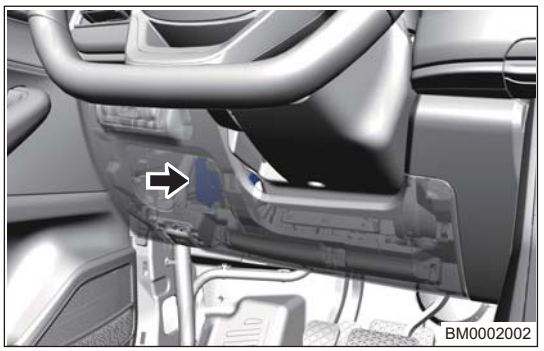
BODY CONTROL SYSTEM

GENERAL INFORMATION

Overview

Description

Body control module is called BCM for short which integrates most of vehicle electrical appliances, and it is an important part of the body electrical system.



1. Function Description
   (a) Tire Pressure Function (if vehicle is equipped with tire pressure): Tire pressure monitoring system is an active safety device, which can monitor tire pressure and temperature in real time and display tire pressure and temperature on meter. When tire pressure is too low or temperature is too high, tire pressure monitoring system will warn the driver of driving danger.
   (b) Window jam protection function (if the vehicle is equipped with jam protection function): When window auto up or remote one-button window up function is operated, if a passenger is jammed by automatically rising window due to carelessness, the jam protection control module control glass regulator motor to operate in reverse before motor reaches the jam protection set force, so that window glass lowers at a certain distance and prevent passenger being jammed.
   (c) The main functions are as below: Defrost, turn signal light, lane change, hazard warning light, position light, park light, low beam light, follow me home, car location, automatic lighting, high beam light, Flash function, front fog light control, rear fog light control, daytime running light, battery save, dome light, 3rd row dome light, rear view mirror foot light, window, PEPS ENGINE START STOP switch backlight control, anti-theft management, luggage compartment opening management (without PLG), luggage compartment opening management (with PLG), door status, central control lock, front wiper control, front washer control, rear wiper control, rear washer control, back-up light control, key status position signal, sudden braking hazard warning light double flashing alarm function, steering auxiliary light, brake light control, rear view mirror folding, DVD settings, remote control function, LIN ambient light, electric children lock.
2. BCM installation position:
   (a) It is installed on body under instrument panel.

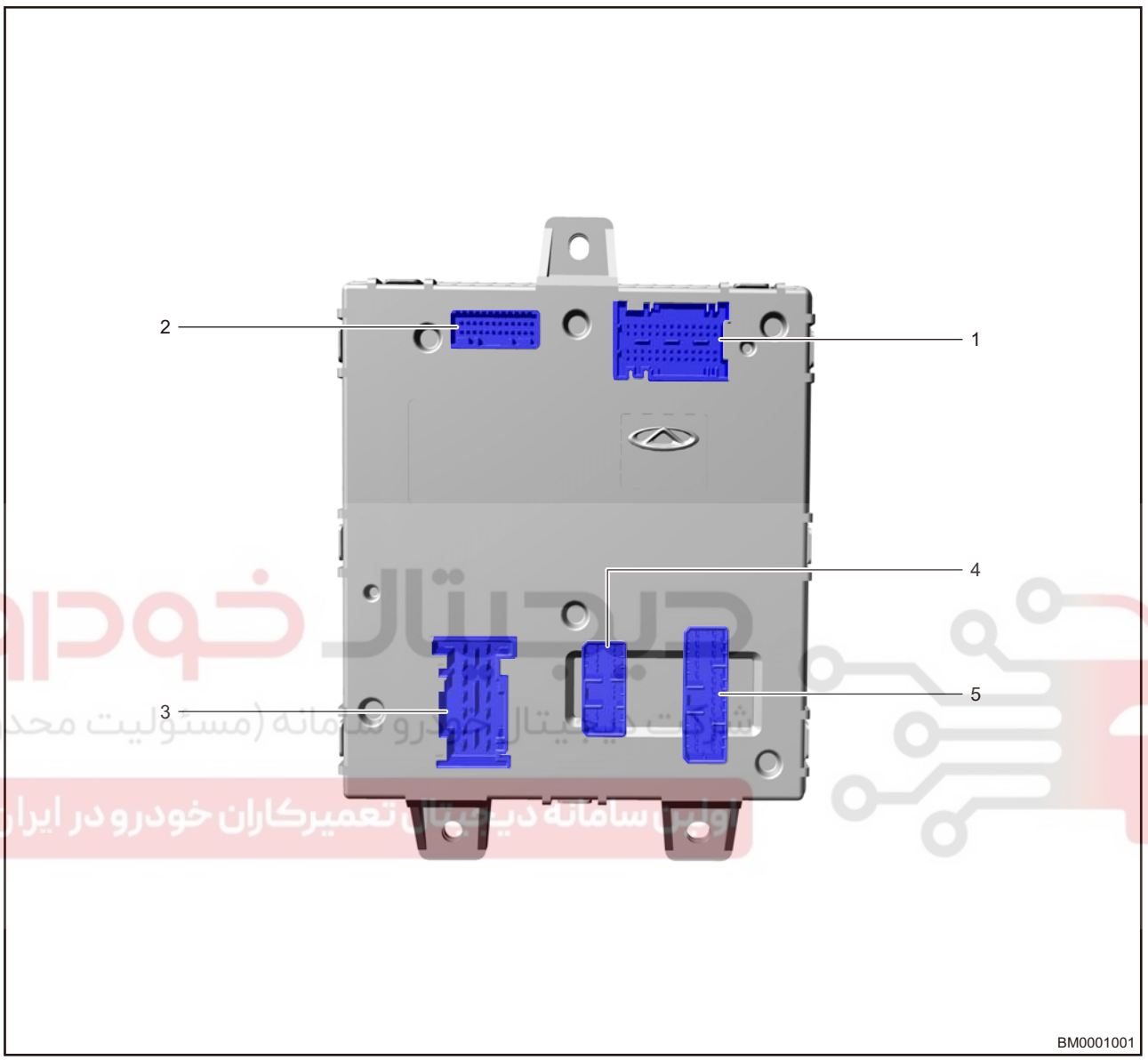
Specifications

Torque Specifications

Description	Torque (N·m)
Body Control Module Bracket Fixing Nut	7 ± 1
Instrument Panel Lower Left Protector Assembly	1.5 ± 0.5
Instrument Panel Fuse and Relay Box Fixing Nut	7 ± 1

Body Control Module

Terminal Definition



1 - 52-Pin Connector	2 - 24-Pin Connector
3 - 14-Pin Connector	4 - 12-Pin Connector
5 - 20-Pin Connector	

52-Pin Connector Terminal Definition

Pin	Signal Type	Function
1	Output-Digital-Low Level	Right Foot Light
2	\	\
3	Input-Pulse Width Adjustment Signal	Light Sensor Input (Auto Wiper)
4	Output-Digital-Low Level	Electric Children Lock Relay
5	Input-Digital-Low Level	Rear Left Door Contact Switch Signal
6	Input-Digital-Low Level	Rear Right Door Contact Switch Signal
7	\	\
8	\	\

Pin	Signal Type	Function
9	\	\
10	Input-Digital-Low Level	Rear Left Door Open Signal
11	\	\
12	Input-Digital-Low Level	Rear Right Door Open Signal
13	Input-Digital-Low Level	Lock/Unlock State Signal
14	Output-Digital-Low Level	Left Foot Light
15	\	\
16	LIN Signal-Digital-High and Low Level	LIN Signal (Sunroof/Ambient Light)
17	\	\
18	Output-Digital-Low Level	High Beam Light Output
19	Input-Analog	Rear Right Window Regulator Switch
20	Input-Analog	Passenger Front Right Window Regulator Switch
21	Input-Analog	Passenger Rear Left Window Regulator Switch
22	Input-Analog	Front Passenger Rear Right Window Regulator Switch
23	Input-Digital-Low Level	Front Left Door Open Signal
24	Input-Digital-Low Level	Front Wiper Stop Position Signal
25	Input-Digital-Low Level	Airbag Signal
26	Input-Digital-Low Level	Rear Wiper Stop Position Signal
27	Output-Digital-Low Level	Door Control Output
28	Output-Digital-Low Level	Luggage Compartment Light Output
29	Output-Digital-Low Level	Rear Defroster Output
30	Output-Digital-Low Level	High Speed Wiper Output
31	Output-Digital-Low Level	Back-up Light Output
32	Input-Pulse Width Adjustment Signal	Light Sensor Input (Auto Highlight)
33	Input-Analog	Front Right Window Regulator Switch
34	Input-Analog	Front Left Window Regulator Switch
35	Input-Digital-Low Level	Back Door Unlock Signal Input
36	Input-Digital-Low Level	Passenger Side Window Regulator Disabled Switch
37	Input-Digital-Low Level	Front Right Door Open Signal
38	Input-Digital-Low Level	Reverse signal
39	Input-Digital-High Level	Brake Switch Input
40	Output-Digital-High Level	Passenger Side Window Regulator Disabled Switch Operation Indicator Light
41	\	\
42	Output-Digital-Low Level	Low Speed Wiper Output
43	Output-Digital-Low Level	Low Beam Light Output
44	Output-Digital-Low Level	Horn Output
45	Analog Ground Signal	Analog Ground
46	Input-Analog	Turn Signal Light Switch
47	Input-Analog	Rear Left Window Regulator Switch
48	Input-Digital-Low Level	Back Door Open Signal
49	Input-Digital-Low Level	Central Control Lock Switch Input
50	Input-Digital-Low Level	Central Control Unlock Switch Input
51	\	\
52	Input-Digital-Low Level	Engine Hood Contact Switch

24-Pin Connector Terminal Definition

Pin	Signal Type	Function
1	\	\
2	CAN Signal-Digital-High and Low Level	High Speed CAN2 Signal Low Terminal
3	\	\
4	LIN Signal-Digital-High and Low Level	LIN Signal (Engine Immobilizer)
5	Input-Digital-High Level	ACC Signal Input
6	\	\
7	Input-Digital-Low Level	Rear Fog Light Input
8	Input-Digital-Low Level	Front Wiper Input
9	Input-Digital-Low Level	Defroster Input
10	Input-Digital-Low Level	Rear View Mirror Folding Input
11	Input-Digital-Low Level	Hazard Warning Light Input
12	Input-Analog	High Beam-Flash Input
13	\	\
14	Output-Digital-High Level	Hazard Warning Light Operation Indicator Light
15	CAN Signal-Digital-High and Low Level	High Speed CAN2 Signal High Terminal
16	\	\
17	Input-Digital-High Level	IGN Signal Input
18	Input-Digital-High Level	Key Insert Signal
19	Input-Digital-Low Level	Rear Washer Input
20	Input-Digital-Low Level	Front Washer Input
21	Input-Digital-Low Level	Rear Wiper Input
22	Input-Digital-Low Level	Front Wiper Input
23	Input-Digital-Low Level	Lighting Input
24	Input-Analog	Wiper Sensitivity Switch

14-Pin Connector Terminal Definition

Pin	Signal Type	Function
1	Power Supply	Power Supply 3
2	Lock Power Supply	Power Supply 6
3	Ground	Ground 1
4	Ground	Ground 2
5	Output-Digital-High Level	Rear Right Window Down Output
6	Output-Digital-High Level	Rear Right Window Up Output
7	Power Supply	Power Supply 2
8	Output-Digital-High Level	Rear Left Window Up Output
9	Output-Digital-High Level	Rear Left Window Down Output
10	Power Supply	Power Supply 1
11	Output-Digital-High Level	Front Right Window Up Output
12	Output-Digital-High Level	Front Right Window Down Output
13	Output-Digital-High Level	Front Left Window Up Output
14	Output-Digital-High Level	Front Left Window Down Output

12-Pin Connector Terminal Definition

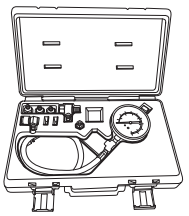
Pin	Signal Type	Function
1	\	\
2	Output-Digital-High Level	Central Control Unlock Output
3	Output-Digital-High Level	Central Control Lock Output
4	Output-Digital-High Level	Luggage Compartment Output
5	Output-Digital-High Level	Front Washer Output
6	\	\
7	\	\
8	\	\
9	Power Supply	Power Supply 5
10	Output-Digital-High Level	Rear Wiper Output
11	\	\
12	Output-Digital-High Level	Rear Washer Output

