

BCM

I . Precautions

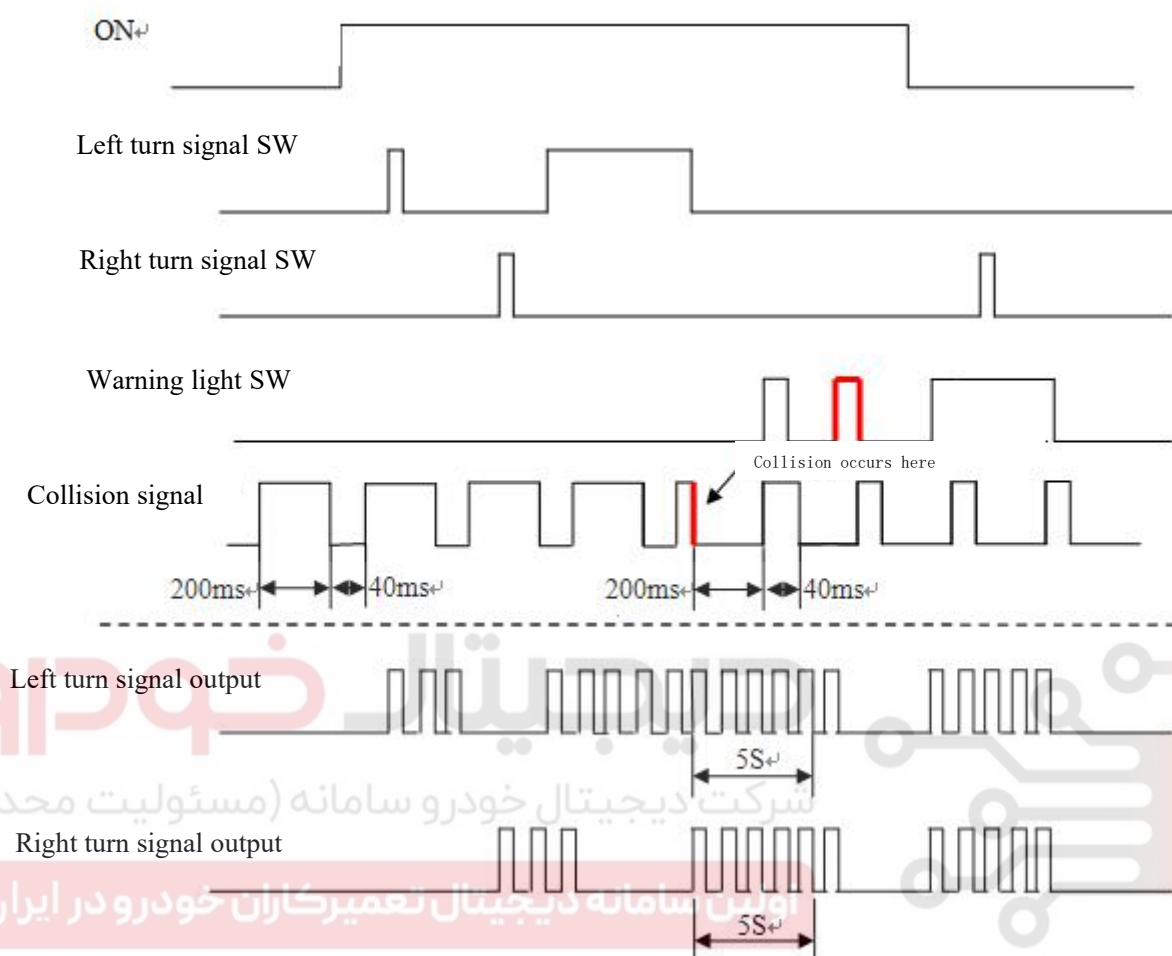
- Strictly observe the operation precautions of the airbag system, otherwise it will cause vehicle damage and personal injury.
- Prior to removal of electric connector, the battery negative has to be removed and wait for at least more than 1 minute, otherwise it will cause vehicle damage.
- When removing and installing component, protect the parts from being detached with cloth so as to prevent damage.
- When removing metal clips from accessories, wrap the knife edge of the flat-edge screwdriver with cloth.
- Be careful not to damage the body components.
- When installing body trims, make sure the clips are securely installed in the body holes, then carefully press them in.
- In case where the removal/installation of some components cannot be achieved by one person, then two should be available for operation so as to prevent drop-down.
- Do not use excessive force when removing and installing some trim parts, for it may cause the part deformation.

II . Layout of Components



III. Function Description

1. Left and right turn signal, warning light control



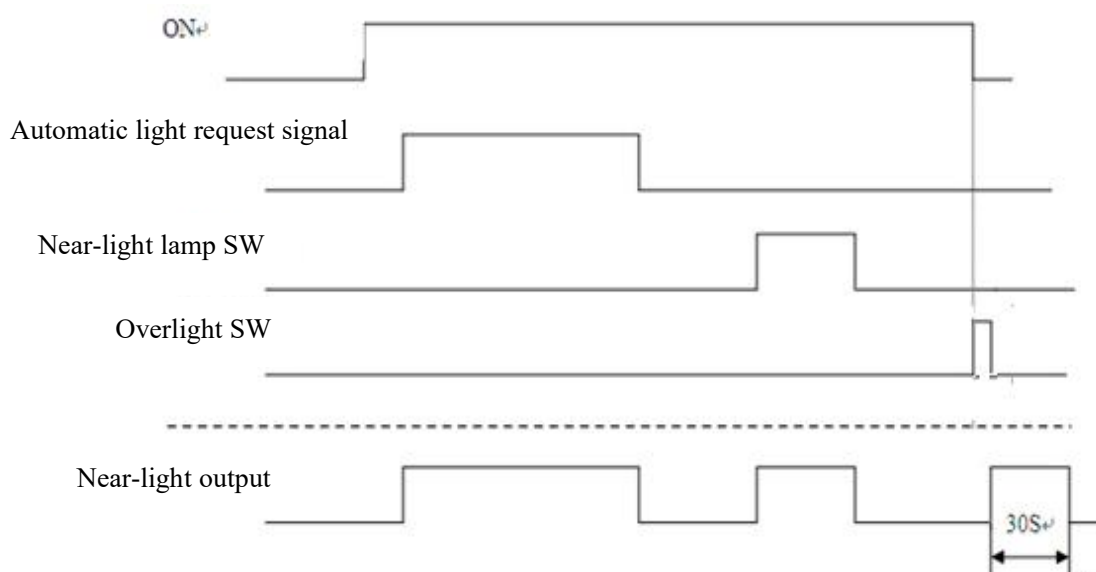
Note: The bold part marked in red means press the hazard light switch after the collision signal occurs for more than 5S.

- 1) When the key is in the ignition switch ON, the corresponding turn signal blinks or turns off when the steering switch is on or off. Meanwhile, the indicator light on the instrument and the flash sound relay in the BCM are connected to blink and sound at the same frequency.
- 2) When the turn signal switch is turned left or right, the BCM drive corresponding turn signal activates and blinks at least 3 times.
- 3) If the turn signal is turned off after activation, the turn signal will turn off immediately after completing its initial minimum 3 flashing cycles.
- 4) If the left turn signal switches from left to right after it is activated, the left turn signal will immediately turn off and the right turn signal will immediately turn on.
- 5) If the right turn signal switches from right to left after it is activated, the right turn signal will immediately turn off and the left turn signal will immediately turn on.
- 6) The warning lights include all turn signals, which can be driven by the key at any

gear. Pressing the next warning light button will cause the warning light to start flashing. Operating the warning light button again will turn it off.

- 7) When the ignition lock switch is ON, the priority of the turn signal and warning light in operation is as follows: If the turn signal is working, turn on the warning light switch, then the warning light work replaces the work of the turn signal, until the warning light switch is turned off, the system does not return to the turn signal working state.
- 8) If the collision signal is received, all the lights will work under the warning light state for at least 5 seconds. After 5 seconds, the warning light will be turned off by pressing the warning light switch again, so as to prevent the warning light switch from being pressed due to the collision.
- 9) When the turn signal reports a fault due to a short circuit, the short circuit status will be recorded in the relevant memory, and the high side driver chip of the turn signal will be turned off immediately, and the turn indicator on the combined instrument will stop. When the ignition key is turned from ON to OFF/ACC and again from OFF/ACC to ON, the output returns to normal. When a short-circuit fault occurs on one turn signal, follow the two-hop logic.
- 10) When working in turn signal mode, if a side turn signal reports a fault due to an open circuit, the number of consecutive sampling failures is greater than 5 times, the open circuit state will be recorded in related memory, and the side turn signal blinks at double frequency, and the steering indicator of the combined instrument blinks at double frequency. When the ignition key is switched from ON to OFF/ACC, the output returns to normal, or in this ignition cycle it can also return to blinking at the normal frequency when the open circuit is troubleshooting.

