

SOUTHWEST RESEARCH INSTITUTE®

Fuels and Lubricants Research Division

ASTM Y350M2 Detergency Test (ASTM D4857)

Specifications

- ASTM TC Sequence I

Objective

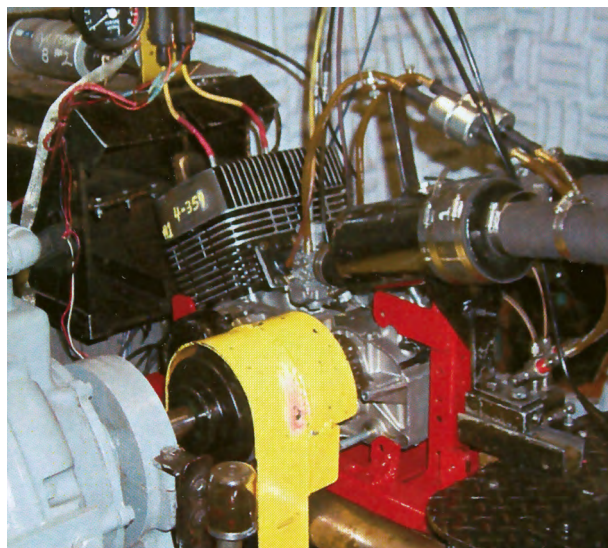
- Evaluate the ability of a two-stroke cycle engine lubricant relative to ring sticking, piston varnish and spark plug fouling.

Field Service Simulated

- Typical air-cooled engines in off-road use.

Test Fixture

- A Yamaha RD350B twin-cylinder, air-cooled, two-stroke cycle, spark-ignition motorcycle engine with a modified fuel system is coupled to a 50-hp dynamometer.
- The separate cylinder arrangement of this engine allows simultaneous evaluation of reference and candidate lubricants.
- External cooling air is supplied to the engine by a variable delivery fan.



Test Parameters

- The test duration is 20 hours on a 5-minute idle cycle, 25-minute part throttle at 6000 rpm, with a one-hour soak period after each 150 minutes of running time.
- Air/fuel ratio and plug temperatures are closely controlled.
- Test conditions are as follows:

Test Parts Evaluation

Particular attention is given to the following conditions at the end of the test:

- Piston skirt varnish
- Piston ring sticking
- Spark plug fouling
- Pre-ignition
- Combustion chamber deposits
- Exhaust port blocking

Used Lubricant Analysis

- None.

Pass/Fail Criteria

- As good or better than the TMC 606 reference lubricant within the specified tolerance on average piston varnish and second ring sticking, exhaust port blocking, and plug fouling is required. The candidate lubricant may not scuff the piston.
- A pass may be given without making a second run if the following conditions all exist after the first run:
 - Piston varnish rating equal to or better than the TMC 606 reference lubricant
 - Second ring sticking merit rating of 9.0 or better
 - No incidence of pre-ignition
 - No more than one incident of plug fouling
 - Exhaust port blocking no more than 5% greater than for the TMC 606 reference lubricant
 - No scuffing or other lubricant-related damage

Parameter	5 Minutes	25 Minutes
Engine speed, rpm	2200	6000
Power, hp	Record	8.5
Spark plug gasket temp, °C	Record	191.6 ± 2.8
Air/fuel ratio	Record	12:5
Fuel/lubricant ratio	50:1	50:1

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

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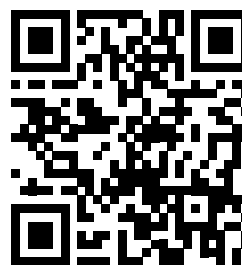
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