

A Look Inside the AMSOIL Motorcycle Oil Study: Four-Ball Wear Test



Motorcycles are very popular vehicles that inspire tremendous brand loyalty. Many motorcyclists invest a great deal of time and energy into their machines and spare no expense when it comes to the protection and performance of their investments. With nearly five million registered motor-

cycles in the United States and sales topping 750,000 units annually, the potential market for AMSOIL Dealers is almost limitless.

The new AMSOIL Motorcycle Oil Study (G-2156) is an excellent sales tool for Dealers seeking to either break into the motorcycle market or increase their sales. The study compares the test results of 26 different motorcycle oils in the most critical areas of motorcycle oil performance, including wear protection, shear stability and rust protection, helping consumers make educated decisions regarding which oil to use in their motorcycles.

One of the most important functions of any motor oil is wear protection. Because motorcycle engines operate under more severe operating conditions than automobiles, the ability of a motorcycle oil to deliver adequate wear protection is especially important.

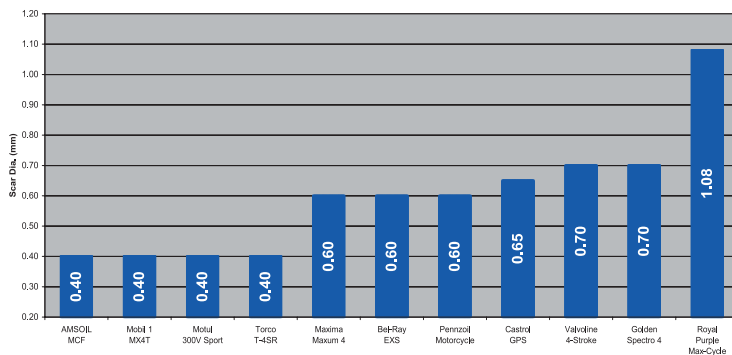
The ASTM D-4172 Four-Ball Wear Test is the standard test used to determine a lubricant's ability to minimize wear in metal-to-metal contact situations. Three steel balls are secured and placed in a triangular pattern within a bath of the test lubricant. With load, speed and temperature kept constant, a fourth ball sits atop the other balls and is rotated and forced into them for one hour. Following the test, the lower three balls are inspected for wear scars at the point of contact. The diameters of the wear scars are measured and the results are reported as an average of the three scars. The lower the average wear scar diameter, the better the wear protection properties of the oil.

For the Four-Ball Wear Test portion of the AMSOIL Motorcycle Oil Study, the loads, speeds and temperatures were maintained at 40 kg,

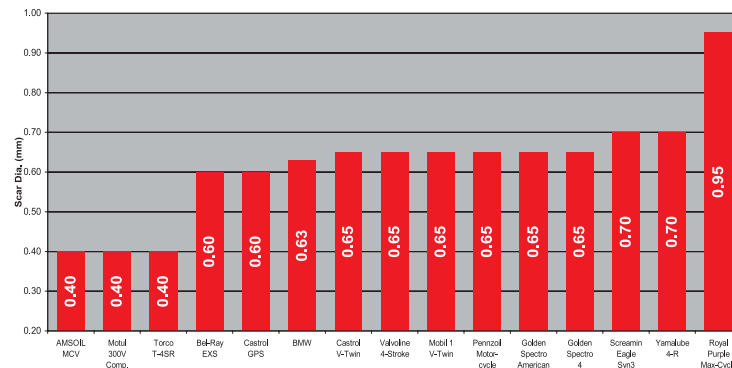
1800 RPM and 150 degrees C respectively for each oil tested. Two separate tests were performed for SAE 40 and SAE 50 oils.

As seen in the graphs, both AMSOIL 10W-40 Synthetic Motorcycle Oil (MCF) and 20W-50 Synthetic Motorcycle Oil (MCV) exhibited minimal wear scars of 0.40 mm, placing them at the top of their respective test groups. Competing motorcycle oils showed wear scars up to twice as large. The wear protection provided by AMSOIL Synthetic Motorcycle Oils is second-to-none, allowing motorcycles to perform better, last longer and require less maintenance.

