

PEPS SYSTEM

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Anti-theft Coil**32-83**

Removal

32-83

Installation

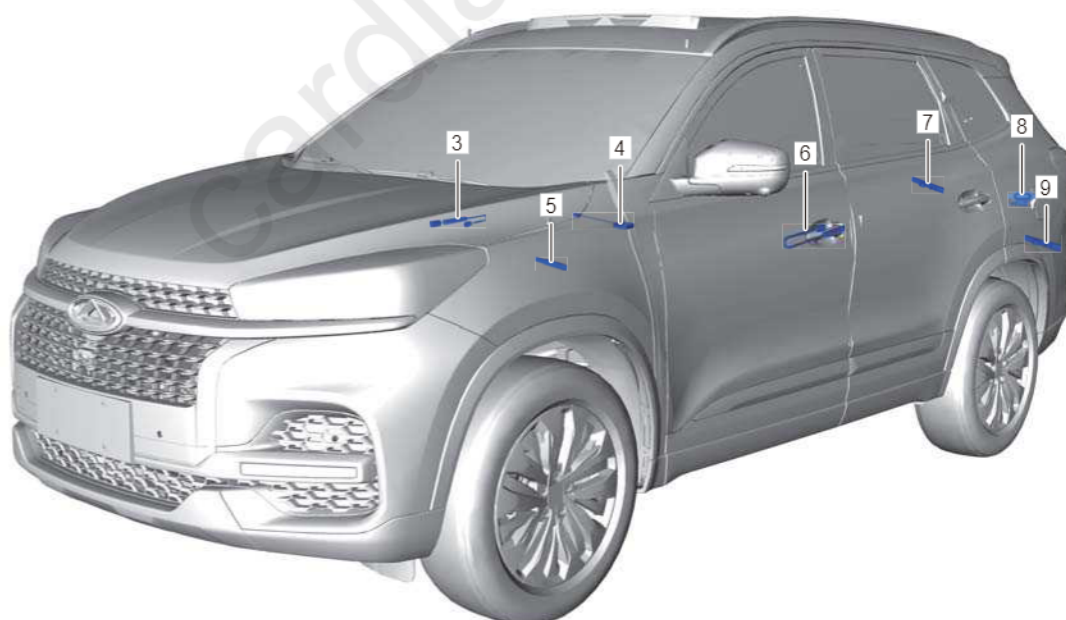
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GENERAL INFORMATION

Overview

E4T15B+DCT



PE0001001

1 - ENGINE START STOP Switch

2 - PEPS Module

3 - Front Right Door Handle Sensor

4 - Immobilizer Coil



Chery Automobile Co., Ltd.

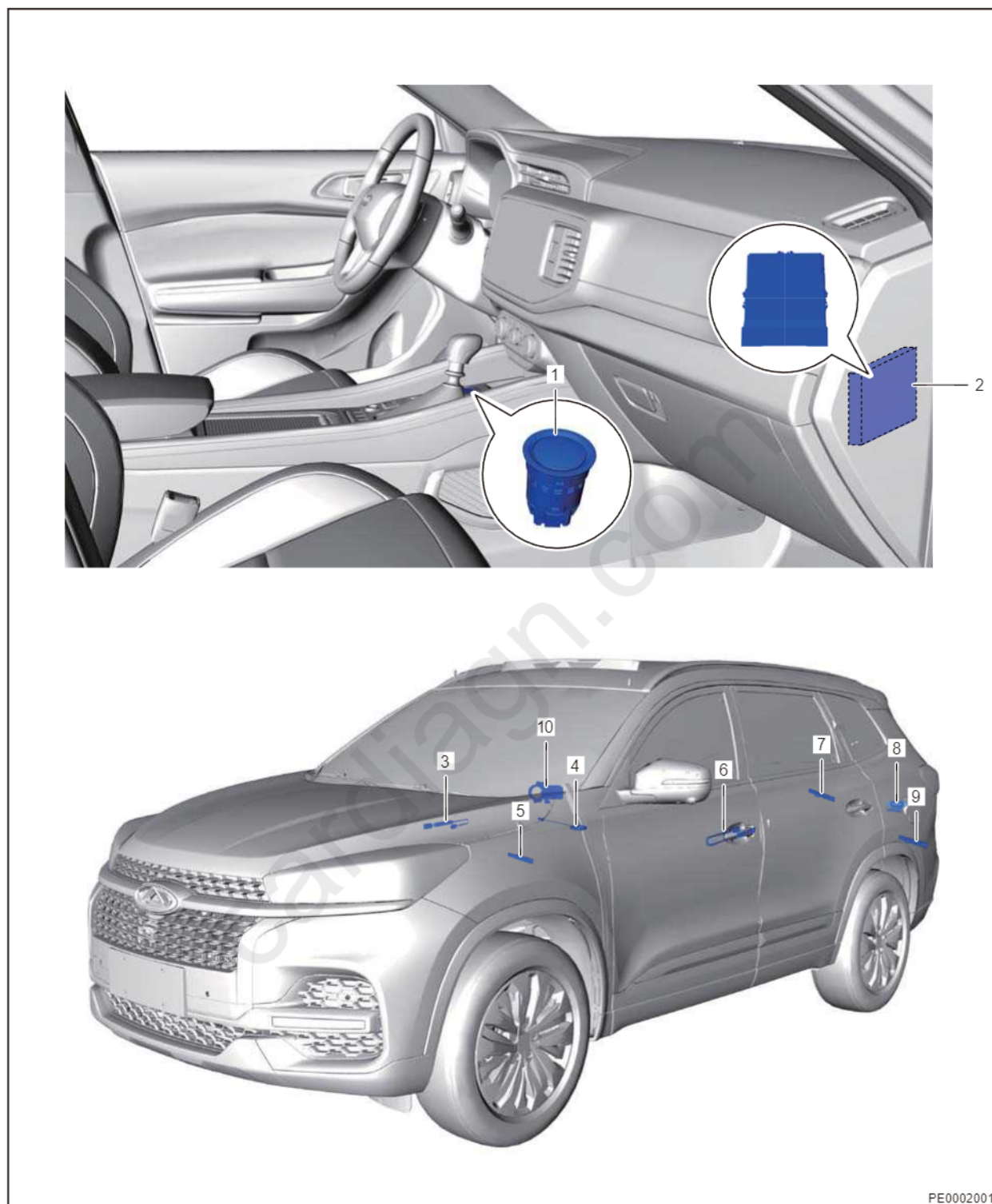
32-PEPS SYSTEM

5 - Front Internal Low Frequency Antenna	6 - Front Left Door Handle Sensor
7 - Rear Low Frequency Antenna	8 - Back Door Release Switch
9 - Rear Low Frequency Antenna (on Rear Bumper Crossmember)	

PEPS system consists of PEPS controller, ENGINE START STOP switch, built-in low frequency antenna (3 antennas are equipped in vehicle to detect key position), immobilizer coil for back up starting, front left/right door handle sensor (front left/right door handle), ESCL module (for MT models), back door microswitch and remote controller (also called smart key).

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E4T15B+MT



PE0002001

1 - ENGINE START STOP Switch	2 - PEPS Module
3 - Front Right Door Handle Sensor	4 - Immobilizer Coil
5 - Front Internal Low Frequency Antenna	6 - Front Left Door Handle Sensor
7 - Rear Low Frequency Antenna	8 - Back Door Release Switch
9 - Rear Low Frequency Antenna (on Rear Bumper Crossmember)	10 - ESCL Module (for MT Models)



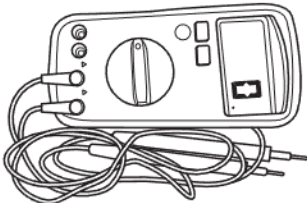
Specifications

Torque Specifications

Description	Torque (N·m)
Hexagon Flange Nut	7 ± 1

Tools

General Tool

Digital Multimeter	 002
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Special Tool

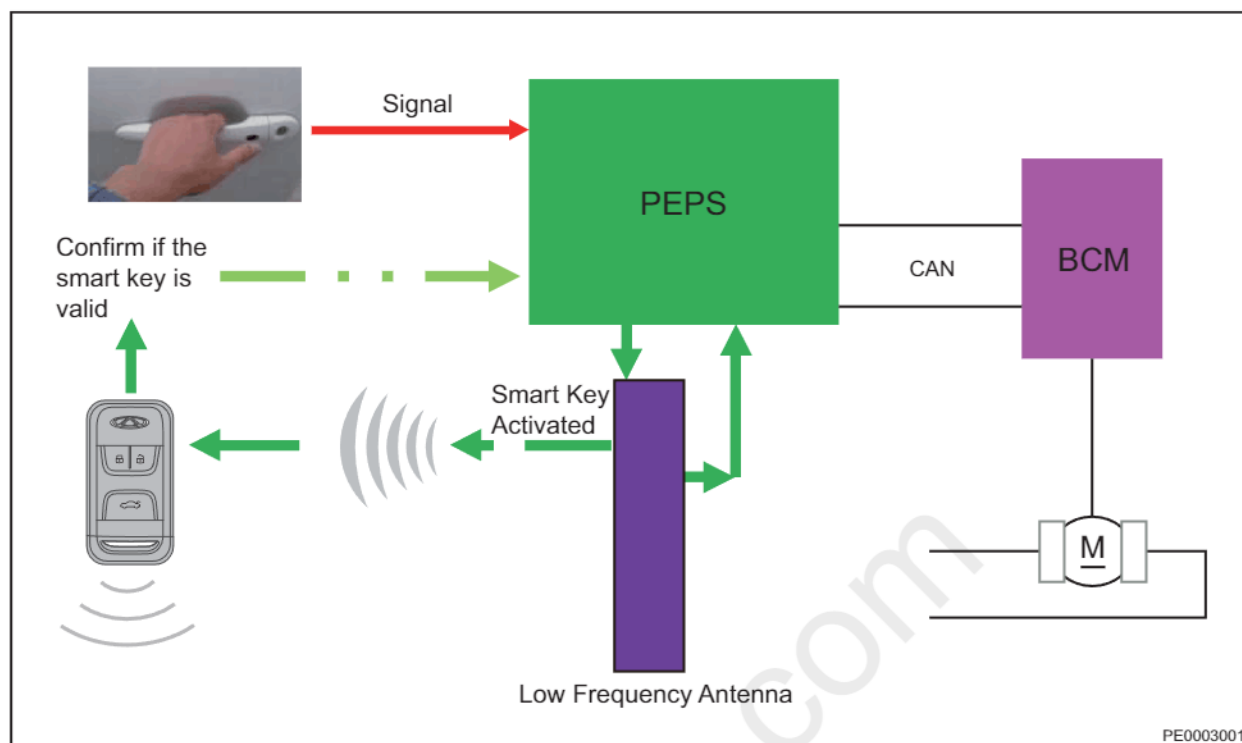
X-431 PAD Diagnostic Tester	 001
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Function Description

PEPS Function Description

Function	
1 - Smart Entry Function	2 - Keyless Entry Function
3 - Mechanical Entry Function	4 - One-button Start Function
5 - One-button Stop Function	6 - Emergency Stop Function
7 - Back Up Start Function	8 - Emergency Start Function
9 - Starting Number Limit Function	10 - Electric Steering Column Lock Control Function
11 - Prompt Function	12 - Engine Immobilizer Function

Smart Entry Function



Smart Door Unlock (Keyless Fortifying Deactivation)

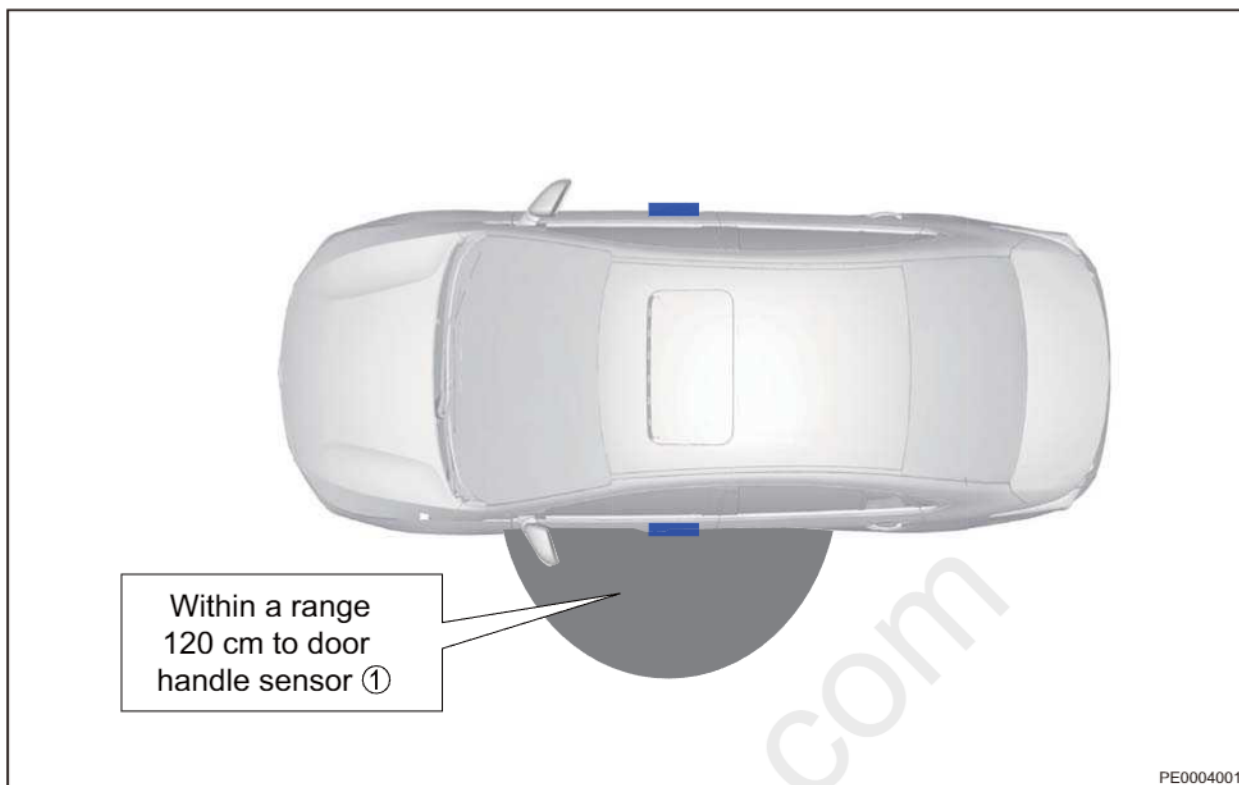
1. When bringing a smart key close to vehicle and pressing door handle switch with doors locked, vehicle will be unlocked.

Hint:

Only front left and right doors are equipped with switches.

2. No matter where the smart key is (put in pocket, hang in the belt or put in bag), as long as the key is within approximately 1.2 m of door handle sensor, if pressing door handle sensor, vehicle will enter fortifying deactivation mode (turn signal lights will flash twice and four doors will be unlocked).
3. If any of following operations is not performed within 30 seconds after pressing door handle sensor (fortifying deactivation) under fortifying mode, all doors will be locked automatically.
 - (a) Open any door
 - (b) Press ENGINE START STOP switch
 - (c) ENGINE START STOP switch is in ACC or ON position





PE0004001

Smart Door Lock (Keyless Fortifying)

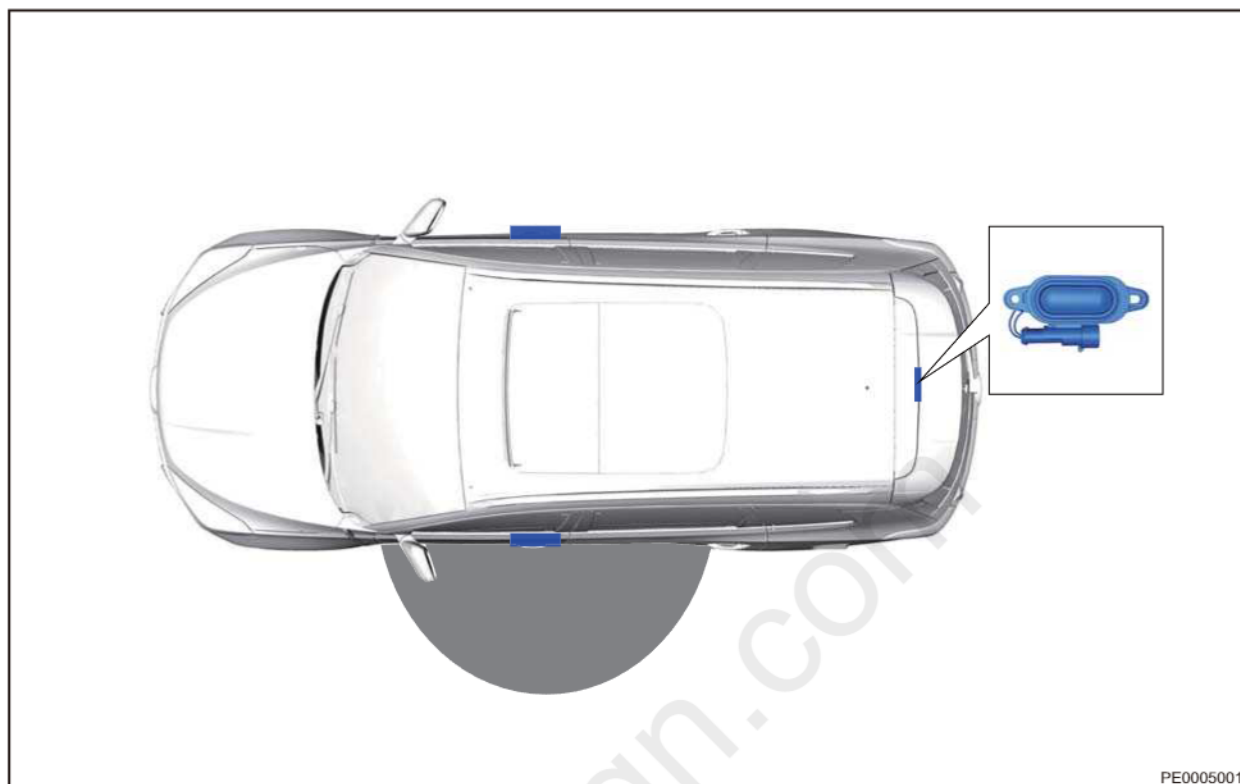
1. When exiting vehicle with smart key and pressing door handle switch with doors unlocked, vehicle will be locked.

Hint:

If any door is not closed properly, it will be unlocked automatically after locking to avoid leaving key inside vehicle.

- (a) Four doors, engine hood and back door are closed, and ENGINE START STOP switch is in OFF position.
 - (b) Press door handle sensor when the smart key is outside the vehicle and within a 1.2m semicircle area around the front left door handle.
 - (c) Vehicle enters fortifying mode (turn signal lights will flash once, horn sounds once and all doors will be locked).
2. Operation range
 - (a) Only distance between smart key and door handle sensor (1) is within specified operation range, smart key function can be used.
 - (b) When smart key battery is discharged or there is strong radio wave in operation position, smart key system also will do not operate normally.
 - (c) It is recommended that do not place smart key together with mobile phone and other radio equipment.
 - (d) Operation range is within 120 cm of each door handle sensor (1).
 - (e) If smart key is too close to door glass, handle or rear bumper, door handle sensor may not be used.
 - (f) When smart key is within operation range, any one even without carrying smart key can press door handle sensor on corresponding side to lock/unlock door.
 3. When using smart key system, door handle sensor will invalid in following conditions
 - (a) When ENGINE START STOP switch is in following positions (ACC or ON position).
 - (b) Smart key is left in cab or luggage compartment (at this time, alarm will sound, turn signal lights will flash and "Smart Key inside Vehicle" will be prompted on instrument cluster if pressing door handle sensor.)

