



F3000车型使用保养手册

F3000 Series Operation and Maintenance Manual



陕西重型汽车进出口有限公司

SHAANXI HEAVY DUTY AUTOMOBILE IMPORT & EXPORT CO.,LTD

地址：西安市经济开发区泾渭工业园陕汽大道

Add:Shanqi Avenue,Jing Wei Industrial Park Xi'an China

电话：0086-29-86956901/86955911

Tel:0086-29-86956901/86955911

www.shacman.com



 Youtube

 Wechat

 Facebook

郑重声明 Statement

如果发生下述行为，陕西重型汽车有限公司将不对汽车产品的可靠性、安全性或适应性承担责任。

If the following events occur, Shaanxi Heavy Duty Automobile Co., Ltd. shall not be responsible for the reliability, safety or adaptability of the automotive products.

1、车辆的铭牌与本公司签发的整车或底盘合格证，同实物不相符或涂改者。

1. The nameplate of the vehicle, the Certificate of Vehicle or Certificate of Chassis issued by the company doesn't consist with the real vehicle or the above nameplate or certificate has been altered.

2、未按照本手册的要求对车辆进行正确使用和规范操作。

2. The vehicle is not correctly used or strictly operated according to the requirements stated in the manual.

3、未按本手册的规定在服务站进行定期保养（包括走合保养和里程保养）。

3. The vehicle is not regularly maintained by the service station according to the requirements stated in the manual (including running-in maintenance and mileage maintenance).

4、未使用本公司规定的油品、冷却液、空气滤芯、机油滤芯。

4. The petroleum products, coolant, air filter or engine oil filter used on the vehicle is not special one for Shacman products by provided by the company

5、质量保证期限内，车辆出现故障后，未经陕西重型汽车有限公司客服中心进行处理，而自行修理。

5. During the warranty period, the vehicle with faults is personally maintained or repaired, other than accepted by the Customer Service Center of Shaanxi Heavy Duty Automobile Co., Ltd.

6、未经本公司许可，自行改变出厂车辆原有结构状态，进行改装、加装或零部件变更引发故障，如对车厢增容、车架加固、钢板弹簧加厚加片或轮胎加层加大等。

6. The original structure is personally modified for vehicle modification without the permission of the company. The additionally mounted or modified components and parts caused faults, for example, vehicle space expansion, vehicle frame strengthening, leaf spring thickening or supplement, and tire layer recovering or tire enlarging, etc.

7、维修车辆时，使用非本公司认可的纯正零部件所生产的故障。

7. The faults are incurred by the applied components and parts which are not the original components and parts accepted by the company when the vehicle is maintained.

8、车辆出现故障或隐含故障未及时排除而继续行驶，扩大化的续发性缺陷及连带的相关零部件损坏。

8. The enlarged subsequence defects and the associated damage of the relevant components and parts occur for the vehicle continues to run without eliminating the previous faults or hidden faults.

9、车辆发生交通事故后，未经公安交通管理部门、保险公司等相关部门进行责任认定，自行处理。

9. After the traffic accident, the accident is personally handled, other than treated by the confirmation of responsibility which is carried out by the Police Traffic Management Department, Insurance Department, and so on .

10、车辆超载超限使用。

10. The vehicle is used under the overloaded or over-limited condition..

11、有外界因素造成的碰撞冲击、燃烧毁坏、划伤脱落等非产品自身缺陷。

11. Non-self defects of the products caused by the external factors, including crash impact, burnt damage and scratch or stripping off.

12、因自然环境影响，如：洪水、闪电、风暴、冰雹等不可抗力造成的车辆损坏。

12. Vehicle damages caused by natural environment influences including floods, lightning, storm, hailstone and other acts of god.

13、车辆正常的噪音、振动、磨损、老化等损耗情况。

13. The normal noise, vibration, abrasion, ageing and other depletions.

14、阻拦、拒绝服务站对车辆进行正常检查、分析鉴定，由此引发的延误损失。

14. The losses incurred by the prevention and objection of the regular inspection, analysis and evaluation carried out by the service station for the vehicle.

15、超出了质量保证期的车辆。

15. The vehicle is not out of quality assurance period.

16、其它非材质、设计、制造原因的修理。

16. Maintenances for reasons other than materials, design and manufacturing reasons.

版权所有翻印必究

All Rights Reserved

提示：车辆投入使用前，请仔细阅读本说明书，并妥善保管，便于随时查阅。

Notice: prior to the vehicle puts into running, please carefully read the instruction and properly keep it for further reference.

前 言

Preface

欢迎您购买和使用陕汽牌 F3000 重型汽车。本手册介绍了陕汽牌 F3000 系列牵引汽车的使用操作与保养。

怎样使您的汽车获得最佳的效益，是我们和您共同追求的目标，但是很大程度上能够取决于您对车辆的熟悉程度和保养是否仔细、全面。我们诚恳地希望您在使用之前能够通读本手册，并对其中介绍的操作程序做到得心应手。

Welcome to purchase and use the SHACMAN F3000 Heavy-duty Truck. The manual instructs the operation and maintenance of the SHACMAN F3000 Heavy-duty Truck. How to achieve the best effectiveness of the automobile is the common target of the company and customer, but it largely depends on your familiarity and maintenance of the automobile. We sincerely hope that you can read the manual before you operate the vehicle and know well of the operational procedures provided by the manual.

提醒注意的是，为适应用户需要，陕西重型汽车有限公司将对生产的汽车产品不断进行改进和完善，我公司保留在任何时候进行产品设计和技术特征更改的权利。因此，本手册中的图形及说明在出版时是正确的，其后的设计和技术特征的更改，恕不另行通知，敬请谅解。

It is worth reminding and noting that the Shaanxi Heavy Duty Automobile Co., Ltd. will continuously improve and perfect the automobile products to meet the needs of the users. And the

company will, at any time, reserve the right of modification of product design and technical characteristics. Thus, the diagrams and explanations in the manual are correct when publishing. But the notice of further modification of design and technical characteristics will not be provided, sorry for the inconvenience.

本手册是车辆的一部分，应与车辆一起保存和使用。

The manual is one part of the vehicle so it shall be kept and used together with the vehicle.

有关我公司产品的质量保修、配件购置等问题，请与陕西重型汽车进出口有限公司海外技术服务部联系。

As for the issues concerning quality assurance and maintenance and accessory procurement of our products, please contact Overseas Technical Service Department of Shaanxi Heavy Duty Automobile Import & Export Co., Ltd.

服务热线：0086-29-86956908 0086-29-86956905（座机）
Service Hotline: 0086-29-86956908 0086-29-86956905（TEL）

本《手册》版权归陕西重型汽车有限公司所有，未经允许，不准翻印、出版，陕西重型汽车有限公司明确保留按照法律规定有关版权等一切权利、包括更改权，该《手册》最终解释权归陕西重型汽车有限公司。

编制单位：陕西重型汽车有限公司商用汽车研究所

The copyright of the Manual is reserved by the Shaanxi Heavy Duty Automobile Co., Ltd. The Manual shall not be reproduced and published without permission. Shaanxi Heavy Duty Automobile Co., Ltd. explicitly reserves all the rights regarding copyright stated in the laws and regulations, including right of modification. The right of final interpretation shall be reserved by the Shaanxi Heavy Duty Automobile Co., Ltd.

Prepared by: Commercial Automobile R&D Center of Shaanxi Heavy Duty Automobile Co., Ltd.

2022年08月第1版

Version 1, AUG. 2022

目 录

一、车辆的编号.....	12
I. Vehicle Code.....	12
(一) 车型号.....	13
(I) Vehicle Model.....	13
(二) 发动机铭牌及钢号.....	18
(II) Engine Nameplate and Steel Grade.....	18
(三) 车辆识别代号.....	20
(III) Vehicle Identification Code.....	20
二、车辆的使用.....	22
II. Vehicle operation.....	22
(一) 驾驶室及主要机构（装置）.....	22
(I) Cab and Key Mechanisms (Devices).....	22
(二) 行车前的准备.....	80
(II) Preparations prior to traveling.....	80
(三) 开前面罩.....	99
(III) Open the radiator grille.....	99

（四）起步与换档.....	101
(IV) Start and gear shift.....	101
（五）制动系.....	117
(V) Brake system.....	117
（六）挂车的对接.....	133
(VI) Butt joint of the trailer.....	133
（七）车辆的拖拽牵引.....	138
(VII) The trailing and dragging of the vehicle.....	138
（八）车轮的更换.....	141
(VIII) Replace the wheels.....	141
（九）驾驶室的翻转操作.....	142
(IX) Overturn operation of the cab.....	142
（十）新车走合.....	146
(X) New Vehicle Running-in.....	146
（十一）发动机电控系统.....	148
(XI) Electronic control system of the engine.....	148
（十二）空气悬架系统——适用于公路牵引/载货车.....	166
XII. Air Suspension System – For Road Traction / lorry trucks.....	166

（十三）双腔燃油供给系统/并联油箱使用说明.....	175
XIII. Dual-chamber fuel supply system / parallel fuel tank instruction.....	175
三、汽车的保养.....	181
III. Automobile Maintenance.....	181
（一）保养类别.....	181
(I) Maintenance Classes.....	181
（二）例行检查和保养的间隔里程.....	182
(II) The mileage interval of the routine inspection and maintenance.....	182
（三）总成换油间隔里程.....	182
(III) The mileage interval of assembly oil change.....	182
（四）保养作业要点.....	188
(IV) Key points of the maintenance operation.....	188
（五）燃料、润滑油和加注量.....	210
(V) Fuel, lubricating oil and filling amount.....	210
四、灯泡一览表.....	246
IV. List of Automobile Bulbs.....	246
五、电器原理图（1-15）.....	265
V. Electrical schematic diagram (1-15).....	265

六、制动管路图.....	287
VI. Brake Piping Diagram.....	287
七、轮胎气压.....	291
VII. Tire Pressure.....	291
八、允许总质量和轴载质量 kg(公斤).....	293
VIII. Allowable Gross Mass and Axle load Mass kg (kilogram).....	293
九. 车辆报废处理注意事项.....	295
IX. Precautions for vehicle scrapping disposal.....	295

一、车辆的编号

I. Vehicle Code

用户在申请赔偿, 订购备件或与维修部门联系时必须准确、完整地注明车辆的编号。车辆的编号应填入:

When applying for compensation, ordering and purchasing spare parts or contacting with the maintenance department, the user shall correctly give out the vehicle code in complete. The following information shall be provided by vehicle code:

车 型 号 Vehicle Model No.: _____

车辆识别代号 VIN: _____

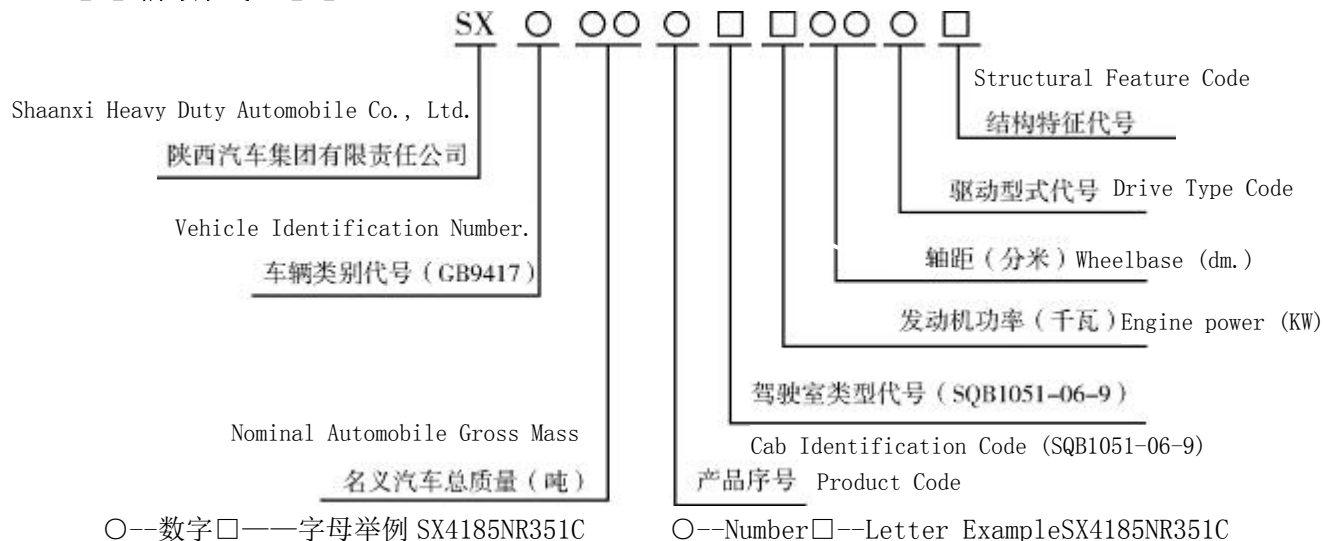
发 动 机 号 Engine No. _____

出 厂 日 期 Exworks Date: _____

(一) 车型号

(I) Vehicle Model

【1】编号形式 【1】 Code Form:



【2】整车铭牌位置

【2】Complete Vehicle Nameplate Position

位置一：副驾驶员车门打开下侧

Position 1: the underside after opening the co-driver door



位置二：陕汽重卡电子标签位置

Position 2: the position of SHACMAN electronic tag



注意事项:

Precautions:

电子标签中装有微型芯片，其中记录有该车的详细信息资料和车辆识别代码，通过具有 GPS 和 GPRS 通信功能的手持机信息管理系统可以随时查询该车相关信息，请妥善保管，不得损毁，否则后果自负！

The electronic tag is equipped with microchip which keeps a record of the detailed information and identification code of the vehicle. The above information can be checked and queried at any time by the handset information management system with GPS and GPRS communication functions. Please properly keep it and damages are not allowable, or at your risk.

【3】驾驶室空气悬浮装置

【3】Air Suspension Device of Cab

牵引车和载货车驾驶室采用空气悬浮装置以提高乘坐舒适性，根据用户要求在适当范围内调整；自卸车和专用车采用液压减振装置不可调。

The cabs of tractor and cargo truck are equipped with air suspension device to improve the comfortableness of seat. It can be adjusted in proper range according to the requirements of the user. But the dumper and special truck equipped with hydraulic vibration damper can not be adjusted.

驾驶室空气悬浮装置调整如下：

The adjustment procedures of air suspension device of cab are listed as follows:

1、前悬置高度阀

1. Front Suspension Leveling Valve

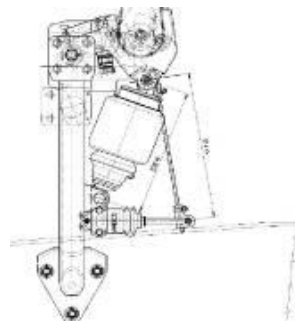
高度阀按图中尺寸 77 ± 5 进行安装，以保证气弹簧的安装矩（即上安装孔中心到下安装中心的距离）在 290 ± 5 。

The leveling valve shall be installed according to the 77 ± 5 specifications stated in the diagram to guarantee the installation distance (i.e. the distance between the center of the upper mounting hole and the center of the lower mounting hole) within the range of 290 ± 5 .

2、后悬置高度阀

2. Rear Suspension Leveling Valve

高度阀按图中尺寸 311 ± 5 （即气弹簧上安装点到高度阀控制杆端的连接孔之间的距离）进行安装，以保证气弹簧的安装矩在 270 ± 5 范围内。The leveling valve shall be installed according to the 311 ± 5 specifications stated in the diagram to guarantee the installation distance of air spring (i.e. the distance between the mounting point of the air spring and the control bar end of the leveling valve) within the range of 270 ± 5 .



注意事项:

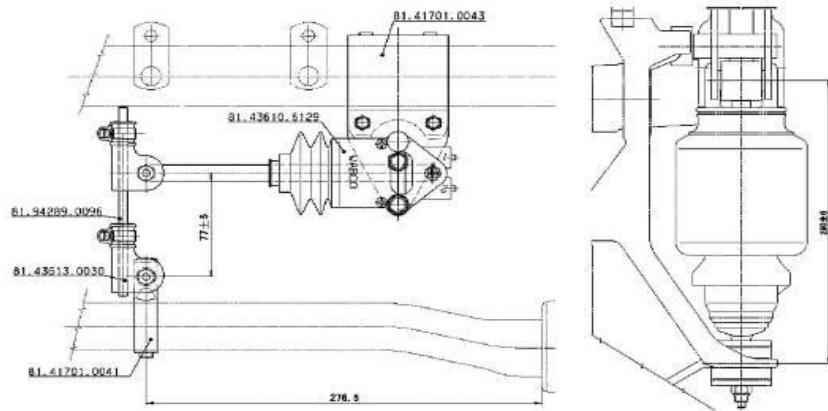
Precautions:

1、储气筒中必须有一定气压才可保证气囊正常工作。

1. There must be a certain of pressure kept in the air-reserve tank to guarantee the normal work of airbag.

2、用户可根据情况适当调整,但不得超出规定范围。

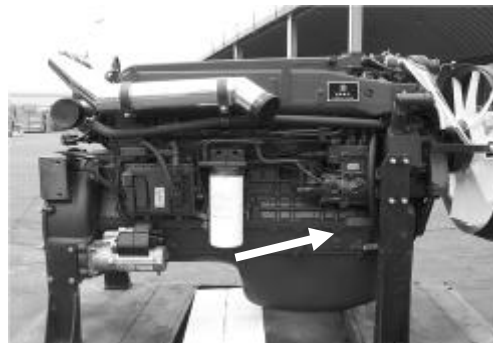
2. The user can carry out adjustment according to the condition, but the adjustment shall not exceed the regulated range.



(二) 发动机铭牌及钢号 (II) Engine Nameplate and Steel Grade



WP10 发动机铭牌位置
Position of WP10 Engine Nameplate

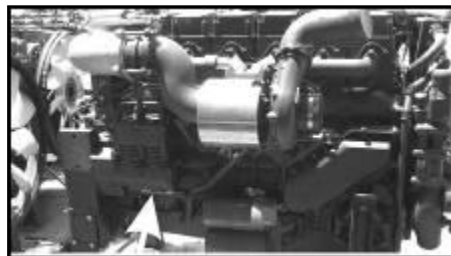


WP10 发动机钢号位置
Position of WP10 Engine Steel Grade



WP12 发动机铭牌位置

Position of WP12 Engine Nameplate



WP12 发动机缸体号位置

Position of WP12 Engine Steel Grade



WP7 发动机铭牌位置

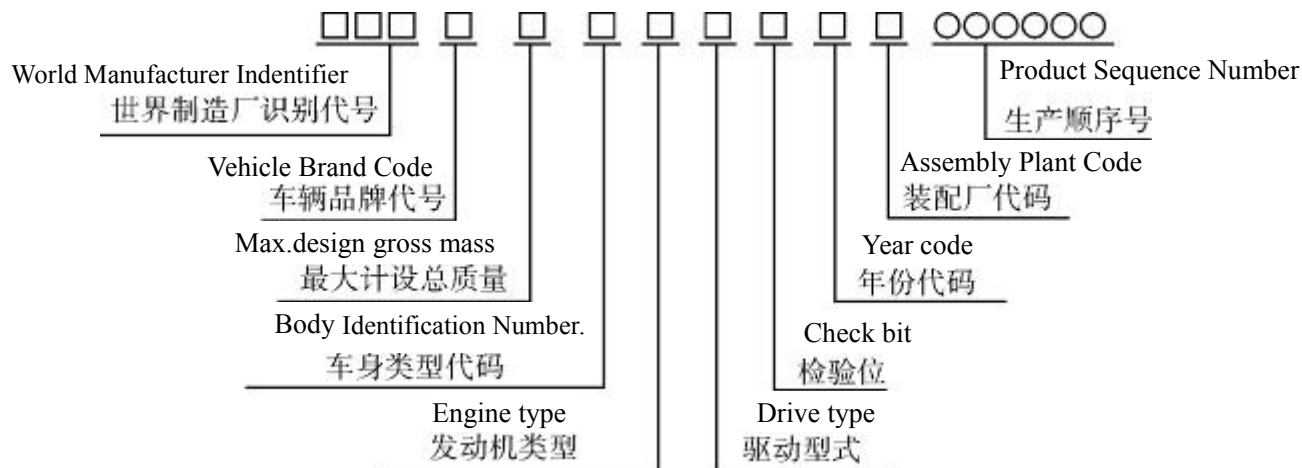


WP7 发动机钢号位置

(三) 车辆识别代号 (III) Vehicle Identification Code

【1】编号形式:

【1】Code Form:



【2】打印位置:

【2】Stamped Position:

在前轴中心线部位的右侧车架腹板外侧。

At the external side of the right frame web in the center line part of front axle.

车辆识别代号打印在前轴中心线部位的右侧车架腹板上。

Vehicle identification code is stamped on the right frame web in the center line part of front axle.



二、车辆的使用

II. Vehicle operation

(一) 驾驶室及主要机构 (装置)

(I) Cab and Key Mechanisms (Devices)

1、车门打开与锁止

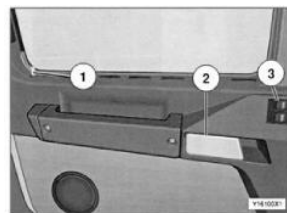
1. Open and lockup of the vehicle door

将钥匙逆时针转动后,听到咔哒声后,拔出钥匙按进圆柱形锁芯用力向外拉,即可打开车门;顺时针转动钥匙,即可将车门锁住。

After turning the key in anticlockwise way and hear click sound, pull out the key and then press the key cylinder and pull it so as to open the vehicle door. If turn the key in clockwise way, the vehicle door will be locked.

在车内时,按下锁止钮①,车门锁止,拉起锁止钮①,拉门把②并向外推即可打开车门。③为车门电动玻璃升降(选装)按钮。

When inside the vehicle, by pressing the lockup knob ①, the vehicle door will be locked. By pulling up the lockup knob ①, the vehicle door will be opened by pulling the door handle ② and pushing out. ③ The knob for controlling the lifting and lowering of electric glasses of the vehicle door (optional).





注意

Notice

切勿在车门关闭好之前行驶车辆，否则将有意外事故的危險。

Do not drive the vehicle before closing the vehicle door, or an accident might be incurred by it.

2、座椅调节及安全帶

2. Seat Adjustment and Safety belt

驾驶座椅所示，该座椅为气垫式，调节时只有在座椅面不超载，气动系统压力为 7 巴和停车状态下进行。调节时应确保能听到座椅锁止装置卡合声音。

See the figure for driver seat. It is air cushioned seat. The seat can be adjusted only if the seat surface is not overloaded and the pressure of pneumatic system is 7 bars in parking state. When adjusting, ensure to hear the click sound of the seat lockup device.

①挺腰装置三档可调

①Back straight device with three gears for adjustment

②靠背仰角调节 ($60^{\circ} \sim 170^{\circ}$)

②Adjustment range of backrest elevation angle ($60^{\circ} \sim 170^{\circ}$)

③后端高度 ($0 \sim 60\text{mm}$) 七档可调

③Rear-end height ($0 \sim 60\text{mm}$) with 7th speed for adjustment

④前端高度 ($0 \sim 60\text{mm}$) 七档可调

④Fore-end height ($0 \sim 60\text{mm}$) with 7th speed for adjustment

⑤减震状态调整

⑤ Adjustment of damping state

⑥滑轨调节把手 (滑道调整量 270mm)

⑥Adjusting handle of sliding rail (adjustment range for 270mm of sliding way)



在气囊充气状态下, 驾驶员自然落座之后气囊将根据人体重量有个充放气的适应过程, 然后向上搬动前端调节手柄(后端调节手柄)给座垫前端(后端)向下(上)适当加(减)力, 使座椅前端(后端)降低(升高)至驾驶员舒适位置, 松开手柄即可。之后, 同一个驾驶员离座后又落座, 将不需要重新调节前端调节手柄或后端调节手柄。若更换驾驶员, 此调节需重新设置。

Under the condition of air inflation of airbag, after the driver takes the seat, the airbag will have an inflation and deflation adaptive process according to the man weight. And then pull up the fore-end adjusting handle (rear-end adjusting handle) to give upward (downward) force to the seat fore-end (rear-end) so as to make the seat fore-end (rear-end) lower (lift) to the comfortable position for driver, and then loosen the handle. If the same driver takes the seat after he/she leaves the seat, there is no need to readjust the fore-end adjusting handle or rear-end adjusting handle. If the driver has changed, the seat needs to be readjusted.

1、手柄水平时座椅有气悬浮减震；

1. When the handle is in level position, the seat has air suspension for damping;

2、顺时针转动手柄，并对座椅向下适当加力，手柄锁止后即为固定式座椅；

2. Turn the handle in clockwise and give downward proper force to the seat. The seat will be fixed after the handle is locked.

3、需转为减震状态时，逆时针转动手柄，并对座椅适当向下加力，即可解除锁止。

3. If the vehicle need turn to be damping state, turn the handle in anticlockwise and give downward force to the seat, then the lockup will be cancelled.

特殊说明

Special Instructions

在路况较差的路面行驶时，可以锁止减震状态，这样将减少对座椅的损坏。

When driving in the poor road condition, the damping state can be locked so as to reduce the possibility of seat damage.

副驾驶室座椅所示。副驾驶座椅为普通型，座面角度和靠背调节功能，调节方法参阅驾驶座椅调节相关内容。

See the figure for co-driver seat. It is common type co-driver seat with the functions of seat angle and backrest adjustment. See the adjustment contents of driver seat for the adjustment method.

①靠背仰角调节 ($60^{\circ} \sim 170^{\circ}$)

① Adjustment range of backrest elevation angle ($60^{\circ} \sim 170^{\circ}$)

②后端高度 ($0 \sim 60\text{mm}$) 七档可调

② Rear-end height ($0 \sim 60\text{mm}$) with 7th speed for adjustment

③前端高度 ($0 \sim 60\text{mm}$) 七档可调

③ Fore-end height ($0 \sim 60\text{mm}$) with 7th speed for adjustment



液压主座椅及配套副座椅如图所示，调节功能为：

- ①靠背仰角调节（ $60^{\circ} \sim 170^{\circ}$ ）
- ②后端高度（ $0 \sim 60\text{mm}$ ）七档可调
- ③前端高度（ $0 \sim 60\text{mm}$ ）七档可调
- ④刚度（体重）调节手轮
- ⑤滑轨调节把手（滑道调整量 230mm ）

Newly added: hydraulic driver seat and the co-driver seat are as shown in the figure

- ①Adjustment range of backrest elevation angle ($60^{\circ} \sim 170^{\circ}$)
- ②Rear-end height ($0 \sim 60\text{mm}$) with 7th speed for adjustment
- ③Fore-end height ($0 \sim 60\text{mm}$) with 7th speed for adjustment
- ④Adjustment roller for stiffness (weight)

⑤Adjusting handle of sliding rail (adjustment range for 230mm of sliding way)



驾驶与副驾驶座椅配有安全带，为确保行车安全请系好安全带。使用时将安全带绕过肩膀和大腿面进行扣合，松紧度可通过拉肩进行调节，但不要在上衣袋中放有钢笔、眼镜等坚硬易碎物品，以防意外发生。扣合安全带时，拉住锁扣将扣闩压入锁卡内，听到啮合声即可，解除时按图中箭头方向按下锁扣上的红色按钮，握压扣闩，安全带可自动收复。



The driver seat and co-driver seat are both equipped with safety belt which shall be fastened to guarantee the driving safety. When using the Safety belt, fasten it by steering by shoulder and upper leg. The tightness degree could be adjusted, but no hard and fragile materials such as pens, glasses and other similar articles shall be put in the breast pocket to prevent accidents from occurring. When fastening the safety belt, pull the lock catch and press the lock latch into the lock clip. When there is a “click “sound, it has been fastened. For loosening the belt, press the red button in the lock catch based on the direction of arrow and hold and press the lock latch, the safety belt can automatically recover.

注意

Notice

为使安全带安全可靠，使用时请用力突然拉动安全带，安全带不应伸长，否则，安全带锁应进行更换。平时应保证安全带清洁干燥，不能将安全带盘绕。对发生意外受损的安全带必须更换，并检查安全带锁钩。In order to guarantee the safety and reliability of the safety belt, do not pull the safety belt in the process of application, or the safety belt needs to be replaced. The safety belt shall be clean and dry at common time and the safety belt shall not be twined. As for the damaged safety belt caused by accidents, the safety belt must be replaced and its lock hook must be checked and inspected.

下卧铺收起与放下

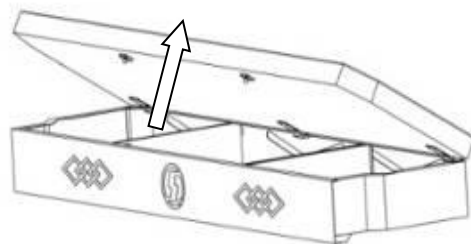
Berth stoops and puts down

Change content: Replace all:

The lower berth is put away and put down

下卧铺的翻起和落下

下卧铺可以翻起，直接将卧铺盖板向上翻起（下图中箭头方向示意），可在下卧铺工具箱和储物箱存放工具和物品。需要下卧铺放平时，将卧铺盖板放下直至放平位置。



The lower berth' s putting away and putting down

The lower berth can be turned upside-down, and the berth cover can be turned upwards (indicated by the direction of the arrow in the figure below) to store tools and objects in the lower berth tool box and storage box. When you need to lay on the bed, lay the berth cover until it is flat.

上卧铺的翻起和落下

Turn up and lay down the upper berth

操作步骤如下:

Operation steps are listed as follows:

首先, 打开卧铺护栏的卡扣, 然后一只手按住卧铺按钮

Firstly, open the lock fastener of the berth guard bar, and then press the berth button with one hand.



一只手握住卧铺吊带的锁扣扣在顶上的卧铺挂钩上, 用力往上扣, 直到听见“咔嗒”的锁紧声, 确认稳固后即可松手

and hold the lock catch of the berth suspension belt to buckle it in the berth hook on the top. After hearing “Click “sound, the user can loosen the belt after confirming it has been fastened.



卧铺两侧的吊带操作完全相同，另外一侧吊带同样操作，卧铺吊带连接完毕。

The operation steps for fastening the belts of the two sides of berth are the same, so the belt in other side can be fastened based on the same operation steps, berth suspension belt had connected completely.



双手托住卧铺，两个拇指分别按住卧铺按钮向上抬起卧铺至需要的高度，然后拇指松开按钮，吊带内部的收紧机构会将吊带收进并锁死，确认稳固后松手即可，如图所示。

Support the berth with both hands and raise the berth to the desired height by pressing the berth button. Then loosen the button by thumb and the belt will be tightened by the tightening mechanism and locked. Do not loosen until the fastening operation has been completed, see the following figure.



需要放下卧铺时，首先双手托住卧铺，按下卧铺按钮，慢慢往下放，直至放到最低点松手即可。

When the user needs to lay down the lower berth, the user shall support the berth with the both hands and then lay down it by pressing the lower berth button until it reaches the lowest position. And then loosen it.



如果需要解开卧铺吊带的锁紧挂钩，请握住吊带锁扣，并用力按锁扣上红色的按钮，即可将卡扣拔出解开卧铺吊带 If the user needs to unfasten the tightening hook of the berth belt, the user shall hold the belt lock catch and pull out the lock catch and unfasten the berth belt by pressing the red button in the lock catch.

防护网的操作

Operation steps of protective net

原始状态防护网是收进卷筒里的

The original state of protective net is setback into the coiling drum.

首先打开防护网支撑杆两端连在卧铺拉带上的卡扣，然后拉起防护网至需要的高度，锁紧卡扣即可。

Firstly, open the lock catch which is connected to the berth belt at the both ends of the protective net, and then raise the protective net to the desired height, and finally fasten and lock the fastener.



上卧铺如图所示

See the figure for the upper berth.

将卡扣锁紧，防护网安装完毕。

After the lock fasteners fastened, the installation of the protective net will be completed.

警告：使用上卧铺时必须将防护网拉起足够高度，并确保锁止，防止人从上面滚落

Warning: when using the upper berth, the user shall raise the protective net to the enough height to guarantee lockup and prevent the people rolling down from the top.

注意事项

Precautions

1. 为保证安全，上卧铺仅供驻车状态下使用，行驶过程中请勿使用上卧铺。

1. To guarantee safety, the upper berth can only be used in parking state, while it shall not be used during driving state.

2. 使用上卧铺休息时请务必将卧铺吊带锁在上方的卧铺挂钩上，并将防护网锁止在最高位置。

2. When using the upper berth for rest, the user shall fasten and lock the berth belt into the upper berth hook and raise and lock the protective net to the highest position.

3. 新车在使用前，请将卧铺外包装塑料薄膜去除，否则卧铺与底板之间无法粘接。

3. Before using the new vehicle, the user shall remove the outer plastic film of the berth, otherwise, he berth cannot be connected to the chassis base.

4. 下卧铺翻起靠背时需听到有“咔哒”声，说明锁止机构锁住，并检查两侧支架是否同时锁好稳固后方可躺靠。

4. When turning the backrest for laying down the lower berth, the lockup mechanism has locked the parts only if the “Click “sound has been heard by the user. The user shall not lie on the berth until the user has checked the both sides of the berth and confirmed that they are both locked.

5. 登上卧铺时，建议采用座椅和下卧铺作为登梯。

5. When the user steps on the upper berth, we suggest the user can take the seat and lower berth as stepping ladder.

6. 上下卧铺均可采用湿毛巾擦拭，使驾驶室保持干净。

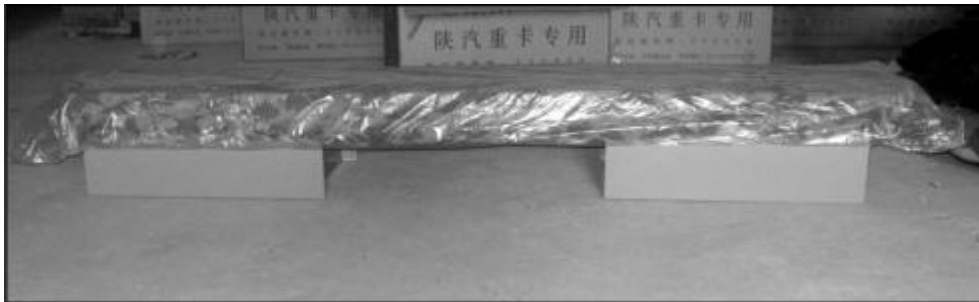
6. The upper and lower berths can both be cleaned by wet towel to keep the cab clean.

7. 抽烟时，请勿将热烟灰掉落卧铺上，以免起火。

7. When smoking, the user shall not drop the hot ash on the berth so as to prevent fire.

8. 卧铺垫内芯为聚氨酯材料，可以用水清洗，但清洗后可能存在一定的变形和褶皱。

8. The material contained in the berth cushion is polyurethane material which could be washed by water, but it may have some transformation and folds after washing.



4. 排气制动手柄

4. Air Exhaust Brake Handle

排气制动手柄安装在方向盘右下方，通过拨动手柄控制排气制动工作。

Air exhaust brake handle shall be installed in the right bottom of the steering wheel and it controls the exhaust brake work by turning the handle.

车辆利用发动机消耗的能力作辅助制动。在冰雪、泥泞路面上使用排气制动可减少侧滑；下长坡时，使用排气制动，可以减少使用行车制动的次数，减少轮胎及车轮制动器的磨损与发热，延长其寿命，降低油耗，提供行车安全性。

The vehicle takes consumption capability of the engine as the auxiliary brake. On the ice and snow or muddy road, the air exhaust brake can reduce side slip. When the vehicle runs down the long slope, the exhaust brake can reduce the frequency of traveling brake and the abrasion and radiation of the tire and wheel brake, extend the service life, reduce fuel consumption and guarantee the service safety.

排气制动时，档位越低效果越好。

When the air exhaust brake is applied, the lower gear is selected, the better effectiveness will be achieved.



5、方向盘的调节

5. Adjustment of the steering wheel

车辆只有在停车时，才可进行方向盘的调节。高度调节时，松开旋钮①，调整完毕旋紧①；倾斜角度调节时，松开旋钮②，调整后旋紧②。

The steering wheel can be adjusted only if the vehicle is in parking state. As for height adjustment, firstly loosen the knob ①, and screw and fasten it ① after adjustment; as for the adjustment of inclination angle, firstly loosen the knob ②, and then screw and fasten it ② after adjustment.



表 1 转向管柱行程-角度-车型对应

Table 1 steering column stroke - angle - model correspondence

车型 type	调节行程 Adjustment stroke	调整角度范围 Adjusting angle range	车型 type	调节行程 Adjustment stroke	调整角度范围 Adjusting angle range
左置 Left hand drive	±20	±5°	右置 Right hand drive	±20	±5°
注：规定向前调节角度为负，向后为正。规定向下调节行程为负，向上为正。调整初始位置为设计状态中间位置。 Note: the forward adjustment angle is negative and the backward is positive. The regulation of downward adjustment is negative and upward is positive. The initial position is adjusted to the intermediate position of the design state.					

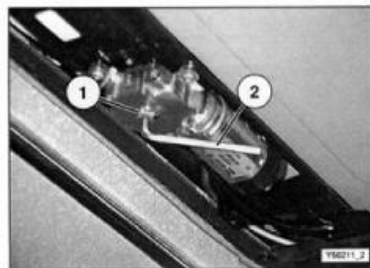
6、天窗的开启与关闭

6. Open and close the sunroof

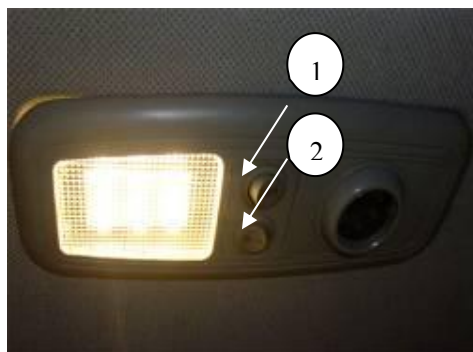
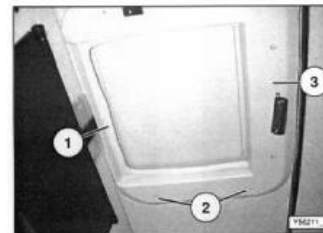
对于手动天窗，开启时，旋转手把后天窗自动弹起打开。关闭时拉下手柄并旋转锁定手柄：对于电动天窗可操纵仪表盘、下铺后围处及天窗旁的任一开关，即可使天窗开启和关闭。As for the opening of manual sunroof, the sunroof will automatically spring up and open after the user turns the handle. As for the closing of manual sunroof, the sunroof will be closed after pulling down the handle and turning to lock it; as for electric sunroof, the sunroof can be opened and closed by pressing any switch in the controllable instrument panel, the rear part of lower berth and the side of sunroof.

电动天窗电机损坏后，若想打开天窗应先拆除边沿保护条①，拧下6个电机盖上的螺丝②并拆下电机盖③，然后将电机塑料插件②上推，推不动为止，最后用5mm内六方键插入②中顺时针转动可关闭天窗，逆时针转动②可打开天窗。

If the electric sunroof is damaged and the user wants to open the sunroof, the user shall, firstly, remove the protective bar ①



along the edge; secondly, screw out the six screws ② in the motor cover and then remove the motor cover③; thirdly, push up the plastic plug-in board ② of the motor until it stops; finally, use the hexagonal square key insert the ② and turn clockwise to close the sunroof, while the sunroof can be opened by turning anticlockwise.



