

Synthetic lubricants on the way

Don't look for major auto manufacturers to recommend using synthetic lubricants as a motor oil any time soon, but keep an eye on what the major fleet operators do if you want to gauge the product's effectiveness.

About 100 persons crowded a three-paper session on synthetic lubricants during the Chicago fall meeting to hear reports on synthetic lubricant development and on specific results with diester synthetics and synthesized hydrocarbon lubricants.

Automobile manufacturers will exhaustively test synthetics before endorsing them, and then the manufacturers probably will recommend a shorter interval between oil changes than their tests validate to provide a "fail-safe" margin for their own products, Robert Trites of Rokay Lubricants Inc. of Plano, TX, told the group.

Session chairman Norman Baker of Celanese Chemical Co., New York, suggested that those interested in synthetics watch how the products are used by large automotive fleet operators during the next few years.

R.H. Boehringer of Emery Industries Inc., Cincinnati, said that synthetics now account for 1 percent of the industry sales. Manufacturers aim at eventually attracting 5 percent, he added.

Synthetics as original equipment for cars are unlikely as long as they remain four to five times as expensive as petroleum oil, Trites said.

Why would anyone want to use a synthetic lubricant if it costs that much more?

First, the lubricant lasts longer. Second, it is more efficient than petroleum counterparts.

Tests by Emery on a diester based lubricant and by Mobil on its synthesized hydrocarbon lubricant M-1 had cars running up to 156,000 and 118,000 miles respectively without an oil drain. Oil was added as needed with less synthetic replacement being needed.

Boehringer and D.S. Taber of Mobil Oil Corp., New York, showed numerous slides of engine interiors after lengthy tests with synthetic and petroleum lubricants. Parts in the synthetic-lubricated engines were cleaner and showed less wear. In Emery tests, petroleum oil was changed every 6,000 miles. Mobil's tests involved similar controls.

Both Emery and Mobil reported improved fuel economy. Trites later noted that gas consumption is influenced by too many variables to pinpoint how much improvement is due solely to synthetic lubricants.

For about five years, Emery has sold a diester-based 5W-20 lubricant for use in Arctic areas of Alaska and Canada. In late September the firm announced that it would soon begin marketing in that same area an SAE 10W-30 SE-CC-CD engine oil and a 75W-90 gear lubricant.

Less wear-and-tear on engines means less down time and a subsequent savings in labor costs, Boehringer said. Furthermore, ester-based oils are more biodegradable than petroleum-based oils.

Hydrolysis of the ester products has not been a problem in laboratory work or in actual use, panel members pointed out. The synthesis begins with as neutral an ester as possible, as low an acidity as can be used.

Boehringer and Taber's presentations included numerous slides of oil pans, crankshafts, cylinders, and other engine parts from engines run with synthetics and with petroleum oil.

Trites, tracing the development of American synthetic lubricants, said that development of aircraft gas turbine (jet) engines spurred interest. Operating temperatures of jet aircraft engines are above the limits of petroleum oils. At 50,000 feet, air temperatures are about -65 F, meaning that a flame-out could quickly chill lubricants to -40 F or colder, he said. If the lubricant thickened, restarting the engine would be impossible, Trites noted. "This would be a

disastrous situation in a single-engine aircraft," he added.

Asked by the Air Force to develop a suitable lubricant, researchers remembered World War II work by German scientists on ester-based synthetics. Using that work as a starting point, they came up with a suitable lubricant.

Some years later, the Army needed a new lubricant for a new diesel engine that would be operating at temperatures above the capabilities of petroleum oil.

The jet engine lubricants were a fresh starting point, Trites said, but the new oil for an automotive type reciprocating engine also faced other problems: corrosion, combustion product removal, sludge and varnish removal, elastomer (seal) compatibility, petroleum compatibility, and hydrolytic resistance.

Synthesized esters with lowered polarity aided compatibility with petroleum products and with seals. Eventually other problems were solved and the Army had a practical Arctic engine oil for its new engines.

Further modifications in subsequent years produced an oil for general commercial use, but one which cost four times more than petroleum engine oil. "Therefore, we decided to try to extend the oil drains by a factor of four," Trites said.

Current tests show adequate performance for drain intervals up to 25,000 miles (or one year); lower oil consumption by up to 45 percent; higher fuel economy and lower crankcase temperatures by up to 50 F.

Commercial and military aviation will stay 100 percent committed to ester-based synthetic lubricants, Trites said, unless some new engine is designed.

Automotive and commercial use will hinge on cost and performance. Trites stressed that the industry should avoid over-selling the synthetics' virtues lest consumers expect too much.

"We know that ester-based synthetic lubricants have a performance edge when the total picture is weighed," he said. "They are not designed to be just another lubricant. They are designed to have an overall beneficial effect on the performance of mechanical equipment such as engines allowing them to operate close to the design capability."

"If you do not feel that you have any trouble operating your equipment, you are not a candidate to become a synthetic lubricant customer." ●

14th World Congress for Fat Research to be Held in England

The 14th World Congress for Fat Research (Science and Technology) will be held Sept. 18 to 22, 1978, in Brighton, England, the International Society for Fat Research has announced.

Persons interested in further information may write to The Assistant Secretary, S.C.I., 14 Belgrave Square, London, SW1X 8PS, England.

Congress chairman will be Dr. P.A.T. Swoboda of ARC Food Research Institute in Norwich, England. Dr. Swoboda has been a member of AOCs since 1964.

Other AOCs members serving on the congress committee are K.G. Berger of Lyons Central Laboratories in London, Prof. F.D. Gunstone of the Chemistry Department of the University of Saint Andrew's in Scotland; and Dr. A.T. James of Unilever Research Laboratory in Bedford, England.

The Congress is being sponsored by the Society of Chemical Industry, the Biochemical Society, The Chemical Society, and the city of Brighton.

Secretary-General of the ISF is Dr. Reinhard Marcuse of Sweden. ●