

10-STEP GUIDE
TO HELP THE TRANSITION
TO **LOWER VISCOSITY
HEAVY-DUTY ENGINE OIL**



AN HF SINCLAIR BRAND

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INTRODUCTION

Making the transition to lower viscosity engine oils requires careful consideration. While improvement in fuel economy is important, if an oil compromises the protection of your engines, it's not a worthwhile trade.

The decision cannot be taken lightly, but it is all about making an educated decision. Careful planning and the use of a high performance engine oil that doesn't compromise on engine protection can yield excellent returns for fleets and drivers alike.

This white paper provides a 10-step process for fleets considering a switch to a lower viscosity engine oil.

STEP 1: CONSULT WITH YOUR ORIGINAL EQUIPMENT MANUFACTURER (OEM)

When considering any change to an engine oil viscosity grade, you should consult with your equipment OEM who will be able to confirm if your warranty will be affected. Even if you are not under warranty, your OEM will have extensive and valuable experience, having tested its models in various environments and with various engine oils.

STEP 2: LOOK FOR THE CORRECT SPECIFICATION

Make sure any new engine oils not only meet the key industry credentials (i.e. API, ACEA) required by your OEM, but also any other OEM-specific requirements. This will ensure you adhere to any warranty requirements and contribute to the appropriate operation of the engine.

STEP 3: SEEK LUBRICANT EXPERTISE

Beyond your OEM, seek the insight of your lubricant supplier. Lubricants are one of the most cost effective and immediate ways to reduce fuel consumption, yet they make up approximately 1% of the total budget for most fleets. Lubricant marketers spend millions of dollars testing their lubricants under various conditions, and in multiple engine types, so they can offer oil recommendations and advice on overall lubrication programs and efficiencies.

We offer full-service support including technical guidance to assist customers with their purchase throughout the lubricant application. The customer is fully backed by a no-nonsense warranty.

STEP 4: CHOOSE SUPERIOR PROTECTION

Today's powertrains run hotter and for longer, so it's important to ensure that your engine is protected at all times. Saving fuel at the expense of protecting your engine is not a compromise worth taking. Look for oil that provides superior protection under all operating conditions.

STEP 5: FIND THE RIGHT OIL

When switching to low viscosity engine oils, there are a few things you should look out for:

High Shear Stability:

A highly shear stable formulation will ensure minimal change to viscosity over time and better handle minor fuel dilution events. This results in better stay-in-grade capabilities and protection for your engine.

Low Temperature Performance:

Look for industry-standard test results such as “Cold Crank Viscosity (CCS)” and “Low Temperature Pumpability (MRV)”; these will ensure that critical components get optimal lubrication, even in the coldest of operating conditions. With improved fluid properties at lower temperatures, these oils do a better and more efficient job of lubricating critical engine parts. They can also increase the life of starters and batteries to combat the additional strain that can occur as a result of anti-idling strategies.

Superior Engine Test Results:

Your engine oil should demonstrate superior engine protection performance against industry recognized tests. It's also important to look for an engine oil that surpasses OEM standards, as these lubricants can provide better engine protection and even offer the potential to safely extend oil drain intervals.

Field Proven Engine Protection:

Field tests provide a better understanding of how new engine oil will perform in the real world. Engine oil demonstrating low iron wear levels, will offer superior engine protection properties. In addition, drain extension could be attained as long as it's done in conjunction with an oil analysis program.

Field Proven Fuel Economy:

Many factors can affect fuel economy, including:

- Driver habits
- Driving terrain
- Weather conditions
- Severity of operating conditions

Fuel economy field tests provide a controlled environment in which real world fuel economy benefits can be assessed. Industry recognized tests, such as the SAE J1321 Type II Fuel Consumption Test, can support fuel economy claims and have strict and rigorous testing guidelines to ensure accuracy in the results.

STEP 6: LOOK FOR THE HTHS VALUE

The HTHS (High Temperature High Shear) value signifies the oil's viscosity in the bearings and highly loaded parts at operating temperature. Lower HTHS generally equates to better fuel economy, but if you go too low, other issues can emerge. It's important not to consider just one parameter but take a holistic view.

STEP 7: UNDERSTAND THE POTENTIAL PITFALLS

In some cases, a change in viscosity grade has been known to cause an issue with the oil pressure indicator. At low revolutions per minute (RPM), it is possible to trigger a low-pressure warning, which could lead to the powering-down of an engine. Sometimes it could be an issue of an electronic update so that the new oil pressure becomes the new normal as opposed to flagging it low compared to the previous higher viscosity oil. OEMs and lubricant experts can support in distinguishing which engines are likely to experience issues with changes in viscosity and work to find solutions to any complications that may arise.