20-Pin Connector Terminal Definition

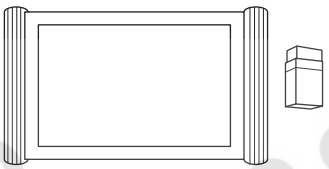
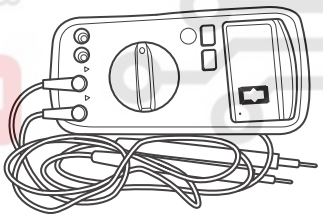
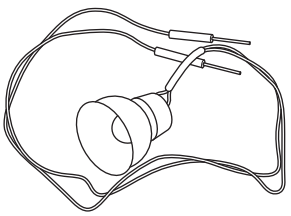
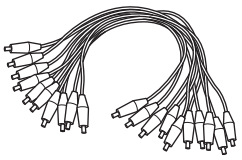
Pin	Signal Type	Function
1	\	\
2	Output-Digital-High Level	Outer Rear View Mirror Unfolding Output
3	Output-Digital-High Level	Outer Rear View Mirror Folding Output
4	Output-Digital-High Level	Left Turn Signal Light Output
5	Output-Digital-High Level	Right Turn Signal Light Output
6	Output-Digital-High Level	Anti-theft Horn Output
7	Output-Digital-High Level	Back-up Light Output
8	Output-Digital-High Level	Stop Light Output
9	Output-Digital-High Level	Background Light
10	Output-Digital-High Level	Rear Position Light (Movable Part) + Left License Light Output
11	Output-Digital-High Level	High Mounted Stop Light Output
12	\	\
13	\	\
14	Output-Digital-High Level	Left Daytime Running Light Output + Front Left Position Light
15	Output-Digital-High Level	Right Daytime Running Light Output + Front Right Position Light
16	Output-Digital-High Level	Battery Save Output
17	Output-Digital-High Level	Rear Fog Light Output
18	\	\
19	\	\
20	Power Supply	Power Supply 4

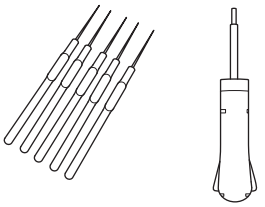
Tools

Special Tool

Tool Name	Part No.	Tool Drawing
Interior & Exterior Dismantling Device	CH-10008	 RCH0000006

General Tools

Tool Name	Tool Drawing
X-431 PAD Diagnostic Tester	 RCH000106
Digital Multimeter	 RCH0002006
Bulb Test Light (21 W)	 RCH008706
Jumper Wire	 RCH0088006

Tool Name	Tool Drawing
Wire Harness Terminal Tools	 RCH008906
Oscilloscope	 RCH0061006

BCM Function Test Regulation

Defroster function

1. Defroster operation conditions: IGN ON; defroster signal active
   (a) Active the defroster switch when the key is in OFF, ACC or START, the defroster will not operate.
2. When defroster is operating: Defroster stopped when 20 minutes elapsed
3. When defroster is operating: Active the defroster signal again, defroster stops
4. When defroster is operating: Key is switched from IGN ON to ACC or OFF, defroster stops
5. When defroster is operating: After the operation time reaches to 20 min. ± 5 s, defroster stops
6. When defroster is operating: When it is in Crank, defroster is paused. After Crank is finished, defroster resumes

   Caution:
   - Caution:
     When voltage is below 11.5 V for more than 5 s, defroster output is shut down temporarily. If voltage is above 12.5 V for more than 15 s in the following counting time, the output will be restarted.

Turn signal light function

1. Left turn signal light operating conditions: IGN ON; left turn signal light switch is activated
2. When left turn signal light is operating: the flashing frequency of left turn signal light is 400 ms on and 400 ms off.
   (a) When left turn signal light is operating: key is switched from ON to OFF, left turn signal light stops operating and meter stops flashing.
3. When left turn signal light is operating
   (a) The corresponding bulb is intact, BCM sends LHTurnLightSts (Bcan&Pcan) and the frequency is the same as left turn signal light;
   (b) If the corresponding 21 W bulb is damaged, BCM sends LHTurnLightSts and the frequency is 2 times of normal operating frequency. No matter whether the bulb is damaged or not, BCM will work and send DirectionIndLeft (Bcan&Pcan) signals.
4. Right turn signal light operating conditions: IGN ON; right turn signal light switch is activated
5. When right turn signal light is operating: the flashing frequency of right turn signal light is 400 ms on and 400 ms off.
   (a) When right turn signal light is operating: key is switched from ON to OFF, right turn signal light stops operating and meter stops flashing.
6. When right turn signal light is operating
   (a) The corresponding bulb is intact, BCM sends RHTurnsignalSts and the frequency is the same as right turn signal light.
   (b) If the corresponding 21 W bulb is damaged, BCM sends RHTurnsignalSts and the frequency is 2 times of normal operating frequency. No matter whether the bulb is damaged or not, BCM will work and send DirectionIndRight signals.
7. When left/right turn signal light is operating: Left/right turn signal light input is deactivated, left/right turn signal light should stop operating immediately
8. When left/right turn signal light is operating: Key is switched from IGN ON to ACC or OFF, and left/right turn signal light stops operating immediately

Lane change function

1. Left lane change operating conditions: IGN ON; left turn signal light switch activates shortly (50 ms ~ 1000 ms)
2. When left lane change is operating: left turn signal light flashes 3 times at frequency of 400 ms on and 400 ms off
3. When left lane change is operating
   (a) The corresponding bulb is intact, BCM sends LHTurnsignalSts and the frequency is the same as left turn signal light.
   (b) If the corresponding 21 W bulb is damaged, BCM sends LHTurnsignalSts and the frequency is 2 times of normal operating frequency. No matter whether the bulb is damaged or not, BCM will work and send DirectionIndLeft signals.
4. During left lane change operation: Left turn signal light switch is activated (50 ms ~ 1000 ms) shortly again, and left turn signal light flashes 3 times again
5. When left lane change is operating: Left turn signal switch remains active (>1000 ms) and automatically switches to left turn signal light operating logic
6. When left lane change is operating: Key is switched from IGN ON to ACC or OFF, and left turn signal light stops operating immediately
7. When left lane change is operating: After flashing 3 times, left turn signal light should stop operating immediately
8. Right lane change operating conditions: IGN ON; right turn signal light switch activates shortly (50 ms ~ 1000 ms)
9. When right lane change is operating: right turn signal light flashes 3 times at frequency of 400 ms on and 400 ms off
10. When right lane change is operating
    (a) The corresponding bulb is intact, BCM sends RHTurnsignalSts and the frequency is the same as right turn signal light.
    (b) If the corresponding 21 W bulb is damaged, BCM sends RHTurnsignalSts and the frequency is 2 times of normal operating frequency. No matter whether the bulb is damaged or not, BCM will work and send DirectionIndRight signals.
11. During right lane change operation: Right turn signal light switch is activated (50 ms ~ 1000 ms) shortly again, and right turn signal flashes 3 times again
12. When right lane change is operating: Right turn signal switch remains active (>1000 ms) and automatically switches to right turn signal light operating logic
13. When right lane change is operating: Key is switched from IGN ON to ACC or OFF, and right turn signal light stops operating immediately
14. When right lane change is operating: After flashing 3 times, right turn signal light should stop operating immediately

Hazard warning light function

1. Hazard warning light function activation conditions: Hazard warning light switch is activated when hazard warning light is not activated
2. When hazard warning light is activated: Flashing frequency of left/right turn signal light and hazard warning light indicator are 400 ms on and 400 ms off
3. When hazard warning light is activated
   (a) The corresponding bulb is intact, BCM sends LHTurnsignalSts and RHTurnsignalSts, and the frequency is the same as turn signal light.
   (b) If any 21 W bulb is damaged, the CAN signal (LHTurnsignalSts and RHTurnsignalSts) frequency of turn signal light and the flashing frequency of hazard warning indicator will be 2 times of normal operating frequency.

4. When hazard warning light is activated: Hazard warning light switch is activated again and hazard warning light function is turned off; left/right turn signal light stops operating immediately
5. When ABM sends a collision signal, hazard warning light function should be activated automatically (CAN signal of left/right turn signal light, indicator and turn signal light). Automatically activated hazard warning light function due to collision can be canceled as key is switched to OFF, then to ON or hazard warning light button is pressed
6. When turn signal light function and hazard warning light function are both effective, BCM should perform the next action

   Caution:
   - In a ignition cycle, BCM responds to one collision signal only.

Position light

1. Position light activation conditions: IGN ON or ACC; small light input or low beam light input is activated
2. When position light is operating: BCM should send ParkLightSts =1(Bcan)
3. When position light is operating: When small light input and low beam input are deactivated, small light stops operating
4. When position light is operating: When key is switched to OFF, small light stops operating and sends ParkLightSts=0(Bcan).

Parking light

1. Parking light activation conditions: Key is switched to OFF; small light switch is activated
2. When parking light is activated: Small light comes on and BCM should send ParkLightSts=1(Bcan).
3. When parking light is activated: Small light switch is deactivated and small light is turned off, BCM should send ParkLightSts=0(Bcan).

Low beam light

1. Low beam light activation conditions: IGN ON; low beam light switch is activated
2. When low beam light is activated: BCM sends LowBeamSts=1
3. When low beam light is activated: When low beam switch input is canceled, low beam light turns off immediately
4. When low beam light is activated: Key is switched from IGN ON to ACC or OFF, low beam light turns off immediately

Follow me home

1. Light is in manual mode
   (a) FMH function activation condition: Flash switch is activated within 2 minutes after key is switched to OFF, and it can be activated again within 2 minutes regardless of whether FMH function is manually turned off or automatically turned off due to overtime.
   (b) When FMH function is activated: Low beam light and small light are illuminated, and both LowBeamSts=1 and ParkTailLightSts=1(Bcan) and FMH time FollowMeTime are sent.
   (c) When FMH function is activated: Default duration is 30 S. Activating Flash switch again for a short time will increase duration of FMH function by 30 S each time, but no more than 8 times.
   (d) When FMH function is activated: Flash switch is activated for 2 seconds, FMH function will be manually turned off - low beam light and position light will turn off immediately and cumulative duration of FMH will be reset.
   (e) When FMH function is activated: Key is switched to ACC or IGN ON, FMH function will be turned off - low beam light and clearance will turn off immediately and cumulative duration of FMH will be reset.

(f) When FMH function is activated: FMH function will be automatically turned off after set FMH working time is reached: low beam light and position light will turn off immediately.

2. Light is in automatic mode
   (a) The vehicle has fortification condition, light combination switch is in AUTO, remote controller lock button is pressed, and BCM receives valid signal sent from rain sensor, and low beam light and position light are automatically turned on for 30s.
   (b) After 30 S or ignition key is switched to OFF/ON/ACC or light combination switch is switched from AUTO, low beam light and position light are turned off.

Car location

1. Light is in manual mode
   (a) LMC function activation condition: IGN OFF; FMH is activated in this same ignition cycle (ON ⩾ ACC ⩾ OFF) and automatically turns off due to overtime; remote control unlock signal is received; four doors are closed.
   (b) When LMC function is activated: Low beam light and small light are on and send ParkTailLightSts=1(Bcan).
   (c) When LMC function is activated: FMH function cannot be activated, low beam light and small light operate in LMC mode.
   (d) When LMC function is activated: remote control lock signal (four doors are closed) is received, LMC function is turned off - low beam light and small light are off.
   (e) When LMC function is activated: Any door is opened, LMC function is turned off -- low beam light and small light are off.
   (f) When LMC function is activated: Any key is switched to ACC or IGN ON, LMC function is turned off -- low beam light and position light are off.
   (g) When LMC function is activated: After receiving remote control unlock signal, LMC function delays 60S (subject to remote control unlock time received).
   (h) When LMC function is activated: Longest duration is 60 s, LMC function will turn off automatically after overtime.
2. Light is in automatic mode
   (a) The key is in OFF, light combination switch is in AUTO, remote controller unlock button is pressed, and BCM receives valid signal sent from rain sensor, and low beam light and position light turn on for 30 s.
   (b) After 30 s or ignition key is switched to ACC, low beam light and position light are turned off.
   (c) When LMC function is activated, if the activation conditions are met again or FMH function is activated, it counts down from 30 s again and the light will not flash.

