

Opinion

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# Express Oil Control for Diagnosis of Machinery and Equipment

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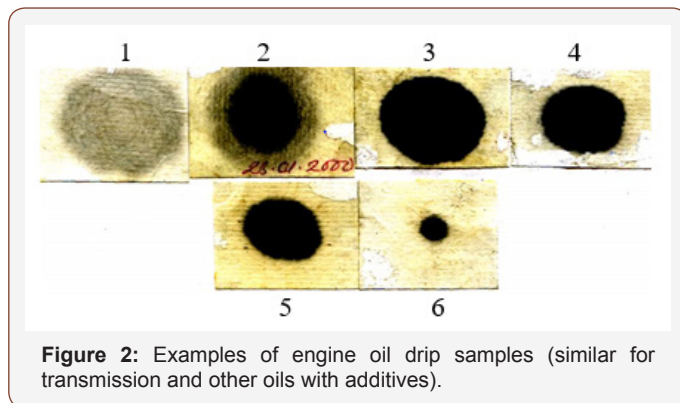
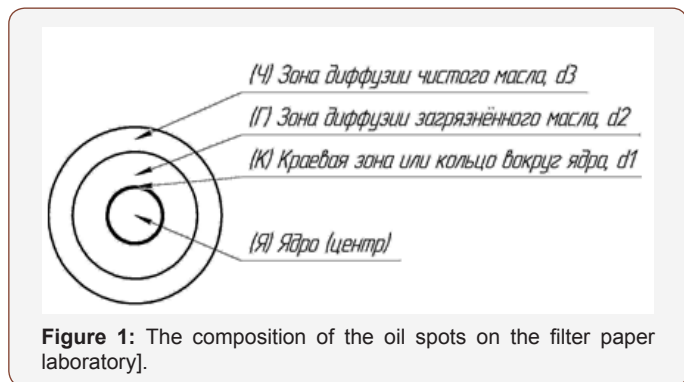
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This control is always needed before the service of machines and equipment. For 0.5 hours evaluate the work of oils, prevent their late change and accident.

Means of verification

The crucible 75.100 ml, thermometer 250 °C, device for the slow controlled heating of the oil to 220 – 235 °C, filter paper.



Determine the temperature of the beginning and end of crackling/foaming/boiling oil when it is watered, flash point, decreasing due to loss of viscosity. An oil stains (“drip sample”, Figures 1&2) on filter paper after 15 - 20 minutes characterizes the contamination, washing, dispersing properties, water cut and overheating of the oil.

Qualitative characteristics of drip samples of motor oils of CC, CD, CF-4, SG-4 quality classes according to API (Figures 1 & 2, Tables 1-3)

Table 1: Quality indicators to assess the oil on the “spot test”.

Part of the Spot	Characteristics of Parts of the Oil Stain by Numbers of Spots in Figure Two Scoring his Assessment “Spot Test”					
	No 1; 1 Point	No 2; 2 Point	No 3; 3 Point	No 4; 4 Point	No 5; 5 Point	No 6; 6 Point
Center or Core (I)	Light	Dark Grey	Black	Thick Black	Thick Black, Co Slime	The Drop is Not Blurred, Only Water Spreads
Ring at the Center (TO)	Absents	Dark Grey	Dark Black	Center, Core and Ring are Fused	The Center or Core is Not Visible	
Dirt (R)	Absents	Grey or Dark Grey	Black			
Pure Oil (Ch)	Spot Light, Disappears after 3 Days	Light	Light, Disappearing	Absents	Absents	

**Table 2:** Optical oil density and spot size of the “drip sample” to assess the performance of the oil.

No. Spots in Figure Two	1	2	3	4	5	6
Approximate Optical Density of Contamination on the Spot on the Device, %	0,22	0,60	1,60	2,40	3,20	4,00
Approximate Full Spot Size, %	100	90	80	65	45	10
Rating “Drip Samples”, Points	1	1,5-2	3	4	5	6

**Table 3:** Quantitative indicators to assess performance motor oil on the “spot test».

Oil Performance	Express Definition Method	Indicator Values For Oils		
		Fresh	Working	Defective
Washing And Dispersing Properties	Calculate The Ratio of The Diameter Of The Rings: The Inner Ring To The Core; The Outer Ring To The Inner. Normal Values Are 1.5 And 1.2	See Spots Number 1, 2	See Spots Number 3, 4	See Spots Number 6,5,
Water Cut	The presence of ragged, jagged edges of the spots, crackling, and foaming, swirling the oil from 95 to 180 °c	No	No	10 Tracks Per 1 Ml Of Oil; Foam or Drilling
Contamina-Tion Of Dirt	Oil stain color	Light	Gray	Black With Gleam
Liquefaction	The flash point of the oil under slow heating from 160 °c	205 - 240 °c	175 °c	165 °c
Overheating The Engine	Oil stain color deviation from colorless, gray or black	-	Without Painting	From Yellow to Light Brown

1. Almost fresh oil in the new engine worked no more than 50 hours; not contaminated, blurs to the largest size, gives a uniformly colored light gray spot with a light outer ring of pure oil.
2. The same, no more than 100 hours; visible core, thin core ring, wide diffusion zone ring of contaminated oil and the outer ring of almost pure oil. This is a classic example of “drip sample” oil with a large margin of performance.
3. Contaminated but have a stock working property worked oil; it requires regular monitoring to get ahead of the sharp deterioration of the oil and motor.
4. Oil is visibly contaminated and loses its detergent-dispersant properties (the spot diameter is considerably decreased, as mechanical impurities enlarged); for Vysocina-prasannah motors this oil needs to be replaced. If the oil stain is yellow – the engine overheated and the oil is excessively oxidized - pitched.

5. Oil - a marriage of emergency motor (oil lost working properties, and maxprimary formed sludge); it is required to eliminate the failure (water leaks, etc.), rinse the motor.

As you work, with the watering, increasing the number and size of mechanical impurities with the loss of the working properties of the oil, its spot with light gray turns into dark black and steadily decreases in size. And a drop of dirty, watered (dead) oil from the engine with an emergency condition does not spread on the filter paper (matter), as it has a lot of viscous sludge.

### Acknowledgement

None.

### Conflict of Interest

No conflict of interest.