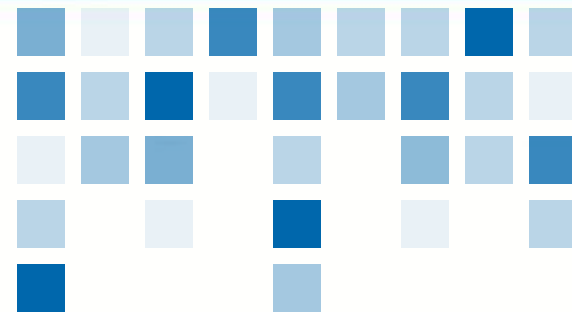




H3000系列牵引车使用说明

海外技术服务部



一、驾驶室及主要机构（装置）

Cab and main mechanisms (Devices)

（一）车门打开与锁止

Open and lock 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。

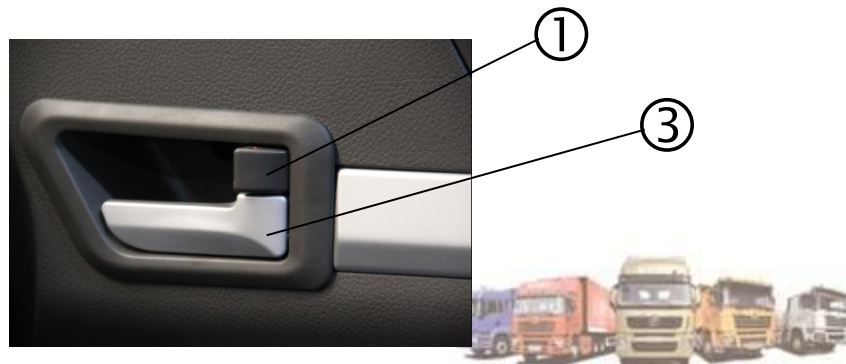
After the key is turned counterclockwise, and a “click” sound is heard, pull out the key and press in the cylindrical lock core and pull outwards forcibly, for the door to be opened, while the key is turned clockwise, for the door to be locked.

在车内时，按下锁止钮①，车门锁止；拉起锁止钮②；拉内开手柄③，并向外推即可打开车门。图示为车门电动玻璃升降（选装）按钮。

Pushdown the lock button ① inside the vehicle to lock the door, and pull up the lock button② and pull inner door handle ③ and push outwards to open the door. The lifing button of electric window regulator (optional) is as shown in the figure.

注意：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

Caution: Never drive the vehicle before doors are properly closed, and otherwise the danger of unexpected accident would happen!



（二）车门玻璃的操作说明：

The operation instructions on door glass

本车门安装电动玻璃升降器，右车门开关可控制左右车门的玻璃升降。

Electric glass lifter is assembled with this door, it can control the glass elevation for both the left and right doors by the switch on the right door.

在电源接通后，按下开关的上部，车门玻璃下降，抬起开关的上部，车门玻璃上升，松手后开关自动复位，玻璃处于停止状态。

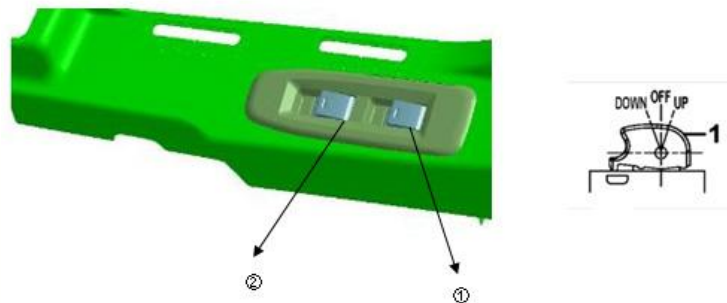
After power switched on, press the upper part of the switch to lower the door glass, and raise the upper part of the switch to lift the door glass. The switch will automatically reset when released hand, and then the glass is in stop position.

注意：Caution

将玻璃升降到位后，应立即松开按钮开关，否则会降低升降器寿命或损坏升降器，锁门时请将玻璃升到位。

。

After the glass is properly lifted or lowered, the button switch shall be released immediately, and otherwise the service life of the lifter may be shortened or the lifter may be damaged. Please lift the glass to the designated position when door is locked.



①—左门玻璃升降开关 ②—右门玻璃升降开关



（三）座椅调节及安全带

Seat adjustment and safety belt

1、座椅的调节seat adjustment

驾驶员座椅如图所示，该座椅为气囊悬浮式，调节时只有在座椅面不超载，气动系统压力为7帕和停车状态下进行。调节时应确保能听到座椅锁止装置卡合声音。

As shown in figure, the driver seat is an air suspension seat. The seat can only be adjusted so long as the seat surface is not overloaded, the pressure of pneumatic system is 7 bar, and under the condition when vehicle is parked. It shall be assured to hear the clamping sound of seat locking device during adjustment.

①减震器钢度调节（45KG-135KG）根据司机的体重，旋转此旋钮可调节座椅，使乘坐舒适。体重参考指标在调节器上的刻度上显示。（仅液压减振座椅有此功能）

Adjust the damper stiffness according to the driver's weight (45 kg to 135 kg) . Rotate the knob to adjust the seat and make the seat comfort. The weight reference index is shown on the scale of regulator. (Only for hydraulic damped seat)

②座椅前后调节把手（滑道调整量200mm）提拉座椅前后调节杆，调节座椅前后位置，松开时座椅锁定。

The fore and aft adjustment handle of seat (Slideway adjustment capacity is 200 mm) : pull the fore and aft adjustment lever to regulate the seat position forward and backward, and the seat will be locked after loosening the lever.



③靠背仰角调节（ $65^{\circ} \sim 155^{\circ}$ ）提拉靠背角度调节器，可调整靠背角度，放松时靠背角度锁定。

The backrest elevation angle adjustment($65^{\circ} \sim 155^{\circ}$):pull backrest angle demodulator to regulate the backrest angle, and the angle will be locked after loosening the demodulator.

④前端高度调节（ $0 \sim 60\text{mm}$ ）提拉前调节按钮，可以调节座垫前边高度。

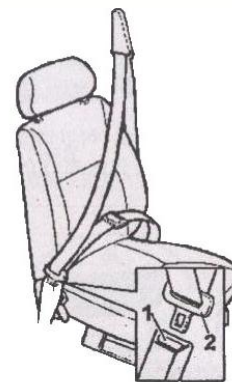
Front-end height adjustment ($0 \sim 60 \text{ mm}$): pull front adjusting button to adjust the front height of seat cushion.

⑤后端高度调节（ $0 \sim 55\text{mm}$ ）提拉后调节按钮，可以调节座垫后边高度。

Rear-end height adjustment ($0 \sim 55 \text{ mm}$): pull rear adjusting button to adjust the rear height of seat cushion.

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 when airbag is inflated, there will be an adaptive process of air charge or discharge according to the weight of human body after driver is naturally seated. Then move upwards the front-end adjusting handle (rear-end adjusting handle) to increase (decrease) a proper force downwards to the front end of the seat cushion, for the front end (rear end) of the seat to lower (rise) to the comfortable position of driver, and then release the handle. Afterwards, it is not required to re-adjust the front-end adjusting handle or the rear-end adjusting handle when the same driver leaves the seat or is seated again. If driver is changed, this adjustment shall be re-set.



1-锁扣 2-锁舌



副驾驶员座椅为固定式座椅，仅有靠背仰角调节功能，调节方法同驾驶员座椅。

The co-driver seat is stationary type seat. It only has backrest elevation angle adjusting function. For the adjustment method, refer to the related items of driver's seat adjustment.

2. 特殊说明 *Special specification*

（1）在调节该座椅前请先观察减振锁止机构是否处于解锁状态。

Please observe whether the shock absorbing locking mechanism is in the unlocked state before adjusting the seat.

（2）请您在确保驾驶安全的情况下调整座椅。

Please adjust seat under safe driving status.

（3）在您前后调整、角度调整时，应将手柄扳到位，以保证机构完全分离后，再进行调整。

Please pull the handle in place when you adjust fore and aft and angle, to ensure the structure is separated completely.

（4）调整完毕后，各手柄自然回位，确保各部位锁止机构可靠。

After the adjustment, the handle will naturally return to the original position, to ensure that each part is locked reliably.



3. 司机及乘客座椅安全带：The safety belt the driver and co-driver.

驾驶员与副驾驶座椅均配有安全带，为确保行车安全请系好安全带。使用时将安全带缓缓地拉出，使安全带位于肩与颈根之间，（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。）将安全带通过胸部的适当位置，拉住锁扣将扣闩压入锁卡内，把锁舌插入锁扣后，听到“咔”一声响，确认锁住后，调整安全带直至感到舒适为止。解除时按下锁扣上的红色按钮，握压扣闩，将安全带缓缓放回即可。

The driver and co-driver seats are both equipped with safety belt, for the purpose of ensuring traffic safety, please fasten them when you driving. The using method is: fasten the belt over your shoulder and neck, adjust its tension by pull or push the belt. (However, to prevent accident, please ensure there is no hard and fragile article in your upper pocket, such as pen and glass, etc.). Hold on lock catch and press latch into its slot, and hear a engaging sound, then the belt is fastened. As shown in the figure, press down the red button on the lock catch according to the direction of arrow to release the belt, grip the latch, and then the belt will reposit automatically.

注意Cautions

1. 确保安全带不被缠绕，不与坚硬的棱边摩擦，防止化学物品的污染。

Ensure that the seat belt is not entangled and do not touch with hard edge, and prevent chemicals pollution.

2. 安全带仅限一人使用。严禁大人、小孩共用一条安全带。

One seat belt only for one person. It is forbidden to adults and children share a seat belt.

3. 安全带任何部件失效及损坏，整个安全带都必须更换。

Any component of seat belt is invalid or damaged, the whole seat belt must be replaced.

4. 如果卷收器发卡应更换安全带。

Seat belt should be replaced if the retractor is not smooth.

5. 一定要根据使用者的身体条件调整好安全带长度，否则容易造成危险。

The safety belt length must be adjusted according to user's physical condition, otherwise, it may cause danger.



（四）卧铺收起与放下: Sleeper lifting and lowering

1. 上卧铺的翻起和落下

Upper sleeper lifting and lowering

操作步骤如下: Sequence can be seen as follows:

首先，双手托住卧铺，两个拇指分别**按住卧铺按钮**，用力按压听见“咔嗒”的解锁声，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(备注：卧铺翻起后可收起上卧铺托架)。

First, hold the sleeper by two hands, press the buttons by the two thumbs separately until a sound of “click” is heard, and lift up the bed to a suitable height, then release the thumbs, the tightening device on the sling will draw in the sling and lock it up automatically. Then check it and release the hands (Note: after the sleeper is lifted, the bracket of upper sleeper can be put away) .



2. 下卧铺的翻起和落下

Lower sleeper lifting and lowering

需要翻起卧铺时，首先双手托住卧铺，慢慢往上抬即可，反之慢慢放回到最低点松手即可。

When lifting up the lower sleeper, firstly, hold the sleeper by two hands, then lift the sleeper up until it reaches to the lowest position.

注意事项: Cautions:

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。

For ensuring safety, the upper bed can only be used while vehicle is parked, and it is prohibited to use it while vehicle is running.

2. 新车在使用前，请将卧铺外包装塑料薄膜去除。

Prior to use of new vehicle, please remove the external plastic packing film of sleeper.

3. 登上卧铺时，建议采用座椅和下卧铺作为登梯。

It is proposed to use seat and lower sleeper as ladder.

4. 上下卧铺均可采用湿毛巾擦拭，使驾驶室保持干净。

Both upper and lower sleepers can be cleaned by wet towel.

5. 下卧铺为整体式结构，卧铺板与卧铺垫均用卧铺面料包裹，其包裹面料可拆开拉链放置洗衣机中清洗。

The lower sleeper is of integral structure. Both sleeper plate and cushion are covered by coating fabric, and the coating fabric of sleeper matting may be cleaned in washing machine by unzipping the pull chain.

6. 抽烟时，请勿将热烟灰掉落卧铺上，以免起火。

Please don't drop the ash on the sleeper during smoking, to avoid fire.

7. 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。

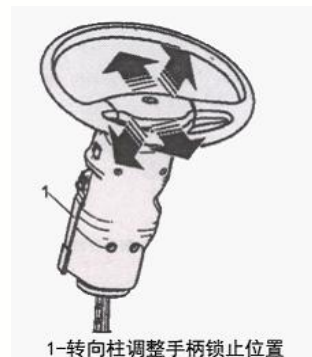
The inner core of sleeper matting is PE material, it may be cleaned by water, but certain deformation and fold may possibly exist after cleaning.



（五）方向盘的调节：Adjustment of 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，将转向柱调整手柄由锁止位置向上抬起，方向盘可进行上下0~75mm的调整；倾斜角度调节（0° ~ 8° ）时，同样将转向柱调整手柄由锁止位置，进行前后调整，前后可进行8° 的调节，直至调整到舒适的位置后，再将调整手柄回复至锁止位置。

Steering wheel may only be adjusted when vehicle parking. In the process of height adjustment, lift the adjusting handle of steering column up from locking position. The adjustment range is between 0 and 75mm. When adjusting tilt angle (0 ° ~ 8 °), adjust the handle of steering column forward and backward from locking position. The adjustment range is between 0° ~ 8° . And pull the handle back to locking position after your adjustment.



（六）天窗的开启与关闭: Sun roof opening and closing

开启时将双手放在天窗扣手位置，向上推起一侧即可开启天窗一边，然后再开启另一边。反之向下拉动天窗扣手，则关闭天窗。

Put your hands on buckle, push up one side to open one side of sunroof, and then open the other side. Whereas, pull the buckle down to close the sunroof.

注意：使用中注意润滑。

Note: Pay attention to lubrication when using.



天窗
Sunroof



（七）排气制动手柄: Exhaust brake handle

安装在转向管柱右侧。打开排气制动开关(向上拨动)，车辆可用发动机消耗的能量作辅助制动。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。排气制动时，档位越低效果越佳。

The handle is installed on the right side of the steering column. Open the exhaust brake switch (pull it upward) to brake vehicle with the energy generated by the engine. While on an icy or muddy road, using exhaust brake can reduce the chance of side sliding. When driving down a long slope, using exhaust brake can shorten the times in operating main brake, decrease abrasion and heat on tyres and wheel brakes, prolong their service life but reduce fuel consumption and improve vehicle safety. When using exhaust brake, the lower the gear shift is, the better the effects will be.



排气制动手柄
Exhaust brake handle



使用方法:

Application methods:

1. 将开关操纵杆向前拨到接通位置，排气制动指示灯点亮。当把脚从加速踏板和离合器踏板挪开，排气制动起作用。踏下加速踏板或离合器踏板，排气制动自动被解除，排气制动指示灯熄灭。当踩下加速踏板或离合器踏板中的任何一个时，排气制动都将不起作用。

Pull the switch lever forward to ON position, the indicator lamp of exhaust brake will light up. The exhaust brake will get to work after move your foot away from the accelerator pedal and the clutch pedal. And it will be invalid after you step down one of the two pedal, and the indicator lamp will go out. When you step down the accelerator pedal or the clutch pedal, exhaust brake will not work.

2. 当车辆挂档行驶时，踩下制动踏板，此时即使不接通排气制动开关，排气制动也起作用。当踩下加速踏板或离合器踏板中的任何一个时，排气制动自动被解除。

When vehicle running, step down brake pedal, the exhaust brake will get to work even if its switch is not turned on. When you step down the accelerator pedal or the clutch pedal, exhaust brake will not work.

3. 将开关操纵杆向后拨到关闭位置后，排气制动指示灯熄灭，排气制动就停止工作。

After pushing the switch lever backward to closed position, the indicator lamp will go out, and the exhaust brake will stop work.



（八）风档清洗储液罐： Windshield cleaning liquid storage tank

风挡清洗储液罐加注口安装在驾驶室前围下端右侧。添加洗涤液时，需在整车在静止/水平状态下。拧开洗涤器盖，加入洗涤液，装入洗涤液高度不得超过规定的高度。

The filler of windshield cleaning liquid storage tank is mounted on the right side of front wall of cab. The cleaning liquid should be added when the vehicle is parking/ in horizontal state. Unscrew washer cover to fill up cleaning liquid. The height of cleaning liquid should not exceed prescribed height.



风档清洗储液罐：
Windshield cleaning liquid storage tank



（九）组合仪表 Combination instrument

1. 概述:

Summary:

陕汽MV电控组合仪表是一款专为陕汽新M3000电控发动机开发的高档电子式全步进电机组合仪表。电控组合仪表能通过点阵液晶菜单选择匹配LNG、CNG、燃油车国三、国四（潍柴、康明斯）等多种发动机，车速表参数K值通过按键可调。

Shanqi MV series electric control combination instrument is a high-grade electronic type stepping motor combination instrument, which is specially developed for Shanqi new M3000 electronic-controlled engine. The electric control combination instrument can match with many engines, such as LNG, CNG, China III and China IV (Weichai, Cummins) engine, etc. you can select engine by lattice LCD menu. The parameter K value can be adjusted by speedometer.

（1）零件号：DZ96189584140，名称：组合仪表（电控发动机、CAN）。

Part number: DZ96189584140. Name: combination instrument (electronically controlled engine, CAN).

（2）效果图：Design sketch

（3）端口定义：Port definition



表1 A插接件端口定义
Table 1: port definition of plug connector A

编号	引脚定义	说明	编号	引脚定义	说明
1	盘式制动器磨损报警	悬空和高有效	15	点火电源+	15+
2			16	点火电源	
3	车厢举升	低有效	17	指示灯电源-	
4	挂车ABS指示	低有效	18	指示灯电源+	
5	冷却液位低	低有效	19	变速箱低档指示	低有效
6	主车ABS指示	低有效	20		
7	进气预热（+）	高有效	21	CAN（预留）	
8	空滤堵塞	低有效	22	CAN H	
9	ASR指示	低有效	23	CAN L	
10	驾驶室锁止	低有效	24	CAN m	
11	前桥气压传感器信号	电压信号（预留电阻信号）	25	CNG气量传感器信号	电压信号
12	后桥气压传感器信号	电压信号（预留电阻信号）	26		
13	油量传感器信号	电阻信号	27	缓速器工作（+）	高有效
14	车速传感器信号	脉冲信号	28	缓速器工作（-）	低有效



29	主车右转向	高有效	33	蓄电池电源+	常电
30	挂车右转向	高有效	34		
31	传感器地		35	车速传感器电源	12V/60mA
32	车速信号输出2	脉冲信号	36	浮动桥指示	高有效



表2 B插接件端口定义
Table 2: port definition of plug connector B

编号	引脚定义	说明	编号	引脚定义	说明
1	取力器反馈信号（取力器1）	低有效	11	排气制动（-）	低有效
2	排气制动（+）	高有效	12	EDC停机（+）	高有效
3	大臂在位（泵车）	高有效	13	EDC停机（-）	低有效
4	EDC维修（+）	高有效	14	分动器	低有效
5	EDC维修（-）	低有效	15	R档指示	高有效
6	电源（泵车）	高有效	16	N档指示	高有效
7	OBD报警（+）	高有效	17	变速箱故障（+）	高有效
8	OBD报警（-）	低有效	18	变速箱故障（-）	低有效
9	EDC诊断（+）	高有效	19	进气预热（-）	低有效
10	EDC诊断（-）	低有效	20	离合器报警	低有效



表3 C插接件端口定义
Table 3: port definition of plug connector C

编号	引脚定义	说明	编号	引脚定义	说明
1	燃油预热	高有效	15	轴差速锁指示	低有效
2	作业（泵车）	高有效	16	驻车制动	低有效
3	后雾灯	高有效	17	充电指示	发动机励磁回路
4			18		
5	左车门开指示	低有效	19	车速信号输出1	脉冲信号
6	ECAS故障	低有效	20	车速信号输出c3	脉冲信号
7	空档取力（取力器2）	高有效	21	挂车左转向	高有效
8	蜂鸣器外部输入-	低有效	22	主车左转向	高有效
9	远光灯	高有效	23	右车门开指示	低有效
10	前雾灯	高有效	24	ECAS工作	低有效
11	轮差速锁指示	低有效	25		
12	行驶（泵车）	高有效	26	仪表照明（预留电路）	电压信号
13			27	气压传感器电源5V	5V电源 /60mA
14	近光灯	高有效	28	安全带指示	低有效

2. 仪表实现方式:

The realization way of instrument

（1）硬件采用模块化线路板、MCU集中控制，结构件采用整体卡扣式安装和激光永久性标识。

The hardware adopts modularization circuitboard and MCU central control. The structural component adopts integral snap installation and laser permanent identification.

（2）仪表指针：步进电机驱动。

The pointer of instrument: it is driven by stepping motor.

（3）背光与照明：以LED发光二极管为载体。刻度盘照明为白色，指针照明为红色。

Backlight and lighting: the lighting carrier is LED light-emitting diodes. The light color of dial is white, and the light color of needle is red.

（4）具备灯光和蜂鸣器声音报警功能，报警指示灯以LED发光二极管为载体。

It has lighting and audible alarm function. The alarm indicator lamp carrier is LED light-emitting diodes.

（5）LCD采用点阵液晶屏，正显显示。

LCD adopts dot matrix LCD screen, it is positive display.



3. 仪表组成:

Instrument composition

(1) 主要由六表头一液晶组成: It is mainly composed of six headers and a LCD.

车速表、转速表、油量表（LNG表、CNG表与油量表共用同一表头）、水温表、气压表1、气压表2为指针表。里程数、油压表、电压表、尿素液位、LNG气量值和CNG气量值、车辆行驶信号等由液晶显示。

Speedometer, tachometer, fuel gauge (LNG meter and CNG meter use the same oil header with fuel gauge), water temperature meter, air pressure gauge 1 and 2 are pointer gauge. Mileage, oil pressure gauge, voltmeter, urea level, LNG and CNG gas volume value and vehicle traffic signal are displayed by the liquid crystal display (LCD).

(2) LNG2、LCD显示:

LCD display:

柴油车型: 显示油压表、电压表、尿素液位、短里程（Ttip）/总里程（ODO）、当前油耗、综合油耗、发动机累计油耗、发动机工作时间、时钟日期、巡航车速、档位信息、故障码等。

For vehicle with diesel engine: it can display oil pressure gauge, voltmeter, urea level, short range (Ttip)/total mileage (ODO), current fuel consumption, combined fuel consumption, cumulative fuel consumption of engine, engine working time, clock and date, cruising speed, gear information and fault code, etc.

LNG车型: 显示油压表、电压表、短里程（Ttip）/总里程（ODO）、LNG总气量值、LNG各气瓶气量值、百公里气耗、发动机当前工作时间、时钟日期、档位信息、故障码等。

For LNG vehicle: it can display oil pressure gauge, voltmeter, short range (Ttip)/total mileage (ODO), total volume value of LNG, total volume value of each LNG gas cylinder, gas consumption per hundred kilometers, current working time of engine, date and clock, gear information and fault code, etc.



CNG车型：显示油压表、电压表、短里程（Ttip）/总里程（ODO）、CNG气量值、发动机当前工作时间、时钟日期、档位信息、故障码等。

For CNG vehicle: it can display oil pressure gauge, voltmeter, short range (Ttip)/total mileage (ODO), total volume value of CNG, current working time of engine, date and clock, gear information and fault code, etc.

在小计里程界面可通过按住左键超过2s清零；发动机类型可通过按键操作在仪表上电时进行选择；菜单（包括语言、单位、参数查询、出厂设置）可通过按键操作设定。详细介绍见内容八。

In the subtotal mileage interface, reset it by pressing down left key more than 2s. You can select engine type by operating the key on instrument when power on. Menu (including language, unit, parameters, and factory setting) can be set by key. For details see Section eight.

在时钟日期界面可以通过按键调节。详细介绍见内容八。

Set clock and date in interface. For details see Section eight.

4. 指示灯说明: Indicator lamp description:



: 变速箱低档指示灯; *low gear indicator lamp of transmission*



: 电池充电指示灯; *battery charging indicator lamp*



: 停车取力指示灯; *PTO indicator lamp when parking*



: 行车取力指示灯; *PTO indicator lamp when running*



: 进气预热指示灯; *air intake preheating indicator lamp*





: 空滤器堵塞指示灯; *air filter blocking indicator lamp*



: 浮动桥指示灯; *float axle indicator lamp*



: 分动器指示灯; *transfer case indicator lamp*



: 安全带指示灯; *safety belt indicator lamp*



: 主车ABS指示灯; *ABS indicator lamp for main vehicle*



: 挂车ABS指示灯; *ABS indicator lamp for trailer*



: 驱动防滑指示灯; *drive antiskid indicator lamp*



: 主车左转向指示灯; *left direction indicator lamp of main vehicle*



: 主车右转向指示灯; *right direction indicator lamp of main vehicle*



: 盘式制动磨损报警指示灯; *disc brake abrasion warning indicator lamp*



: 离合器指示灯; *clutch indicator lamp*



: 冷却液位低指示灯。 *Lower coolant level indicator lamp*





: 挂车左转向指示灯; *left direction indicator lamp of trailer*



: 挂车右转向指示灯; *right direction indicator lamp of trailer*



: 紧急停车指示灯; *emergency parking indicator lamp*



: 车辆故障指示灯; *vehicle failure indicator lamp*



: 驻车制动指示灯; *parking brake indicator lamp*



: EDC诊断指示灯; *EDC diagnosis indicator lamp*



: OBD指示灯; *OBD indicator lamp*



: EDC停机指示灯; *EDC stop indicator lamp*



: 油中有水指示灯; *water in oil indicator lamp*



: 水温高指示灯; *high temperature indicator lamp*



: 油量 (LNG气量低/CNG气压低) 指示灯; *fuel volume (low LNG volume/low CNG volume) indicator lamp*



: 驾驶室锁止指示灯; *cab locking indicator lamp*



: 制动气压低指示灯; *low brake air pressure indicator lamp*





: 远光灯; *high beam*



: 车厢举升指示灯; *boxcar lifting indicator lamp*



: 缓速器指示灯: 常亮表示缓速器工作, 闪烁 (周期: 1s) 表示缓速器故障;
retarder indicator lamp: the lamp lighting shows retarder is working, the lamp flashing (cycle: 1s) means retarder is in fault.



