CHERY A5

CHERY

Electric Equipments Position Figure



After-sales Service Dept.
Chery Automobile Co.,Ltd.



CHERY A5 Electric Equipments Position Figure

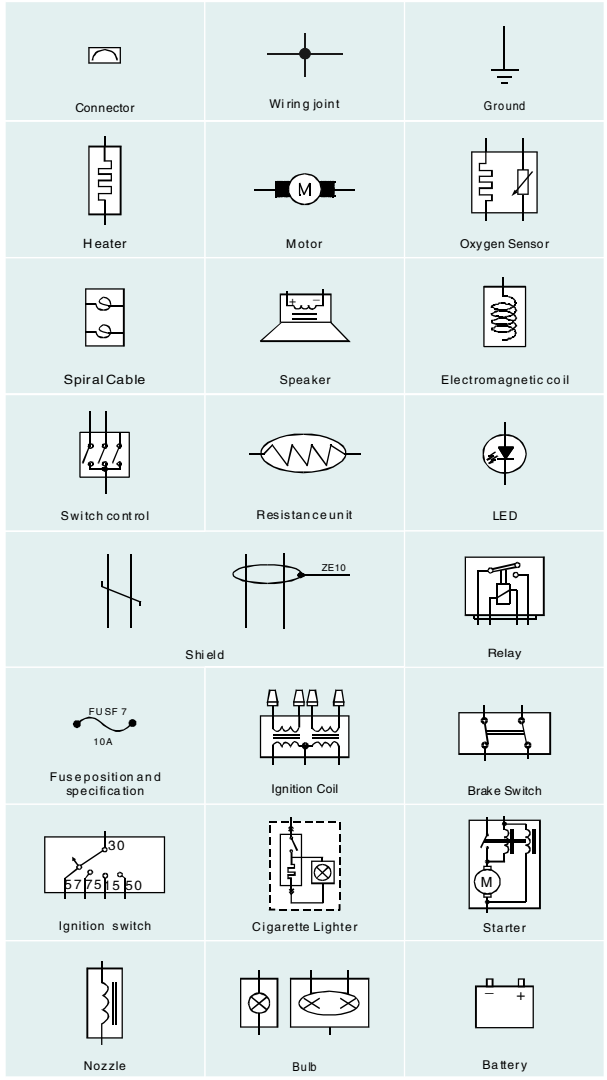
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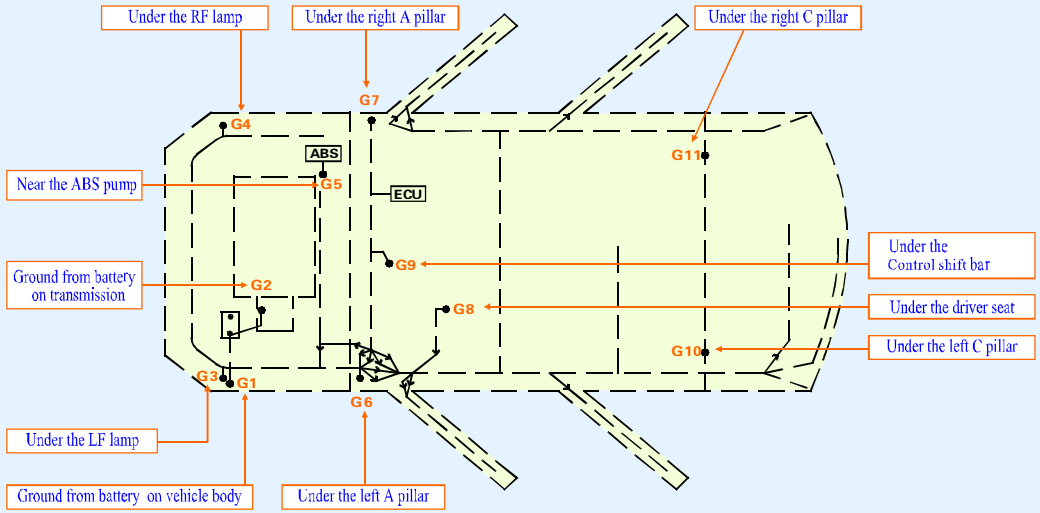
Note：This circuit manual is based on 484model,if there are any incompatibilities please refer to the vehicle.

Figure reading description

1. Instruction of Main Circuit Symbols

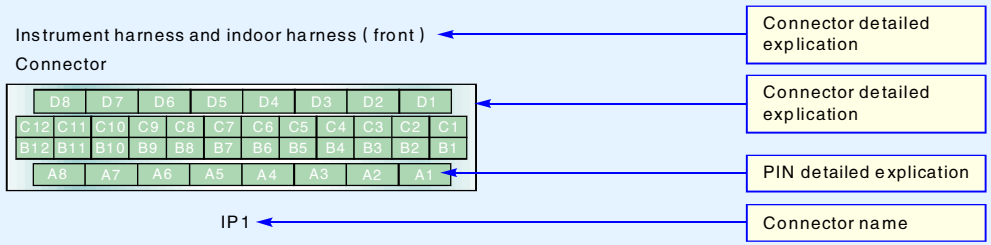


2. Distribution of Various Earth points and Main Modules



3. PIN Definition Explanation

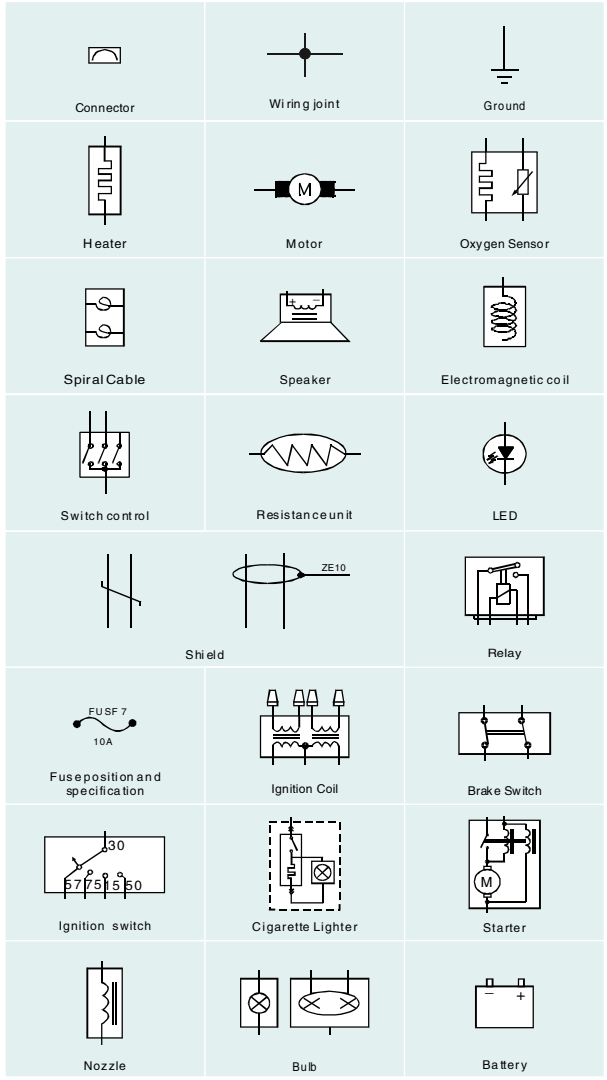
The PIN definition of the circuit theory diagram: For instance as follows:



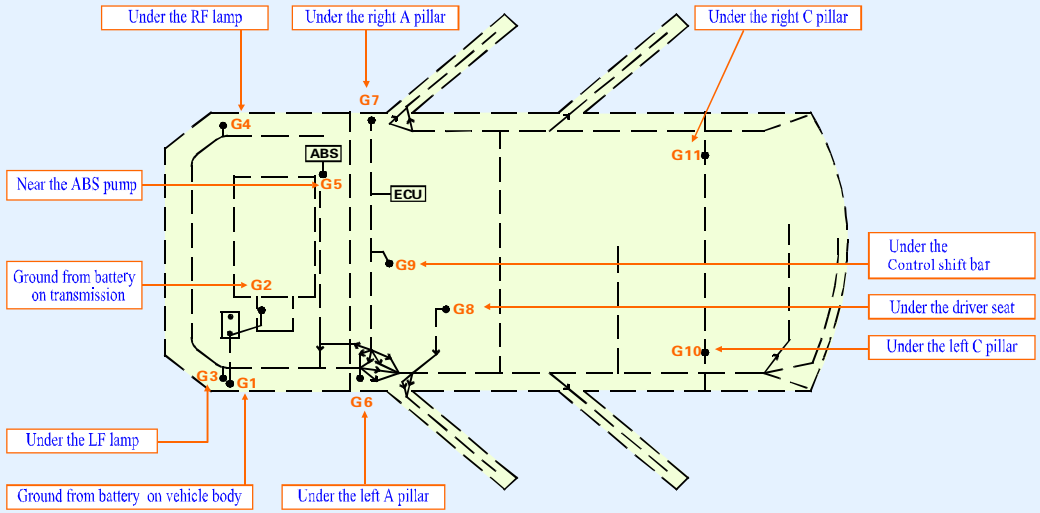
"To IP A/5" indicates "to #5 PIN of plug A of IP Module"
"To ECU5" indicates "to #5 PIN of ECU"

Figure reading description

1. Instruction of Main Circuit Symbols

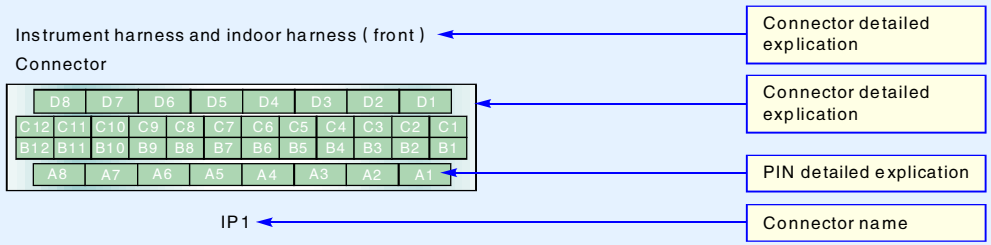


2. Distribution of Various Earth points and Main Modules



3. PIN Definition Explanation

The PIN definition of the circuit theory diagram: For instance as follows:



"To IP A/5" indicates "to #5 PIN of plug A of IP Module"
"To ECU5" indicates "to #5 PIN of ECU"

CHERY A5 Electric Equipments Position Figure



4. Number of main circuit board within relay box

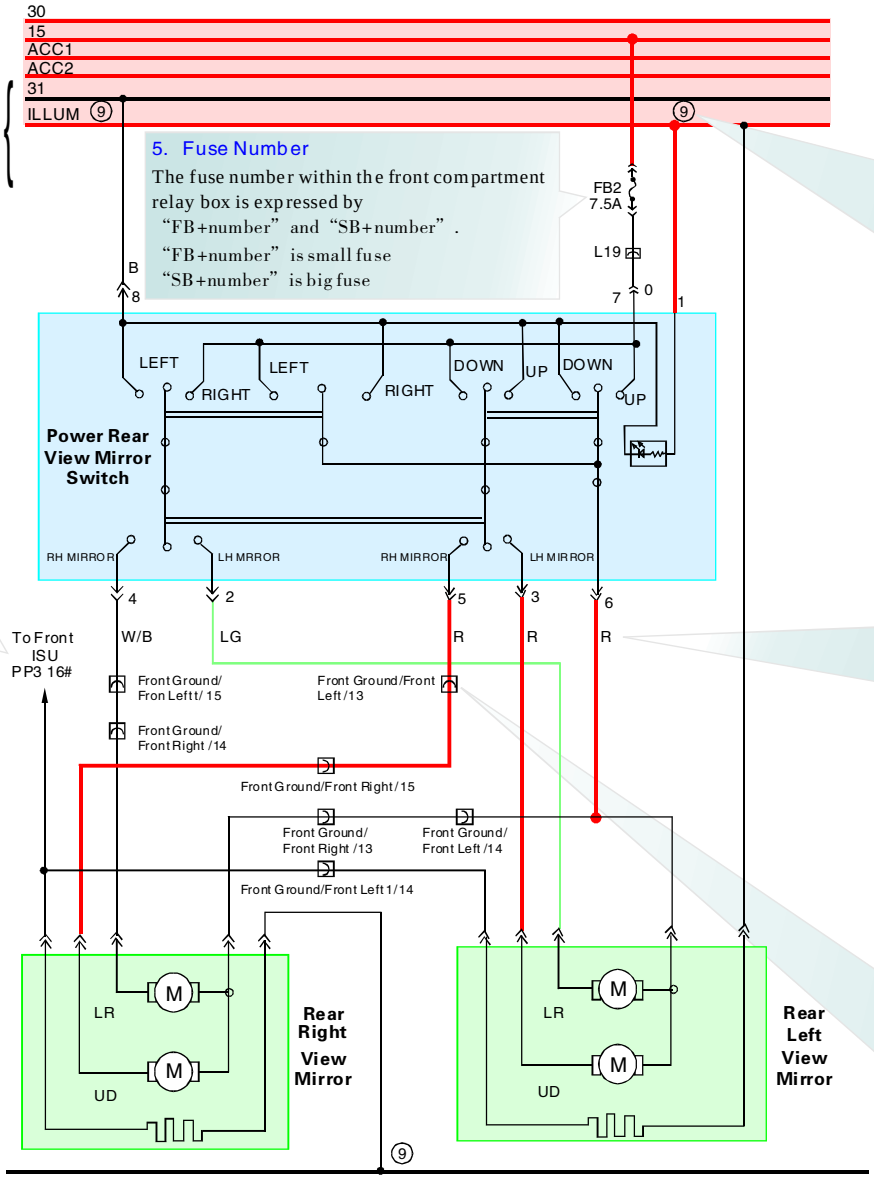
30: From the battery
15: Ignition Switch IGN
ACC1: Ignition Switch ACC (To Mainly Provide The Air-Conditioning System With Power)
ACC2: Ignition Switch ACC（To Provide The Wiper System, Cigarette Light, and External Power Supply Socket With Power）
ILLUM: Luminous Power Line
31: Ground Wire

7. Notes to connector terminals for front and rear ISU

Front ISU PE1 is port A, PE2 is port B, PP3 is port C,PP4 is port D, PP5 is port E, PP6 is port F.
Rear ISU PE1 is port A, PP3 is port B, PP5 is port C, PP6 is port D.

9.Note

This circuit diagram is mainly designed to provide reference for model 2.0/1.6 automatic basic configuration type.As limited time is likely to give rise to international.



6. Ground points on the vehicle (actual lines shall prevail).

1st. Negative of the battery 7th pin. Near the left rear speaker
2nd. Near the right combination headlamp
8th. Near the left pillar A
3nd. Engine hood Ground 9th pin. Near the handbrake
4th. Near the ABS 10th. Near the clutch
5th. Near the steering column 11th#. Near the front right speaker
6th. Near the rear seat belt

8. The colors of the wire are as follow:

B=Black	
W=White	
G=Green	
R=Red	
V=Violet	
Y=Yellow	
P=Pink	
Br=Brown	
Gr=Grey	
O=Orange	
Lg=Light Green	
Sb=Livid	

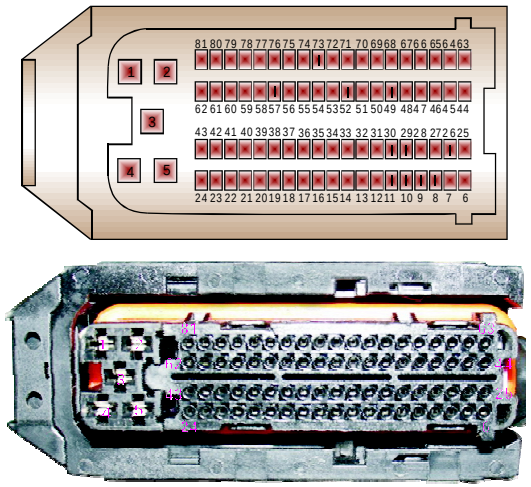
Electric equipments power/circuit power supply
Actuator/control signal
Sensor/feedback signal

10. Notes to plug–in unit

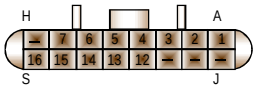
For example: Front ground/front Left/13 means the No.13 terminal for front ground harness and front Left compartment harness connectors.
(Perform lookup according to the notes to connectors)

Connector Note

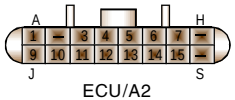
ECU plug–in unit



ECU and Instrument Harness Plug–In Unit

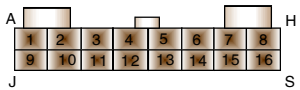


ECU/A1



ECU/A2

Engine and Front Ground Harness Plug–In Unit



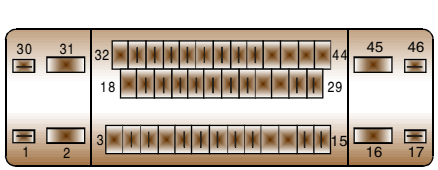
ECU/Front Ground

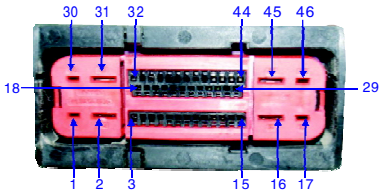
Engine control unit pin description

Pin	Connect point	Pin	Connect point
1	Oxygen sensor heating	42	Inlet temperature
2	Ignition coil 2	43	
3	Ignition coil to ground	44	Non–Persistent power
4	Oxygen sensor heating	45	Non–Persistent power
5	Ignition coil 1	46	Canister purge valve
6	Injection nozzle 4(the 2nd cylinder)	47	Injection nozzle 3 (the 4th cylinder)
7	Injection nozzle 2 (the 3rd cylinder)	48	
8	Engine speed	49	
9	Coolant temperature	50	Fan control 1
10	Fuel consumption	51	Electric ground 2
11	Trouble indicator	52	
12	Persistent power	53	Electric ground 1
13	Ignition switch	54	Electric throttle position
14	Main relay	55	Lower oxygen sensor
15	Engine speed sensor A	56	
16	Pedal accelerator position sensor	57	
17	Sensor ground 1	58	Brake switch
18	Upper oxygen sensor	59	Vehicle speed signal
19	Knock sensor A	60	Mid–pressure switch
20	Knock sensor B	61	Power ground 1
21	Brake lamp	62	CAN communication
22		63	Non–continuance power
23	Accelerating sensor	64	Electric throttle control
24		65	Electric throttle control
25		66	Electric throttle control
26		67	Electric throttle control
27	Injection nozzle 1(the 1st cylinder)	68	Cooling fan
28		69	A/C relay
29		70	Fuel pump relay
30		71	Diagnose K wire
31	EOBD inspect lamp	72	
32	5V power 2	73	Anti–theft equipment
33	5V power 1	74	Clutch switch
34	Engine speed sensor (B)	75	A/C switch
35	Sensor ground 3	76	Power turn switch
36	Sensor ground 2	77	Headlamp switch
37	Air flow sensor	78	Sensor ground
38	Electric throttle position	79	Phase sensor
39	Engine coolant temperature sensor	80	Power ground 2
40	Accelerate pedal position sensor	81	CAN communication
41	A/C pressure		

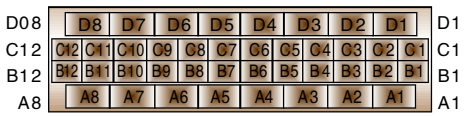


ABS plug–in unit

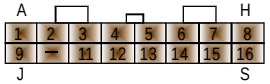




Instrument and Front Ground Harness Plug–In Unit

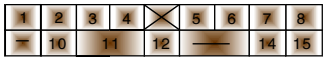


Front Ground/Instrument



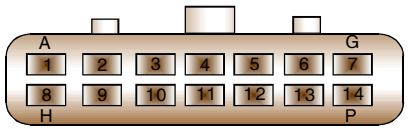
Front Ground/Instrument

Instrument and Air Conditioner Plug–In Unit



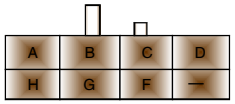
Instrument/Air Conditioner

Front Ground and Front Engine Compartment Harness Plug–In Unit



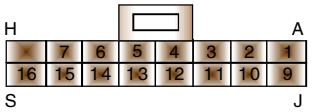
Front Ground/Front Engine Compartment

Front Ground and Roof Harness Plug–In Unit



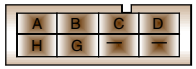
Front Ground/Roof

Front Ground and Front Right Door Harness Plug–In

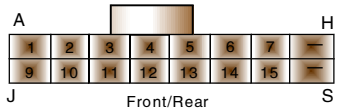


Front Ground/Front Right Door

Front Ground and Rear Ground Harness Plug–In Unit

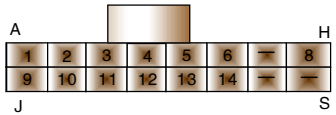


Front/Rear

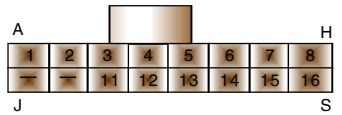


Front/Rear

Front Ground and Front Left Door Harness Plug–In Unit

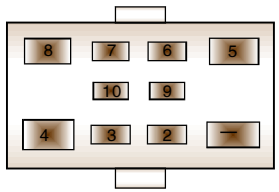


Front Ground/Left 1



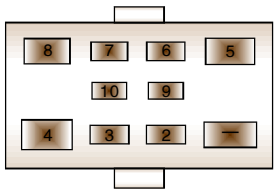
Front Ground/Left 2

Rear Ground and Rear Left Door Harness Plug–In Unit



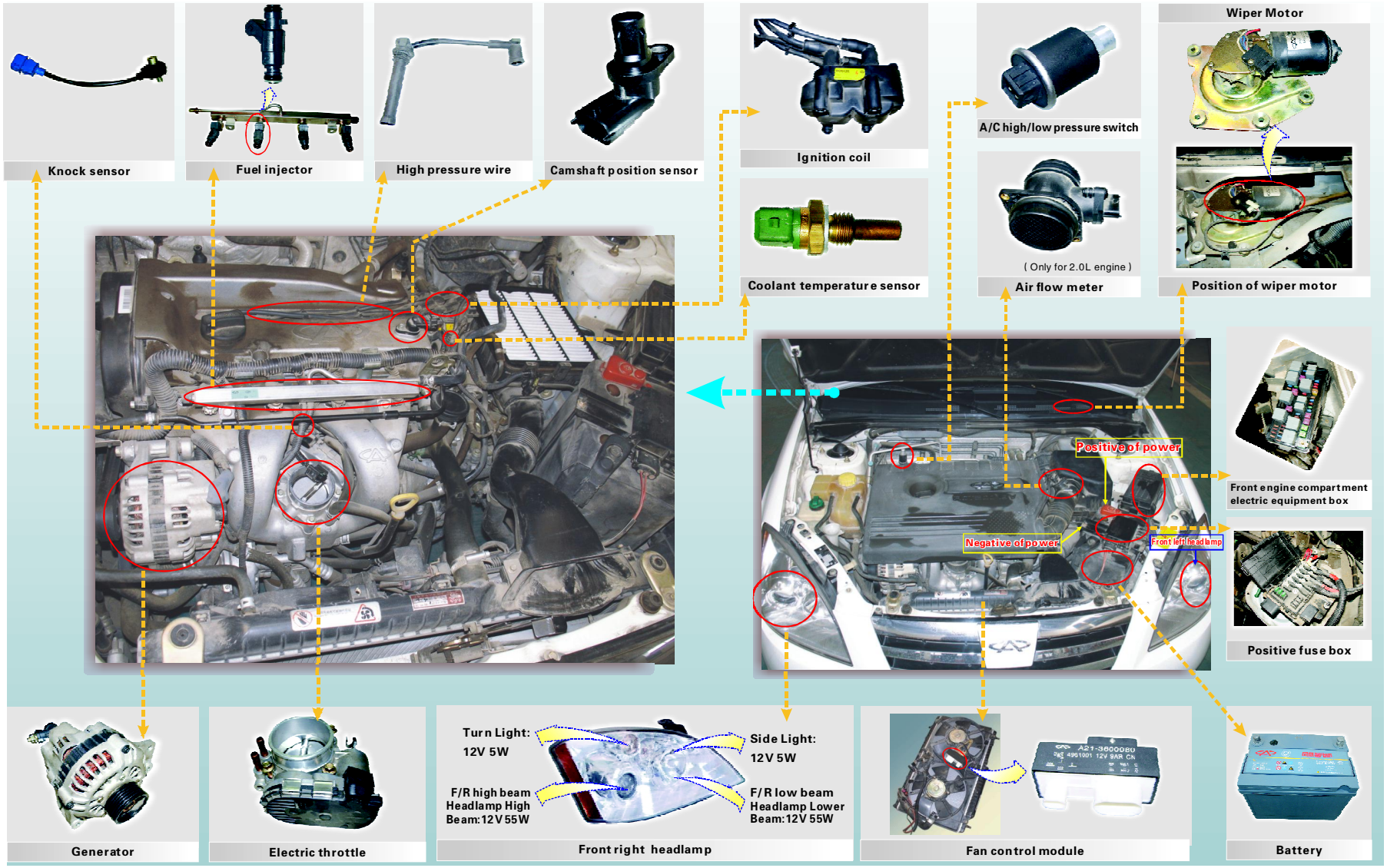
Rear Ground/Rear Left

Rear Ground and Rear Right Door Harness Plug–In Unit



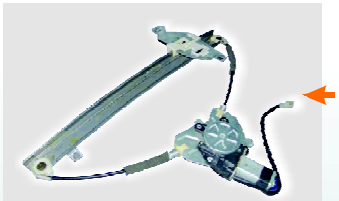
Rear Ground/Rear Right

Position of front engine compartment electric equipment





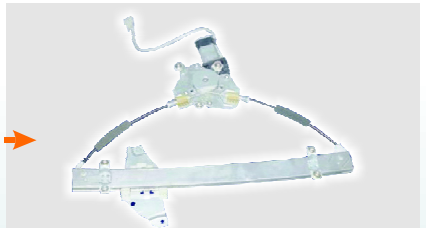
Position of Four Doors Electric Equipment



