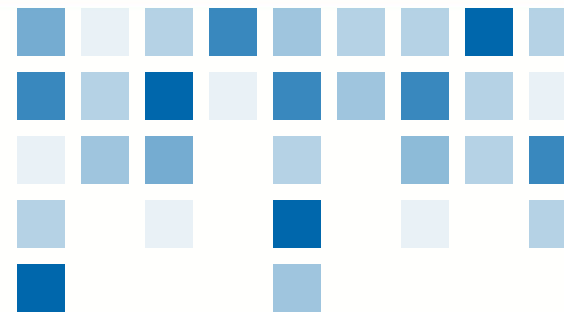
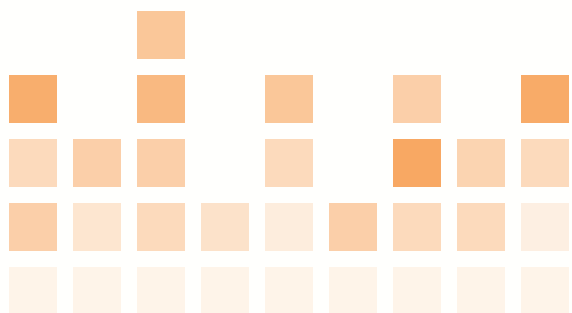




# SHACMAN 汽车电器知识培训

F2000-F3000

陕汽进出口公司服务部培训科



## 第五课 电器装置板的保险丝

### Lesson Five: Fuses in the Electrical Control Unit

**中央电器装置板：**作为整车电路保护装置和集中控制的核心，不仅采用了新材料、新结构，而且设计先进合理、集中度高。由于采用了模块化的设计思路，使其具有了多功能、扩展性强的特点。

中央电器装置板仅依靠本体上的**26** 路熔断丝插口和**17**个继电器、控制器插口就可基本满足整车各种电气功能的需要。在整车控制线路不进行较大改动的情况下，改变装置板上连接片插接位置，即可实现整车控制方式的改变。

中央电器装置板外壳采用耐高低温、耐变形、耐冲击、韧性好的工程塑料，内部采用机械性能良好、电性能优越、耐大负载的金属材料，安装支架设计合理稳固，保证了该装置的可靠性。

The central electrical control unit is a core component responsible for protecting the vehicle's electrical circuits and providing centralized control. It features a design with new materials and structures, characterized by advanced rationality and high integration. Utilizing a modular design approach, it exhibits multifunctionality and strong expandability.