- (c) When smart key is not within exterior operation range.
- (d) When any door is opened or not closed properly.
- (e) When the smart key battery is discharged.



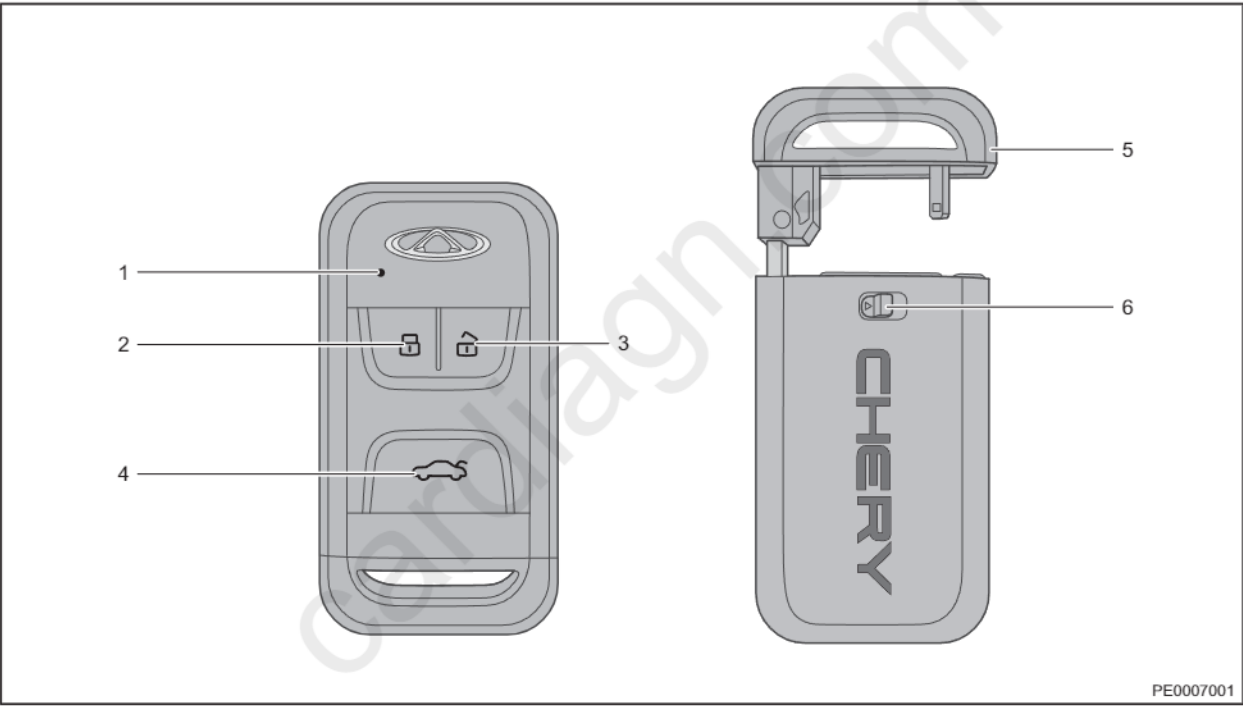
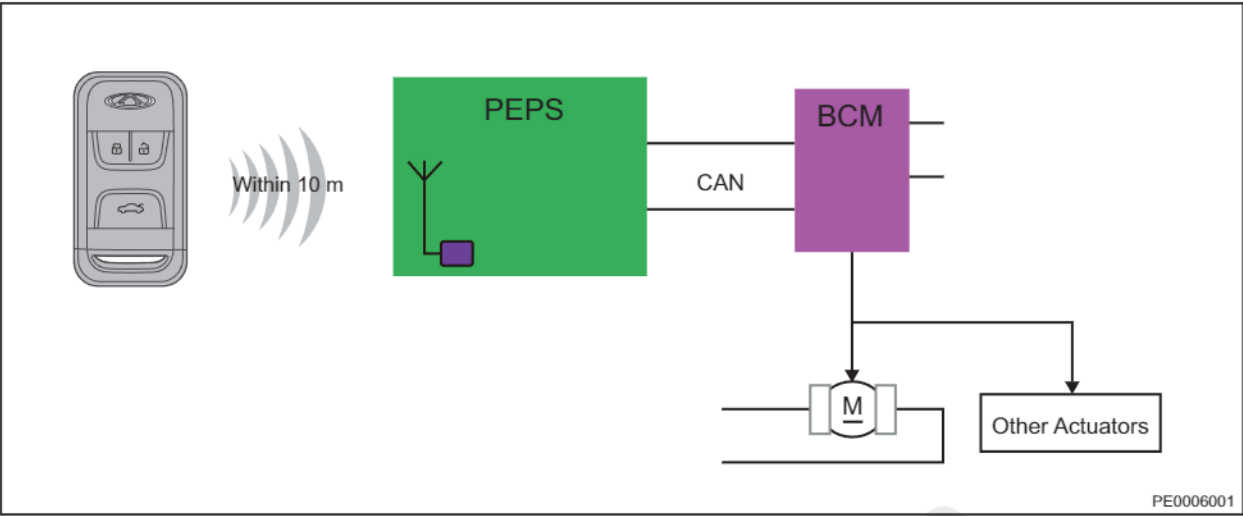
PE0005001

Smart Keyless Luggage Compartment Open

1. If all doors are unlocked, the luggage compartment external electronic switch is activated. At this time, press the switch to open luggage compartment without necessity of carrying smart key.
2. If door is under central lock state, luggage compartment external electronic switch will be disabled. At this time, it is necessary to bring smart key close to rear of vehicle and press electronic switch to open luggage compartment.
3. Precautions for smart entry function
 - (a) For safety, when remote control/central control or mechanical control is used to lock vehicle, if there is a smart key inside vehicle, system will disable door handle switch while remote control still can be used.
 - (b) In order to successfully perform door handle switch operation, do not rapidly operate door handle switch in succession within 0.5 second. and also do not rapidly operate luggage compartment external electronic switch.
 - (c) Smart keyless unlock and lock are only valid when power supply is shut off and four doors are closed properly, or system will not operate.
 - (d) For power saving purpose, after vehicle is parked for 15 days, smart entry for front right door handle will be invalid, only smart entry for front left door handle can be used (it will return to normal if performing remote control unlock once or front left door HSU (door handle sensor) unlock once).
 - (e) In some particular situations, such as smart key is too close to door, system may determine the key is inside vehicle, causing door handle sensor to be disabled. In this case, keyless entry function will not operate normally. At this time, it is necessary to use remote control to lock and unlock vehicle.



Remote Entry Function



1 - LED Indicator	2 - Lock Button
3 - Unlock Button	4 - Luggage Compartment Door Release Button
5 - Mechanical Key	6 - Mechanical Key Release Slider

Remote Lock (Fortifying) Function

- Press lock button on smart key with power supply OFF, door will be locked, turn signal lights will flash (once), horn will sound (once) and vehicle will enter fortifying mode.
 - Press lock button with four doors, hood and luggage compartment door closed properly, door will be locked, body anti-theft system will be turned on and vehicle will enter fortifying mode.
 - If any door is not closed properly, lock system will not operate.
 - If power supply is in ACC or ON position, remote lock function will not operate to avoid misoperation.
 - If doors are closed properly while hood or luggage compartment door is not closed properly, lock system will lock doors, but body anti-theft system cannot be turned on and vehicle will not enter fortifying mode.

Remote Lock (Fortifying Deactivation) Function

1. Press the remote control unlock button, 4 door locks are unlocked, and turn signal light flashes twice, the vehicle enters the fortifying deactivation state.

Hint:

If any of following operations is not performed within 30 seconds after pressing remote unlock button (fortifying deactivation) under fortifying mode, all doors will be locked automatically.

- (a) Open any door
- (b) Press ENGINE START STOP switch
- (c) ENGINE START STOP switch is in ACC or ON position

Hint:

• Description

Press unlock button, so that door will be unlocked and luggage compartment door external switch will be activated (at this time, press luggage compartment external switch to open luggage compartment even if user does not bring valid key).

Under fortifying or anti-theft alarm mode, press unlock button to cancel body anti-theft alarm system.

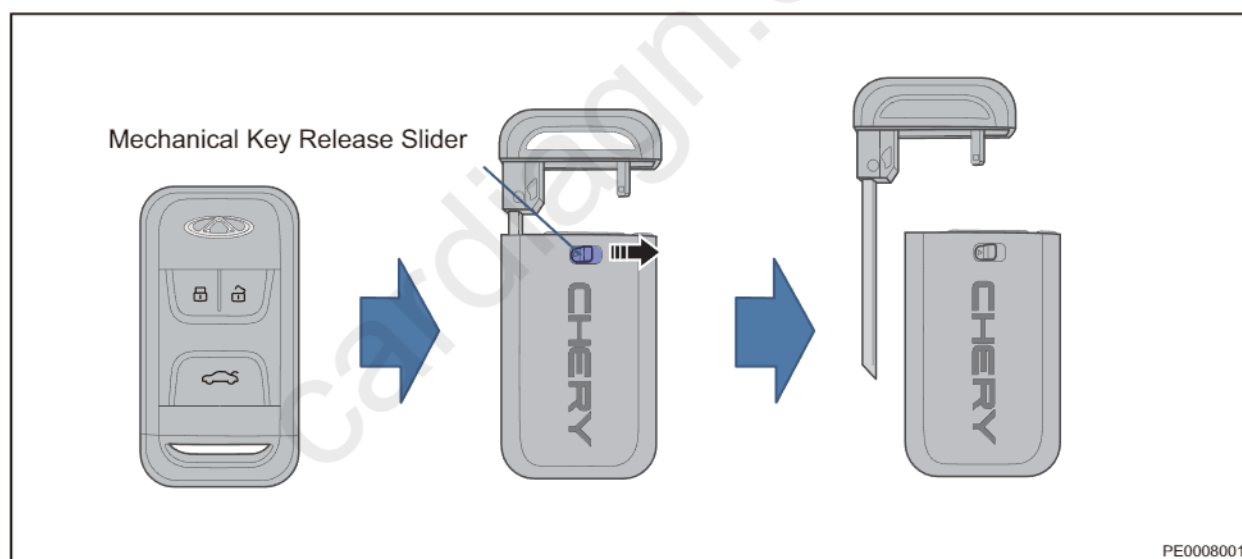
Remote Luggage Compartment Function

1. Long press remote luggage compartment button (about 1.5 seconds), luggage compartment door will be unlocked, at this time, it is still necessary to press back door release switch to open back door (non-power back door). If it is equipped with power back door, back door will open automatically.

Hint:

Open luggage compartment remotely cannot cancel vehicle fortifying.

Mechanical Key Entry Function



PE0008001

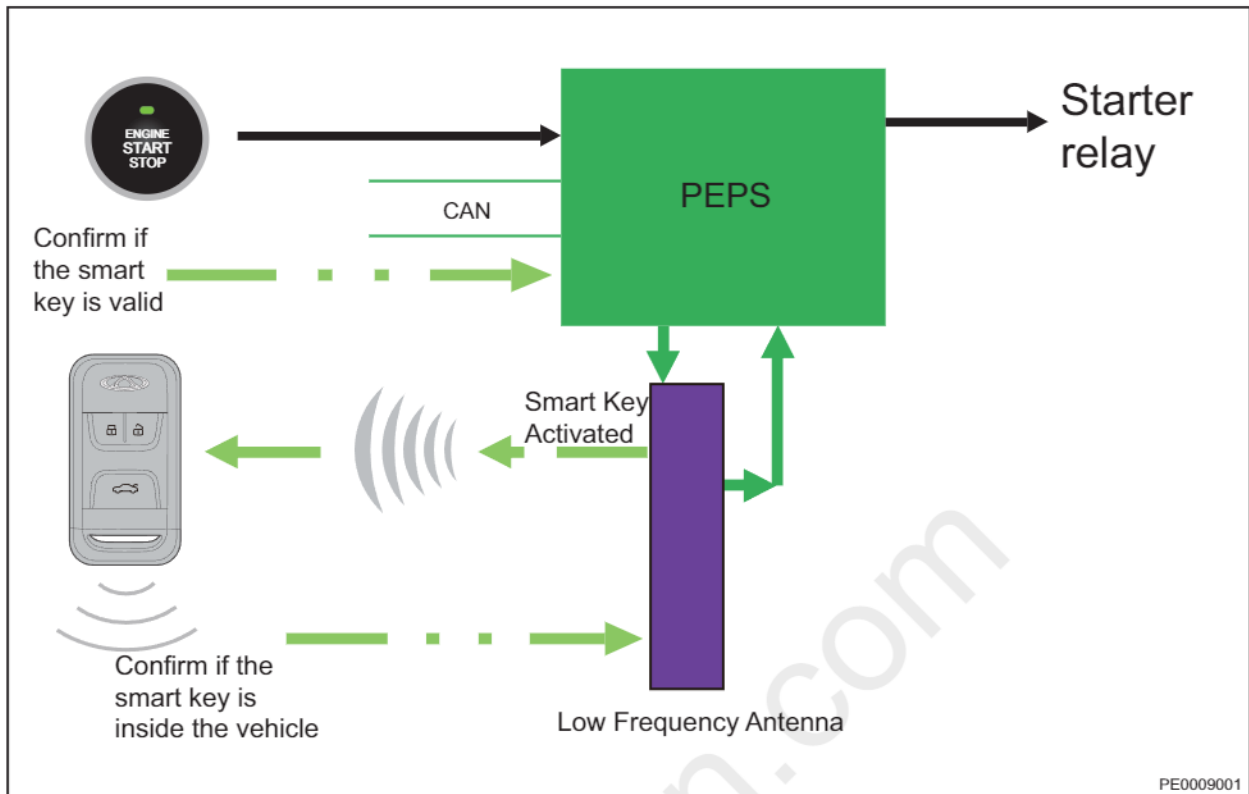
1. When key battery is weak or remote control function cannot operate normally caused by radio interference, it is possible to use mechanical key to lock and unlock vehicle.
2. Slide mechanical key release slider on back side of key and pull out mechanical key, then insert the key into front left door key cylinder and turn it clockwise or counterclockwise to lock or unlock vehicle.

Hint:

When vehicle fortifying is successful, mechanical key can be used to unlock, but it is illegal entry, and alarm will sound and turn signal lights will flash at that time.

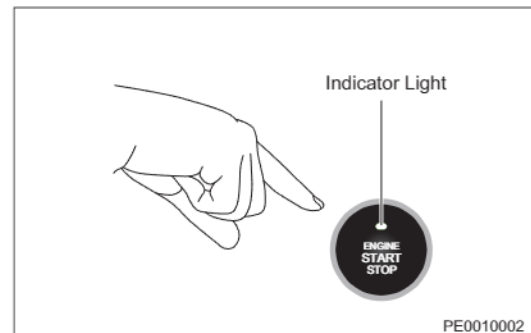


One-button Start Function



1. Indicator does not come on

- (a) Power supply is OFF and brake pedal (for DCT models) or clutch pedal (for MT models) is not depressed, or engine has been started.



2. Amber

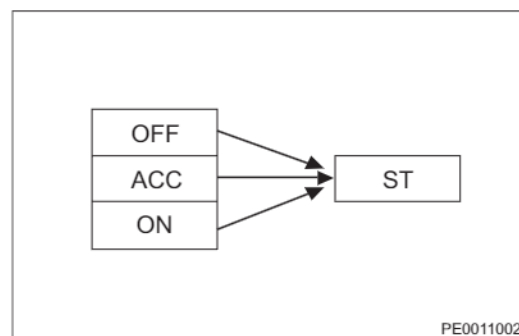
- (a) Power supply state: ACC or ON, brake pedal (for DCT models) or clutch pedal (for MT models) is not depressed.

3. Green

- (a) Brake pedal (for DCT models) or clutch pedal (for MT models) is depressed, and engine will start once press the button.

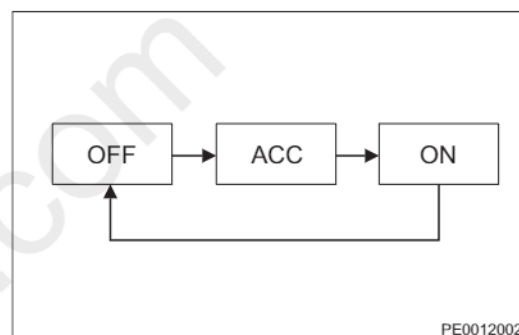
4. One-button start function: It is activated at any power supply state (OFF, ACC, IGN) with legal smart key inside vehicle. Depress brake pedal (for DCT models) or clutch pedal (for MT models), press ENGINE START STOP switch to start engine.

(a) Power supply state switching



5. There are four positions for vehicle power supply: OFF, ACC, ON, ST (ignition). Brake pedal (for DCT models) or clutch pedal (for MT models) is not depressed, press ENGINE START STOP switch:

(a) Power supply state switching



6. Precautions for one-button start function

- (a) For MT models: If clutch pedal is not depressed fully, system will not perform starting operation. For DCT models, if it is not in P or N position, system will not perform starting operation.
- (b) During starting, if brake pedal (for DCT models) or clutch pedal (for MT models) is released halfway, system will suspend starting.
- (c) Press ENGINE START STOP switch then release it when starting, system will judge if starting is successful and stop starting properly.
- (d) For AT models, if it is not in P position, vehicle power supply state (ACC, IGN) will not return to OFF state.

One-button Stop Function

1. For common engine stop mode, 4 km/h of vehicle speed must be met.

Hint:

- For DCT models, if it not in P position, vehicle power supply state will not return to OFF, you must shift to P position before leaving vehicle after stopping. And check if power supply state is in OFF. Make sure that vehicle power supply is in OFF state and then leave vehicle. Otherwise, door cannot be locked.
- Simple method for distinguishing power supply in ACC or OFF:
 - (a) Judged by color of indicator on ignition switch.
 - (b) Under ACC state, instrument cluster will illuminate center display edge of LCD.
 - (c) Operate buttons on remote controller, if lock operation is failed and unlock operation is successful, it indicates that vehicle power supply is not in OFF position.



Emergency Stop Function

- In order to stop engine in emergency, this system has emergency stop mode.

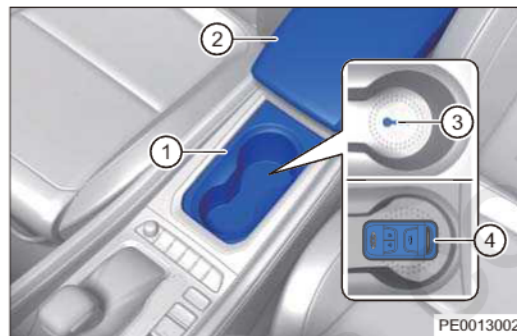
Hint:

- When vehicle speed is more than 4 km/h, press ENGINE START STOP switch for more than 3 seconds in succession.
- If pressing ENGINE START STOP switch for 3 times within 2 seconds with vehicle speed more than 4 km/h, engine will stop and power supply will return to ACC.

Caution:

- If this condition is not met, engine will not shut down and ignition switch is kept in ON.
- During driving, emergency stop will seriously affect normal driving. Do not use this function unless in emergency.

32 Back Up Start Function



1 - Cup Holder	2 - Armrest Box
3 - Bottom of Rear Cup Holder (Key Placing Mark for Back Up Start)	4 - Smart Key (Face up)

- If key can not be recognized by system due to weak battery or interference, PEPS system will not operate normally. At this time, system provides a method to back up start engine, following method can be used to start engine or turn on power supply.
 - Lay key on bottom of rear cup holder with face up, and do not depress brake pedal (for DCT models) or clutch pedal (for MT models).
 - Press the ENGINE START STOP switch once. Power supply state will switch to ON, and "Verification is Successful, it is Possible to Start" is displayed on instrument cluster.
 - Depress brake pedal (for DCT models) or clutch pedal (for MT models) fully, press ENGINE START STOP switch to start engine.