7. 车内照明控制

7. Interior Lighting Control

将开关①拨至右侧接通车内照明电路。当打开车门时照明灯自动点亮。将开关①拨至左侧，照明灯持续点亮。将开关②拨至左侧，接通阅读灯电路。

Turn the switch ① to the right in order to switch on the interior lighting circuit. When open the vehicle door, the lighting will automatically turn on. Turn the switch ① to the left, and the lighting will continuously turn on. Turn

the switch ② to the left in order to switch on the circuit of reading light

注：副驾驶侧的车内照明控制与上述相反。

Note: the interior lighting control in the side of co-driver is contrary to the above control principle.



8. 风档清洗储液罐

8.Cleaning liquid reservoir of windscreen

风档清洗储液罐加注口安装在驾驶室后围左侧。

The filling port of the cleaning liquid reservoir of windscreen is in the left side at the back of the cab.

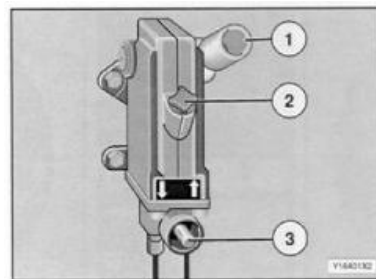
9. 驾驶室的翻转机构

9.The overturn mechanism of cab

翻转前先将驾驶室前面罩打开。

Open the radiator grille of the cab before overturn.

驾驶室翻转前应先将车辆停放好，固定驾驶室内所有松动物品，关掉所有工作设备，并关好车门。确保翻转前方区域安全，无人进入驾驶室和底盘之间后方可操作翻转。



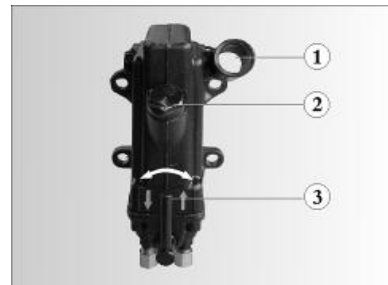
Before the cab is overturned, the vehicle shall firstly park and then fasten all the loosened articles in the cab, secondly shut down all the working equipments and then close the vehicle door. The overturn operation cannot be carried out until the front area for overturn is clear and safe and nobody can enter into the space between the cab and chassis.

翻转时，将专用手柄插入插孔③内，到位后向右转到最大上升位置，最后将撬棍插入孔①内，反复摇动即可进行驾驶室的翻转。驾驶室翻转落回操作与上述过程相反。

When overturning the cab, the user shall insert the special handle into the hole ③. After the insert reach to the desired position, turn it to the maximum lifting position. Finally, insert the crowbar into the hole ①, and the cab be overturned by repeatedly swing. The falling operation of the overturn cab is contrary to the above overturn operation.

为确保油泵正常工作，每两星期打开螺塞②检查油泵的液面应在加注孔的底部边缘，液压油过少时，应极时补充。

In order to guarantee the normal work of oil pump, the user shall open the screw plug ② to check the liquid level of the oil pump every two weeks to confirm whether the liquid level is in the bottom edge of the filling port. If the hydraulic oil is lack, the user shall timely fill enough hydraulic oil.



翻转时注意事项:

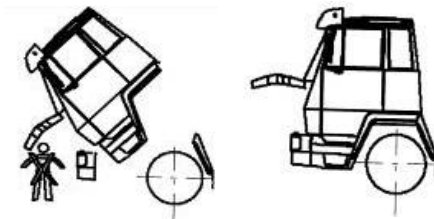
Precautions for overturn:

1. 翻转前先将驾驶室内的未固定物品取出, 并打开前面罩。

1. Before overturn, the user shall take out all the unfastened articles in the cab and open the radiator grille.

2. 翻转时不得有人站在驾驶室前方较近的地方。

2. In the process of overturn, nobody shall stand near the front part of the cab.



10. 控制面板

10. Control Panel

组合仪表是一款单片机编程控制、步进电机驱动指针指示、CAN 总线技术（牵引车）。

Combination instrument has single chip program control, pointer driven by the stepping motor and CAN bus technology (tractor).

在结构设计上, 仪表采用了流线型设计, 塑料摩擦焊工艺, 整体卡扣式安装, 激光永久性标识。

As for the structure design, the instrument has streamline design, plastic friction welding process, complete clip type installation and laser permanent mark.



11. 仪表板

11. Instrument Panel



该表为驾驶员提供关于整车的相关信息，包括： 1—转速表；2—车速里程表； 3—燃油表； 4，5—制动回路气压表；6—水温表；7—机油压力表；8—电压表；9—小里程清零按钮；10—液晶显示器；11—LED报警指示符区域。所有信息由 BCM 通过 CAN 通讯发出，仪表显示。

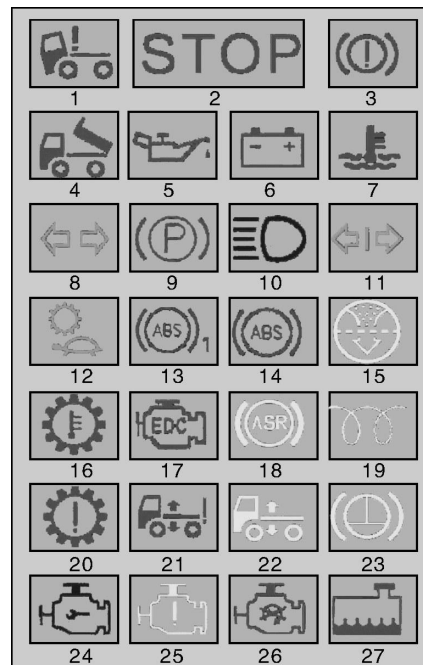


The instrument provide the driver with all the relevant information regarding the vehicle, including: 1-Revolution meter; 2-Speedometer; 3-Fuel meter; 4, 5-Air gauge of brake loop; 6-Water temperature gauge; 7-Engine oil air gauge; 8-Voltmeter; 9-Small mileage zero cleaning button; 10-LCD; 11-LED alarm indicator area. All the information is sent out by the BCM through CAN communication and displayed on the instrument.

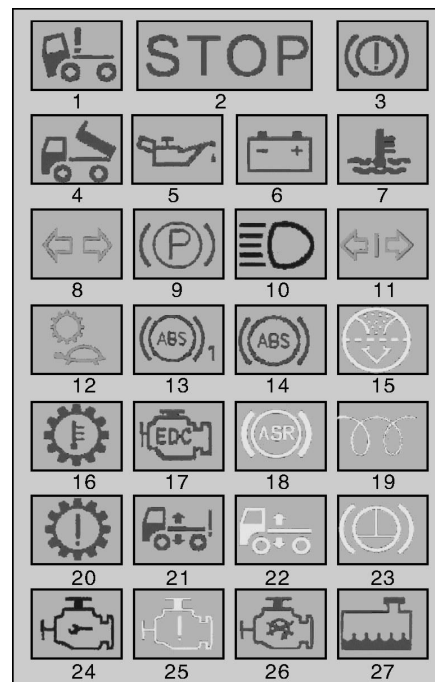
12. 翘板开关和按钮（全部符号，包括选用装置）

12. rocker switch and button (all of them are showed by symbols, including selected devices)

1 驾驶室未锁止	红色
1 The cab has not been locked	Red
2 停车，严重故障报警	红色
2 Parking or major fault alarming	Red
3 刹车气压报警	红色
3 Brake air pressure alarming	Red
4 自卸工作指示	红色
4 Self-discharging working indication	Red
5 机油压力低报警	红色
5 Alarming for pressure low of engine oil	Red
6 充电指示	红色
6 Charging indication	Red
7 水温高报警	红色
7 Alarming for high water temperature	Red

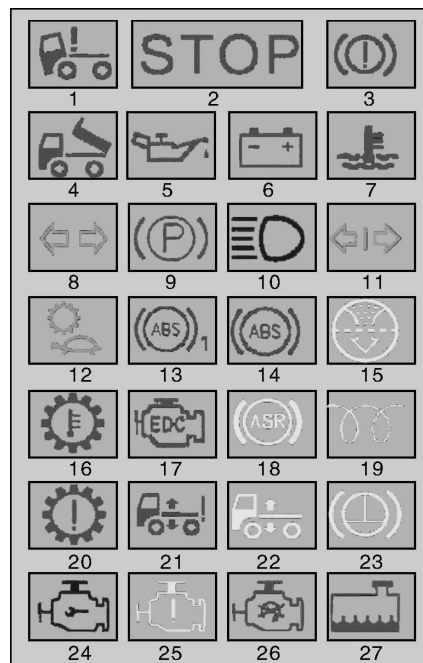


8	主车转向灯	绿色
8	Steering light of the key vehicle	Green
9	驻车制动	红色
9	Parking brake	Red
10	远光灯指示	蓝色
10	Headlight on full beam indication	Blue
11	挂车转向灯	绿色
11	Steering light of trailer	Green
12	低速挡工作	绿色
12	Work in low speed gear	Green
13	主车 ABS 报警	红色
13	key vehicle ABS alarming	Red
14	挂车 ABS 报警	红色
14	trailer ABS alarming	Red
15	空滤器堵塞报警	黄色
15	Block alarming of air filter	Yellow
16	变速箱油温高	红色
16	High temperature of gearbox oil	Red



- 17 EDC 故障
- 17 EDC fault
- 18 ASR 工作
- 18 ASR WORK
- 19 预热器工作
- 19 Preheater work
- 20 变速箱故障
- 20 Gearbox fault
- 21 升降控制故障
- 21 Lifting control fault
- 22 升降控制警告
- 22 Lifting control alarming
- 23 缓速器工作
- 23 Reducer work
- 24 发动机维护
- 24 Engine maintenance
- 25 发动机警告
- 25 Engine alarming

- 红色
- Red
- 黄色
- Yellow
- 黄色
- Yellow
- 红色
- Red
- 红色
- Red
- 黄色
- Yellow
- 黄色
- 黄色
- 蓝色
- Blue
- 黄色
- Yellow



26	发动机停机	红色
26	Engine stop work	Red
27	水位报警	红色
27	Water level alarming	Red

12.1 液晶屏

12.1 LCD (Liquid Crystal Display)

液晶显示屏可以显示和驾驶、服务、维修相关的信息，具体如下：

LCD can display all the relevant information regarding driving, service and maintenance, and details are listed as follows:

车辆信息：如累计行驶里程、小行驶里程和时间等；

Vehicle information: for example, the accumulative driving mileage, small driving mileage and time, etc.

发动机信息：如油压，瞬时油耗等；

Engine information: for example, oil pressure and instantaneous fuel consumption, etc.

故障信息：如由灯泡的过载，短路或断路而引起的故障信息；和发动机等系统之间通讯故障；发动机等电控单元所发出的当前故障信息等。

Fault information: for example, the fault information incurred by overload of bulbs, short

circuit or broken circuit; communication fault between the engine system and other systems; and current fault information sent out by the electric control unit such as engine, etc.

液晶屏上所有信息都是由 BCM 通过总线传递给 CMIC，并显示于液晶屏上。

All the information displayed on the LCD is sent to CMIC by BCM.

结合菜单开关和实际状况，按照在液晶显示屏上的显示顺序和实际状况进行显示。

Combined with the menu switch and actual condition, the information will be displayed on the LCD according to the display sequence and actual condition.

在电源和地线连接良好的情况下，系统处于工作状况下，如果 CMIC 接收不到 BCM 发送的信息达 3 秒钟，液晶屏将不显示任何内容，仪表上的“STOP”灯将闪烁，仪表背光变亮；如果该状态持续时间达三分钟，CMIC 将被全部关闭。

In case the power cable and ground cable are correctly connected and the system is in working condition, if the CMIC cannot receive the information send out by the BCM within 3 seconds, the LCD will not display any content, the indicator light “STOP “ will flicker and the backlight will light up. If the above state lasts three minutes, the CMIC will shut down.

如果开机时 CMIC 就接收不到 CAN 信息，CMIC 将不会被唤醒，处于休眠状态。

If the CMIC cannot receive the CAN information when starting, the CMIC will not be taken up and keep in sleeping state.

在将相关程序下载到中央电脑的过程中，CMIC 上的“STOP”灯也会有上述现象，此时属于正常现象，是

因为此过程中 BCM 不往外发送任何信息，到 CMIC 的通讯全部被切断。

In the process of the relevant program downloaded into the central computer, the “STOP “ light in the CMIC will also flicker which deems to be normal condition, because in this process, the BCM will not send any information and the communication to CMIC is disconnected.

根据显示顺序，各个页面的显示内容如下：

Based on the display sequence, the display contents of each page are listed as follows: 陕汽品牌标识指示

Indication of SHACMAN Brand Mark

该页面显示内容（如图 20）所示，只是在开机瞬间显示两秒种：

The indication displayed on the page (see 20) will just last for two seconds when starting up:

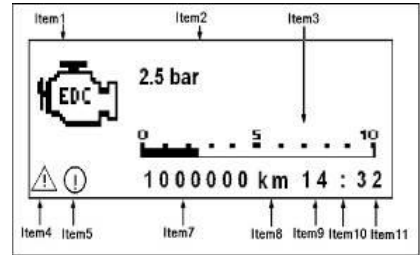
发动机机油压力显示

Display of engine oil pressure

用于显示发动机机油压力，该页面显示内容所示：

It is used for displaying the engine oil pressure, and the displayed contents of the page are showed as follows:

机油压力值：见图中 Item2 和 Item3 中黄色条状码； Value of engine oil pressure: see the yellow bar code of Item2 and Item3 the figure.



显示范围和形式: 0 - 10bar, 见图中 Item3; Display range and form: 0 - 10 bars, see Item3 in the figure;

出错提示符: 在本系统检测到故障时, 显示本提示符; Fault prompt: in case there is any fault detected in the system,

见图 Item4. this prompt will be displayed in LCD; see Item4 in the figure.

工作信息提示符: 如图中 Item5, 任一工作信息接通时, 在液晶上显示本提示符。

Work information prompt: see Item5 in the figure; when any work information is connected, the prompt will be displayed in LCD.

车辆行驶总里程: 如图中 Item7 和 8. Vehicle traveling total mileage: see Item7 and 8 in the figure.

系统时间: 如图 21 中 Item9、10 和 11。

System time: see Item9, 10 and 11 figure 21.

在发动机机油压力低于 0.7bar 时, 发动机机油压力报警指示灯亮, 同时严重报警指示灯闪烁, 蜂鸣器报警。此时应立即停车检查, 否则会导致发动机损坏!

If the engine oil pressure is less than 0.7 bar, the alarm indicator light for engine oil pressure will light up; in case of the alarm indicator light flicks greatly, the buzzer will alarm. In that case, the user shall immediately park and check the vehicle, or the engine may be damaged.

时间里程行驶信息

Traveling information regarding time and mileage

用于显示时间和里程的信息，如图所示：

It is used for displaying the information regarding time and mileage, see the figure for details:

显示内容如下：

The display contents are showed as follows:

当前系统时间(图中 Item1, item2, item3)；

Current system time (see Item1, item2 and item3 figure)；

车辆行驶的累计总里程(图中 Item5, Item6)：显示范围 0~99999999km；

Vehicle traveling accumulative total mileage (see Item5, Item6 in the figure)：

Display range 0~99999999km；

小行驶里程(图中 Item4)： 显示范围 0~9999.9km；

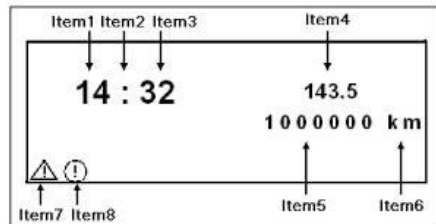
Small traveling mileage (see Item4 in the figure)： Display range 0~9999.9km；

出错信息提示符(图中 Item7)：同发动机机油压力显示页面所述；

Fault information prompt (see Item7 in the figure)： the same as the description of engine oil pressure display page.

工作信息提示符(图中 Item8)：同发动机机油压力显示页面所述。

Work information prompt (see Item8 in the figure)： the same as the description of engine oil pressure display page.



行驶信息 Traveling information

整车电压 Complete vehicle voltage

用于显示整车的电压，显示页面所示；

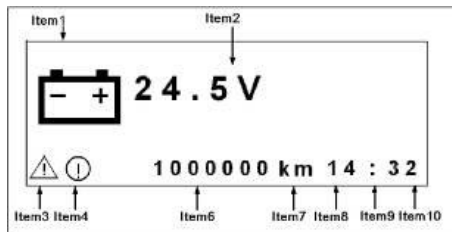
It is used for displaying the complete vehicle voltage, and see the figure for the display page:

蓄电池图标：见图中 Item1 所示；

Rechargeable battery mark: see Item1 figure;

电压数值：见图中 Item2 所示；

Voltage value: see Item2 figure;



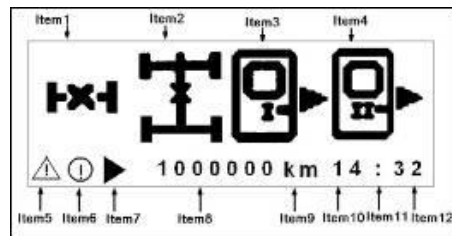
电压信息 Voltage information

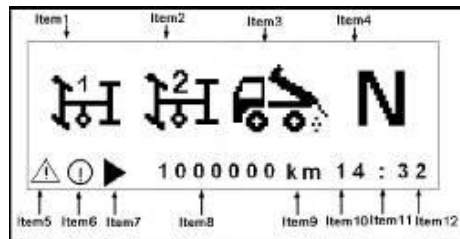
如图所示，由于车辆类型的多样化。CMIC 虽然具有 27 个报警或工作指示符，但是还不足以满足车辆的指示符需要。故将一些指示符放在 LCD 中来显示，如图所示；

See the figure, because of the variety of vehicle types; Though the CMIC has 27 alarm or work indicators, it is not enough to meet the indicator demands of vehicle. So some indicators will be displayed in the LCD, see the figure;

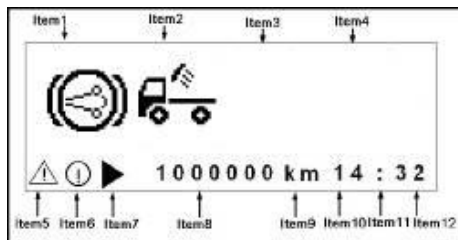
工作信息指示 1

Work information indication1





工作信息指示 2 Work information indication 2



工作信息指示 3 Work information indication 3

工作信息指示符图标：见图中 1，2，3 和 4 所示；

Work information indicator mark: see 1, 2, 3 and 4 in the figure;

出错信息提示符(图中 5)：同发动机机油压力显示页面所述； Fault information prompt (see 5 in the figure): the same as the description of engine oil pressure display page;

工作信息提示符(图中 6): 同发动机机油压力显示页面所述。

Work information prompt (see 6 in the figure): the same as the description of engine oil pressure display page.

翻页指示符(图中 7): 显示需要显示的工作信息多于一页时显示的指示符, 如当前页不是最后一页, 该指示符将闪烁, 如果当前需要显示的指示符页面多于一页且当前是最后一页, 则不闪烁。 Page turning indicator (see 7 in the figure): the indicator is used for displaying work information which needs to be displayed in more than one page. If the current page is not the last page, the indicator will flick, while if more than one indicator pages need to be displayed and the current displayed page is the last page, the indicator will not flick.

此外还可显示车辆行驶累计里程(图中 Item8 和 9)和系统时间(图中 Item10、11 和 12)。

In addition, it can be used for displaying the vehicle traveling accumulative mileage (see Item8 and 9 in the figure) and system time (see Item10, 11 and 12 the figure).

能显示的内容共有 10 个, 分三页显示。

The contents for displaying are more than 10 items which will be displayed in three pages.

第一页内容。含义分别为轴间差速锁、轮间差速锁、左门、右门。

Contents of first page. The meaning of them: inter-axle differential lock, inter-wheel differential lock, left door and right door.

注 意

Notice

严禁在未关闭点火钥匙的情况下直接切断蓄电池和控制器之间的连接(同时危险报警开关和小灯开关不能打开)，特别是在有用电设备工作或发动机运转时。

The connection between the rechargeable battery and controller shall not be directly cut off in case that the ignition key has not been shut off (meanwhile the danger alarm switch and small light switch can not be turned on), especially, in case that the electrical equipment or engine is in working or running state.

否则不仅可能在硬件上损坏整车各系统的电控单元、线束和电子电器元件，更有可能导致系统数据丢失的严重后果！

Or it may damage the electronic control unit, wiring harness and electronic appliances of each system in the vehicle, and even may result in the system data loss!

12.2、液晶屏切换

12.2 .LCD switchover

在仪表台上安装有控制液晶屏操作的操作按钮，能进行菜单的换页等等。

The instrument stage is equipped with the operation button for controlling the LCD operation to execute menu switchover and other actions.

12.3、关闭声音报警

12.3 .Shut down audible alarm

当有故障出现时，如需要取消声音报警，同时按下菜单上翻键或下翻键和菜单确认键来关闭。该状态将被保存在电脑中，只有在下次通电后才能恢复声音报警功能。

In case there is any fault and the user needs to cancel the audible alarm, the user can cancel and close the alarm by pressing the up key or down key and confirm key of the menu. The state will be memorized in the computer, and the audible alarm function can be recovered only if he power is switched on in next time.

12.4、雨刮间隙时间设置

12.4 .Rain wiping interval time set

默认的雨刮间隙为 10s，即工作 2s，间歇 10s 再工作。

The default rain wiping interval is 10s, i.e. working for 2s and recover working after 10s later.

但是也可以对雨刮间歇时间进行调整。调整方法如下：

The rain wiping interval can be adjusted. Adjustment methods are as follows:

打开雨刮间歇档，系统从接通时开始计时，如果下次关闭的时间间隔在 2.5s 到 10s 之间。系统下次工作工作的时间间歇时间将按照本次记录的时间作为间歇时间。

Open the wiper interval gear, the system will time from the connection time to the close time,

if the time interval is within the time range of 2.5s-10s. The adjusted interval will be recorded as wiping interval of the system in next time of working condition.

13、空调控制面板及控制器使用说明

13. Instructions for air conditioner control panel and controller

空调控制器面板如图

See the figure for the air conditioner control panel

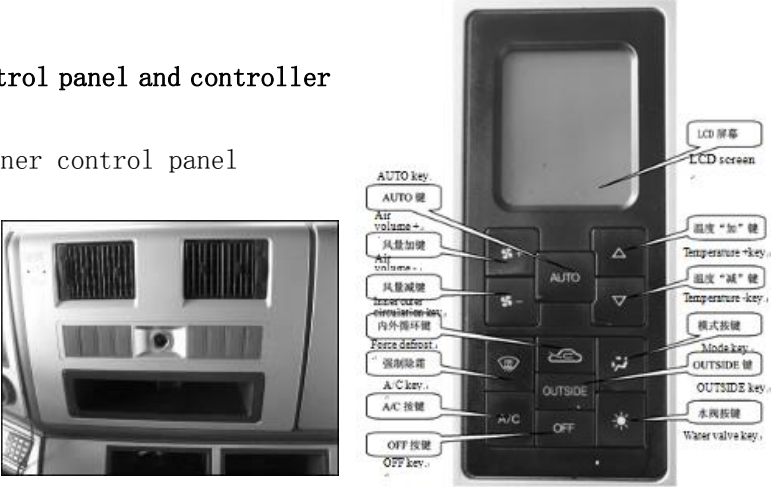
空调送风口如图

See the figure for the air supply outlet of the air conditioner

空调送风口如图所示。按钮功能的详细介绍如下：

See the figure for the air supply outlet of the air conditioner. The detailed instructions for button function is listed as follows:

如图所示, 用户通过对空调控制器的操作, 可实现出风温度调节、风量调节、送风模式（吹面、吹脚吹面、吹脚、吹脚除霜、除霜）调节、空调制冷开/闭、空气内外进风循环状态切换、风挡玻璃除霜/除雾功能开/闭、水阀功能开/闭、显示车外温度等各种功能, 从而使整个空调系统按照用户的设定要求进行正常工作。所有功能的设定均通过按键操作, 通过电子控制实现。



See the figure for the air supply outlet of the air conditioner. The detailed instructions for button function is listed as follows:As shown in the figure, through operating the air conditioner controller, the user can adjust the outlet air temperature, air volume and air supply modes (including FACE, FACE/FOOT, FOOT, FOOT/DEF, DEF), air conditioner cooling on/off, the switching of inner and outer inlet air circulation state for the air conditioner, DEF/DEM function on/off of windshield glass, water valve function on/off and the displaying of outer temperature, etc. so that the air conditioner system can work in normal condition according to the set requirements of the users. The set of all the functions shall be achieved by pressing the key and the electronic control.

同时，空调控制器还带有高清晰的 LCD 屏幕，为用户搭建了人机交互式操控平台，使整个空调系统的工作状态能够一目了然。

Meanwhile, the air conditioner controller is equipped with HD LCD screen and can provide the user with man-machine interactive operational and control platform to make the working state of the whole air conditioner system clear.

按键操作说明:

Operational instructions for press keys:

AUTO 键

AUTO key Inner/outer circulation key

1、在空调系统关机时，按下 AUTO 键，空调系统开机并进入自动工作模式。

1. When the air conditioner system is off, it will enter into working mode by pressing the AUTO key.

2、在空调系统开机状态下，若系统当前为手动工作模式，按下此键，空调系统进入自动模式，屏幕显示 AUTO；再次按下此键退出自动模式，屏幕 AUTO 显示消失。按 AC 键、水阀键、风量键、除霜键、内外循环键、模式键等均退出自动工作模式。

2. When the air conditioner system is on, if the system is in manual working mode, the air conditioner system will enter into auto mode by pressing the key, and the AUTO mark will be displayed in the screen. Re-press the key, the system will quit the auto mode and the AUTO mark will disappear from the screen. The auto working mode will be quit by pressing the following keys, including AC key, water valve key, air volume key, DEF key, inner and outer circulation key and mode key, etc.

3、系统在自动模式下依据车外温度、车内温度自动设定出风温度、风量大小、出风模式、循环模式、AC 工作状态、水阀工作状态等。

3. In AUTO mode, based on the outer temperature and inner temperature of the vehicle, the system automatically sets outlet air temperature, air volume, outlet mode, circulation mode, AC working state and water valve working state, etc.

4、系统自动模式下按温度加键或温度减键，系统不会退出自动模式，但车内温度不再自动设定。

4. In AUTO mode, if the user presses temperature “+ “ or “- “ key, the system will not quit the AUTO mode, but the inner temperature of the vehicle will not be automatically set any longer.

风量加键、风量减键

Air volume “+ “key and “- “key

1、每按一次风量加键，风量逐级增一档直至 4 档（最大档）保持不变。

1. Each time the user presses the air volume “+ “ key, the air volume will increase 1st speed and finally increase to 4th speed (the maximum grade) and will keep in this grade though pressing the key.

2、每按一次风量减键，风量逐级减一档直至 0 档。降至 0 档时，压缩机不工作，制冷图案不显示。

2. Each time the user presses air volume “- “ key, the air volume will decrease 1st speed and finally decrease to Neutral speed . When the air volume decreases to neutral speed, the compressor will not work and the cooling mark will not be displayed any more.

3、OFF 状态下，按下风量加键，系统开机并进入手动模式，默认车内设定温度为 20 度。

3. In OFF mode, after the user presses the air volume “+ “ key, the system will start and enter into manual mode and the default inner temperature of the vehicle is 20℃.

温度加键、温度减键

Temperature “+ “ key and temperature “- “ key

1、每按一次温度加键，设定车内温度增加 0.5℃, 至最大档保持不变。

1. Each time the user presses the temperature “+ “ key, the inner temperature of the vehicle will increase by 0.5℃ and finally reach to the maximum temperature which will not change though pressing the key.

2、每按一次风量减键，设定车内温度减小 0.5℃, 至最小档保持不变。

2. Each time the user presses the air volume “- “ key, the inner temperature of the vehicle will decrease by 0.5℃ and finally reach to the minimum temperature which will not change though pressing the key.

3、空调在 OFF 状态时，按风量增加按键时，开启工作，进入手动模式，同时风量为一档，车内设定温度默认 20 度，模式、混合、内外循环电机为关机前状态。

3. When the air conditioner in OFF state, if the user presses the air volume “+ “ key, the system will start working and enter into manual mode, meanwhile the air volume is in 1st speed, the default inner temperature of the vehicle is 20℃, mixed mode, and the inner and outer circulation motor is in the state prior to off.

内/外循环键

Inner/outer circulation key

1、内/外循环按键按一次，转换一次内/外气工作状态。

1. Each time the user presses the inner/outer circulation key, the inner/outer air working state will change once.

2、自动模式下内外循环风门以内循环 15 分钟，外循环 1 分钟循环执行。

2. In AUTO mode, the inner/outer circulation outlet will have 15 minutes inner circulation and 1 minute outer circulation.

OUTSIDE 键

OUTSIDE key

按一次此按键，液晶屏显示车外温度，3 秒后自动变为显示车内温度。

Each time the user presses the OUTSIDE key, the LCD will display the outer temperature of the vehicle and will automatically display the inner temperature after 3 seconds.

OFF 键

OFF key

1、空调开机状态，按 OFF 按键，进入 OFF 状态，显示屏关闭，同时所有执行机构均关闭，停止工作。（正在执行的动作要进行完）。

1. When the air conditioner is ON, the user presses the OFF key, the system will enter into

OFF state and the display screen will be closed, meanwhile all the actuators will be shut down and stop working. (The actions in progress will complete).

2、空调在 OFF 状态时，按风量增加按键时，开启工作，进入手动模式，同时风量为一档，设定温度默认 20 度，模式、混合、内外循环电机为关机前状态。

2. When the air conditioner is OFF and the user presses the air volume “+” key, the system will start working and enter into manual mode, meanwhile the air volume is in 1st speed, the default inner temperature of the vehicle is 20°C, mixed mode, and the inner and outer circulation motor is in the state prior to off.

除霜键

DEF key

1、按一下按键进入强制除霜：吹风模式为除霜、内循环、风量 4 档、水阀开，AC 开启，混合风门为全热状态。

1. Each time the user presses the key, the system will enter into “Forced Defrost”: air supply mode is DEF mode, inner circulation, air volume is in 4th speed, water valve opened, AC opened, mixed air outlet in all heat state.

2、在非除霜状态下按下此键，空调进入除霜模式，再次按下除霜键退出除霜状态，并恢复除霜前的工作状态。

2. Each time the user presses the key in non-defrost state, the air conditioner will enter

into DEF mode and will quit the DEF mode and recover to be the working state prior to defrosting by re-pressing the key.

模式键 (MODE 键)

Mode Key (MODE Key)

系统共设 5 个吹风模式，即吹脸、吹脸吹脚、吹脚、吹脚除霜、除霜。每按一次模式键，出风模式变化一种状态。所变换状态依次为：吹脸→吹脸吹脚→吹脚→吹脚除霜→除霜→吹脸，屏幕显示立即执行；若第一次按模式键前，风门不在 5 种模式位置中任一位置，则按 MODE 按键后，进入吹脸模式。

The system has 5 outlet modes in total, i.e. FACE, FACE/FOOT, FOOT, FOOT/DEF and DEF mode. Each time the user presses the mode key, the mode will change into another mode. The change order: FACE→FACE/FOOT→FOOT→FOOT/DEF→DEF→FACE, and when the mode is displayed on the screen, it will be immediately executed. If the outlet is not in any mode of the 5 modes when the user press the mode key for the first time, the system will enter into FACE mode after pressing the MODE key.

A/C 键

A/C key

1、手动模式下，每短按一次，压缩机的工作状态（吸/断）切换一次。（相应制冷图标（显示/关闭）切换一次）

1. In manual mode, each time the user presses the A/C key, the working conditions of compressor (suction/stop) will change over. (the relevant cooling mark (display/off) will change over)

2、AC 启动时判断风量状态，如果是 0 档，则设定风量二档，如果不是 0 则维持原状态。

2. When starting the AC, the user shall confirm the state of the air volume. If AC is in Neutral speed, the air volume shall be set in 2th speed; if not, it shall be set in its original state.

3、在开机状态下，长按 AC 按键（大于 5 秒），强制开压缩机（制冷图标显示），若 5 分钟内没有关压缩机，则 5 分钟后自动关压缩机，在此时间内可短按 AC 键（和其它任意键）关压缩机（制冷图标关闭），不受蒸发器温度控制，仅供冬季低温时手工充注制冷剂使用。

3. In On state, if the user presses AC key for more than 5 seconds, the compressor will be forced to start (while the cooling mark will display); if the user does not shut down the compressor within 5 minutes, the system will automatically shut down in 5 minutes. During the period, the user can press AC key (or any other key) to shut down the compressor (while the cooling mark will disappear). It is out of the control of evaporator temperature and only used for manually coolant filling at low temperature in winter.

4、当蒸发器温度 $\leq 0^{\circ}\text{C}$ 时，AC 自动关闭；当蒸发器温度回升 $\geq 3^{\circ}\text{C}$ 后，自动恢复 AC 工作状态，在这两温度范围之间时维持原状态。（AUTO 和手动模式下 AC 都受此限制，以防止蒸发器结冰）。

4. When the evaporator temperature is no more than 0°C , the AC will automatically shut down; when the evaporator temperature is no less than 3°C , the AC will automatically recover to the working state. When the evaporator temperature is within the scale of two values, the AC will remain the original state. (In AUTO and manual mode, the AC has the limits in order to prevent the evaporator frozen).

水阀键

Water valve key

手动模式下，每按一次，水阀的工作状态切换一次（相应制热图标切换显示）。

In manual mode, each time the user presses the key, the working condition of water valve will change (and the relevant heating mark will change to display).

系统自检功能

System self-check function

1、自检内容：

1. Self-check contents:

自动运行一遍各个执行机构后显示故障信息。

The fault information will be displayed after the system automatically has a complete running operation.

执行机构运行按以下顺序：

The actuating mechanism will run according to the following sequence:

- A)、先显示全屏（即显示所有需显示的符号）；
- B)、吹面、内循环一档；
- C)、吹面吹脚、外循环、风速从一档升到三档；
- D)、吹脚、外循环、风速升到最大档；

E)、显示故障码;

F)、自动退出自检程序。

每项内容的显示时间不低于 1.5S, 便于观察。

The display time of the item will not be less than 1.5S so as to be easy for observation.

A). Display full screen (i.e. display all the necessary marks will be displayed);

B). FACE mode, inner circulation, 1st speed;

C). FACE/FOOT, outer circulation, the air speed increases to 3rd speed from 1st speed;

D). FOOT, outer circulation, the air speed increases to the maximum grade;

E). Display the fault code;

F). Automatically quit the self-check program.

2、强制自检自动退出方式:

2. Forced self-check and automatic quit mode:

A)、显示结束后自动退出;

B)、车辆重新启动或按 OFF 键开关;

C)、自检退出后回到自检前的工作状态。

A). Automatically quit after the display has completed;

B). Vehicle reset or press OFF key switch;

C). Recover the pervious working condition after the self-check completed and quit.

3、故障代码定义:

3. Definition of fault codes

00	正常 Normal
01	室内温度传感器故障(短路、断路) Indoor temperature sensor fault (short circuit, broken circuit)
02	室外温度传感器故障(短路、断路) Outdoor temperature sensor fault (short circuit, broken circuit)
03	出风口温度传感器故障(短路、断路) Air outlet temperature sensor fault (short circuit, broken circuit)
04	蒸发器温度传感器故障(短路、断路) evaporator temperature sensor fault (short circuit, broken circuit)
05	模式电机 1 故障 Mode motor 1 fault
06	模式电机 2 故障 Mode motor 2 fault
07	混合电机故障 Mixed motor fault
08	内外循环电机故障 Inner/outer circulation motor fault

09	水阀故障	Water valve fault
10	压缩机驱动故障	Compressor drive fault
11	车内传感器风扇故障	Inner sensor fan fault
12	电源电压故障 (小于 18V 或大于 32V) Power voltage fault (less than 18V or greater than 32V)	
13	电机反馈电压故障 (小于 4.5V 或大于 5.5V) Motor feedback voltage fault (less than 4.5V or greater than 5.5V)	

注意

Notice

1. 空调在 OFF 状态时，按风量增加按键时，空调系统开启工作。
1. When the air conditioner is in the OFF state and the user press the air volume “+” key, the air conditioner system will start to work.
2. 风量 0 档时，A/C 自动关闭。
2. When the air volume is in neutral speed, the A/C will automatically shut down.
3. 系统自动模式下按温度加键、温度减键不会退出自动模式。

3. In AUTO mode, if the user presses the temperature “+” key or “-” key, the system will not automatically quit the AUTO mode.

4. 当蒸发器温度 $\leq 0^{\circ}\text{C}$ 时, AC 自动关闭, 并且手动不能开启; 当蒸发器温度回升 ≥ 3 后, 自动恢复 AC 工作状态。

4. When the evaporator temperature is no more than 0°C , the AC will automatically shut down and can not be started manually; when the evaporator temperature is no less than 3°C , the AC will automatically recover to the working state.

5. A/C 启动时判断风量状态, 如果是 0 档, 则设定风量二档, 如果不是 0 则维持原状态。

5. When starting the AC, the user shall confirm the state of the air volume. If AC is in Neutral speed, the air volume shall be set in 2th speed ; if not, it shall be set in its original state.

6. 当车内温度 $\geq 25^{\circ}\text{C}$ 时强制关闭水阀。

6. When the inner temperature of the vehicle is no less than 25°C , the water valve shall be forced to be shut down.

7. A/C 开启状态下, 当出风口温度小于 3°C 时, 强制开水阀 (通水); 当出风口温度大于 6°C 时, 强制关水阀 (断水)。

7. When A/C is in ON state and the air outlet temperature is less than 3°C , the water valve will be forced to be opened (water supply); when the air outlet temperature is greater than 6°C , the water valve will be forced to be shut down (water cut off).

14、点火钥匙开关的使用

14. Application of ignition key switch

如右图所示：

① LOCK 档位（关断档）：钥匙插入或拔出位置

① LOCK position (off position): the key is inserted or pulled out.

② ACC 档位（停车档）：部分用电器（收音机）可工作

② ACC gear (stop file): Some appliances (receiver) can work

③ ON 档位（行车档）：整车用电器可工作

③ ON position (driving position): The electric appliance for the vehicle can work

④ START 档位（起动档）：起动发动机

④ START gear (starting gear): start the engine

注意

Notice

行车时切勿关闭点火钥匙开关。

The ignition key switch shall not be turned off during the traveling period.



15、组合开关的使用

15. Application of the combined switch

在使用组合开关之前先接通点火钥匙开关。Prior to using the combined switch, the ignition key switch shall be switched on firstly.

1. 如图，①把开关手柄移动到位置 0，接通前照灯近光。

1. As shown in the figure:

① Move the switch handle to position 0 and power on the lower-beam head light.

②把开关手柄经过压力点位置 1 推到位置 2，这时前大灯远光指示灯 10 发光，接通前照灯远光。

② push the switch handle to the position 2 from the position 1 (pressure point), the indicator light 10 of the headlight on full beam will light up and power on the headlight on full beam.

③再次移动开关手柄经过压力点位置 1 到位置 2，这时标有前大灯远光的指示灯 10 熄灭，断开前照灯远光（前照灯近光仍接通）。

③ push the switch handle to the position 2 from the position 1 (pressure point) again, at this moment, the indicator light 10 of the headlight on full beam will go out and disconnect the headlight on full beam (the low-beam headlight has not been switched on yet).



④把开关手柄轻轻推至位置 1，这时标有前照灯近光指示灯 10 点亮。

④slightly push the switch handle to position 1, at this moment, the indicator light 10 of low-beam headlight will light up.