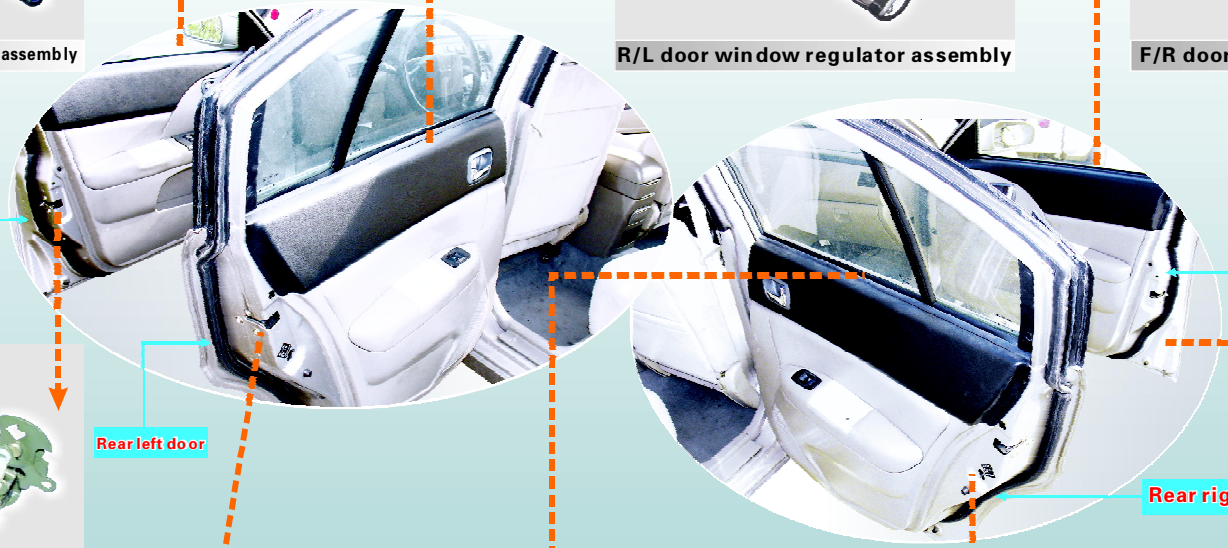
F/L door window regulator assembly

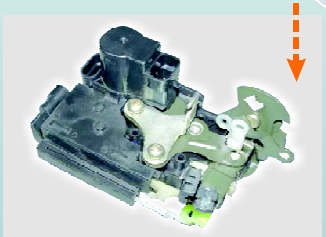


R/L door window regulator assembly

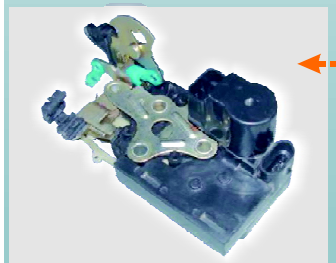


F/R door window regulator assembly

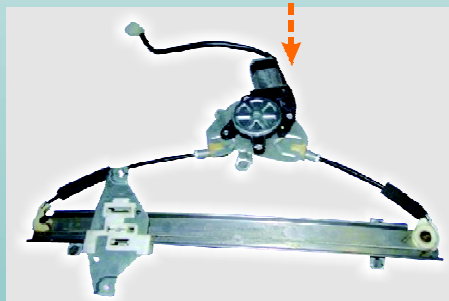




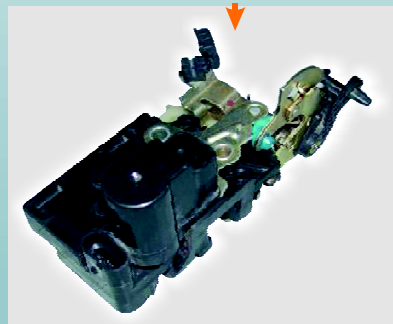
Front left door lock



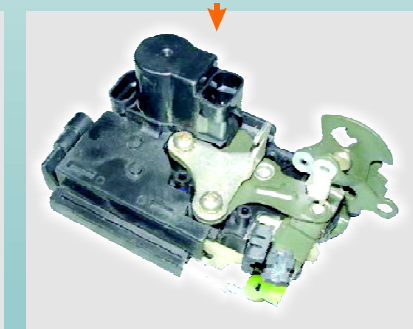
Rear left door lock



R/R door window regulator assembly

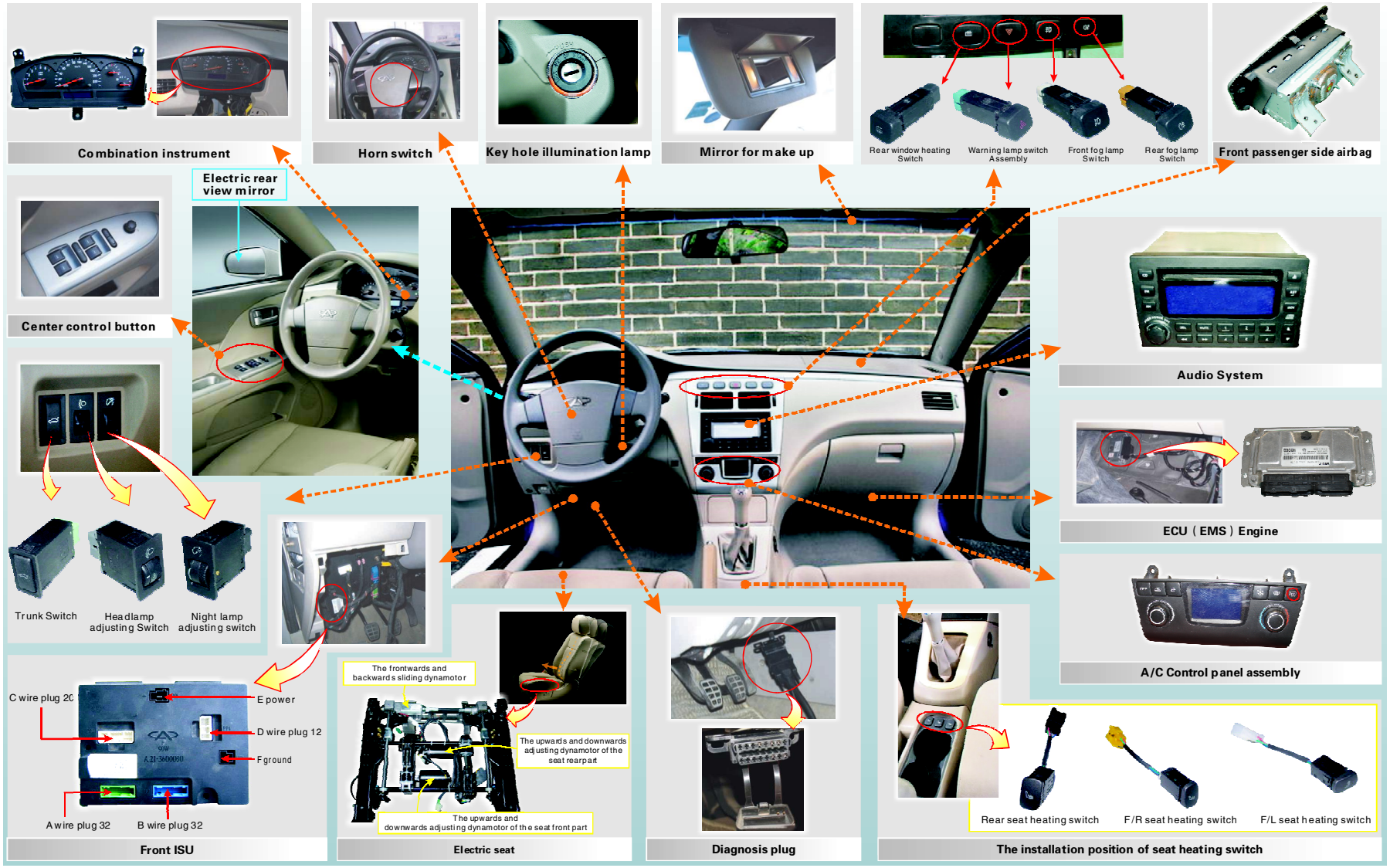


Rear right door lock



Front right door lock

Position of instrument electric equipment

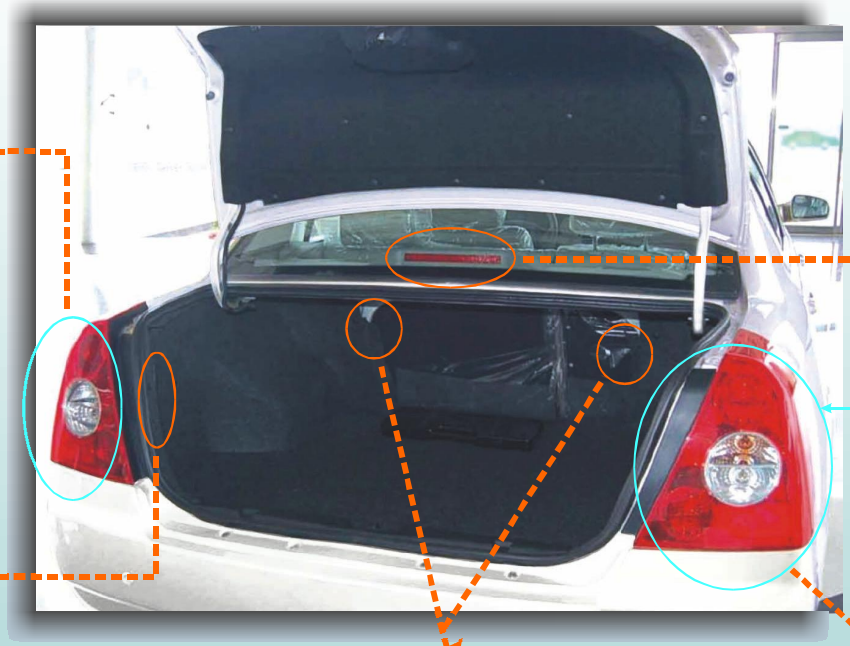


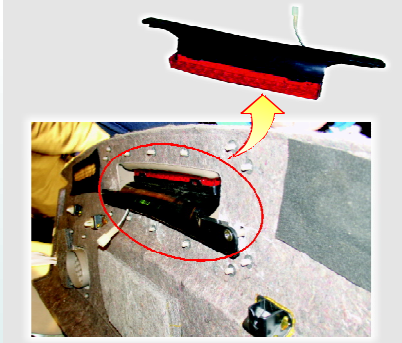


Position of trunk electric equipment



Rear left lamp





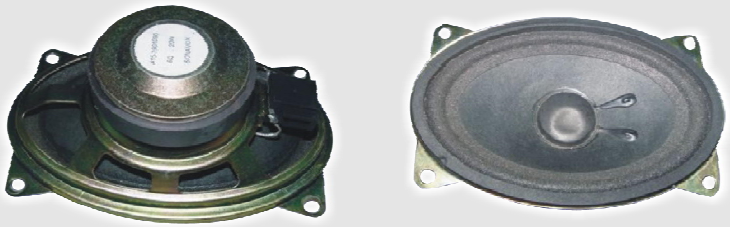
High-mounted brake lamp

Rear right lamp

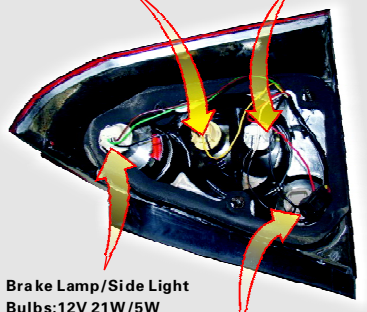




Rear ISU



Rear Reproducer



Tail Lamp Assembly

Starting and Charging System

1. Circuit diagram

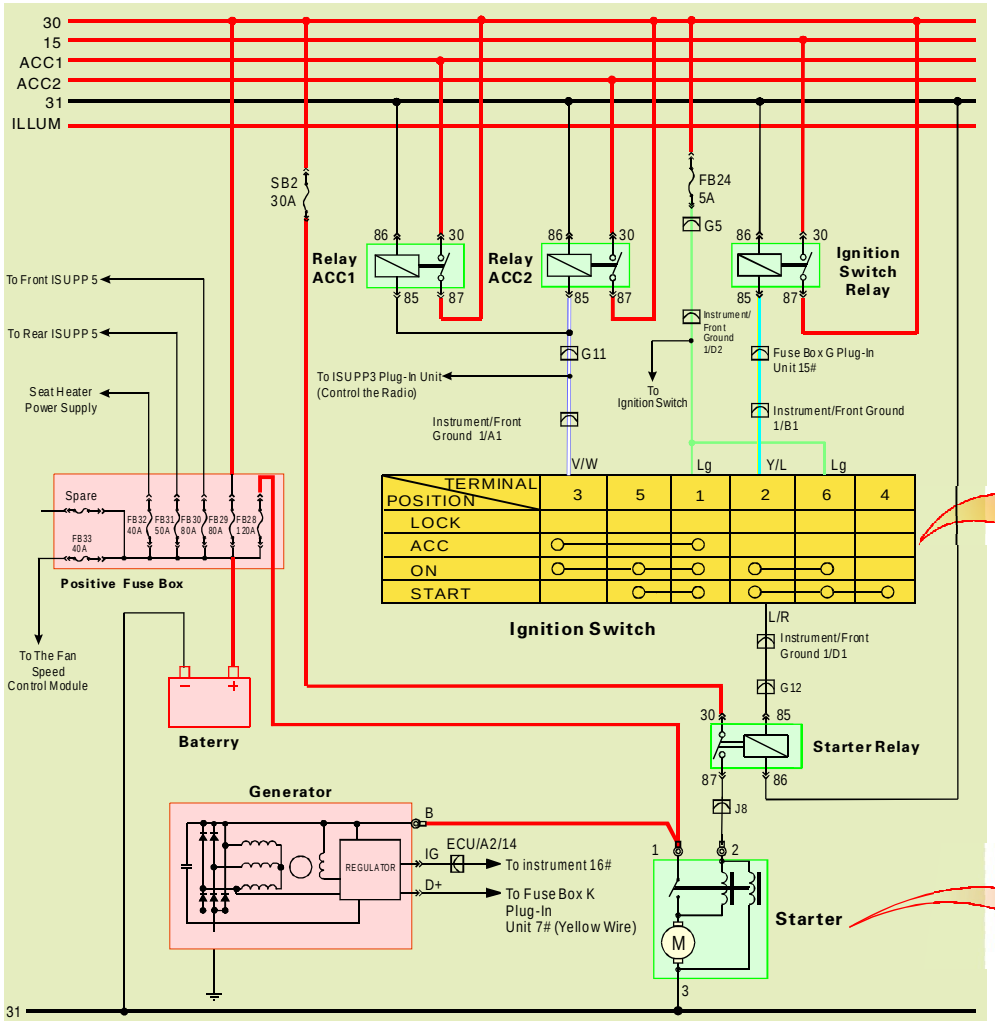


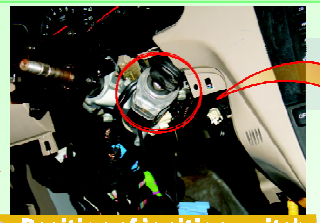
Figure8–1 Starting and Charging System Circuit Diagram

Ignition switch:

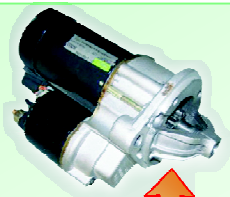
1. 1# and 6# pin of ignition switch is the power of battery 30.

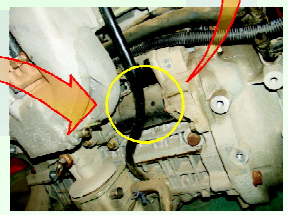
2. When the ignition switch is at the ACC position, the 1#、3# pin of ignition switch is connected, and ACC1 and ACC2 relay both get electricity. The contact point close, 30th live wire–87# pin of ACC1 relay–30# pin of ACC1 relay–ACC1 wire get electricity; 30th live wire–87# pin of ACC2 relay–30# pin of ACC2 relay–ACC2 wire get electricity.

3. When the ignition switch is at the ON position, the 1#、3#、5#pin of ignition switch is connected, and ACC1 and ACC2 wire both get electricity; the 2#、6#pin of ignition switch connected,30th live wire→5Afuse Fb24→6# pin of ignition switch→2# pin of ignition switch→85# pin of ignition relay→86# pin of ignition relay→31 ground. The ignition relay get electricity at the time, and contact point close, 30th live wire→87# pin of ignition relay→30# pin of ignition relay, then the 15th line get electricity.


Position of ignition switch


Ignition switch


Starter

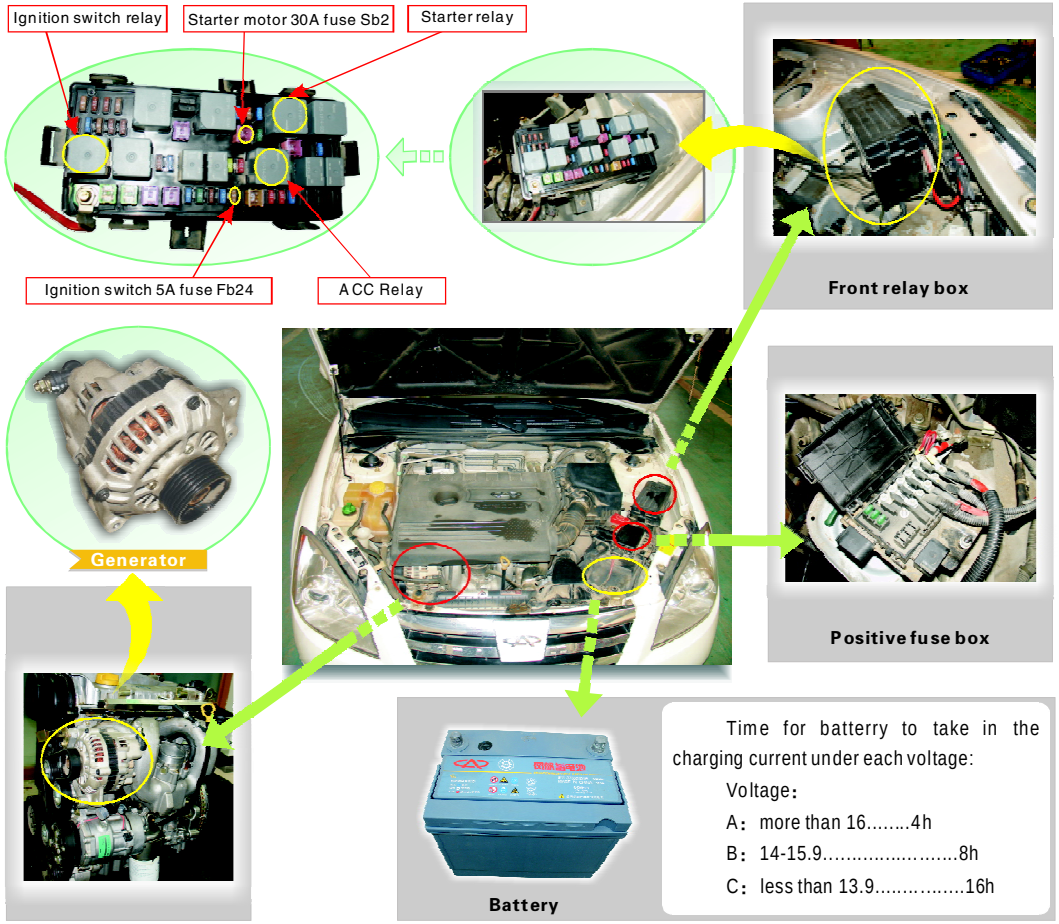


Technical data of starter

Voltage		12V	
Output power		0.8Kw	
Time of starting		30secs	
Rotate direction		Clockwise from the pinion side	
Length of brush		19m(0.650in)	
Gears of pinion when starting		9	
Speciality		Condition	Guarantee
Temperature	No-Load	11V	Less than 55A, more than 5000r/m
	Load	9.5V 0.7Kg.m	Less than 270A, more than 1200 r/m
	Brake	7.7V	Less than 600 A, 1.3Kg • m (94scales/feet)more than
Working voltage of electromagnetic switch		More than 8 V	



2. Equipment position figure of starting and charging circuit



Time for batterry to take in the charging current under each voltage:

Voltage:

A: more than 16.....4h

B: 14-15.9.....8h

C: less than 13.9.....16h

Notice for Maintain Generator:

1.Do not mistake the polarity of IG connection pole and L connection pole.

2.The line between IG connection pole and L connection pole should not be short circuit, do remember to pass through the charging indicator lamp when connect them.

3. There should be no load between the IG coil and E pole.

3. Starting and Charging System Circuit analyse

The starting and charging circuit is shown as figure 8-1. The charging system is a system charging the battery with the output electricity of the AC generator.

When the ignition switch is connected, current flows into the excitation coil, and the coil is initially powered. When the engine starts , stator coil begin to generate electricity, the excitation coil is powered by the output current of stator coil.

The output power of the AC generator increases with the augment of excitation current. And decreases with the fall of the current. When the battery voltage (the voltage of the S end of AC generator) reaches the adjusting voltage, the excitation current is cut off. And when the battery voltage is less than the adjusting voltage , the voltage adjustor controls the excitation current to adjust the output voltage and keep it invariableness.

1. Charging circuit

Gnerator B→1#pin of starter→positive connection fuse box FB28-battery positive pole→vehicle body ground、engine ground→ground line.

2. Starting circuit

(1) The first grade control circuit

When the ignition switch is at the ST position, battery voltage-positive line fuse box 80A fuse Fb29→5A fuse Fb24→6# pin of ignition switch→4# pin of ignition switch→85# pin of starter relay→86# pin of starter relay→31ground line

(2) The second grade control circuit

battery voltage→positive line fuse box 80A fuse Fb29→30A fuse Sb2→30# pin of starter relay→87# pin of starter relay→2# pin of starter-

Start suction coil→starter-ground.

→2# pin of starter→keep coil→ground.

(3) Main circuit

battery voltage→positive line fuse box 120A fuse Fb28→1# pin of starter→electromagnetic switch→starter→ground.

ECU System Circuit

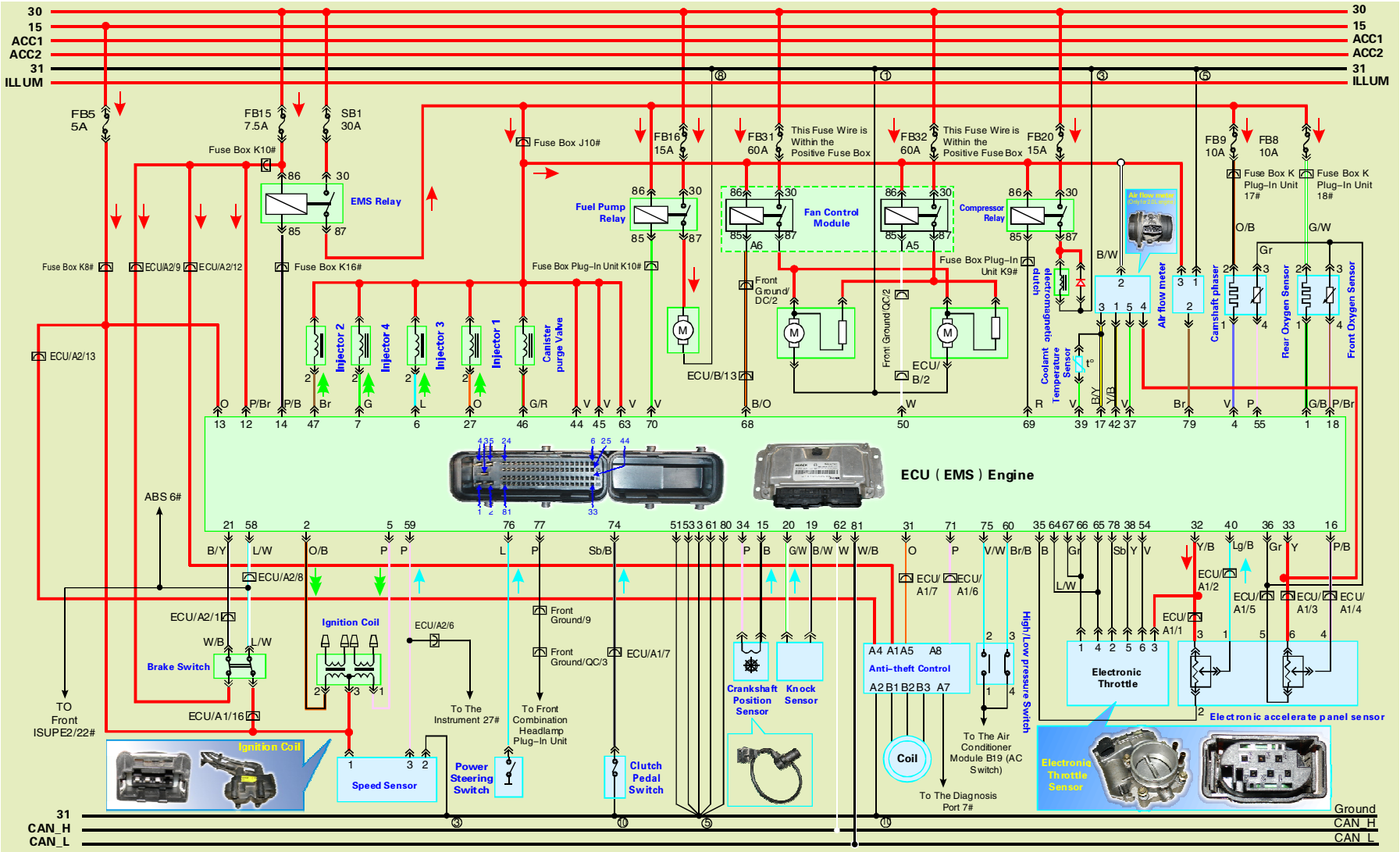


Figure9–1 ECU System Circuit Diagram



Engine management system is mainly composed of sensor、electronic control unit（ECU） and actuator three parts. It controls the basic air intake volume、fuel inject volume and ignition advance angle when then engine is running. The A5 automobile apply the ME7.9.7 electric control system, the constitution is shown as figure 9-2：

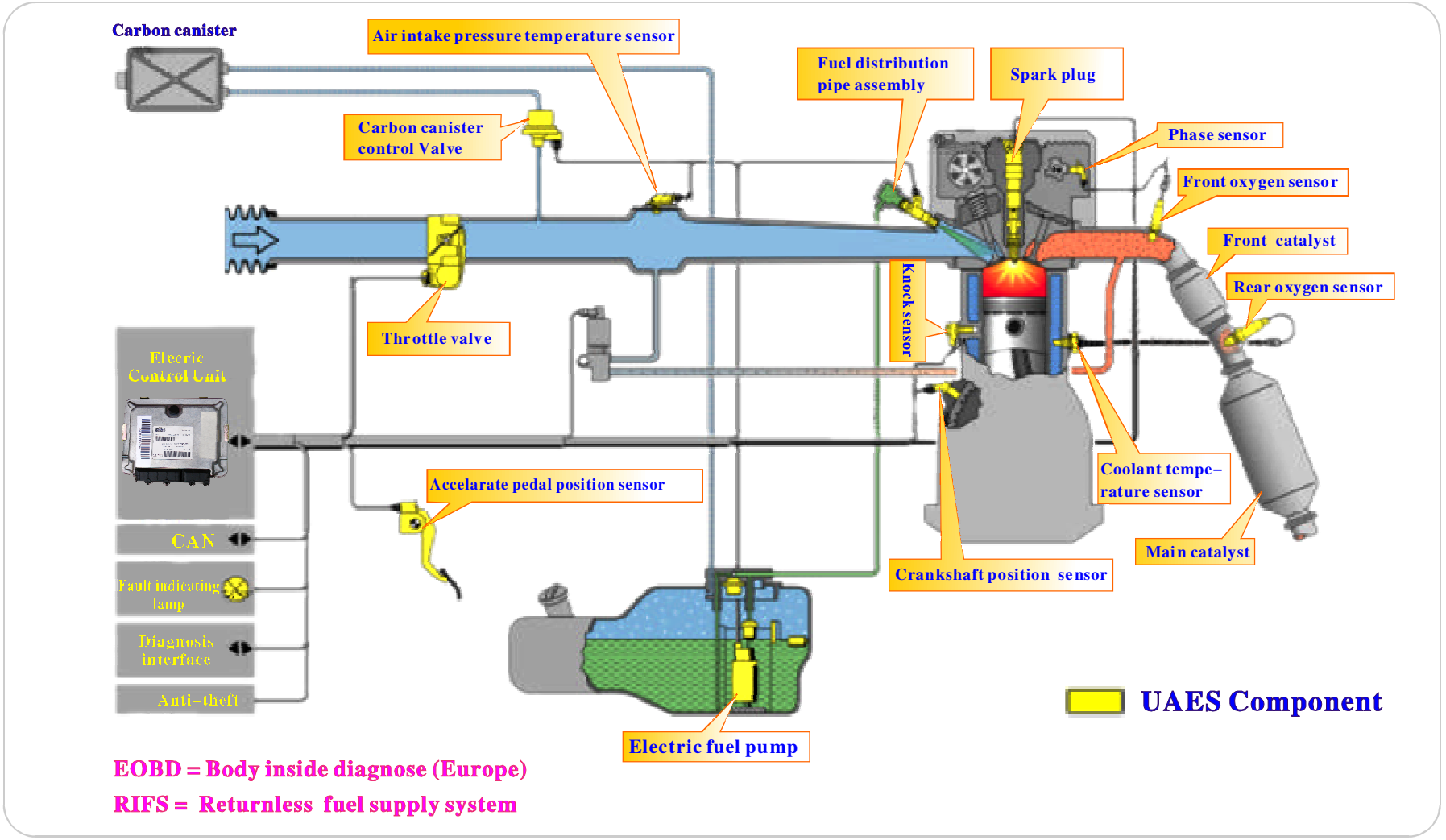


Figure9-2 ME7.9.7 Electric Control System Constitution

◆ Engine ECU

ECU receives and deals with the engine state signals which is inputted by each sensor, and drive each actuator work. It enables the engine work according to established procedure and insures the well motivity、fuel economy and drain performance.