Hint:

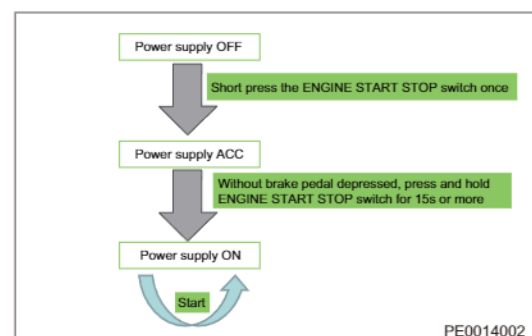
For MT models, communication between ESCL and PEPS is failed or verification does not pass, electric steering column lock cannot be unlocked successfully, power supply cannot switch to ON, engine cannot be started, so back up start function is invalid.

Emergency Start Function

- To prevent engine cannot be started due to signal failure of brake pedal position (for DCT models) or clutch pedal position (For MT models) detected, this system has emergency start mode.

Caution:

- Please contact service station for inspection and repair as soon as possible.



Starting Times Limit Function

1. When serious damage occurs in system, in order to ensure driving safety and prevent steering system locking incorrectly, system will not allow user to start engine limitlessly and engine only can be started for 10 time. And each time engine starts successfully and travel, rest times will reduce one. Please contact Chery service station for repair as soon as possible.

Caution:

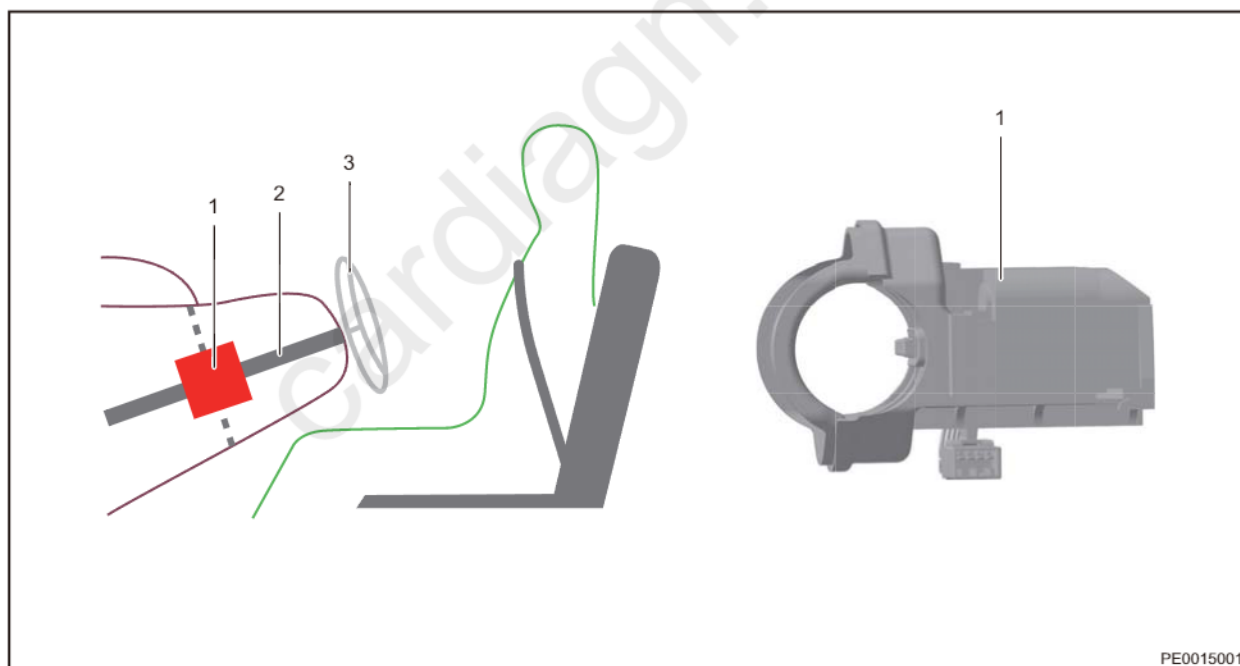
Only MT models have this function.

Hint:

- This system malfunction may be caused by any or several of the following reasons:
 - (a) Serious malfunction in the electric steering column lock
 - (b) Speed signal malfunction of front right wheel
 - (c) Speed signal malfunction of other three wheels
2. Precautions for starting times limit function
 - (a) Keyless entry and PEPS system obtains wheel speed signal from brake controller (ABS/ESP), if any wheel speed signal is malfunctioning, ABS/ESP system warning light in instrument cluster will come on.
 - (b) If malfunction does not be repaired and maximum start times is reached, it is not allowed to start vehicle. Please contact Chery service station for repair immediately and reset "rest start times" with diagnostic tester. Otherwise, if same malfunction occurs next time, start times offered by system will be less than 10 times. (Specific value depends on residual times last time malfunction occurs.)

32

Electric Steering Column Lock Control Function



1. Electric steering column lock is actuator of vehicle anti-theft system, consisting of mechanical locking mechanism and electronic control unit. It performs lock and unlock operation according to command from controller.

Hint:

Only MT models have this function.

- (a) Locking
 - (1) If any door is opened or closed and vehicle speed is 0 within 10 minutes after power supply is turned from ON to OFF, electric steering column lock will be locked.



(2) If any door is not operated within 10 minutes after power supply is turned from ON to OFF, electric steering column lock will not be locked. And even if a door is operated 10 minutes later, electric steering column lock also will not be locked.

(b) Unlocking

(1) When pressing ENGINE START STOP switch with smart key in vehicle, steering column lock will be unlocked.

- In some conditions, such as vehicle is parked on slope, large stress will apply to locking pin and steering column, so that, locking pin will be stuck. At this time:

(a) System will try to unlock for 3 times within 3 seconds.

(b) If steering column lock has not been successfully unlocked, perform related operation according to message "Please press ENGINE START STOP switch, restart power supply" and "Please press ENGINE START STOP switch and turn steering wheel to unlock steering column lock".

32 2. Precautions for electric steering column lock control function

- If unlock is failed, try to shake steering wheel after pressing ENGINE START STOP switch, but do not forcibly turn steering wheel.
- If electric steering column lock cannot be unlocked successfully, system power supply will not be turned on and engine cannot be started for safety, please contact Chery service station for repair in time.
- After replacing electric steering column lock, it is necessary to use diagnostic tester to perform matching and learning.

Prompt Function

To reduce misunderstanding of PEPS features from users and to facilitate the daily diagnosis of simple problems, system will prompt corresponding message to users through instrument cluster display, buzzer and external horn. Regardless of power supply state (OFF, ACC or ON), once PEPS sends information, instrument cluster will handle and display it.

Text Message Prompt	Buzzer	External Horn	Possible Cause
Smart key is not detected	Sound	/	There is no key in vehicle
Smart key is not detected	Sound	/	If you are in vehicle, find smart key and place it in vehicle, or check if passenger brings the key outside
System malfunction, it is allowed to start X times	Sound	/	Please contact Chery Repair Shop for repair immediately.
Please check and repair PEPS system	Sound	/	Please Contact Chery Service Station for Repair Immediately
Please shift to P or N to start	Sound	/	If you want to start engine, shift to P or N
Please depress clutch pedal to start/depress brake pedal to start	Sound	/	If you want to start engine, depress brake pedal (for DCT models) or clutch pedal (for MT models)
Please turn steering wheel to unlock steering column	Sound	/	Turn power supply on while shaking steering wheel to help steering column unlock successfully
Please press ENGINE START STOP switch to turn power supply on again	Sound	/	Turn power supply on while shaking steering wheel to help steering column unlock successfully
Please shift to P	Sound	/	Please shift to P and press ENGINE START STOP switch to turn off power supply

Text Message Prompt	Buzzer	External Horn	Possible Cause
Please pay attention that smart key is in vehicle	Sound	Sound 6 times	Be sure to carry smart key on person when leaving vehicle. Caution: Door handle switch will be disabled by system temporarily, please use remote controller to lock and unlock
Verification is successful and it is possible to start	Sound	/	It is displayed only when performing back up start and verification passed, and key battery is fully discharged usually
Please turn off power supply	Sound	/	User may leave vehicle with shift position not in P and power supply not in OFF
Smart key battery is low	Sound	/	Key battery still can be used, but it comes to failure due to low voltage, it is necessary to replace battery

Engine and Vehicle Anti-theft Function

1. Anti-theft for models with PEPS can be divided into two types.
 2. For DCT models, anti-theft can be divided into two separate parts - "PEPS and ECU encryption engine immobilizer".
 3. For MT models, anti-theft can be divided into two separate parts - "PEPS and ECU encryption engine immobilizer" and "PEPS and ESCL encryption steering column lock anti-theft".
1. For DCT models
 - (a) After power supply is turned to ON, ECM will send one frame of validation data to PEPS via CAN bus to verify. Then PEPS will feedback one frame of validation data as response and send to ECM. If response from PEPS is correct, ECM will determine anti-theft can be canceled. Otherwise, ECM will not inject fuel and ignite.
 2. For MT models
 - (a) After power supply is turned to ACC, PEPS will perform encrypted anti-theft validation with ESCL via special LIN line. If validation passes, ESCL will unlock, or ESCL keeps locking and steering wheel cannot be turned. And power supply cannot be turned to ON.
 - (b) After power supply is turned to ON, ECM will send one frame of validation data to PEPS via CAN bus to verify. Then PEPS will feedback one frame of validation data as response and send to ECM. If response from PEPS is correct, ECM will determine anti-theft can be canceled. Otherwise, ECM will not inject fuel and ignite.

Anti-theft Match

Smart Key Replacement After Vehicle Sold

1. Description
 - (a) There are two match methods between smart key and system: "Replace with new key" and "Add old key".
 - (1) "Add new key" refers to match blank key (never match with any system) with system. It usually happens when user would have additional new key on the basis of the old ones.
 - (2) "Add old key" refers to rematch learned key with system (it is must be previous system).

Caution:

- If user lost a smart key with one key left, when replacing with a new smart key, perform as follows to replace with a new one: Learn the new key by "Add new key" service, delete all smart keys by "Delete all keys" service, then learn the remain two smart keys in order by "Add old key" service. If user finds the lost key, it can be reactivated by "Add old key" service on diagnostic tester. If not, even if the lost one is found, it cannot be used normally.



1. Match Operation

(a) Anti-theft match description for "Add new key" is as follows:

- (1) Technician reads VIN in EMS of user's vehicle with diagnostic tester, then obtain PIN through VIN.
- (2) Place the smart key to be matched on the key mark in cup holder, enter anti-theft control system program on diagnostic tester, select "Add new key" menu, input PIN, diagnostic tester will perform "Add new key" program automatically.
- (3) After that, press unlock button and check if left and right turn signal light indicators on instrument cluster blink. If the indicators blink, new key is matched successfully, otherwise, new key is not matched successfully.

(b) Anti-theft match description for "Add old key" is as follows:

- (1) Technician reads VIN in EMS of user's vehicle with diagnostic tester, then obtain PIN through VIN.
- (2) Enter anti-theft control system program on diagnostic tester, select "Delete all keys" menu.
- (3) Place the smart key to be matched on the key mark in cup holder, enter anti-theft control system program on diagnostic tester, select "Add old key" menu, input PIN, diagnostic tester will perform "Add old key" program automatically.
- (4) After that, press unlock button and check if left and right turn signal light indicators on instrument cluster blink. If the indicators blink, new key is matched successfully, otherwise, new key is not matched successfully.

Caution:

- When performing "Add old key", it is necessary to carry previous matched smart key and perform match operation one by one according to match procedures, or previous matched key will be disabled.
- Regardless of "Add new key" or "Add old key", only one smart key can be kept in vehicle and keep key on key mark in cup holder. Make sure that there is no other key in vehicle. If there is other key, bring it to a position 2 m away from vehicle.

PEPS Module Replacement After Vehicle Sold

1. Technician reads VIN in EMS with diagnostic tester, then obtains PIN through VIN.
2. If vehicle is equipped with ESCL, make sure that ESCL is unlocked. After new PEPS is assembled successfully, press ignition switch (IG) to turn on power supply.
3. Enter anti-theft control system program on diagnostic tester, select "Program IMMO" menu; input PIN according to prompt on diagnostic tester, after "Program IMMO" is performed successfully, it will display "Program IMMO is successful".
4. Then match previous keys one by one according to instructions of "Add old key".
5. If vehicle is equipped with ESCL, enter anti-theft control system program on diagnostic tester and complete "Add old key", then keep power supply in OFF position, check state of ESCL with diagnostic tester, if ESCL is not in Anti-scanning state, replacement is completed, if ESCL is in Anti-scanning state, select "Delete ESCL", input PIN according to prompt on diagnostic tester, ESCL will be deleted successfully after about 10 minutes, then match ESCL according to description for ESCL replacement.

Caution:

- Please contact Chery service station to obtain PIN.
- Unmatched smart keyless entry and PEPS can switch power supply from IGN OFF to IGN ON for 50 times. Once it exceeds 50 times, PEPS cannot be used. So, do not turn on and off power supply at will with PEPS unmatched.
- If ESCL accidentally enters "Anti-scanning" protection mode, it is necessary to perform "Erase ESCL".

EMS Replacement After Vehicle Sold

1. Technician reads VIN in old EMS or smart keyless entry and PEPS unit with diagnostic tester, then obtains PIN through VIN.
2. After new EMS is assembled successfully, press ignition switch (IG) to turn on power supply.
3. Enter anti-theft control system program on diagnostic tester, select "Program EMS" menu; input VIN and PIN according to prompts on diagnostic tester. After "Program EMS" is performed successfully, it will display "Match EMS is successful".
4. Depress brake pedal (for DCT models)/clutch pedal (for MT models), press ignition switch once to check if vehicle can be started successful. If vehicle can be started successful, EMS replacement is completed, if vehicle cannot be started successful, EMS replacement is not completed.

Electric Steering Column Lock (ESCL) Replacement After Vehicle Sold

Caution:

- Only apply to PEPS + MT models

1. Technician reads VIN in old EMS or smart keyless entry and PEPS unit with diagnostic tester, then obtains PIN through VIN.
2. After new Electronic Steering Column Lock (ESCL) is assembled successfully, keep power supply in OFF status;
3. Enter anti-theft control system program on diagnostic tester, select "Program ESCL" menu; input PIN according to prompt on diagnostic tester, after "Program ESCL" is successful, "Match ESCL is successful" will be displayed.
4. Press ignition switch to switch power supply to IGN OFF state, open driver door and close it again, check if lock sound can be heard, then check if steering wheel can be turned. If lock sound can be heard and steering wheel cannot be turned, electric steering column lock is locked successfully.
5. Press ignition switch to switch power supply to IGN ON state, check if unlock sound can be heard, then check if steering wheel can be turned. If unlock sound can be heard and steering wheel can be turned, electric steering column lock is locked successfully, ESCL is matched successfully, or match is failed.

Caution:

- Please contact Chery service station to obtain PIN.



DIAGNOSIS & TESTING

Diagnosis Content

Problem Symptoms Table

Hint:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair or adjust faulty components, or replace as necessary.

Symptom	Suspected Area
Remote controller fails	Remote controller battery is weak
	There is remote control signal interference
	Remote controller enters failure mode (it is necessary to exit)
	Code is lost (add old key)
	PEPS malfunction
	Wireless key malfunction
	BCM malfunction
Vehicle cannot enter fortifying mode	Four doors, hood or back door is abnormal
	Power supply is not in OFF state
	Door lock malfunction
	PEPS malfunction
	BCM malfunction
Vehicle cannot be unlocked	Door lock malfunction
	PEPS malfunction
	BCM malfunction
Microswitch cannot enter fortifying mode and be unlocked	Smart key is not within range
	Open or sticking in microswitch
	Power supply is not in OFF state
	Four doors, hood or back door is abnormal
	Smart key in vehicle
	Smart key battery is low
Luggage compartment cannot be opened	Back door switch fails (open, water leakage or sticking)
	Back door lock malfunction
	PEPS malfunction
	Short or open in wire harness
	BCM malfunction
Vehicle cannot be started (PEPS) (starter runs)	Anti-theft verification does not pass
Vehicle cannot be started (PEPS) (starter does not run)	Gear position is not in P/N (for DCT models)
	Clutch (for MT models)/brake switch (for DCT models) is abnormal
	ENGINE START STOP switch malfunction
	Circuit or starter relay is abnormal
	Starter malfunction
	Start times limit is activated
ESCL cannot be locked or unlocked	Vehicle is parked on slope (lock pin is stuck)
	Door signal is abnormal
	ENGINE START STOP switch cannot be turned on or off
	Short or open in wire harness
	Anti-theft verification fails
	Network communication malfunction

Diagnosis Procedure

Hint:

Use following procedures to troubleshoot the PEPS system.

1 Vehicle brought to workshop

Result

Proceed to
Next

Next

32

2 Check battery voltage

Check if battery voltage is normal.

OK

Standard Voltage: Not less than 12 V

Result

Proceed to
OK
NG

NG

Replace the battery

OK

3 Customer problem analysis

Result

Proceed to
Next

Next

4 Read DTCs

Result

Proceed to
No DTC
Current DTC
History DTC

History DTC



5 Problem Repair (No DTC)

Result

Proceed to
Next

Next

Go to step 7

6 Troubleshoot according to Diagnostic Trouble Code (DTC) chart

Result

Proceed to
Next

Next

Go to step 7

7 Troubleshoot according to Problem Symptoms Table

Result

Proceed to
Next

Next

8 Conduct test and confirm malfunction has been repaired

Result

Proceed to
Next

Next

End

Problem Repair (No DTC)

If PEPS system has problems, but no DTC is stored in PEPS system, this problem is called a problem without DTC. Problems without DTC for PEPS system are divided into following types:

1. Indicator in instrument cluster does not come on or illuminate constantly (incorrect wire harness connection or indicator is damage).
2. Troubleshooting recommendation: check corresponding components according to problem symptom, and troubleshoot following the vehicle repair manual.

DTC Confirmation Procedure

Confirm that battery voltage is normal before performing following procedures.

- Turn ENGINE START STOP switch to OFF.
- Connect diagnostic tester (the latest software) to diagnostic interface.
- Turn ENGINE START STOP switch to ON.
- Using diagnostic tester, record and clear DTCs stored in PEPS control module assembly.

- Turn ENGINE START STOP switch to OFF and wait several seconds.
- Use diagnostic tester to read DTCs.
- If DTC is detected, malfunction indicated by DTC is current. Go to DTC chart, and perform troubleshooting.
- If no DTC is detected, malfunction indicated by DTC is intermittent Please refer to Intermittent DTC Troubleshooting.

Intermittent DTC Troubleshooting

If malfunction is intermittent, perform the followings:

- Check if connector is loose.
- Check if wire harness is worn, pierced, pinched or partially broken.
- Wiggle related wire harness and connector and observe if signal in related circuit is interrupted.
- If possible, try to duplicate conditions under which DTC was set.
- Look for data that has changed or DTC to reset during wiggle test.
- Check for broken, bent, protruded or corroded terminals.
- Check and clean all wire harness connectors and body ground parts related to DTC.
- If multiple trouble codes were set, refer to circuit diagrams to look for any common body ground circuit or power supply circuit applied to DTC.
- Refer to any Technical Bulletin that may apply to this malfunction.

