



# 蓝擎欧III WP6柴油机 维护保养

## Maintenance for Landking WP6 Euro III Diesel Engines



尊敬的用戶：

Respected customers:

感谢您选择了潍柴动力蓝擎欧III柴油机。

Thank you for using Landking Euro III diesel engines of Wei Chai Power.

蓝擎系列柴油机是潍柴动力欧洲研发中心融合国际最前沿内燃机科技开发的具有世界先进水平的成熟产品。

Landking series diesel engines, developed by European R&D center of Wei Chai Power integrating the most advanced technology of internal combustion engines, are mature products with world-class technology.



## 潍柴动力友情提示:

为了提高您的运营效率，降低使用成本，请您仔细阅读手册内容，进行正确的使用保养，采用正宗配件、专用油品。

潍柴动力

## Friendly tips from Wei Chai Power:

In order to improve your operation efficiency and reduce cost, please read the manual carefully for proper use and maintenance. Special fittings and oil should be adopted.

Wei Chai Power



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## 二、蓝擎欧III柴油机维护保养

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# 一、蓝擎欧III柴油机的常规检查

Regular inspection for Landking Euro III diesel engines



# 1. 冷却系统

## Cooling system

- 启动前查看冷却液液面, 检查柴油机冷却系统有无泄漏。

Before starting the engine should check coolant level, check whether the cooling system is leaking or not.

- 运行中注意观察柴油机水温是否在合适的范围内。

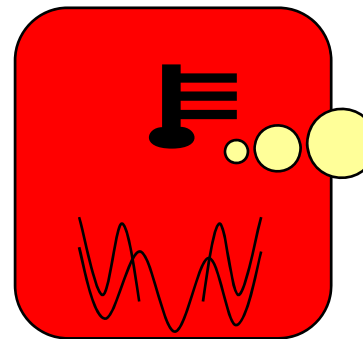
Check whether water temperature is at the required range or not when the engine is running.



**当水温过高时, 请检查:**

**When water temperature is too high, please check:**

- ① 水泵皮带张紧度 the tension of water pump belt
- ② 风扇皮带张紧度 the tension of fan belt
- ③ 节温器 thermostat



海拔3000米  
以下正常水温  
80~95℃  
The normal water  
temperature under the  
sea-level of 3000  
meters is 80~95℃

驾驶室水温表示意图 diagram of  
water temperature in cab



当气温低于4℃时必须使用冷却液！

Must use liquid coolant when ambient temperature is below 4℃ !

推荐使用 Recommendation

长效冷却液 Long-acting liquid coolant

牌 号 Brand	-25	-35	-45
适用温度 applied temperature	-25℃以上	-35℃以上	-45℃以上





## 2. 润滑系统

### Lubricating system

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1、每天开车前请检查机油液面高度；

Check the height of oil level before drive every day.

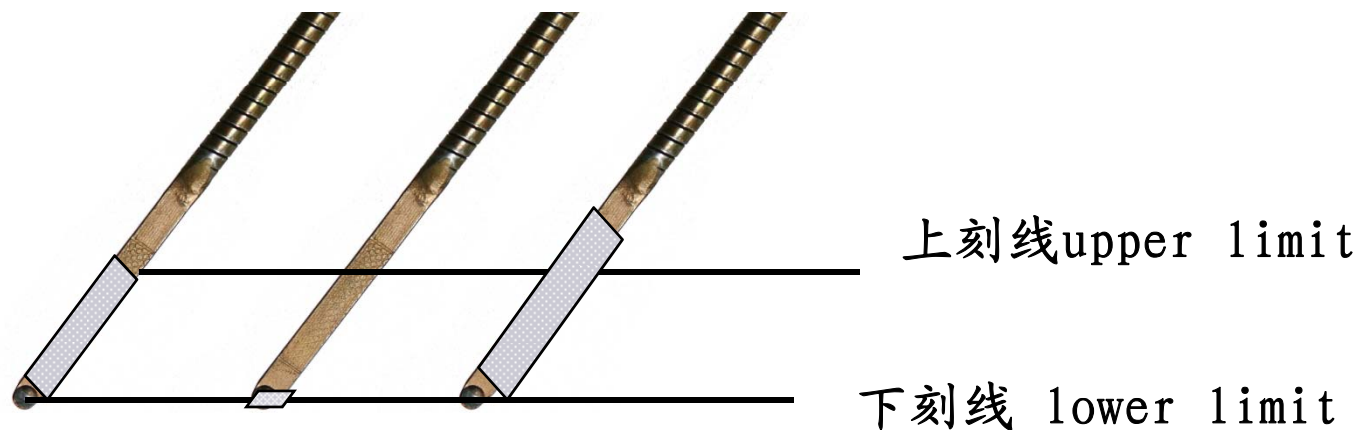
2、如何正确检查？车辆停在平坦路面、开车之前或停车15分钟发动机冷却后，拉出机油油尺，查看机油液面，当液面低于油尺的下刻线或高于油尺的上刻线时，禁止启动柴油机！

How to check it? The vehicle is parking on the plain road, before start or stop for 15 minutes till the engine cools, pull out oil dipstick to check oil level: When the level is below the lower limit of oil dipstick or above the upper limit, it's forbidden to start the engine.



更换机油时，首先拧下油底壳底部的放油螺塞，将旧机油放净后旋上放油螺塞；然后打开加油口盖，注入**CF-4机油**直至达到刻度要求，最后拧紧机油加注口盖。

Before replace oil, firstly, loosen the whorl plug at the bottom of oil pan. After used oil is drained out, tighten the plug. Then open the oil filling cap to fill CF-4 oil up to the limit required, then tighten the cap.



## 机油加注口位置

The position of oil filling inlet



**WP6/WP10/WP12系列**

**WP6/WP10/WP12 series**

## 第一缸摇臂罩

机油加注口 oil filling  
inlet of 1st cylinder  
rocker arm cover



**WP12系列**

**WP12 series**

蓝擎欧III柴油机推荐使用**CF-4机油**。允许高品质机油替代低品质机油

常用机油规格如下所示:

Recommend CF-4 oil to be used in Landking EuroIII diesel engines. High quality oil is allowed to replace low quality oil. The specification of common oil is as follows:

粘度级别 Viscosity grade	0W-30	5W-30	10W-30	15W-40	20W-50
适用温度 applied temperature	-40 ~ 30℃	-30 ~ 35℃	-25 ~ 35℃	-20 ~ 40℃	-15 ~ 50℃



请根据环境温度选择使用正确牌号的机油，否则易造成柴油机故障。

Please use right oil according to ambient temperature, otherwise, engine trouble can occur.

注意：WP6 柴油机必须使用 CF 级 15W/40 牌号机油  
Notice: WP10 diesel engine must use CF 15W/40 oil.



## 小常识：零下35°C时各种牌号机油的表现

Common sense: performances of different brands of oil at the temperature of -35°C