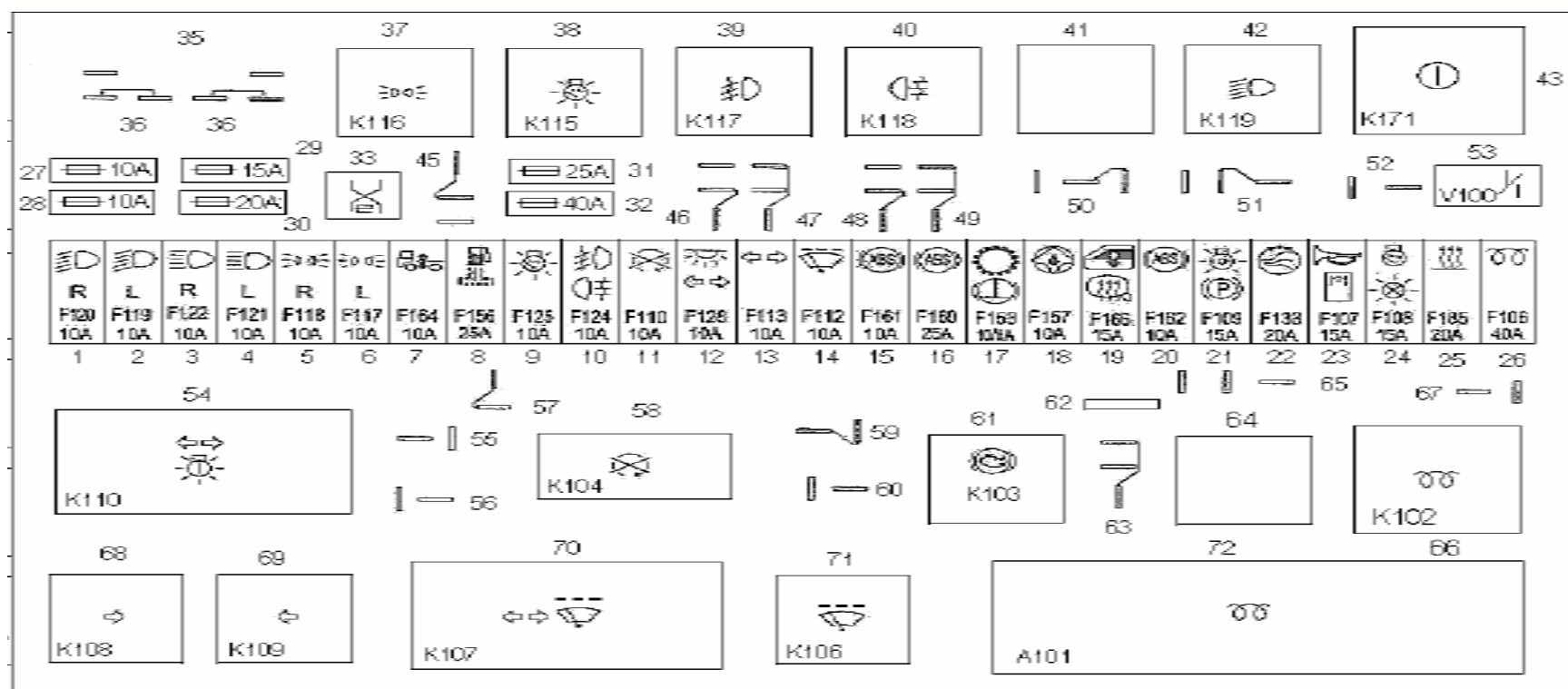
Relying primarily on the vehicle's 26-way fuse wire sockets and 17 relay/controller sockets, the central electrical control unit can meet the basic electrical needs of the entire vehicle. Without making significant changes to the vehicle's control lines, altering the connection positions of the unit's connecting pieces enables changes to the vehicle's control methods.

The unit's housing is constructed from engineering plastics with high resistance to temperature variations, deformation, impacts, and excellent toughness. Internally, it employs metal materials with superior mechanical and electrical performance, capable of withstanding heavy loads. The rational and sturdy design of the mounting bracket ensures the reliability of the unit.



