

Chapter 4 Inspection and Repair of BCM Computer Control System

I .General

BCM is abbreviation of Body Control Module of Chery Automobile, which is also named antitheft computer control unit. It is a device designed to facilitate the driver and passengers to use some electric devices in the vehicle and simple maintenance.

BCM location, disassembly and assembly



Disassembly:

1. Remove the instrument and upper setscrews;
2. Remove the BCM module connector;
3. Remove the nut on it with M10 spanner.

Assembly:

Fix the setscrews with M10 spanner with securing moment at 2.5 -3.5 N·M and then insert the module connector.

Assembly the instrument.

II .Introduction of antitheft control system

The vehicle antitheft control system is designed to implement central monitor with

integration of the antitheft device, power windows and central door lock module. The system is installed on the left side of the evaporator that is at the lower center of the central console. When the switch on the remote control device is pressed down, the central door lock system will enter a security mode with glass window automatically closed to avoid raining, wind or theft in case the user forgets to lock the windows. This function will greatly benefit users.

III. Function theory of antitheft control system

1. Power window

- ① The main power of the control device is under control of the ignition switch. When the ignition switch is closed for 60 seconds, it will forbid the glass to rise or drop.
- ② The elevator control module controls four glass controllers that can sense whether the elevating device clamps any person or material. These devices are under protection by residual current breakers and the leakage limit will change according to the external voltage changes. Four window controllers have function of consecutive output of 8-second protection.
- ③ The safety switch can control whether the right front, left rear and right rear door switches can operate the corresponding glass elevator.
- ④ Operation mode: manual elevation, decline, and automatic decline.

Manual decline: pressing time $\geq 300\text{ms}$

Automatic decline: pressing time $\leq 300\text{ms}$.

Note: When the glass descends automatically, if the decline switch of the glass controller is pressed for over 300ms, the glass movement will be turned into the mode of manual decline; if the elevation switch of the controller is pressed for over 300ms, the glass movement will be turned into the mode of manual elevation. If the pressing time is no less than 300ms, the glass movement will stop.

2. Central door lock

- ① The left front door independently controls the locking and unlocking of central lock;
- ② It can lock and unlock remotely;
- ③ The central door lock cannot operate simultaneously together with the glass elevator.

The central door lock prevails when these two operations are in conflicts and the glass elevator stops. When the central door lock completes the glass elevator resumes the previous task.

3. Remote antitheft function

- ① The remote controller has two keys; one is for setting security mode and the other is to remove the mode.



- ② Security mode: Press the first key on the remote control, then the indicator flashes once, and the central door lock automatically locks. At the same time the engine is locked and the LED will flash slowly to indicate the system is on security mode. When the system is triggered, the turn signal lamp flashes.
- ③ Removing security mode: Press the second key on the remote control, and then the indicator flashes twice; simultaneously the lock will automatically unlock and remove the locking mode of the engine and the LED indicator turns off.
- ④ Two-stage removing security mode: when the system is triggered, pressing any key on the remote control will stop the alarm sound. However, the system is still on the alarm status and the doors locked. If the system continuously receives invading signals, the alarm will sound again after a short pause. The second key should be pressed once immediately after the alarm is removed for the first time so as to remove the alarm completely.
- ⑤ Secondary antitheft function: when the security mode is removed, the door is not opened and the ignition switch is not turned on within 30 seconds, the antitheft device will automatically resume the alarm mode and lock the door.
- ⑥ Automatic locking/unlocking function: the door will automatically lock five seconds later when the ignition switch is turned on and automatically unlock the door when the ignition switch is turned off. If the door is opened once five seconds after the ignition switch is turned on, the system will not automatically lock to prevent the driver being locked outside of the car.
- ⑦ The mainframe is apt to keep the memory of passwords.
- ⑧ Remote closing the window: when set the security mode remotely, the glass elevator

will automatically work to close the glass windows one by one if the glass window is not closed.

4. Code setting mode

- ① Turn on the ignition switch IGN ON/OFF for two times within 7 second and push IGN at ON position.
- ② LED flashes quickly for 3 seconds;
- ③ LED will pause 1 second after the above response;
- ④ When the flash time of LED equals to PIN CODE (PIN CODE =1), set the switch at IGN OFF;
- ⑤ When the ignition switch is set at IGN ON, press the first key to set the system;
- ⑥ Set the switch at IGN OFF;
- ⑦ When IGN is at OFF position for 10 seconds, it means the system has quit the code setting mode or you can immediately turn the IGN at ON position to enter software-switching application.

5. Engine control

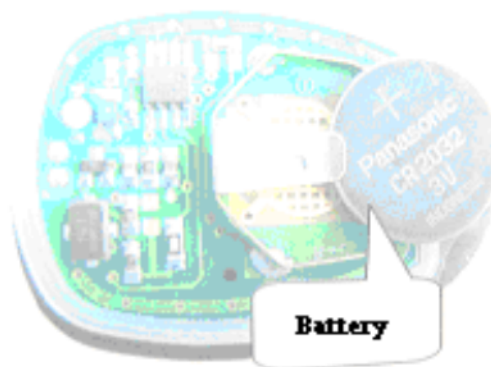
When the ignition switch is set at ST position, the power is supplied through the fuse to BCM No. 2 Foot. The starting relay is embedded in the BCM computer. When the antitheft function fails, the starting relay controls operation of the engine.

IV. Inspection and Repair of Antitheft Controller System

1. Check remote control

- 1) When you press down Unlock or Lock keys, central door lock fails to work. Firstly, remote control should be checked whether LED indicator light flashes or not when you press the button. If it flashes, something is wrong with antitheft computer, which will be then maintained or replaced. Otherwise, something is wrong with remote control. Then the battery should be checked. If there is power in the battery, remote control fails and shall be replaced. If out of power, the battery should be replaced.
- 2) Replace the battery in remote control. Unclench remote control first, and then change battery as shown in the figure below.

Note: Only the battery with regulated voltage (+3V) is available. Put in a proper manner according to positive and negative marks.



2. Check BCM computer

Terminal check of BCM computer is tabulated as below.

Terminal No.	Terminal Notes
A1	Signal for elevation of left front power window
A2	Ignition switch power supply +12V (F14) 20A
A3	Field coil of starter's electromagnetic switch
A4	Switch signal of central door lock (left front)
A5	Battery power signal +12V (F13) 30A
A6	Battery power signal +12V (F13) 30A
A7	Battery power signal +12V (F13) 30A
A8	Grounding
A9	Grounding
A10	Antitheft alarm signal
A11	Control signal for motor lock of central door lock
A12	Control signal for motor unlock of central control door lock
A13	Antitheft indication signal to right turn indicator
A14	Signal for decline of left front power window
A15	Signal for elevation of right front power window
A16	Signal for decline of right front power window
A17	Signal for elevation of right rear power window
A18	Signal for decline of right rear power window
A19	Battery power signal +12V (F13) 30A

A21	Grounding
A22	Signal for elevation of left rear power window
A23	Signal for decline of left rear power window
A25	Antitheft indication signal to left turn indicator
B1	Elevation signal to left front power window switch
B2	Decline signal to right front power window switch
B3	Elevation signal to right front power window switch
B4	Decline signal to right rear power window switch
B5	Elevation signal to right front power window switch
B6	Decline signal to left rear power window switch
B7	Elevation signal to left rear power window switch
B9	Decline signal to left front power window switch
B10	Switch of antitheft device
B11	Signal for boot switch
B13	Signal of antitheft indicator
B14	Signal for door switch
B16	Antitheft antenna

3. Inspection and repair of BCM computer (antitheft computer) circuit

Connect the plug on to BCM computer (antitheft computer). As shown in the figure above, check each circuit terminal, with the result as tabulated below.

Figure Check of BCM Computer (antitheft computer) Circuit

Connection Check	Condition	Standard Value
A1-Grounding	Ignition switch "ON", power window switch "UP"	Power supply voltage
	Ignition switch "ON", power window switch "DOWN"	Conducting
A2-Grounding	Ignition switch "ON"	Power supply voltage
	Ignition switch "Off"	Nonconducting
A3-Grounding	Ignition switch starts the motor, and makes it work	Power supply voltage
	Ignition switch starts the motor but fails	Nonconducting
A4-Grounding	Unlock door with key	Conducting
	Lock door with key	Nonconducting
A5-Grounding	Normal	Power supply voltage
A6-Grounding	Normal	Power supply voltage
A7-Grounding	Normal	Power supply voltage
A8-Grounding	Normal	Grounding
A9-Grounding	Normal	Grounding
A10-Grounding	Antitheft works	Power supply voltage
	Antitheft fails	Nonconducting
A11-Grounding	Central control lock "OFF"	Power supply voltage
	Central control lock "ON"	Conducting

A12-Grounding	Central control lock "ON"	Power supply voltage
	Central control lock "OFF"	Conducting
A13-Grounding	Antitheft works	Power supply voltage
	Antitheft fails	Nonconducting
A14-Grounding	Ignition switch "ON", power window switch "UP"	Conducting
	Ignition switch "ON", power window switch "DOWN"	Power supply voltage
A15-Grounding	Ignition switch "ON", power window switch "UP"	Power supply voltage
	Ignition switch "ON", power window switch "DOWN"	Conducting
A16-Grounding	Ignition switch "ON", power window switch "UP"	Conducting
	Ignition switch "ON", power window switch "DOWN"	Power supply voltage
A17-Grounding	Ignition switch "ON", power window switch "UP"	Power supply voltage
	Ignition switch "ON", power window switch "DOWN"	Conducting
A18-Grounding	Ignition switch "ON", power window switch "UP"	Conducting
	Ignition switch "ON", power window switch "DOWN"	Power supply voltage
A19-Grounding	Normal	Power supply voltage
A21-Grounding	Normal	Conducting
A22-Grounding	Ignition switch "ON", power window switch "UP"	Power supply voltage
	Ignition switch "ON", power window switch "Down"	Conducting