2. 转向灯的使用

2.Application of the steering light

⑤当转向指示灯开关接通时，标有牵引车转向指示灯的绿色指示灯 8 开始闪烁。如果牵引车带有挂车，则标有挂车转向指示灯的绿色指示灯 11 也开始闪烁。转向指示灯具有自动复位功能。

⑤When the indicator light switch is switched on, the green indicator light 8 for the tractor steering indicator light will start to flick. If the tractor is equipped with trailer, green indicator light 11 for the trailer steering indicator light will start to flick. The steering indicator light has the automatic reset function.

如果指示灯 8 和 11 只闪烁一次，则说明转向指示灯发生了故障，请检查更换灯泡。If the indicator light 8 and 11 has just flicked once, it means that the steering indicator light has fault, so the user shall check and replace the bulb.

⑥向前推动开关手柄，直到开关手柄经过压力点到达位置 1，右转向灯持续闪烁。

⑥push forward the switch handle until it reaches position 1 by passing through the pressure point, and the right steering light will continuously flick.



⑦向后拉动开关手柄，直到开关手柄经过压力点到达位置 2，左转向灯持续闪烁。当车辆直线行驶后，手柄自动弹回到位置 0。

⑦pull backward the switch handle until the switch handle reaches the position 2 by passing through the pressure point, and the left steering light will continuously flick. After the vehicle drives in straight line, the handle will automatically recover to the position 0.

⑧向前方/后方推动，拉动开关手柄至压力点并保持在该位置，松手后，开关手柄将自动弹回位置 0。转向灯短时闪烁。

⑧push forward/backward or pull the switch handle to the pressure point and keep it in the position, and the switch handle will automatically recover to the position “0”. After the handle is released. The steering light will flick in a short time.



3. 风档玻璃刮水器的使用按所指方向转动开关手柄，使开关手柄的箭头

3.The application of windscreen wiper: turn the switch handle according to the indicated direction to make the arrow of switch handle

①处于位“0”，“J”，“I”或“II”。

② 于位置“0”时，关闭风档玻璃刮水器。

②处于位置“J”时，风档玻璃刮水器间歇刮水，间歇刮水时间约为10 秒钟。

③处于位置“I”时，刮水器电机低速刮动；处于位置“II”时，刮水器电机高速刮动。

④间歇刮水，可设置大约 2.5 秒到 60 秒之间的无级可调间歇时间。

⑤断开刮水器，转动开关手柄，使其上的箭头①转至位置“0”。或者关掉点火钥匙开关。

①in position “0”，“J”，“I” or “II”.

②When it is in position “0”, the windscreen wiper will be closed.

③When it is in position “J”, the windscreen wiper will intermittently wipe the water, which will lasts for about 10 seconds.

④As for intermittent wiping, the stepless adjustable intermittent time can be set into any value within the range of 2.5s-60s.

⑤Shut off the wiper and turn the switch handle to make it arrow ① rotate to position “0”. Or turn off the ignition key switch.



间歇刮水的间歇时间调整步骤:

Procedures for the intermittent time adjustment of intermittent wiping:

1. 接通间歇刮水（在位置“J”）

1. Power on intermittent wiping (in position "J")

2. 关闭间歇刮水（在位置“0”）

2. Shut off the intermittent wiping (in position "0")

3. 在设定的间歇刮水时间后，扳回开关按钮（在位置“J”）

3. After intermittent wiping time has been set, recover the switch button (in position "J")

注 意

Notice

间歇时间不可能大于 1 分钟，若第 2 步与第 3 步操作时间大于 1 分钟，间歇时间将自动恢复到 10 秒钟（默认值）。

The intermittent time may not be greater than 1 minute. If the time set in step 2 or 3 is larger than 1 minute, the intermittent time will automatically recover to 10 seconds (default value).

4. 风窗玻璃清洗器的使用:

4. The application of windscreen washer:

①向着转向柱方向按一下按钮②（最长时间为 0.9 秒），则出现一个喷淋刮水循环。

① press the button ② in the way toward the steering pillar (the maximum pressing time is 0.9s), the spraying and wiping circulation will be achieved.

②向着转向柱方向按压按钮②时间更长一些（超过 0.9 秒，最长时间为 6.5 秒），只要该按钮处于受压状态，喷淋/刮水循环就持续下去，紧接着就是另外一个 2 到 4 次的刮水循环。

② press the button ② in the way toward the steering pillar for a longer time (more than 0.9s, the maximum pressing time is 6.5s). The spraying and wiping circulation will continue to running only if the button is under pressing. After the circulation, another wiping circulation will run in twice or four times.

注 意

Notice

定期检查刮水片是否集满灰尘或已损坏。在有霜冻的天气环境下，在起动车辆之前，请检查刮水片是否与风挡玻璃冻在了一起。

The user shall regularly check the wiper blade to see whether there is any dust or damage of it. In the frosty weather, prior to start up the vehicle, the user shall check the wiper blade to see whether it has been frozen together with the windscreen or not.

(二) 行车前的准备

(II) Preparations prior to traveling

驾驶前的准备工作主要包括：每次行驶前的例行检查和发动机的起动两方面。

The preparations prior to traveling mainly include regular check prior to each traveling and engine start.



1. 每次行车前的例行检查

1.Regular check prior to each traveling

面罩锁在驾驶员左前方地板处有前面罩锁手柄，向上提起打开前面罩锁。

The radiator grille lock handle is in the left diagonal front floor of the driver. Pull it and open the radiator grille lock.

抓住散热器前面罩左右两侧并向上拉即可打开散热器面罩，向下压即可并闭散热器面罩。

Hold the two sides of the radiator grille and pull up to open the radiator cover, while it could be closed by pressing down.

(1) 将电源总开关扳至接通位置

(1) Switch on the power master switch.

(2) 检查驾驶室是否锁住，若驾驶室未锁住，则驾驶室锁止警告灯点亮。

(2) Check to see whether the cab is locked. If the cab has not been locked, the lockup alarm light of the cab will light up.

(3) 检查冷却液面，加注冷却液。

(3) Check the coolant level and fill coolant if necessary.

本车装铝散热器，必须加注符合 SH0521-1999 要求的 JFG 重负荷长效防冻液。

The vehicle is equipped with aluminum radiator, so JFG heavy duty long-acting antifreeze liquid which complies with the requirements stated in SH0521-1999 must be used for filling.

每日进行冷却液面检查，车辆应停放平坦场地，发动机冷却时，冷却液液面不能低于膨胀箱的观察孔。

Check the coolant level every day. The vehicle shall park in flat yard, and when the engine cools down, the coolant level shall not be lower than the observation port of expansion tank.

经常检查膨胀箱中的冷却液量，及时添加冷却液。The user shall frequently check the coolant level in the expansion tank and add new coolant if necessary.



从膨胀箱的加注口加注冷却液。找出冷却液损耗的原因并解决之。

Fill the coolant from the filling port of the expansion tank. Find the reasons for coolant consumption and solve the problem.

如果冷却液大量损耗而导致系统过热，不要立即添加冷的冷却液。温度上的较大差异会损坏发动机。If the coolant is consumed in a large quantity which leads to system overheating, the user shall not immediately add cold coolant. The large differential temperature may damage the engine.

注 意

Notice

不得加注和掺杂其他排号的防冻液。如违反操作规定，后果自负。

Other types of antifreeze liquid shall not be filled. If the user breaks the above rule, he/she shall bear all the liability and damage.

(4) 检查燃油量

(4) Check fuel quantity

接合电源总开关，打开驾驶室电源钥匙开关，从燃油表上检查燃油量，若指示不准，则需检查燃油表和传感器。

Switch on the power master switch and open the power key switch in the cab. Check the fuel quantity in the fuel gauge, and if the indicator is not correct, the user needs to check the fuel gauge and sensor.

注 意

Notice

切勿将燃油用光，否则，您必须给燃油系统中的气体排出，不定期排除沉淀物。

Do not run out of the fuel, or you must exhaust the air in the fuel system and irregularly remove the sediments.



如图打开驾驶室前面罩

As shown in figure, open the cab radiator grille



如图拉出机油尺

As shown in figure, draw out the engine oil level gaug

(5) 检查发动机机油量

(5) Check the engine oil quantity

汽车停放在水平地面上，发动机冷却后，拉出油标尺⑤，机油液面应在油标尺的上、下刻度线之间（上下刻度之间油量约为 3L）。若液面低于下刻线，需从加油口②处加入规定型号的发动机机油，WP10 发动机，WP12 机油加注口在发动机上，加到规定位置后将机油口盖盖严。

The vehicle shall be parked in flat yard. After the engine cools down, the user shall draw out the oil level gauge ⑤ to check whether the engine oil level is between upper scale mark and lower scale mark (The oil quantity between upper scale mark and lower scale mark is). If the oil level is lower than the lower scale mark, the user shall fill specified type of engine oil into the oil filling port ②. The oil filling port of WP10 and WP12 engine is in the engine. The user shall cover the engine oil port cap after the oil level reaches to the stated position.

注意

Notice

在打开机油口或抽出机油齿时不能起动发动机，机油型号：CI-4 15W/40 级柴机油。

When opening the engine oil port or drawing out the engine oil level gauge, the user shall not start the engine. Model of engine oil: 1st speed CI-4 15W/40 engine diesel oil.

(6) 加注机油

(6) Fill the engine oil

机油加注要将驾驶室翻起后加注，打开机油口盖，加入符合规定型号机油，加注完毕后旋紧机油加注口盖。

The engine oil shall be filled after the cab has been overturned. Open the engine oil cap and then fill the specified type of engine oil. Fasten the engine oil filling cap after the filling operation has been completed.



如图所示机油加注口

The engine oil filling port is shown in figure

(7) 排除制动系储气筒中的水。

(7) Drain off the water in the air-reserve tank of brake system

将排水阀（图中所示）拉下或推上即可排除凝聚在储气筒中的水。

Pull down or push up the drainage valve (as shown in the figure) to drain off the water in the air-reserve tank.



(8) 检查制动液液面高度

(8) Check brake fluid level

总泵贮液罐内制动液的液面高度应位于“MAX”与“MIN”刻线之间。若液面太低，请通过加注口加注制动液使液面达到合适的高度。（建议采用赛福特 909 陕汽专用制动液）

The fluid level of the brake fluid in the main pump reservoir should be between the “MAX” and “MIN” score lines. If the liquid level is too low, please fill the brake fluid through the filling port to make the liquid level reach the appropriate height. (Recommended brake fluid for SaiFord 909 SHACMAN special brake fluid)

离合器液压系统采用合成制动液 DOT3 或 HZY3，在维修时必须清理干净，用同一批次牌号制动液。

The clutch hydraulic system uses a synthetic brake fluid DOT3 or HZY3, which must be cleaned during maintenance, using the same batch of brake fluid.

如发现制动液浑浊，应清洗总泵、分泵、油管接头，更换上述牌号制动液；每隔两年或行驶 18 万公里更换一次制动液。

If the brake fluid is turbid, the main pump, sub-pump, and tubing connection should be cleaned, and replace the above-mentioned brake fluid; replace the brake fluid every two years or 180,000 kilometers.



(10) 检查整个电路系统工作情况。

(10) Check the working condition of the entire circuit system.

(11) 检查润滑油、冷却液及气路的泄漏情况。

(11) Check the lubricating oil, coolant and air pipelines for any leakage.

(12) 检查空气滤清器

在寒冬及多尘条件下使用时，应每天倒空和清理集尘杯（集尘杯套脱落及损坏时密封性差，滤清效果变坏）。否则，会造成发动机、增压器的早期磨损。

(12) Check air filter

When the vehicle runs in cold winter or dusty condition, the user shall empty and clean the dust collection cup everyday (The tightness and filtration effect will go bad if the dust collection cup sleeve is tripped off or damaged). Or it may lead to the abrasion of engine and supercharger in early age.



(13) 检查驾驶室是否锁住。行驶中驾驶室必须锁止。驾驶室未锁止时，驾驶室锁止警告灯点亮，此时应锁止驾驶室。

(13) Check the cab to see whether it is locked. In traveling, the cab must be locked. If the cab has not been locked, the lockup warning light of the cab will light up and at this moment, the user shall lock the cab.

(14) 检查转向油罐的油液液面高度，在发动机没有运转的情况下，液面高度应在油尺上下刻线之间。（即不应低于 MAX 刻线），否则应翻转驾驶室通过加注口①补充油液。

(14) Check the oil level of steering oil tank. In case the engine is not running, the oil level shall be between the upper scale mark and lower scale mark. (i.e. it shall not be lower than the MAX scale mark), or the user shall fill oil into the filling port by overturning the cab.



2. 电源开关的操作

2. Operations of power switch

(1) 电源总开关

(1) Power master switch

将蓄电池箱体外侧手柄按顺时针方向旋转至水平位置即接通整车电源。

Turn the handle outside of the rechargeable battery box in clockwise to the horizontal position and the vehicle power will be switched on.

如图有两种形式。

As shown in figure, there are two types.

注 意
Notice

发动机运转过程中，不得关断电源总开关

In the process of engine running, the power master switch shall not be turned off.



(2) 钥匙开关

(2) Key switch

钥匙开关具有方向盘转动锁止和发动机启动与熄火功能。

The key switch has steering wheel rotating lockup and engine start and flameout function.

① LOCK 档位（关断档）：钥匙插入或拔出位置

① LOCK position (off position): the key is inserted or pulled out.

② ACC 档位（停车档）：部分用电器（收音机）可工作

② ACC gear (stop file): Some appliances (receiver) can work

③ ON 档位（行车档）：整车用电器可工作

③ ON position (driving position): The electric appliance for the vehicle can work

④ START 档位（起动档）：起动发动机

④ START gear (starting gear): start the engine
发动机启动后松开钥匙，钥匙自动回弹到位置“on”，见图。

When the engine is started, the key is released and the key automatically rebounds to the position "on".



3. 发动机的起动

3.The start of engine

(1) 起动前发动机电控系统自检

(1) Prior to starting, the engine electronic control system will execute self-check.

将钥匙插入方向/起动锁的锁孔内，旋转钥匙开关置于通电“1”位置，发动机 ECU 电源接通，仪表板信号灯总成中的两个报警灯都应立即点亮（发动机电控系统进行自检）。

Insert the key into the start lock according to the insert direction and turn the key switch to power on position “1”. The power of engine ECU will switched on and the two alarm lights in the signal light assembly panel will immediately light up (the engine electronic control system will execute self-check).

如果两个报警灯持续两秒钟后全部熄灭（自检完成），说明发动机电控系统一切正常，发动机可以起动。

If the two alarm lights both go out after two seconds (the self-check has been completed), it indicates that the engine electronic control system is in normal condition and the engine can start up now.

信号灯工作状态见表 2-1。

See Table 2-1 for the working condition of signal light.

表 2-1 电控系统信号灯工作状态表

Table 2-1 The working condition form of electronic control system signal light

信号灯名称 Name of signal light	信号灯符号 Symbol of signal light	工作状态 Working condition
黄色报警灯 Yellow alarm light (冷起动信号灯)(cold start signal light)		亮 (2 秒) → 灭 Light up (2s) → Go out
红色报警灯 (EDC 故障诊断灯) Red alarm light (EDC fault diagnosis light)	EDC	亮 (2 秒) → 灭 Light up (2s) → Go out

将变速杆放在空档位置，转动钥匙至“3”的位置，此时起动机应开始工作，发动机启动后，起动机将自动停止。若首次起动失败，应放开钥匙使其回弹位置“2”处，再回转至“0”位，间隔 2 分钟后重复上述步骤，发动机启动后应迅速松开点火钥匙。

Put the gear shift lever on the neutral position and turn the key to position “3”. At this moment, the starter will start to work and it will stop working after the engine starts up. If

the start operation has failed for the first time, the user shall loosen the key to make it recover to position "2" and then turn back the key to position "0". Repeat the above procedures after two minutes later, and the user shall rapidly loosen the ignition key after the engine starts.

注 意

Notice

1. 变速器上装有空档保护开关，空档开关的信号输入电控单元（ECU），由电控单元（ECU）控制起动继电器，若变速器操纵杆未处于空档位置，发动机将不能起动。

1.The transmission is equipped with protective switch for neutral position. The signal of neutral position switch shall be input into the electronic control unit (ECU) which controls the start of relay. If the operating handle of the transmission is not in the neutral position, the engine cannot start.

2. 若首次起动不成功，应将点火钥匙开关回旋至"0"位，然后再次起动，否则发动机不能起动！如果反复将点火钥匙开关从"2"的位置旋转至"3"的位置，容易损坏点火钥匙开关！

2.If the start operation has failed for the first time, the user shall turn the ignition key switch to position "0" and then start again, or the engine cannot start. If the user continuously turns the ignition key switch from the position "2" to position "3", the ignition key switch may be damaged.

3. 发动机电控单元（ECU）预留了一种起动失效备用模式，当车辆变速器上的空档保护开关或连接线路出现故障时，将点火钥匙开关从“2”的位置旋转至“3”的位置，持续3秒以上，发动机电控单元（ECU）才接通起动机继电器，发动机仍可正常起动！

3.The engine electronic control unit (ECU) has a standby mode for start fail. When neutral gear protective switch or the connection circuit in the transmission of the vehicle transmission have faults, the user shall turn the ignition key switch from the position "2" to position "3" and keep the position for more than 3s. After the above operation, the engine electronic control unit (ECU) will connect to the starter relay and then the engine can start in normal way.

注 意

Notice

起动失效备用模式在车辆紧急情况下使用，为安全起见，一般情况下，不推荐用户使用！

The standby mode for start fail can only be used in emergency. For the sake of safety, in general condition, we suggest that the user shall not use the mode.

发动机起动后，机油压力表应立即显示压力，机油压力指示灯应熄灭。发动机冷起动时，机油压力表将显示较高的油压(4.8 巴)，一旦发动机已被加热后并在额定转速下运转时，机油压力表将显示约为 3.5 巴的压力，在怠速时最小油压可降至 1.8 巴，这时不会因此损坏发动机。

After the engine starts, the engine oil pressure gauge will immediately indicate the pressure and the indicator light for engine oil pressure will go out. In the process of the engine cold start, the engine oil pressure gauge indicates high oil pressure (4.8 bars). Once the engine is heated and runs in rated revolution, the indicated pressure of the engine oil pressure gauge will be 3.5 bars. The minimum oil pressure in idling speed will decrease to 1.8 bars, which will not lead to the damage of the engine.

若机油压力表显示的发动机油压太低，立刻关闭发动机!找出原因，查看机油油位高度，然后调整，使它达到要求的高度。因发动机具有增压器，操作时一定要注意。

If the indicated pressure of the engine oil pressure is too low, the user shall immediately shut down the engine and find reasons. And then check the oil level and adjust until it reaches the specified level. For the engine is equipped with the supercharger, so precautions shall be taken in the process of operation.



陕汽 F3000 车型配装潍柴 WP 系列 EGR 国三发动机使用说明:

Application instructions for the SHACMAN F3000 vehicle equipped with Weichai Power WP series EGR STATE III engine:

1、选用燃油必须符合国家标准 GB17691-2005 中相关规定。

2、潍柴 WP 系列 EGR 国三发动机规定使用 CF-4 级机油。允许以高品位的机油代替较低品位的机油。环境温度-15℃以上用 15W/40，-15℃以下用 5W/20 机油（推荐使用：潍柴动力专用机油）

潍柴动力专用机油:

3、防冻液选用：国产长效防冻液:

4、电器原理图：潍柴 WP 系列 EGR 国三发动机电器原理图见五、电器原理图。

1.The selected fuel must comply with the relevant provisions of the GB17691-2005 standard.

2.According to regulations, the Grade CI-4 engine oil shall be used for Weichai Power WP series EGR STATE III engine. It is allowable that the high grade engine oil can replace the low grade ones. If the environmental temperature is above-15℃, the 15W/40 engine oil shall be applied, if it is below-15℃, the 5W/20 engine oil shall be applied (recommendation: special engine oil of Weichai Power)

Special engine oil of Weichai Power:

3.Selection of antifreeze liquid: domestic long-acting antifreeze liquid:

4.Electrical principle chart: see figure 5 for the electrical schematic diagram of Weichai Power WP series EGR STATE III engine.

(三) 开前面罩

(III) Open the radiator grille

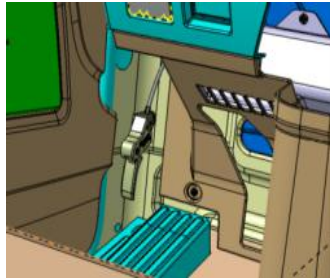
开前面罩，F3000 系列车型设计有前面罩锁，必须先打开才可以翻起前面罩。

As for the open of the radiator grille, the F3000 series vehicle has the radiator grille lock, so the radiator grille can not be opened until the lock is unlocked.

打开前面罩 Open the radiator grille

1. 发动机启动时应怠速运转 3~5 分钟，不得猛轰油门，要待机油压力和油温正常之后方可施加负荷（特别是冷天启动），否则易使增压器轴承、密封环因缺油而早期磨损。

1. When the engine starts, the vehicle shall run in idling speed for about 3~5 minutes. The user shall not heavily step on the accelerator until the engine oil pressure and temperature become normal (especially starting in cold weather), or it may lead to the abrasion of bearings and seal rings of supercharger in early stage because of oil starvation.



2. 发动机熄火时，必须怠速 3~5 分钟，待增压器转速降低之后方可熄火。特别应注意熄火前不要猛轰油门，因为猛轰油门会因柴油机转速骤然提高而使增压器达到较高的转速，此时突然熄火，机油泵立即停止供油，而增压器转子却因惯性还在继续高速旋转，由此因缺油而很快将转子轴，轴承和密封环烧损。

2. In the process of engine flameout, the vehicle shall run in idling speed for 3~5 minutes and get flameout after the revolution of the supercharger decreases. The user shall pay especially Notice: not to heavily step on the accelerator for the above action may lead to the rapidly increase of diesel engine revolution speed and make the supercharger have high revolution. If the vehicle is suddenly flameout at this moment, the engine oil pump will immediately stop supplying oil, but the rotor of the supercharger will continue to rotate in high speed, thus the rotor axle, bearing and seal ring will be burnt and damaged in a short time because of oil starvation.

3. 长期停机的柴油机重新启动之前，一定要先将增压器予润滑，这可以通过拆卸增压器进油管，从进油口倒入适量干净润滑油来实现，否则会因初次启动缺油而早期磨损。

3. Before the diesel engine which has not been used for a long term restarts, the user shall lubricate the supercharger, which could be achieved by dismantling the oil inlet pipe of the supercharger and filling clean lubricating oil in appropriate quantity into the oil inlet, or the parts may have abrasion in early stage because of oil starvation.

4. 发动机的熄火

4. Engine flameout

如果需要发动机熄火时，只须将钥匙开关从位置“ON”处，回转至“OFF”位，电控单元（ECU）停止供电，发动机熄火。

If there is any need of engine flameout, the user shall turn the key switch to position "0" from the position "2". The electronic control unit (ECU) will stop supplying power and the engine will be flameout.

(四) 起步与换档

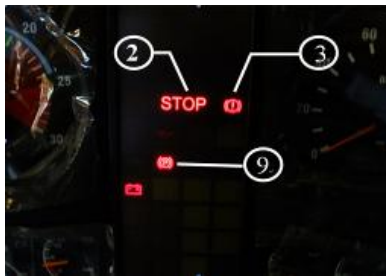
(IV) Start and gear shift

1. 起步

1. Start

发动机启动之后，气压表①和②指针位于红色区域，表示气路系统气压太低，同时图 48 中的报警灯 2 和 3 点亮。只有贮气筒压力大于 5.5 巴，报警灯 2 和 3 熄灭时，车辆才能起步。（如果挂车中的贮气筒压力太低，则报警灯 3 也会灯亮，不能起步），起步时，将手刹柄向上放到位即可起步，同时检测灯 9 熄灭。停车时将手刹柄下拉到位，检测灯 9 点亮。

After the engine starts, the pointers of air gauge ① and ② are in the red area, which indicates that the pressure of air circuit system is too low and the alarm light 2 and figure 48 will light up. The vehicle can not start only



if the pressure of the air reservoir pressure is greater than 5.5 bars and the alarm light 2 and 3 go out. (if the pressure of air reservoir in the trailer is too low, the alarm light 3 will also light up, but the vehicle can not start). The vehicle can start after the user put the hand brake handle in the right position and the detector light 9 will go out. When the vehicle parks, the user shall put the hand brake handle in the right position and the detector light 9 will light up.

2. 变速器的档位

2. Gears of the transmission

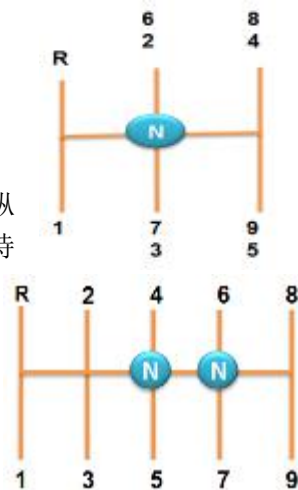
2 变速器的档位

变速器操纵机构型式可分为单 H 型和双 H 型两种。

单 H 型操纵机构其压缩空气经过空气滤清器调节后进入换向阀，由安装在操纵手柄球里的预选阀接通高挡或低挡。其操纵手柄挡位布置如下图所示，目前法士特 9 档(左置)、10 档、12 挡变速器采用此型式。

Gears of a transmission

The control mechanism of a transmission can be divided into two kinds, which is “Single-H” and “Double-H”.



The “Single-H” type control mechanism has its compressed air regulated by the air filter and sends it to the reversing valve; the connection of high or low gear is performed by operating the pre-selector valve inside the handle ball. The arrangement of gears is illustrated as follows. For now, the FAST 9-gear (left-posed), 10-gear, and 12-gear transmission adopt this gear arrangement.

双 H 型操纵机构其操纵装置中的横向换挡杆的拨头直接控制双 H 气阀，使其接通高低挡区的气路或低挡区的气路，来实现高档区挡位与低挡区挡位的自动转换。其操纵手球挡位布置下图所示，目前法士特 9 档(右置)、16 档变速器采用此型式。

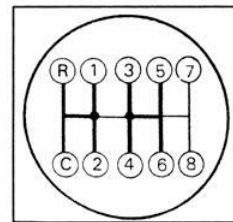
The switch on the traverse shifting lever of the “Double-H” type control mechanism directly controls the double-H valve, connecting the high gear range or the low gear range to achieve automatic shifting between the two ranges. The arrangement of gears is illustrated as follows. For now, the FAST 9-gear (right-posed), and 16-gear transmission adopt this gear arrangement.

3. 变速器的换挡操纵及注意事项:

3. The operations and precautions of the transmission gear shift:

(1) “双 H”换挡方式 (1) “Double H” gear shift mode

“双 H”换挡机构是一种用于组合式变速器的操纵方便的换挡机构，（如图 51）当变速器从低挡段（1-4 档）向高档段（5-8 档）或从高档段向低挡段换挡时，可



以用变速杆直接操纵，不需要同时操纵变速杆和副变速器档位段选择开关，因而换档迅速、方便。双 H 操纵的变速杆有两个空档位置，低档段位于 3、4 档通道的中间位置，高档段时位于 5、6 档通道的中间位置。当从低档段换入高档段时，需用一个冲击力向右推动变速杆以克服变速器内的段位自锁力，这时副变速器即自动从低档段换入高档段，反之亦然。

"Double H" gear shift mechanism is a kind of gear shift mechanism which is used for combined transmission and is easy to operate (see fig. 51). When the transmission shifts from the low gear section (1st speed -4) to the high gear section (5th-8th speeds) or on the contrary, the user can directly operate by the gear shift lever, rather than simultaneously operate the gear shift lever and the gear section optional switch of auxiliary transmission. Thus it can achieve gear shift in a rapid and easy way. There are two neutral positions for the gear shift lever operated by the double H. The low gear section is in the intermediate position of 3rd-4th speed, while the high gear section is in the intermediate position of 5th-6th speed. When the vehicle shift from the low gear section to the high gear section, it needs a impact force to push right the gear shift lever in order to overcome the section self-locking force in the transmission. At this moment, the auxiliary transmission will automatically shift to the high gear section from the low gear section, and vice versa.

4. 伸缩拉杆操纵系统使用说明

4.Added 4 telescopic control system operating instructions

伸缩拉杆变速器操纵是一种新型的变速器操纵装置，具有密封性好、换档轻便、防脱档、掉档、可靠性高的优点。它的操纵器是直接固定在驾驶室上，与软轴类似，密封性好。操纵器中设计有橡胶嵌件，能有效吸收变速杆的振动和噪音，使驾驶室内部更安静更干净。从而提高操纵的舒适性。伸缩拉杆操纵系统能使手柄球处的选、换档力降低约 50%左右，换档十分轻便，有效缓解驾驶员的工作强度，更加人性化。操纵器具有缓冲结构，能防止车辆在恶劣路面上行驶时脱档、掉档等问题。可靠性大大提高。整个操纵系统属于柔性连接，所以在手柄球处会有 50 的自由旷量，属于正常现象。

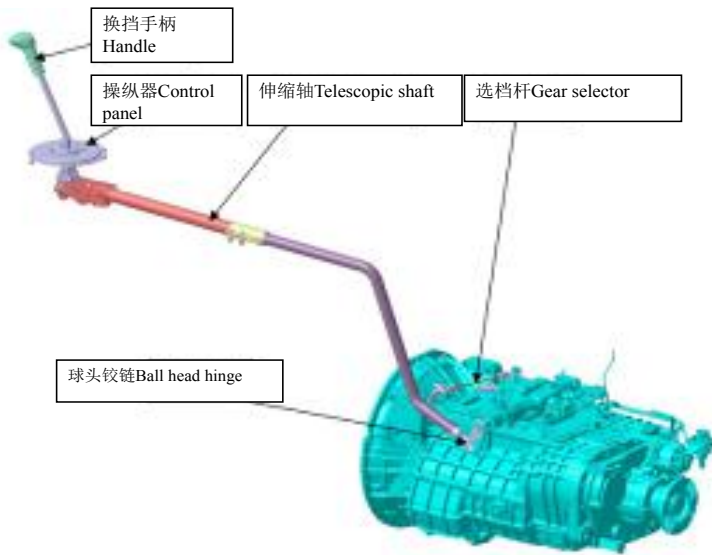
The telescopic shaft control mechanism is a new type of transmission control device; it has good sealing, easy gear shift, anti-disengagement design, and high reliability. The mechanism is directly fixed on the cab, and like soft-shaft mechanism, the sealing is good. There are rubber inserts designed to absorb vibration and noise effectively from the transmission lever, making the cab quieter, cleaner, and the handling more comfortable. This mechanism reduces the force exerted on the handle ball when selecting and shifting gears by about 50%, which facilitates gear shifting in a lighter way with the work intensity reduced. The mechanism also has a buffer structure to avoid gear disengagement while driving on bumpy roads, improving its reliability. The entire control system is flexibly connected, thus a 50mm free extent on the handle ball, and it is normal.

(1) 结构简介

Brief structure instruction

伸缩拉杆操纵结构示意图如下图所示，伸缩拉杆的使用同一般硬杆一样，都是通过操纵手柄球实现选、换档操作。

The structure of telescopic shaft control system is illustrated as follows operation of the telescopic shaft mechanism is the same as that of stiff shaft mechanism, both of which are operated by a handle ball when gear selecting and shifting are needed.



图伸缩拉杆操纵结构示意图

The structure of telescopic shaft control mechanism

（2）伸缩拉杆的开启

The open of telescopic shaft

和驾驶室升降一样，伸缩拉杆的开锁油缸与驾驶室的举升油缸是同一个高压油管路，在打起驾驶室的时候，伸缩拉杆的开锁油缸也同时开启，伸缩拉杆随着驾驶室的升高逐渐伸长，从而方便车辆的检修。

Like the cab lifting, the unlocking cylinder of the telescopic shaft uses the same high-pressure oil pipeline as that of the cab lifting. The unlocking cylinder of the telescopic shaft functions at the same time when the cab is overturned, with the telescopic shaft extending little by little, facilitating the maintenance of the truck.

（3）换挡操纵使用说明

Gear shift operation instructions

当驾驶室落下时，驾驶员坐在驾驶内座椅上，用手向前轻推变速杆手柄球，听到“咯噔”一声，伸缩拉杆总成前端的锁扣即锁止。此时可进行选、换挡动作。伸缩拉杆总成锁扣为手动锁止，当驾驶室翻起和落下后，需进行此操作。

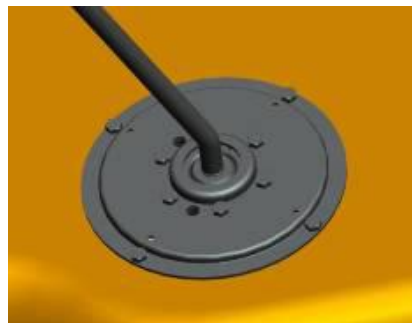
When the cab is overturned to its original position, the driver should sit in the driver's seat and gently push the shift lever handle forward till a “click” sound is heard, which means the lock on the front end of the telescopic shaft assembly is applied. After that, selecting and shifting gear is made possible. Note that the telescopic shaft assembly is to be locked manually, thus the locking operation is required each time after the cab is overturned up and down.

为了防止伸缩拉杆操纵系统在颠簸路面上出现脱挡、掉挡的现象，操纵器总成下端在设计中，单向预留有 5mm 自由间隙，由杠杆比放大后，反应在手柄球处，换挡时单向会有 25mm 自由间隙，即旷量，为正常现象，不影响选、换挡使用。

To prevent gear disengagement of the telescopic shaft control system on bumpy roads, there is a designed 5mm free clearance in each direction in the lower part of the controlling assembly, while the free clearance is amplified to 25mm on the handle ball. It is normal phenomenon, and will not interfere with the selecting and shifting of the gear.

1. 操纵器总成（如右图所示），每隔半年需在钢球处涂抹润滑脂，可降低磨损延长使用寿命，确保总成部件正常使用 250 万次（即 5-8 年）。否则，会造成操纵器总成早磨，换挡时出现卡滞、异响等现象。

1. The assembly of the manipulator (as shown on the right) is required to apply grease on the steel ball every half a year, reducing wear and prolonging the service life, and ensuring the normal use of the assembly for 2 million 500 thousand times (5-8 years). Otherwise, it will result in the early grinding of the manipulator assembly and the phenomenon of stuck and abnormal noise during shifting.

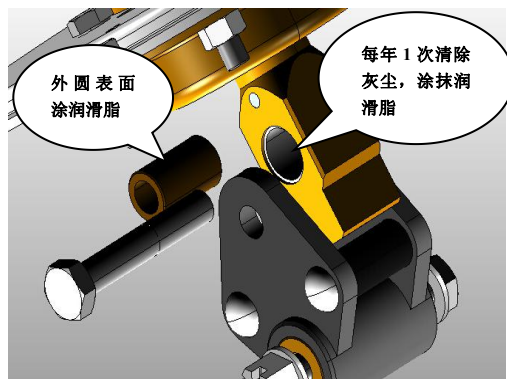


操纵器总成下摆臂轴套处（如图所示），每年清理一次灰尘，并在轴套外圆表面涂抹上润滑脂。否则会
增加换挡阻力，影响换挡手感。

The lower part of the manipulator assembly shaft (as shown in figures) clean the dust once a year and apply grease on the outer surface of the axle sleeve. Otherwise, it will increase the shifting resistance and affect the shifting feel.

备注：车辆在出厂时，操纵器总成已经涂抹好润滑脂，用户可放心使用。

Remarks: before delivery, the vehicle's controller assembly has been smeared with grease. Users can use it safely.



2. 软轴操纵系统

2.soft shaft gearshift system

软轴属于密封件，锁芯管套中已经加注好润滑脂，无需在额外保养。软轴属于易损件。用户在使用 1 到 2 年之后，则需要更换新件。

The soft shaft is a sealing member, and the grease in the lock core sleeve has been filled with grease without additional maintenance. The soft shaft belongs to the vulnerable part. After 1 to 2 years, users need to replace the new parts.

3. 硬杆操纵系统

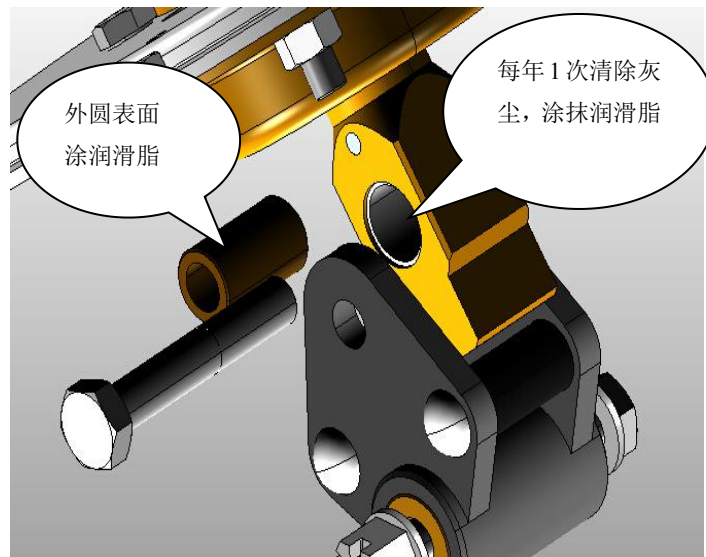
3.Hard rod control system

硬杆操纵系统中，变速杆关节轴承是自润滑结构，无需保养。换挡杆支架和拉杆属于普通金属件，由带自锁结构的标准件连接，用户每隔半年，检查一次操纵系统标准件紧固情况即可。若有松动，则重新拧紧，若有螺纹滑丝或者损坏，直接更换。

In the hard rod control system, the transmission lever joint bearing is self-lubricating structure without maintenance. The shift lever support and the pull rod belong to the ordinary metal parts, which are connected by the standard parts with self-locking structure. The user checks the tightening of the standard parts of the control system once every half a year. If there is any loosening, re tighten it. If the thread is slipped or damaged, replace it directly.

外圆表面涂润滑脂

Grease on the outer surface



注 意

Notice

采用双H换档操作时，当变速器从低档段向高档段（或反之）转换时，不要跳档操纵，否则影响副箱同步器的使用寿命！变速杆在空档位置时，不要随意横向拨动变速杆，避免造成不必要的磨损。

When the double H is used for the operation of gear shift and the transmission shifts to the high gear section to the low gear section (or on the contrary), the user shall not operate by skipping any gear, or it may have bad effects on the service life of the synchronizer of the auxiliary transmission. When the gear shift lever is in the neutral position, the user shall not pull the gear shift lever in crosswise at his/her will to prevent unnecessary abrasion.

(2) 换档注意事项

(2) Precautions for gear shift

1. 换档时，离合器踏板踩至A点，使离合器彻底分离，避免换档故障和接合齿或同步器的早期磨损。应经常检查离合器的正确分离和规定的踏板间隙。

1. When carrying out the gear shift operation, the user shall step on the clutch pedal to position A to make the clutch thoroughly separated and prevent the abrasion of the gear shift fault and connection flange or the synchronizer in the early stage. The user shall frequently check the clutch to confirm that it can be correctly separated and the pedal gap complies with the regulation.

2. 满载起步必须用一档或爬行档！

2.The user must apply 1st speed or creeper gear for full loaded start!