电器装置板安装在驾驶室内部，副驾驶位置的仪表台最右侧(右置车在最左侧)，电器盖板下面。其上安装有大量继电器、保险装置。

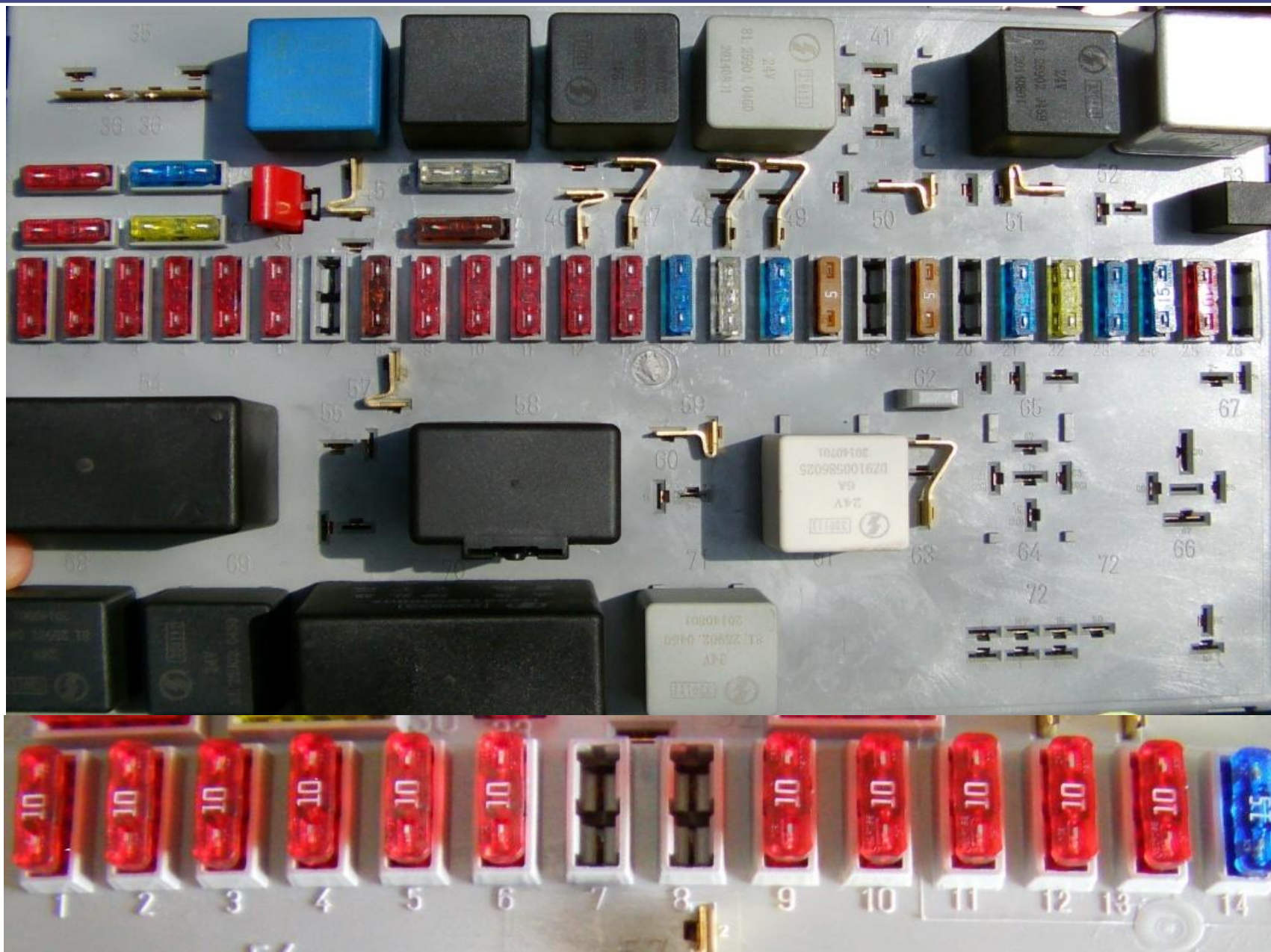
The electrical control unit is installed inside the cabin, on the far right side of the dashboard at the passenger's side (or on the far left for right-hand drive vehicles), beneath the electrical cover. It is equipped with numerous relays and fuse devices.



F2000电器装置板布置图

Electrical Control Unit Layout Diagram





电器装置版的主要部件功能：

其中1—32是**保险丝**。（注：序号1-32 为电器板上的位置号）

**1—F1, 10A**， 右前大灯近光保险丝 ，此处保险丝电源是36号位置的铜片提供的，它的电流输出是通过电器装置板后面的81-5位置由56300线传递到右前大灯的近光灯。

### Main Components and Functions of the Electrical Control Unit

Positions 1 to 32 are fuses. (Note: numbers 1-32 correspond to the position numbers on the electrical control unit.)

F1, 10A: The right front headlight low beam fuse. The power for this fuse is provided by the copper piece at position 36. Its current output is transmitted through position 81-5 on the back of the electrical control unit via wire 56300 to the right front headlight's low beam.



**2—F2, 10A**， 左前大灯近光保险丝，此处保险丝电源是36号位置的铜片提供的，它的电流输出是通过电器装置板后面的81-3位置由56301线传递到左前大灯的近光灯。

The fuse for the left front headlight low beam. The power for this fuse is supplied by the copper piece at position 36. Its current output is transmitted through position 81-3 on the back of the electrical control unit via wire 56301 to the left front headlight's low beam.



3—F3 ， 10A， 右前大灯远光保险丝， 此处保险丝电源是电器装置板后面86-5位置的56502线提供的， 它的电流输出是通过电器装置板后面的81-7位置由56302线传递到右前大灯的远光灯。

The fuse for the right front headlight high beam. The power for this fuse is supplied by wire 56502 at position 86-5 on the back of the electrical control unit. Its current output is transmitted through position 81-7 on the back of the electrical control unit via wire 56302 to the right front headlight's high beam.

4—F4 ， 10A， 左前大灯远光保险丝， 此处保险丝电源是电器装置板后面86-5位置的56502线提供的， 它的电流输出有两路： 第一路是通过电器装置板后面的82-5位置由56303线传递到左前大灯的远光灯。第二路是通过电器装置板后面的82-5位置由另外一根56303线传递到仪表盘的远光指示灯。

The fuse for the left front headlight high beam. The power for this fuse is provided by wire 56502 at position 86-5 on the back of the electrical control unit. Its current output has two paths: The first path is transmitted through position 82-5 on the back of the electrical control unit via wire 56303 to the left front headlight's high beam. The second path is transmitted through position 82-5 on the back of the electrical control unit via another wire 56303 to the high beam indicator light on the dashboard.



