



Chapter 2 ENGINE

SECTION 1 GENERAL DESCRIPTION OF WD615 SERIES ENGINES MANUFACTURED BY SINOTRUK (CNHTC)





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- WD615 series engines are six cylinder, water-cooling, direct injection, in-line high-strengthened vehicle diesel engines adopting the manufacturing technique of 615 series engines of Austria Steyr Trucks Company integrated with the most advanced technique of diesel engine strengthening. With a total displacement of 9.726L, the engine is used for 16-40 tonnage Steyr, HOWO and Huanghe-Prince series heavy-duty trucks. The power range of the full series of the engines is 266-371HP, and their torque range is 1000-1460 Nm. The mode of air intake is charge inter-cooling. The engines are in different models with 240 、 266、 290、 336 、 371HP. The engines are classified into two types: one used for road vehicles and another for off-road all wheel drive vehicles. The difference between the two is that, the road vehicle diesel engine adopts high-position fan (the fan and the water pump are coaxial) and a single oil pump; and the off-road vehicle diesel engine adopts low-position fan (the fan and the crankshaft are coaxial) and duplex oil pump.





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- The best feature of WD615 series diesel engines is that the change of power is realized by adopting different mode of air intake and fuel injection system. WD615.00 is the basic model of the engine of the series. It is a natural aspirate engine. Its power is 200 HP. mounting an exhaust turbocharger on the basic model of WD615.00 engine increases the air intake of the engine immediately and the amount of fuel injection of the high-pressure fuel pump as well, that would increase the power of the engine without changing the structure of the engine very much, i.e. making it a WD615.61 engine with a power of 260 HP. WD615.64 engine is modified slightly on the basis of WD615.61. The modification reduced the maximum rotating speed of the engine with a sacrifice of partial power. The modification increased the maximum torque to meet the need of some kinds of vehicles (such as bus) for torque reserve. Such a diesel engines are called exhaust-turbocharged engine. The exhaust temperature of the engine is comparatively high and the metal parts of the supercharger are good in heat conduction, so the temperature of the air blown out of the supercharger is very high. The air expands at high temperature, which failed the ideal of increasing the power of the engine by increasing the amount of air intake due to the decrease of air intake in density. By cooling the hot air out of the supercharger, increasing the amount of air intake increased by increasing air density, and increasing the amount of fuel injection correspondingly at the same time, the power of the engine can be increased without varying the basic structural parameters of the engine. Air cooling is realized by an air radiator mounted in front of the engine radiator. This air radiator is called intercooler. This change has converted the engine into an inter-cooling WD615.62 engine with a power of 266 HP. The power of WD615.87 engine is 290 HP. By modifying the compression ratio of the supercharger and the poorly matched high-pressure fuel pump, the oil injector can increase the power of WD615.87 respectively to 336 HP (i.e. WD615.69) and 371 HP (i.e. WD615.47). WD615.62、WD615.87、WD615.69 and WD615.47 engines all can meet Euro II Emission Standard. Therefore, except those parts directly related to the power performance such as fuel injection pump, oil injector, supercharger, etc., other fundamental structural parts of this series of engines such as cylinder block, crankcase, crankshaft, cylinder head, connecting rod, camshaft, timing gear, etc. are basically the same. Therefore, the general utilization of the parts for different models of engines in the series is as high as 85%. It is very good for maintenance, interchange of parts and stockpile of spares and has greatly facilitated the customers in the supply of parts.



Fig.2-1 and Fig.2-2 show structure of WD615 series engines. Fig.2-3, Fig.2-4, Fig.2-5, Fig.2-6 and Fig.2-7 are the characteristics curves of the engines of main models.