Figure9-3 Engine ECU

Fault description:

Idle speed not stable、 can not well accelerate、 can not start、 idle speed is too high、the exhaust exceeds the standard、 starts difficult、 A/C invalidation、 fuel injector control invalidation、 flameout and etc.

Trouble Analysis:

（1）The over loading of outer connect set results in the burn of ECU inner components, which leads to invalidation.

（2）Water gets into the ECU and results in the rust in the line board.

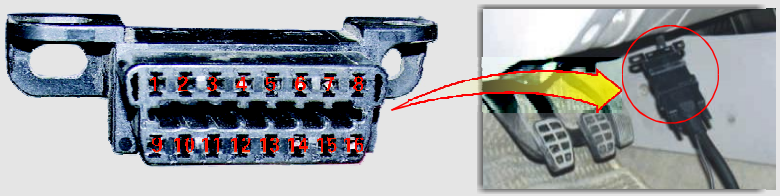


Figure9-4 Diagnosis plugs

Troubleshoot:

（1）（connect the plug）use the engine data K wire to read engine fault record

Start the ignition switch, use the engine data K wire （the standard diagnosis plug 7# pin）ground （that's to connect the 4# and 7# pin of diagnosis plug with a lead） over 2.5s, if there is DTC in the ECU fault memorizer, the engine fault lamp will output the flash code, that's P-CODE. For example: the flashing of P0203 is : flash 10 times continuously-intermission-flash 2 times continuously-intermission-flash 10 times continuously-intermission-flash 3 times continuously.

（2）（Remove the plug）check whether the ECU connect lines are well, and whether the ECU power、ground is normal.

（3）Check whether the working of outer sensor is normal, whether the output signal is creditable and whether the line is well.

（4）Check whether the working of actuator is normal and whether the line is well.

（5）Finally replace the ECU to test.

◆Input signal

（1）Air Flow Meter

The air flow meter（MAF）sensor measures the volume of air that inhaled into the engine. Engine control module（ECM）uses the data to calculate the spout time、ignition timing and engine load.

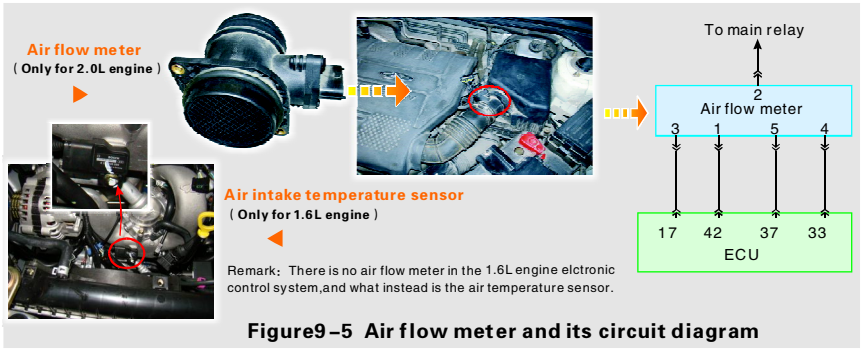


Figure9-5 Air flow meter and its circuit diagram

Trouble analysis: Sensor invalidation result from the pollution of dust、oil and water.

Troubleshoot:

Static state test（zero flux test）:

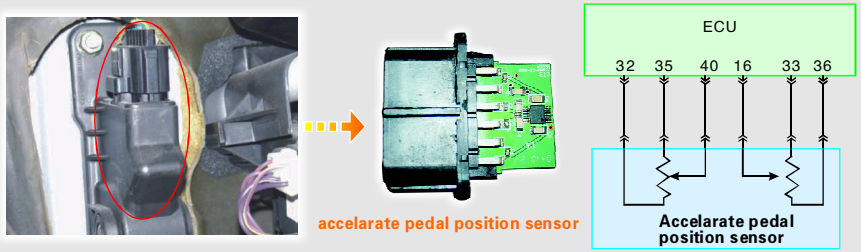
The 1st pin is air intake temperature pressure sensor, connecting to the 42nd pinof ECU; the 3rd pin grounds and connects to the 17th pin of ECU;the 4th pin inputs 5V reference voltage, and connect to 33rd pin of ECU; the 2nd pin inputs 14V rating voltage; the 5th pin is output voltage, and connects to the 37th pin of ECU.

Check the output voltage of 5th pin, if it is over 1.025V, then the sensor will be disqualification.

Dynamic test: If it is primarily diagnosed as the sensor's trouble, connect the emission analyzer and check the performance in the two working condition.

（2）Electric throttle and accelarate pedal position sensor

The driver offer the engine real time torque requirement to ECU with the help of accelerate pedal, ECU send the impulse signal to the electric throttle according to the information it gained.Therefore, the motor in the electric throttle run and the throttle open to the required angle.



Description of the pins of throttle position sensor:

1#、2# pin is 5V reference voltage anode;

3#、5# pin is 5V reference voltage cathode;

4#、6# pin is signal output voltage signal.

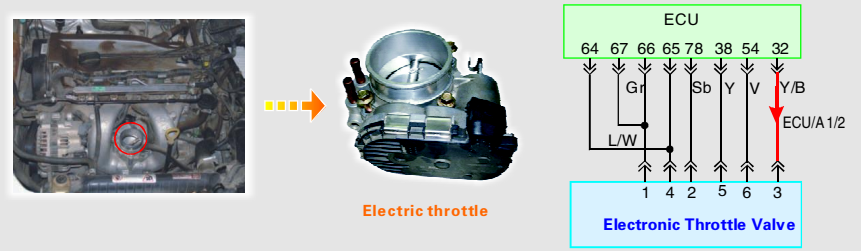


Figure9-6 Electric throttle position sensor and its circuit diagram

Description of electric throttle pin:

The 1st pin is the motor anode, connect to the 66th and 67th pin of ECU;

The 2nd pin is the potentiometer cathode, conenct to the 78th pin of ECU;

The 3rd pin is the potentiometer anode, connect to the 32nd pin of ECU, 5V power;

The 4th pin is the motor cathode, connect to the 64th and 65th pin of ECU;

The 5th pin is the signal output 1, connect to the 38th pin of ECU.

The 6th pin is the signal output 2, connect to the 54th pin of ECU.

（3）Crankshaft position sensor

The crankshaft position sensor is to supply engine speed、crankshaft rotating angle and TDC signal to ECU. I t is used to control the engine ignition and fuel eject timing.

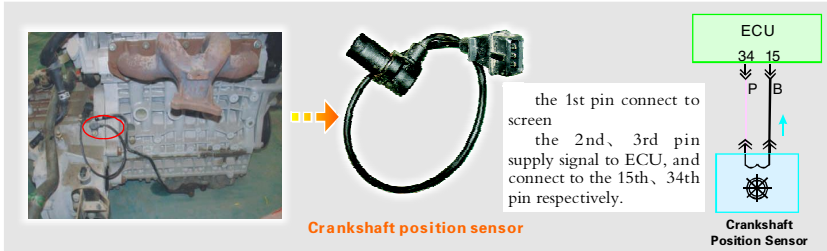


Figure9-7 Crankshaft position sensor and its circuit diagram

Fault description: fault phenomenon.

Troubleshoot: remove the plug, set the multimeter at the OHM position , the two pens connect to the 2nd、3rd pin respectively. The rating resistance will be 860Ω ±10% when it is 20℃.

（4）Phase sensor （camshaft position sensor）

The sensor supply the crankshaft phase information to ECU, that's to distinguish the compression TDC and exhaust TDC.

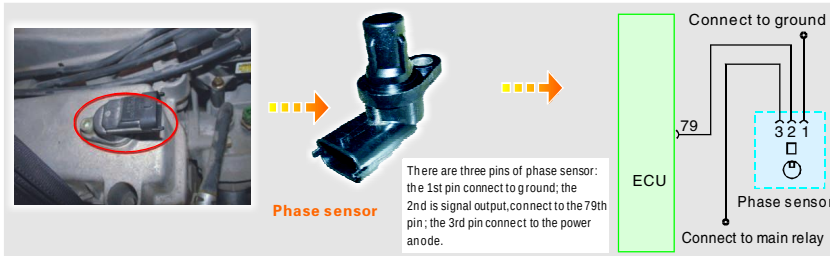


Figure9-8 Phase sensor and its circuit diagram

Fault description: can not start, emission exceed standard, fuel consumption increased and so on.

Troubleshoot: （connect the plug） start the ignition switch but not the engine, set the multimeter at the DC volt position, connecting the two pens to the 3rd、1st pin of sensor, confirm that there is a reference voltage of 12V. Start the engine, then check whether the 2nd pin signal is normal by using the oscillograph.

(5) Knock sensor

The knock sensor supply engine knock information to ECU, and control the knock.

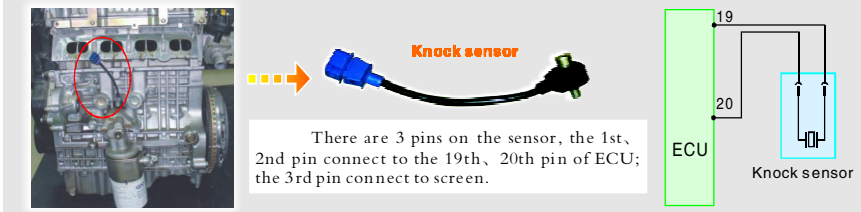


Figure9-9 Knock sensor and its circuit diagram

Fault description: It can not accelerate well

Fault analysis: Several kinds of fluid such as fuel、coolant、brake fluid、water contact to sensor for long time wil result in the erode of sensor.

Troubleshoot: (Remove the plug) Set the multimeter to the ohm position, connecting the two pens to the 1st、2nd and 1st、3rd pin respectively, and the resistance in normal temperature should be more than 1MΩ. Set the multimeter at the mV position, and knock the knock sensor with a hammer gently, then there will be voltage signal output.

(6) Coolant temperature sensor

The coolant temperature sensor supply coolant signal to ECU, so as to enable the start、idle speed、ignition timing and injection impulse width modify. There are two pins, and they can exchange to use.

Fault description: Start difficultly

Troubleshoot: (Remove the plug) Set the multimeter at the ohm shift, the two pens connect to the 1st、2nd pin of sensor respectively, the rating resistance is 2.5kΩ ± 5% when it is 20℃. The other temperatures please refer to table 8-1.

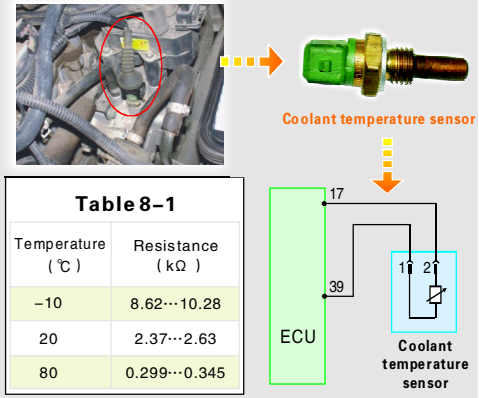


Table 8-1

Temperature (℃)	Resistance (kΩ)
-10	8.62…10.28
20	2.37…2.63
80	0.299…0.345

Figure9-10 Coolant temperature sensor and its circuit

(7) Oxygen sensor

The oxygen sensor is used to detect the content of oxygen in the exhaust,the transmits a signal to ECU, according to the information ECU will make the fuel closed loop control so that the engine can work in the best Condition,and make the CO, HC, NOx compound transformed and depurated mostly by the three-way catalytic converter.

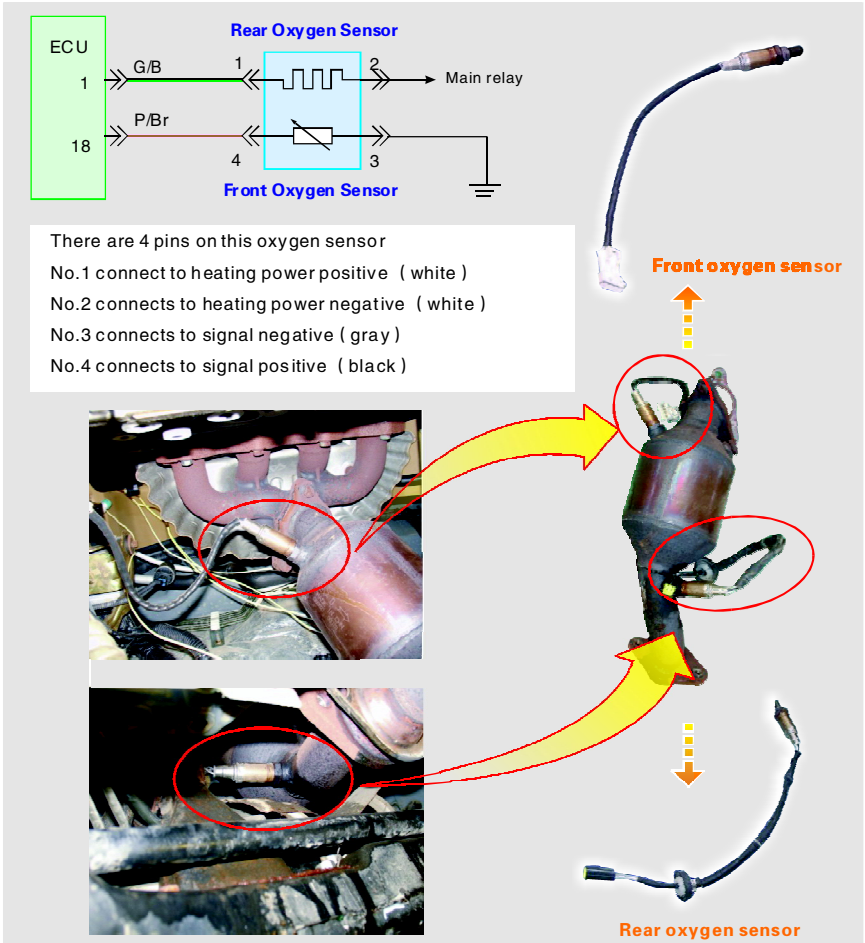


Figure9-11 Oxygen sensor and its circuit



Fault description: Badness idle speed, badness acceleration, badness tail gas, over fuel consume etc.

Fault analysis:

Moisture entering inside of sensor, then the temperature is changed and the pin is broken; the sensor is poisoned (Pb,S,Br,Si)

Troubleshoot:

(1) Disassemble joint, Put digital multimeter to ohm shift, connect meter pen to No.1 (white) and No.2 (white) pins of the sensor. Normally the resistance value is 1~6Ω.

(2) Connect the joint and keep it at idle speed status. When the oxygen sensor reaches to its working temperature 350℃, keep digital multimeter to DC volt shift and connect meter pen to No.3 (gray) and No.4 (black) pins of sensor. Now the voltage should be fluctuate between 0.1– 0.9V quickly (the data also can be gotten from data flow inspected by diagnosis meter) .

(8) Vehicle speed sensor

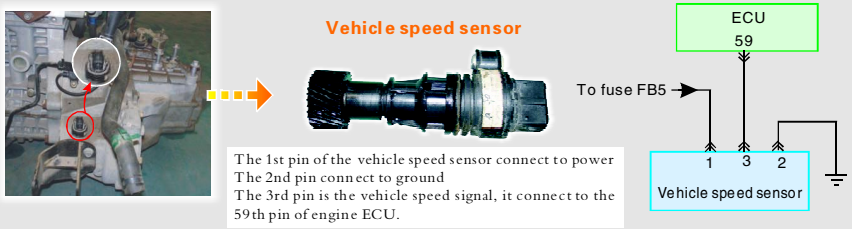


Figure9–12 Vehicle speed sensor and its circuit

(9) A/C pressure switch

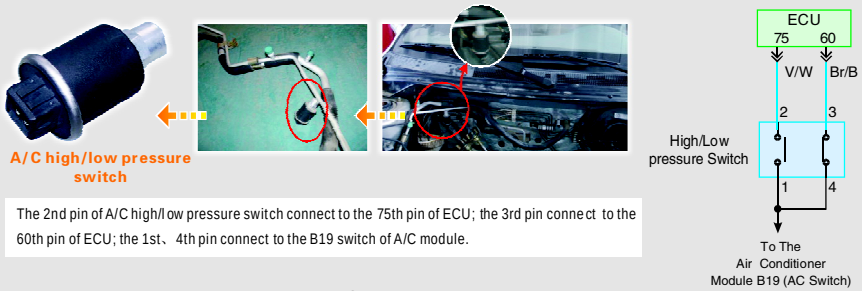


Figure9–13 A/C pressure switch and its circuit

(10) Clutch pedal switch

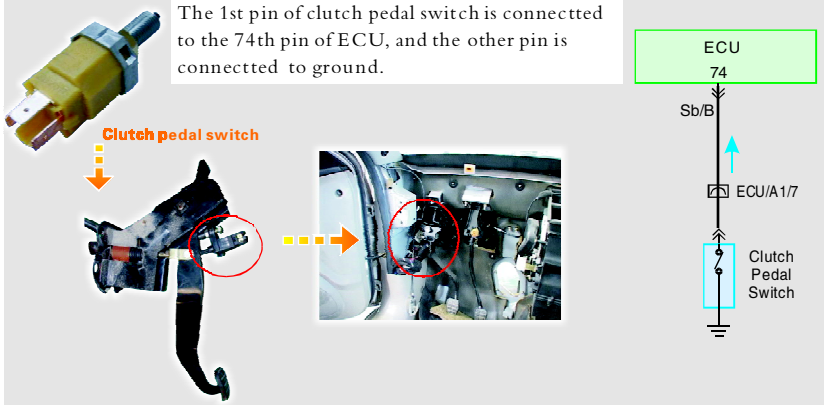


Figure9–14 Clutch pedal switch and its circuit

(11) Power steering switch

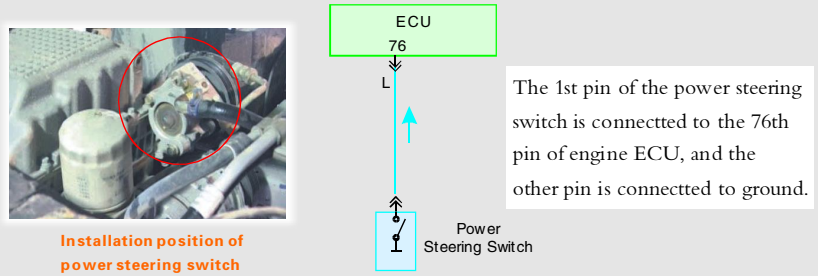


Figure9–15 Power Steering switch and its circuit

◆Actuator

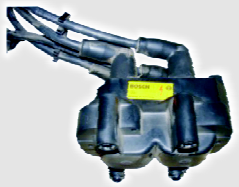
(1) Ignition coil

The ignition coil transforms the low pressure DC of battery to the high pressure electricity, which gets through the spark plug and brings out spark to burn the mixture in the cylinder.





The1st coil primary winding is connectted to the 5th pin of ECU
The 2nd coil primary winding is connectted to the 2nd pin of ECU.
The 3rd pin is connectted to the anode of power
The 4th pin is empty.



Ignition coil

Table 2

Capacity		Cost			Unit
		Min	Model	Max	
Primary winding		0.42	14		V
Resistance (20–25℃)	Elementary winding	11.2	0.5	0.58	Ω
	Secondary winding	3.4	13.0	14.8	kΩ
Electromagnetic induction (20–25℃)	Elementary winding	26.5	4.1	4.8	mH
	Secondary winding	30	32.0	37.5	H
Voltage	Load 50pF	23			kV
	Load 50pF//1MΩ				kV

Figure9–16 Ignition coil

Fault description: can not start.

Fault analysis : The current is too high to burn 、 damage by outside force.

Maintain notice:

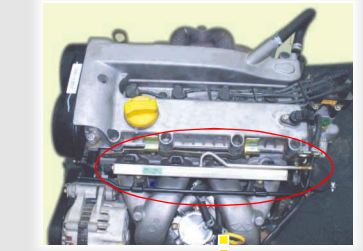
It is forbidden to try the "short circuit test way" to test the ignition function, so as to avoid the damage to electric controller.

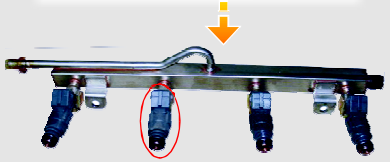
Troubleshoot:

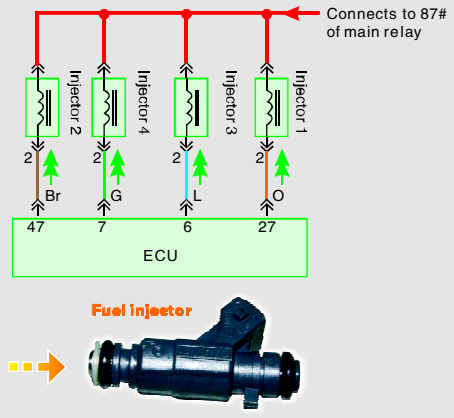
(Remove the plug) set the multimeter at the OHM position, connecting two pens to the two pins of primary winding respectively. When it is 20℃, the resistance is 0.42–0.58Ω , and the secondary winding is 11.2–14.8kΩ. Refer to table 20℃

(2) Fuel injector

ECU sends electric impulse to the coil of injector and forms the magnetic field power.When the power increases enough to overcome the combined force of release spring pressure 、 needle valve gravity and friction, the needle valve begin to rise and the fuel inject procedure start. When the fuel injection impulse stops, the pressure of release spring closes the needle valve again.







Pins: each fuel injector has two pins . The one which is marked with "+" at one side of the shell connects to the 87th pin of main relay output port; the other connects to the 27th、6th、7th、47th pin of ECU.

Figure9–17 Fuel injector and its circuit

Fault description: Idle speed is not well、accelerate not well、can not start (start difficult)and etc.

Fault analysis: Because of the lackness of maintainence, there is colloid accumulate in the fuel injector and result in the invalidation.

Troubleshoot: (Remove the plug) set the multimeter at the ohm position, the two pens connect to the two pins of fuel injector, the rating resistance is 12Ω when it is 20℃.

Advice: clean the fuel injector with specialized clean analyzer.



(3) Fuel pump relay

The battery supplies power to electric fuel pump through fuel pump relay, the relay can only put through the electric fuel pump circuit when starting or the engine is running. When the engine stop running accidently, the fuel pump will also stop automatically.

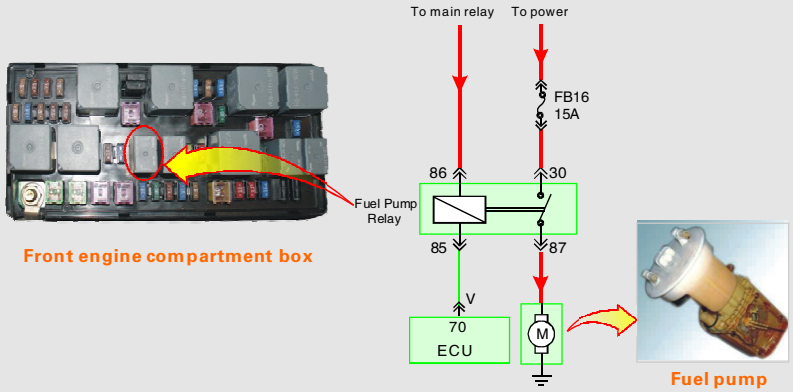


Figure9-18 Fuel pump relay circuit diagram

Fault description: Loud noise when running、can not well accelerate、can not start (start difficult) and etc.

Fault analysis:

For the using of bad fuel:

1. Colloid accumulate and form insulated surface
2. fuel pump bushing and armature locked
3. fuel sensor unit erode.

Troubleshoot: (Remove the plug) set the multimeter at the ohm position, connecting the two pens to the two pins of fuel pump, test the inner resistance, it is not 0 or (that's to say it is not short circuit or open circuit state).

(Connect the plug) connect the fuel pressure gauge at the oil intake pipe, start the engine, check whether the fuel pump work; if it is not work, check the "+" pin to see whether there is power voltage; if it works, observe the working conditions of engine to see whether the fuel pressure is about 300kPa.

(4) A/C relay

The A/C switch open, blower switch open, the A/C pressure is normal, the evaporator temperature sensor detects the correct data, the A/C requirement signal is sent to ECU via these switches. After receiving the signal, ECU controls the A/C relay to close and sends the speed increasing signal to the stepper motor at the same time, and start the electric fan, then the A/C system will start working.

