

X3000车型BCM电控单元介绍 系统功能概述。

X3000配置的BCM电控单元是专门开发，主要针对陕汽X3000车型BCM项目，零件号DZ97189585116，主要负责实现灯光控制、排气制动控制、雨刮喷淋控制功能以及发动机启动控制、燃油防盗等车身控制功能。

Introduction of BCM Electronic Control Unit of X3000 Model

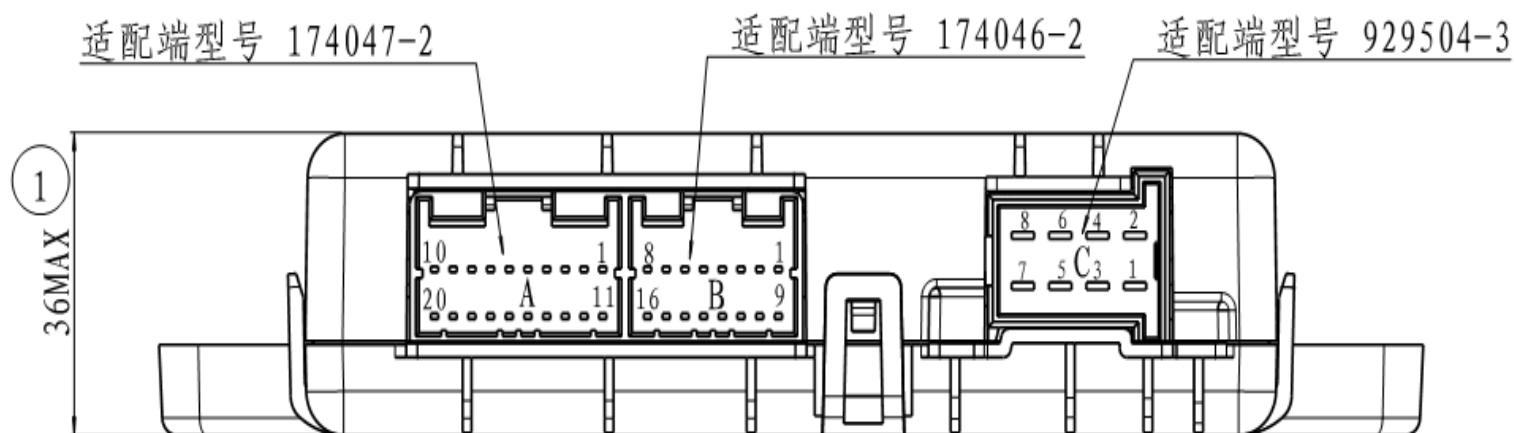
An overview of system functions. The BCM electronic control unit of X3000 is specially developed, mainly for the BCM project of Shaanxi Automobile X3000 model, part number DZ97189585116, mainly responsible for light control, exhaust brake control, wiper spray control, engine start control, fuel anti-theft, etc. Body control function.



BCM插接器结构总括图。

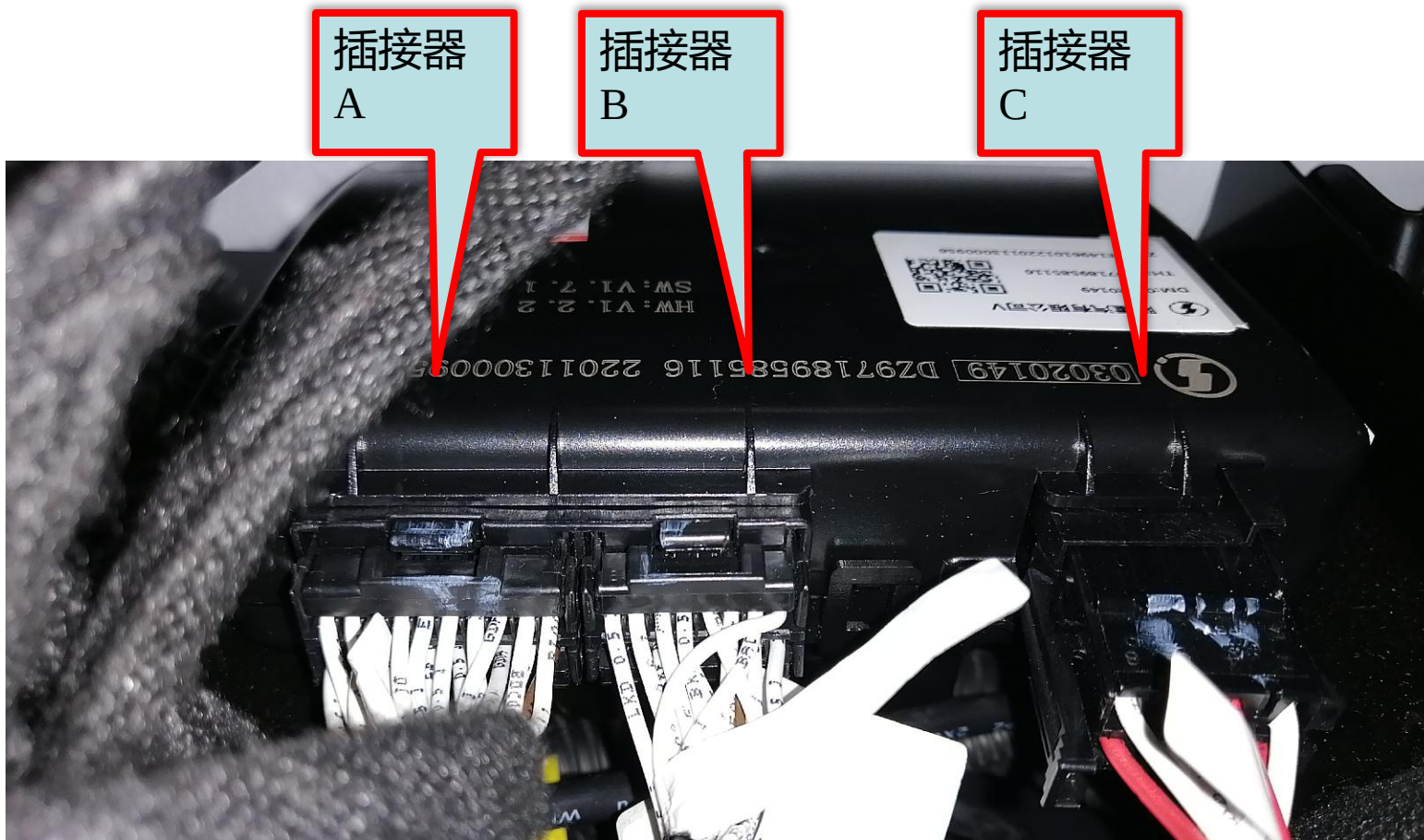
下图为X3000-BCM电控单元，有三个线束插槽A，B，C，每个插槽结构都带有防错保护，共44个针脚。

An overview of the structure of the BCM connector.
The picture below shows the X3000-BCM electronic control unit, which has three wire-speed slots A, B, and C. Each slot structure is provided with error-proof protection, with a total of 44 pins.



图为BCM车身控制器（电控单元）接插件及线束的连接情况。

The picture shows the connection of the BCM body controller (electronic control unit) connector and wiring harness.

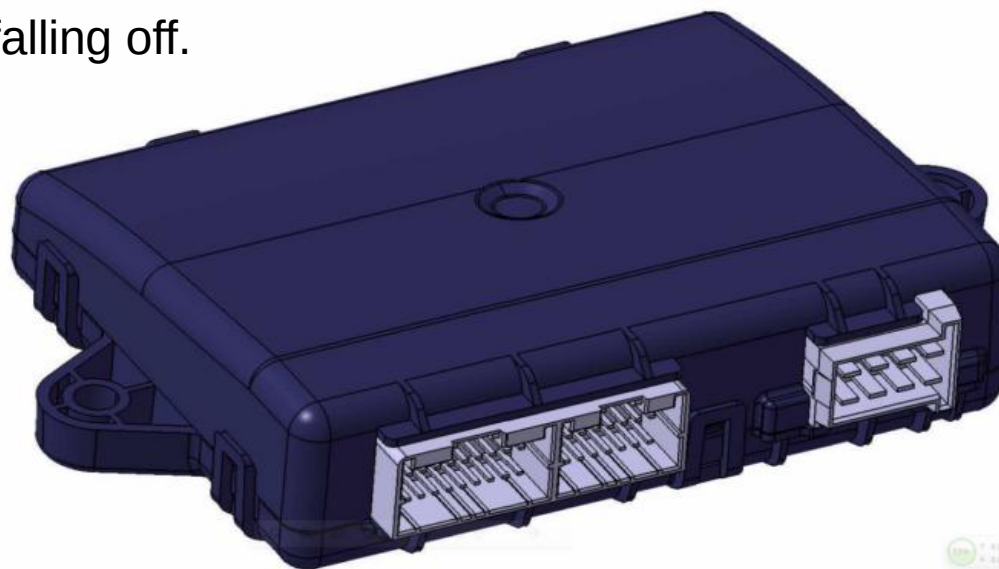


安装定位方式和安装注意事项说明。

BCM电控单元（BCM控制器）安装在副驾驶员前方仪表台内，水平放置，接插件朝向车尾。BCM控制器用M6螺钉固定，用力拧紧，以防脱落。

Instructions on installation and positioning methods and installation precautions.

The BCM electronic control unit (BCM controller) is installed in the instrument panel in front of the co-driver, placed horizontally, with the connector facing the rear of the vehicle. The BCM controller is fixed with M6 screws and tightened firmly to prevent it from falling off.



BCM电控单元工作电压范围：

额定电压：直流24V。

正常工作电压范围：直流16V ~ 32V。

注意：如果电压超出正常工作电压范围之外，所有负载均不工作。

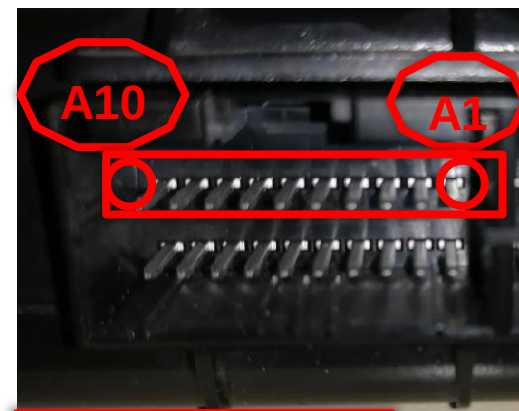
Operating voltage range of
BCM electronic control unit:
Rated voltage: DC 24V.
Normal working voltage range:
DC 16V ~ 32V.
Note: All loads will not work if
the voltage is outside the
normal operating voltage
range.



BCM电控单元的插接件A是20孔的插接器，其针脚定义如下。

The connector A of the BCM electronic control unit is a 20-hole connector, and its pins are defined as follows.

针脚号	信号名称	信号类型	有效方式
pin number	Signal name	signal type	effective way
A1	制动开关信号BI-002	输入端	高有效
	brake switch signal	output	Highly effective
A2	灯光开关I 档BDC	输入端	高有效
	Light switch I gear	output	Highly effective
A3	右转向灯开关信号GDF	输入端	高有效
	Right turn signal switch signal	output	Highly effective
A4	近光灯继电器DB	输出端	高有效
	low beam relay	output	Highly effective
A5	右前雾灯继电器EC	输出端	高有效
	Right front fog light relay	output	Highly effective



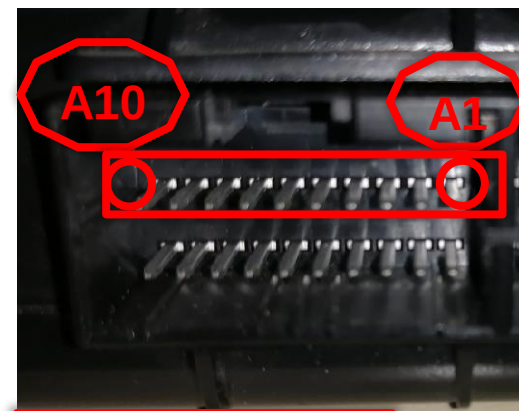
插接器A
connector A



BCM电控单元的插接件A是20孔的插接器，其针脚定义如下。

The connector A of the BCM electronic control unit is a 20-hole connector, and its pins are defined as follows.

针脚号	信号名称	信号类型	有效方式
pin number	Signal name	signal type	effective way
A6	后雾灯继电器EI	输出端	高有效
	Rear fog light relay	output	Highly effective
A7	后雾灯开关信号DI	输入端	高有效
	Rear fog light switch signal	output	Highly effective
A8	钥匙开关50 档BAF	输入端	高有效
	Key switch 50 gears	output	Highly effective
A9	油量传感器信号 LB	输入端	电阻模拟量
	fuel sensor signal	output	Resistance analog
A10	CAN—H DC2	CAN通讯	高端
	CAN high end	CAN bus	high end



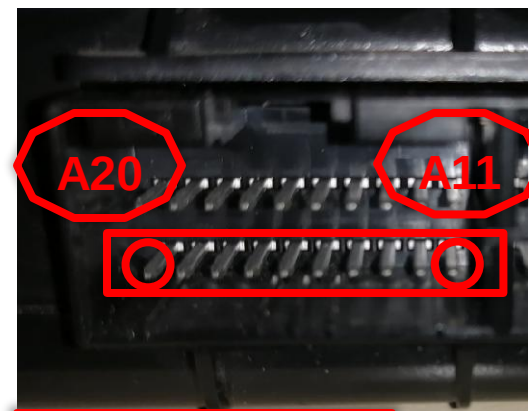
插接器A
connector A



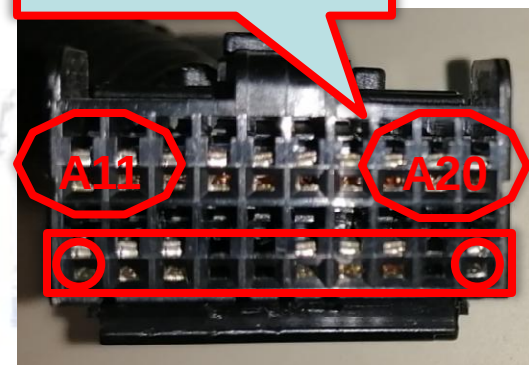
BCM电控单元的插接件A是20孔的插接器，其针脚定义如下。

The connector A of the BCM electronic control unit is a 20-hole connector, and its pins are defined as follows.

