

VEHICLE LIFT AND SUPPORT LOCATIONS

1. NOTICE ABOUT VEHICLE CONDITION WHEN JACKING UP

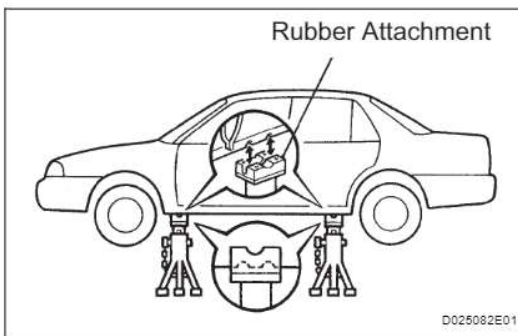
- (a) As a rule, the vehicle must be unloaded when jacking up. Never jack up or lift up the vehicle loaded with things of heavy weight.
- (b) When removing any parts of heavy weight like the engine and transaxle, the center of gravity of the vehicle moves. Place a balance weight so as to keep it from rolling, or hold the jacking support location using the mission jack.

2. NOTICE FOR USING 4 POST LIFT

- (a) Follow the instruction manual for a safety operation.
- (b) Do not damage tires or wheels with a free wheel beam.
- (c) Using a wheel stopper, fix the vehicle.

3. NOTICE FOR USING JACK AND SAFETY STAND

- (a) Work in the flat place using a wheel stopper at all times.
- (b) Use a safety stand with a rubber attachment, as shown in the illustration.
- (c) Support the specified location with a jack and safety stand accurately.
- (d) When jacking up the front wheels, release the parking brake and place wheel stoppers only behind the rear wheels. When jacking up the rear wheels, place wheel stoppers only in front of the front wheels.
- (e) Do not work or leave the vehicle supported only by a jack. Be sure to support the vehicle with a safety stand.
- (f) When jacking up only the front wheels or only the rear wheels, place wheel stoppers to both sides of the wheels that contact ground.

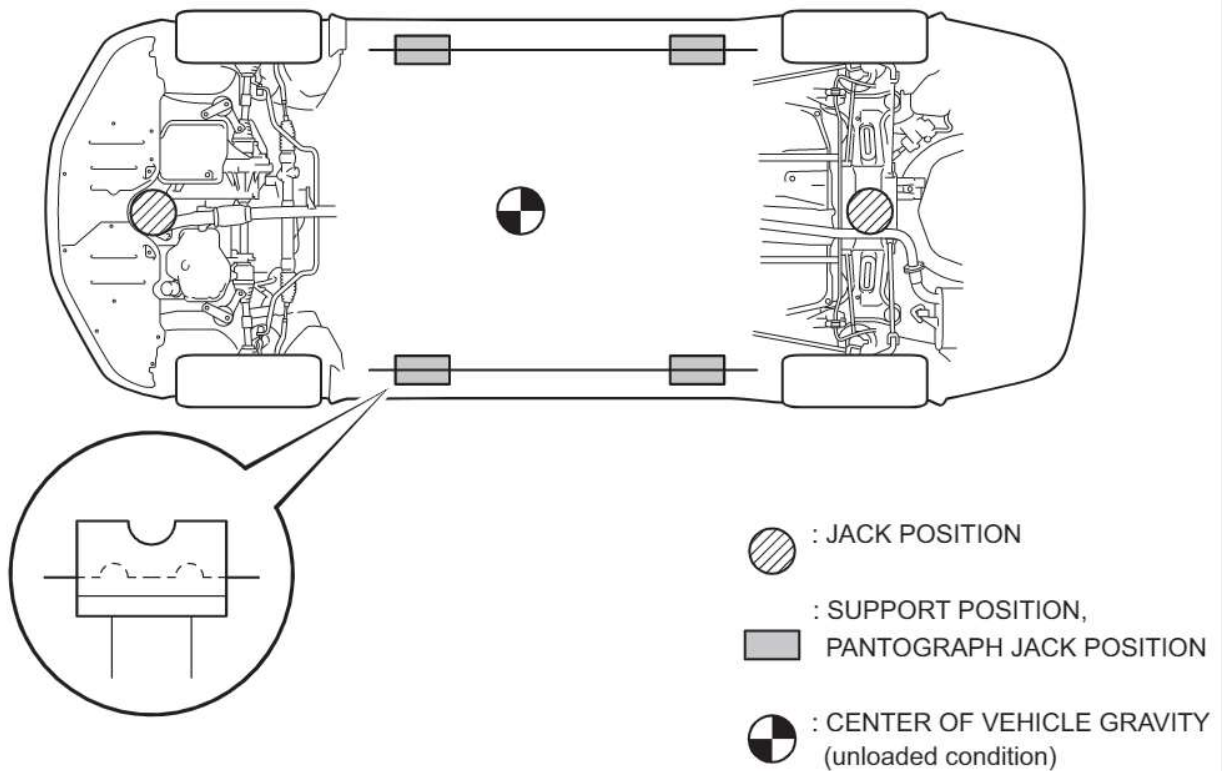


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- (g) When jacking down the vehicle with its front wheels jacked up, release the parking brake and place wheel stoppers only in front of the rear wheels. When jacking down the vehicle with its rear wheels jacked up, place wheel stoppers only behind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

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4. NOTICE FOR USING SWING ARM TYPE LIFT

- Follow the instruction manual of the lift for a safety operation.
- Use a cradle with a rubber attachment, as shown in the illustration.
- Set in the vehicle so as to make its center of gravity as close as possible to the center of the lift.
- 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.
- Be sure to lock the swing arm during the operation.
- Lift the vehicle up until the tires float, and shake the vehicle to make sure that the vehicle is stable.

5. NOTICE FOR USING PLATE TYPE LIFT

- (a) Follow the instruction manual of the lift for a safety operation.
- (b) Use a plate lift attachment.
- (c) Be sure to set the vehicle to the specified position.

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

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

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Swing Arm Type Lift:

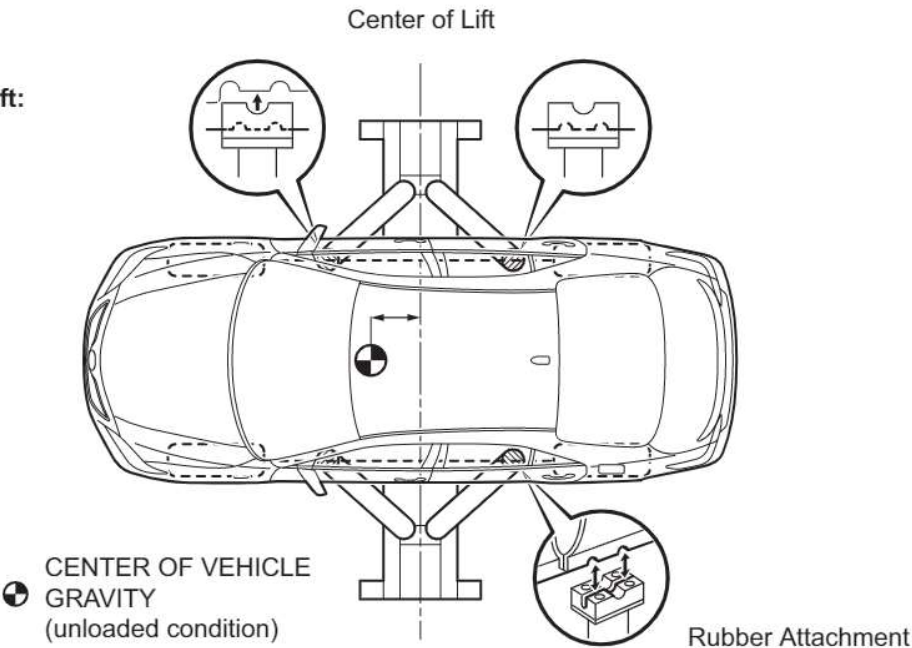
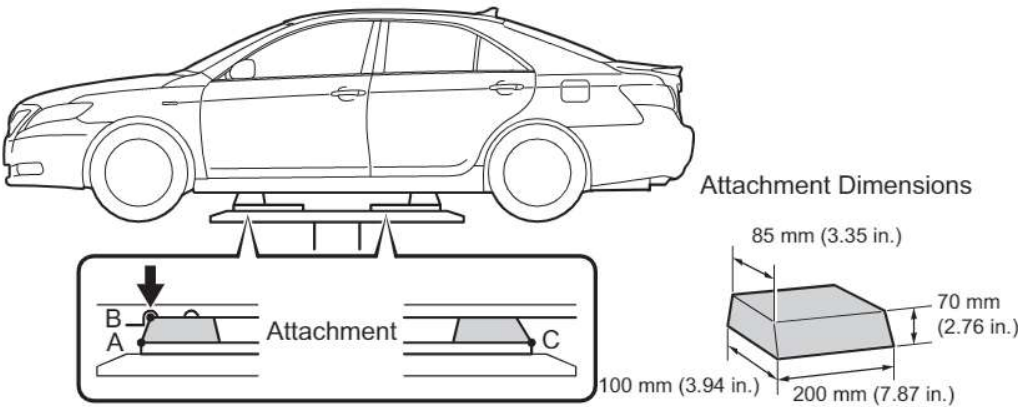


Plate Type Lift:



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CUSTOMIZE PARAMETERS

HINT:

The following items can be customized.

NOTICE:

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

1. AIR CONDITIONING SYSTEM

AIR CONDITIONER:

DISPLAY (ITEM)	DEFAULT	CONTENTS	SETTING
SET TEMP SHIFT (Set Temperature Shift)	NORMAL	To shift the temperature against the displayed temperature	+2 C / +1 C / NORMAL / -1 C / -2 C
AIR INLET MODE (Air Inlet Mode)	AUTO	In case of turning the A/C ON when you desire to make the compartment cool down quickly, this is the function to change the mode automatically to RECIRCULATION mode	MANUAL / AUTO
COMPRESSOR MODE (Compressor Mode)	AUTO	Function to turn the A/C ON automatically by pressing the AUTO button when the blower is ON and the A/C is OFF	MANUAL / AUTO
COMPRS / DEF OPER (Compressor / Air Inlet DEF Operation)	LINK	Function to turn the A/C ON automatically linked with the FRONT DEF button when the A/C is OFF	NORMAL / LINK
EVAP CTRL (Evaporator Control)	AUTO	Function to set the evaporator control to the AUTOMATIC position (AUTO) to save power, or to the coldest position (MANUAL) to dehumidify the air and to prevent the windows from fogging up	MANUAL / AUTO
FOOT / DEF MODE (Foot / DEF Auto Mode)	ON	Function to turn the airflow from FOOT/DEF ON automatically when AUTO MODE is ON	OFF / ON
AUTO BLOW UP (Foot / DEF Automatic Blower Up Function)	ON	Function to change the blower level automatically when the defroster is ON	OFF / ON
AMBIENT TMP SFT (Ambient Temperature Shift)	NORMAL	Function to shift the ambient temperature against the displayed ambient temperature	+3 C / +2 C / +1 C / NORMAL / -1 C / -2 C / -3 C

2. LIGHTING SYSTEM

ILLUMINATED ENTRY:

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

LIGHT CONTROL:

Display	Default	Contents	Setting
LIGHT OFF DELAY	30 s	Keeps the headlights on for a certain period of time after turning the power switch off and closing all the doors with the headlights on.	OFF / 30 s / 60 s / 90 s

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Display	Default	Contents	Setting
SENSITIVITY	NORMAL	Adjusts the sensitivity of the automatic light control system. *1	LIGHT 2 / LIGHT 1 / NORMAL / DARK 1 / DARK 2
DISP EX ON SEN	NORMAL	Changes the ambient brightness level required to dim the lights such as the indicator lights of the combination meter, A/C indicator light, and clock. *1	LIGHT 2 / LIGHT 1 / NORMAL / DARK 1 / DARK 2
DISP EX OFF SEN	NORMAL	Changes the ambient brightness level required to cancel the dimming of the lights such as the indicator lights of the combination meter, A/C indicator light, and clock.	LIGHT 2 / LIGHT 1 / NORMAL / DARK 1 / DARK 2

HINT:

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

Illustration *1

Ambient Brightness Level	Dark ←————→ Bright				
Setting	DARK2	DARK1	NORMAL	LIGHT1	LIGHT2

3. POWER DOOR LOCK CONTROL SYSTEM

DOOR LOCK:

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

WIRELESS D LOCK

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

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4. WIRELESS DOOR LOCK CONTROL SYSTEM

WIRELESS DOOR LOCK CONTROL SYSTEM

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

5. SMART KEY SYSTEM (DOOR LOCK)

SMART:

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

WIRELESS DOOR LOCK:

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

WARNING:

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

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6. METER / GAUGE SYSTEM

METER:

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

HINT:

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

7. SLIDING ROOF SYSTEM

Sliding roof ECU

Display (Item)	Default	Contents	Setting
OPEN/DOOR KEY	ON	Function to manually open sliding roof linked with power window if holding driver's side and passenger's side door key for 1.5 seconds or more to unlock position when power switch is off	ON/OFF
CLOSE/DOOR KEY	ON	Function to manually close sliding roof linked with power window if holding driver's side and passenger's side door key for 1.5 seconds or more to lock position when power switch is off	ON/OFF
OPEN/WIRELESS	ON	Function to manually open sliding roof linked with power window if pressing transmitter UNLOCK switch for 2.4 seconds or more when power switch is off	ON/OFF
CLOSE/WIRELESS	ON	Function to manually close sliding roof linked with power window if pressing transmitter LOCK switch for 2.4 seconds or more when power switch is off	ON/OFF
DOOR KEY OPER	SLIDE	Function to select tilt up or slide open of manual sliding roof operation linked with power window Activated by holding driver's side door key for 1.5 seconds or more to unlock position when power switch is off	TILT/SLIDE
WIRELESS OPER	SLIDE	Function to select tilt up or slide open of manual sliding roof operation linked with power window Activated by pressing transmitter UNLOCK switch for 2.4 seconds or more when power switch is off	TILT/SLIDE

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INITIALIZATION

Procedures necessary when battery terminal is disconnected / reconnected

Necessary Procedures	Procedure Details	Effects / Inoperative Functions When Necessary Procedures are not Performed	Notes
Idle speed control learning	Perform the initialization using the intelligent tester.	-	-

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Procedures necessary when ECU or other parts are replaced

Replacement Part	Necessary Procedures	Effects / Inoperative Functions When Necessary Procedures are not Performed	Notes
Tire pressure warning ECU	1. Register transmitter IDs to "MAIN" setting of switch 2. Register transmitter IDs to "2nd" setting of switch (if necessary) 3. Initialize tire pressure warning system	• Tire pressure warning light blinks • Tire pressure monitoring function (even if tire is punctured or pressure decreases, it is not detected)	-
Tire pressure warning valve and transmitter	1. Register transmitter IDs to "MAIN" setting of switch 2. Register transmitter IDs to "2nd" setting of switch (if necessary) 3. Initialize tire pressure warning system	• Tire pressure warning light blinks • Tire pressure monitoring function of replaced wheel (even if tire is punctured or pressure decreases, it is not detected)	-
Skid control ECU	1. Clear stored value of linear solenoid valve and calibration data 2. Initialize linear solenoid valve and perform calibration 3. Clear zero point calibration data 4. Perform yaw rate and acceleration sensor zero point calibration	• Brake control warning light come on • Brake warning light come on • ABS warning light come on • VSC warning display of multi-information display • Master warning light come on	-
Brake actuator	1. Clear stored value of linear solenoid valve and calibration data 2. Initialize linear solenoid valve and perform calibration	• Brake control warning light come on • Brake warning light come on • ABS warning light come on • VSC warning display of multi-information display • Master warning light come on	-
Brake pedal stroke sensor	1. Clear stored value of linear solenoid valve and calibration data 2. Initialize linear solenoid valve and perform calibration	-	-
Brake pedal	1. Inspect and adjust brake pedal height 2. Clear stored value of linear solenoid valve and calibration data 3. Initialize linear solenoid valve and perform calibration	Brake does not operate properly	-
Yaw rate and acceleration sensor	1. Clear zero point calibration data 2. Perform yaw rate and acceleration sensor zero point calibration	-	-

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Replacement Part	Necessary Procedures	Effects / Inoperative Functions When Necessary Procedures are not Performed	Notes
- Power steering ECU - Power steering link	Perform rotation angle sensor initialization and torque sensor zero point calibration	- EPS control - Steering effort is different between turning steering wheel to left and right - Steering effort varies - Rotation angle sensor or torque sensor malfunction DTC is stored	-
- Front seat assembly - Occupant classification ECU - Accessories (seatback tray and seat cover, etc.)	- Zero point calibration - Sensitivity check	Occupant classification system does not operate properly	-
- ID code box - Certification ECU - Steering lock ECU - Key	- Perform identification code registration (key code, ECU code) - Refer to immobiliser section "REGISTRATION" procedures	- Smart access system with push-button start - Wireless door lock control function - Engine start	When hybrid vehicle control ECU is replaced, registration of ECU communication ID is necessary
- Sliding roof drive gear (Sliding roof control ECU) - Sliding roof housing	Initialize sliding roof system	- Auto operation - Sliding roof operation after power switch is turned OFF - Jam protection function - Key-linked operation function (Driver's door only)	-

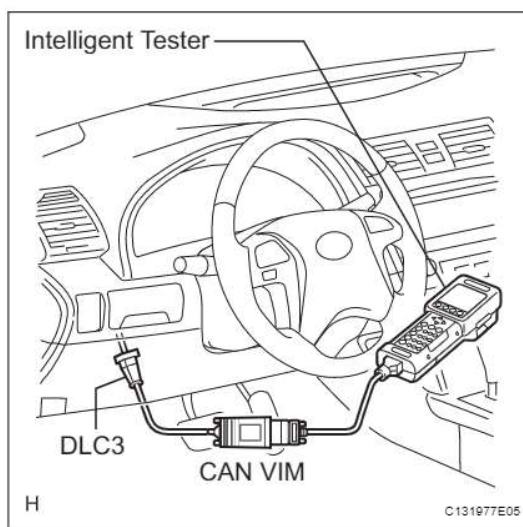
1. PERFORM INITIALIZATION (SFI SYSTEM)

- Apply the parking brake and chock the vehicle.
- Connect the intelligent tester to the DLC3.
- Put the engine in the inspection mode (See page [ES-34](#)).
- Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / COOLANT TEMP.
- Warm up the engine with the A/C switch off until the coolant temperature becomes 83°C (181°F) or more.
- Select the following menu items: DIAGNOSIS / OBD/MOBD / HV ECU / DATA LIST / SOC.
- Move the shift lever to the N position, set the A/C switch to MAX cool or turn on the front defroster, and leave the vehicle until the SOC value becomes below 40%.

HINT:

If the SOC is substantially below 40%, the auxiliary battery may go dead. Therefore, do not allow the SOC to reach substantially below 40%.

- Move the shift lever to the P position and turn the power switch off.
- Disconnect the negative terminal from the auxiliary battery and leave it for 1 minute or more.
- Reconnect the negative terminal to the auxiliary battery and turn the power switch on (IG).
- Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / COOLANT TEMP.



- (l) Check that the engine coolant temperature is 83°C (181°F) or more.
HINT:
If the engine coolant temperature is below 83°C (181°F), start the engine by depressing the accelerator pedal with the shift lever in the P position to increase the coolant temperature.
- (m) Select the following menu items: DIAGNOSIS / ENHANCED OBDII / DATA LIST / PRIMARY / CALCLOAD.
- (n) Move the shift lever to the D position while depressing the brake pedal with your left foot.
- (o) Depress the accelerator pedal with your right foot while firmly depressing the brake pedal with your left foot, and maintain an engine load value of 45% or more (60 to 70% of full acceleration) for approximately 30 seconds.
NOTICE:
Do not perform this step for 40 seconds or more.
- (p) Shift the shift lever to the P position. Turn the power switch off and then wait for 5 seconds before putting the vehicle into the READY-on state again.
- (q) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / USER DATA / ISC LEARNING.
- (r) Check that the air conditioner is off. Lightly depress the accelerator pedal and release it when the engine starts.
- (s) Check that "COMPLETE" is displayed on the intelligent tester screen.
HINT:
- If "ISC LEARNING" is not completed within 1 minute, repeat steps (o) through (r).
 - The engine will usually stop when "ISC LEARNING" is completed. However, the engine will not stop even when "ISC LEARNING" is completed in such cases when the charge level of the auxiliary battery is decreased.

2. DESCRIPTION OF INITIALIZATION (TIRE PRESSURE WARNING SYSTEM)

- (a) Perform initialization in the following cases:
- Before delivery of a new vehicle.
 - After replacement of the tire pressure warning ECU*.
 - After replacement of the tire pressure warning valve and transmitter.
 - Specified tire pressure changes depending on the size or type of the tire.

*: Perform initialization after the transmitter ID registration is completed (See page [TW-14](#)).