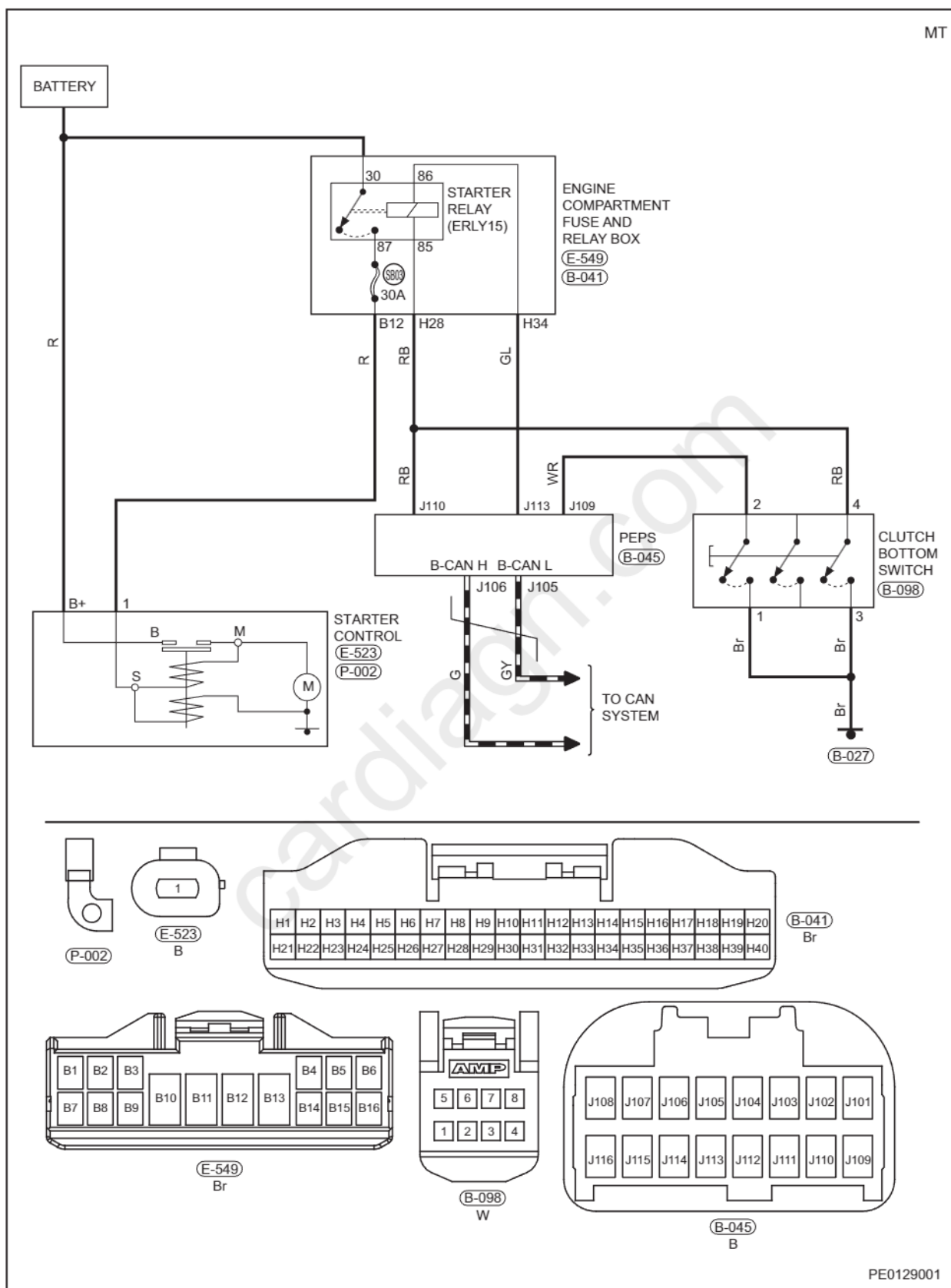
Body Ground Inspection

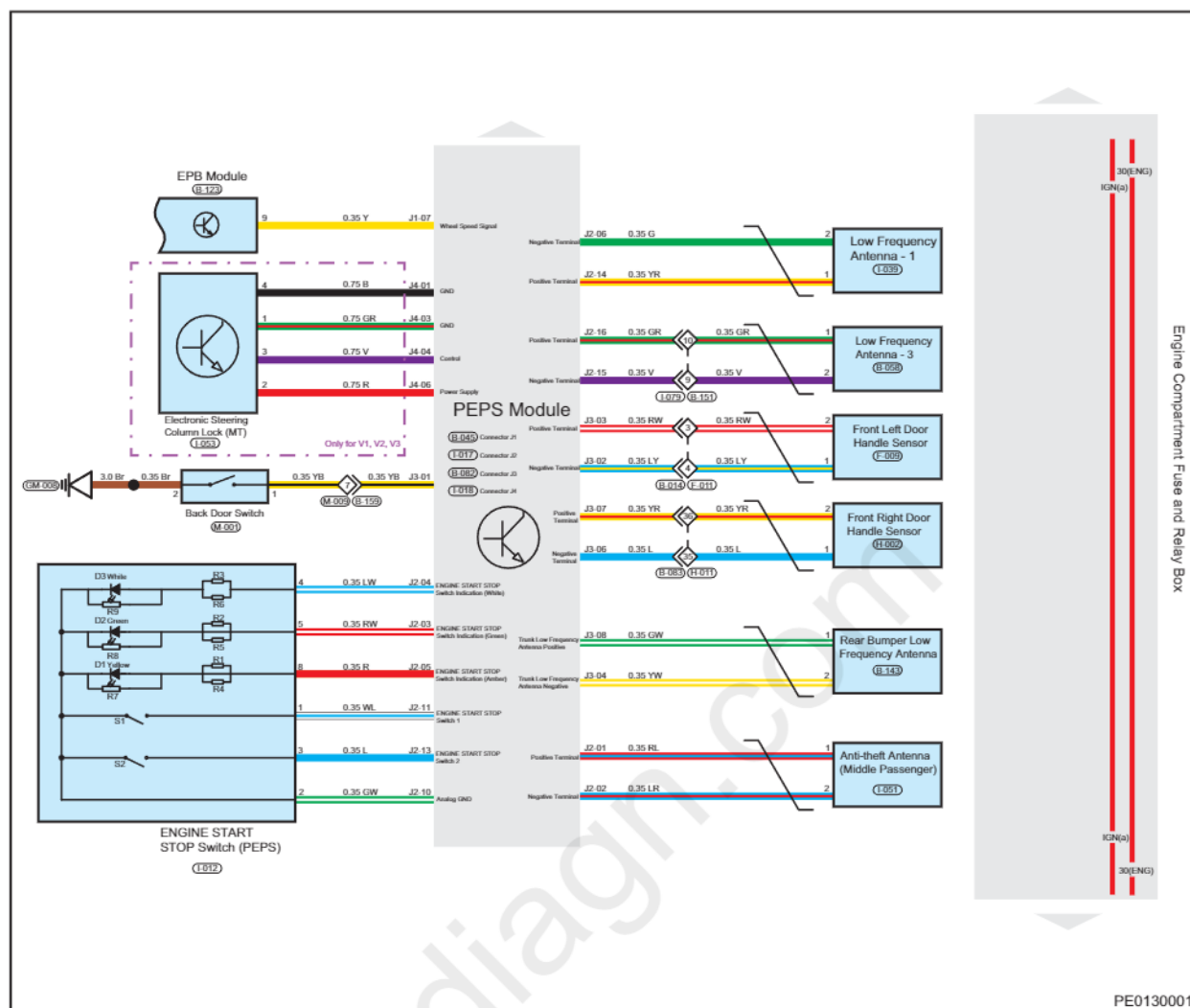
Body ground points are very important to the proper operation of circuits. Body ground points are often exposed to moisture, dirt and other corrosive environments. Corrosion (rust) may increase load resistance. This situation may change the way in which a circuit works. Circuits are very sensitive to proper body grounding. A loose or corroded body ground can affect the control circuit. Check the body ground points as follows:

1. Remove body ground bolt or nut.
2. Check all contact surfaces for tarnish, dirt and rust, etc.
3. Clean as necessary to ensure that contacting is in good condition.
4. Reinstall body ground bolt or nut securely.
5. Check if there are add-on accessories that interfere with body ground circuit.
6. If several wire harnesses are crimped into one body ground terminal, check for proper crimps. Make sure all wire harnesses are clean, securely fastened with providing a good body ground path.



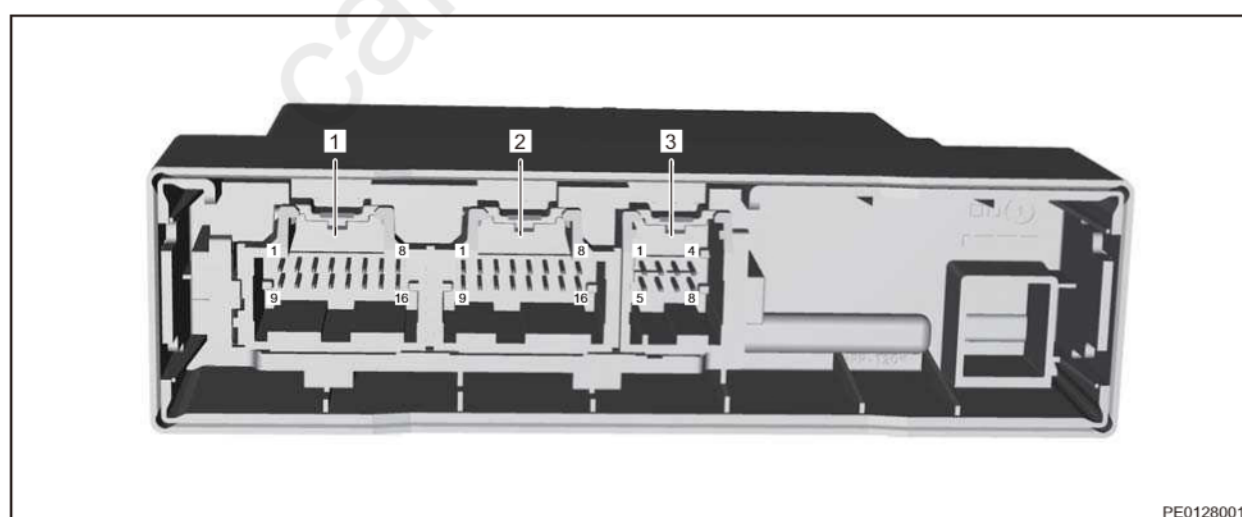
MT





PE0130001

PEPS Control Module Assembly Terminal List



PE0128001

Terminal No.	Terminal Definition	Terminal No.	Terminal Definition
J101	Battery	J109	Clutch switch signal
J102	IG1 Relay Drive (High)	J110	Start relay detection



Terminal No.	Terminal Definition	Terminal No.	Terminal Definition
J103	ACC Relay Drive (High)	J111	Ignition signal
J104	IG2 Relay Drive (High)	J112	Starter Relay (High)
J105	High Speed CAN Low	J113	-
J106	High Speed CAN High	J114	-
J107	Hard Wire Wheel Speed Signal (Front Right Wheel)	J115	-
J108	-	J116	Ground

Terminal No.	Terminal Definition	Terminal No.	Terminal Definition
J201	Spare Antenna Positive End	J209	-
J202	Spare Antenna Negative End	J210	Analog Ground
J203	ENGINE START STOP Switch Indicator Output (Green)	J211	ENGINE START STOP switch 1
J204	ENGINE START STOP Switch Backlight Output (White)	J212	-
J205	ENGINE START STOP Switch Indicator Output (Amber)	J213	ENGINE START STOP Switch 2
J206	Low Frequency Antenna 1 Negative	J214	Low Frequency Antenna 1 Positive
J207	Low Frequency Antenna 2 Negative	J215	Low Frequency Antenna 3 Negative
J208	Low Frequency Antenna 2 Positive	J216	Low Frequency Antenna 3 Negative

Terminal No.	Terminal Definition	Terminal No.	Terminal Definition
J301	Luggage Compartment Unlock Switch	J305	-
J302	Left Door Handle Sensor Negative	J306	Right Door Handle Sensor Negative
J303	Luggage Compartment Low Frequency Antenna Negative	J307	Right Door Handle Sensor Negative
J304	Luggage Compartment Low Frequency Antenna Negative	J308	Luggage Compartment Low Frequency Antenna Positive

Terminal No.	Terminal Definition	Terminal No.	Terminal Definition
J401	Electronic Steering Column Lock Module Control Ground	J406	Electronic Steering Column Lock Power Supply
J402	-	J407	-
J403	Electronic Steering Column Lock Ground	J408	Ground
J404	Electric Steering Column Lock Control Ground	J409	-
J405	-	J410	IG1 Power Supply

Diagnostic Trouble Code (DTC) Chart

DTC	DTC Definition
B1300	Internal Control Module EEPROM Error
B1301	Immobilizer and ECM Authentication Failed
B1302	VIN Not Programmed
B1303	The Antenna Communication is Disturbed
B1304	None Transponder was Detected
B1305	Immobilizer Has None Key was Storage
B1306	Security Code was not Programmed
B1500	Driver Door Outside LF Antenna
B1501	Passenger Door Outside LF Antenna
B1502	Front Internal LF Antenna
B1503	Middle Internal LF Antenna
B1504	Rear Internal LF Antenna

DTC	DTC Definition
B1505	Bumper LF Antenna
B1506	Abnormality of ENGINE START STOP Switch
B1508	Abnormality in ACC Circuit
B1509	Abnormality in Brake Signal
B150A	Abnormality in Vehicle Speed Signal
B150C	Clutch Switch Signal Error
B150F	ESCL Anti-scanning
B1510	Abnormality on Wheel Speed Signal
B1515	ROM Checksum Failure
B1516	HSU Overload
B1517	HSU Switch Continuously Pressed
U0073	CAN Bus Off
U0100	Lost of Communication with Engine Control System Module
U0101	Lost of Communication with Transmission Control Unit
U0129	Lost Communication with Brake System Module
U0140	Lost Communication with Body Control Module
U0329	Lost Communication with Electronic Steering Column Lock
U1300	Software Configuration Error
B1518	Trunk/Back Door Unlock Switch Stuck Failure
B1519	Back Door Lock Switch Continuously Pressed



DTC	B1300	Internal Control Module EEPROM Error
------------	--------------	---

Description

DTC	DTC Definition
B1300	Internal Control Module EEPROM Error

Procedure**1** Check for DTCs

- 32** (a) Using diagnostic tester, clear DTC and read IMMO control module assembly DTC.
 (b) Check if DTC occurs again.

Result

Proceed to
OK
NG

OK

System is normal

NG

2 Check if vehicle PEPS control is normal**Result**

Proceed to
OK
NG

OK

Turn off vehicle power supply (disconnect the negative battery cable), then clear DTC again

NG

Replace PEPS module

DTC	B1301	Immobilizer and ECM Authentication Failed
------------	--------------	--

Description

DTC	DTC Definition
B1301	Immobilizer and ECM Authentication Failed

Procedure

1	Check for DTCs
----------	-----------------------

- (a) Using diagnostic tester, clear DTC and read IMMO control module assembly DTC.
 (b) Check if DTCs occur again.

32**Result**

Proceed to
OK
NG

OK	System is normal
-----------	-------------------------

NG

2	Check if engine can be started normally
----------	--

Result

Proceed to
OK
NG

OK	Turn off vehicle power supply (disconnect the negative battery cable), then clear DTC again
NG	Perform anti-theft match for PEPS and ECU module again



DTC	B1302	VIN Not Programmed
------------	--------------	---------------------------

Description

DTC	DTC Definition
B1302	VIN Not Programmed

Procedure

1	Check for DTCs
----------	-----------------------

- (a) Using diagnostic tester, clear DTC and read IMMO control module assembly DTC.
 (b) Check if DTCs occur again.

Result

Proceed to
OK
NG

OK	System is normal
-----------	-------------------------



2	Turn off vehicle power supply (disconnect the negative battery cable), then clear DTC
----------	--

Result

Proceed to
OK
NG

OK	System is normal
-----------	-------------------------

NG	Input VIN into PEPS again
-----------	----------------------------------

DTC	B1303	The Antenna Communication is Disturbed
------------	--------------	---

Description

DTC	DTC Definition
B1303	The Antenna Communication is Disturbed

Procedure

1	Check for DTCs
----------	-----------------------

- (a) Using diagnostic tester, clear DTC and read IMMO control module assembly DTC.
 (b) Check if DTCs occur again.

32**Result**

Proceed to
OK
NG

OK	System is normal
NG	Turn off vehicle power supply (disconnect the negative battery cable), then clear DTC



DTC	B1304	None Transponder was Detected
------------	--------------	--------------------------------------

Description

DTC	DTC Definition
B1305	Immobilizer Has None Key was Storage

Procedure

1	Check for DTCs
----------	-----------------------

- (a) Using diagnostic tester, clear DTC and read IMMO control module assembly DTC.
 (b) Check if DTCs occur again.

Result

Proceed to
OK
NG

OK	System is normal
-----------	-------------------------

NG

2	Check remote controller
----------	--------------------------------

- (a) Press remote controller and check if red LED indicator blinks normally

Result

Proceed to
OK
NG

NG	Go to step 4
-----------	---------------------

OK

3	Check if smart key type is correct
----------	---

- (a) Check if smart key is original key.

Result

Proceed to
OK
NG

NG	Replace with original smart key and perform test
-----------	---

OK

4 Remove smart key and check remote controller

- (a) Check if remote controller battery voltage is less than 3 V.
 (b) Check remote controller chip for water corrosion or burn.

Result

Proceed to
OK
NG

NG

Replace smart key

OK

32

5 Turn off vehicle power supply (disconnect the negative battery cable), then clear DTC

Result

Proceed to
OK
NG

OK

System is normal

NG

Replace smart key



DTC	B1305	None Transponder was Detected
------------	--------------	--------------------------------------

Description

DTC	DTC Definition
B1304	None Transponder was Detected

Procedure

1	Check for DTCs
----------	-----------------------

- (a) Using diagnostic tester, clear DTC and read IMMO control module assembly DTC.
 (b) Check if DTCs occur again.

Result

Proceed to
OK
NG

NG**Enter anti-theft system and add key****OK**

2	Reconfirm DTCs
----------	-----------------------

- (a) Use diagnostic tester to clear DTCs.
 (b) Check if the same DTCs are still output.

Result

Proceed to
OK
NG

OK**System operates normally****NG****Replace PEPS control module assembly**

DTC	B1306	Security Code was not Programmed
------------	--------------	---

Description

DTC	DTC Definition
B1306	Security Code was not Programmed

Procedure

1	Check for DTCs
----------	-----------------------

- (a) Using diagnostic tester, clear DTC and read IMMO control module assembly DTC.
 (b) Check if DTCs occur again.

32**Result**

Proceed to
OK
NG

NG**Rematch PEPS module****OK**

2	Reconfirm DTCs
----------	-----------------------

- (a) Use diagnostic tester to clear DTCs.
 (b) Check if the same DTCs are still output.