针脚号	信号名称	信号类型	有效方式
pin number	Signal name	signal type	effective way
A11	模拟量地线 31000	GND搭铁	负极端
	Analog ground wire	GND	low effective
A12	危险报警开关信号AC	输入端	高有效
	Hazard alarm switch signal	output	Highly effective
A13	左转向灯开关信号GDA	输入端	高有效
	Left turn signal switch signal	output	Highly effective
A14	雨刮电机低速继电器BE	输出端	高有效
	Wiper motor low speed relay	output	Highly effective
A15	雨刮电机高速继电器BF	输出端	高有效
	Wiper motor high-speed relay	output	Highly effective



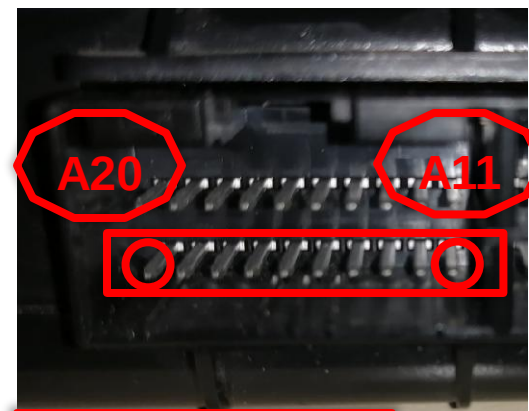
插接器A
connector A



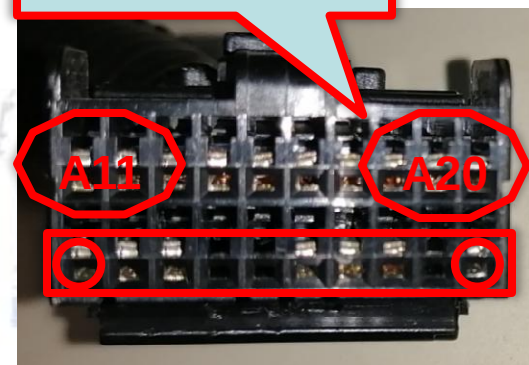
BCM电控单元的插接件A是20孔的插接器，其针脚定义如下。

The connector A of the BCM electronic control unit is a 20-hole connector, and its pins are defined as follows.

针脚号	信号名称	信号类型	有效方式
pin number	Signal name	signal type	effective way
A16	左前雾灯继电器EB	输出端	高有效
	Left front fog light relay	output	Highly effective
A17	钥匙开关ON 档15002	输入端	高有效
	key switch ON	output	Highly effective
A18	前雾灯开关信号 DF	输入端	高有效
	Front fog light switch signal	output	Highly effective
A19	空位 N/A		
	reserved		
A20	CAN—L FC2	CAN通讯	低端
	CAN low end	CAN bus	low end



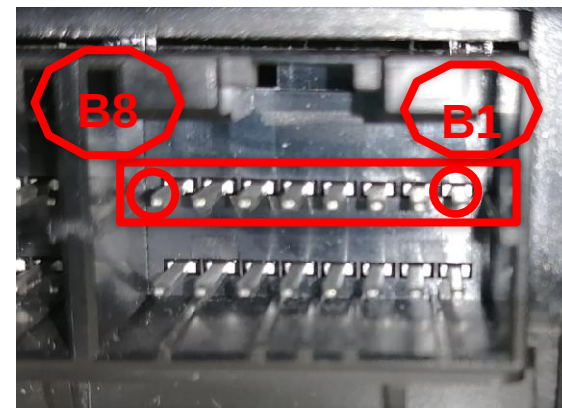
插接器A
connector A



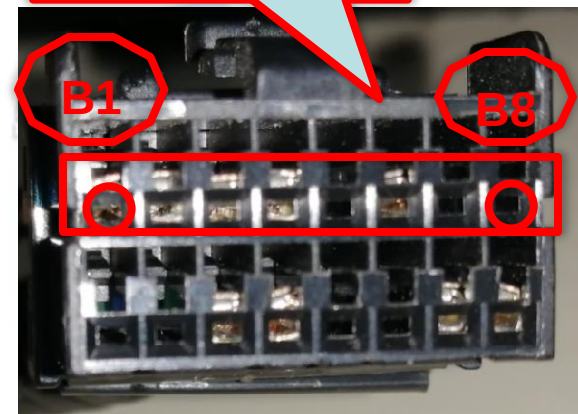
BCM电控单元的插接件B是16孔的插接器，其针脚定义如下。

The connector B of the BCM electronic control unit is a 16-hole connector, and its pins are defined as follows.

针脚号	信号名称	信号类型	有效方式
pin number	Signal name	signal type	effective way
B1	日间行车灯56300	输出端	高有效
	daytime running lights	output	Highly effective
B2	启动继电器BAC	输出端	高有效
	start relay	output	Highly effective
B3	燃油报警器31504	输出端	高有效
	fuel alarm	output	Highly effective
B4	灯光开关II 档BDF-002	输入端	高有效
	Light switch II	output	Highly effective



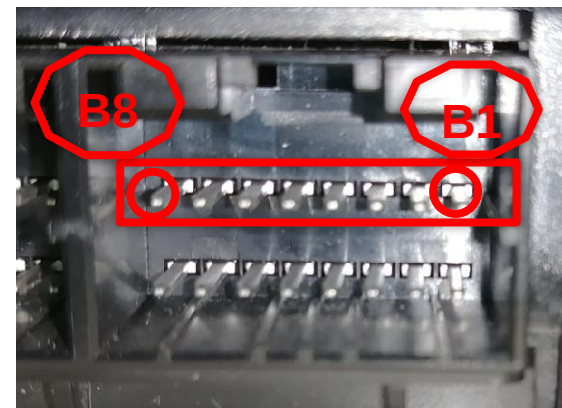
插接器B
connector B



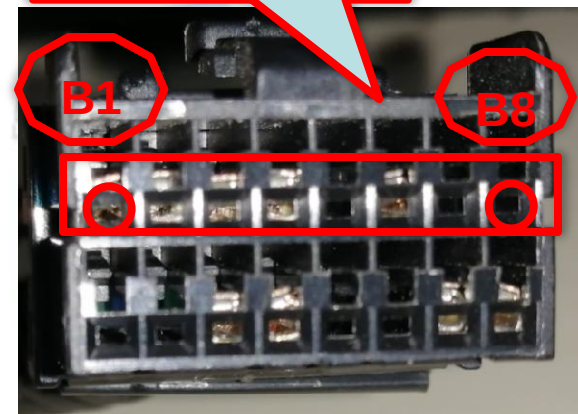
BCM电控单元的插接件B是16孔的插接器，其针脚定义如下。

The connector B of the BCM electronic control unit is a 16-hole connector, and its pins are defined as follows.

针脚号	信号名称	信号类型	有效方式
pin number	Signal name	signal type	effective way
B5	雨刮开关低速档BKD	输入端	高有效
	wiper switch low gear	input	Highly effective
B6	（离合器开关） AI	输入端	高有效
	clutch switch	input	Highly effective
B7	雨刮开关喷淋档 BK002	输入端	高有效
	wiper switch spray gear	input	Highly effective
B8	雨刮回位信号 LKD	输入端	高有效
	wiper reset signal	input	Highly effective



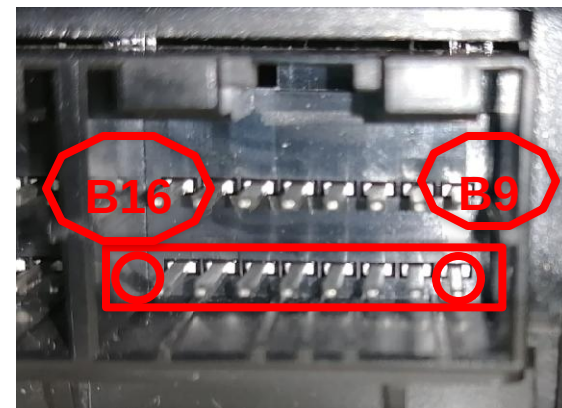
插接器B
connector B



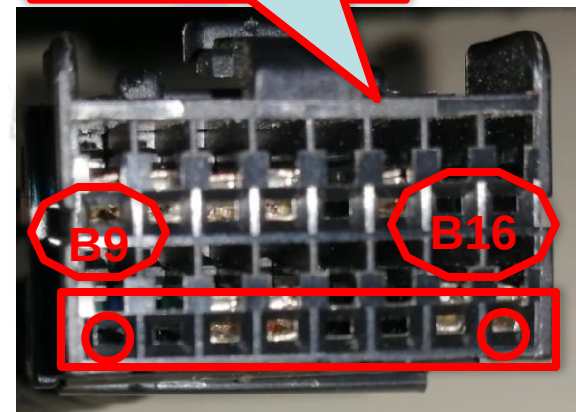
BCM电控单元的插接件B是16孔的插接器，其针脚定义如下。

The connector B of the BCM electronic control unit is a 16-hole connector, and its pins are defined as follows.

针脚号	信号名称	信号类型	有效方式
pin number	Signal name	signal type	effective way
B9	倒车灯继电器 BC	输出端	高有效
	reversing lights relay	output	Highly effective
B10	位置灯继电器BDC003	输出端	高有效
	position light relay	output	Highly effective
B11	地线 31000	GND搭铁	低有效
	ground wire	GND	low effective
B12	(排气制动输出)	N/A	N/A
	N/A	N/A	N/A



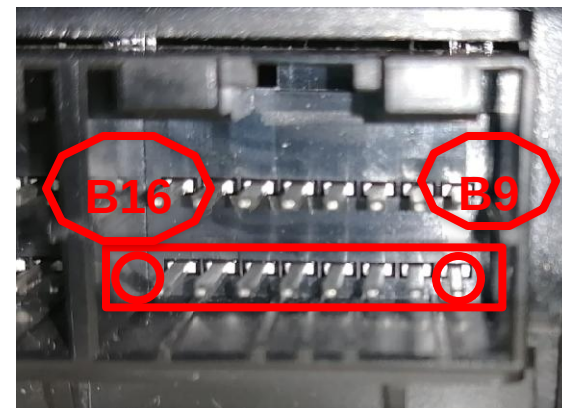
插接器B
connector B



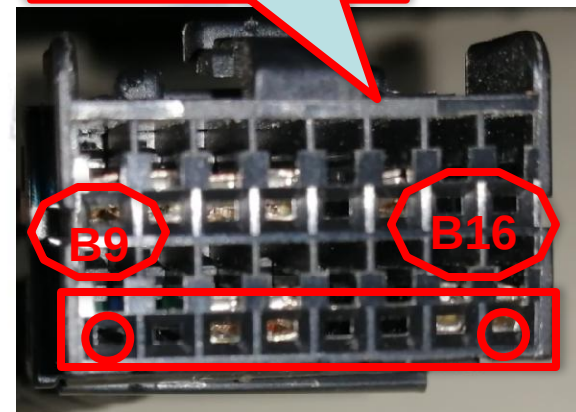
BCM电控单元的插接件B是16孔的插接器，其针脚定义如下。

The connector B of the BCM electronic control unit is a 16-hole connector, and its pins are defined as follows.

针脚号	信号名称	信号类型	有效方式
pin number	Signal name	signal type	effective way
B13	雨刮开关间歇档BKL	输入端	高有效
	Intermittent wiper switch	input	Highly effective
B14	雨刮开关高速档BKF	输入端	高有效
	wiper switch high gear	input	Highly effective
B15	(排气制动开关)	N/A	N/A
	N/A	N/A	N/A
B16	空档信号 LI	输入端	低有效
	Neutral signal	input	low effective



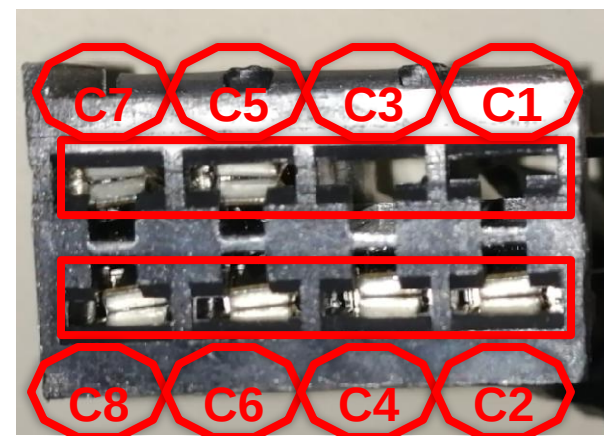
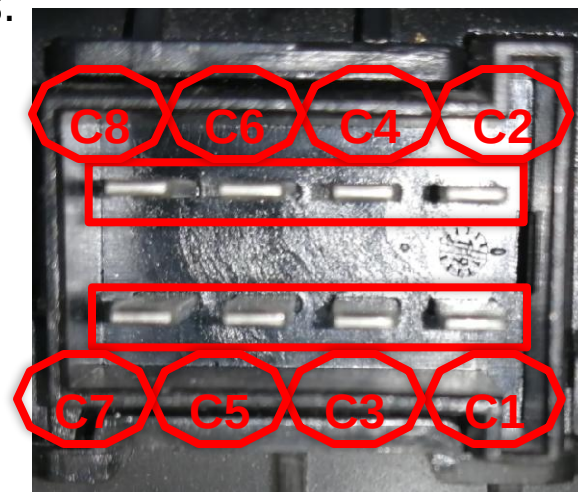
插接器B
connector B



BCM电控单元的插接件C是8孔的插接器，其针脚定义如下。

The connector C of the BCM electronic control unit is an 8-hole connector, and its pins are defined as follows.