STEP 8: MAKE A TRANSITION PLAN

This is particularly important if you manage a fleet. After obtaining advice from OEMs and lubricant providers, target a representative group of trucks in your fleet and run a trial with candidate lower viscosity oils. Finding a group of trucks which represent the varying range of operating conditions you experience will allow you to see where the greatest benefits can be captured. It is also important to identify any engines that may not be good candidates for lower viscosity oils, e.g. older engine designs, in order to prevent increased oil consumption or bearing wear.

STEP 9: DON'T FORGET OTHER POWERTRAIN LUBRICANTS

Lower viscosity transmission and axle oils can contribute equal or greater fuel savings than the heavy-duty diesel engine oil, with no reduction in durability. Many of the above guidelines also apply when considering new driveline oils but once more, choosing the correct fluid should be done by considering various elements and not just one parameter.



STEP 10: ASSESS THE IMPACT WITH USED OIL ANALYSIS

When making a change of this nature, it is important to have all the facts. An established used oil analysis program should be used to assess the impact of new oil on engine durability and oil performance. It is important to be able to track wear metals and ensure that the new oil has the performance traits required to protect the engine throughout the drain interval. In addition to flagging critical issues like coolant contamination, the oil analysis data may also reveal whether you can safely extend your drain intervals, leading to further cost savings.

WHY SWITCH TO A LOW VISCOSITY ENGINE OIL

In recent times, awareness of our collective impact on the environment has increased demand for fuel saving initiatives. In fact, many countries across the globe have committed to reducing carbon emissions. Through new legislation and collaboration with OEMs, there are plans in place to reduce consumption of fossil fuels in heavy-duty vehicles. However, it's not just the environment that will benefit from these changes.

Fuel is one of the leading operating costs for heavy-duty trucking fleets – often accounting for 30-40% of your overall costs – and even the smallest decreases can have a significant impact on the bottom line.

Switching to low viscosity engine oil is just one of the ways you can reduce overall fuel consumption.

HOW DO LOW VISCOSITY ENGINE OILS WORK?

Lower viscosity engine oils are just as durable and protect critical engine hardware as their higher viscosity counterparts, all which reduce viscous drag on moving parts and enable oil to flow more effectively through the engine, resulting in an increased efficiency of overall engine operations which can improve fuel economy. The results are even more impressive in colder climates, where lower viscosity engine oils can more effectively lubricate engine componentry upon start-up and reduce the time it takes for engines to warm up.

THE JOURNEY TOWARD LOW VISCOSITY

The drive to improve fuel economy has been taking place for some time and to do this, the industry has been moving towards lower viscosity solutions, demonstrated by launch of the API FA-4 oil category in 2016. The category was formulated to get the best out of the more fuel efficient, low emissions diesel engines. Lower viscosity API FA-4 oils minimize frictional losses between moving components of the engine and reduce pumping and rotational losses, resulting in less viscous drag and improved fuel economy. This enables engines to run more efficiently and use less fuel, while still offering excellent levels of wear protection by delivering oil more effectively to moving parts within the engine.

Many OEMs are already benefiting from fuel economy focused products. OEMs including Kenworth, Mercedes-Benz, Volvo, Detroit Diesel and Cummins recommend or allow lower viscosity grade oils, such as SAE 10W-30 and 5W-30. Some OEMs, like Detroit Diesel, are factory filling some units with API FA-4 oils with an even lower HTHS viscosity to provide even better fuel economy.

SAE 10W-30 and SAE 5W-30 engine oils have demonstrated fuel economy savings and are available today without significant capital expense. If fleet owners switch to an API CK-4 oil like DURON™ SHP 10W-30 or DURON UHP 5W-30, or API FA-4 oils like DURON Advanced 10W-30 or 5W-30, versus conventional SAE 15W-40 viscosity grades, they can improve fuel economy while ensuring their engines remain protected in even the most extreme climates.

With PC-12 on the horizon and the journey toward low viscosity engine oils set to continue, the next generation of heavy-duty lubricants will be formulated to support OEMs and fleets meet the new US Environmental Protection Agency (US EPA) and the California Air Resources Board (CARB) heavy-duty on-highway regulations.

Expected to have two categories based on HTHS values and face new performance tests, PC-12 lubricants are expected to offer crucial engine protection and even greater fuel economy and performance benefits.



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