

DIAGNOSIS OF TURBO COMPRESSORS CARTRIDGES AFTER REPAIR

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Keywords: cartridge turbocharger, the installation, integrity, recovery details.

Abstract. The work deals with the design of the test bench for turbochargers with the aim of expanding technological capabilities and performance.

ДИАГНОСТИРОВАНИЕ КАРТРИДЖЕЙ ТУРБОКОМПРЕССОРОВ ПОСЛЕ РЕМОНТА

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Ключевые слова: картридж турбокомпрессора, установка, герметичность, восстановление деталей.

Аннотация. Работа посвящена разработке конструкции стенда для испытания турбокомпрессоров с целью расширения технологических возможностей и повышении производительности.

Despite the significant amount of agricultural machinery being acquired, the level of its renewal remains low and clearly insufficient to achieve standard security. Thus, in the Republic of Bashkortostan, over the past two years, agricultural machinery worth almost 6.5 billion rubles was purchased, and outside the standard depreciation periods, 90% of tractors and grain harvesters with an average age of 17.3 years are used and 15.1 years, respectively, 77% of forage harvesters with an average age of 12.9 years, 92% of beet harvesters with an average age of 16.3 years. This leads to massive violations of the technology of cultivation and harvesting of agricultural crops. Disposal of technology is on average 4 times higher than the flow of a new one. Therefore, there is an urgent need to maintain the available agricultural equipment in the period of field work in a constant working condition [1].

Currently, the repair of such units as turbochargers is rarely made, more often they are replaced by new units. Russian and foreign industry currently produces about 10,000 thousand types and modifications of turbo-compressors for automobile and tractor engines. However, the cost of new domestic turbo-compressors is from 8 to 20 thousand rubles. The cost of similar import aggregates, for example, used on combine harvesters of the Case, New Holland, John Deer brands and others is more than 60 thousand rubles. At the same time, the park of foreign agricultural equipment in Russia is growing every year. For example, in the Republic of Bashkortostan, only the combine harvesters of the makrok "Case", "New Holland", "John Deer", and "Dominator Mega" are more than 1,400 units. Today, some of them have a service life of more than 10 years and, of course, need to be repaired [2].

In order to improve the quality of repair of turbochargers, it is advisable to use a test bench for testing turbochargers.

The purpose of developing the design of the test bench for turbo-compressors is to expand the technological capabilities and increase productivity.

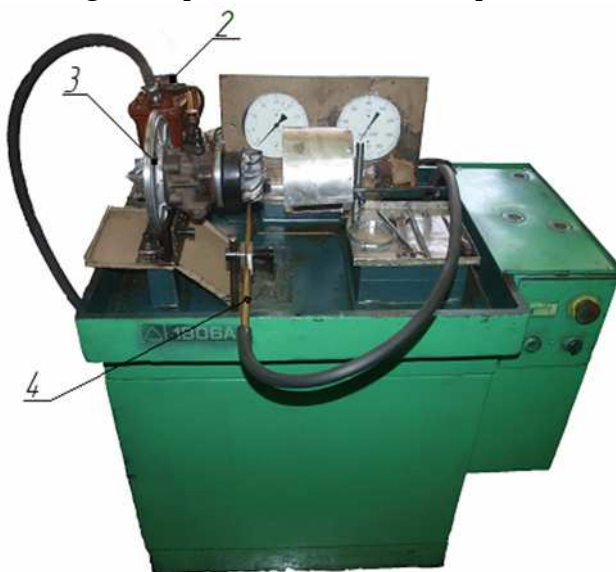


Fig. 1. Test Bench for turbochargers

After assembly, the turbocharger technology must be rolled and tested on diesel oil. The oil pressure in the system should be at least 0.3 MPa, and the temperature should be 85 ... 90 ° C. The turbo-compressors of the YaMZ-238NB and SMD-60 engines are being run in and tested at the KI-8877 stands of the GOSNITI. At the department site, a stand for testing turbocompressors has been developed and introduced, which is shown in Figure 1. The stand for testing turbocompressors consists of a bed; oil tank; electric motor; gear pump; pressure gauges; pressure regulator; filter; node of fastening of a cartridge of a turbocompressor; protective casing; control panel [3].

The stand works as follows. A turbo-compressor cartridge is installed on the stand with the help of a special fixing device.

Oil heated to a temperature of 70°... 80°C, through a six-stage oil pump 1 under a pressure of 10 ... 12 MPa, is fed through a filter 2 to the test turbo compressor 3 (Figure 2).

At the same time, air is fed to the turbine blades through a special nozzle 4 under a pressure of 0.4 ... 0.6 MPa, which gives the turbocharger shaft a rotation of about 5000-6000 rpm. Turbokom the press is driven around within 15-20 minutes. At the same time oil leakage through sealing rings is not allowed.

Practice shows that the resource of turbochargers restored and tested in this way is slightly inferior to the resource of new turbines.

The innovation is that under the pressure of compressed air the rotor of the turbocharger spins up to maximum speed, creating an imitation of its work in real conditions. The stand also regulates the flow of oil to the bearings, checks the tightness of the system.

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Received 10.04.2019