**5—F5, 10A,** 右位置灯、驻车灯保险丝，此处保险丝电源是电器装置板37位置的K116（81.25902.0410）继电器正常吸合后87b端子提供，它的电流输出有四路：第一路是通过电器装置板后面的75-7位置由58302线传递到右侧标志灯和右后位置灯。第二路是通过电器装置板后面的75-7位置由另外一根58302线传递到七孔挂车插座的EA灰红线。第三路是通过电器装置板后面的77-2位置由58302线传递到右示高灯。第四路是通过电器装置板后面的82-1位置由58302线传递到右前大灯内部的右位置灯。

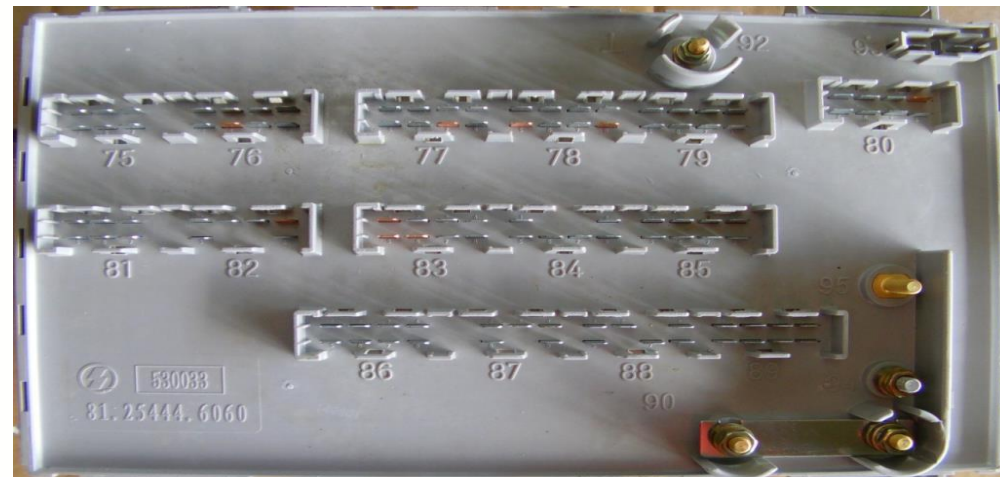
The fuse for the right position light and parking light. The power for this fuse is provided by terminal 87b of relay K116 (81.25902.0410) at position 37 on the electrical control unit when the relay is normally closed. Its current output has four paths: The first path is transmitted through position 75-7 on the back of the electrical control unit via wire 58302 to the right side marker light and the right rear position light. The second path is transmitted through position 75-7 on the back of the electrical control unit via another wire 58302 to the EA gray-red wire of the seven-hole trailer socket. The third path is transmitted through position 77-2 on the back of the electrical control unit via wire 58302 to the right indicator light. The fourth path is transmitted through position 82-1 on the back of the electrical control unit via wire 58302 to the right position light inside the right front headlight.



**6—F6, 10A**，左位置灯、驻车灯保险丝，此处保险丝电源是电器装置板37位置的K116（81.25902.0410）继电器正常吸合后87端子提供的。它的电流输出有四路：第一路是通过电器装置板后面的76-8位置由58303线传递到左侧标志灯、左后位置灯和牌照灯。第二路是通过电器装置板后面的76-8位置由另外一根58303线传递到七孔挂车插座的EF灰绿线。第三路是通过电器装置板后面的77-5位置由58303线传递到左示高灯。第四路是通过电器装置板后面的82-8位置由58303线传递到左前大灯内部的左位置灯。

The fuse for the left position light and parking light. The power for this fuse is provided by terminal 87 of relay K116 (81.25902.0410) at position 37 on the electrical control unit when the relay is normally closed. Its current output has four paths: The first path is transmitted through position 76-8 on the back of the electrical control unit via wire 58303 to the left side marker light, left rear position light, and license plate light. The second path is transmitted through position 76-8 on the back of the electrical control unit via another wire 58303 to the EF gray-green wire of the seven-hole trailer socket. The third path is transmitted through position 77-5 on the back of the electrical control unit via wire 58303 to the left indicator light. The fourth path is transmitted through position 82-8 on the back of the electrical control unit via wire 58303 to the left position light inside the left front headlight.

