

Fleet and Field Evaluations

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Fleet and Field Evaluations

Fuel Injector Plugging

Current production vehicles equipped with MPFI systems have encountered injector plugging problems that have been associated with the use of gasolines that do not contain adequate amounts of detergents. In severe cases this problem can render a vehicle inoperative. The major effort of this procedure is to reproduce fuel injector plugging under controlled conditions and assess the effect of fuel additives as they relate to injector "clean-up" and "keep-clean." The keep-clean Procedure is now available as an ASTM Procedure (D 5598).

Evaluations of injector flows and spray patterns are conducted during the procedure. In addition, subjective evaluations of vehicle driveability and performance can also be performed. Fuel injector spray patterns can be photo-documented to provide a visual record of procedure results.

Intake System Deposits

Various vehicle procedure programs are conducted in order to assess the effect of fuels and fuel additives on intake and combustion system deposits, and particularly on intake valve deposits. The ability of unleaded gasolines to control intake valve deposit formation can be evaluated with fleet Procedures, the most popular of which is the BMW 10,000-Mile Intake Valve Deposit Procedure performed according to ASTM D 5500.

Road Evaluations for Turbocharger Engine Oils

The usage of turbocharger-equipped vehicles has led to the development of highly specialized engine lubricants. SwRI developed an over-the-road, in-service Procedure to evaluate the performance of new oils as they relate to turbo and engine component wear.

Vehicle Driveability and Performance Procedures

SAE and CRC-type vehicle driveability and performance procedures are used to measure vehicle operation as it relates to the evaluation of fuels, additives, and vehicle components. On-site track facilities, trained personnel, and specialized equipment necessary for the procedures are immediately available.

Vehicle Octane Requirement and ORI Evaluations

Fleet programs for octane requirement and octane requirement increase are conducted as an assessment of engine operating parameters as related to fuel octane number and combustion requirements. The CRC-E 15 road procedure is used for these evaluations.

In-Service Fleet and Field Procedure Evaluations

SwRI routinely provides its clients a broad base of commercial fleets to evaluate fuels, lubricants, hardware, and aftermarket components. These evaluations are tailored, in many instances, to meet specific research and marketing requirements of the industry. These fleets include heavy- and light-duty commercial trucks, buses, taxis, municipal police, and individually owned vehicles.

Intake Valve Sticking Evaluations

Vehicle procedure programs are conducted to assess the effect of fuels and fuel additives on intake valve sticking. The ability of fuels to prevent intake valve stem deposits from causing the intake valves to stick at cold temperatures (-20°C) can be evaluated.

Combustion Chamber Deposit Evaluations

Fleet studies are conducted evaluating the tendency of various fuels to form deposits on the piston tops and cylinder head combustion chambers of various automobile engines. The capability of fuel additives to remove previously formed combustion chamber deposits can also be evaluated. The deposit levels are determined by both thickness and weight following cylinder head removal.

Mileage Accumulation Dynamometers

For rapid, cost-effective automotive testing, SwRI offers around-the-clock mileage accumulation at speeds up to 100 mph. To complement its fleet testing capabilities, the Institute has installed twelve mileage accumulation dynamometers (MADs) that accommodate most cars and light trucks up to 7,000 pounds. Virtually any transient or steady-state driving cycle can be accurately reproduced in this facility. Using this equipment, SwRI can evaluate the durability and performance of various automotive fluids, fuels, components, and emissions control systems.