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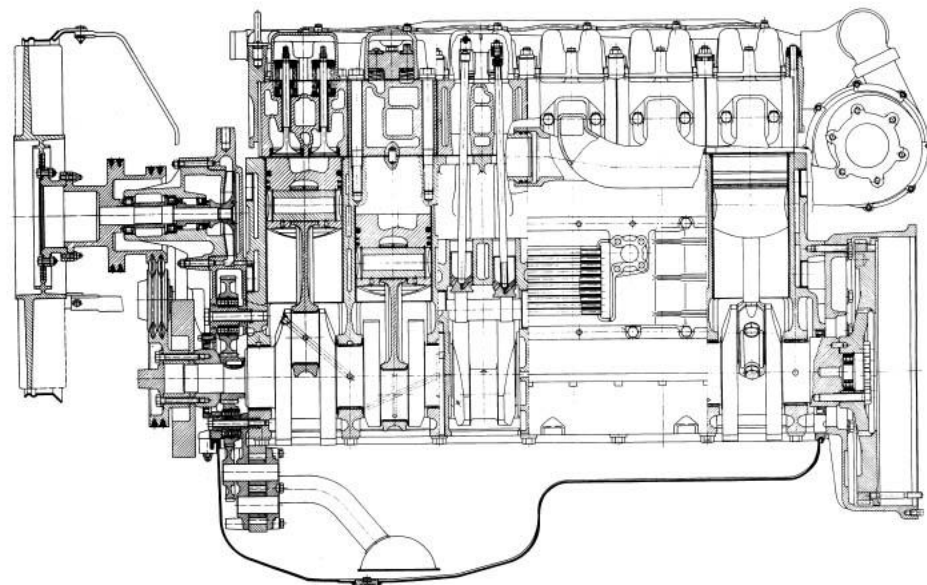
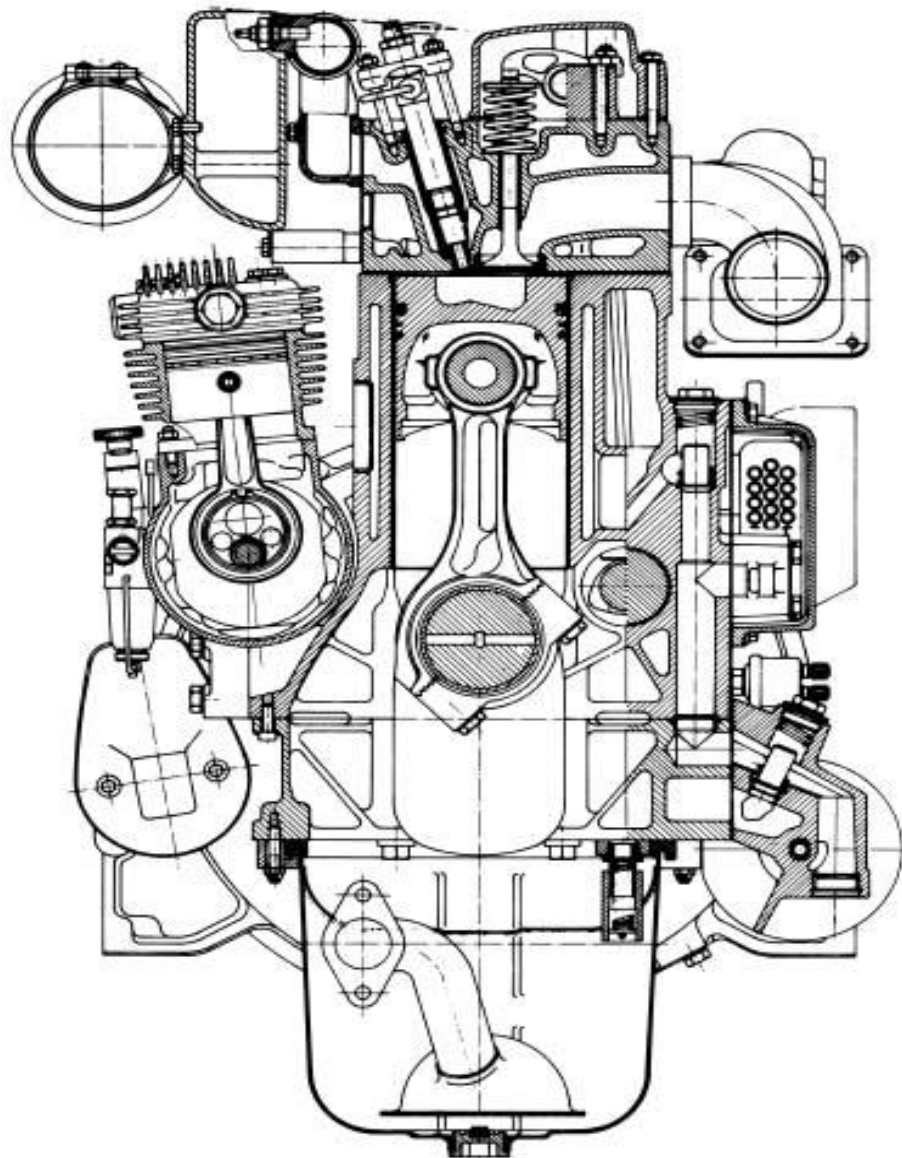