**7—F7, 10A**，电控空气悬架保险丝（EASC选用装置） use for the Electronic Air Suspension Control (EASC Selection Device) System



8—F8，25A，燃油滤清器加热（水寒宝）保险丝（选用），此处保险丝电源是电器装置板后面90、91位置的30010常电提供的，此常电电源只要电瓶总开关接通，就会有电。它的电流输出是通过电器装置板后面的86-1位置由30010线传递到燃油加热继电器K901的30端子。

Optional Fuse for the Fuel Filter Heater (Water Cold Protection). The power for this fuse is provided by the 30010 constant electricity at positions 90 and 91 on the back of the electrical control unit. This constant electricity source is active whenever the battery master switch is turned on. Its current output is transmitted through position 86-1 on the back of the electrical control unit via wire 30010 to terminal 30 of fuel heating relay K901.

9—F9，10A，仪表板照明和开关照明保险丝，此处保险丝电源是电器装置板38位置的K115（81.25902.0459）继电器正常吸合后87端子提供的，它的电流输出是通过电器装置板后面的86-2位置由58000线传递到（仪表照明）分电器X644和（开关照明）分电器X364。

Fuse for Instrument Panel Illumination and Switch Illumination. The power for this fuse is provided by terminal 87 of relay K115 (81.25902.0459) at position 38 on the electrical control unit when the relay is normally closed. Its current output is transmitted through position 86-2 on the back of the electrical control unit via wire 58000 to distribution units X644 (for instrument illumination) and X364 (for switch illumination).

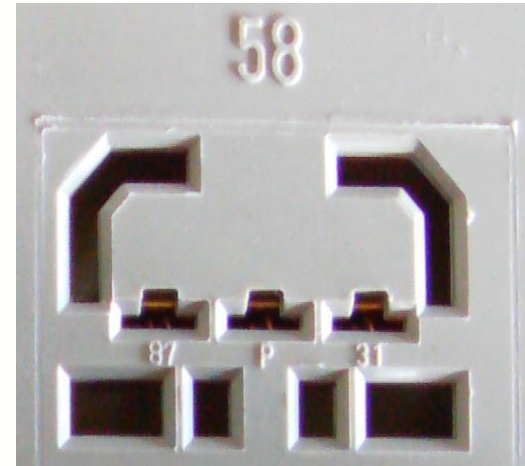


**10—F10**，**10A**，前雾灯和后雾灯保险丝，此处保险丝电源是电器装置板38位置的K115（81.25902.0459）继电器正常吸合后87端子提供的。它的电流输出有三路：第一路是通过电器装置板内部传递到39位置的K117（81.25902.0459）继电器30端子，作为前雾灯电源。第二路是通过电器装置板内部传递到40位置的K118（81.25902.0460）继电器87端子，作为后雾灯电源。第三路是通过电器装置板后面的87-8位置由56005线传递到雾灯开关S555的7号端子，作为雾灯开关的电源使用。

Fuse for Front Fog Lights and Rear Fog Lights. The power for this fuse is provided by terminal 87 of relay K115 (81.25902.0459) at position 38. Its current output has three paths: The first path is transmitted internally to terminal 30 of relay K117 (81.25902.0459) at position 39 on the electrical control unit, serving as the power supply for the front fog lights. The second path is transmitted internally to terminal 87 of relay K118 (81.25902.0460) at position 40 on the electrical control unit, serving as the power supply for the rear fog lights. The third path is transmitted through position 87-8 on the back of the electrical control unit via wire 56005 to terminal 7 of fog light switch S555, serving as the power supply for the fog light switch.

**11—F11**，**10A**，发动机熄火保险丝（潍柴EGR发动机选用），此处保险丝电源是钥匙开关Q101在熄火档位P档时5号端子输出的43000线传递到电器装置板后面的86-4位置提供的，它的电流输出是通过电器装置板内部传递到58位置的P端子。（EGR发动机的车型需要一个黄铜连接片安装在58位置的87和P端子之间）。

Engine Shutdown Fuse (Optional for Weichai EGR Engine). The power for this fuse is provided by wire 43000, which is output from terminal 5 of the key switch Q101 when in the P (shutdown) position, and transmitted to position 86-4 on the back of the electrical control unit. Its current output is transmitted internally to terminal P at position 58 on the electrical control unit. EGR engine models require a brass connector to be installed between terminals 87 and P at position 58.