0W-30

5W-30

10W-30

10W-40

15W-40

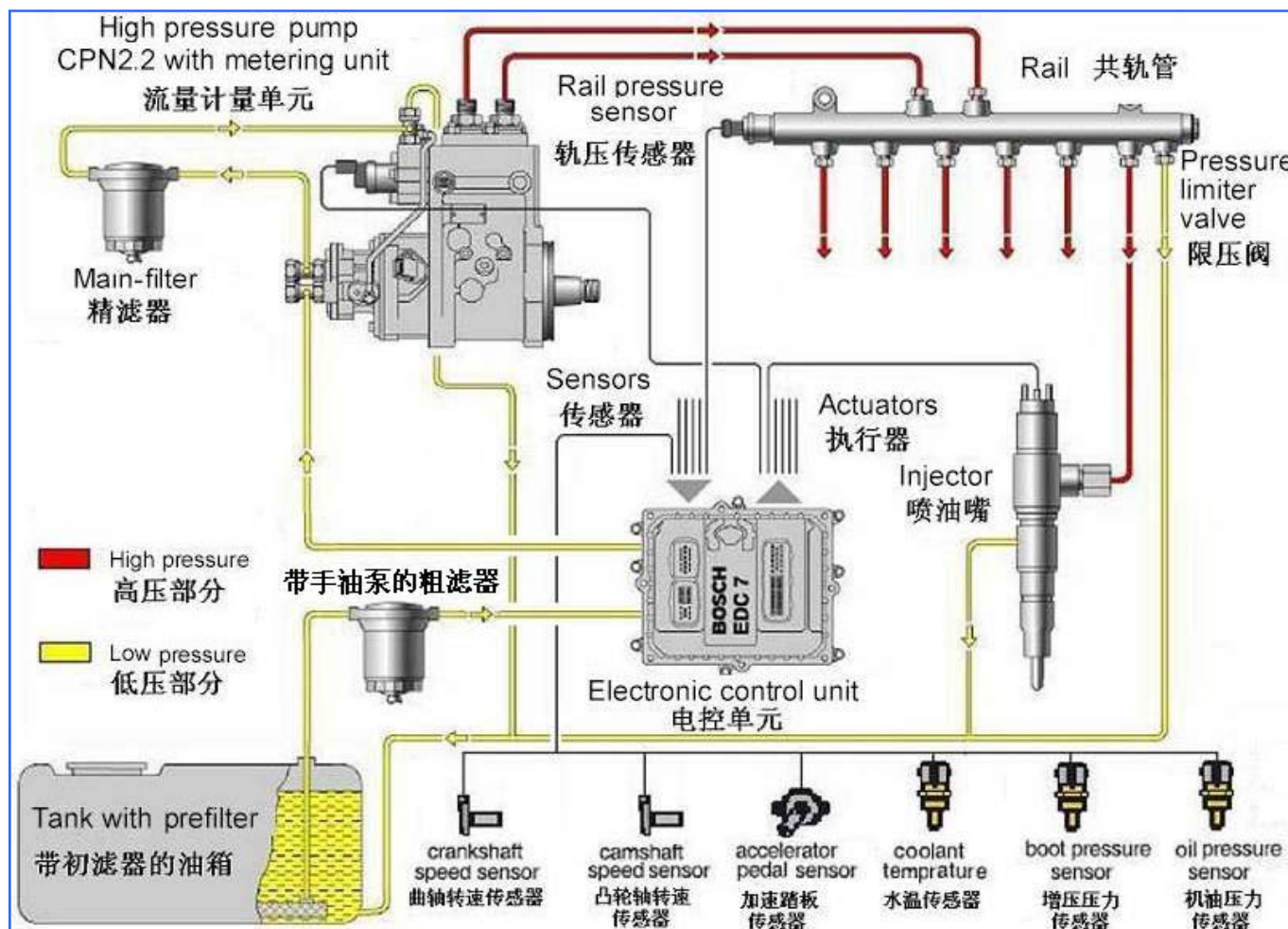


### 3. 燃油系统

#### Fuel supply system

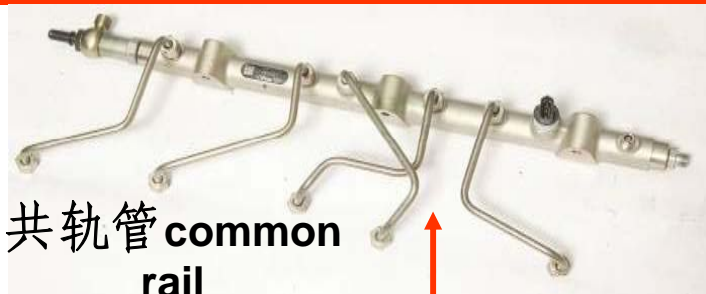
蓝擎欧III柴油  
油机采用博世高  
压共轨系统，主  
要系统部件如图  
所示。

Landking EuroIII  
diesel engines  
apply high  
pressure CR made  
by Bosh, and parts  
of the main  
systems as the  
right Figure:





喷油器  
fuel injector



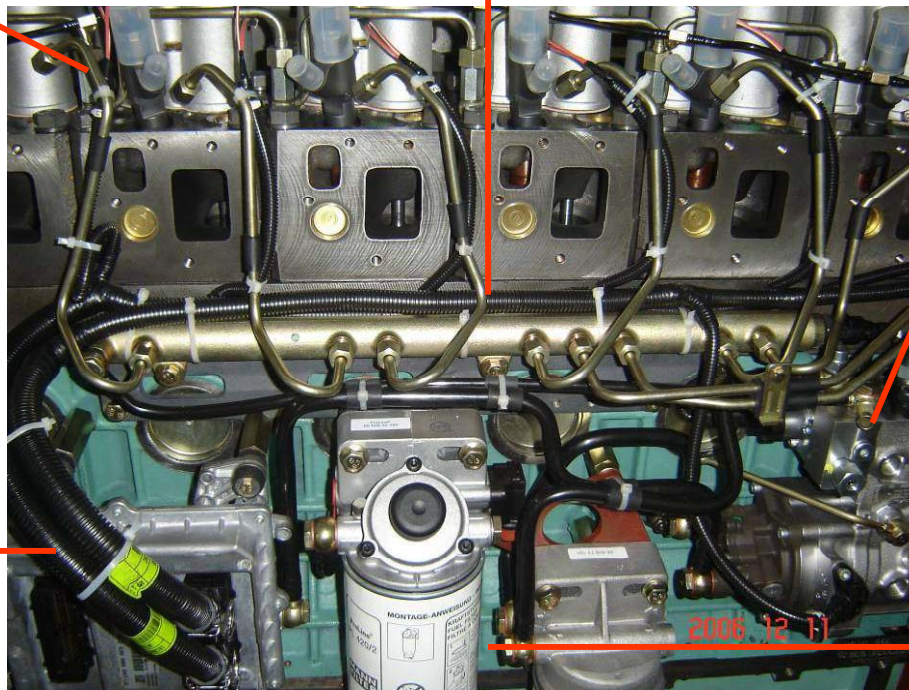
共轨管 common rail



高压油泵 high pressure fuel pump



控制电脑 (ECU)



柴油滤清器  
fuel filter



## 3.1、燃油系统排气

### Deflating Air from Fuel Supply System

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新柴油机、长期停用的柴油机或由于柴油箱吸空、管路漏气，可能会在柴油机低压油路中混有空气，导致柴油机启动困难，启动前需要进行手动排气，方法如下：

Mixed air-fuel in the low pressure fuel passage could possibly be caused by new engines, old engines not used for a long time, or fuel tank empty, pipe leakage, which can result in difficult starting. Therefore, deflating air by hand before start is necessary as the following way:



## 3.1、燃油系统排气

### Deflating Air From Fuel Supply System

1. 排气前要保证油箱中有足够的柴油；

Make sure enough fuel in the tank before deflate air.

2. 松开放气螺栓；（参照右图）

loosen deflating bolt (refer to the right Figure ).

3. 按动手油泵直到放气螺栓无气泡冒出；

Press hand pump until no air bubble spraying out from the deflating bolt.

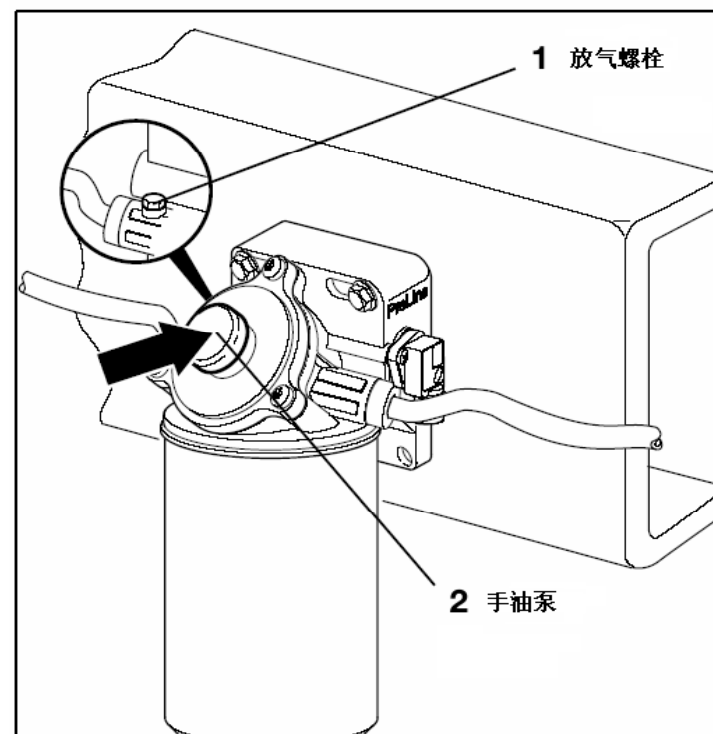
4. 拧紧放气螺栓，启动柴油机。

Tighten deflating bolt, then start the engine.



松开或拧紧放气螺栓时切勿用力过猛，以防损坏。

Don't overexert loosening or tightening deflating bolt, so as to avoid damaging.



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小提示:

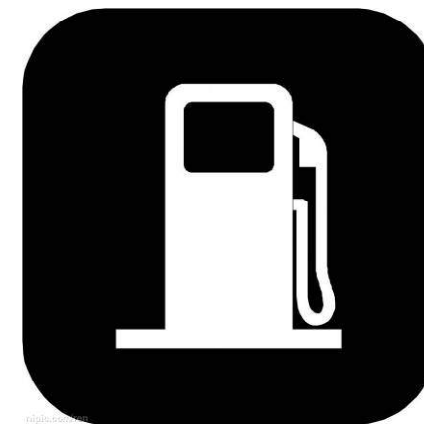
## Special Attentions:

1. 请勿在低压油路排气前一直用起动机强行带动柴油机启动! 这会损害电气系统, 甚至烧坏起动机;

Don't forcibly start engine by the starter before deflate air from the low pressure fuel passage, otherwise, the electric system could be damaged, and the starter even could be burnt out.