Result

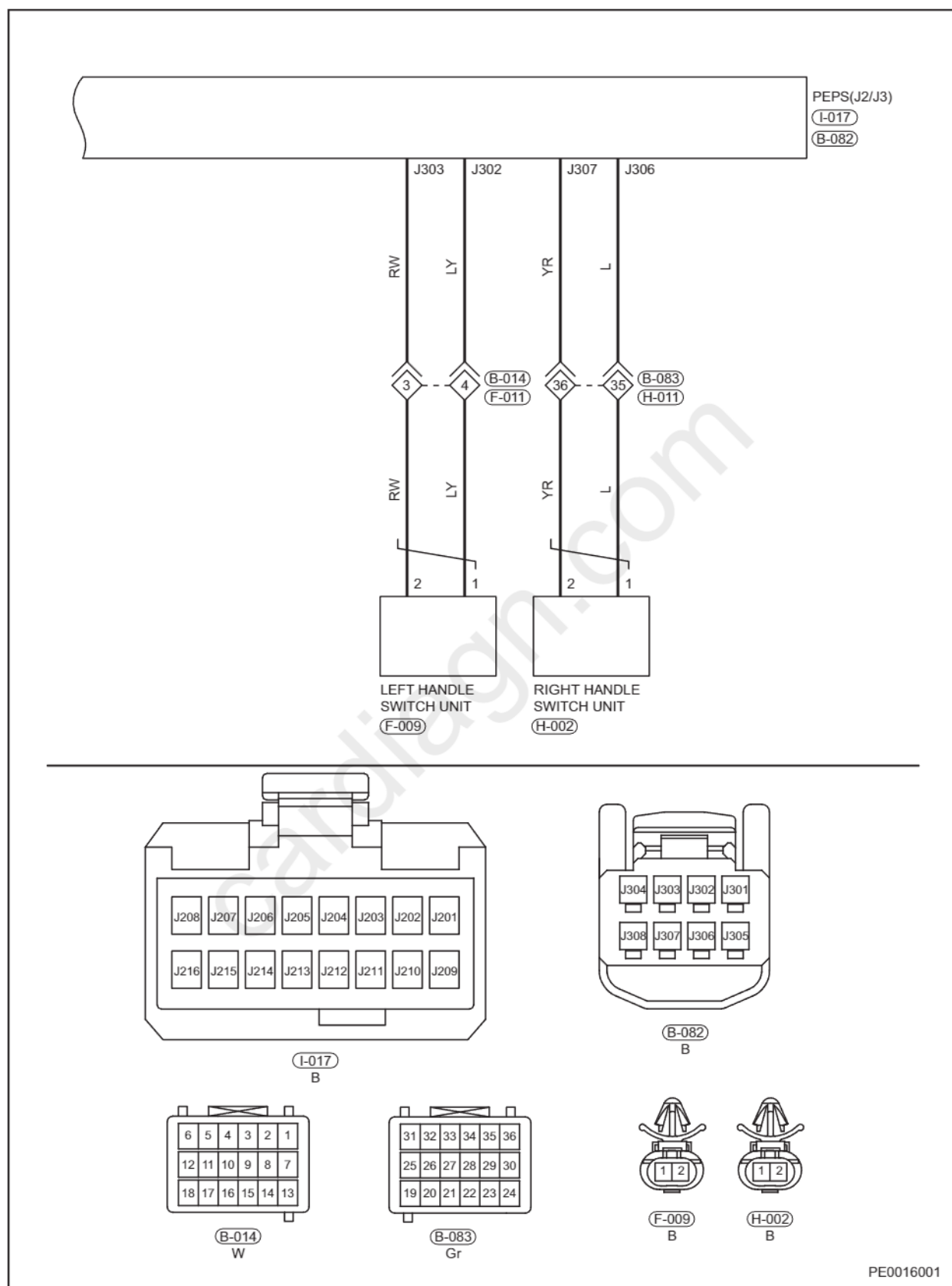
Proceed to
OK
NG

OK**System operates normally****NG****Replace PEPS control module assembly**

DTC	B1500	Driver Door Outside LF Antenna
DTC	B1501	Passenger Door Outside LF Antenna
DTC	B1516	HSU Overload
DTC	B1517	HSU Switch Continuously Pressed

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Circuit Diagram



Description

DTC	DTC Definition
B1500	Driver Door Outside LF Antenna
B1501	Passenger Door Outside LF Antenna
B1516	HSU Overload
B1517	HSU Switch Continuously Pressed

Caution:

Take driver side low frequency antenna as an example to explain troubleshooting procedures for reference.

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

32

Procedure

1 Check if PEPS module output voltage is normal.

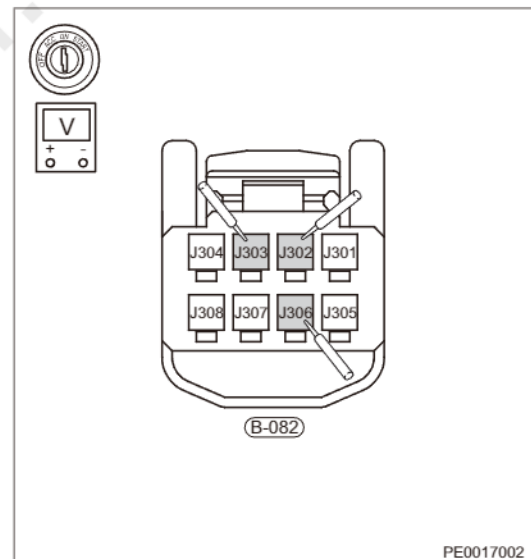
- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the PEPS module connector J3.
- Check if wire harnesses are worn, pierced, pinched or partially broken.
- Check for broken, bent, protruded or corroded terminals.
- Check if related connector pins are in good condition.
- Connect the negative battery cable, turn ENGINE START STOP Switch to ON, use DC voltage band of digital multimeter to measure if voltage between output terminals J3-03 and J3-02 of PEPS module is normal.

OK

Multimeter Connection	Condition	Specified Condition
J3-03 - J3-02	Always	12 V

Result

Proceed to
OK
NG

**NG****Replace PEPS control module assembly****OK****2** Measure resistance of door handle sensor

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the front left door sensor connector F-009.
- Check if wire harnesses are worn, pierced, pinched or partially broken.
- Check for broken, bent, protruded or corroded terminals.

- (f) Check if related connector pins are in good condition.
 (g) Using ohm band of digital multimeter, measure if resistance of front left door handle sensor is normal.

OK

Multimeter Connection	Condition	Specified Condition
Front left door handle sensor terminal 1 - 2	Microswitch not pressed	∞
Front left door handle sensor terminal 1 - 2	Microswitch pressed	$\approx 1\text{ K}\Omega$

Result

Proceed to
OK
NG

NG

Replace left door handle sensor

OK



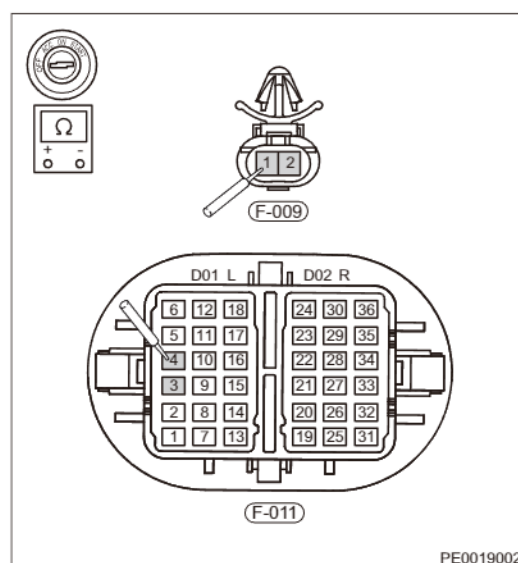
3

Check front left door wire harness for open or short

- (a) Disconnect the front left door wire harness connector F-011.
 (b) Check if wire harnesses are worn, pierced, pinched or partially broken.
 (c) Check for broken, bent, protruded or corroded terminals.
 (d) Check if related connector pins are in good condition.
 (e) Using ohm band of digital multimeter, measure resistance between terminals 1, 2 of connector F-009 and terminals 4, 3 of connector F-011 to check front left door wire harness for open.

OK

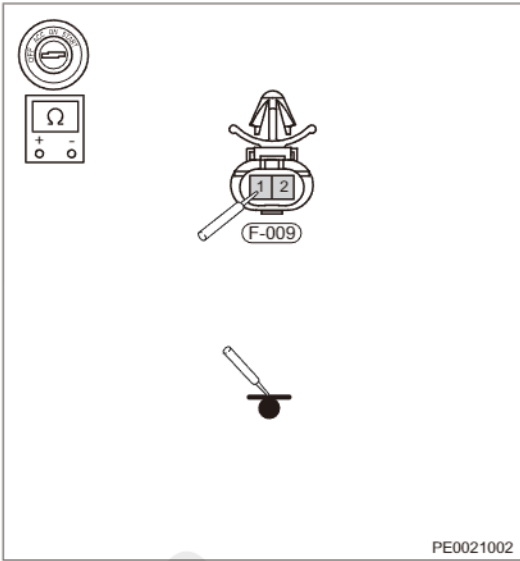
Multimeter Connection	Condition	Specified Condition
F-009-1 - F-011-4	Always	$\leq 1\ \Omega$
F-009-2 - F-011-3	Always	$\leq 1\ \Omega$



- (f) Using ohm band of digital multimeter, measure resistance between terminals 1, 2 of front left door wire harness connector F-009 and body ground to check front left door wire harness for short to body ground.

OK

Multimeter Connection	Condition	Specified Condition
F-009-1 - Body ground	Always	∞
F-009-2 - Body ground	Always	∞



32

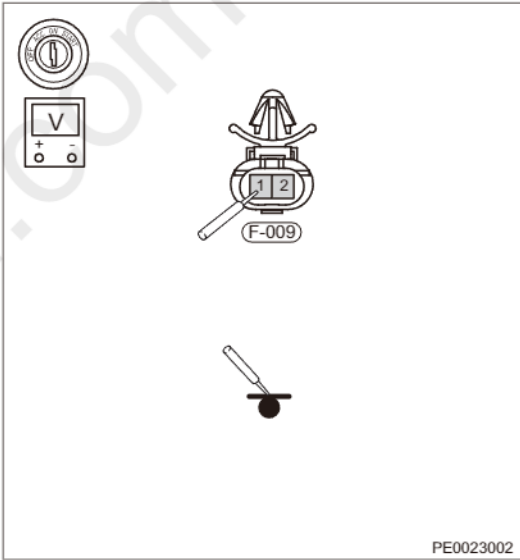
- (g) Connect the negative battery cable, turn ENGINE START STOP switch to ON, (confirm that connectors F-011 and B-014 are disconnected). Using DC voltage band of digital multimeter, measure voltage between terminals 1, 2 of front left door wire harness connector F-009 and body ground to check front left door wire harness for short to power supply.

OK

Multimeter Connection	Condition	Specified Condition
F-009-1 - Body ground	Always	0 V
F-009-2 - Body ground	Always	0 V

Result

Proceed to
OK
NG



NG Replace front left door wire harness

OK

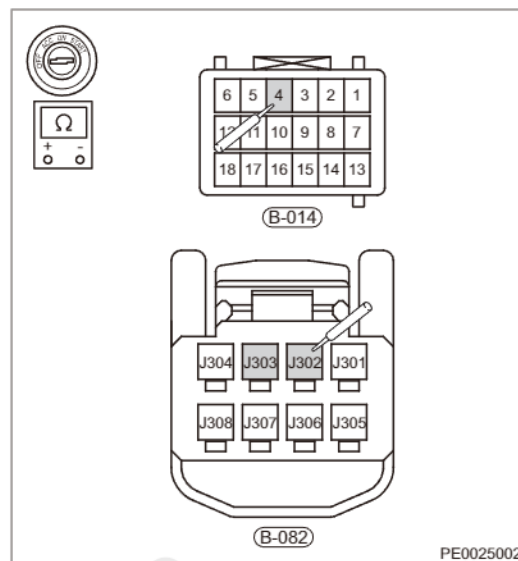
4 Check interior wire harness for open or short

- (a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.

- (c) Using ohm band of digital multimeter, measure resistance between terminals 4, 3 of connector B-014 and terminals 2, 3 of connector J3 to check interior wire harness for open.

OK

Multimeter Connection	Condition	Specified Condition
B-014-4 - J3-02	Always	$\leq 1 \Omega$
B-014-4 - J3-03	Always	$\leq 1 \Omega$

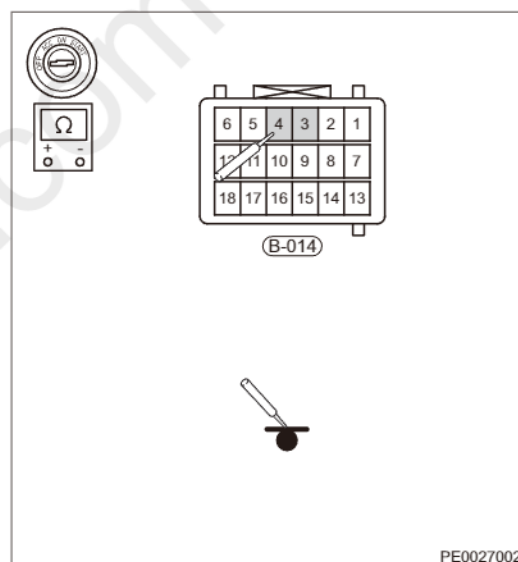


PE0025002

- (d) Using ohm band of digital multimeter, measure resistance between terminals 4, 3 of interior wire harness connector B-014 and body ground to check interior wire harness for short to body ground.

OK

Multimeter Connection	Condition	Specified Condition
B-014-4 - Body ground	Always	∞
B-014-3 - Body ground	Always	∞



PE0027002

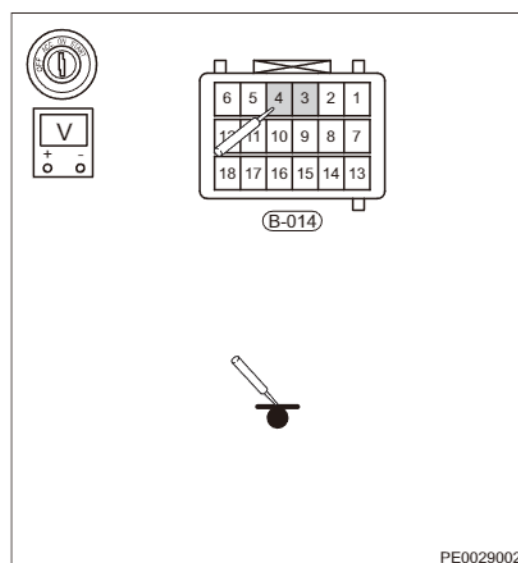
- (e) Connect the negative battery cable, turn ENGINE START STOP switch to ON, (confirm that PEPS module and connector J3 are disconnected). Using DC voltage band of digital multimeter, measure voltage between terminals 4, 3 of interior wire harness connector B-014 and body ground to check interior wire harness for short to power supply.

OK

Multimeter Connection	Condition	Specified Condition
B-014-4 - Body ground	Always	0 V
B-014-3 - Body ground	Always	0 V

Result

Proceed to
OK
NG



PE0029002



OK	Replace PEPS module
NG	Replace interior wire harness

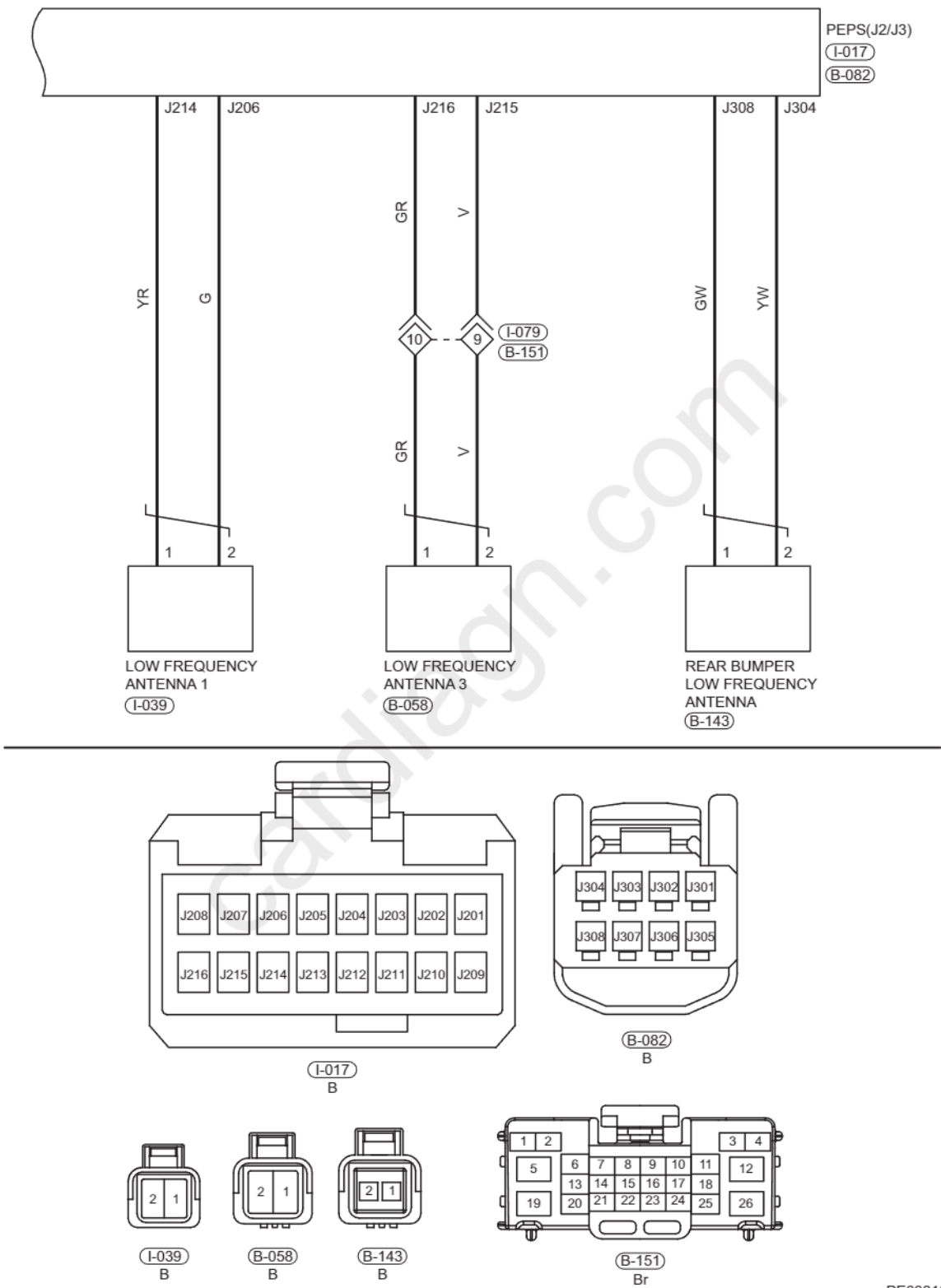
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DTC	B1502	Front Internal LF Antenna
DTC	B1503	Middle Internal LF Antenna
DTC	B1504	Rear Internal LF Antenna
DTC	B1505	Bumper LF Antenna



Circuit Diagram

32



PE0031001

Description

DTC	DTC Definition
B1502	Front Internal LF Antenna
B1503	Middle Internal LF Antenna
B1504	Rear Internal LF Antenna
B1505	Bumper LF Antenna

Hint:

For above DTC troubleshooting, take "B1503 - Middle Internal LF Antenna Circuit Open" as an example.

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Procedure**32****1 Check if PEPS module software configuration code is correct.**

- Using diagnostic tester, enter PEPS system.
- Read software configuration code and check if it is "07".

Result

Proceed to
OK
NG

NG

Input configuration code "07" again and clear DTC

OK**2 Measure resistance of low frequency antenna**

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the interior middle low frequency antenna (2) connector I-032.
- Check if wire harnesses are worn, pierced, pinched or partially broken.
- Check for broken, bent, protruded or corroded terminals.
- Check if related connector pins are in good condition.
- Using ohm band of digital multimeter, measure if resistance of interior middle low frequency antenna (2) is normal.

OK

Multimeter Connection	Condition	Specified Condition
Low frequency antenna (2)	Always	$\approx 10\text{ K}\Omega$

Result

Proceed to
OK
NG



NG

Replace low frequency antenna

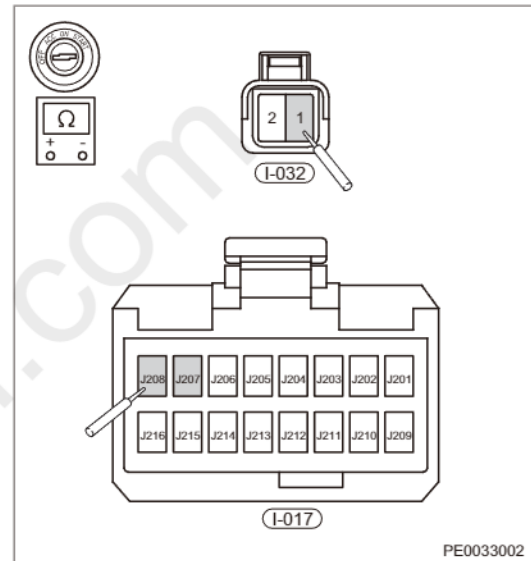
OK

3 Check interior wire harness for open or short

- (a) Turn ENGINE START STOP switch to OFF.
 (b) Disconnect the negative battery cable.
 (c) Disconnect low frequency antenna (2) connector I-032 and PEPS module connector J2.
 (d) Check if wire harnesses are worn, pierced, pinched or partially broken.
 (e) Check for broken, bent, protruded or corroded terminals.
 (f) Check if related connector pins are in good condition.
 (g) Using ohm band of digital multimeter, measure resistance between terminal 1 of connector I-032 and terminal 8 of connector J2, between terminal 2 of connector I-032 and terminal 7 of connector J2 to check instrument cluster wire harness for open.