A23-Grounding	Ignition switch “ON”, power window switch “UP”	Conducting
	Ignition switch “ON”, power window switch “DOWN”	Power supply voltage
A25-Grounding	Antitheft works	Power supply voltage
	Antitheft fails	Nonconducting
B1-Grounding	Ignition switch “ON”, power window switch “UP”	Conducting
	Ignition switch “ON”, power window switch “DOWN”	Nonconducting
B2-Grounding	Ignition switch “ON”, power window switch “UP”	Nonconducting
	Ignition switch “ON”, power window switch “DOWN”	Conducting
B3-Grounding	Ignition switch “ON”, power window switch “UP”	Conducting
	Ignition switch “ON”, power window switch “DOWN”	Nonconducting
B4-Grounding	Ignition switch “ON”, power window switch “UP”	Nonconducting
	Ignition switch “ON”, power window switch “DOWN”	Conducting
B5-Grounding	Ignition switch “ON”, power window switch “UP”	Conducting
	Ignition switch “ON” power window switch “DOWN”	Nonconducting
B6-Grounding	Ignition switch “ON”, power window switch “UP”	Nonconducting
	Ignition switch “ON”, power window switch “DOWN”	Conducting
B7-Grounding	Ignition switch “ON”, power window switch “UP”	Conducting

	Ignition switch “ON”, power window switch “DOWN”	Nonconducting
B9-Grounding	Ignition switch “ON”, power window switch “UP”	Nonconducting
	Ignition switch “ON”, power window switch “DOWN”	Conducting
B10-Grounding	Ignition switch “ON”, antitheft switch “ON”	Conducting
	Ignition switch “ON”, antitheft switch “OFF”	Nonconducting
B11-Grounding	Open the boot lid	Conducting
	Shut the boot lid	Nonconducting
B13-Grounding	Antitheft works	Power supply voltage
	Antitheft fails	Nonconducting
B14-Grounding	Open the door	Conducting
	Shut the door	Nonconducting
B16-Grounding	Normal	Nonconducting

In case of difference with the above, BCM computer (antitheft computer) should be maintained or replaced.

5). For power window control of antitheft computer, refer to “Power Window Maintenance”.

6). For central door lock control of antitheft computer, refer to of “Central Door Lock Maintenance”.

4. Division and match of QQ remote controls

QQ remote controls features two brands and three modules.

I) 9CG, two modules

1) Module 1



(Electrical parts and relay are set on the same side in the module. It has a small lock of remote control with projected mark, a red seal circle, and two batteries.)

2) Module 2



(Electrical parts and relay are set on different sides in the module. It has a small lock of remote control with projected mark, a black seal circle, and two batteries.)

II). 9AK, one module



(Electrical parts and relay are set on different sides in the module. It has a small lock of remote control with dented mark, a black seal circle, and three batteries.)

III). Match methods

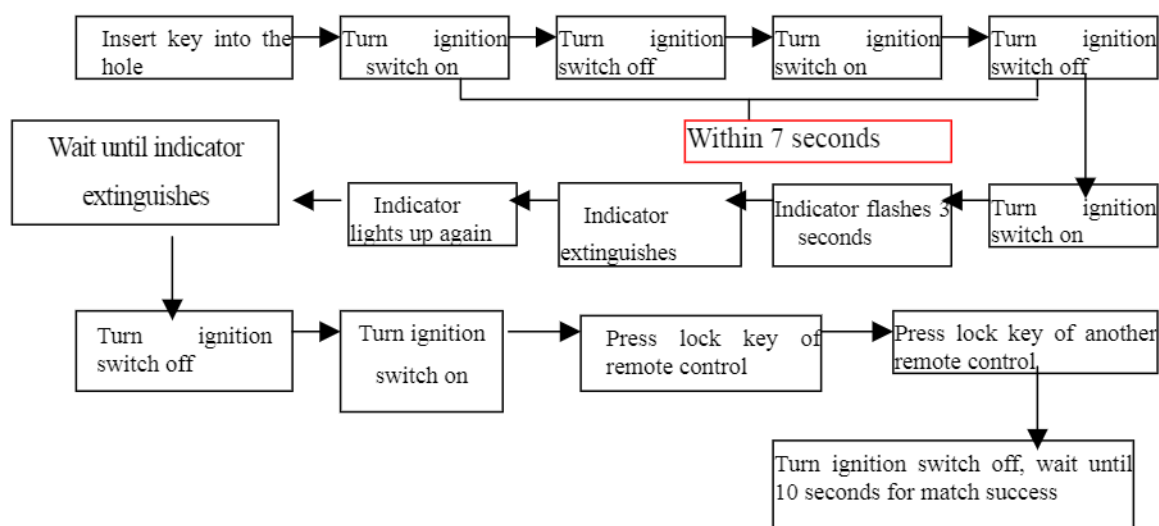
1. 9CG match methods

- 1) Turn ignition switch on three times within 7 seconds. Upon the third time (switch on), observe the antitheft indicator.
- 2) Antitheft indicator will flash three seconds, pause 1 second, and then light up again. Wait until it extinguishes and turn down ignition switch.
- 3) Turn ignition switch on again, and then press any key of remote control; meanwhile

antitheft indicator will flash once. This indicates this remote control has entered into the system.

Note: The first remote control is set into the system After Step 3). Following that, press any key of the second remote control to set it into the system. Many service stations only operate one remote control hereto. So, another control doesn't work after setting. Furthermore, the settings will definitely fail in case of improper process or operation. In this case, do not replace remote control or module casually. Be advised to try again strictly according to this operation process. Operate as in the figure below.

Operation process:



Chapter 5 Operation and Maintenance of Audio System

I. Audio system functions and operations (illustrated just by using Baoling Electronic Tuning Radio (ETR) and please refer to the supplied specifications for other radios).

(I) Panel of audio system and air conditioner (option)



Panel notes:

- 1 Volume
- 2 Power ON/OFF
- 3 Mode selection key
- 4 Waveband selection key
- 5 Clock key or CDMD key
- 6 Automatic Save key
- 7 Save key
- 8 Fast Forward key
- 9 Rewind key
- 10 Cassette compartment
- 11 Tuning key
- 12 Reject key
- 13 LCD display screen

1. Notes of key function

(1) Power ON/OFF (POWER)

Press (2) key to turn on and press it again to turn off the device (Note: the device is initialized when it is electrified for the first time because the power of the chip on the main processor is reset).

(2) Mode selection (MODE)

Press (3) key repeatedly and you will be able to select the function modes in the following order: VOL→BAS→TRE→BL→FA→VOL.

In each mode, press “+” or “-” to adjust electrical frequency for each mode.

VOL

Press “+” or “-” to adjust volume electrical frequency in the range of 0-63.

BAS

Press “+” or “-” to adjust BAS volume in the range of -7 to 7.

TRE

Press “+” or “-” to adjust the volume of left or right sound track in the electrical frequency range of 15L to 15R.

FA

Press “+” or “-” to adjust the volume of left or right sound track in the electrical frequency range of 15L to 15R.

(3) Waveband function selection key (BD)

Press (4) key repeatedly to select the functions in the following order:

FM2 →FM2→FM3→FM4 →AM1→AM2

When the desired waveband is selected, press “^” or “v” to select radio stations manually or automatically. When the desired radio station is selected, press (3) and “+” or “-” to adjust volume.

(4) Clock function key (CLK)

Press (5) key to toggle between radio frequency and clock display. In the radio mode, press CLK, and the clock will be displayed for five seconds before the radio mode returns. Press this key for a long time and simultaneously press “^” or “v”, and then the time (hour and minute) can be adjusted.

(5) Automatic Preset Save key (AS)

Press (6) key and hold for less than two seconds, and then the preset radio stations set by using this key will be displayed one by one. However, by pressing this key and hold for more than two seconds, you will have the character of “ATP” displayed and the device started to scan the radio status automatically. At the same time, six effective radio stations will be automatically saved and the device will start to repeat the order of the six stations until users select one of them by pressing a key (1-6).

(6) Save key (1-6)

Radio Save key (1-6) can save more than 30 radio stations (18 FM stations and 12 AM stations). When users need to save radio stations, they can do so by pressing “^” or “v” to select a desired station and then press the key (1-6) to save it to the key.

(7) Tuning key (“^” or “v”)

By pressing “^” or “v” for a short time, users can search for radio stations manually (AM: 9KHZ and FM: 50HZ) until a desired station is reached. Then, when pressing “^” or “v” for more than one second, users can locate an ideal station. If “^” or “v” is pressed in the process of automatic search, the radio frequency will return to the last station frequency status.

2. Notes for radio operation

(1) Turn on: When POWER key (2) is pressed and characters are displayed, the device is in the mode of radio.

(2) Press BD key (4) to select FM2, FM2, FM3, AM1 and AM2.

(3) Tuning key: Pressing “^” or “v” to manually search for stations upward and downward. Press the key for more than one second, and then the automatic search will be triggered and continue until the desired station is selected.

(4) Manual station saving: Select a desired wave band station to save it to one of the six Save keys (1-6). Press this key (1-6) for two seconds, and then the selected station will be saved to it. The six keys can save one of the FM1, FM2, FM3, AM1 and AM2 stations.

(5) Audio adjustment: Press “MODE” key to display “VOL” and then press “+” or “-” within five seconds to adjust volume. If “+” or “-” is pressed within five seconds, the display will return to the main display status. This method applies to BAS, TRE, BL and FA, too.

(6) Automatic scanning save (six): After pressing this key for about two seconds, users can receive a signal that is used to confirm memory and displays and automatically saves six radio stations with strong radio signals. Pressing this key or one of the six numeric keys will stop this function. If the six saved stations cannot be found, these stations will disappear.

