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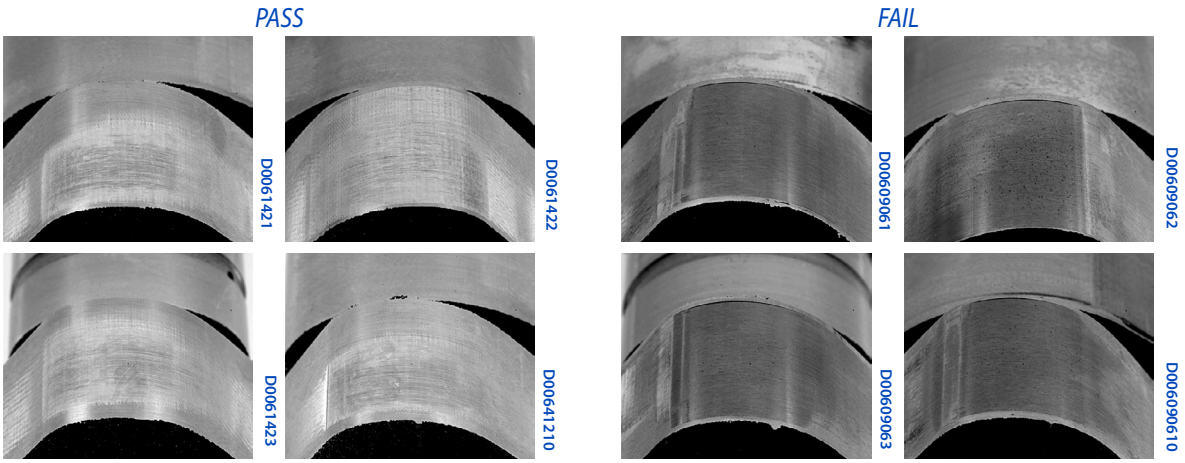
Fuels and Lubricants Research Division

Sequence IVA Engine Test

(ASTM D6891)



Specifications

- API SL/SM/SN
- ILSAC GF-3/GF-4/GF-5

Objective

- Evaluate the effect of an automotive lubricant on controlling cam lobe wear for overhead cam engines equipped with sliding cam followers.

Field Service Simulated

- Taxi, light-delivery truck, or commuter service.

Test Fixture

- 1994 Nissan KA24E 2.4 L fuel-injected, four-cylinder in-line gasoline engine with overhead camshaft, two intake valves, and one exhaust valve per cylinder.

Test Parameters

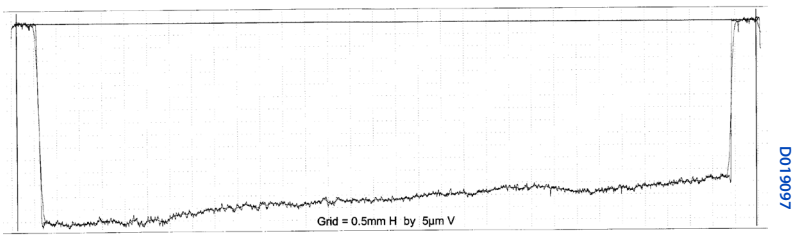
- The test duration is 100 hours involving 100 hourly cycles, each cycle consisting of two operating stages.
- Unleaded Haltermann KA24E Green fuel is used.

Test Parts Evaluation

- The 12 cam lobes are each measured at seven locations, using a surface profilometer to measure maximum wear depth.
- The wear on all seven positions of each lobe is added, then all 12 lobes are averaged for the wear result. This result is the primary evaluation for the test.

Used Lubricant Analysis

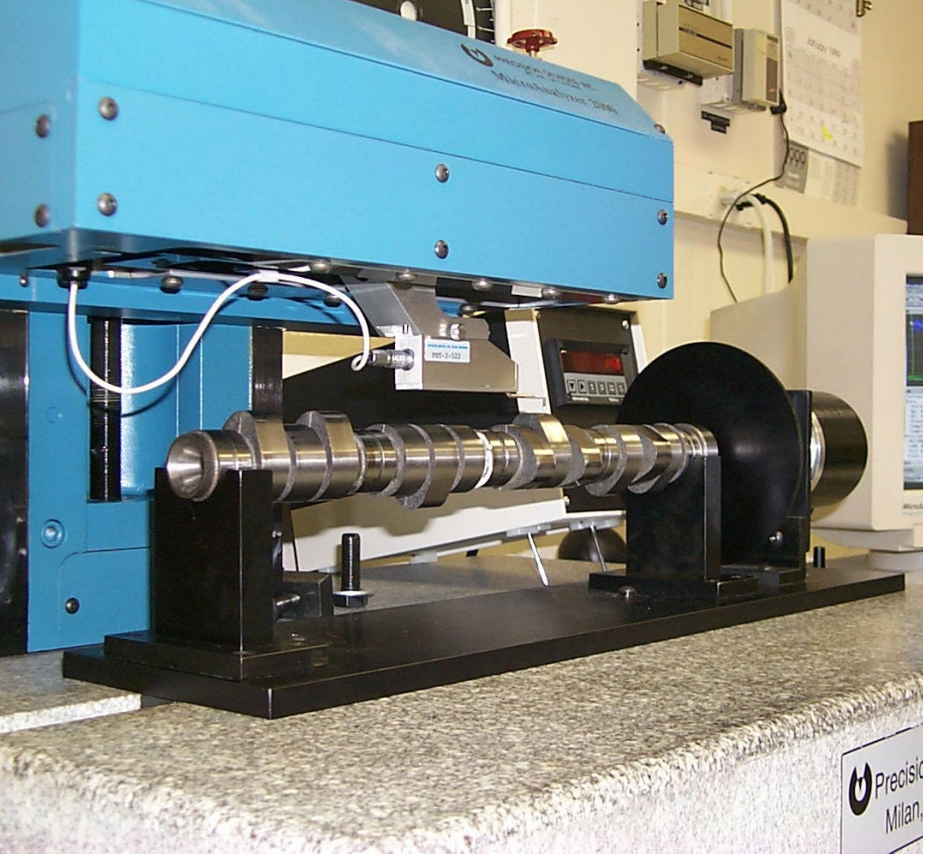
- Viscosity @ 40°C (ASTM D445)
- Fuel dilution (ASTM D3525)
- Wear metals (ASTM D5185)



Test Condition	Stage 1	Stage 2
Time, minutes	50	10
Engine speed, rpm	800	1500
Engine torque, Nm	25	25
Cylinder head lubricant temp, °C	49	59
Coolant temp, °C	50	55

Pass/Fail Criteria

Parameter		Pass Limit
GF-3	Average cam wear, µm	120 maximum
GF-4/5	Average cam wear, µm	90 maximum



We welcome your inquiries. For additional information, please contact:

Khaled Rais
Research Engineer
khaled.rais@swri.org
210.522.3842

Fuels and Lubricants Research Division

Southwest Research Institute
6220 Culebra Road • P.O. Drawer 28510
San Antonio, Texas 78228-0510

swri.org
lubricanttesting.swri.org

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