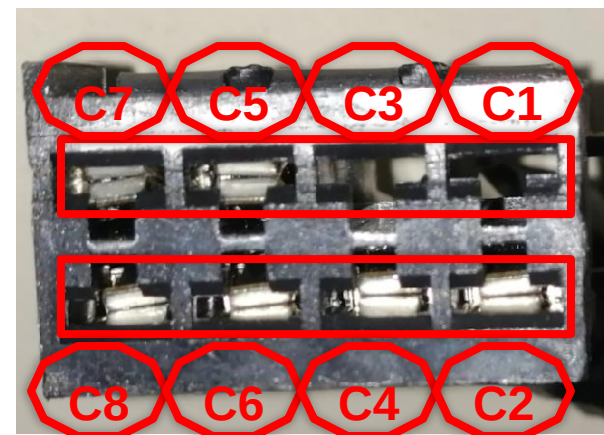
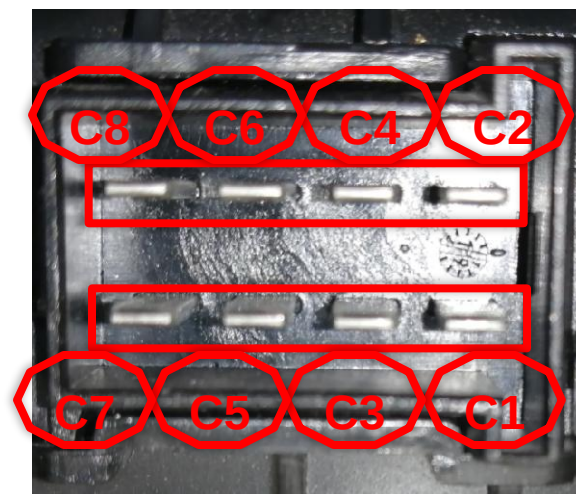
针脚号	信号名称	信号类型
pin number	Signal name	signal type
C1	电源2 A30007	输入端
	Power 2	input
C2	制动灯/挂车制动灯 BA001	输出端
	Brake Lights / Trailer Brake Lights	output
C3	主车右转向灯GA001	输出端
	Main right turn signal	output
C4	电源1 A30008	输入端
	Power 1	input



BCM电控单元的插接件C是8孔的插接器，其针脚定义如下。

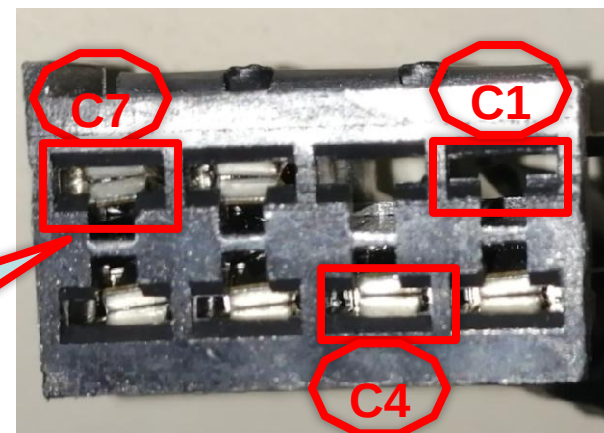
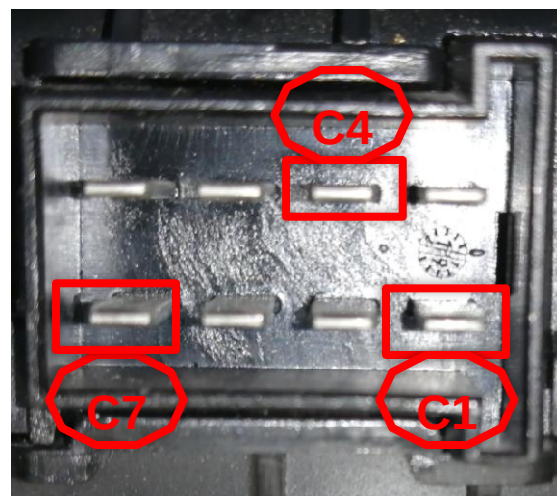
The connector C of the BCM electronic control unit is an 8-hole connector, and its pins are defined as follows.

针脚号	信号名称	信号类型
pin number	Signal name	signal type
C5	主车左转向灯GF001	输出端
	Main left turn signal	output
C6	挂车右转向灯GAD	输出端
	Trailer right turn signal	output
C7	电源3-A30012	输入端
	Power 3	input
C8	挂车左转向灯 GFD	输出端
	Trailer left turn signal	output



BCM车身控制器的常电电源T30有3个是C1, C4, C7, 这三个电源负责分配的**公共负载**是近光灯继电器, 雨刮低速继电器, 雨刮高速继电器, 左前雾灯继电器, 右前雾灯继电器, 后雾灯继电器。

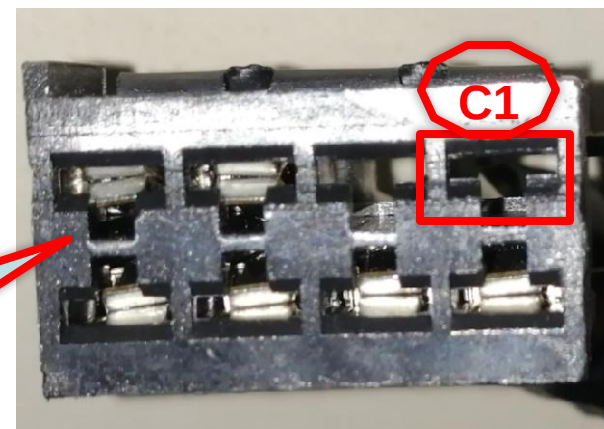
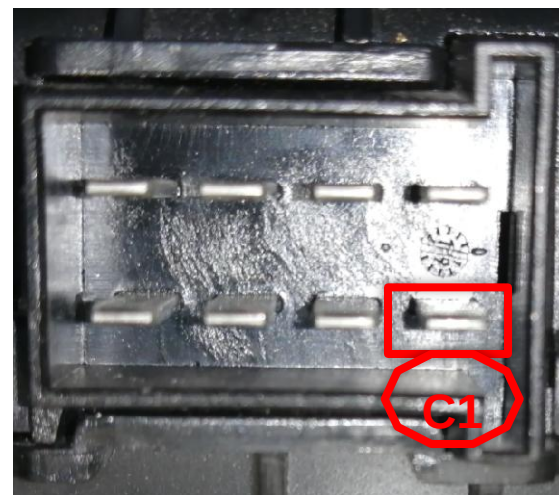
There are 3 constant current power sources T30 of BCM body controller, C1, C4, and C7. The three power sources are responsible for the distribution of common loads: low beam relay, wiper low-speed relay, wiper high-speed relay, left front fog light relay, right front relay. Fog light relay, rear fog light relay.



插接器C
connector C

BCM车身控制器的常电电源T30有3个是C1, C4, C7, 其中C1电源分支分配的负载是主车左/右转向灯、制动灯。

There are 3 constant current power sources T30 of the BCM body controller, C1, C4, and C7. The load distributed by the C1 power branch is the left/right turn signal and brake light of the main vehicle.



插接器C
connector C

BCM电控单元的基本功能描述及功能详解。

其中电源负极线的连接：

BCM的电源负极线由31000棕色线从X242驾驶室左搭铁点连接到BCM的B-11针脚, 位置如图：

Basic functional description and detailed functional explanation of BCM electronic control unit.

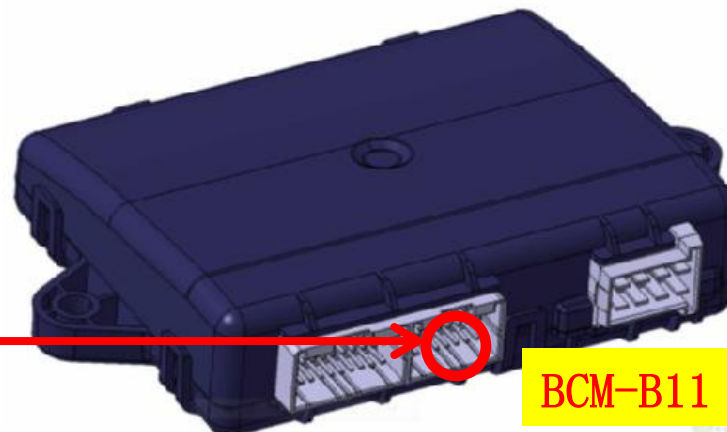
The connection of the power supply negative line:

The negative power supply wire of BCM is connected by 31000 brown wire from the left ground point of X242 cab to the B-11 pin of BCM, the location is as shown in the figure:

X242左搭铁点
ground point

31000

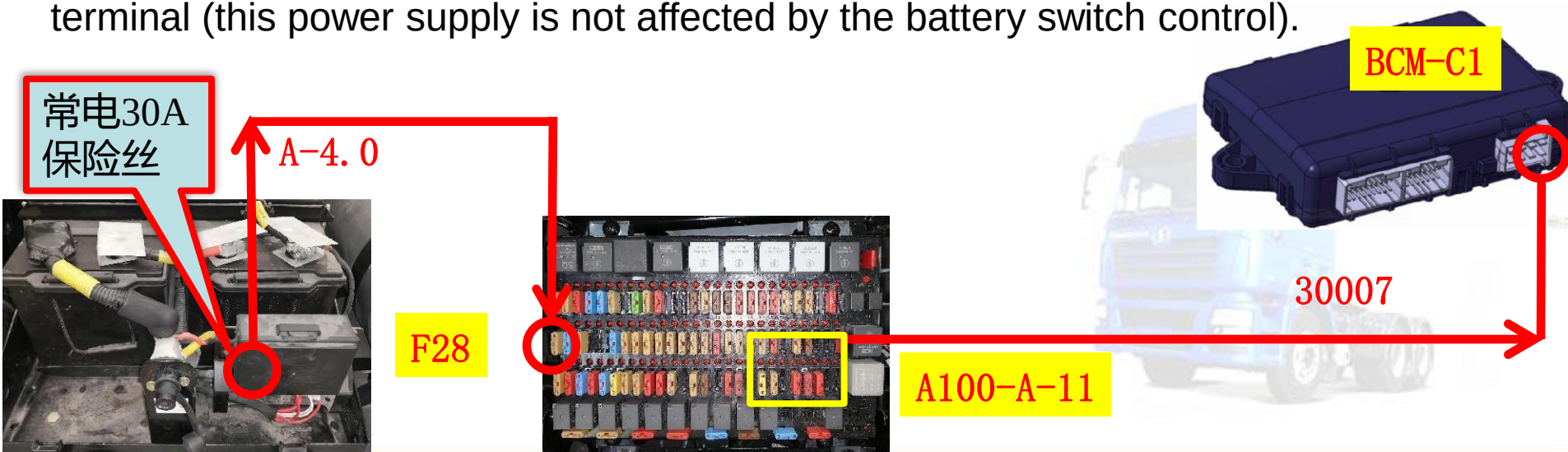
BCM-B11



BCM电控单元的基本功能描述及功能详解。

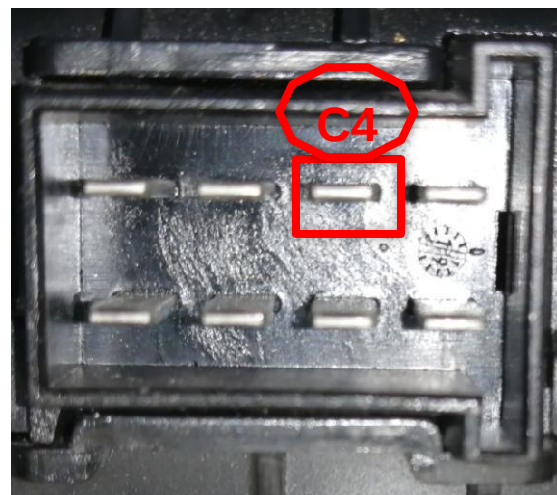
其中C1电源的连接：A100电器装置板输出的30007常电通过F28保险丝从电器装置板A100的A-11插接器输出，此30007常电信号由C1端子接入BCM电控单元的常电（此电源不受电瓶总开关控制）。

Basic functional description and detailed functional explanation of BCM electronic control unit. The connection of C1 power supply: The 30007 constant power output from the A100 electrical device board is output from the A-11 connector of the A100 electrical device board through the F28 fuse. The 30007 constant power signal is connected to the constant power of the BCM electronic control unit through the C1 terminal (this power supply is not affected by the battery switch control).

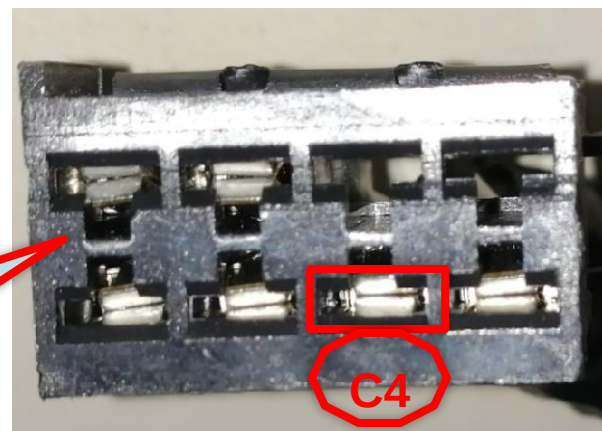


BCM车身控制器的常电电源T30有3个是C1, C4, C7, 其中C4电源分支分配的负载是挂车左/右转向灯、日间行车灯和燃油防盗。

There are 3 constant current power sources T30 of BCM body controller: C1, C4, and C7, among which the load distributed by the C4 power branch is the left/right turn signal of the trailer, daytime running light and fuel anti-theft.