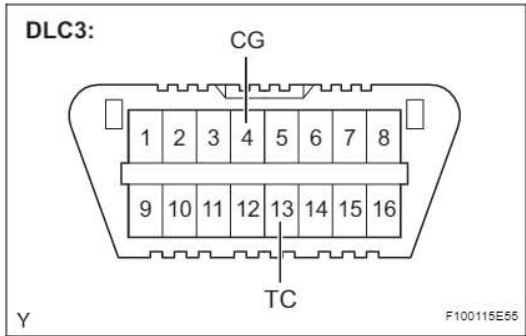
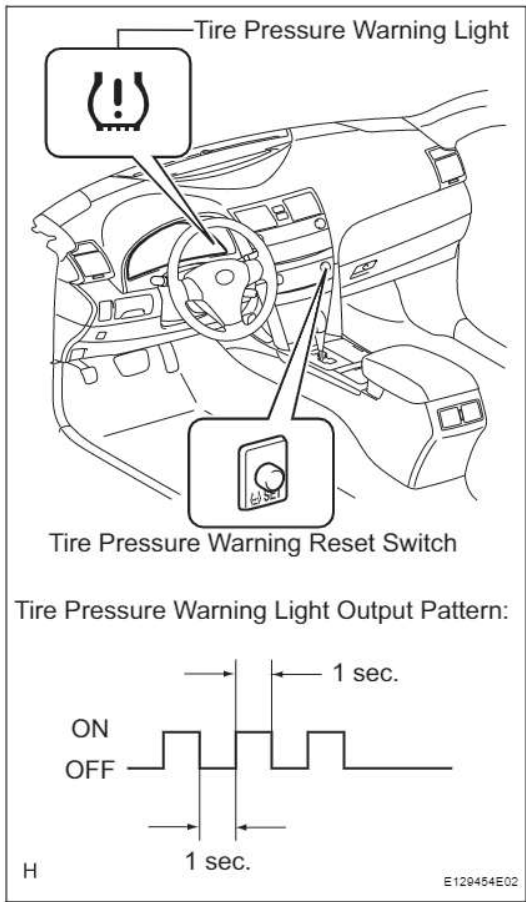
- (b) Before initialization
- (1) Set the air pressure of all wheels to the specified value.

Cold tire inflation pressure

Tire size	Front kPa (kgf/cm ² , psi)	Rear kPa (kgf/cm ² , psi)
P215/60R16 94V	220 (2.2, 32)	220 (2.2, 32)

NOTICE:
Perform the tire pressure adjustment after the vehicle has sufficiently cooled down. If the vehicle is not sufficiently cooled down, increase the air pressure by 20 to 30 kPa (0.2 to 0.3 kgf/cm², 2.9 to 4.3 psi) above the specified value.

3. INITIALIZATION PROCEDURE (TIRE PRESSURE WARNING SYSTEM)
- (a) Keep the tire pressure warning reset switch pressed for 3 seconds or more with the power switch on (IG).
- (b) Check that the tire pressure warning light blinks 3 times (1 second ON, 1 second OFF).
- HINT:
Initialization will be completed if signals are received from all wheels.



- (c) Wait for 2 or 3 minutes with the power switch on (IG).
- NOTICE:**
- The initialization is normally completed within 2 to 3 minutes.
 - If the initialization has not been completed successfully, DTC C2177/77 is set approximately 20 minutes.
 - The initialization can be terminated by making a short circuit between terminals TC and CG of the DLC3 connector.

- (d) Confirm that the initialization has been completed using the intelligent tester.
- (1) Change the mode to test mode using the intelligent tester and check that the tire pressure warning light tire pressure warning light blinks at 0.125 second intervals.
- HINT:
The tire pressure warning light will not blink until the system initialization is complete.
- NOTICE:
The following operations can be used instead of above procedure:
1. Turn the power switch from off to on (IG).

2. Monitor the tire pressure values of all the wheels using the intelligent tester.

3. If the tire pressure values cannot be displayed on the intelligent tester screen, the initialization has failed.

4. It takes 2 to 3 minutes to display the tire pressure data.
- HINT:
 - In winter, as the tire pressure may decrease depending on the ambient temperature, increase the tire pressure by 20 to 30 kPa (0.2 to 0.3 kgf/cm², 2.9 to 4.3 psi) above the specified value after confirmation that the initialization has been completed.

4. DESCRIPTION (ELECTRONICALLY CONTROLLED BRAKE SYSTEM)

- (a) Perform initialization of linear solenoid valve and calibration when the skid control ECU, brake actuator or brake pedal stroke sensor is replaced. Follow the procedure to perform initialization.
- HINT:
- If there is a problem with the auxiliary battery (12 V) voltage, initialization of linear solenoid valve and calibration cannot be completed normally. Make sure to check the auxiliary battery voltage before performing initialization of linear solenoid valve and calibration.
 - If the actuator's temperature is high, initialization of linear solenoid valve and calibration may not be completed normally. In such a case, wait until the temperature decreases and then perform initialization of linear solenoid valve and calibration.
 - If the power switch is turned off, the brake pedal is operated or vehicle speed is input while the linear solenoid valve offset learning is being performed, the learning will be cancelled.

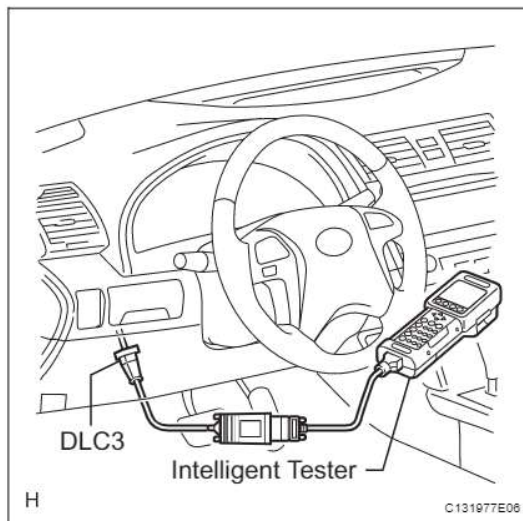
Replacement Parts	Necessary Operation
Skid control ECU	Initialization of linear solenoid valve and calibration

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Replacement Parts	Necessary Operation
Brake actuator assembly	1. Bleed air 2. Clearing stored value of linear solenoid valve and calibration data 3. Initialization of linear solenoid valve and calibration
• Brake pedal stroke sensor • Brake pedal	1. Inspection and adjustment of brake pedal height 2. Clearing stored value of linear solenoid valve and calibration data 3. Initialization of linear solenoid valve and calibration

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5. PERFORM INITIALIZATION OF LINEAR SOLENOID VALVE AND CALIBRATION (INTELLIGENT TESTER) (ELECTRONICALLY CONTROLLED BRAKE SYSTEM)

- (a) Clear the stored value of linear solenoid valve and calibration data.
 - (1) Turn the power switch off.
 - (2) Connect the intelligent tester to the DLC3.
 - (3) Move the shift lever to the P position.
 - (4) Turn the power switch on (IG) with the brake pedal released.
 - (5) Clear the stored value of initialization of linear solenoid valve and calibration following the screen.

HINT:

Refer to the intelligent tester operator's manual for further details.

- (6) Using the intelligent tester, perform initialization of linear solenoid valve and calibration.
- (b) Perform the initialization of linear solenoid valve and calibration.
 - (1) Turn the power switch off.
 - (2) Connect the intelligent tester to the DLC3.
 - (3) Move the shift lever to the P position.
 - (4) Turn the power switch on (IG) with the brake pedal released.

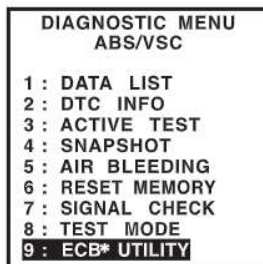
NOTICE:

- If the linear solenoid valve offset learning is performed without turning the power switch on (IG), the learning process may not be completed properly because of insufficient auxiliary battery voltage.
- When the linear solenoid valve offset learning is interrupted, or the learning process is performed with the shift lever not in the P position, DTC C1345/66 will be stored (See page [BC-190](#)).

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Tester Display:

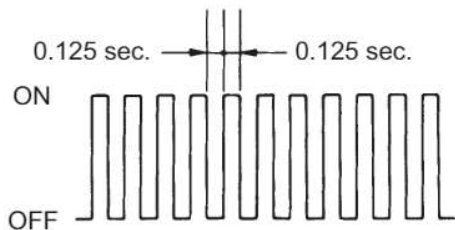


*: Electronically Controlled Brake

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Blinking Pattern in TEST MODE:



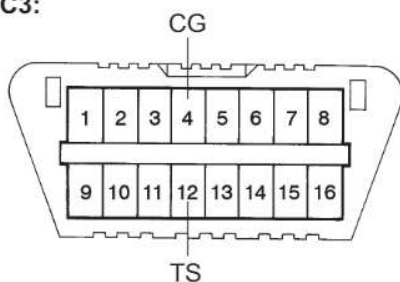
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- (5) Set the intelligent tester to Test Mode (select "ECB* UTILITY").
*: Electronically Controlled Brake
HINT:
Refer to the intelligent tester operator's manual for further details.
- (6) Leave the vehicle stationary without depressing the brake pedal for 1 or 2 minutes.

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- (7) Check that the interval between blinks of the brake control warning light changes from 1 second to 0.25 seconds.
HINT:
 - The time needed to complete initialization of linear solenoid valve and calibration varies depending on auxiliary battery voltage.
 - The brake control warning light blinks at 1 second intervals during initialization of linear solenoid valve and calibration and changes to the Test Mode display.
 - The brake control warning light blinks at 0.25 seconds intervals if the Test Mode is normal.
- (8) Check that DTC C1345/66 which indicates trouble with stroke sensor zero point learning is not output when the brake control warning light changes to the Test Mode display upon initialization of linear solenoid valve and calibration completion.
- (9) Enter the normal mode from the Test Mode following the intelligent tester prompts.
HINT:
Refer to the intelligent tester operator's manual for further details.

DLC3:



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6. PERFORM INITIALIZATION OF LINEAR SOLENOID VALVE AND CALIBRATION (SST CHECK WIRE) (ELECTRONICALLY CONTROLLED BRAKE SYSTEM)

- (a) Clear the stored value of linear solenoid valve and calibration data.
 - (1) Turn the power switch off.
 - (2) Move the shift lever to the P position.
 - (3) Turn the power switch on (IG) with the brake pedal released.
 - (4) Using SST, connect and disconnect terminals TS and CG of the DLC3 4 times or more within 8 seconds.

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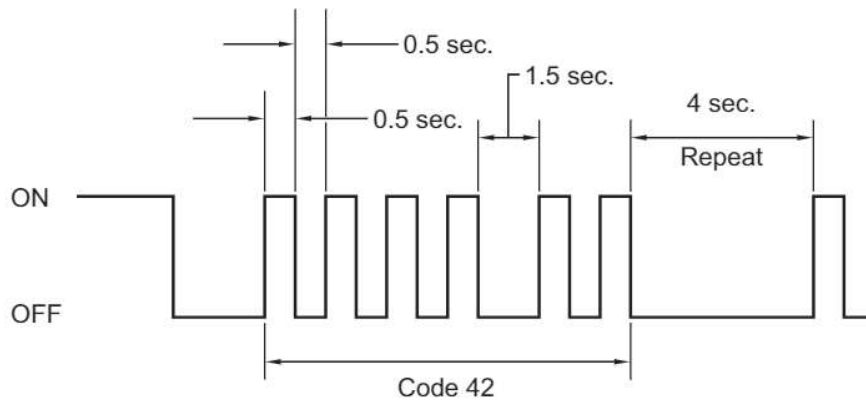
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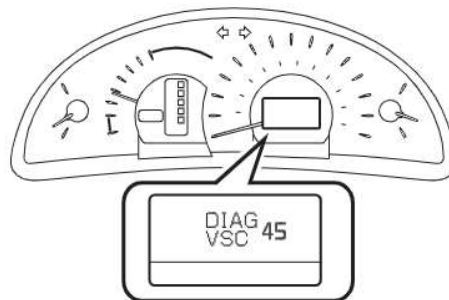
- (5) Check that no codes other than ABS code 42, VSC code 45 and Electronically Controlled Brake code 48, 66, or 95 are stored in the diagnostic system.

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Blinking Pattern of ABS and Electronically Controlled Brake Code (Example Code 42):



Display of VSC Code:



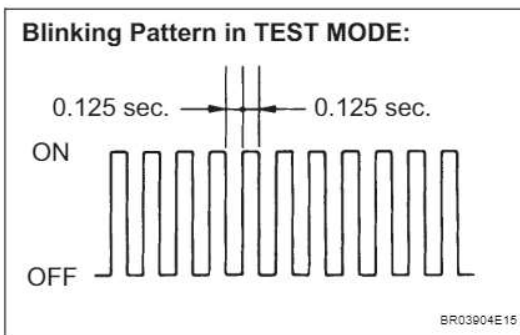
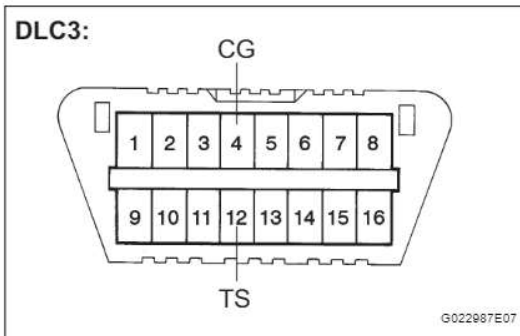
N

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HINT:

The ABS warning, brake control warning lights and multi information display do not indicate the normal system code.

- (6) Remove the SST from the terminals of the DLC3.
- (7) Using the check wire, perform initialization of linear solenoid valve and calibration.
- (b) Perform initialization of linear solenoid valve and calibration.
- (1) Turn the power switch off.



- (2) Using SST, connect terminals TS and CG of the DLC3.

SST 09843-18040

- (3) Move the shift lever to the P position.
- (4) Turn the power switch on (IG) with the brake pedal released.

NOTICE:

- If the linear solenoid valve offset learning is performed without turning the power switch on (IG), the learning process may not be completed properly because of insufficient auxiliary battery voltage.
- When the linear solenoid valve offset learning is interrupted, or the learning process is performed with the shift lever not in the P position, DTC C1345/66 will be stored (See page [BC-190](#)).

- (5) Leave the vehicle stationary without depressing the brake pedal for 1 or 2 minutes.
- (6) Check that the interval between blinks of the brake control warning light changes from 1 second to 0.25 seconds.

HINT:

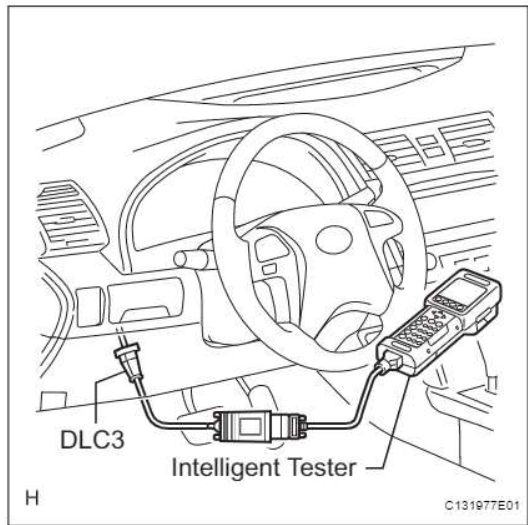
- The time needed to complete initialization of linear solenoid valve and calibration varies depending on the auxiliary battery voltage.
 - The brake control warning light blinks at 1 second intervals during initialization of linear solenoid valve and calibration and changes to the Test Mode display.
 - The brake control warning light blinks at 0.25 seconds intervals if the Test Mode is normal.
- (7) Check that DTC C1345/66 which indicates trouble with stroke sensor zero point learning is not output when the brake control warning light changes to the Test Mode display upon initialization of linear solenoid valve and calibration completion.
 - (8) Turn the power switch off and disconnect the SST from the DLC3.

7. ROTATION ANGLE SENSOR VALUE INITIALIZATION AND TORQUE SENSOR ZERO POINT CALIBRATION (ELECTRONIC POWER STEERING SYSTEM)

NOTICE:

Clear the rotation angle sensor calibration value, initialize the rotation angle sensor value, and calibrate the torque sensor zero point if any of the following has occurred:

- The power steering ECU assembly has been replaced.
- The power steering link assembly has been replaced.
- Steering effort differs between left and right.

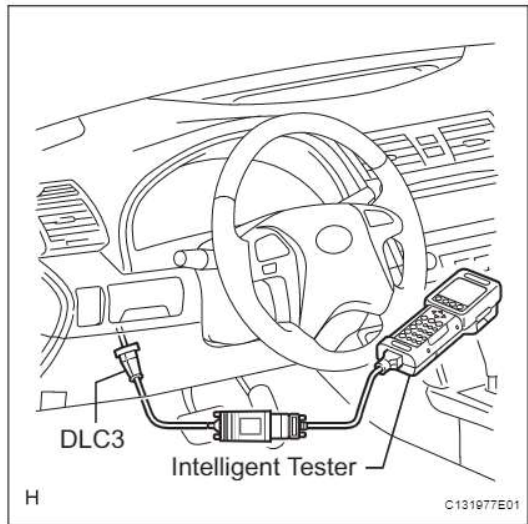


- (a) Inspection before calibration
- (1) Connect the intelligent tester (with CAN VIM) to the DLC3.
 - (2) Turn the power switch on (IG).
 - (3) Turn the intelligent tester on.
 - (4) Select "IG SUPPLY" from the data list.
 - (5) Check the IG power supply voltage on the tester screen.

Tester Display	Measurement Item/Range	Inspection Condition	Reference Value
IG SUPPLY	ECU power source voltage/ Min.: 0 V, Max.: 25.5 V	Power switch on (IG)	10 to 14 V

Standard voltage:
10 to 14 V

NOTICE:
If the IG power supply voltage is 10 V or less, calibration cannot be performed. In this case, charge or replace the battery, and then perform calibration.



- (b) Rotation angle sensor calibration value clear, rotation angle sensor value initialization, and torque sensor zero point calibration.
- NOTICE:**
- If DTC C1516 (Torque Sensor Zero Point Adjustment Incomplete) is stored, the torque sensor zero point cannot be calibrated. Clear the DTC before starting calibration.
 - If DTC C1526 (Rotation Angle Sensor Initialization Incomplete) is stored, the rotation angle sensor value cannot be initialized. Clear the DTC before starting initialization.
- (1) Connect the intelligent tester (with CAN VIM) to the DLC3.
 - (2) Turn the power switch on (IG).
 - (3) Turn the intelligent tester on.
 - (4) Select "TRQ SENSOR ADJ".

- (5) Follow the procedures on the tester display to clear the rotation angle sensor calibration value, initialize the rotation angle sensor value, and calibrate the torque sensor zero point.

NOTICE:

- When initializing the rotation angle sensor value, observe the following to stabilize sensor voltage:
After turning the power switch on (IG), wait for at least 2.5 seconds before turning the steering wheel. Do not turn the steering wheel quickly.
- The steering wheel will vibrate during torque sensor zero point calibration. Do not touch the steering wheel while it is vibrating or for 2 seconds after it stops.

8. ZERO POINT CALIBRATION (OCCUPANT CLASSIFICATION SYSTEM)

NOTICE:

Make sure that the front passenger seat is not occupied before performing the operation:

HINT:

Perform zero point calibration and sensitivity check if any of the following conditions occur.

- The occupant classification ECU is replaced.
- Accessories (seatback tray and seat cover, etc.) are installed.
- The front passenger seat is removed from the vehicle.
- The passenger airbag ON/OFF indicator ("OFF") comes on when the front passenger seat is not occupied.
- The vehicle is brought to the workshop for repair due to an accident or a collision.

- (a) Zero point calibration and sensitivity check procedures.

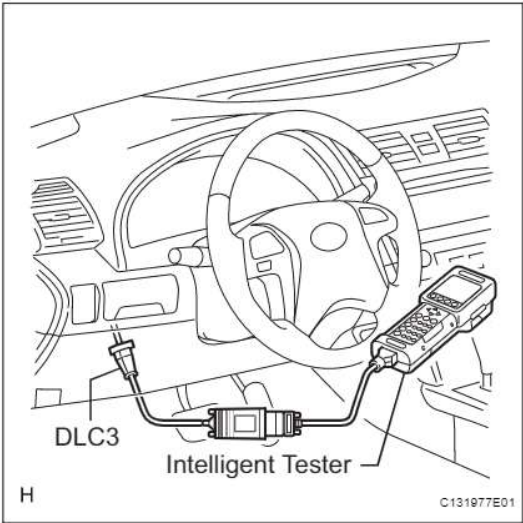
HINT:

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

- (1) Adjust the seat position according to the table below.