2. 在燃油指针到达红线警示时必须加油, 否则油路容易进气!

Fuel must be filled in when fuel pointer reaches the red warning line, otherwise, air could easily penetrate into the fuel passage.



## 3.2、柴油粗滤器放水

### Drain Water from Fuel Pre-filter

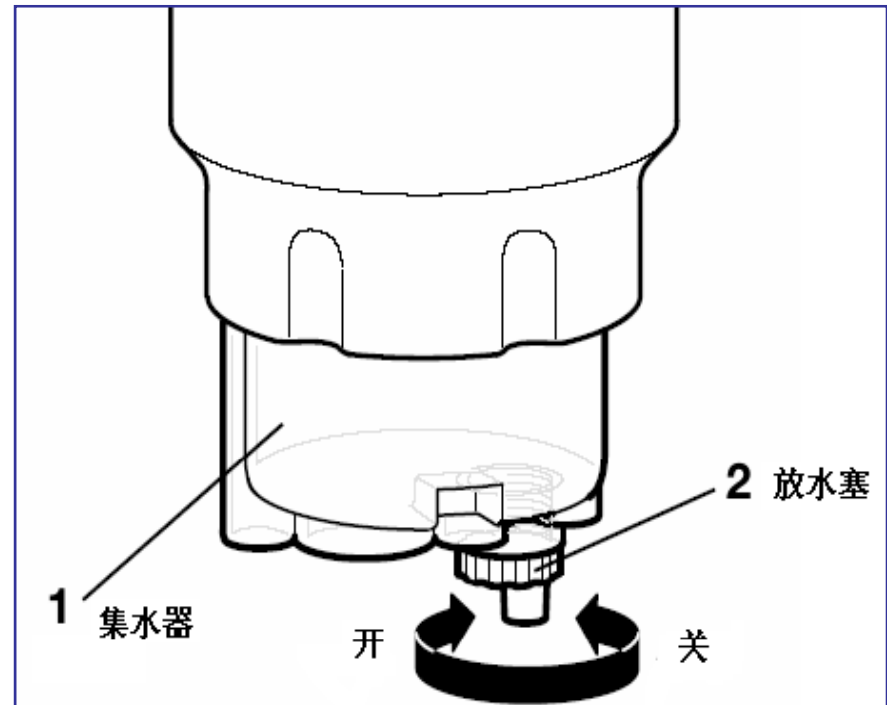


**如果燃油系统进入水分，容易引起高压油泵、喷油器损坏或失效！**

**If there's water in the fuel supply system, high pressure fuel pump and fuel injector could be easily damaged or invalidated.**

请经常定期检查粗滤下滤杯中是否有水，并及时放出。

Please periodically inspect whether there's water in the filter cup of pre-filter or not, so as to drain water in time



集水器放水 drain water  
from water collector

## 3.2、柴油粗滤器放水

### Drain Water from Fuel Pre-filter

#### 放水方法:

The method to drain water :

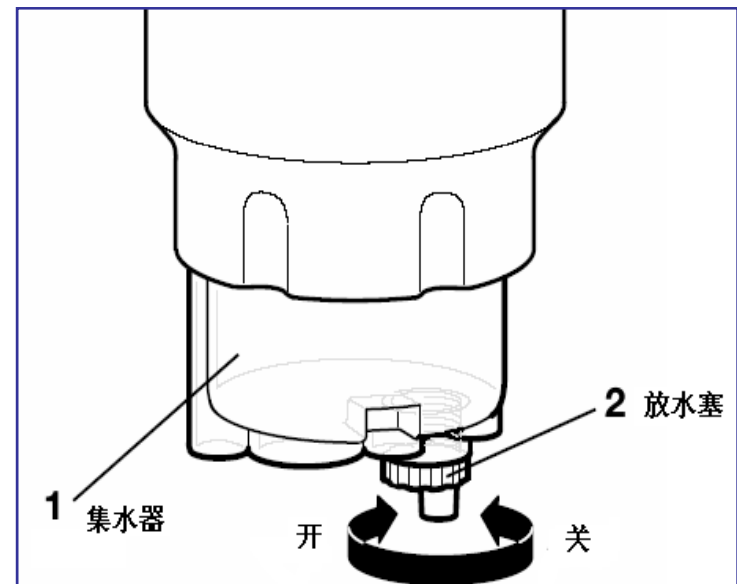
1. 打开集水器底部的放水阀，让水排净；  
Open drain plug (2) at the bottom of water collector (1) to drain off water;
2. 重新拧紧放水阀。  
Tighten the drain plug again.

 开关塑料放水阀用力要轻，以防损坏。  
Lightly loosen or tighten the plastic plug, so as to prevent it from damaging.

小提示：由于各地油品差异，新加油后  
请开车两小时左右观察集水器水位。

#### Special Attention:

Because of fuel quality differences in different places, about two-hour driving later, please inspect the water level of water collector after refill fuel.



集水器放水  
drain water from  
water collector

### 3.3、柴油的选用

#### Fuel Selection



蓝擎欧III柴油机对油品没有比机械泵柴油机更特殊的要求，但请尽量避免加注劣质柴油！

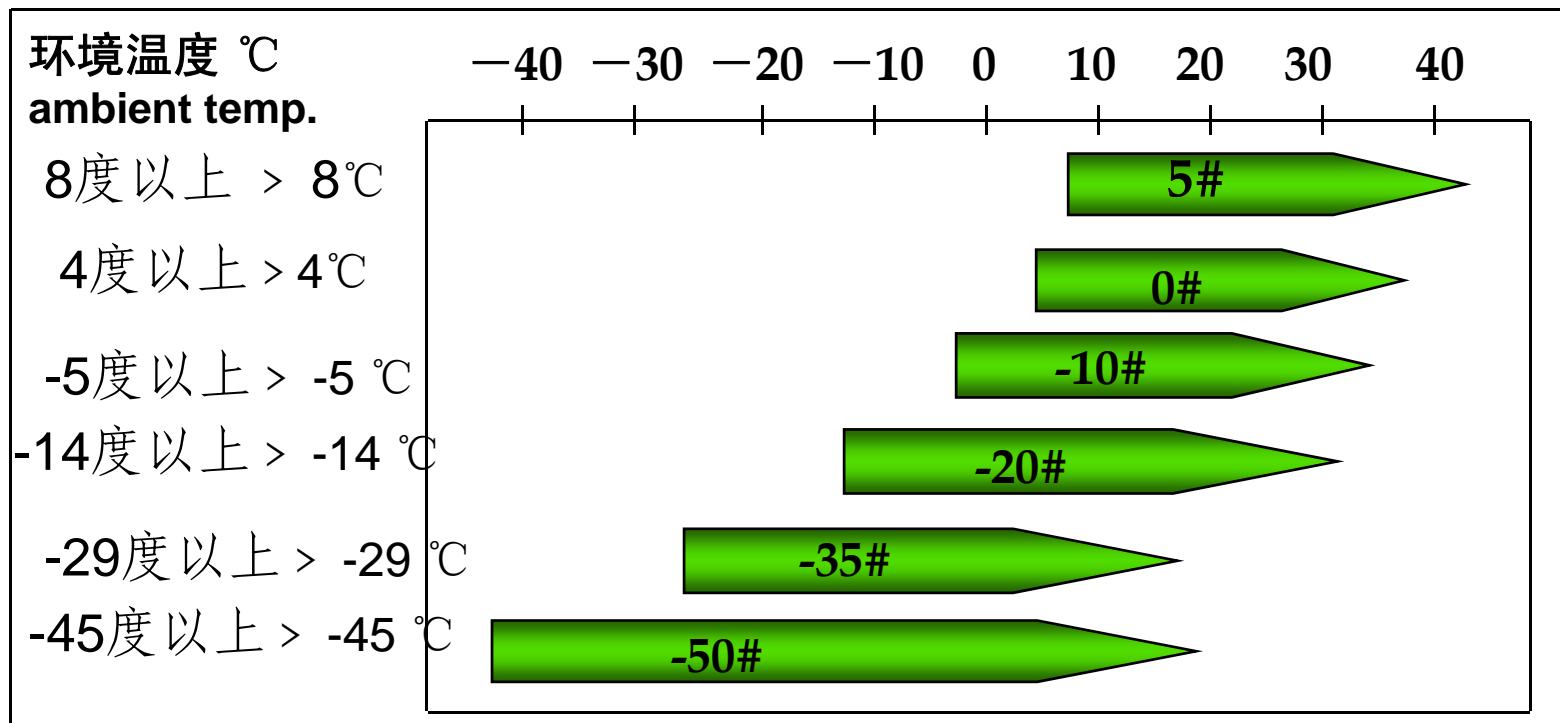
**There's no more special requirements about fuel quality for Landking Euro III diesel engines than that for mechanical pump diesel engines. Please try your best to avoid using low quality fuel !**

小提示：

推荐使用合格的柴油，以保证加注柴油的品质。

**Special Attention:** Recommend using qualified fuel to guarantee the quality of fuel filled.

## 小常识: Common sense



柴油的牌号并不是指柴油所适应的气候温度，而是指在某温度下柴油失去流动性的凝固点。

Fuel brand doesn't mean the ambient temperature the fuel can fit, but the freezing point at which the fuel can't flow under certain temperature.