插接器C
connector C

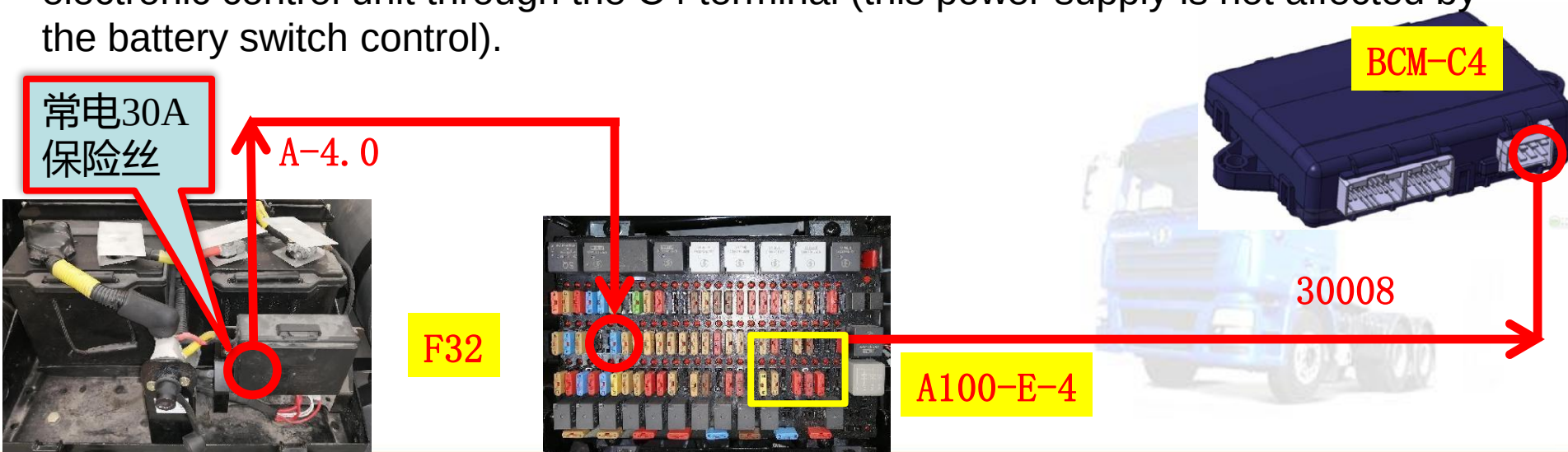


BCM电控单元的基本功能描述及功能详解。

其中C4电源的连接：A100电器装置板输出的30008常电通过F32保险丝从电器装置板A100的E-4插接器输出，此30008常电信号由C4端子接入BCM电控单元的常电（此电源不受电瓶总开关控制）。

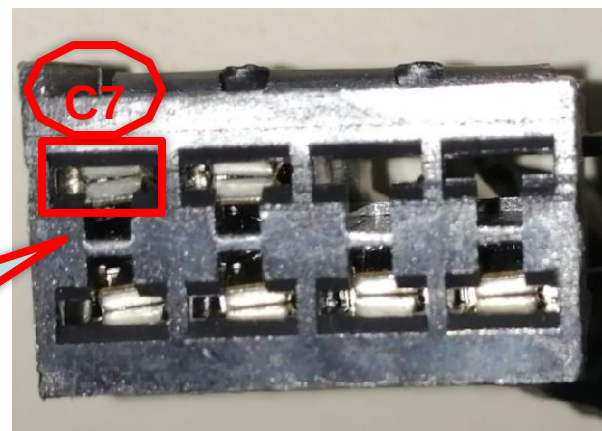
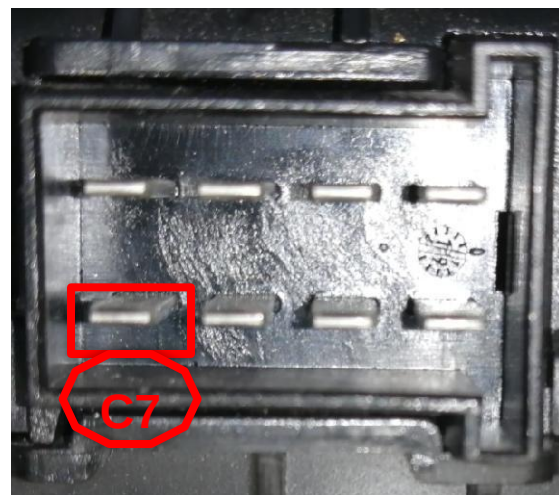
Basic functional description and detailed functional explanation of BCM electronic control unit. The connection of C1 power supply:

The 30008 constant power output from the A100 electrical device board is output from the E-4 connector of the A100 electrical device board through the F32 fuse. The 30008 constant power signal is connected to the constant power of the BCM electronic control unit through the C4 terminal (this power supply is not affected by the battery switch control).



BCM车身控制器的常电电源有3个是C1, C4, C7, 其中C7电源分支分配的负载是启动继电器控制、排气制动电磁阀和位置灯。

There are 3 constant power sources of BCM body controller: C1, C4, and C7, among which the load distributed by the C7 power branch is the start relay control, the exhaust brake solenoid valve and the position light.



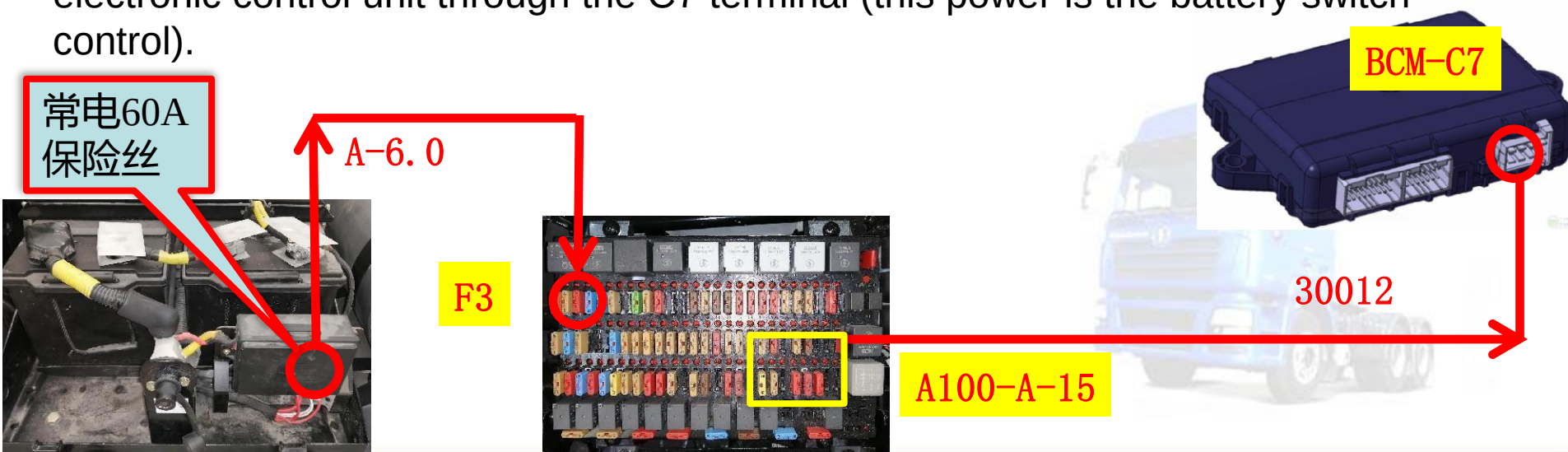
插接器C
connector C

BCM电控单元的基本功能描述及功能详解。

其中C7电源的连接：A100电器装置板输出的30012常电通过F3保险丝从电器装置板A100的A-15插接器输出，此30012常电信号由C7端子接入BCM电控单元的常电（此电源是受电瓶总开关控制）。

Basic functional description and detailed functional explanation of BCM electronic control unit. The connection of C7 power supply:

The 30012 constant power output from the A100 electrical device board is output from the A-15 connector of the A100 electrical device board through the F3 fuse. The 30012 constant power signal is connected to the constant power of the BCM electronic control unit through the C7 terminal (this power is the battery switch control).

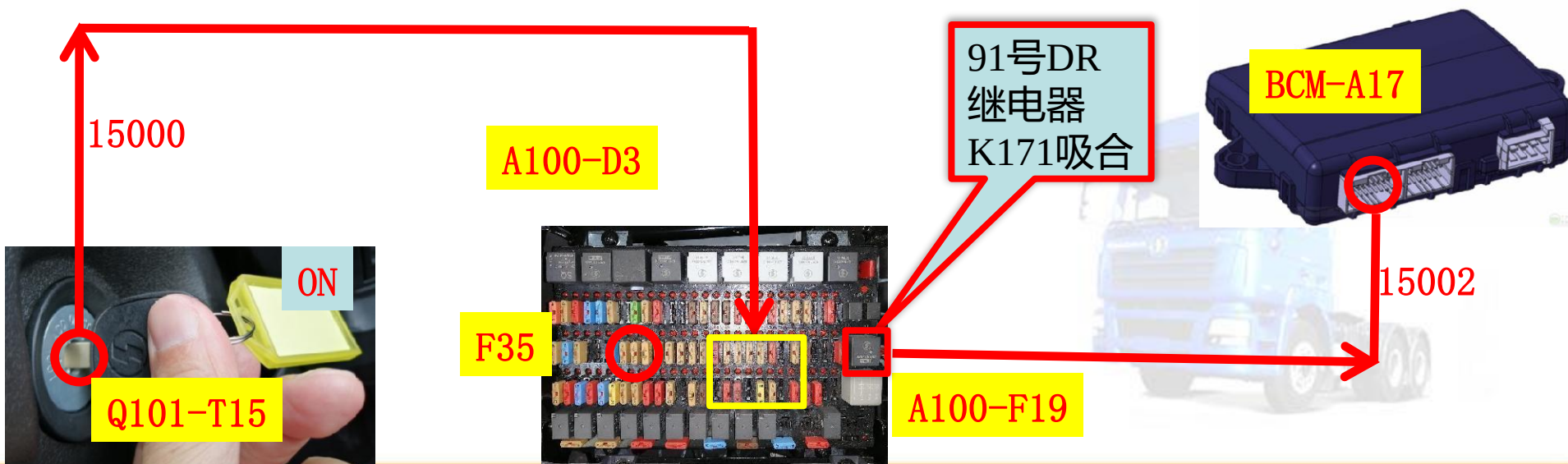


BCM电控单元的基本功能描述及功能详解。

钥匙开关T15信号：钥匙开关Q101旋转进入ON档时，钥匙开关输出端T15信号由15000线进入电器装置板A100-D3插接器，控制91号位置的DR电源继电器K171吸合。

Basic functional description and detailed functional explanation of BCM electronic control unit . Key switch T15 signal:

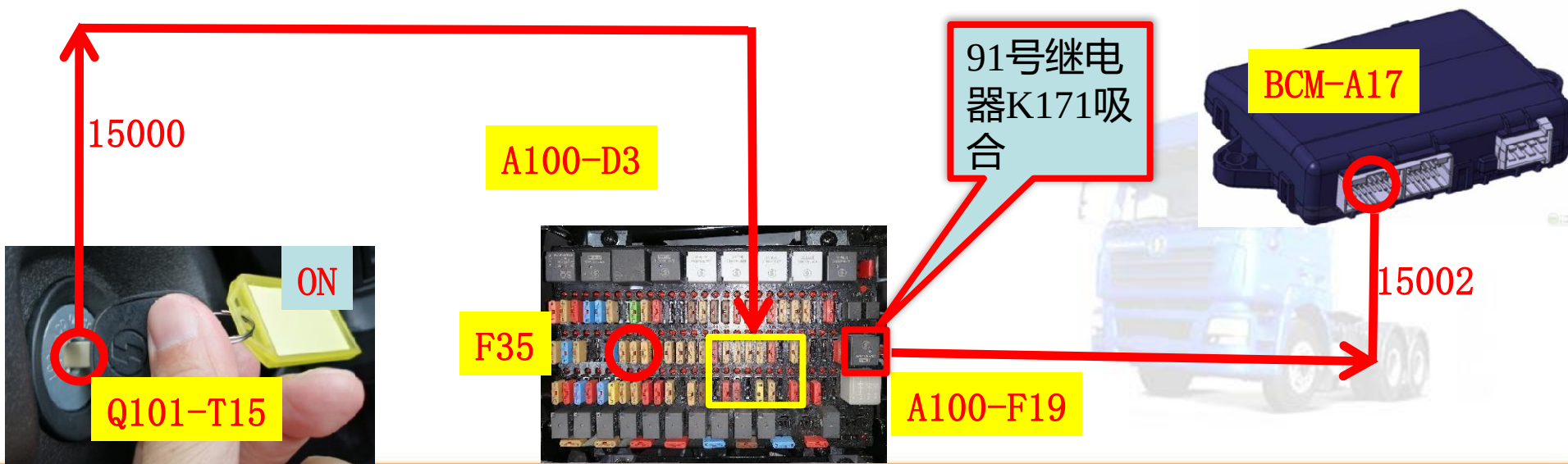
When the key switch Q101 is rotated into the ON position, the signal of the output terminal T15 of the key switch enters the A100-D3 connector of the electrical device board from the 15000 line, and controls the DR power relay K171 at the 91st position to close.



BCM电控单元的基本功能描述及功能详解。

钥匙开关T15信号：K171输出的15000钥匙电通过F35保险丝从电器装置板A100-F19插接器输出，此15002钥匙电信号由BCM电控单元的A17端子接入，于是BCM电控单元执行系统开机动作。

Basic functional description and detailed functional explanation of BCM electronic control unit. Key switch T15 signal: The 15000 key power output from K171 is output from the A100-F19 connector of the electrical device board through the F35 fuse. The 15002 key power signal is connected to the A17 terminal of the BCM electronic control unit, so the BCM electronic control unit performs the system startup action.