: 排气制动指示灯; *exhaust brake indicator lamp*



: 变速箱故障指示灯; *transmission fault indicator lamp*



: 变速箱油温高指示灯; *high temperature indicator lamp of transmission*



: 轮差指示灯; *inter-wheel differential indicator lamp*



: 轴差指示灯; *inter-axial differential indicator lamp*



: ECAS故障指示灯; *ECAS fault indicator lamp*



: ECAS工作指示灯; *ECAS operating indicator lamp*



: (红色指示灯) 机油压力低指示灯; *low engine oil pressure indicator lamp*



: 胎压故障指示灯; *tyre pressure fault indicator lamp*



4.1 上ON档电时，仪表指针在3秒内完成自检—指针运行过程：归零-满量程-回零。

When “ON” power-on, instrument pointer should finish self-inspection within 3s — pointer operational process: zero -full scale - back to zero.

4.2 对于水温过高、油压过低，当仪表连续2s检测到信号有效时，对应的报警灯才亮。对于EDC维修报警灯，当连续2s检测到信号有效时，对应的报警灯才亮；当信号无效时，报警灯应立即熄灭。

For high water temperature and low oil pressure, when effective signals are detected continuously for 2s by the instrument, the corresponding alarm lamp can light up. For EDC maintenance alarm lamp, when effective signals are detected continuously for 2s, the corresponding alarm lamp can light up. When the signal is invalid, the alarm lamp should go out immediately.

4.3 当仪表连续2s检测到水温高信号有效时，水温过高指示灯亮，STOP指示灯亮，蜂鸣器一直响，报警波形见波形1-2。

When effective high water temperature signals are detected continuously for 2s, the high water temperature indicator lamp can light up, and STOP indicator is alight, the buzzer is ringing. The alarm waveform see 1-2.

4.4 上ON档电，进气预热、油压过低、变速箱故障、变速箱油温过高、OBD报警、EDC维修、EDC诊断、EDC停机、油量（气量、液量）指示、制动系统故障指示灯进行自检，没有故障3s后熄灭。

When “ON” power-on, air intake preheating, low oil pressure, transmission fault, too high oil temperature of transmission, OBD alarm, EDC maintenance, EDC diagnosis, EDC stop, oil volume(gas volume, liquid volume) indicating and brake system fault indicator lamps do self-inspection, and the lamps will go out without fault.

4.5 油压过低报警灯点亮后，如仪表连续5s没有接收到CAN信号，该报警灯保持前一状态。

After low oil pressure alarm lamp lighting up, the lamp will keep in previous state if instrument receive no CAN signal continuously within 5s. If the vehicle has no speed, the indicator lamp is lighting up.



and the buzzer stop to ring. If the vehicle has speed (the speed is more than or equal to 5 km/h) for 30s, the indicator lamp will flash for 6 times and buzzer ring for 6 times if seat belt is not fastened. After that, if the vehicle always has speed, the indicator lamp will flash for 6 times and buzzer ring for 6 times for every 30s if seat belt is not fastened. And 10min later, the buzzer stop to ring, and the lamp will be constantly alight. If the seat belt has been unfastened during vehicle running, or if the vehicle has been parked(drive of idle speed), or restart ignition switch after it turned off, the alarm function will be reactivated. The flicker frequency of seat belt indicator lamp and the waveform of buzzer alarm see 1-3.

4.6 当轴差速锁、轮差速锁指示灯亮时，蜂鸣器响，报警波形如波形1-1。

When the indicator lamps of inter-axial and inter-wheel differential lock lighting up, the buzzer is ringing. The alarm waveform see 1-1.

4.7 当车厢举升、驾驶室锁止指示灯亮时，STOP指示灯点亮，蜂鸣器一直响，报警波形见波形1-2。

When the boxcar lifting and cab locking indicator lamp is alight, the STOP indicator lamp will light up and the buzzer is ringing. The alarm waveform see 1-2.

4.8 当离合器报警、冷却液位过低、空滤堵塞、电池充电、OBD报警、EDC诊断、ECAS故障、制动器磨损报警、尿素液位指示灯亮时，车辆故障指示灯亮。

When the clutch alarm, low coolant level, air filter clogging, battery charging, OBD alarm, EDC diagnosis, ECAS fault, brake wear alarm and urea liquid level indicator lamps is alight, the vehicle fault indicator lamp will light up.

4.9 当制动器磨损报警灯亮时，蜂鸣器报警5s，报警波形见波形1-2。

When the brake wear alarm is alight, the buzzer will alarm for 5s. the alarm waveform see 1-2.

4.10 当车速 $\geq 5\text{km/h}$ 时，若驻车制动亮，蜂鸣器一直响，报警波形见波形1-1。

When the speed more than or equal to 5 km/h, the buzzer will ring if the parking brake lamp light up. The alarm waveform see 1-1.



4.11 上“ON”档后，若安全带未系，指示灯闪烁6次，蜂鸣器鸣叫6次；若无车速，指示灯常亮，蜂鸣器停止鸣叫。若有车速(车速 $\geq 5\text{km/h}$)30秒后，安全带未系，指示灯闪烁6次，蜂鸣器鸣叫6次，之后若一直有车速，则每隔30秒，指示灯闪烁6次，蜂鸣器鸣叫6次，期间安全带未系，10分钟后蜂鸣器停止鸣叫，**指示灯**由闪烁变为常亮。若途中系过安全带再解开，或停车（怠速）过，或点火开关断开后重新上ON档，则报警功能重新开启，安全带指示灯闪烁频率和蜂鸣器报警波形如波形1-3。

When “ON” power-on, the indicator lamp will flash for 6 times and buzzer ring for 6 times if seat belt is not fastened. If the vehicle has no speed, the indicator lamp is lighting up, and the buzzer stop to ring. If the vehicle has speed (the speed is more than or equal to 5 km/h) for 30s, the indicator lamp will flash for 6 times and buzzer ring for 6 times if seat belt is not fastened. After that, if the vehicle always has speed, the indicator lamp will flash for 6 times and buzzer ring for 6 times for every 30s if seat belt is not fastened. And 10min later, the buzzer stop to ring, and the lamp will be constantly alight. If the seat belt has been unfastened during vehicle running, or if the vehicle has been parked(drive of idle speed), or restart ignition switch after it turned off, the alarm function will be reactivated. The flicker frequency of seat belt indicator lamp and the waveform of buzzer alarm see 1-3.

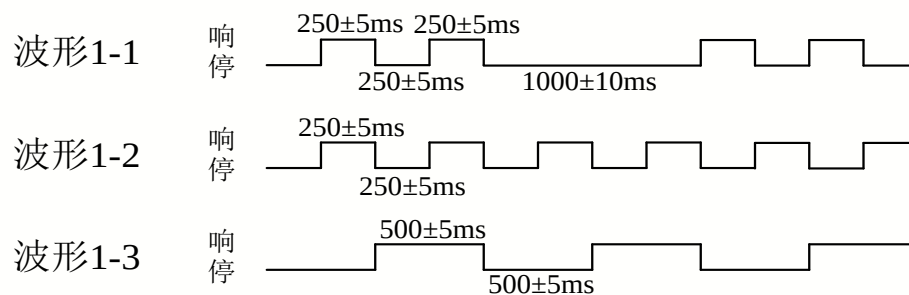
4.12 若仪表连续5s没有收到任何CAN信号，仪表液晶显示“车辆网络故障”（长按左键大于2s或超过10s无动作自动跳转到主界面），STOP指示灯亮，蜂鸣器报警5s，报警波形见波形1-2。

If the instrument receive no CAN signal for 5s, "vehicle network fault" (long press the left key greater than 2s or do no operation more than 10s, it will automatically jump to main interface) will be displayed on liquid crystal display (LCD), the STOP indicator light up and the buzzer alarm ring for 5s. The alarm waveform see 1-2.



4.13 蜂鸣器报警的波形及优先级如下：

The priority and waveform of buzzer alarm is as follows:



蜂鸣器报警的优先级：波形1-2>波形1-1>波形1-3



5. 指针说明：Pointer explanation

5.1 转速表：Tachometer

(1) 经济区域划分：

Economy range division

1100r/min-1200r/min为绿色弧线区；

1100r/min-1200r/min is green curve range；

1500r/min-1600r/min为绿色弧线区；

1500r/min-1600r/min is green curve range；

1200r/min-1500r/min为绿色区；

1200r/min-1500r/min is green range；

1600r/min-1900r/min为红色弧线区；

1600r/min-1900r/min is red curve range；

1900r/min-2600r/min为红色区。

1900r/min-2600r/min is red range.



(2) 指示误差：Indication error

刻线 (x100r/min)	5	10	15	20	25	发动机	工作电压	备 注
允许误差: r/min	(±50)	(±50)	(±50)	(±50)	(±70)			
信号频率 (HZ)	CAN	CAN	CAN	CAN	CAN	电控泵		CAN信号



（3）工作原理：

Operating principle

仪表采集发动机ECU的CAN信号，处理计算后驱动指针指示；如果转速 $>2600\text{rpm}$ ，指针指示在前一位置。如果仪表连续5s没有收到转速信号，转速表指针回零。

The CAN signal of engine ECU is collected by instrument, and after it is calculated, it will drive pointer to indicate. If rotating speed is more than 2600rpm , the pointer indicates to the previous position. If the instrument receives no rotating speed signal for 5s, tachometer pointer will be back to zero.

5.2 车速表: Speedometer

(1) 指示误差: Indication error

刻线 (km/h)	20	40	60	80	100	120	140	工作电压
允许误差: km/h	± 2	± 4	± 6	± 8	± 10	± 12	± 14	
信号频率 (HZ)								24V

(2) 工作原理: Operating

principle

车速表的车速信号来自安装于变速箱输出法兰处的车速传感器，输出为频率信号，其输出信号频率与变速箱输出轴转速有关，车速取决于变速箱输出轴的转速、驱动桥速比、轮胎直径这几个参数。如果车速 $>140\text{km/h}$ ，指针指示在前一位置。如果仪表连续5s没有收到车速信号，车速表指针回零，里程不累计。

Speed signal comes from the speedometer sensor, which is installed at output flange of transmission. The frequency signal is output signal, which is related to the rotation speed of output shaft of transmission. The vehicle speed depends on the rotation speed of output shaft of transmission, the ratio of drive axle and the diameter of tyre. If the vehicle speed is more than 140 km/h , the pointer points to previous position. If the speedometer receives no speed signal for 5s, the pointer of meter will be back to zero, and the mileage will not be accumulated.

备注：车速参数需根据车型具体参数通过按键进行调节。

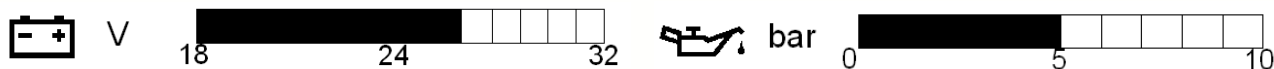
Note: the speed parameters need to be adjusted according to the specific parameters of vehicle by button.



5.3 电池电压表：Battery voltmeter:

电压表表示蓄电池当前的电压。当发电机未工作时电压一般为24V左右，电压过低表明蓄电池电量不足。在发电机开始工作后，整车电路电压应稳定在28V左右，若低于24V则表明发电机的电压调机器可能损坏，应及时维修，否则过高的电压会对车辆电器系统造成破坏。

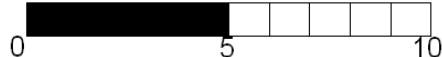
The voltmeter is used to indicate the current battery voltage. The voltage of is generally 24V when generator is not working. Too low voltage shows the battery is lack of electric quantity. After the generator start to work, the circuit voltage of complete vehicle should be about 28V. The voltage adjuster of generator may be damaged if the voltage is less than 24V, it should be repaired timely, otherwise, too high voltage will cause the damage of electrical system of vehicle.



5.4 油压表：Oil pressure

油压表用来显示发动机机油压力。仪表采集发动机ECU传递来的油压CAN信号，经仪表MCU计算处理后在液晶里显示；当仪表连续5s没有收到油压信号时，油压表回零，油压过低指示灯常亮，STOP报警灯同时点亮，蜂鸣器响5s。蜂鸣器报警波形见波形1-2。对于所有类型的发动机：机油压力 $\leq 0.7\text{bar}$ ，油压过低报警灯常亮，STOP紧急停车报警灯同时被点亮，蜂鸣器报警5s。需做回差，直到油压 $\geq 0.9\text{bar}$ 指示灯熄灭。油压低时应停机检修，否则继续运转将会造成发动机的损坏。

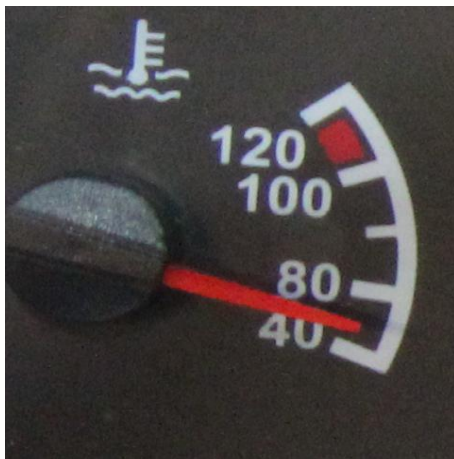
Oil pressure gauge is used to display the engine oil pressure. The oil pressure CAN signal of engine's ECU is collected by the gauge, it can be displayed on LCD after calculated and processed by MCU. When the gauge receiving no oil pressure signal for 5s, the oil pressure gauge will be back to zero, the too low oil pressure indicator lamp normally lights up, STOP alarm lamp lights up at the same time, and the buzzer is ringing for 5s. The buzzer alarm waveform see 1-2. For all diesel engines: When the oil pressure is less than or equal to 0.7bar, the too low oil pressure alarm lamp is normally on, the STOP emergency parking alarm lamp lights up at the same time, and the buzzer is ringing all the time. Need to do return difference. When the oil pressure is more than or equal to 0.9bar, the indicator lamp go out. If the oil pressure is too low, you should stop drive and inspect vehicle, otherwise, the engine may be damaged.



5.5 水温表：Water temperature gauge

水温表用来显示发动机冷却液温度。仪表采集发动机ECU的CAN信号，处理计算后驱动指针指示；当仪表连续5s没有接收到水温信号时，水温表指示在最大值，水温报警灯亮，STOP同时被点亮，蜂鸣器响5s。报警波形见波形1-2。对于柴油类型的发动机：水温 $\geq 100^{\circ}\text{C}$ ，水温过高指示灯常亮，STOP紧急停车报警灯同时被点亮，蜂鸣器一直报警。需做回差，当水温 $\leq 97^{\circ}\text{C}$ ，指示灯熄灭。对于气体类型的发动机：水温 $\geq 98^{\circ}\text{C}$ ，水温过高指示灯常亮，STOP紧急停车报警灯同时被点亮，蜂鸣器一直报警。需做回差，当水温 $\leq 95^{\circ}\text{C}$ ，指示灯熄灭。

Water thermometer is used for displaying the engine coolant temperature. ECU CAN signal of engine is collected by instrument, it can drive pointer indicator after calculated. When the instrument receiving no water temperature signal for 5s, water temperature meter indicates the maximum value, the water temperature alarm lamp lights up, STOP lights up at the same time, the buzzer is ringing for 5s. The alarm waveform see 1-2. For diesel engine: When water temperature is less than or equal to 100°C , the excess water temperature lamp is normally on, the STOP emergency parking alarm lamp lights up at the same time, and the buzzer is ringing all the time. Need to do return difference. When the water temperature is less than or equal to 97°C , the indicator lamp go out. For gas engine: When water temperature is less than or equal to 98°C , the excess water temperature lamp is normally on, the STOP emergency parking alarm lamp lights up at the same time, and the buzzer is ringing all the time. Need to do return difference. When the water temperature is less than or equal to 95°C , the indicator lamp go out.



5.6 油量（气量）表：Fuel gauge (gas meter)：

(1) 柴油车型：燃油表用来指示油箱内柴油液面位置；

For vehicles with diesel engine: the fuel gauge is used to indicate the diesel oil level inside fuel tank;

当油量 $\leq 10\%$ (对应阻值为 65.8Ω)时，油量低报警灯常亮，蜂鸣器报警5s，直到油量 $\geq 15\%$ (对应阻值为 62.7Ω)时指示灯熄灭；在“柴油”模式下，若仪表连续5s没有接收到油量信号，油量低指示灯常亮，指针指示在零位，蜂鸣器报警5s，蜂鸣器报警波形见波形1-2。

When water temperature is is less than or equal to 10%, the low fuel volume alarm lamp is normally on and the buzzer is ringing all the time, and the lamp will go out until the fuel volume is more than or equal to 15% (the corresponding resistance value is 62.7Ω). Under diesel mode, if the gauge receives no fuel volume signal for 5s, the low fuel volume indicator lamp lights up and the pointer points to zero, the buzzer alarms for 5s, the buzzer alarm waveform see 1-2.

(2) LNG车型：油量表用来指示剩余液量位置；

For vehicles with LNG engine: the meter is used to indicate the residual liquid volume;

当装一个气瓶时， $10\% \leq$ 液量值 $\leq 20\%$ ，液量指示灯亮，蜂鸣器报警5s，直到液量 $\geq 23\%$ ，液量指示灯熄灭。液量值 $< 10\%$ 时，液量指示灯亮，蜂鸣器报警5s。

If assembled with one cylinder, when the fluid volume is more than or equal to 10% but less than or equal to 20%, the fluid volume indicator lamp lights up and the buzzer alarms for 5s, and the lamp will go out until the liquid volume is more than or equal to 23%. When the fluid volume is less than 10%, the fluid volume indicator lamp lights up and the buzzer alarms for 5s

当装多个气瓶时，此表头指示液量总量的百分比。当其中一个气瓶的液量值 $\leq 20\%$ 时，液量指示灯闪烁5s，蜂鸣器报警5s，当 $< 10\%$ 时，液量指示灯闪烁5s，蜂鸣器报警5s。当 $10\% \leq$ 气瓶液量总和 $\leq 20\%$ 时，液量指示灯常亮，蜂鸣器报警5s，直到液量总和 $\geq 23\%$ 时，指示灯熄灭。当气瓶液量总和 $< 10\%$ 时，液量指示灯亮，蜂鸣器报警5s。如果计算出的LNG液量比例 $> 100\%$ ，则燃油表指针指示在前一位置。在“LNG”模式下，若仪表连续5s没有接收到任何一个气瓶液量信号，液量指针指示零，液量指示灯常亮，蜂鸣器报警5s，蜂鸣器报警波形见波形1-2。

If assembled with multiple cylinders, the meter indicates the percentage of total liquid volume. When the liquid volume of one cylinder is less than or equal to 20%, the indicator lamp flashes for 5s and the



buzzer alarms for 5s. In "CNG" mode, if the calculated CNG gas volume percentage is more than 100%, the pointer of CNG meter points to the previous position. If the meter receives no cylinder's pressure signal for 5s, the pointer points to zero, the gas volume indicator lamp normally lights up and the buzzer alarms 5s. In "CNG" mode, if the meter receives no cylinder's pressure signal after ignition key switched on 5s, the pointer points to zero, the gas volume indicator lamp normally lights up and the buzzer alarms 5s. The buzzer alarm waveform see 1-2.



5.7 尿素表（仅国四车型有）：

Urea gauge (only for vehicles assemble with China IV engine)

尿素表用来显示尿素箱的尿素液位。仪表采集发动机ECU传递来的的尿素CAN信号，经仪表MCU计算处理后在液晶里显示，它采取数字及条码结合方式显示，数字为实时显示，而条码采取四舍五入方式显示。

It is used for displaying the liquid level of urea tank. The urea CAN signal collected by engine ECU, after it calculated and processed by MCU, it will display on LCD. It is displayed by figure and barcode, the figure is real-time displayed, and the barcode is rounding-off displayed.

当尿素液位 $\leq 13\%$ 时，尿素液位低指示灯常亮，同时车辆故障指示灯亮，蜂鸣器报警5s。需做回差处理，直到液位 $\geq 18\%$ ，尿素液位低指示灯熄灭，车辆故障指示灯熄灭。

When urea level is 13% or less, low-level lamp is normally on, vehicle fault indicator lamp is alight at the same time, and the buzzer is ringing for 5s. Need to do return difference. The low urea level indicator lamp and the vehicle fault indicator lamp will go out until the level is more than or equal to 18%.

当出现非法值（大于100%）时，则尿素液位显示前一状态。

When an invalid value (greater than 100%) produced, the previous urea level will be displayed.

若仪表上钥匙电后接收到尿素液位信号，之后如连续5s没有接收到尿素液位信号，指示符的LED灯（蓝色）点亮，尿素液位低指示灯点亮，同时车辆故障指示灯点亮，蜂鸣器报警5s。退钥匙电不保存状态。蜂鸣器报警波形见波形1-2。



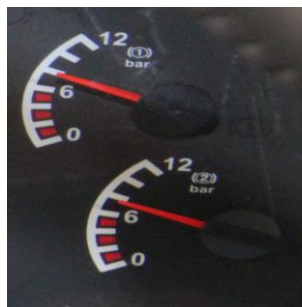
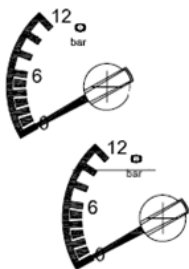
After ignition key switched on, the urea gauge receives no urea level signal for 5s, the LED lamp (blue) lights up, too low urea level indicator lamp lights up, failure indicator lamp of vehicle lights up at the same time, and the buzzer alarm for 5s. The current state will not be stored when ignition key switched off. The buzzer alarm waveform see 1-2.



5.8 气压表: Barometer

当气压 $>12\text{bar}$ ，气压表指针指示在前一位置。当气压 $\leq 5.5\text{bar}$ ，制动系统故障指示灯常亮，仪表指针指示当前采样信号点位置，STOP紧急停车报警灯同时被点亮，蜂鸣器响5s，报警波形见波形1-2。需做回差，当气压 $\geq 6\text{bar}$ 时，制动系统故障指示灯、STOP指示灯灭。如果仪表连续3s没有收到信号，气压表指针回零，制动系统故障指示灯、STOP紧急停车报警灯同时被点亮，蜂鸣器响5s，报警波形见波形1-2。

The pointer will point to previous position when air pressure more than 12bar . The failure indicator lamp will be always alight when the air pressure less than or equal to 5.5bar , and the pointer shows current collected signal position, the STOP emergency parking alarm lamp lights up at the same time, and the buzzer rings for 5s. The alarm waveform see 1-2. Need to do return difference. The brake system failure indicator lamp and the STOP indicator lamp will go out when the air pressure more than or equal to 6bar . If the barometer receives no signal for 3s, the pointer will be back to zero, and the brake system failure indicator lamp and STOP emergency parking alarm lamp will light up at the same time, and the buzzer ring for 5s. The alarm waveform see 1-2.



6.技术要求: Technical specifications:

6.1、工作电压: 18~32V, 标称24V;

Working voltage: 18~32V, nominal voltage: 24V;

6.2、工作温度: -30~+70°C, 储存温度: -40~+85°C

Working temperature: -30~+70°C, storage temperature: -40~+85°C

6.3、仪表正面面板为黑色, 刻度盘底色为黑色, 刻度线、符号、文字的颜色为白色。仪表指针为红色、针帽为黑色。刻度盘红色为报警区域, 夜间照明也为红色, 其余夜间照明为白色。

The color of the front panel of instrument is black. The bottom color of index dial is black. The color of scale line, symbols and text are white. The color of the pointer of instrument is red, and the color of needle cap is black. The red area on index dial is warning area. The night lighting is also red, the rest of the night lighting is white.

电压表: 18V-24V为红色区。

Voltmeter: 18V-24V is red area.

机油压力表: 0bar-0.7bar为红色区。

Oil engine pressure meter: 0bar-0.7bar is red area.

水温表: 98°C-120°C为红色区。

Water temperature: 98°C-120°C is red area.

油量（液量、气量）表: 0-1/8为红色区。

Oil (liquid volume, gas volume) meter: 0-1/8 is red area.

气压表1、2: 0bar-6bar为红色区。

Barometer 1, 2: 0bar-6bar is red area.

6.4、冷却液温度高报警点:

High coolant temperature alarm set point:

柴油发动机的冷却液位报警点是100°C, 气体机的冷却液位报警点是98°C。

The coolant level alarm point of diesel engine is 100°C. The coolant level alarm point of gas engine is 98°C.

机油压力报警点: 70kPa(0.7bar)。

Engine oil pressure alarm point: 70 kPa(0.7bar).



6.5 励磁电流（蓄电池充放电电流）：约为150mA；常电模式下，仪表进入低功耗模式，其静态工作电流 $\leq 3\text{mA}$ 。

Excitation current (the charging and discharging current of battery) : it is about 150mA; under constant electric mode, the instrument gets into low power mode, its static working current is less than or equal to 3mA.

6.6 执行标准：Executive standard:

QC/T 727-2007 《汽车、摩托车用仪表》

<instrment for automobile and motorcycle>

GB 4094-1999 《汽车操纵件、指示器及信号装置的标志》

<Motor vehicles—Symbols for controls, indicators and tell-tales>

QC/T 413-2002 《汽车电气设备基本条件》

< The basic conditions of electrical equipment of vehicle >

6.7 组合仪表材料燃烧特性技术要求应符合GB8410-2006中的等级B。

The technical requirements for materials combustion characteristic of combination instrument shall be in line with the grade B in GB8410-2006.

6.8 仪表插接器及线速端适配插接器均为AMP公司产品，具体型号如下：

The instrument plug-in connectors and harness plug-in connectors are all produced by AMP company, and the specific models are as follows:

	插座型号	对应整车护套	对应整车护套插片
28芯	174979-2	174046-2	173681-1
		174045-2	
36芯	175977-2	175966-2	
		175967-2	
20芯	174977-2	174047-2	173681-1



7. 维修与保养

Repair and maintenance

仪表三包里程：12月或5万公里，先到为准。

The after-sales mileage of instrument: 12 months or 50000 km, whichever occurs first.

注：仪表进水进气进液、整车长时间过电压（ $>36V$ ）、串电瓶起动、整车线束未脱开仪表的情况下违规电焊、整车其他部件短路或起火引起仪表损坏、人为增大整车原标配保险丝的熔断电流和延缓动作时间以及其它人为损坏等情况引起仪表损坏的，不纳入三包。

Note: the following situations are not included in after-sales service: the water, air or liquid get into instrument, long time over voltage($>36V$) of complete vehicle, series battery starting, illegal welding when complete vehicle harness connected with instrument, instrument damage caused by short circuit or fire of other components of the complete vehicle, artificially increase the fusing current and delay movement time of original standard fuse of complete vehicle, and other instrument faults caused by man-made damage.