Automatic lighting

1. Low beam light and position light turn on if the following conditions are met: IGN in ON; light switch is switched to AUTO; LIN valid signal sent from rain sensor is received
2. After automatic lighting is activated, BCM sends low beam light and position light CAN signal to the instrument panel
3. Low beam lights turn off if any condition is met
   (a) IGN switch is not in ON.
   (b) Light switch is switched from AUTO.
   (c) Rain sensor LIN signal is invalid.
4. Position lights turn off if any condition is met.
   (a) IGN switch is not in ON.
   (b) 2 s after light switch is switched from AUTO.
   (c) After rain sensor LIN signal is valid for 5 s.

High beam light

1. High beam light operating conditions: IGN ON; low beam lights are in activating status, high beam light switch is activated
2. When high beam light is operating: High beam lights come on and send HighBeamSts=1
3. When high beam light is operating: When vehicle is in Crank, high beam lights temporarily stop operating but CAN data will be sent continuously and resume operation after Crank.
4. When high beam light is operating: High beam light switch is deactivated and high beam lights turn off
5. When high beam light is operating: Low beam light switch is deactivated and high beam lights turn off
6. When high beam light is operating: Key is switched from IGN ON to ACC or OFF, high beam lights are turned off

Flash function

1. Flash operating conditions: IGN ON; Flash switch is activated
2. When Flash is operating: High beam lights come on and send HighBeamSts=1
3. When Flash is operating: When vehicle is in Crank, high beam lights temporarily stop operating and resume operation after Crank
4. When Flash is operating: When Flash switch is deactivated, high beam lights turn off
5. When Flash is operating: Key is switched from IGN ON to ACC or OFF, high beam lights turn off

Front fog light control

1. Front fog light operating conditions: IGN ON; position lights are in activating status, front fog lights switch is activated
2. Front fog light is operating: Front fog light comes on and send FrontFogLightSts=1
3. Front fog light is operating: Front fog light switch is deactivated, front fog light goes off
4. Front fog light is operating: Key is switched from IGN ON to ACC or OFF, front fog light goes off
5. Front fog light is operating: Front fog light goes off and send FrontFogLightSts=0

Rear fog light control

1. Rear fog light operating conditions: IGN-ON; front fog light or low beam light load is activated; rear fog light switch is activated.
2. When rear fog light is operating: Rear fog light comes on and send RearFogLightSts=1
3. When rear fog light is operating: When rear fog light switch is activated again, rear fog lights turn off
4. When rear fog light is operating: Key is switched from IGN ON to ACC or OFF, rear fog lights turn off
5. When rear fog light is operating: When low beam light or front fog light load is turned off, rear fog lights turn off at the same time.

Daytime running light

1. Daytime running light operating conditions: Engine starts; low and high beam lights and front fog lights are not activated
2. When daytime running light is operating: When engine is stopped, daytime running light function is turned off
3. When daytime running light is operating: The activation of position light, low beam light and front fog light will cause daytime running lights to be turned off
4. When daytime running light is operating: Flash function does not affect daytime running light

Battery save

1. Battery save function remains active during IGN ON or IGN ACC

2. Battery save function remains active without other wake-up sources within 15 minutes after IGN OFF
3. Battery save timing within 15 minutes after key is turned to OFF: Any door or back door unlocking signal received, key insertion or removal will reset timing to 15 minutes

   Caution:
   - Battery save load includes: Key light, dome light and luggage compartment light.
   - Battery Save can be woken up by central control unlock or mechanical unlock after Battery Save is turned off.

Dome light

1. Key insertion and removal, dome light and key light control
   (a) When key is removed, BCM turns on dome light and key light is on for 3 minutes (fades in and fades out).
   (b) Within 3 minutes of dome light operation: Key insertion does not affect the operation timing of dome light and key light.
   (c) Within 3 minutes of dome light operation: When the key is turned to IGN ON, dome light and key light will fade out immediately.
   (d) Within 3 minutes of dome light operation: If all doors are closed after any door is opened, dome light and key light continue to work for 8 s, and then fade out.
2. Door status, dome light and key light control
   (a) If any of doors is opened and remains open, dome light comes on for 3 minutes (fades in and fades out).
   (b) Within 3 minutes of dome light operation: If another door is opened while one door remains open, dome light continues to come on for 3 minutes, and then fads out.
   (c) Within 3 minutes of dome light operation: When the key is turned to ON, all doors are closed, dome light will fade out immediately.
   (d) Within 3 minutes of dome light operation: When the key is turned to OFF or ACC and all doors are closed, dome light will fade out after 8 s; if the key is turned to IG ON within 8 s, dome light will fade out immediately.
3. Remote control key, dome light and key light control
   (a) When BCM receives unlock signal from remote controller: No matter what status the door is in, dome light comes on for 15 S (fades in and fades out).
   (b) During dome light operates within 15s: When the key is in ING ON, the dome light will fade out immediately.
   (c) Within 15 s of dome light operation: When RF is fortified successful, dome light will come off immediately.
   (d) Within 15 s of dome light operation: When any door is opened, dome light enters into mode 2.
4. Collision signal, dome light and key light control
   (a) When the IGN is turned to ON, if CAN signal 'CrashOutputSts' is not "00", BCM will illuminate dome light for 30 minutes. There is no fade-in process, including fade-out process.
   (b) Within 30 minutes of dome light illumination: If key is switched to OFF, dome light will fade out immediately.
   (c) Within 30 minutes of dome light illumination: If BCM receives RF key lock signal, dome light turns off immediately and there is no fade-out process.

   Caution:
   - Please turn rear dome light switch to door control gear to test above function logic.
   - In any of above conditions (key insertion and removal, door status, remote control key) triggers dome light to come on, another event is triggered again, and dome light illumination time is reset.

3rd row dome light

1. 3rd row dome light operating conditions: Luggage compartment is opened and luggage compartment light continuously turns on for 15 minutes.
2. 3rd row dome light is operating: Luggage compartment is closed and luggage compartment light turns off immediately

Rear view mirror foot light

1. Remote and foot light function
   (a) With key in OFF/ACC, perform unlock operation through key or remote function, foot light turns on for 15 s.
   (b) With OFF status, BCM receives wireless fortifying/remote fortifying/PLG fortifying signal, and vehicle enters fortifying mode successfully, foot light turns on for 15 s.
   (c) With key in ON or after counting down for 15 s , foot light turns off.
2. Foot light function controlled by door status signal
   (a) With key in OFF/ACC/ON, open any door, BCM controls the foot light to turns on for 3 minutes.
   (b) Within 3 minutes of foot light operation: If another door is opened while one door remains open, foot light continues to come on for 3 minutes, and then fades out.
   (c) With key in OFF/ACC and foot light turns on and four doors closed, BCM controls foot light to illuminates for 8s then goes off; within 8 s when foot light is illuminated, turn key to ON, foot light goes off immediately.
   (d) With foot light turns on, if key is in ON position and close four doors, foot light turns off immediately.
   Caution:
   - With foot light turns on, open the door, BCM will enter the logic that foot light function controlled by door status signal.
   - It is impossible to turns on foot light by unlocking back door light.
   - With foot light turns on, open the door, BCM will enter the logic that foot light function controlled by wireless signal / PEPS signal.

Window

1. Window activating conditions: Within 2 minutes since IGN ON or IGN switches away from ON position and both front doors were not opened; enable window switch
2. Window switch has 4 states
   (a) Manual UP: When switch is in this position, window is moving up. When switch leaves this position, window stops;
   (b) Manual DOWN: When switch is in this position, window is moving down. When switch leaves this position, window stops;
   (c) Auto UP: When switch is in this position, window is moving up automatically until it stops due to block or position changed;
   (d) Auto DOWN: When switch is in this position, window is moving down automatically until it stops due to block or position changed.
3. When window is operated under auto mode: Press corresponding window up or down switch again to stop the operation.
4. When window is operated under auto mode: For example, after 2 minutes which described in point 1, the operating window stops after finishing this operation.
5. When window is operated under manual mode: For example, after 2 minutes which described in point 1, the operating window stops immediately.
6. Within 2 minutes when key is in ACC or OFF: If any front door opens, window function is disabled.

7. When window disable switch is activated: Input of passenger side will be disabled; if the operating window is activated by switch of passenger side, it will stop immediately. When window disable switch cancel is activated, passenger side input disable is canceled and window disable indicator goes off
8. With key in ACC or OFF: With either front door opened, window switch input will be invalid (it is invalid even front door is closed after opening); and if any window is operating when front door opens, operation should be stopped
9. Crank will stop the operating window immediately, and it can not restore after Crank.

PEPS ENGINE START STOP switch backlight control

1. When position light is on: BCM continuously sends CAN signal to illuminate PEPS backlight
2. When small light is off
   (a) The door status changes as follows:
   - When any door is opened, BCM continuously sends CAN signal to turn on the backlight for 3 minutes, and then sends CAN signal after 3 minutes to turn off the backlight.
   - Within 3 minutes of backlight illumination, if another door is opened, timing will restart again.
   - In IGN-ON state, during 3 minutes of backlight illumination, if all doors are closed, backlight will be turned off after 3 s.
   - In IGN-OFF/ACC status, within 3 minutes of backlight illumination, if all doors are closed, backlight will turn off after continuously turning on for 11 s.
3. PEPS SMART/RKE control

- When BCM receives Order information=2 (unlock) (regardless of door status), BCM continuously illuminates backlight for 18 s and then turn it off.
- If key is switched to ON within18 s, backlight will turn off immediately.
- If key lock signal is received within18 s, backlight will be turned off immediately.
- If any door is opened within 18 S, it is performed according to door status control strategy.

Anti-theft management

1. Fortifying mode
   (a) Trigger conditions:
   - IGN is in OFF (it is not in IGN ON or ACC).
   - Four doors & two covers are closed.
   - BCM receives remote control lock command.
   (b) BCM feedback when fortifying mode is entered:
   - Turn signal light flashes once (turn on for 500 ms) and sends the corresponding LHTurnsignalSts and RHTurnsignalSts (Bcan&Pcan).
   - Theft deterrent indicator is continuous flash at frequency of 100ms, 1900ms.
   - Actuate the anti-theft horn 50 ms and high and low pitched horns 15 ms.
2. Fortifying failure mode
   (a) Trigger conditions:
   - IGN OFF.
   - Any of four doors & two covers is opened.
   - BCM receives remote control lock command.
   (b) BCM light feedback when fortifying failure mode is entered:
   - Turn signal light flashes two times (flashing for 500 ms, interval time is 1s) and sends the corresponding LHTurnsignalSts and RHTurnsignalSts (Bcan&Pcan).
   (c) When entering fortifying failure mode:
   - If four doors are closed and any of the two covers is opened, BCM will perform central control lock once;
   - If two covers are closed and any of the doors is opened, BCM will perform central control lock then unlock (the interval time is 500 ms).

3. Intrusion mode
   (a) Trigger conditions: BCM will enter to alarm status after the following conditions are met when the vehicle is in fortifying mode:
   - Doors or engine hood is opened;
   - Key is turned to IGN ON;
   - Luggage compartment is opened forcibly.

   (b) After entering to intrusion mode, BCM feedback the conditions within one alarm cycle (30 s):
   - Anti-theft horn (with high and low pitched horns and sound at frequency of 500 ms ON and 500 ms OFF) operates for 28 ± 2s, pause for 5s;
   - Left and right turn signal lights flash 28s at frequency of 75 times/min (400 ms on, 400 ms off) and pause for 5s, and send the corresponding LHTurnsignalSts and RHTurnsignalSts (Bcan);
   - Theft deterrent indicator is continuous flash at frequency of 100ms on、 200ms off、 100ms on、 600ms off.

   (c) Four doors & two covers and IGN ON illegal activation action are alarm trigger sources
   - In the same alarm source, a single trigger source can trigger 3 alarm cycles at most;
   - In multiple alarm trigger sources, BCM can trigger 8 alarm cycles at most (after 8 alarm cycles, the sound and light alarm will stop);
   - If the intrusion ends, BCM will stop alarm after the current alarm cycle. If the same alarm source is triggered again after the alarm is over, BCM will perform the remaining alarm cycles.
   - If four doors & two covers are closed when alarm finishes, BCM enters fortifying mode.

4. Fortifying deactivation mode
   (a) Activation conditions: Vehicle is in alarm mode; BCM receives RF unlock command or BCM detects IMMOCodeWarningLightSts=0 for 2 s continuously after the key is switched to IGN ON.
   (b) When the alarm is released: Vehicle exits anti-theft function mode; anti-theft horn (high and low pitched horns (if equipped)) stops working, and the turn signal light stops flashing.
   (c) After alarm is released, if key is not in IGN ON, anti-theft indicator light still flashes at a frequency of 100ms on, 200ms off, 100ms on and 600ms off; if the key is in IGN ON, anti-theft indicator light stops flashing.