Fig.2-1 Structure of WD615 series diesel engines
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Fig.2-2 Structure of WD615 series diesel engines

WD615.62

ng Do
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WD615.64

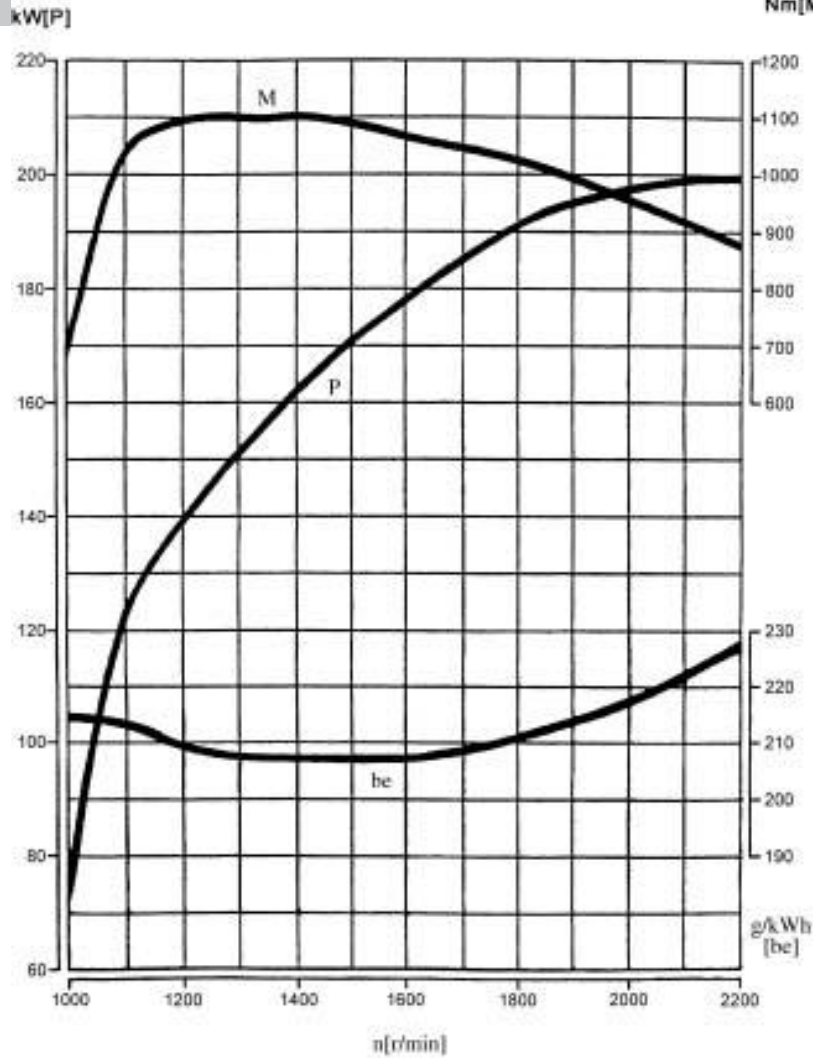