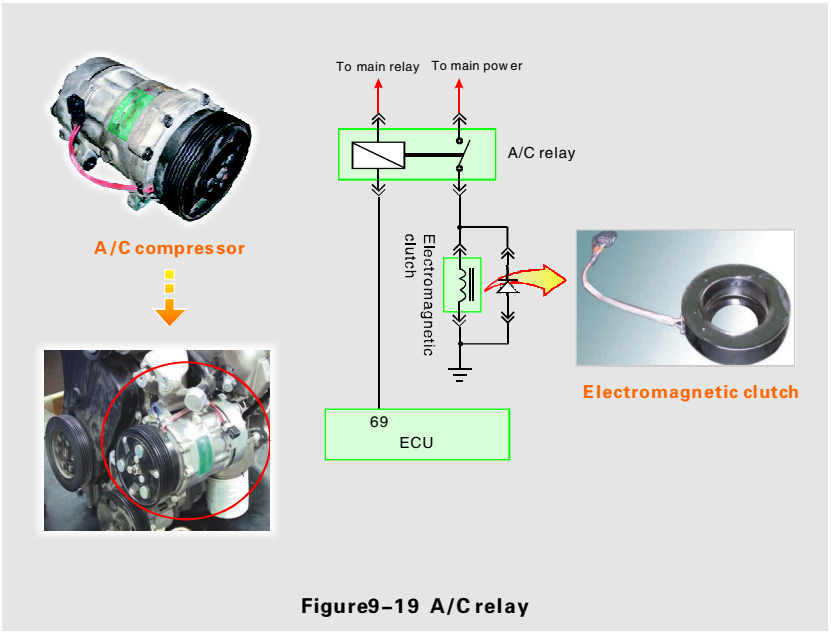


Figure9-19 A/C relay

Common troubles:

1. The blower motor fault (fuse burnt, relay circuit open circuit or short circuit)
2. The A/C pressure is abnormal (high pressure is too high and low pressure is too low) the evaporator temperature sensor fault
3. A/C relay line fault (short circuit to ground、short circuit to power、open circuit)

(5) Cooling fan control module

ECU Controls the running of fan according to the engine coolant temperature and A/C requirement signal, it controls the relay of fan system if conditions are met.

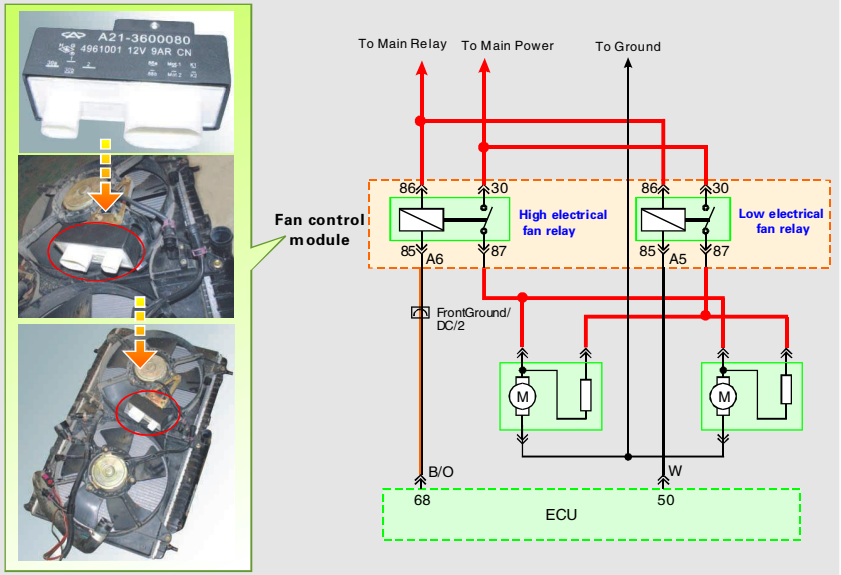


Figure8-20 Cooling fan control module circuit

Common troubles:

1. High speed relay line is short circuit to power;
2. High speed relay line is short circuit to ground;
3. High speed relay line is open circuit;
4. Low speed relay line is short circuit to power;
5. Low speed relay line is short circuit to ground;
6. Low speed relay line is open circuit;
7. Engine coolant temperature sensor fault;
8. Engine air intake temperature sensor fault;

(6) Canister purge valve

Canister purge valve controls the volume of cleaning air flow from charcoal canister to air intake main pipe. The adsorbing capability of carbon canister is limited, if the oil steam adsorbed in the carbon canister can't be consumpt, the oil will volatilize to outside and pollute the air.

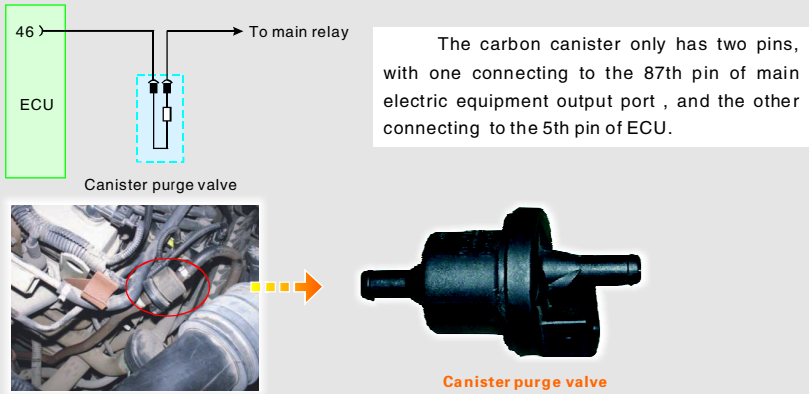


Figure8-21 Canister purge valveand its circuit

Fault description:

The fuel pressure is too low or too high, and start difficultly.

Fault analysis:

Because lacking of maintenance for a long time, it results in that: (1) The filter screen jammed ; (2) Grain impurity result in the serious leakage; (3) Manmade mechanical damage and so on.

Notice for maintenance:

In the maintain procedure: (1) It is forbidden to impact the diaphragm with high pressure gas; (2) It is forbidden to clean it with causticity fluid; (3) It is forbidden to force on it and result in distortion.

Troubleshoot:

Connect the fuel pressure gauge at the oil intake pipe and start the engine to let it work on idle speed, check whether the fuel pressure is about 350kPa; step the accelerate pedal until the engine reaches the speed of 2500rpm, check whether the fuel pressure is about 350kPa then.



ABS System

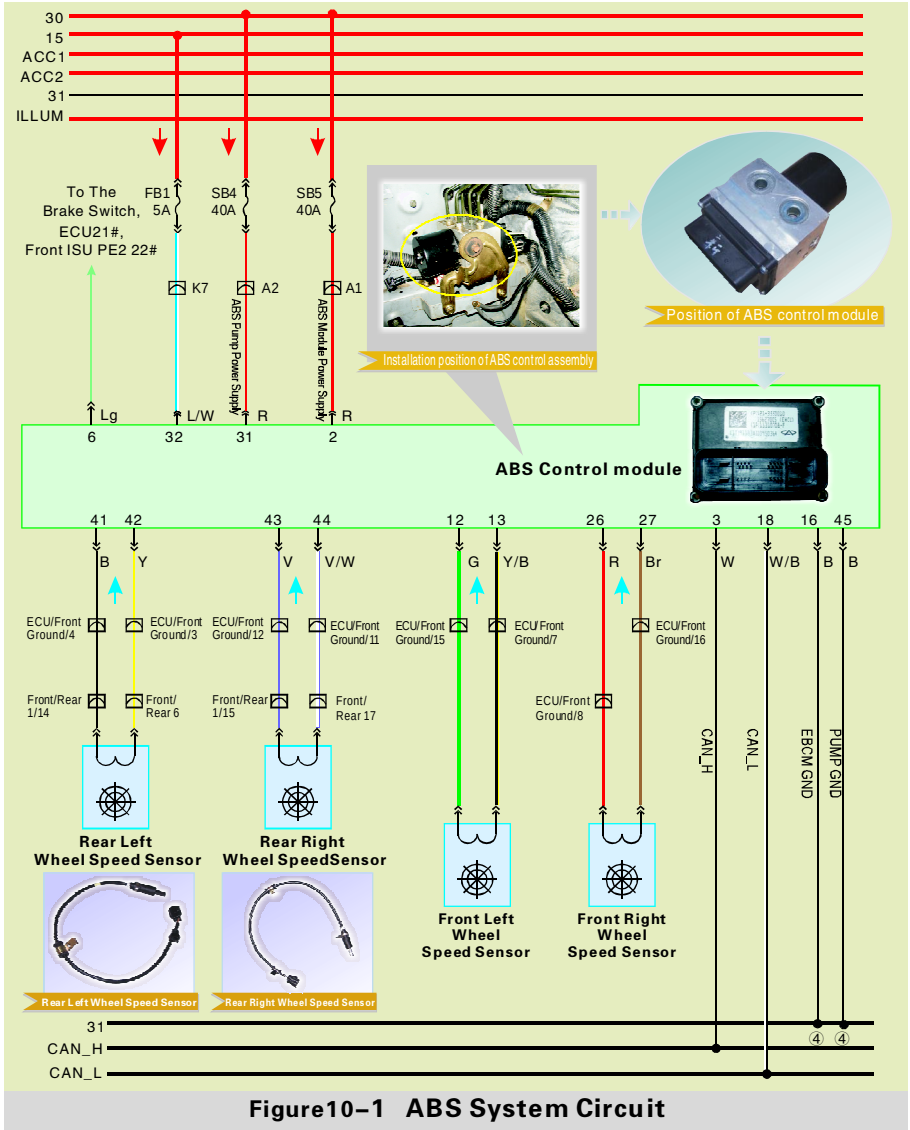
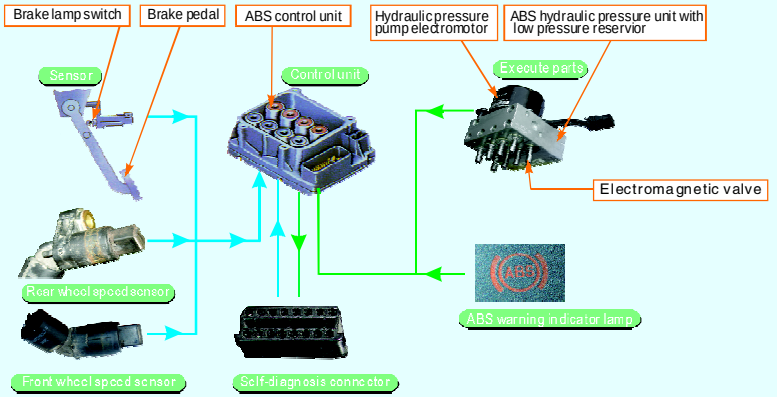


Figure10–1 ABS System Circuit

ABS brake down parts



Circuit analysis: for the cars with no ABS, when forcibly steps down the brake pedal during driving, the wheel speed will decrease suddenly. Once the brake force is more than the friction between wheels and floor, wheels will be braked. The wholly braked wheels will decrease the friction between tire and floor, if the front wheels have braked, driver can hardly control the running direction of the car; and if the rear wheels have braked, the car will swing. The ABS is used to restrain the skidding phenomenon of wheel specially. It will supervise the speed of each wheel and control the hydraulic pressure when braking. This can enable the driver to keep the stability of direction and help the car possess better steering capability. The circuit diagram is shown as figure 10–1.

The voltage of the 30th wire supply to the 31st pin of ABS control unit via the 40A fuse Sb4; The voltage of the 30th wire supply to the 2nd pin of ABS control unit via the 40A fuse SB5; The voltage of the 15th wire supply to the 32nd pin of ABS control unit via the 5A fuse Fb1.

The 12、13、26、27、41、42、43、44 of ABS control unit connect to the F/L、F/R、R/L、R/R wheel speed sensor respectively; when the wheel running, the sensor produces voltage signal which changes with the increase of speed.

The 6th pin of ABS control unit connect to the brake switch signal; the 16th、45th pin of ABS control unit connects to ground.

The 3rd pin of ABS control unit connect to CAN–H wire, and connects to the 30th pin of combination instrument、62nd pin of engine ECU respectively. The18th pin of ABS control unit connects to CAN–L wire, and connects to the 29th pin of combination instrument、81st pin of engine ECU respectively.

Airbag System

circuit analysis:

The circuit of airbag is shown as figure 11-1.

When there is serious frontal crash, to avoid the driver or front passenger bumping onto the steering wheel or instrument panel, there will be an airbag expand on the steering wheel and instrument panel so as to protect the driver and front passenger.

The SRS (Airbag system) include: driver side airbag module、passenger side airbag module、airbag control module、helix cable、wiring harness and SRS fault warning lamp.

When the ignition switch is set at the position of ON or ST, the voltage of battery supply to the 25th pin of SRS control module via FB4 fuse.

The 2nd、1st pin of the airbag module are connectted to the front driver side airbag via helix cable; the 17th、16th pin of airbag module are connectted to the driver side airbag directly; the front passenger side airbag connect to the 3rd、4th pin of airbag module directly; the passenger side airbag connect to the 18th、19th pin of airbag module directly; the 21st、22nd、23rd and 24th pin of airbag module connect to the side airbag crash sensor. The 12nd、37th pin of airbag module connect to passenger side airbag lock.

The 10th pin of the airbag module output the airbag warning signal, it connects to the 17th pin of instrument; the 47th pin of the airbag module output the side airbag warning signal, it connects to the 24th pin of instrument; when the ignition switch is at the position of ON, the SRS warning lamp in the instrument panel flash for 6s with the frequency of 1Hz and then off. If the SRS warning lamp didn't flash for 6s or it keeps shining , Taht's to say the SRS system is not in good working condition.



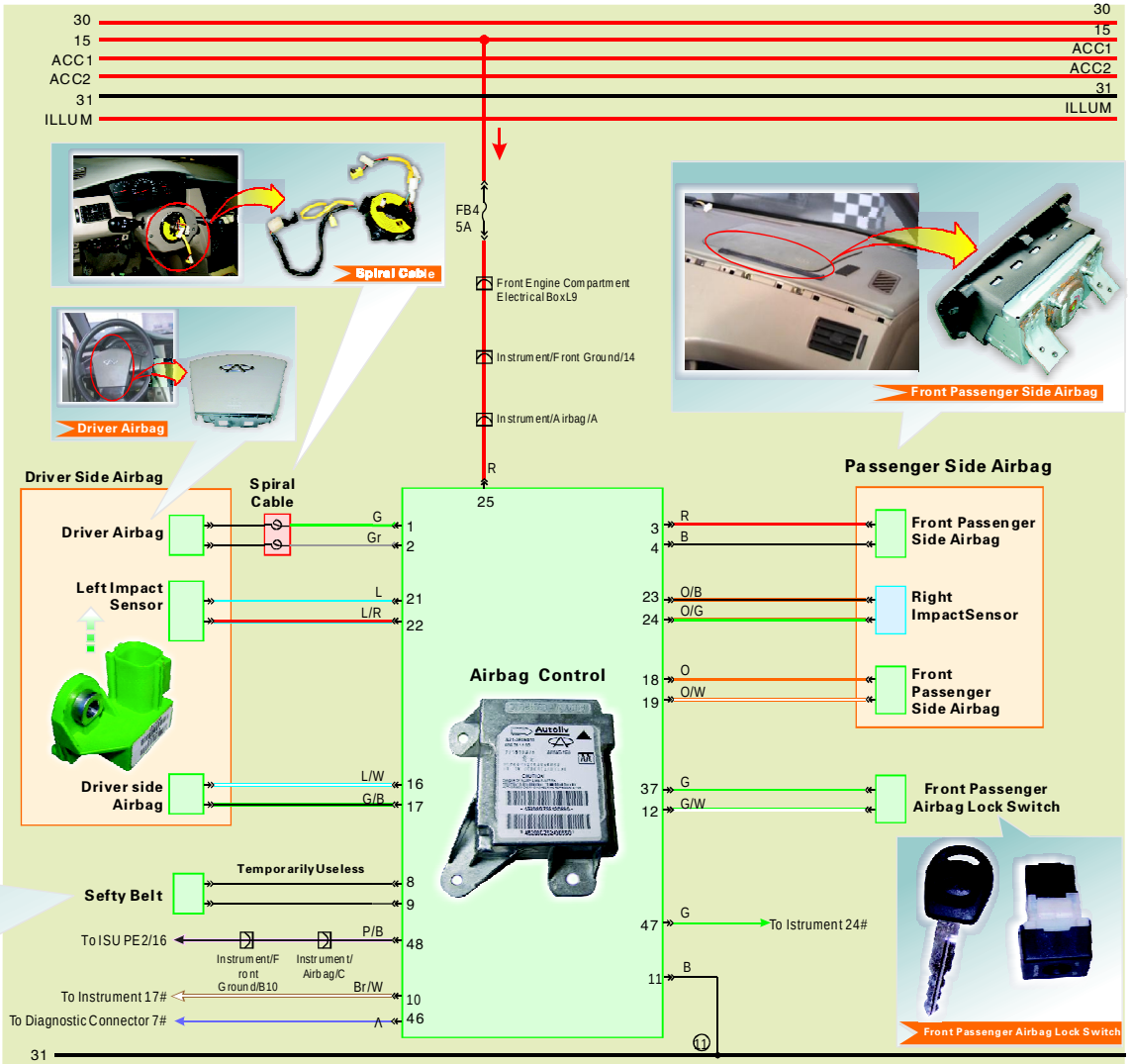


Figure11-1 Airbag System Circuit

Auto A/C System

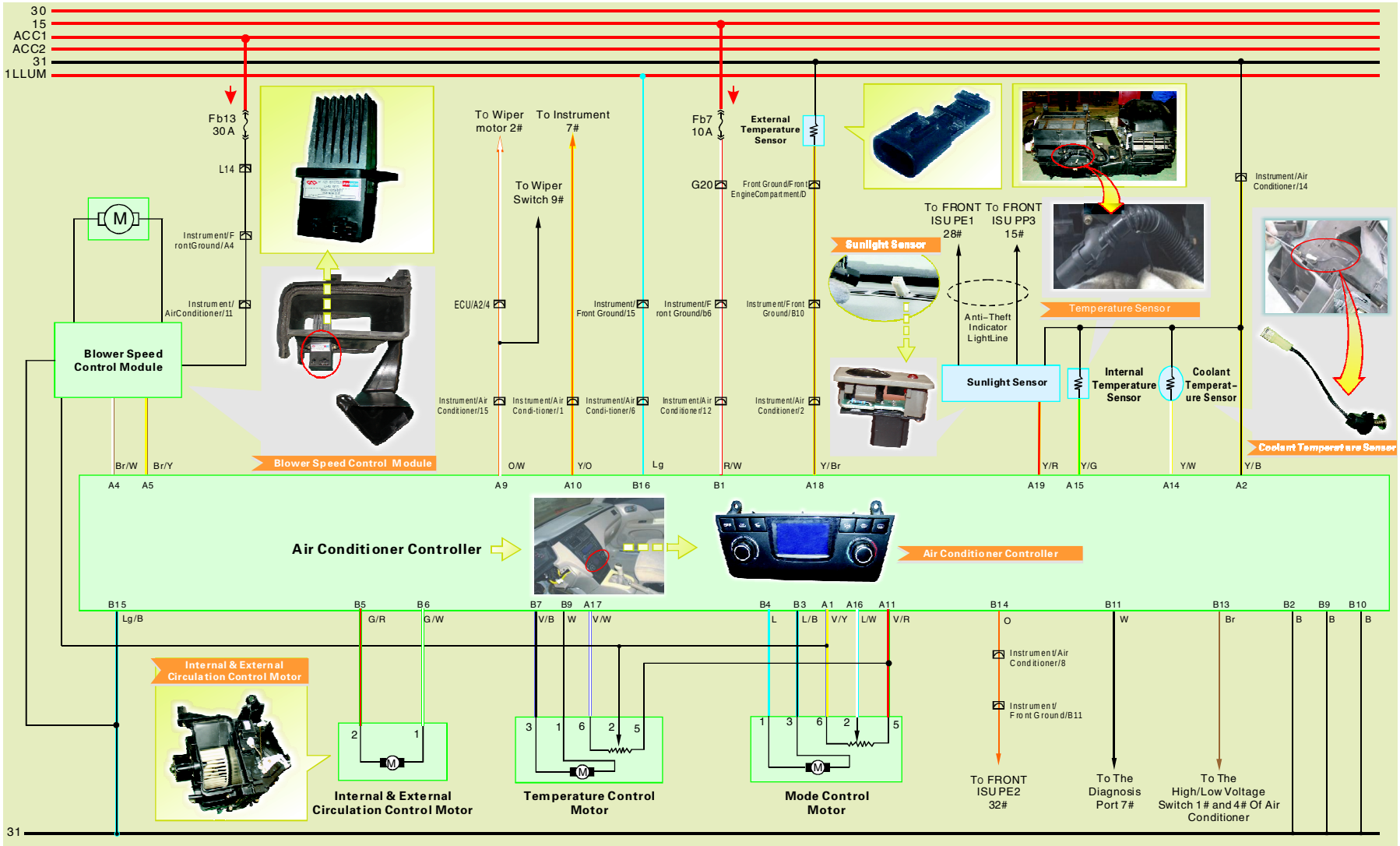


Figure12–1 Air Conditioning System Circuit Diagram

Auto A/C System Circuit Analyse:

The Auto A/C is shown as figure12-1. When the ignition switch is at the position of ON, the ACC1 and the 15th wire gets electricity.

The 15th line supplies power to the B1 pin of A/C controller via Fb7 fuse; the A18、A2、B2、B9、B10、B16 pin of A/C controller connect to ground.

The voltage of ACC1 wire supplies power to the 5th pin of blower speed adjusting module via the Fb13 fuse; the 7th、8th pin of blower adjusting module is connected to the blower motor; the 6th pin connects to ground; the 3rd pin is the blower speed adjusting signal, and connects to the A5 pin of A/C controller; the 2nd pin is the blower voltage feedback signal, and connects to the A4 pin of A/C controller.

The B5、B6 pin of A/C controller connect to inner/outer circulation control motor, the control panel drives the circulate wind door connecting pole、move pole by the control of inner/outer circulation servor motor , and also move the big、small wind door and thereby it realize the control of inner/outer circulate wind.

The B7、B8 pin of A/C controller connect to the cool/warm control motor, the control panel drives the dial and the pole in the temperature adjusting unit by controlling the blend door servor motor, and also move the blend door and thereby it realized the different proportional air mixture.

The B3、B4 pin of A/C controller connect to the mode control motor, the control panel drives the dial and the pole in the wind direction adjusting unit by controlling the mode wind door servor motor, different pole control the open and close of different wind door and thereby it realizes the control of air.

The A18 pin of A/C controller connects the outer temperature sensor. The outer temperature sensor is one of the important sensor of auto A/C. It will influence the air temperature of the wind outlet port、wind volume of the wind outlet port、the position of mode door and the position of air intake port. For the inspection of outer temperature, you can dismantle the connector of the sensor and test the DC voltage of the the front ground/front engine compartment/D end of the wiring harness, the normal value is 5V, if not, that's to say there is something wrong with the wiring harness or A/C computer.

The A15 pin of A/C controller connects the inner temperature sensor. The inner temperature sensor is one of the important sensors of auto A/C.It will influence the air temperature of the wind outlet port、wind volume of the wind outlet port、the position of mode door and the position of air intake port. For the inspection of inner temperature, you can dismantle the connector of the sensor and test the DC voltage of the two ends of the wiring harness, the normal value is 5V, if not, that's to say there is something wrong with the wiring harness or A/C computer.

The A14 pin of the A/C controller connects to the coolant temperature sensor. The coolant temperature sensor is to test the temperature of heater core and modify the position of the blend door.

It can avoid the working of compressor when the engine is in high temperature; it can also control the blower, when the coolant temperature is too low, the system will start the preheat control. That's to say when the coolant temperature is too low and it is in warming working condition , to prevent the cool wind from blowing out, if the coolant temperature is lower than the system set temperature, the blower will work in low speed or doesn't work.

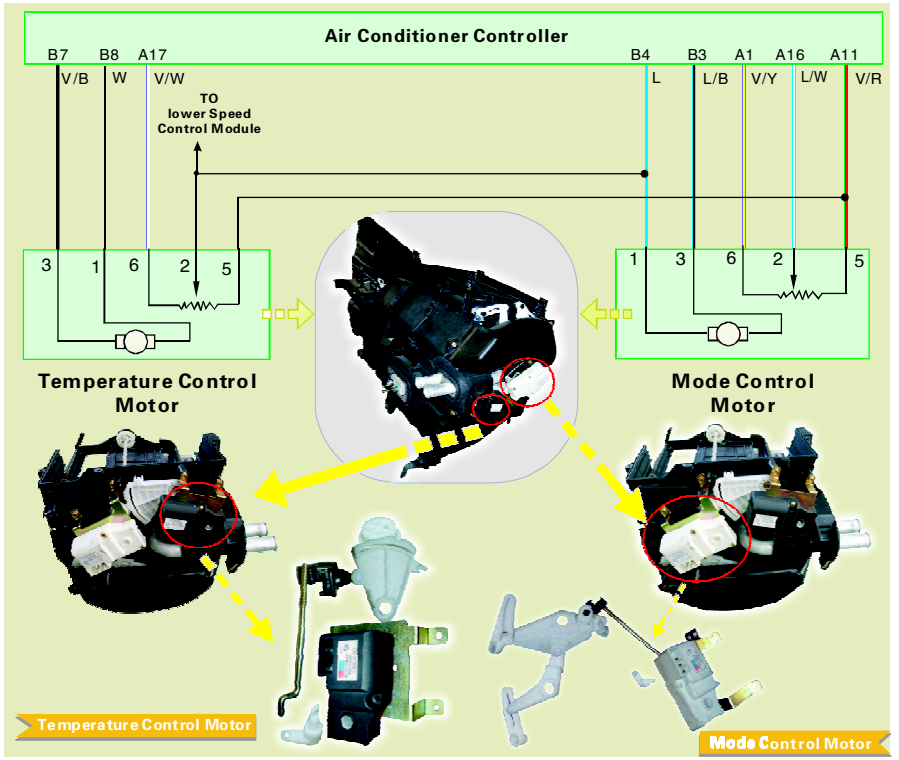
The A19 pin of A/C controller connects to sunshine sensor. The sunshine sensor induce the the strong or weak of the sunshine to modify the position of blend door and speed of blower. To inspect the sunshine sensor, you can read fault code or in the way of testing the resistance or voltage.

(1) Test the resistance

Test in strong sunshine, the resistance will be 4kΩ , cover the sunshine sensor, the resistance will be ∞.

(2) Test the voltage

The voltage in strong sunshine is normally lower than 1V, cover the sunshine sensor, the voltage will be over 4V.





