

LUBE

TECHNI-GRAM



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CLARIFYING GL-4 AND GL-6 GEAR OIL CLASSIFICATIONS

Periodically, questions arise about the selection of the proper gear lubricant for particular gear types and operating conditions. Traditionally, the biggest questions arise concerning a minority of automotive manufacturers...particularly certain import automotive manufacturers...calling for a GL-4 Gear Lubricant. Another confusing issue brought on by some gear lubricant manufacturers is the labeling of their product as a GL-6 Gear Lubricant...a classification that is obsolete.

Automotive gear oils are classified much the same as engine oils. There are two types of classifications, A.) service requirements and B.) viscosity. The service requirements are defined by the American Petroleum Institute (API) Service Classification System. The viscosity measurements are set by the Society of Automotive Engineers (SAE). These two systems have different groups of letters and numbers to avoid confusion with engine oils.

The API Service Classifications are based on the type of service in which the components will be used. The designations are used by manufacturers to select lubricants for particular gear types and operating conditions. Gear lubricants must meet a number of requirements which can be supplied only by specially formulated products. Most gears need oils with some degree of extreme pressure (EP) protection to prevent wear, pitting, spalling, scoring, and eventual tooth breakage. Depending on the application, protection against oxidation, thermal degradation, rust, copper corrosion, water emulsification and foaming must also be provided. Viscosities must be tailored to ambient temperature conditions.

Automotive gear oils are used in most final drives, manual transmission, and transaxles of trucks, buses, and passenger cars. To completely specify a gear lubricant, both the API Service Classification and SAE Grade are required. With the possible exception of API GL-1...a service designation that does not allow friction modifiers or extreme pressure additives to be utilized...lubricants for each API designation are formulated with performance additives. The amount and type of additive used depends on the performance required by a particular application.

The API GL-4 classification was issued in 1943. API GL-4 designates the type of service characteristic of gears, particularly hypoid in passenger cars and other automotive type equipment operated under high-speed/low-torque, and low-speed/high-torque conditions. Conventional API GL-4 Lubricants have predominately been replaced by more specialized manual transmission



... to keep it running

fluids...specifically API GL-5 and MIL-L-2105D minimum performance level gear lubricants. Equipment builders then impose additional requirements to meet their specific needs for improved surface fatigue, component cleanliness, syncromesh durability, and viscometrics. These fluids have excellent thermal stability and carefully tailored frictional characteristics to provide smooth synchronization and good shift quality. As a rule of thumb, API GL-4 Designated Gear Lubricants have 50% less additive protection than GL-5 Gear Lubricants.

It is because of the higher percentage of additives in API GL-5 Gear Lubricants that some import auto manufacturers stick to the older GL-4 Designation. Their experience has shown that the extreme pressure additives in some GL-5 Gear Lubricants have poor yellow metal compatibility and can actually attack the yellow metals in synchronizers. This creates an odd quandary within the industry, as virtually all major manufacturers of gear lubricants produce their gear lubricants to at least meet the minimum GL-5 and MIL-L-2105 Specifications. We have even heard of cases where some manufacturers solved the dilemma by simply placing a GL-4 Sticker on a GL-5 Quality Gear Lubricant!

While we certainly do not dispute certain import automobile manufacturers' findings or need for a less aggressive EP Gear Lubricant, we are stating that not all GL-5 EP Chemistry is alike. For years, SWEPCO's 200 Series Gear Lubricants have provided the superior performance and additive protection needed for improved surface fatigue, component cleanliness, syncromesh durability, and viscometrics without negative effects or syncromesh problems. We accomplish this by utilizing the highest quality ... and quite frankly higher in cost ... additives that provide the necessary protection, but with superior yellow metal compatibility. In fact, SWEPCO's 200 Series Gear Lubricants far exceeded the proposed API Gear Lube Category PG-1 (now MT-1) when it was first introduced years ago. The new MT-1 Category defines a gear lubricant which has the thermal stability, high temperature cyclic durability and copper (yellow metal) compatibility level that are not required by current API GL Categories. PLEASE NOTE that API MT-1 does not address the performance requirements of synchronized manual transmission and transaxles in passenger-car and heavy-duty applications. This is due to concern that some conventional MT-1 Gear Lubricants may have a negative effect on the synchronizers. Once again, SWEPCO's cutting edge technology and advanced chemistry formulations eliminates these concerns. SWEPCO's MT-1 Gear Oils provide superior protection and can be used with total confidence in these passenger-car and heavy-duty applications.

In regards to API-GL-6 Category, as previously stated, this is an obsolete classification. The type of service designated by API-GL-6 is characteristic of gears, specifically high off set hypoid gears in passenger cars and other automotive equipment operated under high-speed, high-performance conditions. Once again, SWEPCO's 200 Series Gear Lubricants (except GL-1) not only meet, but exceed, this obsolete classification. Unlike some conventional gear lubricant manufacturers that utilize a marketing ploy of labeling their gear lubricant GL-6 in an effort to imply superior performance, we at SWEPCO opt to list and label our gear lubricants by the highest active API GL-5* rating rather than create confusion among customers.

*Designates For Limited Slip Differentials