

## Turbocharger in Regional Production Organization and Quality Control

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**Abstract:** Exhaust gas turbocharger parts manufacturing is composed of multiple enterprises. Turbocharger product quality and turbocharger parts manufacturing requirement is the main content of the research. The regional production organization form, which is a kind of production mode, has been developed in recent years. Turbocharger's manufacturing fully describes the geographical concentration of production and it is the product of dimensions and it breeds a basis expansion. Parts of the specialized production enterprises enjoyed the rapid expansion and development. Their producing ability and quality have reached a higher level. The parts and components manufacturing advantages into product advantages of quality. The development trend for product brand manufacturers no longer need to invest a lot of energy to the various parts of the production. As for the product design, the processing and material of the key parts is the main content for this study. Turbocharger product quality requires the precision of the parts and the accuracy of components assembly.

**Keywords:** Assembly, parts, processing technology, turbocharger, regional production, quality control

### INTRODUCTION

Turbocharger can make the engine produces more torque. In order to meet the needs of different engine speed there is a variable turbocharger. Figure 1 is a variable supercharging type turbocharger. By controlling the slide open volume, it makes the low engine speed turbocharger and reduces the throat increase booster. When the engine is running at full steam turbine, the supercharger throat increases assurance booster, thus it will not exceed the demand. Advantages of improving engine performance at low speed. Today, the turbocharger has become less volume, higher speed. The high speed of 280000 rpm gasoline engine with a turbocharger air compression ratio reached to 2-2.5: 1. Diesel engine with turbocharger air compression ratio has reached 4-6: 1. The turbocharger on the engine of automobile utilization rate has reached more than 50%. (Li-Jun, 2010).

Figure 1 is a variable supercharging type turbocharger assembly drawing. Its study is to process the exhaust machine by the impeller engine cylinder combustion exhaust gas driven rotation. The impeller is to rotate the impeller shaft to drive the compressor located coaxially within the impeller rotation. To achieve the purpose of increasing the air pressure. Variable turbocharger turbine supercharger has an exhaust machine, which can change the air intake valve device. The air intake valve plays the role of regulating the gas flow velocity. Regulation of pressurization method is to control exhaust gas engine air intake rate. Low speed operation of the engine into the turbocharger exhaust machine to reduce the amount of waste gas.

Turbocharger boost value is low reaching the engine requirements. Turbocharger exhaust gas engine exhaust speed's role is to improve the speed of rotation of the impeller exhaust machine. The impeller speed increases at the other end of the coaxial compressor impeller speed increases. Compressor impeller is of high speed and high pressure value. Thus you can reach the engine runs at a low speed to improve the turbine supercharger role. When the engine is running at full steam, the turbine supercharger valve mouth is enlarged and the booster will not exceed the demand guarantee. Variable geometry inlet turbocharger has the advantages of improving engine at low speed to increase air pressure ability.

Figure 1 shows the turbocharger in variable supercharging type turbocharger assembly drawing. The turbocharger is increased as compared to the one that can change the air inlet area of the sliding nozzle ring. In passing through the gas volume of the same conditions with decreased flow speed. The following formula shows that the flow velocity and volume flow rate and the flow area between.

$$U = V/A = w/A \rho$$

U - flow meters/sec

V - Volume cubic meters/second,

A - Circulation area m<sup>2</sup>

W - Mass flow kg/sec

Alternative Title gas density kg/m<sup>3</sup>.

In the variable turbocharger added, it can change the air inlet area of the swing nozzle ring. Swing nozzle ring of the swing plate aperture size is determined by.

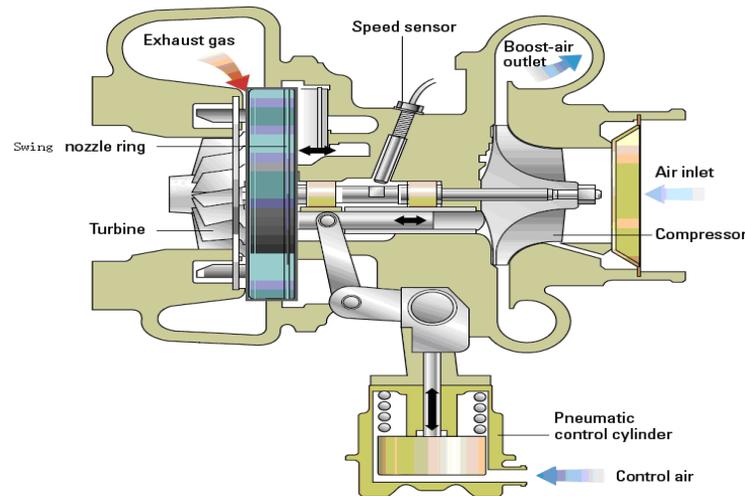


Fig. 1: Variable supercharging type turbocharger

the engine inlet air pressure control. Control of gas pressure drives the piston to move. The piston rod drives the connecting rod to move control nozzle swing plate openings (Chen, 1993).

With the turbocharger using, pressurized gas applications are constantly expanding. Controllable turbocharger has to develop, thus to get good application effect.