8. 液晶屏LCD 信息查看及左右调节钮操作说明:

LCD screen information viewing and instructions on the left and right adjusting knob:

8.1 发动机状态选择 Engine condition selection

先按住左边按钮不放，然后点火锁电源A15、电瓶电源A33上电，左按钮超过2s以上松开仪表液晶显示屏进入“发动机状态选择”显示界面，如图1所示:

Press and hold the left button, the ignition lock power A15 and battery power A33 will be switched on. Release the left button after it is pressed more than 2s, the LCD screen will enter into "engine condition selection" interface, as shown in figure 1:

在该界面下，短按左键（ $\leq 2s$ ，下同），“潍柴柴油”、“康明斯”、“LNG”、“CNG”依次闪烁。当需要选择的状态闪烁时，短按右键（ $\leq 2s$ ，下同），该状态被保存，界面跳转到里程表K值设置界面，如图1-2所示，同时左边第一位数字开始闪烁（周期：1s）。短按左键，左第一位停止闪烁，左第二位闪烁，依次类推。若在上述闪烁状态下，左键右旋，数字从0-9递增；左键左旋，数字从9-0递减。在K值设置过程中，短按右键，所有数字机均停止闪烁，该数字被保存，2s后液晶显示“参数设置完毕”，如图1-3，3s后仪表自动重启，同时液晶显示图1-4,3s后显示正常的主界面。K值的范围为4476-34302。仪表出厂默认为潍柴柴油发动机，K值默认为8000。

Under the interface, short press the left key (less than or equal to 2s, hereinafter inclusive), "Weichai diesel", "Cummins", "LNG", "CNG" flash in turn. When the desired status flashing, short press the right button (less than or equal to 2s, hereinafter inclusive), the status will be saved, and the interface will jump to the K value interface for odometer, as shown in figure 1- 2, at the same time, the first digit on the left side begin to flash (cycle: 1s). Short press the left button, the left first digit stop flashing, the left second digit begin to flash and so on. In the above state, if rotate the left key to the right, the digit will increase from 0 to 9. If rotate the key to the left, the digit will decrease from 9 to 0. In the process of K setting, short press the right key, all digital machine will stop flashing, and the digits will be saved, "parameter setting finished" will be displayed on LCD after 2s, as shown in figure 1-3. The instrument will be restarted automatically after 3s, the LCD displaying as shown in figure 1-4, and the normal main interface will be displayed on LCD after 3s. The range of K value is between 4476 to 34302. The factory default parameters are Weichai diesel engines's, the defaulted K value is 8000.



图1-1

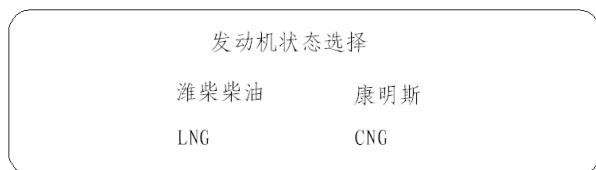


图1-4

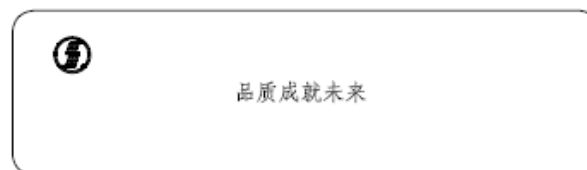


图1-2

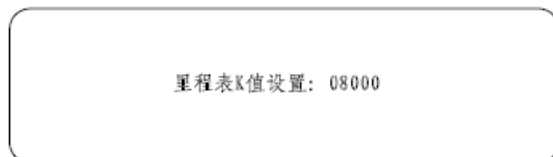
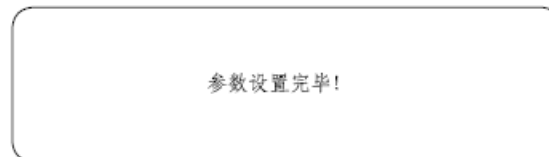


图1-3



8.2 仪表直接上电后界面说明

The instruction on the interface after the instrument directly switched on

(1) 燃油车型界面布局:

Interface layout for fuel vehicles:

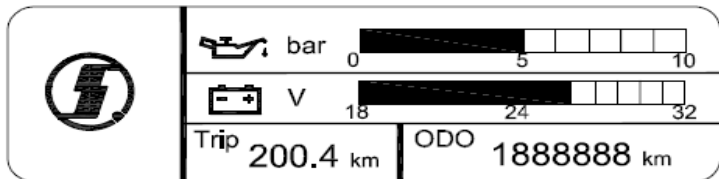
国四仪表的主界面如图5所示，国三仪表的主界面如图5-1所示。

The main interface for China IV vehicles is as shown in figure 5, and the main interface for China III vehicles is as shown in figure 5-1.

短按左键，主界面跳到此界面，如图5-2所示。

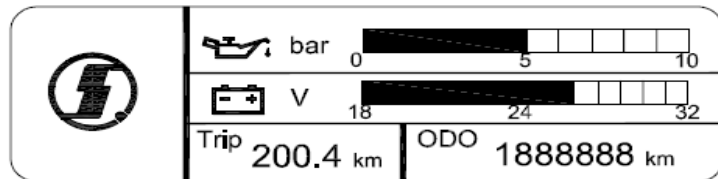
Short press the left key, jump from the main interface to the interface, as shown in figure 5-2.

图5-1



燃油车液晶主界面B(非国四仪表)

图5-1



燃油车液晶主界面B(非国四仪表)



9. 时钟日期调整说明 Clock and date adjustment

在时钟日期界面，长按左键，“分”信息开始闪烁，再短按一下左键，“时”信息开始闪烁，“分”信息停止闪烁；再短按一下左键，“月”信息开始闪烁，“时”信息停止闪烁；再短按一下左键，“日”信息开始闪烁，“月”信息停止闪烁；再短按一下左键，“年”信息开始闪烁，“日”信息停止闪烁；再短按一下左键，所有数字均停止闪烁。

In the date and clock interface, long press the left key, "minute" start to flash, and short press the left key again, "hour" start flashing, the "minute" stop to flash. Short press the left key again, "month" start to flash, "hour" stop to flash. Short press the left key again, "day" start to flash, "month" stop to flash. Short press the left key again, "year" start to flash, "day" stop to flash. And short press the left key again, all digits stop to flash.

(1)在上述闪烁状态下，左键右旋，数字递增；左键左旋，数字递减。

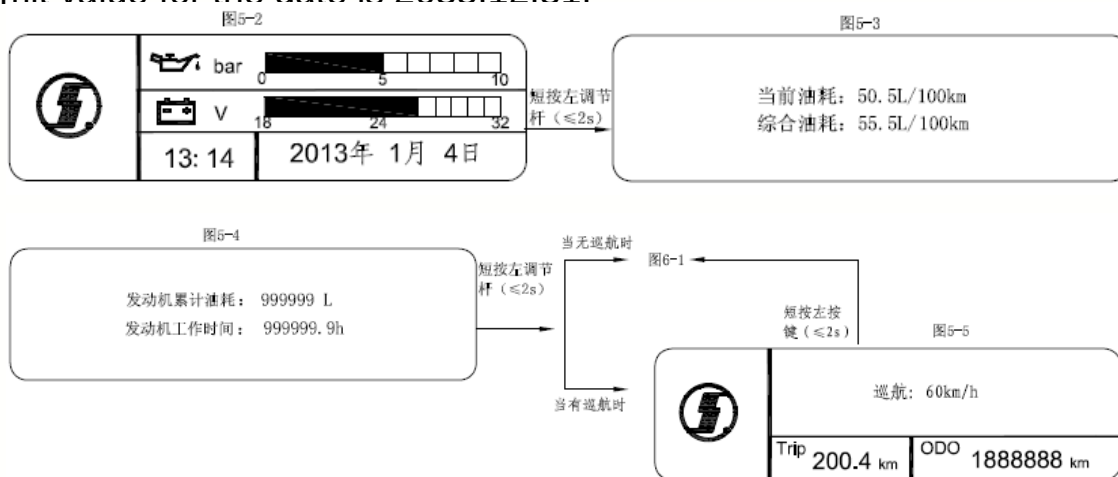
In the above flashing state, rotate the left key to the right, the digit will increase. Rotate the left key to the left, the digit will decrease.

(2)在调整过程中，如突然断常电，不保存调整时的时间及日期。

In the process of adjustment, all the adjusted time and date will not be saved for suddenly poweroff.

(3)日期上限值为2035.12.31。

The upper limit value for the date is 2035.12.31.



10. 总说明 General information

图6-1 主菜单

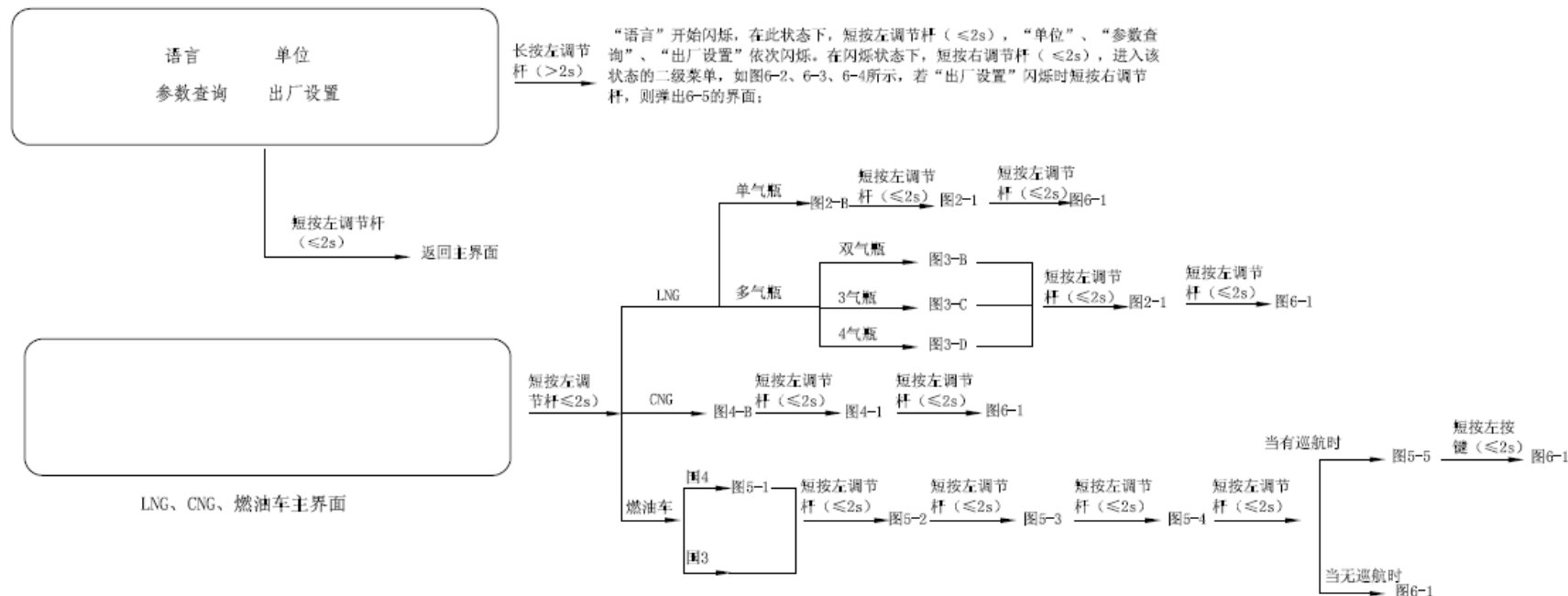
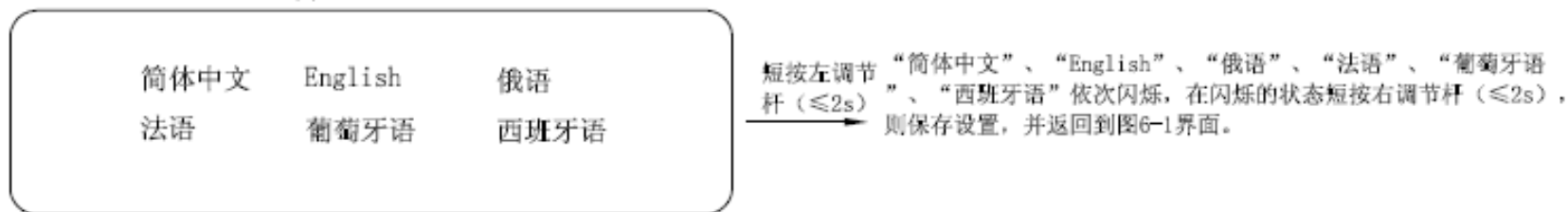


图6-2



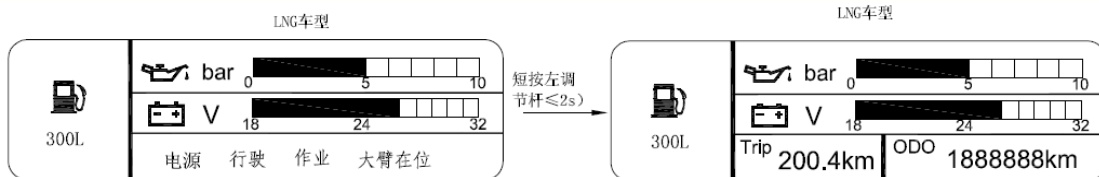
“语言”二级菜单



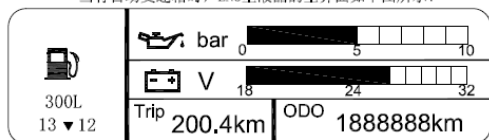
一、驾驶室及主要机构（装置） Cab and main mechanisms (Devices)

当有R或N或前进挡档位时，界面如下（以LNG为例）：

If there is R, N or forward gear, the interface (take LNG for example) is as follows:

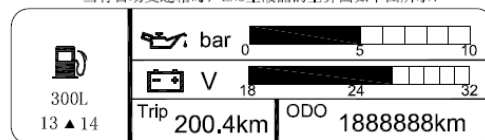


当有自动变速箱时，LNG型液晶的主界面如下图所示：



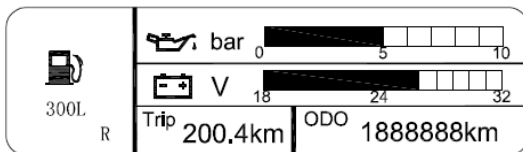
(13为当前档位，12为目标档位)

当有自动变速箱时，LNG型液晶的主界面如下图所示：

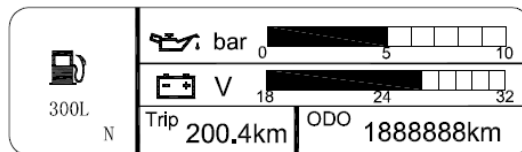


SPN: 520217
发动机被锁止

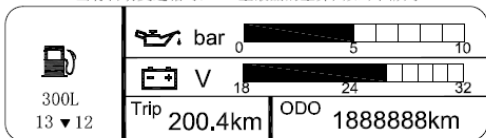
当R档有效时，LNG型液晶的主界面如下图所示：



当N档有效时，LNG型液晶的主界面如下图所示：



当有自动变速箱时，LNG型液晶的主界面如下图所示：



(13为当前档位，12为目标档位)

当有自动变速箱时，LNG型液晶的主界面如下图所示：

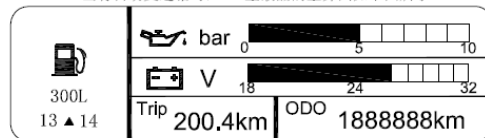


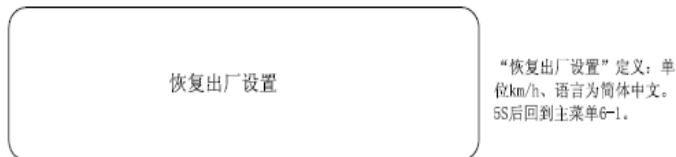
图6-3



图6-4

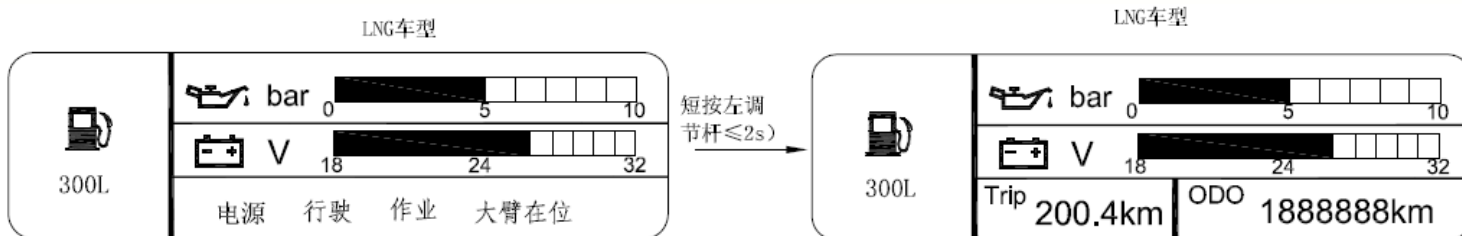


图6-5



当有“作业”、“电源”、“行驶”、“大臂在位”时，主界面如下（以LNG为例）：

If there is a "operation", "power", "driving", "big arm in place", the interface (take LNG for example) is as follows:



注：其他车型时，液晶显示同LNG车型。

Note: for other vehicles, the liquid crystal display is the same as LNG vehicles'.



当仪表收到“锁车”信号时，液晶一直“仪表被锁止，”如下图所示。

When received the lock signal, "instrument is locked" will always displayed on LCD, as shown in the following figure.

当仪表收到“锁车”信号后，
液晶显示如图。

仪表被锁止

当仪表收到锁发动机的故障码时，液晶显示“发动机被锁止”，长按左键或者超过10s无操作自动跳到故障前界面。

When the instrument received the fault codes of lock engine, "engine locked" will displayed on LCD, long press the left key or without any operation more than 10s, automatically jump to the previous interface before the error.

SPN: 520217
发动机被锁止

当仪表连续5s没有收到任何CAN信号时，液晶显示“车辆网络故障”，长按左键或者超过10s无操作自动跳到主界面。

When the instrument receives no CAN signal for 5s, "vehicle network fault" will displayed on LCD, long press the left key or without any operation more than 10s, automatically jump to the previous interface before the error.

车辆网络故障



11. 仪表常见故障维修:

Common fault maintenance of instrument:

原则：根据电气原理图的定义予以检测和维修故障。

Principle: inspect and repair it according to the definition of the electrical schematic diagram.

（1）上电后仪表无显示或指示:

There is no display or indication after switched on:

1) 检查仪表线束是否正确接入：A15：点火电源；A33：电瓶电源；

Check whether the wiring harness of instrument is connected correctly: A15: ignition power supply; A33: battery power supply;

2) 检查A15、A33电源是否过低（ $<16V$ ）或长时间过高（ $>36V$ ），并检查整车其它电器是否有烧坏情况

;

Check whether the voltage of power supply A15 and A33 is too low ($< 16V$) or too high for a long time ($> 36V$), and check whether there is other electrical appliance damage of complete vehicle;

3) 检查整车仪表保险丝是否熔断;

Check whether there is fuse of the vehicle instrument is burned-out;

（2）上电后指针不运转或指示不准确:

Check whether the pointer operates or indicates inaccurate:

1) 检查各表头信号是否正确接入仪表，信号是否满足表3的要求。包括传感器的地线当作信号线接入，信号线当作地线搭铁等等;

Check whether the header s' signals are properly connected to the instrument, whether the signal meet the requirements of table 3. Including the ground wire of sensor serves as a signal access, and signal lines serves as ground bonding, etc.



2) 检查传感器地A31是否可靠接地（搭铁），与“仪表电源-” A16是否同电位（同电位：相当于共点）。若A31电位<A16电位，则信号值与示值成反比的油量表会比正常情况偏高、信号值与示值成正比的CNG气量表、气压表会比正常情况偏低。

Check whether the sensor A31 is reliably grounding (bonding), whether it has the same potential with "instrument power -" A16 (the same potential: equal to concurrent). If A31 potential is less than A16 potential, the fuel gauge (the signal value is inversely proportional to the indicating value) will be higher than normal value, and the CNG gas meter, the barometer (the signal value is proportional to the indicating value) will be lower than normal value.

(3) 当整车出现：在开大灯、雨刮、暖风、空调、门窗等电气时，若出现指针抖动或漂移现象，应检查相应的传感器或电源地线与电瓶、大梁、驾驶室等处搭铁线是否可靠搭铁或有线束漏接。

For complete vehicle: when headlamp, wiper, heater, air conditioning, door and window is switched on, if the pointer oscillates or drifts, check whether the earthing of corresponding sensor or power supply ground wire and battery, girders and cab, etc. is reliable, and whether there is disconnected wire harness.

(4) 转速表不准，需要用发动机诊断工具确认发动机ECU外发的转速信号是否与仪表显示一致。

Tachometer inaccurate: using the engine diagnostic tool to ensure whether the output rotating speed signal is the same with it displayed on LCD .

(5) 车速表、里程数不准，首先应整车是否换过配置（车桥、轮胎、变速箱等），仪表K值是否与设计要求仪表标定的参数一致并咨询陕汽服务中心仪表K值。并依据维修手册修改K值。

Speedometer and mileage inaccurate: first check whether the configurations of complete vehicle have been changed (axle, tyres, transmission, etc.), the K value of instrument is consistent with the calibration instrument parameters of design requirements, and refer to the K value of the service center of Shanqi. And then modify the K value according to the maintenance manual.



注：出厂默认值：车速里程表每公里脉冲数K值为8000。整车出厂时，陕汽会根据整车配置在此基础上进行了修改。里程表每公里脉冲数K值不可随意更改，否则引起仪表指示不准。

Note: the factory default value: pulse number K value per kilometer for speedometer is 8000. When complete vehicle delivery, the K value will be modified by Shanqi according to the configuration of complete vehicle. pulse number K value per kilometer for odometer does not be changed randomly, otherwise it will cause instrument inaccuracy.

车速表不工作，除检查信号线、地线外，还应检查仪表A35是否输出11.4V电源给车速传感器。检查仪表指针是否松动或与刻度盘卡死，检查传感器的线束连接是否正确。

Speedometer does not work: in addition to check the signal wire, ground wire, check whether the instrument A35 output power supply of 11.4 V for speed sensor. Check whether the pointer is loose or the dial is jammed, and check whether the sensor wire is corrected accurately



(6) 点火钥匙断电后，指针不回零：

After the ignition key powered off, the pointer does not return to zero:

1) 检查常电（电瓶电）A33是否接入仪表，是否断开或过低（ $<16V$ ）。

Check whether constant power supply (battery power supply) A33 is connected to the instrument, and whether it is disconnected or its voltage is too low ($< 16V$).

2) 检查指针是否松动或与刻度盘卡死。

Check whether the pointer is loose or the dial is jammed.

(7) 指针指示跳抖：Pointer oscillating:

1) 检查信号和传感器地线，信号值是否满足设计定义。

Check the earth wire of signal and sensor, whether the signal value conforms to the design definition.

2) 检查指针是否松动或与刻度盘磨擦，电机是否损坏。

Check whether the pointer is loose or dial is grinding and whether the motor is damaged.

(8) 液晶显示断码、乱码：

Broken codes or illegible characters displayed on LCD:

液晶插座虚焊、短路、不清洁，液晶排线未可靠插到位。

The socket of LCD is ineracious soldering, short-circuited or unclean. The wires of LCD does not reliably in place.

(9) 里程不记忆：Mileage does not stored:

1) 确认A33电瓶电源是否始终接入仪表，且并未断开；

Confirm whether A33 battery power is always connected to the instrument and never disconnected;

2) 确认每次上电或行车耗时超过10s（上电行车，再熄火，再上电看里程是否记忆等操作不得 $<10s$ ）；

Confirm each power-on or running time is more than 10s (switch on ignition key and drive vehicle, switch the key off, switch on ignition key again, check whether the mileage has been stored, the operation shall be less than 10s);



3) 同时断A15点火和A33电瓶电源，本次行驶的里程数据可能不记忆。

因此，要求关掉A15点火电源后，等指针完全回到零位，液晶熄灭后，再关掉总电源开关。

Cut off A15 ignition and A33 battery power supply at the same time, the mileage data may not be saved. Therefore, after cutting-off A15 ignition, the main power supply should not be switched off until the pointer completely returns to zero and LCD is turned off.

(10) 报警灯不亮或常亮:

Alarm lamp not alight or normally alight

1) 检查整车接线和信号线是否正确。

Check whether the wiring and the signal lines of complete vehicle are correct.

2) 检查整车电源是否长时间过高（>36V），造成电路长时间过电压。

Check whether the vehicle power supply is too high for a long time (> 36V), which will cause overvoltage of circuit for a long time.

(11) 警灯微亮:

Warning lamp is shimmering:

检查整车接线和信号线是否正确，是否有漏电、串电现象。

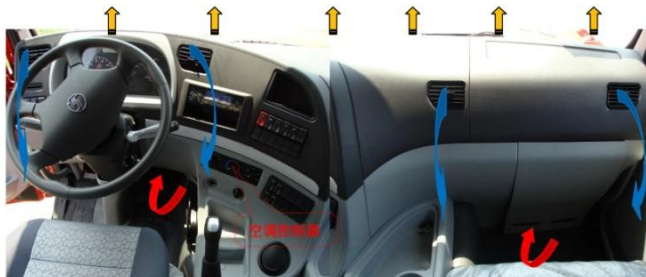
Check whether the vehicle wiring and the signal lines are correct, if there is electric leakage and series-wound phenomenon.



