

Combustion of Oil Sensors in Cars and its Damage

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ABSTRACT

This article presents the causes of ignition of the oil sensor in the display board during the movement of the car engine, violations of the oil composition, the degree of contamination of the oil temperature and provides information on the processes of its elimination.

The oil lamp is inactive when the engine is running and there is a sufficient level of lubricating fluid, that is, it does not light up. If it catches fire, this indicates that there are malfunctions, such as a low oil level in the crankcase, low pressure in the engine oil system (for example, the oil filter is clogged, the oil pump is not working properly), the oil level sensor is out of order, and some other less common ones. In any case, if the oil pressure light is on or blinking, you must first check the level of the lubricating fluid. If its indicator is normal — then you need to look for the reason that caused such an indication and eliminate it.



Figure 1. Olive oil sensor

Operate the machine with a low oil level is highly undesirable, since in such conditions the engine experiences huge mechanical and temperature overloads, which reduces its service life and can

partially or even completely disable it. If at the moment it is not possible to top up the oil at least to the minimum (and preferably medium or two-thirds to full) level, then, in extreme cases, you can get to the car shop with minimal loads, that is, at medium speeds (not very low, and not high) and at a low speed or a car service station, where you can already top up (or completely replace) the engine oil. However, please note that if the store is located far away, it is better to leave the car in place and add oil to it later.

Before considering the reasons why the oil lamp may light up, it is necessary to fix the definitions. Control lamps in the car are controlled by the BCS — the so-called on-board control system. It monitors all the lamps displayed on the instrument panel (turning on / off turn signals, low / high beam, parking brake signal, etc.). Including oil level and pressure lamps. In some cars (newer or more advanced), these lamps are separated, while others (older) usually have only one lamp, and it is activated when the pressure of the lubricating fluid in the crankcase of the engine is low. Usually, a yellow icon (oil pan) on the dashboard indicates a low oil level, and a red lamp indicates a low pressure. On modern multi-function displays, the corresponding labels may appear instead of the "oil pan".



Figure 2. Temperature oil indicator

The lamps can be activated separately from each other, since they work according to data from two sensors (a level sensor and an engine oil pressure sensor). For example, even when the oil level is low, the oil pump is able to provide sufficient pressure. Although it depends directly on the level, if the level is critically small, then there will be no pressure, but if the level has fallen slightly below the minimum permissible level, then the pressure will still be there.

And vice versa — if the oil level is within the normal range, then, for example, if the oil filter is clogged, there may be a situation when the pressure in the system is not enough to effectively lubricate engine parts. A striking example in this case is the situation when a low-pressure lamp is triggered first when the crankcase is broken, and then a low oil level is triggered.

Next, we will consider the reasons why the pressure light may have come on. Let's put them in order from simple to more complex.

Low oil level in the crankcase. This is the simplest problem, and almost anyone can handle it, even a novice car enthusiast, and not ask for help from a car service center. True if it is not related to a leak. All cars, even old carburetor cars, are equipped with an oil pressure sensor. When its indicator falls below the norm, it sends a signal to the ECU (electronic control unit), and that, in turn, activates the corresponding lamp on the instrument panel. At the same time, the lamp does not blink, namely, it is lit in constant mode. On modern cars, instead of a warning lamp, the inscription *c* may appear, which directly indicates that the driver needs to check the oil level in the crankcase. The situation can happen in any mode of engine operation — at idle, under load, in motion, in a parking lot, on hot, on cold, and so on.

An interesting case may be when the lamp lights up in certain situations (for example, for a few

seconds), and then goes out. This may be the case when the car is going up or down a steep incline.

In this case, the oil can be poured into one of the crankcase volumes — front or rear. And if the oil level sensor is located at its opposite end, it will automatically cause the oil lamp to light up on the move. The situation is similar when driving with a side roll or when braking sharply (although in the latter case this is unlikely, and the reasons why the oil lamp lights up when braking, we will consider a little later). If the lamp goes out after the car body returns to its normal horizontal position, it means that this is your case, and there is not enough oil in the crankcase.

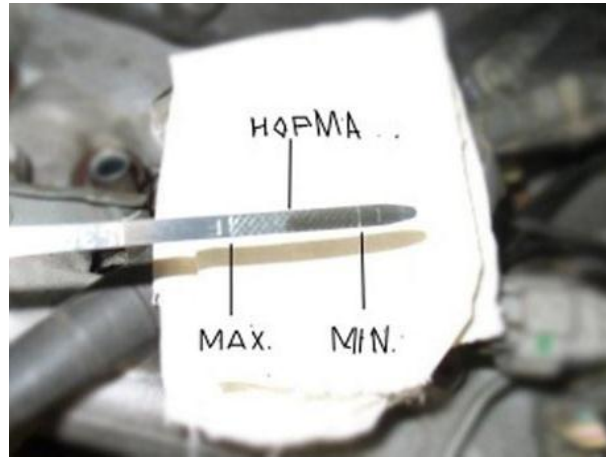


Figure 3. Maximum and minimum oil standards

Incorrectly selected oil. In particular, its viscosity, especially for low-temperature viscosity. If it thickens in the cold, then it is difficult for the pump to pump it through the system and the pressure in it is insufficient, which is recorded by the corresponding sensor. Similarly, during the operation of the machine, the viscosity changes (or the oil simply gets dirty), so there may be a situation when the pressure sensor is triggered in certain situations and the oil pan indicator will either light up or blink.



Figure 4. Viscosity of various oils at temperature

Poor-quality oil filter. A normal oil filter always contains a certain amount of engine oil. This is done in order to avoid oil starvation when starting the engine. This possibility is realized by introducing a check valve or a shut-off washer into its design. These elements provide oil locking when the engine is turned off. However, on low-quality filters, these elements may either not be present at all or do not fully perform their task.



Figure 5. Oil filters

Accordingly, the oil from the filter drains back into the sump pan, and after starting the engine for the first few seconds it gains pressure. This is a very bad situation, since this leads to increased wear of parts, which means a decrease in their overall service life. Usually, after starting the engine, the oil lamp lights up.

Pressure reducing valve of the oil pump. This element performs an important function in the car's oil system, namely regulates, does not significantly increase or decrease the oil level in it. Both of these situations negatively affect the operation of the engine and its individual components. Most often, in this context, the valve spring breaks.

Or it simply stretches due to the wear and tear or poor quality of the steel from which it is made. Another option is that over time, the valve lumen becomes clogged. This is especially true if the car is filled with poor-quality dirty oil or the oil filter is already very worn out. When the pressure reducing valve fails, the oil pressure increases sharply when the engine speed is high.



Figure 6. Oil pump repair



Figure 7. Clogged oil pump mesh

Clogged oil pump mesh. Here the situation is similar to that described with the oil filter. If it is clogged, less oil passes through the grid than it should, which leads to a decrease in pressure in the system and a decrease in its level. In addition, in such a situation, the oil pump runs on wear, which

significantly reduces its service life.

Oil leak. Most often, oil leaks from under various gaskets and O-rings. Also, the place of leakage can be pipes, oil lines, breakdown of the cylinder head gasket (often mixing oil and antifreeze) and so on. If oil leaks from the system in large quantities, this automatically leads to a situation where the pressure in it drops, which will be indicated by the corresponding light on the dashboard.

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