

## Technical Service Bulletin

Date: 09-19-2005

**Product Description: Automotive Gear Oils and Manual Transmission/Transaxle Lubes**

**Subject: API GL Performance Selection for Manual Transmissions and Axle Lubricants**

### OBJECTIVE:

To list the current American Petroleum Institute (API) Service Designations for manual transmissions, transaxles and axles, and the AMSOIL products recommended for each API category.

### ISSUES:

Manual transmissions, transaxles and axles contain differences in internal components and in many instances, require different API lubrication performance specifications to meet each manufacturers requirements. API GL performance specifications need to be defined to provide AMSOIL product application assistance. Currently API categories GL-1, GL-4, GL-5 and MT-1 are in use. API categories GL-2, GL-3 and GL-6 are obsolete and will not be covered in this paper.

### DESCRIPTION:

#### API GL-1

The designation API GL-1 denotes lubricants intended for synchronized manual transmissions operating under mild conditions. Oxidation and rust inhibitors, defoamers and pour depressants may be added to improve the characteristics of these lubricants. The use of extreme pressure or friction modifier additives are prohibited.

#### API GL-4

The designation API GL-4 denotes lubricants intended for axles with spiral bevel gears operating under moderate to severe conditions of speed and load or axles with Hypoid gears operating under moderate speeds and loads. These oils may be used in selected manual transmission and transaxle applications where MT-1 lubricants are unsuitable.

#### API GL-5

The designation API GL-5 denotes lubricants intended for gears, particularly hypoid gears, in axles operating under various combinations of high-speed/shock load and low-speed/high torque conditions. Lubricants qualified under U.S. Military Specification MIL-L-2105D (formerly MIL-L-2105C) satisfy the requirements of the API GL-5 service designation.

#### API MT-1

The designation API MT-1 denotes lubricants intended for non-synchronized manual transmissions used in buses and heavy-duty trucks. Lubricants meeting the requirements of API MT-1 service provide protection against the combination of thermal degradation, component wear, and oil-seal deterioration, which is not provided by lubricants in current use meeting only the requirements of API GL-1, 4, or 5. API MT-1 does not address the performance requirements of synchronized transmissions and transaxles in passenger cars and heavy-duty applications.

The latest military specification is MIL-PRF-2105E, which combines the performance requirements of its predecessor (MIL-PRF-2105D) and API MT-1. MIL-PRF-2105E adds the stringent oil seal compatibility and thermal durability test requirements outlined under API MT-1. Also, both MT-1 and MIL-PRF-2105E require a more severe cooper corrosion test (ASTM D-130) than MIL PRF-2105D.

### RECOMMENDATIONS:

#### API GL-1

AMSOIL products recommended for GL-1 applications are:

- CTG (SAE 10W)
- CTJ (SAE 30)
- CTL (SAE 50)

Use AMSOIL CTL in truck and tractor manual transmissions such as Rockwell (Eaton/Fuller) that may require a GL-1 performance specification.

#### API GL-4

AMSOIL product recommended for GL-4 applications is:

- **MTG (SAE 75W-90)**

AMSOIL MTG is recommended for automotive and light truck GL-4 applications where 75W-85, 75W-90 or 80W-90 viscosities and GL-4 performance specifications are recommended. MTG is ideal for muscle car transmissions such as Muncie, Borg Warner, Saginaw, Ford Top-loader, Dearborn and New Process. Also recommended for Gear Vendors Gear Splitters.

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Date: 09/19/05

Distribution: \_\_\_ Internal X All

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### API GL-5

GL-5 lubricants are recommended by certain manufacturers for use in differentials, transmissions, and transfer-cases. AMSOIL products recommended for GL-5 or applications specifying MIL-PRF-2105E applications are:

- **SVG (75W-90)**  
Recommended for 75W-90 or 80W-90 GL-5 applications.
- **SVO (75W-140)**  
Recommended for 75W-140, 80W-140 or 85W-140 GL-5 applications.
- **FGR (75W-90)**  
Recommended for 75W-90 or 80W-90 GL-5 applications.
- **FGO (80W-140)**  
Recommended for 80W-140 or 85W-140 GL-5 applications.
- **AGL 80W-90)**  
Recommended for 80W-90 GL-5 applications.
- **AGM 75W/80W-90)**  
Recommended for Marine 75W-90 or 80W-90 and GL-4 or GL-5 applications.

### MT-1

AMSOIL products recommended for MT-1 or applications specifying MIL-PRF-2105E or non-synchronized transmission applications are:

- **SVG (75W-90)**  
Recommended for 75W-90 or 80W-90 MT-1 applications.
- **SVO (75W-140)**  
Recommended for 75W-140, 80W-140 or 85W-140 MT-1 applications.
- **FGR (75W-90)**  
Recommended for 75W-90 or 80W-90 MT-1 applications.
- **FGO (80W-140)**  
Recommended for 80W-140 or 85W-140 GL-5 applications.
- **AGL (80W-90)**  
Recommended for 80W-90 GL-5 applications

Note: AMSOIL products should be used according to the manufacturers viscosity requirements at designated temperatures.

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