



# Sequence VE Test

(ASTM D 5302)

## SPECIFICATIONS

API category SG, SH, and SL. ILSAC GF-1, GF-2, and GF-3. MIL-L-21260D, MIL-L-46167B.

## OBJECTIVE

To evaluate a lubricant's performance in combating sludge and varnish formation and preventing valve train wear in a modern overhead camshaft engine. In comparison to the V-D test, sludging tendency is increased, and wear performance is better discriminated.

## FIELD SERVICE SIMULATED

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

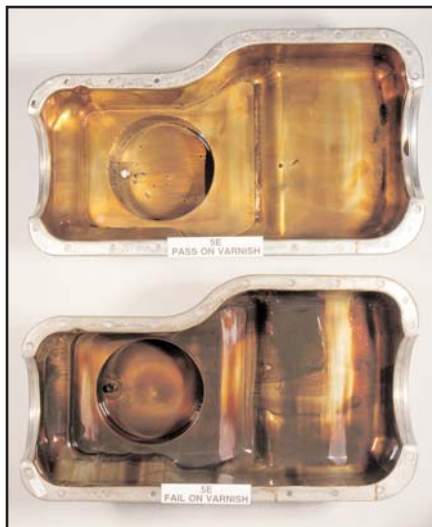
## TEST FIXTURE

A fuel-injected Ford 2.3-liter gasoline engine, 4 cylinder, sliding followers, overhead camshaft, coolant-jacketed rocker cover, and camshaft baffle.

## TEST PARAMETERS

A 288-hour test involving 72 cycles, each cycle consisting of three differing operating specifications (stages). Unleaded Phillips "J" fuel is used, and engine blow-by is intentionally increased. Rocker cover jacket temperature is cycled.

	Stage 1	Stage 2	Stage 3
Time, min	120	75	450
Engine Speed, rpm	2500	2500	750
Load, bhp	33.5	33.5	1.0
Oil Temp, °F	155	210	115
Coolant Temp, °F	125	185	115
Rocker Cover Temp., °F	85	185	85



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## TEST PARTS EVALUATION

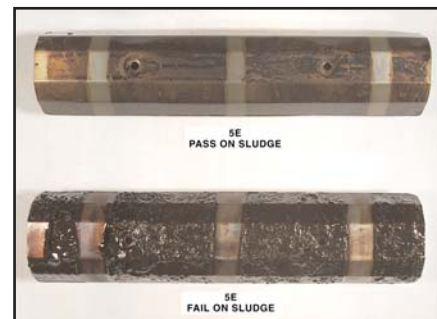
Rate sludge deposits on rocker arm cover, cam baffle, valve deck, front seal housing, cylinder block, and oil pan. Rate varnish deposits on piston skirts, rocker arm cover, cam baffle, cylinder walls, and oil pan. Inspect for "hot" stuck piston compression rings. Rate clogging of oil pump screen, piston oil rings, and camshaft oil feed holes. Measure cam lobe wear and weight loss of follower arms.

## USED LUBRICANT ANALYSIS

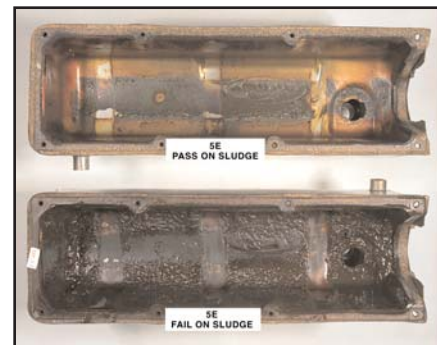
- Kinematic Viscosity
- Iron content
- Copper content
- Silicon content
- Pentane insolubles
- Fuel dilution

## PASS/FAIL CRITERIA

PARAMETER	PASS LIMIT
Average engine sludge, minimum	9.0
Rocker cover sludge, minimum	7.0
Average engine varnish, minimum	5.0
Piston skirt varnish, minimum	6.5
Average cam wear (µm), maximum	127
Maximum cam wear (µm), maximum	380
Oil ring clogging, percent maximum (report only, limit waved)	15
Oil screen clogging, percent maximum	20
Hot stuck compression rings	NONE



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