## 4. 电器系统

### Electrical System

蓝擎欧III柴油机带有控制电脑（ECU）、传感器、电控喷油器等电子元件，过高电压、过大电流可对电器系统造成毁灭性损害；蓝擎欧III系列柴油机发电机额定电压是28V，带有晶体管调节器（雪崩二极管）。因此，在整车进行电焊操作时请注意：

Landking Euro III diesel engines are with ECU, sensors and electrically controlled fuel injectors, etc. Too high voltage or current can damage electrical system. Generators of Landking Euro III series diesel engines, with rated voltage of 28v, have transistor regulators (breakdown diode). Therefore, please pay attention to the following aspects when electrically weld whole vehicle:

 进行电焊操作前必须断开电源；

**Cut off electricity supply before weld;**

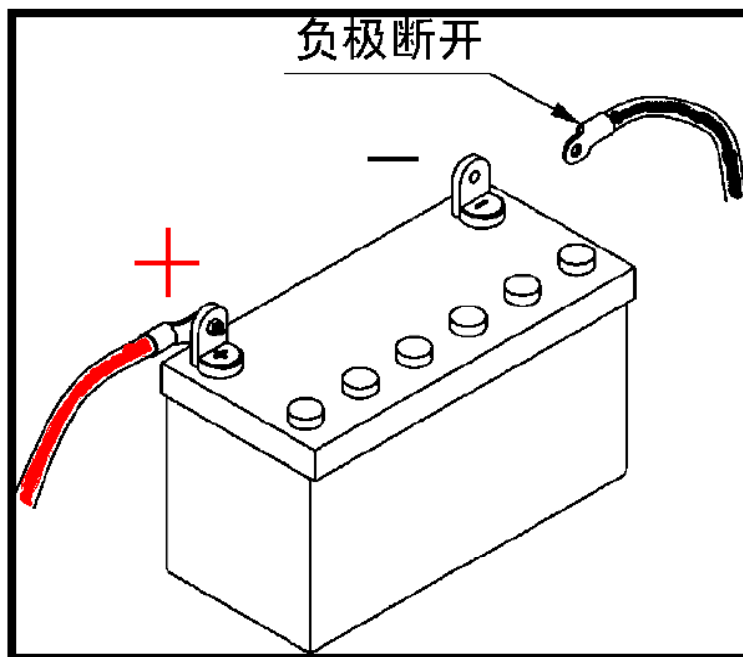
 必须使用蓝擎欧III专用发电机。

**Special generators for Landking Euro III engines must be used.**



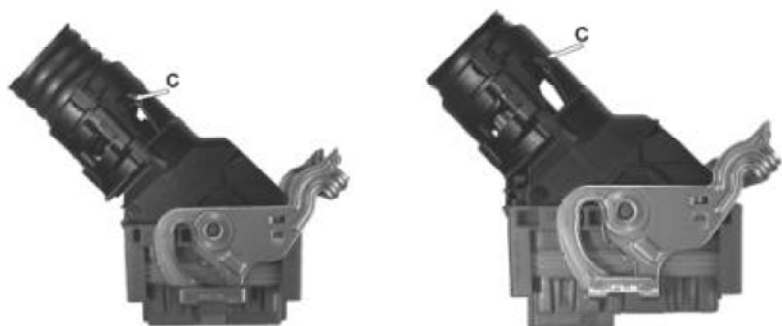
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(1) 关闭蓄电池总开关、断开电瓶负极  
Close the control switch of battery, and cut off  
negative electrode of battery jar.



## (2) 拔掉与ECU连接的线束接插件

**Pull out the wiring harness connector connecting with ECU.**



将接插件从ECU上取下步骤:

Pull out the collector as the following steps:

- 拨开接插件锁紧片, 压到底;  
push aside the locking slice of collector, and press it into its bottom.

- 将接插件取出。

pull out the collector.



**注意不要左右晃动, 以免折弯ECU针脚!**

**Don't shake to avoid ECU stitch bending.**



**在进行ECU 供电电源连接的时候, 务必确认好电源的正负极, 以免烧坏电控单元。Identify positive and negative electrode of electricity supply when connect ECU with electricity supply to avoid ECU burning out.**

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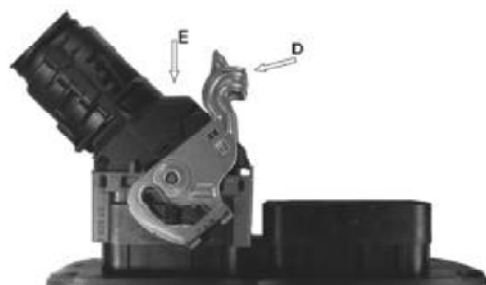
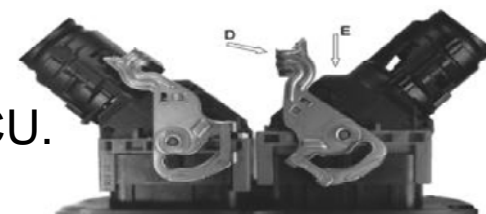
### (3) 进行电焊操作 Welding operation



#### (4) 插上与ECU连接的线束接插件

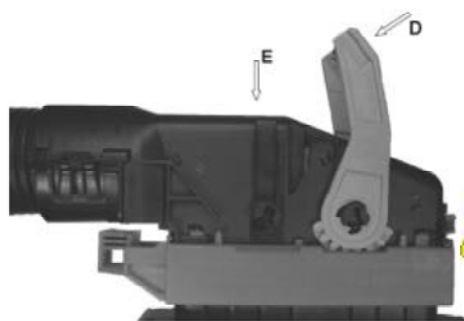
Plug into the wiring harness collector connecting with ECU.

接插件插上ECU步骤:



plug into the collector in the following steps:

- 将接插件摆正轻轻放入ECU插槽, 将插接件压到底;  
Gently and properly put the collector in the ECU groove, and press it into its bottom;
- 合上锁紧片。  
• Shut down the locking slice.



**注意: 不允许频繁插拔ECU接插件! 以免影响ECU的信号连接。**

**Notice: Not allowed to frequently pull out and plug the ECU collector, thereby avoiding influencing message connecting of ECU.**

(5) 接上电瓶负极、打开蓄电池总开关

Connect negative electrode of battery jar, open the control switch of battery.



## ECU插拔操作注意事项

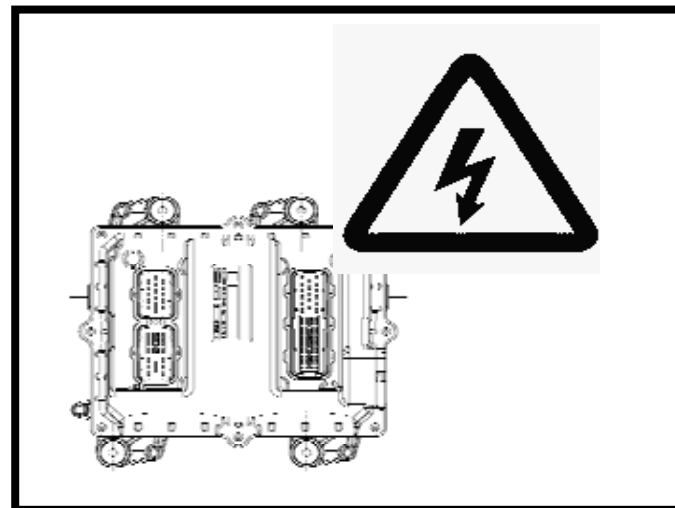
When pull out or plug ECU, pay attention to :

- 对ECU插拔时务必关闭ECU电源，不要用手触摸ECU的管脚。

Must cut off electricity supply for ECU before pull out or plug ECU. Don't touch ECU stitch by hand.

- 不要硬拉硬拽整车的电线和（或）电气线束。当需要断开接插件时，要拿住插接器断开锁扣，不可拉电线，以防损坏！

Don't forcibly draw electrical wire of whole vehicle or electric wiring harness. Hold the disconnection locking buckle when need to disconnect connectors. Don't draw the electrical wire against damaging.





## 5. 机械传动系统

### Mechanical transmission system

柴油机运行前应检查柴油机外部的机械传动系，如皮带的张紧度和磨损程度等。

Inspect mechanical transmission system of external diesel engines before running, such as tensity and wearing of the belt.

皮带通过皮带张紧轮自动张紧，可通过手压皮带检查皮带的松紧。

Belt can be automatically tightened through tension pulley. Press belt by hand to check tension of the belt.