（十）空调调节系统使用操作 Air conditioning system operation

1. 空调系统技术参数 Air conditioning system parameters

1	制冷量 Refrigerating capacity	4.6KW
2	制热量 Heating capacity	6.0KW
3	送风量 Delivery air volume	650m ³ /h（100Pa）
4	电压 Voltage	24V·DC
5	总耗电功率 Total power consumption power	≤450W
6	制冷剂 Refrigerant	R134a

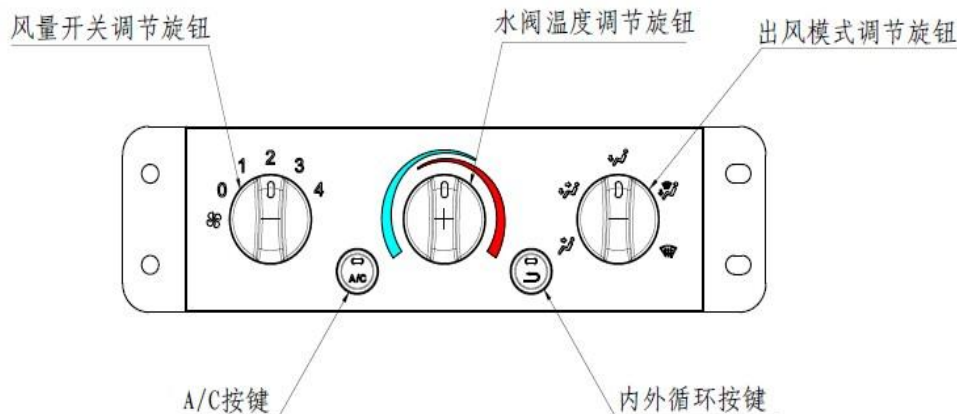


2. 空调控制器操作方法

Air conditioning controller operation method

空调控制器控制面板示意：

The schematic diagram of control panel of air-conditioning



(1) 控制按钮功能 Control button function

水阀温度调节旋钮：调节空调制热量大小。

Water valve temperature adjustment knob: it is used for adjusting the heat capacity of air conditioning.

风量开关调节旋钮：调节风机出风量。

Air volume adjustment knob: it is used for adjusting the air volume of fan.

出风模式调节旋钮：调节空调的工作模式。

The air mode adjustment knob: it is used for adjusting the work mode of air conditioning.



A/C按键：灯亮表示压缩机启动，制冷系统处于工作状态。

A/C button: the lamp lighting-up shows the compressor starts and the refrigeration system is in working condition.

内/外循环按键：开机后默认内循环，按下此键后绿色指示灯亮则进入外循环。

Internal/external loop button: default to internal loop after powered-on, it will start to external loop after pressing this button and the green lamp lighted-up.

背景光：当驾驶员打开小灯控制开关时，面板背景光LED全部点亮。

Background light: when the small lamp is switched on, the LED on the panel will be all alight.

（2）使用说明Instruction

1) 制冷Refrigeration

制冷系统首次使用，将水阀温度调节旋钮调至蓝色全冷位置（即水阀关闭状态），发动机启动后将风量开关开至高档，运行5分钟，然后按下A/C按键（指示灯亮），此时，制冷系统开始工作，车厢内温度开始下降，用户可根据需要调整风量大小和温度大小，使驾驶室保持舒适的温度。空调持续制冷时，当空调蒸发器表面温度下降至2.5摄氏度时，为防止蒸发器结冰，压缩机会自动停止工作。蒸发器表面温度达到5摄氏度时，压缩机会自动开始工作。

For the first using of refrigeration system, adjust the temperature control knob of water valve to blue full cold position (i.e., water valve closed position), put air volume switch to high-grade after engine starting, 5 minutes later, press A/C key (the indicator lamp lights up), at this moment, the refrigeration system begins to operate, the inner temperature begins to reduce. The user can adjust the air volume and temperature to make the cab in comfortable temperature. In the process of air conditioning refrigeration, when the surface temperature of air conditioning evaporator drops to 2.5°C, the compressor will stop working automatically to prevent evaporator freezing. When the surface temperature reaches to 5°C, the compressor will start to work automatically.



调整风口角度，可改变冷风吹出的角度和方向；调节风量开关，可获得1, 2, 3, 4四个档次的风量；转动出风模式调节旋钮，可依次实现“吹面-->吹面吹脚-->吹脚-->吹脚除霜-->除霜”5种模式；当风量开关旋钮处于1~4档时，允许压缩机启动。此状态下若按动一次A/C键可开启压缩机，空调制冷，再按动一次则可关闭压缩机，如此循环；当风量开关处于0档时，不允许开启压缩机，此时按动A/C键无效。

Change the angle and direction of cold air blowing by adjusting the angle of ventilation duct. There are four classes of air volume, adjust it by the air flow switch. Rotate the adjusting knob to change air blowing mode in turn, “blowing face-->blowing face and foot-->blowing foot-->blowing foot and defrosting-->defrosting”. The compressor is allowed to start when air volume switch knob is in 1~4 range. Under the condition, if pressing A/C key once can turn on the compressor, air conditioning refrigerates, and pressing the key again can shut down the compressor, and so on. When air volume switched in 0 range, the compressor is not allowed to turn on, press A/C button is invalid at this time.

注意：制冷时，请保证水阀处于关闭状态。

Note: when refrigerating, please make sure that the water valve is closed.

2) 制热Heating

冬季采暖时，首先使A/C按键处于关闭状态（指示灯灭），在发动机启动后，将水阀温度调节旋钮调至红色区域（水阀打开），开启风量开关，空调开始制热。

Heating in winter: firstly make A/C button in closed state(indicator lamp is not alight), after the engine starting, adjust the temperature control knob of water valve to the red area (water valve opens), and then turn on air volume switch, the air conditioning will start to heat.

调整风口角度，可改变热风吹出的角度和方向；调节风量开关，可获得1,2,3,4四个档次的风量；转动出风模式调节旋钮，可依次实现“吹面-->吹面吹脚-->吹脚-->吹脚除霜-->除霜”5种模式。

Change the angle and direction of heated air blowing by adjusting the angle of ventilation duct. There are four classes of air volume, adjust it by the air flow switch. Rotate the adjusting knob to change air blowing mode in turn, “blowing face-->blowing face and foot-->blowing foot-->blowing foot and defrosting-->defrosting”.



（3）注意事项 Attention matters:

1) 对于整个空调系统，请勿随意拆卸，防止制冷剂泄露。

Please do not disassemble the whole air conditioning system to prevent the refrigerant fluid from leaking.

2) 定期检查皮带的松紧度，防止过松过紧。

Regularly check the degree of tightness of belt, to prevent it is too loose or too tight.

3) 定期清洗冷凝器表面积垢，防止制冷效果下降。

Regularly clean the surface scalefilm of condenser to prevent the influence on refrigeration.

4) 更换零部件时，应按下表规定，补充同型号冷冻油。

When replacing parts, please fill in the same type of freezing oil according to the following table:

更换部件名称 Name of replaced parts	补充冷冻油数量（CC） Filled frozen oil volume (CC)
冷凝器Condenser	40-50
蒸发器Evaporator	40-50
制冷循环胶管 Refrigeration cycle hose	10-20
干燥-贮液器 Dry - receiver	15-25

5) 非专业人员，请勿拆卸修理空调系统。

It is forbidden for non-professional workers to disassemble and repair the air conditioning system.



（十一）点火钥匙开关的使用如图

The use of the ignition key switch, as shown in figure

钥匙开关位置含义：

“0”为ACC位表示发动机处于熄火状态，电源给收录机供电；

“0” is ACC position, which indicates engine is in flameout state, the radio is powered on;

“R”为LOCK位表示车辆处于此位置时，按下锁钮可拔出钥匙，此时方向盘锁住，不按锁钮钥匙不能拔出。

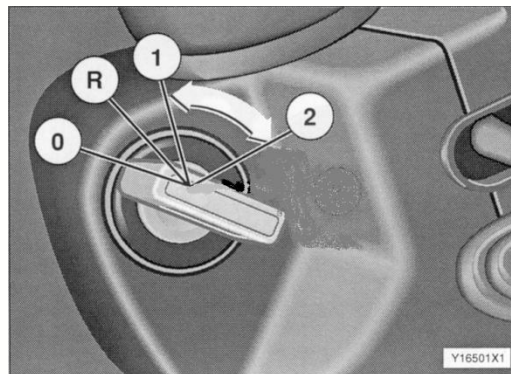
“R” is LOCK position, press lock knob to pull out the key, at this moment, the steering wheel is locked. The key should not be pulled out only when the lock knob is pressed;

“1”为ON位表示当钥匙拧到此位置时，灯光总开关、燃油防盗报警器、ECU、仪表灯电器件工作；

“1” is ON position, when rotate the ignition key to the position, the master lighting switch, burglar alarm for fuel, ECU and electric parts of instrument get to work;

“2”为START位表示起动发动机的位置。

“2” is START position, which indicates engine starting position.



注意：行车时切勿关闭点火钥匙开关。

Note: do not switch off the ignition key during driving.



(十二) 组合开关的使用

Operation of combination switch

在使用组合开关之前先接通点火钥匙开关。

Turn on the ignition switch first before using the combination switches.

1.如图，①把开关手柄移动到位置0，接通前照灯近光。

As shown in figure, ① operate switch handle to Position 0, and turn on lower beam of headlamps

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。

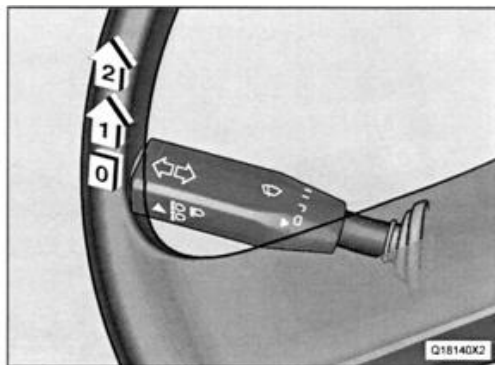
Push switch handle to position 1, when the headlamp high beam indication lamp 10 is lighted, high beam of headlamps is turned on.

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）。

Push switch handle to position 1 and position 2, when the headlamp high beam indication lamp 10 is lighted, switch off high beam(the low beam is still alight).

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。

Gently push the switch to position 1, the marked indicator lamp 10 of low beam will light up.



2.转向灯的使用 Use of direction indicator lamps



: 主车左转向指示灯; the left steering indicator lamp of main vehicle



: 主车右转向指示灯; the right steering indicator lamp of main vehicle



: 挂车左转向指示灯; the left steering indicator lamp of trailer



: 挂车右转向指示灯; the right steering indicator lamp of trailer

①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。

When direction indicator lamp switch is turned on, the green detector lamp 8 marked with tractor direction indicator lamp will start blinking. If the tractor works with a trailer, the green detector lamp 11 marked with trailer direction indicator lamp will also start blinking. The direction indicators feature in 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 indicators 8 and 11 only blinked once, it means that failures might happen to the direction indicator lamps. Please check and replace bulbs if necessary.

②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。

Push the switch handle forward, until the handle passes pressure point and reach Position 1, and the right steering lamp keeps blinking.



③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。

Pull the switch handle backward, until the handle passes pressure point and reach position 2, and the left steering lamp keeps blinking. When the vehicle moves in straight line, the handle will automatically be rebounded to position 0.

④向前方/后方推动，拉动开关手柄至压力点并保持在位置，松手后，开关手柄将自动弹回位置0。转向灯短时闪烁。

Push the handle forward / backward, and pull it to the pressure point and keep it at the position. Release your hand, and the handle will automatically be rebounded to position 0. The steering lamp will blink momentarily.

3.风档玻璃刮水器的使用 Use of windscreen wiper

按所指方向转动开关手柄，使开关手柄的箭头①处于位“INT”，“OFF”，“LO”或“HI”。

Windscreen wiper should be operated through rotating the switch handle, so that its arrow ① can point to positions of “INT”，“OFF”，“LO” or “HI” .

于位置“OFF”时，关闭风档玻璃刮水器。

If the arrow points to “OFF”, turn off the windscreen wiper.

②处于位置“INT”时，风档玻璃刮水器间歇刮水，间歇刮水时间约为10秒钟。

If the arrow points to “INT”, the wiper will be in intermittent wiping condition, and its wiping period will be about 10 seconds.

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

If the arrow points to "LO", the wiper will be in slow wiping condition; If the arrow points to "HI", the wiper will be in quick wiping condition.



④断开刮水器，转动开关手柄，使其上的箭头①转至位置“OFF”。或者关掉点火钥匙开关。

Switch off the wiper, rotate the handle to make arrow ① point to “OFF”. Or turn off ignition key.

4 风窗玻璃清洗器的使用：Use of Windshield Washer:

下组合开关的按钮（最长时间为0.9秒），则出现一个喷淋刮水循环。

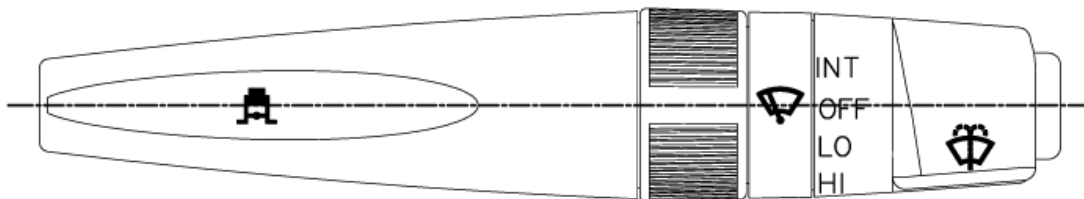
Press the button of combination switch (the longest period can be 0.9s), and a spraying / wiping cycle can be started.

②按压按钮时间更长一些（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。

Press pushbutton for a longer period (longer than 0.9s, and the maximum period can be 6.5s). As along as the pushbutton is in its depressed condition, the spraying / wiping cycle will continue. Immediately, another 2 to 4 times of wiping cycle will be started.

注意：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。

Caution: Please consider of verifying whether the wiper blade has been dusty or damaged in period. Before starting the engine in frost weather, it is best to check whether the wiper blade has been frozen with windscreen.



（十三）仪表板:instrument panel

车身翘板开关的使用 Use of rocker switch

1.收放机的使用Usage of radio

该款收放机带MP3主机、USB接口等功能。

The radio has the functions of MP3 host, USB interface, and so on.

功能：a.FM/AM 手动搜索调谐（TUNE）；FM/AM自动搜索调谐；

Functions: a. F M/AM manual search tune (TUNE);FM/AM automatic search tune;

b.收音存储功能；FM/AM波段转换；[FM1 FM2 FM3]×6自动/手动存储；[AM1 AM2]×6自动/手动存储；收音静音预览（Mute）等。

Radio storage function; FM/AM wave band conversion; [FM1 FM2 FM3] × 6 automatic/manual storage; [AM1 AM2] × 6 automatic/manual storage; Radio mute preview (Mute), etc.

c.支持外接U盘，播放mp3格式；

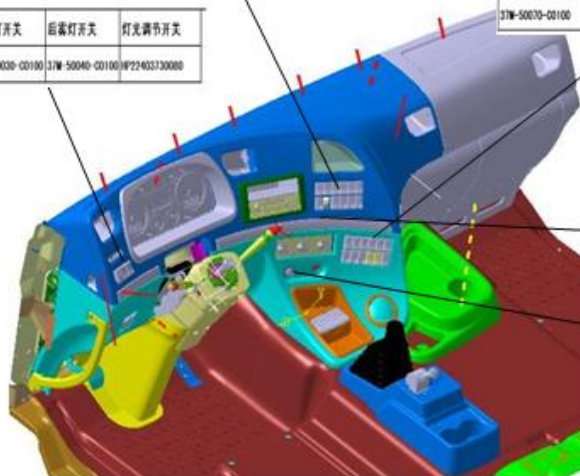
Support external U disk, mp3 format;

- | | |
|---------------------------|----------------|
| 1. 电源开关键 | 2. 音量电位器 |
| 3. 液晶显示屏 | 4. 模式转换键 |
| 5. 波段选择键 | 6. 静音键 |
| 7. 手动扫描键(向下扫描) | 8. 手动扫描键(向上扫描) |
| 9. 系统复位键 | 10. 时钟键 |
| 11.预置键 1、播放暂停 | 12. 预置键 2、浏览播放 |
| 13. 预置键 3、重复播放 | 14. 预置键 4、随机播放 |
| 15. 预置键 5、（播放 MP3 时上选文件夹） | |
| 16. 预置键 6、（播放 MP3 时下选文件夹） | |
| 17. 自动扫描/存储键 | 18. USB 仓盖 |



电源开关	轴间差速锁开关	轮间差速锁开关	室内灯开关	干燥器开关	燃油预热开关（选装）	熄火开关	危险报警警告开关	电气喇叭转换开关	发动机预热开关	远光辅助开关	助力泵开关
37W-56310-00100	37W-50080-00100	37W-50090-00100	37W-50100-00100	37W-50020-00100	37W-56350-00100	37W-50160-00100	37W-50060-00100	37W-50010-00100	37W-50050-00100	37W-50110-00100	37W-50110-00100
后工作灯开关（只装后桥车标配）											
37W-50070-00100											

前雾灯开关	后雾灯开关	灯光调节开关
37W-50030-00100	37W-50040-00100	37W-50030-00100



暖风控制面板

点烟器



（1）收音操作： Radio operation:

——存储电台 **Storage broadcasting stations**

1) 按照您选择的顺序，最多可设置存储18个FM电台（FM1、FM2、FM3各6个）和12个AM电台（AM1、AM2各6个）。

According to the order of your choice, it can set up and storage 18 FM broadcasting stations (six stations for FM1, FM2 and FM3 respectively) and 12 AM broadcasting stations (six stations for AM1 and AM2 respectively).

在收音状态时，反复按面板上的“BAND”键选择波段。收音初始状态为FM1，每按一次，波段按照FM1~FM2~FM3~AM1~AM2循环变化。

When radio working, repeatedly press the "BAND" button on the panel to select band. The initial state of radio is FM1, each time you press the button, the band will change in the order from FM1, FM2, FM3, AM1 to AM2 circularly.

2) 在收音状态时，长按面板上的“▶”或“◀”键，可以在动搜索到下一个或上一个清晰的电台。短按面板上的“▶”或“◀”键，可以手动步进到下一个或上一个清晰的电台。当收到电台后，按住任意一个数字键并保持2s，可将该电台存储到该数字键上。若该键上已存储电台，将被替换。

When radio working, long press "▶" or "◀" button on the panel to search the next or last station. Short press "▶" or "◀" button on the panel to manually enter into the next or last station. After searching station, hold an arbitrary number key and keep for 2s, the station can be stored on the number key. If a station has been stored on the key, it will be replaced.

3) 在FM收音状态时，长按“A.PS”键收音机将自动扫描并存储该波段信号最强的18个电台。存储完毕后，将依次浏览所存储电台。

In the state of FM radio, long press "A.PS" button, the radio will automatically search and store the strongest 18 stations. After the storage, all stored stations will be browsed in turn.

在AM收音状态重复上述操作，可以存储该波段信号最强的12个电台。

Repeat the above operation to search and store the strongest 12 stations in the band.



——收听所存储的电台：Listening to the stored stations:

按面板上的“BAND”键选择波段，再按数字键选择所存储的电台；

Press the "BAND" button on the panel to select band, and then press the number key to choose the stored station;

在收音状态时，短按“A.PS”键收音机将浏览该波段所存储的电台。若要收听所浏览的电台，按一下所显示电台的数字键即可。

In the state of radio, short press "A.PS" button to browse stored stations in the band. If you want to listen to the radio browsed, click on the number key displayed.

音响调节：Sound adjustment:

重复按压音量电位器，收音机将按下列次序循环进行音响模式选择：BAS~TRE~BAL~VOL。

Repeatedly press the volume potentiometer, the radio will circularly choose acoustic modes in the order: BAS ~ TRE ~ BAL ~ VOL.

1. 音量模式（VOL）

Volume mode (VOL)

顺时针或逆时针旋转音量电位器，可调节音量大小。音量电平可在0~63之间任意调节。

Clockwise or counterclockwise rotate the volume potentiometer to adjust volume. The volume level can be randomly adjusted between 0 ~ 63.

2. 低音模式（BAS）

Bass mode (BAS)

顺时针或逆时针旋转音量电位器，可调节低音大小，低音电平可在-14~+14之间任意调节。

Clockwise or counterclockwise rotate the volume potentiometer to adjust bass. The bass level can be randomly adjusted between - 14 ~ + 14.

3. 高音模式（TRE）

Treble mode (TRE)

顺时针或逆时针旋转音量电位器，可调节高音大小，低音电平可在-14~+14之间任意调节。

Clockwise or counterclockwise rotate the volume potentiometer to adjust treble. The treble level can be randomly adjusted between - 14 ~ + 14.



4.左右平衡模式（BAL） Balance mode (BAL)

顺时针或逆时针旋转音量电位器，可调节左右声道音量大小，其电平大小可在L15～R15之间任意调节

Clockwise or counterclockwise rotate the volume potentiometer to adjust the volume of left and right channel. The level can be adjusted between L15 ~ R15.

USB/SD卡操作：

USB/SD card operation:

注意：支持mp3格式的音频文件；

Note: it supports the audio files of mp3 format.

支持32M～4G的以闪存为介质的存储器。

It supports the flash memory storage medium of 32M to 4G.

~~播放USB/SD卡~~

Play USB/SD card

- 按面板上的电源开关键，打开主机电源。

Press the power supply switch on the panel to turn on the host.

- 将U盘/SD卡插入U盘/SD卡转接口，显示屏即显示“USB/SD”开始搜索，搜索完毕后自动播放。

Insert U disk/SD card into U disk/SD card interface, "USB/SD" searching will be displayed on screen, and it will automatically play after searching.

- 在播放过程中将显示：曲目号 已播放时间

During playing, it will display track number and past track time.

- 在U盘/SD播放状态时，按“键▶||”为暂停功能，再按一下恢复播放。

In the U disk/SD card play state, if you want to pause, please press “▶||”。

- 在U盘/SD播放状态时，拔出USB/SD推出USB播放状态，进入收音模式。

In the U disk/SD card play state, pull out the USB/SD to quit USB play state, and then it will enter into radio mode.



——曲目浏览播放

SCAN PLAY

在U盘/SD播放状态时，按“2_{INT}”键进入曲目浏览，播放每首曲目前10s，再次按下该键取消该功能。全曲目浏览完毕后，从第一首曲目正常播放。

In the U disk/SD card play state, press "2 INT " button to enter the track browsing, play each music for 10s, and press the button again to cancel play. After browsing all music, it will play from the first track.

——曲目重复播放

Music repeat

在U盘/SD播放状态时，按“3_{RPT}”键，重复播放当前曲目，再次按下该键取消该功能。

In the U disk/SD card play state, press "3 RPT " to repeat the current track, and press the button again to cancel repeat function.

——曲目随机播放

RANDOM PLAY

在U盘/SD播放状态时，按“4_{RDM}”键进入随机播放模式，再次按下该键取消该功能并进入顺序播放。

In the U disk/SD card play state, press "4RDM" to enter into random play mode, and press the key again to cancel random function and play in order.

——寻找指定曲目

Looking for specified track

在U盘/SD播放状态时，短按“▶”键选取下一首曲目，短按“◀”键选取上一首曲目。

In the U disk/SD card play state, short press "▶" key to select next track, short press "◀" to select previous track.

——寻找曲目中的指定位置

Looking for specified position in the tracks

在U盘/SD播放状态时，长按“▶”或“◀”键，歌曲将快进或快退。

In the U disk/SD card play state, long press "▶" or "◀", the song will advance or retreat quickly.

当找到所要位置时，再按“ ”键即可从当前位置继续播放。

When the position found, you can play from current position by pressing " " button.



——选择要读取的文件夹

Selecting the folder to read

播放U盘/SD卡时，短按预置键5和预置键6可直接进行文件夹选择操作，收放机将从所选择文件夹的第一首曲目开始按顺序播放。

In the U disk/SD card play state, short press preset key 5 and 6 to select folders, the player will start play from the first track inside the selected folder in sequence.

其他功能：

Other features:

——静音功能（MUTE）

Mute function

收音或放音状态时，按静音键，可以使音量保持在静音状态，显示屏显示“MUTE”。

In the radio or playback state, press the MUTE key to make it in mute state, “MUTE” will be displayed on display screen.

若要恢复收音或放音状态，再按该键或改变音量大小即可。

Pressing the key again or changing the volume will restore the radio or playback state.

——时钟设定（DISP）

Clock setting

1.在开机状态时，短按“DISP”键显示时钟，5秒内若不按该键自动回到正常状态；再次按下该键也可回到正常状态。

When power on, short press "DISP" key to display clock, if the button doesn't be pressed for 5s, it will automatically return to normal state. Press the key again to return to normal state.

2.长按“DISP”键，时钟为闪烁状态时，按“▶”和“◀”键调节时钟；再按“DISP”键，分钟为闪烁状态时，按“▶”和“◀”键调节分钟。设定完成后，再按“DISP”键结束。

Long press "DISP" key, the clock begin to flash, press "▶" and "◀" to adjust clock. Then press "DISP" again, the minutes will flash, and press "▶" and "◀" to adjust the minutes. After your setting, then press "DISP" key to end.



备注：

Remark:

时钟调整后，不按任何键，5秒后自动返回正常状态，并保存时钟设置。

After clock adjusted, if there is no key pressed, it will automatically return to normal status after 5s, and save the clock setting.

——收音、USB/SD卡、音频输入转换（MODE）

Radio, USB/SD card, audio input conversion (MODE)

在收音机正常工作状态下，连续按“MODE”键即可以在收音、USB/SD卡、音频输入之间切换播放。若未插入USB/SD卡，连续按下“MODE”键，只在收音和音频输入间转换；若同时插入USB、SD卡，连续按下“MODE”键，收音机按收音～USB播放～SD卡播放～音频输入进行转换。

Under normal working state of the radio, continuously press "MODE" key to convert between radio, USB/SD card and audio. If there is no USB/SD card inserted, continuously press the "MODE" button, it will convert only between radio and audio. If there are USB and SD card inserted at the same time, continuously press the "MODE" button, it will switch in the sequence from radio, USB, SD card to audio.

若只插入USB、SD卡中的一个设备，连续按下“MODE”键，收音机按收音～USB播放/SD卡播放～音频输入进行转换。

If there is only USB or SD card inserted, continuously press the "MODE" button, it will switch between radio, USB/SD card and audio.

——系统复位

（RESET）

当机器出现非正常状态而不能工作时，按下该键系统恢复初始状态，若仍不能正常工作，请将车子送维修服务站维修。

When the radio is in abnormal state and can't work, press the “RESET” key to restore the initial state. If it still cannot work, please send it to maintenance service station.



（十四） 车内照明控制 Interior lighting control

1.前顶灯阅读灯

The front ceiling reading lamp

如图，按下开关接通前顶灯阅读灯电路。

As shown in figure, press the switch to turn it on.