5. Re-fortifying mode
   (a) Trigger conditions:
   - Vehicle is in fortifying mode;
   - BCM receives remote control unlock command.

   (b) BCM feedback when fortifying mode is released:
   - Theft deterrent indicator turns off immediately;
   - Turn signal light flashes 2 times at frequency of 500 ms on and 500 ms off, and sends the corresponding LHTurnsignalSts and RHTurnsignalSts (Bcan&Pcan).

   (c) Within 30±2 s after fortifying mode is released:
   - If any of four doors & two covers are open, BCM exits anti-theft mode;
   - If all four doors & two covers are always closed, BCM will lock automatically and enter the fortifying state after 30 s, and anti-theft indicator will flash at the frequency of 100 ms on and 1900 ms off.

6. Luggage compartment opening mode
   (a) Trigger conditions:
   - Vehicle is in fortifying mode;
   - BCM receives the remote control luggage compartment open command for more than 1.5 s.

   (b) BCM feedback when luggage compartment opening mode is triggered:
   - Turn signal light illuminates for 1 s and sends the corresponding LHTurnsignalSts and RHTurnsignalSts.
   - Luggage compartment is open and no alarm is triggered.

   (c) Then close the luggage compartment, vehicle returns to the fortifying state, and if there is no legal key, the luggage compartment switch cannot open luggage compartment.

(d) After using remote control to open the luggage compartment: After BCM receives remote control lock command, vehicle will immediately lock and return to fortifying state, but the turn signal light prompts fortifying failure.

(e) After using remote control to open the luggage compartment and close it again: After BCM receives remote control lock command, vehicle will immediately lock and return to fortifying state, but the turn signal light prompts fortifying successfully. If there is no registered key after the luggage compartment closed, the switch will not open the luggage compartment.

Luggage compartment opening management (without PLG)

1. When the central control lock is in unlock state
   (a) When the luggage compartment opening switch is activated, the luggage compartment opens.
2. When the central control lock is in lock state
   (a) Luggage compartment is opened
   - IGN OFF.
   - BCM receives the remote control luggage compartment open command for more than 1.5 s.
   - Turn signal light illuminates and sends the corresponding LHTurnsignalSts and RHTurnsignalSts, the luggage compartment opens.
3. After opening the luggage compartment by remote control and close it manually, if there is no registered key (PKE), the luggage compartment will not open by the luggage compartment button.

Caution:

- When luggage compartment is opened, the luggage compartment light turns on.
- When luggage compartment is opened, the actuate time of motor is 200 ms.
- When the vehicle speed reaches 10km/h, the luggage compartment will not be opened (please note that the ignition remains in IGN while testing - BSM is 15 nodes).

Luggage compartment opening management (with PLG)

1. When vehicle is in fortifying deactivation mode
   (a) When the luggage compartment opening switch is activated, luggage compartment can be opened/closed; turn signal light flashes twice with interval of 200ms ON - 200ms OFF.
   (b) During back door opening/closing process, short press wireless controller, back door stops current operation.
   (c) With global in fortifying mode, press GlobaSW and following conditions are met, BCM performs vehicle fortifying:
   - IGN OFF.
   - Four doors and engine hood are closed.
   - Back door locks within 10s.
2. When vehicle is fortifying
   (a) Luggage compartment is opened/closed
   - IGN OFF/ACC position.
   - BCM receives luggage compartment command for over 1.5 s, turn signal light flashes twice, with interval of 200ms ON-200ms OFF.
   (b) During back door opening/closing process, short press wireless controller, back door stops current operation.
   (c) After back door is closed, the vehicle returns to fortifying state.

Door, hood and luggage compartment door status

1. The front left door is open, BCM sends CAN signal 'DriverDoorSts' value which is '1', front left door is closed and signal value is '0'
2. The front right door is open, BCM sends CAN signal 'PsngrDoorSts' value which is '1', front right door is closed and signal value is '0'

3. The rear left door is open, BCM sends CAN signal 'LHRDoorSts' value which is '1', rear left door is closed and signal value is '0'
4. The rear right door is open, BCM sends CAN signal 'RHRDoorSts' value which is '1', rear right door is closed and signal value is '0'
5. The engine hood is open, BCM sends CAN signal 'HoodSts' value which is '1', engine hood is closed and signal value is '0'
6. The luggage compartment is open, BCM sends CAN signal 'BackDoorSts' value which is '1', luggage compartment is closed and signal value is '0'

Central control lock

1. Central control lock activation conditions
   - Close all four doors.
   - Vehicle is not in anti-theft state.
   - Central control lock locked switch is activated.
2. Central control unlock activation conditions
   - Central control lock unlocked switch is activated.
   - Vehicle is not in anti-theft state.
3. Mechanical lock locked/unlocked activation conditions
   - Central control lock or mechanical lock locked switch is activated.
   - Vehicle is not in anti-theft state.
4. Auto unlock (if equipped) activation conditions
   - Vehicle speed is 0 km/h.
   - Door lock is locked.
   - Key is switched to OFF from other positions.

   Caution:
   The bench testing needs to ensure that there is no speed signal after IGN is turned off.
5. Collision unlock
   (a) After BCM receives CrashOutputSts ≠ 00 CAN signal when IGN ON: BCM performs central control unlocking twice and the interval time is 1 s (regardless of the door state); locking is prohibited; key is switched to OFF, prohibit locking is canceled.

Caution:
- BCM receives unlocking or locking command twice in 1 S and the second time will be ignored.
- BCM is powered on again after powered off, BCM has no lock or unlock action.
- For remote control lock and unlock function, please refer to lock and unlock contents in anti-theft management.

Front wiper control

1. Low speed wiper mode (Note: Wiper washer switch)
   (a) Activation conditions: IGN ON; low speed range switch of the wiper is activated.
   (b) When low speed wiper is operating: When wiper switch is switched to other operation mode, the wiper will work in other modes immediately.
   (c) When wiper switch is switched to OFF from low speed range, the wiper will operate at low speed automatically until it returns to wiper stop position (whether it is IGN ON or not).
2. High speed wiper mode
   (a) Activation conditions: IGN ON; high speed range switch of the wiper is activated.
   (b) When high speed wiper is operating: When wiper switch is switched to other operation mode, the wiper will work in other modes immediately.
   (c) When wiper switch is switched to OFF from high speed range, the wiper will operate at low speed automatically until it returns to wiper stop position (whether it is IGN ON or not).

3. Intermittent wiper mode (without rain sensor)
   (a) Activation conditions: IGN ON; wiper intermittent/automatic switch is activated.
   (b) There are 4 gear positions on wiper sensitivity switch: 13 s, 8 s, 4 s, 2 s.
   (c) When the intermittent wiper activation status switches intermittent time to other gear positions, the operation status of wiper is as below:
      (1) When new time interval is shorter than the original one:
         • If wiper is in pause status, wiper will operate in new intermittent at once.
         • If wiper is in moving status, wiper will operate in new intermittent since it is paused.
      (2) When new time interval is longer than the original one:
         • If wiper is in pause status, wiper will operate in new intermittent since it is paused at the next time after completing the current cycle.
         • If wiper is in moving status, wiper will operate in new intermittent since it is paused.
4. Auto wiper (with rain sensor)
   (a) With switch in Auto, BCM receives LIN signal sent from rain sensor, and drives wiper to operate.
   (b) Once LIN signal S_AUTO_H is received, high speed wiper operates.
   (c) Once LIN signal S_AUTO_L is received, low speed wiper operates.
   (d) When LIN signal stops or ignition key is not in ON, if wiper is not in stop position, wiper stops after operating to stop position.
   (e) Operation stops during ignition and restores when ignition is finished.

Front washer control

1. Front washer operation condition: IGN ON
2. Front washer operation will keep on outputting when front washer is activated
3. Washing starts operating after IGN-CRANK stops operating and resumes operating after starting
4. When front washer operation is over
   • When wiper switch is in OFF position, wiper will operate for 3 cycles at low speed, and it operates for 1 cycle again after 6 ± 0.2 seconds; If BCM receives new front washer operation requirements during 3 cycles and 6 seconds of this wiper, wiper will perform new operation.
   • When wiper is in intermittent mode, wiper will operate for 3 cycles at low speed, and then it keeps the intermittent mode.

Rear wiper control

1. Activation conditions: IGN ON; rear wiper is activated
2. During rear wiper is operating, if rear wiper switch is turned to OFF and rear wiper is not in Stop position, rear wiper will continue to operate until it stops at stopping position
3. During rear wiper is operating, if ignition key is turned to ON and rear wiper is not in Stop position, rear wiper will continue to operate until it stops at stopping position
4. During rear wiper is operating, the key is turned to Crank, the rear wiper will pause and the function resumes after Crank
5. When BCM judges front wiper is opened and reverse gear is input, rear wiper operates automatically with interval of 4 s. When either front wiper or reverse gear is closed, rear wiper stops operation.

Rear washer control

1. Rear washer operation condition: IGN ON
2. Rear washer operation will keep on outputting when front washer is activated
3. Rear washing starts operating after IGN-CRANK stops operating and resumes operating after starting
4. When rear washer operation is finished
   • When wiper switch is in OFF position, wiper will operate for 3 cycles at low speed; If BCM receives new rear washer operation requirements during 3 cycles, wiper will perform new operation.

- When wiper is in sweeping mode, wiper will sweep in orignal condition and continue to keep orignal condition after washer switch is released.

Back-up light control

1. Back-up light operating conditions: IGN in ON
2. After receiving reverse switch signal or CAN signal sent from TCU, BCM turns on backup light.
3. If there is no switch signal and CAN signal, it will turn off back-up light.

Key status position signal

1. BCM sends the corresponding KeySts according to the actual location of the key
2. The continuous activation time is up to 10 s as Crank is input, and KeySts = 2 (ON) is sent after 10s. If ACC and ON positions change, BCM sends the corresponding key KeySts according to the actual position of key.

Sudden braking hazard warning light alarm function

1. If the following conditions are met, hazard warning light is activated (CAN signals of left/right turn signal light, indicator light and turn signal light flash at frequency of 140 ms ON/140ms OFF)
   - The key position is in ON position.
   - CAN signal (HLRequestController=1) sent from ESP is received.
2. If any of following conditions is met, stop the hazard warning light (left/right turn signal light, indicator light and turn signal light CAN signal) flashes
   - CAN signal (HLRequestController=0) sent from ESP is received.
   - Key position is in OFF position.

Caution:

- When hazard warning light of this function is operating, operate hazard warning light switch, this function stops immediately;
- During this operation, BCM receives collision signal (CrashOutputSt ≠ 00) and function stops immediately.

Steering auxiliary light

1. When following conditions are met, turn on the fog light auxiliary light function
   - Key position is in ON position.
   - Turn signal light turns on or steering column rotation angle is above 45° (corresponding CAN signal is SteeringAngle).
   - Low beam lights turn on.
   - Vehicle speed is less than 40km/h.
2. When any of following conditions is met, turn off the fog light auxiliary light function
   - Key position is in ACC or OFF position.
   - Turn signal light turns off and steering column rotation angle is less than 10° (corresponding CAN signal is SteeringAngle).
   - Low beam lights turn on.
   - Vehicle speed is less than 40km/h.
3. When fog light auxiliary light is activated, meter indicator is not activated
4. This function can be configured on line

Brake light control

1. When any of following conditions is met, turn on the brake light function.
   - When brake switch is pressed, brake switch is a high level self-locking switch.
   - CAN signal 'BrakeLightsRequest=1' sent from EPB is received.
   - CAN signal 'BrakeLightsRequest=1' sent from ESP is received.

2. When brake light function is turned on, left and right brake lights and high mounted stop light turn on at the same time.
3. When all the above conditions are not met, left and right brake lights and high mounted stop light turn off simultaneously.

