

Specialized Procedures

- ◆ Screening Procedure to Study the Effect of Alcohol Fuel on Crankcase Oils
- ◆ Bearing Oil Film Thickness Measurement Procedure
- ◆ Exhaust Valve Seat Recession Procedure

Screening Procedure to Study the Effect of Alcohol Fuel on Crankcase Oils

Specifications

None.

Objective

This procedure is used as a screening tool to compare the effect of crankcase oils on bore and ring wear in methanol, M85 or ethanol-fueled spark ignition engines.

Field service simulated

Taxicab service.

Procedure fixture

A carbureted 2.3 liter Ford engine, four-cylinder, overhead camshaft, equipped with a blowby condenser, EGR, PCV, specially designed camshaft baffle, and a "flying flush" system for changing oils. A fuel-injected version is also available.

Procedure parameters

A 24-hour procedure involving six cycles, each cycle consisting of three operating modes (stages). Methanol, M85 OR ethanol fuel is used.

	Stage 1	Stage 2	Stage 3
Time, minutes	120	75	45
Engine, rpm	2500	2500	750
Load, bhp	33.5	33.5	1.0
Oil temp, °F	175	187	120
Coolant temp, °F	135	155	120

Procedure parts evaluated

Metals content in the used oil samples are monitored as wear indicators.

Used lubricant analysis

Used lubricant analysis includes eight elements (17 elements optional).

Pass/fail criteria

None.

Bearing Oil Film Thickness Measurement Procedure

Specifications

None at present.

Objective

The objective of this procedure is to determine the minimum oil film thickness at the front main bearing of a fired engine operated at various speeds, loads and oil temperatures.

Field service simulated

Field service simulated is to be determined.

Procedure fixture

Buick 3.8L, V-6 carbureted engine with instrumented front main bearing.

Procedure parameters

Not specified but normal operation is 2500 rpm, 47 bhp and 1600 rpm, 30 bhp. Both conditions at 100°C, 120°C and 140°C oil temperatures.

Procedure parts evaluated

None.

Used lubricant analysis

None. (Routinely)

Pass/fail criteria

None at present.

Exhaust Valve Seat Recession Procedure

Specifications

None at present.

Objective

The objective of this procedure is to determine the response of gasoline additives and/or lead content in the reduction or elimination of exhaust valve seat recession in engines designed to run on regular leaded gasoline.

Field service simulated

Industrial engines designed to continuously operate at high speeds and loads – such as agricultural, stationary, and marine use.

Procedure fixture

Ford industrial engine with replaceable exhaust valve seat inserts.

Procedure parameters

As normally recommended by the engine manufacturer depending on the engine's application.

Procedure parts evaluated

Exhaust valve seat inserts, exhaust valve guides, and intermediate exhaust valve stem tip to rocker arm clearances are evaluated.

Used lubricant analysis

No used lubricant analyses are performed (routinely).

Pass/fail criteria

None at present. Typically failure is when excessive valve seat recession causes incomplete seating of exhaust valve as determined by the valve tip to rocker arm clearance.