OK

Multimeter Connection	Condition	Specified Condition
I-032-1 - J2-8	Always	$\leq 1 \Omega$
I-032-1 - J2-7	Always	$\leq 1 \Omega$

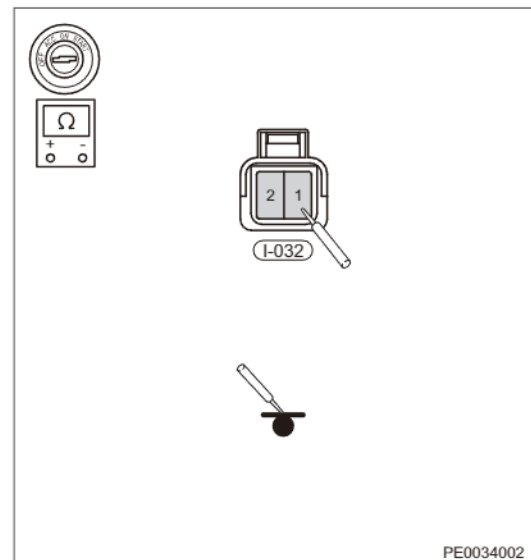


PE0033002

- (h) Using ohm band of digital multimeter, measure resistance between terminals 1, 2 of connector I-032 and body ground to check instrument cluster wire harness for short to body ground.

OK

Multimeter Connection	Condition	Specified Condition
I-032-1 - Body ground	Always	∞
I-032-2 - Body ground	Always	∞



PE0034002

- (i) Connect the negative battery cable (confirm that connectors I-032 and J2 are disconnected). Bridge joint ACC relay and IGN1 relay (connector J2 is disconnected, so ENGINE START STOP switch input is opened). Using DC voltage band of digital multimeter, measure voltage between terminals 1, 2 of connector I-032 and body ground to check instrument cluster wire harness for short to power supply.

OK

Multimeter Connection	Condition	Specified Condition
I-032-1 - Body ground	Always	0 V
I-032-2 - Body ground	Always	0 V

Result

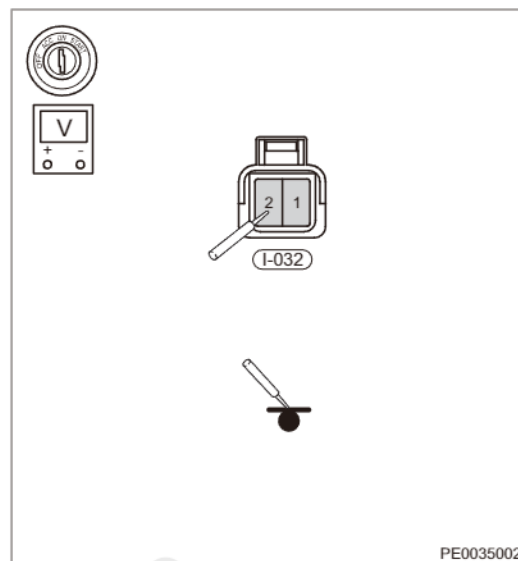
Proceed to
OK
NG

OK

Replace PEPS module

NG

Replace instrument cluster wire harness



PE0035002

32



Circuit Diagram



Description

DTC	DTC Definition
B1506	Abnormality of ENGINE START STOP Switch

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Procedure**1 Enter PEPS system and read related datastream**

- Read datastream "Power Supply Management and Starting State" and "Engine Switch Backlight State".
- Press ENGINE START STOP switch, check datastream conversion activation state and backlight illumination state, to check if ENGINE START STOP switch input is normal.

Result

Proceed to
OK
NG

OK

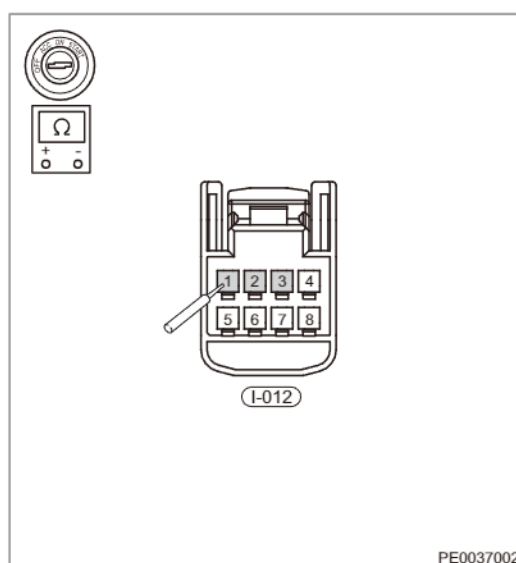
Turn off vehicle power supply (disconnect the negative battery cable), then clear DTC again

NG**2 Check the ENGINE START STOP switch**

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the ENGINE START STOP switch connector I-012.
- Using ohm band of digital multimeter, measure resistance of ENGINE START STOP switch to check if ENGINE START STOP switch is normal.

OK

Multimeter Connection	Condition	Specified Condition
ENGINE START STOP switch terminal 2 - 1	Not pressed	∞
ENGINE START STOP switch terminal 2 - 1	Pushed	$\leq 1 \Omega$
ENGINE START STOP switch terminal 2 - 3	Not pressed	∞
ENGINE START STOP switch terminal 2 - 3	Pushed	$\leq 1 \Omega$
ENGINE START STOP switch terminal 1 - 3	Not pressed	∞
ENGINE START STOP switch terminal 1 - 3	Pushed	$\leq 1 \Omega$
ENGINE START STOP switch terminal 4 - 2	Not pressed	$\approx 6.33 \text{ K}\Omega$



Multimeter Connection	Condition	Specified Condition
ENGINE START STOP switch terminal 5 - 2	Not pressed	$\approx 6.21 \text{ K}\Omega$
ENGINE START STOP switch terminal 8 - 2	Not pressed	$\approx 5.84 \text{ K}\Omega$

Result

Proceed to
OK
NG

NG

Replace the ENGINE START STOP switch

OK

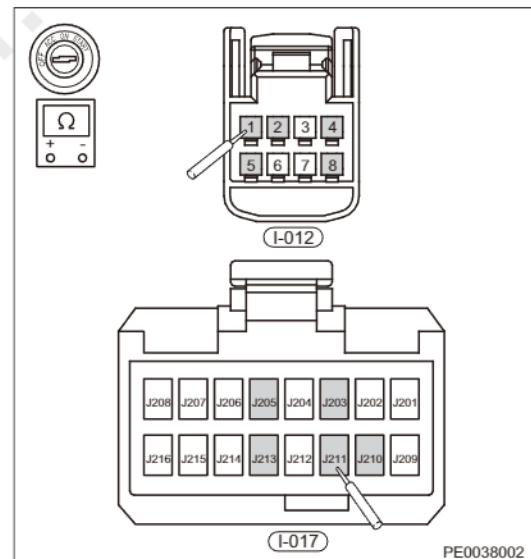
3

Check instrument cluster wire harness for open or short

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect ENGINE START STOP switch connector I-012 and PEPS module connector J2.
- Check if wire harnesses are worn, pierced, pinched or partially broken.
- Check for broken, bent, protruded or corroded terminals.
- Check if related connector pins are in good condition.
- Using ohm band of digital multimeter, measure resistance between terminal 1 of connector I-012 and terminal 11 of connector J2, between terminal 2 of connector I-012 and terminal 10 of connector J2, between terminal 3 of connector I-012 and terminal 13 of connector J2, between terminal 4 of connector I-012 and terminal 4 of connector J2, between terminal 5 of connector I-012 and terminal 3 of connector J2, between terminal 8 of connector I-012 and terminal 5 of connector J2 to check instrument cluster wire harness for open.

OK

Multimeter Connection	Condition	Specified Condition
I-012-1 - J2-11	Always	$\leq 1 \Omega$
I-012-2 - J2-10	Always	$\leq 1 \Omega$
I-012-3 - J2-13	Always	$\leq 1 \Omega$
I-012-4 - J2-04	Always	$\leq 1 \Omega$
I-012-5 - J2-03	Always	$\leq 1 \Omega$
I-012-8 - J2-05	Always	$\leq 1 \Omega$

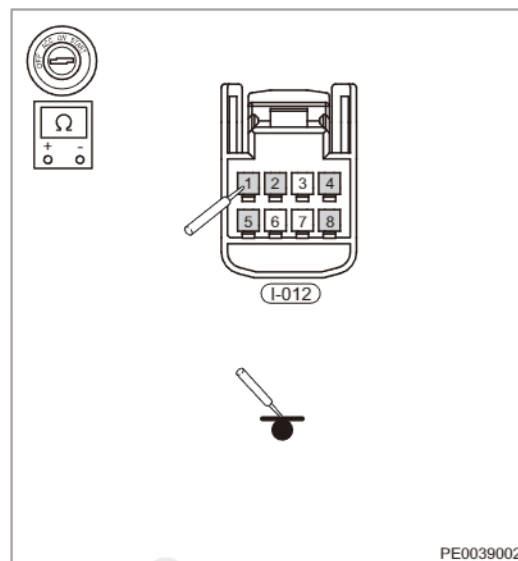


PE0038002

- (h) Using ohm band of digital multimeter, measure resistance between terminals 1, 2, 3, 4, 5, 8 of connector I-012 and body ground to check instrument cluster wire harness for short to body ground.

OK

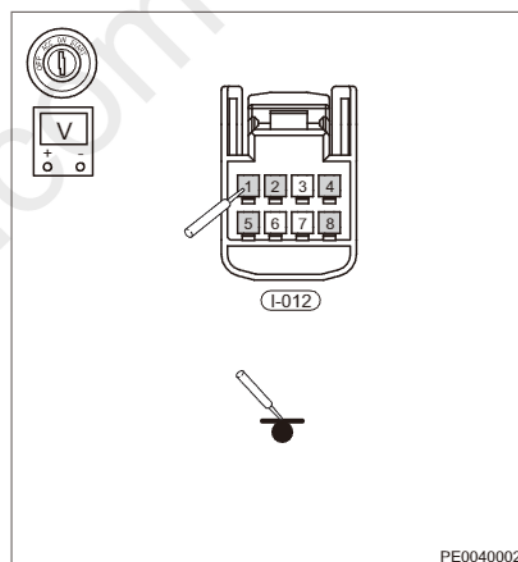
Multimeter Connection	Condition	Specified Condition
I-012-1 - Body ground	Always	∞
I-012-2 - Body ground	Always	∞
I-012-3 - Body ground	Always	∞
I-012-4 - Body ground	Always	∞
I-012-5 - Body ground	Always	∞
I-012-8 - Body ground	Always	∞



- (i) Connect the negative battery cable (confirm that connectors I-012 and J2 are disconnected). Bridge joint ACC relay and IGN1 relay (ENGINE START STOP switch is disabled). Using DC voltage band of digital multimeter, measure voltage between terminals 1, 2, 3, 4, 5, 8 of connector I-012 and body ground to check instrument cluster wire harness for short to power supply.

OK

Multimeter Connection	Condition	Specified Condition
I-012-1 - Body ground	Always	0 V
I-012-2 - Body ground	Always	0 V
I-012-3 - Body ground	Always	0 V
I-012-4 - Body ground	Always	0 V
I-012-5 - Body ground	Always	0 V
I-012-8 - Body ground	Always	0 V



Result

Proceed to
OK
NG

OK

Replace PEPS module

NG

Replace instrument cluster wire harness

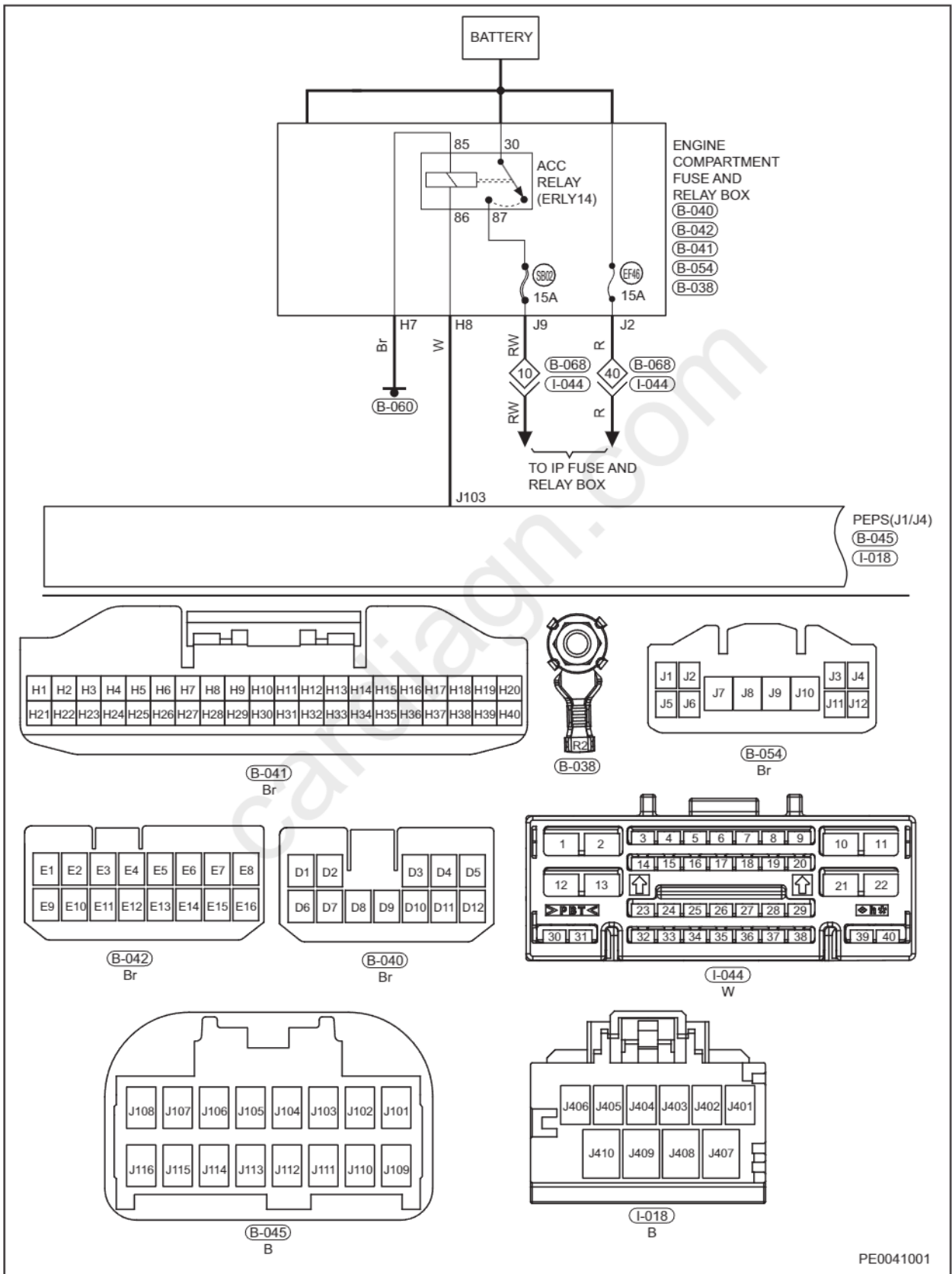


DTC

B1508

Abnormality in ACC Circuit

Circuit Diagram



PE0041001

Description

DTC	DTC Definition
B1508	Abnormality in ACC Circuit

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Procedure**1 Check fuse**

- (a) Measure fuse SB02-15A in engine compartment fuse and relay box with 21 W test light to check if test light comes on.

Result

Proceed to
OK
NG

OK

Turn off vehicle power supply (disconnect the negative battery cable), then turn on power supply again and clear DTC.

NG

2 Check if fuse base jack is abnormal

- (a) Remove fuse SB02-15A in engine compartment fuse and relay box and check fuse base jack for excessive clearance.

Result

Proceed to
OK
NG

NG

Adjust fuse base jack

OK

3 Adjust ACC relay**Result**

Proceed to
OK
NG

OK

Replace ACC relay

NG



4 Check if relay switch power supply is normal

- (a) Unplug ACC relay (ERLY14) in engine compartment fuse and relay box.
 (b) Using 21 W test light or digital multimeter, measure if power supply of ACC relay base No.30 jack is normal.

OK

Multimeter Connection	Condition	Specified Condition
ACC relay base 30 - Body ground (digital multimeter)	Always	Not less than 12 V
ACC relay base 30 - Body ground (21 W test light)	Always	ON

Result

Proceed to
OK
NG

NG**Replace wire harness****OK****5 Short connect the ACC relay base jack control switch**

- (a) Use a wire to bridge joint jacks 87 and 30 of relay ACC base in engine compartment fuse and relay box, and check engine compartment fuse and relay box for open.

Result

Proceed to
OK
NG

NG**Replace wire harness****OK****6 Check ACC relay control body ground**

- (a) Using ohm band of digital multimeter, measure resistance between jack 85 of ACC relay base and terminal H7 of engine compartment fuse and relay box to check engine compartment fuse and relay box for open.

OK

Multimeter Connection	Condition	Specified Condition
ACC relay base 85 - Engine compartment fuse and relay box H7	Always	$\leq 1 \Omega$

- (b) Using ohm band of digital multimeter, measure resistance between terminal H7 of engine compartment fuse and relay box and body ground to check if ground circuit is abnormal.

OK

Multimeter Connection	Condition	Specified Condition
Engine compartment fuse and relay box 5 - Body ground	Always	$\leq 1 \Omega$

Result

Proceed to
OK
NG

NG

Handle the GB-060 ground position or replace the wire harness.

OK

32

7

Check ACC relay control power supply side

- (a) Disconnect the negative battery cable.
- (b) Disconnect the PEPS module connector J1.
- (c) Check if wire harnesses are worn, pierced, pinched or partially broken.
- (d) Check for broken, bent, protruded or corroded terminals.
- (e) Check if related connector pins are in good condition.
- (f) Using ohm band of digital multimeter, measure resistance between terminal H8 of engine compartment fuse and relay box and terminal 3 of connector J1.

OK

Multimeter Connection	Condition	Specified Condition
Engine compartment fuse and relay box H8 - J1-03	Always	$\leq 1 \Omega$

Result

Proceed to
OK
NG

OK

Replace PEPS module

NG

Replace wire harness



Circuit Diagram



Description

DTC	DTC Definition
B1509	Abnormality in Brake Signal

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Procedure**1 Check for DTCs**

- (a) Using diagnostic tester, clear DTC and read PEPS control module assembly DTC again.
 (b) Check if DTCs occur again.

Result

Proceed to
OK
NG

OK

System is normal

NG

2 Using diagnostic tester, enter other system

- (a) Using diagnostic tester, enter other system (such as ESP module, TCU) and check if same DTC occurs.