Rear view mirror folding

1. The switch is point contact type. Press the folding switch, the mirror is automatically folded, and press it again, the mirror is automatically unfolded
2. When it is powered on again after powered off, BCM stores the switch state before powered off
3. When the vehicle speed is greater than 10km/h, the folding function is shielded and the unfolding function works
4. When the vehicle is in Crank, the unfold/fold function is paused and the function is restored after crank is finished

DVD settings

1. Daytime running light function
   (a) DVD setting is ON to turn on the daytime running light function; DVD setting is OFF to turn off the daytime running light function.
2. Fortifying prompt
   - DVD setting is light that turn signal light flashes once and horn does not sound when it is fortified.
   - DVD setting is horn that horn sounds and turn signal light does not flash when it is fortified.
   - DVD setting is light and Horn that turn signal light flashes and horn sounds when it is fortified.
3. Auto lock
   (a) DVD setting is ON to turn on the auto lock function; DVD setting is OFF to turn off the auto lock function.
4. Headlight delay
   (a) DVD is set to On to turn on the headlight delay function; DVD is set to off to turn off the headlight delay function.
5. Rear view mirror folding
   (a) DVD is set to On to turn on the rear view mirror folding function; DVD is set to off to turn off the rear view mirror folding function.

Remote control function

1. Remote fortifying mode
   (a) Trigger conditions:
      - IGN is in OFF (it is not in IGN ON or ACC);
      - Four doors & two covers are closed;
      - BCM receives remote fortifying command signal TBOX_ArmingCmd=01.
   (b) BCM feedback when fortifying mode is entered:
      - Turn signal light flashes once (turn on for 500 ms) and sends the corresponding LHTurnsignalSts and RHTurnsignalSts.
      - Theft deterrent indicator is continuous flash at frequency of 100ms on, 1900ms off.
      - Actuate the anti-theft horn 50 ms and high and low pitched horns 15 ms.
2. Remote fortifying deactivation mode
   (a) Trigger conditions:
      - IGN is in OFF (it is not in IGN ON or ACC);
      - Four doors & two covers are closed;
      - BCM receives remote fortifying command signal TBOX_ArmingCmd=10.

(b) BCM feedback when remote fortifying deactivation mode is entered:
- BCM performs fortifying deactivation, Four doors and luggage compartment unlocks and left/ right turn signal lights flash twice (500 ms on and 500 ms off, continuous for two times)

3. Remote open luggage compartment mode
   (a) Trigger conditions:
   - Key position is in OFF;
   - BCM receives remote open luggage compartment command signal TBOX_TrunkCmd=01.

   (b) BCM feedback when luggage compartment opening mode is triggered:
   - Turn signal light illuminates and sends the corresponding LHTurnsignalSts and RHTurnsignalSts.
   - Luggage compartment is open at the same time and no alarm is triggered.

4. Remote car location mode
   (a) Trigger conditions:
   - IGN-OFF/IGN-ACC;
   - BCM receives car location function command "TBOX_SearchVehicleReq=1".

   (b) BCM feedback when remote fortifying deactivation mode is entered:
   - High and low pitched horns sound 3 s (500msON-500msOFF-500msON-500msOFF-500msON), left and right turn signal lights flash 3 s (500msON-500msOFF-500msON-500msOFF-500msON), low beam light turns on 15 S.

5. Remote start mode
   (a) Trigger conditions: BCM receives PEPS _1 (0x480) Signal "Start_StopRequest=011"
   (b) BCM feedback when remote start mode is entered
   - Anti-theft alarm function caused by ON gear position is shielded, but caused by four doors, engine hood and back door is not shielded.
   - After BCM shields the alarm, it sends signals "RVS_LiftAntiTheftAlarmRsp=1" to PEPS and "RVSMode=1" to CLM. (PEPS receives signal "RVS_LiftAntiTheftAlarmRsp=1", it will control the vehicle to start).
   - After BCM receives engine state signal EngineSts =1, it will turn on position light and send ParkingLightSts=1.

   (c) Exit remote start mode: Turn the key to OFF position
   (d) BCM feedback when remote start mode is exited:
   - BCM will not shield the anti-theft alarm caused by ON gear position.
   - BCM sends RVSMode=0.

LIN ambient light

1. Initial status

   When vehicle rolls from the line and powered on for the first time or vehicle battery is powered on again after disconnection, ambient light function default is on, and it turns on/off according to DVD setting.

2. Ambient light turns on / off
   (a) When all the following conditions are met, BCM sends LIN signal TheaterDimmingRequest=01 (ON) (Ambient light turns on)
   - Position light output is in activated state.
   - DVD setting is ON.

   (b) Position light output is deactivated or DVD setting is OFF, ambient light turns off.

3. Door control logic related ambient light
   (a) When all the following conditions are met, BCM sends LIN signal TheaterDimmingRequest=01 (ON) (ambient light turns on)
   - Position light output is not activated.
   - Vehicle is in fortifying deactivation mode.
   - Any door is opened.

- DVD setting is ON.

(b) Ambient light is opened and continues 3 minutes.

(c) Close all vehicle doors within 3 minutes after ambient light is turned on, and ambient light is turned off after 8 s.

(d) Open any other door within 3 minutes after ambient light is turned on, then count again for 3 minutes after the last door is opened

(e) With position light output is not activated, if one of following conditions is met, BCM sends LIN signal TheaterDimmingRequest=00 (OFF) immediately (ambient light turns off)

- Vehicle enters fortifying mode successfully.
- DVD setting is off.

4. Ambient light color

(a) Initial state: When vehicle rolls from the line and powered on for the first time or vehicle battery is powered on again after disconnection, related driving mode default is off. And it turns on/off according to DVD setting.

(b) When related driving mode is off: Ambient light default color is blue, and different colors can be selected according to DVD setting.

(c) When related driving mode is on

Ambient light is green under ECO mode.
Ambient light is red under sport mode.
Ambient light is blue under Normal mode.

5. Ambient light brightness (musical rhythm)

(a) Initial Status

- When vehicle rolls from the line and powered on for the first time or vehicle battery is powered on again after disconnection, musical rhythm mode default is off.

(b) When musical rhythm mode is off: Ambient light brightness is Level 3, and different levels can be selected according to DVD setting.

(c) When musical rhythm mode is on: According to different brightness level signals sent from IHU, it changes levels from zero with the musical rhythm

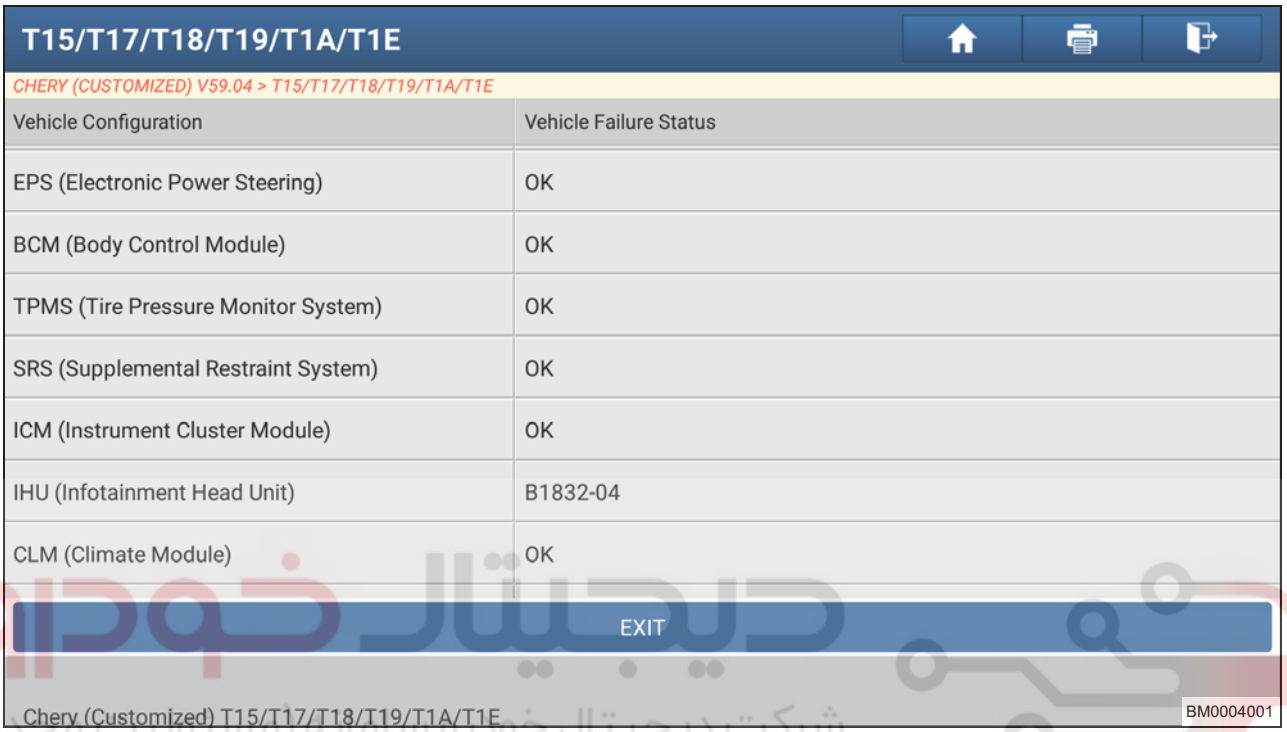
Electric children lock

1. Confirm the lock state when powered on for the first time, the switch backlight should be in accordance with lock status. After meter is opened, the hint information should be indicated to actual operation accordingly
2. ON position enables children lock switch to be operated by switch. When it is activated, lock status, meter hint, switch backlight are indicated to the same operation
3. Children lock can be operated within 2 minutes after power off. Countdown is canceled if either front door is opened and operation is disabled
4. After Crash output STS ≠ 00 or hard wire signal, perform unlock operation twice with interval of 1 s. No operation is allowed in this period until power off
5. Function is normal when door lock and children lock switch are operated simultaneously and alternately for several times