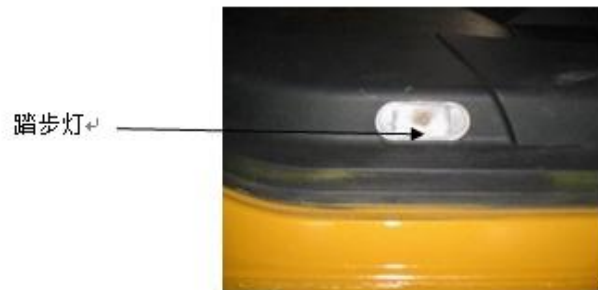


2.顶灯

Ceiling lamp

按下仪表台上的照明灯开关，接通顶灯电路。

Press the lighting switch on instrument to turn on the ceiling lamp.



3.踏步灯

Step lamp

安装在车门上。打开车门，接通踏步灯电路；关闭车门，断开踏步灯电路。

The lamp is installed on the door. The lamp will be alight when door is opening, and the lamp will be extinguished when door is closing.



（十五）附件系统: Attachment system:

1. 中烟灰箱: Ash tray

使用点烟器和烟灰盒时，沿箭头方向向下，在中间标示处轻按约2秒钟，待锁扣与锁环分离，放开后中烟灰箱自动弹开。关闭时，同样沿箭头方向关闭中烟灰箱，在中间标志处向下轻按中烟灰箱约2秒钟，待锁扣与锁环接触好后，即可以关闭中烟灰箱。

If you want to use the cigarette lighter and ash tray, downwards along the direction of arrow, lightly press the middle mark for about 2s, after the lock and lock ring separated, the ash tray will automatically bounce off after you stop pressing. When the ash tray closing, close it along the direction of arrow, lightly press the middle mark for about 2s, after the lock and lock ring engaged, the ash tray is closed.

2. 烟灰盒: Ashtray:

若要进行清洁，首先打开盖子，沿图中箭头所示方向拉出整个烟灰盒即可。

If you want to clean ashtray, firstly open the cover, pull it out completely along the direction of the arrow indicated in figure.

注意：在离开车辆之前，为安全起见一定要将烟灰盒关上。

Note: before leaving the vehicle, as a safety precaution, the ashtray must be closed.



3. 点烟器: Cigarette lighter.

要用点烟器时，将点烟器直接按入，松手后等待10秒钟，点烟器前部的电阻丝烧红后会自动弹出，回到原来的位置，此时可以拔出点烟。用完后，放入原来的位置。

If you want to use cigarette lighter, press the cigarette lighter directly, 10 seconds later, the cigarette lighter will automatically pop up after the front resistance wire burnt red and back to its original position, at this time, you can pull it out. After use, put it in the original position.

警告: 绝对不能让点烟器长时间处于接通状态，如果长时间不能自动弹出，一定要人为拔出。

Warning: never let the cigarette lighter in the connected state for a long time, if it cannot be automatically bounded for a long time, pull it out manually.

4. 遮阳板: Visor:

使用遮阳板时，只需将遮阳板上端向下扳动，确认稳固后松手即可。收起时，向上扳动遮阳板确认稳固后即可。

Put down the visor: pull the upper end of the visor downwards, and release it if it is solid. Pack up the visor: pull it upwards and confirm whether it is solid.



5. 窗帘: Curtain:

(1) 挂窗帘时, 将窗帘的吊环依次挂入在相应导轨上的吊钩上, 然后沿导轨方向均匀展开, 窗帘之间用尼龙搭扣搭接, 侧围、后围窗帘下端的金属按扣卡在护板上的塑料卡扣上。

Curtain hanging: hang the jump ring of curtain into the hook of corresponding guide rail in turn, and then spread the curtain evenly along the guide direction. The curtain connect with each other by nylon fastener. For the curtain of side and rear wall, make the metal snap-fastener at lower end of curtain into the plastic snap on backplate.

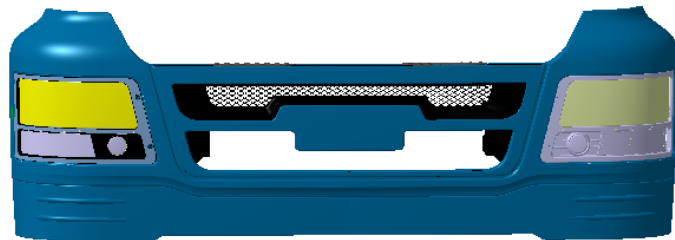
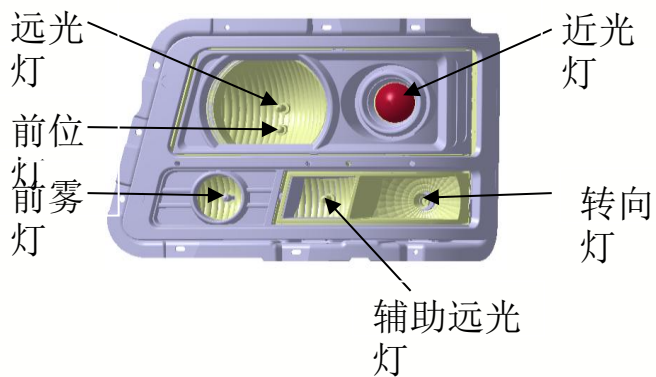
(2) 收拢窗帘时, 先将尼龙搭扣解开, 然后沿导轨方向均匀收拢, 再用搭扣捆束窗帘。

Curtain folding-up: loosen the nylon fastener, evenly fold it up along the guide direction, and then bundle it by fastener.

6. 后视镜及前下视镜: Rearview mirror and front down view mirror:

驾驶室车门左右侧均安装有外后视镜, 前下视镜及侧下视镜只安装在右侧。驾驶员可调节后视镜及下视镜以达到最佳的后视及下视效果。

External rearview mirrors are installed on both sides of door. The front and side down view mirrors are only installed on the right side of door. All the mirrors can be adjusted in order to achieve the best visual effect.



（1）灯泡一览表： Bulb lists:

前组合灯总成： The front combination lamp assembly:

组成：远、近光灯、前位灯、转向灯、前雾灯、辅助远光灯、灯壳、装饰板等，前位灯位于远光灯的灯碗处。

It is composed of: high and low beam, front position lamp, steering indicator lamp, front fog lamp, auxiliary high beam, lamp housing and decorative plate, and so on. The front position lamp locates at the lamp bowl of high beam.

（2）位置：安装在保险杠上，使用支架与保险杠连接。（右前组合灯与左前组合灯对称）

Location: it is installed on the bumper and connected with bumper by brackets. (the right front combination lamp is symmetric with the left one).

7. 侧转向灯： Side steering indicator lamp

安装在上车踏板装饰板上 (左右对称)，当打开转向灯开关或危急报警开关时，与前、后转向灯同步闪烁。

It is installed on the decorative plate of get-on pedal (the left and right lamps are symmetrical). When switched on steering indicator lamp or emergency alarm switch, it will flash along with the front and rear steering indicator lamp.



侧转向灯

8. 示廓灯：（适用于除非洲版以外的车型） Outline marker lamp: (except for Africa type vehicles)

安装在遮阳罩上，左右各一个，当小灯开关打开时，示廓灯点亮。

The lamps are installed on the sun visor, one on the left and one on the right. When the small lamp is switched on, the outline marker lamp will light up.

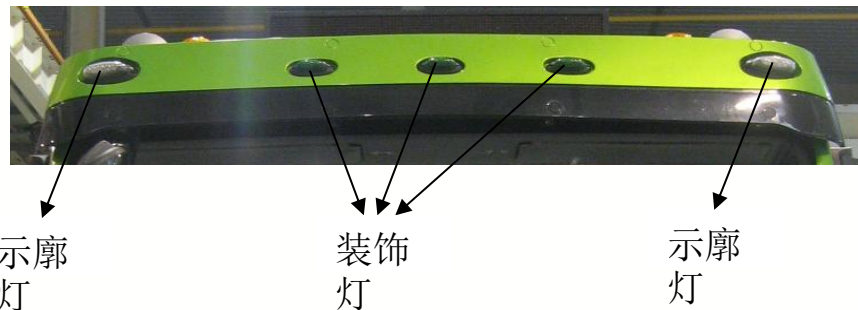
9. 装饰灯：（适用于除非洲版以外的车型）

Decorative lamp: (except for Africa type vehicles)



安装在遮阳罩上中间位置，当小开关打开时，装饰灯点亮。

It is installed on the middle position of sun visor. When the small lamp is switched on, the decorative lamp will light up.

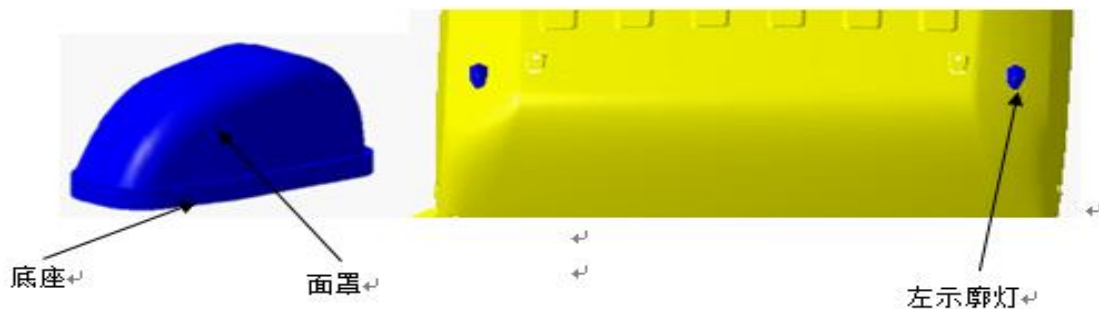


10. 示廓灯：（适用于非洲版车型）

Outline marker lamps: (applicable to Africa vehicle type)

安装在驾驶室顶盖上方，左右各一个，当小灯开关打开时，示廓灯点亮。

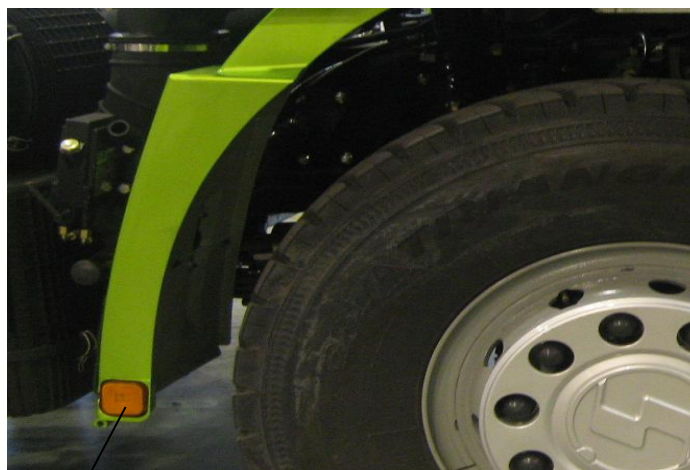
The lamps are installed above cab roof, one on the left and one on the right. When the small lamp is switched on, the outline marker lamp will light up.



11. 侧标志灯 Side marker lamp

安装在前轮翼子板上，左右各一个，当小灯开关打开时，示阔灯点亮。

The lamp is installed on the front fender, one on the left and one on the right. When the small lamp is switched on, the outline marker lamp will light up.



侧标志灯
Side marker lamp



二、行车前的准备 Preparation before driving

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启动两方面。

Preparation work before drive includes the following two aspects: routine inspection before each drive and starting engine.

（一）每次行车前的例行检查：

Routine inspection before each drive

1. 抓住散热器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 both the left and right sides of radiator cover. Pull it upward, and the radiator cover can be opened. Press it downward, and the radiator cover can be closed.



2. 机油加注口 Oil filling port

3. 新鲜空气过滤器 Fresh air filter

4. 冷却液加注口 Cooling fluid filling port

5. 发动机机油尺 Engine oil dipstick

6. 离合器液压油储液罐 Clutch hydraulic oil storage tank

7. 将电源总开关扳至接通位置。 Turn on main power switch

8. 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。

Inspect whether the cab has been locked. If not, the signal lamp of cab lock will be on immediately.

9. 检查冷却液面，加注冷却液。

Check for liquid coolant level, and add liquid coolant if necessary.

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最低液面刻度线。

Perform daily level inspection for coolant. The vehicle should be parked on a flat ground. When the engine is cold, the coolant level should not be less than the lowest level of expansion vessel.



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。

Add coolant from the filler port of expansion vessel. Find consumption reasons of coolant and resolve the problems.

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 system overheats due to too much consumption of coolant, it is not allowed to add cold coolant immediately. Bigger temperature difference might damage the engine.

10. 检查燃油量 Check for fuel volume

接合电源总开关，打开驾驶室內的电源钥匙开关，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，见图。

Switch off main power switch and turn on power key switch inside the cab. Check for fuel volume on the fuel gauge. If the indication is not accurate, fuel gauge and transducers should be verified, see the figure.

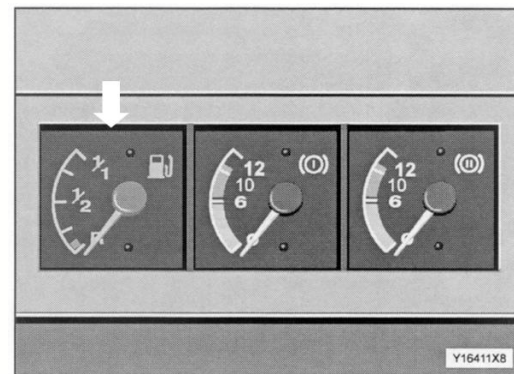
切勿将燃油用完，否则，您必须将燃油系统中的气体排出。

Do not use up the fuel, otherwise, you should exhaust the air in fuel system.

11. 检查发动机机油量 Check for engine oil volume

汽车停放在水平地面上，发动机停机半小时后，打开驾驶室前面罩，拉出油标尺，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，需从加油口处加入规定型号的发动机机油，加到规定位置后将机油口盖盖严。

Park the vehicle on a flat ground. After engine stops for half an hour, open the front cover, and pull out the oil scale, and the oil level should be between its upper limit and lower limit (the oil volume between the two limits is about 3L). If the oil level is lower than the lower line, it is necessary to add specified type engine oil through oil filler port, and close the oil filler cap tightly until the required level is reached.



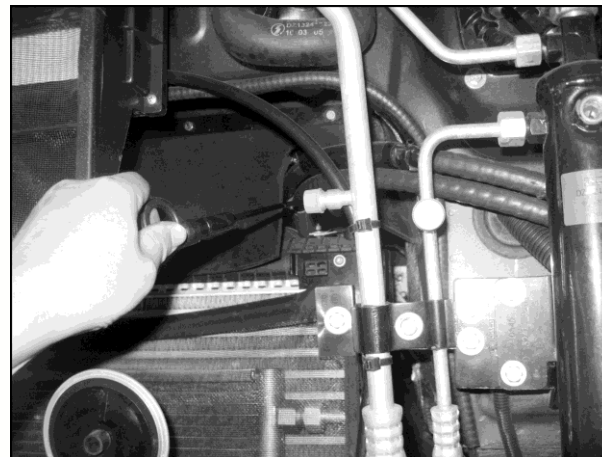
注意 Caution

在打开机油口或抽出机油尺时不能起动发动机，机油型号：机油选用CF-4 15W/40。

The engine can't be started when opening the oil filler port or pulling out the oil scale, oil type: 15W/40 grade diesel engine oil.



如图打开驾驶室前面罩
Open the radiator grille



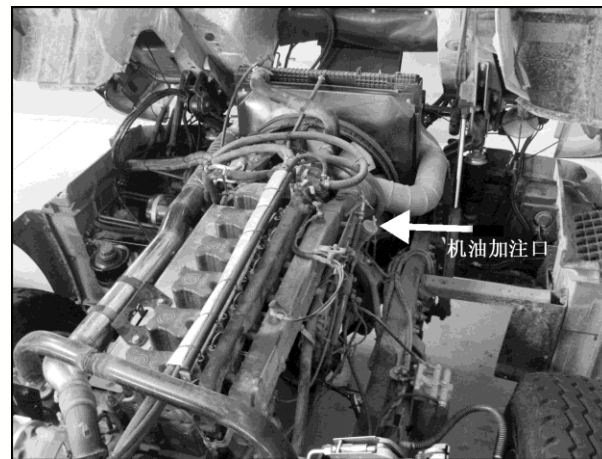
如图拉出机油尺
pull out the oil scale



12. 加注机油 Fill in 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，WP10发动机机油加注口在缸体的右侧，加注完毕后旋紧机油加注口盖。

Fill in the engine oil after tilting the cab, open the engine oil cover, the oil filling port of WP10 engine is on the right side of the cylinder body, the oil filling port of WP10 engine is at the fifth cylinder cover, fill in the stated type of engine oil, and screw up the cover after filling.

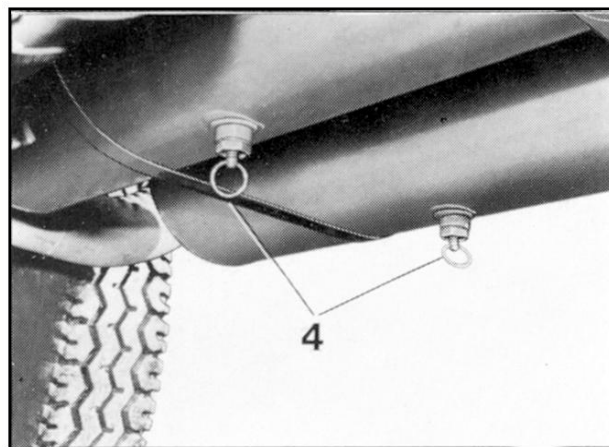
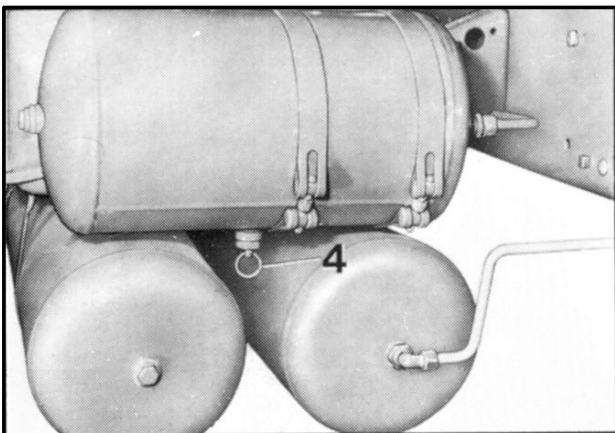


13. 排除制动系储气筒中的水。

Drain water out of the air reservoir in braking system.

将排水阀4拉下或推上即可排除凝聚在储气筒中的水。

Pull drain valve 4 downward, or push it upward, and the water condensed in the air reservoir can be drain out.



14. 检查离合器总泵上储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，见图。

Total pump liquid tank liquid level height should be between “MAX” and “MIN”. If the level is too low, please add brake fluid through the filler port, so that the level can be suitable. If the level is too low, please add brake fluid through the filler port, so that the level can be suitable, see the figure.

15. 检查轮胎气压，必要时可用轮胎充气接头或装在贮气筒上的充气接头充气。

Check the pressure in tyres. When necessary inflate through tyre inflation inlet or gas charging connection.

16. 检查整个电路系统工作情况。

Check for working conditions of the complete electric circuit system.

17. 检查润滑油、冷却液及气路的泄漏情况。

Check leakage of oil, coolant and air circuits.

18. 检查空气滤清器

Check air filter

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。

In cold winter or dusty conditions, dust collector should be emptied and cleaned everyday (if the dust collector sleeve drops off or is damaged, air tightness will become worse, and the filtration effectiveness will go worse.) Otherwise, earlier wear might be resulted in on the engine and booster.

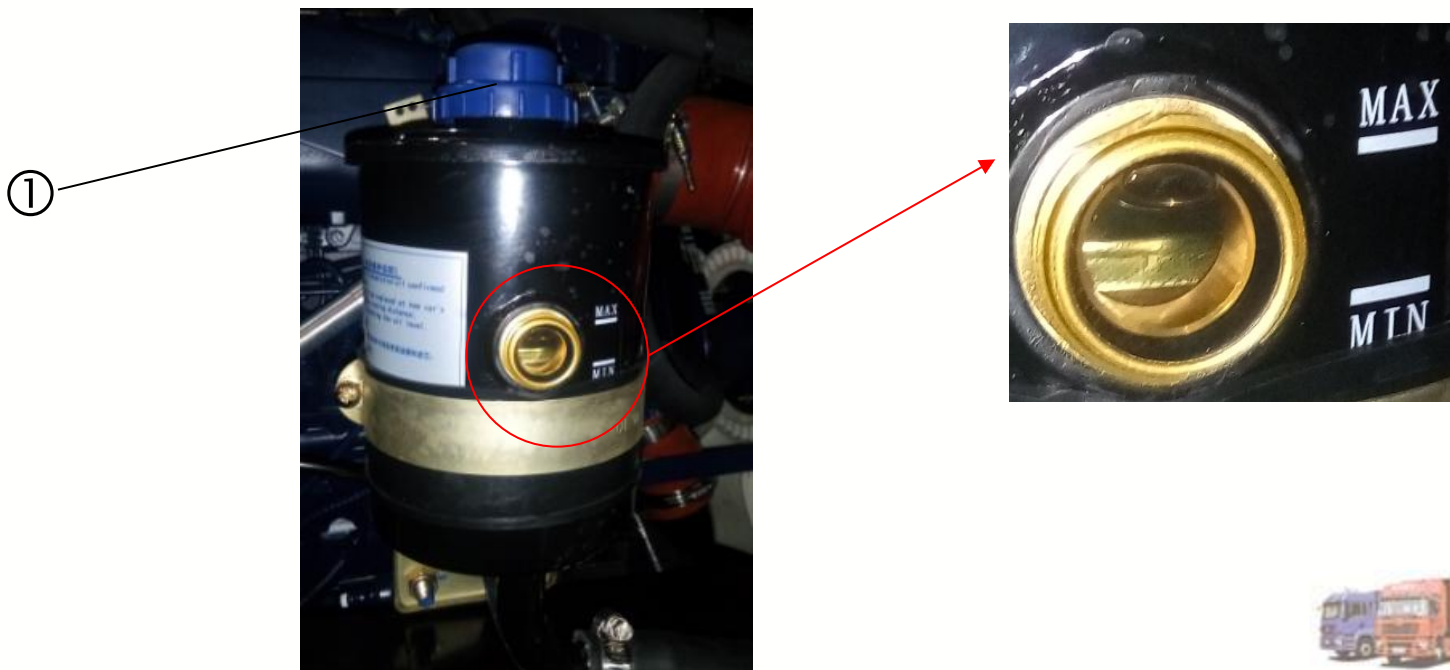


19. 检查驾驶室是否锁住。行驶中驾驶室必须锁止。驾驶室未锁止时，驾驶室锁止警告灯点亮，此时应锁止驾驶室。

Check whether the cab has been locked. The cab should be locked in driving condition. If the cab is not locked, the cab lock signal lamp should be lighted, in case of which the cab should be locked.

20. 检查转向油罐的油液液面高度，驻车状态在发动机运转的情况下，液面高度应在油尺上下刻线之间，即不应低于油尺Min刻线，否则应翻转驾驶室通过加注口①补充油液。

Check oil level of steering oil tank. When vehicle is in parking and engine is in operating state, the liquid level height should be between the upper and lower scale (or between the the upper and lower edge of the observation well of oil tank), that is not lower than the Min. scale of dipstick (or not less than observation well of oil tank), otherwise, add oil from filling port ① after cab tilted.



(二) 电源开关的操作:

Operation of power switch

1. 电源总开关

Main power 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。电源总开关钥匙手柄设计为不能拔出，请勿用力拔，以免造成损坏。

Rotate the outside handle of the battery case in clockwise direction, until the handle is in its horizontal position, and the power supply for complete vehicle can be switched on. The power master switch key handle can't be pulled out, do not pull it hard to avoid damaging.



MAN箱体

注意：发动机运转过程中，不得关断电源总开关！

Do not switch off the main power switch when engine is running !

2. 钥匙开关 Key switch

钥匙开关具有发动机启动与熄火功能。

The key switch features in starting & shutdown engine.

“0” 为ACC位表示发动机处于熄火状态，电源给收录机供电；

“0” is ACC position, which indicates engine is in flameout state, the radio is powered on;

“R” 为LOCK位表示插入或拔出钥匙位置，发动机处于熄火状态；

"R" is LOCK position, which indicates plug in or pull out the key and shutdown the engine;

“1” 为ON位表示点火开关接通电源,行车期间钥匙的位置；

"1" is ON position, which indicates the ignition key powered on, it is the key position in driving condition;

“2” 为START位表示起动发动机的位置。

"2" is START position, which indicates engine starting position.

发动机启动后松开钥匙，钥匙自动回弹到位置“ON”。

Release the key after starting the engine, and the key should automatically be rebound to position ON.



汽车用铅酸蓄电池使用注意事项: Cautions for lead-acid battery

警告: 严禁反接电极, 否则会损坏车辆电器设备!

Warning: it is strictly prohibited to connect the electrode in reverse, otherwise it will damage the vehicle electrical equipment!

3. 【电池维护】

Battery Maintenance

提醒注意电池的合理维护可以更好的发挥电池性能及延长使用寿命。

To pay attention to the proper maintenance of battery, which can make battery function better and extend its service life.

(1) 定期检查液面, 如低于下标线 (电池正面Min标线), 请用蒸馏水或纯水补充至上标线, 绝不可添加硫酸液。

Check liquid level regularly, if it is lower than the bottom line (Min. line on the top side of battery), add distilled water or pure water to reach the top marking line, but never add sulfuric acid solution.

(2) 电池若长期不用, 请从车上拆下, 保持电池为完全充足电状态, 每月补充电一次。
If the battery is not used for long period, remove it from the vehicle, and keep the battery in fully charged state, and make a supplementary charge every month.

(3) 避免大电流长时间充电。
Avoid large current charging for a long time.

(4) 若充电时电池液温高于45°C, 应立即停止充电, 待液温下降后再进行充电。
If the battery liquid temperature is higher than 45 °C during charging, stop charging immediately, and do not charge until the liquid temperature drops.



4. 【注意事项】 Cautions

(1) 电池使用和充电时会产生爆炸气体，电池要远离明火，避免正负极端子接触短路及端子与接线松动。

The battery will produce explosive gas during charging, so keep the battery away from fire, and avoid contact short circuit of positive and negative terminals and loose connection.

(2) 电池充电应在良好通风处，电池充电前应松开液口栓，防止气体产生爆炸。

The battery charging should be done in well-ventilated place, release the liquid outlet bolt before charging to prevent gas explosion.