BCM电控单元的基本功能描述及功能详解。

钥匙开关T50信号：钥匙开关Q101旋转进入ST档时，钥匙开关输出端T50信号由BAF线输出，此T50启动信号由BCM电控单元的A8端子接入，BCM电控单元收到启动的指令，发动机启动受到变速器TCU及发动机ECM和BCM电控单元的综合判断。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Key switch T50 signal: When the key switch Q101 is rotated to enter the ST gear, the key switch output terminal T50 signal is output by the BAF line, the T50 start signal is connected to the A8 terminal of the BCM electronic control unit, and the BCM electronic control unit receives the start command. The engine start is subject to the comprehensive judgment of the transmission TCU and the engine ECM and BCM electronic control units.



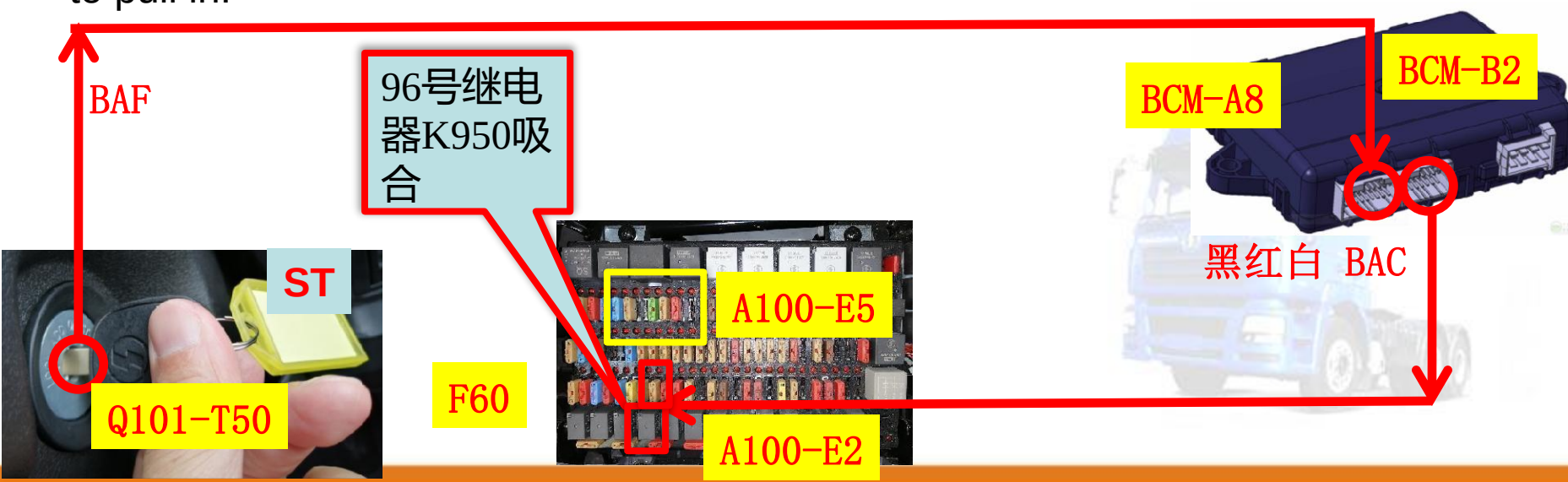
BCM电控单元的基本功能描述及功能详解。

T50启动输出：发动机启动时，由BCM电控单元的B2端子由BAC 线输出的启动信号线进入电器装置板A100-E2插接器，启动信号驱动96号启动继电器K950吸合。

Basic functional description and detailed functional explanation of BCM electronic control unit.

T50 startup output:

When the engine starts, the starting signal line output by the BAC line from the B2 terminal of the BCM electronic control unit enters the A100-E2 connector of the electrical device board, and the starting signal drives the No. 96 starting relay K950 to pull in.

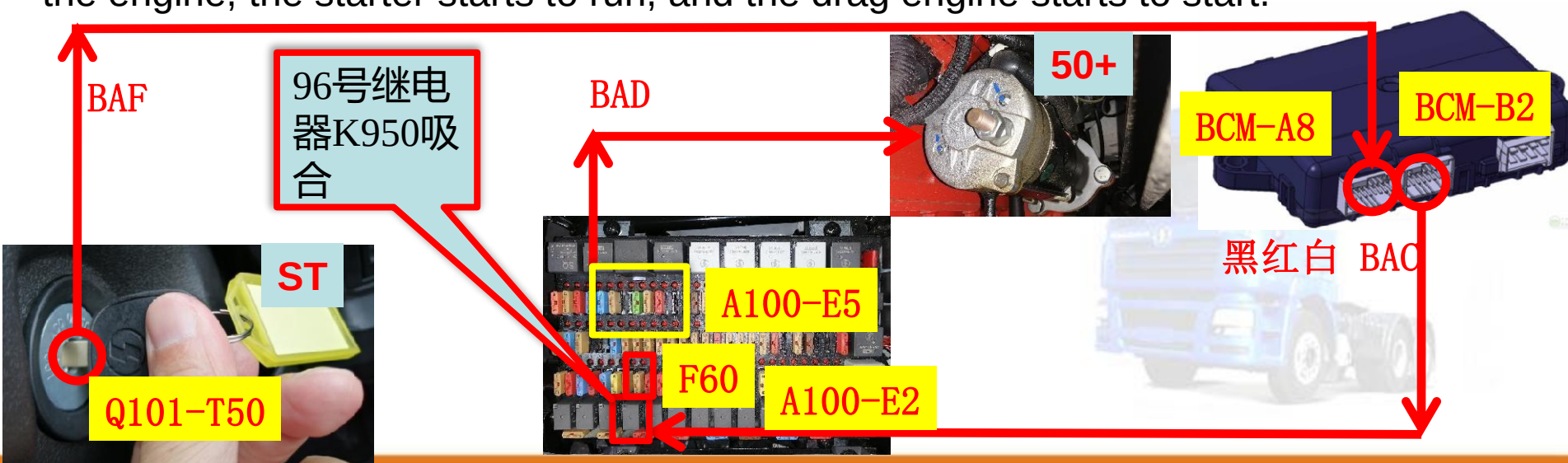


BCM电控单元的基本功能描述及功能详解。

T50启动负载输出：由60号熔断丝提供电源，96号启动继电器K950吸合之后，从电器装置板A100-E5插接器输出的启动负载线BAD黑红黄（1mm²）线，最终到达起动机50接线柱，起动机开始运转，拖动发动机开始启动。

Basic functional description and detailed functional explanation of BCM electronic control unit.

T50 start load output: powered by No. 60 fuse, after No. 96 start relay K950 is pulled in, the start load line BAD black, red and yellow (1mm²) output from the electrical device board A100-E5 connector will eventually reach the starter The 50 terminal of the engine, the starter starts to run, and the drag engine starts to start.





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BCM电控单元的基本功能描述及功能详解。

空挡启动保护功能：

启动保护只有传动系断开时（挂空档），空档信号有效，车辆静止时，BCM控制器才允许启动发动机。

注意：防止安全事故发生。

当车辆停车、静止时，应将变速杆置为空档，然后再旋转钥匙开关启动发动机。

Basic functional description and detailed functional explanation of BCM electronic control unit . Neutral start protection function : Start protection Only when the power train is disconnected (in neutral), the neutral signal is valid, and the BCM controller allows the engine to be started when the vehicle is stationary.

Note: To prevent safety accidents.

When the vehicle is parked and stationary, the gear lever should be set to neutral, and then the key switch should be rotated to start the engine.



BCM电控单元的基本功能描述及功能详解。

空挡启动保护功能：

当变速器置于空档（N）时，空档的触点接通，其换挡控制器通过硬线通讯给变速器TCU，变速器的空挡信号有效，变速器TCU通过CAN总线传输空挡报文。

Basic functional description and detailed functional explanation of BCM electronic control unit . Neutral start protection function:

When the transmission is placed in neutral (N), the contact of neutral is turned on, and its shift controller communicates to the transmission TCU through hard wire, the neutral signal of the transmission is valid, and the transmission TCU transmits the neutral message through the CAN bus.



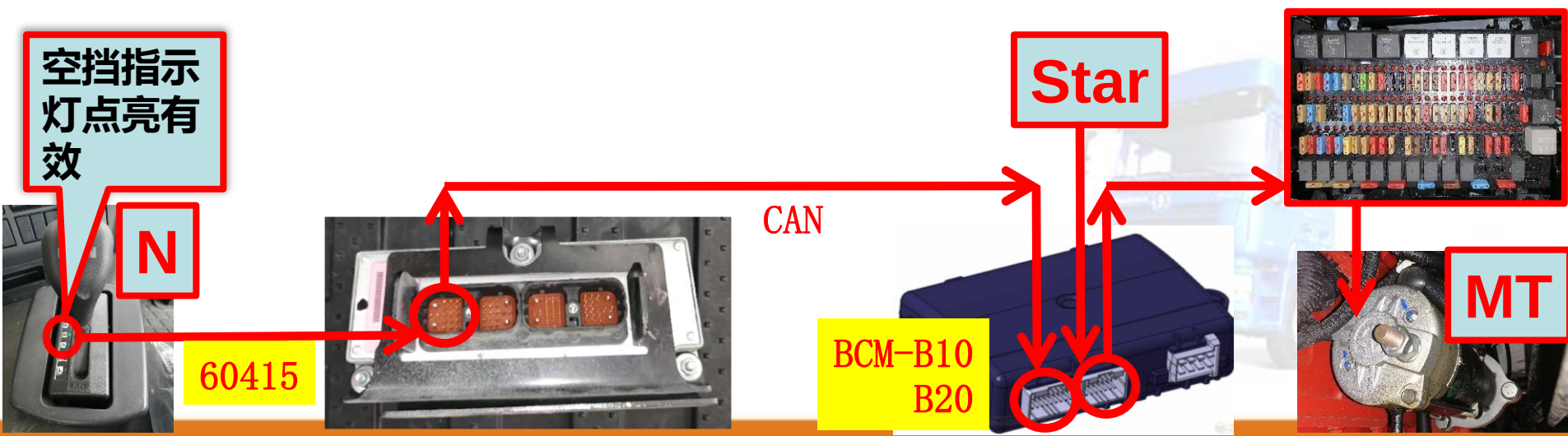
BCM电控单元的基本功能描述及功能详解。

空挡启动保护功能：

当变速器置于空档（N）时，由黄绿色CAN总线传递到BCM控制器的B-10和B-20针脚位置，BCM控制器收到此空挡报文，允许可以正常启动发动机。

Basic functional description and detailed functional explanation of BCM electronic control unit . Neutral start protection function:

When the transmission is in neutral (N), it is transmitted to the B-10 and B-20 pins of the BCM controller by the yellow-green CAN bus. The BCM controller receives this neutral message, allowing the engine to be started normally.



BCM电控单元的基本功能描述及功能详解。

防重复启动功能：

二次启动保护功能，若发动机已经在运转（转速 $\geq 650\text{rpm}$ ），再次旋转进入ST档时，启动机将没有反应。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Anti-restart function:

Secondary start protection function, if the engine is already running (speed $\geq 650\text{rpm}$), the starter will not respond when it rotates again to enter the ST gear.



BCM电控单元的基本功能描述及功能详解。

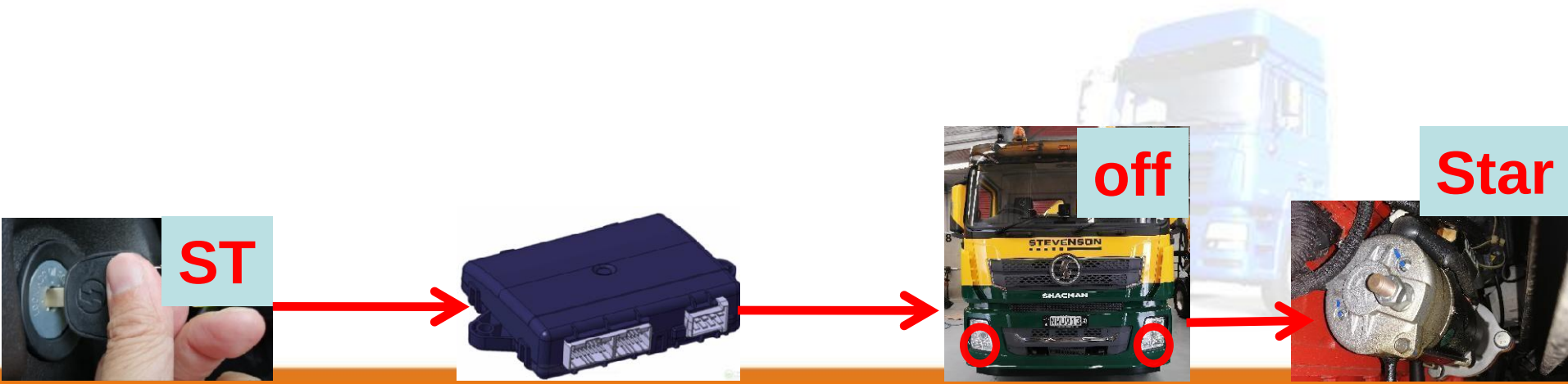
电源保护功能：

起动机工作期间，BCM电控单元会临时关闭近光灯及雾灯，对整车电源系统进行保护。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Power protection function:

During the operation of the starter, the BCM electronic control unit will temporarily turn off the low beam and fog lights to protect the vehicle power system.



BCM电控单元的基本功能描述及功能详解。

雨刮电路组成：

雨刮电路系统由BCM车身控制器、F37保险丝、F56保险丝、雨刮低速继电器K94、雨刮高速继电器K95、雨刮器开关(组合开关)S108、雨刮电机M102、喷淋电机M103组成。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Wiper circuit composition:

The wiper circuit system consists of BCM body controller, F37 fuse, F56 fuse, wiper low-speed relay K94, wiper high-speed relay K95, wiper switch (combination switch) S108, wiper motor M102, and spray motor M103.



