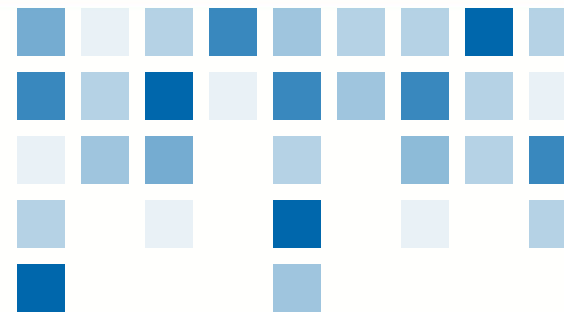
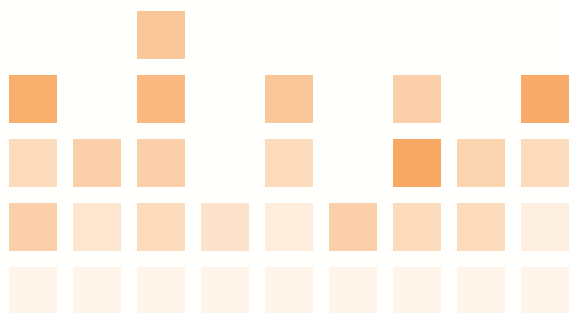




SHACMAN 汽车电器知识培训

F2000-F3000

陕汽进出口公司服务部培训科



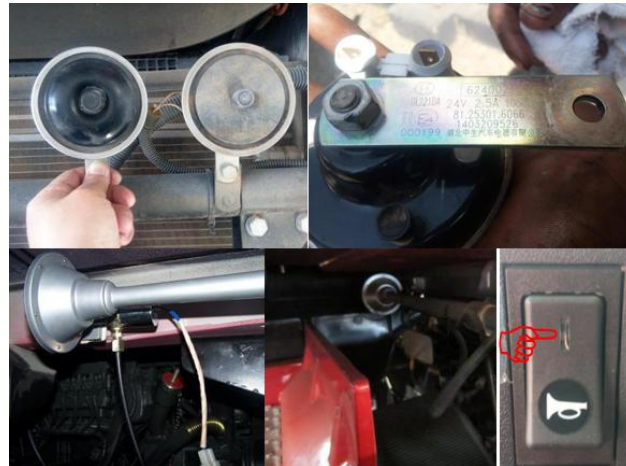
第三十五课 电气喇叭 干燥罐 驾驶室锁止 点烟器电路

1、电、气喇叭电路：

喇叭是汽车的音响信号装置。在汽车的行驶过程中，驾驶员根据需求和规定发出必需的音响信号，警告行人和引起其他车辆注意，保证交通安全，同时还用于催行与传递信号。

Electric and Air Horn Circuit

The horn is an audible signaling device in a vehicle. During driving, the driver uses the horn to emit necessary audible signals according to needs and regulations. This helps to warn pedestrians and attract the attention of other vehicles, ensuring traffic safety. The horn is also used for prompting and signaling.



电气喇叭电路包括电喇叭保险丝，电喇叭，气喇叭，喇叭转换开关，方向盘喇叭按钮。

电、气喇叭电源：喇叭电路的电源是由23号熔断器F107从电器装置板A100-79-4位置的“15001”号线上得来的，因此钥匙开关Q101旋至“1”或“3”位时，喇叭电路均接通电源。

喇叭转换开关：S226是气、电喇叭转换开关，实际上也就是电、气喇叭的工作选择开关。此开关有两个位置，在0位可以接通电喇叭电路，在1位可以接通气喇叭电路。转换开关里的夜光照明是由驾驶室照明灯9号熔断器F125接通电源的。灯光开关S111开到小灯位置可以点亮喇叭转换开关的夜光照明。

方向盘喇叭按钮：S103是安装在方向盘中间部位的喇叭按钮导电触点结构。在转向柱中间安装有导电铜环，在方向盘中间安装有导电铜触点，导电铜触点后面有一个小弹簧，导电铜环和导电铜触点互相接触依靠当小弹簧产生的压力保持良好的导电性，并且在方向盘360°旋转过程中不会断开电路连接。

The electric horn circuit comprises the following components: electric horn fuse, electric horn, air horn, horn selector switch, and steering wheel horn button.
Power Source for Electric and Air Horns: The horn circuit is powered by fuse 23 (F107) from position A100-79-4 on the electrical device board via the "15001" line. When the ignition switch Q101 is turned to positions "1" or "3," power is supplied to both electric and air horn circuits.

Horn Selector Switch (S226): S226 is the horn selector switch, allowing for the selection between electric and air horns. This switch has two positions: Position "0" connects the electric horn circuit. Position "1" connects the air horn circuit. The night illumination within the switch is powered by fuse 9 (F125) via the cab lighting circuit. The switch's illumination can be activated by turning the light switch S111 to the parking light position.

