

Gear Oil Market is Heating Up

Gear oil has been a hot topic around the industry lately. Vehicle manufacturers, field testers and lubricant manufacturers all are weighing in on the evolution of differentials and its effect on gear oil performance and design. The recent release of the AMSOIL *A Study of Automotive Gear Lubes* white paper is showing consumers that AMSOIL performance is not limited to motor oils.

Raising Awareness

Most consumers are unaware of how important differential maintenance has become. It is the gear lubricant's job to lubricate, cool and protect geared systems. It must also carry damaging wear debris away from contact zones and muffle the sound of gear operation. These tasks have become increasingly difficult with the demands placed on modern differentials, especially in pickups and SUVs. Consumers want more towing capacity, more torque, longer drain intervals and maximum fuel economy. In addition, most vehicles operate under severe service as defined by vehicle manufacturers, but the majority of vehicle owners are unaware of this. Severe service applications include towing, hauling, plowing, off-road use, frequent stop-and-go driving, steep-hill driving and temperature extremes. How prevalent is severe service operation? A September 2007 Lubes 'N' Greases article entitled "Torque & Spark" notes that more than 90 percent of Ford Super Duty pickups are used for towing. That means that more than 90 percent of Super Dutys operate in severe service and require superior gear lubrication.

Gaining Momentum

In recent years, studies have revealed that most differential wear occurs during the break-in period. Because differentials are not equipped with filters, break-in metals are suspended in the oil, causing increased wear as the particles mesh between the gears. Severe-service operation causes additional stress to the differential during the break-in period and can cause premature differential damage or failure. This revelation, along with the marked increase in the ratio of horsepower to differential size, helped to bring differential maintenance to the forefront. Changing the gear lube after the break-in period (about 3,000 miles) is a low-cost maintenance investment that provides a significant payoff, including greatly reduced wear, extended differential gear and bearing life and protection for expensive vehicle investments. In fact, many auto manufacturers now recommend an initial drain interval of between 500 and 3,000 miles. Most consumers are unaware of this recommendation.

Severe Service Remains a Big Challenge

Harold Chambers, a lubrication technology specialist with Ford Transmission & Driveline Engineering, is quoted in Lubes 'N' Greases as saying, "One of the biggest challenges for our vehicles is towing. We also need to run quietly for the life of the vehicle. We want to optimize the power density – that is, get the maximum torque capability with the least fatigue life in the smallest space possible." Chambers also

lists fuel economy and heat generation as major obstacles, both adversely affected by severe service.

"Overall, because of higher durability and towing needs, we're seeing more wear and distress issues with gear sets," said Chambers.

AMSOIL Answers the Call

Today's driveline challenges depend upon gear lubricants to supply solutions. As clearly demonstrated in the gear lube white paper, *A Study of Automotive Gear Lubes*, AMSOIL answers the call with Severe Gear[®] Synthetic EP Gear Lubes. When pitted against 13 of the industry's most popular gear lubes, AMSOIL Severe Gear came out on top, performing well in every category. AMSOIL Severe Gear proved robust enough to maintain its viscosity when subjected to temperature changes. It was durable enough to retain viscosity during use, even during severe service. It proved superior in resisting oxidation, protecting against wear, resisting foaming and providing protection under extreme pressures. AMSOIL Severe Gear ranked first or second in 13 out of 16 tests and never ranked below fourth, the only gear lube to test so well. The high ranking of AMSOIL Severe Gear clearly points to a well-balanced formulation capable of delivering effective, long-lasting lubrication protection to all differential components. Most notable is the superior performance of AMSOIL Severe Gear in the critical areas of extreme-pressure protection and viscosity and oxidation stability.

The Extra Mile

To further verify the findings reported in *A Study of Automotive Gear Lubes*, additional testing was performed on AMSOIL Severe Gear. The L-37 Axle Rig Test evaluates load-carrying, wear protection and extreme-pressure properties of gear lubricants. Already considered a rigorous test, the severity of the test was increased to challenge Severe Gear to the absolute limits in gear lube performance. Following a gear conditioning phase, the test is normally conducted for 24 grueling hours at 80 wheel rpm, 1740 lbf-ft torque per wheel with an axle sump temperature maintained at a constant 275°F (135°C). To further challenge the integrity of AMSOIL Severe Gear Synthetic 75W-90, the test severity was increased by adding 20 percent greater load. Under these test conditions, Severe Gear was tested at 2088 lbf-ft per wheel for a total combined load of 4176 lbf-ft. This is equivalent to a Chevy pickup with a Duramax 6.6 liter engine and Allison transmission pulling a loaded trailer uphill at full throttle in second gear for 24 straight hours. AMSOIL Severe Gear passed all the requirements, even under 20 percent greater load.

Severe Service Requires Severe Gear

Without a doubt, AMSOIL Severe Gear Synthetic Gear Lubricants provide superior, worry-free protection, even in severe service. For a complete look at indisputable proof, order *A Study of Automotive Gear Lubricants* (G2457).