(7) Stereo: ST9 will be automatically displayed when a stereo station is received (stereo indication)

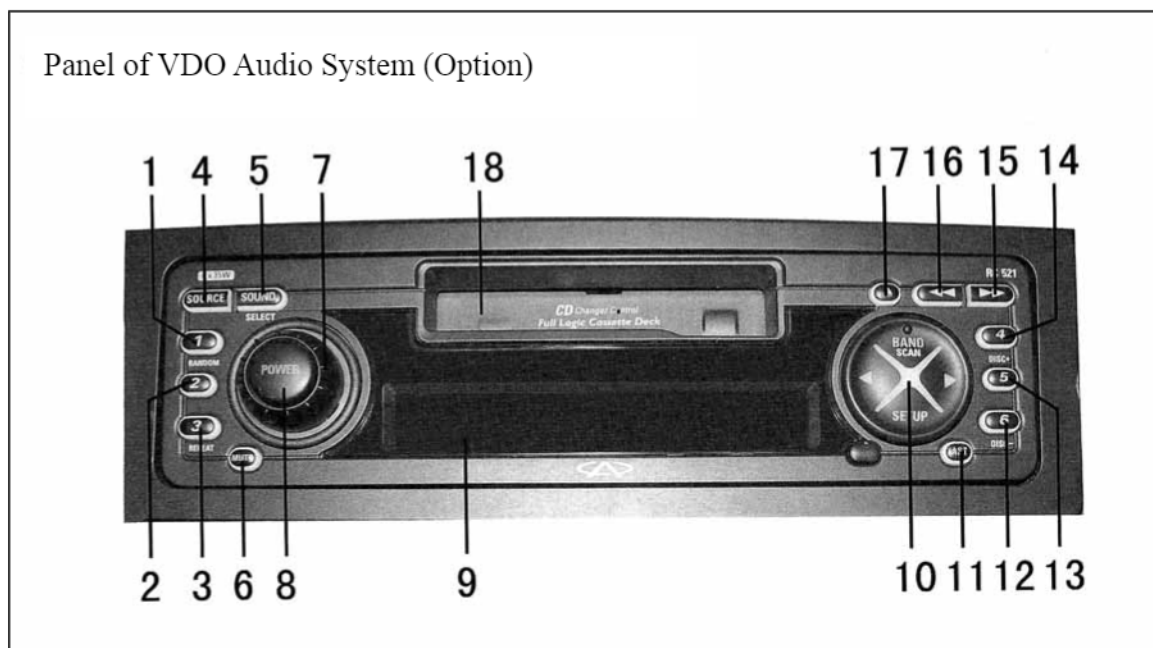
(8) Scan and save programs: By browsing the preset keys (1-6), the saved stations can be retrieved.

3. Notes for Tape player operation

- (1) The turn-on operation is the same as in the radio mode.
- (2) Insert gently a cassette with the open side on the right into the compartment. When the display shows TAPE and “◀” or “▶”, the device is in normal play status.
- (3) Volume adjustment: the operation is the same as in the radio mode.
- (4) Select songs: Press FF “▶▶” or FW “◀◀” to find desired programs quickly.
- (5) Playing direction conversion: Press FF “▶▶” and FW “◀◀” at the same time to reverse the playing direction.
- (6) Radio and player conversion: Just by inserting a cassette gently into the compartment will change the device from the status of radio to that of music player. Press Reject (12) to remove the cassette, and then the device changes to the status of radio.

Press FF or RW keys (when the operations of FF or RW complete, the device will automatically change from the status of radio to that of player).

II. CD player panel (Option)(illustrated just by using VDO CD player and please refer to the supplied specifications for other players)



Notes for function keys

- 1 Preset Key 1 RANDOM: CD player starts/stops random playing
- 2 Preset Key 2
- 3 Preset Key 3
- 4 Source: sound source
- 5 Sound: Press for a short time: sound effect mode Select: Press for a long time: Sound

setting mode

- 6 MUTE
- 7 Volume
- 8 Power switch
- 9 Display
- 10 BAND SCAN: Radio frequency scanning/CD player song scanning
- ◀ ▶ : High-end and low-end scanning (playing) Previous/next song (CD cassette)

Automatic music scan system

- 11 AST: automatic saving system
- 12. Preset key 6 DISC-: Choose forward discs 13. Preset key 5
- 14 Preset key 4 DISC+: Choose backward discs
- 15 Fast Forward ▶▶
- 16 Rewind
- 17 Reject ▲ Press for a short time to reverse the cassette Press for a long time to reject the cassette
- 18 Cassette compartment

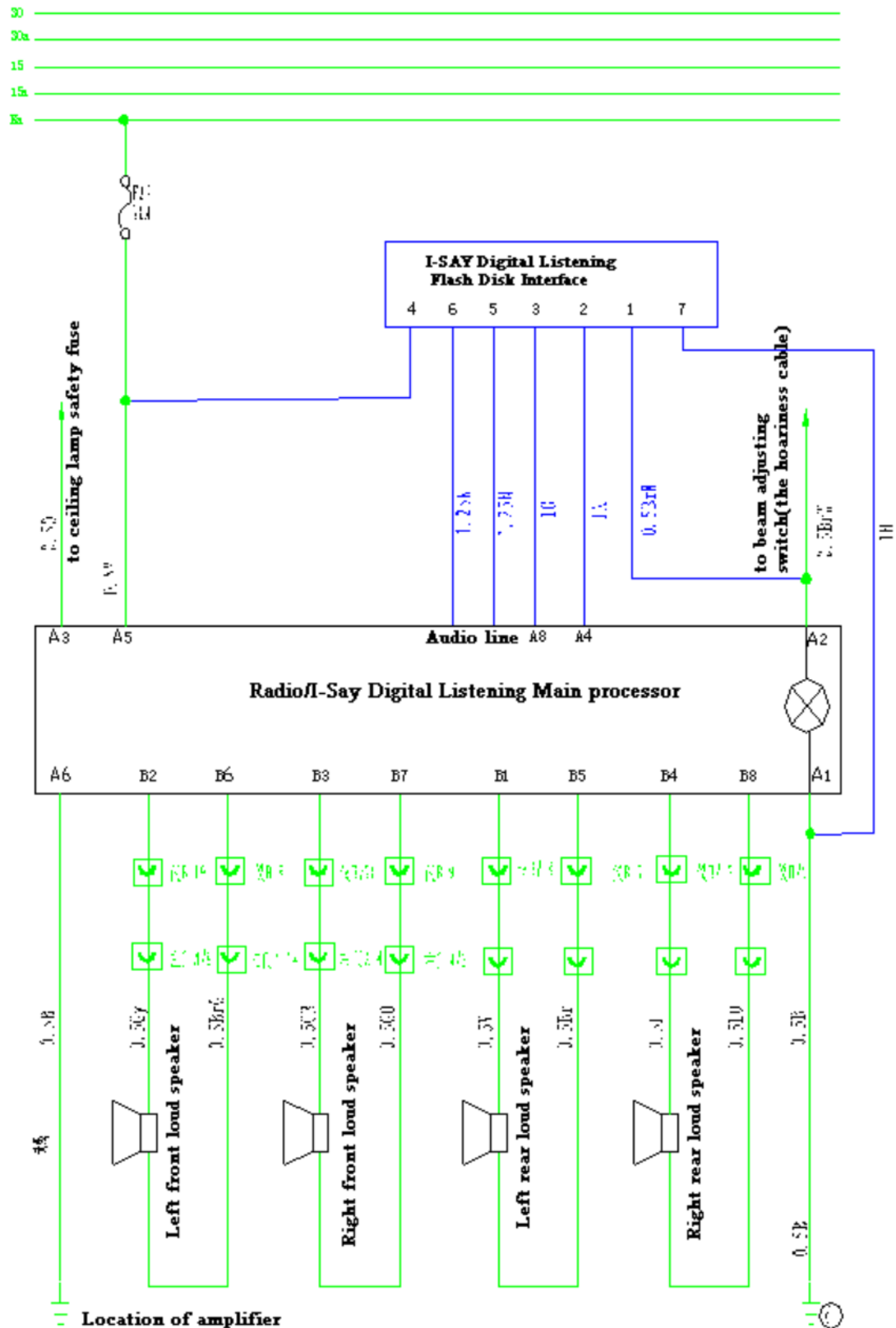
Note: VDO CD player is optional. See supplied manuals for the information on use and maintenance of VDO CD players.

III. Audio system maintenance

1. Before the radio maintenance, shut off the ignition switch and disconnect the battery negative wire.
2. Common problems and troubleshooting

Symptom	Possible Cause	Solution
The main processor fails to be turned on	Fuse broken	Replace it with another fuse of the same type
	Wrong wiring	Check the wiring against the wiring diagram
The main processor works but without sound output	Speakers and wires	Check connections and speakers
	Main processor out of order	Consult a professional radio technician
Poor sound quality of the main processor, with interference	External signal antenna	Check the connection between the antenna and main processor or amplifier power.
	Dirty magnetic tapes and heads	Clean magnetic heads
Cassettes blocked	Tapes damaged	Replace the broken cassettes
	Main processor failure	Consult a professional radio technician

3. Audio circuit diagram



IV. Disassembly and assembly of the Audio system

1. Disassembly and assembly of the Audio system

Disassembly:

Turn off the power and ignition switch, and remove wires connected with the battery.

Remove the outer shield of the radio.



Loosen the two holding bolts on both sides of the main processor.



Remove wires connect with the main processor and take out the device.

Assembly: Reverse to the disassembly process.

2. Disassembly and assembly of speakers

Note: Do not touch its vibration membrane or other parts. Otherwise, the sound effect will be affected or damaged!

Disassembly of the front speaker

Remove the panel shield (see the notes for the vehicle body).

Remove the four holding bolts.

Take out the beam plug.

Remove the speaker.



Assembly: Reverse to the disassembly process.

3. Disassembly and assembly of the antenna

Disassembly: Remove the top light (refer to Disassembly of Top Light).

Loosen the bolts.

Remove the plug connected to signal reception lines to remove the antenna.

Assembly: Reverse to the disassembly process.