Steering Wheel Horn Button (S103): S103 is the steering wheel horn button with a conductive contact structure. A conductive copper ring is mounted in the middle of the steering column. A conductive copper contact is installed in the center of the steering wheel, backed by a small spring. The pressure from the spring ensures good conductivity between the copper ring and contact, maintaining electrical connection even during 360-degree rotation of the steering wheel.



喇叭转换开关S226在0位时，按压方向盘喇叭按钮可以接通电喇叭H102电路，电喇叭工作鸣响。

当喇叭转换开关S226在1位时，按压方向盘喇叭按钮可以接通气喇叭电磁阀H142电路，气喇叭工作鸣响。

电喇叭：H102是电磁发声器件。汽车电喇叭是靠金属膜片振动发音。为了使得汽车喇叭音调更加丰满，一些汽车电喇叭将高、低音调喇叭并联成一体，组成双音喇叭。电喇叭工作时电流经触点通过线圈，线圈产生磁力吸下衔铁强制膜片移动，衔铁移动使触点断开，电流中断磁力消失，膜片在本身的弹性和弹簧片作用下又同衔铁一起恢复原位，触点[闭合电路](#)接通，电流再通过触点流经线圈产生磁力，重复上述动作。如此反复循环膜片不断振动，从而发出嘀嘀音音。

此电喇叭通常安装在驾驶室前面罩下面的横梁上面。

气喇叭：H142是电磁控制的气动发声器件。由一个电磁阀控制气喇叭的气流，气喇叭利用压缩空气的气流使金属膜片产生振动，振动产生的声响经过喇叭扩音就发出响亮的嘀嘀声音。

Horn Selector Switch (S226) Operation. When the horn selector switch S226 is in position "0": Pressing the steering wheel horn button connects the electric horn circuit (H102), causing the electric horn to sound.

When the horn selector switch S226 is in position "1": Pressing the steering wheel horn button connects the air horn electromagnetic valve circuit (H142), causing the air horn to sound.

Electric Horn (H102). H102 is an electromagnetic sound-generating device. Car electric horns produce sound through the vibration of a metal diaphragm. To achieve a fuller tone, some car electric horns parallel high and low tone horns to create dual-tone horns. When the electric horn operates, current passes through the coil via contacts, creating a magnetic force that pulls the armature downward, forcing the diaphragm to move. The movement of the armature causes the contacts to open, interrupting the current flow and causing the magnetic force to disappear. The diaphragm, under its own elasticity and the action of springs, returns to its original position with the armature, closing the contacts and completing the circuit again. This cycle repeats, causing the diaphragm to vibrate continuously, emitting honking sounds. This electric horn is typically installed on the crossbeam under the front hood of the vehicle.

Air Horn (H142): H142 is an electromagnetically controlled pneumatic sound-generating device. An electromagnetic valve controls the airflow for the air horn. The air horn utilizes the airflow from compressed air to vibrate a metal diaphragm, producing sound. The honking sound is amplified by the horn's resonant chamber, resulting in a loud honking noise.

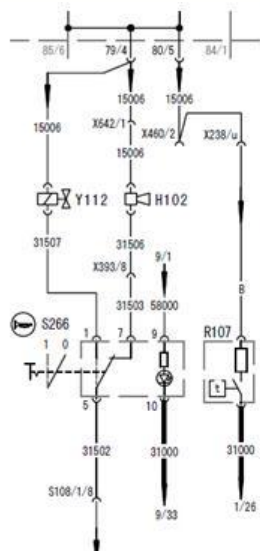


气喇叭的外形多是长喇叭形（筒形），声音大且声调高，传播距离远，多用在大型、重型汽车上。

、此气喇叭通常安装在驾驶室下面副驾驶地板部位。有的车型安装两个气喇叭在驾驶室上面顶盖上。

The air horn is typically elongated in shape (cylindrical), producing a loud and high-pitched sound with a long propagation distance. It is commonly used in large and heavy-duty vehicles.

This type of air horn is usually installed beneath the passenger-side floor area of the cabin. In some vehicle models, two air horns may be mounted on the roof of the cabin above the driver's compartment.