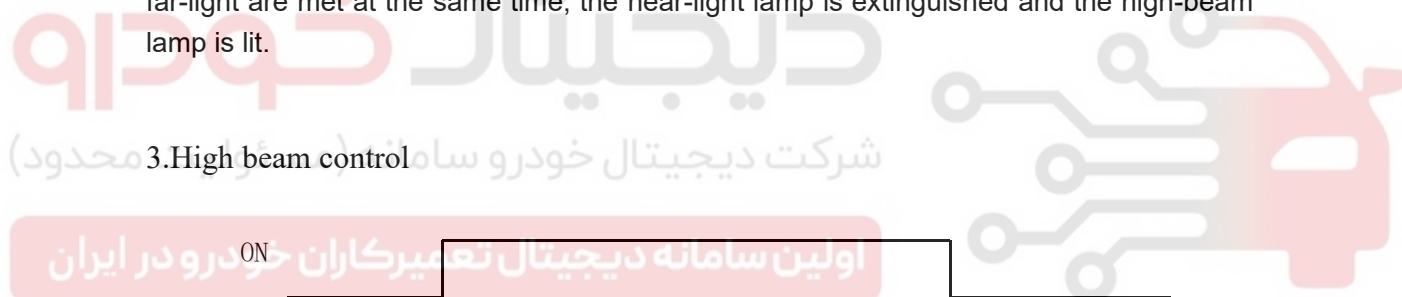
2. Near light lamp, accompany me home control



Note: Effective automatic light request signal means that the light AUTO gear is effective, and the sunlight signal reaches the requirement of lighting threshold;

- 1) When the ignition switch is ON, when BCM detects that the headlamp near-light switch input is valid, the near-light light will light up.
- 2) When the ignition switch is ON, when the BCM detects that the automatic light request signal (open AUTO and reach the sunlight sensor lighting threshold) is effective, the near-light light will light up.
- 3) When the ignition state is OFF, the overlight switch from ON to OFF will trigger the "take me home" function, and once the ignition cycle will activate the "take me home" function, and the next time the ignition state jumps to OFF, the "take me home" function will be enabled again, and the near-light lamp can be kept on for 30S.
- 4) Condition 1: The near-light lamp is ON. When it detects that the ignition switch is not ON or the corresponding near-light switch, the automatic light request signal (light AUTO or sunlight signal) is off, the near-light lamp is off.
- 5) Under the above condition 3, when the time is up, the near-light lamp will be turned OFF. If the ignition state jumps to OFF, it will also be turned off.

When the ignition switch is in ON gear, if the opening conditions of near-light and far-light are met at the same time, the near-light lamp is extinguished and the high-beam lamp is lit.



- 1) High beam control pin output low level when receiving AUTO switch or headlight switch.
- 2) When the ignition switch is ON, the high beam lights up when the BCM detects that the high beam switch input is valid.

4.Position light control

Position lights are divided into high and low processing:

Low distribution:

When the input of the position light switch is valid or the automatic light request position light is on, the output of the position light, license plate light and backlight will be turned on. When the input of the position light switch is invalid and the automatic light

request position light is turned off, the output of the position light, license plate light and backlight will be turned off.

When the input of the position light switch is still valid, if the left front door is open, pull out the key and the small light will be off immediately. If the left front door is closed, the small light does not turn off when you pull out the key. If you open the left front door, the small light turns off when the key is inserted.

High distribution(with PEPS):

When the position light switch input is valid or the automatic light request position light is turned on, the output of the position light, license light and backlight is turned on. When the input of the position light switch is invalid and the automatic light request position light is turned OFF or the ignition state is turned OFF, the output of the position light, license light and backlight is turned off. If the above conditions are not met, the output is closed.

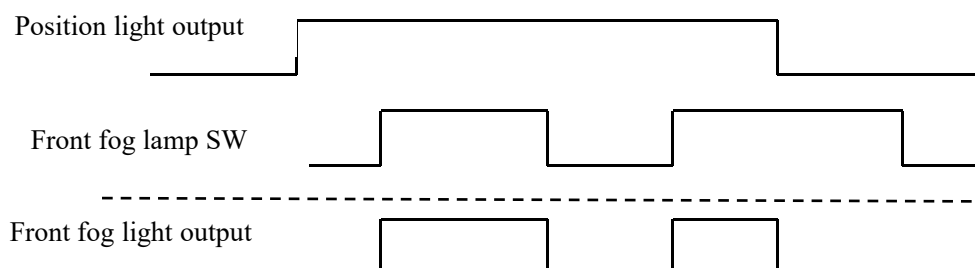
When the position light switch input is still valid, if the left front door is in the open state, the ignition state from ACC to OFF state, the small light will be immediately extinguished; If the left front door is closed and the ignition lock is OFF, the small light of the left front door will be turned OFF and the small light will be turned off when the ignition lock is switched from off to ACC or ON.



5.Front fog light control

1) The ignition switch is in ON gear. When the position light is on, press the front fog light switch to light the front fog light.

2)The ignition switch is not in IG2 or the position light is off or the front fog light is off when the front fog light switch is off.



6. Rear fog light control

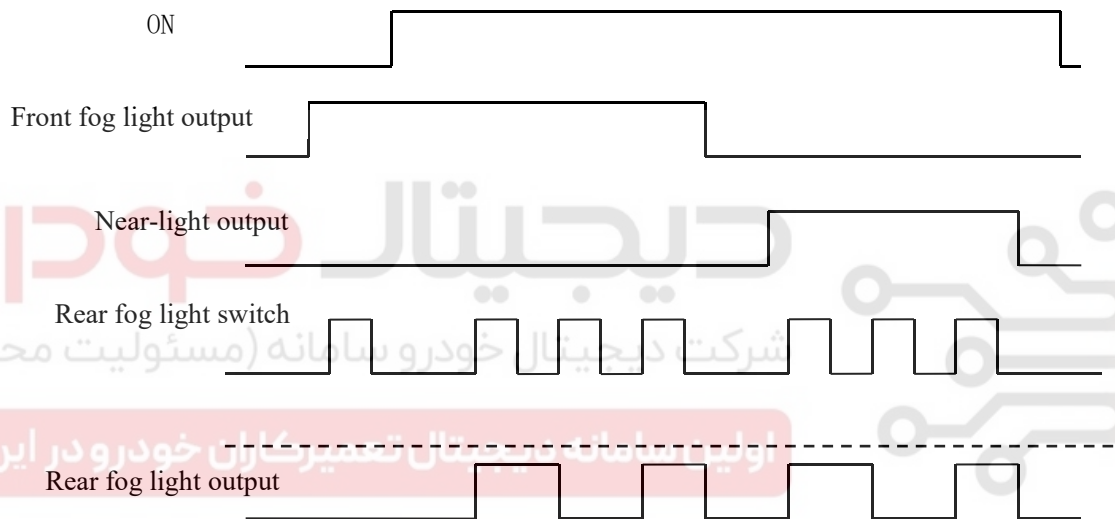
The rear fog lamp is turned on when the following conditions are met:

Opening condition:

The ignition switch is IG2, the front fog lamp or headlamp (near or far light) is lit, and the rear fog lamp switch is effective at this time; When starting, the rear fog lamp will be off. After starting, the front and rear fog lamp will be resumed;

Closing conditions:

- 1) When the front fog lamp and headlamp (near and far light) are off or the rear fog lamp switch is off, the rear fog lamp is off.
- 2) Ignition switch from ON to ACC or OFF.



7. Indoor light control

Output condition of indoor light dimming

If the door light is in the middle control gear and meets one of the following conditions, the indoor light is on:

- 1) Defusing successfully
- 2) Any one of the four doors opens
- 3) Collision signal valid

If one of the following conditions is met, the indoor light is gradually off:

- 1) After the dismounting is successful, the indoor light continues to work for 30 seconds, and the indoor light gradually turns off.
- 2) The door is opened to close, and the indoor light will gradually turn off after working for 30 seconds. After successful fortification, the indoor lights fade out immediately.

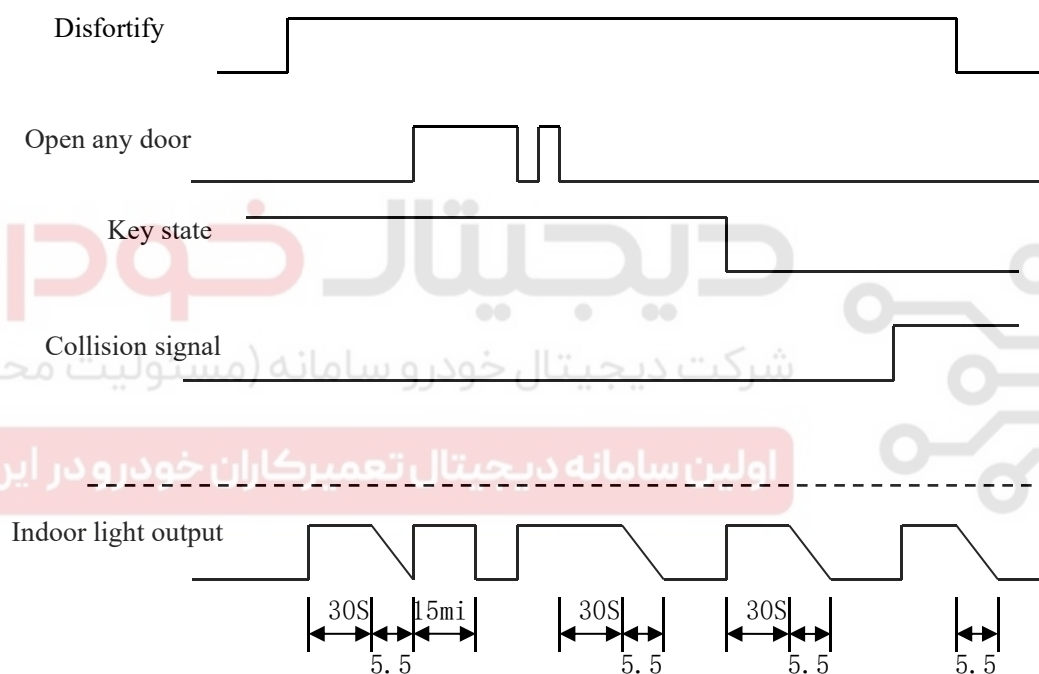
If one of the following conditions is met, the indoor light is turned off immediately:

When the door is closed to open, the indoor lights continue to work. If the door is open for more than 15min, the indoor lights will be immediately extinguished.

