SINGLE CYLINDER ENGINE TESTS FOR EVALUATING THE PERFORMANCE OF CRANKCASE LUBRICANTS

Part IV: Labeco L-38 Test Method

Not an ASTM Standard

STP 509A

04-509040-12



AMERICAN SOCIETY FOR TESTING AND MATERIALS

SINGLE CYLINDER ENGINE TESTS FOR EVALUATING THE PERFORMANCE OF CRANKCASE LUBRICANTS

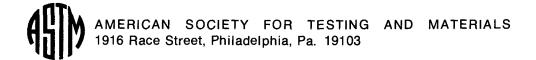
Part IV: Labeco L-38 Test Method

Not an ASTM Standard

Sponsored by Technical Division B on Automotive Lubricants of ASTM Committee D-2 on Petroleum Products and Lubricants

ASTM SPECIAL TECHNICAL PUBLICATION 509A (PART IV)

04-509040-12



Copyright © by American Society for Testing and Materials 1980 Library of Congress Catalog Card Number: 78-74558

NOTE

The Society is not responsible, as a body, for the statements and opinions advanced in this publication.

Printed in Philadelphia, Pa. August 1980

LABECO L-38 TEST METHOD FOR STUDY OF THE OXIDATION CHARACTERISTICS OF CRANKCASE OILS IN THE CLR OIL TEST ENGINE

Related ASTM Publications

- Single Cylinder Engine Tests for Evaluating the Performance of Crankcase Lubricants, Part I: Caterpillar IG2 Test Method, STP 509A (Part I), 1979, bound, \$9.75, 04-509010-12; looseleaf, \$12.75, 04-509011-12
- Single Cylinder Engine Tests for Evaluating the Performance of Crankcase Lubricants, Part II: Caterpillar IH2 Test Method, STP 509A (Part II), 1979, bound, \$9.75, 04-509020-12; looseleaf, \$12.75, 04-509021-12
- Single Cylinder Engine Tests for Evaluating the Performance of Crankcase Lubricants, Part III: Caterpillar 1D2 Test Method, STP 509A (Part III), 1979, bound, \$9.75, 04-509030-12; looseleaf, \$12.75, 04-509031-12
- Miscellaneous Standards for Petroleum Products, 1979, \$38.75, 03-402079-12
- The Relationship Between Engine Oil Viscosity and Engine Performance, Part I, STP 621 (1977), \$15.00, 04-621000-12
- The Relationship Between Engine Oil Viscosity and Engine Performance, Part II, STP 621-S1 (1977), \$12.00, 04-621010-12
- The Relationship Between Engine Oil Viscosity and Engine Performance, Part III, STP 621-S2 (1978), \$15.00, 04-621020-12
- The Relationship Between Engine Oil Viscosity and Engine Performance, Part IV, STP 621-S3 (1978), \$15.00, 04-621030-12
- The Relationship Between Engine Oil Viscosity and Engine Performance, Parts V & VI, STP 621-S4 (1980), \$18.00, 04-621040-12
- Multicylinder Test Sequences for Evaluating Engine Oils, STP 315G (1977), \$20.00, 04-315070-12

L-38

Copies of information letters pertaining to this test may be obtained by contacting:

ASTM Test Monitoring Center P. A. Bennett (Administrator) 4400 Fifth Avenue Pittsburgh, Pennsylvania 15213, U. S. A.

This version was edited by James C. Ballard, 769 Yale, University City, Missouri 63130, with the help of the leader and members of the Written Procedures Subpanel of the ASTM B-II Single Cylinder Surveillance Panel.

L-38

TABLE OF CONTENTS

1.	Scop	oe
2.	Sumi	mary of Methods
3.	Signi	ficance
	3.1	Method
	3.2	Use
	3.3	Validity
4.	Defin	nitions 2
5.	Appa	aratus2
	5.1	Test Engine 2
	5.2	Test Bearing
	5.3	Main Bearings, and Crankshaft and Camshaft
		Thrust Washers 2
	5.4	Carburetor
	5.5	Air Cleaner 2
	5.6	Distributor
	5.7	Spark Plug 3
	5.8	Crankcase Ventilating System 3
	5.9	Oil Filter and Heater 3
	5.10	Cooling System
	5.11	Exhaust System
	5.12	Tin-Plated Engine Parts9
	5.13	Oil Drain Valves 9
	5.14	Power Absorbing Unit
	5.15	Auxiliary Instruments
		5.15.1 Fuel Flow Rate
		5.15.2 Air-Fuel Ratio 9
		5.15.3 Pressures
		5.15.4 Temperatures
	5.16	Procurement of Parts11
6.	Reag	pents and Materials11
	6.1	Fuel11
	6.2	Test Oil
	6.3	Reference Oils11
	6.4	Engine Coolant

SINGLE CYLINDER ENGINE TEST

L-38

	6.5	Cleaning Materials	. 11
		6.5.1 Power Section Cleaning	11
		6.5.2 Oil Heater Cleaning	12
		6.5.3 Copper-Lead Test Bearing Cleaning	13
	6.6	Procurement of Reagents and Materials	
7.	Safet	ty	. 13
8.	Prep	aration of Apparatus	. 13
	8.1	Supplementary Service Information	13
	8.2	Installation of Oil Drain Valves	13
	8.3	Operational Settings and Clearances	13
	8.4	Conditioning and Preliminary Break-In of New	
		and Newly-Rebuilt Engines	14
	8.5	Reconditioning of Engine after Each Test	14
		8.5.1 New Parts	14
	8.6	Cleaning of Oil Pump, Oil Pressure Regulator,	
		Distributor, and Crankcase Breather	15
	8.7	Cleaning of Power Section	15
		8.7.1 General Instructions	15
,		8.7.2 Cleaning of Cylinder Head	16
		8.7.3 Liner Finish	16
		8.7.4 Crankshaft Rear Seal	17
	8.8	Cleaning of Oil Heater	17
	8.9	Cleaning of Copper-Lead Test Bearing	17
	8.10	Measurements	17
	8.11	Engine Assembly Torque Specifications	19
9.	Calib	ration Test Method	19
10.	Proce	edure	20
	10.1	Run-In	20
	10.2	Intermediate Bearing Weight Loss Checks	21
	10.3	Test Operating Conditions	21
	10.4	Warmup Schedule	22
	10.5	Air-Fuel Ratio and Spark Advance	22
	10.6	Shutdown and Oil Drain Procedure	22
	10.7	Oil Sampling and Oil Addition	23
	10.8	Oil Consumption Computation	23
	100	Periodic Massuroments	24

SINGLE CYLINDER ENGINE TEST

L-38

11. Inspe	ection	. 24
11.1	Oil Sample Inspection	. 24
	Engine Part Varnish Rating	
11.3	Engine Part Sludge Rating	. 25
11.4	Test Bearing Weight Loss Determination	. 25
Appendix A	Glossary	. 26
Appendix B	Procurement of Test Parts	. 27
Appendix C	Procurement of Reagents and Materials	. 28
Appendix D	: Safety	. 29
Appendix E	Suggested Salvage Method for Camshaft	
	Bearing Journals	. 30
Appendix F:	Precision Data	. 31
Appendix G	: Specifications for Engine Overhaul	. 32
Appendix H	Data Sheet	. 34

SINGLE CYLINDER ENGINE TEST

L-38

FIGURES

Figure	1	Crankcase Breather: Air Inlet Detail	4
Figure	2	Crankcase Off-Gas Control System	5
Figure	3	Alternate Crankcase Off-Gas Control System	6
Figure	4	Alternate Rocker Cover Airflow Control System	7
Figure	5	Oil Heater and Installation	8