Results, 4-Ball Wear Test, SAE 40 Group



Results, 4-Ball Wear Test, SAE 50 Group



Although zinc has long been considered an excellent anti-wear additive, it is interesting to note that the oils with the highest levels of zinc, Maxima Maxum 4 in the SAE 40 group and Golden Spectro 4 in the SAE 50 group, did not test in the top of their groups. These results indicate that simply formulating an oil with a high zinc level is not sufficient in minimizing wear.

A coupon offer for one free Motorcycle Oil Study is included in each case of AMSOIL 10W-40 (MCF) and 20W-50 (MCV) Motorcycle Oil. It is also available for purchase.

Stock #	U.S.	Can.
G-2156	2.00	2.60

A Look Inside the AMSOIL Motorcycle Oil Study: Rust Protection



By comparing the test results of 26 different motorcycle oils in the most critical areas of motorcycle oil performance, the AMSOIL Motorcycle Oil Study (G-2156) is an excellent sales tool for Dealers seeking to either break into the motorcycle market or increase their sales. The March issue of the *Action News* took a closer look at the specifics of the Four-Ball Wear Test and how each of the oils fared. This

As seen in the photos and graphs, both AMSOIL 10W-40 Synthetic Motorcycle Oil (MCF) and 20W-50 Synthetic Motorcycle Oil (MCV) showed no rust spots, placing them at the top of their respective test groups. Many competing motorcycle oils failed the test. AMSOIL Synthetic Motorcycle Oils provide unsurpassed rust protection, allowing motorcycles to perform better, last longer and require less maintenance. Order the G-2156 Motorcycle Oil Study to see all the results

Motorcycle Oil Study

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issue examines rust protection.

Rust protection is particularly important in motorcycle applications. Often used seasonally, then stored and unused during the offseason, condensation and moisture within the engine promote rust formation. In addition, the combustion process and short trip driving create condensation and acids that further promote corrosion and rust.

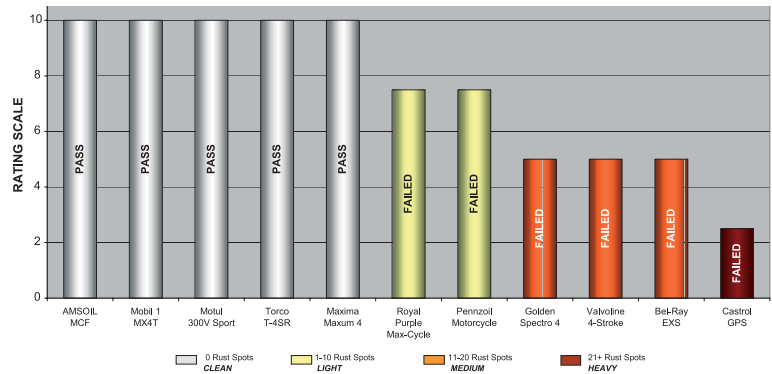
Rust is as abrasive as dirt, causing problems such as scratching and pitting on cylinders, pistons and bearing surfaces, leading to blow-by, lower compression and reduced power and performance. When rust forms on needle bearings, bearing failure results. Rust also causes excessive wear on bearings, camshafts, lifters and gear surfaces.

Motor oil has little or no natural ability to prevent rust. It must be formulated with special rust inhibitors. However, because rust inhibitors typically sacrifice wear protection by competing with antiwear additives for the metal surface, many motorcycle oils are formulated without rust inhibitors. AMSOIL Synthetic Motorcycle Oils are formulated with breakthrough technology that provides outstanding protection against rust without sacrificing wear protection (see Four-Ball Wear Test article in the March *Action News*).

The ASTM D-1748 humidity cabinet test measures a lubricant's ability to protect against rust and corrosion. A standard metal reference coupon is immersed in the test oil before being placed in a humidity cabinet for 24 hours at 120 degrees F. Following the test period, the coupons are removed and inspected for rust. In order to pass the test, an oil may allow no more than three rust spots less than or equal to 1 mm in diameter. Oils allowing more than three rust spots, or one rust spot larger than 1 mm in diameter, fail the test.

Two separate tests were performed for SAE 40 and SAE 50 oils. As seen in the graphs, failing oils were divided into three categories: oils showing 1-10 spots, oils showing 11-20 spots and oils showing over 20 spots.

Results, Rust Protection, SAE 40 GROUP



Results, Rust Protection, SAE 50 GROUP