The time for the indoor light to fade out is 5.5 ± 0.5 seconds.

The collision signal triggers the internal light to light up:

- 1) When the collision signal is valid, the inner roof light will be on immediately.
- 2) After the collision triggers the inner top light, if the ignition state changes from OFF to ON, the inner top light will fade out.
- 3) After the inner top light is triggered by the collision, if there is no fading condition described in 2), the inner top light will keep on for 15min and then immediately turn off.



8. Power-saving function

1) When BCM detects any of the following signal changes in OFF, it immediately switches on the power-saving relay and restores power supply:

- a) Status signal of any of the five doors
- b) RKE unlocks the signal
- c) Central control unlock signal
- d) Ignition status signal
- e) Mechanical key unlock signal

2) After switching on the power-saving relay, all the above signals do not change, then shut down the power-saving relay 15 minutes later.

3) After switching on the power-saving relay, if any of the above signal changes are

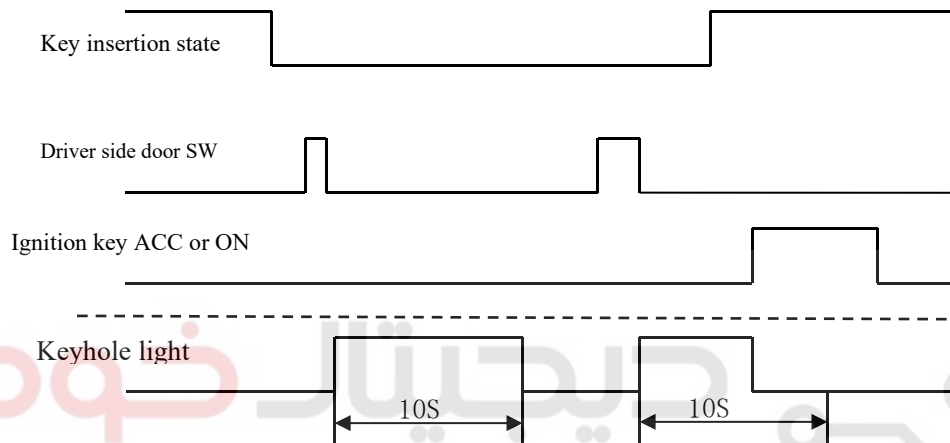
detected again, the time counting will start again for 15 minutes.

4) Ignition switch in ACC, ON, START gear, energy-saving relay always sucking.

5) After the BCM enters hibernation, turn off the energy-saving relay.

9.Keyhole lighting

When OFF, the left front door is opened and the keyhole light is lit; When the left front door is closed, the keyhole light is ON for 10 seconds and then extinguished. When the key is turned to the ignition switch ACC or ON, the keyhole light is immediately extinguished.



10.Front wiper control

1) With the key in the ignition ON, the front wiper control switch is set to high speed. Low speed. Intermittent position means that the corresponding switch is switched on, then the front wiper performs the corresponding action.

2) When the wiper is in intermittent gear, the intermittent time adjustment has five gears. Intermittent times are listed below:

Intermittent class	Stall resistance value	Intermittent time(Speed $\leq 100\text{km/h}$)	Intermittent time(Speed $> 100\text{km/h}$)
"Level 1"	0	4s	0s
"Level 2"	12.5K	6s	2s
"Level 3"	25.2K	8s	4s
"Level 4"	37.9K	10s	6s
"Level 5"	50K	12s	8s

3) Wiper high and low speed control: When the switch is switched on at low speed, the low speed relay draws and the motor runs at low speed. If the high speed gear is on, the high speed and low speed relay is drawn at the same time, and the motor runs at high speed.

4) When the tap switch is effective, keep scraping at low speed.

5) The first spray is less than 400ms. The wiper does not operate. When the spray is larger than 400ms, the wiper follows the spray and wipes at a low speed.

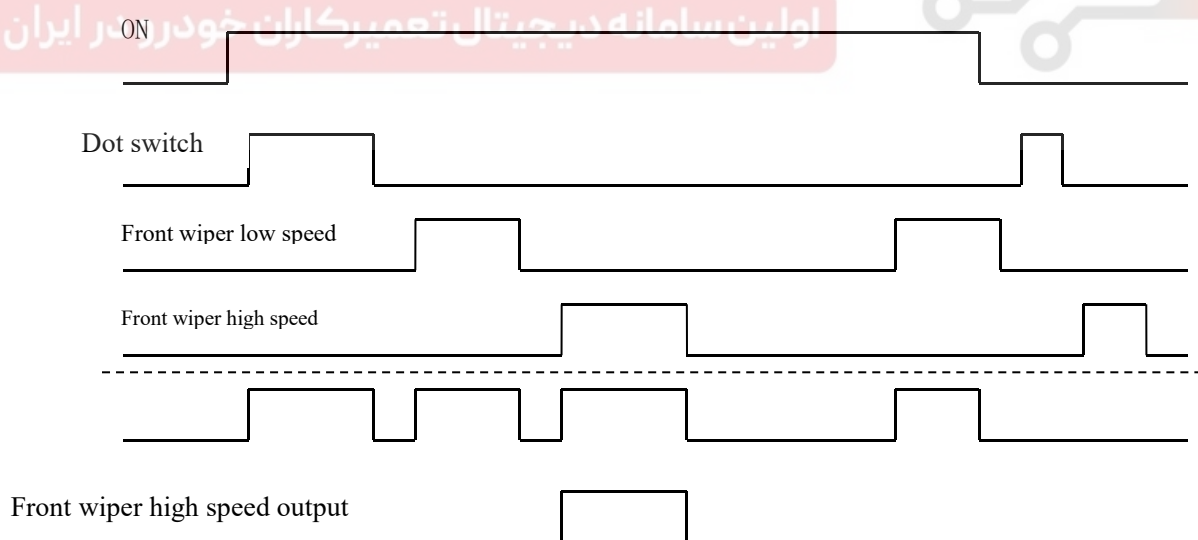
6) Front wiper reset control: when the switch is off and the motor does not run to the initial position, the BCM does not receive the reset signal, the high-speed relay is disconnected, the low-speed relay keeps on, and the motor continues to run; When the motor runs to the initial position, the reset switch closes, the BCM receives the reset stop signal, the low-speed relay is disconnected, and the motor stops running.

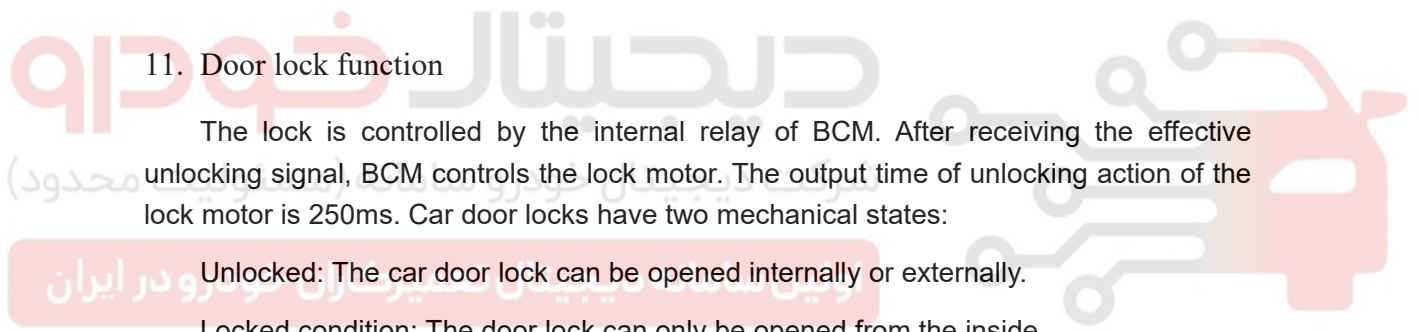
7) In intermittent, water linkage is preferred.

8) The high-speed operation period of the wiper is 1S, and the low-speed operation time of the wiper is 4/3S.