Result

Proceed to
OK
NG

NG

3 Check interior wire harness and connector

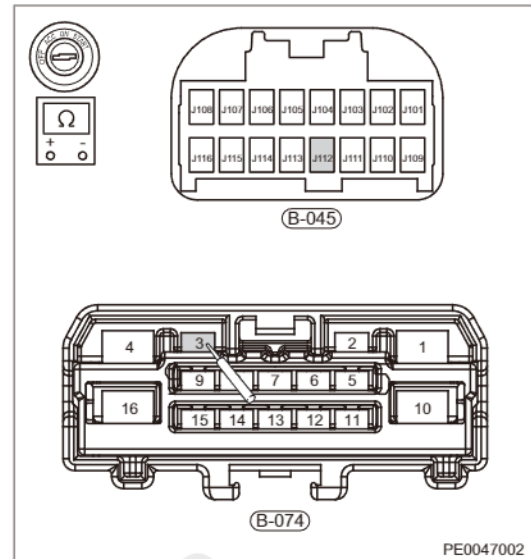
- (a) Turn ENGINE START STOP switch to OFF.
 (b) Disconnect the negative battery cable.
 (c) Disconnect connectors Q-033, B-074 and terminal J1 of PEPS module.
 (d) Check if wire harnesses are worn, pierced, pinched or partially broken.
 (e) Check for broken, bent, protruded or corroded terminals.
 (f) Check if related connector pins are in good condition.



- (g) Using ohm band of digital multimeter, measure resistance between terminal 3 of connector B-074 and terminal 12 of connector J1 to check for open.

OK

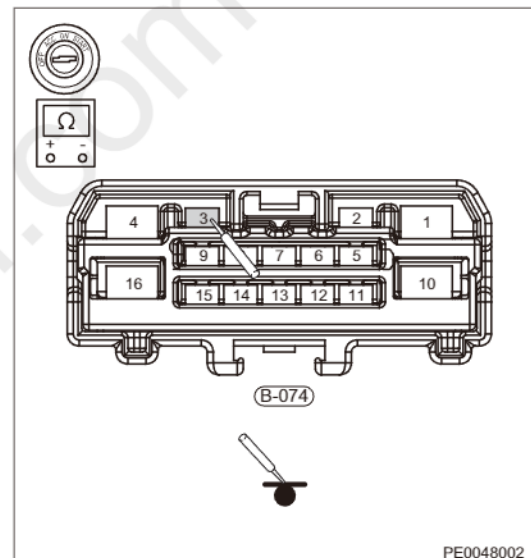
Multimeter Connection	Condition	Specified Condition
B-074-03 - J1-12	Always	$\leq 1 \Omega$



- (h) Using ohm band of digital multimeter, measure resistance between terminal 3 of connector B-074 and body ground to check for short to ground.

OK

Multimeter Connection	Condition	Specified Condition
B-074-03 - Body ground	Always	∞



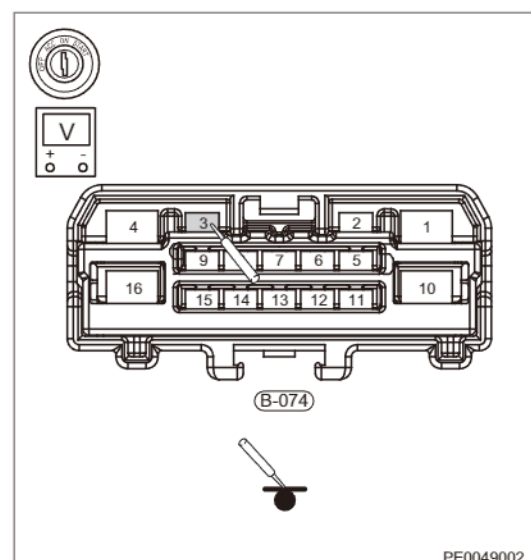
- (i) Connect the negative battery cable.
 (j) Turn ENGINE START STOP switch to ON.
 (k) (Confirm connectors J1 and B-074 are disconnected.) Using DC voltage band of digital multimeter, measure voltage between terminal 3 of connector B-074 and body ground to check for short to power supply.

OK

Multimeter Connection	Condition	Specified Condition
B-074-03 - Body ground	Always	0V

Result

Proceed to
OK
NG



OK

Replace PEPS module

NG

Replace interior wire harness

4

Check fuse

- (a) Measure fuse EF24-10A in engine compartment fuse and relay box with 21 W test light.

Result

Proceed to
OK
NG

NG

32

5

Check brake switch

- (a) Turn ENGINE START STOP switch to OFF.
 (b) Disconnect the negative battery cable.
 (c) Disconnect the connector Q-028.
 (d) Check if wire harnesses are worn, pierced, pinched or partially broken.
 (e) Check for broken, bent, protruded or corroded terminals.
 (f) Check if related connector pins are in good condition.
 (g) Using digital multimeter, measure internal resistance of brake switch to check if brake switch is abnormal

OK

Multimeter Connection	Condition	Specified Condition
Brake switch 1 - 3	Brake pedal not depressed	∞
Brake switch 1 - 3	Brake pedal depressed	$\leq 1 \Omega$
Brake switch 2 - 4	Brake pedal not depressed	$\leq 1 \Omega$
Brake switch 2 - 4	Brake pedal depressed	∞



Result

Proceed to
OK
NG

OK

Turn on power supply again and clear DTC

NG

Replace brake switch

6

Check fuse base jack

- (a) Turn ENGINE START STOP switch to OFF.
 (b) Disconnect the negative battery cable.
 (c) Remove fuse EF24-10A in engine compartment fuse and relay box and check fuse base jack for excessive clearance.



Result

Proceed to
OK
NG

NG

Adjust fuse jack clearance

OK

7**Check fuse base jack input power supply****32**

- (a) Connect the negative battery cable.
- (b) Turn ignition switch to ON.
- (c) Measure fuse jack input power supply with 21 W test light and check if test light comes on.

Result

Proceed to
OK
NG

OK

Replace fuse EF24-10A

NG

Replace front bumper wire harness

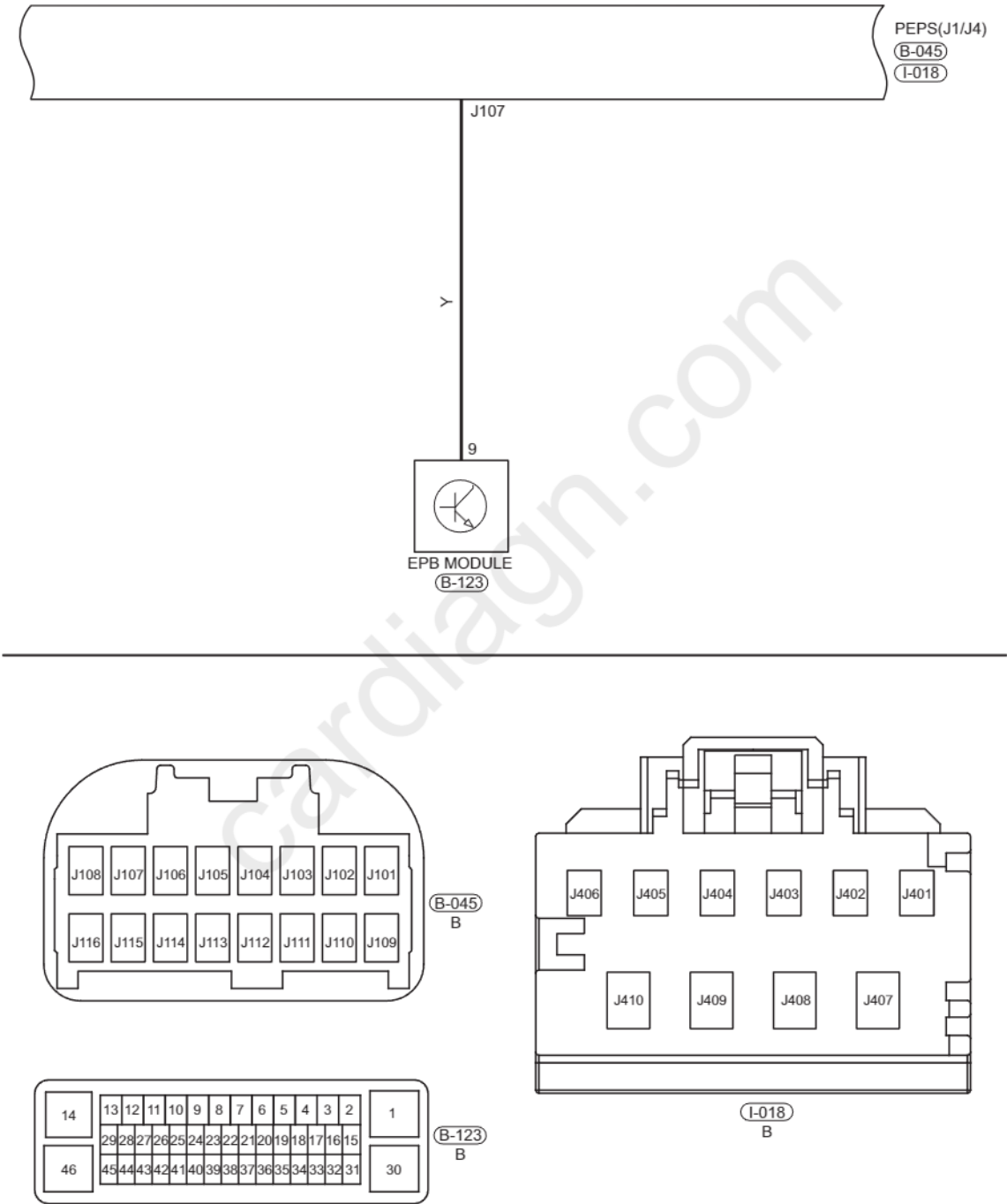
DTC	B150A	Abnormality in Vehicle Speed Signal
DTC	B1510	Abnormality on Wheel Speed Signal

cardiagn.com



Circuit Diagram

32



PE0050001

Description

DTC	DTC Definition
B150A	Abnormality in Vehicle Speed Signal
B1510	Abnormality in Vehicle Speed Signal

Caution:

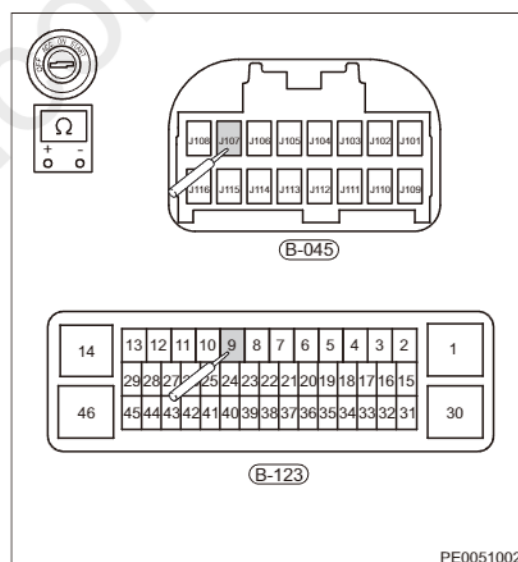
For above DTCs, refer to brake control system troubleshooting. If brake control system is normal, perform following diagnosis procedures.

Procedure**1 Check interior wire harness for open or short**

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the PEPS module connectors J1 and B-123.
- Check if wire harnesses are worn, pierced, pinched or partially broken.
- Check for broken, bent, protruded or corroded terminals.
- Check if related connector pins are in good condition.
- Using ohm band of digital multimeter, measure resistance between terminal 7 of connector J1 and terminals 9 of connector B-123 to check interior wire harness for open.

OK

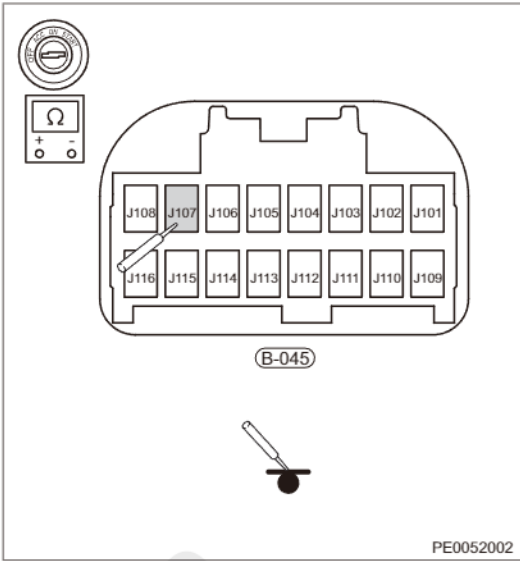
Multimeter Connection	Condition	Specified Condition
J1-07 - B-123-09	Always	$\leq 1 \Omega$



- (h) Using ohm band of digital multimeter, measure resistance between terminal 7 of connector J1 and body ground to check interior wire harness for short to body ground.

OK

Multimeter Connection	Condition	Specified Condition
J1-07 - Body ground	Always	∞



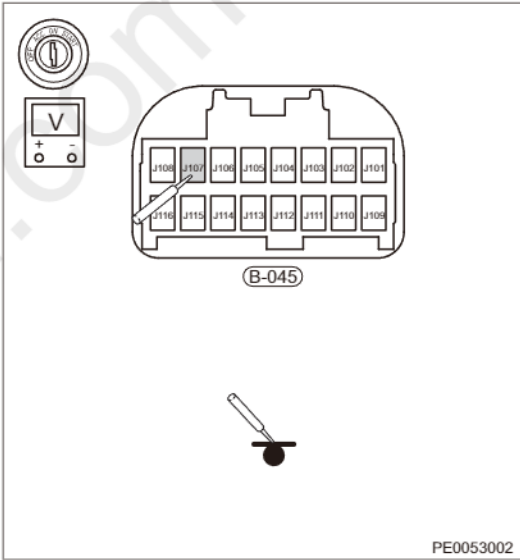
- (i) Connect the negative battery cable, turn ENGINE START STOP switch to ON, (confirm that connectors B-123 and J1 are disconnected). Using DC voltage band of digital multimeter, measure voltage between terminal 7 of connector J1 and body ground to check interior wire harness for short to power supply.

OK

Multimeter Connection	Condition	Specified Condition
J1-07 - Body ground	Always	0 V

Result

Proceed to
OK
NG



OK	Replace PEPS module
NG	Check wire harness

Description

DTC	DTC Definition
B150C	Clutch Switch Signal Error

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Procedure

1 Check for DTCs

- 32 (a) Using diagnostic tester, clear DTC and read PEPS control module assembly DTC again.
(b) Check if DTCs occur again.

Result

Proceed to
OK
NG

OK

System is normal

NG

2 Using diagnostic tester, enter other system

- (a) Using diagnostic tester, enter other system (such as ECU control unit) and check if same DTC occurs

Result

Proceed to
OK
NG

NG

3 Check PEPS module connector

- (a) Turn ENGINE START STOP switch to OFF.
(b) Disconnect the negative battery cable.
(c) Disconnect the PEPS module connector J1.
(d) Check if wire harnesses are worn, pierced, pinched or partially broken.
(e) Check for broken, bent, protruded or corroded terminals.
(f) Check if related connector pins are in good condition.
(g) Connect the negative battery cable.
(h) Turn ENGINE START STOP switch to ON.

- (i) Using DC voltage band of digital multimeter, measure voltage at terminal 9 of connector J1, check if voltage jumps as clutch pedal is depressed (at this time, ECU monitors clutch switch signal at high level). So, check interior wire harness for open.

OK

Multimeter Connection	Condition	Specified Condition
J1-09 - Body ground	Clutch pedal not depressed	$\approx 12\text{ V}$
J1-09 - Body ground	Clutch pedal depressed	0 V

Result

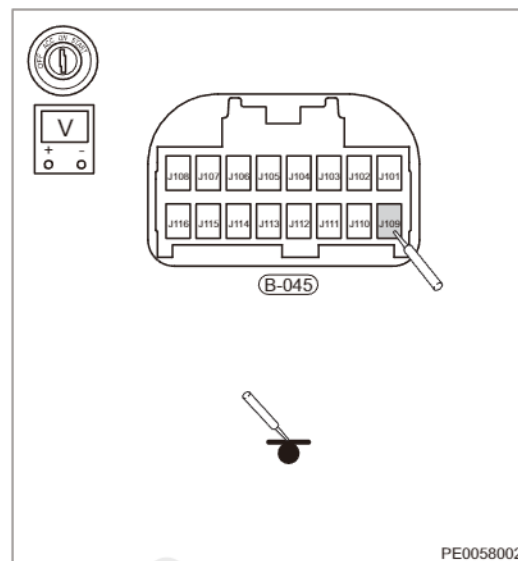
Proceed to
OK
NG

OK

Replace PEPS module

NG

Replace interior wire harness



32

4 Check clutch switch

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect the clutch bottom switch connector B-098.
- Check if wire harnesses are worn, pierced, pinched or partially broken.
- Check for broken, bent, protruded or corroded terminals.
- Check if related connector pins are in good condition.
- Using digital multimeter, measure internal resistance of clutch bottom switch to check if brake bottom switch is abnormal

OK

Multimeter Connection	Condition	Specified Condition
Clutch bottom switch 1 - 2	Brake pedal not depressed	∞
Clutch bottom switch 3 - 4	Brake pedal not depressed	∞
Clutch bottom switch 5 - 6	Brake pedal not depressed	$\leq 1\ \Omega$
Clutch bottom switch 1 - 2	Brake pedal depressed	$\leq 1\ \Omega$
Clutch bottom switch 3 - 4	Brake pedal depressed	$\leq 1\ \Omega$
Clutch bottom switch 5 - 6	Brake pedal depressed	∞

Result

Proceed to
OK
NG

NG

Replace clutch bottom switch



OK

5 Check clutch bottom switch ground signal

- (a) Using ohm band of digital multimeter, measure resistance between terminal 1 of clutch bottom switch connector B-098 and body ground to check if clutch bottom switch ground signal is normal
- OK**

Multimeter Connection	Condition	Specified Condition
B-098-1 - Body ground	Always	≤ 1 Ω

Result

32

Proceed to
OK
NG

OK	Replace interior wire harness
NG	Handle GB-027 ground signal

DTC	B1518	Trunk/Back Door Unlock Switch Stuck Failure
DTC	B1519	Back Door Lock Switch Continuously Pressed



32



Description

DTC	DTC Definition
B1518	Trunk/Back Door Unlock Switch Stuck Failure
B1519	Back Door Lock Switch Continuously Pressed

Caution:

When performing electrical equipment diagnosis and test, always refer to circuit diagram for related circuit and component information.

Procedure**1 Check vehicle malfunction condition**

- (a) Press back door release switch to check if back door is opened.

Result

Proceed to
OK
NG

OK

Turn off vehicle power supply (disconnect the negative battery cable), then turn on power supply again and clear DTC.

NG**2 Check back door release switch**

- (a) Turn ENGINE START STOP switch to OFF.
 (b) Disconnect the negative battery cable.
 (c) Disconnect back door release switch connector M-001.
 (d) Check if wire harnesses are worn, pierced, pinched or partially broken.
 (e) Check for broken, bent, protruded or corroded terminals.
 (f) Check if related connector pins are in good condition.
 (g) Using ohm band of digital multimeter, measure if resistance of back door release switch is normal to check if back door release switch is damaged.

OK

Multimeter Connection	Condition	Specified Condition
Back door release switch 1 - 2	Not pressed	∞
Back door release switch 1 - 2	Pushed	$\leq 1 \Omega$

Result

Proceed to
OK
NG

NG

Replace back door release switch



OK

3 Check back door release switch ground side

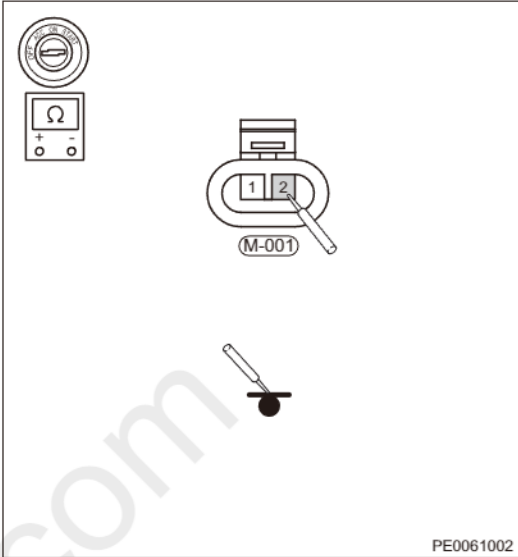
- (a) Using ohm band of digital multimeter, measure resistance between terminal 2 of connector M-001 and body ground to check ground side for normal.