3. 爬行档 C 只用于坡道、满载起步或在十分恶劣的路面上行驶。只有在车辆处于停止状态下才能挂倒档和爬行档 C。

3.Creeper gear C is only used for slope road, full loaded start and traveling in the bad road. The reverse gear and creeper gear C can be used only if the vehicle is in stop state.

4. 在换档过程中必须平稳地扳动变速杆，直至该档完全接合。

4.In the process of gear shift, the user must steadily pull the gear shift lever until the gear shift has been totally connected.

5. 装用富勒变速器时，司机在操作过程中，当由 4 档换 5 档（或由 5 档换 4 档）应将离合器彻底分离，并使变速杆在经过高档区空档（或低档区空档时）有意识地稍停片刻（1-2 秒），以使付变速箱完成高低档区位间的转换。

5.As for the vehicle equipped with Fuller transmission, in the process of operation, the driver shall totally separate the clutch by shifting to Gear 5 from the Gear 4 (or on the contrary) and make the gear shift lever stop in the neutral gear of high gear area (or the neutral gear of low gear area) for a moment (1-2s) so as to make the auxiliary gearbox complete the shift of high gear and low gear area.

6. 装用富勒变速器时，不允许车辆在高档区停车。

6.As for the vehicle equipped with Fuller transmission, the vehicle is not allowable to park in the high gear area.

注 意

Notice

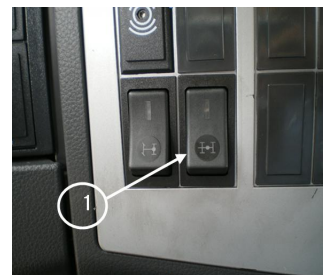
汽车被拖行时，应将传动轴拆下来。否则容易损坏变速器！禁止车辆在变速箱挂空档的情况下拖行或滑行。拖行速度：不超过 40km/h（公里/小时）。When the vehicle is trailed, the drive axle shall be dismantled. Or the transmission may be damaged. The vehicle shall not be trailed or sliding in case the gearbox is in the neutral gear. Trailing speed: less than 40km/h.

4. 差速锁的作用

4.Functions of the differential lock

驱动桥上装有差速锁，当车轮打滑或陷入泥坑时，使用差速锁可以提高汽车的通过性，差速锁包括轮间差速锁和桥间差速锁。

The drive axle is equipped with the differential lock. When the vehicle has wheel-slip or the wheels sink into the mud, the passing possibility of the vehicle may be improved by the application of differential locks which include inter-wheel differential lock and inter-axle differential lock.



(1) 4×2 车型的轮间差速锁的操作。

(1) Operations of the inter-wheel differential lock for Model 4×2 vehicle.

只有当车辆处于停止状态，才能接合差速锁，它是通过轮间差速锁翘板开关②来操纵的。接合前必须分离离合器。

The differential lock can be connected only if the vehicle is in stop state. It is controlled and operated by the inter-wheel differential lock rocker switch ②. The clutch must be separated before connection.

差速锁的脱开：放松油门，踩下离合器，将翘板开关按回原位，待开关上的指示灯熄灭后，差速锁即脱开。

Tripping of the differential lock: take the foot off the accelerator, step on the clutch and turn the rocker switch to its original state, the differential lock will trip off after the indicator light in the switch goes out.

(2) 6×4 车型的差速锁操作

(2) Operations of the differential lock for the Model 6×4 vehicle

a. 桥间差速锁

a. Inter-axle differential lock

开关①用来锁住第一和第二后桥间的桥间差速器。在车辆处于停止状态时，通过桥间差速锁翘板开关来操纵桥间差速锁，接合差速锁时必须先分离离合器。当桥间差速锁接合时，指示灯即亮。



Switch ① is used for locking the inter-axle differential mechanism between the first and second rear axle. When the vehicle is in stop state, the user shall operate the inter-axle differential mechanism by the inter-axle differential lock rocker switch. When the differential lock is connected, the clutch must be separated in advance. When the inter-axle differential lock is connected, the indicator light will light up.

b. 轮间差速锁

b. Inter-wheel differential lock

①、②用来同时锁住第一、第二后桥的轮间差速器。只有在车辆直线行驶时，才能使用轮间差速锁。

① and ② are used for simultaneously locking the inter-wheel differential mechanisms of the first and second rear axle. The inter-wheel differential lock can be used only if the vehicle travels in straight line.

在车辆处于停止状态下，通过翘板开关，来操纵轮间差速锁，在接合前必须先分离离合器。

When the vehicle is in stop state, the user shall operate the inter-wheel differential lock by the rocker switch. When the differential lock is connected, the clutch must be separated in advance.

注 意

Notice

当轮间差速锁指示灯仍然亮时，车辆不能转弯行驶。原则上应先接合桥间差速锁，再接合轮间差速锁。

When the indicator light of inter-wheel differential lock is still on, the vehicle shall not

make a turn. In principle, the inter-axle differential lock shall be connected first, and then the inter-wheel differential lock.

汽车通过坏路面后,应立即解除差速锁,放松油门,踩下离合器,将差速锁翘板开关扳回原位,翘板开关指示灯熄灭后差速锁作用即解除。

When the vehicle travels through the bad road, the driver shall immediately release the differential lock, take the foot off the accelerator, step on the clutch and pull the differential lock rocker switch to the original position. The differential lock will be released after the indicator light of rocker switch goes out.

(五) 制动系

(V) Brake system

车辆的制动系有:行车制动(脚制动)、辅助制动(排气制动)、应急和驻车制动(手制动),以及挂车制动(选用装置)共4套制动装置。

Brake systems of the vehicle include traveling brake (footbrake), auxiliary brake (exhaust brake), emergency and parking brake (manual brake), and trailer brake (optional device), i.e. 4 sets of brake device in total.

1. 行车制动

1. Driving brake

踏板操纵，双回路气压制动。最大工作压力为 1MPa，调压阀切断压力为 1MPa。第一回路作用在后桥（或双后桥）车轮上，第二回路作用在前桥车轮上，一旦两个回路中有一个储气筒压力降到 0.55MPa（5.5 巴）以下，储气筒压力指示灯即亮，这时应立即停车并找出压力泄漏的原因。

Pedal manipulation, dual circuit air brake. The maximum working pressure is 1MPa and the pressure regulating valve cutoff pressure is 1MPa. The first circuit acts on the rear axle (or double rear axle) wheels, and the second circuit acts on the front axle wheels. Once one of the two circuit drops below 0.55 MPa (5.5 bar), the air cylinder pressure indicator light is on. At this moment, park immediately and find out the cause of the pressure leak.

在短时间内，连续多次进行全制动，也可能导致压力降到 0.55MPa（5.5 巴）以下。

In a short period of time, performing full braking several times in succession may also cause the pressure drop below 0.55 MPa (5.5 bar)

泄漏检查：整车打满气后发动机熄火，接上手制动后压力降在 2 小时内最多为 49kPa 或者在 30 分钟内最多为 10kPa。

Leak check: the engine stalls after the vehicle is full of gas, and the maximum pressure is 49 kPa within 2 hours or 10 kPa within 30 minutes after the hand brake is applied.

2. 辅助制动

2. Auxiliary brake

1. 由驾驶室内安装在驾驶员左前方地板上的按钮阀操纵，此时行驶的车辆可利用发动机消耗的能量作辅助制动。下长坡时，一定要用排气制动；在冰雪、泥泞路面上使用排气制动可减少侧滑；会车、通过较差路段等可用排气制动提前减速。

The auxiliary brake is controlled and operated by the button valve mounted on the floor in the left diagonal front of the driver in the cab. The traveling vehicle can execute auxiliary brake by the energy consumed by the engine. When driving down the long slope, the driver must use exhaust brake. In ice and snow or mud road, the exhaust brake can be used to reduce sideslip. When the vehicle meets other cars or passes through the bad road, the exhaust brake can be used for reducing the speed in advance.

使用排气制动，可以减少使用主制动的次数，减少轮胎及车轮制动器的磨损与发热，延长其寿命，降低油耗，提高行车安全性。

Through the usage of exhaust brake, the usage frequency of master brake, abrasion and heat of tires and wheels can be reduced and it is in favor of extending the service life, reducing the fuel consumption and improving the safety of traveling.

使用排气制动时应该注意:

Precautions for the application of exhaust brake:

- (1) 发动机转速不得高于 2000 转/分。
- (2) 变速器档位低时，排气制动效率较高。
- (3) 严禁车辆空档滑行，空档时无辅助制动作用。
- (4) 踩下离合或油门踏板会使排气制动失效或退出工作，可能会影响驾驶，请谨慎操作。
- (5) 雨雪、湿滑等恶劣路况时，慎用排气制动，以免引起侧滑、甩尾等事故发生。

(1) The engine revolution speed shall not be greater than 2000 r/m.

(2) When the transmission is in low gear, the efficiency of the exhaust brake is high.

(3) The vehicle is not allowed to travel in neutral gear for there is no auxiliary brake effect when traveling in neutral gear.

(4) Pressing the clutch or the accelerator pedal will cause the exhaust brake to fail or exit the operation, which may affect driving. Please be careful..

(5) In rain, snow, slippery and other bad road conditions, exhaust brakes should be used with caution to avoid accidents such as side slipping and tail flick.

2. 缓速器制动

2. Retarder brake

手控制方式

Hand control

驾驶员通过逐级扳动手控开关手柄来实现对缓速器的控制；手控开关分五档（1 个恒速档，4 个制动档），各位置缓速作用如下：

0 档——缓速器关闭

1 档——缓速器恒速档

2 档——最大缓速力矩的 1/4

3 档——最大缓速力矩的 1/2

4 档——最大缓速力矩的 3/4

5 档——最大缓速力矩

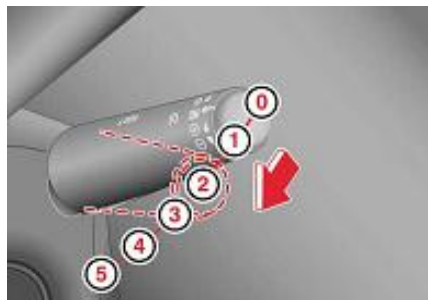
The driver controls the retarder by flipping the switch handle step by step; the switch has five gears (including one constant speed gear, and four brake gears), and the retarding effect of each gear is as follows:

0 gear - retarder off

1st gear - constant speed gear

2nd gear - 1/4 of the maximum retarding torque

3rd gear- 1/2 of the maximum retarding torque
4th gear - 3/4 of the maximum retarding torque
5th gear - maximum retarding torque



制动档的操作

operation of the brake gear

(1) 车辆上电后自动进行缓速器其自检，如“缓速器控制器指示灯”变绿后熄灭，则代表缓速器可正常工作；

(1) After the vehicle is powered on, the self-test of the retarder is automatically performed. If the indicator light of the retarder controller turns green and goes out, it means that the retarder is ready to work normally

(2) 车辆点火后，缓速器就处于待命状态。

(2) After the engine is ignited, the retarder is on standby.

(3) 当需要缓速时，驾驶员根据路况、载荷等信息扳动手控开关手柄逐级到需要的档位即可，（此时缓速器控制器指示灯变亮，除了 1 档恒速档指示灯不亮）。

(3) When speed retarding is needed, the driver can flip the switch handle step by step to the required gear position according to the information of road conditions, load, etc. (At this time, the indicator light of the retarder is on, except for the constant speed of the 1st gear when the indicator light will be off)

(4) 缓速器在制动档“5 档”时，缓速器控制器会自动激活发动机制动进行联合制动。

(4) When the retarder is in the 5th gear, the retarder controller will automatically activate the engine brake for combined braking.

(5) 把手控开关手柄扳回“0”位置，缓速器退出工作。

(5) Flip the switch handle back to the “0” position and the retarder will stop functioning.

恒速档的操作

Application of the constant speed gear

(1) 下长坡时要启动恒速功能前，首先使车辆速度减到安全的速度值时，当达到想要保持的车速时，把缓速器的手控开关扳到恒速档 1 档，此时缓速器会根据路况、载荷实时调节制动力，使得车辆一直匀速行驶。

(1) Before activating the constant speed function on the long slope, first reduce the vehicle speed to a safe value, and when the speed to be maintained is reached, flip the switch handle to the 1st gear. At this time, the retarder will adjust the braking force in real time according to the road conditions and load, so that the vehicle will travel at a constant speed.

(a) 当踩下油门踏板，缓速器的制动功能会自动取消；松开油门踏板后，瞬时车速将被重新记忆，并以此车速重新开始保持恒速行驶。

(a) When the accelerator pedal is applied, the brake function of the retarder will cancel automatically; after the accelerator pedal is released, the instantaneous speed will be memorized again and the vehicle will resume driving at the same constant speed as memorized.

(b) 在“恒速档”时，车速如果不能维持匀速，缓速器控制器会自动激活发动机制动进行联合制动。

(b) If the vehicle speed cannot be maintained at a constant speed when in “the constant speed gear”, the retarder controller will automatically activate the engine brake for combined braking.

(2) 如果使用了恒速档，如果车速仍会明显加快，请使用辅助刹车使车辆减速。

(2) With the constant speed gear engaged, use the auxiliary brake to decelerate the vehicle if the speed still rises.

(3) 开关扳回 0 档，恒速功能解除。

(3) Flip the switch handle back to “0” gear and the constant speed function will cancel itself.

脚控方式（选装功能）

Foot control (optional)

脚控方式中，由脚制动总阀控制，共分三级缓速，制动力矩根据踏板的行程而定。

In the foot control mode, there are three retarding gears which are controlled by the brake master valve. The braking torque is determined by the pedal travel.

当踏板处于第一段行程时，缓速器 I 档开始工作，随着制动踏板行程的加大，当踏板行程处于第二阶段时，缓速器 II 档开始工作，进一步加大踏板行程，直至缓速器 III 档开始工作。

When the pedal is in the first stroke of travel, the 1st gear starts to work. As the brake pedal travel increases, the pedal is in the second phase, and the 2nd gear starts to work. Further increase the pedal travel, the 3rd gear will start to work.

1 档——最大缓速力矩的 1/4

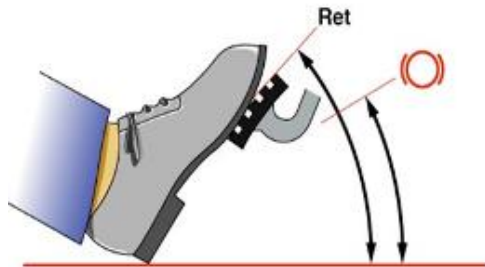
2 档——最大缓速力矩的 1/2

3 档——最大缓速力矩的 3/4

1st gear - 1/4 of the maximum retarding torque

2nd gear - 1/2 of the maximum retarding torque

3rd gear - 3/4 of the maximum retarding torque



注意：当行程加大到临界点时，此时主刹车也开始工作，注意此时，辅助刹车不会因为主刹车的工作而停止，同时此时液力缓速器的制动效果最大。

Note: When the brake travels to the limit, the main brake starts to work. Note that the auxiliary brake will not stop working while the main brake functions. Meanwhile, the brake effect of the hydraulic retarder reaches the highest level.

注 意

Notice

(1) 下坡使用缓速器时，需保证发动机转速不低于 1500rpm，若转速过低，需降低一个档位来提高发动机转速，确保冷却系统的性能。（此时发动机的转速是被动提高，不会增加油耗）

(1) When using a retarder on a downhill slope, it is necessary to ensure that the engine speed is not less than 1500 rpm. If the rotational speed is too low, one gear downshift is required to increase the engine speed to ensure the function of the cooling system. (In this case, the engine speed is increased passively without increasing fuel consumption.)

(2) 下坡使用缓速器时禁止使用空档或离合器处于分离状态，否则无法提供系统所需的冷却水流量。

(2) When using the retarder on a downhill slope, neutral gear or separated clutch is not allowed, otherwise the water coolant flow required by the system cannot be provided.

(3) 如果冷却水温或油温达到最大限制，缓速器电控单元会自动降低系统允许的最大制动扭矩或者停止工作。

(3) If the water coolant temperature or oil temperature reaches the maximum limit, the retarder electronic control unit will automatically reduce the maximum allowable braking torque of the system or stop working.

(4) 当缓速器达到最大制动效果时，车速仍然不能维持稳定时，此时，驾驶员应采取如下措施：

a、使用主制动进行减速；

b、降低档位和车速；

(4) If the vehicle speed cannot be maintained stable even when the retarder reaches the maximum braking effect, the driver should take the following measures:

a. Use the main brake for deceleration;

b. Downshift the gear and vehicle speed;

(5) 缓速器工作时指示灯连续闪烁，表明电路有故障，必须检查排除。

(5) The indicator light flashes continuously when the retarder is working, indicating that the circuit is faulty and the trouble must be checked and eliminated.

(6) 缓速器是属于辅助刹车装置，不能替代主制动，请有预期性的使用，如有紧急状况请使用主刹车器减速。

(6) The retarder is an auxiliary brake device and cannot be used as a substitute for the main brake. Please use it as intended. If there is an emergency, use the main brake to decelerate.

(7) 在雨雪天气、路面湿滑或者车辆 ABS 有故障时，请慎重使用缓速器。

(7) Please use the retarder with caution when the road is slippery for rain and snow or if the vehicle ABS has failed.



3. 应急和驻车制动

3. Emergency and parking brake

手制动可兼作应急制动和驻车制动，它是通过后桥（或双后桥）上的弹簧储能制动缸起作用的。驻车制动通过操纵手制动阀手柄来实现，当制动系统出现故障时，依靠储能弹簧的推动，自动实现应急制动。

The manual brake can also be used as emergency brake or parking brake. It achieves its function by the energy storage spring brake cylinder of the rear axle (or double rear axles). The functions of parking brake are achieved by operating the manual brake valve handle. When the brake system has any fault, the emergency brake can be automatically achieved by the push effects of the energy storage spring.

只有在制动系压力达 0.55MPa (5.5 巴) 时，手制动信号灯熄灭后，弹簧制动才能完全松开。

The spring brake can be released only if the pressure of brake system reaches 0.55MPa (5.5 bars) and the manual brake signal light goes out.



注 意 Notice

在起动发动机之前，必须将手制动阀手柄放在制动位置，否则，制动系压力升高后，原有的驻车制动作用将消除。

Prior to starting the engine, the manual brake valve handle must be in the brake position, or the effects of parking brake will eliminate after the pressure of brake system pressure increases.

检查位置：带挂车时，当车辆停在坡道上时，应将手制动手柄向后拉到“检查位置”，这时，仅由主车的弹簧储能制动起作用。应能使满载列车停稳在 12%的坡道上。

Check position: when the vehicle with trailer parks in the slope, the driver shall pull backward the manual brake handle to the “Check Position”, in this case, only the energy storage spring brake of the master vehicle will have effects. It may make the full loaded vehicle steadily park in the 12% slope.

4. 挂车制动（选用装置）

4.Trailer brake (optional device)

挂车制动阀，慢慢向后拉制动阀手柄，可用来制动半挂车。它是独立于牵引车上的制动系统

The trailer brake valve is used for the brake of semi-trailer by slowly pulling backward the brake valve handle. It is a brake system independent of tractor.

5. 制动系使用注意事项

5. Precautions for the application of brake system

(1) 弹簧制动缸的紧急松开

(1) Emergency release of the spring brake cylinder

当连接弹簧制动缸的管路因泄漏而造成自行制动时，只要将缸上的螺栓 6 拧出到松开位置 1，即可将制动器松开。在松开弹簧制动缸之前应先挂上 1 档，并检查脚制动是否正常。

When the automatic brake occurs caused by the leakage of the pipelines connecting to the spring brake cylinder, the user can just screw out the bolts the cylinder to position 1 so as to release the brake. Prior to the release of the spring brake cylinder, the driver shall put into 1st speed and check to see whether the footbrake is normal.

当在有坡度的路面上松开弹簧制动缸时，必须将车轮塞住，防止滑坡。

When the spring brake cylinder is released in the slope, the driver must stop up the wheel to prevent slope slide.

(2) 制动管路的维护

(2) Maintenance of brake pipelines

在制动用塑料管附近进行焊接、切割和钻孔时必须遵守下列规定：

The following provisions must be observed when the welding, cutting or bore drilling operation is carried out around the plastic pipes for brake:

a. 管路中的压力要预先放掉。

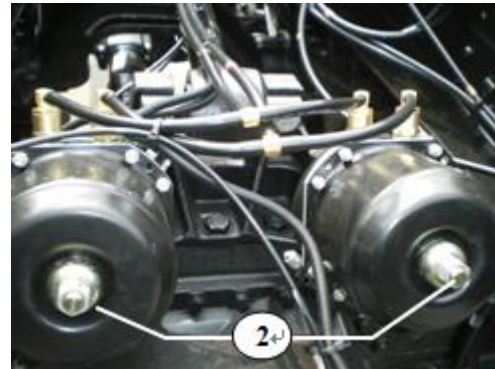
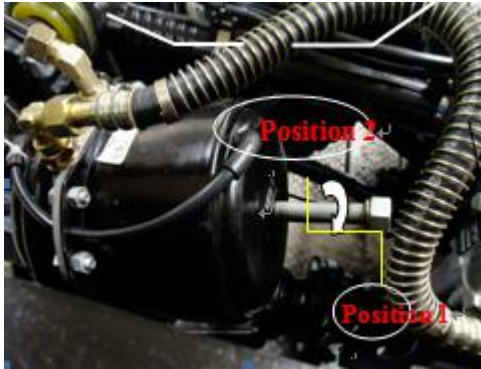
a. The pressure in the pipelines shall be released in advance.

b. 应将管子盖住以免受到火星、火焰及灼热切屑的损伤。

- b. The pipes must be covered to prevent the damages of spark, flame or scorching hot cuttings.
- c. 无压力管子允许受热的最高温度为 130℃，持续时间为 1 小时。
- c. The allowable maximum temperature for the pipes with no pressure is and last time is 1 hour.

1. 松开位置 2. 正常行驶位置

1.Release position 2.Normal driving position



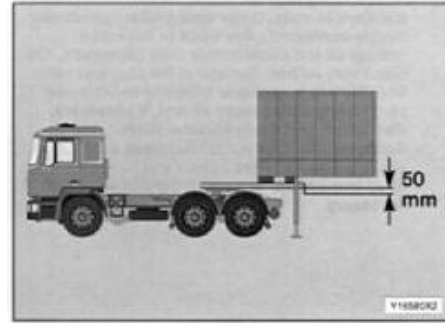
(六) 挂车的对接

(VI) Butt joint of the trailer

对接前应先做到:

Operations prior to butt joint:

- 松开鞍座上的紧固装置
- 检查半挂车连接盘和中心销钉是否比鞍座的顶端至少低 50 毫米, 如有必要, 调整到合适高度
- 牵引车缓慢倒车移向半挂车 (鞍座连接将自动锁止)
- 紧固手柄, 或检查插式锁
- 连接压缩空气管路和电缆
- 将半挂车的支承柱提升到行车位置
- Loosen the fastened device of the saddle.
- Check the joint panel and central pin of the semi-trailer to see whether they are lower than the top of the saddle (at least 50mm). Adjust them to the appropriate height if necessary.
- The driver shall slowly back the tractor to the semi-trailer (saddle joint will be automatically locked up).
- Fasten the handle or check the insert lock.
- Connect the compressed air pipelines and cables.
- Lift the support pillar of the semi-trailer to the traveling position.



注 意 Notice

当牵引车带上半挂车之后，请务必检查挂钩的锁止手柄或插式锁是否正确锁止。

When the tractor is connected to the semi-trailer, the driver shall check the lockup handle of the hook or the insert lock to see whether it is correctly locked.

连接压缩空气管路

Connect the compressed air pipelines

• 请确认这些管路和电缆被正确连接，并且可以轻微地自由移动以抵消牵引车一半挂车总成的运动，管路和电缆不能被拉紧，也不能被缠绕和磨破。

- 首先连接制动管路接头（黄色）①
- 然后连接贮气筒管路（红色）②
- 检查连接装置

• The user shall confirm that the above pipelines and cables are correctly connected and they can slightly and freely move to offset the movement of tractor and semi-trailer assembly. The pipelines and cables can not be tightly tensioned and can not be also wrapped or abraded.

- Firstly, connect the joint of the brake pipelines (Yellow) ①
- Secondly, connect the air reservoir pipelines (Red) ②
- Finally, check the joint device

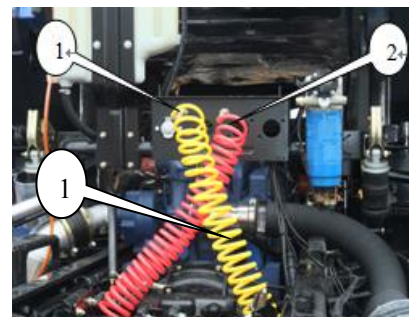
2. 挂车的摘除

2. Remove the trailer

摘除挂车前应先做到:

The following operations shall be carried out prior to removing the trailer:

- 防止半挂车滑溜
- 检查路面是否坚实
- 首先检查半挂车支承柱是否能负载，然后拉伸支承柱，直到载荷从牵引车悬架转移到支承柱。不要伸得太长，否则会将半挂车从鞍座上顶开。当心鞍座被楔住。
- Preventions for semi-trailer sideslip
- Check the firmness of the road surface.
- firstly, check the support pillar of the semi-trailer to see whether it can bear the load and then drag the support pillar until the load shifts to the support pillar from the suspension frame of the tractor. The extension shall not be too large, or it may move the semi-trailer off the saddle. Notice:s shall be paid on the saddle to prevent it from being blocked.



断开压缩空气管路

Disconnect the compressed air pipelines

注意

Notice

小心事故和伤害！

Be careful of accidents and damages!

请务必遵照下面所描述的顺序来断开连接头。否则半挂车制动器将松开，导致半挂车可能滑溜。

The joints must be disconnected according to the following specified orders. Or the semi-trailer brake will be released and lead the semi-trailer to have sideslips.

• 首先断开贮气筒管路（红色）②半挂车被制动。• Firstly, disconnect the air reservoir pipelines (Red) ②, the semi-trailer will be broken.

• 然后将制动管路接头断开（黄色）①

• Then disconnect the joint of the brake pipelines (Yellow) ①

3. 鞍座的操作

3. Operations of the saddle

• 抬升锁定器①

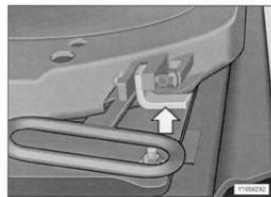
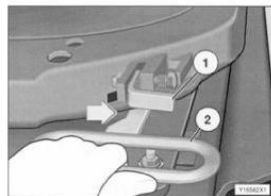
• Lift the lock ①

向前（→）旋转手柄②把它拉出来并固定在极板边缘的凹槽中

Rotate forward (→) the handle ②, pull out and fix it in the slot on the edge of the plate.

挂上挂车后检查

Check after the trailer is connected.



确保下锁定器（→）已经位于锁定位置（落下位置）此时，锁合牢固。

Guarantee the lower lock (→) has been in the lockup position (falling position), and at this moment, the lockup is firm.

如果下锁定器未能降低到其锁定位置，则鞍座没有正确连接。当心事故！重复这个挂接过程。

If the lower lock has not lowered to the lockup position, it indicates that the saddle has not been correctly connected. Be careful of accidents! Repeat the above joint and connect procedures.

注 意

Notice

半挂车和牵引车之间的距离有严格限制！

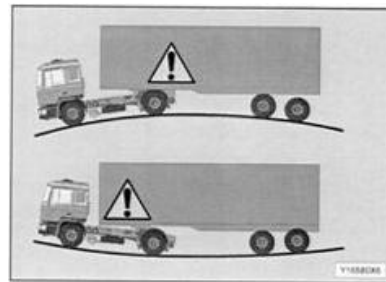
There is strict limitation for the distance of the semi-trailer and tractor!

牵引车挂车的机动性是有限制的！

The maneuverability of the tractor trailer also has limitation.

当行驶在水洼，斜坡和泥泞路面时，会对牵引车和半挂车造成严重的损坏。

When the vehicle travels in road with puddles of water, slopes or mud road, the tractor and semi-trailer may have great damages.



(七) 车辆的拖拽牵引

(VII) The trailing and dragging of the vehicle

拖拽牵引时，卡车在其前端安装牵引钩，牵引钩在牌照座的下面。

When the vehicle is trailed or dragged, the trailing hook shall be mounted under the license seat in the front of the truck.

当牵引车辆时，请将其牌照座折叠起来。

When trailing the vehicle, the license seat shall be folded.

当卡车被向前拖拽时，牵引钩上的负荷不可超过该车净重量的一半，即大约为 10 吨，当车辆受到陷阻或抛锚需要将其拉出泥潭或牵引时，须先将车辆卸载。如果由于技术或实际的条件的限制不可能卸载时，那么将车辆拉出时应在车辆上选用尽可能多的牵引点。

When the truck is trailed forward, the load of the trailing hook shall not exceed one half of the vehicle net weight, i.e. about 10 tons. When the vehicle is trapped or needs to be trailed and dragged, the vehicle shall be unloaded in advance. If the vehicle can not be unloaded because of the technical limitation or the actual condition, the user shall select the trailing points as much as possible when trailing or dragging the vehicle.

牵引时，以下几方面很重要：

The following operations are very important when the vehicle is trailed or dragged:

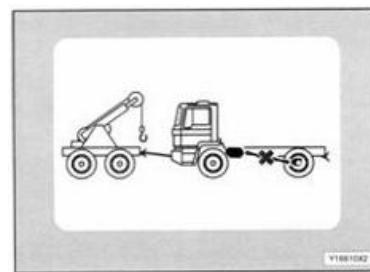
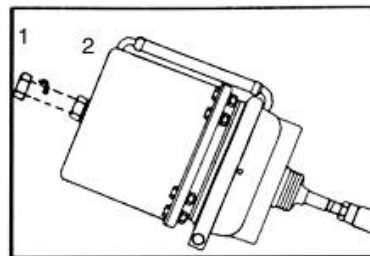
- 脱开传动轴啮合来中断传动系。在全轮驱动车辆里，前传动轴啮合也需脱开
- 为了给制动系提供压缩空气和提供动力转向。可能需要运转发动机

- 请使用牵引杆，而不要使用软缆索
- 合上电源主开关
- 启动点火开关
- 如果车辆有转向/起动锁。将钥匙旋到行车位“2”一旦勿将其拔出
- 将变速箱置于空档
- 如果在保险杠后装有压缩空气管路接头（选用装置），请将其与牵引车的压缩空气系统相连
- Strip off the meshing of drive axle to disconnect the drive system. As for the full-wheel-drive vehicle, the meshing of the front drive axle shall be stripped off.
- In order to supply compressed air and power steering for the brake system, The engine may need to start and run.
- Please use the trailing bar, rather than flexible hawser.
- Switch on the power master switch
- Switch on the ignition switch
- If the vehicle has steering/start lock, The user shall turn the key to traveling position “2” and shall not pull it out.
- Put the gearbox in the position of neutral gear
- If the compressed air pipeline joint (optional device) is mounted at the back of fender-guard, the user shall connect it to the compressed air system of the tractor.

当发动机不能运转，被牵引车辆无气源时，请按图，将（中）后桥制动气室弹簧储能制动解除。（此时完全没有制动）

When the engine can not start and the tractor is lack of air source, the user shall, as shown in figure, release the energy storage spring brake in the (middle) rear axle brake air chamber. (There is no brake at this moment).

- 拖拽牵引速度不可大于 40 公里/小时。
- 如果车辆陷住，拖拽时起牵引作用的车不要左右摇摆，也不要斜着拉，特别是不要斜向一侧
- 如果转向系损坏，抬起前轴。
- The trailing and dragging speed shall not be greater than 40 km/hr.
- If the vehicle is trapped in mud, the tractor shall not vacillate to the right or left or be slant to one side.
- If the steering system is damaged, the user shall lift the front axle.



位置 1 松开 Position 1 is released.

位置 2 行驶引时? Position 2 is trailed in traveling?

(八) 车轮的更换

(VIII) Replace the wheels

注意事项

Precautions

(1) 更换车轮时应注意不要碰伤车轮螺栓上的螺纹。

(1) When replacing the wheels, the user shall pay Notice: not to damage the thread of the bolts in the wheels.

(2) 制动鼓和轮辋配合面上决不能粘上油漆、润滑脂和其它脏东西。

(2) The contact face of the brake drum and rim shall not have any painting, lubricating grease and other dirt.

(3) 车轮螺母的压紧面应清洁，没有脏物或油污。

(3) The seal face of the nuts in the wheels must be cleaned without any dirt or oil dirt.

(4) 所有的车轮螺母的螺纹都是右螺纹。装上车轮，在车轮悬空的条件下按对角交叉顺序拧紧螺母，然后放下车轮，对于钢制轮辋以 550-650Nm(55-65 公斤米)的力矩拧紧螺母；铝合金轮辋以 610-680Nm(61-68 公斤米)的力矩拧紧螺母。

(4) All wheel nut threads are right-hand threads. Fit the wheels, tighten the nuts in the diagonally opposite order with the wheels floating, and then lower the wheels. Tighten the nuts with a torque of 550-650 Nm (55-65 kg) for the steel rims; 610-680 Nm for the aluminum alloy rims (61-68 kilograms (m)of torque tighten the nut.

(5) 所有的车轮螺母的螺纹都是右螺纹。装上车轮，在车轮悬空的条件下按对角交叉顺序拧紧螺母，然后放下车轮，以 550-600Nm (55-60 公斤米) 的力矩拧紧螺母。

(5) All the threads of the wheel nuts are right-hand threads. Install the wheels and fasten the nuts in crossing sequence. And then lower down the wheels and fasten the nuts with 550-600Nm (55-60 kilogram-meters) torque.

(6) 每次重装轮胎后，必须在行驶 50 公里后复紧一次轮胎螺母。

(6) Each time the tyre is re-installed, the tyre nuts must be fastened again after the vehicle travels in 50km.

(九) 驾驶室的翻转操作

(IX) Overturn operation of the cab

1. 步骤

1. Steps

(1) 翻转前先将驾驶室内所有未固定的东西搬下来。关闭车门、打开散热器面罩（不得半开）。将变速杆放在空档位置。用楔块将车轮楔住。

(1) Prior to overturning the cab, the user shall remove all the unfastened articles out of the cab in advance. Close the vehicle door and open the radiator cover (totally opened). Put the gear shift lever in the neutral gear position. Stop the wheels by wedge blocks.

(2) 对于半挂牵引车，松开牵引车与半挂车间的制动气路及电路接头，并将接头盖盖上。

(2) As for the semi-tractor, the user shall cut off the brake connector in the gas circuit and electric circuit and then cover the connector caps.

(3) 翻转时不得有其它人员站在驾驶室前方较近的地方。

(3) In the process of overturn, nobody shall stand in front of the cab.

(4) 将翻转油泵的转换手柄板到“↑”位置。开始翻转操作。

(4) Pull the switching handle plate of the overturn oil pump to the position “↑”. Start the overturn operation.

(5) 驾驶室翻回原位：将翻转油泵的转换手柄板到“↓”位置，用手摇泵将驾驶室翻过来，驾驶室必须翻回到底，当锁止机构锁上后，手摇泵继续打，直到手柄上感到有明显增加的压力为止，然后检查举升缸间隙是否符合图示要求（间隙为 18 ± 1.5 ）。要求驾驶人员必须检查举升油缸是否回落到位，以避免驾驶室的损坏。

(5) Overturn the cab to its original position: pull the switching handle plate of the overturn oil pump to the position “↓” and overturn the cab to the limit position by manual pump. When the lockup mechanism has been locked, the user shall continue to operate the manual pump until the user feels that there is increased pressure on the handle. And then check the clearance of the lifting cylinder to see whether it complies with the requirements stated in the figure (clearance: 18 ± 1.5). The driver must check the lifting cylinder to confirm that it has fallen to the original position to avoid the damage of c



(6) 最后，将锁止手柄扳到原来的锁紧位置。

若驾驶室未锁住，仪表板上的锁止信号灯即亮。

(6) Finally, pull the lockup handle plate to its original lockup position.

If the cab has not been locked, the lockup signal light in the instrument panel will light up.

注 意

Notice

每次翻转时都要翻到底，即超过上止点，才能进行驾驶室翻转后的作业。

Each time the user overturn the cab, the cab shall reach to its upper limit. And then the following operations can be carried out.

驾驶室处于翻起状态时禁止人员进入驾驶室。When the cab is in the process of overturn, nobody shall enter into the cab.

2. 翻转系统的加油和排气只有在驾驶室翻回原位后才能进行

2. The oil-filling or air-exhausting operation can not be carried out until the cab recovers to its original position.

加油前，必须检查液压油是否清洁，符合要求方可加油。

Prior to filling oil, the user shall check the hydraulic oil to see whether it is clean or not. The oil-filling operation can not be carried out until the oil complies with the relevant requirements.

加油步骤:

Oil-filling Procedures:

(1) 打开油塞 1 加入规定的液压油，加满至液面 3。

(2) 一边用手摇泵慢慢将驾驶室翻起一边继续加油。

(3) 将驾驶室放下，同时让多余的油溢出。

(4) 再用油泵将驾驶室翻起并在落回原位后检查和补充油面。

(5) 最后将加油塞 1 拧上。

(1) Open the oil plug 1 and fill the required hydraulic oil until it reaches the level 3.

(2) Continue to fill oil and slowing overturn the cab by operating the pump at the same time.

(3) Lower down the cab and let the surplus oil overflow out of the port.

(4) Overturn the cab by the oil pump and check and replenish the level after it falls to its original position.

(5) Finally, screw on the oil-filling plug 1.

3. 翻转系统功能检查

3. Check of the overturn system function

(1) 将驾驶室向前翻转到上止点，检查驾驶室在超过上止点后的落下情况，若系统工作正常，则驾驶室应在有阻尼的情况下慢慢落下，而无冲击现象。

(2) 将驾驶室翻转约 30° 时，驾驶室应能在此位置保持 20 分钟不产生下沉。

(1) Overturn the cab to its upper limit and check the falling condition of the cab after it exceeds the upper limit. If the system can work in normal condition, the cab shall slowly fall in damped condition, but without any impact phenomenon.

(2) Overturn the cab by 30° , the cab shall keep this position for 20 minutes, but without any falling effect.

(十) 新车走合 (X) New Vehicle Running-in

走合里程规定为 2000-2500km (公里)。走合前对车辆进行例行检查, 保证车辆处于正常工作状态。

The specified running-in mileage is 2000-2500km. prior to running-in, the user shall carry out regular inspection for the vehicle to guarantee it is in normal working condition.

走合注意事项:

Running-in Precautions:

1. 冷发动机刚起动后不要马上加速, 只有在达到正常使用温度后, 才能提高发动机转速。
1. The cold engine shall not immediately accelerate after start. The engine revolution speed shall not be enlarged only if it reaches the temperature in normal condition.
2. 走合期应在平坦良好的路面上行驶。
2. During the running-in period, the vehicle shall travel in the flat and good road.