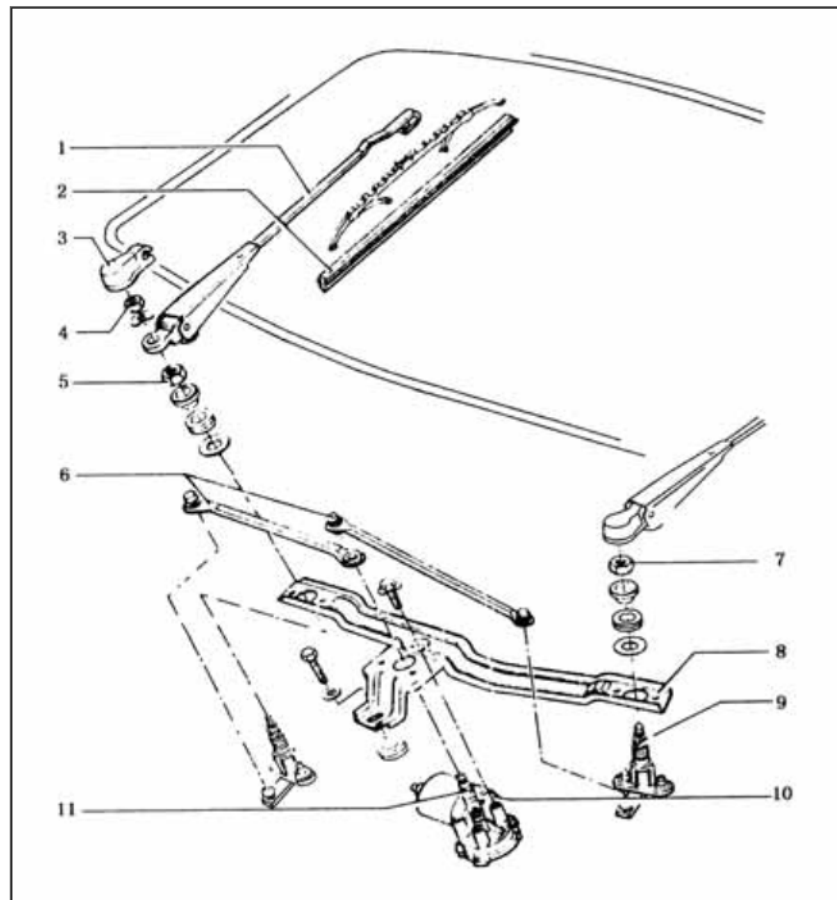
Chapter 6: Inspection and Repair of Other Accessories

I .The structure and maintenance of wiper and wash equipment

1. The structure of wiper and wash equipment

Wiper and washer equipment of Chery S11 consist of fuse, combination wiper switch with intermittent position, windshield wiper relay and motor, rear wiper motor, wiper abutment, connecting rod assembly, locating lever, wiper rubber strip, water injection pump, reservoir and nozzle etc. They are shown as follows:





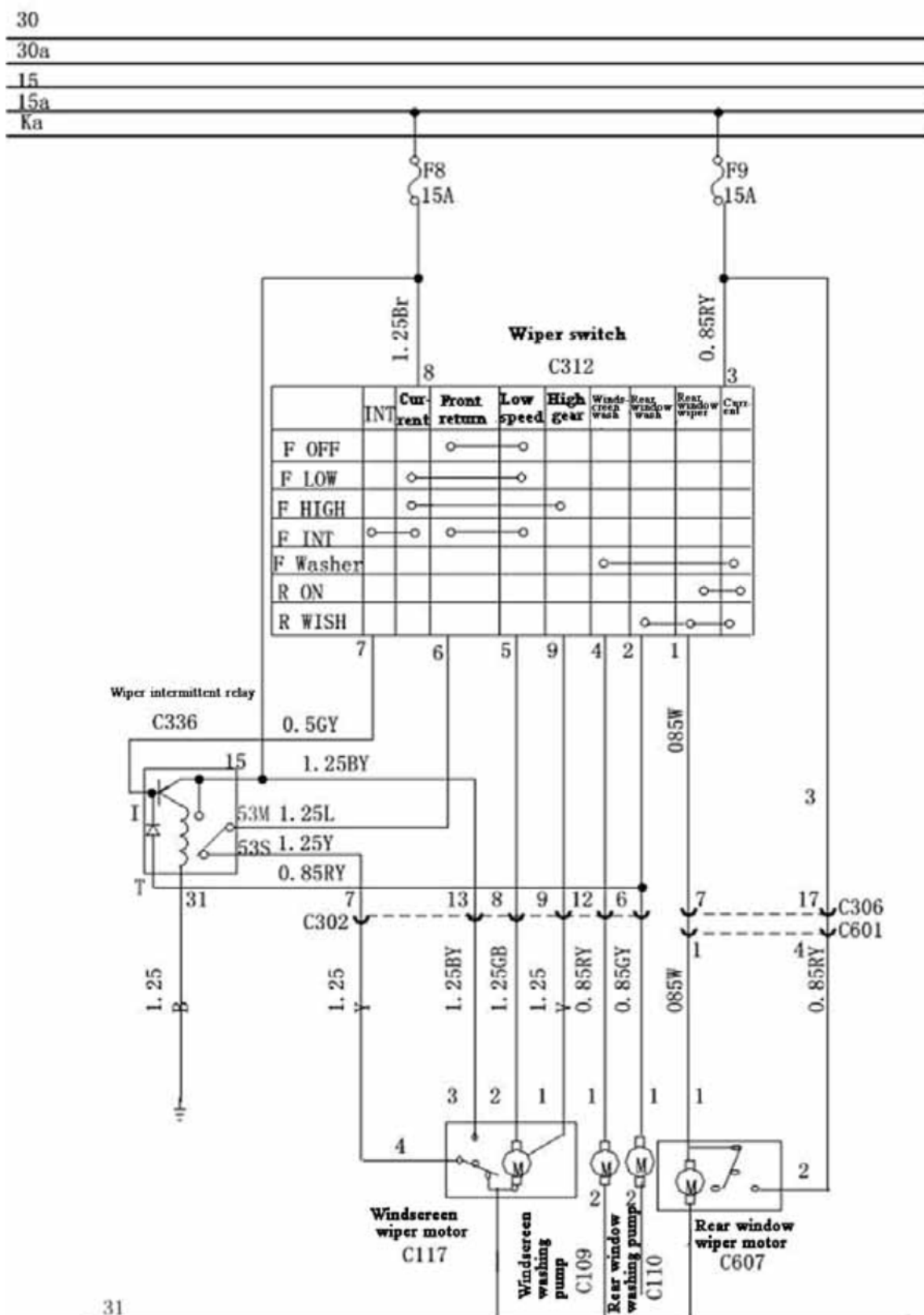
Structure of the wiper

- 1- wiper arm 2- wiper rubber strip 3- protective cover
 4、5、7- nuts 6- swing link 8- abutment 9- journal
 10- motor 11- crankshaft

The circuit system for the wiper and wash equipment is shown in the figure. If the start-up switch is turned on, by switching the wiper switch between the positions thereof, the power supply controlled by the start-up switch can be connected directly to the wiper motor through the fuse (fast position) or can actuate the motor through the relay (slow position, intermittent position and water injection position).

When the wiper switch is in its lowest position, the wiper is out of operation. When the wiper switch is turned to the “2” position, the wiper operates in intermittent mode. Every some 6 seconds the wiper does one operating cycle. When the wiper switch is turned in the direction of the steering wheel, the front wiper is actuated, the water injection pump pumps water, the wiper moves to and fro for 3 to 4 times and stops. When the wiper

switch is in its “third” position, the wiper operates in the fast mode. When the wiper switch is turned in the direction of instrument panel to the last position, the rear wiper operates in its slow mode and the water injection pump injects water at mean time. Turning the turn button to “ON”, the rear wiper operates permanently.



Circuit diagram of the wiper and wash equipment

2. Inspection and Repair of wiper and wash equipment

(1) Removal of Wiping rubber Strip

① Hold the two steel straps on the sealed side of wiping rubber strip with slip-joint pliers, remove them from the upper clamp and draw the rubber strip together with the steel straps from the other clamps of wiper blade.

② Insert new wiper rubber strip in the lower clamp of the wiper blade and fasten it.

③ Insert the two steel straps into the groove of the first wiper rubber strip, align them with the rubber strip and push them below the rubber strip lips in the groove.

④ Press the steel straps together with the rubber strip, mount the upper clamp by putting the lips on the both side of the clamp in the positioning groove of the wiping rubber strip.

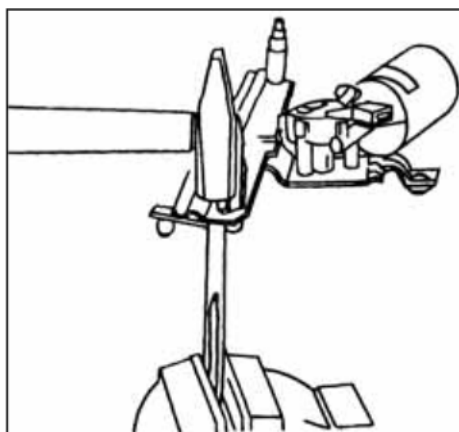
(2) Adjustment of the position of crankshaft

① Turn the wiper motor to the limit position.

② Install the crankshaft and adjust it until the tubular internal thread can be seen.

(3) Replacing the wiper abutment

Once the wiper abutment is removed, it should be replaced. During the removing of the wiper abutment, the rivet should be cut off with cutting knife. As shown in the figure, while installing the wiper abutment, the abutment should be abutmented securely.



Removal of the wiper abutment



Installation of the wiper abutment

(4) Inspection of conduction of wiper switch and washer switch

As shown in the figure, if the performance of conduction does not conform to the states shown in the figure, the wiper switch and the washer switch must be replaced.

		
Switch position	Connection inspection	Conductance
OFF	6-5	Yes
Front intermission (INT)	7-8 6-5	Yes
Front slow (LOW)	8-5	Yes
Front fast (HIGH)	8-9	Yes
Front washing (Washer)	4-3	Yes
Rear wiper (ON)	2-11	Yes
Rear washer in operating (WISN)	1-10-3	Yes

Figure Inspection of wiper and washer switches

(5) Inspection of the operation of the front washer

As shown in the figure, the terminals 8 and 5 are respectively connected to the positive and negative pole (anode and cathode) of the secondary cell, and the positive and negative probes of a voltmeter are respectively connected to the terminals 7 and 5. Turn on the washer switch, check up if the voltage changes as follows: after the washer switch was turned on for one second, the volt meter displays the supply voltage, and after turning off for 3 seconds, 0 voltage is displayed. If it is not the case, the wiper and washer switch should be replaced.

