METHODS OF INCREASING THE STRENGTH OF COMPOSITE POLYMER MATERIALS AND COATINGS USED IN AUTOMOBILES.

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Today, the process of making car details in machine building is diverse: turning, tooth expansion, knurling, turning, tooth cutting, and others. These types of details are made on the appropriate types of metal cutting machines and tools. The details are divided into classes depending on the cleanliness of the surface.

Based on GOST2789-89, it is divided into 14 cleanliness qualities. New details are made by the factory that manufactures the working surface in accordance with these qualities. Cleanliness of the surface of the repaired details should not be more than 1-2 degrees of cleanliness of the surface of the new detail. During the use of cars, the surface of its details is eroded by friction.

Friction is a process that occurs when almost any mechanism works. Technically, it has both positive and negative significance. In bearings, gears, and piston systems, it leads to wear of friction surfaces and loss of power. 30-40% of the used energy is spent on friction. In this case, friction is a harmful factor. In the case of brakes and clutches, friction is useful, therefore, in this place, it is tried to increase it to a certain value without exceeding the permitted limit values.

Research conducted by scientists shows that [1-10] 80-90% of the reason for the loss of performance of machines and mechanisms is wear due to friction. 100 million to reduce friction on the whole earth in one year. tons of lubricants are used. In developed countries, the breakdown of machine tools due to friction and wear corresponds to 4-5% of the national income [7].

This diploma project covers the following main issues: types of friction and wear in cars, rules of wear, friction pair materials, selection of oils; the effect of oils on the corrosion of materials; friction and wear of details in various conditions; friction and lubrication processes; the effect of various factors on friction and wear; methods of increasing corrosion resistance of details and h..o.

The study of the physical basis of the process of car parts being eaten away made it possible to restore the eaten details. This allows to correctly solve the issue of choosing equipment for repairing parts and choosing rational methods of cutting and repairing various materials.

Currently, there are various methods used to study the process of corrosion of car parts: the IV-13, TS-14 and TSV-18 mineraloceramic plate devices created in the TSNIITMASH and VNII laboratories are used most often to determine the degree of corrosion of the parts based on the vibration frequencies of the parts. This method is very effective in determining the degree of corrosion of complex structures, including the engine, without disassembling its parts.

The KI-332 TSM device created by Mendeleev's Moscow Institute of Chemistry and Technology is one of the most effective ways to determine the wear of car parts without disassembling the engine in exchange for analyzing the fractional composition of the oil inside it.

As a result of various researches, devices were invented that work based on the relationship between the inspection force of the inspection tool and the eating of the detail. These devices are built on the basis of control of consumption according to the size of the inspection force or other indicators. Most of the wear condition monitoring devices produced by foreign companies are designed to record the failure of the device according to the strength indicators.

For example, when checking the condition of the device according to vibroacoustic emission indicators, several types of vibrations occur. There are many reasons for the vibrations that occur during the inspection process: zagotovka, friction of individual parts of the material, the appearance of various small holes, etc. These vibrations have a frequency of 10-300 kHz, so the process of their occurrence is usually called vibroacoustic emission (frequencies up to 60 kHz are called vibroacoustic, and more than that are called acoustic).

Usually, at the University of Cambridge, the acceleration of the wave propagating from the measuring point is measured for this purpose. For each appearance, a frequency range has been established through special studies, in which the relationship between the state of detail and the vibroacoustic emission indicators is clearly visible. The separation of the desired range is determined using filters included in the electronic circuit, the accelerometer is connected to its output.

A number of different methods are used to process the measurement results to determine the limit of damage and corrosion. The simplest of them is to compare the amplitude of oscillations with preset maximum values, or to compare each measured amplitude with another maximum value.

The reliability of monitoring of vibroacoustic emission indicators is reduced due to various external influences on it, for example, temperature drop, change of perforation depth, etc. Such control devices are produced by many companies. In order to increase the reliability of determining the limit corrosion and distortions of the broad nomenclature, it is necessary to combine the monitoring of indicators on vibroacoustic emission with the monitoring of strength indicators.

In addition to the above methods, there are other methods. These are: checking with the help of electric driving force, or thermo-electric driving force, intensity of heat release, heating of the part, radioactivity of metal scrap, etc. But these methods are used only in laboratory conditions so far.

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