

News Release



**The Pressure's on; Exxonmobil helps
Vodafone McLaren Mercedes
gear up for the Singapore street race**

Singapore, 28th September 2008 – The Inaugural Singapore Grand Prix on the 28th September is going to make its mark on the Grand Prix Racing calendar when it takes its place as the first ever night race and the third street circuit of this years new and improved calendar. As it will also be the fourth in the four race gearbox rule for Hamilton and second for Kovalainen, the Vodafone McLaren Mercedes team will be seeking added support from their wider technology team, specifically looking towards Mobil Racing Synthetic Gear Oil for friction reduction, gearbox reliability and optimum power efficiency in what will be one of the most demanding races in grand prix racing.

The 2008 introduction of the four race gearbox regulation has presented increased demands on the reliability of the gearbox to withstand these pressures. Singapore will fall within the toughest four race gearbox sequence for both drivers, where there will be a severe combination of high loads around the many corners and fast speeds for some of the longest straights. As it is also a street race comprising of 23 corners, it will focus extreme pressures into this one specific area through excessive gearbox use.

The gearbox itself is made up of 400 parts, of which the oil is a vital component. In addition to this there are numerous rotating bearings, nine of which carry the main transmission loads. All these components are lubricated and cooled by less than 2 litres of Mobil Racing Synthetic Gear Oil which must keep the gearbox temperature under control.

Bruce Crawley, Mobil 1 Motorsport Technology Manager explains, "During a race the oil keeps the gearbox temperature under control by completing 1200 laps of what is

known as the 'cooling circuit'. To give you a reference, this is more than 20 times the number of laps the car does around the average track and amazingly all this is driven by a collection of pumps that efficiently circulate the oil using less power than five domestic lights bulbs."

While the goal of the gear oil is to maintain the life of the gear box throughout the four race regulation, it is also essential to reduce friction and guarantee ultimate power efficiency through to the rear wheels. The gearbox itself is a highly complex component, with seven gear ratios designed to meet the various straight and corner speed requirements of each track – for instance, gear seven is varied to provide 230mph at Monza or 190mph at Monaco.

Drilling down further, the gear oil's ability to cool the gearbox components is only one role the lubricant plays. Each individual gear change takes a toll on the system and requires superior efficiency and perfect momentum. With gear changing now, quite literally at the drivers finger tips, technology has made it possible to change down 6 gears in only 1.2 seconds. Of course, some races require more gear changes than others. The Canadian Grand Prix is one of the most demanding, requiring the drivers to change gears 4000 times in total- that is every 1.3 seconds on average. By comparison, a lesser example is at the British GP where gear changes are made every 1.9 seconds, making a total of 2500 times throughout the race.

With this much activity hidden away under the shell, every single component needs the potential to achieve its optimal power output. In one single race there could be up to 60 million individual gear tooth contacts, such that each drop of oil each lubricates a tooth up to 32,000 separate times.

"The pressure between these teeth is enormous." explains Bruce Crawley, "The normal operating pressure between the gear teeth is equivalent to the weight of over 3000 grand prix racing cars supported on the palm of one hand. Indeed the transient load rises to twice that during a gear change."

While it is important for ExxonMobil and Vodafone McLaren Mercedes to ensure the optimisation of the gearbox through the four race rule, they are also focused on minimizing any friction losses to maximise power output. ExxonMobil, a 14 year technology partner, has created gearbox oil that has evolved year on year. This continued development and improvement is ongoing with new synthetic technology development constantly underway to assist Vodafone McLaren Mercedes in the pursuit of improving race pace performance.

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