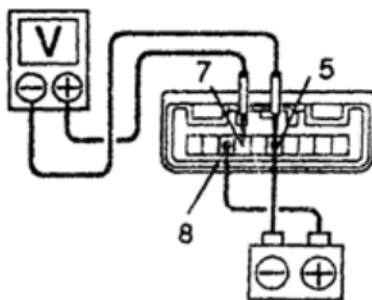


Figure Inspection of the operation of the front washer

(6) Inspection of the performance of the front wiper motor

The circuit arrangement is shown in the figure. Inspect the low speed performance of the front wiper motor, and replace it if necessary. It should be noted that the inspection should be accomplished as soon as possible, in order to prevent overheating (overburning) of the motor.

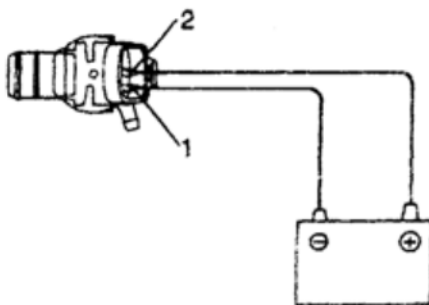


Figure Inspection of the performance of the front wiper motor

(7) Trouble-shooting of the wiper and wash equipment

Typical troubleshooting can be seen in the table

Trouble-shooting chart of wiper and washing equipment

Symptom	Possible causes	Solution
Start-up switch on, turning the wiper switch among the positions, but the wiper fails to work.	Fuse blowing out Wiper motor socket joint defective Internal circuit break rotor of wiper motor clamping	Replace Repair or replace Repair or replace
Wiper fails to work except in “slow” mode	Loose contact or circuit break of the connecting wire Relay damaged Wiper switch defective	Repair or replace connecting wire Replace Repair or replace
Wiper fails to work except in “fast” mode	Relay defective	Replace
Wiper works except in “int” mode	Loose contact or circuit break of the connecting wire Wiper switch defective Relay damaged	Repair or replace connecting wire Repair or replace Replace
In “water injection” position the wiper fails to wipe and inject water, while works well in the other positions	Loose contact or circuit break of the connecting wire Wiper switch defective Water injection motor or Water injection pump defective. Connecting pipe or nozzle blocked	Repair or replace Repair or replace Repair, replace or clean
Water marks remain on the window	Wiper rubber strip contaminated	Clean the wiper rubber strip with hard nylon brush and cleaning agent

	Rubber strip broken or damaged because of being abrasion on the edge	Replace
	Rubber strip aging, surface torn	Replace
Water remains after wiping	Paint, polishing agent and oil, etc left on windshield	Wiping windshield with clean rag dipped in degreaser
Wiper blade works well on one side, and emits crack on the other side	Wiper rubber strip is deformed and fails to work Locating arm is distorted and wiper blade sidelining gets stuck on windshield	Replace Carefully make the arm vertical
Part of surface can not be wiped	Wiper rubber strip is dropped out the groove wiper blade does not contact windshield uniformly, spring or steel strip get bent Wiper arm contacts with windshield under too great pressure	Insert the wiper rubber strip in the groove Replace Lubricate wiper lever joint and spring or replace the arm

II . Inspection and Repair of Horns

Only one horn is used in Chery S11, it is installed to the inside of front left bumper beam, the current through the horn relay contacts is supplied by F4(10A)

Typical troubleshooting and solutions thereof are shown in the table

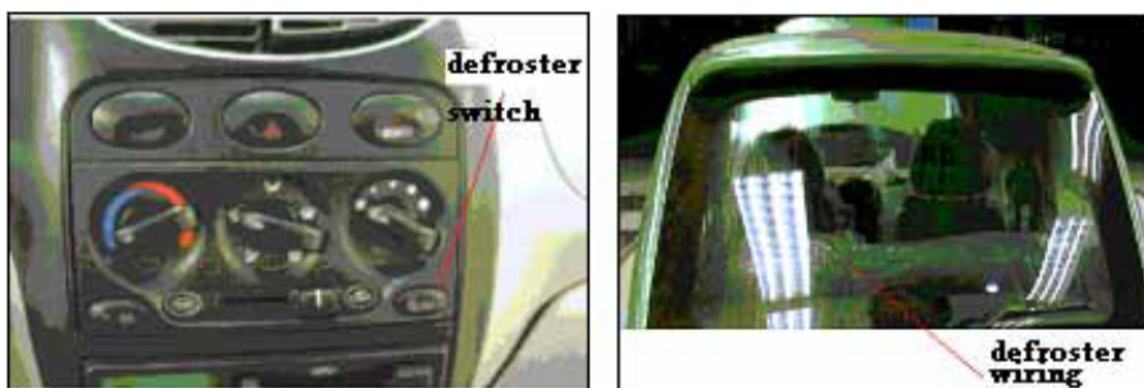
Table Typical troubleshooting and solutions of horn

Symptom	Causes	Solution
Horn does not work	Loose contact of the horn connector,	Repair or replace
	Fuse blowing out	Replace
	Horn relay defective	Replace

	Horn button wiring broken or loose contact thereof	Repair or replace
The sound of horn is low	Insufficient charge of secondary cell Horn defective Interference between horn and direction indicator lamp	Recharge or change the cell Replace Adjust
After releasing the horn button, the horn would not stop	Short in the horn button	Replace Repair

III. Inspection and Repair of the Defrost System

In figure defrost system is schematically shown.



Schematic view of the defrost system

1、Inspection of the conduction of the defroster switch

As shown in the table, if it does not conform to the table, change the defroster switch.

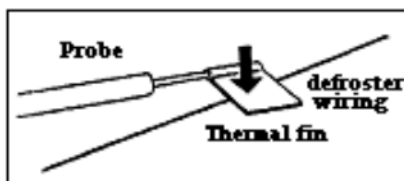
Inspection of the defroster switch

Switch position	Connection to the instrument	Conductance
Switch OFF	-	No

Switch ON	1-2	Yes
-----------	-----	-----

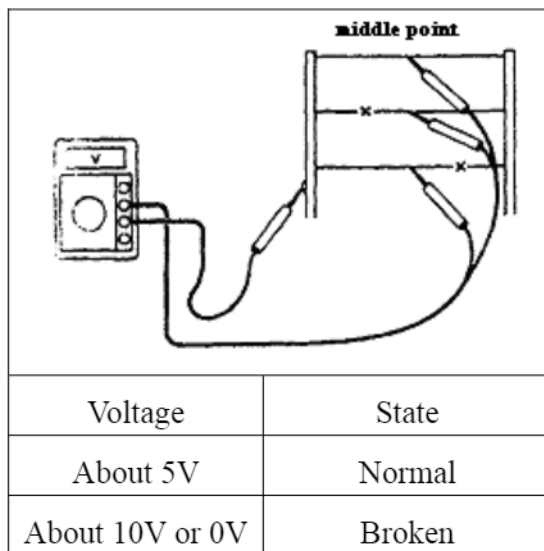
2、Inspection of defroster wiring

While cleaning the window, wipe with soft cloth along the line, don't damage the defroster wiring. Don't use cleaning agent or cleaning device, otherwise the surface will be damaged. While inspecting the voltage, insert the negative probe in an end of the thermal fin, and push the wiring with finger as shown.



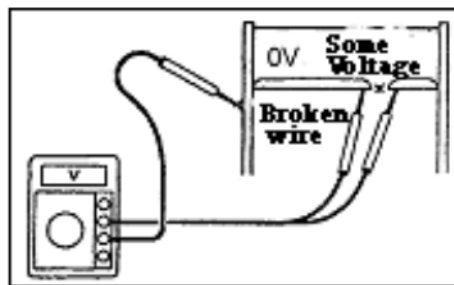
Inspection of voltage

Turn the start-up switch to ON, turn the defroster switch to ON, check the voltage at the midpoints of each wire as shown. If the wire is broken, there is a voltage of about 10v between the positive terminal of the meter and the midpoints of the wire, there is no voltage between earth and the midpoints of wire.



Inspection of voltage of midpoint of the defroster wire

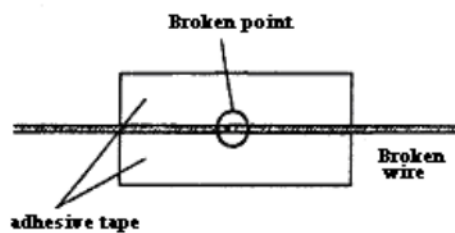
Connect the positive probe of the Voltage meter to positive terminal of the defroster, negative probe to the earth end. Press the positive probe on the hot wire and move it to the negative terminal. If the voltage springs from 0V to some V at some point, this point is the broken point, as shown in the figure. If the defroster wiring is not broken, at the positive terminal of the defroster wiring the volt meter shows 0V, and during the probe move to the other terminal, the voltage increases gradually to 12V.



Detection of the broken point of the defroster wiring

3、Repairing of the defroster wiring

Eliminate the tool cleaning broken point with lubricating grease (wax) and organosilicon, during the repairing, attach adhesive tape on the both side of the defroster wiring. After mixing of the repairing agent, drop the repairing agent to the broken point in appropriate amount with electric brush. Remove the adhesive tape after few minutes, as shown in the figure



Repairing of the defroster wiring

IV. Inspection and Repair of Control System of Power Windows

1. Operating mode of power windows

(1) the function of power windows timer

①After the start-up switch shut off, the power windows are operable within 30 seconds. If the doors are opened or closed in the period, the power windows can be operated within another 30 seconds.

②During lowering the power window, if an overload is detected, the power windows are operable within 30 secs.

③Within the last 6 seconds of above-mentioned period, if the door window switch is hold upwards for over 0.3 second, the door window then works in overloaded state to prevent that the door window stops in opened state.