3. 应及时换挡，平稳地接合离合器，避免突然加速和紧急制动。
3. The driver shall timely shift the gear and steadily step on the clutch to avoid abrupt acceleration and emergency brake.
4. 上坡前及时换入低档，不要让发动机在很低转速下工作。
4. Prior to climbing the slope, the driver shall timely shift to the low gear and shall not let the engine work in low revolution speed.
5. 新车最初 3000km 不得拖带挂车，车载质量不得超过额定车载质量的 70%。
5. The vehicle shall not trail or drag any trailer at the first and the vehicle loaded mass shall not exceed the 70% of the rated vehicle loaded mass.
6. 检查和控制发动机的机油压力和冷却液的正常温度。经常注意变速器、前后桥、轮毂及制动鼓的温度，如有严重发热，应找出原因，立即调整或修理。
6. Check and control the engine oil pressure of the engine and coolant temperature. Frequently keep an eye on the temperature of the transmission, front rear axle, wheel hub and brake drum. If the temperature has greatly increased, the driver shall find out the reasons and timely carry out adjustment or maintenance.
7. 在最初 50 公里行驶和每次更换车轮后须以规定的力矩将车轮螺母拧紧。
7. The wheel nuts shall be fastened by the specified torque at the first driving for 50km or each time the wheel is replaced.
8. 在走合期满后，须将喷油泵上的限位块拆除，走合期内严禁拆除限位块。
8. After the running-in period has expired; the driver shall dismantle the stop block of the fuel injection pump. The stop block shall not be removed during the running-in period.

走合完毕后，按汽车的保养规定的“第一次检查”的内容进行检查与保养。

After the running-in is completed, the driver shall carry out inspection and maintenance according to the specified contents of “First Maintenance”.

（十一）发动机电控系统

(XI) Electronic control system of the engine

一、发动机电控系统简介：

I. Instructions for the engine electronic control system:

WP 系列国三发动机采用了 BOSCH 公司柴油发动机电子控制高压共轨技术，发动机电子控制单元 (ECU) 可根据输入的压力、温度、转速、油门踏板位置等各类电信号，对发动机的喷油量与正时进行自动控制，达到减少排放、降低油耗的目的。

WP series EGR STATE III engine adopts the electronic control high-pressure common-rail technique of BOSCH corporation. Based on the electronic signals of the input pressure, temperature, revolution speed, accelerator pedal position and so on, the engine electronic control unit (ECU) can automatically control the oil injection and timing of engine in order to reduce emission and decrease the fuel consumption.

WP 系列国三发动机电控系统具有稳定的系统处理能力、多层次的系统保护和纠错能力，保证了发动机的可靠性和安全性，发动机电子控制单元 (ECU) 还具有系统故障自检、自诊断和故障输出功能，便于对发动机电控系统的维修。

The electronic control system of WP series EGR STATE III engine has stable system processing capacity, multi-layer system protection and error correction capability so as to guarantee the reliability and safety of the engine. The engine electronic control unit (ECU) has the following functions including system fault self-checking function, self-diagnosis function and fault output function in favor of the maintenance of the electronic control system of the engine.

注意事项:

Precautions:

1. 发动机出厂时已按试验规范严格进行了出公司的试验, 用户不得随意调整电控单元 (ECU) 内的数据, 改变柴油机功率和配置;

1. The engine has been strictly tested according to the test specifications of the company. The user shall not adjust the data of the electronic control unit (ECU) at his/her will to change the power and configuration of the diesel engine.

2. 整车电气系统各部件的检修必须由专业电气人员进行;

2. The parts of electric system in the vehicle must be inspected by the professional electric persons.

3. 电控系统各部件的检修必须由潍柴维修站的专业人员进行;

3. The parts of electronic control system must be inspected by the professional persons of Weichai Maintenance Station.

4. 电控单元 (ECU)、共轨油泵和喷油器为精密部件, 用户不得自行拆解;

4. The electronic control unit (ECU), the common-rail oil pump and the oil injector are precision

parts, so the user shall not dismantle it at his/her will.

5. 整车进行焊接操作时，必须切断整车与电控单元（ECU）的电路连接；

5. When the vehicle is under welding operation, the circuit connection of the vehicle and electronic control unit (ECU) must be cut off.

6. 插拔电控单元（ECU）插接器时，务必切断电控单元（ECU）的电源，以免损坏电控单元或其他部件；

6. Plug in or draw out the connector of the electronic control unit (ECU), the power of the electronic control unit (ECU) must be cut off to prevent damaging the electronic control unit and other parts.

7. 在进行电控单元（ECU）供电电源连接时，务必确认好电源的正、负极，以免损坏电控单元。

7. In the process of switch on the electronic control unit (ECU), the user shall confirm the anode and the cathode to prevent damaging the electronic control unit.

二、整车发动机专用电气设备：

II. Special electrical equipments for the vehicle engine

（1 信号灯：

（1）Signal light:

组合仪表中央的信号灯总成部分中有四个发动机专用报警信号灯（名称、符号、功能见下表）。

There are four alarm signal lights for the engine in the assembly of signal light in the center of the combination instrument (see the following figure for the name, symbol and function of them).

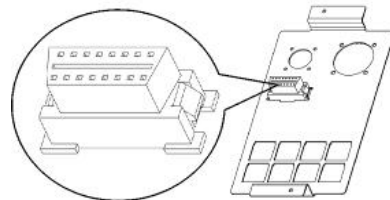
信号灯名称 Name of signal light	信号灯符号 Symbol of signal light	功能 Functions
黄色报警灯 (报警信号灯) Yellow alarm light (alarm signal light)		未定义 Undefined
黄色报警灯 (冷起动信号灯) Yellow alarm light (cold start signal light)		用于进气加热装置工作状态指示。 It is used for the working condition indication of the air intake heater.
红色报警灯 (故障诊断灯) EDC-电控柴油发动机 Red alarm light (fault diagnosis light) EDC- electronic control diesel engine		用于电控系统故障指示和故障代码输出。 It is used for the indication of the electronic control system fault and fault code output.

蓝色报警灯 (油水混合信号灯) Blue alarm light (Signal light for oil-water mixture)		用于粗滤器中积水过多报警。 It is used for alarming the surplus water of the strainer.
--	---	---

(2) 翘板开关:

(2) Rocker switch:

仪表台装备了发动机有关的翘板开关。(见图 66) The instrument table is equipped with the rocker switches regarding the engine. (See fig. 66)



①--A/C 空调请求开关

(具体功能见空调请求开关使用)

①--A/C air conditioner request switch

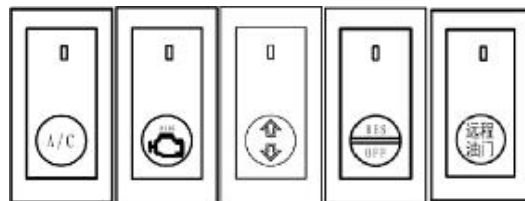
(refer to the application of air conditioner request switch for its detailed function)

②--EDC 诊断开关

(具体功能见故障诊断开关使用)

②--EDC diagnosis switch

(refer to the application of fault diagnosis switch for its detailed function)



③--远程油门转换开关

(具体功能见远程油门使用)

③--remote accelerator change-over switch

(refer to the application of remote accelerator for its detailed function)

(3) 诊断接口: (3) Diagnose interface:

诊断接口是一个使用发动机专用标定、诊断工具(如: 诊断仪)进行数据输入、故障信息输出的专用接口, 诊断接口安装在驾驶室内副驾驶侧诊断接口板内, 具体见图。

The diagnose interface is a special interface used for data input and fault information output by the engine marking and diagnosis tool (for example, the diagnosis instrument). The diagnose interface is mounted in the diagnosis interface plate which is at the side of co-driver in the cab. See the figure for details

三、发动机起动操作步骤:

III. Operation steps for starting the engine:

(1) 起动发动机前电控系统自检:

(1) Prior to starting the engine, the electronic control system shall carry out self-check:
操作步骤: 钥匙插入方向盘锁孔内, 转动钥匙至“1”位置(见图 45), 电控单元 (ECU) 电源接通, 系统上电自检。

Operation steps: insert the key into the lock hole of the steering wheel and then turn the key to position “1” (see fig. 45). The power of electronic control unit (ECU) will be switched on and the system will execute electrical self-check.

信号灯总成中冷起动灯（黄色）、EDC 故障诊断灯（红色）均点亮，如果这两个信号灯在 1~2 秒钟后全部熄灭（如果两个个信号灯均不亮，须检查电控系统电源或信号灯连接线路），表示发动机电控系统正常。

The cold start light of the signal light assembly (yellow) and EDC fault diagnosis light (Red) will light up. If the two signal lights go out in 1~2s (if the two signal lights have not lighted up yet, the user shall check the power of the electronic control system or the wiring lines of the signal lights), it indicates that the engine electronic control system is in normal working condition.

如果冷起动灯（黄色）未熄灭，表明发动机进气加热装置开始工作（详细说明见进气加热的使用）；

If the cold start light (yellow) has not gone out yet, it indicates that the engine air intake heater has started to work (see the application of air intake heater for the details).

如果油水混合灯（蓝色）点亮，表明粗滤器中积水过多，需进行放水处理；

If the oil-water mixture light (blue) has lighted up, it indicates that there are too much water in the strainer and the user shall carry out water drainage operation.

如果 EDC 故障诊断灯（红色）熄灭后又点亮，表明发动机电控系统或整车匹配电气设备存在故障，须对电控系统和整车匹配电气设备进行检修（详细说明见电控系统故障检查）。

If the EDC fault diagnosis light (red) has lighted up again after going out, it indicates that the engine electronic control system or the vehicle electrical equipments have faults. The user shall check and maintain the vehicle electrical equipments and the electronic control system (see the electronic control system fault check and maintenance for details).

报警灯全部熄灭后，按发动机使用、保养手册中的要求进行燃油油位，电源电压，冷却液液位等方面的检查，检查合格后方可起动发动机。

After the alarm lights all went out, the user shall carry out the check of fuel level, power voltage, coolant level and other items according to the requirements stated in the Maintenance Manual. The engine shall not start until the check has completed and confirmed that all the items are qualified.

(2) PTO 功能使用

(2) Application of PTO function

该功能多用于专用车，用以调整发动机转速。

The function is mainly used for special vehicles in order to adjust the engine revolution speed.

操作步骤：

Operation steps:

A. 上电，起动发动机

a. Power on and start the engine.

B. 点动巡航恢复开关即可激活 PTO 功能，此时发动机转速将提升到 1350 转/分，使用巡航加、减开关可调整发动机转速。PTO 激活时发动机转速范围在 800rpm~1700rpm、汽车车速范围在 0~3km/h 之间。

b. Press the cruise recover switch in a click way to activate the PTO function, at this time the engine revolution speed will rise to 1350r/m. The engine revolution speed could be adjusted by the cruise “+” or “-” switch. When the PTO is in activated state, the engine revolution speed range is 800rpm~1700rpm, while the vehicle speed range is 0~3km/h.

C. 点动巡航关断开关即可关闭 PTO 功能，车速将回到怠速状态。

c. Press the cruise ON/OFF switch to shut down the PTO function and the vehicle speed will recover into the idling state.

注 意

Notice

在PTO状态下，离合、排气制动和油门都不会起作用！

In the PTO state, the clutch, exhaust brake and accelerator will be out of service.

(4) 怠速调整功能使用

(4) Application of idling adjustment function

用于调整发动机怠速。

It is used for adjusting the engine idling speed.

操作步骤:

Operation steps:

A. 上电，起动发动机。

a. Power on and start the engine.

B. 踩下刹车，按下巡航恢复键1~2秒，激活怠速调整，此时发动机转速为600rpm。

b. Step on the brake and press on the cruise recover key for 1~2s to activate the idling adjustment. At this time, the engine revolution speed is 600rpm.

C. 通过巡航加、减开关调整发动机怠速，调整范围为600rpm~1000rpm。

c. The engine idle speed can be adjusted by pressing the cruise “+” or “-” switch. Adjustment range: 600rpm~1000rpm.

D. 按下巡航恢复键1~2秒，确定当前怠速，松开刹车开关，怠速调整完成。

d. Press the cruise recover key for 1~2s to set the idle speed and then release the brake switch to complete the idling adjustment.

注 意

Notice

发动机本身就能保证下列怠速提升。

The engine can guarantee the following increase of idle speed.

1. 发动机根据水温调整发动机怠速，比如：WP10 水温 40℃时怠速 600rpm，0℃时 770rpm；

1. The engine can adjust the engine idle speed according to the water temperature, for example, as for WP10 engine, the idle speed is 600rpm at water temperature 40℃ and 770rpm at 0℃ .

2. 有车速时，怠速提升 100rpm。

2. When the vehicle has any speed, the idling speed will increase by 100rpm.

(5) 排气制动使用：

(5) Application of the exhaust brake：

排气制动是一种发动机辅助制动装置，排气制动起作用时发动机停止喷油，驾驶员在下长坡时使用，可节省燃料。

The exhaust brake is a kind of engine auxiliary brake device. When the exhaust brake works, the engine will stop injecting oil and the vehicle can decrease the fuel consumption when the driver travels in the long slope.

工作条件:

Working condition:

由于排气制动的工作受电控单元 (ECU) 的控制, 排气制动起作用时, 康明斯发动机转速须在 1000 转/分, 避免下坡时发动机熄火。

Since the work of the exhaust brake is controlled by the electronic control unit (ECU), when the exhaust brake works, the engine revolution speed must be greater than 800r/m in order to prevent the vehicle from engine flameout when it is traveling down the slope.

检查步骤:

Check steps:

A. 钥匙开关通电, 起动发动机;

a. Power on the key switch and start the engine.

B. 踩下排气制动按钮;

b. Step on the exhaust brake button.

C. 按下发动机制动翘板开关, 康明斯 JACOB 制动器工作。

c Press the exhaust brake button; add "c Press the engine brake rocker switch and the Cummins JACOB brake works."

当发动机满足排气制动的条件时(转速), 踩下排气制动按钮, 排气制动蝶阀打开, 排气制动起作用。

When the engine satisfies the conditions for the exhaust brake (for example, revolution speed), the butterfly valve of the exhaust brake will be opened and the exhaust brake will start to work after the user steps on the exhaust brake button.

注 意

Notice

A. 不能踩着油门测试排气制动，踩下油门踏板会使排气制动失效！

a. The user shall not step on the accelerator to test exhaust brake for the exhaust brake will be out of service if the accelerator pedal is stepped on.

B. 排气制动在低转速时效果不明显。

b. The effects of exhaust brake are small in the low revolution speed.

C. 排气制动工作时，制动灯会点亮。

C. The effect of exhaust brake at low speed is not obvious. Added "c Brake lamp will light when exhaust brake is working."

(6) 进气加热装置的使用：

(6) Application of the air intake heater:

电控单元（ECU）根据发动机上的温度传感器来感应环境温度，通过驱动进气加热继电器控制进气加热栅格的工作，加热发动机进气，便于发动机冷起动。

The electronic control unit (ECU) senses the environmental temperature by the temperature sensor in the engine. It controls the work of the air intake heating grille and the heats the engine air by driving the air intake heating relay so as to achieve the engine cold start.

进气加热工作条件：

The working condition air intake heating:

环境温度在 0℃ 以下

The environmental temperature is below 0℃.

操作步骤:

Operation steps:

A. 打开钥匙开关

a. Open the key switch

冷起动信号灯亮，电控单元（ECU）根据感应的环境温度，自动控制各个过程（预加热、加热、后续加热）的时间。

The cold start signal light will light up and the electronic control unit (ECU) will automatically control the lasting time of each steps (preheating, heating and post-heating) according to the sensed environmental temperature.

B. 预加热：如果温度条件符合，则进行预加热，冷起动灯闪烁，否则冷起动灯熄灭；

b. Preheating: if the temperature conditions can be satisfied, the preheating action will be carried out and the cold start will start to flick, or the cold start will go out.

C. 预加热结束后，冷起动灯闪烁 3 次，提示驾驶员预加热已完成；

c. After the completion of preheating action, the cold start light will flick for three times, which indicates the driver that the preheating action has been completed.

D. 冷起动灯熄灭后，驾驶员可以起动发动机；

d. After the cold start light goes out, the driver can start the engine.

E. 起动发动机后，仍然有一个后续加热的过程，该过程冷起动灯不亮。

e. After the engine is started, there is still a preheating process in which the cold start light will not light up.

注 意

Notice

A. 根据环境温度的不同，电控单元（ECU）会自动控制加热的时间，一般预加热在 1 分钟之内，后加热时间略长，通常在 2 分钟（-10℃时）。

a. According to the different environmental temperatures, the electronic control unit (ECU) can automatically control the heating time. In general, the preheating time shall be within 1 minute, while the post-heating time is a little longer, i.e. 2 minutes (at -10℃).

B. 若在冷起动灯点亮或闪烁过程中起动发动机，则加热过程中断。

b. If the driver starts the engine when the cold start light is on or flicking, the heating process will be interrupted.

（7）空调请求开关的使用：

（7）Application of the air conditioner request switch:

在需要打开空调时，应先按下该开关，电控单元（ECU）接收空调需要打开的信息，控制发动机怠速提升至 700rpm，一般情况下，再打开空调的制冷开关，空调系统即开始工作。

When the air conditioner needs to be opened, the user shall press the switch first. And then the electronic control unit (ECU) will receive the information of opening the air conditioner and the idle speed of engine will increase to 700rpm. In general, at this time, the user opens the refrigeration switch of the air conditioner and then the air conditioner system will start to work.

电控单元（ECU）根据当前发动机工况控制压缩机继电器的工作，如果发动机负载过大（如：车辆重载爬坡），电控单元（ECU）会暂时切断压缩机的工作，负载减小后，自动恢复压缩机的工作。

The electronic control unit (ECU) controls the work of the compressor relay according to the current working condition of the engine. If the load of the engine is too large (for example, vehicle climbing in full load state), the electronic control unit (ECU) will cut off the work of compressor and will recover the work of the compressor after the load decreases.

说明：开空调请求开关也可作为怠速提升装置！

Instruction: the air conditioner request switch can also be regarded as the idling increase device.

(8) 故障诊断开关的使用:

(8) Application of the fault diagnosis switch:

电控单元 (ECU) 具有故障自诊断的功能，一旦检测出电控系统故障，系统就会产生对应的故障代码并存入内存，依照故障的严重等级，使故障诊断灯点亮，并自动进入不同程度的失效保护模式。

正常状态下，诊断灯常亮表示比较严重的故障，需及时进行排查。通过专业的故障诊断仪可以读取故障码；

诊断灯不亮但有故障码可能为历史故障或当前级别较低的故障，不会影响车辆的正常驾驶。

大部分情况下，失效保护模式仍能维持发动机以低功率的方式带故障运行（“跛行回家”），此时，发动机的转速将受到限制。

少数极其严重的故障，失效保护模式会使发动机停止喷油并熄火。

(8) Application of the fault diagnosis switch:

Change content: Replace all content:

The electronic control unit (ECU) has the fault self-diagnosis function. Once all electronic

control system faults is checked out, the system will memorize the code regarding the fault into the computer memory. And then, it will make the fault diagnosis light on according to the fault grade and automatically enter into the fail protective mode in different degrees.

Under normal conditions, the diagnostic light is always on to indicate a more serious fault. It is necessary to perform troubleshooting in time. Fault codes can be read through a professional fault diagnostic instrument;

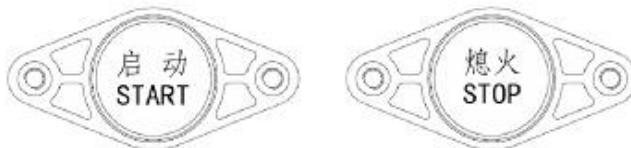
The diagnostic light is off but there is the fault code that may be a historical fault or a current low level fault and will not affect the normal driving of the vehicle.

In most cases, the fail-safe mode can still keep the engine running in a low-power manner (“Limp home”), at which point the engine speed will be limited.

In a few extremely serious failures, the fail-safe mode stops the engine from injecting and extinguishing.

(9) 远程油门使用

(9) Application of the remote accelerator



对于专用车，如果装有远程油门，可使用远程油门转换开关在脚油门和远程油门之间转换。

As for special vehicles equipped with the remote accelerator, the user can achieve the change-over of foot pedal accelerator and remote by using the remote accelerator change-over switch.

断开远程油门转换开关时远程油门失效，脚油门有效；

When the remote accelerator change-over switch is switched off, the remote accelerator will be out of service, but the foot pedal accelerator becomes effective.

按下远程油门转换开关时脚油门失效，远程油门有效。

When the remote accelerator change-over switch is switched on, the foot pedal accelerator will be out of service, but the remote accelerator will become effective.

(10) 车下启动/熄火开关的使用：

(10) Application of under-chassis start/flameout switch:

为方便车下发动机的维修，发动机电控单元（ECU）具有车下启动/熄火的功能。

For the convenience of the maintenance of the vehicle engine, the engine electronic control unit (ECU) has the under-chassis startup/flameout function.

使用车下启动、熄火开关可以在不使用钥匙开关的情况下启动或停止发动机，其前提条件是：

As for the under-chassis start, the flameout switch can start or stop the engine without usage of the key switch under the following preconditions:

1、ECU 要上电工作即钥匙开关要处于打开位置。

1. ECU is power on, i.e. the key switch in the “ON “position.

2、变速箱要处于空档位置。

2. The gearbox is in the neutral gear position.

3、车速传感器工作正常且车速为 0。

3. The vehicle speed sensor is in normal working condition and the vehicle speed is 0.

注 意

Notice

1、车下启动条件比较苛刻，并且不会开启紧急启动模式，所以在启动前请确保各开关、传感器及电气线路工作正常。

1. The conditions for the under-chassis start are very strict and the emergency start mode will not be started, so prior to starting, the user shall guarantee each switch, sensor and electrical circuit in normal working condition.

2、当该熄火开关按下时，发动机将不能起动！

2. When the flameout switch is pressed on, the engine will not start.

康明斯 ISM 系列发动机是由发动机本体装配的电子控制模块（ECM）根据发动机上传感器感应的信号，进行自动、综合控制的电控发动机。该发动机不仅具有先进的自动控制功能，而且还具有系统内故障检测、自诊断的功能。

The Cummins ISM series engine is an electronically controlled engine that is automatically controlled in a comprehensive method by an electronic control module (ECM) mounted on the engine body via a variety of sensors. The engine not only has advanced automatic control functions, but also has the function of fault detection and self-diagnosis.

(十二) 空气悬架系统——适用于公路牵引/载货车

XII. Air Suspension System - For Road Traction / lorry trucks

一、空气悬架系统简介:

I. Introduction to Air Suspension System:

空气悬架是采用了空气弹簧作为弹性元件的悬架系统,相比传统的板簧悬架,空气悬架具有设计寿命长、工作可靠、舒适性好的特点,且空气悬架的耐疲劳性也很好,即使在承载力很大的情况下,仍能保证较长的使用寿命。同时,通过高度调节装置,可在不同承载力或通过坑洼路面的情况下,维持悬架高度不变,车辆跳动较小,因此特别适用于运输玻璃制品、精密仪器等货物。而由于空气弹簧没有互相摩擦的零件(密封件),故即使在尘土、颗粒或沉淀物质多的环境中工作也不会磨损,维护费用低。

The air suspension is a suspension system using an air spring as an elastic element. Compared with the traditional leaf spring suspension, the air suspension has the advantages of long design life, reliable work, and good comfort, and the fatigue resistance of the air suspension. It is also very good, even in the case of large bearing capacity; it can guarantee a long service life. At the same time, through the height adjustment device, under the condition of different bearing capacity or through the pit road surface, the suspension height is maintained and the vehicle pulsation is small, so it is particularly suitable for transporting glass products, precision instruments and other goods. Since the air spring does not have parts (seal) that rub against each other, it does not wear out even if it is operated in an environment with a large amount of dust, particles, or precipitates, and the maintenance cost is low.

注意事项:

1. 确保气囊不长时间的接触液压油、润滑油、溶剂;
2. 即使在高速公路和一级公路等良好路面行驶, 车辆也不允许超载超过 10%;
3. 为了保证空气悬架的使用寿命, 请按要求进行维护保养;
4. 高度控制机构为重要部件, 对车辆使用安全有直接影响, 用户不得私自拆卸、更改设置, 以免出现安全事故;
5. 整车进行焊接、火花切割等操作时, 需对气囊及气管路进行妥善保护;
6. 用户在自行搭载上装时, 上装任何部件不得影响高度调节机构的运动空间, 囊皮圆周范围(悬架高度在初始位置时) 30mm 内不得有障碍物。

Precautions:

1. Ensure that the air bag does not contact the hydraulic oil, lubricating oil, and solvent for a long time;
2. Even if the vehicle is running on a good road condition such as a highway and first-class highways, the vehicle is not allowed to overload more than 10%;
3. In order to ensure the service life of the air suspension, please perform maintenance as required;
4. The height control mechanism is an important component, which has a direct impact on the safety of the use of the vehicle. Users are not allowed to dismantle and change the settings in order to avoid safety accidents.
5. When the vehicle is used for welding, spark cutting, etc., airbags and gas lines need to be properly protected;

6. When users carry their own tops, they must not wear any parts that will affect the movement of the height adjustment mechanism. There must be no obstructions within 30 mm of the circumference of the bladder (when the suspension height is in the initial position).

二、高度阀的调节

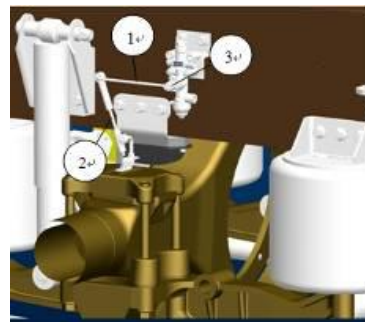
高度阀的调节在车辆出厂时已调整完毕，除非在车辆使用过程中，高度阀连杆机构意外遭到破坏时，用户不得自行调节高度阀连杆机构，必要时，高度阀的调整应遵循以下原则：

- 1、车架下翼面距离车桥中心面的距离为 200mm，且此时件 1 应水平；
- 2、高度阀上的摆轴（件 3）上有箭头图标，件 1 应从箭头端插入；
- 3、各连杆之间的销轴应相互平行，且转动灵敏，不得有卡滞现象；
- 4、车桥跳动过程中，件 1 的摆动行程越大越好；
- 5、件 1 的有效长度推荐值为 180~190mm；
- 6、在高度调整至合适时，件 1 与件 2 的角度推荐值为 70° ；
- 7、车桥左右两侧的高度阀安装方式对称，对应各杆调整长度一致。

II. The height of the valve adjustment

The adjustment of the height valve has been adjusted when the vehicle is shipped from the factory. Unless the height of the valve linkage is accidentally damaged during the use of the vehicle, the user has to adjust the height valve linkage. If necessary, the adjustment of the height valve should abide the following rules:

1. The distance between the lower wing surface of the frame and the center surface of the axle is 200mm, and the piece 1 should be horizontal at this time;



2. There is an arrow icon on the swing shaft (item 3) on the height valve, and the part 1 should be inserted from the arrow end;

3. The pins between the connecting rods should be parallel to each other and be sensitive to rotation so that there is no jamming;

4. During the axle bounce, the larger the swing stroke of the part 1 is better;

5. The recommended value of the effective length of item 1 is 180~190mm;

6. When the height is adjusted to the proper value, the recommended value of the angle of item 1 and item 2 is 70° ;

7. The installation method of the height valve on the left and right sides of the axle is symmetrical, corresponding to the adjustment length of each pole.

三、空气悬架使用，用户在使用带空气悬架车辆的过程中应注意以下内容：

1、每天或在出车前进行例行检查，例行检查内容包括：

a、目视检查空气悬架充气充足、均衡；

b、悬架高度正常，系统无泄漏。

简易的检查方法为：在首次使用车辆时，把处于良好状态的车辆停放于水平地面上，分别在悬架前后左右四处位置，选择四个易测量的点（这些点均应低于气囊最低点），测量该点到车架的距离，并记录，以后每次检查时，只需将车辆停放在水平地面上，测量这四个点到车架的距离，如果数值没有较大改变，即可判定悬架高度正常，系统无泄漏。

2、若检查不合格时，需查出原因，排除故障，必要时进行维修。

3、还应定期进行安全检查（间隔里程 2000-3000km），检查时，车辆应停放在干净、平整路面上，驻

车制动，检查以下项目：

- a、所有紧固件无松动；
- b、在不小于 6 巴的供气压力下，空气弹簧充气正常，同一桥两侧的气囊坚实程度一致，并检查空气弹簧有无磨损、损伤和不适当的鼓起，并且周围有 30mm 以上的间隙。
- c、减震器无漏油和损坏，工作正常。简单的判定方法为：无明显故障时，行车后减震器发热表示工作正常（可能烫手）。
- d、所有零部件和焊缝无裂纹。

III. The use of air suspension, the user in the use of air suspension vehicle should pay attention to the following content:

- 1. Routine inspections are performed daily or before departure. Routine inspections include:
 - a. Visually inspect the air suspension for adequate inflation and balance;
 - b. Suspension height is normal and the system has no leakage.

The simple inspection method is: when using the vehicle for the first time, park the vehicle in good condition on the level ground, and place four positions around the suspension, select four easy-to-measure points (these points should be lower than the lowest point of the airbag.) Measure the distance from the point to the frame and record. After each inspection, just park the vehicle on the level ground and measure the distance between the four points to the frame. If the value does not change significantly, It is determined that the suspension height is normal and the system has no leakage.

- 2. If the inspection is unqualified, it is necessary to find out the reason, troubleshoot, and repair if necessary.

3. Safety inspection (interval mileage 2000–3000km) should also be carried out regularly. During the inspection, the vehicle should be parked on a clean, level road surface, parked and braked to check the following items:

a. No loosening of all fasteners;

b. Under the air supply pressure of not less than 6 bar, the air spring is inflated normally, the airbags on both sides of the same bridge are consistent in strength, and the air springs are inspected for wear, damage and improper bulging, and there are more than 30 mm gap.

c. The shock absorber has no oil leakage and damage, and it is working normally. The simple determination method is: When there is no obvious fault, the damper heat after driving indicates normal operation (may be hot).

d. all parts and welds without cracks.

四、后提升功能的使用

后提升功能仅允许用户在轻载工况下使用，且操作提升时需停车，由于提升轴提升及下落过程中，空气弹簧会通过充放气调整悬架高度，车辆会有窜动可能，故请在提升过程中进行驻车制动。操作方法如下：

1、操作前需确认整车气压不低于 9bar；

2、确认是否已进行驻车制动；

3、轻载工况下（重载时系统设定不能提升）按下驾驶室内控制提升功能的翘板开关，提升轴即开始提升直至提升到位；

4、重载时或不需要提升时，将控制提升功能的翘板开关复位，提升轴将落下。

IV. The use of rear lift function

The rear lift function only allows the user to use under light load conditions, and it needs to stop when the operation is lifted. As the lift shaft lifts and falls, the air spring will adjust the suspension height through deflation, and the vehicle will be shaken possibly. Please park and brake during the lift. The method of operation is as follows:

1. Before operating, it is necessary to confirm that the vehicle pressure is not lower than 9bar;
2. Confirm whether parking brake has been performed;
3. under light load conditions (the system settings cannot be increased under the heavy load) press the rocker switch in the cab to enhance the control function, lift the shaft to start lifting until it is lifted into place;
4. When the vehicle is overloaded or does not need to be lifted, the rocker switch which controls the lift function will be reset and the lift shaft will fall.



控制提升功能的翘板开关示意图

Rocker Switch Schematic of Control Lifting Function

(六) 悬架系统关键部位紧固螺栓复紧保养要求

车辆行驶前必须保证前、后钢板弹簧 U 形螺栓的真正拧紧，才能避免钢板弹簧的早期非正常损坏。车辆行驶前必须保证悬架系统各个承载件固定螺栓完全拧紧，包括前后悬架板簧支架、U 型螺栓、推力杆、平衡轴支架、气囊托架、稳定杆支架、减振器支架等部位，这样才可以提高整车运行可靠性及各个零部件使用寿命。

1. 新车磨合行驶 200km 及 500km 时，即应按规定的力矩，拧紧前后悬架系统关键点的螺栓及螺母，如板簧支架、U 型螺栓、推力杆、气囊托架、稳定杆支架、减振器支架等悬架关键部位。
2. 新车磨合结束时（2500km~3000km 左右），在承载状态下按规定力矩再次紧固关键点螺栓及螺母。
3. 汽车投入正常使用后，应在满载状态下，每隔 200~300km 按规定力矩，拧紧一次前后悬架关键部位的螺栓及螺母，连续紧固 2~3 次，以后趋于稳定，可按常规保养进行维护。

(VI) Maintenance requirements for tightening bolts in critical parts of the suspension system

In order to avoid early abnormal damage of the leaf springs, it must be ensured that the U-bolts of the front and rear leaf springs are actually tightened before starting the vehicle. To ensure the reliability of the entire vehicle and the service life of various components, all the fixing bolts of the suspension system must be fully tightened before use of the vehicle, including front and rear suspension leaf spring brackets, U-bolts, thrust rods, balance shaft brackets, airbag brackets, stabilizer bar brackets, shock absorber brackets and other parts.

1. When the new car runs 200km and 500km, tighten the bolts and nuts of the key points of the front and rear suspension systems according to the specified torque, such as leaf spring bracket, U-bolt, thrust rod, airbag brackets, stabilizer bar brackets, shock absorber brackets and other

suspension key parts.

2. When the new vehicle runs-in (2500km to 3000km or so), tighten the key bolts and nuts with the specified torque under the load.

3. After the vehicle is put into normal use, it shall be tightened once every two to three hundred kilometers in accordance with the specified torque, tighten the bolts and nuts of the key parts of the front and rear suspensions at full load, and shall be tightened continuously for two to three times. Afterwards, it will become stable and can be maintained according to routine maintenance.

(十三) 双腔燃油供给系统/并联油箱使用说明

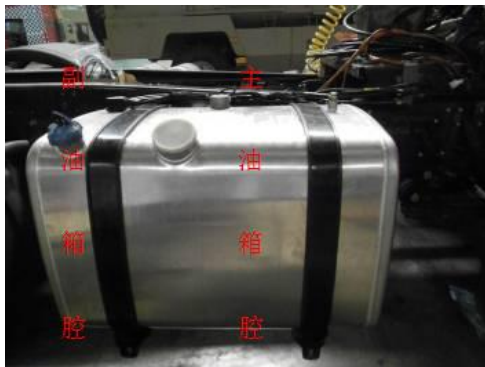
XIII. Dual-chamber fuel supply system / parallel fuel tank instruction

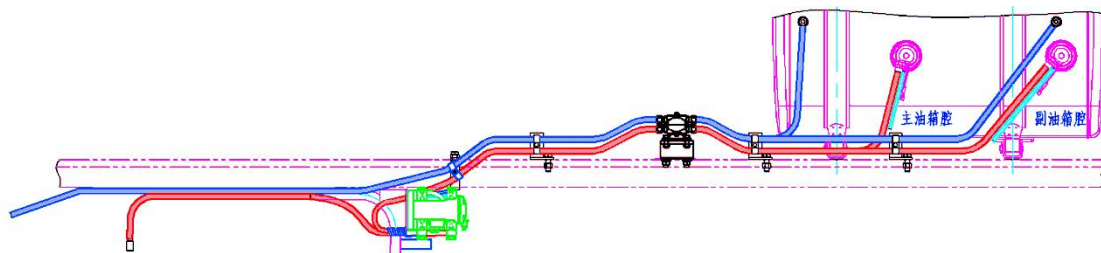
1、双腔油箱介绍

1. Dual-chamber fuel tank introduction

双腔燃油供给系统由双腔燃油箱、油量感应器、燃油管路、供油换向阀、燃油粗滤器等零部件组成。

Dual-chamber fuel supply system consists of dual-chamber fuel tanks, fuel sensors, fuel lines, oil supply reversing valves, fuel preliminary filter and other components.





实现功能:

Function realization:

在寒区或冬季启动发动机时采用低牌号柴油，发动机启动后改用 0#等高牌号柴油，提高燃油燃烧率，降低油耗，节约成本。

Low-grade diesel is used to start the engine in cold regions or in winter. After the engine is started, it is changed to 0# and other high-grade diesel to improve the fuel combustion rate, reduce fuel consumption, and save costs.

系统原理:

System principle:

对其中一个燃油箱隔板进行密封设计，把腔体分为两部分，可盛装不同牌号的燃油；主副油箱的供给管路采用电磁阀控制进行切换。

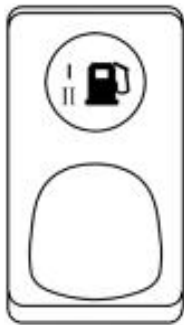
One of the fuel tank partitions is designed to be sealed. The chamber is divided into two parts and can hold different grades of fuel; the supply lines of the main and auxiliary fuel tanks are switched by solenoid valves.

2. 双腔油箱操作说明

2. Dual chamber fuel tank instructions

双腔油箱切换开关在驾驶室仪表台上，如下图所示（注：各车型外形有所不同 切换开关状态 I 为使用主油箱燃油的开关，状态 II 为使用副油箱燃油的开关）：

The dual-chamber tank switch trigger is shown on the cab dashboard, as shown in the following figure (Note: Each vehicle model has a different shape. The switch state I is the switch of the main fuel tank, and the switch state II is the switch of the auxiliary fuel tank)



开关默认状态为油箱 I，此时双腔油箱的主油箱工作，此时油量表显示的油量值为主油箱当前燃油量；当闭合此开关时，燃油切换阀工作，将油路由主油箱切换至副油箱，此时油量表的显示也自动切换为副油箱当前燃油量。

The default state of the switch is fuel tank I. At this time, the main fuel tank of the dual chamber oil tank works, and the oil amount shown in the fuel gauge is the current fuel quantity of the main tank; when the switch is closed, the fuel switch valve works and the oil is switched from main tank to the auxiliary fuel tank. At this time, the display of the fuel gauge is automatically switched to the current fuel quantity of the auxiliary fuel tank.

注 意

Notice

1、切勿将油箱内的燃油用完，否则需要排空供给管路内的空气。再次加油时，应将切换开关恢复至 I 档。

1. Do not run out of fuel in the tank, otherwise you will need to empty the air in the supply line. When refueling, the diverter switch should be restored to I position.

2、如果在气温较高的使用环境下，适合主油箱内盛装柴油的牌号（如 0#柴油）要求时，主副油箱可盛装同牌号柴油，起到油箱增加容量的作用。一般情况下，应将切换开关置为 I 档（即使用主油箱内的燃油），此时油量表显示值为主油箱该时的燃油量，当油量表显示为零时，表明此时主油箱燃油基本用完，可以按下切换开关至 II 档，启用副油箱内的备用燃油，此时油量表显示也自动切换为副油箱当前燃油量。再次加油时，应将切换开关恢复至 I 档。

2. Under the high temperature environment, if suitable for the use of diesel (such as 0# diesel) in the main fuel tank, the main and auxiliary fuel tanks can be filled with the same grade of diesel fuel, which will increase the capacity of the fuel tank. Under normal circumstances, the diverter switch should be set to I position (that is, using the fuel in the main tank). At this time, the fuel gauge shows the value of the fuel in the main tank. When the oil gauge shows zero, it means that the fuel in the main fuel tank is almost used up; then you can press the switch trigger to the II position to enable the reserve fuel in the auxiliary fuel tank. At this time, the fuel gauge display also automatically switches to the current fuel quantity of the auxiliary fuel tank. When refueling, the switch trigger should be restored to I position.

3、如果在气温较低的冬季或寒冷地带，主油箱可盛装稍高牌号的柴油，副油箱盛装与使用环境匹配的低牌号柴油，用于低温启动。启动发动机前，应将切换开关置为Ⅱ档，采用副油箱的柴油启动发动机，待发动机完全预热，且主油箱内柴油流动性尚可的情况下，切换开关至Ⅰ档，使用主油箱的柴油进行正常作业。但是，请在准备停车前五分钟时，应将切换开关置为Ⅱ档，使燃油管路内充满低牌号柴油，便于下次启动。

3. If the temperature is low in the winter or in cold regions, the main tank can hold slightly higher grades of diesel fuel, and the auxiliary tanks contain low-grade diesel oil that matches the low-temperature environment for low-temperature start-up. Before starting the engine, the diverter switch should be set to II position. The diesel engine of the auxiliary fuel tank is used to start the engine. When the engine is completely warmed up, and the diesel fluidity in the main

fuel tank is still available, switch the switch trigger to the I position and use the diesel fuel of the main tank to perform normal operations. However, five minutes before you are ready to stop, you should set the switch to II position so that the fuel line is filled with low-grade diesel for easy start-up next time.

