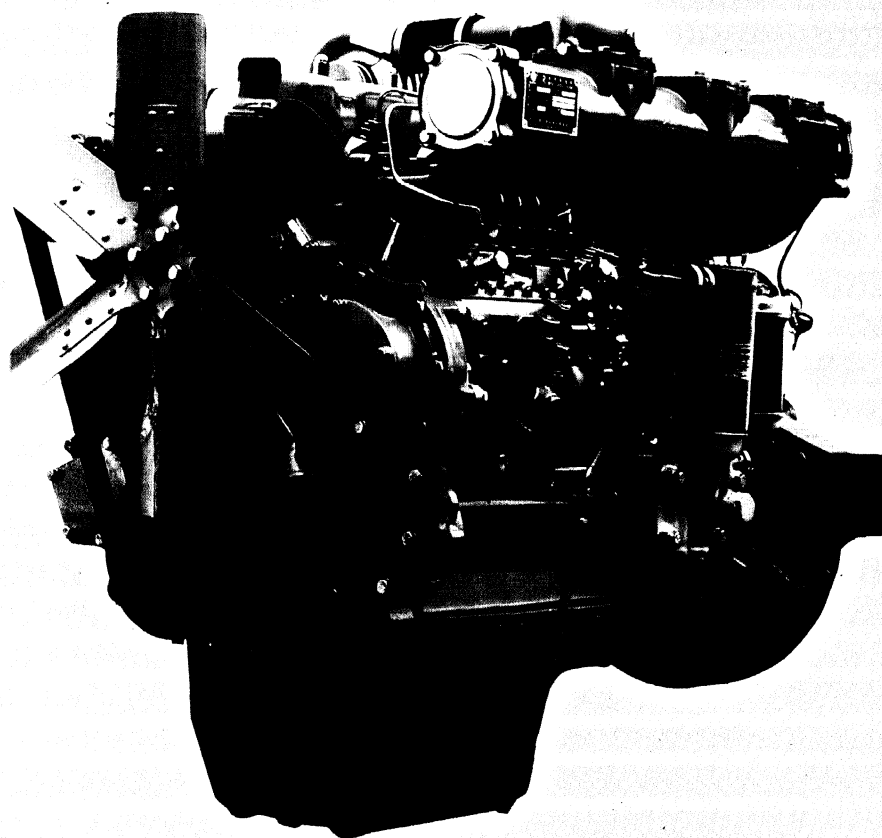




**HUAFENGDONGLI**

# **R Series Diesel Engine**

# **OPERATION AND MAINTENANCE MANUAL**



**Shandong Weichai Huafeng Power Co., Ltd**

# Preface

R series diesel engine is a four-stroke, vertical, water-cooled, inline and direct injecting combustion chamber type, high-speed diesel engine. This series diesel engine is specially designed for our country by Ricardo Consulting Engineers Co. of Britain, and manufactured and developed firstly by Ricardo Consulting Engineers Co. cooperated with Shandong Weichai Huafeng Power Co., Ltd. It's a new generation product instead of the same type diesel engine in our country. This type diesel engine possesses performances of high power, economy and easy starting, under the environment with temperature higher than  $-10^{\circ}\text{C}$ , the diesel engine can be easily started without preheating. The first overhaul period is 8000hrs. Its reliability and service life achieved a advanced level among the same kind products all over the world.

R series diesel engine covers 8 types as: both four-cylinder and six-cylinder with bore of 100mm, both four-cylinder and six-cylinder with bore of 105mm, and every style has two models of natural aspirated and supercharged. R105 series is bore-enlarged from R100 series, besides piston, piston ring, piston pin, cylinder liner, cylinder liner seal ring and injection pump, all other parts can be exchanged between both two types of diesel engine.