Manual A/C System

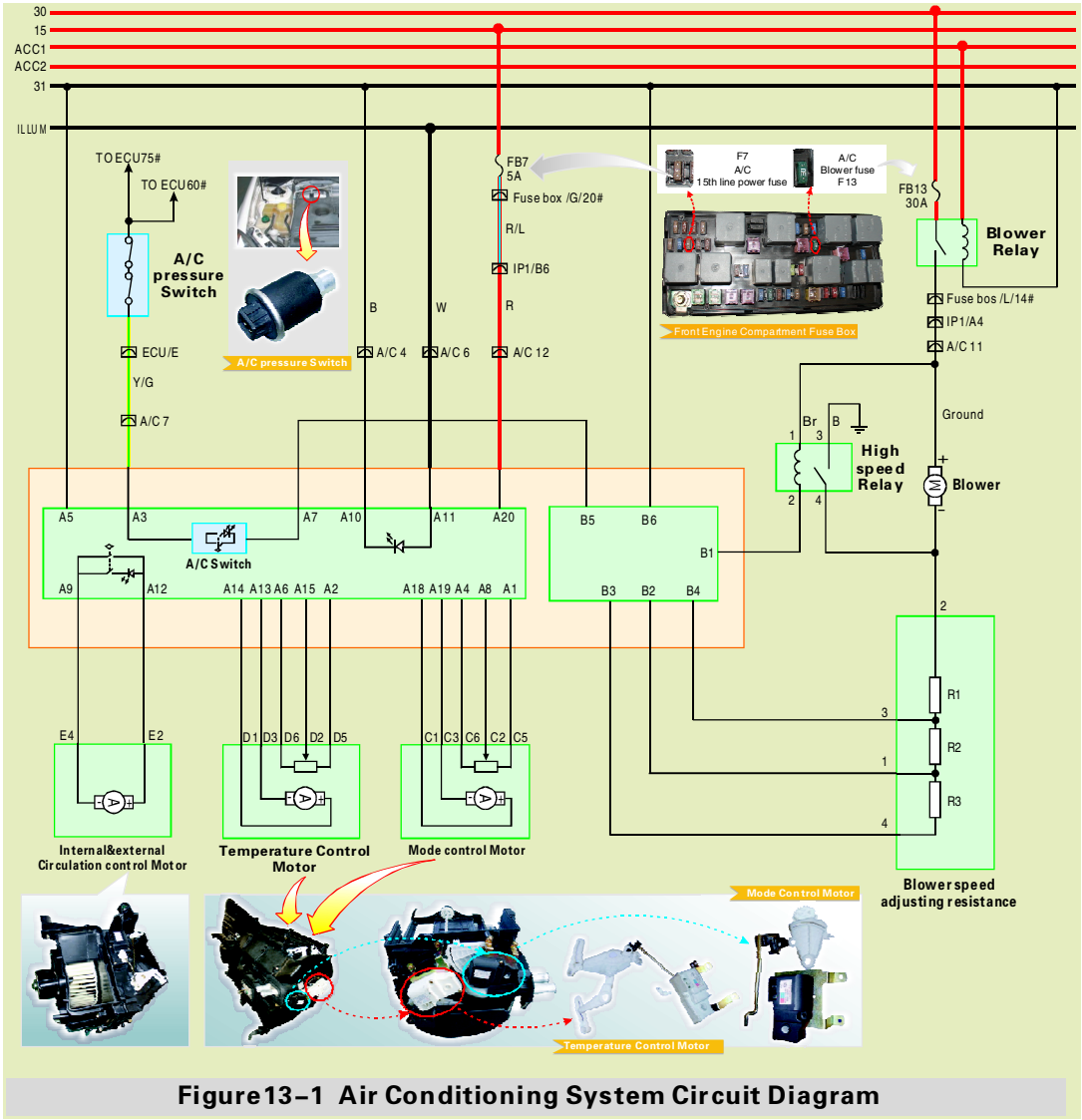


Figure13–1 Air Conditioning System Circuit Diagram

Manual A/C System Circuit Analyse:

The manual A/C is shown as figure13–1. When the ignition switch is at the position of ON, the ACC1 and the 15th line get electricity.

The 15th line supplies power to the A20 pin of A/C controller.

The ACC1 line supplies power to the blower relay coil; the blower relay coil get electricity and the contact closed, the voltage of the 30th line→FB13→blower relay contact point→blower motor→the 2nd pin of blower speed adjusting resistance.

The two ends of blower motor and high speed relay contact point (the 3rd、4th) parallel connected, the high speed relay coil (the 2nd pin) connect to the B1 pin of A/C controller, when the high speed relay coil get electricity, the contact closed. The voltage of the 30th line→FB13→blower relay coil→blower motor→connect to ground. Then the blower motor will run in high speed.

The 3rd pin of the blower speed adjusting resistance is connectted to the B4 pin of A/C controller, the 1st pin of blower speed adjusting resistance is connectted to the B2 pin of the A/C controller, the 4th pin of blower speed adjusting resistance are connectted to the B3 pin of the A/C controller, the running speed of the blower motor is controlled by A/C controller.

The A9、A12 pin of A/C controller are connectted to the inner/outer circulation control motor, the control panel drive the circulation wind door connecting bar、shift lever by controlling the inner/outer circulation servo motor so as to drive the movement of the large、small wind door and realize the control of inner/outer circulation wind.

The A13、A14 pin of A/C controller are connectted to the cool/warm control motor, the control panel drive the connecting bar、shift lever of temperature adjusting control mechanism by controlling the blend door servo motor so as to drive the movement of the blend door and realize the mixture of different ratio of air and gas.

The A18、A19 pin of A/C controller are connectted to the mode control motor, the control panel drive the connecting bar、shift lever of wind direction adjusting control mechanism by controlling the mode wind door servo motor, different shift lever control the open and close of different wind door and thereby realize the control of air.

The A3 pin of A/C controller is connectted to the A/C Pressure Switch.

Front ISU System

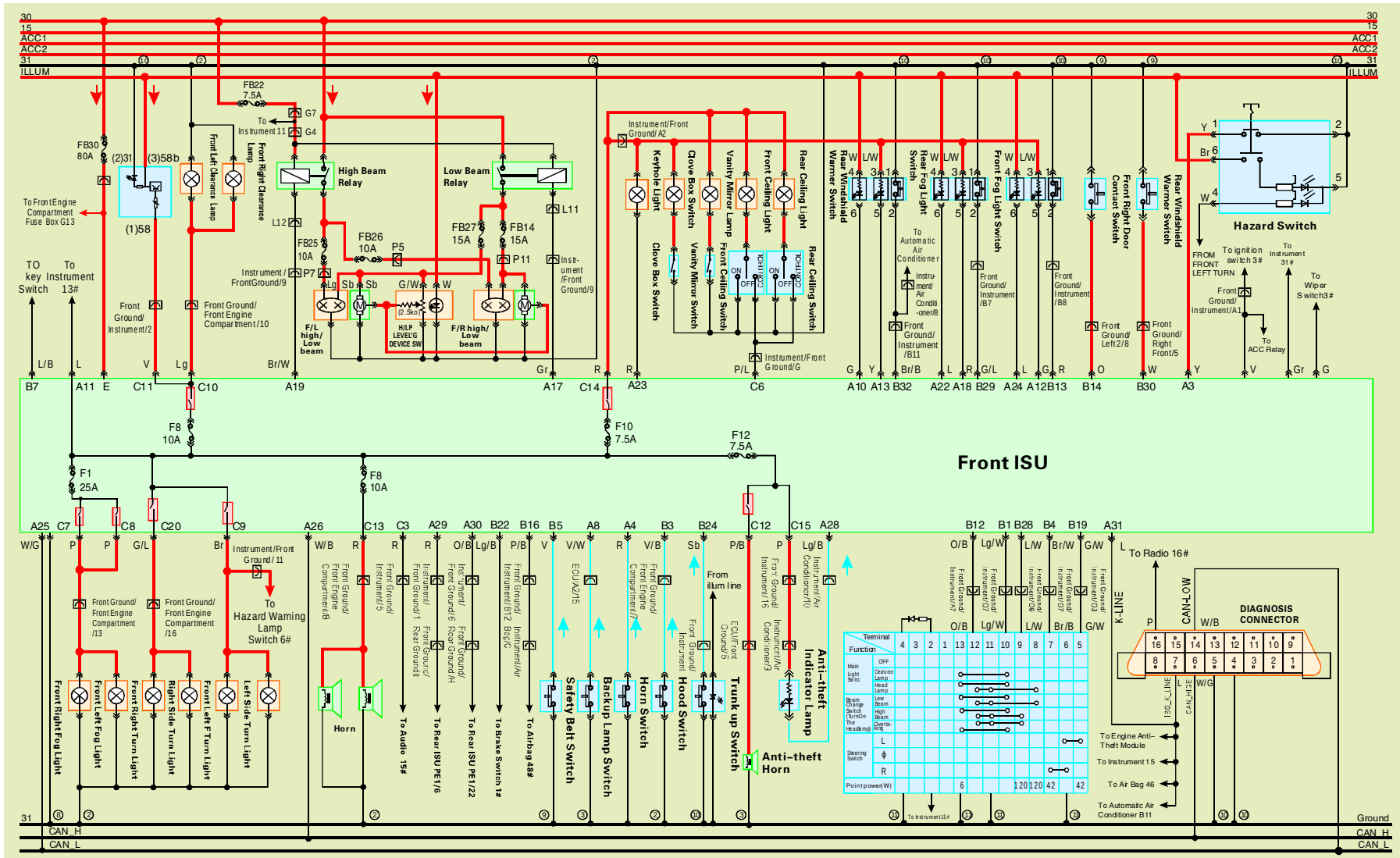


Figure14–1 Front ISU System Circuit Diagram



A5 has two vehicle body computer, one is front ISU （shown as figure 14-2 ，the other is rear ISU .

1. Front ISU

The parts that controlled by the front ISU have the following functions:

（1）Inner lamp control and steering lamp、headlamp high/low beam;
（2）Central control lock function
（3）Button-type electric window operation function
（4）Intermission time control of window wiper
（5）Delay the close time of electric window when the ignition switch is off
（6）Rear view mirror heating control fuction (the adjustment of the motor is Controlled by switch)
（7）Key not pull out warning
（8）Warning and anti-theft
（9）CAN-BUS data transfer(with instrument、engine、ABS computer)

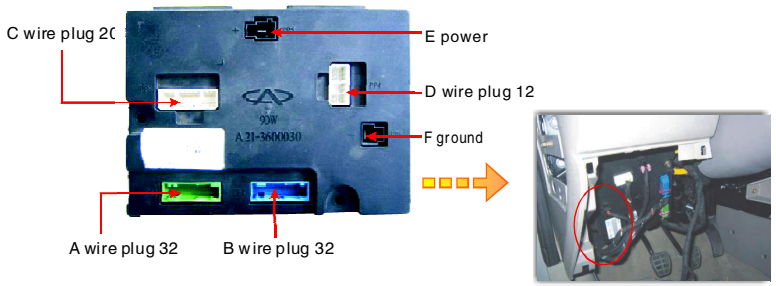


Figure14-2 Front ISU

2. Vehicle inner illumination lamp

The 30th power line supply power to the front ISU via the fuse FB 29, and then via the fuse F10 and output from the C14 pin of ISU to supply power to key hole illumination lamp、glove box lamp、make up mirror 、front roof lamp、rear roof lamp.

The B14 of front ISU is the F/L contact switch; the B30 of front ISU is the F/R contact switch.

When the indoor illumination lamp switch is at the left side or right side (door control position), the front ISU computer will control the inner illumination lamp (roof lamp work).

When the ignition power is off, if one of the 4 doors is open, the inner illumination lamp will light on; while after 15 min, the inner illumination lamp will be off automatically to save electricity.

When the ignition power is off, open one door, the inner illumination lamp will light on until the door is closed, and will continue to light for 15s after the door closed.

When the ignition power on, the inner illumination lamp will light on only when the door is open, and be off when the door is closed.

The A23 pin of front ISU is the key hole illumination lamp signal output pin, when the ignition power is off, the key illumination lamp will light on if open the driver 's door. Even if the driver's door is closed, the lamp will continue to light on for 8s. Shown as figure 14-3.

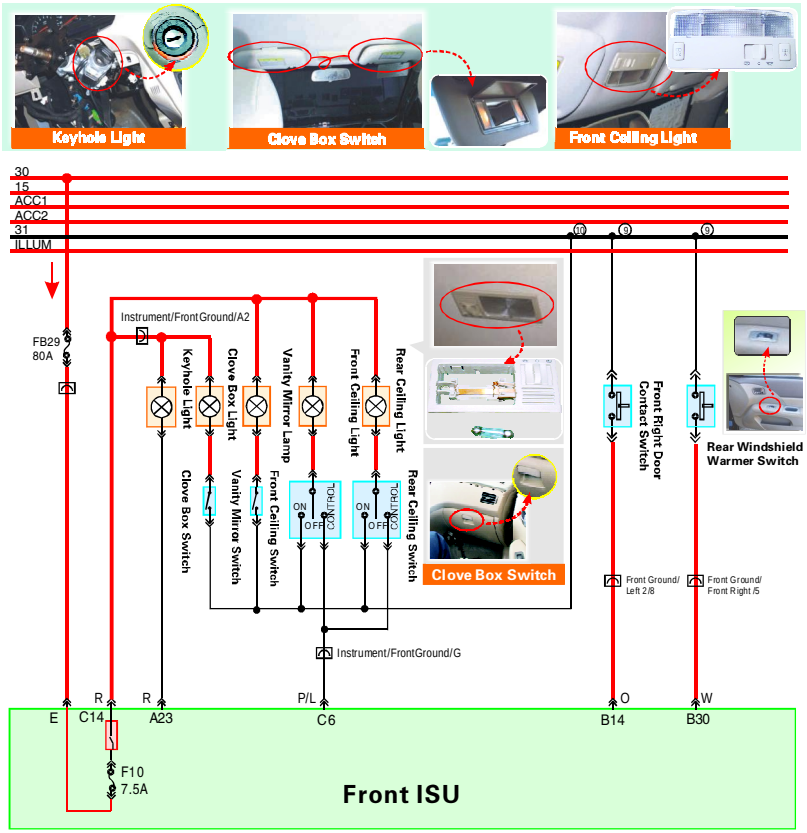


Figure14-3 Vehicle inner illumination lamp circuit

3. Turn lamp and hazard warning light circuit

(1) Turn lamp and dangerous warning lamp circuit

As shown in figure 14-4, the 30th power line supply power to the E pin of front ISU via fuse Fb29 and then fuse FB25, and output from the C20 pin of front ISU to suppply power to F/R turn lamp and right side turn lamp; the voltage output from the the C9 pin of front ISU supply power to F/L turn lamp and left side turn lamp; it also supply power to the 4th pin of dangerous warning lamp.

If one turn lamp cause trouble , then the other turn lamp of the same side will speed up the flashing frequency, and it will be twice of that in normal condition. But the side turn signal lamp will not be influenced.

(2) Anti-theft activate lamp warning

There are two modes of vehicle lamp warning system: activate or unchain mode.

When the vehicle lamps connected, open the driver's door (system activate), the buzzer will warning. If you close the driver's door or turn off the vehicle lamp switch when the buzzer is warning , it will stop.

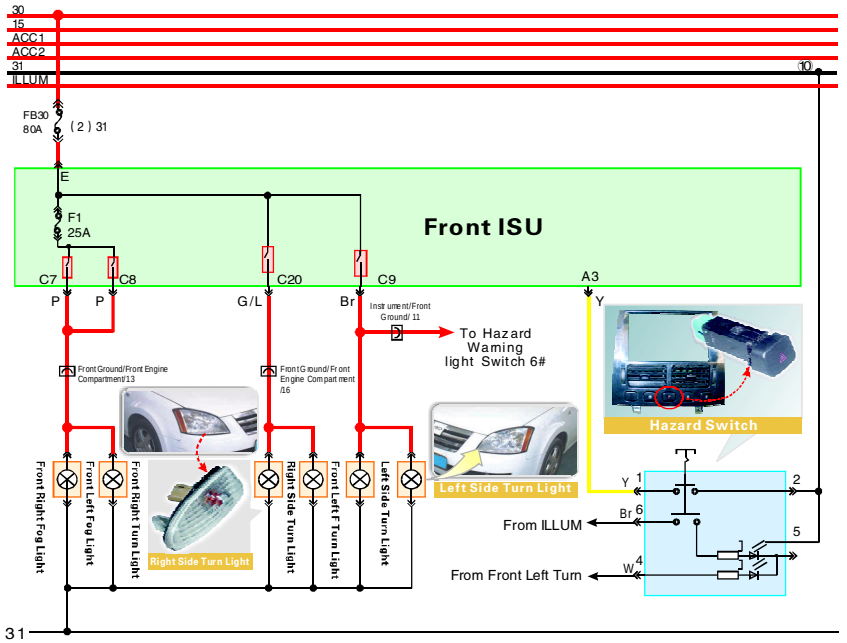


Figure14-4 Turn lamp circuit

4. Headlamp circuit

(1) High Beam Circuit

High Beam Control Circuit:

The voltage of 30th line→fuse FB22→high beam relay coil→the A19 pin of front ISU, when the high beam relay coil get electricity, the contact point will close.

High Beam Main Circuit:

The voltage of 30th line→line after the high beam relay contact point get into two lines: one line via the FB25→F/L high beam, the other line via the FB26→F/R high beam, the high beam light on then.

(2) Low Beam Circuit

Low Beam Control Circuit:

The voltage of 30th line→fuse Fb22→low beam relay coil→the A17 pin of front ISU, when the low beam relay coil get electricity, the contact point will close.

Low Beam Main Circuit:

The voltage of 30th line→line after the low beam relay contact point get into three lines: one line via the FB27→ F/L low beam and F/L lamp adjusting motor , the 2nd line supply power to headlamp adjusting switch; the 3rd line via the FB14→F/R low beam and F/R lamp adjusting motor , the low beam light on then.

(3) Lamp Combination Switch

Lamp Changing Switch:

When the switch is set at the high beam position, the 10th and 13th pin of lamp combination switch are connectted, the 12nd、8th and 11st pin are connectted, the B1 pin of front ISU→the 10th pin of lamp combination switch→the 13rd pin of lamp combination switch→ground, the B12 pin of front ISU→the 12nd pin of lamp combination switch→the 11st pin of lamp combination switch→ground.

When the switch is set at the low beam position, the 12nd and 11th pin of lamp combination switch are connectted, the 12nd、11st and 9th pin are connectted.

When the switch is set at the overtake position, the 10th and 13rd pin of lamp combination switch are connectted.

Lamp Main Switch:

When the switch is set at the dimmer position, the 10th and 13th pin of lamp combination switch are connectted; and when the switch is set at the headlamp position, the 10th and 13rd pin of lamp combination switch are connectted, and the 12nd、11st and 8th pin are connectted.

Steering Switch:

When the switch is set at the L position, the 6th and 5th pin of lamp combination switch are connectted; and when the switch is set at the R position, the 6th and 7th pin of lamp combination switch are connectted. The circuit is shown as figure 14-5.



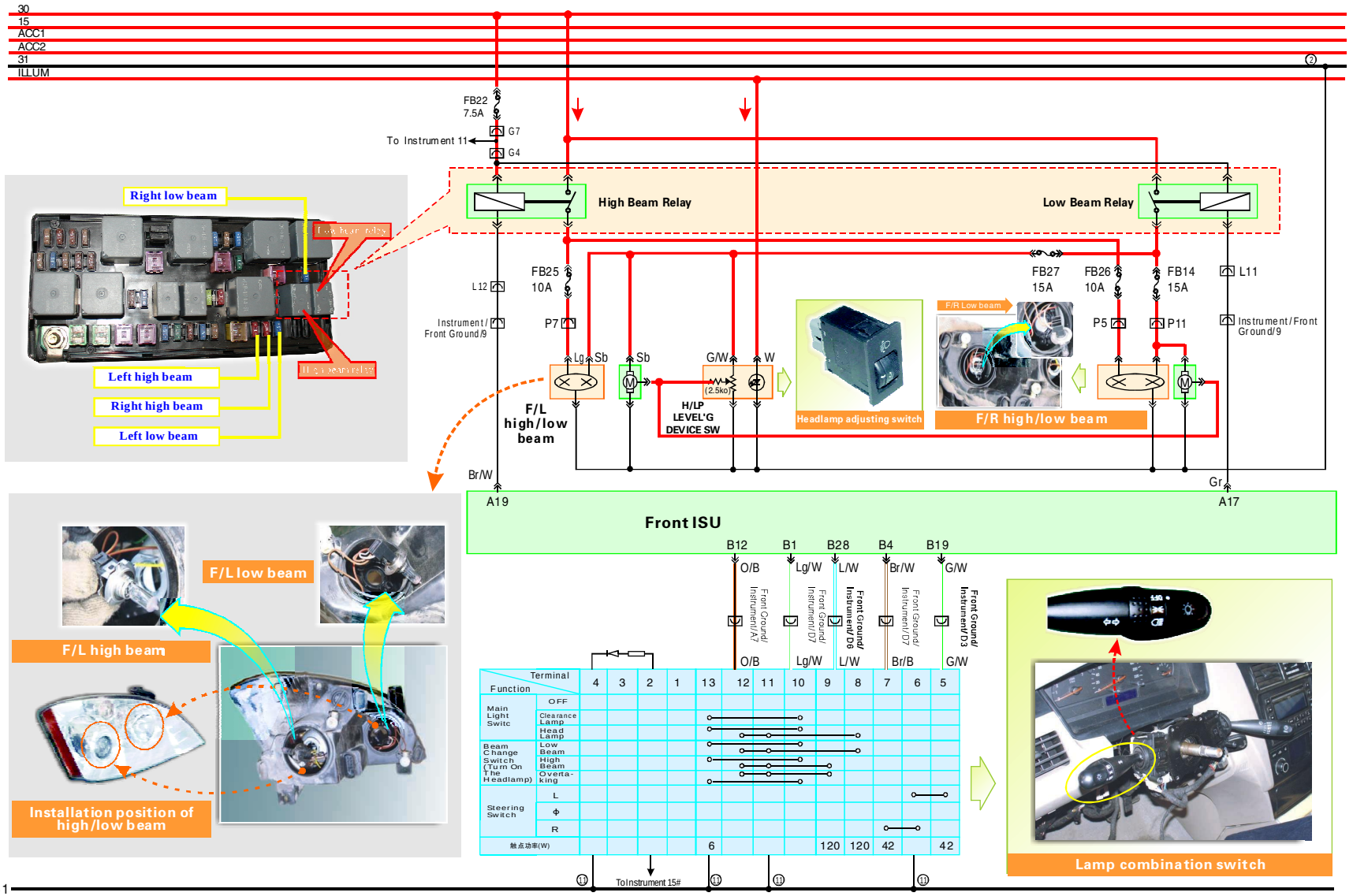


Figure14–5 Headlamp Circuit

5. Night lamp adjusting circuit

The night lamp adjusting circuit is shown as figure 14–6, the brightness adjustment of the dark light (night lamp) is controlled by the knob at the left lower part of instrument. The darklight main power is supplied by the C11 pin of front ISU.

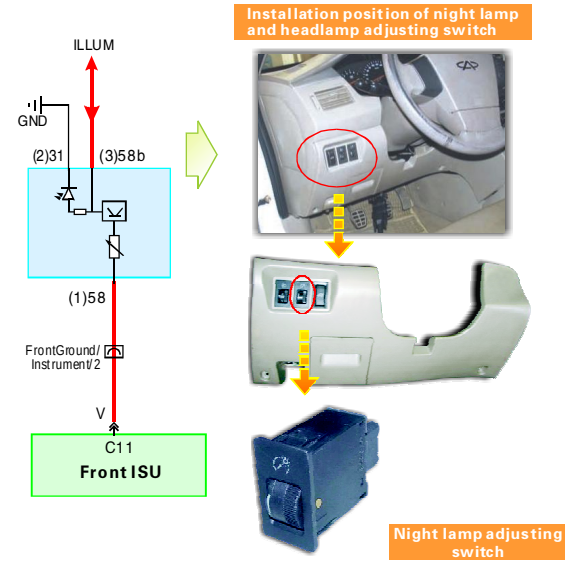


Figure14–6 Night lamp adjusting circuit

6. Fog lamp circuit

The 30th power line→fuse FB29→the E pin of front ISU→fuse F1→ the C7、C8 pin of front ISU to output, supply power to the front/rear fog lamp.

The 30th power line→fuse Fb29→the E pin of front ISU→fuse F10→the C14 pin of front ISU to output→supply power to the 3rd pin of front/rear fog lamp switch. The fog lamp circuit is shown as figure 14–7.

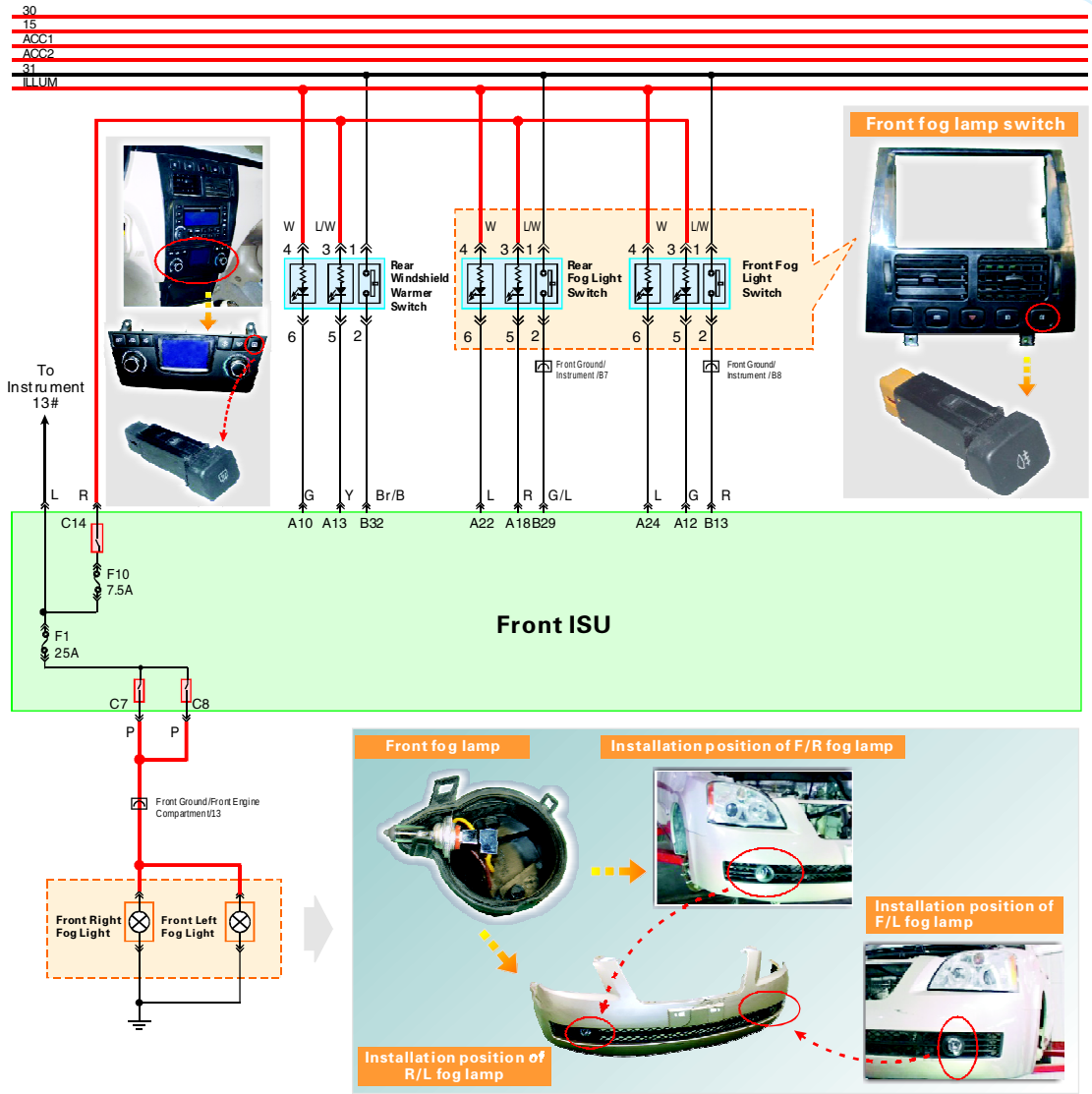


Figure14–7 Fog Lamp Circuit



7. CAN-BUS main line

The CAN data bus designed by the BOSCH company is applied by Chery A5, shown as figure 14-8. This enables the data communication of each computer, and forms the on-board network system. The instrument is connectted to the engine EMS、ABS、front ISU computer by CAN line and share the data. The CAN end of instrument is 29、30; the CAN end of engine ECU is 62、81; and the CAN end of front ISU is A25、A26.