(2) The function of power windows

①operating condition

In the ON state of the start-up switch, after the start-up switch is turned off(the operating time of the power window timer is within 30s)

②operating progress

The power window switch is actuated for over 0.3s, the door window rises and lowers automatically. During its operating, if the power window switch is actuated once again, the door window stops.

③stop conditions of the door windows

A. If the current through the door window motor is higher than $14.5A+1A$, the door window stops after 0.7s operating time.

B. After operating for 6s (required by raising and lowering the door window), the operating stops.

※**Reference:** if raising or lowering not completed within 6s, check the overload current detecting function of door window motor or the installation of the door edging and door window regulator.

(3) stepping mode power window

①Operating condition: the same as that of power windows.

②Within 0.3s, if power window switch is in its raising or lowering position, the door window operates in stepping mode with the step length of 0.5s.

③If raising and lowering switch is actuated in same direction N times within 0.3s, the door window operates for a period of $(0.5 \times N)s$.

④ Stop condition of the door windows: it is the same as that of power windows. In the stepping mode, once another switch is turned on, the operation (of lowering switch in raising operation/lowering switch/raising switch in raising operation) stops.

2. Supplying circuit of power window (see theftproof computer)

3. Inspection of the circuit of the power window

(1) In this circuit, for the BCM computer (theftproof computer) controlled power window, the direction of the current through the power window motor is changed automatically to make the motor rotating clockwise or anticlockwise, so that the door window is raised or lowered.

(2) If the start-up switch turned on, the BCM computer (theftproof computer) actuates the power window by supplying operating signal to the power window switch.

(3) If the start-up switch turned off, the BCM computer (theftproof computer) actuate the power window relay within the operating delay of 30s, i.e. after the start-up switch turned off, all the door windows can be actuated within 30s.

(4) Push the power window switch upward or downward (over 0.3s), the BCM computer (theftproof computer) instructs with signal to supply forward or backward current, so as to rotate the power window motor clockwise or anticlockwise.

(5) With the start-up switch on, push the power window switch upward or downward, check if there is forward or backward current output on the terminals of the BCM computer (theftproof computer). If not, the switch is defective, if voltage is output thereon, but the power window wouldn't rise or lower, then the power window motor is defective.

The power window hoister

4. Inspection and Repair of Electric Components

(1) control device of the power window

Check the conductance of the power window main switch as shown in the figure. If it does not conform to the figure, replace the power window main switch.

			
switch	switch position	Connection to the instrument	conductance
Switch on the driver side	UP	13-12	Yes
	OFF	3-12	Yes
	DOWN	14-12	Yes
Switch on the by-driver side(window unlocked)	UP	5-12 3-12 5-3	Yes
	OFF	3-12	Yes
	DOWN	6-12 3-12 3-6	Yes
Switch on the by-driver side(window locked)	UP	5-12	Yes
	OFF	-	
	DOWN	6-12	Yes
Rear left switch(window unlocked)	UP	9-12 3-12 9-3	Yes
	OFF	3-12	Yes
	DOWN	10-12 3-12 3-10	Yes
Rear left switch(window locked)	UP	9-12	Yes
	OFF	-	
	DOWN	10-12	Yes
Rear right switch(window unlocked)	UP	1-12 3-12 1-3	Yes
	OFF	3-12	Yes
	DOWN	2-12 3-12 2-3	Yes
Rear right switch(window locked)	UP	1-12	Yes
	OFF	-	
	DOWN	2-12	Yes

Figure Inspection of conductance of power window main switch

(2) window secure switch



switch	position	connection to the instrument	conductance
Front driver side secure switch	ON	12-11	Yes
	OFF	3-12	Yes

On the door interior panel of the drive side, an rear window secure switch button is provided. Push the button, the power windows switches of the by-driver side and the both rear door windows are deactivated. Then the corresponding window switches can only be controlled from the window switch on the driver side.

Description of the switches

Among all the four doors, the control switch for the other three doors, rearview mirror adjust switch and secure switch are only provided on the front left door.

Note: with the secure switch the switched on the rear doors can be locked. Only when the secure switch is pulled out, the rear windows can be opened and closed with these switches.

(3) Check the conductance of switches on the passenger door window, rear left door window and rear right window as shown in the figure. If it does not conform to the figure, replace the power window switch.

		
Switch position	Connection to the instrument	Conductance
UP	1-5	Yes
OFF	-	
DOWN	3-5	Yes

Inspection of conductance of power window switch

(4) Inspection of conductance of power window motor on the front left door
Connected the terminal 1 to positive pole of the secondary cell, the terminal 2 to the

negative pole of the secondary cell, and check if the motor rotates clockwise as shown in the figure; connect the terminals reversely, check if the motor rotates anticlockwise. If the result is not as mentioned, replace the front left power window motor.

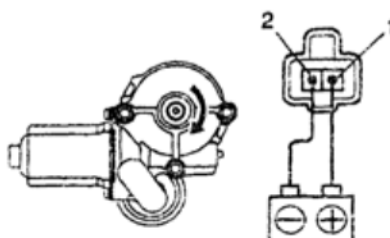


Figure Inspection of left front door motor

(5) Inspection of conductance of power window motor on the front right door

Connected the terminal 2 to positive pole of the secondary cell and the terminal 1 to the negative pole of the secondary cell, and check if the motor rotates clockwise as shown in the figure; connect the terminals reversely, check if the motor rotates anticlockwise. If the result is not as mentioned, replace the front left power window motor.

(6) Inspection of conductance of power window motor on the rear left door

Connected the terminal 1 to positive pole of the secondary cell, the terminal 2 to the negative pole of the secondary cell, and check if the motor rotates clockwise as shown in the figure; connect the terminals reversely, check if the motor rotates anticlockwise. If the result is not as mentioned, replace the rear left power window motor.

(7) Inspection of conductance of power window motor on the rear right door

Connected the terminal 1 to positive pole of the secondary cell, the terminal 2 to the negative pole of the secondary cell, and check if the motor rotates clockwise as shown in the figure; connect the terminals reversely, check if the motor rotates anticlockwise. If the result is not as mentioned, replace the rear left power window motor.

(8) Typical troubleshooting of power windows

Table Typical troubleshooting of power windows

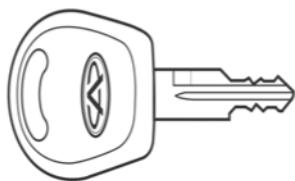
symptom	possible reasons	solution
Start up switch on, power window does not work	FuseFuse blowing out power window switch theftproof computer	replace repair or replace repair or replace

	connecting wire defective	repair or replace
None of the power windows works	connecting wire defective power window motor power window switch theftproof computer	repair or replace wire repair or replace repair or replace repair or replace
Power window does not lower	power window switch power window motor connecting wire defective	repair or replace repair or replace repair or replace
Power window does not rise	power window switch power window motor connecting wire defective	repair or replace repair or replace repair or replace
Power window rises slowly	connecting wire defective power window motor power window switch theftproof computer	repair or replace wire repair or replace repair or replace repair or replace
Power window does not lowers slowly	connecting wire defective power window motor power window switch theftproof computer	repair or replace wire repair or replace repair or replace repair or replace

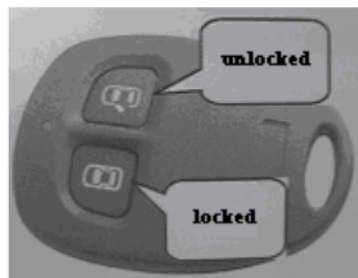
V . Inspection and Repair of the control device of electric door lock

1.Description of the operation of central control door lock

Key



Remote controller



All the doors can be operated simultaneously with the key and the remote controller

All the doors can be locked or unlocked at the driver side door lock with the key.

While unlocking, secure buttons of all the doors move upward. While locking, secure buttons of all the doors move downward. The doors can also be locked by pushing the

secure button down.

Door lock

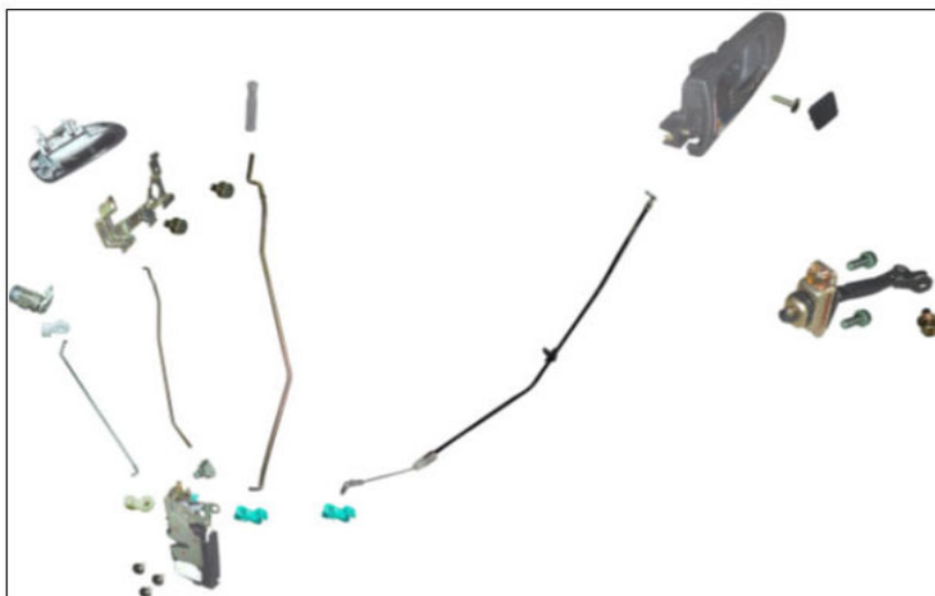
The front doors can be locked and unlocked from outside with the key and can be locked from inside with the door handle.

Before leaving the car, push down the locking rod down and close the door to lock it.

After entering the car and turning the start-up switch on, if the door is not locked or opened within 5min, it will be locked automatically. Once the start-up switch is off and the key is pulled out, the door lock will be unlocked automatically.