OK

Multimeter Connection	Condition	Specified Condition
M-001-2 - Body ground	Always	≤ 1 Ω

Result

Proceed to
OK
NG



PE0061002

NG Handle GM-008 ground circuit

OK

4 Check back door release switch circuit signal voltage

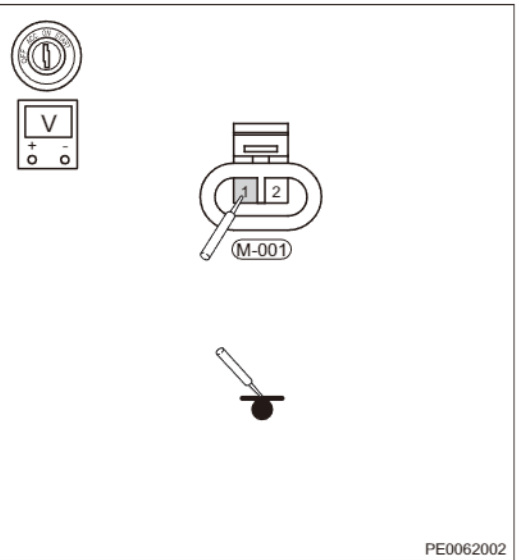
- (a) Connect the negative battery cable.
(b) Turn ENGINE START STOP switch to ON.
(c) Using DC voltage band of digital multimeter, measure if signal voltage at terminal 1 of connector M-001 is normal.

OK

Multimeter Connection	Condition	Specified Condition
M-001-1 - Body ground	ON state	Not less than 12 V

Result

Proceed to
OK
NG



PE0062002

OK Handle poor connector contact

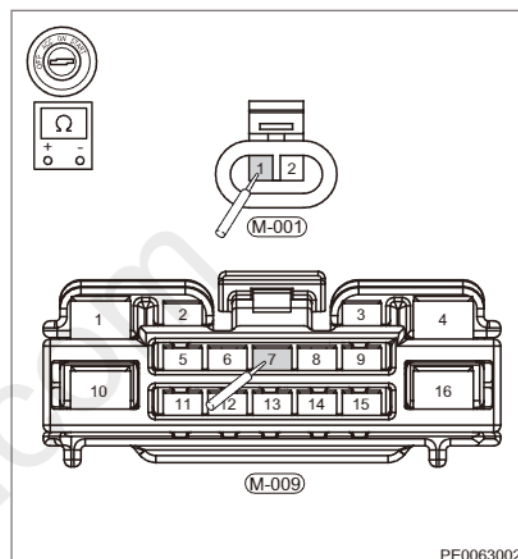
NG

5 Check back door wire harness for open or short

- Turn ENGINE START STOP switch to OFF.
- Disconnect the negative battery cable.
- Disconnect connectors M-009 and B-159.
- Check if wire harnesses are worn, pierced, pinched or partially broken.
- Check for broken, bent, protruded or corroded terminals.
- Check if related connector pins are in good condition.
- Using ohm band of digital multimeter, measure resistance between terminal 1 of connector M-001 and terminal 7 of connector M-009 to check back door wire harness for open.

OK

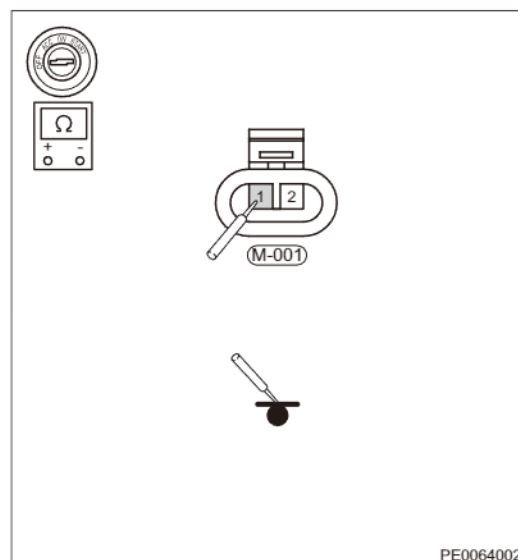
Multimeter Connection	Condition	Specified Condition
M-001-01 - M-009-07	Always	$\leq 1 \Omega$



- Using ohm band of digital multimeter, measure resistance between terminal 1 of connector M-001 and body ground to check back door wire harness for short to body ground.

OK

Multimeter Connection	Condition	Specified Condition
M-001-01 - Body ground	Always	∞



- (i) Connect the negative battery cable, turn ENGINE START STOP switch to ON, (confirm that connectors M-001 and M-009 are disconnected). Using DC voltage band of digital multimeter, measure voltage between terminal 1 of connector M-001 and body ground to check back door wire harness for short to power supply.

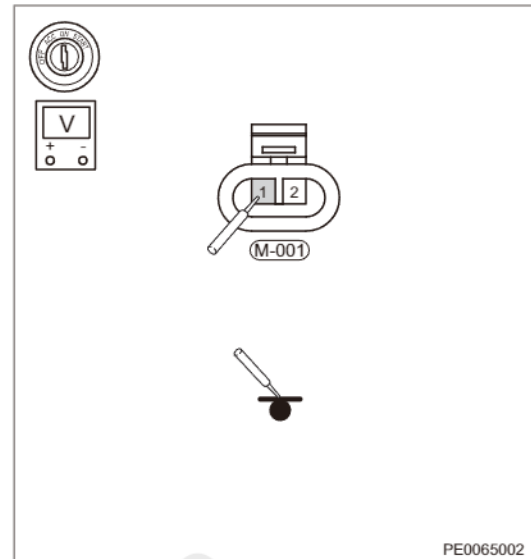
OK

Multimeter Connection	Condition	Specified Condition
M-001-01 - Body ground	Always	0 V

Result

Proceed to
OK
NG

32



NG

Replace back door wire harness

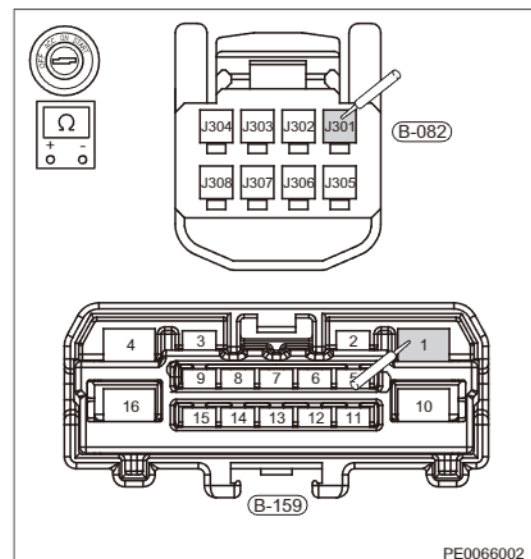
OK

6 Check interior wire harness for open or short

- Disconnect the PEPS module connector J3.
- Check if wire harnesses are worn, pierced, pinched or partially broken.
- Check for broken, bent, protruded or corroded terminals.
- Check if related connector pins are in good condition.
- Using ohm band of digital multimeter, measure resistance between terminal 7 of connector B-159 and terminals 1 of connector J3 to check interior wire harness for open.

OK

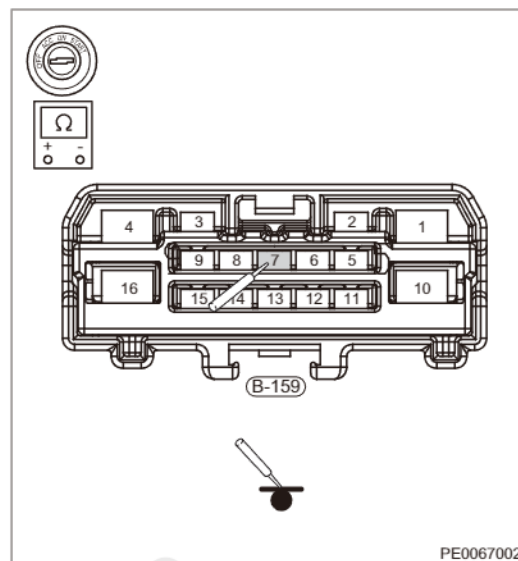
Multimeter Connection	Condition	Specified Condition
B-159-07 - J3-07	Always	$\leq 1 \Omega$



- (f) Using ohm band of digital multimeter, measure resistance between terminal 7 of connector B-159 and body ground to check interior wire harness for short to body ground.

OK

Multimeter Connection	Condition	Specified Condition
B-159-07 - Body ground	Always	∞



- (g) Connect the negative battery cable, turn ENGINE START STOP switch to ON, (confirm that connectors B-159 and J3 are disconnected). Using DC voltage band of digital multimeter, measure voltage between terminal 7 of connector B-159 and body ground to check interior wire harness for short to power supply.

OK

Multimeter Connection	Condition	Specified Condition
B-159 -07 - Body ground	Always	0 V

Result

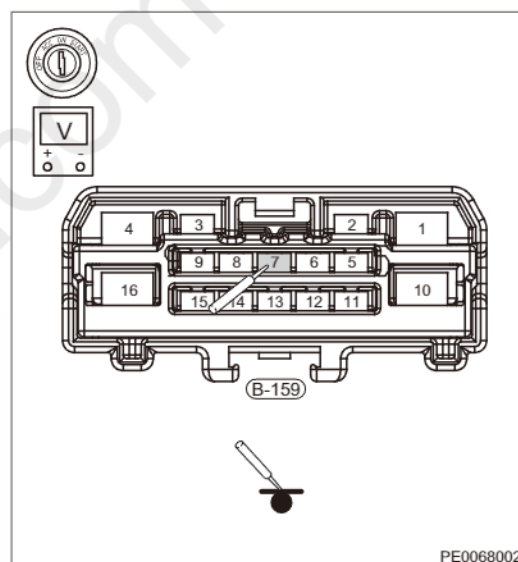
Proceed to
OK
NG

OK

Replace PEPS module

NG

Replace interior wire harness



DTC	B150F	ESCL Anti-scanning
-----	-------	--------------------

Description

DTC	DTC Definition
B150F	ESCL Anti-scanning

Procedure

1	Electric steering column lock enters anti-scanning state
---	--

(a) Enter anti-theft control system, delete and learn ESCL.

DTC	U0100	Lost of Communication with Engine Control System Module
DTC	U0129	Lost Communication with Brake System Module
DTC	U0140	Lost Communication with Body Control Module
DTC	U0329	Lost Communication with Electronic Steering Column Lock

Description

DTC	DTC Definition
U0100	Lost of Communication with Engine Control System Module
U0129	Lost Communication with Brake System Module
U0140	Lost Communication with Body Control Module
U0329	Lost Communication with Electronic Steering Column Lock

Procedure

1	Refer to "CAN COMMUNICATION" for troubleshooting
----------	--



ON-VEHICLE SERVICE

PEPS Control Module Assembly

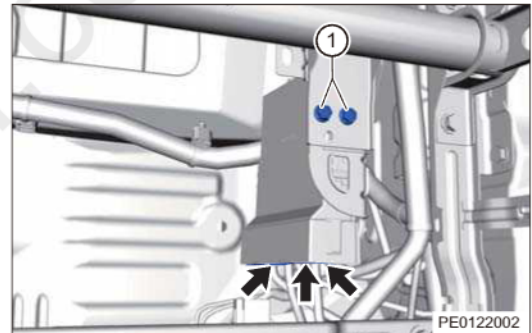
Removal

Warning/Caution/Hint

Caution:

- DO NOT separate PEPS controller and fixing bracket at will, or clamping structure of controller will be damaged, unless controller malfunction is confirmed by troubleshooting result, it can be removed and cannot be reused.
- DO NOT replace PCB board of PEPS controller at will, or it cannot be traced back and may be make abnormal sound.
- After replacing PEPS controller assembly, before performing key learning and anti-theft matching, do not press ENGINE START STOP switch at will if nor necessary (it is set that keyless start can be performed for 50 times), to prevent locking PEPS controller and vehicle power supply cannot be turned on.

1. Turn ENGINE START STOP switch to OFF.
2. Disconnect the negative battery cable.
3. Remove the glove box assembly (See page 47-11).
4. Remove the PEPS module.
 - (a) Disconnect the PEPS module connectors (arrow).
(If panoramic image system is configured, disconnect panoramic image module connector)



- (b) Remove 2 coupling bolts (1) between PEPS module mounting bracket and instrument panel crossmember.

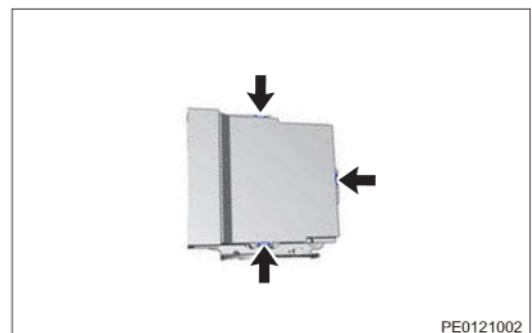
Tightening torque

$7 \pm 1 \text{ N}\cdot\text{m}$

- (c) Remove PEPS module and mounting bracket, use a screwdriver to carefully remove PEPS module from 3 fixing notches (arrow) of mounting bracket.

Caution:

- When using screwdriver, be careful not to damage 3 bayonets of PEPS module.



Installation

1. Installation is in the reverse order of removal.

Caution:

- When installing PEPS module to bracket, check if bayonets are well fitted with notches. If not, readjust them.

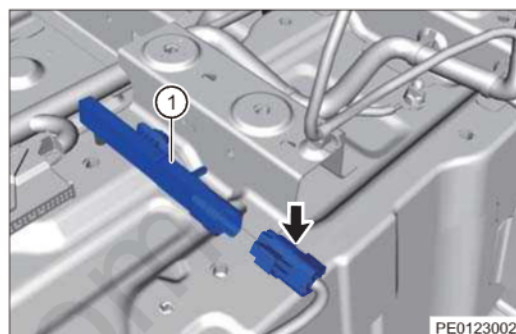
Front Low Frequency Antenna (For MT models)

Removal

1. Turn ENGINE START STOP switch to OFF.
2. Disconnect the negative battery cable
3. Remove the auxiliary fascia console assembly (See page 47-7).
4. Remove the front low frequency antenna

Hint:

- The mounting brackets of (MT models) and (DCT models) are different.
- (a) Disconnect the connector (arrow) from front low frequency antenna.



- (b) Using a tool, detach fixing clip (1) from fixing hole.

Caution:

- DO NOT repeatedly remove and install it, and dispose it if it becomes loosen.

Installation

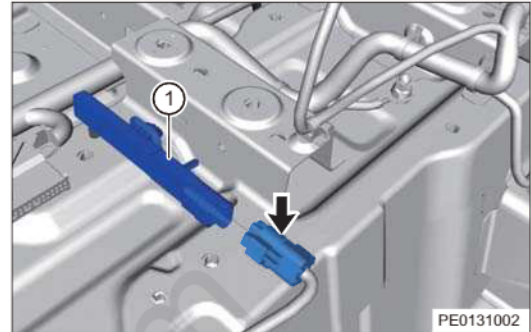
1. Installation is in the reverse order of removal.



Front Low Frequency Antenna (For DCT models)

Removal

1. Turn ENGINE START STOP switch to OFF.
2. Disconnect the negative battery cable
3. Remove the auxiliary fascia console assembly (See page 47-7).
4. Remove the front low frequency antenna
 - (a) Disconnect the connector (arrow) from front low frequency antenna.



- (b) Using a tool, detach fixing clip (1) from fixing hole.

Caution:

- DO NOT repeatedly remove and install it, and dispose it if it becomes loosen.

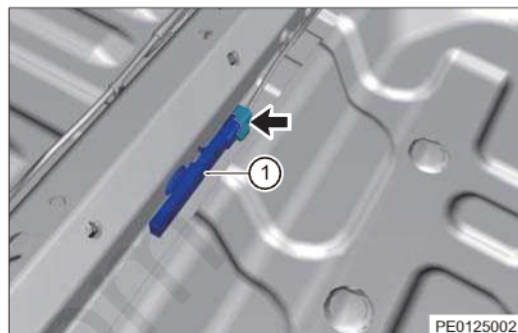
Installation

1. Installation is in the reverse order of removal.

Rear Low Frequency Antenna

Removal

1. Turn ENGINE START STOP switch to OFF.
2. Disconnect the negative battery cable.
3. Remove the luggage compartment carpet (See page 51-28).
4. Remove the rear seat assembly (7-seat configuration) (See page 48-20).
5. Remove the rear low frequency antenna assembly.
 - (a) Disconnect the connector (arrow) from rear low frequency antenna.



- (b) Using a tool, detach fixing clip (1) from fixing hole.

Caution:

- DO NOT repeatedly remove and install it, and dispose it if it becomes loosen.

Installation

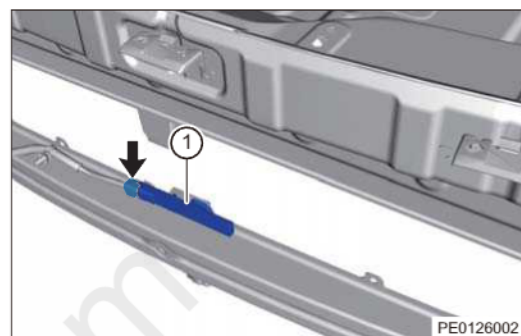
1. Installation is in the reverse order of removal.



Rear Bumper Low Frequency Antenna

Removal

1. Turn ENGINE START STOP switch to OFF.
2. Disconnect the negative battery cable.
3. Remove the rear bumper assembly (See page 50-25).
4. Remove the rear low frequency antenna assembly.
 - (a) Disconnect the connector (arrow) from rear bumper low frequency antenna.



- (b) Using a tool, detach fixing clip (1) from fixing hole.

Caution:

- DO NOT repeatedly remove and install it, and dispose it if it becomes loosen.

Installation

1. Installation is in the reverse order of removal.

Anti-theft Coil

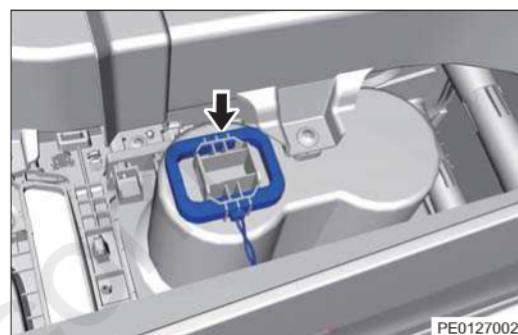
Removal

1. Turn ENGINE START STOP switch to OFF.
2. Disconnect the negative battery cable.
3. Remove the auxiliary fascia console assembly (See page 47-7).

Hint:

Disconnect anti-theft coil connector while removing auxiliary fascia console. Prevent wire harness from breaking.

4. Remove the anti-theft coil.
 - (a) Press two clips with left hand while hold coil (arrow) with right hand, and unplug it in opposite direction of installation direction with large force.



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Installation

1. Installation is in the reverse order of removal.

Caution:

- Align anti-theft coil with auxiliary fascia console assembly and card slot at the bottom of cup holder (the connector faces front passenger side). In order to avoid operating by mistake, there is no character on the surface close to bottom of cup holder, and the surface with character should be exposed after junction.
- The anti-theft coil must be installed with a smooth surface against the cup holder, and ensure it is installed in place, otherwise it may fall off from the bracket, thus failing to carry out normal key learning and anti-theft matching.



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