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

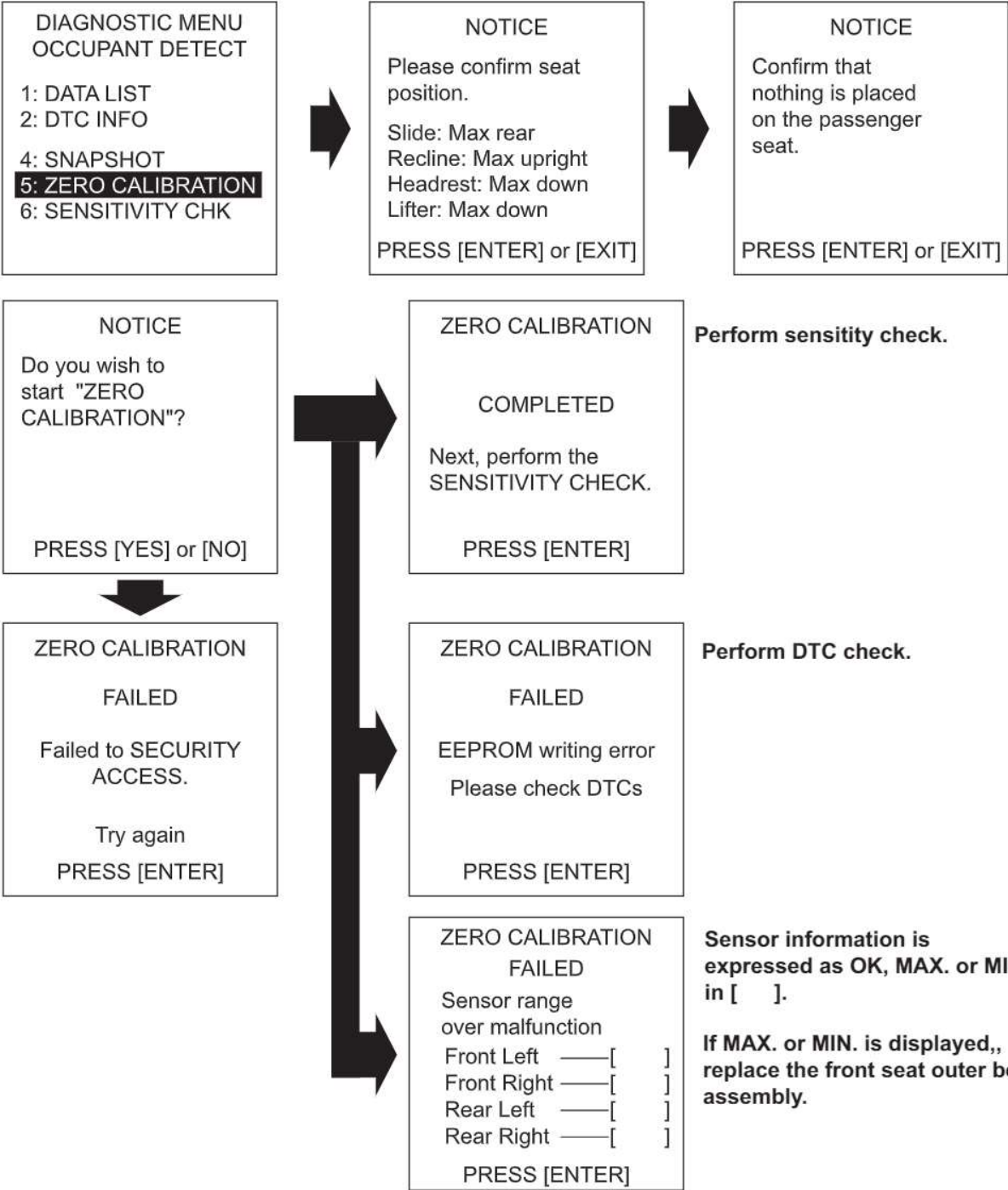
- (2) Connect the intelligent tester to the DLC3.
(3) Turn the power switch on (IG).



(4) Perform the zero point calibration by following the prompts on the tester screen.

ZERO POINT CALIBRATION PROCEDURE

“1: DIAGNOSIS” - “1: OBD/MOBD” - “MODEL YEAR” - “MODEL SELECTION” - “CAMRY” - Select the option parts” - “9: OCCUPANT DETECT”
Refer to the following screen flow.



HINT:
Refer to the intelligent tester operator's manual for further details.

- OK:
"COMPLETE" is displayed.
- (5) Perform the sensitivity check by following the prompts on the tester screen.

(6) Confirm that the beginning sensor reading within standard value.

Standard value:
-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 standard value.

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SENSITIVITY CHECK PROCEDURE

"1: DIAGNOSIS" - "1: OBD/MOBD" - "MODEL YEAR" - "MODEL SELECTION = CAMRY" - Select the option parts - "9: OCCUPANT DETECT" - Refer to the following screen flow.

DIAGNOSTIC MENU
OCCUPANT DETECT

1: DATA LIST
2: DTC INFO

4: SNAPSHOT
5: ZERO CALIBRATION
6: SENSITIVITY CHK



NOTICE

Please confirm
that nothing is
placed on the
passenger seat.

PRESS [ENTER] or [EXIT]



SENSITIVITY CHECK

Beginning sensor
reading should be
-3.2 to 3.2 kg.
(-7 to 7 lbs)

Sensor reading
0.00 kg

PRESS [ENTER]



SENSITIVITY CHECK

Blace 30 kg (66 lbs)
weight on passenger
seat. Sensor reading
should be 27 to 33 kg.
(59 to 73 lbs)

Sensor reading
0.00 kg (*1)

PRESS [ENTER]

*1: kg = lb

Unit can be changed based on unit conversion setting.

[System Selection Screen]

"1: DIAGNOSIS" - "9: SETUP" - "4: UNIT CONVERSION"
- "WEIGHT" (kg = lbs)

- Standard value:
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 the weight made from liquid is used).

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INTRODUCTION – REPAIR INSTRUCTION

IN

- When the sensitivity deviates from the standard value, retighten the bolts of the front passenger seat without deforming the seat rail. After performing this procedure, if the sensitivity is not within the standard value, replace the front seat assembly RH.
- When zero point calibration has not finished normally, replace the front seat assembly RH.

9. DESCRIPTION OF CODE REGISTRATION (ENGINE IMMOBILIZER SYSTEM)

HINT:

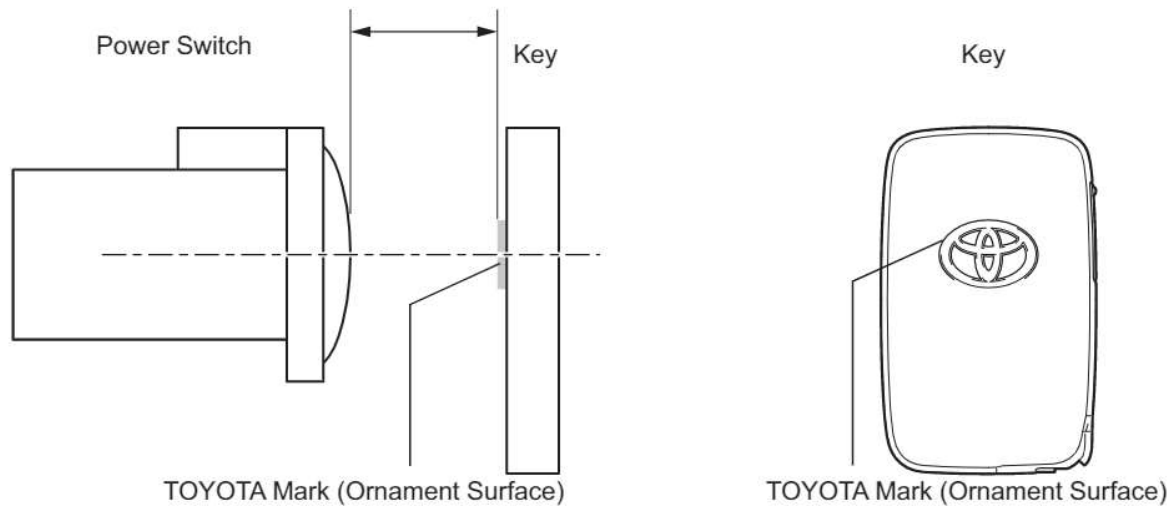
- ID codes are the same as recognition codes for the wireless transmitter and the engine immobiliser function. Registering an ID code enables the smart key system, the wireless door lock control function and the engine immobiliser function to be operated.
- Code registration is needed when the certification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

(a) PROCEDURE "1"

The vehicle with the smart key system does not have a key slot. Therefore, hold the key close to the power switch to register the key, as shown in the illustration below.

Hold the key with its ornament surface within a range of 10 mm (0.39 in.) or less from the power switch.

Communication distance: 10 mm (0.39 in.) or less from the power switch.



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10. PART REPLACEMENT KEY REGISTRATION (ENGINE IMMOBILIZER SYSTEM)

The following table shows ECU replacement and key registration procedures in case the malfunctioning ECU has been identified after troubleshooting the smart key system.

HINT:

- The following procedures indicated in the table below require the use of the intelligent tester:
 - New key ID registration
 - Additional key ID registration
 - Key ID erasure
 - ECU code registration
- If all of the registered keys are not available, replacement of the ID code box is also required.
- A maximum of 7 keys can be registered.

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INTRODUCTION – REPAIR INSTRUCTION

Part to be replaced	Condition		Procedure	Reference
Certification ECU	Customer has brought all keys		1. Replace certification ECU	-
			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	-
			4. Reregister all keys (new key ID registration) HINT: If some keys are not registered during above steps, they will be disabled because they cannot be registered later.	PROCEDURE "B"
		Key ID codes cannot be either registered or erased	1. Replace certification ECU	-
			2. Replace ID code box	-
			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 certification ECU, replace ID code box and certification ECU. If some keys are not registered during above steps, they will be disabled because they cannot be registered later.	PROCEDURE "A"
			4. ECU communication ID registration	PROCEDURE "F"
ID code box	At least 1 key is available		1. Replace ID code box	-
			2. Register recognition codes in ECUs (ECU code registration)	PROCEDURE "E"
			3. ECU communication ID registration	PROCEDURE "F"
	All keys are lost	1. Replace ID code box	-	
		2. Replace certification ECU	-	
		3. Reregister all keys (new key ID registration) HINT: If some keys are not registered during above steps, they will be disabled because they cannot be registered later.	PROCEDURE "A"	
		4. ECU communication ID registration	PROCEDURE "F"	
		Steering lock ECU	Customer has brought at least 1 key	
2. Register recognition codes in ECUs (ECU code registration)	PROCEDURE "E"			
All keys are lost	1. Replace steering lock ECU		-	
	2. Replace certification ECU		-	
	3. Replace ID code box		-	
	4. Reregister all keys (new key ID registration) HINT: If some keys are not registered during above steps, they will be disabled because they cannot be registered later.		PROCEDURE "A"	
5. ECU communication ID registration	PROCEDURE "F"			
Main body ECU (Instrument panel J/ B)	No condition required		Replace main body ECU (Instrument panel J/ B)	-
Hybrid vehicle control ECU	No condition required		1. Replace hybrid vehicle control ECU	-
			2. ECU communication ID registration	PROCEDURE "F"

INTRODUCTION – REPAIR INSTRUCTION

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Part to be replaced	Condition	Procedure	Reference
Key	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 "E"
	All keys are lost	1. Replace certification ECU	-
		2. Replace ID code box	-
		3. Register all keys (new key ID registration) HINT: If customer brings lost keys at later date, they can be registered using additional key ID registration function.	PROCEDURE "A"
		4. ECU communication ID registration	PROCEDURE "F"

11. KEY REGISTRATION (ENGINE IMMOBILIZER SYSTEM)

(a) PROCEDURE "A"

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

Process	Procedure
1. Start of registration	1. Connect intelligent tester (with CAN VIM) to DLC3 2. Turn power switch on (IG) 3. Select "SMART KEY / ID UTILITY / SMART CODE REG" from tester menu HINT: The power switch cannot be turned on (IG) more than 10 times. After connecting tester, turn tester on while turning 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 tester screen HINT: The mode is automatically selected by tester, new registration mode or add mode.
3. Verification of unregistered key *1	Hold unregistered key close to power switch (For details, refer to PROCEDURE "1") Confirm that wireless door lock buzzer sounds. Place unregistered key on front passenger's side seat. Confirm that wireless door lock buzzer sounds
4. Registration of ID code	Perform operation according to prompts on tester 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 registration procedures from process 1 again. Make sure that only 1 key is in the cabin during registration procedures. If 2 or more keys are in the cabin simultaneously, electric waves will interfere with each other, preventing normal registration.

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INTRODUCTION – REPAIR INSTRUCTION

(b) PROCEDURE "B"

New key ID registration (when replacing certification ECU)

Process	Procedure
1. Start of registration	1. Connect intelligent tester (with CAN VIM) to DLC3 2. Turn power switch on (IG) 3. Select "SMART KEY / ID UTILITY / SMART CODE REG" from tester menu HINT: The power switch cannot be turned on (IG) more than 10 times. After connecting tester, turn tester on while turning 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 tester screen HINT: The mode is automatically selected by tester, new registration mode or add mode.
3. Confirmation of all registered keys *1	Hold unregistered key close to power switch (For details, refer to PROCEDURE "1") Confirm that wireless door lock buzzer sounds
4. Confirmation of ECU code	Perform operation according to prompts on tester screen
5. Verification of unregistered key *2	Hold unregistered key close to power switch (For details, refer to PROCEDURE "1") Confirm that wireless door lock buzzer sounds. Place unregistered key on front passenger side seat. Confirm that wireless door lock buzzer sounds
5. Registration of ID code	Perform operation according to prompts on tester 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 registration procedures from process 1 again. If performing the key confirmation procedure for a key, the security indicator 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 has not been finished within the specified time, perform registration procedures from 1 again. Make sure that only 1 key is in the cabin during 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

Process	Procedure
1. Start of registration	1. Connect intelligent tester (with CAN VIM) to DLC3 2. Turn power switch on (IG) 3. Select "SMART KEY / ID UTILITY / SMART CODE REG" from tester menu

INTRODUCTION – REPAIR INSTRUCTION

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Process	Procedure
2. Confirmation of registered key *1	Perform operation according to prompts on intelligent tester screen HINT: The mode is automatically selected by tester, new registration mode or add mode.
	Hold unregistered key close to power switch (For details, refer to PROCEDURE "1")
	Confirm that wireless door lock buzzer sounds once
3. Confirmation of ECU code	Perform operation according to prompts on tester screen
4. Verification of unregistered key *2	Hold unregistered key close to power switch (For details, refer to PROCEDURE "1")
	Confirm that wireless door lock buzzer sounds. Place unregistered key on front passenger's side seat.
	Confirm that wireless door lock buzzer sounds
5. Registration of ID code	Perform operation according to prompts on tester screen
6. End of registration	Finish 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 registration procedures from process 1 again.

*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 has not been finished within the specified time, perform registration procedures from 1 again. Make sure that only 1 key is in the cabin during 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.

Process	Procedure
1. Start of erasure	1. Connect intelligent tester (with CAN VIM) to DLC3 2. Turn power switch on (IG) 3. Select "SMART KEY / ID UTILITY / SMART CODE ERS" from tester menu
2. Confirmation of registered key *1	Perform operation according to prompts on intelligent tester screen
	Hold unregistered key close to power switch (For details, refer to PROCEDURE "1")
	Confirm that wireless door lock buzzer sounds once
3. Confirmation of ECU code	Perform operation according to prompts on tester screen
4. Erasure of ID code	Perform operation according to prompts on tester 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 erasure procedures from process 1 again.

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(e) PROCEDURE "E"
ECU code registration

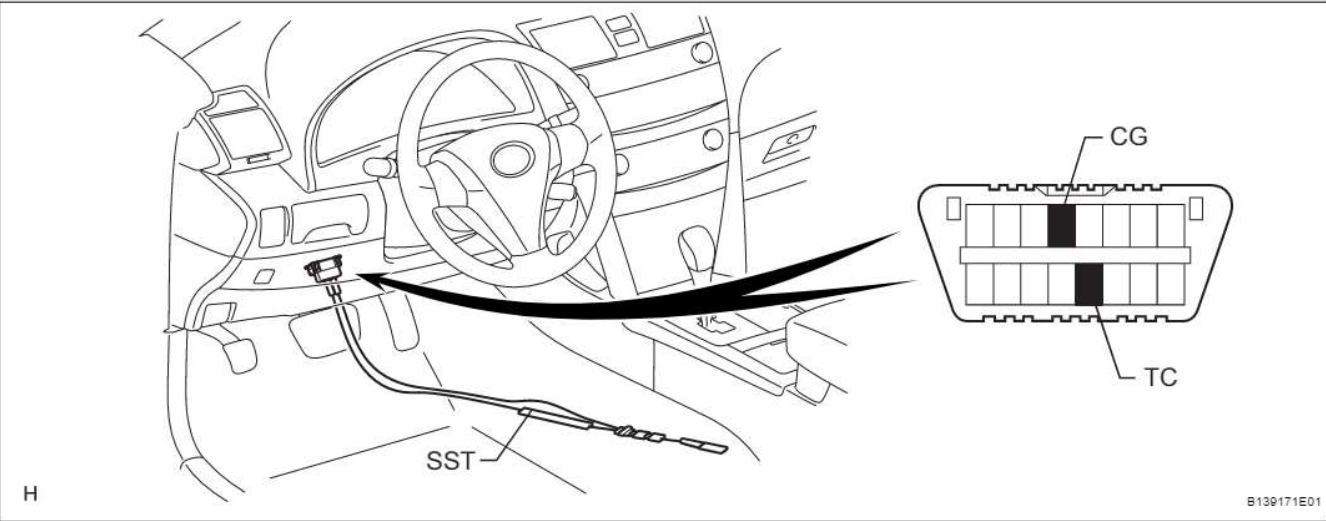
Process	Procedure
1. Start of registration	1. Connect intelligent tester (with CAN VIM) to DLC3 2. Turn power switch on (IG) 3. Select "SMART KEY / ID UTILITY / ECU COMM ID REG / ID Code Box and Steering Lock" from tester menu
2. Confirmation of registered key *1	Hold unregistered key close to power switch (For details, refer to PROCEDURE "1") Confirm that wireless door lock buzzer sounds once
3. Registration of ECU code	Perform operation according to prompts on tester 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 erasure procedures from process 1 again.

(f) PROCEDURE "F"
ECU communication ID registration

- NOTICE:**
- The ECU communication ID should be registered when the ID code box and/or the hybrid vehicle control ECU is replaced in order to match these ECU communication ID.
 - The engine cannot be started unless the ECU communication ID matches.
 - After the registration, pressing the power switch may not start the hybrid control system on the first try. If so, press the power switch again.
 - After the hybrid control system is started, erase DTC B2799-542, 790 (code for hybrid vehicle control ECU's immobiliser communication error).

Register the ECU communication ID.



- (1) Using SST, connect terminals TC and CG of the DLC3.
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- (2) Turn the power switch on (IG) and leave it for 30 minutes.

HINT:

Do not start the engine.

- (3) Turn the power switch off and disconnect terminals TC and CG.

- (4) Check that the hybrid control system.

OK:

Hybrid control system starts and stays on for more than 3 seconds.

HINT:

Using an already registered key, turn the power switch on (IG) with the brake pedal depressed.

12. INITIALIZE SLIDING ROOF DRIVE GEAR SUB-ASSEMBLY (SLIDING ROOF SYSTEM)

NOTICE:

When replacing the sliding roof drive gear, the sliding roof drive gear requires initialization. If a reset is not executed, the following functions do not operate: auto operation and key off operation.

- Turn the power switch on (IG).
- Make sure that the sliding roof is fully closed.
- Push and hold the CLOSE switch or the UP switch until the following movement finishes: Tilt up → approximately 1 second → tilt down → slide open → slide closed.
- Check that the sliding roof stops at the fully closed position.
- Finish the initialization.
- Check that the AUTO operation works normally.

NOTICE:

If the following conditions occur during initialization procedure, initialization will fail:

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

HINT:

- If the sliding roof cannot be fully closed or its position has become misaligned, perform initialization again.
- If the roof glass stops moving or starts moving in the opposite direction while the CLOSE or UP switch is held down, continue to hold the switch for another 10 seconds or more to return the sliding roof control ECU to an uninitialized condition. Then perform the initialization procedure again.

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- If the AUTO operation function and jam protection function do not operate after the drive gear has been reset, replace the sliding roof drive gear (sliding roof ECU).

IN

INSPECTION MODE PROCEDURE

1. INSPECTION MODE

- (a) Activating inspection mode (Not using the intelligent tester)

HINT:

Perform procedures "A" to "D" within 60 seconds.

- (1) Turn the power switch on (IG) (Procedure "A").
 - (2) Fully depress the accelerator pedal twice with the shift P position (Procedure "B").
 - (3) Fully depress the accelerator pedal twice with the shift N position (Procedure "C").
 - (4) Fully depress the accelerator pedal twice with the shift P position (Procedure "D").
 - (5) Check that the HV system warning light blinked on the multi-information display (Procedure "E").
 - (6) Start the engine by turning the power switch while depressing the brake pedal (Procedure "F").
- (b) Activating inspection mode (Using the intelligent tester)
- (1) Connect the intelligent tester to the DLC3.
 - (2) Turn the power switch on (IG).
 - (3) Turn the intelligent tester on.
 - (4) Select following menu items: DIAGNOSIS / OBD/MOBD / HV ECU / ACTIVE TEST / INSPECTION MOD1 / ON.
 - (5) Check that the HV system warning light blinks on the multi-information display and the master warning light are illuminated in the combination meter.
 - (6) Start the engine by turning the power switch while depressing the brake pedal.
- (c) Deactivating inspection mode
- (1) Turn the power switch off. The HV main system turns off simultaneously.

CAUTION:

- The idling speed in inspection mode is approximately 900 rpm. The engine speed increases to 1,500 rpm if the accelerator pedal is depressed by less than 60 %. If the accelerator pedal is depressed by more than 60%, the engine speed increases to 2,500 rpm.
- If a DTC is set during inspection mode, the master warning light and the warning message illuminate on the multi-information display.
- When the master warning light illuminates during the inspection mode, deactivate the inspection mode, and check DTC(s).
- Driving the vehicle without deactivating the inspection mode may damage the transaxle.

IN

HOW TO PROCEED WITH TROUBLESHOOTING

1. OPERATION FLOW

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

IN

1 VEHICLE BROUGHT TO WORKSHOP

NEXT

2 CUSTOMER PROBLEM ANALYSIS

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

NEXT

3 INSPECT BATTERY VOLTAGE

Standard voltage:
11 to 14 V
If the voltage is below 11 V, recharge or replace the battery before proceeding.

NEXT

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

- (a) Visually check the wire harnesses, connectors and fuses for open and short circuits.
(b) Warm up the engine to the normal operating temperature.
(c) Confirm the problem symptoms and conditions, and check for DTCs.

Result

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

B

Go to step 6

A

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INTRODUCTION – HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

5

DTC CHART

- (a) Check the results obtained in step 4. Then find the output DTC in the DTC chart. Look at the "Trouble Area" column for a list of potentially malfunctioning circuits and/or parts.

NEXT

Go to step 7

6

PROBLEM SYMPTOMS CHART

- (a) Check the results obtained in step 4. Then find the problem symptoms in the problem symptoms table. Look at the "Suspected Area" column for a list of potentially malfunctioning circuits and/or parts.