Operating mode

When the driver locks or unlocks the door lock, the door operating device installed on the side of driver seat, lock or unlock signal will be sent to the micro switch in the door lock. According to the lock or unlock signal sent by the door operating device, The BCM computer (theftproof computer) will activate the motor integrated in the door operating device. The built-in motor of the door operating device is controlled by the signal on the 201 terminal of the BCM computer (theftproof computer) to lock and unlock each door lock jointly. Or the rotating direction of the door lock motor is changed according to the direction of output current of BCM computer (theftproof computer)), whereby the door lock will be locked or unlocked through the connecting rod.



2. Inspection and Repair of the Central Control Door Lock

(1) BCM computer (theftproof computer)

The BCM computer (theftproof computer) is installed in the instrument panel on the left

side of the lower evaporation box. It gets power supply from the secondary cell, and receives opening and closing signal from the door lock device of the front left door to control the direction of the central door lock device. The BCM computer (theftproof computer) is in charge of controlling the central door lock and power window.

(2) Door lock operating device (driver seat side)

When the driver opens the front left door from outside, the micro switch inside the door lock operating device connects the circuit to the ground or disconnected it from the ground, and sends signals to the BCM computer (theftproof computer). When the driver opens the front left door from inside, by turning the start-up switch off and pulling the key out, the BCM computer (theftproof computer) will unlock the central control door lock automatically, or if the door on the driver side is open directly, the central controlled door lock will be unlocked.

(3) Door lock operating device (front passenger side door and rear doors)

Midget motors are provided in the three door lock operating devices. Both terminals of each of these motors receive positive or negative current from the BCM computer (theftproof computer), the rotating direction of the motors is changed, and the door locks are operated in opening or closing direction through the connecting rods.

(4) Inspection of the door lock motor

Malfunction of the door lock motor can be determined by checking the electric resistance. Specifically, check the electric resistance on the terminal 1 and 2 of the connector of the door lock operating device. If infinity shows, broken coil of the motor can be determined. A simple way of inspection is, supply instantaneous (within 0.3s) current to the terminal 1 and 2 of the connector of the door lock operating device, the motor should rotate; if reverse current is supplied, the motor should rotate in opposite direction. It should be noted, that the supply time should be short, otherwise the armature coil may be damaged due to overload.

① Inspection of the operating of motors

a、Connect the positive pole (+) to the terminal 1, and the negative pole (-) to the terminal 2, check if the door lock connecting rod moves to the “UNLOCK” position

b、Connect them reversely, check if the door lock connecting rod moves to the “LOCK” position. If it is not the case, replace the door lock assembly.

3. Circuit Diagram

Pages 107-108 show the circuit diagram of power supply of the power window

VI. The structure, Inspection and Repair of the power rearview mirror

1. Internal rearview mirror

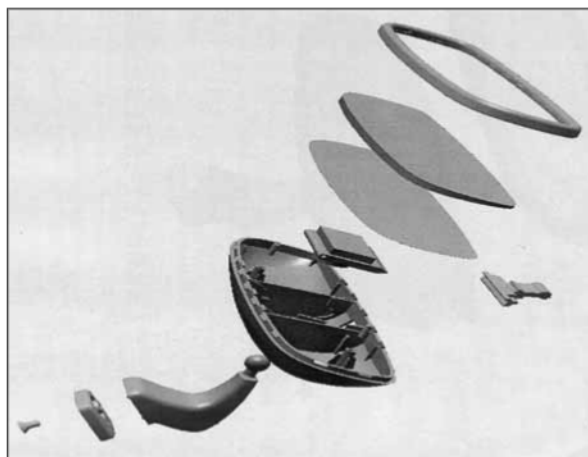
External appearance of the assembly



Technical parameter

No.	Parameter	Criterion
1	reflectivity of the mirror	$\geq 40\%$
2	Angular of upward adjustment of the rearview mirror	≥ 22
	Angular of downward adjustment of the rearview mirror	≥ 28
	Angular of leftward adjustment of the rearview mirror	$\geq 30^\circ$
	Angular of rightward adjustment of the rearview mirror	$\geq 30^\circ$
3	Angular of adjustment of handle	$4^\circ 30'$

(1) Explosive view



(2) Usage/operation guide and warning

Usage/operation guide

- ① According to the different driver's visual, adjust the mirror angular of the assembly
- ② Turn the handle to adjust the mirror angular in the up and down direction to prevent dazzle.

Warning:

If the Number of manual adjusts excesses a predetermined value, operating force will lower.

3、 Assemble, disassemble and warning

Steps of assemble and disassemble

- (1) Prize off the mirror frame with tools, and remove damaged mirror
- (2) Put new mirror in the mirror case in position, insert the mirror frame in the corresponding groove of mirror case assembly

Notice:

- (1) Remove the mirror frame with caution, don't scratch or damage other parts
- (2) Put the new mirror in the correct position of the mirror case, face the reflecting surface outward; Insert mirror frame in position.

2. Structure of power rearview mirror and control switch

The rearview mirror of Chery S11 is electric controlled. If the driver turns the turning switch on, turning light of the rearview mirror gives turning signal in the corresponding direction. Turn the adjust button in the car to adjust the angular of the mirror in upward, downward, leftward or rightward direction.

In the power rearview mirror on the both side, permanent magnet motors are provided, four currents, i.e. two positive and two negative, can be attained by switching the two motor switches, so that adjustment in different direction can be done.

The control switches are provided in the combination switch on the driver side. When the start-up switch is ON, operate the switches in the four directions to select the rearview mirror to be adjusted. On the control switch panel there are L, R printed, L stands for left rearview mirror, and R for right rearview mirror, stop operating is in the middle. After the mirror to be adjusted is selected, operate the switch in four directions above-mentioned, the space angle of the selected mirror is adjusted. After the adjustment, turn the switch back to the middle. In the figure power rearview mirror and the switches thereof are shown.



Power rearview mirror

- 1- Left rearview mirror assembly
- 2- Wire connector 3- Control switch

Notice:

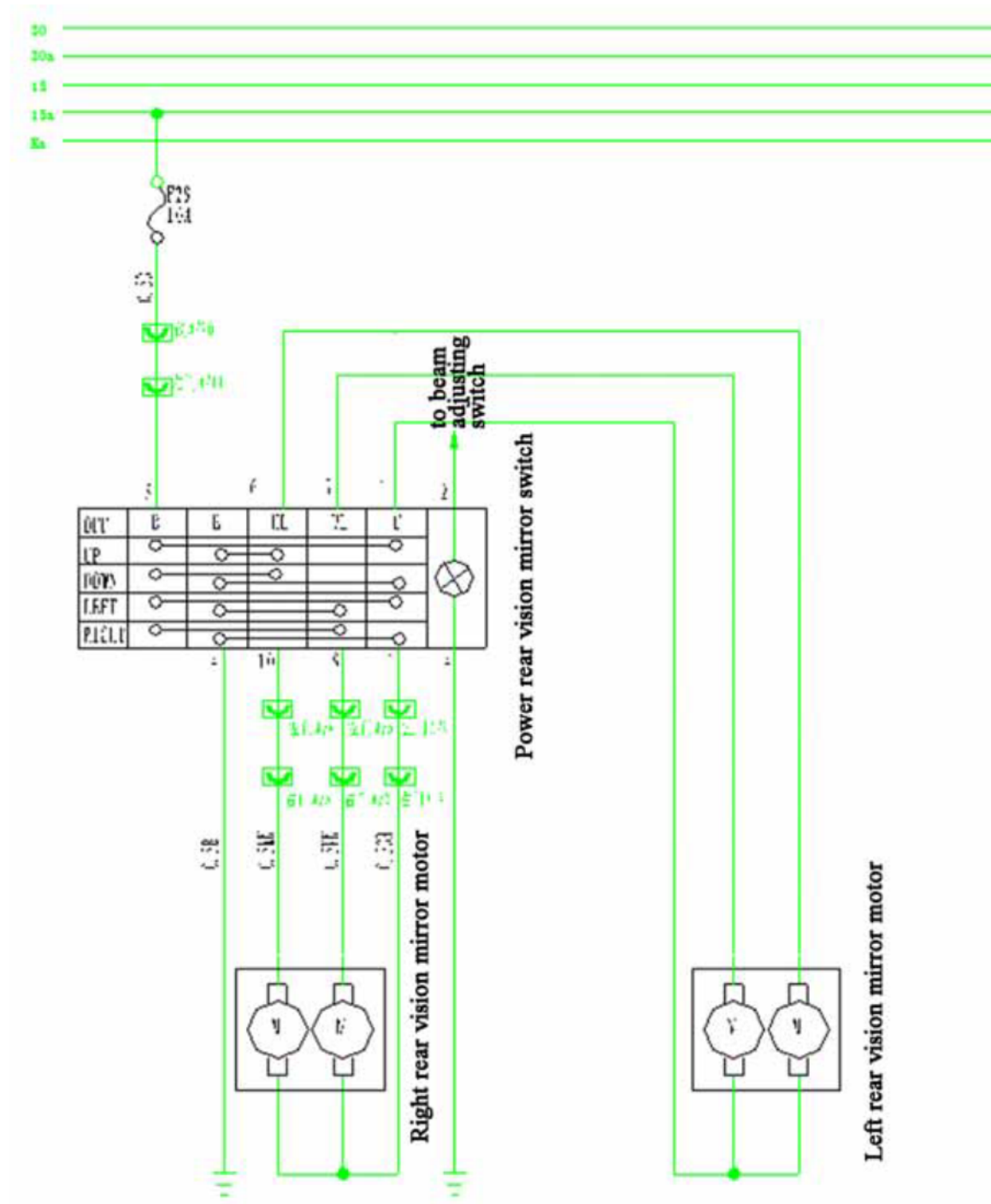
If adjust the rearview mirror manually, do not go beyond the range of adjust angle, otherwise the function or service life thereof will be influenced.