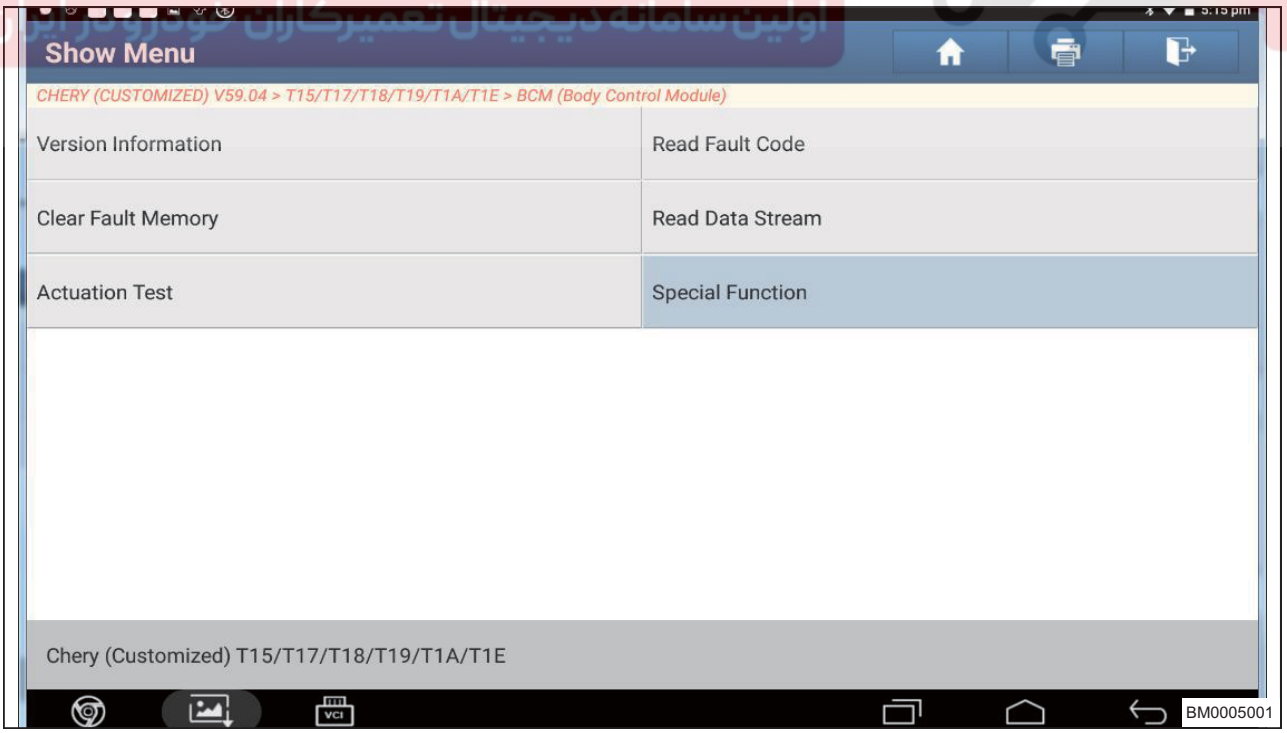
General functions for diagnostic tester

Diagnostic tester menu

1. Select "New Tiggo 7" model
2. Body control system menu



3. Diagnostic menu is as shown in illustration
   Click "BCM (Body Control Module)"



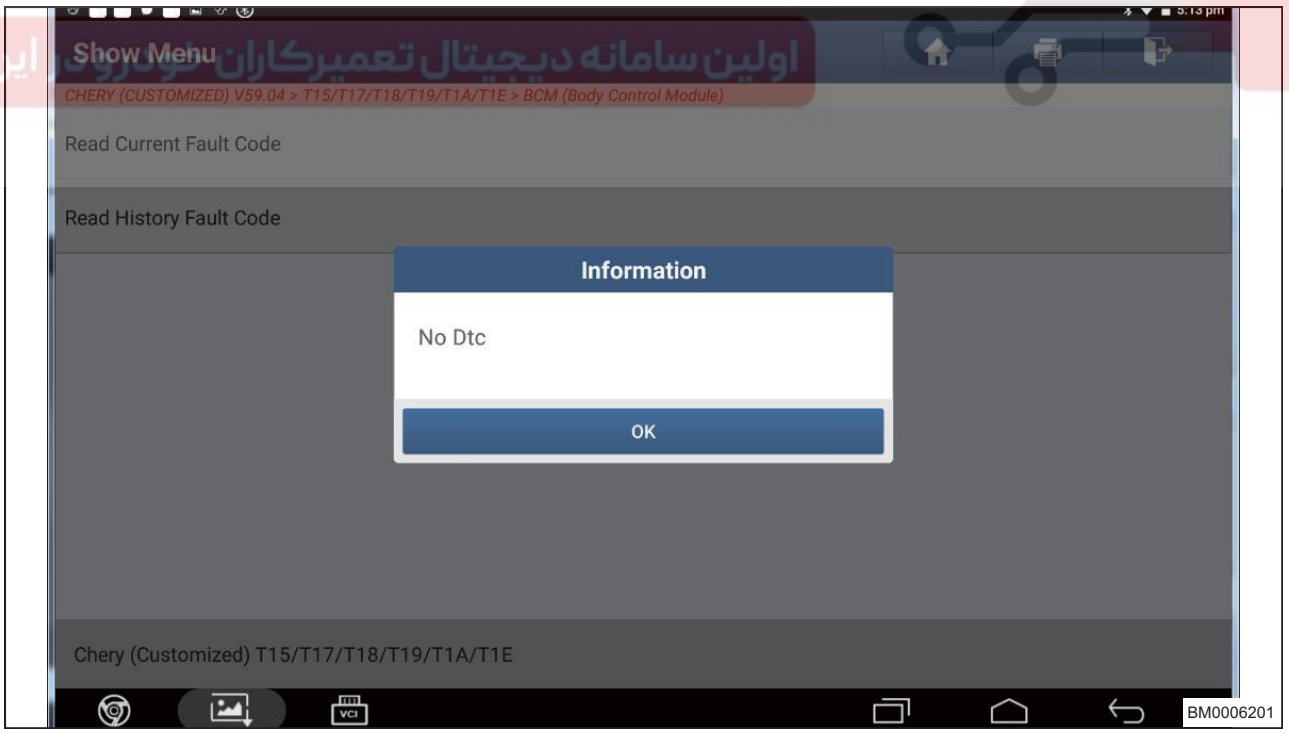
Read and Clear DTCs

Read DTCs

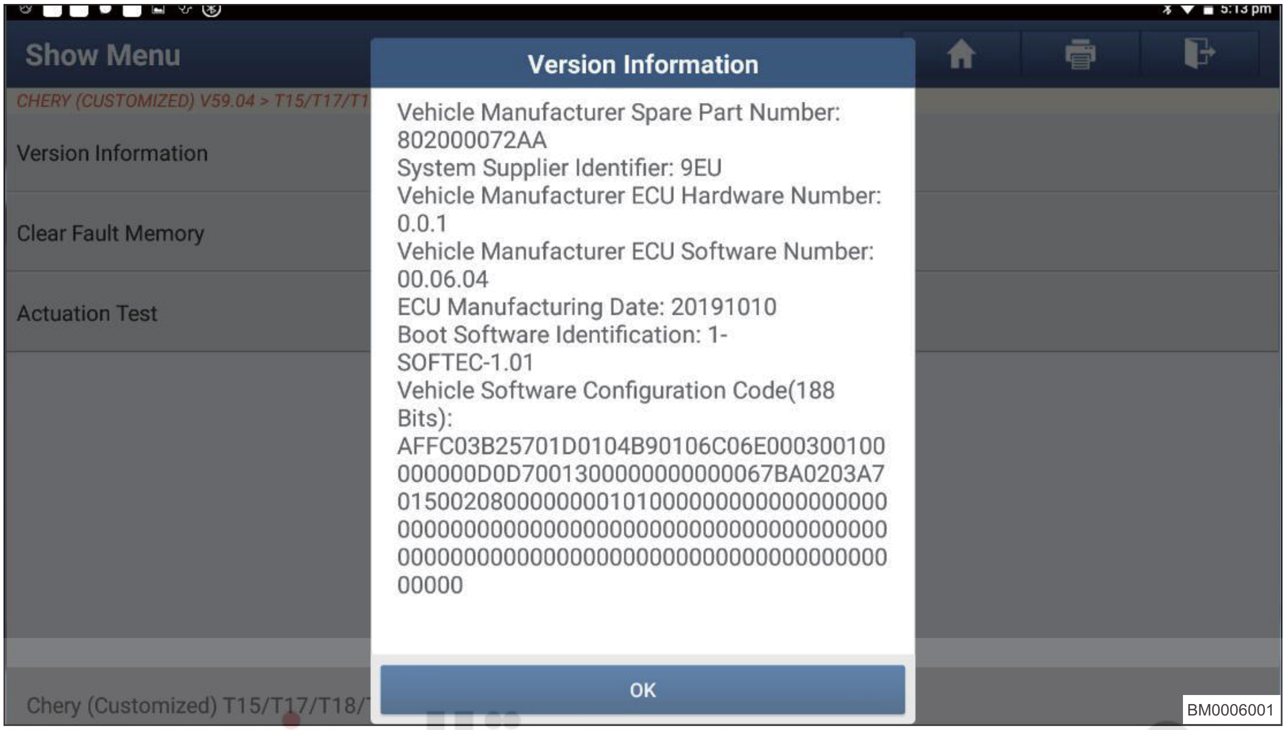
1. Read DTCs

(a) Read current DTC
(b) Read history DTC

2. Dispaly malfunction information

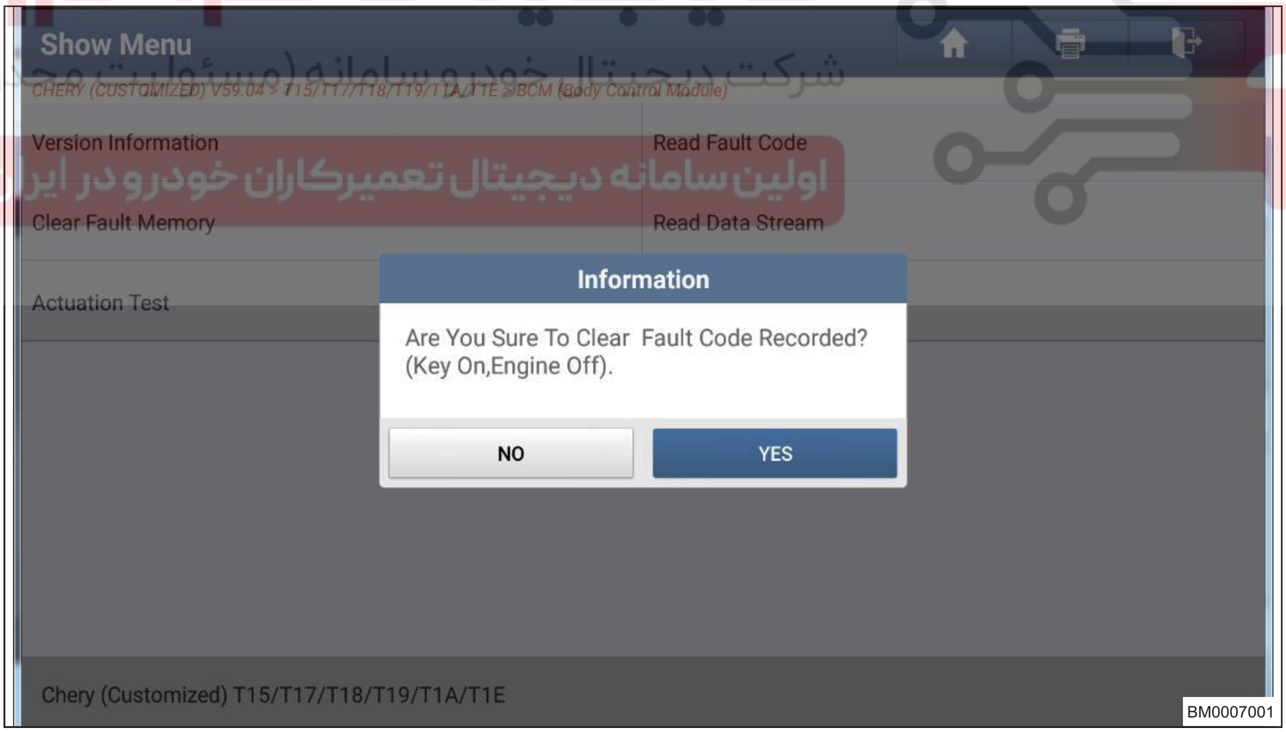


3. Reading Version Information



Clear DTCs

4. Click "Clear Fault Memory" to clear DTCs.



Caution:
Check that engine is not in activated condition and key is in IGN ON condition before clearing the DTCs.

Read data stream

Caution:
Turn ignition switch to ON before reading certain data stream.

Caution:

These switch signal input status can be checked by the following data streams which can help you to determine these input signals or malfunctions related to these signals.

1. Input status (light):
   - Left turn signal light: Not activated/activated. When combination light switch assembly is operated in left position, screen displays activated, otherwise it displays not activated.
   - Right turn signal light: Not activated/activated. When combination light switch assembly is operated in right position, screen displays activated, otherwise it displays not activated.
   - Front fog light: Not activated.
   - Rear fog light: Not activated/activated. When light switch is operated in rear fog light position, screen displays activated, otherwise it displays not activated.
   - Position light: Not activated/activated. When light switch is operated in position light position, screen displays activated, otherwise it displays not activated.
   - Low beam light: Not activated/activated. When light switch is operated in low beam light position, screen displays activated, otherwise it displays not activated.
   - High beam light: Not activated/activated. When light switch is operated in high beam light position, screen displays activated, otherwise it displays not activated.
   - Hazard warning light: Not activated/activated. When hazard warning light switch is operated, screen displays activated, otherwise it displays not activated.
   - Overtake light: Not activated/activated. When light switch is operated in overtake light position, screen displays activated, otherwise it displays not activated.
   - Reverse light: Not activated/activated. When reverse gear is operated, screen displays activated, otherwise it displays not activated.
   - Brake light: Not activated/activated. When brake pedal is operated, screen displays activated, otherwise it displays not activated.
2. Input status (wiper):
   - Front wiper (high speed range): Not activated/activated. When wiper switch is operated in this position, screen displays activated, otherwise it displays not activated.
   - Front wiper (low speed range): Not activated/activated. When wiper switch is operated in this position, screen displays activated, otherwise it displays not activated.

- Front wiper (auto/intermittent): Not activated/activated. When wiper switch is operated in this position, screen displays activated, otherwise it displays not activated.
- Rear wiper: Not activated/activated. When wiper switch is operated in this position, screen displays activated, otherwise it displays not activated.