BCM电控单元的基本功能描述及功能详解。

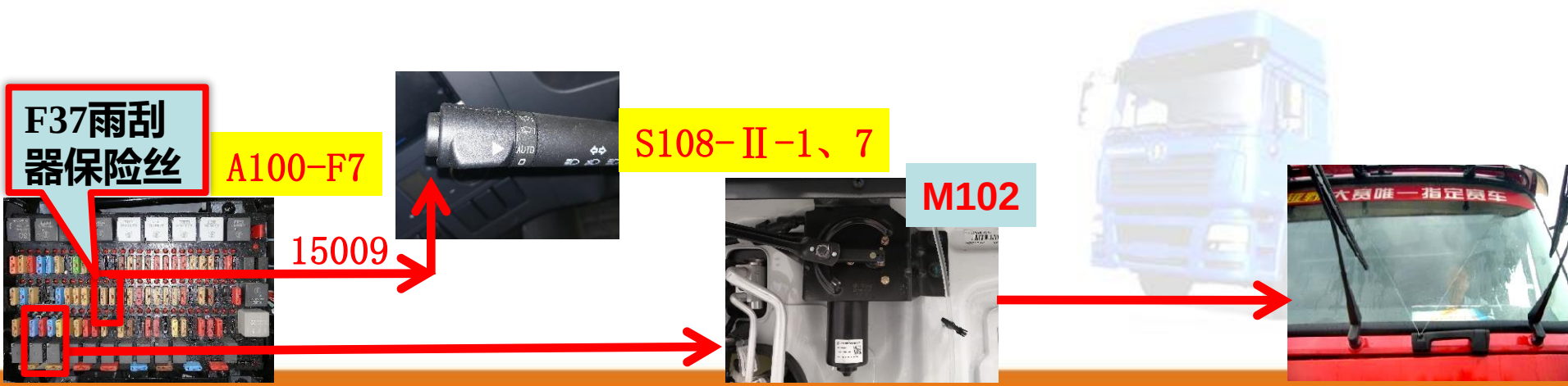
雨刮器正极电源1（组合开关）：

雨刮电路的（组合开关）电源是由F37保险丝提供的，通过15009线从电器装置板A100-F7针脚连接到组合开关S108-II的1号/7号端子。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Wiper positive power supply 1 (combination switch):

The power supply of the wiper circuit (combination switch) is provided by the F37 fuse, which is connected from the A100-F7 pin of the electrical device board to the No. 1/7 terminal of the combination switch S108-II through the 15009 line.



BCM电控单元的基本功能描述及功能详解。

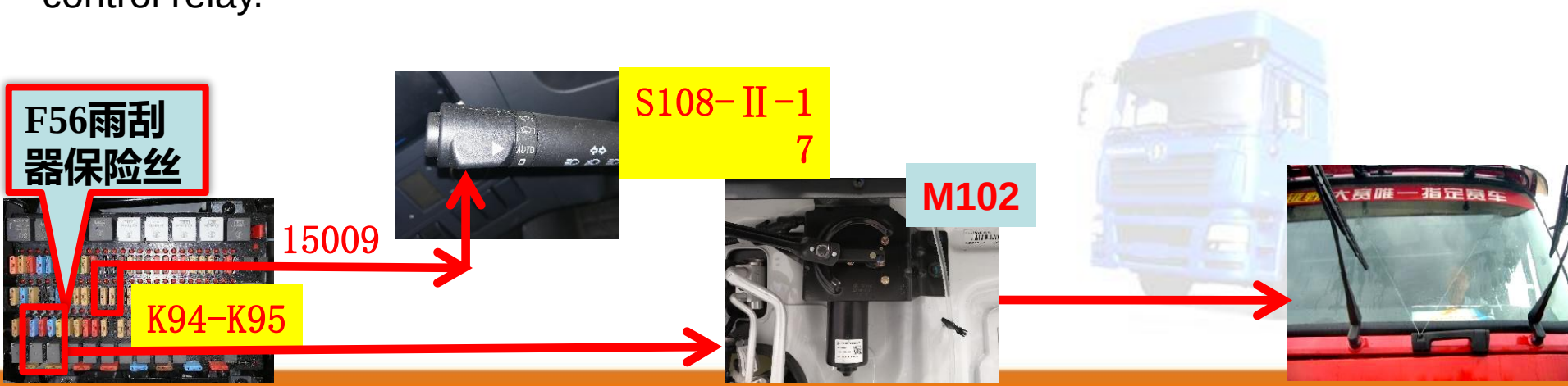
雨刮器正极电源2（高低速）：

雨刮电路的（高低速）电源是由F56保险丝提供的，从电器装置板内部连接到94号雨刮器低速控制继电器的30端子，还有95号雨刮器高速控制继电器的30端子。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Wiper positive power supply 2 (high and low speed):

The power (high and low speed) for the wiper circuit is provided by the F56 fuse, which is connected from the inside of the electrical device board to terminal 30 of the No. 94 wiper low-speed control relay, and terminal 30 of the No. 95 wiper high-speed control relay.



BCM电控单元的基本功能描述及功能详解。

雨刮低速功能1:

雨刮器开关(组合开关)S108旋入低档 I 时, 其雨刮器低速控制信号通过BKD线接入BCM电控单元的B05端子, BCM从A14端子输出的雨刮器低速控制信号, 通过BE色线接入电器装置板的E8位置。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Wiper low speed function 1:

When the wiper switch (combination switch) S108 is screwed into low gear I, the wiper low speed control signal is connected to the B05 terminal of the BCM electronic control unit through the BKD wire, and the wiper low speed control signal output by the BCM from the A14 terminal is connected to the electrical device through the BE color wire. E8 position of the board.



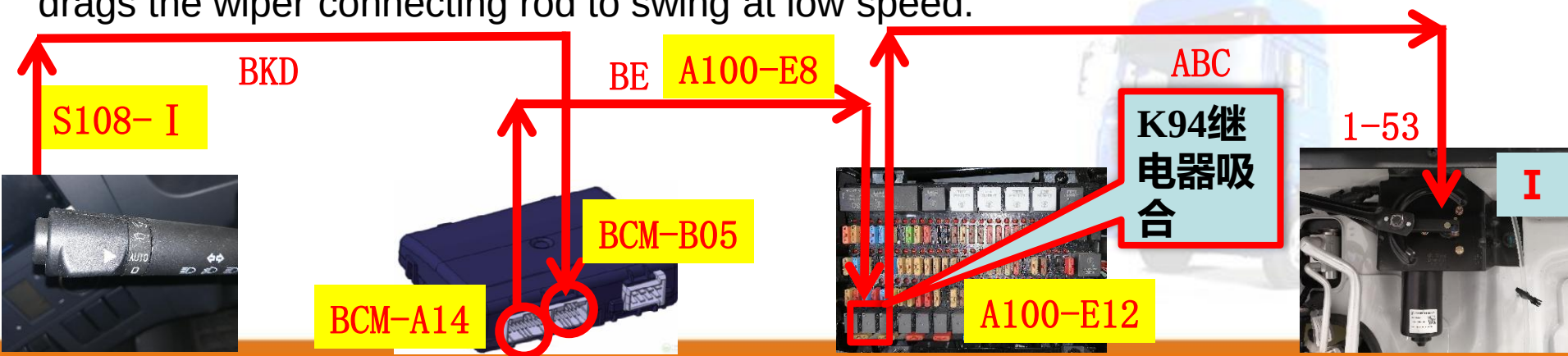
BCM电控单元的基本功能描述及功能详解。

雨刮低速功能2:

BE线是雨刮低速控制信号，它驱动K94雨刮低速继电器吸合时，从电器装置板的E-12的位置输出的雨刮电机低速工作电流通过ABC线，接入雨刮器电机M102的1号端子53，雨刮电机运转拖动雨刮器连杆低速摇摆。

Basic functional description and detailed functional explanation of BCM electronic control unit. Wiper low speed function 2:

The BE line is the wiper low-speed control signal. When it drives the K94 wiper low-speed relay to pull in, the low-speed working current of the wiper motor output from the position E-12 of the electrical device board passes through the ABC line and is connected to No. 1 of the wiper motor M102. Terminal 53, the wiper motor runs and drags the wiper connecting rod to swing at low speed.



BCM电控单元的基本功能描述及功能详解。

雨刮高速功能1:

雨刮器开关(组合开关)S108旋入高档II时, 其雨刮器高速控制信号通过BKF线接入BCM电控单元的B14端子, BCM从A15端子输出的雨刮器控制信号, 通过BF线接入电器装置板的A100-E3号位置驱动95号继电器。

Basic functional description and detailed functional explanation of BCM electronic control unit . Wiper high-speed function 1:

When the wiper switch (combination switch) S108 is screwed into high-grade II, the high-speed control signal of the wiper is connected to the B14 terminal of the BCM electronic control unit through the BKF line, and the wiper control signal output by the BCM from the A15 terminal is connected to the electrical device board through the BF line. Position A100-E3 for additional relays.



BCM电控单元的基本功能描述及功能详解。

雨刮高速功能2:

BF线是雨刮器高速控制信号，它驱动K95雨刮高速继电器吸合时，从电器装置版的E9号位置输出的雨刮电机高速工作电流通过BGC线，接入雨刮器电机M102的4号端子53b，雨刮电机运转拖动雨刮器连杆高速摇摆。

Basic functional description and detailed functional explanation of BCM electronic control unit . Wiper high-speed function 2:

The BF line is the high-speed control signal of the wiper. When it drives the K95 wiper high-speed relay to close, the high-speed working current of the wiper motor output from the E9 position of the electrical device version passes through the BGC line and is connected to the No. 4 terminal 53b of the wiper motor M102. The operation of the wiper motor drives the wiper connecting rod to swing at high speed.



BCM电控单元的基本功能描述及功能详解。

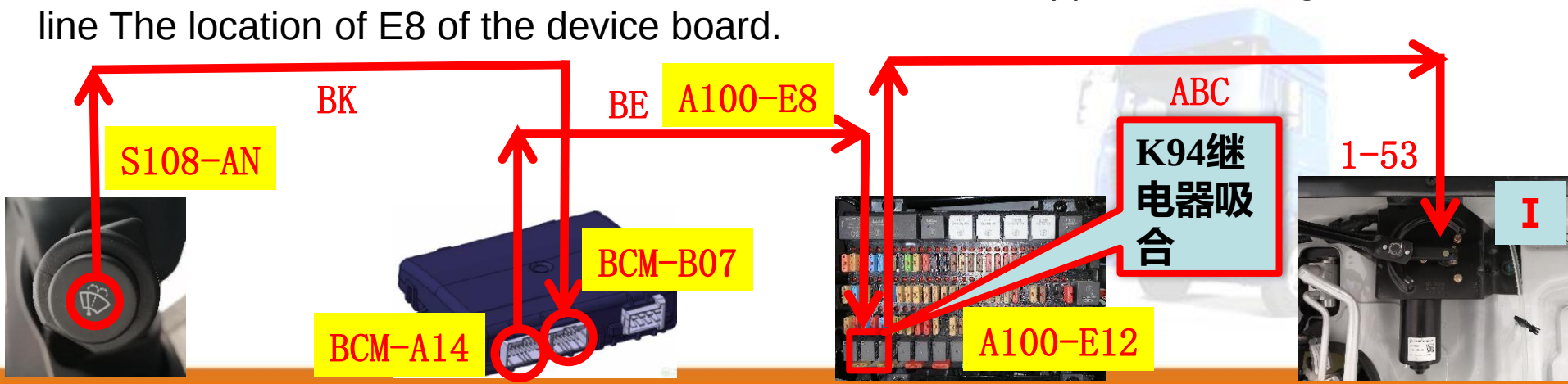
雨刮喷淋功能1（雨刮片摇摆）：

雨刮器开关(组合开关)S108按压侧面喷淋按钮时，其雨刮器喷淋控制信号通过BK线接入BCM电控单元的B07端子，BCM从A14端子输出的雨刮器低速控制信号，通过BE线接入电器装置板的E8的位置。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Wiper spray function 1 (wiper blade swing):

When the wiper switch (combination switch) S108 presses the side spray button, its wiper spray control signal is connected to the B07 terminal of the BCM electronic control unit through the BK line, and the wiper low-speed control signal output by the BCM from the A14 terminal is connected to the electrical appliance through the BE line The location of E8 of the device board.



BCM电控单元的基本功能描述及功能详解。

雨刮喷淋功能2（雨刮片摇摆）：

BE线是雨刮低速控制信号，它驱动K94雨刮低速继电器吸合时，从电器装置板的E12的位置输出的雨刮电机低速工作电流通过ABC线，接入雨刮器电机M102的1号端子53，雨刮电机运转拖动雨刮器连杆低速摇摆。

Basic functional description and detailed functional explanation of BCM electronic control unit. Wiper spray function 2 (wiper blade swing):

The BE line is the wiper low-speed control signal. When it drives the K94 wiper low-speed relay to pull in, the low-speed working current of the wiper motor output from the position of E12 on the electrical device board passes through the ABC line and is connected to the No. 1 terminal 53 of the wiper motor M102. , the wiper motor runs to drag the wiper connecting rod to swing at low speed.



