

**ARE YOU  
USING THE  
RIGHT OIL  
FOR YOUR  
ENGINE?**



# THE INSIDE STORY ABOUT PROTECTING YOUR ENGINE AND MAINTAINING GOOD OIL QUALITY

## Valvoline understands motor oil

Since 1866, the Valvoline® brand has represented quality, innovative and high-performance lubricant products for the most demanding engine applications. In cooperation with global original equipment manufacturers (OEMs) such as Cummins, we have first-hand insight into the design of new engines and maintenance expectations for today's drivers and operators.

## Valvoline motor oil exceeds OEM performance requirements

OEMs design their motor oil specifications to optimize the performance and life of every engine. Many oil producers strive to meet the OEM, ACEA and API performance limits. Valvoline goes one step further by studying the specifications of major OEMs with the goal of exceeding engine protection requirements.

## Valvoline motor oil protects your engine

Valvoline selects technologies and chemistries for today's engines to run effectively for longer periods and often at high speeds and higher maximum loads.

- > High thermal and oxidation stability helps reduce sludge build-up, deposits and viscosity increase.
- > TBN reserves neutralizing acid formation.
- > Effective balance between detergents (cleaning) and dispersants (collecting dirt) guarantee the cleaning of wear-causing particles, keep fuel injectors clean and keep power output at the required level.
- > Low temperature properties improve engine start-up in cold weather.
- > Component compatibility protects gasket and seal life.

## Valvoline motor oil reduces operating costs

Although good quality oils are more costly to manufacture than those of lesser quality, they offer a number of performance benefits including extended drain intervals. At the same time, they provide better protection against oxidation and nitration, the main causes of oil degradation.

- > Using a good quality oil may enable you to extend oil drain intervals, provided an effective oil analysis is in place. Extended drains can cut operator expenses and reduce the amount of used oil requiring disposal.
- > Choosing the right lubricant protects engines, helping to avoid unscheduled downtime.
- > Valvoline oil and good maintenance habits prolong the life of your engines.

## Valvoline motor oil = peace of mind!

Valvoline motor oils are based on innovative chemistry, quality base stocks and the latest additive technology. They protect your engine giving you the piece of mind to focus on your business.

All oils may look the same. However, a closer look into its formulation and the performance of your engine can reveal the level of protection you really get with each engine oil.

# GOOD QUALITY MOTOR OIL VS.

# POOR QUALITY MOTOR OIL

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The most reliable way to test oil quality is through a used oil analysis program via an independent laboratory. This scientifically advanced method involves running a complete oil analysis test suite. The test verifies whether or not you are using a good quality oil.

Another way to test oil quality is by checking engine condition, power outputs and overall performance.

## Testing engine piston rings

Valvoline premium motor oils form a protective layer on metal parts to inhibit rust and corrosion and reduce high temperature deposits. The pictures at right and on the next page illustrate a piston operating on cheaper oil vs. Valvoline premium lubricants.

Heavy carbon deposits on the crown land and in the top piston groove using a competitor's oil

Clean piston and piston ring where Valvoline premium products were used



## The engine sump pan test

Valvoline premium motor oils use superior base stocks and the latest dispersant technology. This results in superior sludge and soot control properties. A good test of oil quality is to look at an engine's sump pan. You can immediately tell whether or not the oil is providing good sludge control.

The left side of the picture below shows an engine using good quality motor oil with superior sludge and excellent soot control.



Superior sludge and soot control leaves engines clean

Poor sludge and soot cleanliness

On the right, the engine sump pan has dark soot and sludge deposits that were formed by a mixture of post combustion deposits, which can contain soot, water vapor and other waste products. Using Valvoline motor oil regularly will help remove these harmful deposits and keep any contaminants separated.

## The turbo deposit test

Soot deposits and post combustion deposits can attach themselves to turbocharger



blades and reduce engine efficiency. Good quality oils can protect the turbocharger from deposit formation; they do this by using the correct combination of high quality base stocks, innovative detergents and dispersant technology. The right chemistry prevents deposits from occurring. Leading manufacturers, such as Mercedes-Benz\*, focus on turbo performance as one of its key areas when developing engine oil test sequences. Valvoline motor oil exceeds this performance criteria and offers excellent deposit control.

## Reduce and control deposit formation on both fuel injectors and valves

Valve deposit formation can depend on the type and quality of fuel being used. A good quality motor oil can also help prevent the build up of these harmful deposits while improving engine efficiency and protecting expensive fuel injection equipment.



## Oil consumption comparison

Good quality oil exhibits reduced oil consumption rates because of its lower volatility characteristics. Because of its superior oxidation stability, synthetic oils generally perform better than conventional oils. A reduction in oil consumption can help lower expenses and impact overall operating costs.

## Protect your after-treatment devices

Well-selected, good quality oil can protect expensive after-treatment systems such as Selective Catalytic Reduction (SCR) and diesel particulate filters (DPF). In most cases, these have been fitted for new cars, trucks and buses to help meet the latest European emission legislation. The combination of poor quality oil and the wrong oil viscosity can damage these systems and create emission and engine performance problems.

## Extreme temperature performance

Good quality oils can be used over a wider range of temperatures compared to conventional oils with a similar viscosity.