Maintain way of the CAN data transmission system

①BUS line test

The inspect of connect capability、open circuit or short circuit、computer power or ground.

② Close the ignition switch, control the unit plug, and do not connect the wiring harness plug at the time. Test the resistance between the 62nd and 81st pin of A5 engine control unit, this is the resistance value of the data trasmission end port, the prescriptive value is 123Ω, if it is not so, please replace the engine control unit.

③DTC logical decision.

④Signal waveform test.

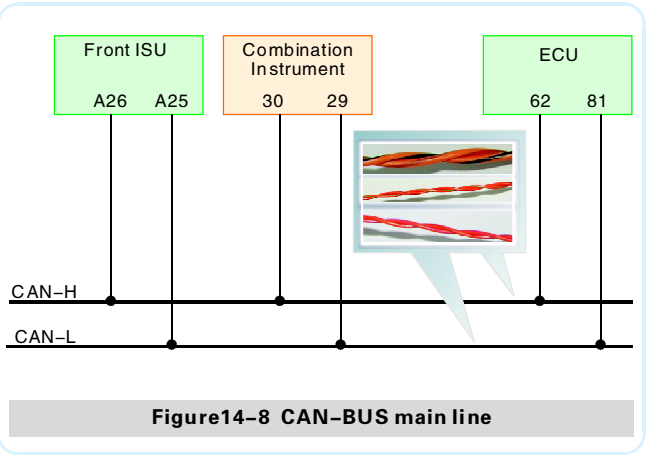
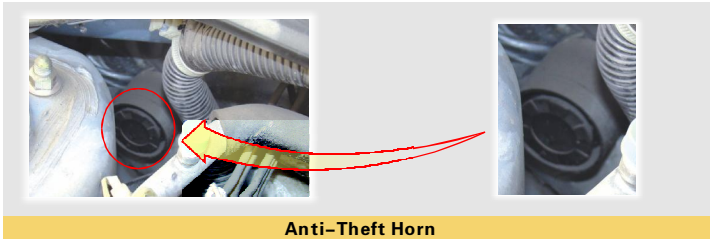


Figure14-8 CAN-BUS main line

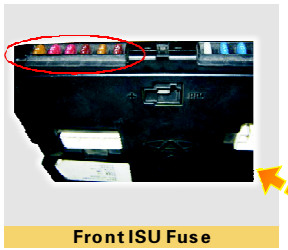
8. Other position circuit diagram



Anti-Theft Horn

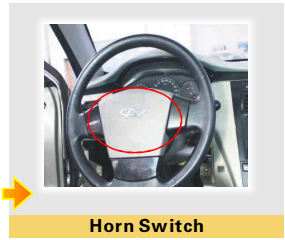


Door Contact Switch



Front ISU Fuse

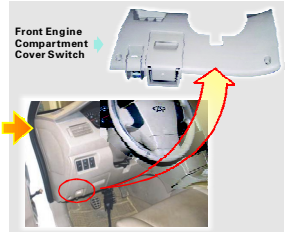




Horn Switch

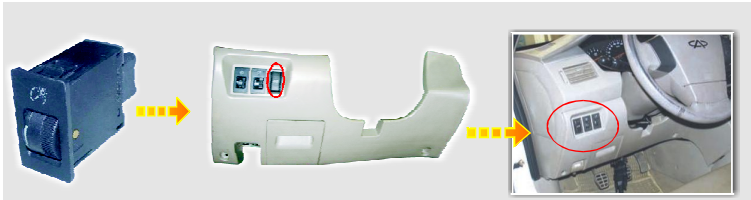


Front turn Lamp



Installation position of front engine compartment cover and trunk switch

Front ISU



Trunk Switch

Installation position of night lamp and headlamp adjusting switch



Diagnosis Plug

Rear ISU System

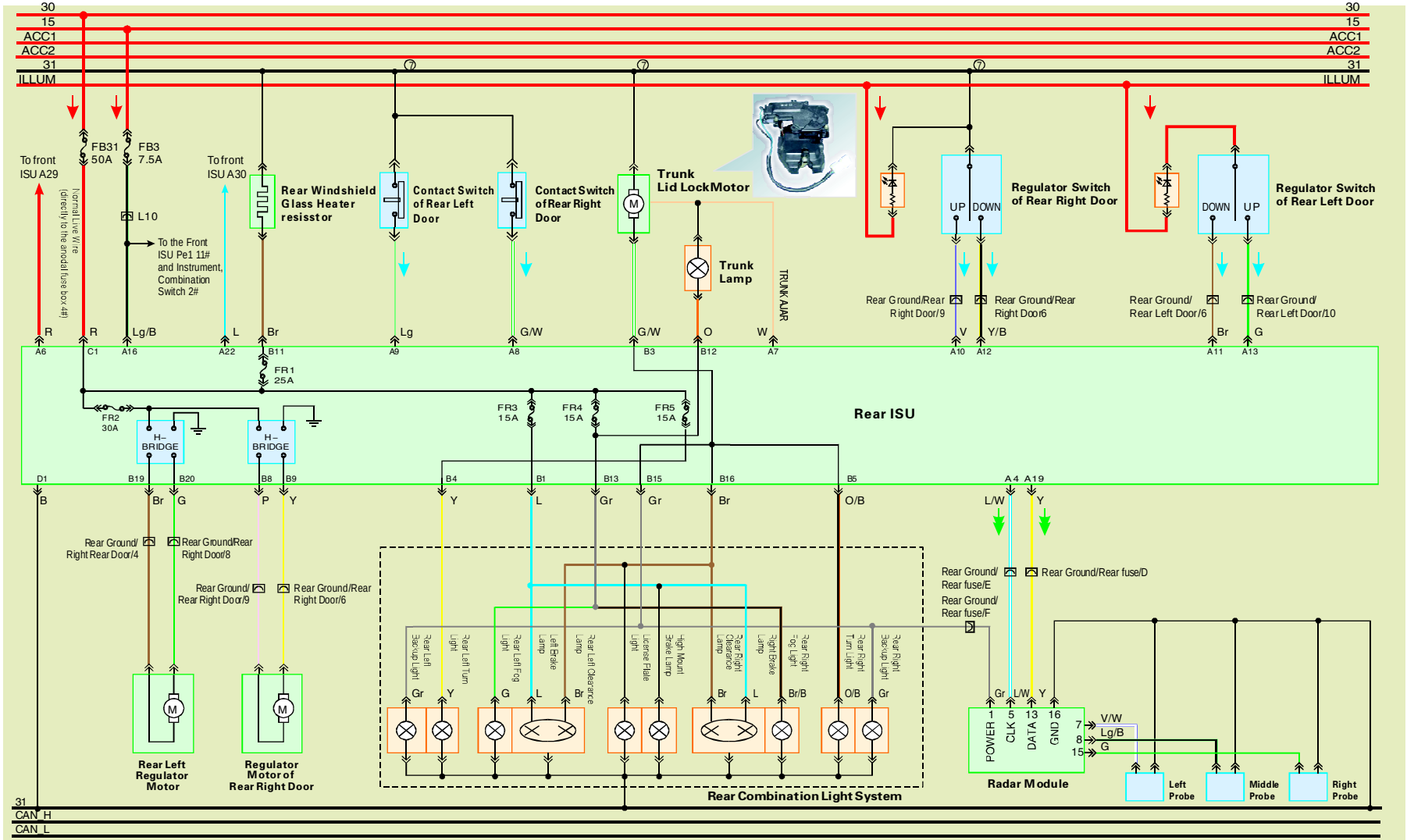


Figure15–1 Rear ISU System Circuit Diagram



(1) Rear ISU

The parts that controlled by the rear ISU have the following functions:

①Rear window galvanothermy wire time control

②Rear trunk lock motor

③Rear trunk illumination lamp

④Reverse radar system

⑤Vehicle outside rear lamp（brakelamp、fog lamp、reverse lamp 、license plate lamp and so on）

⑥The rear left、right door window lifter motor

⑦Data transfer with front ISU

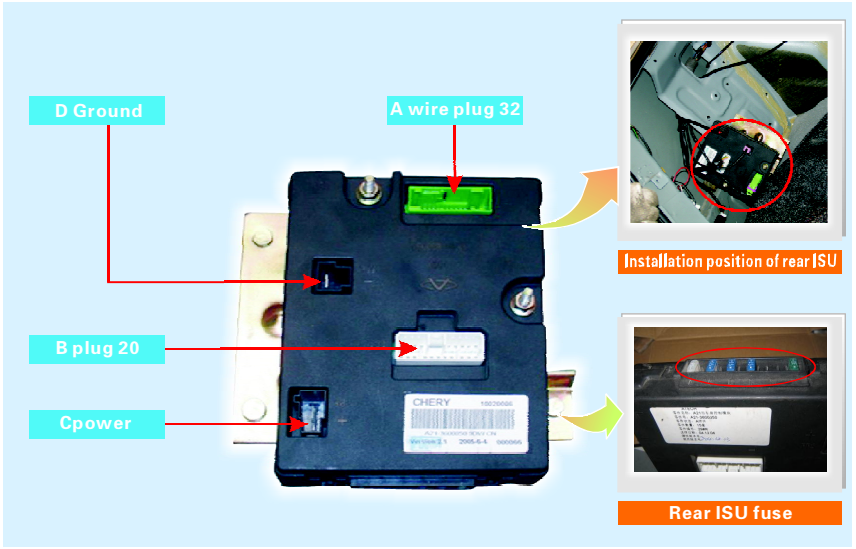


Figure15-2 Rear ISU Configuration

(2) Reverse radar system

The Advanced reverse warning system is setted into The A5 , it is composed of the following parts:

（1）Reverse warning control unit

（2）Reverse warning R/L sensor

（3）Reverse warning mid sensor

（4）Reverse warning R/R sensor

（5）Rear ISU computer

（6）Reverse switch

The 1st pin of the reverse warning control unit is the power supply pin, it connects the B15 pin of rear ISU; the 5th pin is CLK, it connects to the A4 pin of rear ISU; the 13th pin is DAT, it connects to the A19 pin of rear ISU;the 16th pin is GND; the 7th pin connect to the reverse warning R/L sensor; the 8th pin is connectted to the reverse warning mid sensor;the 15th pin is connectted to the reverse warning R/R sensor.

The reverse warning system start to self-check when the ignition switch is turned on, if the ignition switch is not turned off, the reverse warning system will keep in active state, but the distance control fuction could only be started when the vehicle is put into gear. When the reverse warning system is in active state, the buzzer in the instrument will make a short signal sound.

If the control unit finds trouble in the system during the self-check procedure, the buzzer will generate a 5s continuous sound. When put into the reverse gear, and if the vehicle is 1.5m away from the roadblock, the buzzer will start to warning. The sound frequency will increase with the shorten of the distance. And when there is only 25mm, the buzzer will generate continuous sound.

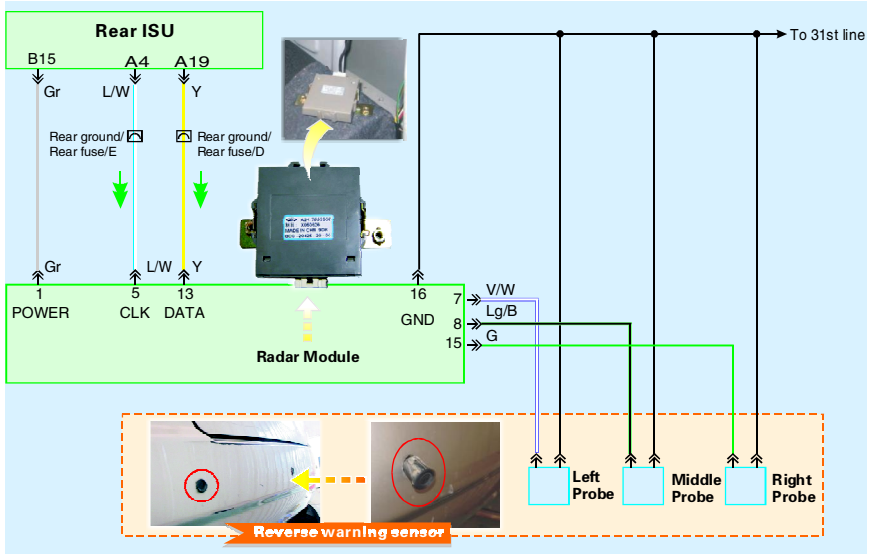


Figure15-3 Reverse Radar System Circuit

(3) Brake lamp and reversing lamp circuit

The 30th wire supplies power to the C1 pin of rear ISU via fuse Fb31, the rear ISU gets electricity. The B1 pin of rear ISU is connectted to the left brake lamp、high-mounted brake lamp and right brake lamp; the B4 pin is connectted to the rear left turn lamp; the B15 pin is connectted to the rear left reversing lamp、rear right reversing lamp and the 1st pin of reversing radar ; B16 is connectted to the rear left dimmer、license plate lamp and rear right dimmer.

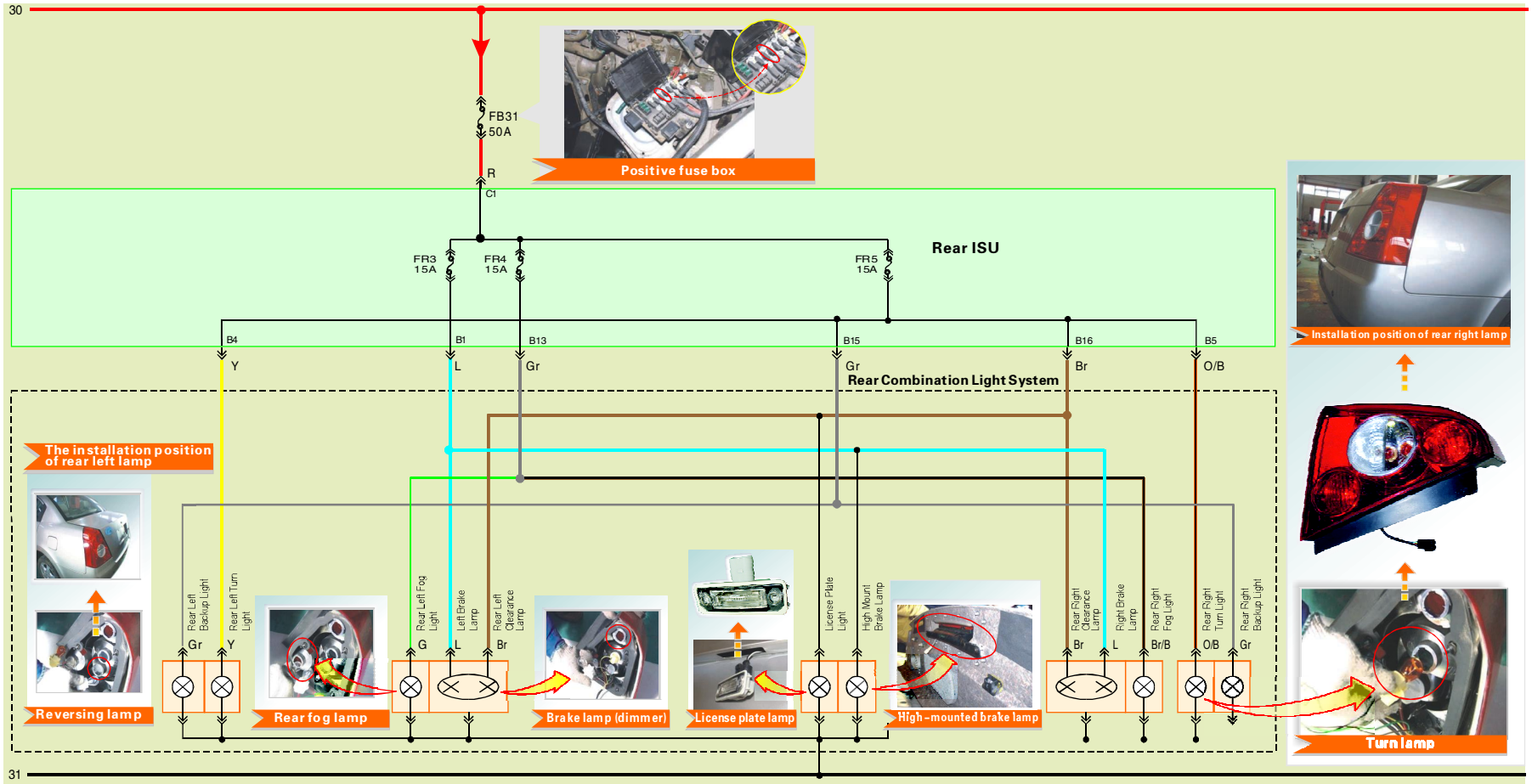
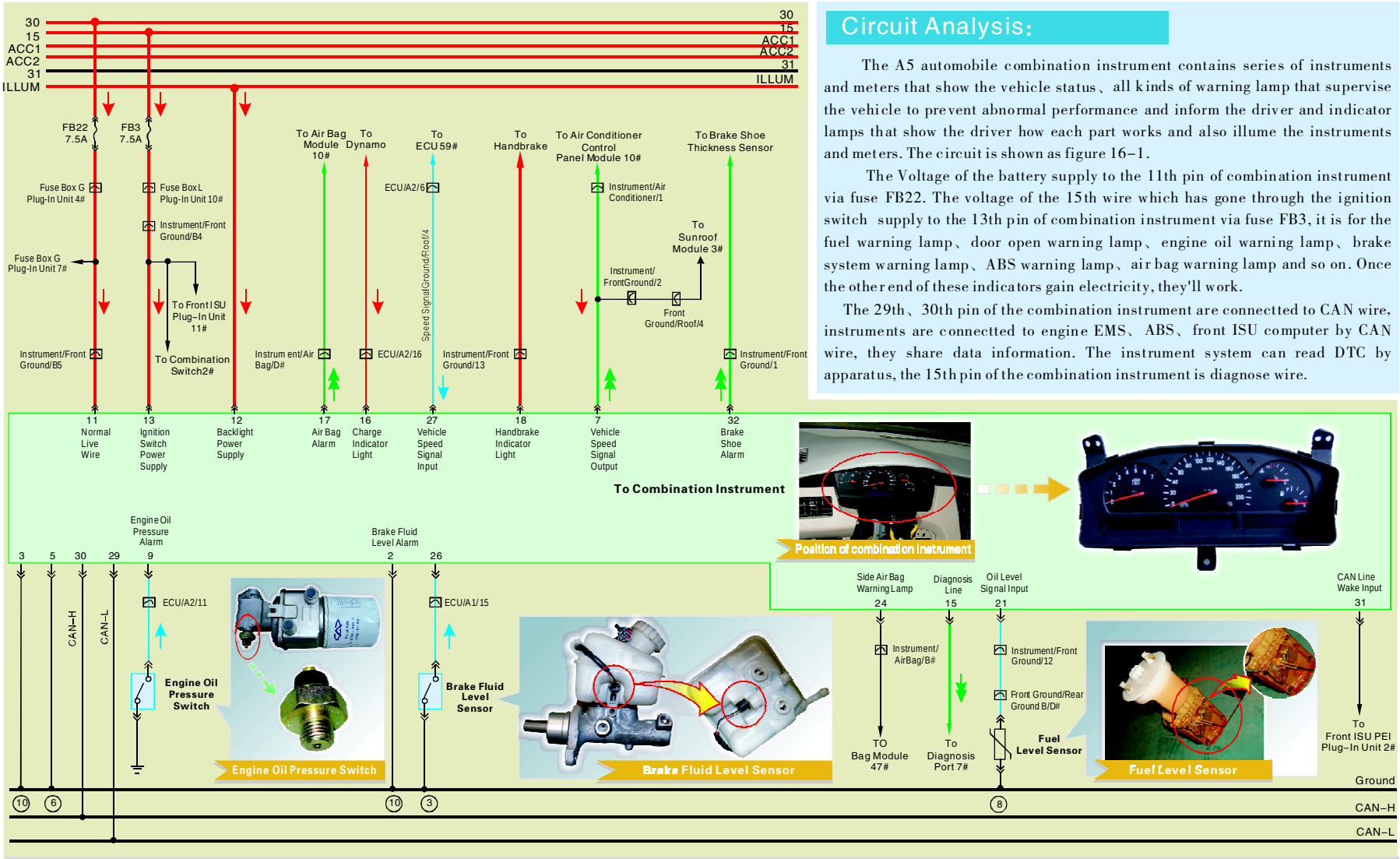


Figure15-4 Brake Lamp and Reversing Lamp Circuit



Instrument System



Circuit Analysis:

The A5 automobile combination instrument contains series of instruments and meters that show the vehicle status、all kinds of warning lamp that supervise the vehicle to prevent abnormal performance and inform the driver and indicator lamps that show the driver how each part works and also illume the instruments and meters. The circuit is shown as figure 16-1.

The Voltage of the battery supply to the 11th pin of combination instrument via fuse FB22. The voltage of the 15th wire which has gone through the ignition switch supply to the 13th pin of combination instrument via fuse FB3, it is for the fuel warning lamp、door open warning lamp、engine oil warning lamp、brake system warning lamp、ABS warning lamp、air bag warning lamp and so on. Once the other end of these indicators gain electricity, they'll work.

The 29th、30th pin of the combination instrument are connectted to CAN wire, instruments are connectted to engine EMS、ABS、front ISU computer by CAN wire, they share data information. The instrument system can read DTC by apparatus, the 15th pin of the combination instrument is diagnose wire.

Figure16-1 Instrument System Circuit Diagram

Wiper System

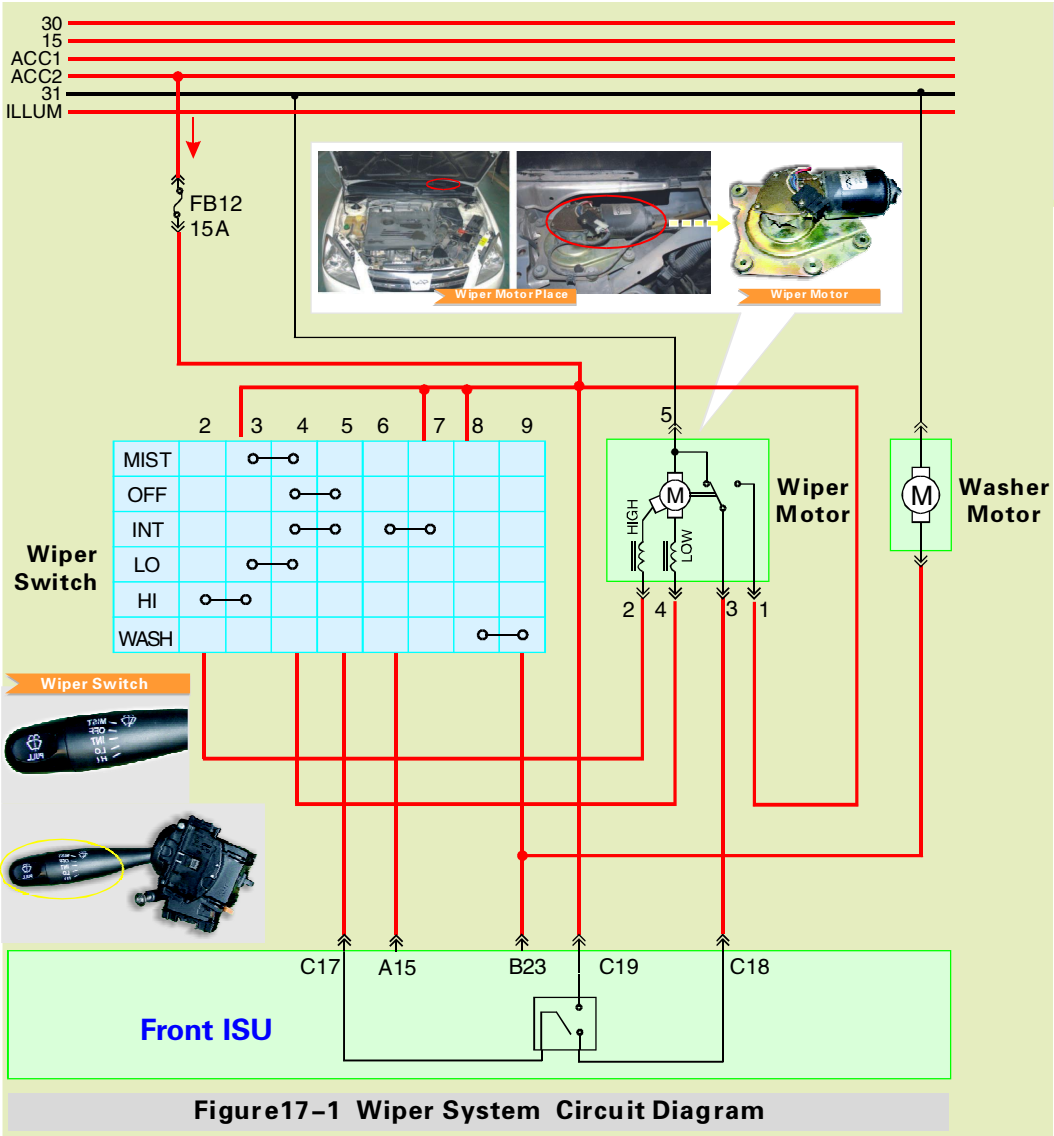
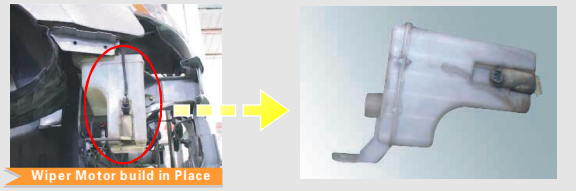


Figure17-1 Wiper System Circuit Diagram



Wiper System Circuit Analysis:

The wiper system ciruit is shown as figure 17-1.