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## 二、柴油机维护保养

### Maintenance for Diesel Engines



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合理的保养可以有效提高柴油机的使用寿命,降低故障率,减小使用成本。

Proper maintenance can effectively prolong service life of diesel engines, decrease trouble rate and reduce cost.

**保养内容: Maintenance contents :**

更换柴油滤芯、机油滤芯;

Replace fuel filter element and oil filter element;

清理检查空气滤芯,每清理5次后必须更换。

Clean and check air filter element. Replace it every 5 times of cleaning.

**保养周期: Maintenance interval:**

可参考如下要求按时到蓝擎欧III服务站保养。

Maintenance should be done in time at Landking Euro III service stations according to the following requirements:





# 1. 卡车 Truck

公路用卡车请参照下列标准进行保养:

Maintenance for highway trucks according to the following standard:

负载情况 load	≦标载 rated load	>标载 rated load
首次保养 1 <sup>st</sup> maintenance	新车运行3000公里或50小时 (以先到为准) New vehicle run 3000 km or for 50hrs	
例行保养 periodical maintenance	每运行1万公里或500小时 (以先到为准) Every 10,000km or 500hrs	每运行1万公里或400小时 (以先到为准) Every 10,000km or 500hrs



非公路用卡车（含水泥搅拌车）请参照下列标准进行保养：

Maintenance for non-highway truck (including cement mixing vehicle) according to the following standard:

负载情况 load	≤标载 rated load	>标载 rated load
首次保养 1 <sup>st</sup> maintenance	新车运行50小时或3000公里（以先到为准） New vehicle run for 50hrs or 3,000kms	
例行保养 periodical maintenance	每运行300小时或1万公里 （以先到为准） Every 300hrs or 1,0000km	每运行200小时或0.5万公里 （以先到为准） Every 200hrs or 5,000km

## 2. 客车 Bus

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公交车（城市公交、通勤车）请参照下列标准进行保养：

Maintenance for bus (city bus, dedicated bus for workers )according to the following standard:

<b>首次保养</b> <b>1st</b> <b>maintenance</b>	新车运行50小时或3000公里（以先到为准） New vehicle run 50hrs or 3,000km
<b>例行保养</b> <b>periodical</b> <b>maintenance</b>	每运行300小时或1万公里（以先到为准） Every 300hrs or 10,000km



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客运、旅游车请参照下列标准进行保养：

Maintenance for passenger bus, sight seeing bus according to the following standard:

<b>首次保养</b> <b>1st</b> <b>maintenance</b>	新车运行3000公里或30小时（以先到为准） New vehicles run 3,000km or 30hrs
<b>例行保养</b> <b>periodical</b> <b>maintenance</b>	每运行1万公里或300小时（以先到为准） Every 10,00km or 300hrs



### 3. 工程机械 Construction Machinery

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装载机、挖机、压路机、汽车起重机等请参照下列标准

进行保养:

Maintenance for loader, excavating machine, road roller and crane, etc according to the following standard:

<b>首次保养</b> <b>1st maintenance</b>	新车运行50小时或3000公里（以先到为准） New vehicle run for 50hrs or 3,000km
<b>例行保养</b> <b>periodical maintenance</b>	每运行200小时或1万公里（以先到为准） Every 200hrs or 10,000km

**小提示：恶劣工况下请适当缩短例行保养时间或里程！**

**Special attention:** Please properly shorten periodical maintenance interval or mileage under severe work condition.





柴油机操作人员，必须认真阅读《使用保养说明书》，熟悉柴油机结构，严格遵守说明书规定的技术操作和保养规程。

Operators of diesel engines must carefully read *Operation and Maintenance Manual*, and well understand the structure of diesel engines, strictly comply with the operation and maintenance stipulated in the *Operation and Maintenance manual*.

在本手册提出的保养要求基础上，请根据使用工况按柴油机说明书要求定期进行柴油机例行检查，并更换柴油机油。

Based on the maintenance requirements stipulated in the manual, please periodically inspect diesel engines and replace oil in accordance with work condition.

# 蓝擎欧III柴油机维修指南

## Maintenance Guide for Landking Euro III Diesel Engines

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蓝擎欧III柴油机在机械方面的维修与传统欧II柴油机保持一致。

对于蓝擎欧III电控系统方面的故障，用户可以去就近潍柴欧III服务站维修，**不允许私自对燃油系统、电控系统拆卸操作**，以免造成不必要的损失。

Maintenance on mechanical system of Landking Euro III Diesel Engines is similar with that of Euro II.

For the trouble on electronically controlled system of Landking Euro III Diesel Engines, users may go to Wei Chai Euro III maintenance station nearby. **Don't dismantle or repair fuel supply system and electronically controlled system privately**, so as to avoid unnecessary loss.

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小提示:

## Special attention:

维修、更换柴油机零配件须知:

**When repair or replace components of diesel engines, pay attention to :**

蓝擎欧III系列柴油机是高性能的柴油机，用户在维修时请按照潍柴动力欧III系列柴油机维修手册和零件图册的要求进行操作，请购买**正宗配件**，以确保柴油机性能、可靠性和使用寿命。

Landing Euro III series diesel engines have high performance, therefore, maintenance should be done in accordance with *Maintenance Manual and Parts Catalogue of Wei Chai Power Landing Euro III series diesel engines*. Please purchase **special fittings** to ensure the performance, reliability and service life of diesel engines.





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# 三、柴油机操作注意事项

Attention points for operating diesel engines



# 1. 欧III柴油机的油门踏板的操作

## Accelerator Pedal Operation of EuroIII Diesel Engines



蓝擎欧III柴油机采用电子油门踏板，内部采用的是电子结构传感器。

建议用户在驾驶过程中平稳加速、减速，可以更好地达到节油效果。

Landking Euro III diesel engines adopt electro-accelerator pedal with electro-structure sensor inside. Recommend that users placidly accelerate or decelerate speed when drive to ensure more effective fuel-saving.

## 2. 换挡时机的选择

Time selection for shifting the gear

柴油机工作点影响柴油机的燃油经济性，行车时挡位的选择对节油也有很大的影响，一般而言高挡节油。

Operating points of diesel engines influence fuel economy, but gear selection when drive also has a great impact on fuel saving. Generally, high gear saves fuel.

A、一挡起步；

Shift the first gear to start.

B、进入高挡前，柴油机转速应该提升到1200转左右；

Before shift high gear, the speed of diesel engines should be accelerated to about 1200 r/min.



## 2. 换挡时机的选择

Time selection for shifting the gear

C、避免出现高转速低挡位的情况，当工况允许时，应积极挂高挡，使柴油机运行在经济转速区内。

In order to avoid high speed, but low gear, should positively shift high gear to make diesel engines run at the range of economical speed if work condition permitted.

**小提示：**对机械变速箱而言，蓝擎欧III柴油机在整车挂挡滑行时停止喷油，比空挡滑行省油！

**Special Attention:** For mechanical gear-box, whole vehicle matched with Landking Euro III diesel engines stop injecting fuel when sliding with shifting the gear, which is more fuel-saving than that when sliding with neutral gear.



### 3. 柴油机经济转速

#### Economical Speed of Diesel Engines



柴油机系列 diesel engine series	经济转速 economical speed
WP6	1200-1800
WP10、WP10N	1100-1600
WP12、WP12N	1100-1600

## 4. WEVB的使用

### Usage of WEVB

下长坡推荐使用WEVB（潍柴专利发动机安全制动系统）；

Recommend to use WEVB when run downward the long slope ( Wei Chai patent of safety brake system for engines)

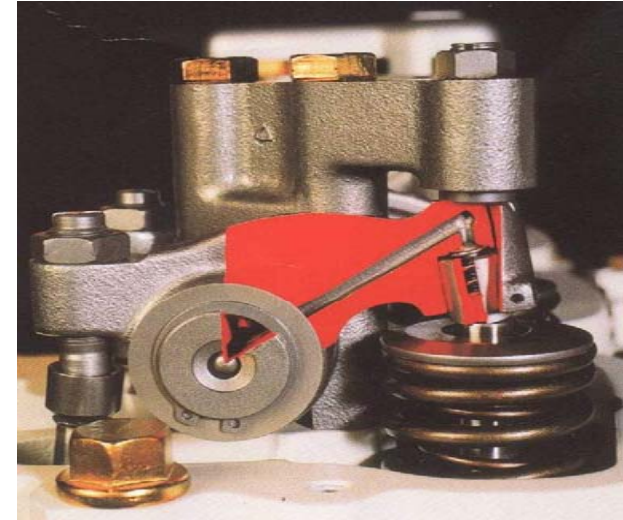
蓝擎欧III柴油机的WEVB受电控单元控制，在WEVB起作用时，柴油机不喷油，从而节油。

WEVB is controlled by electronically controlled unit. When WEVB works, the diesel engine doesn't inject fuel to save fuel.