Fig.2-3 Characteristics curves of 266 hp WD615.62 diesel engine

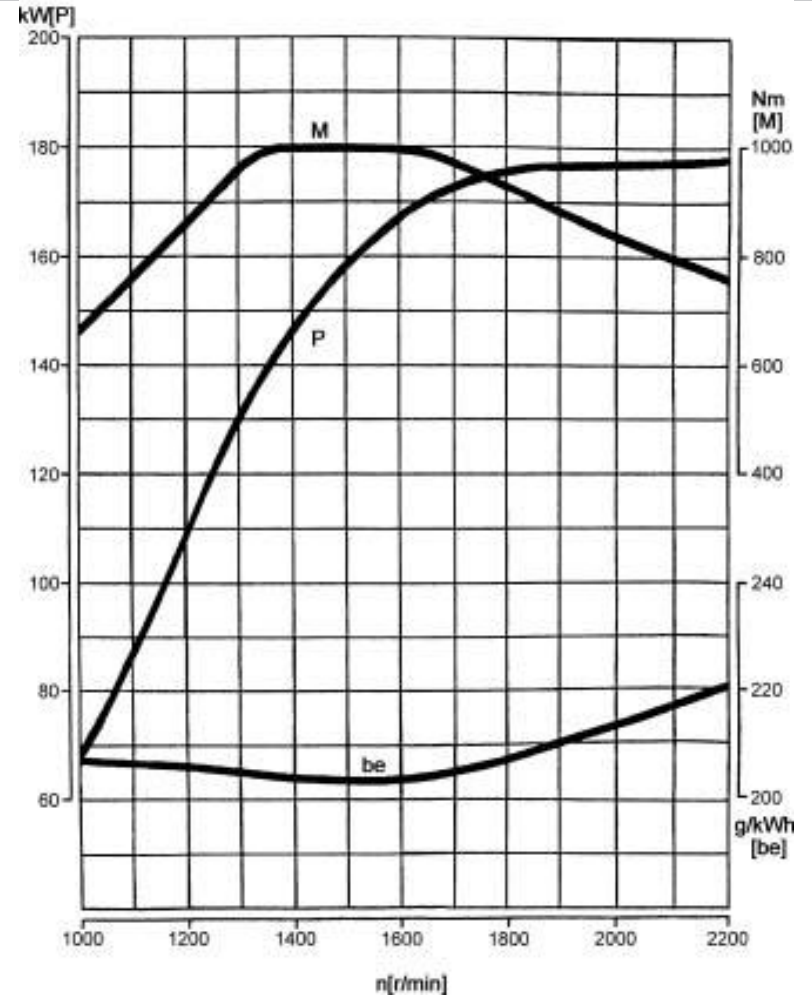


Fig.2-4 Characteristics curves of 240 hp WD615.64 diesel engine

WD615.87

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WO ZZ kW[P]

WD615.69

Nm[M]