The ACC2 power supply wire supplies power to the C19 of front ISU、the 3rd、7th、8th pin of wiper switch via fuse FB12.

When the wiper switch is set at the HI position, the 2nd、3rd pin of the wiper switch are connectted, the ACC2 power supply wire→the 3rd pin of wiper switch→the 2nd pin of wiper switch→the 2nd pin of wiper motor→the 5th pin of wiper motor→the 31st line are connectted to ground. The wiper motor will work in high speed then.

When the wiper motor is set at the position of LO, the 3rd、4th pin of wiper switch are connectted, the ACC2 power supply wire→the 3rd pin of wiper switch→the 4th pin of wiper switch→the 4th pin of wiper motor→the 5th pin of wiper motor→the 31st line are connectted to ground. The wiper motor will work in low speed then.

When the wiper switch is set at the WASH position, the 8th and 9th pin are connectted, the ACC2 power supply wire→8th pin of wiper switch→9th pin of wiper switch→washing motor→the 31st line are connectted to ground. The washing motor will spew water then.

When the wiper switch is at the position of INT, the 4th、5th pin are connectted, 6th、7th pin are connectted, when the wiper switch input intermission signal to the front ISU via A15pin, the inner relay of front ISU will electrify for 0.5s. After 0.5s,The ACC2 power supply wire→the 1st pin of wiper Motor→the 3rd pin of wiper Motor→the C18 pin of front ISU→the C17 pin of front ISU→ the 5th pin of wiper switch→the 4th pin of wiper switch→the 4th pin of wiper motor→the 5th pin of wiper motor→the 31st line are connectted to ground. The wiper motor will work in low speed then. the motor will operate for one circle and stop at the stop position with the control of wiper motor cam plate switch circuit.

If the input time of washer switch is over 0.3s, the inner washer of front ISU will electrify. When the washer switch is in the connect position, the wiper motor will continue to work. If the washer switch is disconnected again, the motor will continue to operate for 2 circles.



Power Rear View Mirror System

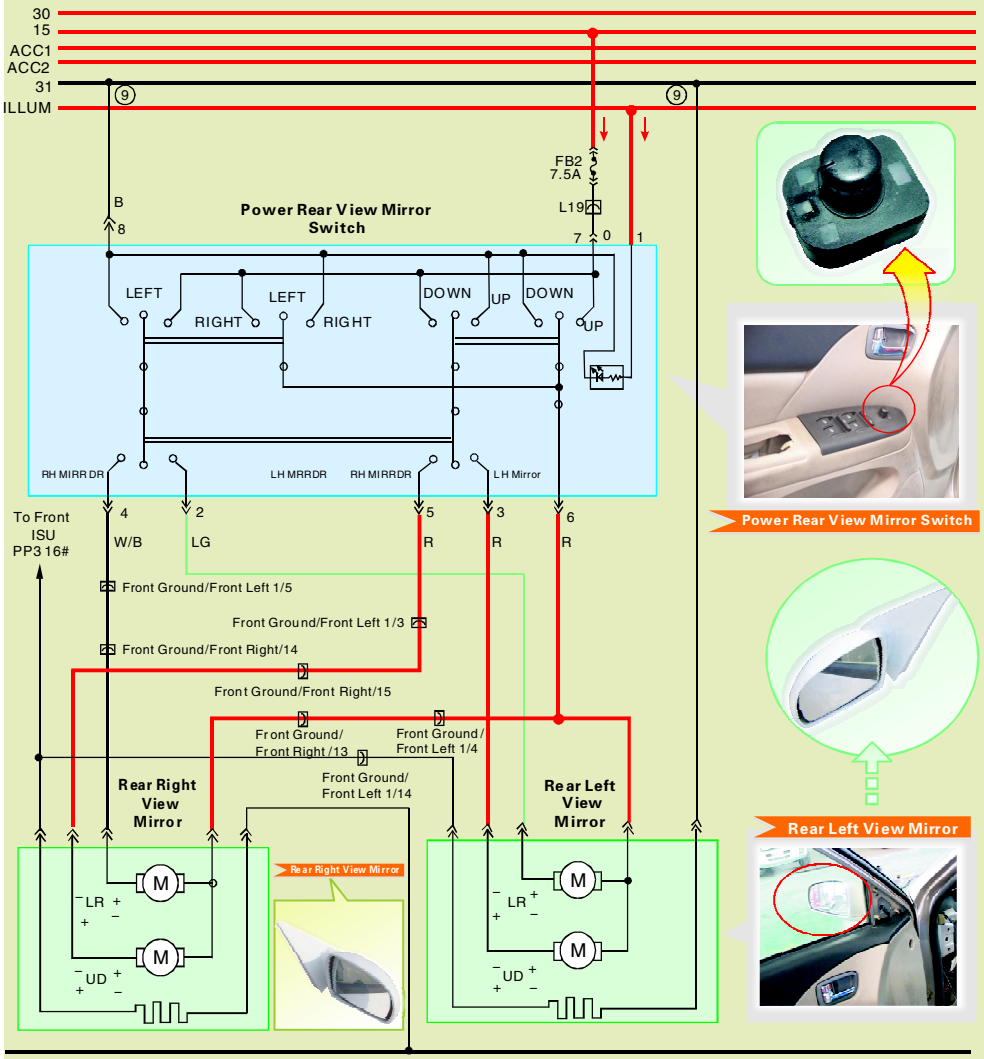


Figure18–1 Power Rear View Mirror Circuit Diagram

Power Rear View Mirror System Circuit analyse:

The power rear view mirror is shown as figure 18–1. When the ignition switch is set to the position of ON or ST, the voltage of the battery gets to the 15th wire→7.5A fuse Fb2→7th pin of power rear view mirror switch, the power rear view mirror get voltage.

1. The rear left view mirror incline to up and down, turn left and right circuit

(1) Rear left view mirror

Rear left view mirror upwards: choose the L button on the control switch panel, press the UP key of the control switch, the 7th and 6th pin of rear view mirror switch are connectted, the 3rd and 8th pin are connectted, the power go through the 7th pin of control switch→6th pin→rear left view up and down control motor→3rd pin of rear view mirror→8th pin→ground. The rear left view mirror will move upwards then.

Rear left view mirror downwards: press the DOWN key of the control switch, the 7th and 3rd pin of rear view mirror switch are connectted, the 6th and 8th pin are connectted, the power go through the 7th pin of control switch→3rd pin→rear left view up and down control motor→6th pin of rear view mirror→8th pin→ground. The rear left view mirror will move down–wards then.

Rear left view mirror move to left: press the LEFT key of the control switch, the 7th and 6th pin of rear view mirror switch are connectted, the 2nd and 8th pin are connectted, the power go through the 7th pin of rear view mirror→6th pin→rear left view left and right control motor→2nd pin of rear view mirror→8th pin→ground. The rear left view mirror will move left then.

Rear left view mirror move to right: press the RIGHT key of the control switch, the 7th and 2nd pin of rear view mirror switch are connectted, the 6th and 8th pin are connectted, the power go through the 7th pin of rear view mirror→2nd pin→rear left view left and right control motor→6th pin of rear view mirror→8th pin→ground. The rear left view mirror will move right then.

(2) The rear right view mirror

The working principle of the right rear view mirror is the same with the left. Choose the R button on the control switch panel, when press the UP button , the 7th and 6th pin of rear view mirror switch are connectted, the 5th and 8th pin are connectted; when press the DOWN button, the 7th and 5th pin of the rear view mirror are connectted, the 6th and 8th are connectted; when press the LEFT button, the 7th and 6th pin of the rear view mirror are connectted, the 4th and 8th are connectted; when press the RIGHT button, the 7th and 4th pin of the rear view mirror are connectted, the 6th and 8th are connectted.

2. Demist part circuit

There is demist circuit in the left and right power rear view mirror, when press the demist switch, voltage from the ISU PP3 16# connect to 31st ground wire via rear left、right view mirror heating wire.

Power Window of Front Door & Power Door Lock System

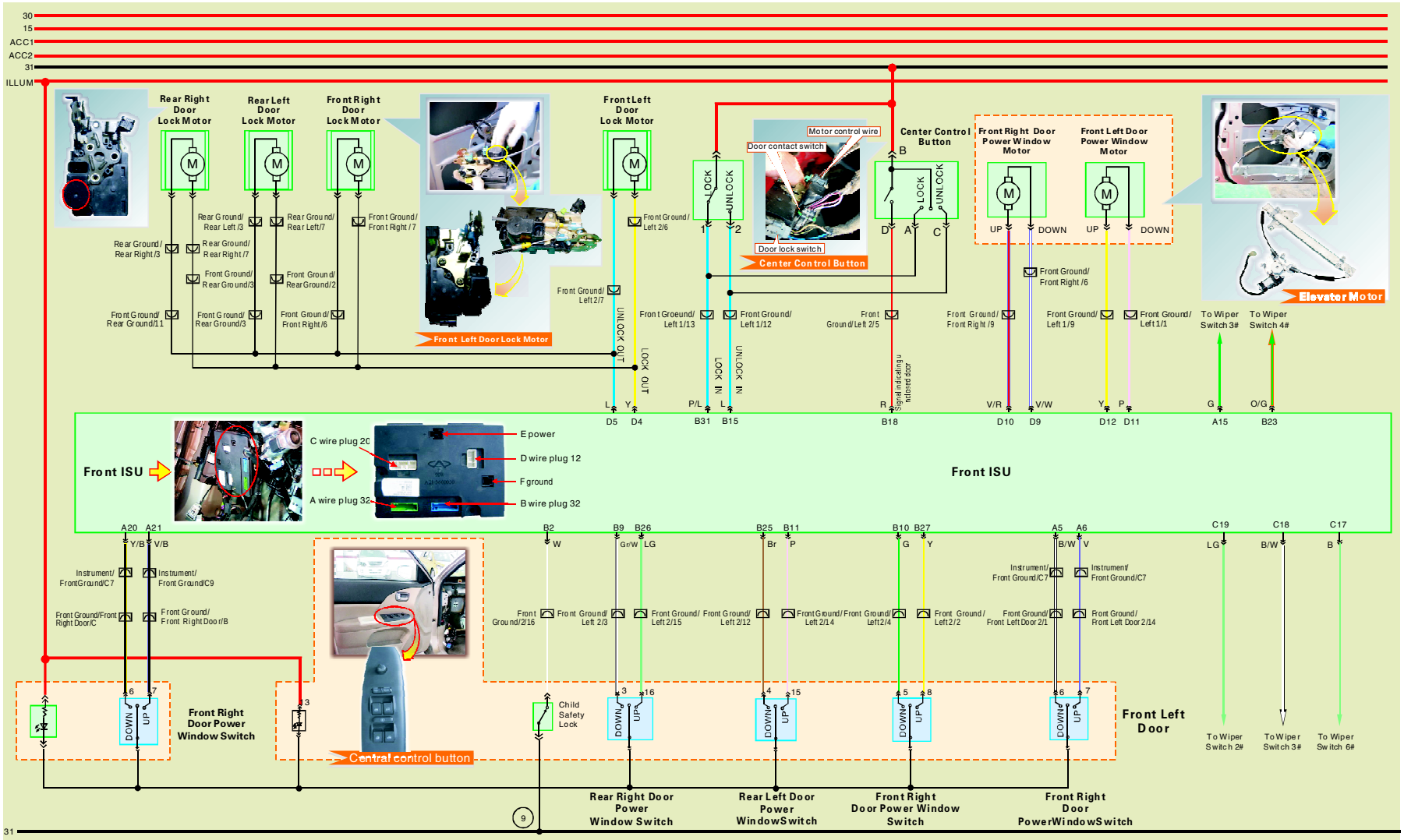


Figure19–1 Power Window of Front Door & Power Door Lock System Diagram

Power Window of Front Door & Power Door Lock Circuit analyse:

The circuit analysis of front door window lifter and four doors lock. Please refer to figure 19-1.

1. power window

The power window system circuit is composed of power window main switch that set at the front left door、three power window switches that set at the three doors、four window motor and front、rear ISU computer.

The power window button operation set is the device to have the F/L、F/R、R/L、R/R window go up and down automatically.

In the 40s after turning off the ignition power, the windows' movement can be controlled, and after 40s, there will be no response.

The front ISU receives the up or down signal from the power window main switch to drive the power window motor work to open or close the window.

The 2nd pin of ISU is connectted to the children safety lock. When press the safety switch on the power window main switch, signal is sent to the front ISU,which cut off the rear door power window motor to prevent the rear seat window working. This will enable the passenger, especially children to miss-open the window and result in accident.

2. Central lock

The vehicle door control set is at the driver seat side. When the driver open or close the door, the open and close signal from the minisize switch in the door lock will be sent to the B31 and B15 pin of front ISU. The ISU computer control the door lock motor work according to the open or close signal from the D4 and D5 pin of ISU.

If use the manual key (outer) or button at the drive side (inner) to lock or unlock, the four doors will response immediately.

If press the lock/unlock button on the remote controller when pull out the ignition key from the lock core, the four doors will be locked immediately. Then, the anti- theft system will get into the activation or release state. If one door is not closed well, then use the remote controller to lock, all the four doors will be locked or unlocked right away .

Electric Seat System

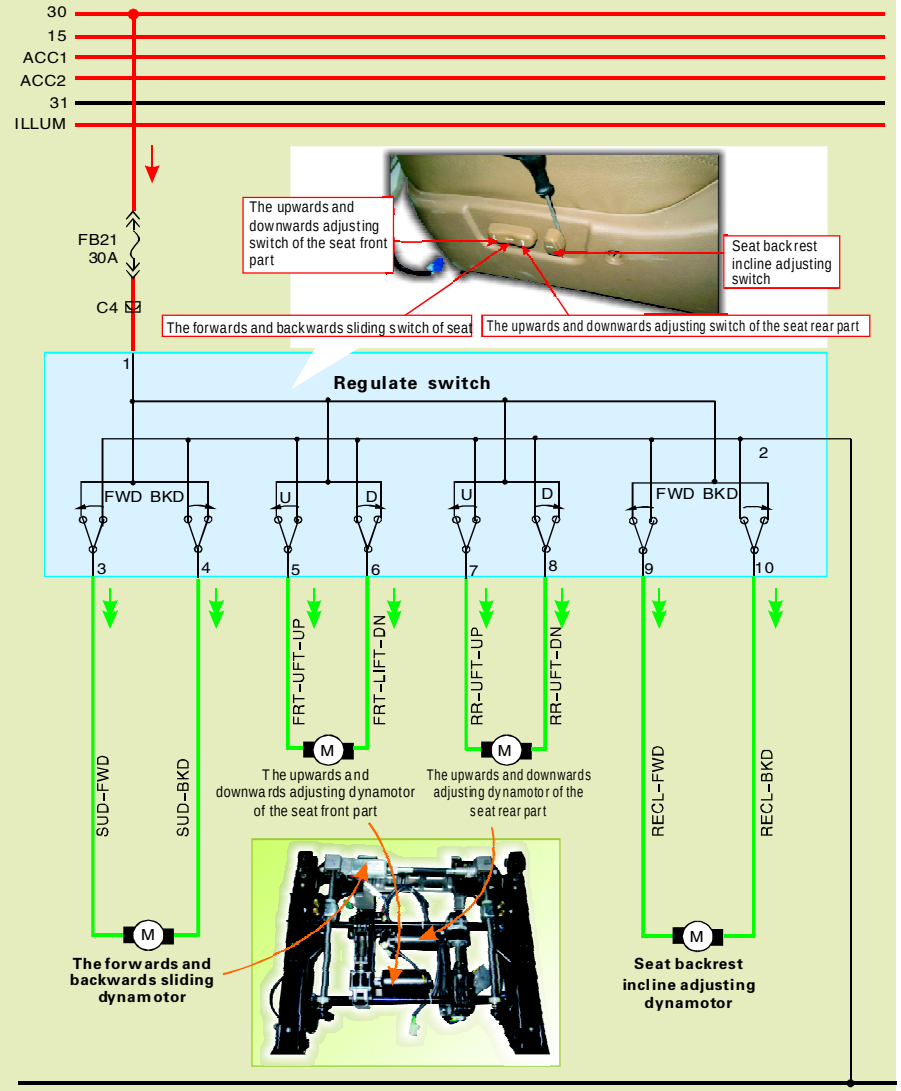


Figure20-1 Electric seat 8 Directional Adjust Circuit

Electric Seat System Circuit Analysis:

The driver seat of A5 is electric adjustable seat. It has four adjusting motor and adjust control switch. The adjusting motor is permanent magnet motor. It realizes the the circumvolve from frontispiece to inverse with the different electrified direction of each motor. So, the four adjusting motors enable the seat to move towards 8 directions such as front、rear、up、down、gradient and so on. The 8 directions adjustable seat circuit is shown as figure 20-1.

The positive voltage of battery→positive fuse box 120A fuse Fb28→30th line→30A fuse Fb21→the 1st pin of electric seat adjusting switch.

(1) Upwards and downwards of seat front part

When press the UP button of the front seat's part, battery voltage that reaches the 1st pin of adjusting switch via the UP contact point of seat's adjusting switch→the 5th pin of seat's adjusting switch→the front seat's up and down motor→the 6th pin of seat adjusting switch→the UP contact point of seat adjusting switch→the 2nd pin of seat adjusting switch→the ground point near the hand brake→Negative of battery, then the front part of seat will move upwards.

When press the DOWN button of the front seat's part, battery voltage that reaches the 1st pin of adjusting switch via the DOWN contact point of seat's adjusting switch→the 6th pin of seat's adjusting switch→the front seat up and down motor→the 5th pin of seat's adjusting switch→the DOWN contact point of seat's adjusting switch→the 2nd pin of seat's adjusting switch→the ground point near the hand brake→Negative of battery, then the front part of seat will move downwards.

(2) Forwards and backwards of seat

When press the FRONT button of the seat , battery voltage that reaches the 1st pin of adjusting switch via the FRONT contact point of seat's adjusting switch→the 3rd pin of seat's adjusting switch→the forwards and backwards sliding motor→the 4th pin of seat's adjusting switch→the FRONT contact point of seat's adjusting switch→the 2nd pin of seat's adjusting switch→the ground point near the hand brake→Negative of battery, then the front part of seat will move forwards.

When press the REAR button of the seat , battery voltage that reaches the 1st pin of adjusting switch via the REAR contact point of seat's adjusting switch→the 3rd pin of seat's adjusting switch→the forwards and backwards sliding motor→the 4th pin of seat's adjusting switch→the REAR contact point of seat's adjusting switch→the 2nd pin of seat's adjusting switch→the ground point near the hand brake→Negative of battery, then the front part of seat will move backwards.

(3) Upwards and downwards of seat rear part

When press the UP button of the seat's rear part, battery voltage that reaches the 1st pin of adjusting switch via the UP contact point of seat's adjusting switch→the 7th pin of seat's adjusting switch→the front seat up and down motor→the 8th pin of seat's adjusting switch→the UP contact point of seat's adjusting switch→the 2nd pin of seat's adjusting switch→the ground point near the hand brake→Negative of battery, then the rear part of seat will move upwards.

When press the DOWN button of the seat's rear part, battery voltage that reaches the 1st pin of adjusting switch via the DOWN contact point of seat's adjusting switch→the 8th pin of seat's adjusting switch→the front seat up and down motor→the 7th pin of seat's adjusting switch→the DOWN contact point of seat's adjusting switch→the 2nd pin of seat's adjusting switch→the ground point near the hand brake→Negative of battery, then the rear part of seat will move downwards.

(4) The forwards and backwards adjustment of backrest

When press the FRONT incline button of the seat backrest , battery voltage that reaches the 1st pin of adjusting switch via the FRONT contact point of seat's adjusting switch→the 9th pin of seat's adjusting switch→the backrest forwards and backwards adjusting motor→the 10th pin of seat's adjusting switch→the FRONT incline contact point of seat's adjusting switch→the 2nd pin of seat's adjusting switch→the ground point near the hand brake→Negative of battery, then the front part of seat will incline forwards.

When press the REAR incline button of the seat backrest , battery voltage that reaches the 1st pin of adjusting switch via the REAR contact point of seat's adjusting switch→the 10th pin of seat's adjusting switch→the backrest forwards and backwards adjusting motor→the 9th pin of seat's adjusting switch→the backwards incline contact point of seat's adjusting switch→the 2nd pin of seat's adjusting switch→the ground point near the hand brake→ Negative of battery, then the front part of seat will incline backwards.



Seat Heater System

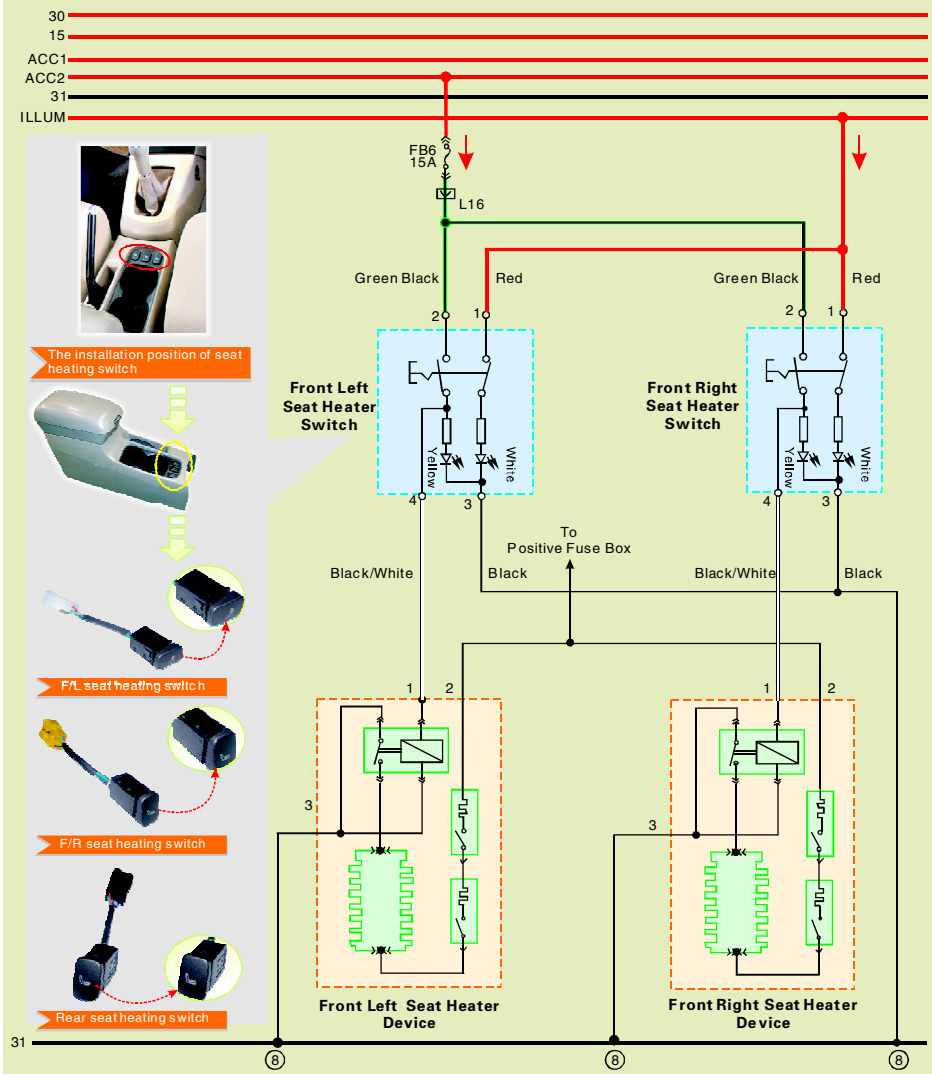


Figure21-1 Seat Heater System Circuit Diagram

Seat Heater System Circuit Analysis:

(1) Front left seat heater

◆Control circuit

When press the front left seat heating switch, the voltage of ACC2 wire→15A Fb6 fuse→2nd pin of front left seat heating switch→contact point of front left seat heating switch→4th pin of front left seat heating switch→1st pin of front left seat heating set→3rd pin of front left seat heating set→ground.

◆Main circuit

The positive pole of battery→FB32 fuse in positive pole fuse box→2nd pin of the front left seat heating set→go through the heating wire and relay contact point in the front left seat heating set→3rd pin of the front left seat heating set→ground. The front left seat heater heating then.

The voltage of ACC2 wire→15A Fb6 fuse→2nd pin of front left seat heating switch→contact point of front left seat heating switch→3rd pin of front left seat heating switch→ground. The left heat indicator lamp light on.

(2) Front right seat heater

◆Control circuit

When press the front right seat heating switch, the voltage of ACC2 wire→15A Fb6 fuse→2nd pin of front right seat heating switch→contact point of front right seat heating switch→4th pin of front right seat heating switch→1st pin of front right seat heating set→3rd pin of front right seat heating set→ground.

◆Main circuit

The positive pole of battery→FB32 fuse in positive pole fuse box→2nd pin of the front right seat heating set→go through the heating wire and relay contact point in the front right seat heating set→3rd pin of the front right seat heating set→ground. The front right seat heater heating then.

The voltage of ACC2 wire→15A Fb6 fuse→2nd pin of front right seat heating switch→contact point of front right seat heating switch→3rd pin of front right seat heating switch→ground. The right heat indicator lamp light on.

Audio System

Circuit Analysis:

The circuit of the acoustics is shown as figure 22–1. The acoustic system possess the fuctions of tape play、radio listening 、broadcast frequency memory、sound control、front/rear/left /right reproducer volume and so on.

The voltage from battery directly supplies to the 16th pin of acoustics and the 16th pin of diagnose port via the 15A fuse Fb23.

The night ILLUM wire supplies power to the 14th pin of acoustics, and light up the acoustic night lamp.

The 11th pin of acoustic is connectted to antenna that with amplifier to receive broadcast signal from broadcasting station.

There are six horns on the vehicle, the R/L horns are connectted to the 6th、7th pin of acoustics; the R/R horns are connectted to the 9th、8th pin of acoustics; the F/R and F/R alt horns are connectted to the 5th、4th pin of acoustics; the F/L and F/L alt horns are connectted to the 2nd、3rd pin of acoustics.