**WEVB在柴油机转速低于800转时不起作用。**

**WEVB can't work when the speed of diesel engines is less than 800 r/min.**



# 潍柴动力蓝擎欧III柴油机服务四项特别提示

## Four Special Attentions for Landking Euro III Diesel Engine Service of Wei Chai Power

- **强保建议**——按照要求由潍柴动力欧III服务站进行柴油机的强保;  
**Forcible Maintenance Suggestion**--- Forcible Maintenance should be done by Euro III maintenance station of Wei Chai Power in accordance with relevant requirements;
- **维修建议**——维修服务由潍柴动力欧III服务站进行;  
**Maintenance Suggestion**---Maintenance should be done by Euro III maintenance station of Wei Chai Power;
- **配件建议**——使用由潍柴动力欧III服务站提供的**正宗配件**;  
**Fittings Suggestion**--- Use **special fittings** provided by Euro III maintenance station of Wei Chai Power;
- **油品建议**——使用正宗柴油，使用由潍柴动力欧III服务站、配件专卖店提供的**蓝擎欧III柴油机专用机油**。  
**Oil Suggestion**--- Use **special oil for Landking Euro III diesel engines** provided by exclusive agency of fittings.





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## 四、蓝擎WP6柴油机维护保养方法

The way of maintenance for Landking WP10 diesel engines

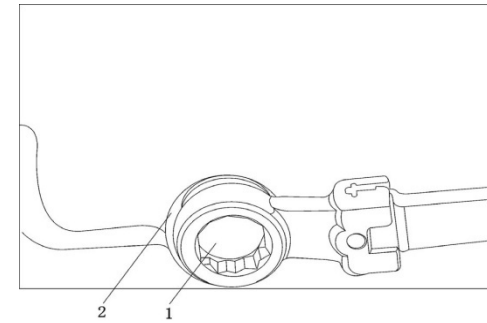




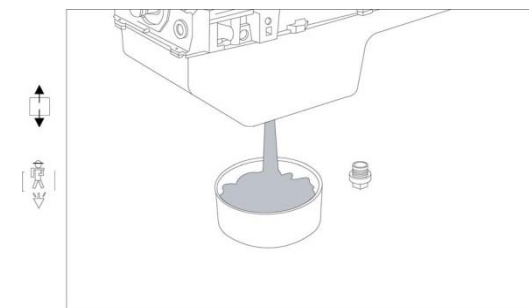
# 1、换机油及机油滤清器

## Replace Oil and Oil Filter

- 更换机油和机油滤清器，以清除悬浮在机油中的杂质。
- **Replace the oil and oil filter to clean the impurities containing in oil.**
- 注意：应在机油是热的时候放油
- Note: The oil should be drained off when it is hot.
- **19mm 开口扳手**
- Tool: 19mm open-ended wrench



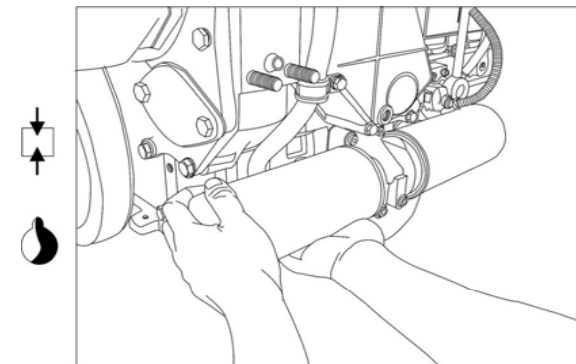
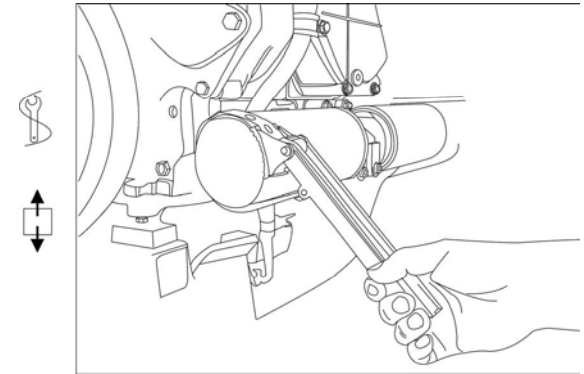
- 在发动机下放置回收机油的容器,准备收集 **13** 升机油,打开放油螺塞 **1**, 注意密封圈 **2**。放尽机油; 加置密封垫圈 **2**后, 拧紧放油螺塞 **1**。
- Put the recollecting oil container under the engine for collecting 13L oil. Open drain plug 1, pay attention to seal ring 2. Drain out all oil. After mounting seal ring 2, tighten the drain plug.
- 注意：热机油会伤人
- Note: Hot oil can injure people.



# 1、换机油及机油滤清器

## Replace Oil and Oil Filter

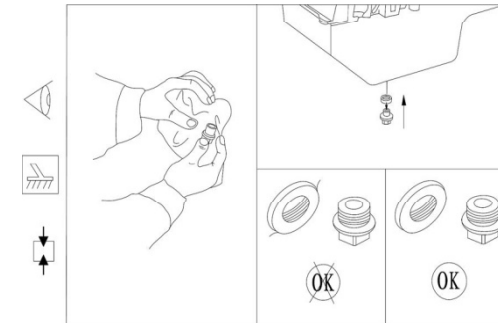
- 滤清器专用扳手
- Tool: The special wrench for filter.
- 清洁滤清器头部四周，拆下滤清器。
- Clean the end surrounding of the filter, and remove it.
  
- 装上新的机油滤清器
- Install the new oil filter
- 注意：安装机油滤清器时，密封圈要校正，且要在密封圈上涂上润滑油。
- Note: Adjust the seal ring and smear some lubricating oil on it while fitting the oil filter.



# 1、换机油及机油滤清器

## Replace Oil and Oil Filter

- 32mm 开口扳手
- Tool:32mm open-ended wrench
- 检查和清洁放油螺塞螺纹及密封表面，并装上放油螺塞。
- Check and clean the screw thread and seal ring, and then install the whorl plug.

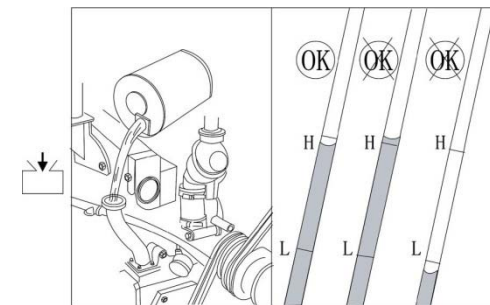


将清洁的机油注入柴油机到油尺的上刻度线，油底壳容量为13L。

- Fill the clean oil up to the upper limit, the capacity of the oil sump is 13L.

注意：WP6柴油机必须使用CF-4 级 15 W/40 牌号机油。

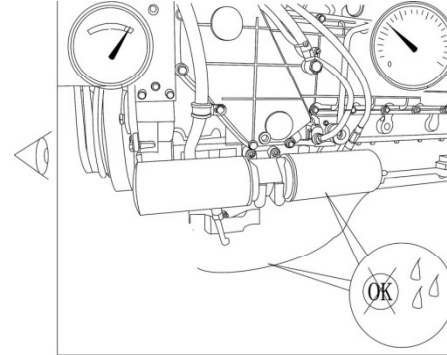
Note: WP6 diesel engines must use CF-4 15W/40 oil.



# 1、换机油及机油滤清器

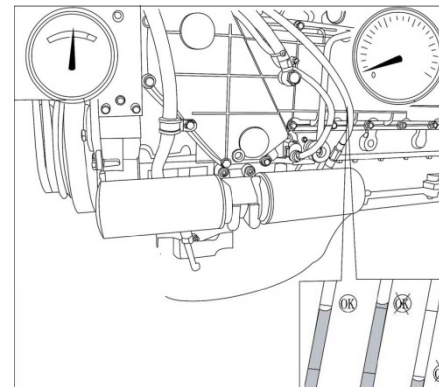
## Replace Oil and Oil Filter

- 发动机怠速运转，检查滤清器和放油螺塞处是否漏油。  
Run the engine at idling speed and check the filter to find whether it leaks or not.



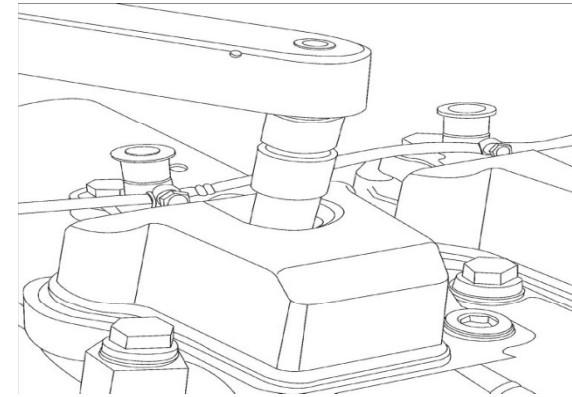
停车后约 5min 让机油自上部零件流入油底壳，再检查油面高度，必要时补充机油至油尺的上刻度线。

- Stop the engine and make the oil run into the sump from the upper parts 5 minutes later, then check the oil level, fill oil up to the upper limit if necessary.



