

4T Motorcycle Technology – Moving in the right direction



“Tightening emissions standards across the globe are accelerating the rate at which motorcycle OEM’s are shifting from 2 Stroke to 4 Stroke engine technology. In response to this trend, the Japanese Standards Organisation (JASO) has recently finished the first major revision to its four-stroke motorcycle oil standard.”

Special Requirements

Today’s four-stroke motorcycle engine environment is far more severe than that of the automobile. Motorcycle engines run hotter and faster and tend to have reduced oil capacities to handle engine lubrication and cooling. These factors favour the use of specifically tailored oils, as opposed to standard passenger car motor oils (PCMOs), in modern motorcycle engines.

In recent years automotive oil formulations have changed to meet the needs of increasingly advanced hardware, to deliver fuel economy requirements and to provide improved catalyst compatibility. Motorcycle OEMs have become increasingly concerned about the direction of these changes.

Friction modifiers, used in PCMOs to enhance automotive fuel economy, can lead to clutch slippage in those motorcycles that use the same oil for engine and transmission lubrication, while lower viscosity grades can sometimes lead to increased gear pitting.

The specific requirements of today’s motorcycle engines means that it has become increasingly important to use oils specifically designed to meet their requirements and which are more robust than most current PCMOs.

JASO leads the way

Japan’s historical position as a major motorcycle manufacturing country means that JASO has been at the forefront in the development of four-stroke motorcycle oil standards (to which oil companies such as Syntol Racing Lubricants must adhere)

The current JASO standard, which was introduced in 1999, has three major requirements:

Physical properties, engine performance and friction performance.

The friction requirements categorise oils as either high friction JASO MA or low friction JASO MB, and are central to the JASO four-stroke standard.

In 2005 JASO began reviewing the standard; it became available for use in mid-2006.

The new standard

The new 2006 JASO standard raises acceptable oil quality levels and introduces two further major changes. Firstly, additional clutch friction classifications have been defined to recognise the lower frictional characteristics of new PCMOs and to allow OEMs to better define their oil recommendations. And secondly, phosphorous limits have been added to improve catalyst compatibility if needed in the future, while assuring good antiwear performance.

Revisions to the JASO four-stroke motorcycle oil

	standard 1999	2005 Revision
Engine performance (API)	SE to SJ	SG to SM
Engine performance (ILSAC)	GF-1, GF-2	GF-1, GF-2, GF-3
Engine performance (ACEA)	A1 to A3	A/B, C2, C3
Engine performance (CCMC)	G-4, G-5	Eliminated
Phosphorous level (wt %)	No limits	0.08 – 0.12
SAE Viscosity Grades*	Not Allowed	Allowed if stay-in-grade
Friction Performance	MA, MB	MA2, MA1, MA, MB

*Other than XW-30, XW-40, XW-50

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The JASO MA and MB friction classifications now have maximum and minimum limits and the JASO MA category has been subdivided into two new classifications, JASO MA1 and MA2, which allows further differentiation. It is expected that many PCMOs will be categorised as JASO MA1, whereas oils specifically formulated for four-stroke motorcycle use will be categorised as JASO MA2. Oils formulated to meet JASO MB must typically contain high levels of friction modifiers to significantly alter their friction properties. The intention is that OEMs will be able to recommend JASO MA2 oils for optimum clutch performance.

Friction Performance

Index/Classification	MA2	MA1	MA	MB
Static friction index	1.70 X<2.50	1.15 X<1.70	1.15 X<2.50	0.50 X<1.15
Dynamic friction index	1.80 X<2.50	1.45 X<1.80	1.45 X<2.50	0.50 X<1.45
Stop time index	1.90 X<2.50	1.55 X<1.90	1.55 X<2.50	0.50 X<1.55

Despite the very real concerns about the direction being taken in formulating PCMOs, this standard does not completely eliminate their use in motorcycles. Most PCMOs will be able to meet the frictional requirements for JASO MA, the category currently recommended for the majority of four-stroke motorcycles. Some however will be excluded if they are unable to meet the new phosphorous limits

Sunoco Futura 10W40 JASO MA

Denne olie har gennem mange år været anvendt til mange MC og til stor tilfredshed blandt MC ejere, herunder har vi særlig erfaring gennem 20 år med Honda VFR og Sunoco Futura 10W40.

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