**12—F12**，**10A**，危急警告灯、行车记录仪、收音机保险丝。此处保险丝电源是电瓶正极柱的常电（此常电不受电瓶开关控制，或持续耗电装置）经过30000线由电器装置板后面的83-4位置进入传递到46位置的（黄铜）连接片提供的，它的电流输出有两路：第一路是通过电器装置板后面的83-7位置的30006线传递到了危险灯开关的3号位置，作为危险灯控制电源。第二路是通过电器装置板后面的87-2位置的30006线传递到了（常通电源）分电器X348，作为收音机、组合仪表、行车记录仪常电电源。

Fuse for Hazard Warning Lights, Dashboard Camera, and Radio. The power for this fuse is provided by the constant power from the positive terminal of the battery (this constant power is not controlled by the battery switch or is used for devices with continuous power consumption). It enters through wire 30000 at position 83-4 on the back of the electrical control unit and is provided to the brass connector at position 46. Its current output has two paths: The first path is transmitted through wire 30006 at position 83-7 on the back of the electrical control unit to terminal 3 of the hazard light switch, serving as the power supply for the hazard lights. The second path is transmitted through wire 30006 at position 87-2 on the back of the electrical control unit to distribution unit X348 (constant power supply), serving as the constant power supply for the radio, combination instrument, and Dashboard Camera.



**13—F13**，**10A**，转向灯保险丝。此处保险丝电源是47位置的（黄铜）连接片提供的15001钥匙电（意思是打开钥匙开关才会有电）。它的电流输出是通过电器装置板后面的87-3位置的49000线传递到了危险灯开关的9号位置，作为转向灯控制电源。

Turning Signal Fuse. The power for this fuse is provided by the brass connector at position 47, which supplies power from wire 15001, which means power is available only when the key switch is turned on. Its current output is transmitted through wire 49000 at position 87-3 on the back of the electrical control unit to terminal 9 of the hazard light switch, serving as the control power for the turning signals.

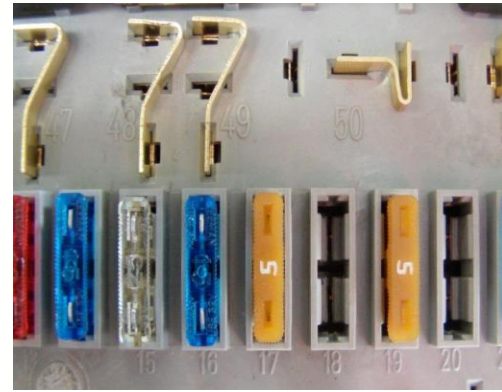


**14—F112, 15A**，雨刮喷淋保险丝。此处保险丝电源是15001电源提供的钥匙电（意思是打开钥匙开关才会有电）。它的电流输出有三路：第一路是通过电器装置板后面的78-5位置的20000线传递到了雨刮电机的2号位置，作为雨刮电机位置信号的电源。第二路是通过电器装置板后面的82-4位置的20000线传递到了组合开关的2-1号位置，作为雨刮一档、二档和间歇档工作电源。第三路是通过电器装置板后面的82-4位置的另外一根20000线传递到了组合开关的2-6号位置，作为雨刮喷淋档电源。

Windshield Wiper and Washer Fuse. The power for this fuse is provided by wire 15001, which means power is available only when the key switch is turned on. Its current output is split into three paths. Through wire 20000 at position 78-5 on the back of the electrical control unit to terminal 2 of the windshield wiper motor, serving as the power source for the windshield wiper motor position signal. Through wire 20000 at position 82-4 on the back of the electrical control unit to terminal 2-1 of the combination switch, serving as the power source for the operation of the windshield wiper in the first gear, second gear, and intermittent gear. Through another wire 20000 at position 82-4 on the back of the electrical control unit to terminal 2-6 of the combination switch, serving as the power source for the windshield wiper washer gear.

