E114323

Sequence VG Test

(ASTM D 6593)

SPECIFICATIONS

API Category SL/SM and ILSAC GF-3/GF-4. Sludge and varnish deposit test method API Category SL/SM and ILSAC GF-3/GF-4. Replacement test for Sequence VE (ASTM D 5302) sludge and varnish.

OBJECTIVE

To evaluate a lubricant's performance in combating sludge and varnish formation in a modern engine.

FIELD SERVICE SIMULATED

Moderate temperature taxicab service, urban and suburban delivery service, job commuting service.

TEST FIXTURE

A fuel-injected 2000 Ford 4.6-liter gasoline engine, 8 cylinder, roller followers, coolant-jacketed rocker covers, and camshaft baffles.

TEST PARAMETERS

A 216-hour test involving 54 cycles, each cycle consisting of three differing operating specifications (stages). Unleaded Haltermann SVGM2 fuel is used, and engine blowby is intentionally increased. Rocker cover jacket temperature is cycled.

	Stage 1	Stage 2	Stage 3
Time, minutes	120	75	45
Engine Speed, rpm	1200	2900	700
Load Manifold Abs. Press., kPa	69	66	Record
Oil Temp, °C	68	100	45
Coolant Temp, °C	57	85	45
Rocker Cover Temp, °C	29	85	29

TEST PARTS EVALUATION

Rate sludge deposits on rocker arm covers, cam baffles, timing chain cover, oil pan baffle, oil pan and valve decks. Rate varnish deposits on piston skirts (thrust) and cam baffles. Inspect for "hot" and "cold" stuck piston compression rings. Rate clogging of oil pump screen and piston oil rings. Measure roller folower pin wear and ring gap increase.

USED LUBRICANT ANALYSIS

- Kinematic viscosity
- Tin content
- Iron content
- Silicon content
- Copper content
- Pentane insolubles
- Aluminum content
- Fuel dilution
- Lead content
- Total base number

PASS/FAIL CRITERIA

PARAMETER	PASS LIMIT
Average engine sludge, minimum	7.8
Rocker cover sludge, minimum	8.0
Average engine varnish, minimum	8.9
Piston skirt varnish, minimum	7.5
Oil screen clogging, % maximum	20
Hot stuck compression rings	NONE
Oil screen debris	Rate and report
Oil ring clogging	Rate and report
Cold stuck rings	Rate and report
Follower pin wear, avg.	Rate and report
Ring gap increase, avg.	Rate and report