NEXT

7

CIRCUIT INSPECTION OR PARTS INSPECTION

- (a) Identify the malfunctioning circuit or part.

NEXT

8

ADJUST, REPAIR OR REPLACE

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

NEXT

9

CONFIRMATION TEST

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

NEXT

END

2. CUSTOMER PROBLEM ANALYSIS

INTRODUCTION – HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS**IN-75****HINT:**

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

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

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

The diagnostic system in the CAMRY HV has various functions.

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

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

System	DTC Check (Normal Mode)	DTC Check (Check Mode)	Sensor Check/Test Mode (Input Signal Check)	Data List	Active Test
SFI System	○	○		○	○
Smart Key System (Starting)	○			○	○
Hybrid Control System	○			○	○
Hybrid Battery System	○	○		○	○
Tire Pressure Warning System	○		○	○	○
Electronically Controlled Brake System	○		○	○	○
Electric Steering Lock	○			○	○
Electronic Power Steering System	○			○	

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INTRODUCTION – HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

System	DTC Check (Normal Mode)	DTC Check (Check Mode)	Sensor Check/Test Mode (Input Signal Check)	Data List	Active Test
Air Conditioning System	○			○	○
Airbag System	○	○		○	
Occupant Classification System	○			○	
Seat Belt Warning System					○
Engine Immobilizer System	○			○	○
Cruise Control System	○			○	
Lighting System	○			○	○
Power Door Lock Control System	○			○	○
Wireless Door Lock Control System	○			○	○
Smart Key System (Door Lock)	○			○	○
Meter/Gauge System	○			○	○
Audio and Visual System	○				
Navigation System	○				
Window Defogger System					○
Fuel Lid Opener System				○	○
Sliding Roof System	○			○	○

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

1

DTC CHECK

NEXT

2

MAKE A NOTE OF DTCS DISPLAYED AND THEN CLEAR MEMORY

NEXT

3

SYMPTOM CONFIRMATION

Result

Result	Proceed to
No symptoms exist	A
Symptoms exist	B

B

Go to step 5

A

4

SIMULATION TEST USING SYMPTOM SIMULATION METHODS

NEXT

5

DTC CHECK

Result

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

B

TROUBLESHOOTING OF PROBLEM INDICATED BY DTC

A

6

SYMPTOM CONFIRMATION

Result

Result	Proceed to
No symptoms exist	A
Symptoms exist	B

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

B

SYSTEM NORMAL

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INTRODUCTION – HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

A

TROUBLESHOOTING OF EACH PROBLEM SYMPTOM

IN

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

4. SYMPTOM SIMULATION**HINT:**

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

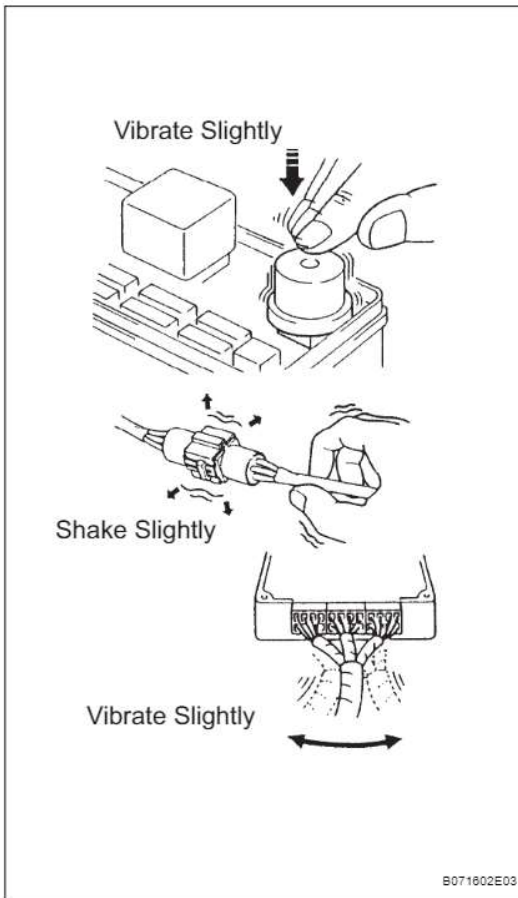
For example:

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

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.

INTRODUCTION – HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

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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.

NOTICE:

Applying strong vibration to relays may open relays.

(2) **CONNECTORS**

Slightly shake the connector vertically and horizontally.

(3) **WIRE HARNESS**

Slightly shake the wire harness vertically and horizontally.

HINT:

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

(b) **HEAT METHOD:** When a malfunction seems to occur when the area in question is heated.

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

NOTICE:

- **Do not heat to more than 60°C (140°F). Exceeding this temperature may damage the components.**
- **Do not apply heat directly to the parts in the ECU.**

(c) **WATER SPRINKLING METHOD:** When a malfunction seems to occur on a rainy day or in high-humidity.

(1) Sprinkle water onto the vehicle and check if the malfunction occurs.

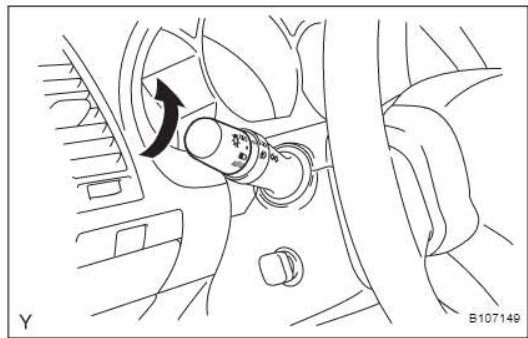
NOTICE:

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

HINT:

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





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

5. **DIAGNOSTIC TROUBLE CODE CHART**

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

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

6. **PROBLEM SYMPTOMS TABLE**

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

HINT:

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

Item	Description
Problem Symptom	-
Circuit Inspection, Inspection Order	Indicates the order in which the circuits need to be checked
Circuit or Part Name	Indicates the circuit or part which needs to be checked
See Page	Indicates the page where the flowchart for each circuit is located

7. **CIRCUIT INSPECTION**

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

Item	Description
Circuit Description	The major role, operation of the circuit and its component parts are explained.
Diagnostic Trouble Code No. and Detection Item	Indicates the diagnostic trouble codes, diagnostic trouble code settings and suspected areas for a problem
Wiring Diagram	This shows a wiring diagram of the circuit. Use this diagram together with ELECTRICAL WIRING DIAGRAM to thoroughly understand the circuit. Wire colors are indicated by an alphabetical code. B = Black, L = Blue, R = Red, BR = Brown, LG = Light Green, V = Violet, G = Green, O = Orange, W = White, GR = Gray, P = Pink, Y = Yellow, SB = Sky Blue The first letter indicates the basic wire color and the second letter indicates the color of the stripe.

INTRODUCTION – HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

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Item	Description
Inspection Procedures	Use the inspection procedures to determine if the circuit is normal or abnormal. If abnormal, use the inspection procedures to determine whether the problem is located in the sensors, actuators, wire harnesses or ECU.
Indicates the condition of the connector of the ECU during the check	Connector being checked is connected. Connections of tester are indicated by (+) or (-) after the terminal name. Connector being checked is disconnected. The inspections between a connector and body ground, information about the body ground is not shown in the illustration.

IN

GLOSSARY OF SAE AND TOYOTA TERMS

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

SAE ABBREVIATIONS	SAE TERMS	TOYOTA TERMS ()-ABBREVIATIONS
A/C	Air Conditioning	Air Conditioner
ACL	Air Cleaner	Air Cleaner, A/CL
AIR	Secondary Air Injection	Air Injection (AI)
AP	Accelerator Pedal	-
B+	Battery Positive Voltage	+B, Battery Voltage
BARO	Barometric Pressure	HAC
CAC	Charge Air Cooler	Intercooler
CARB	Carburetor	Carburetor
CFI	Continuous Fuel Injection	-
CKP	Crankshaft Position	Crank Angle
CL	Closed Loop	Closed Loop
CMP	Camshaft Position	Cam Angle
CPP	Clutch Pedal Position	-
CTOX	Continuous Trap Oxidizer	-
CTP	Closed Throttle Position	LL ON, Idle ON
DFI	Direct Fuel Injection	Direct Injection (DI./INJ)
DI	Distributor Ignition	-
DLC3	Data Link Connector 3	OBD II Diagnostic Connector
DTC	Diagnostic Trouble Code	Diagnostic Trouble Code
DTM	Diagnostic Test Mode	-
ECL	Engine Coolant Level	-
ECM	Engine Control Module	Engine Electronic Control Unit (ECU)
ECT	Engine Coolant Temperature	Coolant Temperature, Water Temperature (THW)
EEPROM	Electrically Erasable Programmable Read Only Memory	Electrically Erasable Programmable Read Only Memory (EEPROM), Erasable Programmable Read Only Memory (EPROM)
EFE	Early Fuel Evaporation	Cold Mixture Heater (CMH), Heat Control Valve (HCV)
EGR	Exhaust Gas Recirculation	Exhaust Gas Recirculation (EGR)
EI	Electronic Ignition	Distributorless Ignition (DLI)
EM	Engine Modification	Engine Modification (EM)
EPROM	Erasable Programmable Read Only Memory	Programmable Read Only Memory (PROM)
EVAP	Evaporative Emission	Evaporative Emission Control (EVAP)
FC	Fan Control	-
FEEPROM	Flash Electrically Erasable Programmable Read Only Memory	-
FEPROM	Flash Erasable Programmable Read Only Memory	-
FF	Flexible Fuel	-
FP	Fuel Pump	Fuel Pump
GEN	Generator	Alternator
GND	Ground	Ground (GND)
HO2S	Heated Oxygen Sensor	Heated Oxygen Sensor (HO ₂ S)
IAC	Idle Air Control	Idle Speed Control (ISC)
IAT	Intake Air Temperature	Intake or Inlet Air Temperature
ICM	Ignition Control Module	-

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INTRODUCTION – TERMS

SAE ABBREVIATIONS	SAE TERMS	TOYOTA TERMS ()-ABBREVIATIONS
IFI	Indirect Fuel Injection	Indirect Injection (IDL)
IFS	Inertia Fuel-Shutoff	-
ISC	Idle Speed Control	-
KS	Knock Sensor	Knock Sensor
MAF	Mass Airflow	Air Flow Meter
MAP	Manifold Absolute Pressure	Manifold Pressure Intake Vacuum
MC	Mixture Control	Electric Bleed Air Control Valve (EBCV) Mixture Control Valve (MCV) Electric Air Control Valve (EACV)
MDP	Manifold Differential Pressure	-
MFI	Multiport Fuel Injection	Electronic Fuel Injection (EFI)
MIL	Malfunction Indicator Light	Check Engine Light
MST	Manifold Surface Temperature	-
MVZ	Manifold Vacuum Zone	-
NVRAM	Non-Volatile Random Access Memory	-
O2S	Oxygen Sensor	Oxygen Sensor, O ₂ Sensor (O 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 Particulate Filter (DPF) Diesel Particulate Trap (DPT)
RAM	Random Access Memory	Random Access Memory (RAM)
RM	Relay Module	-
ROM	Read Only Memory	Read Only Memory (ROM)
RPM	Engine Speed	Engine Speed
SC	Supercharger	Supercharger
SCB	Supercharger Bypass	E-ABV
SFI	Sequential Multiport Fuel Injection	Electronic Fuel Injection (EFI), Sequential Injection
SPL	Smoke Puff Limiter	-
SRI	Service Reminder Indicator	-
SRT	System Readiness Test	-
ST	Scan Tool	-
TB	Throttle Body	Throttle Body
TBI	Throttle Body Fuel Injection	Single Point Injection Central Fuel Injection (Ci)
TC	Turbocharger	Turbocharger
TCC	Torque Converter Clutch	Torque Converter
TCM	Transmission Control Module	Transmission ECU, ECT ECU
TP	Throttle Position	Throttle Position
TR	Transmission Range	-
TVV	Thermal Vacuum Valve	Bimetallic Vacuum Switching Valve (BVSV) Thermostatic Vacuum Switching Valve (TVSV)
TWC	Three-Way Catalytic Converter	Three-Way Catalytic (TWC) Manifold Converter CC _{RO}

INTRODUCTION – TERMS

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SAE ABBREVIATIONS	SAE TERMS	TOYOTA TERMS ()-ABBREVIATIONS
TWC+OC	Three-Way + Oxidation Catalytic Converter	CC _R + CCo
VAF	Volume Airflow	Air Flow Meter
VR	Voltage Regulator	Voltage Regulator
VSS	Vehicle Speed Sensor	Vehicle Speed Sensor
WOT	Wide Open Throttle	Full Throttle
WU-OC	Warm Up Oxidation Catalytic Converter	-
WU-TWC	Warm Up Three-Way Catalytic Converter	-
3GR	Third Gear	-
4GR	Fourth Gear	-

IN

2007 *Camry Hybrid* Repair Manual



HOW TO USE THIS MANUAL

GENERAL INFORMATION

1. GENERAL DESCRIPTION

- (a) This manual is written in accordance with SAE J2008.
 - (1) Diagnosis
 - (2) Removing / Installing, Replacing, Disassembling / Reassembling, Checking and Adjusting
 - (3) Final Inspection
- (b) The following procedures are omitted from this manual. However, these procedures must be performed.
 - (1) Use a jack or lift to perform operations
 - (2) Clean all removed parts
 - (3) Perform a visual check

2. INDEX

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

3. PREPARATION

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

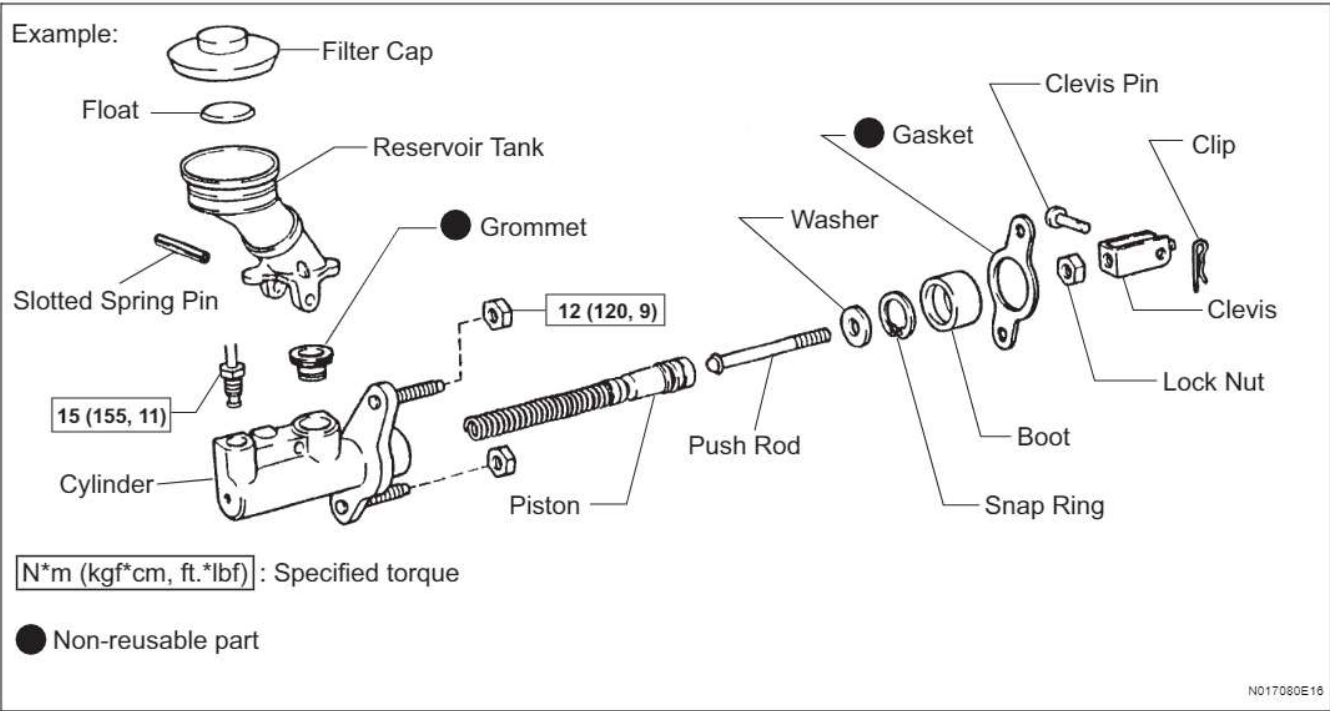
4. REPAIR PROCEDURES

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

IN

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INTRODUCTION – HOW TO USE THIS MANUAL



- (c) Torque specifications, grease application areas and non-reusable parts are emphasized in the procedures.
- HINT:
There are cases where such information can only be explained by using an illustration. In these cases, torque, oil and other information are described in the illustration.
- (d) Only items with key points are described in the text. What to do and other details are explained using illustrations next to the text. Both the text and illustrations are accompanied by standard values and notices.

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

- (e) Illustrations of similar vehicle models are sometimes used. In these cases, minor details may be different from the actual vehicle.
- (f) Procedures are presented in a step-by-step format.

5. SERVICE SPECIFICATIONS

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

6. TERM DEFINITIONS

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

7. INTERNATIONAL SYSTEM OF UNITS

- (a) The units used in this manual comply with the International System of Units (SI UNIT) standard. Units from the metric system and the English systems are also provided.

Example:

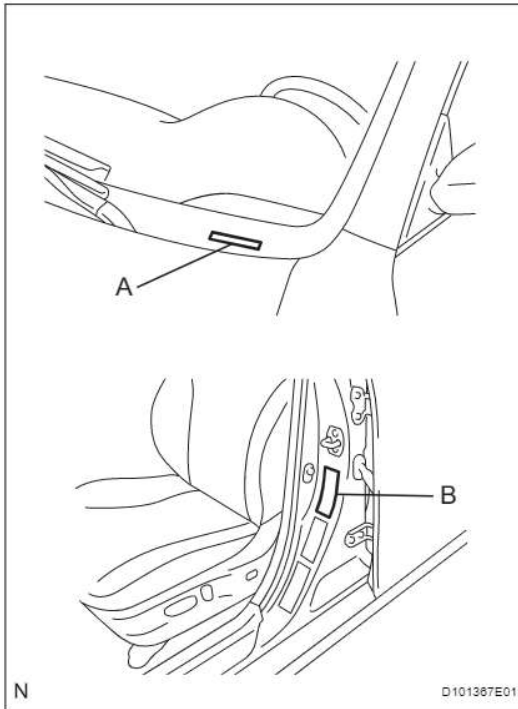
Torque: 30 N*m (310 kgf*cm, 22 ft.*lbf)

IN

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INTRODUCTION – IDENTIFICATION INFORMATION

IN



IDENTIFICATION INFORMATION

VEHICLE IDENTIFICATION AND SERIAL NUMBERS

1. VEHICLE IDENTIFICATION NUMBER

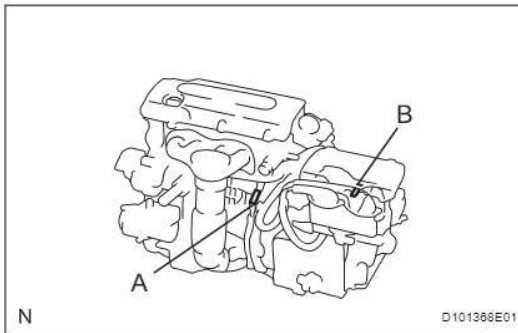
- (a) The vehicle identification number is stamped on the vehicle body and on the certification label, as shown in the illustration.

A:

Vehicle Identification Number

B:

Certification Label



2. ENGINE SERIAL NUMBER AND TRANSAXLE SERIAL NUMBER

- (a) The engine serial number is stamped on the cylinder block of the engine, and the transaxle serial number is stamped on the housing, as shown in the illustration.