4、在双腔油箱在切换后，如发动机不能正常起动，须排出管路内部空气方能正常使用。在使用过程中，切勿将油箱内的燃油用完，否则需要排空供给管路内的空气。（搭载潍柴共轨发动机的车型标配水寒宝，具有自动排气功能；搭载康明斯发动机和潍柴机械泵发动机的车型，需要多次按下滤清器上的手动泵进行排气。）

4. After the double-chamber fuel tank is switched, if the engine cannot start normally, the internal air of the pipeline must be discharged before it can be used normally. Do not run out of fuel in the tank. Otherwise the air in the supply line should be evacuated. (Weichai common-rail engine are equipped with a water-cooled model, which has an automatic exhaust function; Cummins engine and a Weichai mechanical pump engine need to be depressurized by pressing the manual pump on the filter several times.)

3. 并联油箱的使用

3. Use of parallel fuel tanks

并联油箱的使用与双腔油箱的使用方法相同。

The use of parallel fuel tanks is the same as the use of dual chamber fuel tanks

三、汽车的保养

III. Automobile Maintenance

(一) 保养类别

(I) Maintenance Classes

根据汽车的不同用途和使用条件，以及预期的年行驶里程，将汽车的保养制度分为三类。

Based on the application and usage conditions of the vehicle and the predicted annual traveling mileage, the maintenance system can be divided into three classes.

I 类：使用条件恶劣(气候严寒或酷热，含尘量高，短距离运输，越野使用)或汽车年行驶里程不到 2 万(公里)。

Class I : Bad usage conditions (cold or extremely hot weather, high dust content, transportation in short distance, or overland usage) or the annual traveling mileage is less than.

II 类：短、中距离运输，年行驶里程不到 6 万(公里)。

Class II: Transportation in short or intermediate distance, the annual traveling mileage is less than.

III 类：远距离运输，年行驶里程超过 6 万(公里)。

Class III: Transportation in long distance, the annual traveling mileage is more than.

(二)例行检查和保养的间隔里程

(II) The mileage interval of the routine inspection and maintenance

各类使用条件的汽车例行检查和保养的间隔里程见表 1

See Table 1 for the mileage interval of the routine inspection and maintenance in various usage conditions.

(三)总成换油间隔里程

(III) The mileage interval of assembly oil change

1. 正常使用条件见表 2

1. See Table 2 for the normal usage conditions.

2. 在恶劣使用条件下的发动机换油间隔里程见表 3

2. See Table 3 for the mileage interval of engine oil change in bad usage conditions.

恶劣使用条件分三种情况:

The bad usage conditions can be divided into three types:

(1) 热带或寒带气候(温度经常高于+30℃或低于-10℃)

(2) 使用含硫量 0.5-1.0%的燃油

(3) 使用含硫量 1.0-1.5%的燃油

(1) Tropical climate or cold climate (the temperature usually is higher than + or lower than)

(2) Use the fuels with 0.5-1.0% sulphur content

(3) Use the fuels with 1.0-1.5% sulphur content

表 1 Table 1

单位: 1000 公里 Unit: 1000km

类别 Type	例行 检查 Routine inspection	一级 保养 Class I Maintenance	例行 检查 Routine inspection	二级 保养 Class II Maintenance	例行 检查 Routine inspection	一级 保养 Class I Maintenance	例行 检查 Routine inspection	三级 保养 Class III Maintenance	例行 检查 Routine inspection	一级 保养 Class I Maintenance	例行 检查 Routine inspection	二级 保养 Class II Maintenance	例行 检查 Routine inspection	一级 保养 Class I Maintenance	例行 检查 Routine inspection	四级 保养 Class IV Maintenance
I	5 85 165 245	10 90 170 250	15 95 175 255	20 100 180 260	25 105 185 265	30 110 190 270	35 115 195 275	40 120 200 280	45 125 205 285	50 130 210 290	55 135 215 295	60 140 220 300	65 145 225 305	70 150 230 310	75 155 235 315	80 160 240 320
II	10 170 330 490	20 180 340 500	30 190 350 510	40 200 360 520	50 210 370 530	60 220 380 540	70 230 390 550	80 240 400 560	90 250 410 570	100 260 420 580	110 270 430 590	120 280 440 600	130 290 450 610	140 300 460 620	150 310 470 630	160 320 480 640

类别	例行检查	一级保养	例行检查	二级保养	例行检查	一级保养	例行检查	三级保养	例行检查	一级保养	例行检查	二级保养	例行检查	一级保养	例行检查	四级保养
Type	Route inspection	Class I Maintenance	Route inspection	Class II Maintenance	Route inspection	Class I Maintenance	Route inspection	Class III Maintenance	Route inspection	Class I Maintenance	Route inspection	Class II Maintenance	Route inspection	Class I Maintenance	Route inspection	Class IV Maintenance
III	15	30	45	60	75	90	105	120	135	150	165	180	195	210	235	240
	255	270	285	300	315	330	345	360	375	390	405	420	435	450	465	480
	495	510	525	540	555	570	585	600	615	630	645	660	675	690	705	720
	735	750	765	780	795	810	825	840	855	870	885	900	915	930	945	960

表 2 Table 2

●换油标记 ● Oil change mark

类 别 type	发动机 engine (自吸、增压) (Self-priming , supercharged)	变速器 transmission 分动器 Transfer case	前、后桥 Front, rear axle	附 注 Note
第一次检查 First inspection	●	●		行驶 2000-2500km Mileage: 2000-2500km
例行检查 routine check	●		●	前、后桥根据车型进 行换油里程选择 Choose the oil mileage of front and rear axles based on model
一级保养 class I maintenance	●		●	
二级保养 class II maintenance	●	●	●	
三级保养 class III maintenance	●	●	●	
四级保养 class IV maintenance	●	●	●	

备注：前、后桥换油周期按车型区分：自卸车/专用车/复合版、加强版牵引及载货车免首保，换油周期 3 万 km 或 1 年；轻量化牵引车及载货车免首保，换油周期 6 万 km 或 1 年。

Note: The oil change periods of the front and rear axles are classified by model: Dump truck/special car/composite version, reinforced version tractors and trucks do not require first maintenance, oil change period is 30,000 km or 1 year; lightweight tractors and Trucks do not require first maintenance and the oil change interval is 60,000 km or 1 year.

表 3 Table 3

使用条件 Usage conditions	类 别 Types	自然吸气发动机 Naturally aspirated engine	增压发动机 Engine with supercharger
恶劣条件 (1) Bad conditions (1)	I II III	每隔 5000km Every5000km	每隔 5000km Every5000km
恶劣条件 (2) Bad conditions (2)	I II III	5000km 5000km 10000km	5000km 5000km 10000km
恶劣条件 (3) Bad conditions (3)	I II III	10000km	5000km
恶劣条件 (1+2) Bad conditions (1+2)	I II III	7500km 7500km 10000km	5000km
恶劣条件 (1+3) Bad conditions (1+3)	I II III	5000km	2500km

(四) 保养作业要点

(IV) Key points of the maintenance operation

1. 日常保养项目

1. Daily maintenance items

(1) 检查手制动和脚制动。

(1) Check the manual brake and foot brake

(2) 检查照明、信号系统及各种指示灯工作情况(机油压力、贮气筒压力、空滤器保养示灯、充电指示灯等)。

(2) Check the working condition of the lighting and signal system and various indicator lights (including indicator lights of engine oil pressure, air reservoir pressure and air filter maintenance, and charging indicator light, etc.)

(3) 检查刮水器和风挡玻璃洗涤器清洗瓶的液面。

(3) Check the washer bottle level of the wiper and windscreen.

(4) 检查轮胎气压与状态。

(4) Check the tire pressure and state.

(5) 检查发动机机油、冷却液和燃油液面。

(5) Check the level of engine oil, coolant and fuel level.

(6) 检查制动防冻液泵充液量和各种工作油、液的容量。

(6) Check the filling amount of the brake antifreeze liquid pump and the capacity of various operating oil and fluids.

(7) 排除贮气筒中的水。

(7) Eliminate the water in the air reservoir.

2. 各级保养项目 (表 4)

2. Items of each maintenance class (Table 4)

发动机 Engine	第一次检查 FirstCheck	例行检查 Routineinspection	一级 保养 Class I Maint enanc	二级 保养 Class II Maint enanc e	三级 保养 Class III Maint enanc e	四级 保养 Class IV Maint enanc e
更换发动机油 (每年至少一次) Replace the engine oil (at least once per year).	●	●	●	●	●	●
更换机油滤清器或滤芯 Replace the engine oil filter or the filter cartridge.	●	每次更换发动机油时 Each time the user replaces the engine oil,				
检查调整气门间隙 The user shall adjust the valve clearance	●		●	●	●	●
检查喷油咀开启压力					●	●

发动机 Engine	第一次检查 FirstCheck	例行检查 Routineinspection	一级 保养 Class I Maint enanc e	二级 保养 Class II Maint enanc e	三级 保养 Class III Maint enanc e	四级 保养 Class IV Maint enanc e
Check the open pressure of the fuel injection nozzle;						
更换燃油滤清器或滤芯 Replace the fuel filter or the filter cartridge;			●	●	●	●
清洗燃油泵粗滤器 Clean the fuel pump strainer;			●	●	●	●
检查冷却液容量并加足 Check the coolant level and fill more if necessary;	●	●	●	●	●	●

发动机 Engine	第一次检查 First Check	例行检查 Routine inspection	一级 保养 Class I Maint enanc	二级 保养 Class II Maint enanc e	三级 保养 Class III Maint enanc e	四级 保养 Class IV Maint enanc e
更换冷却液 Check the cooling degree;	每隔 24 个月 Every 24 months.					
紧固冷却管路管夹 Fasten the cooling pipe clamp	●					
紧固进气管路软管和凸缘连接件 Fasten the joint of the air intake flexible pipe and flange;	●		●	●	●	●
检查空滤器保养指示灯 Check the air filter maintenance indicator light;			●	●	●	●
清洁空滤器的集尘杯 Clean the dust collecting cup of the air filter;		●	●	●	●	●

发动机 Engine	第一次检查 First Check	例行检查 Routine inspection	一级 保养 Class I Maint enanc e	二级 保养 Class II Maint enanc e	三级 保养 Class III Maint enanc e	四级 保养 Class IV Maint enanc e
清洁空滤器主滤芯 Clean the main filter cartridge of the air filter;	当指示灯亮时 When the indicator light lights up,					
更换空滤器主滤芯 Replace the main filter cartridge of the air filter;	当主滤芯损坏时 When the main filter cartridge is damaged,					

表 4-2 Table 4-2

发动机 Engine	第一次检查 First Check	例行 检查 Routi ne inspe ction	一级 保养 Class I Maint enanc e	二级 保养 Class II Maint enanc e	三级 保养 Class III Maint enanc e	四级 保养 Class IV Maint enanc e
更换空滤器安全滤芯 Replace the safety filter cartridge of the air filter.	清洗 5 次主滤芯以后 After the main filter cartridge has been cleaned for 5 times,					
检查紧固三角皮带 The user shall check and fasten the triangle belt;	●	●	●	●	●	●
检查增压器轴承间隙 Check the supercharger bearing clearance;					●	●

发动机 Engine	第一次检查 First Check	例行 检查 Routine inspe ction	一级 保养 Class I Maint enanc e	二级 保养 Class II Maint enanc e	三级 保养 Class III Maint enanc e	四级 保养 Class IV Maint enanc e
检查喷油泵 Check the fuel injection pump;						●
检查调整离合器的行程和钢丝绳状况 Check and adjust the clutch stroke and the condition of the steel wire rope;	●	●	●	●	●	●
调整怠速转速 Adjust the idling speed;	●					

变速器 Transmission	第一次检查 First Check	例行检查 Routine inspection	一级保养 Class I Maintenance	二级保养 Class II Maintenance	三级保养 Class III Maintenance	四级保养 Class IV Maintenance
检查变速器油面 Check the transmission oil level;			●			
更换变速器润滑油（每年至少一次） Replace the transmission lubricating oil (at least once per year);	●			●	●	●
清洗空气滤清调节器滤芯 Clean the regulator filter cartridge of the air filter;				●	●	●
更换变速器通气装置 Replace ventilation device of the transmission.				●	●	●

表 4-3 Table4-3

前桥 Front axle	第一次检查 Firs Check	例行 检查 Rout ine Insp ecti on	一级 保养 Clas s I Main tena nce	二级 保养 Clas s II Main tena nce	三级 保养 Clas s III Main tena nce	四级 保养 Clas s IV Main tena nce
检查主减速器和轮边减速器油面 Check the master reducer and the hub reducer oil level;			●			
更换主减速器和轮边减速器润滑油 (每年至少一次) Replace the lubricating oil of the master reducer and hub reducer (at least once per year)	●			●	●	●

前桥 Front axle	第一次检查 Firs Check	例行 检查 Rout ine Insp ecti on	一级 保养 Clas s I Main tena nce	二级 保养 Clas s II Main tena nce	三级 保养 Clas s III Main tena nce	四级 保养 Clas s IV Main tena nce
清洁前驱动桥通气装置 Clean the ventilation device of the front drive axle;			●	●	●	●
检查调整非驱动前桥滚锥轴承间隙 Check and adjust the taper roller bearing clearance of the non-drive front axle.	第一次 2 级保养进行 During the first Class II maintenance period					
更换轮毂润滑脂（非驱动前桥）隙 Replace the lubricating grease of the wheel hub (non-drive front axle)					●	●

后桥 Rear axle	第一次检查 First Check	例行 检查 Routine Inspection	一级 保养 Class I Maintenance	二级 保养 Class II Maintenance	三级 保养 Class III Maintenance	四级 保养 Class IV Maintenance
检查主减速器和轮边减速器油面隙 Check the oil level of the master reducer and hub reducer		●				
更换主减速器和轮边减速器润滑油（每年至少 一次） Replace the lubricating oil of the master reducer and hub reducer (at least once per year)	●			●	●	●
清洁通气装置 Clean the ventilation device			●	●	●	●

后桥 Rear axle	第一次检查 First Check	例行 检查 Routine Inspect ion	一级 保养 Class I Main tena nce	二级 保养 Class II Main tena nce	三级 保养 Class III Main tena nce	四级 保养 Class IV Main tena nce
检查调整轮毂滚锥轴承间隙 Check and adjust the taper roller bearing clearance of the wheel hub	第一次 2 级保养时进行 During the first Class II maintenance period					
传动轴 drive axle						
重新紧固传动轴螺栓 Re-fasten the drive axle bolts	●					
目检传动轴的连接和磨损 Visually check the joint and abrasion of the drive axle				●	●	●

表 4-4 Table 4-4

驾驶室 Cab	第一次 检查 First Check	例行 检查 Routine inspect ion	一级 保养 Class I Mainte nance	二级 保养 Class II Mainte nance	三级 保养 Class III Mainte nance	四级 保养 Class IV Mainte nance
检查刮水器的动作 Check the wiper	●	●	●	●	●	●
重新紧固驾驶室锁紧手柄 Re-fasten the cab lockup handle	●			●	●	●
重新紧固发动机罩 Re-fasten the engine cover	●					
检查驾驶室翻转手油泵油面 Check the oil level of the manual oil pump for overturning the cab				●	●	●

驾驶室 Cab	第一次 检查 First Check	例行 检查 Routine inspect ion	一级 保养 Class I Mainte nance	二级 保养 Class II Mainte nance	三级 保养 Class III Mainte nance	四级 保养 Class IV Mainte nance
检查举升柱塞的调整情况 Check the adjustment of the lifting plunger piston.	●		●	●	●	●
底盘 Chassis						
检查牵引钩的固定和动作 Check the fastening condition and the action of the trailing hook	●		●	●	●	●
重新紧固横梁螺栓 Re-fasten the beam bolts	●					
紧固前、后钢板弹簧骑马螺栓和支架 Fasten the U-bolts and supporting frame of the front and rear steel plate spring.	●			●	●	●
检查备胎的固定机钩				●	●	●

驾驶室 Cab	第一次 检查 First Check	例行 检查 Routine inspect ion	一级 保养 Class I Mainte nance	二级 保养 Class II Mainte nance	三级 保养 Class III Mainte nance	四级 保养 Class IV Mainte nance
Check the fixed mechanism of the spare tire.						
检查调整钢板弹簧侧挡板间隙 Check and adjust the side damper clearance of the steel plate spring.				●	●	●
检查车轮螺母的固定 Check the fixation of the wheel nuts.	●			●	●	●
检查蓄电池的固定 Check the fixation of the rechargeable battery.				●	●	●
检查燃油箱的固定 Check the fixation of the fuel tank.				●	●	●

表 4-5 Table 4-5

制动系 Brake system	第一次检查 First Check	例行检查 Routine inspection	一级保养 Class I Maintenance	二级保养 Class II Maintenance	三级保养 Class III Maintenance	四级保养 Class IV Maintenance
贮气筒放水 Discharge the water in the air reservoir	●	●	●	●	●	●
检查气压系统密封性（气压表检查） Check the tightness of the pressure system (use the air gauge)	●		●	●	●	●
清洗油水分离器中的调压阀滤网查） Clean the filter screen of the pressure regulating valve in the oil-water separator.				●	●	●
检查制动摩擦片厚度，调整制动器间隙 Check the thickness of the brake friction plate and adjust the brake clearance				●	●	●
清洁车轮制动器 Clean the wheel brake					●	●

制动系 Brakesystem	第一次检查 First Check	例行检查 Routine inspection	一级保养 Class I Maintenance	二级保养 Class II Maintenance	三级保养 Class III Maintenance	四级保养 Class IV Maintenance
检查制动管路和软管易擦伤的部位 Checktheeasilybruisedpartsofthebrakepipelinesandflexiblepipes.	●			●	●	●
检查制动室的功能 Checkthefunctionofthebrakechamber.			●	●	●	●
检查脚制动、手制动和排气制动的效能 （在试车时进行） Checktheperformanceofthefootbrake,manualbrakeandexhaustbrake(duringthecommissioningperiod)	●		●	●	●	●

表 4-6 Table 4-6

电 气 Electrical system	第一次 检查 First Check	例行 检查 Routi ne inspe ction	一级 保养 Class I Mainte nance	二级 保养 Class II Mainte nanc e	三级 保养 Class III Mainte nanc e	四级 保养 Class IV Main tena nce
更换转向机油系 Replace the steering engine oil system	●		●	●	●	●
检查转向油罐油面高度 Check the oil level of the steering oil tank	●	●	●	●	●	●
更换转向油罐的油滤器 Replace the oil filter of the steering oil tank	●		●	●	●	●
检查转向系统的功能 Check the functions of the steering system	●	●	●	●	●	●
检查转向杆件的螺栓、接头和锁紧件- Check the bolts, joints and locking fastener of the steering lever	●	●	●	●	●	●

表 4-7 Table 4-7

润 滑 Lubrication	第一次 检 查 First Check	例行 检查 Routine Inspection	一级 保养 Class I Maint enanc e	二级 保养 Class II Maint enanc e	三级 保养 Class III Maint enanc e	四级 保养 Class IV Maint enanc e
水泵 Water pump	●	●	●	●	●	●
离合器拨叉轴 clutch fork shaft	●	●	●	●	●	●
离合器踏板轴 Clutch pedal shaft	●	●	●	●	●	●
离合器分离轴承 Clutch release bearing	●	●	●	●	●	●

润 滑 Lubrication	第一次 检 查 First Check	例行 检查 Routine Inspection	一级 保养 Class I Maint enanc e	二级 保养 Class II Maint enanc e	三级 保养 Class III Maint enanc e	四级 保养 Class IV Maint enanc e
离合器用制动液 Clutch brake fluid	每隔两年或行驶 18 万公里更换一次 Replace every two years or driving 180,000 kilometers					
万向节和传动轴中间支承 Universal joint and intermediate support of the drive axle	●	●	●	●	●	●

润滑 Lubrication	第一次 检查 First Check	例行 检查 Routine Inspection	一级 保养 Class I Maint enanc e	二级 保养 Class II Maint enanc e	三级 保养 Class III Maint enanc e	四级 保养 Class IV Maint enanc e
转向主销前轴 Steeringmasterpinfrontaxle	●		●	●	●	●
钢板弹簧销 Steelplatespringpin	●	每 4 周至少一次 Atleastonceever yfourweeks				
减振器下支架 Lowersupportingframeofthereducer	●	●	●	●	●	●
变速器换挡杆支座	●	●	●	●	●	●

Supporting seat of the transmission gear shift lever						
制动凸轮轴及制动臂 Brake camshaft and brake arm	●	●	●	●	●	●
牵引钩 trailing hook	●	●	●	●	●	●
鞍座 Saddle	●	●	●	●	●	●
驾驶室车门铰链 Vehicle door hinge of the cab			●	●	●	●
按计划对驾驶室重新进行防锈处理 Rust-proof treatment for the cab according to the plan.	每隔 12 个月一次 Once every 12 months					

注：在工地使用的汽车每周一次，清洗后的汽车应给所有润滑点重新加润滑脂。

Note: as for the vehicles used in the construction site, the user shall clean the vehicles once every week, and shall fill the lubricating grease to the lubricating points after cleaning.

(五)燃料、润滑油和加注量

(V) Fuel, lubricating oil and filling amount

名称 name	牌号 brand	总成 assembly	用量 (升) dosage (L)
柴油 夏季凝点<0℃ Diesel Condensation point in Summer <0° C 冬季凝点<-20℃ Freezing point in winter < -20° C	GB252 优级品 0 号轻柴油 GB252 Premium Grade 0Light Diesel GB252 优级品-20 号轻柴油 GB252 Premium Grade-20 Light Diesel Oil		按油箱 容 量 By fuel tank capacity
发动机机油 Engine oil	冬季 CI-4 5W/30 Winter CI-4 5W/30 夏季 CI-4 5W/40 Summer CI-4 5W/40	WP7 系列发动机 WP7 series engine	20
		WP9/10H 系列发动机 WP9/10H series engine	30
		WP10 系列发动机 WP10 series engine	24
		WP12 系列发动机 WP12 series engine	28
		ISM 系列发动机 ISM series engine	34

名称 name	牌号 brand	总成 assembly	用量 (升) dosage (L)
潍柴 EGR 系列 国三排放柴油机 Weichai EGR series EURO III diesel engine	CF-4WP-E32	蓝擎系列; 超大吨位重卡; WP10、WP12 系列 EGR 发动机 Landking series; heavy duty truck in large tonnage; WP10. WP12 series EGR engine	24 28
齿轮油 Gear oil	API-GL4 或 GL-5 85W/90 重负荷车辆齿轮油 GL-5 85W/90 Gear oil for heavy-duty vehicle	变速器 transmission 法士特 9 档 FAST 9gears 法士特 12 档 FAST 12 gears 法士特 16 档 FAST 16 gears 伊顿 S9 S15 系列变速器 Eaton S9 S15 series transmission ZF 16 档系列 ZF 16 series transmission	12 14.5 15 13.2 14
		STR 冲焊桥 STR welding axle 中桥主减速器 Middle axle main reductor 后桥主减速器 rear axle main reductor 轮边减速器 (每边) Wheel reductor (each side)	8.3 6 2

名称 name	牌号 brand	总成 assembly	用量 (升) dosage (L)
齿轮油 Gearoil	API-GL4 或 GL-585W/90 重负荷车辆齿轮油 GL—585W/90 Gearoilforheavy-dutyveh icle	STR 铸造桥 STR cast axle 中桥主减速器 Middle axle main reductor 后桥主减速器 rear axle main reductor 轮边减速器 (每边) Wheel reductor (each side)	12.3 8.3 2.8
		TGX 桥 TGX axle 中桥主减速器 Middle axle main reductor 后桥主减速器 rear axle main reductor 轮边减速器 (每边) Wheel reductor (each side)	16 12 3.5
		MAN 单级 HD425 中桥主减速器 Middle axle main reductor 后桥主减速器 rear axle main reductor 轮边减速器 (每边) Wheel reductor (each side)	14 11.5 1.1

名称 name	牌号 brand	总成 assembly	用量 (升) dosage(L)
齿轮油 Gearoil	API-GL4 或 GL-585W/90 重负荷车辆齿轮油 GL—585W/90 Gearoilforheavy-dutyvehicle	STR 铸造桥 STR cast axle 中桥主减速器 Middle axle main reductor 后桥主减速器 rear axle main reductor 轮边减速器 (每边) Wheel reductor (each side)	12.3 8.3 2.8
		TGX 桥 TGX axle 中桥主减速器 Middle axle main reductor 后桥主减速器 rear axle main reductor 轮边减速器 (每边) Wheel reductor (each side)	16 12 3.5
		MAN 单级 HD425 中桥主减速器 Middle axle main reductor 后桥主减速器 rear axle main reductor 轮边减速器 (每边) Wheel reductor (each side)	14 11.5 1.1

名称 name	牌号 brand	总成 assembly	用量（升） dosage (L)
齿轮油 Gearoil	API-GL4 或 GL-585W/90 重负荷车辆齿轮油 GL—585W/90 Gearoilforheavy-dutyvehicle	MAN 单级 HD469	14
		MAN single reduction HD469	
		中桥主减速器	
		Middle axle main reductor	
		后桥主减速器	11.5
		rear axle main reductor	
		轮边减速器（每边）	
		Wheel reductor (each side)	
		MAN 单级 HD485	14.3
		MAN single reduction HD485	
		主减速器	
		Main reductor	
		轮边减速器（每边）	1.1
		Wheel reductor (each side)	

名称 name	牌号 brand	总成 assembly	用量 (升) dosage (L)
液压油 Hydraulic oil	TRANSYND	Allision 自动变速箱 Allision Automatic transmission	3000 系列为 27 The 3000 series is 27 4000 系列为 45 The 4000 series is 45
	HVN32 低温液压油 low temperature hydraulic oil GB7631.2-87	ZF 转向加力器 ZF Steering booster	3.5
			4.5
		驾驶室翻转油 Cab flip oil	0.3
		转向助力装置 Steering assist device	单前轴车型 3.9 the vehicle of Single front axle 3.9
			双前轴车型 5.1 the vehicle of double front axle 5.1

名称 name	牌号 brand	总成 assembly	用量（升） dosage (L)
长效防冻防蚀冷却液（冬夏季常年使用） Long-term anti-freeze anti-corrosion coolant (used in summer and winter)	重负荷四季长效 Heavy duty four-year long-acting 防冻防蚀冷却液 Antifreeze and anti-corrosion coolant	WP10 WP12	约 40L （按需） About 40L (on demand)
锂基润滑脂 或复合润滑脂 Lithium grease or composite grease	3 锂基润滑脂 Lithium grease (GB7324-87)	前轴轮毂（每个） Front axle hubs (each)	600 克 600g
		底盘部分（每个） Chassis section (each)	约 250 克 （按需）About 250g (on demand)
	2 锂基润滑脂 Lithium grease (GB7324-87)	水泵 Water pump	120 克 120g
		离合器分离装置 Clutch separation device	按需 On demand

缓速器相关介绍

Increase content: retarder related introduction

缓速器型号 Retarder model	保养维护换油时所填充的油量 (L) The amount of replacement oil you need to fill during maintenance (L)	维修或更换热交换器后所填充的油量 (L) The amount of oil filled or maintained after the heat exchanger is repaired or replaced. (L)	如果缓速器整体维修并更换热交换器后所填充的油量 (L) (初始装载) If the retarder is repaired and replaced by heat exchanger, the amount of oil filled will be increased. (L) (initial loading)
VR115CN(并联) (Parallel connection)	5.90	6.60	6.80
FHB320B(并联) (Parallel connection)	5.50	5.50	5.50
FH400B(串联) (Series connection)	7.0	7.0	9.0
VOITH (福伊特) 和法士特并联缓速器没有设计油量检测孔, 必须采用放油检查加注量 VOITH and FAST parallel retarders do not design oil measuring holes, and the amount of oil injection must be checked.			

缓速器 厂家 Retarder manufact urer	供应商 Supplier	品牌 brand	品牌 brand	SAE等级 SAE Grade	性能等级 Performance grade
福伊特 VOITH	美孚 Mobil	Mobil Delvac XHP Extra	美孚黑霸王 XHP 特级 Mobil delvac super XHP	10W-40	A
	美孚 Mobil	Mobil Delvac 1	美孚黑霸王 1 号 Mobil delvac No. 1	5W-40	B
	长城 Great Wall	Sinopec JUSTAR J500 (SL)	长城牌金吉星 The Great Wall brand gold Jetion	5W-40	B
	长城 Great Wall	Sinopec JUSTAR J500 (SM)	长城牌金吉星 The Great Wall brand gold Jetion	5W-40	B

缓速器 厂家 Retarder manufact urer	供应商 Supplier	品牌 brand	品牌 brand	SAE等级 SAE Grade	性能等级 Performance grade
法士特 FAST	多级合成机油：10W-40 Multistage synthetic oil: 10W-40				API-CC或 API-SF以上 API-CC or Above API-SF
换油周期：公路运输：9000km，工程车辆：45000km；但不超过 2 年 Oil change cycle: Road Transportation: 9000km, construction vehicle: 45000km, but not more than 2 years.					

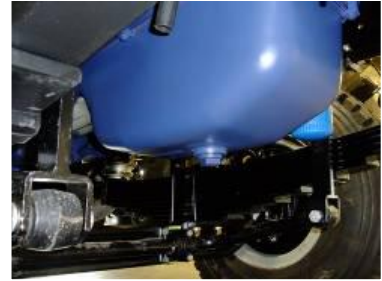
牌 号 Brand 项 目 Items	JFL318	JFL-336	JFL-345
适应选用最低气温 Choose the applicable minimum temperature	-10℃	-26℃	-35℃

更换发动机油时要在热状态时进行

Replace engine oil in thermal state.

将旧油放出时应注意检查机油颜色是否正常和有无异物，以便发现故障隐患。待油放尽后拧紧清除杂物的放油螺栓，更换新机油滤清器芯，将新机油注入发动机到油尺上限。为防止在没有润滑油的情况下启动发动机，应使用排气制动器或使高压油泵处于断油位时按动起动按钮，空运转一会儿后，再启动发动机，并低速运转。检查机油滤清器有无渗漏，停机五分钟后，检查并补充机油油面到油尺上限。

In the process of the oil drainage, the user shall check the engine oil to see whether its color is normal and it has any foreign material so as to find out the fault hidden danger. After the oil has been drained off, the user shall fasten the oil drainage bolts for previous foreign material elimination and shall replace the new engine oil filter cartridge and then fill new engine oil into the engine until it reaches the upper limit of the oil gauge. In order not to start the engine without any lubricating oil, the user shall use the exhaust brake or press the start button when the high pressure oil pump is in the fuel cut-off position and then start the engine and keep it in low revolution speed after idling for a moment. Check the engine oil filter for any leakage. After the engine is shut for about five minutes, the user shall check and fill engine oil to the upper limit of the oil gauge.



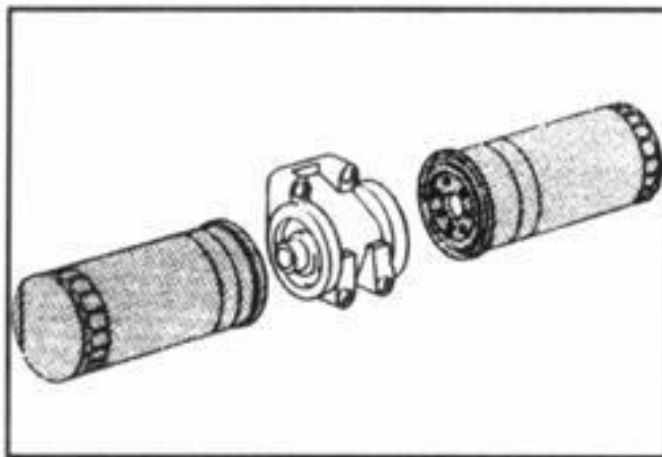
换发动机机油

换机油滤芯

Replace the engine oil filter cartridge

两个关联的机油滤清器的滤芯要同时更换。在密封垫上涂上一层薄薄的油，并且只能用手固紧滤清器。

Replace the filter cartridges of the two related engine oil filters at the same time. Spread one layer of thin oil on the seal washer and then manually fasten the filter.



调整气门间隙

Adjust the valve clearance

冷发动机的气门间隙

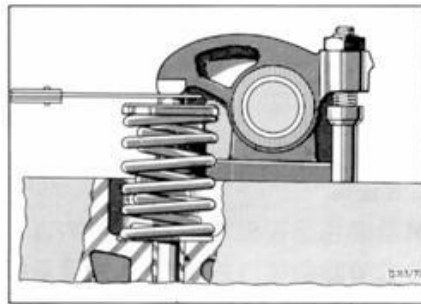
The valve clearance of the cold engine

进气门: 0.3 毫米

Air intake valve: 0.3mm

排气门: 0.4 毫米

Air exhaust valve: 0.4mm



燃油滤清器

Fuel filter

应同时更换两个滤芯

Replace the two filter cartridges at the same time.

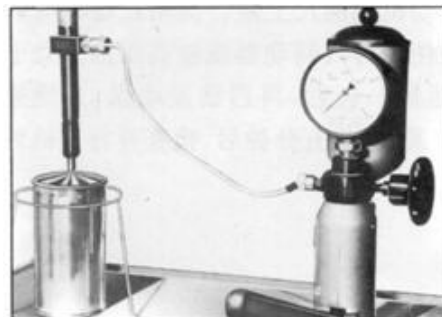


检查喷油嘴开启压力

Check the open pressure of the oil injection nozzle

喷油压力: 225 巴

Oil injection pressure: 225 bars



清洗燃油粗滤器

Clean the fuel strainer

1-油滤器盖 1-oil filter cover

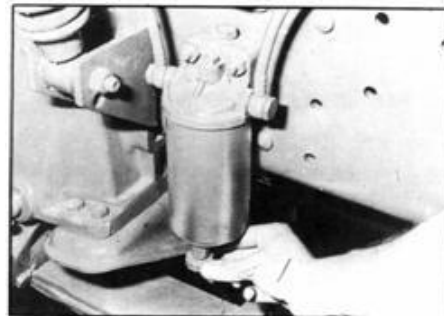
2-放气螺塞 2-air drainage screw plug

每天打开排液塞，将杂质排出。

Open the fluid drainage plug every day to drain the impurities.

每次保养时，都要清洗滤芯。

Each time the maintenance is carried out, the user shall clean the filter cartridge.



空滤器保养指示灯检查

Check the air filter maintenance indicator light

将驾驶室翻转，在发动机运转情况下，短时间地盖住进气口，空滤器保养指示灯应立即亮。

Overturn the cab and quickly cover the air inlet in case that the engine is running, and then the air filter maintenance indicator light should immediately light up.



5-堵塞报警指示器

5- Clogging alarm indicator

注意：

不能单纯依靠堵塞报警指示灯来判定空滤器是否阻塞，应根据使用情况不定期的拆盖检查。

NOTE: Do not solely rely on the clogging alarm indicator to determine whether the air filter is blocked. Please do unscheduled inspection by opening the cover according to usage.



空滤器的保养

1、普通空滤器

若空滤器阻塞报警灯点亮，应擦净集尘装置，清除滤芯上的尘土。

扳动空滤器端盖卡扣或者拧动螺母，取下端盖，清理端盖内的尘土，并用干净抹布擦拭。注意：侧置抬高布置的空滤，需先翻转驾驶室。

Maintenance of Air filter

1. Common air filter

If the clogging alarm indicator light of Air filter is on, please wipe the dust collector and remove dust from the filter element.

Pull the buckle of the air filter cover or Screw nut, remove the end cap, clean the dust inside the end cap, and wipe with a clean cloth.

Note: For the elevated air filters, mounted on the side, the cab should be turning over first.



轻轻抽出主滤芯，用压力不高于 500kPa 的干燥压缩空气，沿斜角交叉方向吹净滤芯内、外表面。最好由内向外吹。并擦净密封端面。

Gently pull out the main filter element with dry compressed-air with a pressure not higher than 500 kPa blowing the net inside and outside surface of the filter element along the diagonal cross direction. It's best to blow from the inside out. Wipe the sealing end face.



严禁将滤芯的一端在汽车轮胎上轻敲，以抖掉里面的尘土。这种方法不能将灰尘清除干净。

将照明工具（如手机、手电筒灯）放入滤芯里，然后检查外表面有无裂缝、穿孔或其它损坏。

注 意： 严禁使用有裂缝和穿孔的滤芯，否则将导致发动机异常磨损。



It is forbidden to tap one end of the filter element on the car tire to shake off the dust inside. This method does not remove the dust totally.

Place lighting tools (such as cell phones, flashlights) into the filter element and inspect the outer surface for cracks, perforations, or other damage.

Note: It is forbidden to use cracked and perforated filter elements, otherwise it will cause abnormal engine wear.

检查密封圈 7。若密封圈已损坏或滤芯有任何其它的损坏时一定要更换。

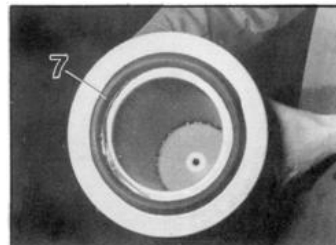
Check the seal ring 7. If the seal ring is damaged or if there is any other damage to the filter element, it must be replaced.

安全滤芯

安全滤芯只能换不能清洗。在主滤芯每清理 5 次或损坏后，或每两年要更换一次安全滤芯。若在主滤芯刚清理后指示灯马上又亮，则应更换安全滤芯。

Safety filter

Safety filter can only be changed, not cleaned. Replace the safety filter element after every 5 times' cleanness, or damaged, or every two years. If the indicator light up immediately after the main filter element has been cleaned, then the safety filter element should be replaced.



安装顺序

①轻轻将安全滤芯插入空滤器壳里，径向密封结构的将密封圈装配到位调整好，轴向密封结构的用大六角螺母固紧。

②轻轻将主滤芯插入空滤器壳里，径向密封结构的将密封圈装配到位调整好，轴向密封结构的用小六角螺母固紧。

③装上有排尘阀的盖子（其口一定要朝后或朝下），并扣好卡扣或者拧紧中心螺栓上的螺母。



Installation sequence

- ① Gently insert the safety filter element into the air filter housing. The radial seal structure adjusts the seal ring in position. The axial seal structure is fastened with a large hex nut.
- ② Gently insert the main filter element into the air filter housing. The radial seal structure adjusts the seal ring in place. The axial seal structure is fastened with a small hex nut.
- ③ Install the lid with the dust valve (the port must be facing backwards or downwards) and fasten the buckle or tighten the nut on the center bolt

2、油浴式空滤器

新车出厂前未加注机油，投入运营时务必先加注 4L 机油，机油黏度必须类似发动机同期用的机油。

车辆运行 5000 公里或连续使用 80-150h，应拆下油底壳查看。

当晃动底壳，机油不易流动时需清洗滤芯总成，更换机油。

在特别恶劣的使用条件下，必须每天检查清洗并更换机油。

滤芯应定期保养或更换，并保证密封良好，保养与更换滤芯的方法与普通空滤器相同。



2.Oil bath air filter

The new car has not been filled with oil before leaving the factory. When it is put into operation, it must be filled with 4L of oil. The viscosity of the oil must be similar to the oil used in the engine during the same period.

