

Research Technical-Operating Materials

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Annotation: Motor oils have a set of physical and chemical properties established by the relevant regulatory documents that characterize its operational purpose.

Motor oils have a set of physical and chemical properties established by the relevant regulatory documents that characterize its operational purpose.

Viscosity-temperature properties have a multilateral operational significance. Viscosity largely determines the mode of lubrication of friction pairs, heat removal from working surfaces and gap seals, the magnitude of energy losses in the engine, its performance, the speed of starting the engine, pumping oil through the lubrication system, cooling rubbing parts and cleaning them from contamination.

Detergent and dispersant properties characterize the ability of the oil to provide the necessary cleanliness of engine parts, maintain oxidation products and contaminants in suspension. The higher the detergent and dispersant properties of the oil, the more insoluble substances (aging products) can be retained in the operating oil without precipitation, the less varnish deposits and carbon deposits form on hot parts, the higher the allowable temperature of the parts (degree of engine forcing).

Antioxidant properties largely determine the resistance of the oil to aging. The operating conditions of motor oils in engines are so harsh that it is not possible to completely prevent their oxidation. Appropriate purification of base oils from undesirable compounds present in raw materials, the use of synthetic base stocks, as well as the introduction of effective antioxidant additives, can significantly slow down the oxidation of the oil, which leads to an increase in its viscosity and corrosively, a tendency to form deposits, foul oil filters and others. adverse consequences (difficulty in cold start, deterioration in pump ability, etc.).

The anti-wear properties of engine oil help to prevent wear of friction units, the formation of a strong film on rubbing surfaces, which excludes direct contact of rubbing parts. The antiwear properties of oils depend on their viscosity and viscosity-temperature characteristics, lubricity, and oil purity.

The anti-corrosion properties of motor oils depend on the composition of the base components, the concentration of anti-corrosion, antioxidant additives and metal deactivators. As motor oils age, the corrosiveness of motor oils increases. Oils from low-Sulphur oils with a high content of paraffinic hydrocarbons, which form aggressive organic acids during oxidation processes, which interact with non-ferrous metals and their alloys, are more prone to an increase in the corrosively of oils from low-sulfur oils with a high content of paraffinic hydrocarbons.

To control the quality of fresh oil during its production, as well as when it is received by oil depots and consumers, laboratory methods and test methods are used on model plants. For auto tractor diesel engines, engine oil indicators determined by laboratory methods (the so-called physical and chemical indicators of engine oil) are prescribed by GOST 8581-78. This standard establishes requirements for motor oils for automotive diesel engines manufactured for the needs of the country's economy and exports. These requirements for product quality can be divided into:

1) oil must be produced in accordance with the requirements of a certain standard according to the technological regulations approved in the prescribed manner;

2) in terms of physical and chemical indicators, engine oils must comply with the requirements and standards specified.

Based on the data reviewed (the indicated values in the requirements of NIIAT, NAMI, GNIKh and manufacturing companies), we can say that motor oils must first be evaluated and selected according to the parameters that are laid down in regulatory documents, and research should be carried out in accordance with their requirements.

Preliminary studies have shown that improperly selected oils have led to premature failure of car engines, including those operating in urban environments.

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