Technical parameter

No.	Parameter	Criterion
1	reflectivity of the mirror	$\geq 40\%$
2	curvature of the mirror surface	Left: R1200~R2000 Right: R1200
3	upward/downward, leftward/rightward turning angle of the rearview mirror	$\geq 7^\circ$
4	folding angle inward of left rearview mirror	Max 65°
	folding angle outward of left rearview mirror	Max 70°
5	folding angle inward of right rearview mirror	Max 70°
	folding angle outward of right rearview mirror	Max 70°

The power rearview mirror consists of mirror glass (reflecting surface), two motors, connecting member, driving unit and case etc. control switches include rotary switch, swing switch and wiring harness etc.

Electric circuit diagram of power rearview mirror



3. Inspection of power rearview mirror

(1) Power rearview mirror can only be operated in one direction

For example, the power rearview mirror can only turn left or turn up, defective switch can be

determined, replacement should be made. If motor or wiring is defective, power rearview mirror can not be operated in both directions; if the wiring is broken, no current flows through the motor, so the power rearview mirror cannot turn in any direction. If the coil or the brush of motor is defective, the power rearview mirror cannot turn in any direction either. It is impossible that the motor rotates only in one direction.

※**Reference:** if the electric control device that changes rotating direction of the motor (power window, motor circuit, power rearview mirror, electric driven seat etc.) can only operate in one direction, it is mainly because the defective switch.

(2)Power rearview mirror on right or left side doesn't work

The causes may be the defective switches of the right or left side, or may be defective wiring or motor on the side that power rearview mirror doesn't work.

①Remove the interior door panel on the defective side (to check the power rearview mirror connector)

②Remove power rearview mirror wiring connector

③Inspection of power rearview mirror on the left side: if the right/left angle can not be adjusted, after removing the wiring connector, connect a universal meter between the yellow wire and black-red wire, no matter on the right or the left side, push the angle adjusting switch down, and voltage of 12V will be shown (digital display). If voltage is shown, the switch and wiring are normal, the power rearview mirror should be replaced; if no voltage is detected, check if the wiring is broken. If the wiring is not broken, defective switch can be determined. If the up/down angle can not be adjusted, connect the universal meter between the green wire and black-red wire, make the inspection as above described and find out where is defective.

④Inspection of power rearview mirror on the right side: The inspection and decision are made in the same way as that of the left power rearview mirror, but the color of the wiring should be noted. if the right/left angle can not be adjusted, connect the universal meter between the grey wire and black-red wire; if the up/down angle can not be adjusted, connect the universal meter between the blue wire and black-red wire.

※ **Reference:** the color of wiring here mentioned is corresponding to that on the door wiring side, not to that on the power rearview mirror motor side.

(3) Right/left angle or up/down angle can not adjusted on the both sides.

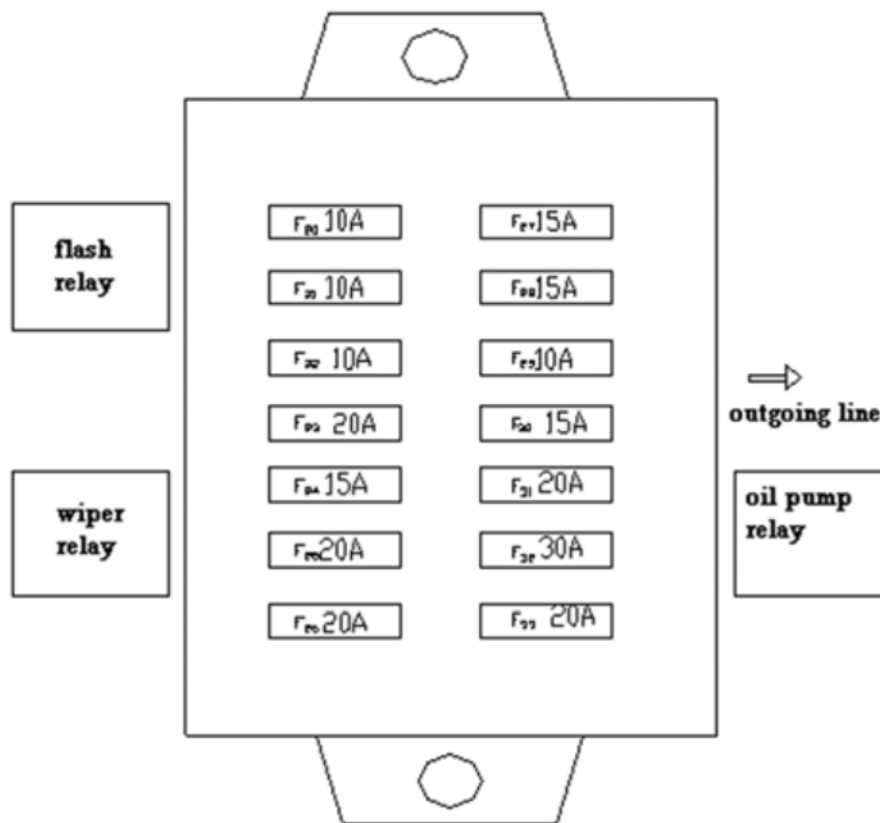
Almost all of this kind of problems is caused by defective switch. If the problem is not disappeared after the switch is replaced, it may be resulted from the short cut between the motor wiring and car body. After turning on the switch on, if the wiring that is short with car body is connected to the positive pole, the switch is cut off due the high current

between the wiring and the car body. If only the switch is replaced without eliminating the short cut, the switch will still be cut off. Therefore, under such circumstances, remove the power rearview mirror wiring connector instead of replacing the switch, check which wire among the yellow, green, blue, grey and black-red wires is short with car body. That is, these wires should be checked one by one with the universal meter. Find out the defective wire and fix it, and replace the switch (in the off state)

VII、 Fuse and Relay

Fuse and relay boxes are installed rear left to the motor chamber and below the instrument console.

Internal fuse box below the instrument console



Description

F20 instrument, headlight switch signal
(controlled by start-up switch)

F22 direction indicator lamp

F24 brake light, headlight switch signal()

F26 rear wiper

F28 rear wiper, front and rear washing pump

F30 ceiling light, theftproof module, radio,
trunk light, diagnosis ports

F32 central controlled door lock

F21 airbag

F23 oil pump

F25 radio

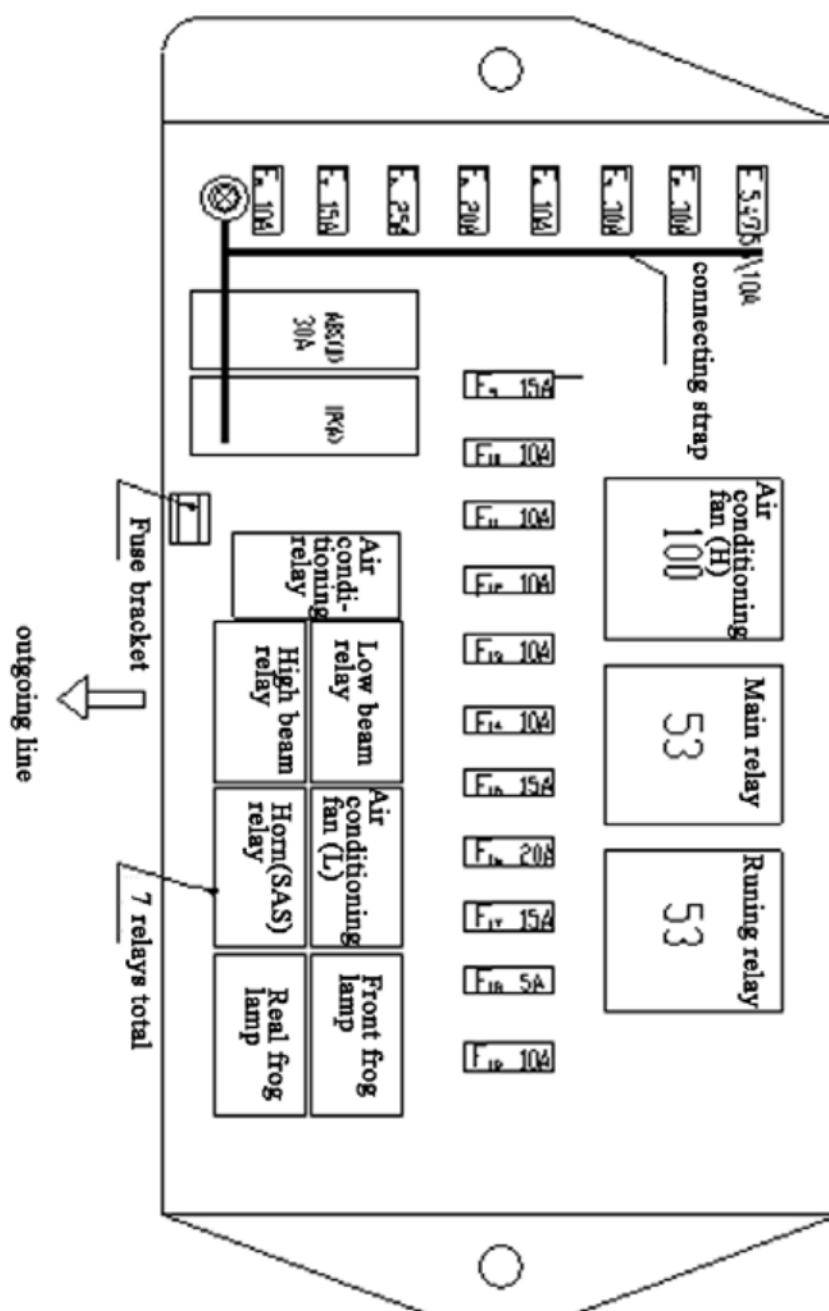
F27 front wiper

F29 power rearview mirror

F31 alarm light, theftproof module

F33 starter

Fuse and relay of the engine chamber



Description:

F1 ECU	F2 Fan	F3 ABS
F4 Horn	F5 Headlight	F6 Main relay
F7 Front fog light	F8 Rear fog light	F9 left small light
F10 right small light	F11 Left dim light	F12 Right dim light
F13 Left traffic beam	F14 Right traffic beam	F15 Defrosting
F16 Blower	F17 Back light, odometer sensor	
F18 ABS	F19 Ignition coil	