

**SU GRAY**  
CASTROL

**ISSUE:**  
**E005-WKSHP**

## TECH TALK - EXPERT TO EXPERT

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### FUEL EFFICIENT ENGINE OILS

**WE ALL REMEMBER THE DAYS WHEN IT WAS POSSIBLE TO USE “ONE ENGINE OIL” ACROSS MOST VEHICLES WITH CONFIDENCE. THE HARDWARE CHANGES TO REDUCE GREENHOUSE GAS EMISSIONS HOWEVER, HAVE LED TO INCREASINGLY COMPLEX LUBRICANT REQUIREMENTS. THE “ONE OIL SUITS ALL” APPROACH HAS BECOME JUST A FOND MEMORY.**

Vehicle manufacturers globally are required to reduce vehicle emissions to comply with stricter legislation. Reducing the volume of fuel a vehicle uses is an effective method of meeting these lower emissions targets. The European Union has set a fleet average CO<sub>2</sub> target for all new cars in Europe commencing in 2020, these vehicles will appear on our shores complying with these requirements. The financial penalty for breach of this target is significant, with the estimated penalty in 2020 for a single European manufacturer estimated at €350 million (Institute of Mechanical Engineers, 2016).

**One method of reducing fuel usage is to specify the use of lower viscosity lubricants.** Oils which are designed for fuel efficiency exhibit a thinner film of oil in critical areas of the engine such as the ring/liner interface and journal bearings. This thinner film makes for less resistance and therefore lower fuel use. Lubricants which are not designed to be fuel efficient will form a thicker film in these critical areas adding drag and increasing fuel consumption.

This technology is not new. Since 1995 some engines sold in Australia have been designed to use ‘fuel efficient’ lubricants. These engines, including Holden’s VS Commodore and the Ford AU Falcon, utilised new technology which allowed the use of lower viscosity oils without reducing component life through increased friction and wear.

#### WHAT DEFINES A FUEL EFFICIENT OIL?

The viscosity of oil under engine operating conditions is defined under the High Temperature/High Shear (HTHS) criteria. The lower the HTHS viscosity, the thinner the oil film will be. Typically, to be designated a fuel efficient product a lubricant needs to have a HTHS value less than 3.5 mPas.

Two main industry bodies define fuel efficiency specifications; ACEA (European Automobile Manufacturers Association) have categories for both petrol and diesel while ILSAC (International Lubricants Standardization and Approval Committee) governs only petrol. OEM’s also develop their own specifications, for example Holden DEXOS1™ specification.

Not surprisingly, fuel efficient engine oils are now also being recommended in light commercial diesel engines. The emissions strategy for many of these engines already includes exhaust treatments systems such as Diesel Particulate Filters (DPF).

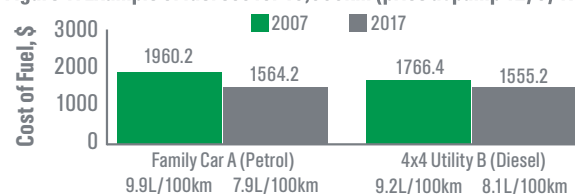
**IT’S IMPORTANT TO BE AWARE THAT FUEL EFFICIENT OILS ARE NOT GENERALLY BACKWARDS COMPATIBLE WITH OLDER VEHICLES.** This impacts workshops who are finding the number of engine oils needed on hand increasing.

#### WHAT’S IN IT FOR YOU AND YOUR CUSTOMERS?

There will be a reduction in fuel costs between older and newer vehicles over a service interval as a result of technology enhancements and lubricant developments. **Engine and transmission changes, along with lubricant changes all add up to a reduced fuel spend.**

The Family Car example (Figure 1) shows \$396 saving per service interval (year). From an environmental position, this equates to 693Kg of CO<sub>2</sub>/15,000km for the one vehicle. If you multiply this by the number ‘Family Car A’ units sold in Australia in 2016 it is closer to 18,000 tonnes of CO<sub>2</sub> reduced versus the 2007 emissions, having a huge impact to our environment. (Calculation based on vehicle sales for Family Car A in 2016). This is in just the one model of vehicle.

Figure 1: Example of fuel cos for 15,000km (price at pump 12/6/17, VIC)



#### A WORD OF CAUTION:

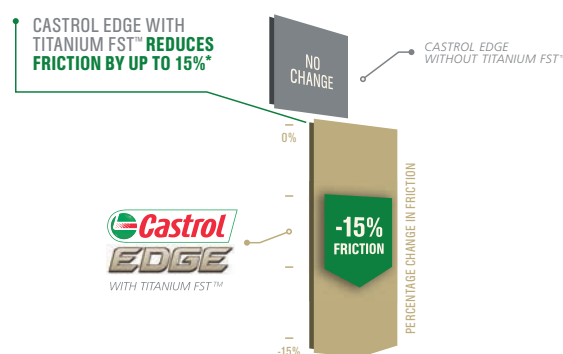
Where it once may have been possible to vary the viscosity of the engine oil without causing an issue, those days are disappearing fast. Hydraulically actuated valve timing, cylinder deactivation and idle stop technologies are sensitive to viscosity.

It is increasingly important to use an engine oil of the correct SAE grade and the correct HTHS viscosity in modern engines - **both petrol and diesel**. Using the correct oil will maximise engine protection, vehicle driveability and performance as well as maximising the saving for your hip pocket. Equally important is the need to continue using oils of ‘traditional’ HTHS to provide the appropriate levels of protection in older engines.

#### TECHNOLOGY DRIVEN:

As a lubricant manufacturer, with 13 technology sites globally, Castrol is constantly developing oils to meet and exceed OEM and industry requirements.

**THE TECHNOLOGY IN CASTROL EDGE WITH TITANIUM FST DELIVERS DOUBLE THE FILM STRENGTH AND 15% LESS FRICTION (HFRR TESTING RESULTS). THIS TECHNOLOGY ENABLES ENGINES TO ACHIEVE BOTH FUEL EFFICIENCY AND DURABILITY.**



\*In our testing, Castrol EDGE with TITANIUM FST™ gave up to 15% lower friction than the same Castrol oil without TITANIUM FST™. Products representing 61% of our 2012 sales volume were tested.

Modern engines are now increasingly complex to lubricate. Castrol can support your workshop to manage your lubricant requirements. Contact us today for a product review.