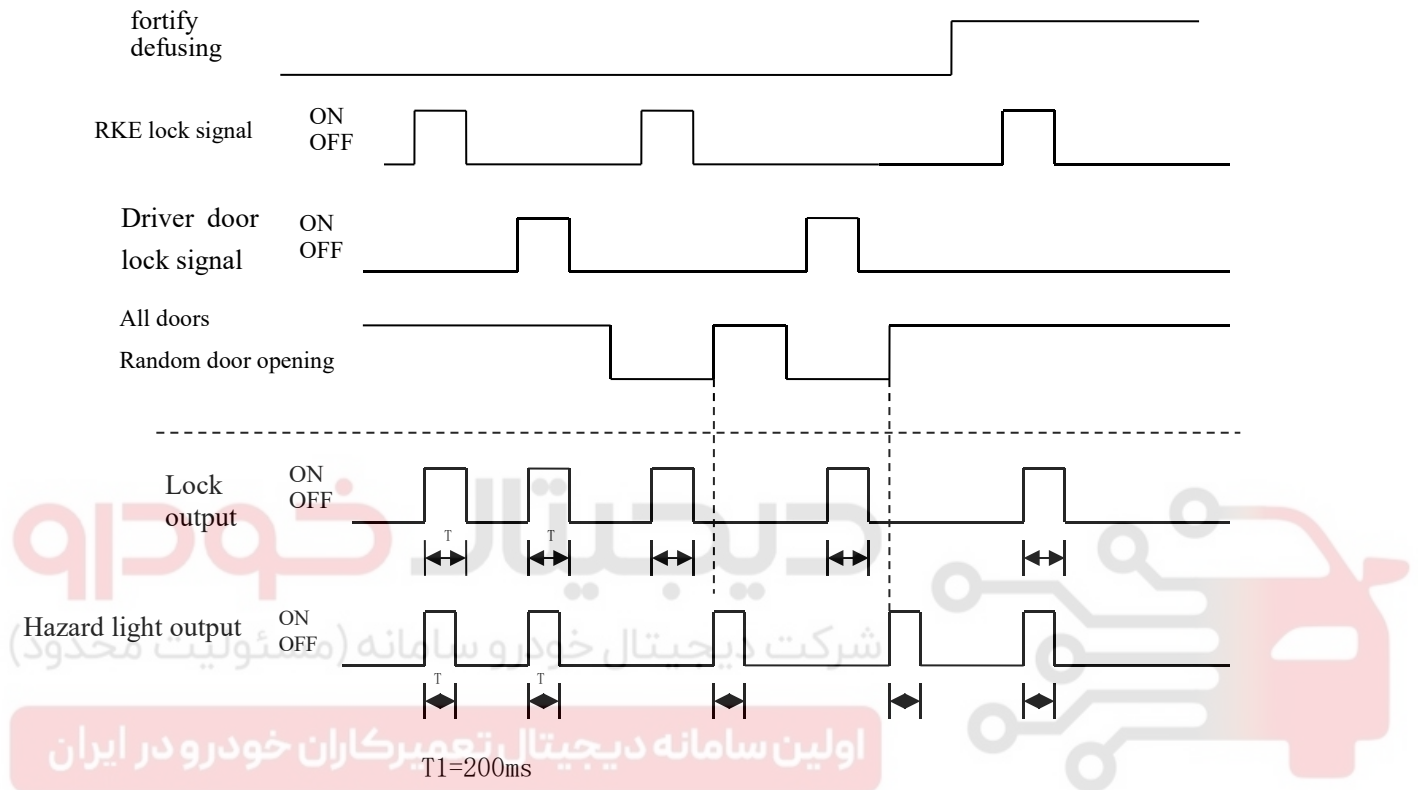
Front wiper plug turn protection

During operation, when the front wiper homing switch is detected and does not change for 18 seconds, it should be judged as motor gridlock and shut down the output. The wiper can be restarted only when the ignition switch has an on-off ON cycle or when the wiper switch is restarted.





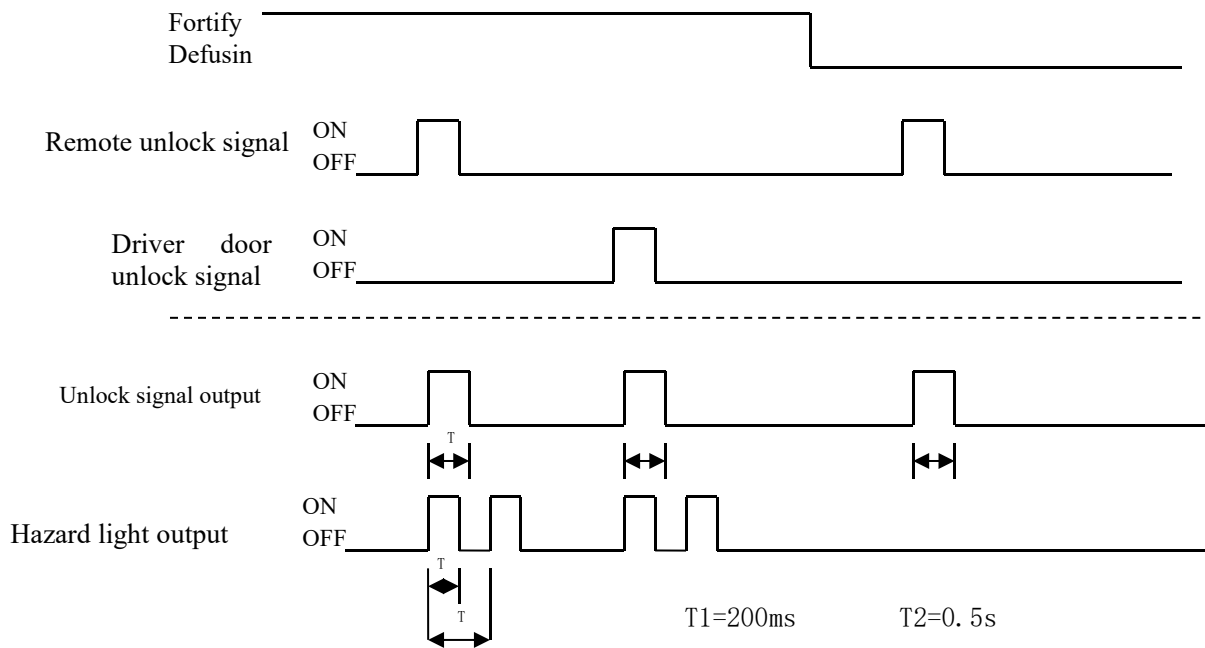
In the state of fortifications, after receiving effective RKE (or CAN) or mechanical key locking signal, BCM still performs the locking action and performs the confirmation action at the same time, that is, the motor locking action. The double-side turn signal blinks once, the blinking period is 1 second, 0.5 second on, 0.5 second off, and the horn buzzes for 100ms.



13.RKE (or CAN) or mechanical key unlock

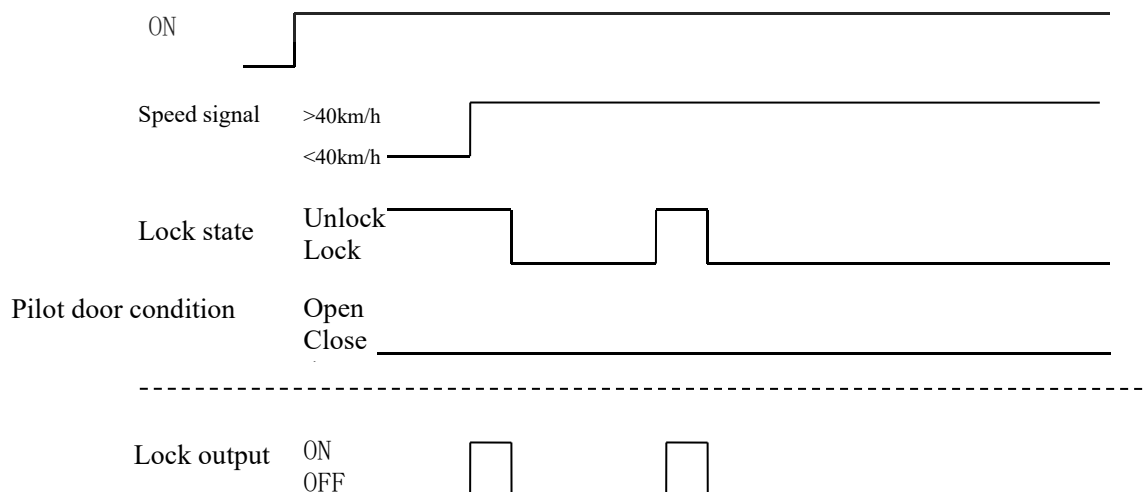
In the fortification state, after receiving the effective RKE unlock signal or mechanical key unlock signal, the BCM will unlock the four doors, implement the unlock, and perform the confirmation action. Both side turn signals blink twice and then go out..

In the defusing state, when the BCM receives a valid RKE or mechanical key unlock signal, the BCM performs the unlock action and the bilateral turn signal blinks twice accordingly.