2、空气干燥器加热器：

为了避免在冷季将空气干燥器的排污口结冰堵死，在空气干燥器的排污口安置有一个加热器R107，这个加热器是电加热，在空气干燥器内部安装有加热电阻丝和自动控制开关。

当温度低于设定温度时，加热器自动开始工作，对其排污口进行加热，当温度上升至设定温度以上时，内置在加热器里的开关自动将加热器关闭，如此周而复始地工作。

空气干燥器加热器的电源：加热器R107电路的电源是由23号熔断器F107从电器装置板A100-80-5位置的“15006”号线上得来的钥匙电源。此“15006”电源经过驾驶室扩展插接器X460-2和驾驶室底盘插接器X238-u，然后由黑色B线连接到空气干燥器的2孔插接器。

Air Dryer Heater: To prevent the drainage outlet of the air dryer from freezing and becoming blocked during cold seasons, a heater, R107, is installed at the drainage outlet of the air dryer. This heater is electrically powered and internally equipped with heating resistor wires and an automatic control switch.

When the temperature falls below the set temperature, the heater automatically starts working to heat its drainage outlet. Once the temperature rises above the set temperature, the switch embedded within the heater automatically turns off the heater. This cycle repeats continuously.

Power Supply for the Air Dryer Heater: The circuit for heater R107 is powered by fuse 23 (F107) from position A100-80-5 on the electrical device board via the "15006" line, which receives power from the ignition source. This "15006" power line passes through the cab extension connector X460-2 and the cab chassis connector X238-u, and then connects to the air dryer's 2-pin connector via the black B wire.



3、驾驶室锁止电路：

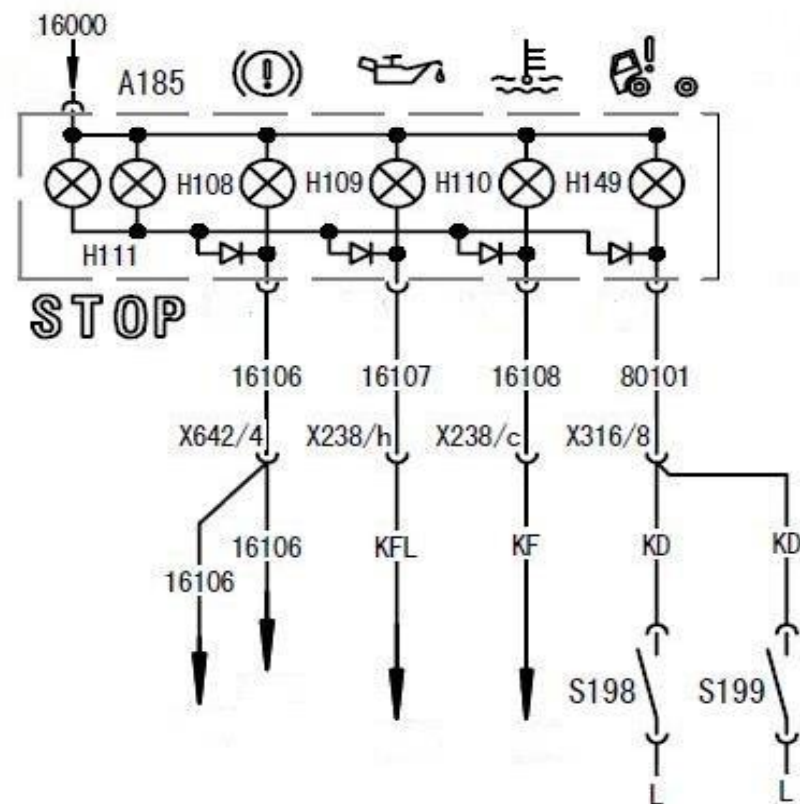
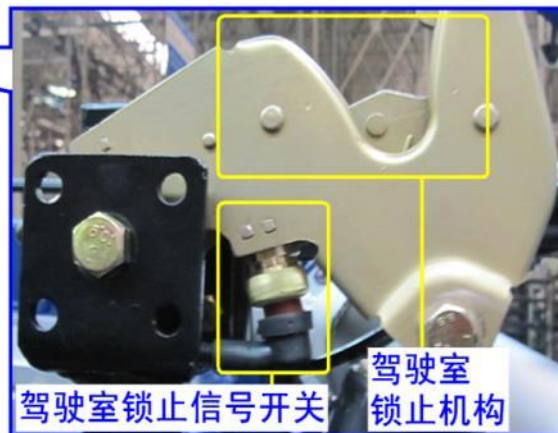
德龙F2000重卡设置有一个驾驶室翻转落座锁止指示电路系统。当驾驶室升起时，驾驶室翻转指示灯H149就会点亮，警告驾驶员有危险，不可以行车。在驾驶室落座锁止机构上安装有左、右两个行程开关S198和S199。当驾驶室完全落座到锁止位置时，S198和S199全部断开，指示灯H149熄灭，表示驾驶室已完全落座锁止。如果左、右锁止机构有任何一边(或全部)没有完全落座锁止，则S198和S199其中有一只(或全部)开关闭合，使指示灯H149点亮以示警告。