(3) 电池内含有硫酸液，在电池充电或者电池旁工作，注意个人保护，请使用防护眼镜及橡胶手套，避免硫酸液接触眼睛、皮肤和衣服，一旦接触，请立即用大量清水冲洗，严重时马上就医治疗。

There is sulfuric acid solution contained in battery, so pay attention to personal protection when charging the battery or working next to the battery, use protective glasses and rubber gloves to prevent sulfuric acid liquid from contacting with eyes, skin and clothes, once contact with it, flush with plenty of water immediately, and seek a medical treatment if it is serious.



三、发动机的起动： Start engine

(一) 起动前发动机电控系统自检

Self-checking of electronic control system before engine starting

将钥匙插入方向/起动锁的锁孔内，旋转钥匙开关置于通电“ON”位置（见图），发动机ECU电源接通，仪表板信号灯总成中的三个报警灯都应立即点亮（发动机电控系统自检），欧三系统无OBD报警信号灯）。

Plug the key into the hole of direction/ start lock, rotate the key switch to the on-position “ON”, the ECU power of engine is on, and two warning lamps of signal lamps assy. in panel should be lighted immediately (electronic control system is self-checking. The EUROIII system has no OBD alarm signal).

如果两个报警灯（冷起动信号灯、EDC故障诊断灯）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 warning lamps (cold start signal lamp and EDC fault diagnosis lamp) go out after 2s (self-checking is over), which means the electronic control system of engine is normal, the engine can be started.

信号灯工作状态见表2-1。

Signal lamps' working condition sees table 2-1.



表2-1电控系统信号灯工作状态表

Table 2-1: signal lamps' working condition of electronic control system

信号灯名称Name of signal lamp	信号灯符号Symbol of signal lamp	工作状态Working condition
黄色报警灯Yellow alarm lamp（冷起动信号灯）(Cold start signal lamp)		用于进气加热装置工作状态指示For indicating the operating status of air intake heating device
红色报警灯（EDC故障诊断灯）Red alarm lamp (EDC failure diagnosis lamp)		发动机一般故障General fault of engine
红色报警灯（EDC停机灯）Red alarm lamp (EDC halt lamp)		发动机严重故障Major fault of engine
黄色报警灯Yellow alarm lamp（OBD报警信号灯）（OBD alarm signal lamp）		后处理系统故障Fault in aftertreatment system
蓝色报警灯Blue alarm lamp（油中有水报警信号灯）（Water in oil alarm lamp）		用于粗滤器中积水过多报警For alarming more water in coarse strainer



1. 将变速杆放在空档位置，转动钥匙至“START”的位置(见图)，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“ON”处，间隔2分钟后重复上述步骤，发动机起动后应迅速松开点火钥匙。

Set the shift lever into neutral position, and turn the key to position “START” (as shown in the figure), at this time, the starter should start to work and then stop automatically after the engine is started. If the first starting fails, release the key to let it rebound to position “ON”, repeat the steps above after 2min, and the ignition key should be released soon after the engine is started.

注意：Caution

1. 变速器上装有空档开关，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。

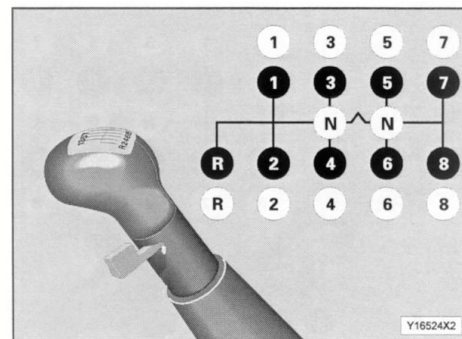
There is neutral position-protect switch in transmission, the signal of neutral position switch is input into ECU, which controls the starting of relay, if the control lever of transmission is not in neutral position, the engine can't be started

2. 若首次起动不成功，应将点火钥匙开关回旋至“ON”位置，然后再次起动，否则发动机不能起动！

If the first starting fails, turn the ignition key switch back to position “ON”, then restart the engine, otherwise the engine can't be started!

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开关或连接线路出现故障时，将点火钥匙开关从“ON”的位置旋转至“START”的位置，持续3秒以上，发动机电控单元（ECU）才接通起动继电器，发动机仍可正常起动！

There is a starting failure standby mode for ECU of engine, when there is failure in neutral position switch of transmission or connecting lines, rotate the ignition key switch from position “ON” to position “START”, after lasting for 3s, the ECU can connect the relay, and then the engine can be normally started!



注意：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！

Starting failure standby mode can be chosen during the emergency condition, for safety, normally it is recommended!

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。

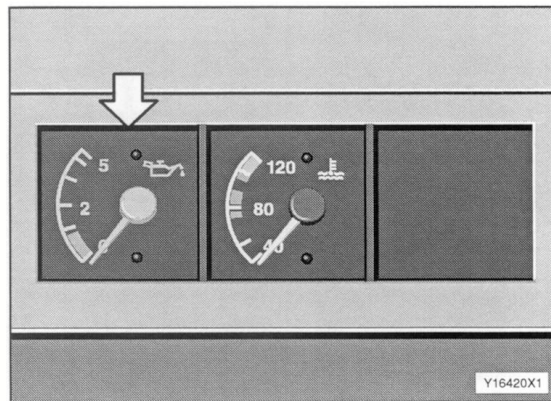
After the engine is started, the oil gauge should immediately indicate pressure, and the oil gauge indication lamp should be off. When the engine is cold started, the oil gauge should indicate a higher oil pressure (4.8 bars). Once the engine has been hot and running in its normal revolution speed, the oil gauge should indicate about 3.5 bars. The lowest oil pressure can reach 1.8 bars at idle speed, when the engine will not be damaged.

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。

If the gauge indicated engine oil pressure is too low, shutdown the engine immediately. Find reasons and check oil level, after which perform regulation, so that the oil can reach required level.

因发动机具有增压器，操作时一定要注意。

Since the engine is equipped with a booster, the following cautions should be considered.



(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。

After engine started, it should operate at idle speed for 3 ~ 5 minutes. Do not step down throttle fiercely. You can apply load after it has normal oil pressure and oil temperature (especially start in cold season), otherwise, the turbocharger bearing and seal ring may be early worn due to short of oil.

(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。

When engine stalling, it must operate at idle speed for 3~5 minutes and it should be stalled until turbocharger speed reduced. Especially don't step down throttle fiercely before engine stall. Fiercely steping-down throttle may lead higher rotating speed of supercharger, if suddenly shut down the engine, the engine oil is stopped to supply immediately, however, the rotor of the turbocharger still rotates at high speed, the rotor will soon lack of oil, which will cause bearing and seal ring damage.

(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。

Before start a longtime stopped diesel engine, you must lubricate supercharger firstly. Remove the inlet tube of the supercharger, fill in clean lubricating oil from the inlet. Otherwise, it will lead to early wear.

(4)发动机的熄火

Engine stalled

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“LOCK”位,电控单元（ECU）停止供电，发动机熄火。

Rotate the ignition key from "ON" position to "LOCK" position, the engine will be stalled. And then, the electronic control unit (ECU) will stop power supply and the engine will stall.



(二) 开前面罩

Open the radiator grille

面罩开闭 Radiator grille opening and closing

前面罩开启 Radiator grille opening

1. 在驾驶室仪表台下方司机侧，向上扣动面罩锁拉手。

The handle of radiator grille lock locates under the instrument at codriver' s side, pull it upwards to open the radiator grille.

2. 在驾驶室外，向外翻开前面罩。

Pull the radiator grille upwards.

前面罩关闭

Radiator grille closing

向下拉动面罩待面罩下落到适当高度，在面罩下部用力关闭面罩，使面罩锁扣住锁销。面罩锁紧后，其与两侧外侧板应无翘曲现象。

Pull the radiator grille downward to appropriate height, forcibly close it to lock it up. After it locked up, there should be no warping phenomenon on both sides of the lateral plate.



面罩锁

Radiator grille



(三) 起步与换档

Start and shift

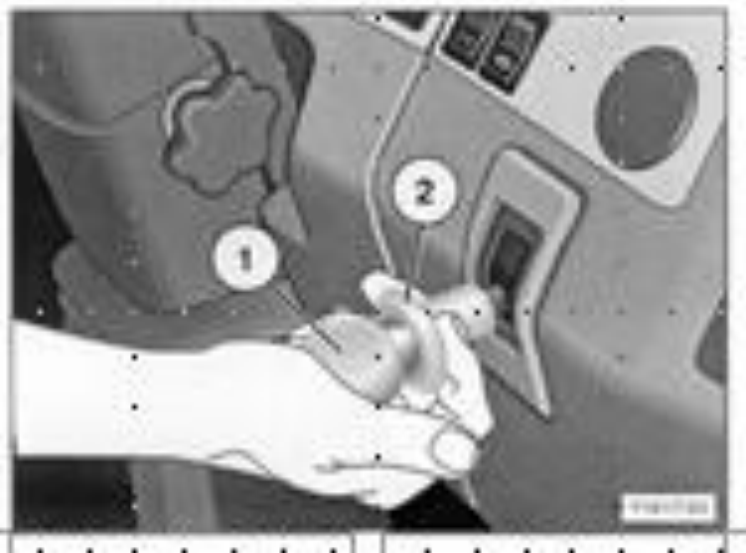
1. 起步Start

发动机启动之后，气压表指针位于红色区域，表示气路系统气压太低，同时图中的报警灯点亮。只有贮气筒压力大于5.5巴，报警灯熄灭时，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，同时检测灯熄灭。

After the engine is started, air gauges should be in the red region, indicating that pressure of the pneumatic system is too low, at the same time of which the warning lamp shown in figure should be lighted. The vehicle cannot be started until the air tank pressure is higher than 5.5 bars, and warning lamp is off. (If air tank pressure in the trailer is too low, the warning lamp will also be lighted, and the vehicle cannot be started.) The vehicle can be started if only the hand brake handle is pulled down to the position. Meanwhile, the detector lamp should be off.

停车时将手刹柄下拉到位，检测灯点亮。

Pull the hand brake handle up to the position to stop the vehicle, and the detector lamp should be lighted.



2.变速器的档位

Transmission shift position

变速杆及变速器档位见，当变速器处于低档区时，指示灯1点亮。实际车辆档位。高低档区切换未采用变速杆上的扳把（→），而是将变速杆左（低档区）右（高档区）推拉。

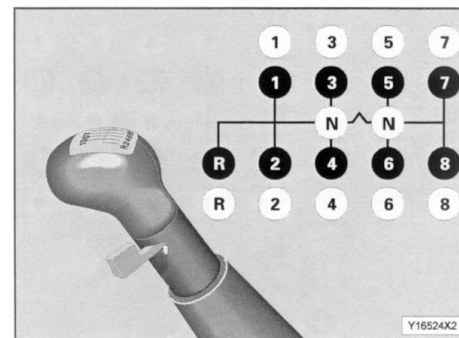
Shift bar and transmission shift positions are shown as figure. When the transmission is in High range, the detector lamp 1 will be lighted. Actual vehicle shifts can be referenced as figure. High range shift operation should be fulfilled not with the handle (→) on the shift bar, but through pushing the shift bar in the left (Low range) to the right (High range) direction.

双H操纵的高低档转换是将变速杆左（低档区）右（高档区）推拉，以实现高低档切换。

In order to realize the high and low switching, the high and low-gears transformation dual-H control push the shift lever from the left (low gears) to the right (high gears).

如该车型采用单H操纵，通过手柄球下方的拨片来实现高低档转换（向上为高档、向下为低档）。

In order to realize the high and low switching, the high and low-gears transformation dual-H control push the shift lever from the left (low gears) to the right (high gears).



3. 变速器的换档操纵及注意事项:

Shift operation of transmission and cautions:

(1) "双H"换档方式 "Dual-H" shift mode

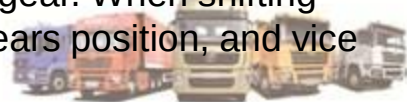
9档和16档采用的是"双H"换档机构，一种用于组合式变速器的操纵方便的换档机构，（如图）当变速器从低档段（1-4档）向高档段（5-8档）或从高档段向低档段换档时，可以用变速杆直接操纵，不需要同时操纵变速杆和副变速器档位段选择开关，因而换档迅速、方便。双H操纵的变速杆有两个空档位置，低档段位于4、5档通道的中间位置，高档段时位于6、7档通道的中间位置。当从低档段换入高档段时，需用一个冲击力向右推动变速杆以克服变速器内的档位自锁力，这时副变速器即自动从低档段换入高档段，反之亦然。

Nine-gears and sixteen-gears transmission adopts "Dual-H" shift system, which is a kind of convenient shift mechanism for composite transmission, (shown as figure). Directly handle the shift lever, so that the transmission can be shifted from low range (1st shift – 4th shift) to high range (5th shift – 8th shift), or from high range to low range, without necessity of simultaneously handling the shift lever and shift selector of auxiliary transmission. Therefore, the shift operation is smooth and convenient. There are two neutral positions on a Dual-H shift lever: low range neutral gear is between 4th shift and 5th shift; high range neutral gear is between 6th shift and 7th shift. When shifting from a low range gear into a high range gear, an impact force is needed to push the shift lever to the right, in order to overcome the range self-lock force inside the transmission. After that, the auxiliary transmission will automatically shift from low range to high range, vice versa.

(2) "单H"换档方式 "Single- H shift mode

12档全同步器系列变速器基本操纵机构为"单H"换档机构，其中R1、2、3、4、5、6 档在低档区，R2、7、8、9、10、11、12 档在高档区，低档区空档位置在3、4 档，高档区空档位置在9、10 档。当从低档段换入高档段时，拨动手柄球上的预选阀到高档位置即可，反之亦然。

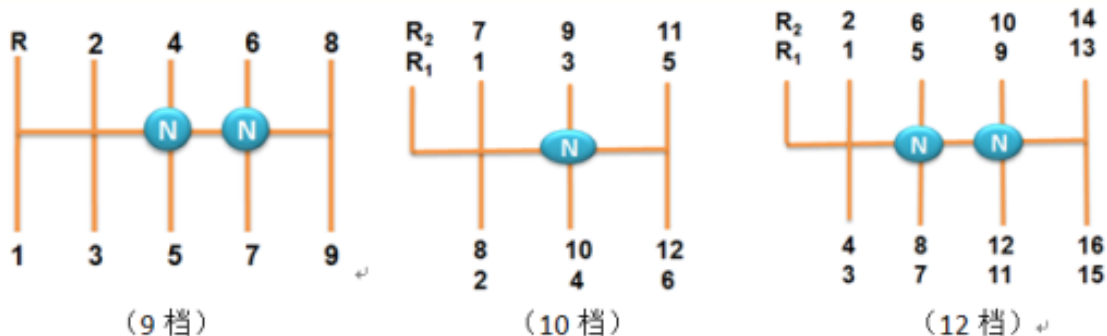
12-gears synchronizer series transmission are basically of single-H shift mechanism, in which R1, 2, 3, 4, 5, and 6 gear are in low-gears, R2, 7, 8, 9, 10, 11, 12 gear are in high-gears. The neutral position of low gears is at 3rd and 4th gear, and the neutral position of high gears is at 9th and 10th gear. When shifting gear from low-gears to high-gears, stir the primary valve on the handle ball to high-gears position, and vice versa.



三、发动机的起动

Start engine

变速器 (品牌, 型号) Transmission (brand, model)	全程同步, 带手动操作 The entire synchronization, with manual operation				-
	Fast12JS160T12JS180T12JS200T	Fast12JS160TA12JS180TA12JS200TA	Fast16JS180T16JS200T16JS240T	Fast16JS180TA16JS200TA16JS240TA	
-档位和速比 Gear and speed ratio	前-12, 后-2Front-12, rear-2		前-16, 后-2Front-16, rear-2		前-6,后-1Front-6,rear-1
123456789101112131415163.X.13.X.2	15.5312.089.397.335.734.463.482.712.101.641.281.0014.863.33	12,109,417,315,714,463,482,712,111,641,281,000.7811.562.59	17.0414.0311.669.608.046.625.534.553.743.082.562.111.771.451.211.0016.3013.42	14.0311.649.607.976.625.494.553.783.082.562.111.751.451.211.000.8313.4211.13	4.702.211.531.000.760.675.55



4. 伸缩拉杆操纵系统使用说明:

Telescopic rod control system 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。

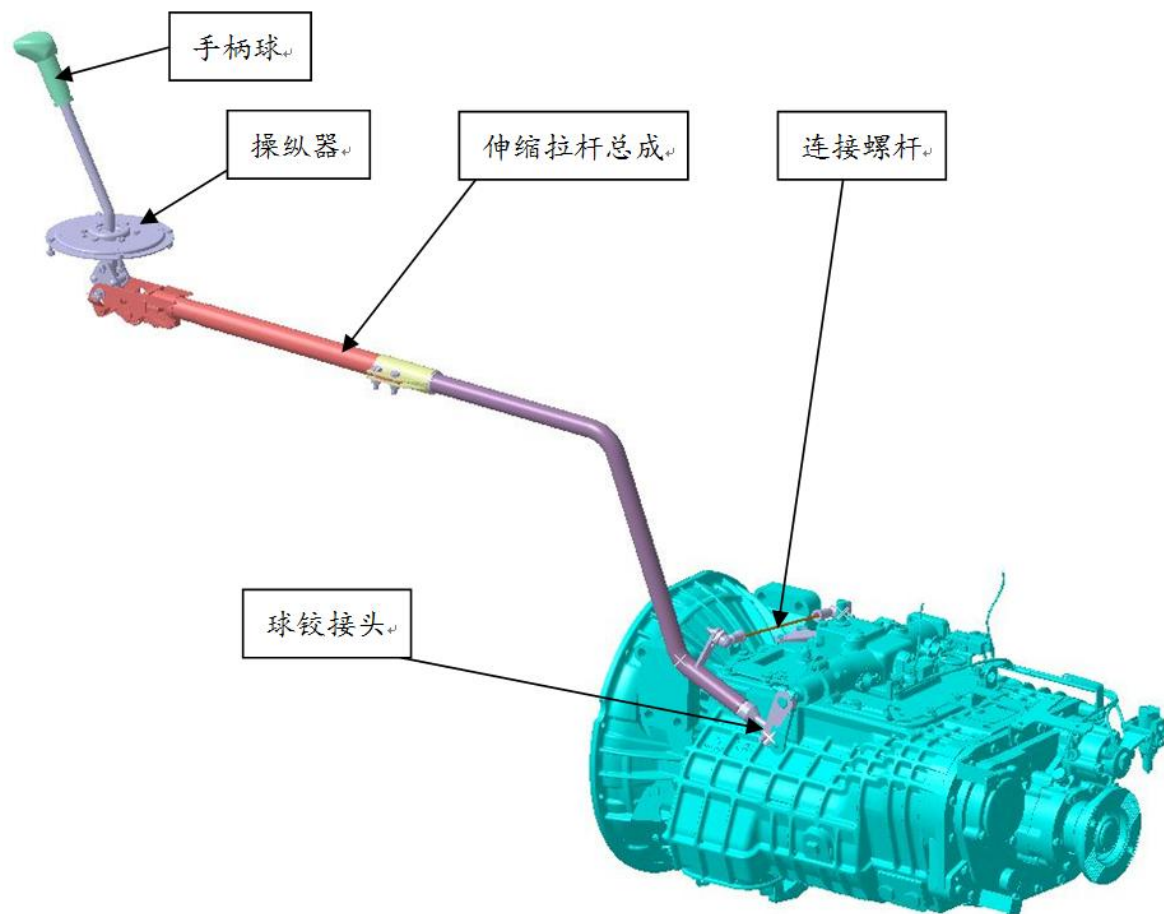
Telescopic shaft transmission control is a new type of transmission control device, which has the advantages of good sealing, effortless shifting, preventing for spontaneous out-of-gear and high reliability. The manipulator is directly fixed on cab. It is similar to soft shaft with good sealing. Manipulator is designed in the rubber insert, which can effectively absorb the vibration and noise of gear lever, so as to make the cab quieter, cleaner and more comfortable. The middle power assembly and multi-link structure can reduce the gear-selecting and gear-shifting force for about 50%, which make gear-shifting more portable and effectively relieve the driver's working intensity. The control instrument has buffer structure, which can prevent vehicle for spontaneous out-of-gear when traveling on bad road. The reliability is improved greatly. The whole control system belongs to the flexible connection, so there should have 50 free amount at handle ball, which is normal.



(1)结构简介 Structure introduction

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。

As the usage of the common hard rod, they select-gear and shift-gear by operating handle ball.



(2)伸缩拉杆的开启

The opening of telescopic rod

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。

It is the same as the lifting of cab. The unlocking oil cylinder of telescopic rod and the lifting oil cylinder of cab use the same high pressure pipe line. When the cab lifted, the unlocking oil cylinder of telescopic rod will open at the same time. The telescopic rod will increase along with the cab lifting, which is convenient for the maintenance of vehicles.

(3)换挡操纵使用说明

Shift control and use 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 cab lowering, the driver sitting on the seat, gently push the ball handle of gear shift lever forwards, the lock catch on the front of telescopic rod assembly will be locked after hearing a "click". At this moment, gear selecting and shifting operation can be done. The lock catch of the telescopic rod assembly is manual-controlled, and it should be locked after cab lifting and lowering.

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。

When driving on bumpy road, in order to prevent the telescopic rod control system from appearing off-gear phenomenon, for the design of the bottom of manipulator assembly, there should reserve an one-way free clearance of 5mm (after the lever ratio enlarged, it will react at the ball handle), and there should have an one-way free clearance of 25mm when gear shifting (that is clearance). It is normal phenomenon, and it will not affect gear selecting and shifting.



四、制动系 Brake system

四、制动系 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 system includes the following types of devices in total: service brake (foot brake), auxiliary brake (exhaust brake), emergency and parking brake (hand brake), and trailer brake (optional brake).

（一）行车制动 Service brake

踏板操纵，双回路气压制动。工作压力为1MPa（10bar），调压阀切断压力为1MPa（10bar）。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 bar）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。

It is a paddle-operated dual-circuit pneumatic brake. Its working pressure is 1MPa（10bar）, and its governor break-off pressure is 1MPa（10bar）. The first circuit effects on the rear axle wheels (or wheels on dual rear axle). The second circuit effects on the front axle wheels. Once air-reserve tank pressure of a circuit goes down below 0.55MPa (5.5bars), the indication lamp of the air brake reservoir pressure will be lighted. In this condition, the vehicle should be stopped immediately and reasons of the pressure leakage should be located.

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 bar）以下。

Multiple full braking in a short time might also result in pressure being decreased to lower than 0.55MPa (5.5bars).

泄漏检查：在发动机熄火，接上手制动后压力降在2h内最多为0.05MPa（0.5 bar）或者在30min内最多为0.01MPa（0.1 bar）。

Leakage inspection: when engine is in flameout condition and after the hand brake is engaged, the pressure drop in two hours should be 0.05MPa (0.5bars), or 0.01MPa (0.1bars) in 30min at most.



(二) 辅助制动 Auxiliary brake

辅助制动系统采用排气制动，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 adopts exhaust brake. When the running vehicle can be stopped with the engine-consumed energy. When the vehicle is in slope-down condition, exhaust brake has to be used. The exhaust brake can lower the chances of side skidding on icy or sloughy roads. When passing each other or passing poor road sections, exhaust brake can be used to deaccelerate 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。

Exhaust brake can lower times of using main brake, reduce abrasion and heat of tyres and wheel brakes, prolong vehicle lifetime, decrease fuel consumption, and improve traveling safety.

使用排气制动时应该注意：

Cautions:

(1) 发动机转速不得高于2000转/分。

Engine revolution speed should not exceed 2,000rpm.

(2) 变速器档位低时，排气制动效率较高。

Exhaust brake efficiency is higher when the transmission is in a lower shift.

(3) 严禁车辆空档滑行，空档时无辅助制动作用。

Neutral coasting is forbidden, and auxiliary brake cannot take effects in neutral position.



(三) 应急和驻车制动

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（图示手柄拉上者为手制动阀处于驻车位置）。当行车制动系统出现故障时，也可通过拉起手制动阀实现应急制动。

Hand brake can be used as both emergency brake and parking brake. It can take effects through the spring energy storage cylinder mounted on rear axle (or dual rear axle). Parking brake can be realized through operating hand brake valve handle. If failures appear in the brake system, with the help of the energy storage spring, emergency brake can be fulfilled automatically.

只有在制动系压力达0.55MPa（5.5巴）以上时，手制动信号灯熄灭后，弹簧制动才能完全松开。Only when pressure of the brake system has reached 0.55MPa (5.5bars), and the signal lamp of hand brake has been off, can the spring brake be released.

注意：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。

Cautions: Before starting engine, the hand brake valve handle should be in its braking position. Otherwise, after pressure in the brake system has been increased, the original parking brake will lose its effect.

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-up Position: when the vehicle is pulling a trailer, the hand brake handle should be pulled back to its “Check-up Position” if the vehicle stops on a slope. In this case, only the energy storage spring takes effects in braking, so that the full-loaded trailer can stably park on a 12% slope.



（四）挂车独立制动 Trailer indenpent brake

慢慢向后拉动挂车独立制动阀手柄，可用来单独制动半挂车。

Slowly pull the brake valve handle backward, and the semi-trailer can be stopped. It is a brake system independent from tractor.

图示手柄落下者为挂车独立制动手阀。

The independent brake hand valve of trailer is as shown in figure.



(五) ABS电控系统 (选用装置)

ABS electrical system (optional device)

1.ABS工作

ABS operation

打开钥匙开关, 如系统无故障, ABS指示灯自检3s内熄灭; 如系统有故障, 指示灯将点亮, 在对ABS系统修理和诊断后, 车速大于7km/h时灯灭, 对电磁阀进行自检, 4S/4M四通道ABS自检顺序为: 右前-左后-左前-右后, 共四声。

Switch on the key switch, if the system is trouble-free, ABS lamp will go out within 3s, if the system is in trouble, the indicator lamp will light up. After repair and diagnostic on ABS system, the lamp will go out when the speed is greater than 7 km/h. And then, solenoid valve will do self-inspection, the self-checking order of ABS with 4S / 4M four-channel is: right front - left rear- left front - right rear, totally four tones.

当车速大于40km/h时, 踩下制动踏板, 实施紧急制动, 然后观察制动痕迹, 如果无制动长距离拖痕说明ABS制动起作用, 功能正常。

When the speed is greater than 40 km/h, depress the brake pedal to carry out emergency brake, and then observe the braking traces, if there is no braking long distance drag mark, which shows the ABS is effective.