A:

Engine Serial Number

B:

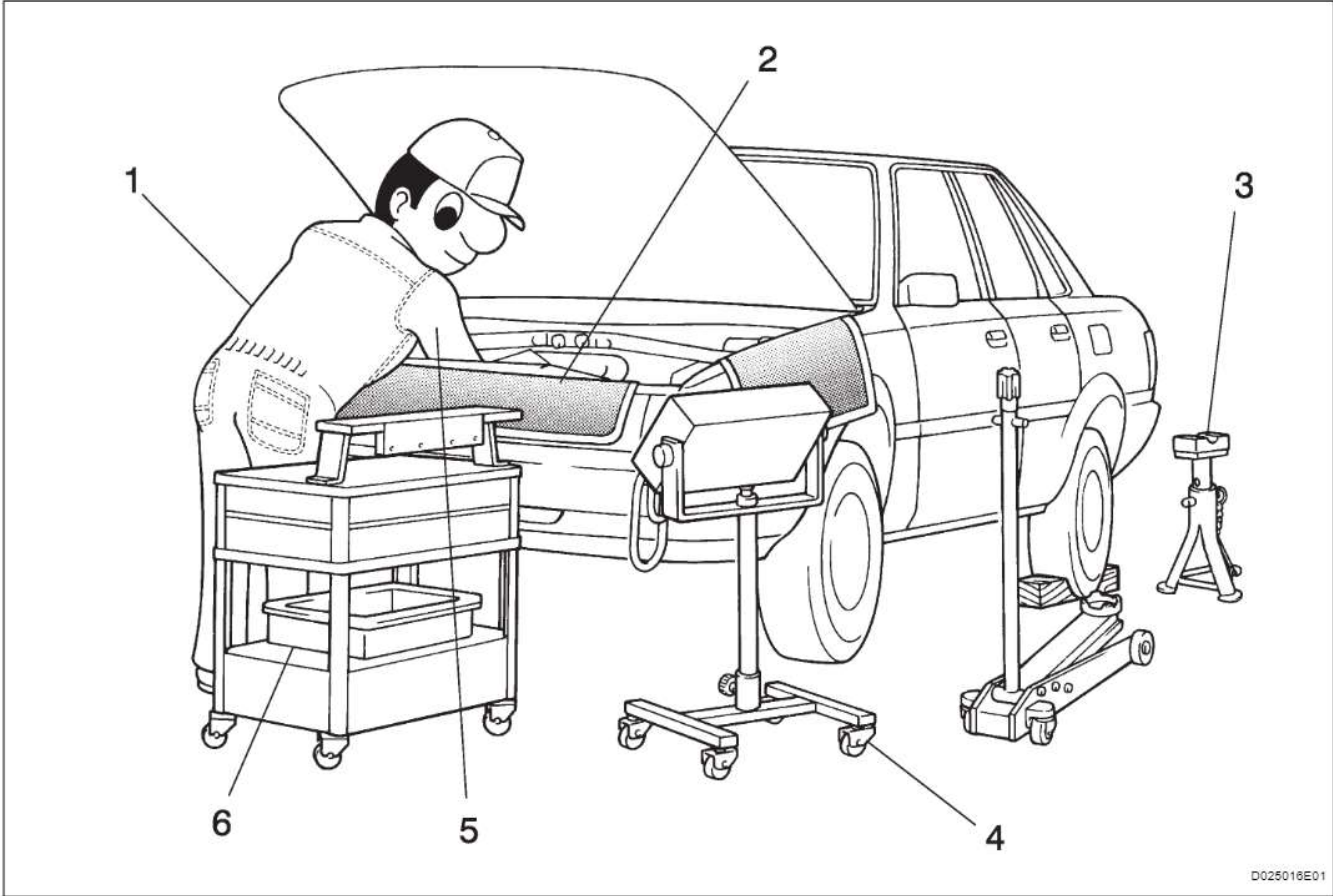
Transaxle Serial Number

REPAIR INSTRUCTION

PRECAUTION

1. BASIC REPAIR HINT
- (a) HINTS ON OPERATIONS

IN



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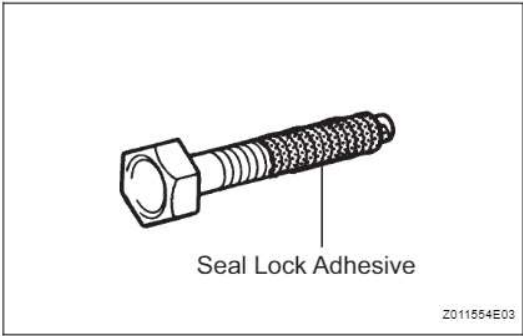
1	Attire	• Always wear a clean uniform. • Hat and safety shoes must be worn.
2	Vehicle protection	Prepare a grille cover, fender cover, seat cover and floor mat before starting the operation.
3	Safety operation	• When working in a pair or groups, be sure to check safety for one another. • When working 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 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 the parts, check the general condition of the assembly and for deformation and damage. • When the assembly is complicated, take notes. For example, note the total number of electrical connections, bolts, or hoses removed. Add matchmarks to insure 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.

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INTRODUCTION – REPAIR INSTRUCTION

6	Removed parts	- Place the removed parts in a separate box to avoid mixing them up with the new parts or contaminating the new parts. - 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.
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IN



- (b) JACKING UP AND SUPPORTING VEHICLE
- (1) Care must be taken when jacking up and supporting the vehicle. Be sure to lift and support the vehicle at the proper locations.
- (c) PRECOATED PARTS
- (1) Precoated parts are bolts and nuts that are coated with a seal lock adhesive at the factory.
- (2) If a precoated part is retightened, loosened or moved in any way, it must be recoated with the specified adhesive.
- (3) When reusing a precoated part, clean off the old adhesive and dry the part with compressed air. Then apply new seal lock adhesive appropriate to that part.
- (4) Some seal lock agents harden slowly. You may have to wait for the seal lock adhesive to harden.
- (d) GASKETS
- (1) When necessary, use a sealer on gaskets to prevent leaks.
- (e) BOLTS, NUTS AND SCREWS
- (1) Carefully follow all the specifications for tightening torques. Always use a torque wrench.
- (f) FUSES
- (1) When inspecting a fuse, check that the wire of the fuse is not broken.
- (2) When replacing fuses, be sure that the new fuse has the correct amperage rating. Do not exceed the rating or use one with a lower rating.

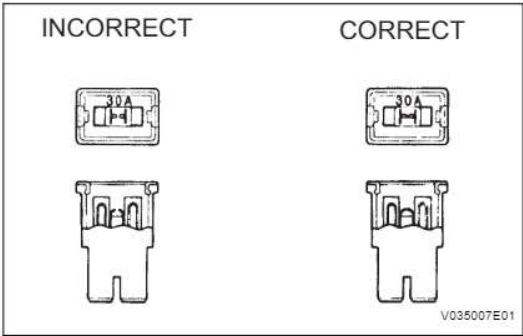
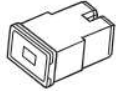
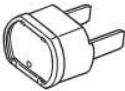


Illustration	Symbol	Part Name	Abbreviation
N	N	FUSE	FUSE

INTRODUCTION – REPAIR INSTRUCTION

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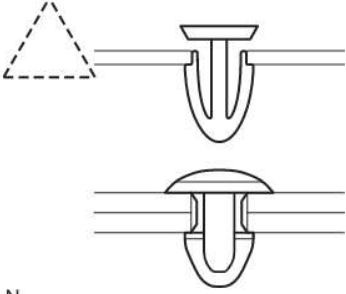
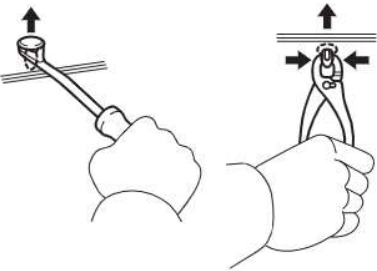
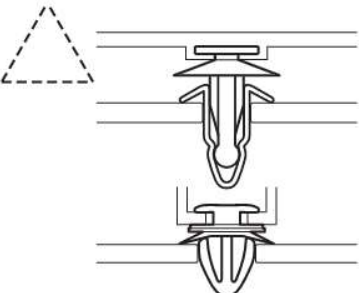
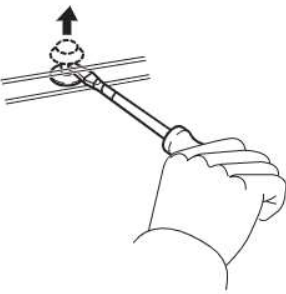
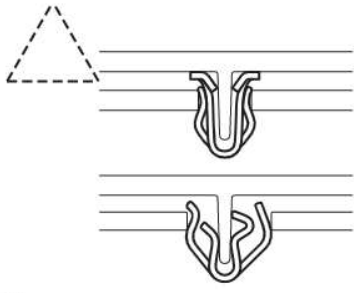
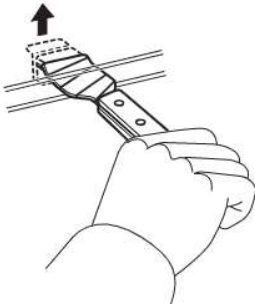
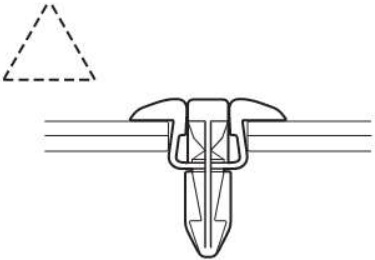
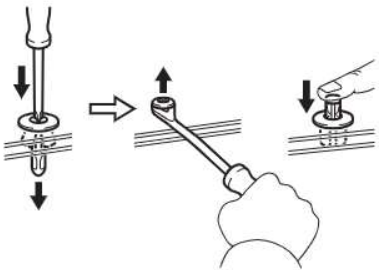
IN

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

- (g) CLIPS
- (1) The removal and installation methods of typical clips used for vehicle body parts are shown in the table below.
- HINT:
- If clips are damaged during work, always replace the damaged clip with a new one.

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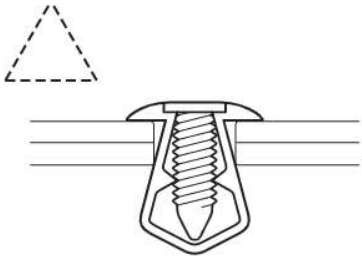
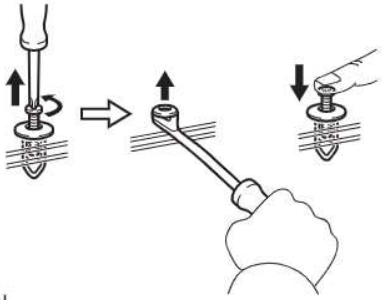
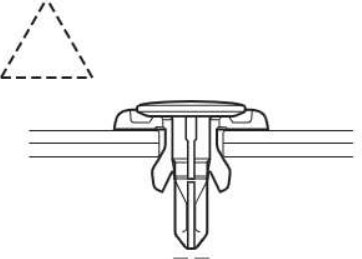
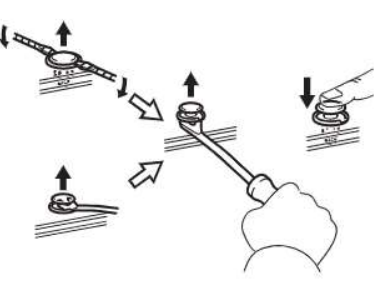
INTRODUCTION – REPAIR INSTRUCTION

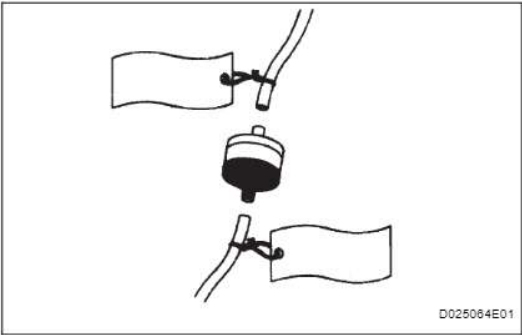
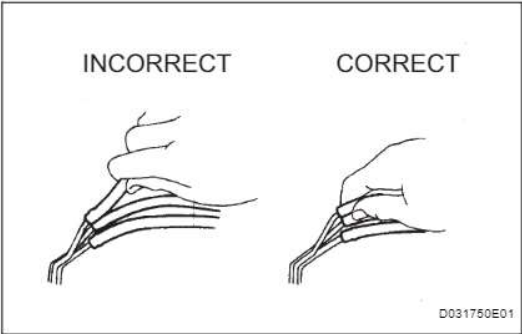
Shape (Example)	Removal/Installation
 N	Remove clips with clip remover or pliers.  N
 N	Remove fasteners with clip remover or screwdriver.  N
 N	Remove clips with wide scraper to prevent panel damage.  N
 N	Remove clips by pushing center pin through and prying out shell.  N

INTRODUCTION – REPAIR INSTRUCTION

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IN

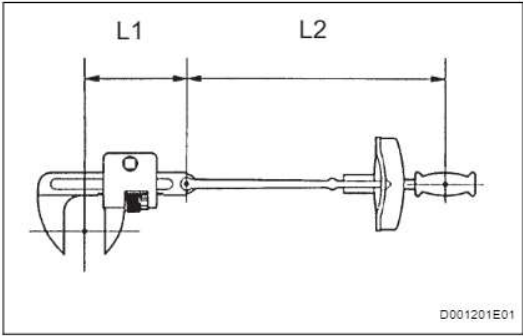
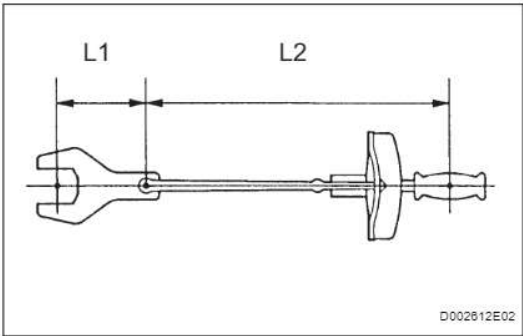
Shape (Example)	Removal/Installation
 N	Remove clips by unscrewing center pin and prying out shell.  N
 N	Remove clips by prying out pin and then prying out shell.  N



- (h) REMOVAL AND INSTALLATION OF VACUUM HOSES
- (1) To disconnect a vacuum hose, pull and twist from the end of the hose. Do not pull from the middle of the hose as this may damage the hose.
 - (2) When disconnecting vacuum hoses, use tags to identify where they should be reconnected.
 - (3) After completing any hose related repairs, double check that the vacuum hoses are properly connected. The label under the hood shows the proper layout.
 - (4) When using a vacuum gauge, never force the hose onto a connector that is too large. If a hose has been stretched, air may leak. Use a step-down adapter if necessary.

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(i) TORQUE WHEN USING TORQUE WRENCH WITH EXTENSION TOOL

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

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

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

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

2. PRECAUTIONS FOR HIGH-VOLTAGE CIRCUIT INSPECTION AND SERVICE

NOTICE:
The hybrid system contains a 244.8 V high-voltage system with a strong alkali solution of potassium hydroxide. Be sure to follow the instructions in this manual to handle the system correctly. Failure to do so may result in serious injury or electrocution.

(a) Engineer must undergo special training to be able to perform high-voltage system inspection and servicing.

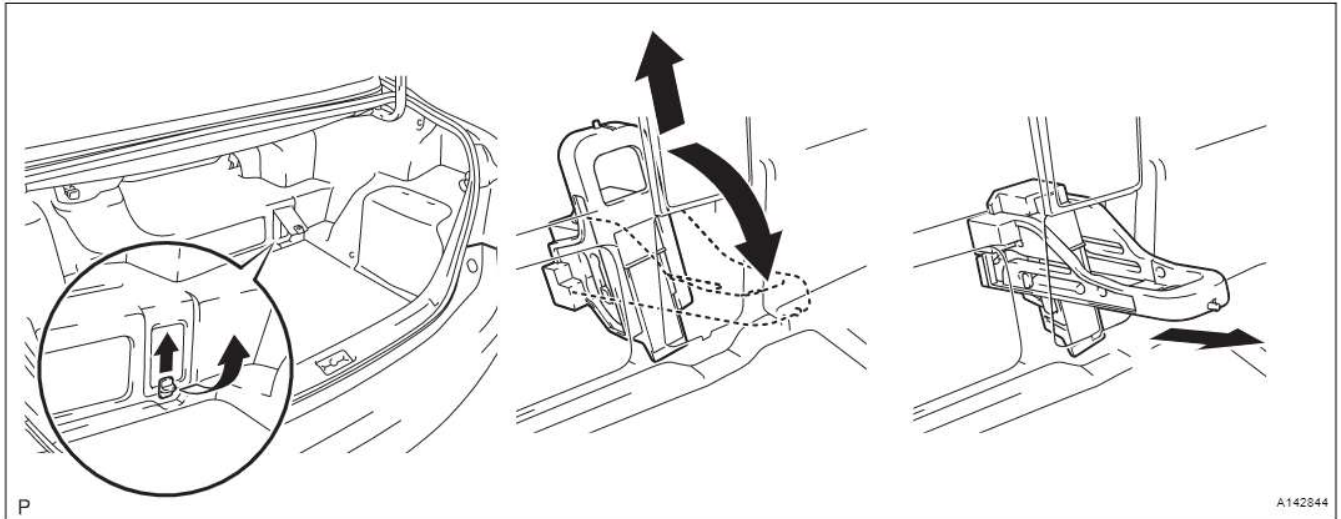
(b) All high-voltage wire harness connectors are colored orange. The HV battery and other high-voltage components have "High Voltage" caution labels. Do not carelessly touch these wires and components.

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

IN

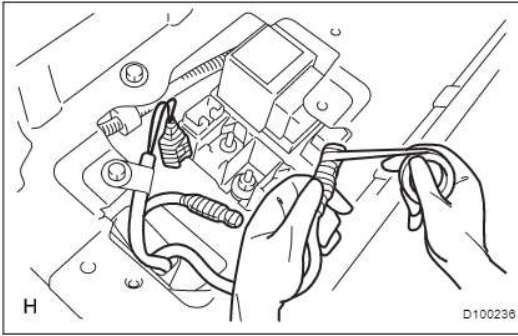
**NOTICE:**

- Before removing the service plug, confirm power switch off.
 - Do not put the vehicle into the READY-on state after removing the service plug grip as the ECU may be damaged.
- (d) After removing the service plug, wait 10 minutes before touching any of the high-voltage connectors and terminals.
- HINT:**
10 minutes are required to discharge the high-voltage condenser inside the inverter.
- (e) Before wearing insulated gloves, make sure that they are not cracked, ruptured, torn, or damaged in any way. Do not wear wet insulated gloves.
- (f) When servicing the vehicle, do not carry metal objects like mechanical pencils or scales that can be dropped accidentally and cause a short circuit.
- (g) Before touching a bare high-voltage terminal, wear insulated gloves and use a tester to make sure that the terminal voltage is 0 V.



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- (h) After disconnecting or exposing a high-voltage connector or terminal, insulate it immediately using insulation tape.
- (i) The screw of a high-voltage terminal should be tightened firmly to the specified torque. Both insufficient and excessive torque can cause failure.

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

IN

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Person in charge: _____

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

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

Person in charge: _____

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

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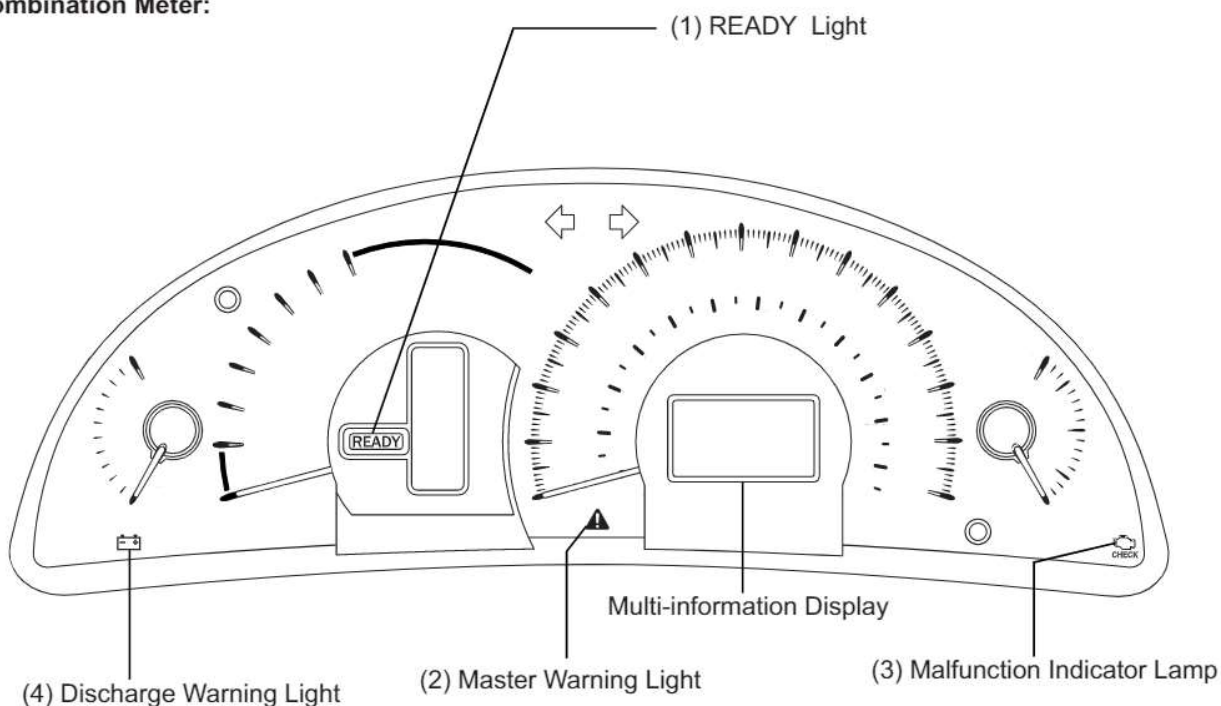
INTRODUCTION – REPAIR INSTRUCTION

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- (k) After servicing the high-voltage system and before reinstalling the service plug, check again that you have not left a part or tool inside, that the high-voltage terminal screws are firmly tightened, and that the connectors are correctly connected.
- (l) Do not place the battery upside down while removing and installing it.

3. ACTIONS TO BE TAKEN WHEN THE WARNING LIGHT IS LIT

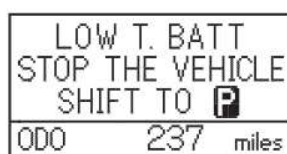
Combination Meter:



H

E123357E03

Multi-information Display:



(5) LOW T. BATT STOP THE VEHICLE SHIFT TO P



(6) CHECK HYBRID SYSTEM



(7) HYBRID SYSTEM OVER HEAT

N

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- (a) If one of the warning lights (2) to (7) becomes lit, connect an intelligent tester to the DLC3 connector to check the DTCs (Diagnostic Trouble Codes). Then, refer to the applicable troubleshooting steps in this manual to inspect and repair the affected area. The foregoing actions are also required if the READY light does not illuminate when the vehicle is first started.

Combination Meter

Warning Light	Outline
(1) READY Light	This light blinks when the driver simultaneously presses the brake pedal and turns on the power switch while the shift lever is in the P position. Thereafter, the light changes to illumination when the system starts, thus informing the driver that the vehicle is drivable.
(2) Master Warning Light	The primary function of this warning light, which illuminates simultaneously with the sounding of a warning buzzer, is to inform the driver in case of a certain condition is detected.
(3) Malfunction Indicator Lamp	Turns on when there is a malfunction in the engine control system.
(4) Discharge Warning Light	Turn on when there is a malfunction in the DC 12 V charging system (converter assembly).

