	Central Processing Unit
CRS	Child Restraint System
CTR	Center
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	Distributor less 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

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	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
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
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

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	Instrument Panel
IRS	Independent Rear Suspension
ISC	Idle Speed Control
J/B	Junction Block
J/C	Junction Connector
KD	Kick-Down
KDSS	Kinetic Dynamic Suspension System
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
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

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	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
REAS	Relative Absorber System
RFS	Rigid Front Suspension
RH	Right-Hand
RHD	Right-Hand Drive
RLY	Relay
ROM	Read Only Memory
RR	Rear
RRS	Rigid Rear Suspension
RSE	Rear Seat Entertainment
RWD	Rear-Wheel Drive
SC	Supercharger
SCV	Swirl Control Valve (for gasoline engine)
Suction	Control Valve (for diesel engine)
SDN	Sedan
SEN	Sensor

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	Starting Injection Control System
SOC	State Of Charge
SOHC	Single Overhead Camshaft
SPEC	Specification
SPI	Single Point Injection
SPV	Spill Control Valve
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 Intrusion 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
[illegible]	

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	Variable Power Steering
VSC	Vehicle Stability Control
VSV	Vacuum Switching Valve
VTV	Vacuum Transmitting Valve
WT-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

GLOSSARY OF SAE AND TOYOTA TERMS

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

SAE ABBREVIATIONS REFERENCE

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 (Al)
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)

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DI	Distributor Ignition	-
DLC3	Data Link Connector 3	OBD II Diagnostic Connector
DTC	Diagnostic Trouble Code	Diagnostic Trouble Code
DTM	Diagnostic Test Mode	-
ECL	Engine Coolant Level	-
ECM	Engine Control Module	Engine Electronic Control Unit (ECU)
ECT	Engine Coolant Temperature	Coolant Temperature, Water Temperature (THW)
EEPROM	Electrically Erasable Programmable Read Only Memory	Electrically Erasable Programmable Read Only Memory (EEPROM)
EFE	Early Fuel Evaporation	Cold Mixture Heater (CMH), Heat Control Valve (HCV)
EGR	Exhaust Gas Recirculation	Exhaust Gas Recirculation (EGR)
EI	Electronic Ignition	Distributor less 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_2 S)
IAC	Idle Air Control	Idle Speed Control (ISC)
IAT	Intake Air Temperature	Intake or Inlet Air Temperature
ICM	Ignition Control Module	-
IFI	Indirect Fuel Injection	Indirect Injection (IDL)
IFS	Inertia Fuel-Shutoff	-
ISC	Idle Speed Control	-
KS	Knock Sensor	Knock Sensor
MAF	Mass Airflow	Air Flow Meter
MAP	Manifold Absolute Pressure	Manifold Pressure Intake Vacuum
MC	Mixture Control	Electric Bleed Air Control Valve (EBCV) Mixture Control Valve (MCV) Electric Air Control Valve (EACV)
MDP	Manifold Differential Pressure	-

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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_2 S)
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 Paniculate Filter (DPF) Diesel Particulate Trap (DPT)
RAM	Random Access Memory	Random Access Memory (RAM)
RM	Relay Module	-
ROM	Read Only Memory	Read Only Memory (ROM)
RPM	Engine Speed	Engine Speed
SC	Supercharger	Supercharger
SCB	Supercharger Bypass	E-ABV
SFI	Sequential Multiport Fuel Injection	Electronic Fuel Injection (EFI), Sequential Injection
SPL	Smoke Puff Limiter	-
SRI	Service Reminder Indicator	-
SRT	System Readiness Test	-
ST	Scan Tool	-
TB	Throttle Body	Throttle Body
TBI	Throttle Body Fuel Injection	Single Point Injection Central Fuel Injection (Ci)
TC	Turbocharger	Turbocharger
TCC	Torque Converter Clutch	Torque Converter
TCM	Transmission Control Module	Transmission ECU, ECT ECU
IP	Throttle Position	Throttle Position
TR	Transmission Range	-
TW	Thermal Vacuum Valve	Bimetallic Vacuum Switching Valve (BVSV) Thermostatic Vacuum Switching Valve (TVSV)
		Three-Way Catalytic (TWC)

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TWC	Three-Way Catalytic Converter	Manifold Converter CC_{RO}
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	-

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