信号灯电源：驾驶室翻转指示灯的电源经由电器装置板A100上的24号仪表系统熔断器F108来的，此电源由电器装置板A100-89-6经过“16000”号标识线经组合仪表内部的锁止指示灯H149，然后由80101线经过驾驶室底盘插接器X316-8传递到底盘，经过KD蓝黄色号标识线传递到两个并联的开关S198、S199，开关的另一端L棕色线在电磁阀搭铁点“21”接地。

Cabin Locking Circuit: The Delong F2000 heavy-duty truck is equipped with a cabin overturn locking indicator circuit system. When the cabin is lifted, the cabin overturn indicator light, H149, illuminates, warning the driver of the danger and prohibiting driving. On the cabin locking mechanism, there are left and right stroke switches, S198 and S199. When the cabin is fully seated into the locking position, both S198 and S199 are disconnected, and the indicator light, H149, goes off, indicating that the cabin is fully locked in place. If either (or both) the left or right locking mechanisms fail to fully engage, S198 and S199 will be closed (or both), causing the indicator light H149 to illuminate as a warning.

Power Supply for the Signal Light: The power supply for the cabin overturn indicator light is derived from fuse 24 of the instrument system on electrical device board A100. This power supply passes through line "16000" from position A100-89-6 on the electrical device board, goes through the cabin's internal locking indicator light H149 within the instrument cluster, and then passes through wire 80101 via cab chassis connector X316-8 to the chassis. From there, it goes through KD blue-yellow labeled wires to the two parallel switches, S198 and S199. The other end of the switches, labeled L brown wire, is grounded at electromagnetic valve grounding point "21".





4.点烟器和烟灰盒:

汽车的点烟器是电能转换成热能的装置。点烟器的外壳铁皮部分是电源的负极，中间的电热丝是电源的正极，当插入点烟器并向下按动锁止后，点烟器的电热片和点烟器插座的正极接触，开始加热，当电热片温度达到后，电热片完全烧红，受温度的影响，锁止卡簧变型，释放点烟器插头，点烟器自动弹出。

点烟器电源：由电器装置板A100后面的91接线柱处接来的电源线30010，此30010经过电器装置板右侧外挂熔断器F158(10A)，由30011线连接至点烟器R108，为点烟器提供电源。因此当电瓶总开关打开通电时，点烟器均接通电源。

点烟器的负极电源L棕色线连接到电器装置板的A100-85-2位置。



Cigarette Lighter and Ashtray:

The cigarette lighter in a car is a device that converts electrical energy into heat. The outer metal shell of the cigarette lighter serves as the negative pole of the power supply, while the central heating coil serves as the positive pole. When the cigarette lighter is inserted and pressed down to lock, the heating coil of the cigarette lighter makes contact with the positive pole of the cigarette lighter socket, initiating the heating process. Once the heating coil reaches a certain temperature and glows red, influenced by the temperature, the locking spring deforms, releasing the cigarette lighter plug, and the cigarette lighter automatically pops out.

Power Supply for the Cigarette Lighter:

The power supply for the cigarette lighter is sourced from wire 30010, connected to terminal 91 on the electrical device board A100. This wire 30010 passes through external fuse F158 (10A) on the right side of the electrical device board and is then connected to the cigarette lighter R108 via wire 30011, providing power to the cigarette lighter. Therefore, when the battery master switch is turned on, power is supplied to the cigarette lighter.

The negative pole power supply for the cigarette lighter, labeled L brown wire, is connected to position A100-85-2 on the electrical device board.



在点烟器R108内还有一只由调光开关R106控制的夜光照明指示灯。此夜光照明指示灯连接的是调光器R106输出的亮度可调电源58300，由X349分电器分配提供。

烟灰盒照明灯：2个烟灰盒照明灯是功率1.2瓦的小灯泡。此照明灯由9号保险丝F125经电器装置板后面A100-86-2位置连接到分线器X364接来的电源线58000，接至烟灰盒照明灯E177和E178，只要灯总开关S111开至小灯位置，就可以点亮点烟器夜光照明灯和烟灰盒照明灯。

In the cigarette lighter R108, there is also a night illumination indicator light controlled by the dimmer switch R106. This night illumination indicator light is connected to the dimmer R106's adjustable brightness power supply, labeled 58300, distributed by distributor X349.

Ashtray Illumination Lights: There are two ashtray illumination lights, each with a power rating of 1.2 watts. These lights are powered by wire 58000, connected to terminal position A100-86-2 on the rear side of the electrical device board A100 via fuse 9 (F125). This power supply is then connected to distributor X364 and further to the ashtray illumination lights E177 and E178. As long as the main light switch S111 is turned to the "small light" position, both the cigarette lighter night illumination light and the ashtray illumination lights can be activated.

