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MODERN SCIENTIFIC CHALLENGES AND TRENDS

COLLECTION OF SCIENTIFIC WORKS
OF THE INTERNATIONAL SCIENTIFIC CONFERENCE

Issue 5(27)
Part 3

Warsaw
2020

SCIENCECENTRUM.PL ISSUE 5(27) ISBN 978-83-949403-3-1

TABLE OF CONTENTS

SECTION: ARCHITECTURE

SECTION: ART STUDIES

SECTION: ECONOMICS

SECTION: HISTORY SCIENCE

SECTION: TECHNICAL SCIENCE. TRANSPORT

SCIENCECENTRUM.PL ISSUE 5(27) ISBN 978-83-949403-3-1

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COMBUSTION-THE INFLUENCE OF AMBIENT TEMPERATURE ON THE LUBRICANT CONSUMPTION

Abstract: *At an ambient temperature of 40°C, the viscosity of the fluid in the hydraulic system decreases sharply, which leads to its deviation from the system connections exceeding the permissible level. Due to the high temperature, the heated oil in the engine crankcase is pushed out of the breather, aggregates, joint surfaces, oil seals and bearing covers. The article analyzes the influence of ambient temperature on the consumption of fuel and lubricants,as well as the causes of contamination of fuel and lubricants.*

Key words: *Air dustiness, oil, polishing, liquid flow, high temperature, dynamic loading, pure oil, aluminum, calcium, iron oxides.*

When the air temperature is high, due to a decrease in its density, the engine performance deteriorates, that is, their power decreases, and fuel consumption increases. If the air density is low, the air brake system compressors will not function properly. As a result of increasing temperature in the hydraulic brake systems, these jams occur, which negatively affects the operation of the system. In high temperature conditions, the demand for fuel supply, cooling, lubrication, and electrical appliances changes. When designing machines, this must be taken into account.

High ambient temperature negatively affects the quality of the lubricant, as well as the overheating of the oil in the transmission, engine, and steering mechanism.

The maximum temperature of the engine is 80-100°C. Increasing this value leads to an increase in the temperature of the fuel-air mixture, which reduces the engine power and its economic indicators. For example, when the temperature of the air entering the carburetor increases from 20°C to 80°C, the engine power decreases by 15%, and the specific fuel consumption increases by 16-17%. In addition, increasing the temperature of the fuel-air mixture increases the risk of premature combustion (explosive combustion) of the mixture in the engine cylinder.

At ambient temperatures above 32-35°C the machine operates at low speed and high load, when the engine is heated to 100-110° With its thermal mode deteriorates, and the power is reduced. This means that the intake of high-temperature air into the engine cylinders reduces its power.

Dust in the air contains up to 82% of the minerals quartz and corundum. They have a high hardness and cause abrasive abrasion of friction surfaces. The amount of dust in the air is not always the same, it depends on weather conditions and many other factors. High temperatures and too low precipitation for a long time lead to an increase in the amount of dust in the air.

When processing row spacing with RC-4 and CRT-4 cultivators, air pollen decreases with increasing distance to the soil. This indicator in the upper hinge

SCIENCECENTRUM.PL ISSUE 5(27) ISBN 978-83-949403-3-1

areas of the cultivator is 10-12 times less than the axis of the base cord, while increasing the speed of the unit by 1.35 times, the amount of dust in the air on average is 1.3...Increases by 1.5 times.

Dust particles on the unit's hinges (minimum 0.005-0.001 mm and maximum 0.60-0.90 mm) penetrate the plug and accelerate the bonding of the unit's parts. The degree of intensity of food intake depends on the mineralogical composition, size and shape of the dust particles. When the distance from the soil to the parts of the unit is 15, 45, 65 cm, respectively, the air dust will contain 20-25, 30-35, 50-60% of silicon dioxide, 60-70, 55-65, 40-45% of aluminum, calcium, iron oxides and 10-15, 5-10, 2-5% of various element carbonates.

In summer, the amount of dust in the air on highways reaches 1.5-2.0 g / m^3, and on cultivated areas-3.5 g / m^3. During sandstorms in deserts, the amount of dust in the air is 17 g/m^3. The stability of the dust cloud and its amount mainly depends on the composition of the soil, the speed and direction of movement of the machine, and the strength of the wind.