If the vehicle is operated for 5,000 kilometers or continuously used for 80-150 hours, the oil pan should be removed for inspection.

When shaking the bottom shell, it is necessary to clean the filter assembly and change the oil when the oil is not easy to flow.

Under particularly harsh conditions of use, daily inspections must be performed to clean and change the oil.

The filter element should be regularly maintained or replaced, and the seal is good. The method of maintenance and replacement of the filter element is the same as that of an ordinary air filter.

3、沙漠空滤器

沙漠空滤器由壳体、旋风管粗滤器、主滤芯和安全滤芯等部件组成。

每行驶一周：挤捏排尘袋排尘积灰，检查排尘袋的完好性。

粗滤器的保养

①按照主滤芯的保养方法拆下主滤芯，同时拆下安全滤芯，将出气口与发动机断开或用净物堵隔。



- ②打开卡子取下下盖，清理表面积尘
- ③用压缩空气反复吹净各部位积尘；
- ④按照相反顺序安装各部件，并检查安装是否到位。

滤芯应定期保养或更换，并保证密封良好，保养与更换滤芯的方法与普通空滤器相同。

警告：用户使用滤芯时，应使用原厂生产的同型号滤芯；绝对不能使用不合格的滤芯，否则，会因此产生发动机非正常磨损。

3. Desert air filter

Desert air filter consists of shell, cyclone pipe strainer, main filter element and safety filter element and other components.

Use for Every week: squeeze the dust bag to remove dust and check the integrity of the dust bag.

Maintenance of strainer

- ① Remove the main filter element according to the maintenance method of the main filter element, remove the safety filter element at the same time, and disconnect the air outlet from the engine or block it with a clean material.
- ② Open the clip and remove the cover to clean the surface dust.
- ③ Repeatedly blowing various parts with compressed air
- ④ Install the parts in reverse order and check that the installation is in place

The filter element should be regularly maintained or replaced, and the seal should work as required. The method of maintenance and replacement of the filter element is the same as that of the common air filter.

Warning: When using the filter element, the user should use the filter element of the same type produced by the original manufacturer; absolutely not to use the unqualified filter element. Otherwise, abnormal engine wear will occur.

变速器油面检查及换油

Check the transmission oil level and change the oil

1-油面检查与加油螺塞

1-Check the oil level and the oil filling screw plug

2-放油螺塞（从变速器底部看）

2-Oil drainage screw plug (check from the bottom of the transmission)

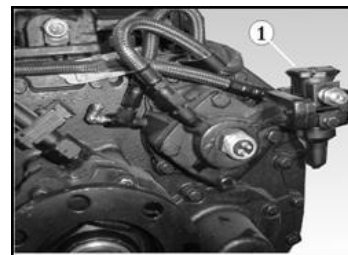


富勒变速器空滤器

Fuller transmission air filter

清洗空气滤清器中的滤芯 1，并用压缩空气吹干。若滤清器有损坏，则一定要更换。

Clean the filter cartridge 1 of the air filter and dry it by the compressed air. If the filter has any damage, the user must replace it.



检查后驱动桥的油面

Check the oil level of the rear drive axle

1-加油螺塞

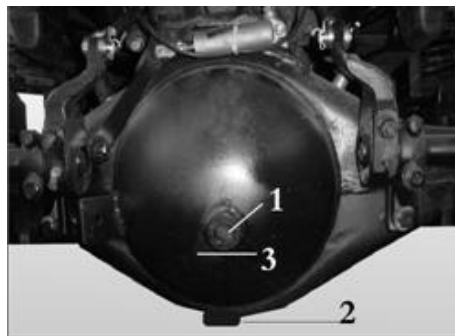
1-Oil filling screw plug

2-放油螺塞

2-Oil drainage screw plug

3-油面

3-Oil level



检查中桥的油面

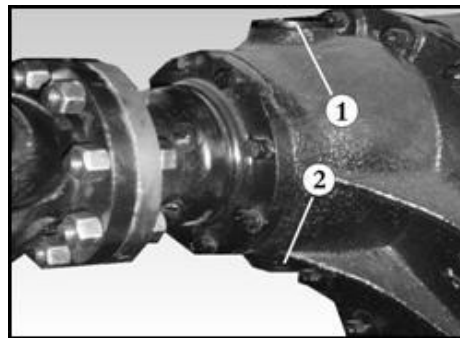
Check the oil level of the intermediate axle

1-加油螺塞

1-Oil filling screw plug

2-放油螺塞

2-Oil drainage screw plug



后桥的行星式轮边减速器

Planetary hub reducer of the rear axle

1-加油螺塞

1- Refueling screw plug

2-放油螺塞

2 -Oil drain plug

3-油面

3-Oil level

换油（热油时）

转动轮毂，使放油螺塞 2 转到下方。放出轮边减速器中的油，

然后仍在此位置上由 1 处加油。再将轮毂转到图示位置，让多余的油流出。

Change oil (when hot oil)

Turn the wheel hub to put the oil drain plug 2 to the down position. Release the oil in the wheel reductor,
Release the oil in the wheel reductor,

Then still refuel at position from 1. Then turn the hub to the position shown in the picture, so that the excess oil flows out.



注意：轮边装配轮毂轴承单元时，不用加换润滑油，50 万公里免维护。在轮毂上会铆接警告标识。

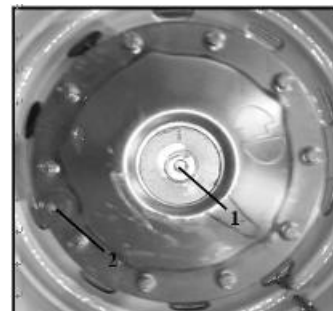
Note: When wheel hubs are equipped with wheel hub bearing units, there is no need to change lubricants and 500,000 km are maintenance-free. Warning signs will be riveted on the hub.

清洗桥的通气装置。

将所有的前、后驱动桥轮毂上的通气孔螺塞拧下，并用压缩空气吹净。

Clean the bridge ventilator.

Loosen the vent plugs on all front and rear axle hubs and blow them down with compressed air.

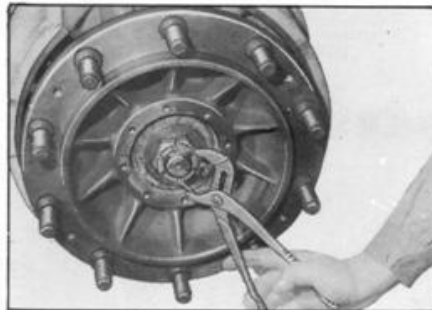


刚性前轴

更换轮毂中的润滑脂。

Rigid front axle

Replace the grease in the hub.



摩擦片厚度检查

Friction plate thickness check

摩擦片属于损耗件，使用过程中，厚度减薄会造成制动间隙加大，制动效果变差，影响行车安全。

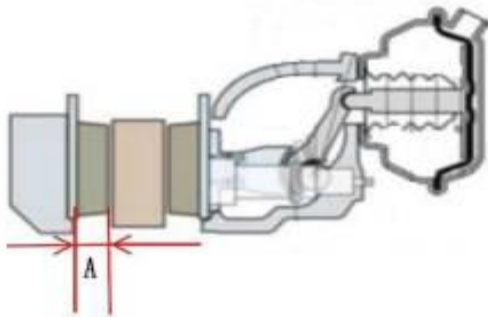
Friction plates are wearing parts. During use-procedure, thickness reduction will increase the braking gap and the braking effect will deteriorate, which will affect the safety of driving.

1. 盘式制动器:

Disc brakes:

要求摩擦片厚度不得小于 2mm，否则需要及时停车对制动摩擦片进行更换维修。

It is required that the thickness of the friction plate should not be less than 2mm. Otherwise, the brake pads need to be replaced in time after parking.



2. 鼓式制动器:

Drum brake:

要求摩擦片厚度不得小于 6mm。

The thickness of the friction plate must not be less than 6mm.

用户需定期检查制动摩擦片，先拔掉制动毂内侧检测窗口处的防尘塞，通过的制动间隙调整窗口观察制动蹄上摩擦片的状态，正常摩擦片有一个台肩，台肩高度为 6mm，当摩擦片磨损至与台肩高度一致或台肩消失，则此时必须马上更换摩擦片。

The user needs to check the brake linings on a regular basis. Pull out the dust plug at the detection window at the inner side of the brake hub first. Observe the condition of the friction lining on the brake caliper through the brake clearance adjustment window. The normal friction lining has a circular bead, whose height is 6mm. When the friction plate wears to the same height as the circular bead or the circular bead disappears, the friction plate must be replaced immediately.



制动器的间隙调整

Brake clearance adjustment

1. 制动间隙手动调整臂

1. Brake clearance manual adjustment arm

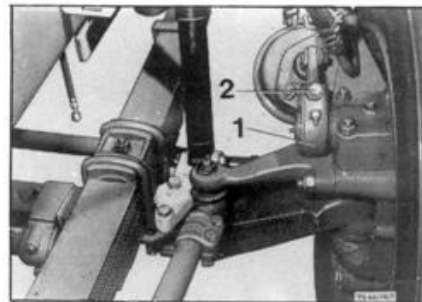
当蹄鼓间隙不满足 0.7~1.2mm 的要求时, 就必须对制动间隙进行调整:

驱动桥制动器间隙的调整方法: 向里旋动间隙调节臂上的螺钉, 直至车轮锁死, 再把调节螺钉往后退, 听到三次响声即可。When the hoof drum clearance does not meet the requirements of 0.7-1.2mm, the brake clearance must be adjusted:

Drive axle brake clearance adjustment method: inwardly turn the screw on the gap adjustment arm until the wheel locks, and then back off the adjustment screw again and hear three sounds.

前轴制动器间隙的调整方法: 旋动蜗杆轴端六角螺栓 2, 直至车轮锁死, 再返旋, 听到三次响声即可。

Front axle brake clearance adjustment method: Rotate the worm shaft end hexagon bolt 2 until the wheel locks and re-rotate again until you hear three-time sounds.



2. 制动间隙自动调整臂

2. Brake clearance automatic adjustment arm

自调臂在正常情况下，用户无需手动调整制动间隙，只要定期进行日常维护保养、检查调整臂功能是否正常即可。如有问题，请及时更换。

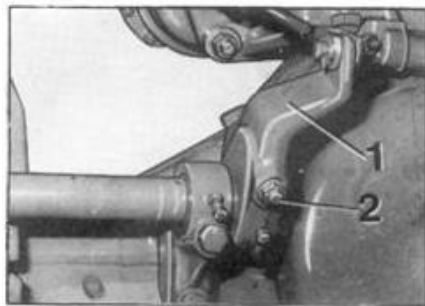
Under normal conditions, the user does not need to manually adjust the braking gap of automatic adjustment arm if the user does the regular maintenance and regular inspection of the adjustment arm function. If there is a problem, please replace it in time.

注意事项:

Notes:

1. 因为自调臂的结构特点是其间隙为自动调整，故要求只有在安装、拆卸、检测时，才允许手动转动蜗杆六角头，否则，会严重影响调整臂使用寿命。

1. Because the structural characteristics of the automatic adjustment arm is that the clearance is automatically adjusted, it is required to manually rotate the worm's hex head only when it is installed, disassembled and tested. Otherwise, the service life of the automatic adjustment arm will be seriously affected.



2. 售后维修重新装配制动气室或调整臂时，必须严格按照正确的操作程序进行，安装有误将会导致制动间隙过小，必须重新按照正确步骤进行装配。否则会造成车辆出现制动发热、摩擦片异常磨损、左右制动力矩不平衡、调整臂易损坏等问题出现。

On the condition of after-sales maintenance, when re-assembling the brake air chamber or the adjusting arm, it must be carried out in strict accordance with the correct operating procedure. An incorrect installation will result in a too-small brake gap and must be re-assembled in accordance with the correct procedure. Otherwise, it will cause the brakes to generate heat, the abnormal wear of friction plates, the unbalance of the left and right brake torques, and easily damage to the adjustment arm.

3. 盘式制动器均为制动间隙自动调整装置，无需手动调整。

Disc brakes are the brake clearance automatic adjustment devices and there is no need to manually adjust

液压转向系统液压油的检查与更换

Check and replace the hydraulic oil of the hydraulic steering system.

1. 转向油的检查与加注

1. The inspection and fill of the steering oil.

在发动机停止运转的情况下，查看转向油罐内油面高度，液面高度不应高于油罐观测孔上沿（或 MAX 刻线），在发动机运转的情况下，液面高度不应低于油罐观测孔下沿（或 MIN 刻线）。

When the engine stops running, check the height of the oil surface in the steering oil tank. The level of the liquid surface should not be higher than the top of the tank observation hole (or the MAX line). In the case of the engine running, the level of the liquid level should not be lower than the lower edge of the tank observation hole (or the MIN line).

油面不足时应及时补油。补油时，启动发动机并使其保持在低速稳定运转，在向油罐补充新油的同时，将方向从一个极端打到另一个极端反复进行，直到油罐内明显没有气泡溢出为止。熄灭发动机，将油罐油面加至上述要求位置，将盖密封。

If the level is lower than the scale mark, the user shall immediately fill the oil. When the oil filling is going to be carried out, the user shall start the engine and keep it run in low revolution speed. In the process of filling oil into the oil storage tank, the user shall repeatedly



turn one side to the other until there is no air in the return oil. Shut down the engine and fill the oil into the oil storage tank until the oil level reaches to the required position and then seal it by cover.

注意：补油必须使用相同种类的液压油，并要特别注意不允许使脏物和尘土进入转向油罐内。

Note: Charge must use the same kind of hydraulic oil, and special care must be taken not to allow dirt and dust to enter the steering tank.

2. 转向油更换周期

2.Steering oil change cycle

首次更换在 2000-4000km，以后每行驶 13000-15000km 需更换液压油或视具体情况（油液变质、杂质较多等）更换。

For the first time in 2000-4000km, after each 13000-15000km, hydraulic oil should be replaced or replaced according to specific conditions (oil deterioration and impurities).

更换转向油时，应将汽车前轴顶起，打开转向油罐的加油盖，加入洁净的转向油，在发动机停止运转的情况下，将方向从一个极端打到另一个极端反复进行，并同时向转向油罐内加注转向油至要求高度。随后启动发动机，重复上述步骤，直至油液高度满足要求，恢复加油盖。

When replacing the steering oil, the front axle of the car should be jacked up, the steering oil is injected into the tank to the required height when the Steering wheel is repeated from one extreme to the other while the engine stops running. Then start the engine, repeat the above steps

until the oil level meets the requirements, and restore the fuel cap.

注意：更换转向油时，应放出转向器、油泵、油罐、油管及助力油缸的残油，并确认整个液压系统彻底清洁，无任何杂质时，方可加入转向油。

Note: when the steering oil is replaced, the residual oil of the steering gear, oil pump, oil tank, tubing and auxiliary oil cylinder should be released, and the whole hydraulic system is thoroughly cleaned and the steering oil can be added without any impurity.

转向油罐

Steering oil tank

在更换油罐滤芯（单前轴车型 DZ95189470088/双前轴车型 DZ95319470088）时，不要让油滴到油罐之外，不要让油污杂物进入油罐，以免造成油路堵塞。

When replacing the oil tank filter cartridge (single front axle model DZ95189470088/ double front axle model DZ95319470088), do not let oil drop out of the oil tank, do not let oil dirt into the oil tank, so as not to cause oil road blockage.



水泵轴承润滑

Bearing lubrication of the water pump

将水泵的润滑脂帽往下拧一圈

Loosen the lubricating grease cap of the water pump for one circle

润滑离合器分离轴

Lubricate the clutch release axle

润滑离合器分离轴右边及左边的轴承。

Lubricate the right and left bearing of the clutch release axle

润滑离合器分离轴承

Lubricate the clutch release bearing

装富勒变速器

Install the Fuller transmission

润滑万向节

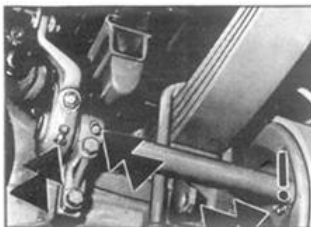
Lubricate the universal joint

润滑转向节主销及制动臂制动凸轮轴

Lubricate the steering joint pin and the brake cam shaft of brake arm

润滑后桥制动臂和凸轮轴

Lubricate rear axle brake arm and cam shaft



四、灯泡一览表

IV. List of Automobile Bulbs

灯具名称 LightingName		灯泡型号 BulbsModel	灯泡功率 BulbsPower	单车数量 SingleVehicleNumber
近光灯	Low-beamheadlight	H1	70W	2
远光灯	Headlightsonfullbeam	H7	70W	2
前位置灯	Frontpositionlight	W5W	5W	2
前雾灯	Frontfoglight	H3	70W	2
前转向灯	Frontsteeringlight	P21W	21W	2
侧转向灯	Sidesteeringlight	P21W	21W	2
示高灯	Heightlamp	R10W	10W	2
后组合灯 Rearcombinationlamp	转向灯 Steeringlight	P21W	21W	2
	位置灯 Positionlamp	R5W	5W	2

灯具名称 LightingName		灯泡型号 BulbsModel	灯泡功率 BulbsPower	单车数量 SingleVehicleNumber
后组合灯 Rearcombinationlamp	后示廓灯 Rearoutlinemarkerlamp	R5W	5W	2
	制动灯 Brakelight	P21W	21W	2
	倒车灯 Reversinglight	P21W	21W	2
	后雾灯 Rearfoglight	P21W	21W	2
	侧位置灯 Sidepositionlamp	R10W	10W	2
室内照明灯 Indoorlightinglamp		R10W、P21W	10W、21W	4
信号灯 Signallight		1. 2W-BAX10D	1. 2W	32

A101 控制单元
火焰预热冷起动系统，白烟减少装置置
A106 吹风机控制
加热和空调
A156 右侧主视镜
A157 左侧主视镜
A251 左侧广角视镜
A252 右侧广角视镜
B100 火焰预热冷起动
系统的温度传感器/白烟减少装置
B101 制动回路 I 储气筒压力传感器
B102 制动回路 II 气筒压力传感器
B103 燃油液位高度传感器
B104 油压传感器
B105 冷却液温度传感器
B109 驻车制动开关检测灯
B110 行驶记录仪传感器
E102 左侧倒车灯

E108 右侧驻车灯
E109 左侧驻车灯
E110 前大灯近光，右侧
E111 前大灯近光，左侧
E112 前大灯远光，右侧
E113 前大灯远光，左侧
E114 车前信号灯，右侧
E115 车前信号灯，左侧
E116 车后信号灯，右侧
E117 车后信号类，左侧
E118 尾灯、左侧
E119 尾灯、右侧
E122 雾灯，右侧
E123 雾灯，左侧
E124 后雾灯，右侧
E125 后雾灯，左侧
E127 车内照明，左侧
E128 车内照明，右侧

E150 门灯，右侧	F122 保险丝，前大灯远光，右侧
E162 门灯，左侧	F124 保险丝，雾灯和后雾灯
E177 烟灰缸照明，左侧	F125 保险丝，仪表板照明和开关照明
E178 烟灰缸照明，右侧	F128 保险丝，车内照明，阅读灯和门灯，危险警告灯，行车记录仪，收音机
E190 铺位照明	F133 保险丝，吹风机电动机，加热与通风
E204 铺位照明	F153 保险丝，变速箱控制单元（备用）
F106 火焰预热冷起动系统的熔断保险丝	F156 保险丝，燃油滤清器加热（备用）
F107 保险丝，气动喇叭，空气干燥器	F157 保险丝，集中润滑系统（备用）
F108 保险丝，监视器系统（仪表显示，检测灯）	F158 保险丝，点烟器
F109 保险丝，制动灯，倒车灯，驻车制动	F160 保险丝，挂车防抱死制动系统（备用）
F110 保险丝，发动机熄火	F161 保险丝，防抱死制动系统压 1 力控制阀（备用）
F112 保险丝，风挡清洗器和刮刷系统	F162 保险丝，防抱死制动系统控制单元（备用）
F113 保险丝，转向指示灯	F164 保险丝，电控空气悬架（备用）
F117 保险丝，驻车灯和尾灯，左侧	F166 保险丝，后视镜加热器
F118 保险丝，驻车灯和尾灯，右侧	F185 保险丝，辅助加热器
F119 保险丝，前大灯近光，右侧	G100 蓄电池 1
F120 保险丝，前大灯近光，左侧	G101 蓄电池 2
F121 保险丝，前大灯远光，左侧	

G102 交流发电机

H100 交流发电机检测灯（充电检测）

H101 火焰预热冷起动系统的检测灯

H102 空气喇叭

H108 制动回路 I 和 II 的储气筒压力检测灯

H109 机油压力的检测灯

H110 冷却液温度的检测灯

H111 中央警示灯 STOP

H112 制动装置灯，左侧

H113 制动装置灯，右侧

H117 驻车制动检测灯

H118 牵引车转向指示灯的检测灯

H119 挂车转向指示灯的检测灯

H120 车前转向指示灯，右侧的

H121 车前转向指示灯，左侧的

H122 车后转向指示灯，右侧的

H123 车后转向指示灯，左侧的

H125 侧转向指示灯，左侧的

H126 侧转向指示灯，左侧的

H129 大灯远光检测指示灯

H149 驾驶室锁的转向指示灯

H169 气动喇叭 2（用于双音频喇叭）

K102 均断某些线路的继电器，火焰预热塞

K103 动机帛动的伎感器极限值（1050 转/分）

K104 发动机熄火的延时继电器

K105 限速系统的限制阀传感器

K106 继电器，刮水脉冲

K107 转向指示器和间歇刮水传感器

K108 均断某些线路的电源继电器，转向指示器，
右侧

K109 均断某些线路的电源继电器，转向指示器，
左侧

K110 控制单元，转向指示灯

K115 继电器，接线柱 58

K116 驻车 and 尾灯继电器

K117 继电器，雾灯

K118 电器，后雾灯
K119 继电器，前大灯近光和远光
K171 继电器，用电器，接线柱 15
M100 起动机电动机
M102 刮水器电动机
M103 风挡清洗器电动机
M116 吹风机电动机
加热与通风
M117 伺服电动机，前大灯近光调节器，左侧
M118 伺服电动机，前大灯近光调节器，右侧
P100 行驶记录仪
P101 发动机转速计
P102 仪表板显示，制动回路 I 储气筒压力
P103 仪表板显示，制动回路 II
储气筒压力
P104 仪表显示，燃油油位
P105 仪表显示，燃油油位
P106 仪表显示，冷却液温度

Q101 转向锁（点火开关锁）
R100 火焰加热塞 1
R101 火焰加热塞 2
R106 变光开关，仪表板照明
R107 空气干燥器
R108 点烟器
R109 电位器，前大灯灯光调节器
S103 气动喇叭按钮
S104 倒车灯开关
S105 发动机制动脚踏开关
S106 后视镜加热开关
S108 转向柱组合开关（转向指示灯，风挡间歇清洗/
刮水前大灯闪光灯）
S109 危险警告灯开关
S111 开关，灯
S113 雾灯、后雾灯开关
S149 蓄电池总开关（机械操作）
S161 传感器开关，制动灯

S174 开关, 换挡显示
S178 开关, 驾驶室锁
S180 开关, 半档显示
S181 车门控制开关, 左侧
S182 车门控制开关, 右侧
S183 开关, 吹风机, 加热与通风
S185 开关, 轮间差速锁检测灯
S187 开关, 轮间差速检测灯
S198 开关, 驾驶室锁, 右侧
S199 开关, 驾驶室锁, 左侧
V100 单向离合器二极管, 接线柱 115
X129 跨接到中央电气系统
X148 跨接到中央电气系统
Y100 电磁阀, 火焰预热冷起动系统
Y102 电磁阀, 关闭发动机 发动机制动
Y103 电磁阀, 限速系统
Y145 电磁阀, 轮间差速锁

A101 Control Unit	B105 Coolant temperature sensor
Flame preheating cold start system, white smoke reduction device	B109 Parking brake switch detector light
A106 Air blower control	B110 Taveling data recorder sensor
Heating and air conditioner	E102 Left reversing light
A156 Right main mirror	E103 Right reversing light
A157 Left main mirror	E108 Right parking light
A251 Left wide-angle view mirror	E109 Left parking light
A252 Right wide-angle view mirror	E110 Low-beam headlight, right side
B100 Flame preheating cold start	E111 Low-beam headlight, left side
Temperature sensor of the system/white smoke reduction device	E112 Headlight on full beam, right side
B101 Brake circuit I pressure sensor of the air-reserve tank	E113 Headlight on full beam, left side
B102brake circuit II pressure sensor of the air cylinder	E114 Front signal light, right side
B103 Fuel level sensor	E115 Front signal light, left side
B104 Oil pressure sensor	E116 Rear signal light, right side
	E117 Rear signal light, left side
	E118 Tail light left side
	E119 Tail light, right side
	E122 Fog light, right side

E123 Fog light left side
E124 Rear fog light, right side
E125 Rear fog light left side
E127 Interior lighting, left side
E128 Interior lighting, right side
E150 Door light, right side
E162 Door light left side
E177 Ashtray lighting, left side
E178 Ashtray lighting, right side
E190 Berth lighting
E204 Berth lighting
F106 Fuse of the flame preheating cold start system
F107 Fuse, wind-tone horn, air dryer
F108 Fuse, monitor system (instrument display, detector light)
F109 Fuse, brake light, reversing light, parking brake

F110 Fuse, engine flameout
F112 Fuse, windscreen washer and wiping system
F113 Fuse, steering indicator light
F117 Fuse, parking light and tail light, left side
F118 Fuse, parking light and tail light, right side
F119 Fuse, low-beam headlight, right side
F120 Fuse, low-beam headlight, left side
F121 Fuse, headlight on full beam, left side
F122 Fuse, headlight on full beam, right side
F124 Fuse, fog light and rear fog light
F125 Fuse, instrument panel lighting and switch lighting
F128 Fuse, interior lighting, reading light and door light, hazard warning light, traveling data recorder, radio receiver
F133 Fuse, air blower motor, heating and

ventilation

F153 Fuse, gearbox control unit (spare parts)

F156 Fuse, fuel filter heating (spare parts)

F157 Fuse, central lubricating system (spare parts)

F158 Fuse, cigarette lighter

F160 Fuse, trailer antilock brake system (spare parts)

F161 Fuse, antilock brake system pressure control valve (spare parts)

F162 Fuse, antilock brake system control unit (spare parts)

F164 Fuse, electronic control air suspension frame (spare parts)

F166 Fuse, rearview mirror heater

F185 Fuse, auxiliary heater

G100 Rechargeable battery 1

G101 Rechargeable battery 2

G generator

H100 Detector light of AC generator (charging detection)

H101 Detector light of the flame preheating cold start system

H102 Air horn

H108 Pressure detector light of the air-reserve tank in brake circuit I and II.

H109 Detector light of the engine oil pressure

H110 Detector light of the coolant temperature

H111 Central warning light STOPS

H112 Brake light left side

H113 Brake light, right side

H117 Detector light of parking brake

H118 Detector light of the tractor steering indicator light

H119 Detector light of the trailer steering indicator light

H120 Front steering indicator light, right side
H121 Front steering indicator light left side
H122 Rear steering indicator light, right side
H123 Rear steering indicator light left side
H125 Side steering indicator light left side
H126 Side steering indicator light left side
H129 Detection indicator light of the headlight on full beam
H149 Steering indicator light of the cab lock
H169 Wind-tone horn 2 (used for double audio frequency horn)
K102 Relay in some circuits, flame preheating plug
K103 Sensor limit value (1050r/m)
K104 Time delay relay when engine is flameout.
K105 Limit valve sensor of the speed limit system
K106 Relay, wiper pulse

K107 Steering indicator and interim wiper sensor
K108 Power relay in some circuits, steering indicator, right side
K109 Power relay in some circuits, steering indicator, left side
K110 Control unit, steering indicator light
K115 Relay, terminals 58
K116 Parking and tail light relay
K117 Relay, fog light
K118 Electrical devices, rear fog light
K119 Relay, low-beam headlight and headlight on full beam
K171 Relay, electrical devices, terminals 15
M100 Starter motor
M102 Wiper motor
M103 Windscreen washer motor
M116 Air blower motor

Heating and ventilation

M117 Servo motor, low-beam headlight regulator,
left side

M118 Servo motor, low-beam headlight regulator,
right side

P100 Traveling data recorder

P101 Engine revolution gauge

P102 Instrument panel display, brake circuit
I air-reserve tank pressure

P103 Instrument panel display, brake circuit
II

Air-reserve tank pressure

P105 Instrument display, fuel level

P105 Instrument display, fuel level

P106 Instrument display, coolant temperature

Q101 Steering lock (ignition switch lock)

R100 Flame heating plug 1

R101 Flame heating plug 2

R106 Dimmer switch, instrument panel lighting

R107 Air dryer

R108 Cigarette lighter

R109 Potentiometer, headlight regulator

S103 Wind-tone horn button

S104 Reversing light switch

S105 Engine brake pedal switch

S106 rearview mirror heating switch

S108 Steering pillar combination switch
(steering indicator light, windscreen interim
cleaning/wiping headlight flashlight)

S109 Hazard warning light switch

S111 Switch, light

S113 Fog light, rear fog light switch

S149 Rechargeable battery master switch
(mechanical operation)

S161 Sensor switch, brake light

S174 Switch, gear shift display

S178 Switch, cab lock	shutting down the engine
S180 Switch, semi-gear display	Y103 Electromagnetic valve, speed limit system
S181 Vehicle door control switch, left side	Y145 Electromagnetic valve, inter-wheel
S182 Vehicle door control switch, right side	differential lock
S183 Switch, air blower, heating and ventilation	
S185 Switch, inter-wheel differential lock detector light	
S187 Switch, inter-wheel differential detector light	
S198 Switch, cab lock, right side	
S199 Switch, cab lock, left side	
V100 One-way clutch diode, terminals 115	
X129 Connect to the central electrical system	
X148 Connect to the central electrical system	
Y100 Electromagnetic valve, Flame preheating cold start system	
Y102 Electromagnetic valve, engine brake for	

(a) 收录机导线连接

电流路径的设计

1. 动力传输, 起动机控制, 火焰预热冷起动系统
2. 机油压力和温度计油箱压力 1-2 燃油油位, 冷却液温度
3. 危险警告灯和指示灯 STOP 灯, 机油压力, 储气筒压力, 卸车, 驻车制动, 驾驶室锁
4. 行驶记录仪
5. 发动机转数表
6. 轮间差速锁
7. 空气干燥器, 气动喇叭
8. 制动灯, 倒车灯
9. 后视镜加热器
10. 转向指示灯
11. 加热, 通风
12. 点烟器, 车内灯和门灯中央电气系统
13. 风挡清洗器 刮水器
14. 照明开关, 仪表板照明

(a) Wiring connection of the radio recorder
Design of the current path

1. Power transmission, starter control, flame preheating cold start system
2. Engine oil pressure and temperature, fuel tank pressure 1-2 fuel level, coolant temperature
3. Hazard warning light and indicator light STOP light, engine oil pressure, air-reserve tank pressure, unloading, parking brake, cab lock
4. Traveling data recorder
5. Engine revolution counter
6. Inter-wheel differential lock
7. Air dryer, wind-tone horn
8. Brake light, reversing light
9. Rearview mirror heater
10. Steering indicator light
11. Heating, ventilation
12. Cigarette lighter, inner light and door light, central electrical system
13. Windscreen washer and wiper
14. Lighting switch, instrument panel lighting

- 15. 前大灯
- 16. 驻车尾灯和信号灯
- 17. 雾灯
- 18. 后雾灯
- 19. 发动机制动发动机熄火
- 20. 速度限制系统
- 21. 前大灯光束调节器
- 22. 备用保险丝

- 15. Headlight
- 16. Parking tail light and signal light
- 17. Fog light
- 18. Rear fog light
- 19. Engine brake, engine flameout
- 20. Speed limit system
- 21. Headlight beam regulator
- 22. Standby fuse

更换前大灯灯炮

Replace the headlight bulb

打开前大灯灯座

Open the headlight socket

- 打开前大灯灯座

Open the headlight socket

- 使用专用钥匙（↑）向上拔弹片，即可打开大灯灯座。向前翻转前大灯灯座。

• Use the special key raise the clip upward (↑) and then open the headlight socket. Overturn the headlight socket.

- 按住锁止机构，并取下前大灯灯罩。• 将线缆插头从灯座拔出

- Hold the lockup mechanism and remove the headlight cover.

- 将电灯座的弹簧接头臆压在一起并向下折叠起来

- • Press the clip to the connector of the socket together and then fold it.

- 取下已坏的灯泡

- Remove the damaged bulb.

- 换上新卤素灯泡，将锁止凸舌卡在反光镜的凹槽里

- Change the new halogen bulb and then get the lockup flange stuck in the groove of the reflector.

- 将弹簧夹抬起

- Raise the spring clip.

- 一起压弹簧接头，使其卡住锁止凸舌
- Press the spring connector to make it lock the lockup flange.
- 将线缆插头插回灯座
- Plug the cable connector into the socket.
- 装回前大灯保护罩
- Install the headlight protective cover.
- 盖上前大灯灯座
- Cover the headlight socket
- 检查前大灯的调整情况。如有必要，可再次调整。
- Check the adjustment of the headlight. Re-adjust headlight if necessary.



说明：远光和近光的灯泡是相同的，因此如果没有多余的灯泡，也可暂时用远光灯泡来代替近光灯泡。

Instructions: the bulbs of low-beam headlight and headlight on full beam are same, so if there is no spare bulb, the user can use the bulb of headlights on full beam to replace the bulb of the low-beam headlight.

更换侧边灯灯泡

Replace side light bulbs

- 按下灯座 (→)，旋转并取下灯座，将其从后部拿出
- Press the socket (→) and rotate to remove the socket and take it out from the back.
- 换上新灯泡
- Change the new bulb.
- 以相反的顺序安装灯座
- Install the socket in a manner on the contrary to the removing steps.

更换仪表或检测指示灯

Replace the instrument or detection indicator light

按以下步骤更换出故障的仪表或指示灯

Replace the instruments or the indicator lights with faults according to the following steps:

- 关闭蓄电池控制开关，或断开蓄电池
- Turn off the control switch of the rechargeable battery or switch off the rechargeable battery.
- 拧下螺钉，从仪表板顶部取下仪表盖。
- Screw out the bolts and remove the instrument cover from the top of the instrument panel.

- 从仪表盘出故障部分取下螺钉
- Screw out the bolts in the fault parts of the instrument panel.
- 向上振摇这部分仪表板，将其从后部提出来。
- Shake out the instrument panel and pull it out of the back.
- **排除故障**
- **Eliminate the faults**

按相反的顺序，重新安装这一部分。

Install the parts in a manner on the contrary to the removing steps.