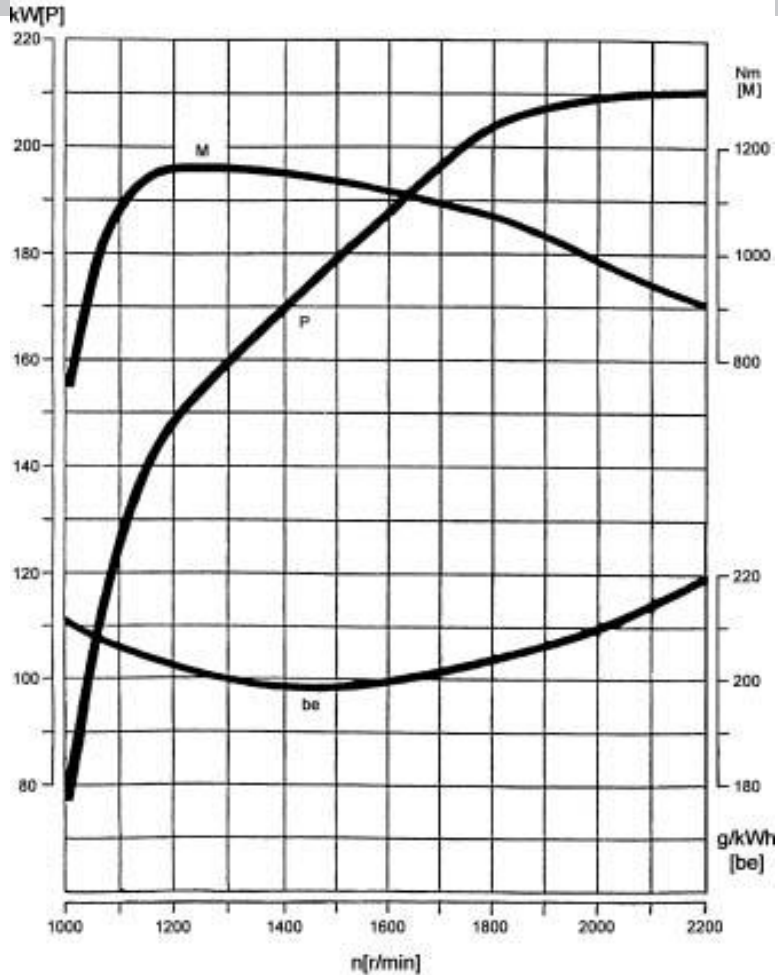


Fig.2-5 Characteristics curves of 290 hp WD615.87 diesel engine

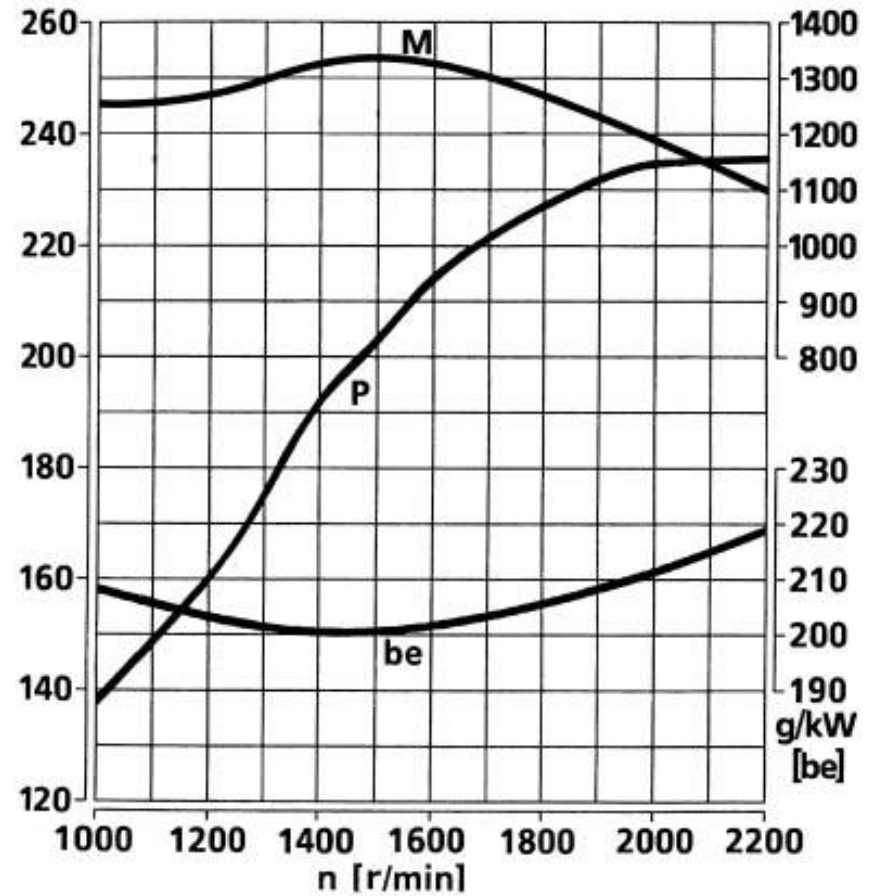


