Different Type of Oil Ratings

ILSAC standards (Source: CDX Global)

Oil Ratings

Engine oil is subjected to considerable thermal and mechanical stresses as it lubricates the internal combustion engine. Specific engine oils have properties that make them suitable for specific application. However there are limitations to what an oil can do. Therefore there are several different methods for determining an oil's suitability to a specific purpose.

As a result a number of engineering associations have determined a range of standards and references that are now uniformly used to identify a particular oils quality and durability. An example of these standards are:

- The Association des Constructeurs Europeans d'Automobiles (ACEA) standards have been developed in co-operation with european vehicle manufacturers and apply to oils used in european vehicles.(The ACEA ratings are referred to as sequences);
- The American Petroleum Institute (API);and the,
- International Lubricants Standardization and Approval Committee (ILSAC) standards which apply to oils used in US produced and based vehicles.

Many vehicle manufacturers also apply standards for an oil's suitability to their vehicles. This commonly applies to european cars and to those fitted with oil monitoring systems. This also applies to most some US and Japanese manufacturers and some specialty manufacturers.

Given the severity and variation of existing and future vehicle emission regulations, it is essential that the vehicle manufacturers recommendations for lubricants be strictly adhered to. As a result, more stringent ratings are being used when classifying oils.

Failure to do so will possibly jeopardize the emissions warranty, the vehicle failing emission tests or suffering engine damage.

When undertaking an oil change exercise, as a minimum, the vehicle owner's manual should be consulted when no other information is available. This is to ensure that only the correct type of oil is used and thus secure the emissions warranty of the vehicle.

API Ratings

The American Petroleum Institute has set standards for engine oils used in both spark ignition and compression ignition engined vehicles. The appropriate lubricant is identified by two letters. The first identifying lubrication category and the second the lubricant standard. Oils that comply with the various API standards display the API starburst insignia.

Specifically, oils used for spark ignition engines are identified by the letter "S". “S” standing for service category. Engine oils used for commercial category engines are identified by the “C” prefix. Engine oils meeting this standard are suitable for compression ignition engines. The standards are upgraded periodically and can be described as follows.

Service category oils started with the "SA" rating in 1920.

The ratings are as follows:

- SA - is an engine oil without additives.
- SB - Some antioxidant and anti scuff property additives were added
- SC - Meets 1964-1967 requirements of US Automotive manufacturers
- SD - Meets 1968-1971 requirements
- SE - 1972-1979
- SF - 1980-1988
- SG - 1989-1993
- SH - 1994-1997
- SJ - Meets 1998-2000 requirements
- SL - Meets 2001-2003
- SM - 2004-on

SA to SH ratings are now effectively obsolete for use in modern cars however there are still vehicles on the road that recommend the use of oils with these ratings. It should be noted that the SF to SH rating generally exceeds all previous ratings and can be used in vehicles with recommended older ratings. However, some of the newer oils are not recommended for use in older vehicles and manufacturers are now producing oils with specific ratings for use in "older vehicles".

Commercial category oils are not categorized chronologically so the same rules as with the "s" ratings do not apply. In this case the ratting are as follows:

- CA rating is for - Light duty engines operating with high quality fuel.
- CB - Moderate duty operating on lower quality (high sulphur) fuel.
- CC - Moderate to severe duty diesel, 1964
- CD - Severe duty diesel, including turbo.
- CD-II - Severe duty two stroke diesel.
- CE - Turbo/Supercharged heavy duty diesels from 1983
- CF - Off road indirect injection diesel engines and others using a broad range of fuel types including high sulphur. (May be used to replace API CD oils)
- CF-2 - Severe duty two stroke diesel engine service from 1994

ILSAC ratings

The US based International Lubricants Standardization and Approval Committee (ILSAC) is controlled by the API. It includes the major the US vehicle manufacturers, the US engine manufacturers association and Japanese manufacturers who assemble vehicles in the US. The standards work in addition to the API SH, SJ and SM standards for engine oils and are effectively the fuel economy version of the those oil specifications.

The ILSAC GF-1 standard indicates the oil meets both API SH and the Energy Conserving II (EC-II) requirements. It was created in 1990 and upgraded in 1992 and became the minimum requirement for oil used in American and Japanese automobiles.

An EC-II oil provides a 2.7% fuel economy improvement over reference used in a laboratory test engine.

ILSAC GF-1 specifications apply to multigrade oils that have a O, 5 and 1O W rating and 20, 30, 40 or 50 summer rating.

ILSAC GF-2 replaced GF-1 in 1996. The oil must meet both API SJ and EC-II requirements. The GF-2 standards requires 0W-30, 0W-40, 5W-20, 5W-30, 5W-40, 5W-50, 10W-30, 10W-40 and 10W-50 motor oils to meet stringent requirements for phosphorus content, low temperature operation, high temperature deposits and foam control.

GF-3 an oil must meet both API SL and the EC-II requirements. The GF-3 standard has more stringent parameters regarding long-term effects of the oil on the vehicle emission system, improved fuel economy and improved volatility, deposit control and viscosity performance. The standard also requires less additive degradation and reduced oil consumption rates over the service life of the oil.

The GF-4 standard was introduced in 2004 and increases the compliance parameters over GF-3 by a significant margin.

ACEA Sequences

The Association of Constructours of European Automobiles performs the same task as the API, however the standards are more stringent and the descriptors vary. There are 14 oil sequences that identify oil that is appropriate for specific applications.

Engine oils classified for use in petrol engines have an “A” prefix. Engine oils classified for use in Diesel passenger cars use a “B” prefix and Engine oils classified for use in commercial diesel engines use an “E” prefix. A number follows the identifier. A higher number indicating a higher quality oil.

Full ACEA specs are:

- A1 Fuel Economy Petrol
- A2 Standard performance level
- A3 High performance and / or extended drain
- B1 Fuel Economy diesel
- B2 Standard performance level
- B3 High performance and / or extended drain
- B4 For direct injection passenger car diesel engines
- E1 Non-turbo charged light duty diesel
- E2 Standard performance level
- E3 High performance extended drain
- E4 Higher performance and longer extended drain
- E5 (1999) High performance / long drain plus American/API performances