**15—F15, 25A**，挂车ABS 电磁阀保险丝（选用）。此处保险丝电源是48位置的（黄铜）连接片提供的30010常电电源。它的电流输出是通过电器装置板后面的84-6位置的73000线传递到了ABS挂车插座的1号位置AF红绿线。

Trailer ABS Solenoid Fuse (optional). The power for this fuse is provided by the brass connector at position 48, sourced from wire 30010 (constant power). Its current output is transmitted through wire 73000 at position 84-6 on the back of the electrical control unit to terminal 1 of the ABS trailer socket, using the AF red-green wire.



**16—F16，15A**，主车ABS 电磁阀保险丝（选用）。此处保险丝电源是49位置的（黄铜）连接片提供的30010常电电源。它的电流输出是通过电器装置板后面的84-7位置的73000线传递到了ABS控制器的14孔插头8号位置常电电源。 Optional Main Vehicle ABS Solenoid Fuse. The power for this fuse is provided by the 30010 constant power source from the brass connector at position 49. Its current output is transmitted from the 84-7 position on the back of the electrical unit panel via the 73000 wire to the constant power supply at pin 8 of the 14-pin connector on the ABS controller.

**17—F17，5A**，主车ABS控制器保险丝（选用）。此处保险丝电源是15001电源提供的钥匙电。它的电流输出是通过电器装置板后面的88-2位置的73001线传递到了ABS控制器的14孔插头7号位置钥匙电电源。

**Optional Main Vehicle ABS Controller Fuse.** The power source for this fuse is provided by 15001 ignition power. Its current output is transmitted through the 73001 wire at position 88-2 on the electrical device panel to the 7 position of the 14-pin plug of the ABS controller, serving as ignition power.

**18—F18，10A**，集中润滑系统保险丝（选用）。此处保险丝电源是15001电源提供的钥匙电。它的电流输出是通过电器装置板后面的85-5和84-8位置提供给相关设备电源。

**Optional Centralized Lubrication System Fuse.** The power source for this fuse is the ignition power provided by 15001. Its current output is supplied to the relevant equipment power through positions 85-5 and 84-8 on the back of the electrical device panel.

**19—F19，15A**，后视镜加热器保险丝（选用）。此处保险丝电源是15001电源提供的钥匙电。它的电流输出是通过电器装置板后面的89-1位置24012线传递到了后视镜加热开关S106的6号位置，作为电源使用。

**Optional Rearview Mirror Heater Fuse.** The power source for this fuse is the ignition power provided by 15001. Its current output is transmitted through position 89-1 on the back of the electrical device panel via the 24012 wire to position 6 of rearview mirror heating switch S106, serving as the power supply.



**20—F20, 5A**, 挂车ABS 控制器保险丝（选用）。此处保险丝电源是15001电源提供的钥匙电。它的电流输出是通过电器装置板后面的89-2位置的73002线传递到了ABS挂车插座的2号位置BF黑绿线。

Optional Trailer ABS Controller Fuse. The power source for this fuse is the ignition power provided by 15001. Its current output is transmitted through the 73002 wire at the 89-2 position on the electrical device board to position 2 of the ABS trailer socket via the BF black-green wire.

**21—F21, 15A**, 驻车制动、倒车灯、制动灯保险丝。此处保险丝电源是15001电源提供的钥匙电。它的电流输出有三路：第一路是通过电器装置板后面的89-3位置的43001线传递到了制动灯开关的1号位置，作为制动灯电源。第二路是通过电器装置板后面的89-3位置的另外一根43001线传递到了驻车制动灯开关，作为信号灯电源。第三路是通过电器装置板后面的89-3位置的43001线传递到了倒车灯开关，作为倒车灯电源。

Parking Brake, Reverse Light, Brake Light Fuse. The power source for this fuse is the ignition power provided by 15001. Its current output has three routes. The first route passes through the 43001 wire at the 89-3 position on the electrical device board to position 1 of the brake light switch, serving as the brake light power supply. The second route passes through another 43001 wire at the 89-3 position on the electrical device board to reach the parking brake light switch, serving as the signal light power supply. The third route passes through the 43001 wire at the 89-3 position on the electrical device board to reach the reverse light switch, serving as the reverse light power supply.

**22—F22, 20A**, 暖风电机、空调保险丝。此处保险丝电源是15001电源提供的钥匙电。它的电流输出是通过电器装置板后面的89-4位置的25009线传递到了暖风机控制器的6号位置，作为风机电源。

Heater Blower Motor, Air Conditioning Fuse: The power source for this fuse is the ignition power provided by 15001. Its current output is transmitted through the 25009 wire at the 89-4 position on the electrical device board to position 6 of the blower motor controller, serving as the blower motor power supply.



