

an area that needed to be addressed in order to achieve improved fuel economy over the life of the oil.

AMSOIL Synthetic Motor Oils resist oxidation longer than petroleum motor oils, maintaining their cooling and lubricating effectiveness far longer than conventional motor oils, while keeping the engine clean and maintaining efficient fuel consumption.

Volatility

The volatility properties of GF-3 oils are improved, lowering oil consumption, extending oil life, easing stress on catalytic converters and improving fuel economy.

AMSOIL Synthetic Motor Oils keep oil consumption at an absolute minimum. Where conventional motor oils can lose up to 15 percent of their original weight in high-temperature conditions, which thickens the oil and contributes to poor circulation, reduced fuel economy, excessive emissions and engine wear, AMSOIL Motor Oils effectively resist vaporization. In fact, AMSOIL Motor Oils easily surpass rigorous European volatility standards, set at 13 percent weight loss. According to AMSOIL Laboratory Director Dave Leitten, "I expect volatility requirements to become increasingly tighter with each new performance category. AMSOIL is well ahead of the game in this area."

Emissions System Protection

An initial goal for GF-3 was to reduce phosphorus levels in engine oils. The primary source of phosphorus in engine oils is in antiwear additives called ZDDP's. Although these additives are extremely effective in wear reduction, some manufacturers believe phosphorus contaminants are harmful to vehicles' catalytic converters. However, since there is not total agreement in the automotive and lubrication industries on this belief, and since automakers weren't comfortable reducing the level of ZDDP in engine oils and sacrificing wear protection, the goal was put on hold for the upcoming GF-4 agenda.

GF-3 does, however, still offer improved emissions system protection through improved oil consumption specifications. The less a motor oil vaporizes, the less phosphorus contaminants end up in the exhaust. Motor oils that demonstrate low volatility present less risk to catalytic converters, despite their phosphorus levels. Because AMSOIL Synthetic Motor Oils keep oil consumption to an absolute minimum, potentially damaging phosphorus contaminants are not an issue. AMSOIL Motor Oils offer the ultimate in both wear protection and emissions system protection, period.

High-Temperature Deposits

GF-3 addresses high-temperature deposits using the IIF and TEOST tests, but the level of improvement is debatable. "We made substantial improvement in addressing high-temperature deposits using the IIF and TEOST tests," says Mike McMillan of General Motors. "Our reference oil tests show that." However, according to Pete Misangyi of Ford, "We didn't get enough in deposit control. Antioxidant or long-life aspects could have been done better. The category could have been more robust from the engine oil life side. We've got improved



base stocks and the category ought to have taken better advantage of that."

The synthetic formulation of AMSOIL Synthetic Motor Oils so effectively resists oxidation, they naturally run cleaner than conventional petroleum motor oils. "At AMSOIL, we use only the finest detergent/dispersant additives during the blending process, and this effectively keeps deposits under control for extended drain intervals," said Leitten.

Low-Temperature Pumpability

GF-3 improvements in the area of low-temperature pumpability were minimal. "The viscometric properties of motor oils at low temperatures can and do change very fast," says Dennis Florkowski of DaimlerChrysler. "I think it's reasonable to expect [aging] oil to retain its pumpability characteristics throughout the entire drain interval. We owe this to our customers. We were not successful with this in GF-3."

Conventional lubricants contain paraffins, or waxes, that thicken and inhibit flow in cold weather conditions. In fact, conventional motor oils may leave critical working parts unprotected for five full minutes after startup. Synthetic motor oils do not contain paraffins, and they remain fluid in low temperatures. AMSOIL Synthetic Motor Oils exhibit outstanding low-temperature pumpability throughout extended drain intervals, permitting easy engine cranking in the most frigid conditions for quick starts and immediate post-startup protection.

Coming Soon: GF-4

Although GF-3 standards are not even a year old, work has begun on the next engine oil standard, GF-4, and the auto industry would like to see it implemented by spring 2004. The list of priorities for GF-4 include even tighter fuel economy specifications, emissions system protection, improved wear protection, reduced phosphorus levels, used-oil pumpability and extended drain intervals. While some engine oil manufacturers have struggled to meet GF-3 specifications and look forward to the new standard with worry and uneasiness, AMSOIL Dealers can rest easy knowing that AMSOIL Motor Oils are world-class products blended to meet the toughest worldwide specifications.