Regional production is emerging red because of the state-owned enterprise management system and economic system reform since the exchange of personnel and other factors. Along with the enterprise system and management pattern change, new business forms and different ownership enterprises formed. Regardless of the kind of production, the factors of production, including the material of the object are different. As a means of production machinery and equipment, it can provide a larger number of labor personnel as well as technology development and added value increasing. To improve the productivity and increase the profit becomes the production target. To improve the efficiency of production and technology together with the improvement of the management. While initially to form the dispersive production should improve the management mode in order to adapt to the economic reform at first, it should change with the administrative mandatory characteristic. After a period of time, the centralized production disintegration should be replaced by the new product supply chain. The formation of the new production and supply mode are composed of natural and social resources decision. Personnel and production technique of regional share. The means of production, the known information exchange channels for turbocharger dispersed mode of production lay a solid foundation.

Exhaust gas turbocharger is an engine mounted auxiliary parts (Li-Jun and Jia, 2011). The production and the operating cost are relatively small. The initial

input is not too much. Therefore, turbocharger products are suitable for all types of enterprises production. At the same time, as for the turbocharger itself, it has small size. Requirements of the processing equipment are fit with the majority of ordinary mechanical. Parts for decentralized processing reduce the initial investment cost and technical threshold.

**Turbocharger parts machining and production organization:** One is to repair the market with parts production enterprises. These production enterprises often do not have the production plan. Most of these products have fixed users. The market for repair processing parts is used in a production area of turbocharger repair. Repair parts are the most vulnerable parts market. As for the impeller, it has the shaft and seal. Another is to provide enterprises with product assembly parts and components. The production of qualified enterprises has put forward the need of turbocharged models and production quantity. Ke-Long and Li-Jun (2011) in the processing enterprises, it is to provide parts and components. Two kinds of processing for turbocharger products manufacturers can be used. A production enterprise to have several close production cooperative enterprises. Especially for those who need to have a certain scale of cooperative enterprises. Product manufacturing enterprises in close cooperation processing enterprises choose according to processing capacity and the processing quality definition. Between the enterprises are the mutual shares to form joint-stock business. The cooperation between them in some ways can help the profit sharing. At the same time, it can control the turbine supercharger major parts of the production cycle and the processing quality.

**Turbocharger parts processing quality control:** Turbocharger affects the performance of the main

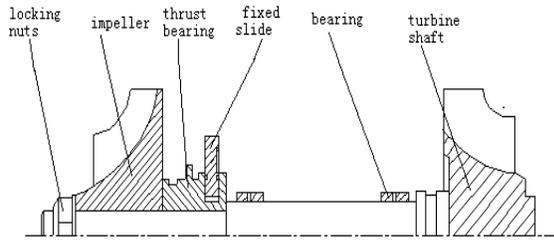


Fig. 2: Schematic diagram of the turbine shaft assembly

components due to the processing precision of the middle box body and the turbine shaft precision in processing and assembling. It produces the parts according to the requirements of the processing arrangement. Spare parts processing quality assurance with the design technical requirements. Main parts include the intermediate casing, impeller, exhaust casing body, a compressor housing and bearing. These parts of the processing requirements of the host plant and turbocharger parts factory should exchange information processing. Process design and execution to get the agreement between the parties. In the course of processing, it requires implementation measures. The reasonable formulation of various parts of the processing requirement is to ensure that the processing, clamping, cutting and machine tools. Qualified parts requirements in the process of machining process, machining machinery and qualified operators. These are the regional production accumulated over the years. Qualified parts in warehouse and assembly machine and detection. Inspection, testing components enterprise standards and testing, tests method. Spare parts processing quality assurance.

**Turbocharger assembly quality:** Figure 2 is a schematic diagram of turbine shaft assembly. The right side of fixed slide is installed and positioned with the small end of the middle box body to limit the axial position of the turbine shaft. Bearing is fixed in the middle of the box body Sliding bearing in the middle of the box body is supported the turbine shaft. The impeller and the shell of the clearance are composed of a fixed plate, a thrust bearing, impeller and shaft machining dimension accuracy decision. Shell assembly between the size precision will affect the impeller and casing clearance.

The turbocharger assembly quality control also needs to formulate the corresponding technical requirements. Assembly technology to detailed provisions is to be fitted a work piece mounting surface processing method and parts of the assembly sequence and turbocharger assembly machine order. Before the assembly parts and workshop temperature and

cleanliness, the assembly quality of the factors should be required. A reasonable assembly process route is the operator of rule-based. Turbocharger assembly to sampling, tests the turbocharger indicators. This test can only adopt the sampling way on a batch of turbocharger for random detection. After detection of a turbocharger, it will have traces. Followed by the personnel training and job continuity can effectively guarantee the turbocharger assembly accuracy (Su-Ying and Li-Jun, 2011).

## CONCLUSION

Turbocharger in the regional mode of production depends on the regional economic and technological factors. It is a long-term accumulation of technology and the change of economic system. Few has economic strength or a market leading enterprise as the subject. With the combination between the enterprise production is the premise. By having the brand enterprises, it will boost the turbocharger machine market, speed up the product and manufacturing capability.

Many enterprises's production model in the area of turbocharger production plays a role in promoting. In turbocharger parts and components production stage, the advantage of the enterprise cooperation can be fully reflected.

Regional cooperation of many enterprises production mode under the control of the machining quality of parts. It is needed to establish a close cooperative enterprise group. Thus, key technology and the application of the processing quality and quantity control can be reached.

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