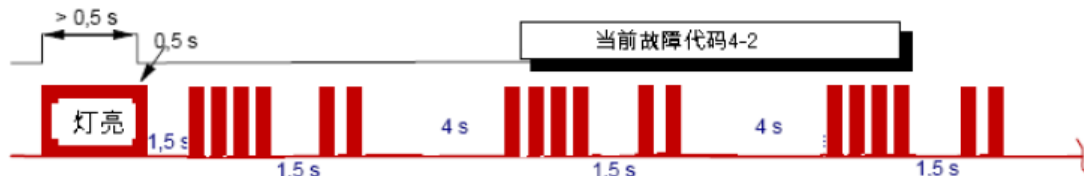


2. 自诊断功能

Self-diagnosis function

ABS具有故障自诊断的功能，当检测出电控系统故障，系统能产生对应的故障代码并输出，仪表上对应的指示灯点亮，当挂车ABS系统有故障时，相应的挂车ABS指示灯会点亮报警。

ABS has self-diagnosis function. When the fault is found in electronic control system, the system can generate and output a corresponding fault code, and the corresponding indicator lamp on the meter is alight. When trailer's ABS system is in fault, the corresponding indicator lamp of trailer's ABS will light up.



主车ABS指示灯（红色） 挂车ABS指示灯（红色）

ABS indicator lamp of main vehicle (red) ABS indicator lamp of trailer (red)

如车辆匹配CAN仪表，在仪表液晶屏上能显示故障代码，故障码形式为SPN+FMI。如匹配普通仪表时，会以闪码形式报出故障码，具体操作为：打开钥匙开关，按下开关板处的诊断开关，1.5S后指示灯会闪，数闪的次数确定闪码。一个闪码代表一个故障，一个闪码分两组，第一组可以闪1-8次，第二组可以闪1-6次，每个码间隔1.5s，每组之间间隔4s。

If a vehicle matching with CAN instrument, the fault code will be displayed on the instrument LCD screen, the fault code form is SPN + FMI. If a vehicle matching with ordinary instrument, the fault code will be reported as flash code. The specific operation is: switch on the key switch, press the diagnosis switch, the lamp will flash after 1.5s, and determine the flash code according to the number of flashing times. A flash code represents a failure. A flash code is divided into two groups, the first group may flash for 1-8 times and the second group can flash for 1-6 times, the interval between each code is 1.5s and the interval between each group is 4s.



(六)制动系使用注意事项

Operation cautions of brake system

1.弹簧制动缸的紧急松开

Emergency release of 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。

If pipeline connection spring brake cylinder results in self-brake because of leakage, the brake can be released if only screwing off bolt 6 on the cylinder to position 1. Before releasing the spring brake cylinder, set the transmission into shift 1, and check whether foot brake can work normally.

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 releasing the spring brake cylinder on slope roads, the wheels should be wedged in order to prevent slipping.

2.制动管路的维护

Maintenance of braking pipeline

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 regulations should be obeyed in welding, cutting or drilling near the plastic brake pipeline.

a.管路中的压力要预先放掉。

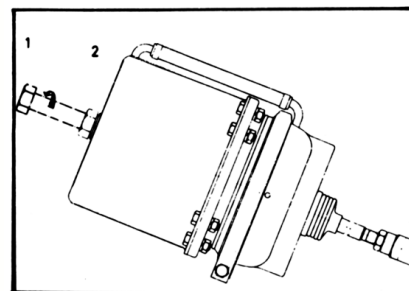
Release the pressure out of the pipeline in advance.

b.应将管子盖住以免受到火星、火焰及灼热切屑的损伤。

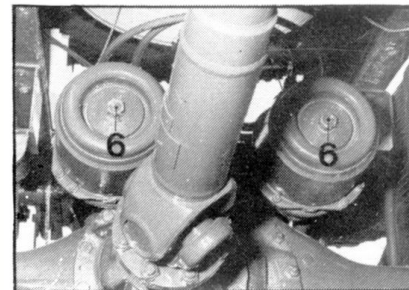
Cover the pipeline, lest that sparks, flames or scorching scraps might damage the pipeline.

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。

As for the unpressurized pipelines, their maximum allowable heating temperature is 130℃ and the duration is not longer than 1 hour.



1.松开位置
Release position



2. 正常行驶位置
Normal driving position



五、挂车的对接

Joining of the trailer

(一)对接前应先做到:

The following items should be performed before jointing:

1.松开鞍座上的紧固装置

Loosen the fastening device on fifth wheel.

2.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

Check whether semi-trailer joint flange and central pine are at least 50mm lower than the fifth wheel top. Adjust it into its suitable height in necessary.

3.牵引车缓慢倒车移向半挂车（鞍座连接将自动锁止）

Slowly reverse the tractor to the semi-trailer (saddle joint should be latched automatically).

4.紧固手柄，或检查插式锁

Fasten the handle or check the latched lock.

5.连接压缩空气管路和电缆

Connect compressed air line and cables

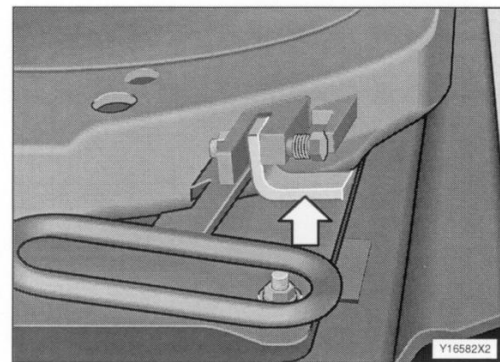
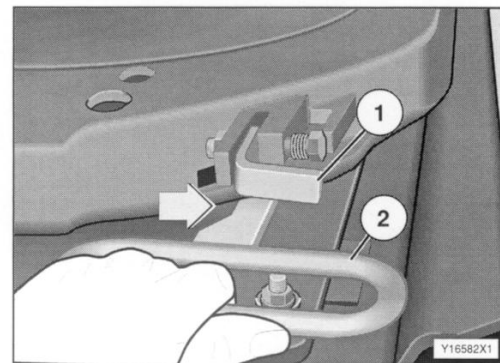
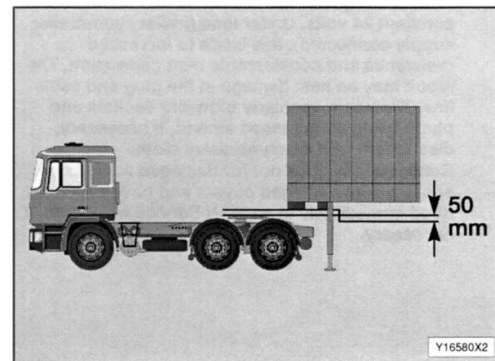
6.将半挂车的支承柱提升到行车位置

Suspend the support post of semi-trailer to its drive position.置

注意！Cautions:

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。

After the tractor has carried the semi-trailer, it is a must to check whether the locking handle or latched lock on hanger can function correctly or not.



(二) 连接压缩空气管路 Connect compressed air line.

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。

See that the pipelines and cables have been correctly connected, and can be moved freely and slightly, so that to counteract the movement of the tractor-semi trailer assembly. The pipelines and cables can neither be tensioned, nor be wound or worn to damage.

首先连接制动管路接头（黄色）①

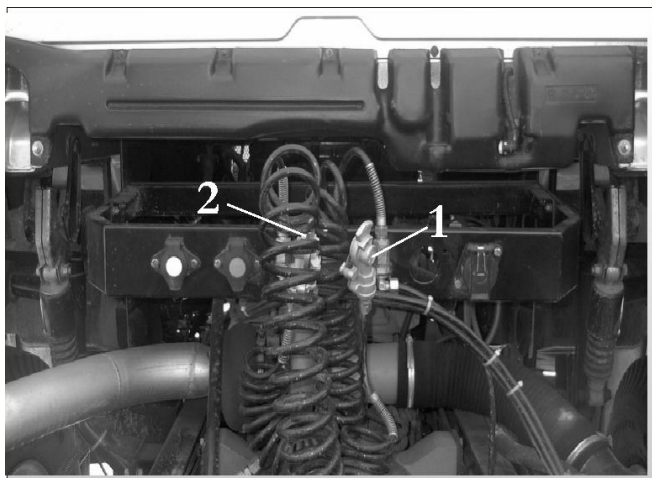
First of all, connect the braking line fittings (yellow) ①

然后连接贮气筒管路（红色）②

Then, connect air storage reservoir tubes (red) ②

检查连接装置

Check connection devices



(三) 挂车的摘除 Remove trailer

摘除挂车前应先做到：Before removing a trailer, the following procedures should be performed firstly:
防止半挂车滑溜

Stop the semi-trailer from slipping

检查路面是否坚实

Check whether the road is compact or not

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。

Firstly, check whether the semi-trailer support post can burden load or not, after which stretch the support post, until the load is transmitted onto it from tow car suspension. The support post should be stretched too long. Otherwise, the semi-trailer might be pushed off the fifth wheel. Caution that the fifth wheel might be wedged.

断开压缩空气管路

Disconnect the compressed air line.



五、挂车的对接 Joining of the trailer

(四) 注意——小心事故和伤害！

Caution: Take care of accidents and injure!

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。

Be sure to disconnect connectors in the following sequence. Otherwise, the semi-trailer might slip because of its brake being released.

首先断开贮气筒管路（红色）②半挂车被制动。

First of all, disconnect air storage reservoir tubes (red) ②with the semi-trailer in braking status.

然后将制动管路接头断开（黄色）①

Then, disconnect the braking line fittings (yellow) ①

鞍座的操作Fifth wheel operation

抬升锁定器①

Lift locking mechanism①

向前（→）旋转手柄②把它拉出来并固定在极板边缘的凹槽中

Turn handle ② forward and pull it out, and fix it into the groove on the edge of pole plate.

挂上挂车后检查Inspection after trailer removing

确保下锁定器（→）已经位于锁定位置（落下位置）此时，锁合牢固。

Perform inspection in order to ensure lower locking mechanism in its latched position (fallen position).

Then, lock it firmly.

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 locking mechanism cannot go down into its latched position, the fifth wheel has not been connected correctly. Take care of accidents! Repeat the procedure.

注意！ Caution:

半挂车和牵引车之间的距离有严格限制！

There is strict restriction in distance between a semi-trailer and a tractor!

牵引车挂车的机动性是有限制的！

There is also restriction in mobility of tractor trailer!

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。

Serious damage might be caused when the vehicle is running on puddle road, slopes or sloughy roads.





SHACMAN

六、车辆的拖拽牵引、专用车使用

Vehicle towing and trailing

陕西重型汽车进出口有限公司

SHAANXI HEAVY DUTY AUTOMOBILE IMPORT & EXPORT CO.,LTD

六、车辆的拖拽牵引、专用车使用

Vehicle towing and trailing

(一)牵引车 Tractor

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。

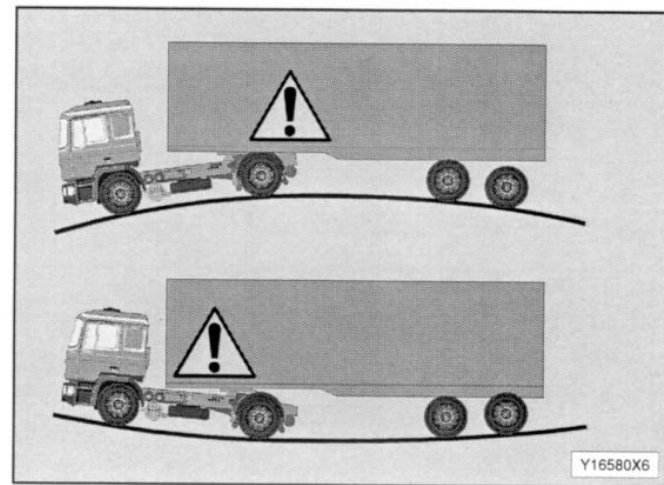
When the vehicle is to be trailed, a towing hook is mounted below the license plate support in the front of truck.

当牵引车辆时，请将其牌照座折叠起来。

In trailing operation, the license plate support should 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选在车辆上选用尽可能多的牵引点。

When the truck is towed forward, load onto the towing hook should be higher than on half of net weight of vehicle, which is about 10 tons. If the vehicle is tramped or shutdown and needs to be drawn out of a mire or trailed, the vehicle should be unloaded first. If it is impossible to unload the vehicle because of technical or actual limitations, towing points should be selected as many as possible on the vehicle in trailing procedure.





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牵引时，以下几方面很重要：

In trailing operation, the following several items are very important:

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

Disengage drive shaft meshing to interrupt the driving system. In an all-wheel driven vehicle, its front drive shaft axle should also be disengaged.

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

It is possibly necessary to run the engine in order to supply compressed air for brake system and power steering.

请使用牵引杆，而不要使用软缆索

Please don't use flexible cable but drawbar.

合上电源主开关 Connect main power switch.

启动点火开 Turn on ignition switch.

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

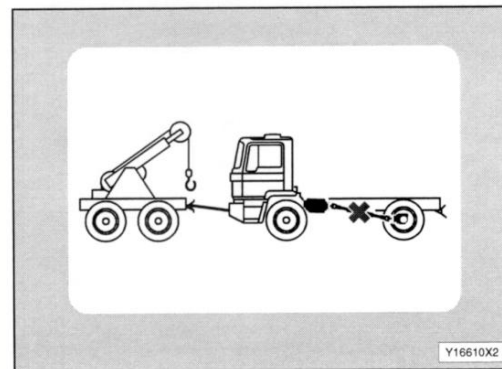
If your vehicle is equipped with a steering/starting lock, turn the key to drive position 2 but don't draw it out.

将变速箱置于空档

Set the transmission in neutral position.

如果在保险杠后装有压缩气管路接头（选用装置），请将其与牵引车的压缩空气系统相连

If (optional) fittings of compressed air tubes are mounted behind collision bumper, they are best to be connected with compressed air system of the trailer.



位置1松开

Position 1: release





SHACMAN

六、车辆的拖拽牵引、专用车使用

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

If the engine cannot be operated, and no air supply can be provided for the trailer, please follow the Figure to release the energy storage spring brake in (medium) rear axle brake chambers. (Here, the brake is not done completely.)

拖拽牵引速度不可大于40公里/小时。

Trailing speed should not be higher than 40 km/h.

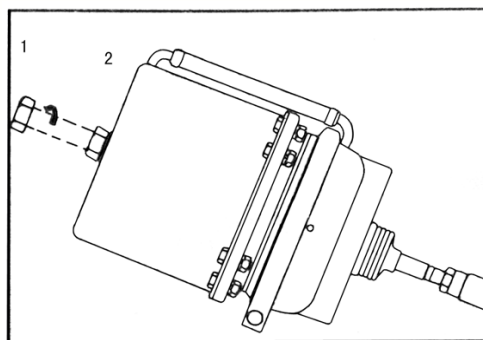
如果车辆陷住，拖拽时起牵引作用的车不要左右摇摆，也不要斜着拉，特别是不要斜向一侧

If the vehicle is tramped, the tractor should neither swag in trailing operation, nor draw the trailer in the sidewise direction. The latter point should especially be avoided.

如果转向系损坏，抬起前轴。

If steering system is damaged, raise the front axle.

如图所示As shown in figure



位置2正常行驶

Position 2: normal driving





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Vehicle towing and trailing

陕西重型汽车进出口有限公司

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(二) 专用车 **Special vehicle**

1. 取力器(QH50/QH70等取力器)工作

PTO operating (QH50 / QH70 PTO)

(1) 停车取力

Power take-off when vehicle parking

停车取力时,首先将变速器操纵杆放在低档区的空档位置,按下取力器开关(不操作取力器选择开关),此时常断电磁阀闭合,变速箱副箱处于空档位置,根据需要将变速器挂入合适档位,此时取力器工作,而车辆处于停驶状态。

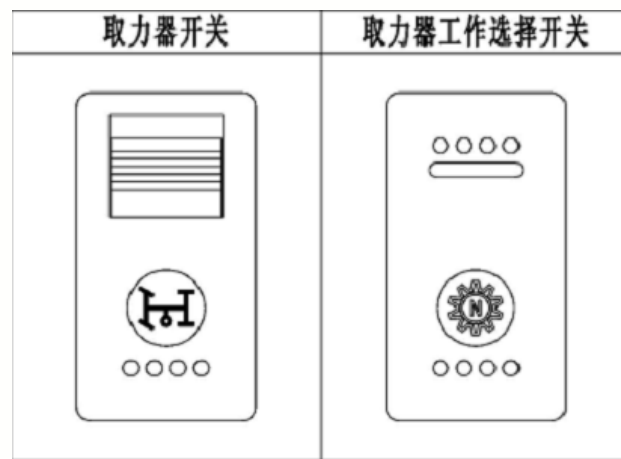
Power take-off when vehicle parking: push the gear shift lever in the neutral position of low gears, press the switch of PTO (do not press the selection switch of PTO), at the moment, the constant turned-off solenoid valve is closed and the auxiliary transmission is in neutral position. Engage the transmission to desired gear, PTO begins to work. The vehicle is in parking state.

(2) 行车取力

Power take-off when vehicle running

行车取力时,首先使车辆处于低档区缓慢行驶,此时先按下取力器工作选择开关,再按下取力器开关,取力器处于挂档工作状态,根据需要将变速器挂入合适档位,此时取力器工作,而车辆处于行驶状态。

Power take-off when vehicle running: keep the vehicle slowly running in low gears, press the operating selection switch of PTO, and then press the switch of PTO, in this moment, the PTO is operating in driving condition. Engage the transmission to desired gear, PTO begins to work. The vehicle is in driving state.





七、远程油门控制器操作说明

Controller instructions on remote accelerator

(一) 远程油门结构形式

The configuration of remote accelerator

摇臂式远程油门如图1所示。旋钮式远程油门控制器如图2所示。

The lever-type remote accelerator is as shown in figure 1. The knob-type remote control throttle is as shown in figure 2.

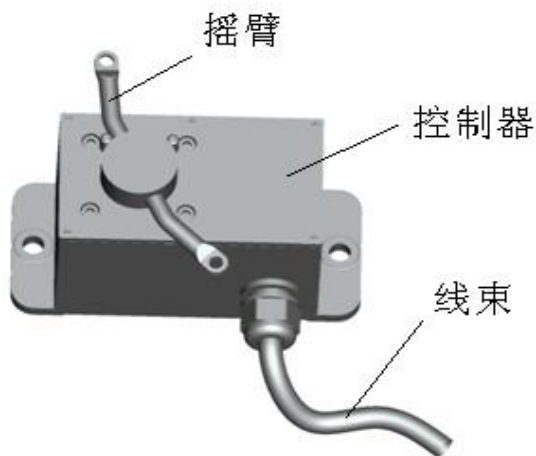


图1 摇臂式远程油门控制器

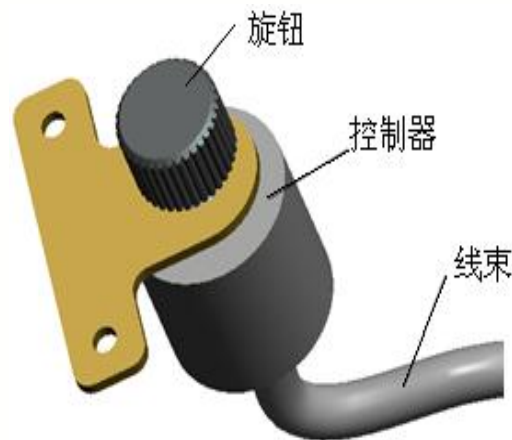


图2 旋钮式远程油门控制器





(二) 远程油门控制器操作说明

Controller instructions on remote accelerator

远程油门控制器一般随二类底盘发送，放入驾驶室内，需上装生产厂家对其重新安装固定，详见《远程油门安装规范》。

Remote throttle controller generally assembles with the second class chassis. It is located inside cab, and it will be installed and fixed by assembly plants. For details see “the installation specification of remote accelerator” .

在安装固定好远程油门控制器后，将远程油门控制器的线束插接器连接于分线盒内预留的远程油门接口上，该分线盒一般在车架右纵梁尾部。

After the installation of fixation of remote throttle controller, connect the harness plug-in connectors of remote throttle controller with the reserved interface for remote accelerator inside the junction box. The junction box generally locates at the tail end of right longitudinal beam for frame.

驾驶室仪表台上有远程油门转换开关，如图3所示，可使用远程油门转换开关在脚油门和远程油门之间转换。

There is a transfer switch for remote throttle on instrment, as shown in figure 3. It is used for switch transferring between the foot accelerator and remote accelerator.

注：专用车其他部分使用说明请以参照上装厂家相关手册。

Note: special for the rest of the instructions please refer to our reference jacket factory handbook.





(三) 远程油门使用

Usage of remote throttle

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。

For special vehicle equipped with remote throttle, whose change-over switch can be used to convert between foot throttle and remote throttle.

断开远程油门转换开关时远程油门失效，脚油门有效；

When turn off remote throttle change-over switch, the remote throttle will be useless, but foot throttle will be effective.

按下远程油门转换开关时脚油门失效，远程油门有效。

When press down remote throttle change-over switch, foot throttle will be useless, but the remote throttle will be effective.



八、车轮的更换 Wheel replacement

八、车轮的更换 Wheel replacement

注意事项: Cautions:

(1) 更换车轮时应注意不要碰伤车轮螺栓上的螺纹。

Don't damage threads on wheel bolts when replacing 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。

No paint, grease or other dirt is allowed to pollute the matching surface between brake drum and wheel rim.

(3) 车轮螺母的压紧面应清洁, 没有脏物或油污。

Clamping surface of wheel nuts should be clean without dirt or oil fouling.

(4) 在装车轮以前, 应先将与车轮定位孔及轮边减速壳上相配的外圆擦干净, 并抹上一点油脂。

Before mounting the wheel, wipe out the excircle surface matching with wheel location holes and wheel reductor housing, and coat a little grease.

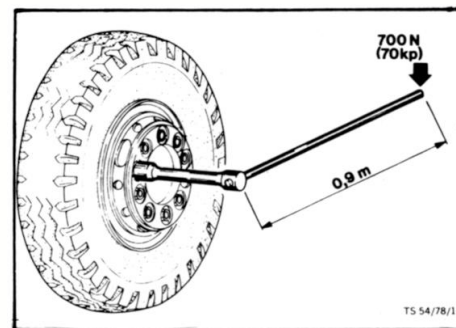
(5) 在车轮螺栓和车轮螺母的螺纹上抹上一点油脂、机油或其它防咬合剂。Coat a little grease, oil or other anti-meshing agent on threads of wheel bolts and wheel nuts.

(6) 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。

Threads on all wheel nuts are right handed threads. Mount the wheel, and tighten the nuts in diagonal crossing orders with the wheel being suspended, after which release the wheel and screw the nuts with a torque of 550-600N·m (55-60kgm). For aluminum alloy rim, screw the nuts with a torque of 610-680N·m (61-68kgm).

(7) 每次重装轮胎后, 必须在行驶50公里后复紧一次轮胎螺母。

After each time of remounting wheels, re-screw the wheel nuts after run the vehicle for 50 km.



九、驾驶室的翻转操作 Cab tilting operation

驾驶室翻转前应将车辆停在平坦地面上，不影响其它车辆通行，并使用驻车制动，变速杆置于空挡，关闭发动机以及所有工作设备，关闭好车门。翻转前将驾驶室内未固定的物品固定或取出，确保驾驶室翻转前方和后方区域无人，可执行驾驶室翻转操作。

Before tilting operation of cab, on condition that do not obstruct other vehicles, park vehicle on flat ground, apply parking brake, shift gearlever in neutral position, shut down engine and all working devices, and close vehicle door. Before tilting the cab, all unfixed things should be fixed or moved out of the cab, ensure there is no person standing in front and rear of the cab, and then the cab could be tilted.

(一)手动翻转操作步骤:

Manual tilting operation steps:

1.翻转前先将驾驶室內的未固定物品取出，并打开前面罩。

Before tilting the cab, all unfixed things should be moved out of the cab, and radiator grille should be opened up.

2.翻转时不得有人站在驾驶室前方较近的地方。

In tilting procedure, no person is allowed to stand near the front of the cab.

3.将翻转油泵的转换手柄扳③到“ ”位置如图示。

Turn the transfer handle ③ for tilting oil pump to the “ ” position as indicated in the figure.

4.将撬棍插入孔①内如图示，用翻转泵进行翻转操作，每次驾驶室翻转必须达到止点（驾驶室重心翻过翻转点后自由下落至静止状态）。

Insert the crowbar into the hole ① as indicated in the figure, and use tilting pump for tilting operation. The cab must be turned over to the dead point (cab to freely fall to a stationary state after the center of gravity for the cab has turned over the tilting point)



九、驾驶室的翻转操作 Cab tilting operation

5.驾驶室翻回原位：将翻转油泵的转换手柄③扳到“ ”位置后，摇动翻转泵撬棍使驾驶室翻回原位，并继续摇动撬棍，直到撬棍上感到有明显增加的阻力为止，确保驾驶室锁止。

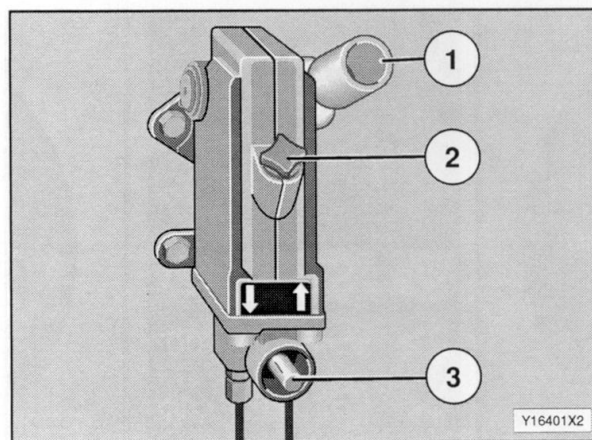
Cab Turnover to Original Position: After the transfer handle ③ for the tilting oil pump is turned to the “ ” position, rock the crowbar of tilting pump for the cab to turn over to the original position, continue rocking the crowbar, until obviously increased resistance is felt on the crowbar, and ensure that the cab is locked up.

6.若驾驶室未锁住，仪表板上的锁止信号灯点亮，请立即检查并完成操作确保驾驶室锁止。
If cab is not locked up, the locking signal light on the instrument panel turns on, please examine at once and complete the operation to ensure that cab is locked up.

7.驾驶室落下后，与上进气道连接的橡胶波纹管必须与下进气道紧密贴合到位，防止进入灰尘。
After the cab falling down, rubber bellows connecting with upper inlet duct must closely joint with which of lower inlet duct to prevent dust.