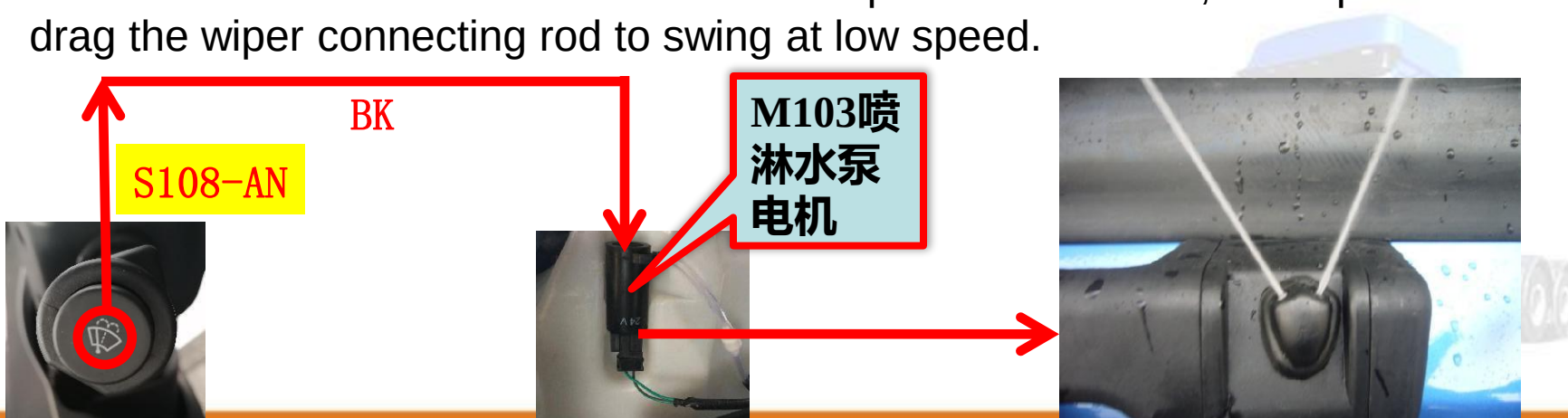
BCM电控单元的基本功能描述及功能详解。

雨刮喷淋功能3（喷射洗涤剂）：

雨刮器开关(组合开关)S108按压侧面喷淋按钮时，其雨刮器间歇控制信号通过另外一个BK线，接入M103喷淋水泵电机的插接器，水泵运转喷射玻璃洗涤剂，配合雨刮器片的摇摆，达到清洗前挡风玻璃的目的。

Basic functional description and detailed functional explanation of BCM electronic control unit. Wiper spray function 2 (wiper blade swing):

The BE line is the wiper low-speed control signal. When it drives the K94 wiper low-speed relay to pull in, the low-speed working current of the wiper motor output from the position of E12 on the electrical device board passes through the ABC line and is connected to the No. 1 terminal 53 of the wiper motor M102. , the wiper motor runs to drag the wiper connecting rod to swing at low speed.



BCM电控单元的基本功能描述及功能详解。

雨刮自动回位功能1:

雨刮电机的位置信号线由LKD线接入BCM的B08端子。雨刮电机内部集成了一个机械式滑环，当雨刮在归位位置时，该滑环为闭环回路。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Wiper automatic return function 1:

The position signal line of the wiper motor is connected to the B08 terminal of the BCM by the LKD line. A mechanical slip ring is integrated inside the wiper motor. When the wiper is in the home position, the slip ring is a closed loop.



BCM电控单元的基本功能描述及功能详解。

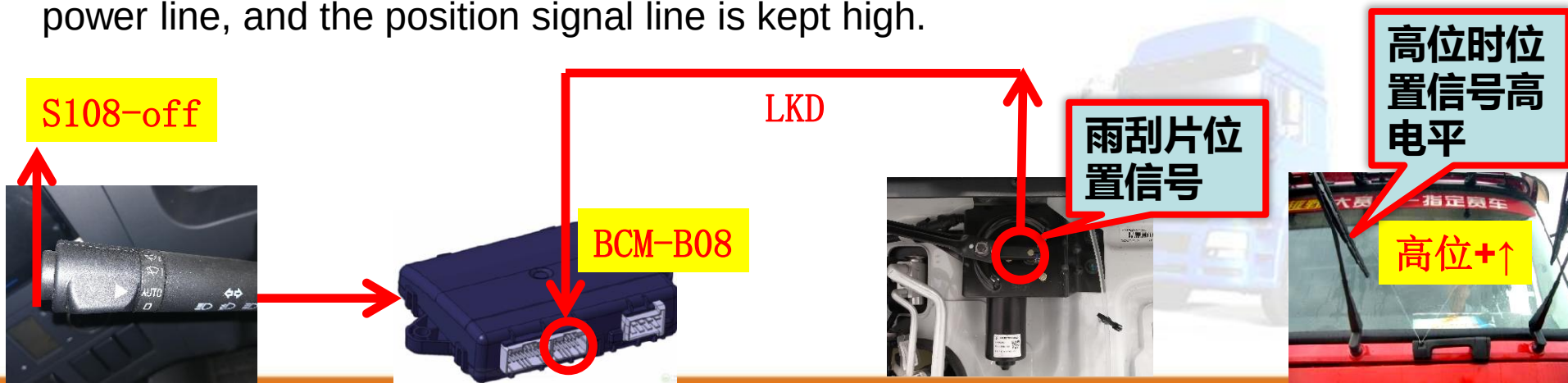
雨刮自动回位功能1:

当雨刮器片运行在最低位置时，归位开关接通搭铁线，位置信号线是低电平。当雨刮器片运行在较高位置时，归位开关接通24伏电源线，位置信号线保持在高电平。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Wiper automatic return function 1:

When the wiper blade is running at the lowest position, the homing switch is connected to the ground wire, and the position signal wire is low level. When the wiper blade is running in the high position, the home switch is connected to the 24V power line, and the position signal line is kept high.



BCM电控单元的基本功能描述及功能详解。

雨刮自动回位功能2:

雨刮电机内部设有回位开关， BCM从B8端子接收此雨刮片位置信号， 驾驶员可以随时关闭雨刮组合开关， 则BCM根据雨刮器位置信号， 自动继续低速运行雨刮电机。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Wiper automatic return function 2:

There is a return switch inside the wiper motor. The BCM receives the wiper blade position signal from the B8 terminal. The driver can turn off the wiper combination switch at any time, and the BCM automatically continues to run the wiper motor at low speed according to the wiper position signal.



BCM电控单元的基本功能描述及功能详解。

雨刮自动回位功能3:

当归位开关信号低电平时，雨刮低速继电器被立即关断，最终使雨刮片运行到前挡风玻璃下方的水平位置，即雨刮片最低位时停止。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Wiper automatic return function 3:

When the home switch signal is low, the wiper low-speed relay is immediately turned off, and finally the wiper blade runs to the horizontal position below the front windshield, that is, the wiper blade stops at the lowest position.





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BCM电控单元的基本功能描述及功能详解。

雨刮功能（堵转保护） 1:

如果雨刮电机发生堵转故障，若此时雨刮电机仍然有驱动电压，BCM-B8端子接收不到位置信号高-低电平的连续变化，若雨刮位置信号连续15秒钟不再变化。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Wiper function (lock protection) 1:

If the wiper motor is blocked, if the wiper motor still has driving voltage at this time, the BCM-B8 terminal cannot receive the continuous change of the position signal high-low level. If the wiper position signal does not change for 15 seconds continuously .

K94/K95
不再吸合

雨刮器-off

15秒钟无变化

LKD

雨刮片位置
信号无
变化

电机堵转

BCM-B8



BCM电控单元的基本功能描述及功能详解。

雨刮功能（堵转保护） 2:

则BCM立即关闭所有雨刮电路的输出，即BCM控制K94、K95继电器不再吸合，避免雨刮电机烧毁。直至堵转故障维修排除后，雨刮才开始正常工作。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Wiper function (lock protection) 2:

Then the BCM immediately turns off the output of all the wiper circuits, that is, the BCM controls the K94 and K95 relays to no longer pull in to prevent the wiper motor from burning. The wipers did not start to work normally until the locked rotor fault was repaired.



BCM电控单元的基本功能描述及功能详解。

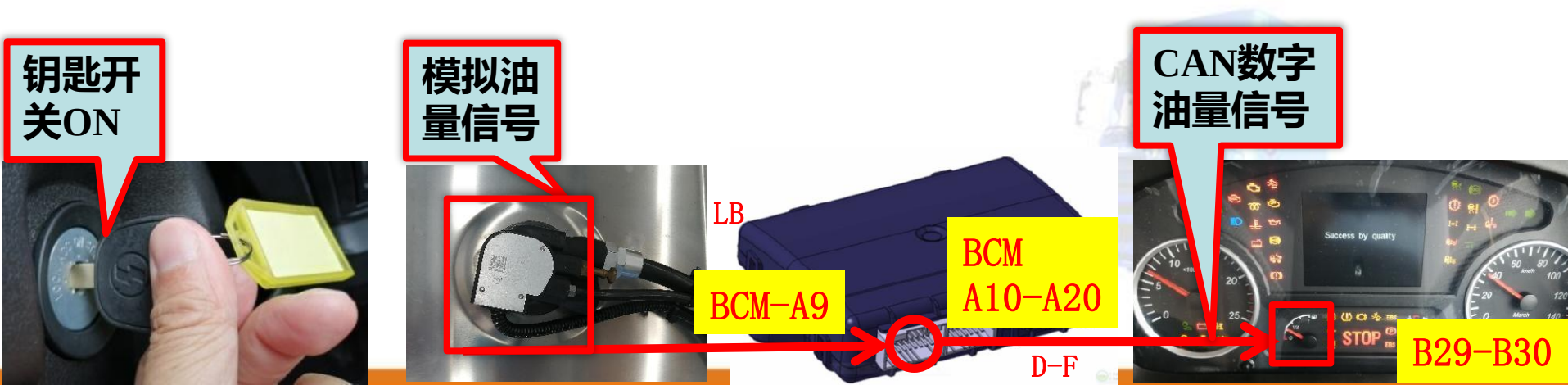
燃油显示功能：

钥匙开关在ON档，燃油箱的油量传感器检测油箱燃油量，通过干簧管输出模拟电阻信号，油量传感器的电阻值在 $72\ \Omega$ — $10\ \Omega$ 之间变化， $72\ \Omega$ 时燃油最低， $10\ \Omega$ 时油箱满油。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Fuel display function:

When the key switch is in the ON position, the fuel level sensor of the fuel tank detects the fuel level of the fuel tank, and outputs an analog resistance signal through the dry reed switch. The resistance value of the fuel level sensor varies between $72\ \Omega$ and $10\ \Omega$. When $72\ \Omega$ is the lowest, the fuel tank is full.



BCM电控单元的基本功能描述及功能详解。

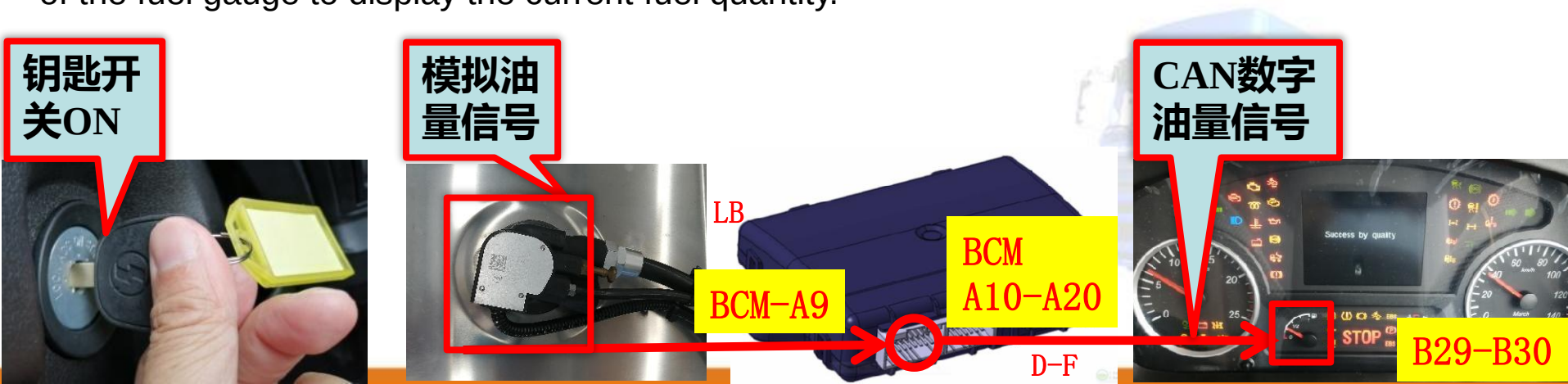
燃油显示功能：

钥匙开关在ON档，油量传感器通过LB线传递（模拟信号）油量到BCM-A9插接器，BCM计算燃油量，通过DF黄绿CAN总线（数字信号）传递到仪表的B-29号B-30号位置。仪表运算CAN信号驱动燃油表指针显示当前燃油量。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Fuel display function:

When the key switch is in the ON position, the fuel quantity sensor transmits the fuel quantity (analog signal) to the BCM-A9 connector through the LB line, and the BCM calculates the fuel quantity and transmits it to the B-29 No. of the instrument through the DF yellow-green CAN bus (digital signal). Location B-30. The instrument calculates the CAN signal to drive the pointer of the fuel gauge to display the current fuel quantity.



BCM电控单元的基本功能描述及功能详解。

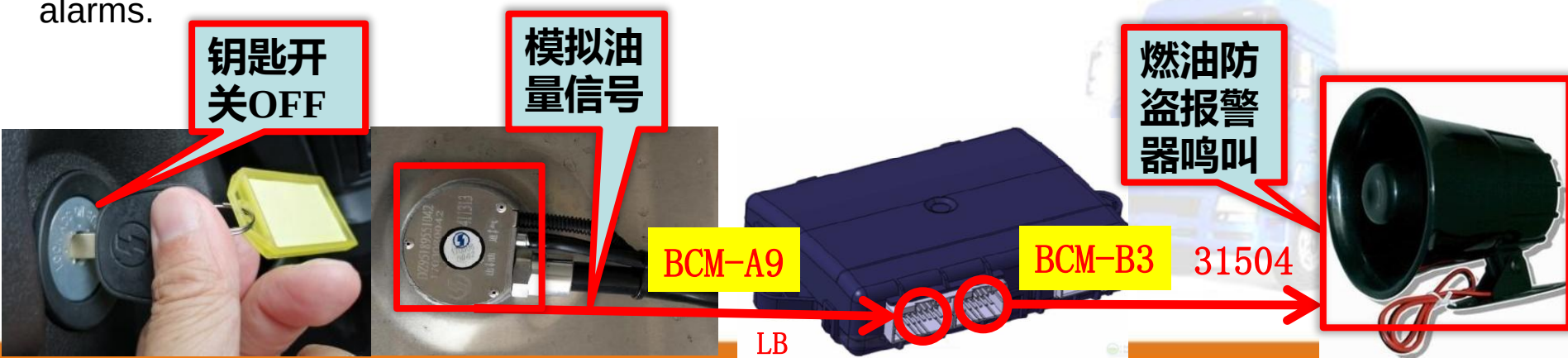
燃油防盗报警功能1（选装功能）：

钥匙开关OFF档，BCM控制器实时监测油箱的油量变化率，若油量传感器电阻变化率大于设定值（默认2%），连续变化3次后，则BCM通过B3针脚的31504线输出的燃油防盗报警信号会驱动报警器发出响声鸣叫进行声音报警。电阻异常报警15次之后停止。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Fuel anti-theft alarm function 1 (optional function):

When the key switch is in the OFF position, the BCM controller monitors the fuel volume change rate of the fuel tank in real time. If the fuel volume sensor resistance change rate is greater than the set value (default 2%), after three consecutive changes, the BCM outputs the output signal through the 31504 line of the B3 pin. The fuel anti-theft alarm signal will drive the alarm to emit a beeping sound to give an audible alarm. It stops after 15 abnormal resistance alarms.



