

LUBRICANT- ENGINE OIL- SERVICE FILL

1.0 GENERAL

1.1 Purpose

This standard presents the requirements of a petroleum oil containing additives suitable for lubricating automotive gasoline engines.

1.2 Coverage of this Standard

The lubricants described in this standard are intended only for use as service-fill of engine crankcases.

This standard is intended as a guide for procurement by Chrysler Parts Division. This standard has also been developed for use by the lubricant industry as a guide to the engine oil properties required to protect Chrysler engines.

1.3 Location of Definitions/Abbreviations/Acronyms

Definitions/Abbreviations/Acronyms can be found in Section 5.0 toward the end of this standard.

1.4 Additional Requirements

Any oil marketer wishing to claim MS-6395 performance must send a letter to Chrysler with the form in Appendix A completely filled out (address included in Appendix A). Oil marketers must meet all the requirements contained in MS-6395 and may not claim conformance to selected portions only.

Oils must meet all requirements of the API Engine Oil Licensing and Certification System (EOLCS) for ILSAC GF-5 certification, as specified in API Publication 1509, latest edition. The product must have a current API license.

All engine tests must be conducted according to the procedures specified in the ACC Product Approval Code of Practice (Level I and Level II support is not sufficient for formulation changes described in Bulletin C-24, test on final), as specified for licensing a product to use the ILSAC Certification Mark in API 1509.

It is the intent that the product purchased by Chrysler under this specification (that is, the final formulation), will have passed all requirements defined herein. In the event that Chrysler does not agree with the suitability of any read across, base oil interchange, or other change, Chrysler reserves the right to require additional testing.

2.0 MATERIAL CHARACTERISTICS

The lubricants defined by this standard are engine oils of ILSAC GF-5 quality with additional requirements necessary to protect Chrysler Group LLC engines. Fleet testing, under conditions defined by Chrysler Group LLC Organic Materials Engineering is required to confirm product performance in Chrysler Group LLC engines. These lubricants shall be free from suspended matter, water, and other foreign materials.

3.0 PERFORMANCE REQUIREMENTS OF THE MATERIAL ***

The finished lubricants shall conform to the following:

TABLE 1: PHYSICAL AND CHEMICAL PROPERTIES						
ITEM	METHOD	GRADE	REQUIREMENT			QA
Viscosity 100 °C, cSt	ASTM D445	SAE XW – 20	MIN 5.6 MAX 9.3			C
		SAE XW – 30	MIN 9.3 MAX 12.5			C
Viscosity Index	ASTM D2270	All Viscosity Grades	Report			I
Borderline Pumping, cP	ASTM D4684A	SAE 0W – XX SAE 5W – XX SAE 10W – XX	40,000 Max @ -40 C 40,000 Max @ -35°C 50,000 Max @ -30°C			A
Scanning Brookfield, cP	ASTM D4684A	SAE 0W – XX SAE 5W – XX SAE 10W – XX	40,000 Max @ -40 C 40,000 Max @ -35°C 50,000 Max @ -30°C			I
Gelation Index, (Submit curve)	ASTM D5133	All	12 Max- To be evaluated from -5 °C to temperature at which 40,000 cP is attained or -40°C, or 2°C below the appropriate MRV TP1 temperature, whichever occurs first			P
Apparent Viscosity, cP	ASTM D5293	SAE 0W - XX SAE 5W – XX SAE 10W – XX	6200 Max @ -35 C 6600 Max @ -30°C 7000 Max @ -25°C			C
HTHS, cP After Shear	ASTM D4683A ASTM D6278	SAE XW-20 SAE XW-30 SAE XW-20 SAE XW-30	Minimum 2.6 Minimum 2.9 -After ASTM D-6278, 30 Pass- Minimum 2.3 Minimum 2.6			I
Density	ASTM D1298 or ASTM D4052	All	Initial submission +/- 0.7 %			P
Flash Point	ASTM D92A	All	Minimum 200°C			P
Foam Tendencies	ASTM D892	All		Volume	Stability	
			Seq. I	10	0	A
			Seq. II	50	0	C
			Seq. III	10	0	A
	ASTM D6082		Seq. IV	100	0	A
TAN TBN	ASTM D664A ASTM D2896	All	Report			A
Copper Corrosion A	ASTM D130	All	Maximum 1a			A
Phosphorus, ZDP	ICP or Equivalent	All	0.06 - 0.08 wt%			C
Deposits- Report Rod, I Filter & Total	ASTM D7097A ASTM D6335B	All	Maximum 35 mg Total			I
		All	Total Deposits 30 Mg Max			I
Volatility Distillation - and-Noack	ASTM D6417 and ASTM D5800	All	10% Max @ 371°C			P
			15% Max, 1 hr @ 250°C			I
ROBO	ASTM D7528	All (at fresh oil grade)	Report			A
		All (at one grade above)	60,000 cPs			A

Tests designated "C" are control tests for quality assurance purposes and must be run on each production batch. Tests designated "P" are performance tests and should be run on a regular, but not every batch, basis (minimum four times per year). Tests designated "A" are performance tests which should be run on an annual basis. Tests designated "I" are for initial Engineering qualification purposes only. The supplier may substitute internal test methods after initial approval if a direct correlation to the ASTM method specified is established to the satisfaction of Organic Materials Engineering.