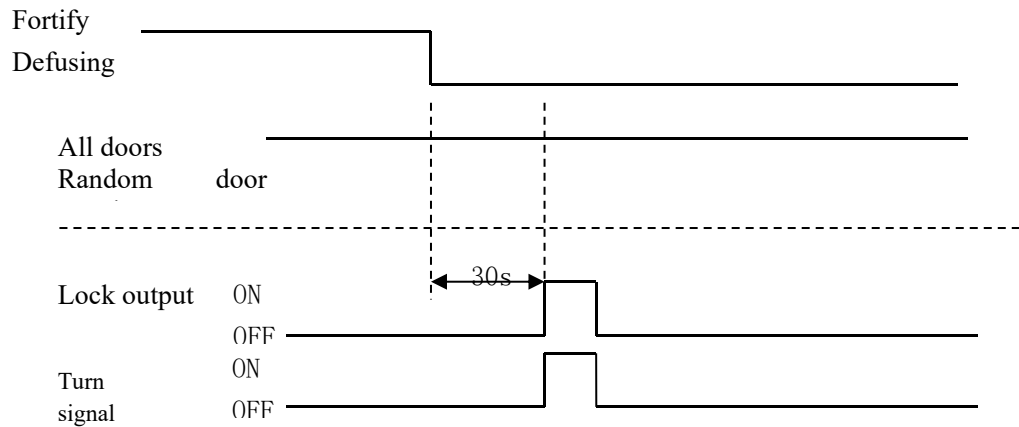
14. Automatic locking/unlocking function

When the vehicle speed reaches the preset value n (the default value is 40km/h), if the lock motor is in the unlocked state and the driver's door is closed, BCM will automatically lock the door, open the left front door lock after automatically locking, and immediately execute the locking action, and continue to perform the locking action after detecting the left front door lock or the unlocked state. If the left front door is still unlocked after three times of locking, the locking action is not performed. The automatic lockout function is not restored until the speed drops below 40 km/h.



15.Secondary fortification function

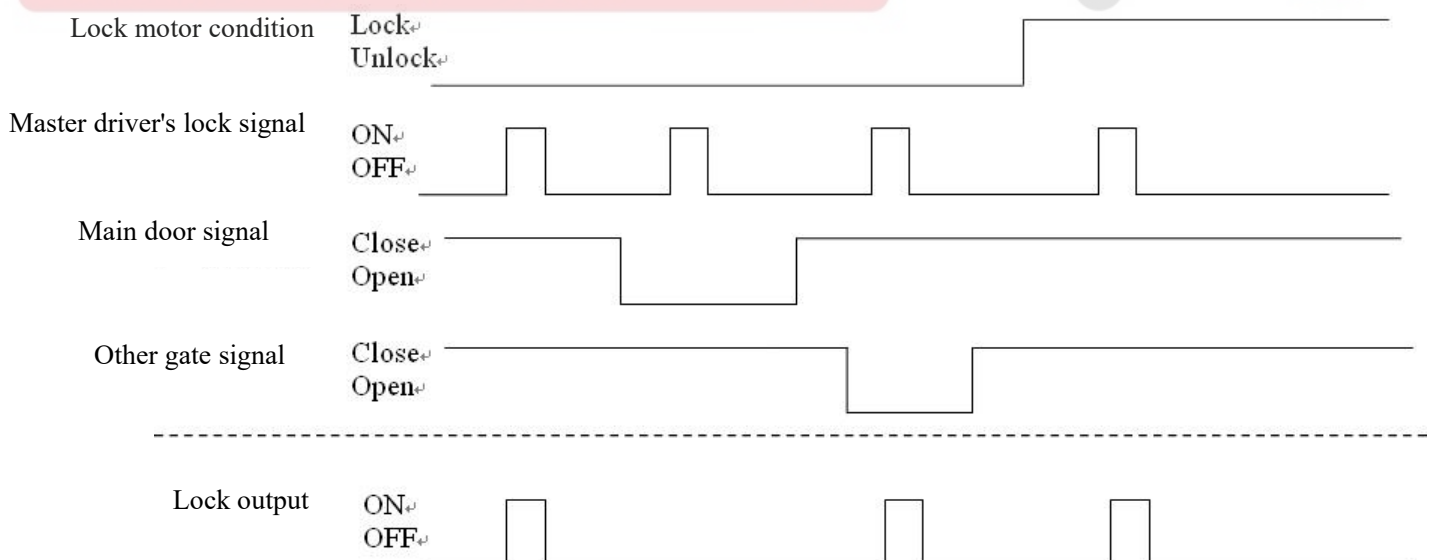
If there are no doors open, no keys inserted and no ignition conditions (ACC,ON,CRANK) within 30 seconds of disarming, try the RKE locking operation process (please refer to the RKE locking section).



16.Central control opening and closing function

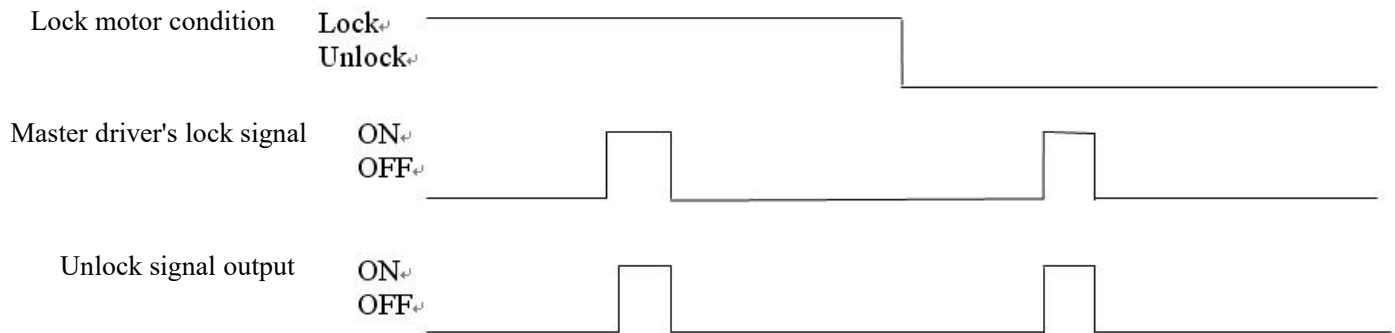
1) Central control switch control latching:

When the BCM receives the signal of the central control latching switch, it performs all lock locking. If the lock motor is locked, the lock motor will re-execute the lock action after BCM receives the signal of the central control lock switch.



2) Central control switch controls unlocking:

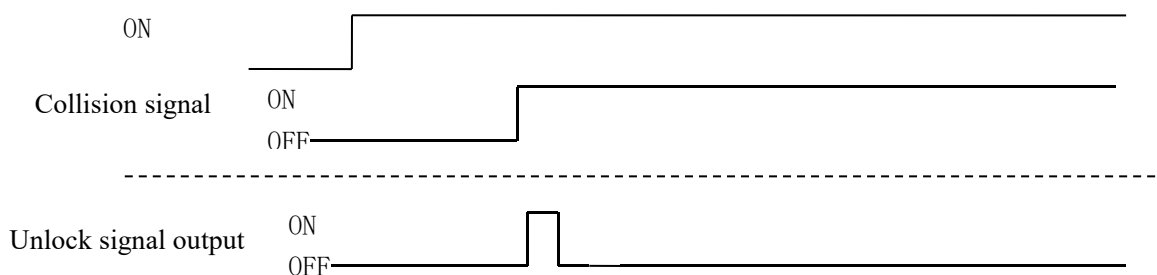
After receiving the signal of central control unlocking switch, BCM shall execute the four-door motor unlocking action. If the four door locks are unlocked, the lock motor shall re-execute the unlocking action after the BCM receives the signal of the central control unlocking switch.



17. Collision force unlocking function

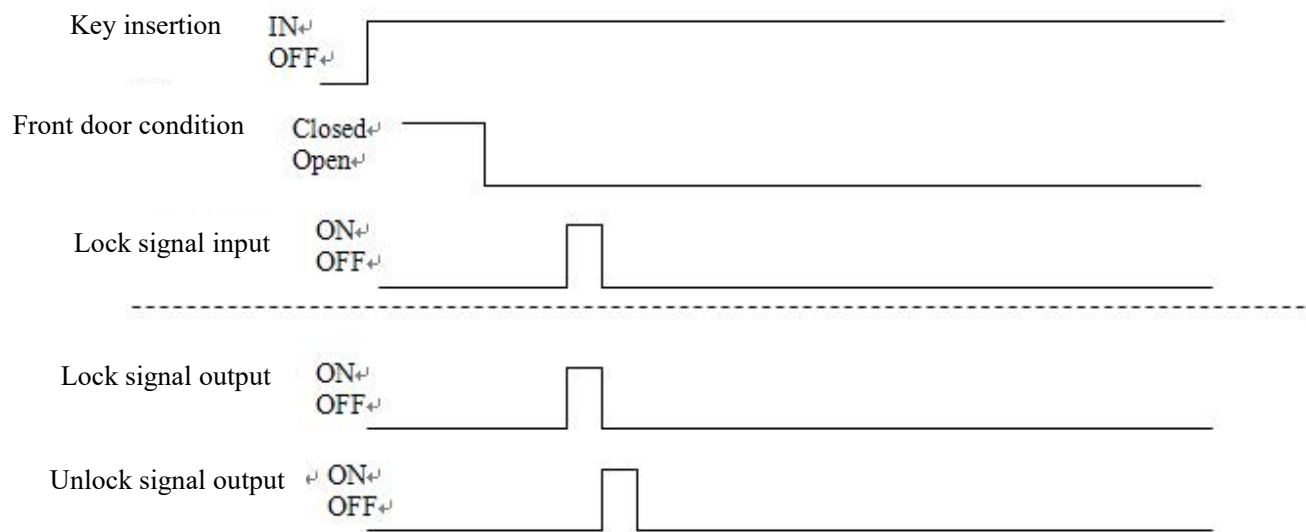
When the ignition switch is in ON gear, BCM will forcibly open the four door locks after receiving the effective collision signal; Shielding speed automatic locking function. Shielding central control locking function and RKE remote control locking function (collision priority).