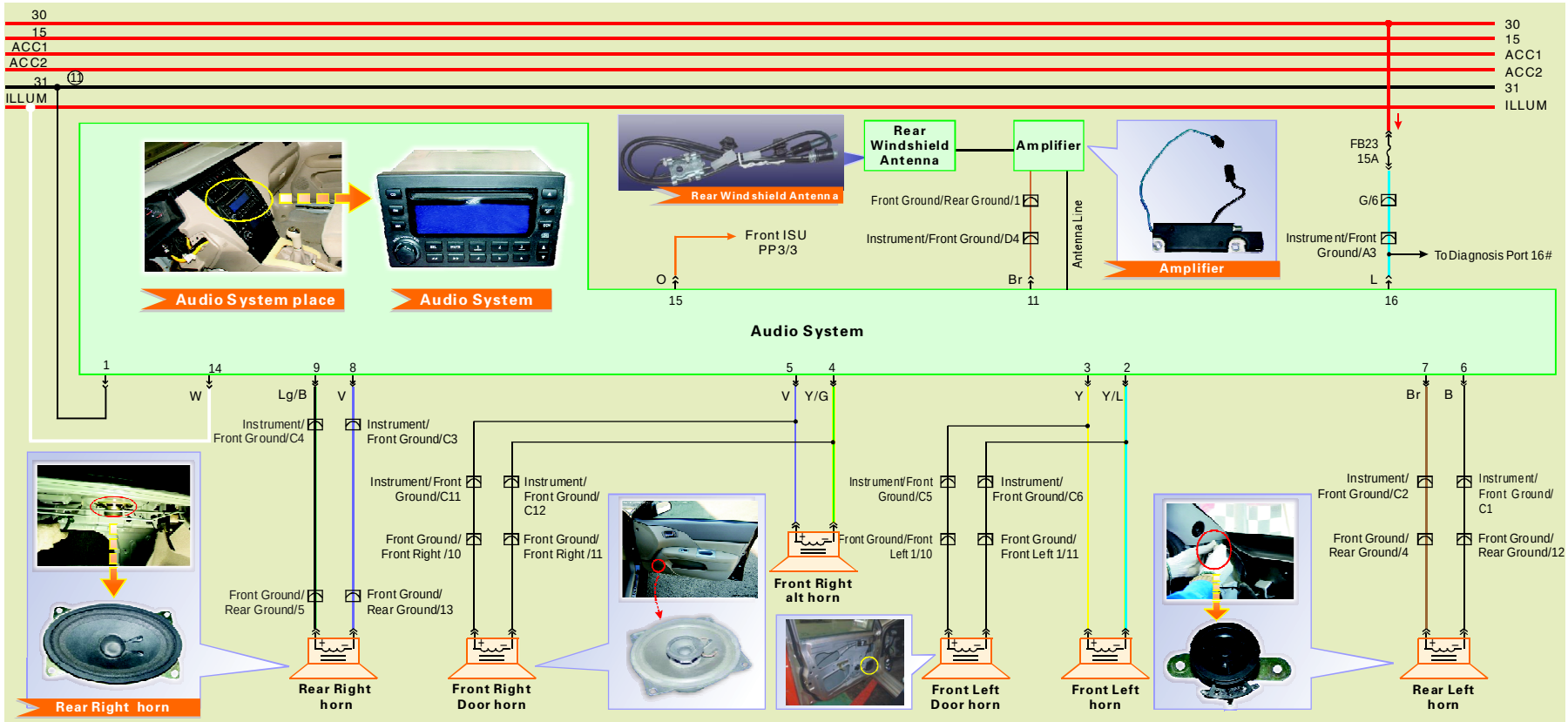


Figure22–1 Audio System Circuit Diagram

Audio System

Circuit Analysis:

The circuit of the acoustics is shown as figure 22–1. The acoustic system possess the fuctions of tape play、radio listening 、broadcast frequency memory、sound control、front/rear/left /right reproducer volume and so on.

The voltage from battery directly supplies to the 16th pin of acoustics and the 16th pin of diagnose port via the 15A fuse Fb23.

The night ILLUM wire supplies power to the 14th pin of acoustics, and light up the acoustic night lamp.

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There are six horns on the vehicle, the R/L horns are connectted to the 6th、7th pin of acoustics; the R/R horns are connectted to the 9th、8th pin of acoustics; the F/R and F/R alt horns are connectted to the 5th、4th pin of acoustics; the F/L and F/L alt horns are connectted to the 2nd、3rd pin of acoustics.

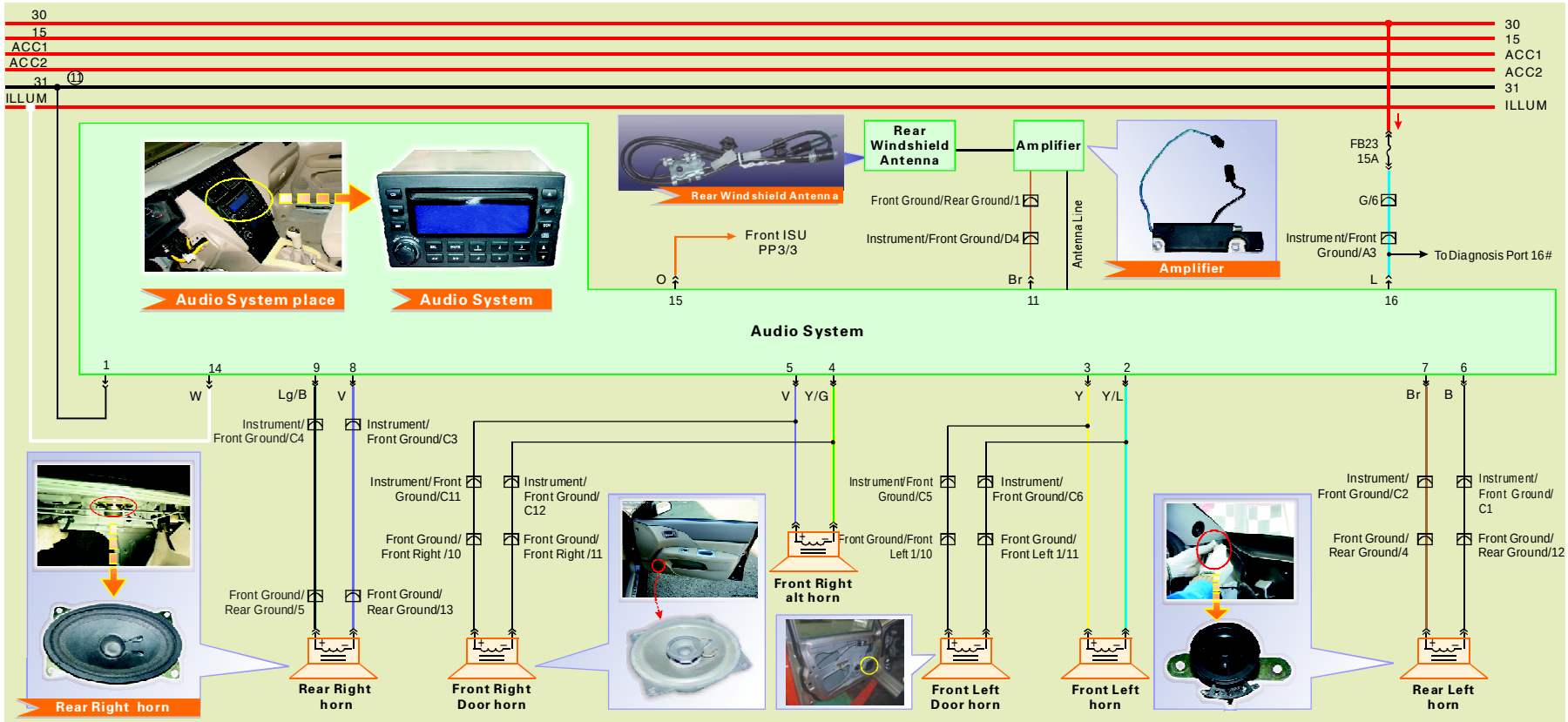


Figure22–1 Audio System Circuit Diagram



Sun roof & Cigarette Lighter System

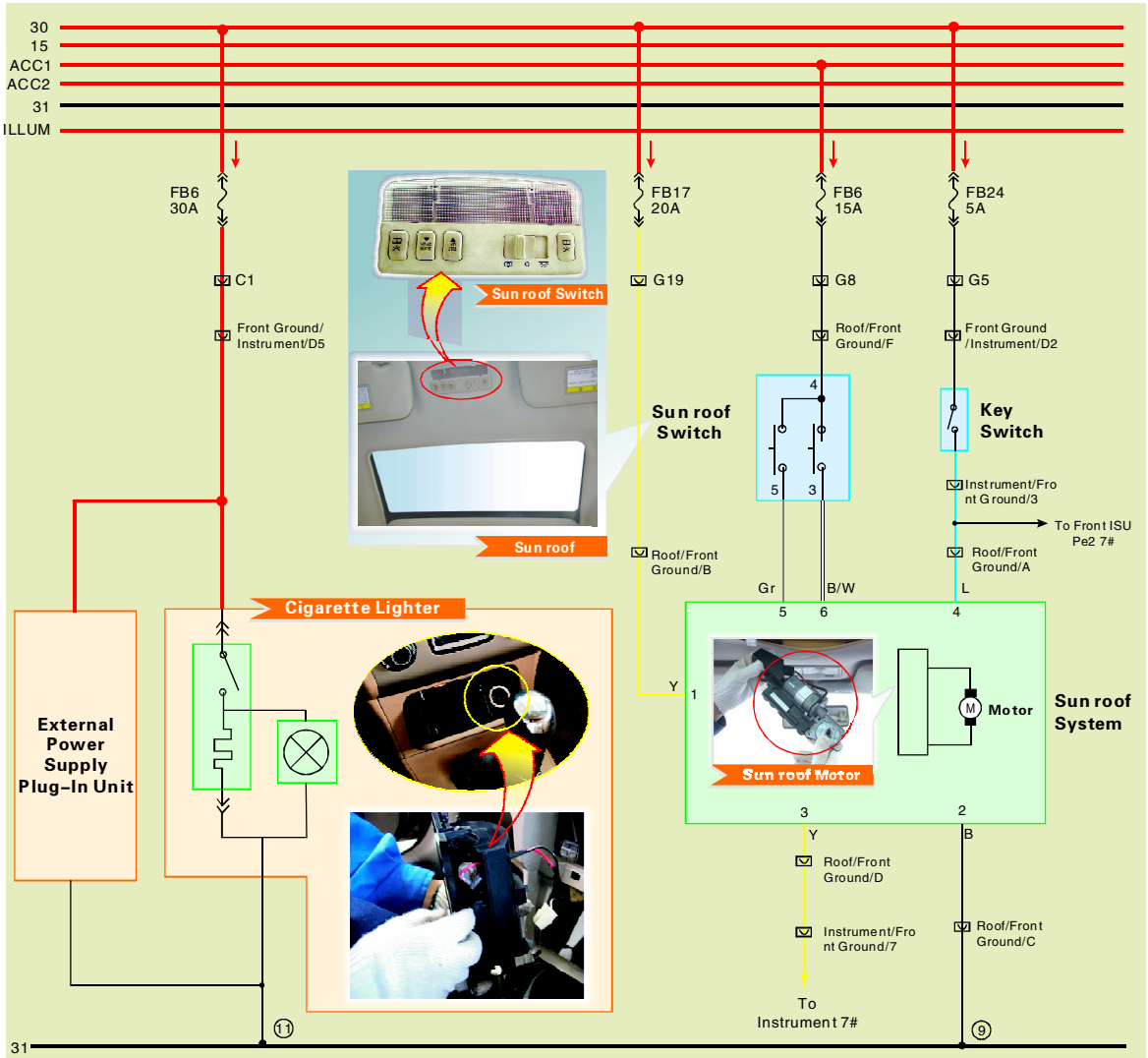


Figure23-1 Sun roof & Cigarette Lighter System Circuit Diagram

Circuit Analysis:

1. The voltage of the 30th wire supply to the 1st pin of sun roof system via fuse Fb17; The voltage of the 30th wire supply to the 4th pin of sun roof system via fuse FB24 and then key switch signal, the 4th pin of the sun roof is controlled by key signal switch; the 5th and 6th pin of the sun roof system are connectted with the sun roof switch, when press down the button, the voltage of the 15th wire via the 15A Fb6→sun roof switch→supply power to the 5th and 6th pin of sun roof system; the 2nd pin of the sun roof module conenct to ground near the hand brake.

2. The 30th wire supplies to the cigarette lighter via the 30A fuse Fb6. When press down the lighter switch, the lighter gain the electricity and heating thread work, the indicator lamp light on. The two ends of the cigarette lighter parallel are connectted to the outer power.

Circuit of the Front Engine Compartment Fuse Box

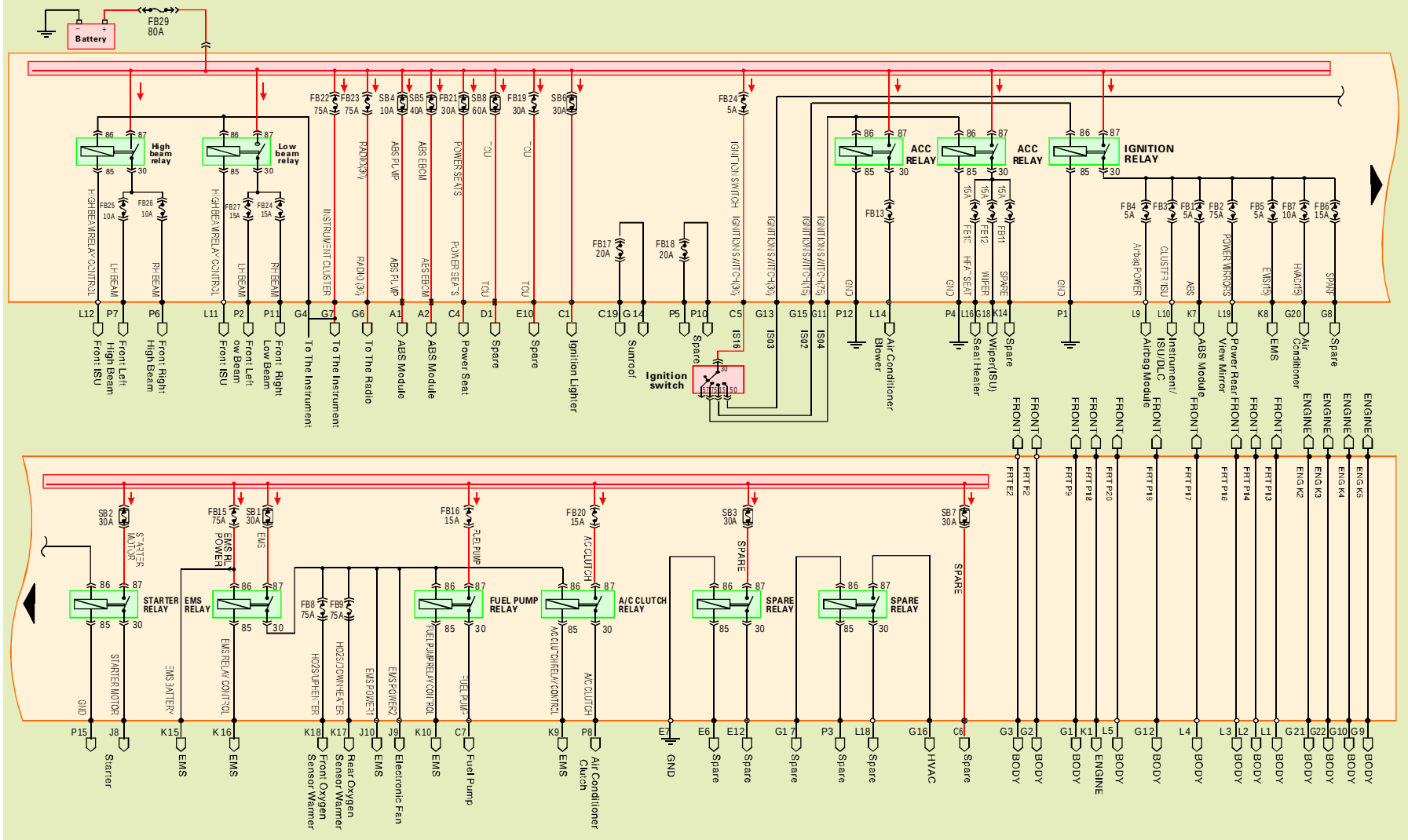
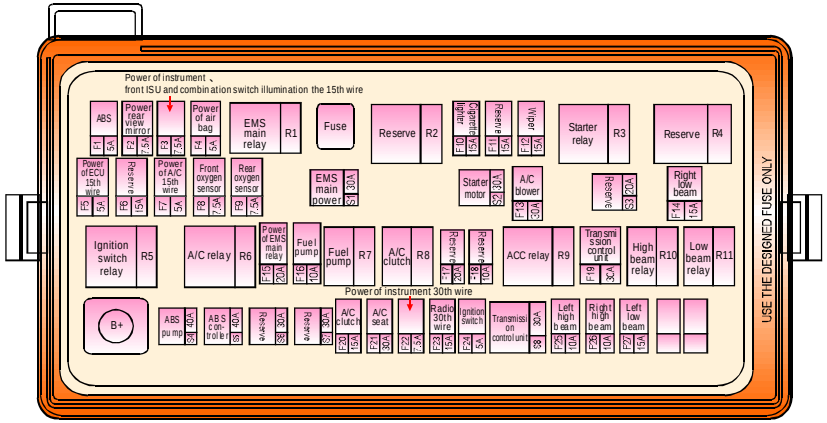


Figure24–1 Circuit of the Front Engine Compartment Fuse Box



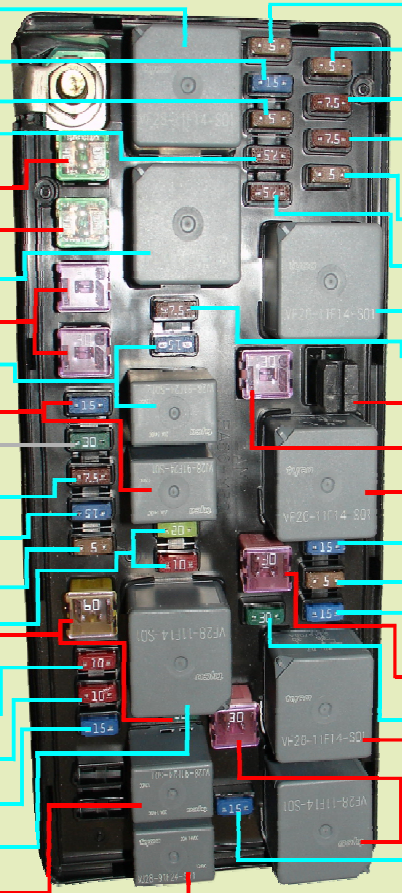
Front Engine Compartment Fuse Box





Relay Box

- Ignition relay
- Standby
- A/C 15 pin power
- Front oxygen sensor
- ABS pump
- ABS controller
- ACC relay
- Standby
- Fuel pump
- A/C clutch
- Electric adjusting seat
- Instrument 30 pin power
- Radio 30 pin
- Ignition switch
- Standby
- Transmission control unit
- Left high beam
- Right high beam
- Left low beam
- ACC relay
- High beam relay



- ECU15 pin power
- ABS
- Motor rear mirror
- Instrument 、 front ISU or combination switch light 15 pin power
- Airbag power
- Rear oxygen sensor
- EMS main relay
- EMS main relay power
- Fuse clamp
- EMS main power
- Standby
- Cigarette lighter
- Standby
- Wiper
- Starting motor
- A/C blower
- Starting relay
- **Standby**
- Right low beam
- Low beam relay

Circuit of the Front Engine Compartment Fuse Box Circuit Analyse :

1. Voltage of battery→fuse FB29→fuse FB22→the C4、C7 pin of Circuit of the Front Engine Compartment Fuse Box→supply power to instrument

At the same time, Low beam relay and High beam relay coil get electricity , and relay contact point close:

voltage of battery→fuse FB29→ contact point of high beam relay →fuse FB25→ Front left High Beam

→Fuse FB26→Front Right High Beam

Voltage of battery→fuse FB29→ contact point of Low beam relay →fuse FB25→ Front left High Beam

→Fuse FB26→Front Right High Beam



Figure 24-2

2. Voltage of battery→ Fuse FB29→fuse FB23→the G6 pin of Circuit of the Front Engine Compartment Fuse Box→supply power to radio

3. Voltage of battery→fuse FB29→fuse SB4→the A1 pin of Circuit of the Front Engine Compartment Fuse Box→supply power to ABS PUMP。

4. Voltage of battery→fuse FB29→fuse SB5→the A2 pin of Circuit of the Front Engine Compartment Fuse Box-supply power to ABS EBCM。

5. Voltage of battery→fuse FB29→fuse FB21→the C4 pin of Circuit of the Front Engine Compartment Fuse Box→supply power to electric seat

6. Voltage of battery→fuse FB29→fuse SB8→the D1 pin of Circuit of the Front Engine Compartment Fuse Box→supply power to TCU。

voltage of battery→FuseFB29→fuse FB19→the E10 pin of Circuit of the Front Engine Compartment Fuse Box→supply power to TCU。

7. Voltage of battery→Fuse FB29→fuse SB6→the C1 pin of Circuit of the Front Engine Compartment Fuse Box→supply power to ignition lighter

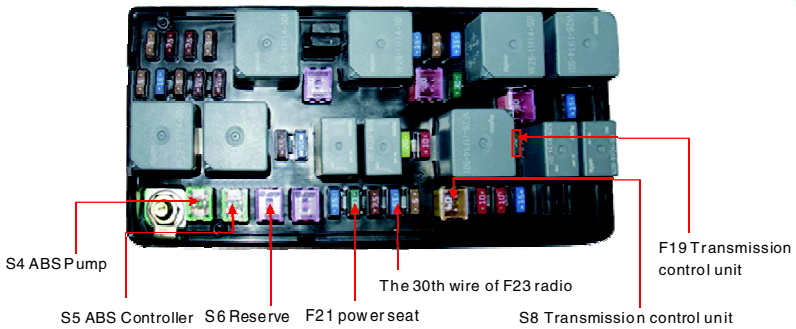


Figure 24-3

8. Voltage of battery→fuse FB29→fuse FB24→the C5 pin of Circuit of the Front Engine Compartment Fuse Box→supply power to Ignition switch。

（1）The 75th Line Ignition switch→the G11 pin of Circuit of the Front Engine Compartment Fuse Box→ACC relay coil get electricity; Voltage of battery→fuse FB29→ACC relay contact point and then supply to :

①Fuse Fb13→the L14 pin of Circuit of the Front Engine Compartment Fuse Box→Air Conditioner Blower。

②Fuse FB10→the L16 pin ofl Circuit of the Front Engine Compartment Fuse Box→Seat Heater。

③Fuse FB12→the G18 pin of Circuit of the Front Engine Compartment Fuse Box→Wiper（ISU）。

（2）The 15th pin of Ignition switch→the G15 pin of Circuit of the Front Engine Compartment Fuse Box→Ignition Relaycoil get electricity; Voltage of battery→fuse FB29→Ignition relay contact point and then supply to :

①Fuse FB4→the L9 pin of Circuit of the Front Engine Compartment Fuse Box→Airbag Module。



② FuseFB3→ the L10 pin of Circuit of the Front Engine Compartment Fuse Box→Instrument/ISU/DLC。

③Fuse Fb1→the K7 pin of Circuit of the Front Engine Compartment Fuse Box→ ABS Module。

④ FuseFB2→ the L19 pin of Circuit of the Front Engine Compartment Fuse Box→Power Rear View Mirror。

⑤FuseFB5→the K8 pin of Circuit of the Front Engine Compartment Fuse Box→ EMS。

⑥ FuseFB7→ the G20 pin of Circuit of the Front Engine Compartment Fuse Box→Air Conditioner 。

（3）The 50th line Ignition switch→the G13 pin of Circuit of the Front Engine Compartment Fuse Box→Starter Relay coil get electricity:

Voltage of battery→fuse FB29→fuse SB2→Starter Relay contact point-the J8 pin of Circuit of the Front Engine Compartment Fuse Box→Starter

9. Voltage of battery→fuse FB29→fuse FB15: one line supplies to the K15 pin of Circuit of the Front Engine Compartment Fuse Box→supply power to EMS; another line supply to EMS Relay→EMS, when the EMS Relay coil get electricity, the contact point close, voltage of battery→fuse FB29→fuse SB1→EMS Relay contact point, and then the power supply is as follow:

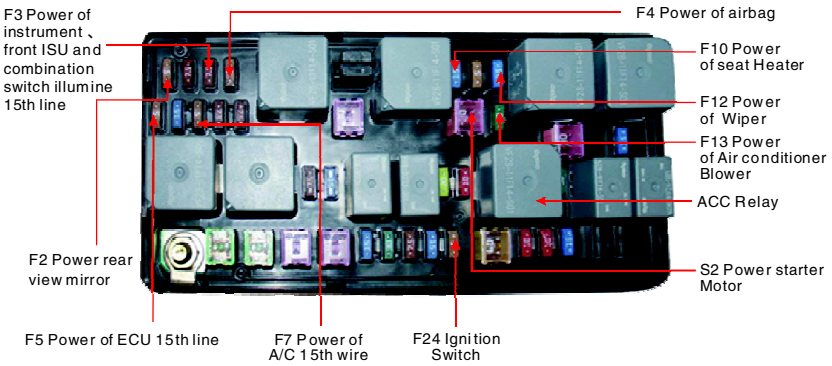


Figure24-4

①fuse FB8→the K18 pin of Circuit of the Front Engine Compartment Fuse Box→ Front Oxygen Sensor Warmer。

②fuse FB9→the K17 pin of Circuit of the Front Engine Compartment Fuse Box→Rear Oxygen Sensor Warmer。

③The J10 pin of Circuit of the Front Engine Compartment Fuse Box→EMS。

④The J9 pin of Circuit of the Front Engine Compartment Fuse Box→Electronic Fan

⑤Fuel Pump Relay→the K10 pin of Circuit of the Front Engine Compartment Fuse Box→EMS. When Fuel Pump Relay get electricity, the contact point close, voltage of battery→fuse FB29→fuse FB16→Fuel Pump Relay contact→the C7 pin of Circuit of the Front Engine Compartment Fuse Box→Fuel Pump

⑥A/C Clutch Relay→the K9 pin of Circuit of the Front Engine Compartment Fuse Box→EMS. When A/C Clutch Relay get electricity, the contact point close, voltage of battery→fuse Fb29→fuse FB20→A/C Clutch Relay contact→the P8 pin of Circuit of the Front Engine Compartment Fuse Box→Air Conditioner Clutch

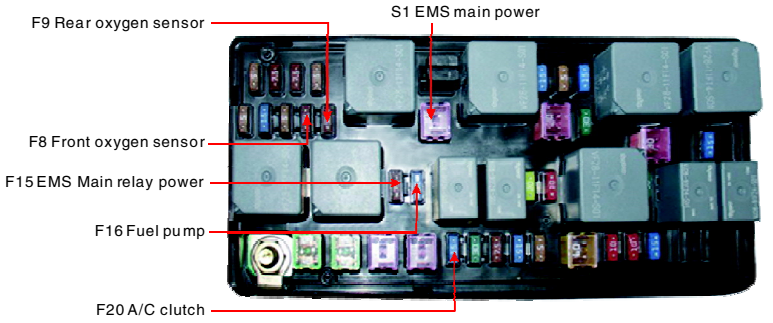


Figure24-5



After-sales Service Dept. Chery Automobile Co.,Ltd.