TABLE 2: REQUIRED ENGINE SEQUENCE TEST PERFORMANCE***			
METHOD	CHARACTERISTIC	REQUIREMENT	QA
Sequence VIII ASTM D6709	40 hours- Bearing Weight Loss 10 hours- 100 C Stripped Viscosity	26 mg max Stay in Grade	I
Ball Rust Test ASTM D6557	Average Grey Value	100 min	I
Sequence IIIG ASTM D7320	Viscosity Increase at 40°C Average engine Ratings at EOT -Weighted piston deposit (WPD) -Hot Stuck Rings -Cam and Lifter Average Wear, mg Oil consumption, liters Low Temp. Viscosity, 80 hour EOT, cP	150% Maximum 4.0 min none 60 max Report Measure CCS viscosity of the EOT ROBO sample at the CCS temperature corresponding to original viscosity grade. Run both a and b below a. If CCS viscosity measured is less than or equal to the maximum CCS viscosity specified for the original viscosity grade, run ASTM-D-4684 (MRV TP-1) at the MRV temperature specified in SAE-J-300 for the original viscosity grade. b. If CCS viscosity measured is higher than the maximum viscosity specified for the original viscosity grade in J300, run ASTM-D-4684 (MRV TP-1) at 5 °C higher temperature (i.e., at MRV temperature specified in SAE-J-300 for the next higher viscosity grade).	I
Sequence IIIGB	Phosphorous Volatility	Target 82%, Minimum 79%	I
Sequence VG ASTM D6593A	Average Engine Sludge Rocker Arm Cover Sludge Piston Skirt Varnish Average Engine Varnish Oil Screen Clogging, % Hot Stuck Compression Rings Cold Stuck Rings Oil Screen Debris, % Oil Ring Clogging, %	8.0 min 8.3 min 7.5 min 8.9 min 15 max none Report Report Report	I
Sequence IVA ASTM D6891A	Cam Wear, microns	90 max	I
Sequence VID ASTM D7589	Fuel Economy Improvement Sum of 16 hour, 96 hour results / 96 hour result	SAE XW-20 2.6 / 1.2 min SAE 5W-30 1.9 / 0.9 min SAE 10W-30 1.5 / 0.6 min	I

TABLE 3: ADDITIONAL REQUIREMENTS			
CHARACTERISTIC	REQUIREMENT	TEST METHOD	QA
Homogeneity, Miscibility	Pass	ASTM D6922	I
Emulsion Retention	Pass, provide pictures	ASTM D7563	I

TABLE 4: ELASTOMER COMPATIBILITY					
Run at 150 C and sampled at 70, 168, 504 and 1008 hours					
ELASTOMER (SAE J2643)	CHARACTERISTIC	LIMITS		TEST METHOD	QA
Polyacrylate Rubber (ACM-1)	Volume (% Δ)	-5	15	ASTM D471	I
	Hardness (points)	-10	10	ASTM D2240	I
	Tensile Strength (% Δ)	-40	30	ASTM D412	I
Hydrogenated Nitrile Rubber (HNBR-1)	Volume (% Δ)	-5	5	ASTM D471	I
	Hardness (points)	-5	5	ASTM D2240	I
	Tensile Strength (% Δ)	-20	10	ASTM D412	I
Fluorocarbon Rubber (FKM-1)	Volume (% Δ)	-3	3	ASTM D471	I
	Hardness (points)	-3	3	ASTM D2240	I
	Tensile Strength (% Δ)	-70	10	ASTM D412	I
Ethylene Acrylic Rubber (AEM)	Volume (% Δ)	0	30	ASTM D471	I
	Hardness (points)	-15	10	ASTM D2240	I
	Tensile Strength (% Δ)	-50	30	ASTM D412	I

Oil must pass Chrysler Las Vegas fleet test. The test is run in Chrysler vehicles for 100,000 miles in taxicabs in Las Vegas over two summers and one winter. Chrysler material engineering can supply more detail. Fleet plan must be approved by Chrysler's Material Engineering before testing begins.

Tests designated "I" are for initial Engineering qualification and lubricant industry guidance.