23—F23，15A，气喇叭、空气干燥器加热保险丝。此处保险丝电源是15001电源提供的钥匙电。它的电流输出有两路：第一路是通过电器装置板后面的80-5位置的15006线传递到了空气干燥器，作为电加热电源。第二路是通过电器装置板后面的79-4位置的15006线传递到了电喇叭和气喇叭，作为喇叭电源。

Air Horn, Air Dryer Heating Fuse. The power source for this fuse is the ignition power provided by 15001. Its current output has two routes: The first route passes through the 15006 wire at the 80-5 position on the electrical device board to reach the air dryer, serving as the electrical heating power supply. The second route passes through the 15006 wire at the 79-4 position on the electrical device board to reach the electric horn and air horn, serving as the horn power supply.

24—F24，15A，仪表工作系统保险丝。此处保险丝电源是15001电源提供的钥匙电。它的电流输出是通过电器装置板后面的89-6位置的16000线传递到仪表电源分电器X362，作为仪表工作系统电源。

Instrument Working System Fuse. The power source for this fuse is the ignition power provided by 15001. Its current output is transmitted through the 16000 wire at the 89-6 position on the electrical device board to the instrument power distributor X362, serving as the instrument working system power supply.

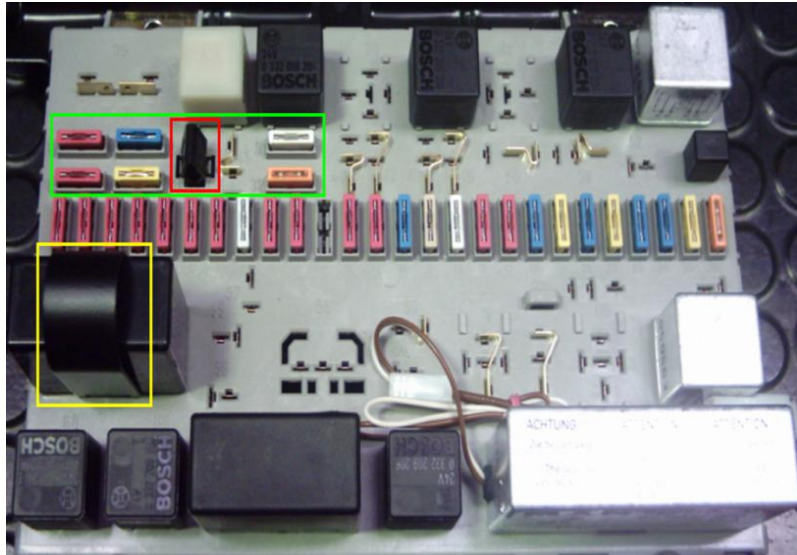


25—F25, 10A, 车内照明灯（阅读灯、门灯、踏步灯、卧铺灯）保险丝。此处保险丝电源是电器装置板后面90、91位置的30010常电提供的，此常电电源只要电瓶总开关接通，就会有电。它的电流输出是通过电器装置板后面的89-8位置由30010线传递到常电电源分电器X350，作为室内照明灯电源。

Interior Lighting (Reading Lamp, Door Lamp, Step Lamp, Sleeper Lamp) Fuse. The power source for this fuse is the constant power provided by 30010 at the 90th and 91st positions on the electrical device board. This constant power supply remains active as long as the battery master switch is turned on. Its current output is transmitted through the 30010 wire at the 89-8 position on the electrical device board to the constant power supply distributor X350, serving as the power supply for interior lighting.

26—F26, 40A, 火焰预热冷启动保险丝（潍柴国二发动机选用）

26—F26, 40A, Flame Preheating Cold Start Fuse (Optional for Weichai Euro II Engine)



27—10A, 备用保险丝。 Spare fuse

28—10A, 备用保险丝。 Spare fuse

29—15A, 备用保险丝。 Spare fuse

30—20A, 备用保险丝。 Spare fuse

31—25A, 备用保险丝。 Spare fuse

32—40A, 备用保险丝。 Spare fuse

33—保险丝拔插器，用于辅助拔插保险丝使用。 Fuse Puller, used to assist in removing and inserting fuses.

