



To: All X-1R distributors

From: Nigel (Mac) McKenzie

Cc:

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Subject: Engineering Bulletin – Just What Do Those Numbers On An Oil

Taken from a site known as the Oil Bible

Just what do those numbers on an oil-can mean? What is a 10W30 and is it better for me to use a 0W30 instead. Both of the numbers refer to the viscosity of the oil, with the W standing for Winter and not weight although you will see me confuse the two later in this message. The first number is the viscosity of the oil at Zero degrees Fahrenheit (-18°C) the second is the viscosity of the oil at 210 degrees Fahrenheit (100°C). In other words at the temperatures that water freezes and boils.

Viscosity is a measure of the "flowability" of an oil. More specifically, it is the property of an oil to develop and maintain a certain amount of sheering stress dependent on flow and then to offer continued resistance to flow. Thicker oils generally have a higher viscosity, and thinner oils a lower viscosity. This is the most important property for an engine. An oil with too low a viscosity can shear and loose film strength at high temperatures. An oil with too high a viscosity may not pump to the proper parts at low temperatures and the film may tear at high rpm.

To put it basically you should always use the oil weight recommended by the manufacturer of the vehicle that you drive. In simple terms your engine is designed to work with an oil with a set "thickness" if the oil is thick then not enough oil will pump around the engine, if thin then too much will pump around the engine. Either way you will get unexpected build up of pressure and in an engine this means heat. Using the wrong viscosity oil will result in the degradation of the oil faster than anticipated.

Multi viscosity oils work like this: Polymers are added to a light base (5W, 10W, 20W), which prevent the oil from thinning as much as it warms up. At cold temperatures the polymers are coiled up and allow the oil to flow as their low numbers indicate. As the oil warms up the polymers begin to unwind into long chains that prevent the oil from thinning as much as it normally would. The result is that at 100 degrees C the oil has thinned only as much as the higher viscosity number indicates. Another way of looking at multi-viscosity oils is to think of a 20W-50 as a 20 weight oil that will not thin more than a 50 weight would when hot.

Multi viscosity oils are one of the great improvements in oils, but they should be chosen wisely. Always use a multi grade with the narrowest span of viscosity that is appropriate for the temperatures you are going to encounter. In the winter base your decision on the lowest temperature you will encounter, in the summer, the highest temperature you expect. **The polymers can shear and burn forming deposits that can cause ring sticking and other problems.** 10W-40 and 5W-30 require a lot of polymers (synthetics excluded) to achieve that range. This has caused problems in diesel engines, but fewer polymers are better for all engines. The wide viscosity range oils, in general, are more prone to viscosity and thermal breakdown due to the high polymer content.