A report of the tests specified in tables 1 - 4, along with the GF-5 approval data, shall be furnished by the vendor. The test report shall be from a recognized laboratory and the tests conducted within the 12-month period preceding the submission of the material to Chrysler Group LLC. A complete copy of the test results identifying the laboratory and date of the tests by the same laboratory, using reference fuels and lubricants shall be provided to Organic Materials Engineering.

Additional tests may be prescribed, as necessary, to establish the suitability of the lubricant for the purpose intended and conformance to the quality desired.

4.0 QUALITY

Refer to CS-9801 for general quality requirements.

Lubricants supplied under this standard shall not deviate from the properties of the original sample by more than the amount indicated below:

TABLE 5: PRODUCT CONSISTENCY REQUIREMENTS			
CHARACTERISTIC	TEST METHOD	DEVIATION	QA
Density	ASTM D1298 or D4052	+/- 0.7 %	C
Elemental Analysis	ICP or equivalent	-10 + 15%	C
Infrared Spectroscopy	Spectrogram shall conform to that of the originally approved material.		C

Tests designated "C" are control tests for quality assurance purposes and must be run on each production batch. The supplier may substitute internal test methods after initial approval if a direct correlation to the ASTM method specified is established to the satisfaction of Organic Materials Engineering.

5.0 DEFINITIONS/ABBREVIATIONS/ACRONYMS

ACC: American Chemical Council

API: American Petroleum Institute

ASTM: American Society for Testing and Materials

ILSAC: International Lubricant Standardization and Approval Committee

6.0 GENERAL INFORMATION

Three asterisks "****" after the section/paragraph header denotes single or multiple technical changes to the section/paragraph. Specific technical changes within a section, subsection, table, or figure may be highlighted in yellow.

Certain important information relative to this standard has been included in separate standards. To assure the processes submitted meet all of Chrysler requirements, it is mandatory that the requirements in the following standards be met.

CS-9800 - Application of this standard, the subscription service, and approved sources

CS-9003 - Regulated substances and recyclability

Within Engineering Standards, the Regulatory (Government-mandated) requirements are designated by <S> and <E> which correspond to Safety and Emission Shields respectively. When applicable, the Chrysler mandated requirements are designated by <D> which correspond to the Diamond symbol and by <A> for Appearance related objectives, respectively.

For specific information on this document, please refer to the contact person shown in the "Publication Information" Section of this document. For general information on obtaining Engineering Standards and Laboratory Procedures, see CS-9800 or contact the Engineering Standards Department at engstds@chrysler.com.

7.0 REFERENCES

Chrysler Standards	ASTM Standards	ASTM Standards	ASTM Standards	ASTM Standards	SAE Standards
CS-9003	ASTM D92A	ASTM D2240	ASTM D5800	ASTM D6891A	SAE J300
CS-9800	ASTM D130	ASTM D2270	ASTM D6082	ASTM D6922	SAE J2643
CS-9801	ASTM D412	ASTM D2896	ASTM D6278	ASTM D7097A	
	ASTM D445	ASTM D4052	ASTM D6335B	ASTM D7320	
	ASTM D471	ASTM D4683	ASTM D6417	ASTM D7528	
	ASTM D664A	ASTM D4684A	ASTM D6557	ASTM D7563	
	ASTM D892	ASTM D5133	ASTM D6593A	ASTM D7589	
	ASTM D1298	ASTM D5293	ASTM D6709		

Chrysler Standards	ASTM Standards	ASTM Standards	ASTM Standards	ASTM Standards	SAE Standards
Quality and Reliability Documents					
Other Documents					
API EOLCS ILSAC GF-5 Available from www.api.org					

TABLE 6: MOPAR PART NUMBERS***			
DESCRIPTION	PART NO. QUART	PART NO. GALLON	PART NO. BULK
SAE 0W-20	68152004PA	681520005PA	None
SAE 5W20	04761872MB	68079549MB	68101996AA
SAE 5W30	04761838MB	04761844MB	68101997AA
SAE 10W30	04761839MB	04761845MB	68101998AA