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

To ensure normal operation of oil pump, screw off screw-plug ② as shown in figure every two weeks, check whether liquid level of oil pump locates at bottom edge of filling port, and fill it up if hydraulic oil is too less.



(二) 注意事项: Cautions:

1.每次翻转驾驶室时都要将驾驶室翻到底，即驾驶室重心越过翻转轴中心，才能进行驾驶室翻转后的作业，驾驶室在未翻过止点之前禁止任何人员或肢体进入驾驶室下方与底盘之间！

Each tilting operation of cab must be done thoroughly, that is to say, the center of gravity should exceed the center of tilting shaft, only after which operations hereafter can be started. Persons are prohibited to enter the cab or body is prohibited to enter the space between the cab and chassis before the cab is not tilted over its dead center.

2驾驶室翻转前必须将驾驶室前面罩全部打开方可翻转驾驶室！

The front face mask of cab must be fully opened, before the cab may be turned over!

3.驾驶室处于翻起状态时禁止任何人员进入驾驶室！

It is forbidden for any person to enter into the cab when it is under the tilted status!

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加油前，必须检查液压油是否清洁，符合要求方可加油。

Only when the cab is tilted back to its original position, the oiling and exhausting operation can be carried out to the tilting system. Hydraulic oil must be checked if it is clean or not, before oiling, and it can only be used when it is in compliance with requirements.



(三) 加油步骤: Oiling Steps:

(1)打开油塞1加入规定的液压油，加满至液面3。

Open the oil plug 1 and add specified hydraulic oil, until the liquid level 3 is filled up.

(2)一边用手摇泵慢慢将驾驶室翻起一边继续加油。

Slowly turn up the cab using hand-operated pump while oil is being further added.

(3)将驾驶室放下，同时让多余的油溢出。

Lower the cab, and allow the excessive oil to spill over.

(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。

Then turn up the cab again, and examine and supplement the oil level when the cab is dropped to the original position.

(5)最后将加油塞1拧上。

Screw on the oiling plug 1 in the end.

(四) 翻转系统功能检查

Examining Functions of Tilting System

(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。

Tilt the cab forward until its top dead center, and check for the cab's lowering conditions after exceeding the top dead center. If the system works normally, the cab should be lowered down with damping force but without impact.

(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。

When being turned up to 30°, the cab should be available to keep in the position for 20 m without going down.



十、新车走合 The running-in of the vehicle.

走合里程规定为2000-4000km（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 running-in mileage is specified as 2000-4000km. Routine inspection shall be conducted for the vehicle, to ensure that vehicle is under normal working condition.

（一）走合注意事项：Running-in cautions:

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。

It is best not to speed up immediately soon after cold engines are started. The engine speed cannot be increased until it has been in its normal operation temperature.

2.走合期应在平坦良好的路面上行驶。

Vehicles in running-in period should be operated on complanate and favourable roads.

3.应及时换档，平稳地接合离合器，避免突然加速和紧急制动。

It is best to shift in time, and stably engage clutch, in order to avoid sudden acceleration an emergency brak e.

4.上坡前及时换入低档，不要让发动机在很低转速下工作。

Shift into low gears in time before climbing slopes, when engines are not allowed to work in very low 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%。

In preliminary 3000km, a new vehicle is not allowed to work with its trailer, and the vehicle-loaded mass should not be higher than 70% of its normal 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。

Check and control oil pressure of engine and normal temperature of coolant. Frequent inspection should be done to temperature of transmission, front and rear axles, hubs and brake drums. If acute clarification is found, its reasons should be clarified, and regulation or maintenance should be done immediately.

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。

After the first 50 km operation and each time of wheel replacement, wheel nuts should be screwed as specifications.

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。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 running-in period is expired, limiting stopper on injection pump should be removed. It is prohibited to remove the limiting stopper in running-in period. After running-in is completed, inspection and maintenance should be done to the vehicles as contents of "First-time Inspection" in maintenance specifications.



十一、发动机电控系统

Electronic control system of engine

(一) 发动机电控系统简介:

Brief introduction for electronic control system of engine

WP系列电控发动机均采用了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。国四发动机在国三发动机的基础上进行了进一步优化, 增加了后处理系统及OBD功能。

WP series China III engine has introduced the electronic-control high-pressure common-rail technology for diesel engine of BOSCH Company. For the purpose of emission and fuel consumption reduction, electronic control unit (ECU) can automatically control injection quantity and timing of engine according to all kinds of electric signal such as input pressure, temperature, rotating speed, the position of throttle pedal, and so on. The China IV engine is optimized on the basis of China III engine, it has the aftertreatment system and OBD functions.

WP系列电控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 for WP series China III engine has capacities of stable system processing, multilevel system protection and error correction, which can ensure reliability and security of engine. The electronic control unit (ECU) also has capacities of system fault self-detection, self-diagnosis and fault output, which is convenient to maintenance for the electronic control system of engine.



(二) 注意事项: Cautions:

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;

The engine has been strictly carried out delivery test according to test specification before ex factory. Costumers are not allowed to randomly adjust data within electronic control unit (ECU) and change power and configuration of 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;

The inspection and repair for all components of complete vehicles' electrical system must be carried out by professional electrical personnel.

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;

The inspection and repair for all components of electronic control system must be carried out by professional 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;

Because of electronic control unit (ECU), common-rail oil pump and injector are precise components, so customers are not allowed to self-disassemble them.

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;

The circuit connection between complete vehicle and electronic control unit (ECU) must be cut off when the complete vehicle is in welding operation.

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;

The power supply of electronic control unit (ECU) must be cut off when connector of the electronic control unit (ECU) is plugged in or pulled out to prevent damage of the electronic control unit (ECU) and other components.

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。

When connect power supply of electronic control unit (ECU), whose positive and negative electrode must be confirmed to prevent damage of the electronic control unit.



(三) 整车发动机专用电气设备:

Special electrical installation for engine of complete vehicle

1. 信号灯:

Signal lamp

Table 11-1:

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 special alarm signal lamps for engine inside signal assembly on the center of combination instrument (for the names, symbols and functions see the following table)

表11-1

信号灯名称Name of signal lamp	信号灯符号 Symbol of signal lamp	功能Function
黄色报警灯（报警信号灯）Yellow alarm lamp(alarm signal lamp)		未定义 Undefined
黄色报警灯Yellow alarm lamp（冷起动信号灯）(Cold start signal lamp)		用于进气加热装置工作状态指示For indicating the operating status of air intake heating device
红色报警灯（EDC故障诊断灯）Red alarm lamp (EDC failure diagnosis lamp EDC—电控柴油发动机EDC-electric control diesel engine		用于电控系统故障指示和故障代码输出。For output fault the indication code and fault code of electronic control system.
蓝色报警灯（油水混合信号灯）蓝色报警灯Blue alarm lamp（油中有水报警信号灯）（Water in oil alarm lamp）		用于粗滤器中积水过多报警For alarming more water in coarse strainer



2. 诊断接口:

Diagnostic 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，诊断接口位于驾驶室内保险盒附近，由驾驶室线束自带。

Diagnostic interface is a special interface used to data inputting and fault information outputting by special engine calibration and diagnostic tools (such as: diagnostic instrument). The diagnostic interface is installed inside the cab near fuse box, it is integrated with cab harness.

（四）发动机起动操作步骤:

Operating procedures for engine start

1. 起动发动机前电控系统自检:

Before engine starts, control system will do self-inspection

操作步骤：钥匙插入方向盘锁孔内，转动钥匙至“ON”位置，电控单元（ECU）电源接通，系统上电自检。

Operating procedures: insert key to locking hole on steering wheel, rotate key to "ON" position (as shown in Figure 45) for connecting power supply of electronic control unit (ECU), the system will do self-inspection.

信号灯总成中冷起动灯（黄色）、EDC故障诊断灯（红色）、OBD指示灯（黄色、国四）均点亮，如果前两个信号灯在1~2秒钟后熄灭（如果信号灯均不亮，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（国四系统OBD指示灯在发动机运行10s后熄灭）。

The cold start lamp (yellow) and EDC fault diagnosis lamp (red) in signal lamp assembly are both alight, if they go out after 1 ~ 2 s (if they are not alight, power supply of the electronic control system or connect circuit of the signal lamp must be inspected), it indicates electronic control system of engine is normal. The OBD indicator lamp of China IV engine will go out after the engine operating for 10s.



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 lamp (yellow) does not go out, it shows air inlet heating device has been operating (detailed specification refers to the usage of air inlet heating).

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 mixing lamp (blue) is alight, it indicates there is too much water inside coarse filter and require to water drain.

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 lamp (red) lightens again after the lamp goes out, it shows there is something wrong with electronic control system of engine or matching electrical device of complete vehicle, which must be inspected and repaired (detailed specification refers to fault inspection of electronic control system).

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 all alarm lamp go out, inspect fuel level, supply voltage, coolant level, etc. in accordance with the requirements of engine operation and maintenance instruction, and start engine if they are qualified.



（五）巡航功能使用

Usage of cruise function

由于电控发动机可以精确的控制喷油时间和喷油量，所以可根据工况的改变自动调整发动机的转速以达到巡航的目的。

For the purpose of cruise, electronic control engine can automatically adjust rotating speed according to different operating conditions because of the engine can precisely control fuel injection time and volume.

使用巡航必须先满足以下条件：

The using of cruise function must meet the following conditions in advance:

发动机转速范围：1200rpm~1900rpm

Engine speed range: 1200rpm~1900rpm

巡航工作时最小启动车速：25km/h

Minimum start speed when cruise is operating: 25km/h

巡航工作时最大启动车速：90km/h

Maximum start speed when cruise is operating: 90km/h

操作步骤：

Operating procedures:

a. 上电，起动发动机，此时巡航处于可被激活状态；

Power on, start engine, here, cruise could be activated.

b. 当满足巡航激活的条件后（档位、车速、转速）按下巡航加开关激活巡航，则将当前车速设为巡航车速，巡航处于保持状态；

Press down “increase switch” of cruise to activate cruise after all conditions (such as gear, speed and rotating speed) meet the requirements of cruise activation, thus, current speed will be set up as cruise speed, and the cruise is in freeze mode.

c. 当巡航打开时，可以通过巡航加、减开关调整巡航车速：

When cruise is operating, cruise speed could be adjusted by “increase or decrease switch” :



加速：长按巡航加，巡航设定点的转速会增加，同时车辆速度也会随之增加；

Speed up: long-time press “increase switch” to increase rotating speed, at the same time, vehicle speed also increases.

减速：长按巡航减，巡航设定点的转速会减小，同时车辆速度也会随之减小；

Speed down: long-time press “decrease switch” to decrease rotating speed, at the same time, vehicle speed also decreases.

点加：短按巡航加，巡航设定点的速度会根据标定值（2km/h）增加，同时车辆速度也会随之增加；

Click up: short-time press “increase switch” to increase the speed of cruise set point according to nominal value (2km/h), at the same time, vehicle speed also increases.

点减：短按巡航减，巡航设定点的速度会根据标定值（2km/h）减小，同时车辆速度也会随之减小。

Click down: short-time press “decrease switch” to decrease the speed of cruise set point according to nominal value (2km/h), at the same time, vehicle speed also decreases.

d.如果需要完全退出巡航，可点动巡航关闭开关以关闭巡航。如果采用巡航关断开关退出巡航,则不可使用恢复键恢复，只有再次按下巡航加或巡航减开关才能进入新的巡航状态。

Click on “cruise off-switch” to shut down and completely stop cruise. The cruise can not be restored by “restore switch” if stop cruise by “cruise shutdown switch”, and a new cruise state can be started only by repressing “increase switch” or “decrease switch” .

巡航过程中，踩下离合、制动、排气制动都可以退出巡航。

During cruise, the cruise can be stopped by step down clutch, brake and exhaust brake.

巡航退出后，可直接按巡航恢复键恢复刚刚设定的巡航速度，前提是按恢复键的时候仍满足巡航激活条件。

After cruise stop, directly press “restore switch” can restore the former cruising speed provided that activating conditions are met when pressing the key.

使用油门踏板也可退出巡航。巡航过程中如果踩下油门，ECU会对巡航扭矩和踏板扭矩进行比较，取最大的数值，以满足巡航过程中的超车，松开油门踏板后，巡航会自动恢复。

Cruise can also be stopped by step down throttle pedal. During cruise, if step down the throttle pedal, ECU will compare cruise torque with pedal torque to get maximum speed to meet the requirements of overtaking, and the cruise will be automatically restored after releasing the pedal.



注意事项: Cautions

a.使用巡航有一定的局限性。当遇到较长、较大的坡度或路况较差时，不推荐使用巡航。否则若由于加速度或减速度太大退出巡航，则巡航被锁定，本次驾驶循环不能再次进入巡航，ECU必须断电重启后才可以恢复巡航功能。

Cruise has a certain limitation. The using of cruise is not recommended when a vehicle drive over a longer and larger slope or bad road. Otherwise, the cruise will be stopped and locked up because of too large acceleration or deceleration. Besides, the cruise can not be restarted in this driving cycle, and ECU must be shut down and restarted to restore cruise function.

b.巡航功能的实现条件比较苛刻，所以当巡航功能不能激活的时候，首先要检查开关状态是否正常。例如：如果离合开关损坏，这时ECU收到的信号就是1，ECU就认为离合已经被踩下，所以巡航功能就不会被激活。其他的几个开关也是一样。

The realization of cruise function must meet hard conditions. You'd better check whether switch is in normal condition when cruise function can not be activated. For example, if clutch is damaged, ECU will consider the clutch is stepped down when receiving signal 1, therefore, the cruise function can not be activated. It is the same as other switches.



(六)排气制动使用:

Usage of 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。

Exhaust brake is an auxiliary brake of engine. The engine will stop fuel injecting when the exhaust brake is operating. The exhaust brake is used when a vehicle driving over long slope to reduce fuel consumption.

1.工作条件:

Operating conditions:

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，发动机转速须在800转/分以上，避免下坡时发动机熄火。

Engine speed must be more than 800 rpm to avoid engine miss during running downhill when exhaust brake is operating because of the exhaust brake is controlled by electronic control unit (ECU).

2.检查步骤:

Inspecting procedures:

a.钥匙开关通电，起动发动机；

Power on key switch and start engine;

打开排气制动开关；

Turn on exhaust brake switch

当发动机满足排气制动的条件时(转速)，打开排气制动开关，排气制动蝶阀打开，排气制动起作用。

When engine meets the condition (rotating speed) of using exhaust brake, step down exhaust brake button to open butterfly valve of the exhaust brake, which will come into operation.

注意 Cautions:

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！

Do not test exhaust brake when throttle pedal is stepping down, because the exhaust brake will be out of work when the pedal is stepping down.

b.排气制动在低转速时效果不明显。

The effect of exhaust brake is not obvious in low rotating speed.



(七)进气加热装置的使用: Usage of 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。

Electronic control unit (ECU) induces ambient temperature according to temperature sensor on engine, and controls air intake heating grill by driving air intake relay to heat engine air intake so as to cold start the engine.

1. 进气加热工作条件:

Air intake heating working conditions:

环境温度在0°C以下

Ambient temperature should be below 0 °C.

2. 操作步骤:

Operating procedures:

a. 打开钥匙开关

Switch on ignition key

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。

When cold start signal lamp is alight, electronic control unit (ECU) will automatically control the time of each process (preheating, heating and subsequent heating) according to induced ambient temperature.

b. 预加热: 如果温度条件符合, 则进行预加热, 冷起动灯持续点亮, 否则冷起动灯熄灭;

Preheating: carry out preheating if temperature condition is met, cold start lamp will be flashing, otherwise, the lamp is not alight.

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;

After preheating, the cold start lamp will flash for three times to indicate driver the preheating has finished.

d. 冷起动灯熄灭后, 驾驶员可以起动发动机;

Driver can start engine after the cold start lamp goes out

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。

After engine starts, there is still a subsequent heating process, in which cold start lamp is not alight.



注 意

Cautions:

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1min之内，后加热时间略长，通常在2min(-10°C时)。

Electronic control unit (ECU) will automatically control heating time according to different ambient temperature. Generally, preheating time is within 1 minute, and subsequent heating time is about 2 minutes (when the temperature is -10°C).

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。

Heating process is interrupted if start engine when cold start lamp is alight or flashing.

(八)空调请求开关的使用:

Usage of request switch for air conditioner

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。

Please first press “request switch” when turn on air conditioner. When it receives the information of turning on the air conditioner, electronic control unit (ECU) will increase idle speed to 700rpm, and then turn on “cooling switch” of the air conditioner, generally, which will come into operation.

说明：开空调请求开关也可作为怠速提升装置！

Explanation: idle speed can also be increased when turn on “request switch” of air conditioner.



(九) 故障诊断: Fault diagnosis

1. 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。

For its fault self-diagnosis function, once electronic control unit (ECU) detects there is something wrong with electronic control system, the system will generate a fault code and store it in memory, and lighten fault diagnosis lamp according to the fault severity, and automatically activate different failure protection mode.

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。

In normal condition, it shows the system has gotten into severe fault if the diagnosis lamp is always alight and need to be inspected in time.

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。

If the system generates a fault code but the diagnosis lamp is not alight, it indicates the system fault is a former fault or a lower-grade fault, which will not affect normal running of vehicle.

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。

In most cases, engine will operate with fault (Limp Home) at low speed under failure protection mode, and its rotating speed will be limited.

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。

When a few extreme severe faults occurred, failure protection mode will stop fuel injection and operation of engine.

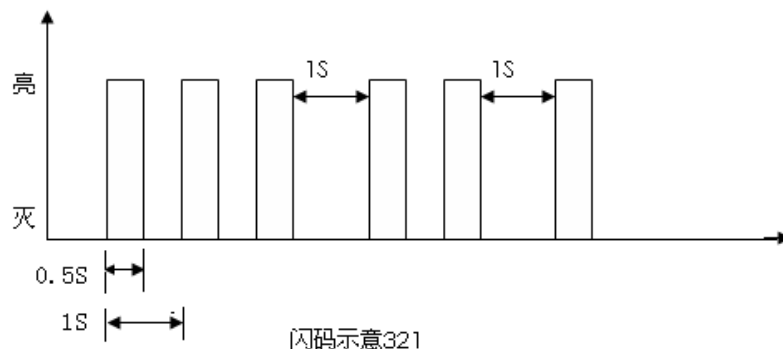


2.故障码的读取：Fault code reading:

- a.通过专业的故障诊断仪读取：Read fault code by professional fault diagnosis instrument;
 - b.通过发动机故障信号灯的闪码读取。Read the flash code of the fault signal lamp of engine.
- 请注意：如果诊断请求开关一直导通时，故障诊断灯将常亮！

Note: if the diagnosis request switch is always turned on, the fault diagnosis lamp will be alight constantly!

每个闪码由3位数组成，位与位之间间隔1秒。例如：闪码321，诊断信号灯的工作程序如下图所示：
Each flash code consists of three digits with an interval of 1s. For example: flash code 321, the work program of diagnosis signal lamp is as shown in the figure below:



将读出的闪码对照闪码表（详见发动机使用说明书）查找具体的故障说明，进而排除故障。如果是一些复杂的故障或发动机电控系统内部故障，则请联系当地服务站人员帮助解决，不可私自拆卸发动机以及相关部件。

Compare the read flash code with code table (for details see the engine specification) to find specific fault specification. If there is complex fault or the internal fault of electric control system of engine, please contact local service station. Do not disassemble the engine and related parts.



（十）车下启动/熄火开关的使用：

Usage of start/stop switches outside vehicle:

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 maintenance for an engine mounted under vehicle, engine electronic control unit (ECU) has a start/stop function outside vehicle.

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：

A vehicle can be started or stopped by “start/stop switch” outside the vehicle without using of key switch. However, the following preconditions must be met:

ECU要上电工作即钥匙开关要处于打开位置。

If ECU wants to power on, that is key switch must be in turning on position.

变速箱要处于空档位置。

Gearbox must be in neutral position.

车速传感器工作正常且车速为0。

Speed sensor works normally and the speed is 0.

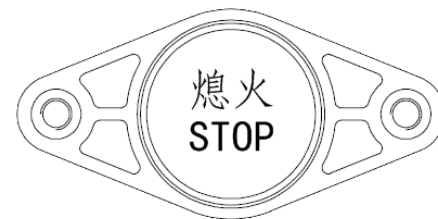
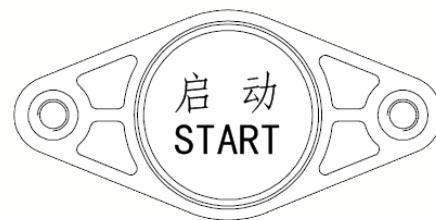
注意：Cautions

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。

The outside start conditions are rigorous. And the emergency start mode can not be activate. Therefore, before starting, please ensure all switches, sensors and electric lines can work normally.

2、当该熄火开关按下时，发动机将不能起动机！

When the turn-off switch pressed, the engine will not be started!



十二、天行健智雅版BD车载终端使用说明

The instructions on Zhiya BD onboard terminal of Tianxingjian

天行健智雅版BD车载终端包括：车载智能终端和辅助显示屏两部分，车载智能终端配有单显小屏；车载终端安装在驾驶室高架箱上，显示屏安装在驾驶室仪表台上。

Zhiya BD onboard terminal of Tianxingjian including: onboard intelligent terminal (with an indenpent small screen) and auxiliary display screen. The onboard terminal is installed on the elevated box of cab, and the display screen is installed on instrument desk.



十三、空气悬架系统——适用于公路牵引/载货车

The air suspension system: use for highway tractor and truck

(一) 空气悬架系统简介:

The air suspension system introduction:

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 which is adopted air spring as elastic component. Compared with the traditional leaf spring suspension, it has a long design life, reliable working performance, and excellent comfort. The fatigue resistance of the air suspension is also very good. Even in the case of heavy bearing capacity, it also can ensure a longer service life. Under the condition of different bearing capacity or the vehicle drives on uneven roads, it can maintain the same suspension height and a little bouncing of vehicle by height adjustment device. Therefore, it is especially applicable to transport glass products, precise instruments and other goods. Due to the air spring has no friction between components (sealing element), it can not wear out under the working conditions of dust, particles, or more precipitations and has a low maintenance cost.



(二) 注意事项:

Notes:

1. 确保气囊不长时间的接触液压油、润滑油、溶剂;
1. To ensure that the air bag has no contact with hydraulic oil, lubricating oil and solvent for a long time;
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%;
2. Even the vehicle drives on the good pavement of highway and first-class highway, it can not permit that the overload of vehicle is more than 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;
3. In order to guarantee the service life of air suspension, please keep maintenance as required;
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;
4. The height control mechanism is an important component and it has a direct effect on using security of vehicle. User shall not disassemble or change the settings. If not, it may leads to accidents.
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;
5. When vehicle is in the operation of welding or spark cutting, the air bag and air pipe shall be adopted by proper protection.
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。
6. When the user installed it on their own, any installed components can not affect motion space of height adjustment device. There shall be no obstacles in the circle range (the suspension height is in the initial position) within 30mm.



(三) 高度阀的调节

The altitude valve adjustment

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：

The altitude valve has been adjusted when it leaves the factory. Unless the altitude valve linkage is damaged by accident in the process of vehicle operation, the user can be adjusted altitude valve linkage. If necessary, the altitude valve adjustment shall be follow the following principles:

(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；

(1) The distance between the lower side of frame and center surface of axle is 200mm, and the component 1 shall be level.

(2) 高度阀上的摆轴（件1）上有箭头图标，件2应从箭头端插入；

(2) The pendulum (component 1) of altitude valve has the arrow, and the component 2 shall be inserts from the arrow end.

(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；

(3) The axis pin between the connecting rods shall be parallel to each other. The rotation is flexible, and it shall be no clamping stagnation.

(4) 车桥跳动过程中，件2的摆动角行程越大越好（极限摆动角为 $\pm 45^\circ$ ）；

(4) When the axle is in the process of bouncing, the swing angle stroke of component 2 is greater, the better (the limit swing angle is $\pm 45^\circ$).

(5) 件1的有效长度推荐值为190~200mm；

(5) The effective length recommended value of component 1 is between the 190 and 200 mm;

(6) 在高度调整至合适时，件2与件4的角度推荐值为 70° ；

(6) When the height is adjusted to the proper position, the angle recommended valve of component 2 and 4 is 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。

(7) The installation ways for altitude valve in left and right sides of axle is symmetrical, and the adjusted length of corresponding rods is the same.



(四) 空气悬架的使用

Use of air suspension

为了充分发挥空气悬架的性能，用户在使用过程中应注意以下内容：

In order to develop the air suspension performance, user shall be pay attention to the following contents in the process of using:

(1) 每天或在出车前进行例行检查，例行检查内容包括：

The routine inspection shall be performed before driving or in everyday. The routine inspections include:

a、目视检查空气悬架充气充足、均衡；

Check the air suspension if it is inflated and balanced.

b、悬架高度正常，系统无泄漏。

The suspension height is normal and the system has no leakage.

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。

The simple inspection way is: park the vehicle on the level ground, which is used at first time in a good state. Select four easy measuring points (all points shall be less than the lowest point of air bag) respectively in front, rear, left and right position of suspension. Measure the distance from this point to frame and record. After this inspection, it is only need to park the vehicle on level ground, measure the distance from these four points to frame. If the value has no significant changes, it can determine that the suspension height is normal and the system has no leakage.

(2) 若检查不合格时，需查出原因，排除故障，必要时进行维修。

If the inspection is not qualified, it is need to find out the reason. Troubleshoot and repair it if necessary.



(3) 还应定期进行安全检查（间隔里程2000-3000公里），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：

The security checks shall be performed at regular intervals (if the interval mileage is between 2000 and 3000 km). The vehicle shall be parked on clean and flat road, and check the following items:

a、所有紧固件无松动；

All fasteners are no loose.

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。

The air spring inflation is normal at air supply pressure which is not less than 6 bars. The airbag solid degree of two sides of same axle is the same. Check the air spring if it is wear, damaged, and bulged, and there is clearance which exceeds the 30mm.

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）。

The damper has no oil leakage and damage, and working operation is normal. The simple determination method is: if there is no obvious malfunction, the damper is in heating state after the engine operated; it shows the working operation is normal (it may be hot).

d、所有零部件和焊缝无裂纹。

All parts and weld joints have no cracks.



介 绍 完 毕
谢 谢 大 家

thank you

