SURFACE VEHICLE STANDARD

J2116™ JAN2025

Issued 1990-10
Revised 2025-01

Superseding J2116 JUL2003

Two-Stroke-Cycle Gasoline Engine Lubricants Performance and Service Classification

RATIONALE

Updated formatting and contact information and removed a footnote that is no longer relevant.

1. SCOPE

This SAE Standard was prepared by Technical Committee 1, Engine Lubrication, of SAE Fuels and Lubricants Council. The intent is to improve communications among engine manufacturers, engine users, and lubricant marketers in describing lubricant performance characteristics. The key objective is to ensure that a correct lubricant is used in each two-stroke-cycle engine.

1.1 Background

SAE J1510 previewed the cooperative effort of SAE, ASTM, API, and CEC in developing a universal classification for engine performance. SAE J1510 provides a great deal of information on the properties of two-stroke-cycle lubricants.

SAE J1536 is a classification in rheological terms only. SAE J1536 is a companion classification to SAE J2116. By use of both SAE J1536 and SAE J2116, any lubricant can be classified in terms of both rheology and engine performance.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J1510 Lubricants for Two-Stroke-Cycle Gasoline Engines

SAE J1536 Two-Stroke-Cycle Oil Fluidity/Miscibility Classification

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/J2116_202501/

2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D4681 Specification for Lubricants for Two-Stroke-Cycle Gasoline Engines (TSC-4)

ASTM D4857 Test Method for Determination of the Ability of Lubricants to Minimize Ring Sticking and Piston Deposits in Two-Stroke-Cycle Gasoline Engines Other Than Outboards

ASTM D4858 Test Method for Determination of the Tendency of Lubricants to Promote Preignition in Two-Stroke-Cycle Gasoline Engines

ASTM D4859 Specification for Lubricants for Two-Stroke-Cycle Spark-Ignition Gasoline Engines - TC

ASTM D4863 Test Method for Determination of Lubricity of Two-Stroke-Cycle Gasoline Engine Lubricants

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 NMMA Publications

Available from National Marine Manufacturers Association, 10 S. Lasalle Street, Suite 3500, Chicago, IL 60603, Tel: 312-946-6200, https://www.nmma.org/.

TC-W3

3. PERFORMANCE CHARACTERISTICS

There are a number of engine test rating areas which are indicative of the contribution of a lubricant to the proper performance and durability of a two-stroke-cycle engine. In each category within this classification, the relevant rating areas are given numerical limits which permit assignment of a pass or fail to the performance of a lubricant. These areas include:

a. Ring sticking

b. Varnish (which may include piston skirts, lands, and undercrowns)

c. Preignition

d. Scuffing

e. Exhaust system blockage

Table 1 relates these performance characteristics to the critical lubrication requirements of each of the four Performance and Service categories. To assist in understanding the purpose of each category, normal engine service applications are also provided.

4. PERFORMANCE CRITERIA

Table 2 summarizes the ASTM standard test methods, test engines, primary performance criteria, and status for each category.

Table 1 - Performance and service classification
Two-stroke-cycle gasoline engine lubricants
Critical lubrication requirements and normal service

API Letter Designation	Critical Lubrication Requirements	Normal Engine Service Applications
TA	• Piston Scuffing • Exhaust System Blocking	Mopeds and Other Extremely Small Engines (Typically <50 cc)
TB	• Piston Scuffing • Deposit-Induced Preignition • Power Loss Due to Combustion Chamber Deposits	Motor Scooters and Other Highly Loaded Small Engines (Typically 50 to 200 cc)
TC	• Ring Sticking • Deposit-Induced Preignition • Piston Scuffing	Various High-Performance Engines (Not Outboards) (Typically 20 to 500 cc)
TD	• Piston Scuffing • Ring Sticking • Deposit-Induced Preignition	Outboard Engines

Table 2 - Performance and service classification
Two-stroke-cycle gasoline engine lubricants
Test methods and primary candidate oil performance criteria

Letter Designation	Status	ASTM[1] Designation	Test Engine	Primary Performance Criteria	
TA	Obsolete[2] as of MAR93	Not yet assigned	Yamaha CE50S	Tightening—Method in preparation Exhaust Blocking—Method in preparation	
TB	Obsolete[3] as of MAR93	Not applicable	Vespa 125TS	Tightening—Method never developed Preignition—Method never developed Power Loss—Method never developed	
TC		D4859	Covers Category TC comprehensively, including Primary Performance Criteria		
		D4857	Yamaha RD 350B	Ring Sticking/Deposits In Two (crossover) test runs	
				Second Ring Sticking, Avg Prior to 1999	0.5 Max below ASTM Reference Oil Specified in D4857
				1999 and later	0.5 Max below ASTM Reference Oil Specified in D4857, after application of industry correction factor
				Piston Skirt Varnish, Avg	0.5 Max below Reference Oil
				Plug Fouls	2 Max above Reference Oil
				Preignition (major)	1 Max per run
				Exhaust Blocking	10% Max above Reference Oil
				Scuff/Seizure	None
				In one (without crossover) test run	
				Second Ring Sticking, Avg	9.0 Min
				Piston Skirt Varnish, Avg	Absolutely equal or better than Reference Oil