3. Input status (window):
   1. Driver side input status (window):
      (a) Driver side front left window up: Not activated/activated. When this switch is operated in up position, screen displays activated, otherwise it displays not activated.
      (b) Driver side front right window up: Not activated/activated. When this switch is operated in up position, screen displays activated, otherwise it displays not activated.
      (c) Driver side rear left window up: Not activated/activated. When this switch is operated in up position, screen displays activated, otherwise it displays not activated.
      (d) Driver side rear right window up: Not activated/activated. When this switch is operated in up position, screen displays activated, otherwise it displays not activated.
      (e) Driver side front left window down: Not activated/activated. When this switch is operated in down position, screen displays activated, otherwise it displays not activated.
      (f) Driver side front right window down: Not activated/activated. When this switch is operated in down position, screen displays activated, otherwise it displays not activated.
      (g) Driver side rear left window down: Not activated/activated. When this switch is operated in down position, screen displays activated, otherwise it displays not activated.
      (h) Driver side rear right window down: Not activated/activated. When this switch is operated in down position, screen displays activated, otherwise it displays not activated.
   2. Passenger side input status (window):
      (a) Passenger side front right window up: Not activated/activated. When this switch is operated in up position, screen displays activated, otherwise it displays not activated.
      (b) Passenger side rear left window up: Not activated/activated. When this switch is operated in up position, screen displays activated, otherwise it displays not activated.
      (c) Passenger side rear right window up: Not activated/activated. When this switch is operated in up position, screen displays activated, otherwise it displays not activated.
      (d) Passenger side front right window down: Not activated/activated. When this switch is operated in down position, screen displays activated, otherwise it displays not activated.
      (e) Passenger side rear left window down: Not activated/activated. When this switch is operated in down position, screen displays activated, otherwise it displays not activated.
      (f) Passenger side rear right window down: Not activated/activated. When this switch is operated in down position, screen displays activated, otherwise it displays not activated.
   3. Glass lock switch: Not activated/activated. When driver side glass lock switch is operated, screen displays activated, otherwise it displays not activated.
4. Input status (lock):
   - Central control lock: lock/unlock. (Used to indicate central lock button status signals of front left door glass regulator switch).
   - Key lock: lock/unlock. (Used to indicate front left door lock status signals, such as unlock/lock).
5. Input Status (Door, engine hood, luggage compartment door):
   - Front left door is ajar: Not activated/activated. This signal is sent from door lock state switch. When door lock is in half-locked or open position, it displays activated. Otherwise, it displays not activated.
   - Front right door is ajar: Not activated/activated. This signal is sent from door lock state switch. When door lock is in half-locked or open position, it displays activated. Otherwise, it displays not activated.
   - Rear left door is ajar: Not activated/activated. This signal is sent from door lock state switch. When door lock is in half-locked or open position, it displays activated. Otherwise, it displays not activated.

- Rear right door is ajar: Not activated/activated. This signal is sent from door lock state switch. When door lock is in half-locked or open position, it displays activated. Otherwise, it displays not activated.
- Engine hood is ajar: Not activated/activated. This signal is sent from engine hood contact switch. When engine hood is not closed properly, it displays activated. Otherwise, it displays not activated.
- Rear compartment door is ajar: Not activated/activated. This signal is sent from lock state micro switch. When door lock is in open position, it displays activated. Otherwise, it displays not activated.
- Rear cover released switch: Not activated/activated. When vehicle is in fortifying deactivation mode. Press back door release button, screen displays activated, otherwise it displays not activated.

6. Input status (key):
   - Key is inserted (no PEPS): Not activated/activated. This signal is sent from key contact mirco switch of ignition cylinder. When key is inserted, it displays activated. Otherwise, it displays not activated.
   - ACC: Not activated/activated. This signal is sent from ACC power supply. When ACC is powered on, it displays activated. Otherwise, it displays not activated.
   - IGN: Not activated/activated. This signal is sent from IGN power supply. When IGN is powered on, it displays activated. Otherwise, it displays not activated.
7. Input status (rear view mirror folding):
   - Rear view mirror power folding: Not activated/activated. When rear view mirror folding is operated, screen displays activated, otherwise it displays not activated.
8. Input state (rear defroster/heat):
   - Rear defroster: Not activated/activated. Operate rear defrost switch. If rear defroster signal is received it displays Activated. Otherwise, it displays not activated.
9. Input status (washer):
   - Front washer: Not activated/activated. When wiper switch is operated in this position, screen displays activated, otherwise it displays not activated.
   - Rear washer: Not activated/activated. When wiper switch is operated in this position, screen displays activated, otherwise it displays not activated.
10. Input status (wiper intermittent):
    - 1 st (13 s): Not activated/activated. When wiper switch is operated in this position, screen displays activated, otherwise it displays not activated.
    - 2 st (8 s): Not activated/activated. When wiper switch is operated in this position, screen displays activated, otherwise it displays not activated.
    - 3 st (4 s): Not activated/activated. When wiper switch is operated in this position, screen displays activated, otherwise it displays not activated.
    - 4 st (2 s): Not activated/activated. When wiper switch is operated in this position, screen displays activated, otherwise it displays not activated.
11. Input status (stop position):
    - Front wiper: Not activated/activated. When wiper switch is operated in this position, screen displays activated, otherwise it displays not activated.
    - Rear wiper: Not activated/activated. When wiper switch is operated in this position, screen displays activated, otherwise it displays not activated.
12. Window status signal (only used on the vehicle equipped with jam protection): (Refer to "Windshield, Window Glass"sections).
13. Software configuration information: The configuration code that BCM is written to is some number.

Actuation Test

Caution:

Diagnostic tester provides operation test function for the 25 parts. It is used to test whether these parts and the related circuits are functioning properly.

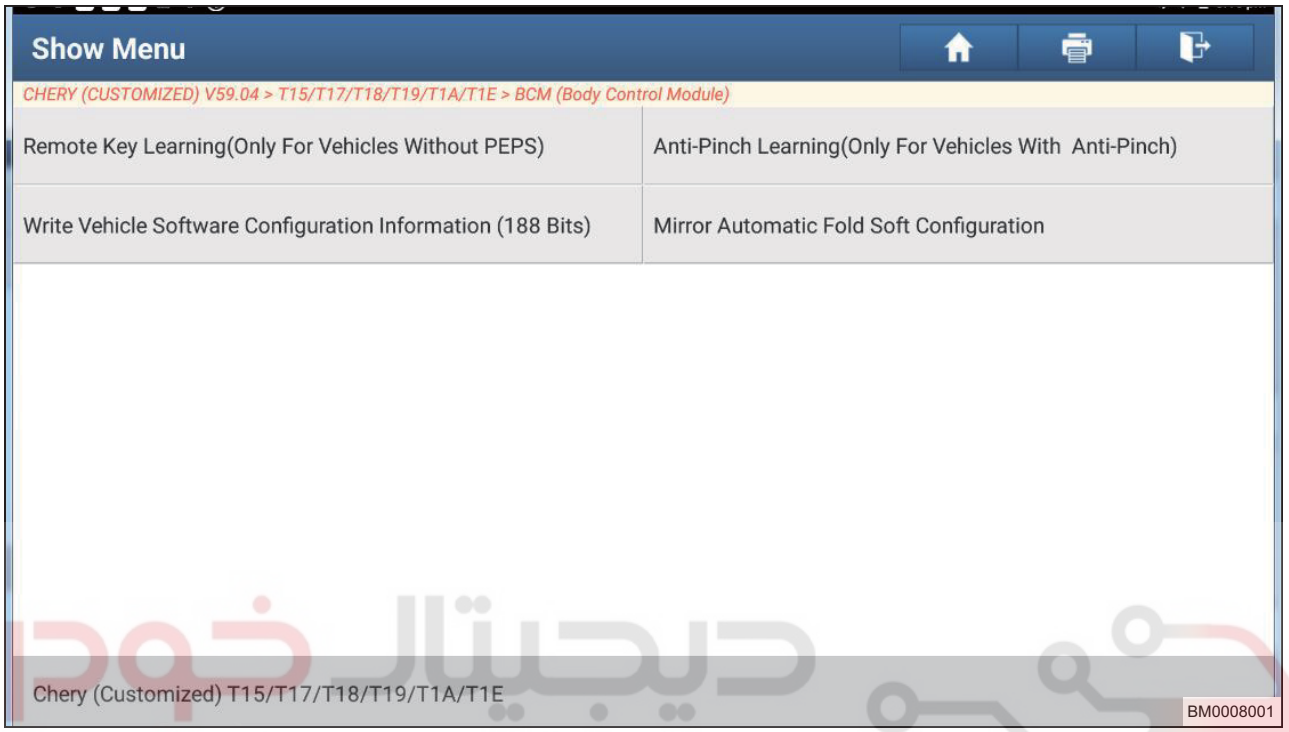
No.	Part	No.	Part
1	Left Turn Signal Light	14	Front Washer
2	Right Turn Signal Light	15	Front Wiper (Low Speed Range)
3	Position Light	16	Front Left Window
4	Low beam lights	17	Front Right Window
5	High beam lights	18	Rear Left Window
6	Rear Fog Lights	19	Rear Right Window
7	Daytime Running Light	20	Central Control Lock
8	Dome light	21	Luggage Compartment Lock
9	Security Indicator Light	22	Anti-theft Alarm
10	Hazard Warning Light	23	Rear View Mirror Folding
11	Window Regulator Disabled Switch Indicator Light	24	Defroster
12	Luggage Compartment Light	25	Brake light
13	Front Wiper (High Speed Range)		

1. Left turn signal light: Click "ON" to turn on the light. And click "OFF" to turn off the light
2. Right turn signal light: Click "ON" to turn on the light. And click "OFF" to turn off the light
3. Position light: Click "ON" to turn on the light. And click "OFF" to turn off the light
4. Low beam light: Click "ON" to turn on the light. And click "OFF" to turn off the light
5. High beam light: Click "ON" to switch the solenoid to high beam position. And click "OFF", the solenoid returns to low beam position
6. Daytime running light: Click "ON" to turn on the light. And click "OFF" to turn off the light
7. Rear fog light: Click "ON" to turn on the light. And click "OFF" to turn off the light
8. Dome light: Click "ON" to turn on the light. And click "OFF" to turn off the light
9. Security indicator light: Click "ON" to turn on the light. And click "OFF" to turn off the light
10. Hazard warning light: Click "ON" to turn on the light. And click "OFF" to turn off the light
11. Window regulator disabled switch indicator light: Click "ON" to turn on the light. And click "OFF" to turn off the light
12. Luggage Compartment light: Click "ON" to turn on the light. And click "OFF" to turn off the light
13. Front wiper (high speed range): Click "ON" to operate wiper at high range. Click "OFF" to stop operation
14. Front washer: Click "ON" to operate washer motor. Click "OFF" to stop operation
15. Front wiper (low speed range): Click "ON" to operate wiper at low range. Click "OFF" to stop operation
16. Front left window: Click "UP" to raise the glass. And click "DOWN" to lower the glass
17. Front right window: Click "UP" to raise the glass. And click "DOWN" to lower the glass
18. Rear left window: Click "UP" to raise the glass. And click "DOWN" to lower the glass
19. Rear right window: Click "UP" to raise the glass. And click "DOWN" to lower the glass
20. Central control lock: Click "LOCK" to lock the central control lock. And click "UNLOCK" to unlock the central control lock
21. Luggage compartment lock: Click "UNLOCK" to unlock the luggage compartment lock
22. Anti-theft alarm: Click "Activated" to alarm anti-theft horn. And click "OFF" to stop alarming
23. Rear view mirror folding: Click "Folding" to fold rear view mirror, click "Unfolding" to unfold rear view mirror, and click "Return" to exit
24. Defroster: Click "ON" to operate the rear defroster. And click "OFF" to stop the rear defroster

25. Brake light: Click "ON" to turn on the light. And click "OFF" to turn off the light

Special Operation

1. Special operation menu



(a) Wireless key learning (only used on the model without PEPS)

Hint:

- The whole series of new Tiggo 7 model are equipped with PEPS.

(b) Jam protection (only used on the model equipped with jam protection)

(c) Write vehicle software configuration information

(d) Rear view mirror auto folding function

Jam protection (only used on the model equipped with jam protection)

2. (See to 49–xx)

Write vehicle software configuration information automatically

3. If electronically controlled injection ECU is installed on vehicle originally and can perform data communication, click this menu to write software configuration information automatically

Caution:

- During operation, it is necessary to "Confirm if the VIN code is consistent with vehicle VIN code?" To ensure that ECU is original and the software configuration information is never modified.