R series diesel engine features easy adaptation to meet the various needs of matched equipments, according to the requirement of users. It can be furnished with hydraulic pump for lifting and steering purposes, air compressor and vacuum pump for breaking purposes and full power take-off from the front end of the crankshaft. Through being changed for some of its parts accordingly, it can be used to match with truck, tractor, small power generating station, engineering machinery, agricultural machinery, irrigation machinery, drilling machinery and so on. The output range of various version of R series diesel engine is 35KW - 125KW, its rated speed is 1500r/min - 2800r/min. The model, its make-up rule and the meaning of the symbol for every type is as follows:

$\text{R } \underline{\text{6}} \text{ } \underline{\text{100}} \text{ Z } \underline{\text{D}} \text{ } \underline{\text{1}} \text{ - } \underline{\text{2}}$   
 $\text{⑦ } \text{⑥ } \text{⑤ } \text{④ } \text{③ } \text{② } \text{①}$

- ①: distinguish symbol, Expressed with number sequence
- ②: Version symbol, expressed with number sequence
- ③: application feature symbol, expressed with alphabet  
no alphabet; for common usage; T: for tractor; G: for engineering machinery; Q: for vehicle; D: for generating set;  
C: for marine usage; P: for power take-off unit
- ④: construction feature symbol, expressed with alphabet; no alphabet: for natural aspirated model;  
Z: for turbocharged model.
- ⑤: cylinder bore (mm)
- ⑥: cylinder number
- ⑦: series symbol; stand for imported from RICARDO

This operating manual mainly introduces common usage type. For various versions,

only show their different features. As technology progresses and usage expands, the engine will be modified and improved from time to time, therefore the product supplied hereafter may be slightly different from that described in this manual and the users are kindly advised to notice it.

Being obtained as the accidental test result, the characteristic curves in the manual are only supplied for reference. And the picture in the manual can't be the accordance of check upon delivery.

The manual is compiled by Wang Jinghai, Zhao Ruian, Yang Lin, Sun Chuanhai, Wang Luhai, Dou Yuxiang, Jiang Bo, Yu Caihong, Liu Taicheng, Zhuang Longping, Wei Zhiyou, Du Zhijun, advised by Li Peiyan, Chen Ling, Hao Sixian, and finally examined and approved by Chen Ling. For the limit of the compilers, there may be mistakes in the manual, if you find any, please point out so that they can be corrected. Also, it will be appreciated if you give your suggestions about our products.

The compilers  
June, 2005.

## Attention

1. The diesel engine operators must familiarize themselves with this manual as well as engine construction and strictly follow the procedures of operation and maintenance especially the regulations for safety operation described in this manual.
2. Before operating an engine at full load, the **60** hours running in should be carried out as specified in the manual.
3. Increase its speed gradually after starting a cold engine, never let it run at high speed abruptly, and don't stop the engine instantly while its cooling water is still hot, also don't let the engine running long time without load.
4. If the ambient temperature falls below  $+5^{\circ}\text{C}$ , drain the cooling water out of the radiator, the lubricating oil cooler and the diesel engine itself completely after stopping the engine. Continuous keeping the water in the oil cooler should be forbidden.
5. Never run the diesel engine without an air cleaner so as to prevent the unfiltered air from entering the cylinders.
6. The engine must be filled with specified grade fuel and lubricating oil, and a special and clean container for each oil should be used. The fuel oil should be settled for **72** hours and filtered before using.
7. The inspection and repair of the components in electrical system must be carried out by the person who has a good knowledge of electricity.
8. If the water pump is without oil filler, it's a ??? bearing water pump, and needn't add lub oil to it.
9. Be sure to use water – cooling diesel engine. Please refer to **P. 43** for details.
10. The working environment of the diesel engine should be well ventilated to avoid being polluted by waste gas or smoke.
11. The power rating and amending of the diesel engine is according to **GB6072.1 – 2000** the first section of reciprocating internal combustion engine; standard basic condition, the

rating and testing method of power, fuel consumption and engine oil consumption.

12. The manufacturing of the diesel engine is according to the common technical requirement for low and middle level powered diesel engine in JB/T8895 – 1999 and Q/WCG005 – 2002R series diesel engine enterprise standard.
13. The No. of production license of this series diesel engine is: XK06 – 205 – 00160, XK06 – 205 – 00161, XK06 – 205 – 00279.
14. The position of safety warning marks:
  - (1) There's a guard against burning mark at the end of the cylinder cover which is beside the exhaust manifold of the diesel engine.
  - (2) There's a guard against fire mark at the oil filler.
  - (3) There's a guard against twinning mark on the inlet manifold.
  - (4) There's a flywheel rotating direction mark on the flywheel housing.

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