Abrasive contaminants are primarily dust (road and field) and dust. Studies show that 80% of the contamination of the working fluid consists of quartz particles and metal oxides (iron, aluminum) in atmospheric dust, as well as food in the form of highly dispersed metal particles.

Mechanical inclusions in the composition of diesel fuel according to GOST 305-82 cannot be at all. But, according to GOSNITI, fuel is polluted on the road from the refinery to the warehouse of the tractor crew and the warehouse itself from 0.0005 to 0.0630%.

Heating the oil affects the rate of its oxidation, the higher the temperature, the greater the rate of oxidation of the oil. When the oil temperature in the engine reaches 50-60°C, the oxidation is normalized, further increase in temperature leads to an increase in the intensity of oil oxidation, as a result of which the oil loses its basic properties.

The average content of pollutants in diesel fuel is calculated as 100 g (0.01%) per 1 ton of fuel. If the diesel engine operates in conditions where the amount of dust in the air is 1-2, 5 g / m^3, the number of mechanical inclusions in the fuel tank increases by two to three times compared to the original. The air dust collector easily penetrates the tank through the air pump. Dust enters the high-pressure fuel pump mainly through filters, while filters cannot properly clean the fuel after a certain period of operation.

It was found that 1 ton of diesel fuel distributed by oil bases contains 100-120 g of pollutants. In order for the devices with diesel fuel to work normally, it is necessary to limit the degree of contamination of the fuel. The size of the dust particles also significantly affects the eating of the plunger pairs In this case, the particle size should not be larger (no more than 1.5-2.5 microns) than the gap between a pair of condoms. Solid dust particles, especially the elbow shaft, accelerate the eating of long and connecting rod necks. For example, in technically clean calculated air, the number of containers eaten by the necks and bearings of the engine elbow shaft liners that have worked under a load of 100 hours does not exceed 10-14 microns. If the amount of dust in the air at the entrance to the air filter is 2-3 g / m^3, then the edibility of these parts reaches 90-100 microns.

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The experience of operating T-74 and T-75 tractors shows that as a result of breaking the tightness of their transmission housings, abrasive particles accumulate in aggregate cartons in an amount exceeding the permissible amount, as a result of which the rate of absorption of transmission parts increases several times compared to parts that worked on pure oil. The mechanical connections that make up the oil consist of flammable and non-flammable components. In turn, the non-flammable part of the mechanical connections contains food of transmission parts and soil dust. In turn, the non-flammable part of the mechanical connections contains food of transmission parts and soil dust.

During the operation of tractors, as a result of dynamic loads and elastic deformation of the frame when passing obstacles that affect the details of the body of transmission units, due to the slow loosening of fasteners, the tightness of the units begins to deteriorate, which makes it easier for dust to get into the oil.

Test results show that the consumption of transmission parts working in oil contaminated with dust (0.8-2.4%) is 1.5-5.5 times higher than in pure oil.

As you know, the details of machines that process the soil, eat relatively more, most of them are subjected to polishing. Statistics show that as a result of abrasive treatment, 75-80% of machine tillage parts fail, and 20-25% - due to breakage. The results of checking the bearings of two tracked tractors show that 57-61% of all defects occurring in them are due to defects arising from increased radial friction.

Dust particles in the air settle on the rods of hydraulic cylinders, the surfaces of spool distributors covered with an oil film, are pulled through the seals inside, washed by the flow of working fluid and distributed throughout the system. Even in Central Asia, the level of contamination of working fluids stored at oil bases with mechanical compounds exceeds the level established in GOST 6370-83. The hydraulic system of machines used in Uzbekistan was 0.22% of the average mass of mechanical connections in oil samples taken 30 minutes after payment.

The working fluid of the hydraulic system is contaminated by 0.01-0.44% of the mass, in some cases even more. As a result, the intensity of absorption of exciting parts increases. The number of pump parts in this system depends on the number, size, and hardness of the dust particles that pollute the liquid being pumped by the pump, and its useful coefficient of operation. Filters in the system cannot completely clear the working fluid from dust particles. Excessive fluid contamination, failure, or inefficient filter operation reduces the service life of all friction parts, including pump parts.

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