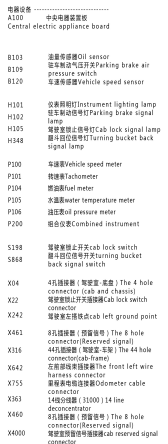
五、电器原理图 (1-15)

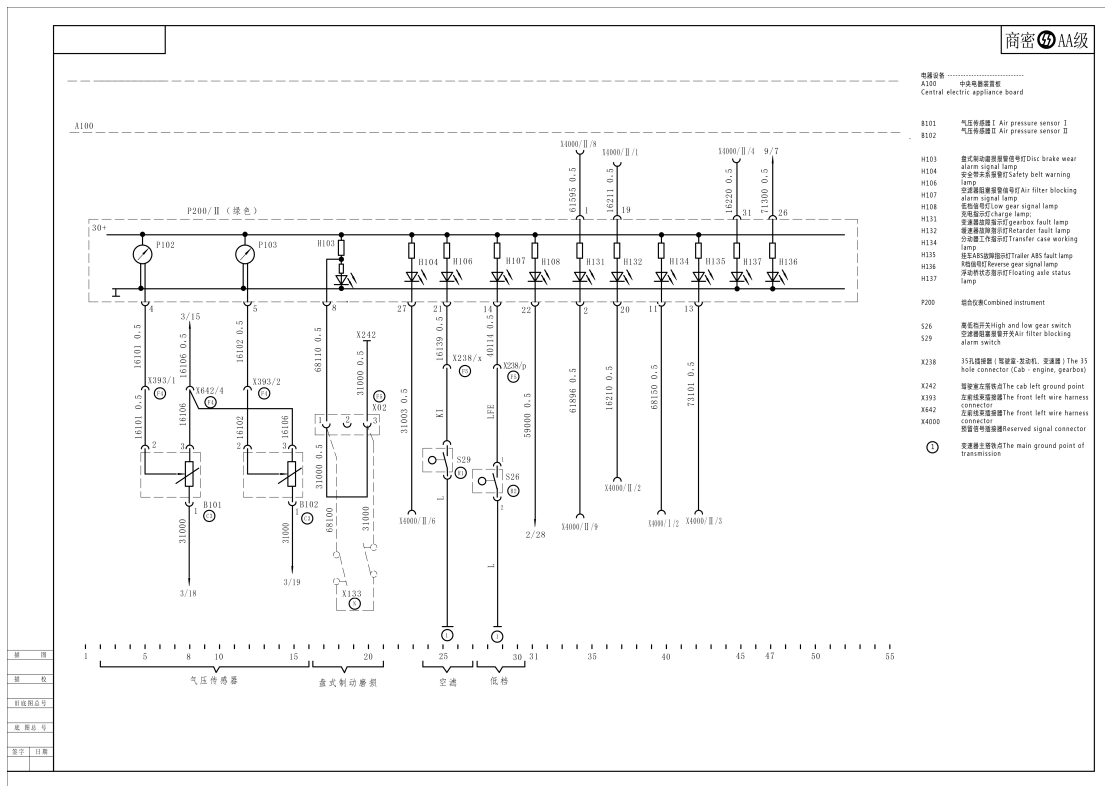
V. Electrical schematic diagram (1-15)

电控高压共轨发动机车型电器原理图

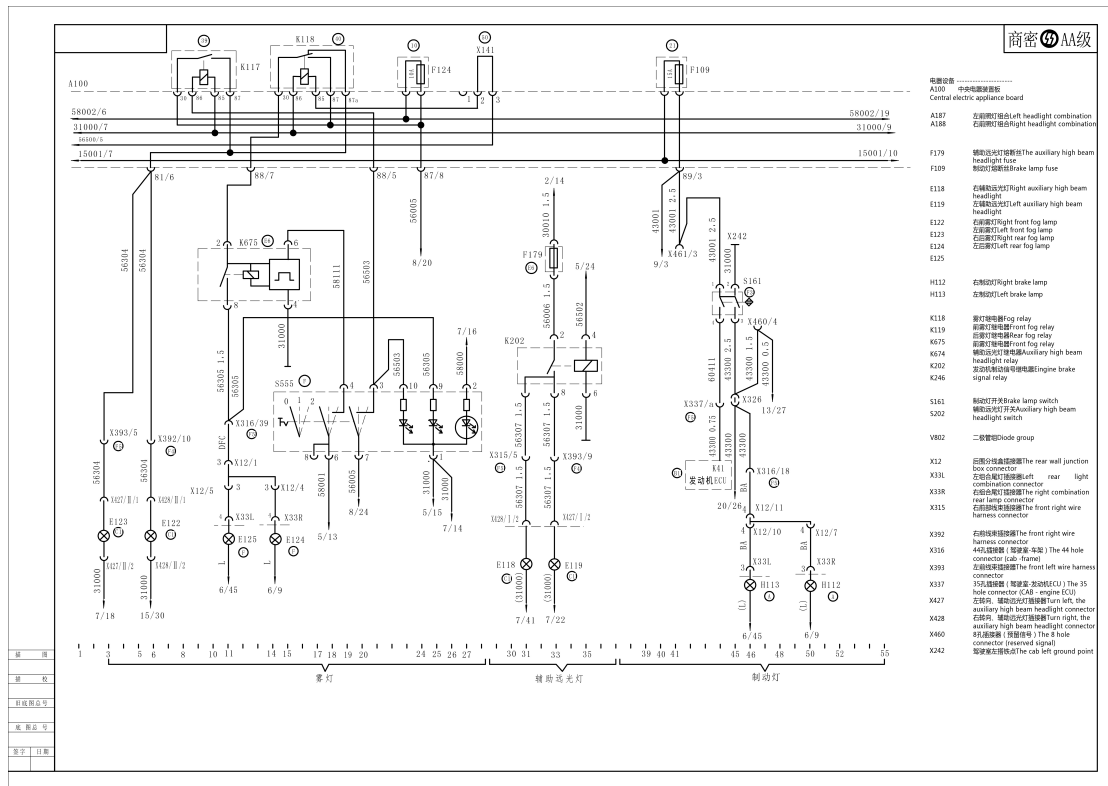
Electrical schematic diagram for vehicle model equipped with the electronic control high-pressure common-rail engine

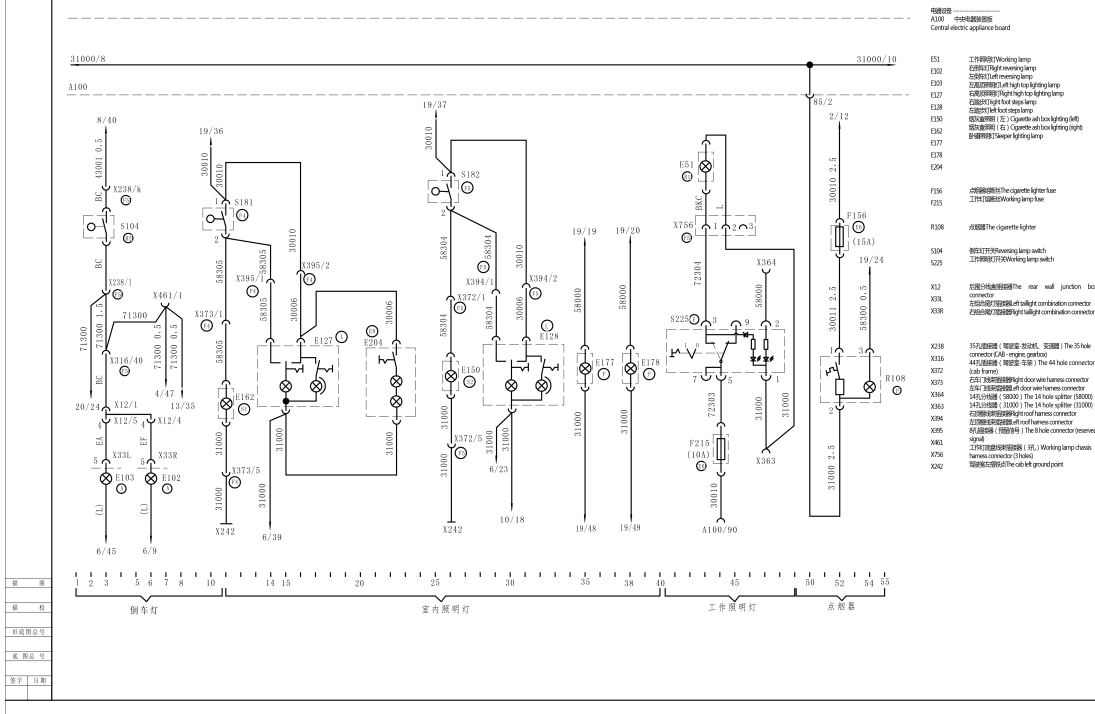
















编 号	
编 校	
目次图总号	
成 图 总 号	
签字	日期



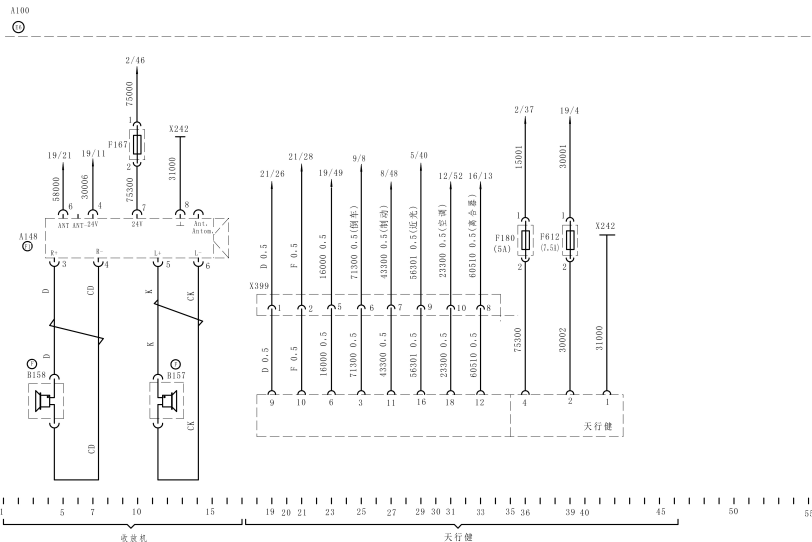
电 器 设 备 -----
A100 中央电器装置板
Central electric appliance board

A148	24V收音机 24V radio
B157	左扬声器 Left speaker
B158	右扬声器 Right speaker

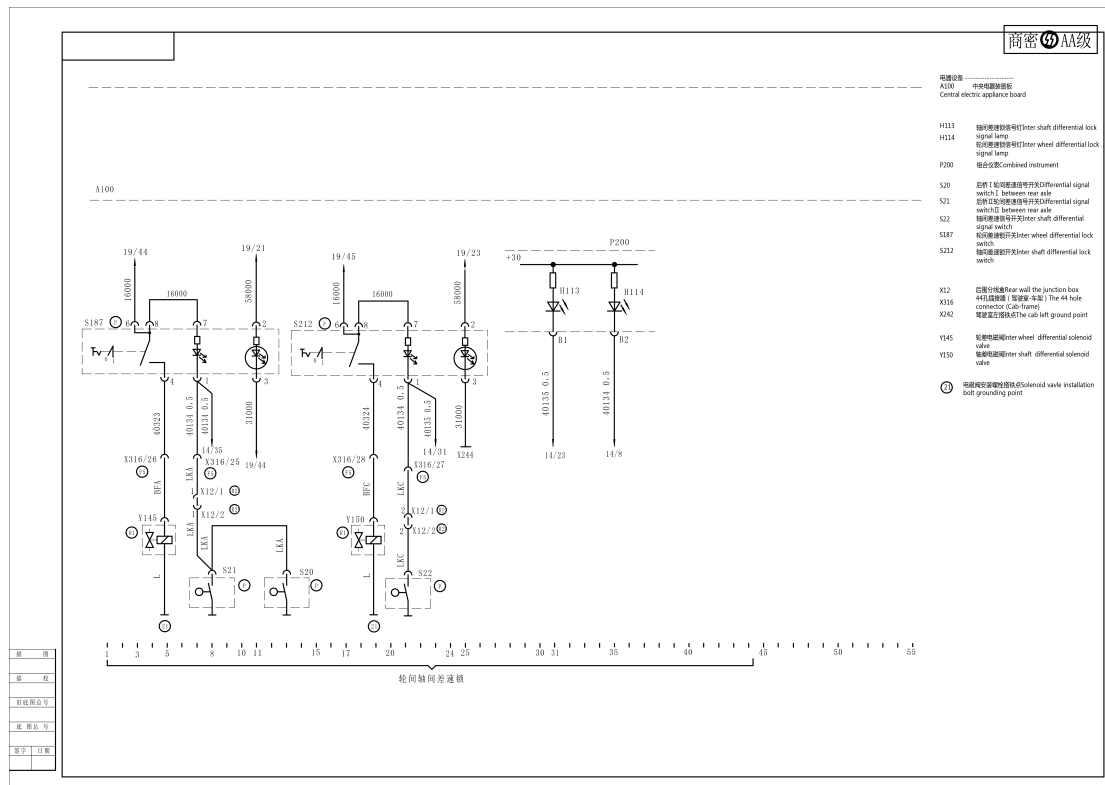
F167	收音机熔断丝 (10A) Radio fuse(10A)
F180	天行健+15电源熔断丝TianXingJian+15 power fuse
F612	天行健B+电源熔断丝TianXingJian B+ power fuse

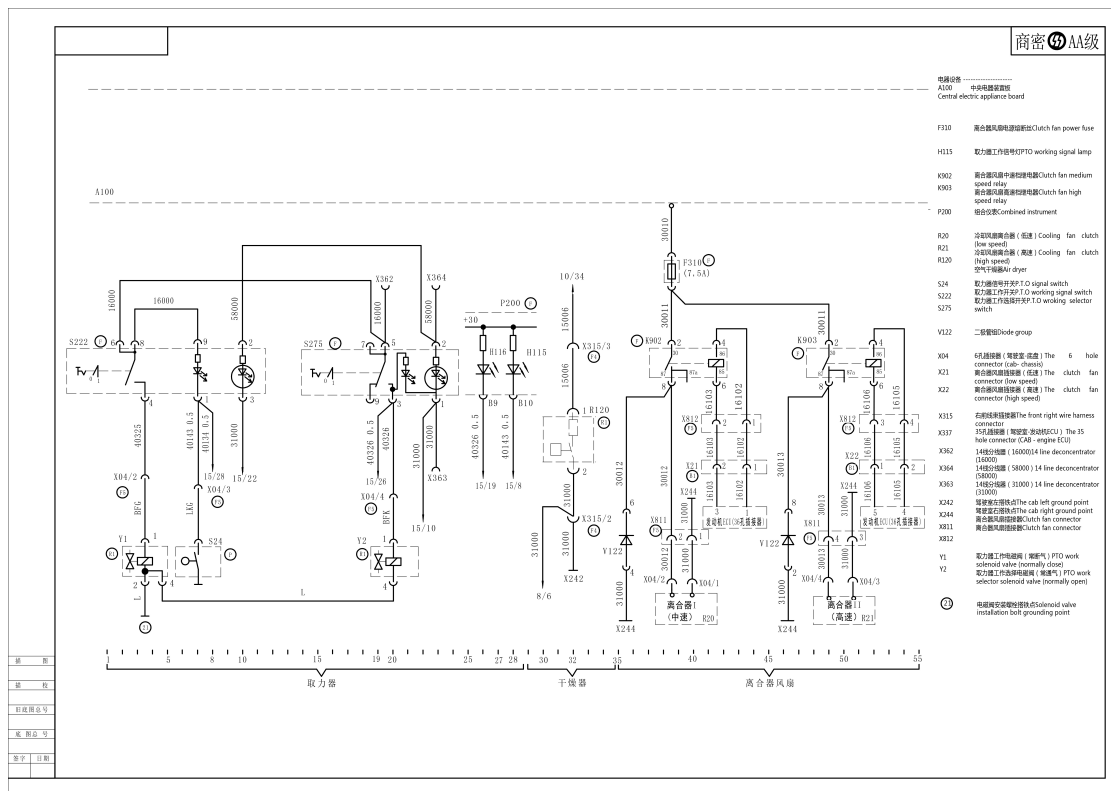
X242	驾驶室左落铁点 The cab left ground point
X266	平行键槽键槽 TianXinglian connector

X399	天行健连接器 TianXingjian connecto
------	------------------------------

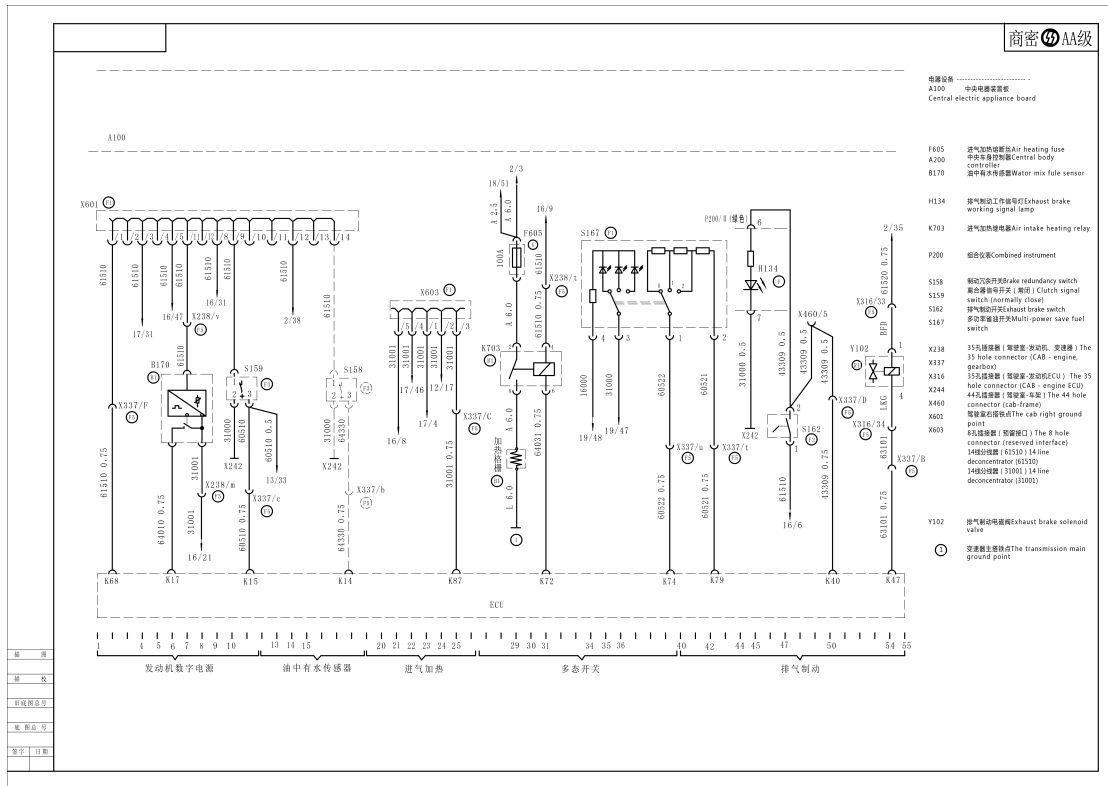


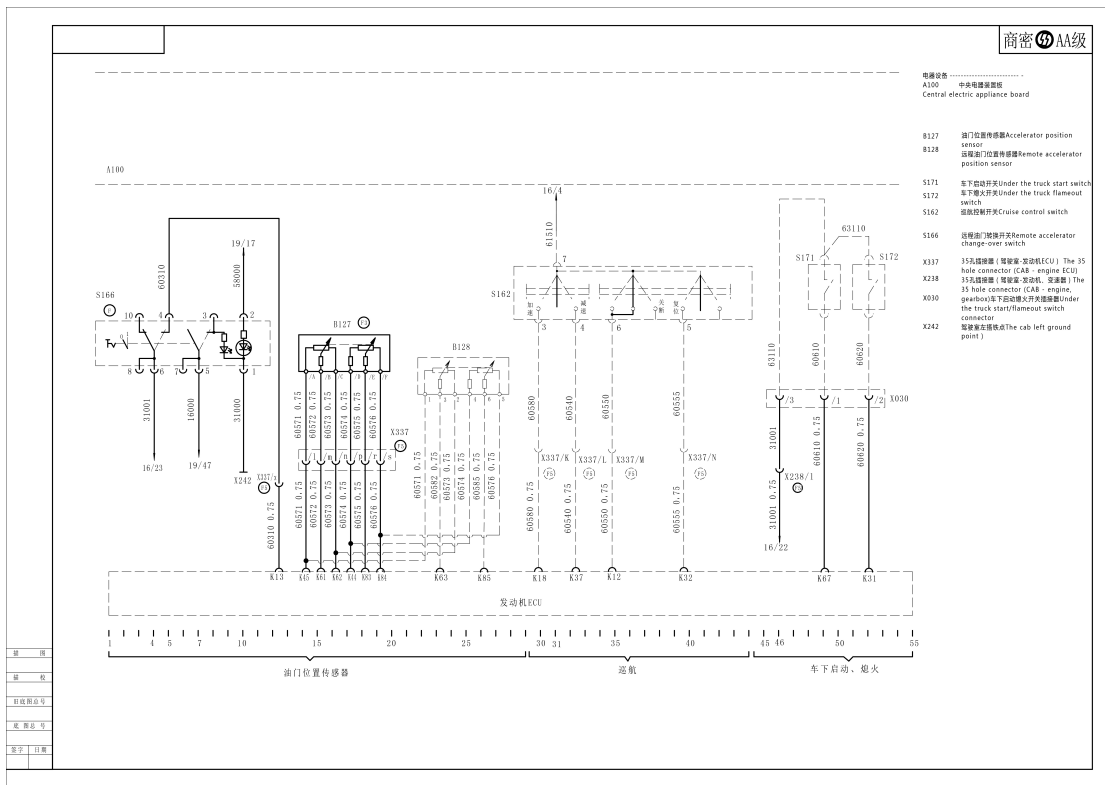
编 号	
编 校	
封面图章号	
成 图 总 号	
签字	日期

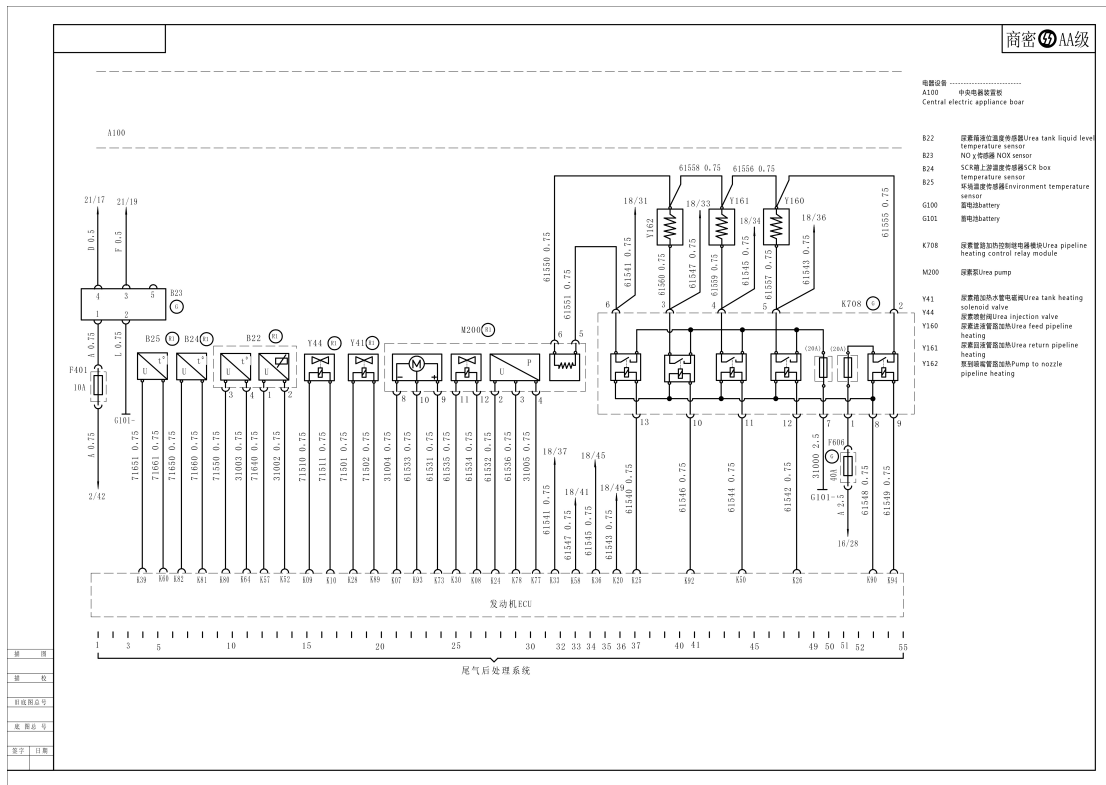


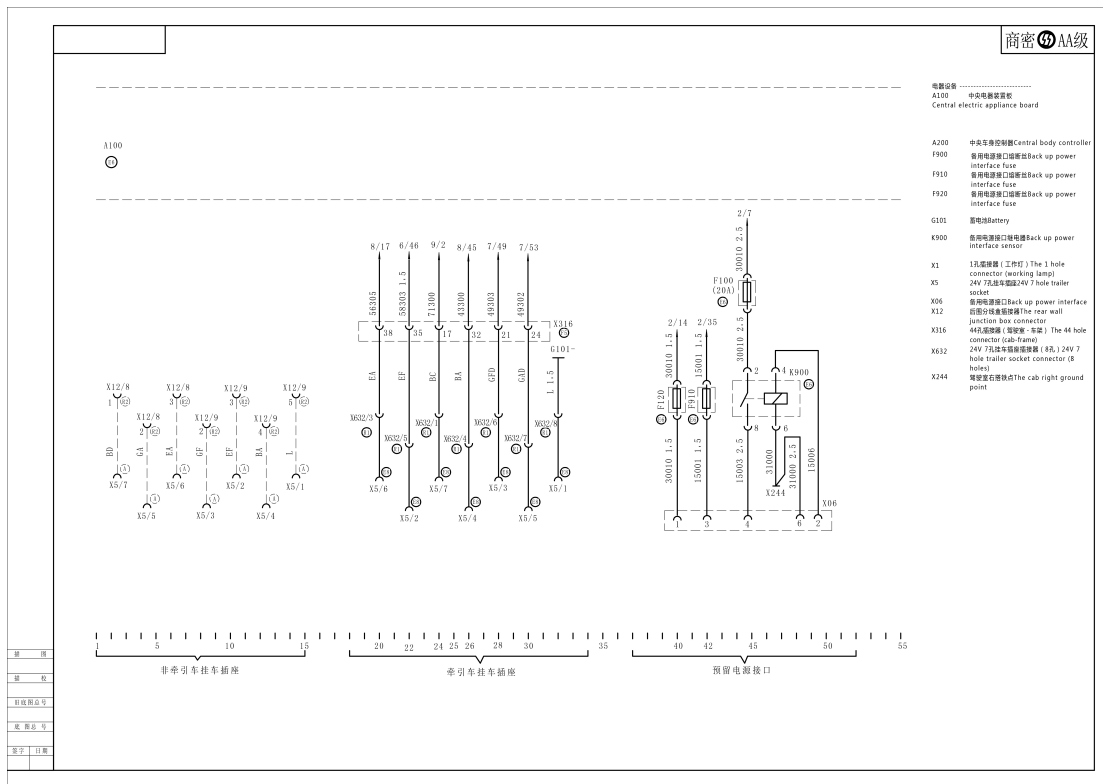


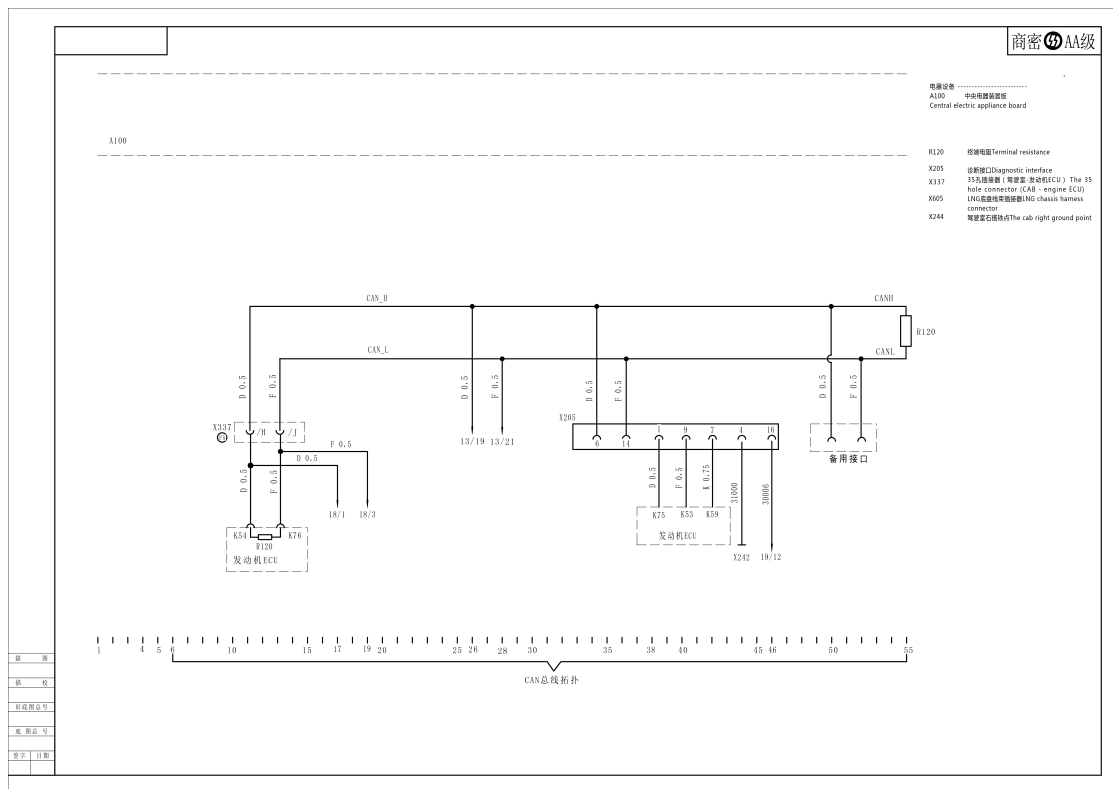
商密 AA级

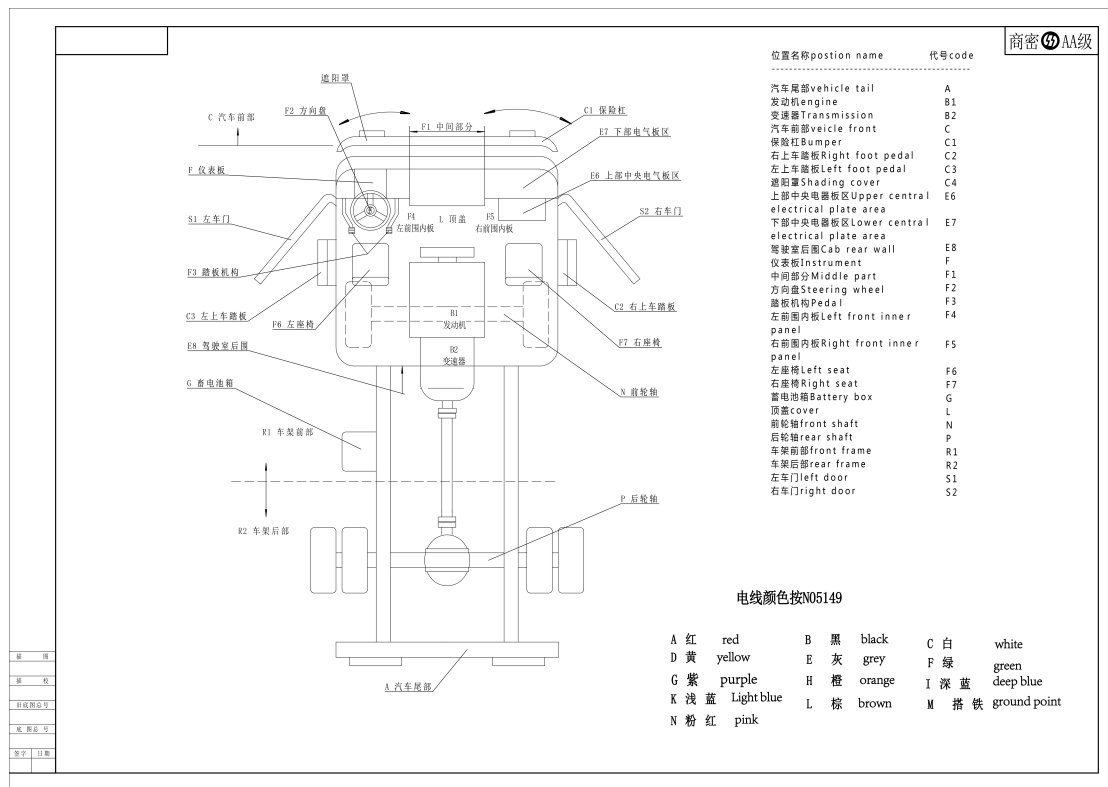












六、制动管路图

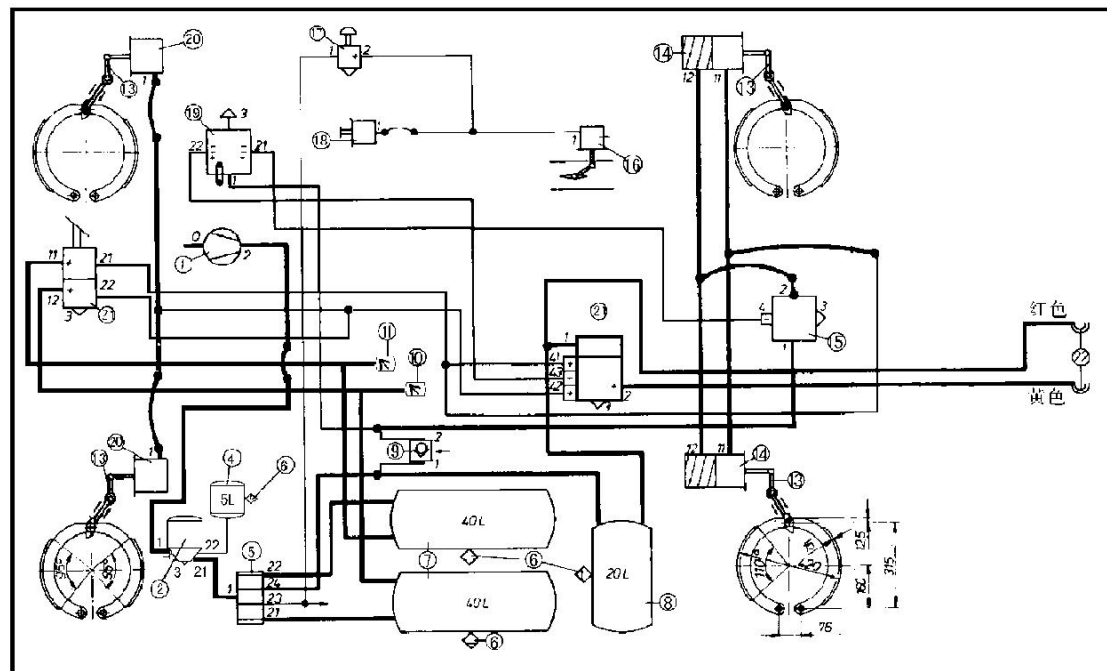
VI. Brake Piping Diagram

- | | |
|---|---|
| 1. 空压机 | 9. 单向阀 |
| 1. Air compressor | 9. Single direction valve |
| 2. 带调压阀的空气干燥器 | 10. 前轮制动气压表 |
| 2. Air dryer with pressure regulating valve | 10. Front wheel brake air gauge |
| 4. 反冲罐 | 11. (中) 后轮制动气压表 |
| 4. Backwash tank | 11. Air gauge of (middle) rear wheel brake |
| 5. 四回路保护阀 | 12. 双管路挂车制动控制阀 |
| 5. Four circuits protective valve | 12. Control valve of double pipelines trailer brake |
| 6. 放水阀 | 13. 制动臂 |
| 6. Water drainage valve | 13. Brake arm |
| 7. 储气筒 | 14. 复合式气制动室 |
| 7. Air-reserve tank | 14. Combined type air brake chamber |
| 8. 储气筒 | 15. 继动阀 |
| 8. Air-reserve tank | 15. Relay valve |

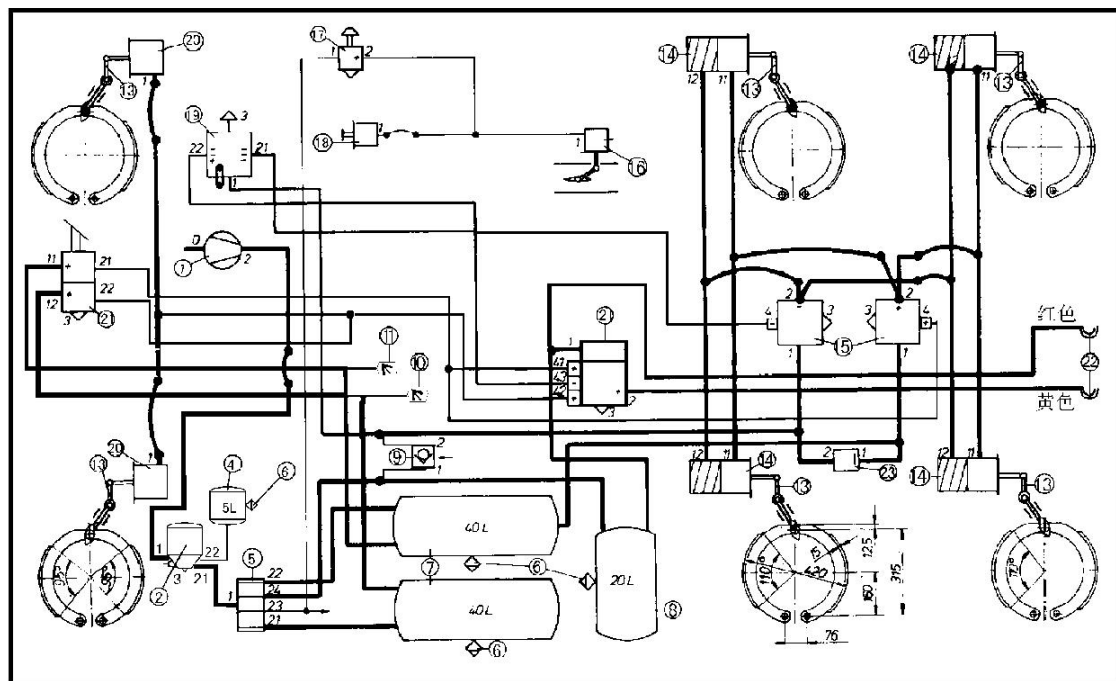
- 16. 工作缸
- 16. Working cylinder
- 17. 排气制动操纵阀
- 17. Operating valve of the exhaust brake
- 18. 工作缸
- 18. Working cylinder
- 19. 停车制动阀
- 19. Parking brake valve

- 20. 制动气室
- 20. Brake chamber
- 21. 双回路制动气阀
- 21. Double circuits brake air valve
- 22. 挂车制动气路连接器
- 22. Trailer brake pipeline joint
- 23. 溢流阀
- 23. Overflow valve

4 × 2 制动系统图



6×4 制动系统图



七、轮胎气压
VII. Tire Pressure

常用轮胎型号 Common tire model	额定充气压力 kPa Rated inflation pressure kPa	轮胎层级 PR Tire level PR	额定负荷 (单/双胎) kg Rated load (single/double tire) kg
11.00-20	910±20 (单胎 single tire)、840±20 (双胎 double tire)	18	3650/3150
12.00-20	810±20 (单胎 single tire)、740±20 (双胎 double tire)	18	3750/3350
10.00R20	930±20	18	3250/3000
11.00R20	930±20	18	3550/3250
12.00R20	830±20	18	3750/3450
11.00R22.5	830±20	16	3000/2725
12.00R22.5	930±20	18	3550/3250
275/70R22.5	830±20	16	2800/2575

常用轮胎型号 Common tire model	额定充气压力 kPa Rated inflation pressure kPa	轮胎层级 PR Tire level PR	额定负荷 (单/双胎) kg Rated load (single/double tire) kg
295/80R22.5	900±20	18	3550/3250
295/80R22.5	830±20	16	3350/3075
315/80R22.5	830±20	18	3750/3450
425/65R22.5	830±20	20	5000

单位: kpa (≈1kg/cm²)

八、允许总质量和轴载质量 kg(公斤)

VIII. Allowable Gross Mass and Axle load Mass kg (kilogram)

车型 Vehicle Mode 总质量和轴载质量 Gross mass and axle load mass	260/42	280/4	280/6	310/6	280/6
前轴额定轴载质量 Front axle rated axle load mass	6500	6500	6500	6500	6500
技术允许轴载质量 Technical allowable gross mass	7500	7500	7500	7500	7500
前驱动桥额定轴载质量 Front drive axle rated axle load mass					6000
中、后桥额定轴载质量 Intermediate and rear axle rated axle load mass	10000	10000	10000	10000	10000
技术允许轴载质量 Technical allowable gross mass	13000	13000	13000	13000	13000

车型 Vehicle Mode					
总质量和轴载质量 Gross mass and axle load mass	260/42	280/4	280/6	310/6	280/6
中、后桥额定轴载质量 Intermediate and rear axle rated axle load mass	10000	10000	10000	10000	10000
技术允许轴载质量 Technical allowable gross mass	13000	13000	13000	13000	13000
额定总质量 Rated Gross Mass	16000	16000	26000	26000	26000
技术允许总质量 Technical Allowable Gross Mass	19000	19000	32000	32000	32000
列车总质量 Vehicle Gross Mass	0086-29-86 95690800	43000	43000	47000	47000

九. 车辆报废处理注意事项

IX. Precautions for vehicle scrapping and disposal

1、汽车报废后，必须按国家法规要求，到当地环保部门指定单位进行拆卸分解，严禁私自拆卸分解。

1. After the vehicle is declared worthless, the owners shall take the vehicle to the specified organization of the local environment agency for scrapping according to the requirements of national laws and regulations. The owners shall not scrap and dispose the vehicle at their will.

2、汽车尾气排放，污染空气对人体有害，本产品出厂时，经过严格检验，符合国家现行标准。用户对发动机大修后，应对尾气进行检测。

2. The vehicle will have exhaust emissions which pollute the air and do harm to human body, so the vehicle manufactured by your company has passed the strict inspection and complies with the current national standard. After the engine is overhauled, the users shall detect and test the tail gas.

3、发动机机油、齿轮油、液压油等矿物油，随意向土地排放，会造成土壤和地下水源污染，应集中回收处理。

3. It will cause soil pollution and underground water source pollution if the engine oil, gear oil, hydraulic oil or other mineral oil is discharged into the earth at will, so the above oil shall be recycled for central disposal.

4、汽车防冻液、冷却液等，含有对人体有害物质，严禁随意排放，应集中回收处理。

4. Vehicle antifreeze liquid and coolant both have substances harmful to humans, so they are not allowed to be discharged at will and shall be recycled for central disposal.

5、报废汽车用铅酸蓄电池（电瓶）及其电解液，对人体有害，必须按当地环保部门指定单位集中回收处理。

5. The plumbic acid rechargeable battery and the electrolyte solution of the scraped car are harmful to humans, so they shall be recycled for central disposal by the specified organization of the local environment agency.

6、本产品使用的塑料件、橡胶、玻璃、复合材料件（如玻璃钢等件）、电器、仪表灯具等属低降解材料，损坏报废后不得任意抛洒，必须按当地环保部门指定单位集中回收处理。

6. The plastic parts, rubber, glasses, composite material (for example glass fiber reinforced plastics), appliances, instrument lights of the vehicle are all low degradation materials, so the above parts or materials after scrapped shall be recycled for central disposal by the specified organization of the local environment agency, rather than discharged at will.