8.0 ENGINEERING APPROVED SOURCE LIST***

TABLE 7: ENGINEERING APPROVED SOURCE LIST***			
Materials covered by this standard shall only be purchased from the source(s) listed in this table.			
APPROVED SUPPLIER	VISCOSITY	VENDOR CODE	SUPPLIER CODE
Shell Oil, Inc 700 Milam Pennzoil Tower N. Suite 29054 Houston, TX 77002	SAE 0W-20	PC 1443	90117
	SAE 5W-20	500005370 PC 1444	
	SAE 5W-30	500005371 PC 1436	
	SAE 10W-30	500005372	
Imperial Oil Products and Chemicals Division 240 Fourth Avenue SW Calgary, Alberta, Canada T2P 3M9	SAE 0W-20	RN005917AAAB RN005918AAAB	52070K
	SAE 5W-20	RN005911AAB RN005912AAB	
	SAE 5W-30	RN005911AAC RN005912AAC	
	SAE 10W-30	RN005911AC RN005912AC	
Petronas (Europe) Via Santena 1 10029 Villastellone Turin, Italy	SAE 0W-20	1395	64458
	SAE 5W-20	1392	
	SAE 5W-30	1391	
	SAE 10W-30	1393	
Viscosity Oil (Petronas-US) 600 H Joliet Road Willowbrook, IL 60527	SAE 0W-20	1395	64458
	SAE 5W-20	1392	
	SAE 5W-30	1391	
	SAE 10W-30	1393	
Valvoline/Ashland Consumer Markets 3499 Blazer Parkway Lexington, KY 40509	0W-20	780785 VV 9190	94016
	5W-20	VV 1740 VV 3170 VV 9270	
	5W-30	VV 1770 VV 2910 VV 9550	
	10W-30	VV 1290 VV 2960 VV 9350	

TABLE 7: ENGINEERING APPROVED SOURCE LIST***			
Materials covered by this standard shall only be purchased from the source(s) listed in this table.			
APPROVED SUPPLIER	VISCOSITY	VENDOR CODE	SUPPLIER CODE
Petro-Canada Lubricants Inc. 2310 Lakeshore Road West Mississauga, Ontario. Canada L5J 1K2	5W-20	RDL-3589	
	5W-30	RDL-3590	
	10W-30	RDL-3591	

9.0 PUBLICATION INFORMATION

Contact/Phone Number: Bradley Cosgrove, 248-576-6516

Alternate Contact/Phone Number: Haiying Tang, 248-512-0593

Department Name & Department Number/Tech Club/Organization: Organic Materials Engineering, 5840/SciLabs

Date Standard Originally Published: 1976-11-17

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Change Notice:

- Added ASTM D7589 to table 2 and Section 7
- Added Petro-Canada to Table 7
- Added Sequence IV to foam test to Appendix A
- Added ASTM code for Sequence IIIG to Appendix A

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APPENDIX A: DATA SUBMISSION FORM***

Data is required from the Las Vegas fleet test as it is obtained; do not wait until the test is complete to review with Chrysler. Send completed tables to the following address:

Chrysler Group LLC
 CIMS 482-00-13
 800 Chrysler Drive
 Auburn Hills, MI 48326-2757
 Attn.: Engine oil property reports

TABLE A-1: OIL INFORMATION					
Oil Code					
Viscosity Grade					
Oil Description					
Blend information		Name		Percentage	
Base Oil 1					
Base Oil 2					
VM					
DI					
PPD					
Total					

TABLE A-2: PHYSICAL AND CHEMICAL PROPERTY REPORT***		
ITEM	METHOD	RESULTS
Viscosity 100°C, cSt	ASTM D445	
Viscosity Index	ASTM D2270	
Borderline Pumping, cP	ASTM D4684A	
Scanning Brookfield, cP	ASTM D5133	
Gelation Index	ASTM D5133	
Apparent Viscosity, cP	ASTM D5293	
HTHS, cP	ASTM D4683	
After Shear	ASTM D6278	
Foam Tendencies	ASTM D892	
	Sequence I	
	Sequence II	
	Sequence III	
	ASTM D6082 Sequence IV	
Copper Corrosion	ASTM D130	
Phosphorus, ZDP	ICP or equivalent	
Deposits- Report Rod, Filter & Total	ASTM D7097A	
	ASTM D6335B	
Volatility Distillation -and-Noack	ASTM D6417	
	or ASTM D5800	

TABLE A-3: ENGINE SEQUENCE TEST RESULTS***		
METHOD	CHARACTERISTIC	RESULTS
Sequence IIIG ASTM D7320	Viscosity Increase at 40°C	
	Low Temp. Viscosity, EOT, Cp	
	SAE 0W-XX @ -40°C	
	SAE 5W-XX @ -30°C & -35°C	
	SAE 10W-XX @ -30°C & -25°C	

TABLE A-4: ELASTOMER COMPATIBILITY		
Run at 150 C and sampled at 70, 168, 504 and 1008 hours		
ELASTOMER (SAE-J-2643)	CHARACTERISTIC	RESULTS
Polyacrylate Rubber (ACM-1)	Volume (% Δ)	
	Hardness (points)	
	Tensile Strength (% Δ)	
Hydrogenated Nitrile Rubber (HNBR-1)	Volume (% Δ)	
	Hardness (points)	
	Tensile Strength (% Δ)	
Fluorocarbon Rubber (FKM-1)	Volume (% Δ)	
	Hardness (points)	
	Tensile Strength (% Δ)	
Ethylene Acrylic Rubber (AEM)	Volume (% Δ)	
	Hardness (points)	
	Tensile Strength (% Δ)	