Multi-information Display

Multi-information Display	Outline
(5) LOW T. BATT STOP THE VEHICLE SHIFT TO P	This warning display indicates to the driver that the SOC is lower than the minimum standard value (%). At the same time, the master warning light blinks and the buzzer sounds.
(6) CHECK HYBRID SYSTEM	This warning display indicates to the driver that a malfunction has occurred in the THS II system. At the same time, the master warning light illuminates and the buzzer sounds. However, these are inactive for 5 seconds after the power source is turned to power switch on (IG).
(7) HYBRID SYSTEM OVER HEAT	This warning display indicates to the driver that the temperatures of any parts related to the THS II system exceed the standard value. At the same time, the master warning light illuminates and the buzzer sounds.

4. ACTIONS TO BE TAKEN WHEN BATTERIES ARE DEPLETED**HINT:**

The CAMRY HV uses a 12 V auxiliary and a 244.8 V hybrid vehicle battery. Therefore, there are two recharging methods when the batteries are depleted.

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

HINT:

The following problems indicate that the auxiliary battery is depleted:

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

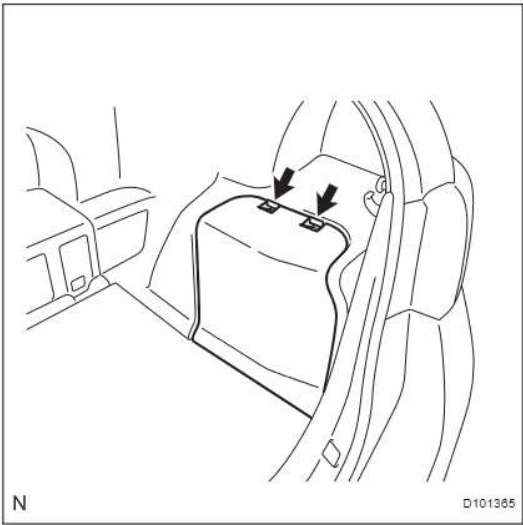
CAUTION:

Never use a quick charger.

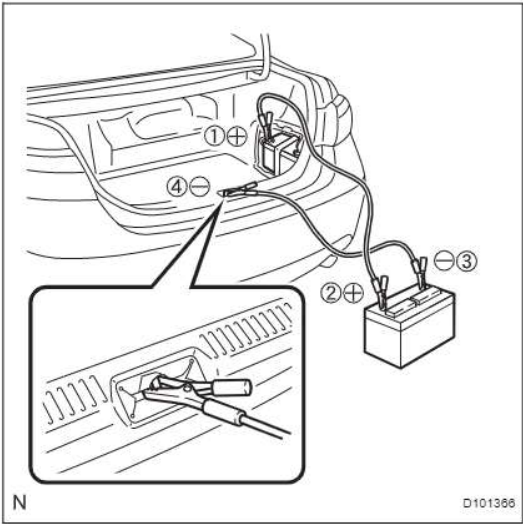
- (1) Move the shift lever to the P position and engage the parking brake.

INTRODUCTION – REPAIR INSTRUCTION

IN

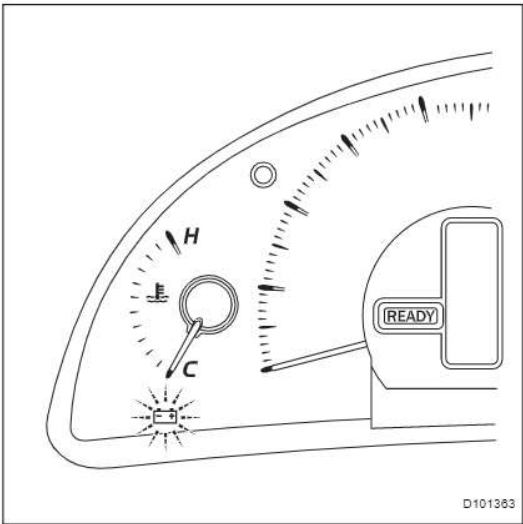


- (2) Release the 2 claws, then remove the auxiliary battery cover.



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

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



- (5) Put the vehicle into the READY-on state to start the hybrid system.

NOTICE:
Immediately disconnect the booster cable in the reverse order of connection after the hybrid system and the engine have started. Do not leave the booster cable connected because it is not designed for recharging purposes.
If the hybrid system fails to start and the discharge warning light turns ON, the HV battery may be depleted.

- (b) When the hybrid vehicle battery is depleted: Replace the hybrid vehicle battery.

HINT:
When the hybrid vehicle battery is depleted, the HYBRID VEHICLE BATTERY WARNING illuminates, and DTC P3000-389 is stored in the hybrid vehicle control ECU.

5. SPECIAL NOTES FOR VEHICLE INSPECTION

CAUTION:

If the vehicle is run in the inspection mode, for such as a speedometer test, DTC ●●●●● may be output. Therefore, if the warning light comes on, after canceling the inspection mode, check for DTCs using the intelligent tester and clear the DTCs.

- (a) Vehicle conditions
- (1) Before activating inspection mode, turn the air conditioning off, start the engine with the shift lever in the P position, and check that the engine stops within several seconds after starting (engine warm up check).
 - (2) Activate inspection mode and inspect the vehicle.

Shift position for each test

Test item	Inspection mode	Shift position
1. Speedometer test	Inspection mode	D

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

CAUTION:

After canceling the inspection mode, turn the power switch on (IG) again and check that the warning light is OFF.

- (b) Special notes for speedometer test
- CAUTION:
- Be sure to perform the test in the inspection mode (See page IN-65).
 - Do not use the speedometer tester to perform rapid starting or quick acceleration/ deceleration without first setting the proper load on the vehicle. Failing to set the load may damage the transaxle.
- (1) Depress the accelerator pedal slowly and gradually accelerate the vehicle. Make a measurement.
- (2) After the measurement, use the brake to gradually decelerate the vehicle.
- (c) Special notes for using the chassis dynamometer
- (1) Always set an appropriate load before starting the test.
- NOTICE:
- Be sure to perform the test in the inspection mode (See page IN-65).
 - Suddenly acceleration or deceleration of the vehicle on a chassis dynamometer under minimal load may damage the transaxle.

6. ACTIONS TO BE TAKEN FOR VEHICLE DAMAGED BY IMPACT

NOTICE:

The hybrid system contains a 244.8 V high-voltage system with a strong alkali solution of potassium hydroxide. Be sure to follow the instructions in this manual to handle the system correctly. Failure to do so may result in serious injury or electrocution.

(a) Items to be prepared or operation at the accident site

- Protective clothing (insulated gloves, rubber gloves, goggles, and safety shoes)
- Saturated boric acid solution 20 L (obtain 800 g of boric acid powder, put it into a container, and dissolve it in water)
- Red litmus paper
- ABC fire extinguisher (effective against both oil flames and electrical flames)
- A shop rag or piece of cloth (for wiping off the electrolyte)
- Insulation tape (for insulating cable)
- Electrical tester

(b) Actions to be taken at the accident site

NOTICE:

Do not touch a bare cable that may have high-voltage. If the cable must be touched or if accidental contact is unavoidable, wear insulated gloves and insulate the cable using insulation tape.

- If the vehicle catches on fire, use an ABC fire extinguisher to extinguish the fire. Trying to extinguish a fire using only a small amount of water can be more dangerous than effective. Use a substantial amount of water or wait for firefighters.
- Visually check the HV battery and the immediate area for any electrolyte leakage. Do not touch any leaked liquid because it could be highly alkaline electrolyte.
- Work on the vehicle only after the vehicle has been pulled out of the water.

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

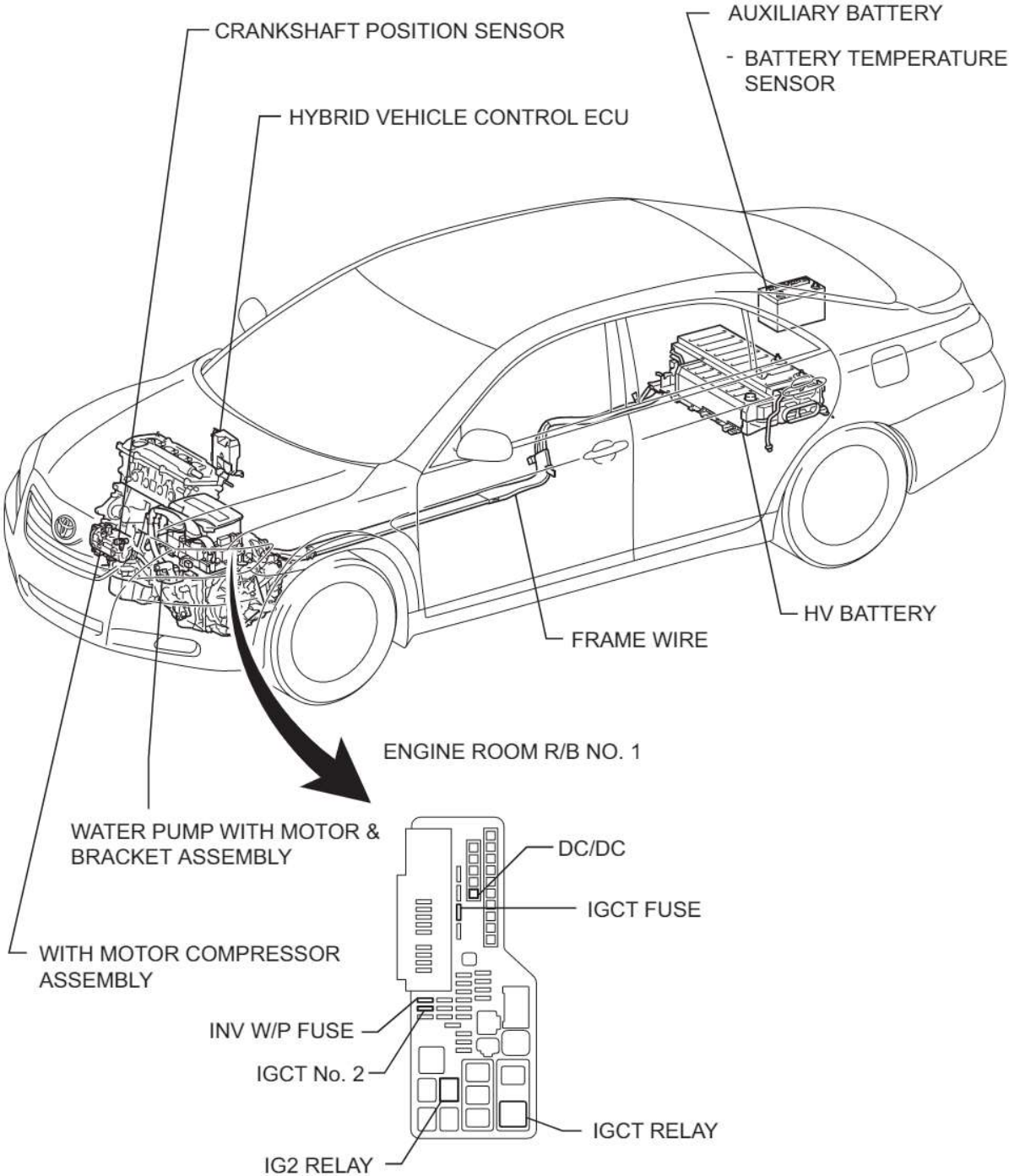
NOTICE:

Do not touch any leaked liquid because it could be highly alkaline electrolyte. Wear rubber gloves and goggles, neutralize the liquid with saturated boric acid solution, and then apply red litmus paper to the leak. Check that the paper does not turn blue. Wipe the neutralized liquid with a shop rag or piece of cloth.

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

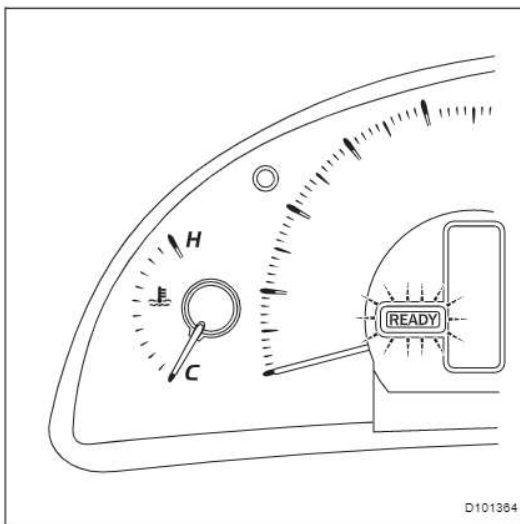
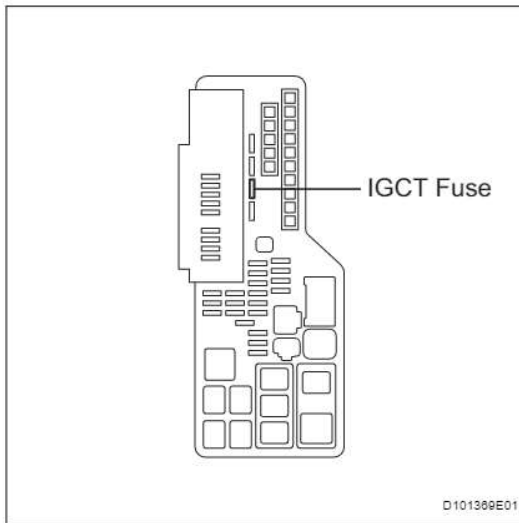
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IN



- (3) Turn the power switch off.

HINT:

If the power switch cannot be turned off, remove the IGCT fuse from the engine room R/B No. 1 or disconnect the cable from the negative terminal of the auxiliary battery.

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

NOTICE:

Be sure to install the service plug before turning the power switch on (IG). Starting the hybrid system with the service plug removed may damage the ECU.

- (c) Moving the damaged vehicle

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

- One or more of the high-voltage components and cables are damaged.
- The driving, traction, or fuel system is damaged.
- The master warning light is on.
- The READY light does not come on when the vehicle is in the READY-on state.

CAUTION:

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

NOTICE:

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

- (1) Park the vehicle in a safe place.
 - (2) Shift the shift lever to the "P" position, and apply the parking brake.
 - (3) Turn the power switch off, and disconnect the power cable from the negative (-) terminal of the auxiliary battery.
 - (4) Remove the service plug while wearing insulated gloves.
- (d) Actions required after moving the damaged vehicle
- (1) Procedure

If you see any liquid on the road surface, it could be highly alkaline electrolyte leakage. Wear rubber gloves and goggles, neutralize the liquid with saturated boric acid solution, and then apply red litmus paper to the leak. Check that the paper does not turn blue. Wipe the neutralized liquid with a shop rag or piece of cloth.
 - (e) Items to be prepared (when repairing damaged vehicles)
 - Protective clothing (Insulated gloves, rubber gloves, goggles, and safety shoes)

- Saturated boric acid solution 20 L (obtain 800 g of boric acid powder, put it into a container, and dissolve it in water)
 - Red litmus paper
 - A shop rag or piece of cloth (for wiping off the electrolyte)
 - Vinyl tape (for insulating cable)
 - Electrical tester
- (f) Precautions to be observed when servicing the damaged vehicle

NOTICE:

Always follow instructions to ensure safety.

- (1) Wear insulated or rubber gloves, goggles, and safety shoes.
- (2) Check the HV battery and immediate area for any electrolyte leakage.
Do not touch any leaked liquid because it could be highly alkaline electrolyte. Wear rubber gloves and goggles, neutralize the liquid with saturated boric acid solution, and then apply red litmus paper to the leak. Check that the paper does not turn blue. Wipe the neutralized liquid with a shop rag or piece of cloth.

NOTICE:

- **If the electrolyte comes in contact with your skin, use a saturated boric acid solution or a large amount of water to wash it off. If the electrolyte comes in contact with an article of clothing, take it off immediately.**
 - **If the electrolyte comes in contact with your eyes, call out loudly for help. Do not rub your eyes. Wash them immediately with a large amount of water and seek medical care.**
- (3) Do not touch a bare cable that could be a high voltage cable. If the cable must be touched or if accidental contact is unavoidable, follow the following instructions: 1) wear insulated or rubber gloves and goggles, 2) measure the voltage between the cable and the body ground using an electrical tester, and 3) insulate the cable using insulation tape.
 - (4) If damage to any of the high-voltage components and cables is suspected, cut the high-voltage circuit using the procedure below.

NOTICE:

Do not touch a bare cable that may have high-voltage. If the cable must be touched or if accidental contact is unavoidable, wear insulated gloves and insulate the cable using insulation tape.

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- (5) Turn the power switch off.

HINT:

If the power switch cannot be turned off, remove the IGCT fuse from the HV relay block or disconnect the cable from the negative terminal of the auxiliary battery.

- (6) Wear insulated gloves, and then remove the service plug.
- (g) Precautions to be taken when disposing of the vehicle
- (1) Disposing of HV battery
When scrapping the vehicle, remove the HV battery from the vehicle and return it to the location specified by the manufacturer. Any damaged HV battery should also be returned to the specified location.

CAUTION:

- **After removing the battery, keep it away from water. Water may heat the battery, which results in fire.**
 - **Accidents such as electric shocks could result if the vehicle and its hybrid vehicle battery are disposed of improperly or abandoned. Therefore, make sure to return any hybrid battery to the prescribed recovery route through a TOYOTA dealer.**
- (h) Precautions to be observed when towing
- (1) Tow the damaged vehicle with its front and rear wheels lifted off the ground.

CAUTION:

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

- (i) Towing with the 4 wheels on the ground

CAUTION:

- **If the damaged vehicle needs to be towed using a rope, do not exceed 30 km/h (19 mph) and tow a limit distance and then have the vehicle towed by a truck.**
- **Turn the power switch on (IG) and shift the selector lever to the N position.**
- **If any abnormality is present in the damaged vehicle during towing, stop towing immediately.**

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

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

CAUTION:

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

(a) GENERAL NOTICE

- (1) As malfunctions of the SRS are difficult to confirm, the Diagnostic Trouble Codes (DTCs) become the most important source of information when troubleshooting. When troubleshooting the SRS, always check the DTCs before disconnecting the battery.
- (2) Work must be started at least 90 seconds after the power 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 power 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 system memory. The back-up power source may inadvertently power the SRS and cause it to deploy.

IN

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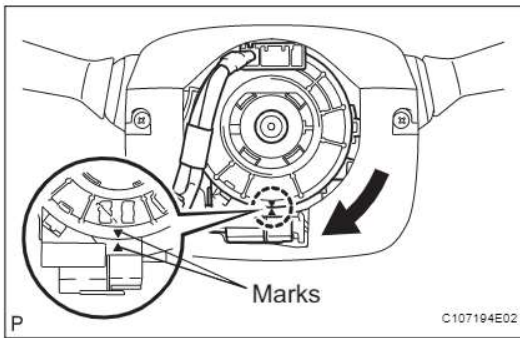
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- (3) In minor collisions where the SRS does not deploy, the steering pad, front passenger airbag assembly, driver side knee airbag assembly, front seat side airbag assembly, curtain shield airbag assembly and front seat outer belt assembly should be inspected before further use of the vehicle.
 (See page [RS-348](#) for steering pad)
 (See page [RS-385](#) for front passenger airbag assembly)
 (See page [RS-415](#) for front seat side airbag assembly)
 (See page [RS-365](#) for driver side knee airbag assembly)
 (See page [RS-409](#) for curtain shield airbag assembly)
 (See page [SB-24](#) for front seat outer belt assembly)
- (4) Never use SRS parts from another vehicle. When replacing parts, use new parts.
- (5) Before repairs, remove the airbag sensor assemblies if impacts are likely to be applied to the sensor during repairs.
- (6) Never disassemble and attempt to repair all airbag sensor assemblies and all airbag assemblies.
 1. Steering pad
 2. Front passenger airbag assembly
 3. Driver side knee airbag assembly
 4. Front seat side airbag assembly
 5. Curtain shield airbag assembly
 6. Front seat outer belt assembly
- (7) Replace the airbag sensor assemblies and the airbag assemblies if: 1) damage has occurred from being dropped, or 2) cracks, dents or other defects in the case, bracket or connector are present.
- (8) Do not directly expose the airbag sensor assembly or airbag assembly to hot air or flames.
- (9) Use a voltmeter / ohmmeter with high impedance (minimum = 10 kΩ) for troubleshooting electrical circuits.
- (10) Information labels are attached to the SRS components. Follow the instructions on the labels.
- (11) After work on the SRS is completed, check the SRS warning light.

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(b) SPIRAL CABLE

- (1) The steering wheel must be fitted correctly to the steering column with the spiral cable at the neutral position, as cable disconnection and other problems may occur. Refer to the information about correct installation of the steering wheel (See page RS-359).

(c) STEERING PAD

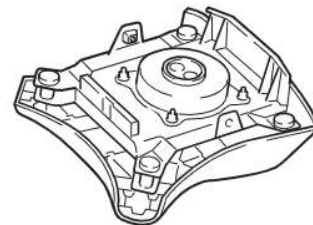
- (1) Always place a removed or new steering pad surface upward as shown in the illustration. Placing the horn button with the pad surface facing down could cause a serious accident if the airbag inflates. Also, do not place anything on top of the horn button.