When the BCM detects a change in ignition switch status from OFF to ON, the automatic locking function is restored. Central control locking function and RKE locking function.



18. Anti-false lock function

After the key is inserted into the ignition lock, the driver's side door opens. If the driver's side lock status signal is the lock command, execute the unlock command three times immediately after executing the lock command, and the unlock interval is 0.5s each time.



19.Lock protection function

The lock counter is incremented by 1 for every lock/unlock signal it receives. When the lock counter reaches the value $N=8$ times for 10 seconds, the lock function will be disabled until a certain amount of time (the default is 15 seconds) is restored and the lock protection function will remain unlocked.

20.Anti-theft alarm control

The alarm module realizes the alarm function of the vehicle under various abnormal conditions. Once the alarm module is activated, it will start the sound and light alarm to remind the user and inhibit the start function:

- 1) When each door is closed, use the remote control or mechanical key to lock the door. The danger warning light flashes $T2(1.0 \pm 0.2\text{sec})$ and is in the alert state. When any door is not closed (except the left front door), use the remote control or mechanical key to lock the door and enter the fortification waiting state.

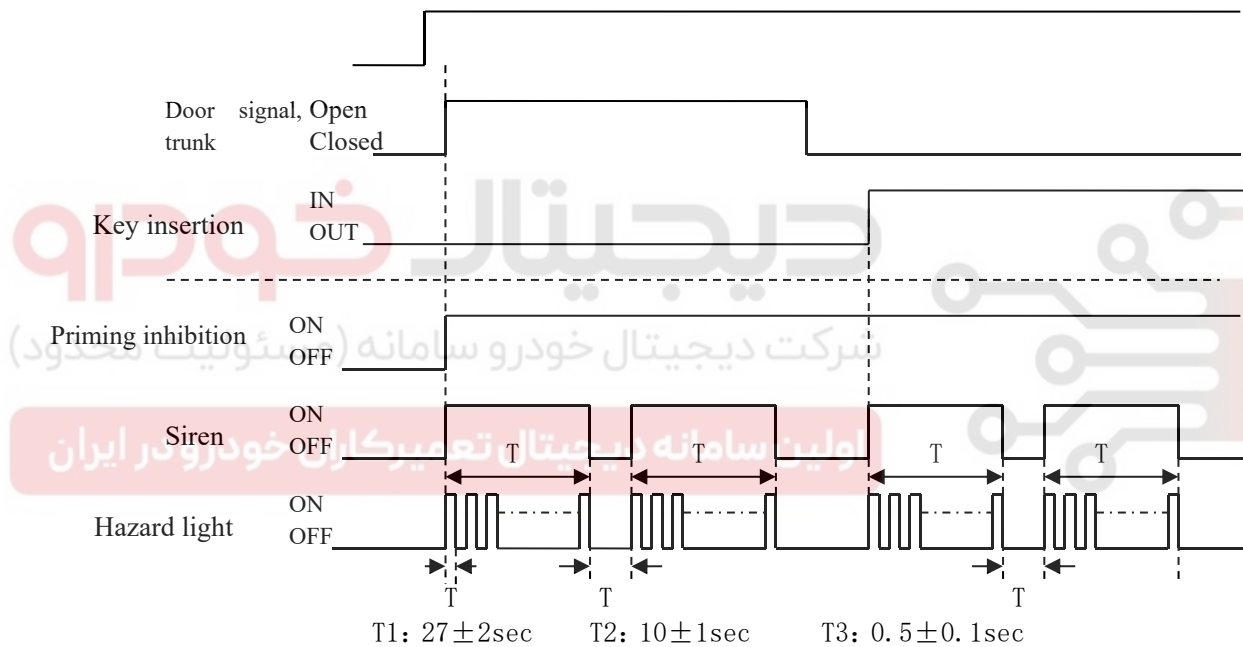
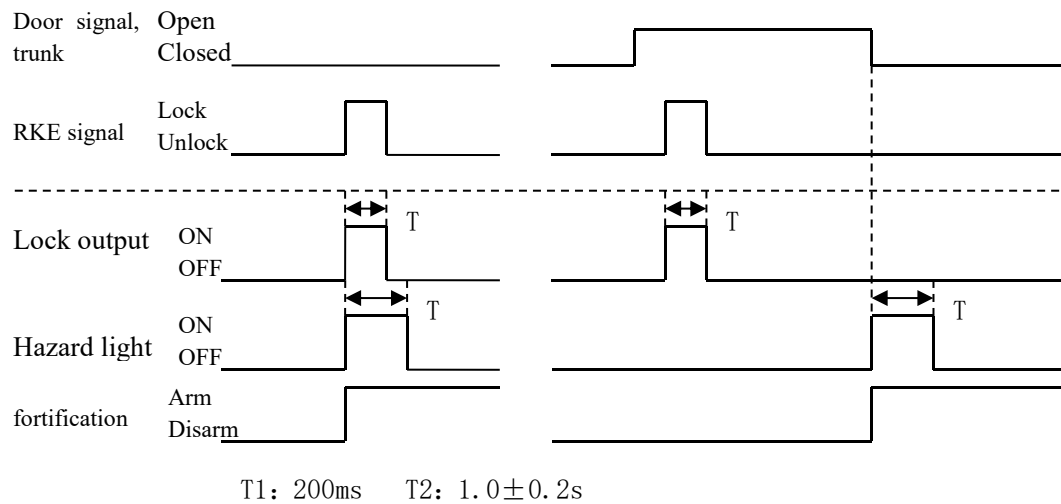
If any of the following conditions is triggered, the system exits the fortification waiting state and enters the defenceless state:

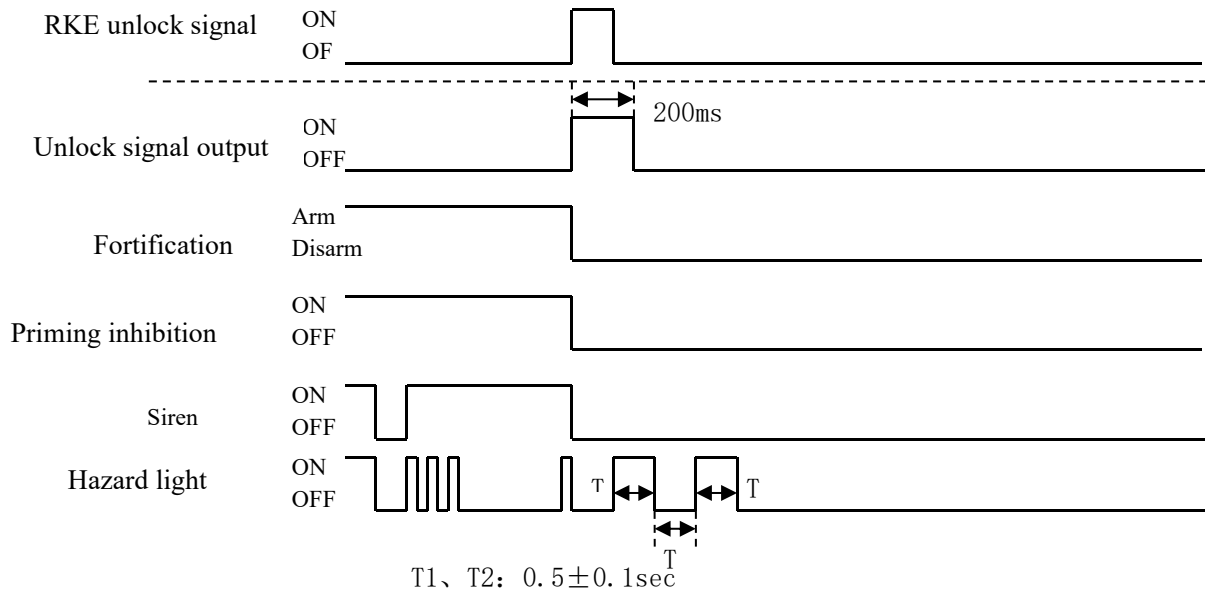
- 1、 The central control lock function is executed;
- 2、 The key goes into the ignition;
- 3、 Remote unlock

If none of the above conditions are triggered, then when all doors are closed, the turn signal flashes to enter the alert state.