Fig.2-6 Characteristics curves of 336 hp WD615.69 diesel engine

WD615.47

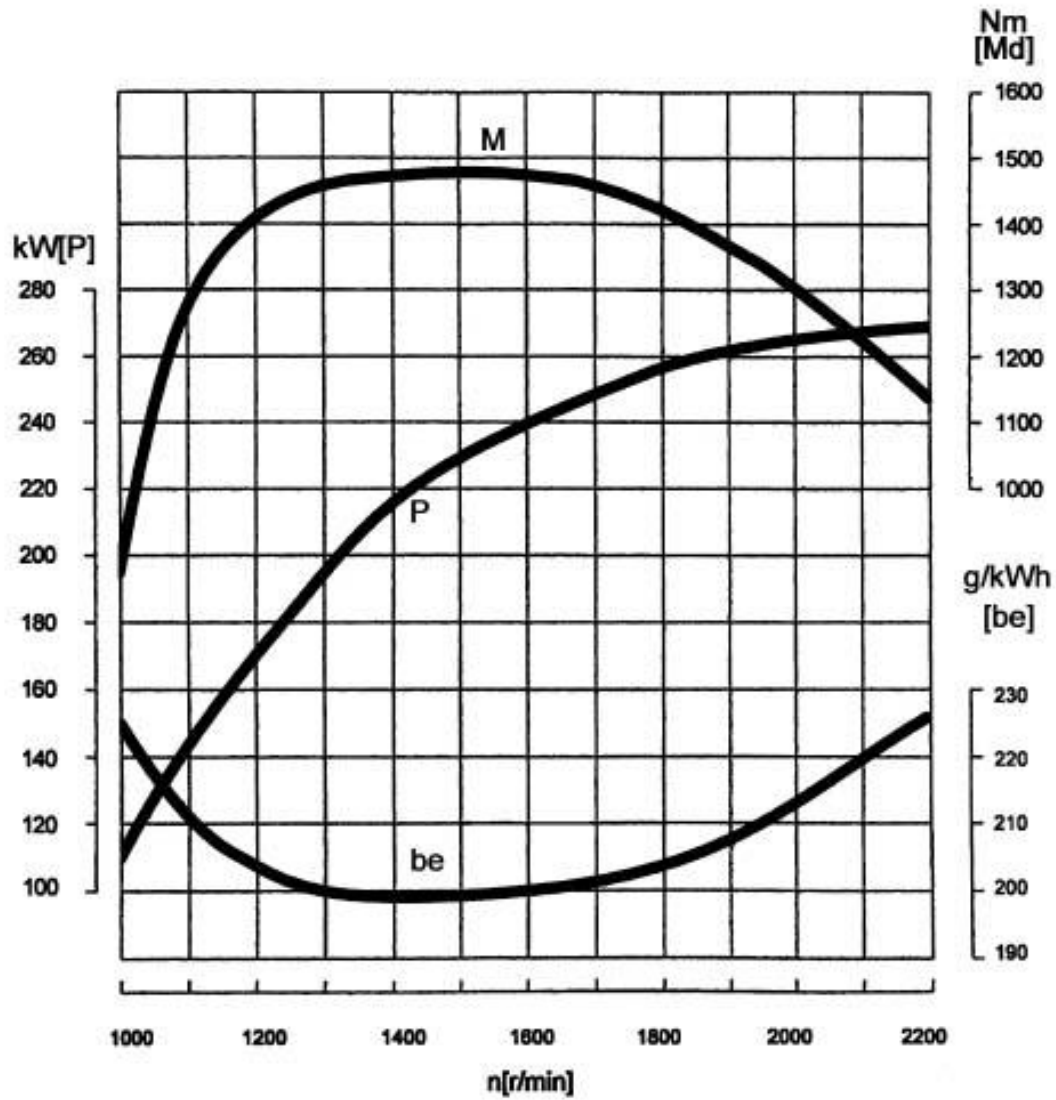


Fig. 2-7 Characteristics curves of 371 hp WD615.47 diesel engine