



## 15 min lubrication oil analysis - spots problems and prevents failure

### GRIME

A poor result here can mean oil contamination by dust, wear particles, carbon, insolubles and other impurities. A degree of sediment is always evident, but a lot of sediment (saturation point) will be obvious and very dark. A healthy engine will show clearly visible circles after 50 to 100 oil hours but the degree of contamination is something you will learn about your engine with repeated tests over time. A bad result is an indication of poor combustion conditions (carburation, timing, valves or exhaust). If the engine is known to be good and the oil is poor, the stain is likely to cover the next ring as well. An oil change is required once the grime level reaches saturation point. It is worth noting that the poorer the oil condition, the longer the result will take to fully appear. ①

### OIL CONDITION

The older the oil, the darker the result will be. As indicated above - if there is too much sediment both the centre spot and the second ring will be covered. If the engine is known to be in good order and a lighter brown ring is formed around the centre spot, there is likely to be a combustion problem producing too much sediment. A poor result here can also be an indication of oxidised or burnt oil from an overdue oil change, short-term overheating, low oil level, incorrect oil grade or high content of sulphur in fuel. The oil may also be contaminated as a result of poor filtration and a large degree of wear particles, dust or debris. ①

### WATER

When water or coolant is significantly present in the oil, the resultant peaks in the outer perimeter of the second ring (effectively a third ring) will be evident within minutes and could cover all the rings. Water contamination can be: a) condensation (without a coloured corona) through cold running and short stop-go journeys and b) anti-freeze /coolant which will show a coloured corona after about 30 minutes. A poor result here is a serious issue that will require immediate attention as the oil will be badly degraded. It can be an early warning of a blown head gasket or block problems, furthermore small amounts of water can also cause corrosion of internal components and bearing surfaces within a very short time, leading to immediate and catastrophic failure. This is particularly important if the vehicle is not used on a regular basis. ①

### FUEL

If the oil is contaminated by fuel, a light clear pale yellow ring will form around the outermost circle. This will become evident in a very short time after the initial oil drip from the dipstick. A small transparent ring is common in a healthy engine, but if this ring remains after a few hours it is an indication of moderate levels of fuel in the oil. The bigger the ring, the greater the amount of fuel and the necessity to investigate. Holding the test up to the light will highlight the result. A poor result here is an indication of unburnt fuel condensing on the pistons, poor carburation due to tuning or wear, valve leakage or worn pistons, rings or bores. ①

① For further information regarding the implications of problems and remedies see our website [www.oil-spy.com](http://www.oil-spy.com)  
Please note that Oil Spy is an advisory product and the company can take no responsibility for actions taken or not taken and the results thereof.



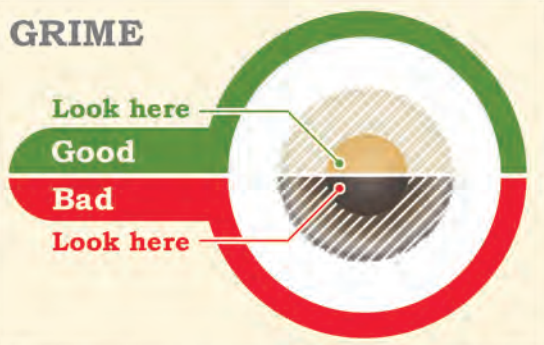
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As an enthusiast you will know your engine, and the Oil Spy tests will help you to understand what is going on internally. Whilst poor test results are an obvious indication that something is 'going on' and needs to be rectified, so will changes that occur over a longer period of time be an indication that attention is required reasonably soon. Advance notice of the deterioration of the oil condition is a certain method of safeguarding your engine from lubrication breakdown, which in many cases is the root cause of total and catastrophic engine failure. The failure can occur in a very short space of time without any prior audible or visual signs. Completing Oil Spy tests at regular intervals is the best way to protect your engine. It is also an accurate indication of engine condition if you are a prospective buyer or seller. The test is a useful tool to ensure that an engine problem has been fully solved after intervention.

**Start with a drop of warm engine oil in the middle of the test card.**

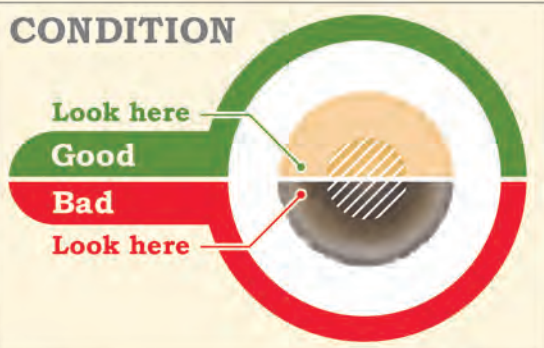
### GRIME



Centre spot is light brown/grey = oil is in good condition and no sediment present.

Centre spot black/dark brown = significant levels of sediment, sludge, wear debris, carbon and oxides present. Oil requires change, reason requires investigation.

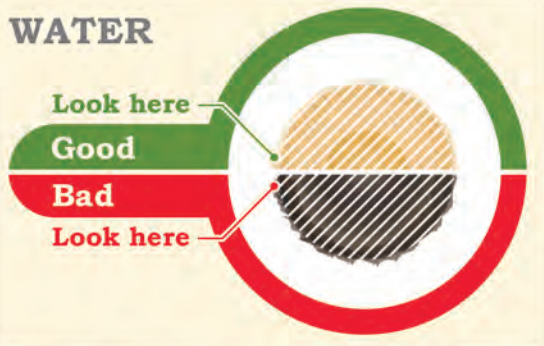
### CONDITION



Middle ring light colour = no oxidation. Oil is in good condition and protecting the engine.

Middle ring dark brown = high level of oxidation and/or sediment or other contamination. Requires oil change and investigation as to cause.

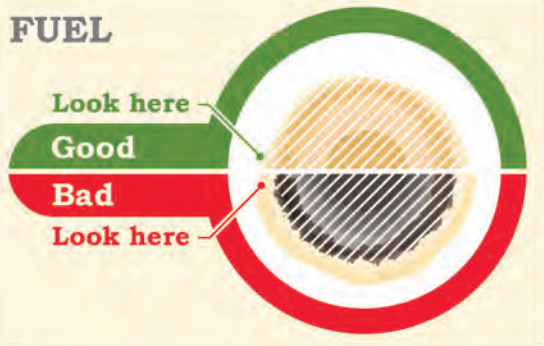
### WATER



Outer boundary of middle ring (effectively third ring) shows soft peaks = no water or coolant present in oil.

Outer boundary of middle ring (third ring) forms clear sharp peaks = high levels of water or coolant in oil. Colour denotes anti-freeze. Attn' required as oil performance is impaired.

### FUEL



Outer ring is "small" and shows no fuel present in oil. This ring is the edge of the analysis stain and is always meant to be here.

Outer ring wide, indicating significant fuel levels in oil, severely diminishing lubrication performance. Oil requires change and reason requires investigation.