Example:

○
CORRECT



✗
INCORRECT

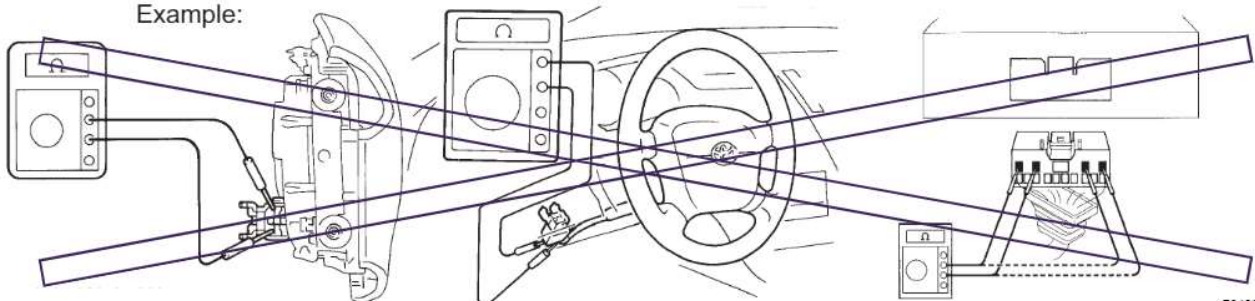


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- (2) Never measure the resistance of the airbag squib. This may cause the airbag to inflate, which could cause serious injury.

Example:



- (3) Grease or detergents of any kind should not be applied to the horn button.
- (4) Store the horn button assembly in an area where the ambient temperature is below 93°C (200°F), the humidity is not high and there is no electrical noise.
- (5) When using electric welding anywhere on the vehicle, disconnect the airbag ECU connectors (4 pins). These connectors contain shorting springs. This feature reduces the possibility of the airbag deploying due to current entering the squib wiring.

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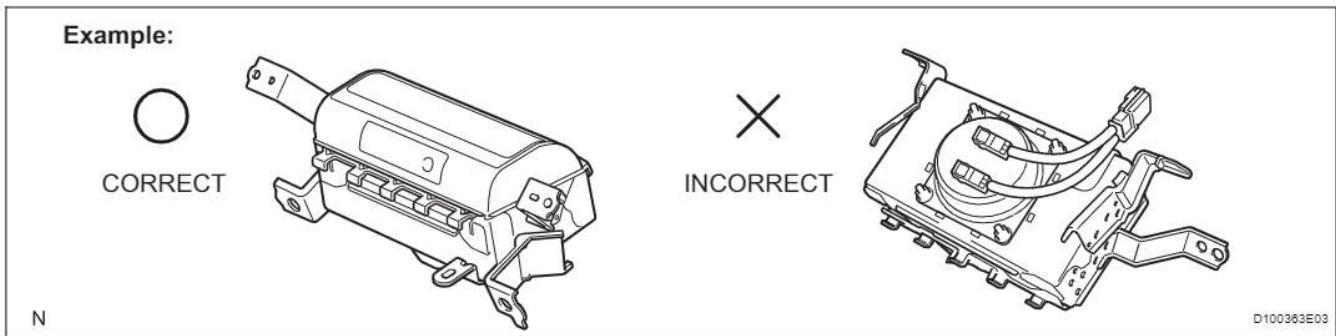
INTRODUCTION – REPAIR INSTRUCTION

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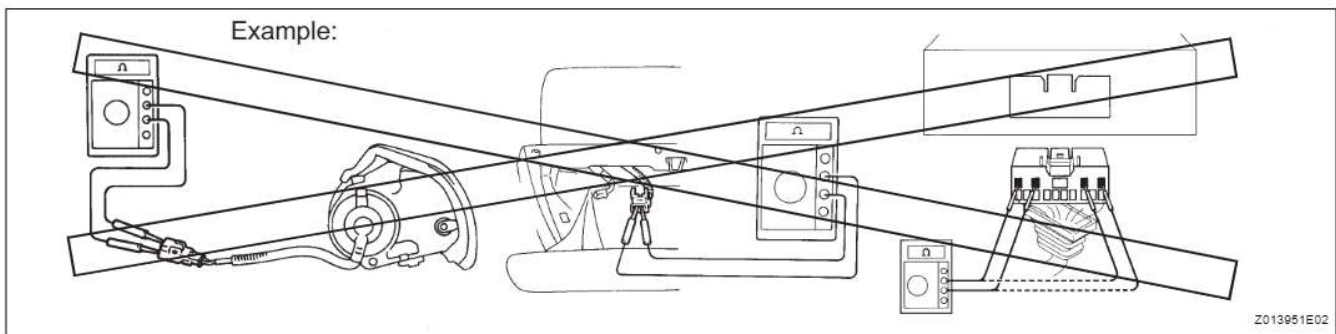
(6) When disposing of the vehicle or the horn button assembly by itself, the airbag should be deployed using SST before disposal (See page [RS-348](#)). Activate the airbag in a safe place away from electrical noise.

(d) FRONT PASSENGER AIRBAG ASSEMBLY

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



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



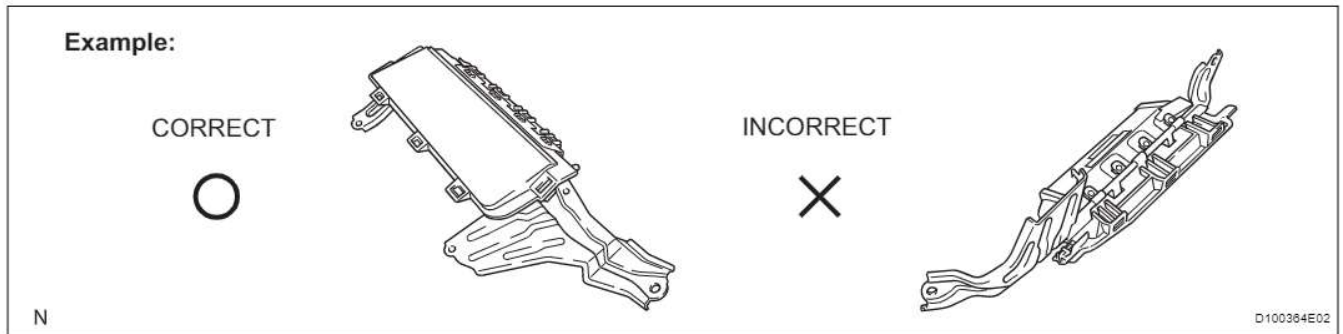
- (3) Grease or detergents of any kind should not be applied to the front passenger airbag assembly.
- (4) Store the airbag assembly in an area where the ambient temperature is below 93°C (200°F), the humidity is not high and there is no electrical noise.
- (5) When using electric welding anywhere on the vehicle, disconnect the airbag ECU connectors (4 pins). These connectors contain shorting springs. This feature reduces the possibility of the airbag deploying due to current entering the squib wiring.
- (6) When disposing of the vehicle or the airbag assembly unit by itself, the airbag should be deployed using SST before disposal (See page [RS-385](#)). Activate in a safe place, away from electrical noise.

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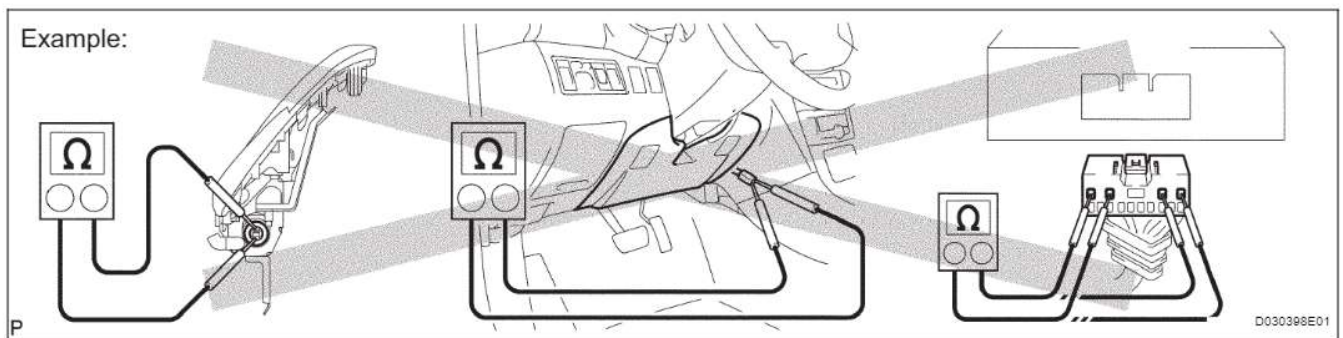
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(e) DRIVER SIDE KNEE AIRBAG ASSEMBLY

- (1) Always place a removed or new knee airbag assembly with the airbag inflation direction facing upward. Placing the airbag assembly with the airbag inflation direction facing downward could cause a serious accident if the airbag inflates.



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

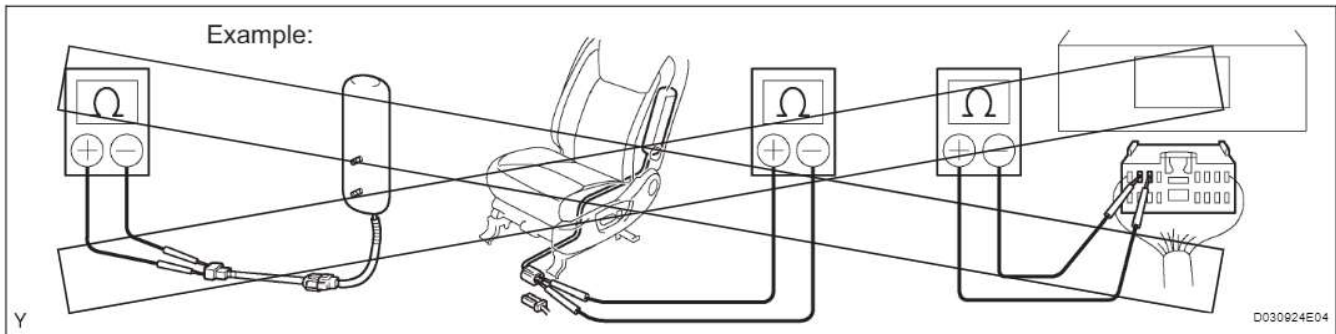


- (3) Grease or detergents of any kind should not be applied to the knee airbag assembly.
- (4) Store the knee airbag assembly where the ambient temperature is below 93°C (200°F), the humidity is not high and there is no electrical noise.
- (5) When using electric welding anywhere on the vehicle, disconnect the airbag ECU connectors (2 pins). These connectors contain shorting springs. This feature reduces the possibility of the airbag deploying due to current entering the squib wiring.
- (6) When disposing of a vehicle or knee airbag assembly unit by itself, the airbag should be inflated using SST before disposal (See page RS-365). Activate in a safe place, away from electrical noise.
- (f) FRONT SEAT SIDE AIRBAG ASSEMBLY
- (1) Always place a removed or new front seat side airbag assembly with the airbag inflation direction facing up.

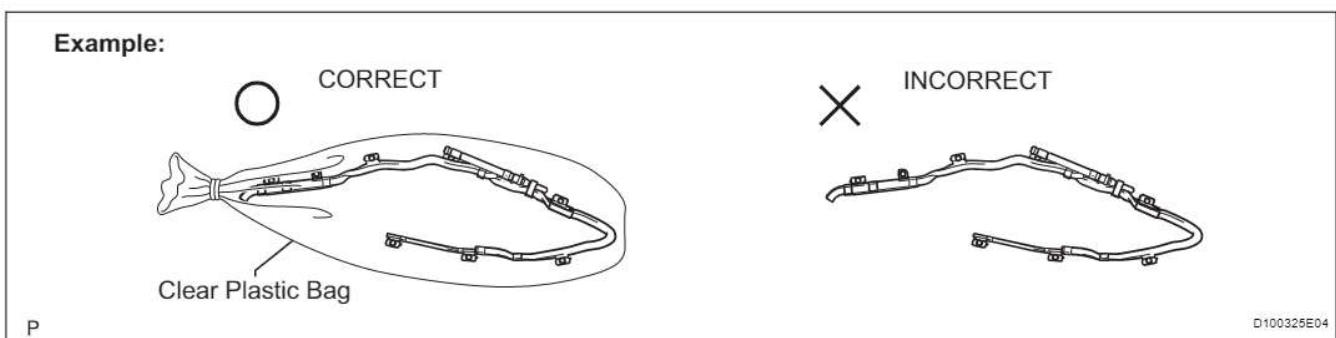
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- (2) Never measure the resistance of the airbag squib. This may cause the airbag to inflate, which could cause serious injury.



- (3) Grease or detergents of any kind should not be applied to the front seat side airbag assembly.
- (4) Store the airbag assembly in an area where the ambient temperature is below 93°C (200°F), the humidity is not high and there is no electrical noise.
- (5) When using electric welding anywhere on the vehicle, disconnect the airbag ECU connectors (2 pins). These connectors contain shorting springs. This feature reduces the possibility of the airbag deploying due to current entering the squib wiring.
- (6) When disposing of a vehicle or the airbag assembly unit by itself, the airbag should be deployed using SST before disposal (See page [RS-415](#)). Activate in a safe place away from electrical noise.
- (g) CURTAIN SHIELD AIRBAG ASSEMBLY
- (1) Always place a removed or new curtain shield airbag assembly in a clear plastic bag, and keep it in a safe place.

**CAUTION:**

The plastic bag is not reusable.

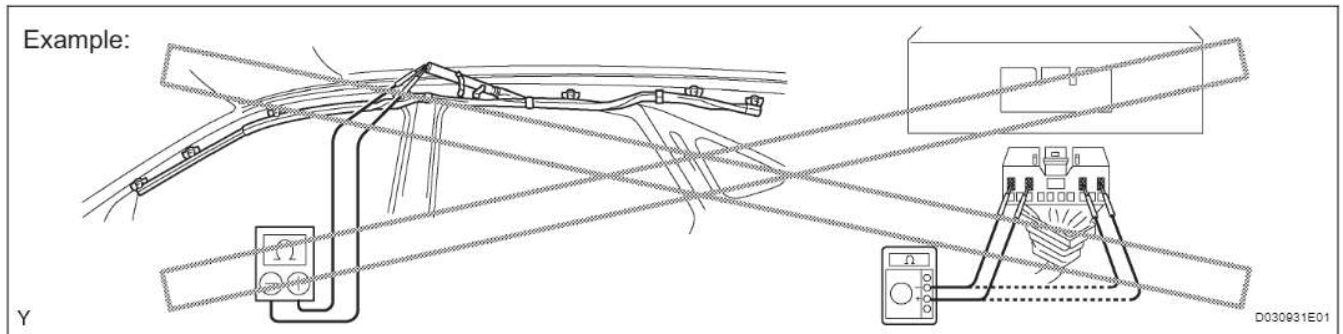
NOTICE:

Never disassemble the curtain shield airbag assembly.

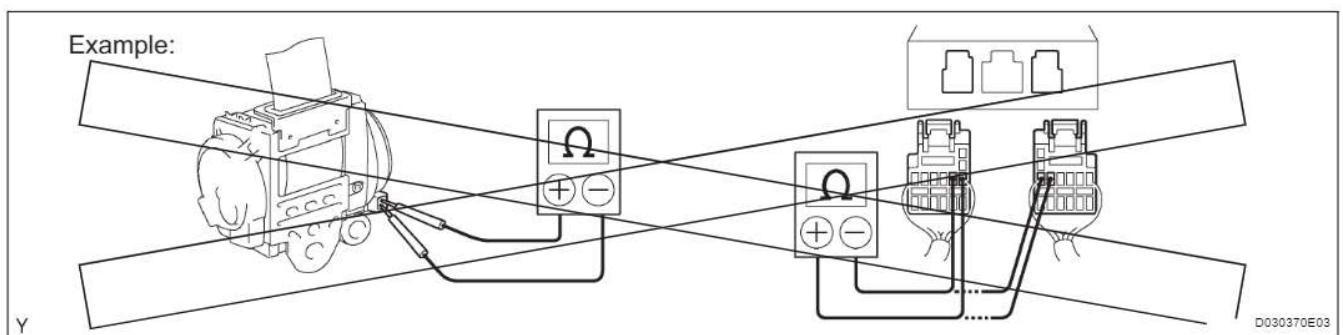
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- (2) Never measure the resistance of the airbag squib. This may cause the airbag to inflate, which could cause serious injury.



- (3) Grease or detergents of any kind should not be applied to the curtain shield airbag assembly.
- (4) Store the airbag assembly in an area where the ambient temperature is below 93°C (200°F), the humidity is not high and there is no electrical noise.
- (5) When using electric welding anywhere on the vehicle, disconnect the airbag ECU connectors (4 pins). These connectors contain shorting springs. This feature reduces the possibility of the airbag deploying due to current entering the squib wiring.
- (6) When disposing of a vehicle or the airbag assembly unit by itself, the airbag should be deployed using SST before disposal (See page [RS-409](#)). Activate in a safe place away from electrical noise.
- (h) FRONT SEAT OUTER BELT ASSEMBLY AND REAR SEAT OUTER BELT ASSEMBLY (SEAT BELT PRETENSIONER)
- (1) Never measure the resistance of the seat outer belt. This may cause the pretensioner of the seat belt to activate, which could cause serious injury.



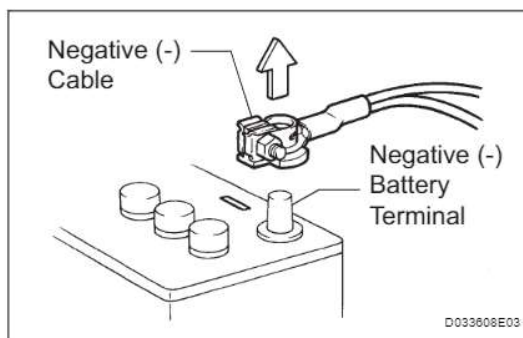
- (2) Never disassemble the seat outer belt.
- (3) Never install the seat outer belt on another vehicle.
- (4) Store the seat outer belt in an area where the ambient temperature is below 80°C (176°F), the humidity is not high and there is no electrical noise.

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- (5) When using electric welding anywhere on the vehicle, disconnect the airbag ECU connectors (2 pins). These connectors contain shorting springs. This feature reduces the possibility of the airbag deploying due to current entering the squib wiring.
- (6) When disposing of a vehicle or the seat outer belt unit by itself, the seat outer belt should be activated before disposal (See page [SB-24](#)). Activate in a safe place away from electrical noise.
- (7) As the seat outer belt is hot after being activated, allow some time for it to cool down sufficiently before disposal. Never apply water to cool down the seat outer belt.
- (8) Grease, detergents, oil or water should not be applied to the front seat outer belt.
- (i) **AIRBAG SENSOR ASSEMBLY**
 - (1) Never reuse an airbag sensor assembly that has been involved in a collision where the SRS has deployed.
 - (2) The connectors to the airbag sensor assembly should be connected or disconnected with the sensor placed on the floor. If the connectors are connected or disconnected while the airbag sensor assembly is not placed on the floor, the SRS may activate.
 - (3) Work must be started at least 90 seconds after the power switch is turned off and the cable is disconnected from the negative (-) battery terminal, even if only loosening the set bolts of the airbag sensor assembly.
- (j) **WIRE HARNESS AND CONNECTOR**
 - (1) The SRS wire harness is integrated with the instrument panel wire harness assembly. All the connectors in the system are standard yellow. If the SRS wire harness becomes disconnected or the connector becomes broken, repair or replace it.



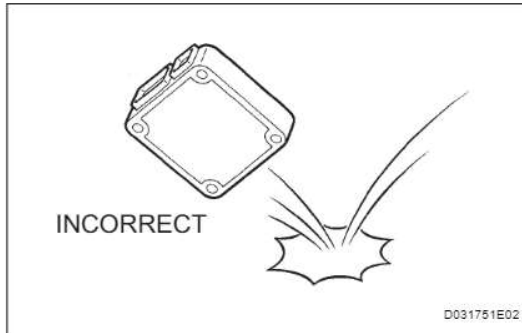
8. ELECTRONIC CONTROL

- (a) **REMOVAL AND INSTALLATION OF BATTERY TERMINAL**

NOTICE:

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

- (1) Before performing electronic work, disconnect the cable from the negative (-) battery terminal to prevent component and wire damage caused by accidental short circuits.



- (2) When disconnecting the cable, turn the power switch and headlight dimmer switch off and loosen the cable nut completely. Perform these operations without twisting or prying the cable. Then disconnect the cable.
- (3) Clock settings, radio settings, audio system memory, DTCs and other data are erased when the cable is disconnected from the negative (-) battery terminal. Write down any necessary data before disconnecting the cable.

(b) **HANDLING OF ELECTRONIC PARTS**

- (1) Do not open the cover or case of the ECU unless absolutely necessary. If the IC terminals are touched, the IC may be rendered inoperative by static electricity.
- (2) Do not pull the wires when disconnecting electronic connectors. Pull the connector itself.
- (3) Do not drop electronic components, such as sensors or relays. If they are dropped on a hard surface, they should be replaced.
- (4) When cleaning the engine with steam, protect the electronic components, air filter and emission-related components from water.
- (5) Never use an impact wrench to remove or install temperature switches or temperature sensors.
- (6) When measuring the resistance between terminals of a wire connector, insert the tester probe carefully to prevent terminals from bending.

9. 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 engine sources.
- (2) Never work in a pit or near a pit as vaporized fuel will collect in those places.

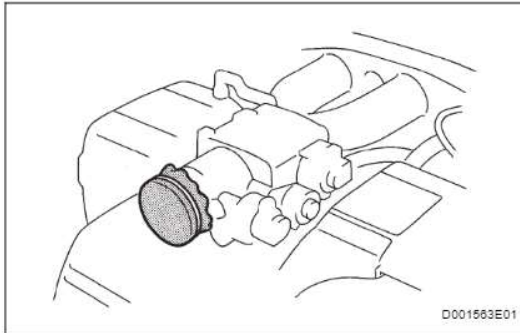
(b) **REMOVING AND INSTALLING FUEL SYSTEM PARTS**

- (1) Prepare a fire extinguisher before starting the operation.
- (2) To prevent static electricity, install a ground wire to the fuel changer, vehicle and fuel tank, do not spray the surrounding area with water. Be careful when performing work in this area, as the work surface will become slippery. Do not clean up gasoline spills with water, as this may cause the gasoline to spread, and possibly create a fire hazard.
- (3) Avoid using electric motors, working lights and other electric equipments that can cause sparks or high temperatures.