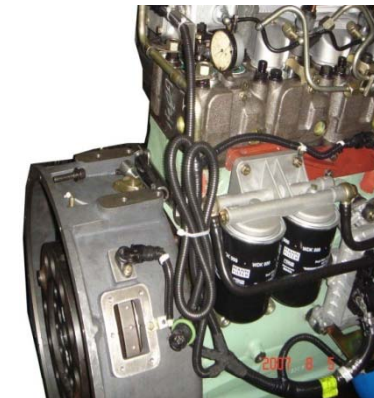
## 2、检查调整气门间隙 Check and adjust the valve clearance

- 检查调整气门间隙
- Check and adjust the valve clearance
- 13mm 套筒扳手
- Tool: 13mm sleeve wrench
- 拆下气缸盖罩
- Dismantle the cylinder head cover.



慢慢转动柴油机，使飞轮壳上刻线对准飞轮上的 **OT** 刻度线，此时使第一缸活塞处于压缩行程的上止点位置（一缸进排气阀处于关闭状态）。

- Turn diesel engine slowly, make the upper scale mark on flywheel housing align the OT scale mark on flywheel, and at this time, let the piston of the first cylinder be located at the top dead center in the compression stroke (intake and exhaust valves of Cylinder 1 closed).





## 2、检查调整气门间隙

### Check and adjust the valve clearance

- 塞尺

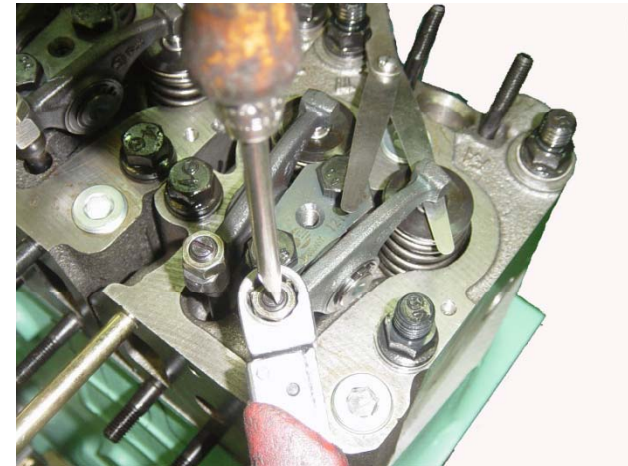
Tool: Clearance guage

进气门间隙 0.20mm

The clearance of intake valve is 0.20mm

排气门间隙 0.30mm

The clearance of exhaust valve is 0.30mm



- 注意：检测气门间隙时，柴油机 应为冷态——低于 60℃，塞尺在气门杆顶和摇臂间滑动时，有阻滞发粘感觉时，所测间隙值为准确值。

Note: When check the clearance of valve, the engine should be at the cool condition-its temperature is less than 60℃ .When the clearance guage glides between the top of valve rod and rocker arm and can be felt retarded and sticky, the measuring result is proper.

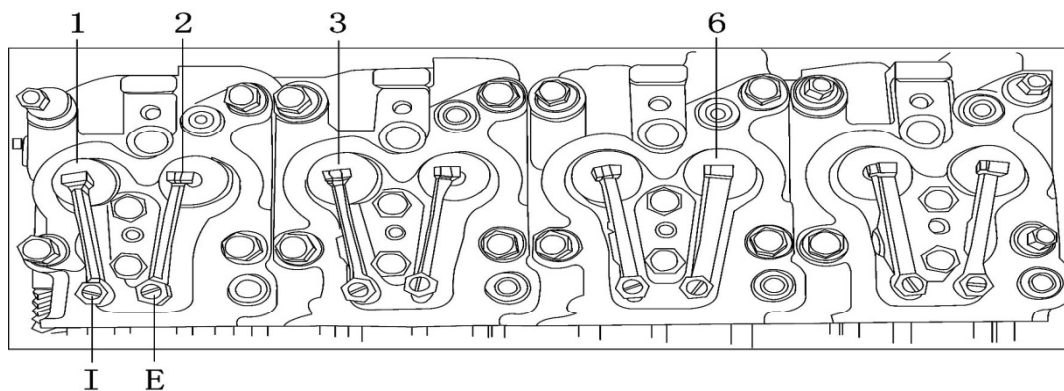
## 2、检查调整气门间隙

### Check and adjust valve clearance

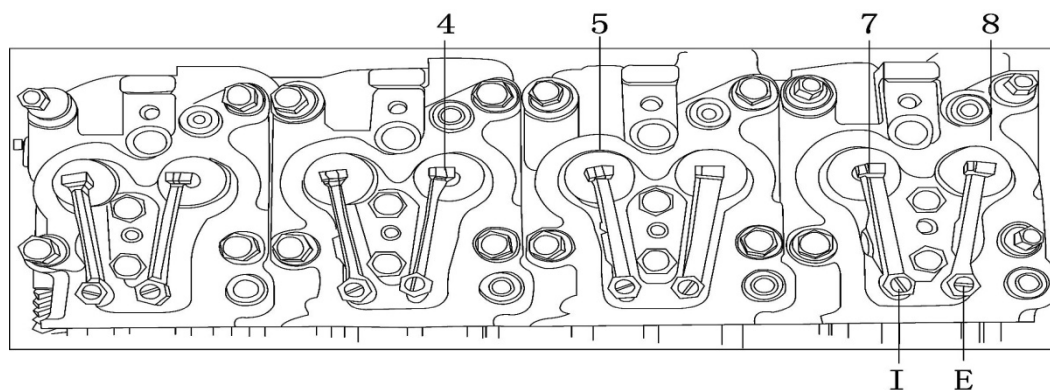
- 6# 螺丝刀、14mm 梅花扳手
- Tools: 6#screwdriver and 14mm double offset ring wrench
- 第一缸活塞位于压缩行程上止点位置。
- The piston of 1<sup>st</sup> cylinder is at TDC of the compression stroke.
- 此时调整四缸机第 1、2、3、6，六缸机第 1、2、3、6、7、10（从曲轴皮带轮端数）气门的间隙，用塞尺调整好间隙后拧紧摇臂锁紧螺母，并复查气门间隙，直到达到要求为止。
- At this time, adjust the 1st, 2nd, 3rd and 6th valve clearances of 4-cylinder engine and the 1st, 2nd, 3rd, 6th, 7th and 10th of 6-cylinder engine (from crankshaft pulley end). Adjust the clearance by using the feeler and tighten the lock nuts of the rock arm. Recheck the valve clearance till it is qualified.
- 如步骤 A 所示检查或调整气门间隙（I表示进气，E 表示排气）。
- Check and adjust the valve clearance as step A(I-air intake Valve E-air exhaust valve)
- 用塞尺调整好间隙后拧紧摇臂锁紧螺母，并复查气门间隙，直到到要求为止。
- Adjust the clearance by guage and tighten the fixing nut of rocker arm, re-check the clearance till it meets the requirement.



## 2、检查调整气门间隙 Check and adjust valve clearance



图A  
step A



图B  
step B



## 2、检查调整气门间隙

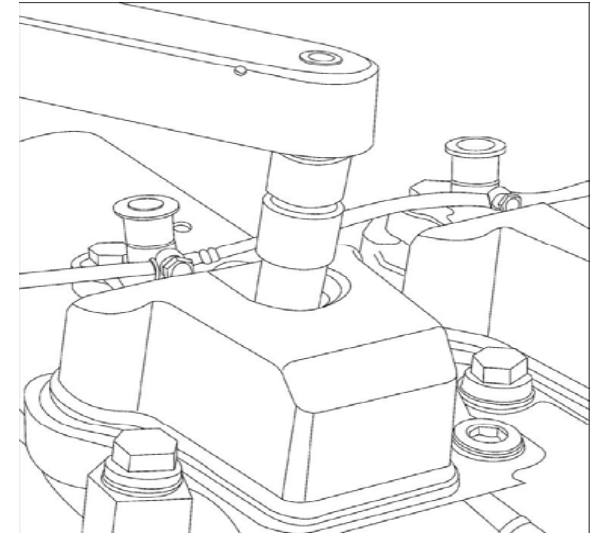
### Check and adjust valve clearance

- 再转动曲轴 360° 也可以在减震器上做标记后转动 360° 此时调整四缸机第 4、5、7、8，六缸机第 4、5、8、9、11、12（从曲轴皮带轮端数）气门的间隙，同样松动摇臂锁紧螺母用塞尺调整好后重新拧紧摇臂锁紧螺母。
- Next, turn the crankshaft to 360° ; or mark on the shock absorber, and then turn it to 360 .At this time, adjust the 4th, 5th, 7th, and 8th valve clearances of the 4-cylinder engine and the 4th, 5th, 8th, 9th,11th and 12th of the 6-cylinder engine (counted from the crankshaft pulley end). Loosen the lock pinch nut of the rock arm, adjust it by using the feeler and tighten it well.
- 按步骤 B 所示调整气门间隙。
- Adjust the valve clearance as step B.
- 同样松动摇臂锁紧螺母，用塞尺调整好后重新拧紧摇臂锁紧螺母。
- Loosen the fixing nut of rocker arm, adjust the clearance by guage then tighten the nut again