- 2) When on alert, four doors. When the hood or trunk is open, or a key insertion signal is detected, the vehicle will alarm and the start suppression function will be turned on.
- 3) Use the remote control or mechanical key to unlock and release the alert state. The door lock is opened, and the danger warning light blinks T1($0.5 \pm 0.1\text{sec}$), and blinks T1 seconds after T2 ($0.5 \pm 0.1\text{sec}$).
- 4) When the car is in a state of alarm, open the door, the alarm whistle will sound T1($27 \pm 2\text{sec}$), and the interval T2($10 \pm 1\text{sec}$) will still sound T1; The danger warning light blinks at T3 ($0.5 \pm 0.1\text{sec}$) at the same time, with duty ratio of 50%. The time is the same as the alarm siren. The start suppression is on, and the trigger alarm source is lifted within the alarm cycle. The alarm lasts for three cycles at most. After three cycles, if the alarm source is released, all doors will be locked, the turn signal will flash once, and the car will enter the fortification state. The siren also sounded T3 ($0.5 \pm 0.1\text{sec}$) with duty cycle ratio of 50%.
- 5) In the alarm state, if the door is closed, press the lock button of the remote control or the mechanical key to lock the door, then exit the alarm state, all the doors are locked, the turn signal flashes, the anti-theft relay is closed, and the alarm state is re-entered.
- 6) In the alarm state, if the door is open, press the lock button of the remote control or the mechanical key to lock the door, then exit the alarm state, all the doors are locked, the anti-theft relay is closed, the horn stops the alarm, and after all the doors are closed, the turn signal flashes, and the alarm state is entered again.
- 7) In the alarm state, use the remote control or mechanical key to unlock and release the alarm. The unlock relay outputs the unlock signal, and the door is in the unlocked state; Remove alert status. Danger warning flashes twice. Siren stops.
- 8) When the power is switched off, the power should return to the state before the power failure.

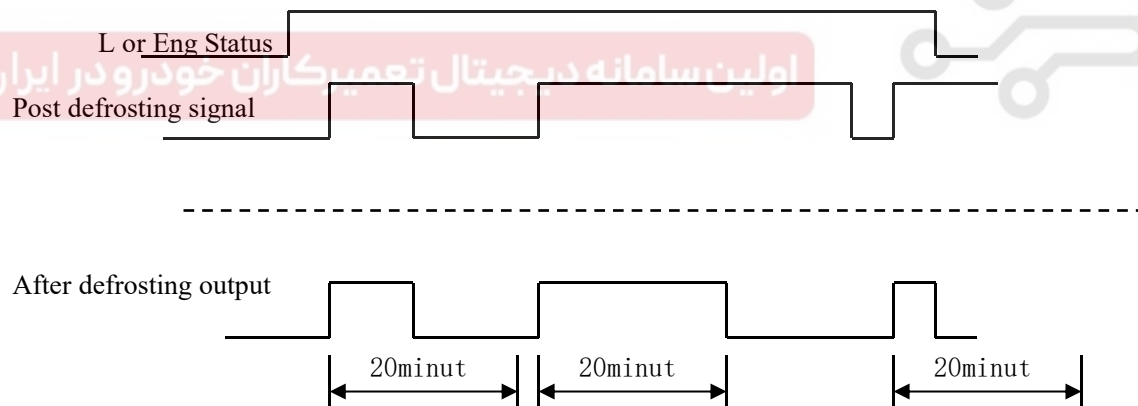
In fortified mode, after unlocking the CRANK by remote control or mechanical key, no door opening or key insertion (or ignition state ACC,ON,CRANK) would need to be re-fortified for 30 seconds.





21. After defrosting function

After the engine starts (L or EngStatus is valid) and receives the effective signal (200ms high level) output by the air conditioning controller at the same time, the rear defrosting will start heating. After 20 minutes, it will be automatically cut off. Press the defrosting switch during the heating stop.

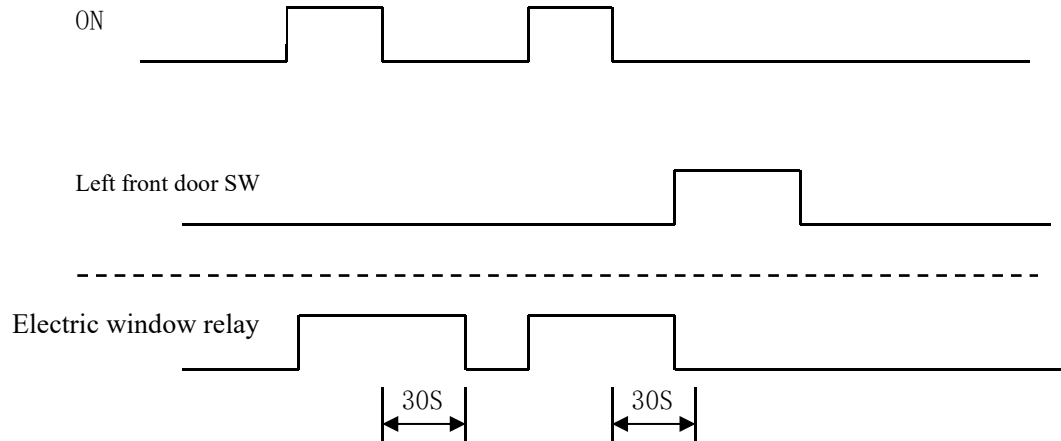


22. Electric window control

Used to enable power control of electric window.

1) The ignition switch can be turned ON when it is on.

2) If the left front door is not opened within 30 seconds after the ignition switch is ON-OFF, it can be opened. If the left front door is opened or 30 seconds is up, the window cannot be lifted.



IV. BCM terminal definition

BCM controller terminal definition

J1		J1	
1	NC	27	NC
2	IG2	28	Electric window relay
3	NC	29	Pre-wiper interval adjustment
4	GND	30	Headlight near-light SW
5	Left turn signal SW	31	Position light SW
6	NC	32	Mechanical key unlock SW
7	ACC	33	Rear fog light SW
8	IG1	34	Right turn signal SW
9	Warning light SW	35	NC
10	Mechanical key locking SW	36	Key insert SW
11	NC	37	NC
12	NC	38	Front wiper point move SW
13	Front wiper high-speed SW	39	NC
14	NC	40	Start suppression relay
15	Rear defrosting relay	41	CAN1_L
16	Front wiper high-speed SW	42	CAN1_H
17	NC	43	NC
18	buzzer	44	NC
19	Light AUTO	45	Pre-wiper interval adjustment
20	Keyhole lighting	46	Sunlight input
21	Front wiper intermittent SW	47	NC
22	Generator L terminal	48	NC

23	NC	49	Headlamp high beam SW
24	Front water jet switch	50	Front fog light SW
25	Backlit and adjusted	51	NC
26	NC	52	External antenna

J2		J2	
1	Left rear door SW	25	NC
2	Right rear door SW	26	NC
3	The hood SW	27	Right front door SW
4	Left front door lock status SW	28	Rear fog lamp relay
5	Central control unlock SW	29	High beam control
6	Front fog lamp relay	30	Small lamp relay
7	NC	31	NC
8	GND	32	Backlight adjustment
9	NC	33	NC
10	NC	34	NC
11	NC	35	Right turn signal
12	Indoor light	36	NC
13	NC	37	Collision signal
14	NC	38	Central control lock signal
15	Daytime running light relay	39	Left front door SW
16	NC	40	Trunk door SW
17	NC	41	Near-light lamp relay
18	High beam relay	42	Alarm horn
19	NC	43	NC
20	NC	44	park brake switch
21	Front wiper return SW	45	Post defrosting signal
22	NC	46	NC
23	NC	47	Battery energy saving
24	Left turn signal	48	NC

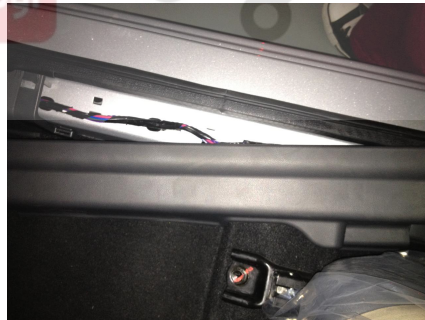
J3		J3	
1	Internal lamp power supply	12	NC
2	NC	13	Front wiper relay connection 2
3	External lamp power supply	14	Lock motor power supply
4	NC	15	Front wiper high speed
5	Backlight	16	NC
6	NC	17	Front wiper power supply
7	GND	18	Lockout machine
8	NC	19	wiper
9	NC	20	Unlock motor
10	NC	21	Front wiper low speed
11	Front wiper relay connection 1	22	GND

V. Disassemble

1.Remove the glove box.



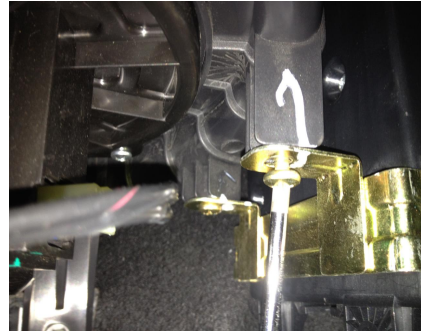
2.Remove passenger door jamb guard plate.



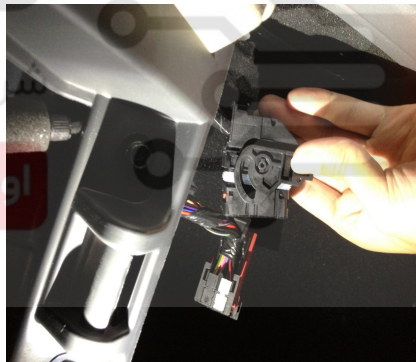
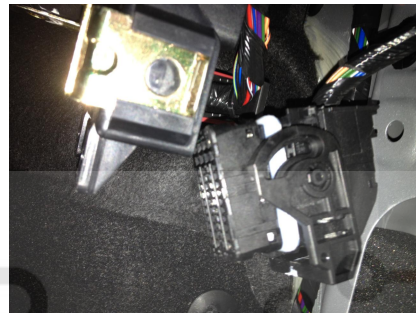
3.Remove passenger door jamb guard plate.