While conventional oils have a temperature operating range of -30°C to 160°C, synthetics remain effective from -55°C to 290°C. These performance characteristics allow synthetic engine oils to provide easier cold starting and quicker oil flow to crucial engine parts, thus providing strong lubrication properties in both high-temperature and high-load conditions.



# MYTHS THE AND FACTS

Many vehicle owners may not be aware of the engine problems that can occur from using poor quality oil. This is mainly due to some common misconceptions about motor oil. Our goal is to dispel some of these misconceptions.

**Myth:** I think the oil I'm using is good enough because I haven't had a problem with my engine. So there's no need for me to pay extra money for higher quality oil.

**Fact:** You may or may not be able to see the impact of inferior quality oils right away. In a seemingly good performing engine, harmful contaminants may already have entered the engine's lubricating system and begun to cause corrosion, rust, wear, etc. Just because you haven't experienced any symptoms doesn't mean problems don't exist. When problems do become visible, it may be too late or very costly to bring the engine's performance back to normal. It is always advisable to stick to high quality, warranty backed brands for maximum protection.

**Myth:** Older vehicles have already passed the manufacturer's warranty period. There is no need to use quality oil.

**Fact:** Older engines are more prone to wear and tear. An older engine needs quality lubrication to help protect crucial engine parts and ensure long-life.

**Myth:** Good quality oil will leak from the seals of older vehicles.

**Fact:** Good quality oil does not cause leaks. In fact, good quality oil is tested in dozens of industry standard, OEM-approved tests to prove its seal performance. Oils are tested to ensure that they are fully compatible with the electrometric materials from which all automotive seals and gaskets are made. If an older engine is in good condition and does not have oil leaks, good quality oil provides the same advantages as when used in a new engine.

Myth: Synthetic oil is only for new engines or vehicles.

Fact: Quality synthetic motor oil can be used in old as well as new cars including vehicles in which conventional oil was previously used. Synthetic motor oils are beneficial for the good health, long life and top performance of new or old cars.

Myth: Motor oils can cause sludge.

Fact: This is true. Poor quality oils can contribute to sludge build-up. Sludge deposits are formed by a combination of dirt, soot, partially burned fuel, oxidized motor oil, leaked coolant and condensed water vapor produced during combustion. Good-quality motor oil keeps these contaminants separated and held in suspension. They are drained with the oil and not left behind to create deposits or sludge. Using a good quality oil along with regular oil and filter changes will prevent sludge problems from occurring.

Myth: The normal oil change intervals recommended by the OEMs are conservative. It's safe to extend the time between oil changes.

Fact: The normal oil change intervals provided in the owner's manual are not conservative. Engines have become more demanding of an oil, but recommended oil change intervals have not been shortened. According to the definitions in the owner's manuals, most of us drive vehicles in "severe" service conditions. The oil change intervals these demanding conditions are about half as long as normal intervals. Stop-and-go, short-trip, inner city driving creates very tough conditions for an engine oil. We advise against extending any OEM engine oil drain interval recommendations for any type of service.

Myth: You can tell the condition of an oil by its look, smell and color. If it turns dark or goes black quickly, it's not good.

Fact: Nothing could be further from the truth. If an oil is doing its job cleaning the engine, then it will be dirty when it is drained. In the case of diesel engines, the oil may look dirty within a few hours of operation. This indicates that the motor oil is keeping soot, dirt and other combustion contaminants in suspension. These will then be carried to the filter or removed from the crankcase when the oil and filter are changed. Good quality motor oils are formulated to hold these contaminants in suspension until the oil is drained when the oil and filter are changed.

Myth: New or rebuilt engines need to be “broken in” with non-detergent, non-synthetic oil.

Fact: With the technologies used in today’s oil formulations and engine designs, manufacturers no longer recommend the use of non-detergent oils for the break-in period. In fact, engines come factory-filled with high-quality performance motor oil which contains high levels of detergents and dispersant additives.

Myth: Thicker motor oil is better for your engine and increases engine life.

Fact: The main reason vehicle manufacturers recommend thinner or lighter viscosity grades of engine oil is because a gain in fuel economy may be achieved. Lower viscosity oils may help reduce internal engine friction. As a result, it takes less energy to pump the thinner oil throughout the small passages inside an engine.

Thinner motor oil is also essential for easy starting, particularly in cold weather and for good lubrication once the engine starts. Thinner oils, such as SAE 5W-30, will flow faster than heavier motor oils during start-up and initial engine operation helping to protect the engine. The viscosity grade(s) recommended by the vehicle manufacturer depend somewhat on engine design. Engine manufacturers have spent considerable time and expense experimenting with different viscosity grades. The owner’s manual indicates the grades they feel will best protect the engine at specific temperatures. While one manufacturer’s engine may require an SAE 10W-40, another manufacturer’s engine may require a SAE 5W-30 viscosity grade. This is likely due to different tolerances within the engine, field test experience or other engine design factors.

Myth: Synthetic oils are too expensive.

Fact: Not true. Tests and experience have proven that synthetics can greatly extend oil drain intervals, provide better fuel economy, reduce engine wear and enable vehicles to operate with greater reliability. All these elements combine to make synthetic engine oils more economical than conventional, non-synthetic-based oils. In Europe, synthetics have enjoyed increased acceptance as vehicle users look first for performance and long-term protection rather than initial price. As more sophisticated engine technologies place greater demands on today’s motor oils, we will no doubt see an increasing re-evaluation of oil buying habits as well.



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