## 2、检查调整气门间隙 Check and adjust valve clearance

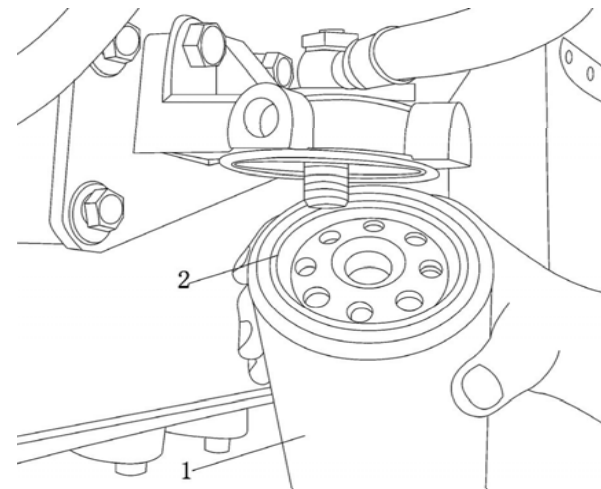
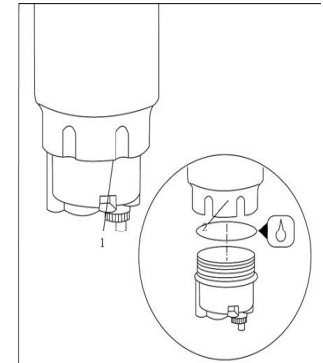
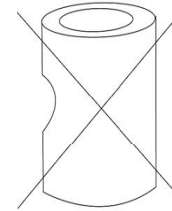
- 13mm 套筒扳手
- Tool:13mm sleeve wrench
- 安装气缸盖罩垫片和气缸盖罩。
- Install the gasket and cylinder head cover
- 螺栓拧紧力矩 10-15N·m。
- The tightening torque of bolt is10-15N·m.



### 3、更换燃油滤清器芯 Replace fuel filter element

#### 更换燃油滤清器芯

- **Replace fuel filter element**
- 更换燃油滤清器芯时按以下步骤操作：
- Replace fuel filter element in the following steps:
- **A.** 卸下旧的燃油滤清器芯；如果安装在粗滤器上的集水器皿还可以再用，请将集水器皿取下。
- Dismantle the old fuel filter element. Remove the water collector installed on coarse filter if reused.



### 3、更换燃油滤清器芯

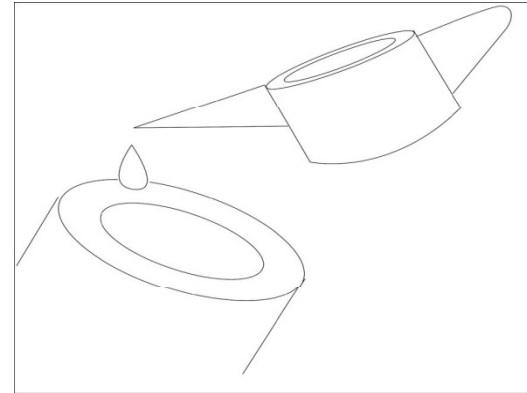
#### Replace fuel filter element

- B. 润滑封口。

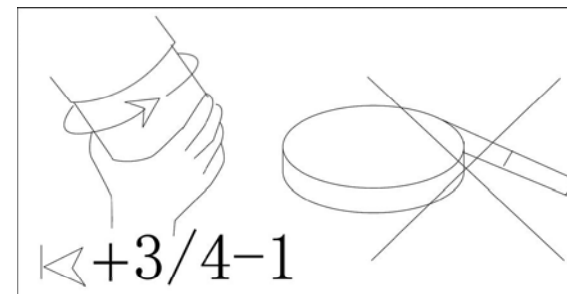
Lubricate the seal lips.

- C. 用手拧上滤清器直至封口与接口结合。

Turn the filter by hand until the seal is closed with interface.



- D. 继续用手拧滤清器直至滤清器牢固安装（大约 3/4 圈），不要使用工具。  
Continue to turn the filter with hands until the filter is installed solidly (about 3/4 turns).



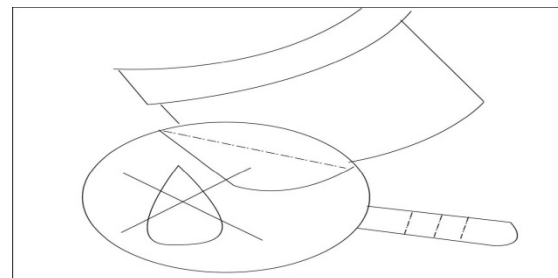
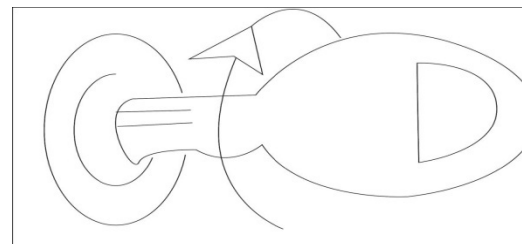
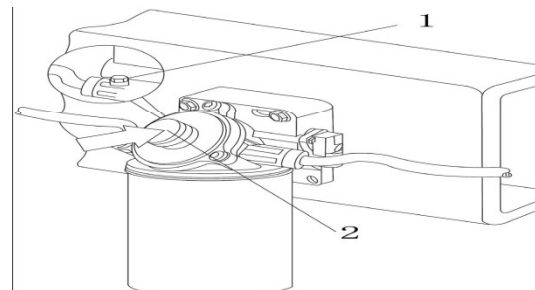
### 3、更换燃油滤清器芯 Replace fuel filter element

- E. 排气直至无气泡出现。  
Deflate until there is no bubble.

- F. 启动发动机。  
Start Engine.

- G. 进行泄漏实验。  
Conduct leakage test.

- H. 必要时重新拧紧。  
Retighten when necessary



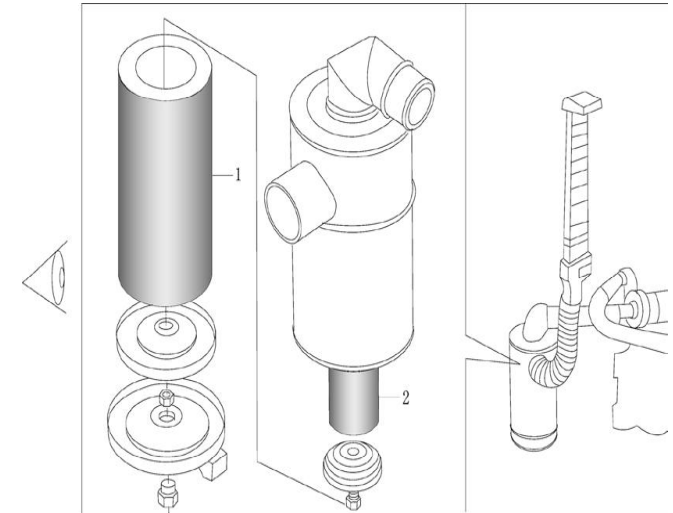
## 4、检查空气滤清器滤芯 Check air filter element

- 检查空气滤清器滤芯

- Check the air filter element

- 柴油机最大允许进气阻力为7kPa，柴油机必须在标定转速和全负荷运转时检查最大进气阻力，当进气阻力达到最大允许极限时，应按制造厂的规定清洁或更换滤芯。

The maximum air intake resistance of the engine should be 7kPa and inspection should be done at the rated speed and full load. When the resistance reaches the maximum limit allowed, the air filter element should be cleaned or replaced as per the maintenance guide from the manufacture.



## 4、检查空气滤清器滤芯

### Check air filter element

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- **注意:**
- **Note:**
- .不得吹破滤纸
- .Don't blow off the air filtering paper
- 不得用水和油清洗滤纸
- .Don't clean the air filtering paper by water and oil
- .不得用力拍打或敲打滤芯
- Don't beat the core forcibly.



## 4、检查空气滤清器滤芯

### Check air filter element

- 注意：决不允许在没有空滤器时使用发动机，否则灰尘和杂质进入柴油机会导致发动机早期磨损。
- Note: It is not allowed to use the engine without air filter, otherwise the dust and impurity will cause early wearing of the engine.
- 从空滤器中拆下空滤芯，轻拍端面使灰尘落下，也可用压缩空气反吹（由内向外吹）。
- Remove the filter core from the air filter element and beat the side of the element lightly to make dust fall down, or blow the element backward (blow back from inside to outside) by compressed air.