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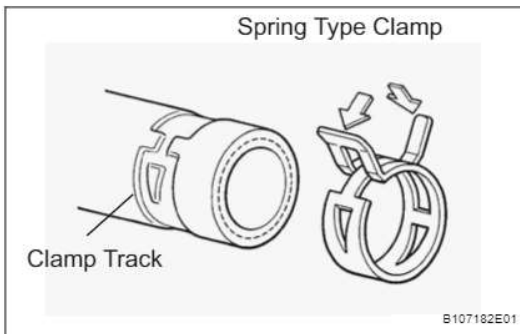
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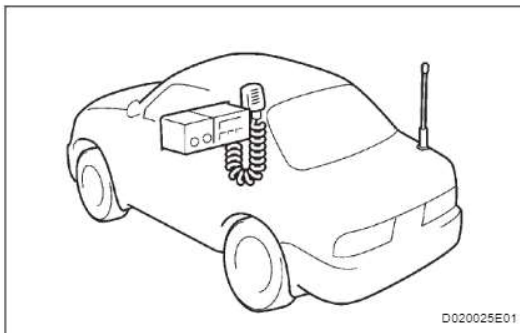
- (4) Avoid using iron hammers as they may create sparks.
- (5) Dispose of fuel-contaminated cloth separately using a fire resistant container.

10. REMOVAL AND INSTALLATION OF ENGINE INTAKE PARTS

- (a) If any metal particles enter inlet system parts, this may damage the engine.
- (b) When removing and installing inlet system parts, cover the openings of the removed parts and engine openings. Use gummed tape or other suitable materials.
- (c) When installing inlet system parts, check that no metal particles have entered the engine or the installed parts.

**11. HANDLING OF HOSE CLAMPS**

- (a) Before removing the hose, check the clamp position so that it can be reinstalled in the same position.
- (b) Replace any deformed or dented clamps with new ones.
- (c) When reusing a hose, attach the clamp on the clamp track portion of the hose.
- (d) For a spring type clamp, you may spread the tabs slightly after installation by pushing in the direction of the arrows as shown in the illustration.

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

- (a) Install the antenna far away from the ECU and sensors of the vehicle electronic systems as possible.
- (b) Install an antenna feeder at least 20 cm (7.87 in.) away from the ECU and sensors of the vehicle electronic systems. For details about ECU and sensors locations, refer to the section on the applicable components.
- (c) Keep the antenna and feeder separate from other wirings as much as possible. This will prevent signals sent from the communication equipment from affecting vehicle equipment and vice-versa.
- (d) Check that the antenna and feeder are correctly adjusted.
- (e) Do not install any high-powered mobile communication system.

13. FOR VEHICLES EQUIPPED WITH TRACTION CONTROL (TRC) AND VEHICLE STABILITY CONTROL (VSC) SYSTEMS

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

- (a) NOTICES WHEN USING DRUM TESTER

- (b) Activating inspection mode (Not using the intelligent tester)

HINT:

Perform procedures "A" to "D" within 60 seconds.

- (1) Turn the power switch on (IG) (Procedure "A").
 - (2) Fully depress the accelerator pedal twice with the shift P position (Procedure "B").
 - (3) Fully depress the accelerator pedal twice with the shift N position (Procedure "C").
 - (4) Fully depress the accelerator pedal twice with the shift P position (Procedure "D").
 - (5) Check that the HV system warning light blinked on the multi-information display (Procedure "E").
 - (6) Start the engine by turning the power switch while depressing the brake pedal (Procedure "F").
- (c) Activating inspection mode (Using the intelligent tester)
 - (1) Connect the intelligent tester to the DLC3.
 - (2) Turn the power switch on (IG).
 - (3) Turn the intelligent tester on.
 - (4) Select following menu items: DIAGNOSIS / OBD/MOBD / HV ECU / ACTIVE TEST / INSPECTION MOD1 / ON.
 - (5) Check that the HV system warning light blinks on the multi-information display and the master warning light are illuminated in the combination meter.
 - (6) Start the engine by turning the power switch while depressing the brake pedal.
 - (d) NOTICES OF RELATED OPERATIONS TO VSC
 - (1) Do not carry out unnecessary installation and removal as it might affect the adjustment of VSC related parts.
 - (2) Be sure to follow the instructions for work preparation and final confirmation of proper operation of the VSC system.

14. 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.

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- (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.

IN

HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

GENERAL INFORMATION

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

FOR USING INTELLIGENT TESTER

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

IN

ELECTRONIC CIRCUIT INSPECTION PROCEDURE

1. BASIC INSPECTION

(a) WHEN MEASURING RESISTANCE OF ELECTRONIC PARTS

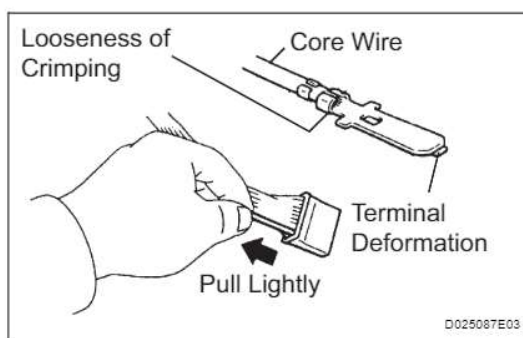
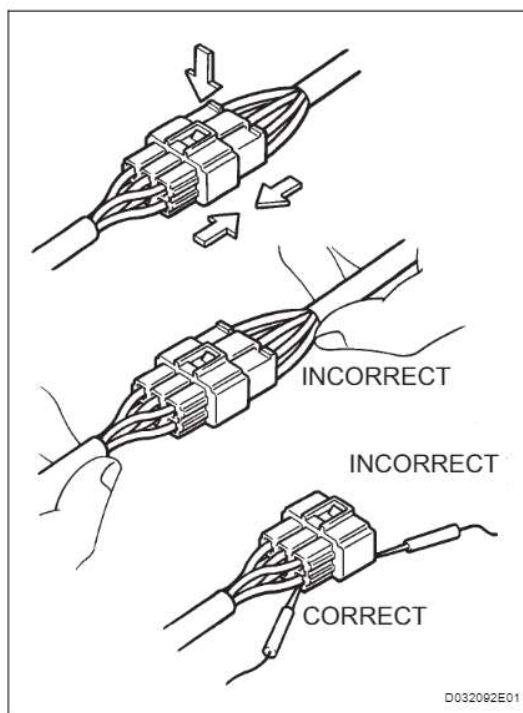
- (1) Unless otherwise stated, all resistance measurements should be made at an ambient temperature of 20°C (68°F). Resistance measurements may be inaccurate if measured at high temperatures, i.e. immediately after the engine has been stopped. Measurements should be made after the engine has cooled down.

(b) HANDLING CONNECTORS

- (1) When disconnecting a connector, first squeeze the mating connector housing halves tightly together to release the lock, and then press the lock claw and separate the connector.
- (2) When disconnecting a connector, do not pull on the harnesses. Grasp the connector directly and separate it.
- (3) Before connecting a connector, check that there are no deformations, damage, looseness or missing terminals.
- (4) When connecting a connector, press firmly until it locks with a "click" sound.
- (5) If checking a connector with a TOYOTA electrical tester, check the connector from the backside (harness side) using a mini test lead.

NOTICE:

- **As a waterproof connector cannot be checked from the backside, check it by connecting a sub-harness.**
- **Do not damage the terminals by moving the inserted tester needle.**

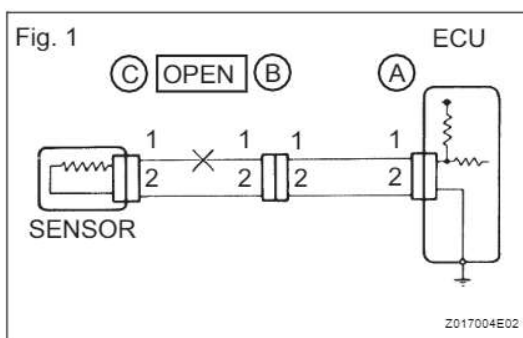
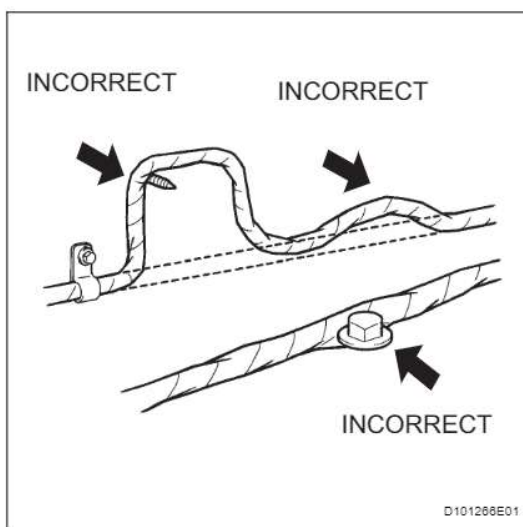
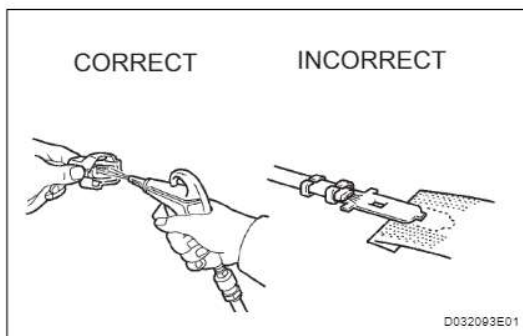
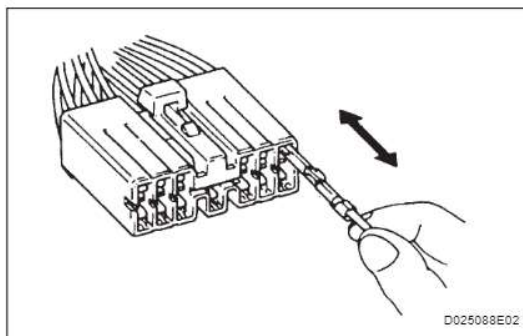


(c) CHECKING CONNECTORS

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

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

NOTICE:

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

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(d) REPAIR METHOD OF CONNECTOR TERMINAL

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

(e) HANDLING OF WIRE HARNESS

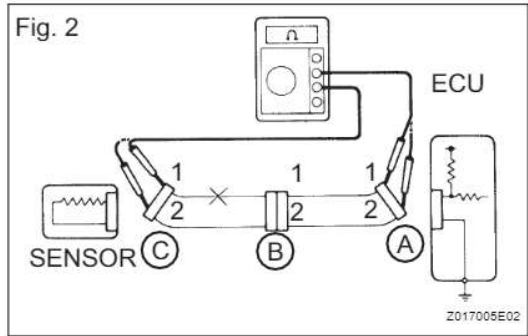
- (1) If removing a wire harness, check the wiring and clamping before proceeding so that it can be restored in the same way.
- (2) Never twist, pull or slacken the wire harness more than necessary.
- (3) The wire harness should never come into contact with a high temperature part, or rotating, moving,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

2. CHECK FOR OPEN CIRCUIT

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

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

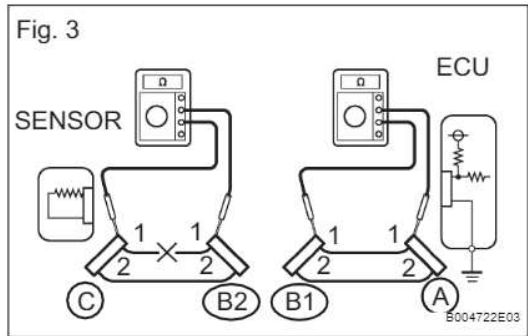
Standard resistance (Fig. 2)

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

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

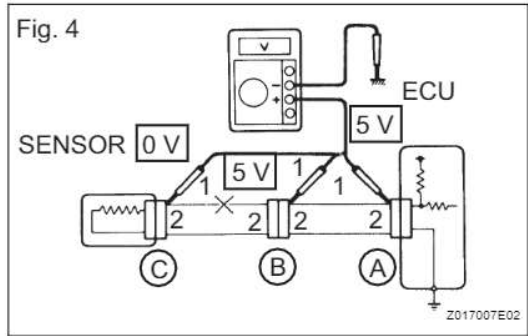
- (2) Disconnect connector B and measure the resistance between the terminals of the connectors.

Standard resistance (Fig. 3)



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

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



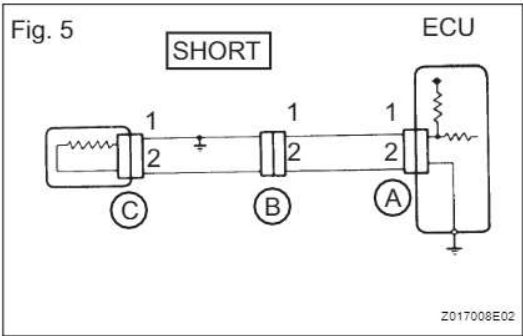
- (c) Check the voltage.
- (1) In a circuit in which voltage is applied to the ECU connector terminal, an open circuit can be checked by conducting a voltage check. With each connector still connected, measure the voltage between the body ground and these terminals (in this order): 1) terminal 1 of connector A, 2) terminal 1 of connector B, and 3) terminal 1 of connector C.

Standard voltage (Fig. 4)

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

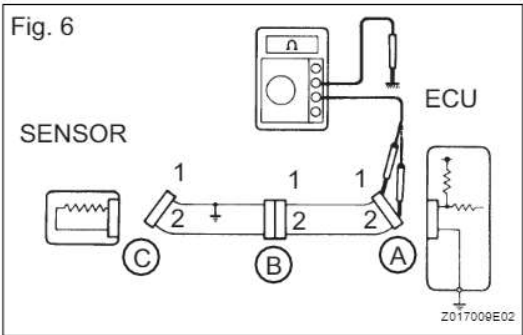
If the results match the examples above, an open circuit exists in the wire harness between terminal 1 of connector B and terminal 1 of connector C.

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3. CHECK FOR SHORT CIRCUIT

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



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

Standard resistance (Fig. 6)

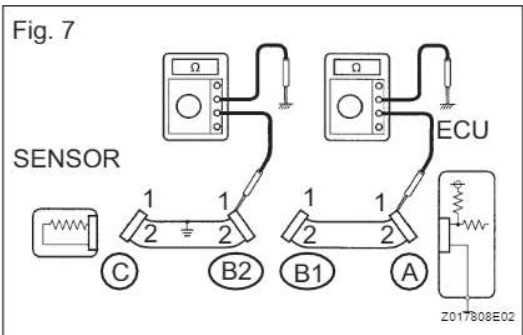
Tester Connection	Specified Condition
Connector A terminal 1 - Body ground	Below 1 Ω
Connector A terminal 2 - Body ground	10 k Ω or higher

HINT:

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

(2) Disconnect connector B and measure the resistance.

Standard resistance (Fig. 7)



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

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

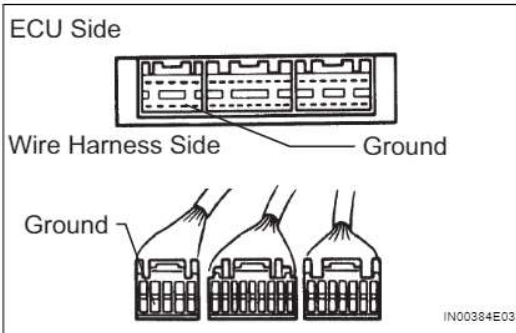
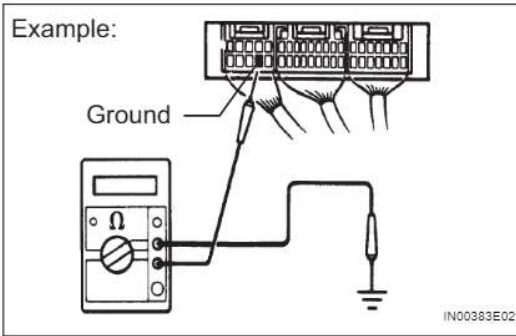
4. CHECK AND REPLACE ECU

NOTICE:

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

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INTRODUCTION – HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS



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

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

Standard resistance:

Below 1 Ω

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

TERMS

ABBREVIATIONS USED IN MANUAL

Abbreviations	Meaning
ABS	Anti-Lock Brake System
A/C	Air Conditioner
AC	Alternating Current
ACC	Accessory
ACIS	Acoustic Control Induction System
ACM	Active Control Engine Mount
ACSD	Automatic Cold Start Device
A.D.D	Automatic Disconnecting Differential
A/F	Air-Fuel Ratio
AHC	Active Height Control Suspension
ALR	Automatic Locking Retractor
ALT	Alternator
AMP	Amplifier
ANT	Antenna
APPROX.	Approximately
ASSY	Assembly
A/T, ATM	Automatic Transmission (Transaxle)
ATF	Automatic Transmission Fluid
AUTO	Automatic
AUX	Auxiliary
AVG	Average
AVS	Adaptive Variable Suspension
AWD	All Wheel Drive Vehicle
B+	Battery Voltage
BA	Brake Assist
BACS	Boost Altitude Compensation System
BAT	Battery
BDC	Bottom Dead Center
B/L	Bi-Level
B/S	Bore-Stroke Ratio
BTDC	Before Top Dead Center
BVSV	Bimetallic Vacuum Switching Valve
CAN	Controller Area Network
CB	Circuit Breaker
CCo	Catalytic Converter For Oxidation
CCV	Canister Closed Valve
CD	Compact Disc
CF	Cornering Force
CG	Center of Gravity
CH	Channel
CKD	Complete Knock Down
COMB.	Combination
CPE	Coupe
CPS	Combustion Pressure Sensor
CPU	Central Processing Unit
CRS	Child Restraint System

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INTRODUCTION – TERMS

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

INTRODUCTION – TERMS

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Abbreviations	Meaning
FR	Front
F/W	Flywheel
FW/D	Flywheel Damper
FWD	Front-Wheel-Drive
GAS	Gasoline
GND	Ground
GPS	Global Positioning System
GSA	Gear Shift Actuator
H/B	Hatchback
H-FUSE	High Current Fuse
HI	High
HID	High Intensity Discharge (Headlight)
HPU	Hydraulic Power Unit
HSG	Housing
HT	Hard Top
HV	Hybrid Vehicle
HWS	Heated Windshield System
IC	Integrated Circuit
IDI	Indirect Diesel Injection
IFS	Independent Front Suspension
IG	Ignition
IIA	Integrated Ignition Assembly
IN	Intake (Manifold, Valve)
INT	Intermittent
I/P	Instrument Panel
IRS	Independent Rear Suspension
ISC	Idle Speed Control
J/B	Junction Block
J/C	Junction Connector
KD	Kick-Down
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

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Abbreviations	Meaning
MIL	Malfunction Indicator Lamp
MIN.	Minimum
MG1	Motor Generator No. 1
MG2	Motor Generator No. 2
MMT	Multi-mode Manual Transmission
MP	Multipurpose
MPI	Multipoint Electronic Injection
MPX	Multiplex Communication System
M/T, MTM	Manual Transmission (Transaxle)
MT	Mount
MTG	Mounting
N	Neutral
NA	Natural Aspiration
NO.	Number
O2S	Oxygen Sensor
OC	Oxidation Catalyst
OCV	Oil Control Valve
O/D	Overdrive
OEM	Original Equipment Manufacturing
OHC	Overhead Camshaft
OHV	Overhead Valve
OPT	Option
ORVR	On-board Refilling Vapor Recovery
O/S	Oversize
P & BV	Proportioning and Bypass Valve
PBD	Power Back Door
PCS	Power Control System
PCV	Positive Crankcase Ventilation
PKB	Parking Brake
PPS	Progressive Power Steering
PROM	Programmable Read Only Memory
PS	Power Steering
PSD	Power Slide Door
PTC	Positive Temperature Coefficient
PTO	Power Take-Off
PZEV	Partial Zero Emission Vehicle
P/W	Power Window
R & P	Rack and Pinion
RAM	Random Access Memory
R/B	Relay Block
RBS	Recirculating Ball Type Steering
R/F	Reinforcement
REAS	Relative Absorber System
RFS	Rigid Front Suspension
RH	Right-Hand
RHD	Right-Hand Drive
RLY	Relay
ROM	Read Only Memory
RR	Rear

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Abbreviations	Meaning
RRS	Rigid Rear Suspension
RSE	Rear Seat Entertainment
RWD	Rear-Wheel Drive
SC	Supercharger
SCV	Swirl Control Valve
SDN	Sedan
SEN	Sensor
SICS	Starting Injection Control System
SOC	State Of Charge
SOHC	Single Overhead Camshaft
SPEC	Specification
SPI	Single Point Injection
SRS	Supplemental Restraint System
SSM	Special Service Materials
SST	Special Service Tools
STD	Standard
STJ	Cold-Start Fuel Injection
SW	Switch
SYS	System
T/A	Transaxle
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
VPS	Variable Power Steering
VSC	Vehicle Stability Control

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Abbreviations	Meaning
VSV	Vacuum Switching Valve
VTV	Vacuum Transmitting Valve
VVT-i	Variable Valve Timing-intelligent
W/	With
WGN	Wagon
W/H	Wire Harness
W/O	Without
1ST	First
2ND	Second
2WD	Two Wheel Drive Vehicle (4 x 2)
3RD	Third
4TH	Fourth
4WD	Four Wheel Drive Vehicle (4 x 4)
4WS	Four Wheel Steering System
5TH	Fifth