BCM电控单元的基本功能描述及功能详解。

燃油防盗报警功能2（选装功能）：

如果在钥匙开关OFF档，油量传感器检测到开路、短路、信号不可信等故障，燃油防盗功能也会报警。

燃油防盗功能报警时除报警器工作外，BCM同时驱动整车的左右转向灯也会闪烁进行灯光报警。开路、短路故障报警5次之后停止。60秒钟之后再报警。

Basic functional description and detailed functional explanation of BCM electronic control unit. Fuel anti-theft alarm function 2 (optional function):

If the fuel sensor detects open circuit, short circuit, unreliable signal and other faults in the OFF position of the key switch, the fuel anti-theft function will also alarm.

When the fuel anti-theft function alarms, in addition to the alarm work, the left and right turn signals of the BCM drive the vehicle at the same time will also flash to give a light alarm.

Open circuit, short circuit fault alarm 5 times and then stop. Alarm again after 60 seconds.

钥匙开关OFF

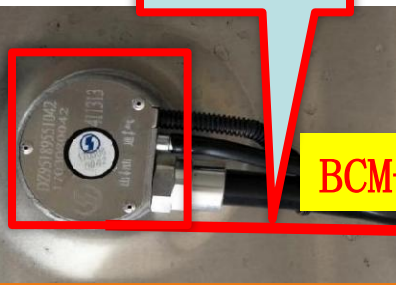
模拟油量信号

BCM-A9

BCM-B3

燃油防盗报警器鸣叫

左右转向灯闪烁



BCM电控单元的基本功能描述及功能详解。

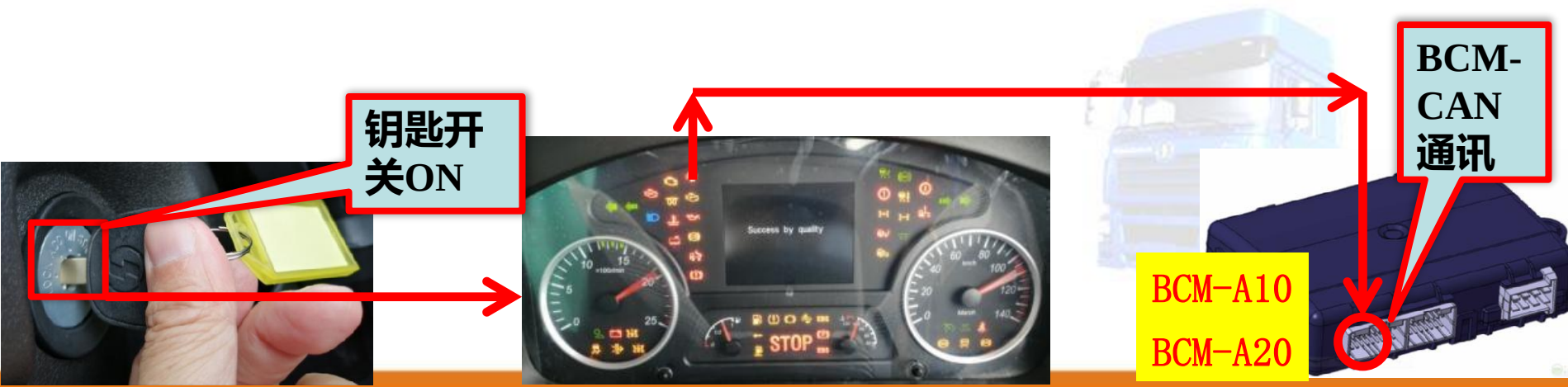
CAN通信功能:

当钥匙到ON档，BCM工作时CAN通讯功能启动，其CAN-H通过A10针脚的D黄色线连接，其CAN-L通过A20针脚F绿色线连接。CAN总线通讯速率为250Kbit/s。

Basic functional description and detailed functional explanation of BCM electronic control unit.

CAN communication function:

When the key is in the ON position and the BCM is working, the CAN communication function is activated, its CAN-H is connected through the D yellow line of the A10 pin, and its CAN-L is connected through the A20 pin F green line. CAN bus communication rate is 250Kbit/s.



BCM电控单元的基本功能描述及功能详解。

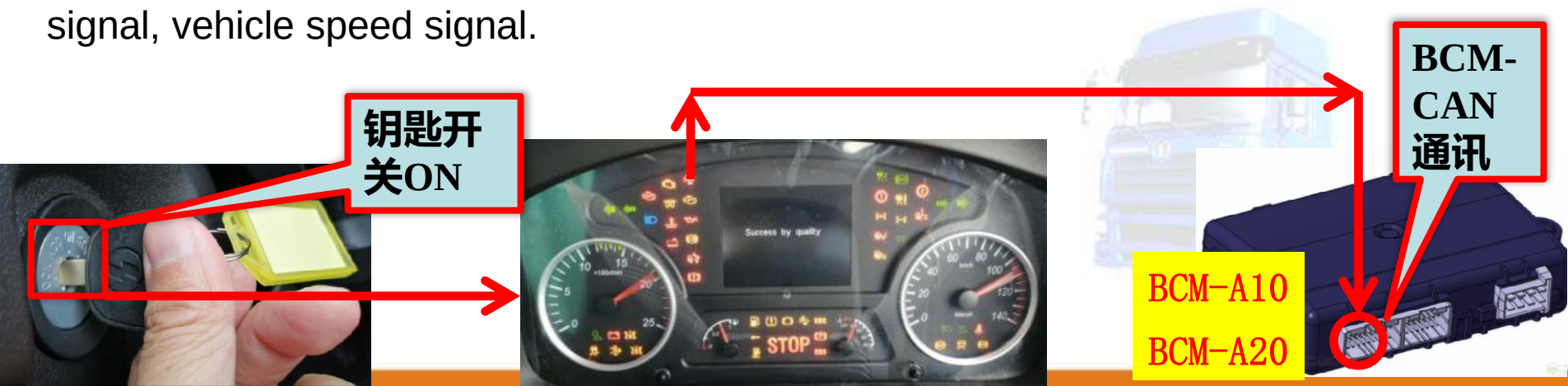
CAN通信功能:

整车通过CAN总线从BCM传输的信号有:

油量表信号, 油量液位低指示灯, 手制动指示灯, 前雾灯指示灯, 后雾灯指示灯, 主车转向灯指示灯, 挂车转向灯指示灯, 空挡开关信号, 制动灯信号, 离合器信号, 排气制动信号, 车速信号。

Basic functional description and detailed functional explanation of BCM electronic control unit. CAN communication function:

The signals transmitted by the vehicle from the BCM through the CAN bus are:
Fuel gauge signal, low fuel level indicator, hand brake indicator, front fog light indicator, rear fog light indicator, main vehicle turn signal indicator, trailer turn signal indicator, neutral switch signal, brake Light signal, clutch signal, exhaust brake signal, vehicle speed signal.



BCM电控单元的基本功能描述及功能详解。

故障诊断功能1:

当BCM工作时故障诊断功能启动，如果有BCM系统故障，则通过CAN总线向仪表发送故障码报文。在仪表的菜单中可以查询BCM故障码，其故障码以SPN+FMI形式显示。

Basic functional description and detailed functional explanation of BCM electronic control unit.

Fault diagnosis function:

When the BCM is working, the fault diagnosis function is activated. If there is a fault in the BCM system, it will send a fault code message to the instrument through the CAN bus. The BCM fault code can be queried in the menu of the instrument, and the fault code is displayed in the form of SPN+FMI.



BCM电控单元的基本功能描述及功能详解。

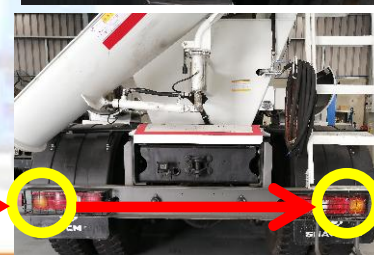
故障诊断功能2:

比如转向灯电路中有故障发生，BCM控制器会记录并输出故障信息，将SPN+FMI故障码信息通过仪表菜单向驾驶员警示。

故障码
查询

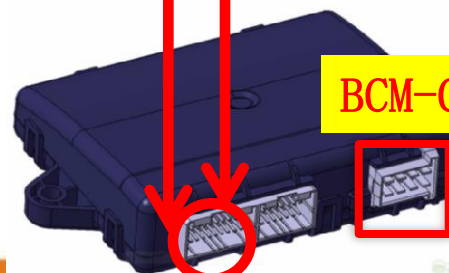


转向灯
断路故障



GA
GF

BCM-C3 C5



BCM
SPN 523767

F 11
FMI 2

S109



Basic functional description and detailed functional explanation of BCM electronic control unit.

Troubleshooting function 2:

For example, if there is a fault in the turn signal circuit, the BCM controller will record and output the fault information, and warn the driver of the SPN+FMI fault code information through the instrument menu.

故障码
查询

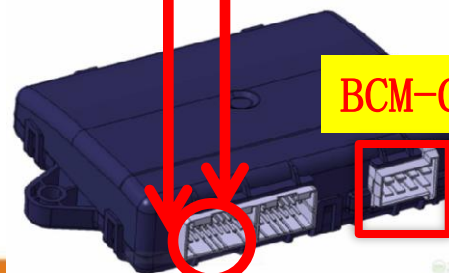


转向灯
断路故障



GA
GF

BCM-C3 C5



BCM
SPN 523767

F 11
FMI 2

S109



BCM电控单元的基本功能描述及功能详解。

故障诊断功能：BCM故障代码表（SPN+FMI）。

Basic functional description and detailed functional explanation of BCM electronic control unit. Fault diagnosis function: BCM fault code table (SPN+FMI).

BCM故障代码表V2.0-BCM fault code table V2.0			
序号	SPN	FMI	故障描述 Fault description
1	523702	6	近光灯继电器短路故障
			Low beam relay short circuit fault
2	523712	6	左前雾灯继电器短路故障
			Left front fog lamp relay short circuit fault
3	523713	6	右前雾灯继电器短路故障
			Right front fog lamp relay short circuit fault
4	523714	6	后雾灯继电器短路故障
			Rear fog light relay short circuit
5	523716	5	日间行车灯开路故障
			Daytime running lights open circuit fault
6	523716	6	日间行车灯短路故障
			daytime running lights short circuit

Basic functional description and detailed functional explanation of BCM electronic control unit. Fault diagnosis function: BCM fault code table (SPN+FMI).

BCM故障代码表V2.0-BCM fault code table V2.0

序号	SPN	FMI	故障描述 Fault description
7	523704	5	主车左转向灯欠载故障
			Main vehicle left turn signal underload fault
8	523704	6	主车左转向灯短路故障
			Main car left turn signal short circuit fault
9	523705	5	主车右转向灯欠载故障
			Main vehicle right turn signal underload fault
10	523705	6	主车右转向灯短路故障
			Main vehicle right turn signal short circuit fault
11	523730	5	挂车左转向灯开路故障
			Trailer left turn signal open circuit fault
12	523730	6	挂车左转向灯短路故障
			Trailer left turn signal short circuit fault
13	523731	5	挂车右转向灯开路故障
			Trailer right turn signal open circuit fault

BCM电控单元的基本功能描述及功能详解。

故障诊断功能：BCM故障代码表（SPN+FMI）。

Basic functional description and detailed functional explanation of BCM electronic control unit. Fault diagnosis function: BCM fault code table (SPN+FMI).

BCM故障代码表V2.0-BCM fault code table V2.0

序号	SPN	FMI	故障描述 Fault description
14	523731	6	挂车右转向灯短路故障
			Trailer right turn signal short circuit fault
15	523710	5	制动灯开路故障
			Brake light open circuit fault
16	523710	6	制动灯短路故障
			Brake light short circuit
17	523423	7	雨刮电机堵转机械故障
			Wiper motor locked rotor mechanical failure
18	523733	6	雨刮电机低速继电器短路故障
			Wiper motor low speed relay short circuit fault
19	523734	6	雨刮电机高速继电器短路故障
			Wiper motor high speed relay short circuit fault

Basic functional description and detailed functional explanation of BCM electronic control unit. Fault diagnosis function: BCM fault code table (SPN+FMI).

BCM故障代码表V2.0-BCM fault code table V2.0

序号	SPN	FMI	故障描述 Fault description
20	1675	5	启动机继电器开路故障
			Starter relay open circuit fault
21	1675	6	启动机继电器短路故障
			Starter relay short circuit fault
22	523767	2	燃油量传感器信号故障
			Fuel quantity sensor signal failure
23	523754	5	排气制动电磁阀开路故障
			Exhaust brake solenoid valve open circuit fault
24	523754	6	排气制动电磁阀短路故障
			Exhaust brake solenoid valve short circuit fault
25	523735	6	位置灯继电器短路故障
			Position light relay short circuit fault
26	524100	5	排气制动电磁阀开路故障
			Exhaust brake solenoid valve open circuit fault