Write vehicle software configuration information manually

4. Write the front 32 digits of vehicle software configuration information manually
5. Write the rear 16 digits of vehicle software configuration information manually

Rear view mirror auto folding function

6. Click the menu to set ON/OFF of rear view mirror auto folding function

DIAGNOSIS & TESTING

Common problem symptoms table

Symptom	Probable Cause and Recommended Countermeasures
Remote controller failure or distance of remote control is close	(For PEPS model, remote controller failure has nothing to do with BCM. BCM cannot be replaced) • Battery voltage of remote controller is low - Replace the battery. (Voltage of new replaced battery should more than 2.9 V), it needs to rematch. • Metallic films are attached to windows, which causes signal to be shielded and vehicle is malfunctioning without any reason. Peel off the metallic films to solve the problem. • There is electromagnetic interference. Perform the test at another place. • If remote controller is damaged, replace and rematch it.
Rear defroster not operate	Refer to operation principle (control logic). Check the input and output signal. For diagnosis please refer to "Perform Diagnosis According to Symptoms".
Turn signal light does not come on	
Small light does not come on	
High beam light does not come on	
Fog light does not come on	
Daytime running light does not come on	
Glass cannot raise up	
Door lock cannot lock/unlock/luggage compartment cannot open	
Wiper washer dose not operate or operate abnormally	
Only horn alarms or only turn signal light flashes when it fortifies	It can be set on DVD/navigation interface, refer to On-vehicle Service section.

DTC Chart

DTC	Description	Fault Type
B1000-16	Power Supply	Circuit Voltage Below Threshold
B1000-17		Circuit Voltage Above Threshold
B1001-11	Left Side Turn Lamp Control Circuit	Circuit Short To Ground
B1001-13		Circuit Open
B1002-11	Right Side Turn Lamp Control Circuit	Circuit Short To Ground
B1002-13		Circuit Open
B1005-11	Front Park Light Output Control Circuit	Circuit Short To Ground
B1005-13		Circuit Open
B1006-11	Rear Park Light Output Control Circuit	Circuit Short To Ground
B1006-13		Circuit Open
B1008-11	Rear Fog Control Circuit	Output Short to Ground
B1008-13		Circuit Open
B1008-71		Actuator Stuck
B1009-71	Rear Wiper Control Circuit	Actuator Stuck
B100C-13	Front Left Window Up Control Circuit	Circuit Open
B100C-71		Actuator Stuck
B100D-13	Front Left Window Down Control Circuit	Circuit Open
B100D-71		Actuator Stuck
B100E-13	Front Right Window Up Control Circuit	Circuit Open
B100E-71		Actuator Stuck
B100F-13	Front Right Window Down Control Circuit	Circuit Open
B100F-71		Actuator Stuck

DTC	Description	Fault Type
B1010-13	Rear Left Window Up Control Circuit	Circuit Open
B1010-71		Actuator Stuck
B1011-13	Rear Left Window Down Control Circuit	Circuit Open
B1011-71		Actuator Stuck
B1012-13	Rear Right Window Up Control Circuit	Circuit Open
B1012-71		Actuator Stuck
B1013-13	Rear Right Window Down Control Circuit	Circuit Open
B1013-71		Actuator Stuck
B1016-71	Rear Washer Control Circuit	Actuator Stuck
B1017-71	Front Washer Control Circuit	Actuator Stuck
B101D-11	Siren Output Control Circuit	Circuit Short To Ground
B1024-71	Trunk Lock Control Circuit	Actuator Stuck
B1027-11	Battery Saver Output Control Circuit	Circuit Short To Ground
B101E-11	L-DRL Control Circuit	Circuit Short To Ground
B101E-13		Circuit Open
B101F-11	R-DRL Control Circuit	Circuit Short To Ground
B101F-13		Circuit Open
B1035-11	Brake Light Control Circuit	Circuit Short To Ground
B1035-13		Circuit Open
B1036-11	H-Brake Light Control Circuit	Circuit Short To Ground
B1036-13		Circuit Open
B1039-11	NTC Intput Circuit / Reversing Lamp Control Circuit	Circuit Short To Ground
B1039-13		Circuit Open
B1021-17	Anti-pinch Module Power Supply	Circuit Voltage Above Threshold
B1021-16	Anti-pinch Module Power Supply	Circuit Voltage Below Threshold
B1022-71	FL Window Button	Actuator Stuck
B1023-71	FR Window Button	Actuator Stuck
B1033-71	RL Window Button	Actuator Stuck
B1025-71	RR Window Button	Actuator Stuck
B1026-71	Passenger FR Window Button	Actuator Stuck
B1034-71	Passenger RL Window Button	Actuator Stuck
B1028-71	Passenger RR Window Button Short	Actuator Stuck
B1029-71	FL Window Relay	Actuator Stuck
B102A-71	FR Window Relay	Actuator Stuck
B102B-71	RL Window Relay	Actuator Stuck
B102C-71	RR Window Relay	Actuator Stuck
B102D-96	Anti-pinch Module Controller	Component Internal Failure
B102E-86	FL Window Motor Position Signal	Actuator Stuck
B102F-86	FR Window Motor Position Signal	Actuator Stuck
B1030-86	RL Window Motor Position Signal	Actuator Stuck
B1031-86	RR Window Motor Position Signal	Actuator Stuck
B1032-87	Lost Communication With Anti-pinch Module MCU	Missing Message
B103A-62	Signal Compare Failure	Missing Message

DTC Confirmation Procedure

1. Diagnostic tester can be connected to diagnostic interface and communicate with the vehicle via vehicle data link.
2. Confirm the current malfunction, and carry out diagnostic test and repair procedures.

3. If DTC cannot be deleted, malfunction indicated by DTC is current.
4. Measure electrical system voltage with a digital multimeter.
5. Visually check the related wire electrical harness.
6. Check and clear all DTCs related to BCM ground.
7. If lots of DTCs are set, use circuit diagram to check any common ground circuit or power supply circuit and find the cause of DTCs.

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.
- Monitor the diagnostic tester data related to this circuit.
- 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.
- Inspect sensors and mounting areas for damage, foreign matter, etc. that will cause incorrect signals.
- Use data recorder and/or oscilloscope to help diagnose intermittent malfunctions.

Ground Inspection

Ground points are very important to the proper operation of circuits. 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 grounding. A loose or corroded ground can affect the control circuit. Check the ground points as follows:

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

Malfunction Diagnosis Repair Flow

Warning/Caution/Hint:

When reading DTCs, some DTCs are not related to trouble symptom. And these functions are normal and not affect vehicle use, clear them.

1. Check if DTC occurs again

   If malfunction does not occur, check and repair the suspected wire harness and electrical connector. Proceed to the next step if malfunction occurs again.
2. Check for DTCs

   Perform reading to check whether there is any DTC. Proceed to the diagnostic procedures based on malfunction symptoms when there is no DTC. Proceed to the next step when DTC is found:
3. Clear and read DTCs again

   Record DTCs and clear them. Perform test and read DTC again to check whether there is any DTC. Proceed to the diagnostic procedures based on malfunction symptoms when there is no DTC. Proceed to the next step when DTC related to malfunction symptom is found.
4. Deal with the malfunction symptom according to DTC
5. After repairment, perform test again according to DTC stragety

   Repair it again if malfunction has not been repaired.

6. After malfunction has been repaired, prevent the malfunction from reoccurring according to the malfunction reasons.
7. Malfunction diagnosis ends.

Trouble Symptom Diagnosis

Warning/Caution/Hint:

- If a function of BCM is failed, but there is no DTC, perform diagnosis according to trouble symptom.
- This diagnosis needs to combine with control logic (see Operation section). Check input/output signal of BCM for normal operation. If input/output is normal, there is a malfunction in BCM. Otherwise, check the input or output part.

1. Check if DTC occurs again

   If malfunction does not occur, check and repair the suspected wire harness and electrical connector. Proceed to the next step if malfunction occurs again.
2. Check if power supply and ground of controller are normal

   If it is abnormal, repair the power supply and ground based on the electronic diagram. Proceed to the next step if it is normal.
3. According to the control logic, read related data stream with diagnostic tester and check if it is normal (refer to data stream part of diagnostic tester)

   If it is abnormal, repair the related input signals based on the circuit diagram. Proceed to the next step if it is normal.
4. Perform operation test using diagnostic tester to see if there is any related operations performed by diagnostic tester. (refer to operation test part for diagnostic tester)

   If it is normal, input part has no malfunction. Otherwise, proceed to the next step.
5. Check if actuator is normal (refer to diagnostic chapter of each actuated part)

   If result is abnormal, replace the actuator.
6. If above diagnostic results are normal, replace BCM

Body Control Module

Removal

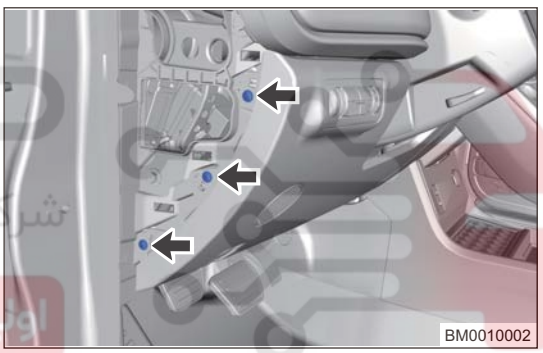
Warning/Caution/Hint:
Before replacing BCM, read configurations of the original software. After replacing it, write the original configuration codes.

1. Turn off all electrical equipment and ENGINE START STOP switch.
2. Disconnect the negative battery cable.
3. Remove the body control module

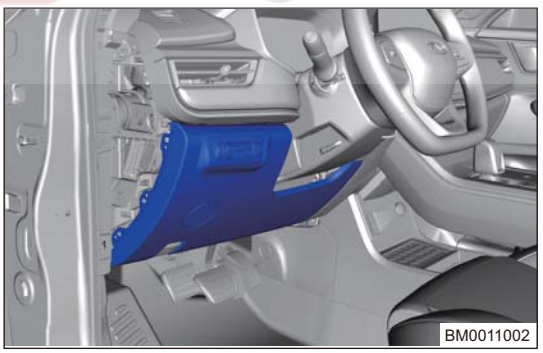
(a) Remove the instrument panel left end panel assembly.

(b) Remove 3 fixing screws (arrow) from instrument panel lower left protector assembly.

Tightening torque
1.5 ± 0.5 N·m

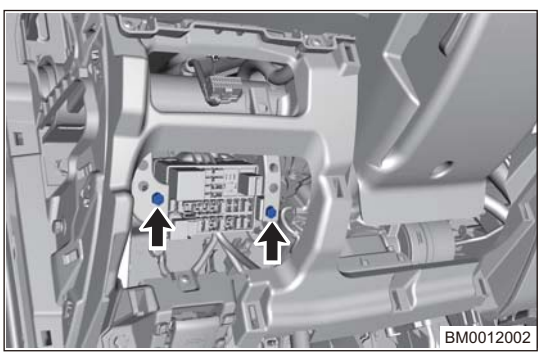


(c) Remove the instrument panel left lower protector assembly.

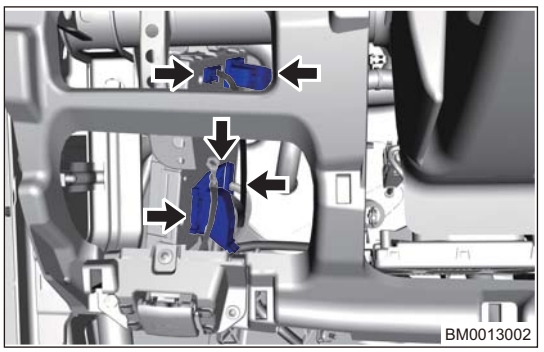


(d) Remove 2 fixing bolts (arrow) from instrument panel fuse and relay box.

Tightening torque
7 ± 1 N·m

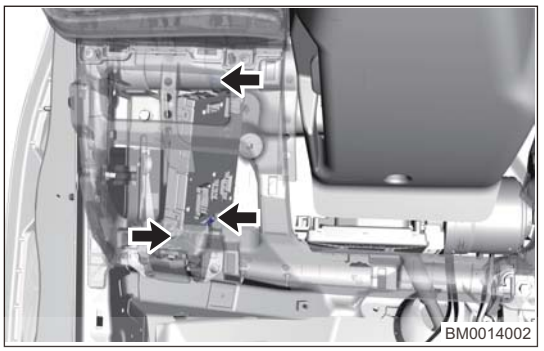


(e) Disconnect the body control module connectors (arrow).



(f) Remove 3 fixing nuts (arrow) from body control module bracket.

Tightening torque
7 ± 1 N·m



(g) Remove the body control module.

Installation

1. Installation is in the reverse order of removal.

Caution:
If controller bracket has been removed, install the bracket first, then install BCM to the bracket.

- MEMO -