4.Remove 3 BCM retaining nuts in turn.



5.Unplug the BCM3 plug-ins in turn.



IV. Technical parameter

Parameter	Value
Rated voltage	DC12V
Service voltage range	DC9V~16V
Static current	$\leq 5\text{mA}$
Operating temperature	$-40^{\circ}\text{C}\sim+80^{\circ}\text{C}$
Storage temperature	$-40^{\circ}\text{C}\sim+85^{\circ}\text{C}$

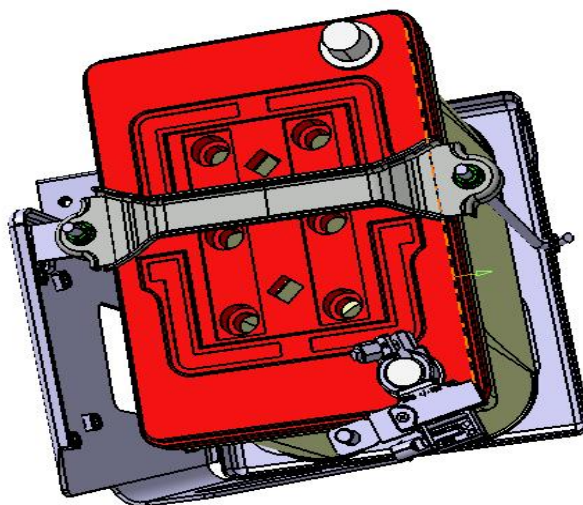


Batteries and battery sensors

I. Matters needing attention

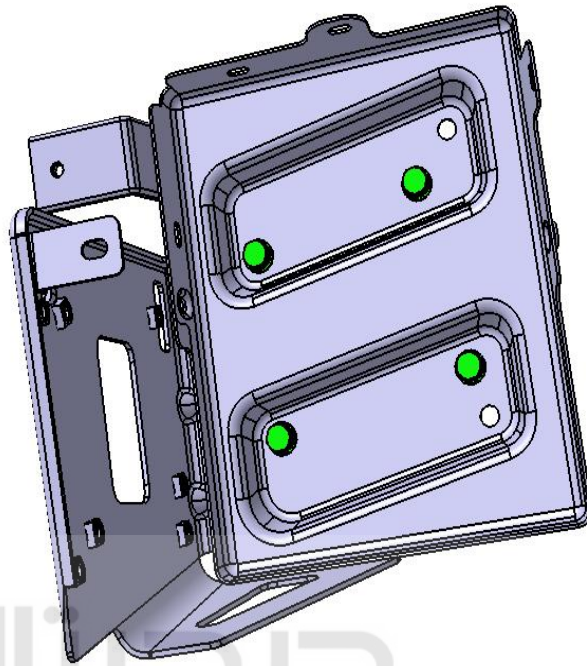
- Vehicles equipped with start-stop system use special start-stop battery and battery sensor, replacement parts must use the same type of product designated by Jianghuai Automobile.
- It is not recommended to disconnect the negative battery terminal for vehicles equipped with the start-stop system.
- ESD prevention is required during the installation of the smart battery sensor
- Smart battery sensor installation process does not need to apply other chemicals (such as: lubricating oil, silicone, grease, coolant, etc.)
- The smart battery sensor cannot be damaged
- The column clamp of the smart battery sensor can only be screwed to the battery column clamp
- If stainless steel is used, the nut must be surface treated such as GLEITMO 605 or at least tinned
- The correct SOC and SOH values will appear when: after power-on, the vehicle has been left standing for more than 3.5 hours while the battery parameters are correct
- The positive clip of the external charging device must grip the positive battery pole, and the negative clip must be grounded, not the negative battery pole. Only when a continuous current passes through the sensor can the charge balance be carried out correctly
- After mechanical installation, please connect the battery sensor electronically. Make sure that the sensor is well connected to the negative pole of the battery, and the LIN wire (the other end) is connected to the ECU. Then plug the connector into the sensor

II. Schematic diagram



III. Battery and battery sensor installation

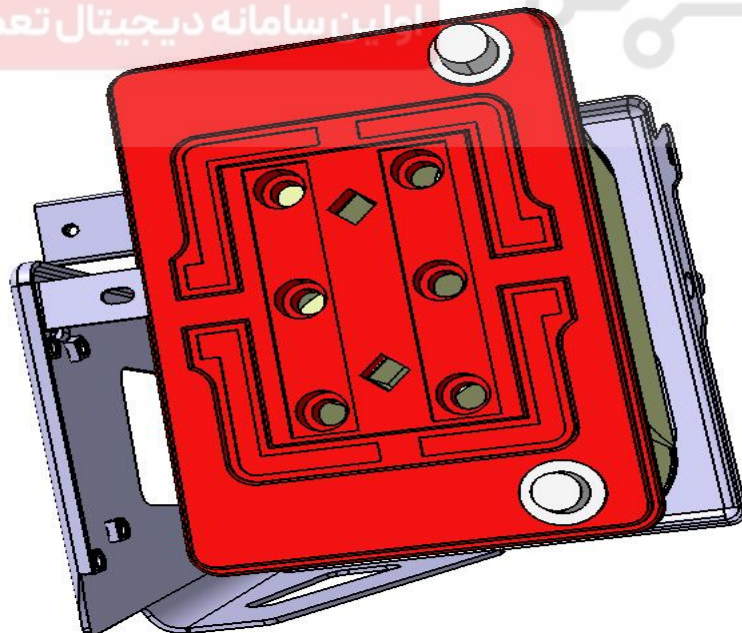
1. Stationary battery tray



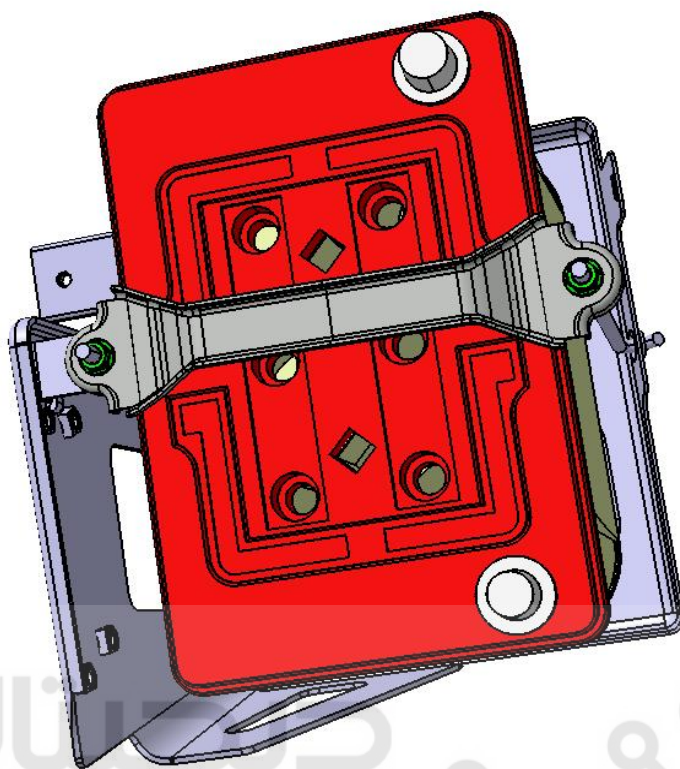
2. Storage battery

شرکت دیجیتال خودرو (مسئولیت محدود)

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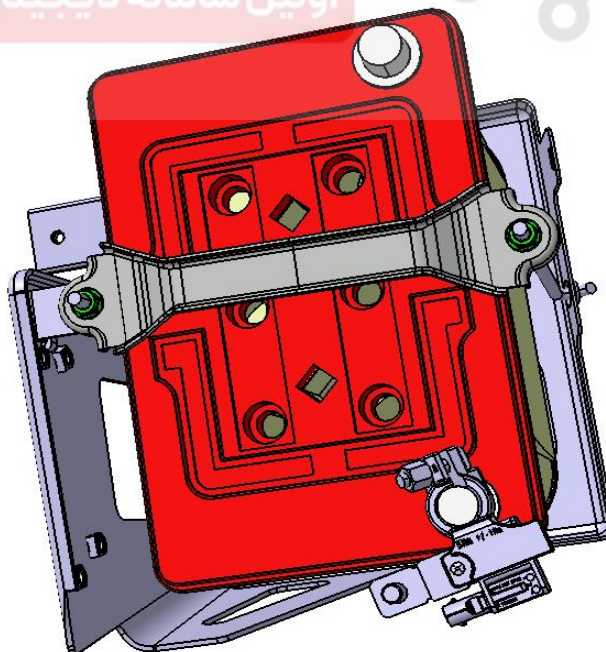
3. Stationary battery



4. Install battery sensors

شرکت دیجیتال خودرو (تسویک محدود)

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IV. Battery technical parameters

Parameter	Value
Figure number	3703010U8513
20h rate capacity	48Ah
Reserve capacity	100min
CCA value	720
Weight	16KG

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

