



OIL, ENGINE, ACEA E7-08, API CI-4 INITIAL AND
SERVICE FILL, SAE 10W40

WSS-M2C944-A

1. SCOPE

This material specification defines the minimum acceptable performance requirements and physical/chemical properties of engine oils to be used by Ford Motor Company in its worldwide engine/vehicle manufacturing operations.

2. APPLICATION

This specification will be released for initial fill engine oils used for lubrication of heavy-duty compression ignition engines using diesel fuels. The specification will also be used to define engine oils for servicing Ford heavy-duty engines where applicable.

3. REQUIREMENTS

3.1 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.2 PERFORMANCE

Shall meet all the requirements of "ACEA European Oil Sequences E7-08", "American Petroleum Institute Heavy-Duty Diesel Engine Oil CI-4" and additional Ford requirements. Where applicable, the required engine tests shall be conducted in accordance with the most recently approved procedures as described in ASTM Special Technical Publications 315 and the applicable ASTM Standards, Research Reports and Information Letters and with the ACEA sequences.

All tests under surveillance by ASTM must be conducted using test equipment monitored by and calibrated to the requirements of the ASTM Test Monitoring Center.

All engine performance testing used to support a claim of compliance with the ACEA sequences must be generated according to the EELQMS. Suppliers must demonstrate commitment to comply with the ATIEL Code of Practice.

3.3 VISCOSITY GRADE

Shall meet all the requirements of the applicable SAE viscosity grade as defined in SAE Standard J300 (latest revision), "Engine Oil Viscosity Classification".

3.4 PHYSICAL/CHEMICAL PROPERTIES

3.4.1 Low Temperature Pumping Viscosity, at -30 °C, 60,000 mPa.s max
(ASTM D 4684, MRV TP-1)

Date	Action	Revisions	Rev. 0
2010 10 07	Activated		



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- 3.4.2 Copper Corrosion,
(ASTM D 130 or ISO 2160, 3 h at 100 °C) 1b max
(Dark Orange)
- 3.4.3 Seal Compatibility
- Shall be compatible with all current production component materials.
- 3.4.4 Physical Appearance and Odor
- Shall be clear and bright with no objectionable odor.
- 3.4.5 Contaminants
- Shall be free of carcinogens, toxins, metals not removed in refining or from previous use.

3.5 "READ ACROSS" GUIDELINES

All performance tests must be conducted on the final oil formulations. Exceptions may be permitted with supporting supplementary data on similar formulations to allow for approval in the absence of complete testing.

3.6 QUALIFICATION PROCEDURE

3.6.1 Documentation

Supplier must furnish to the affected Materials Engineering activity a completed and certified copy of the attached Supplement A, test reports demonstrating full compliance with all the requirements of this specification and a copy of the final American Chemistry Council (ACC – formerly CMA) and ERC Summaries if available. The need for ACC and ATIEL registration of tests will be determined by the affected Materials Engineering Activity. The copy of the ACC and ERC Summaries should be sent directly from Registration Systems Inc. and ERC to the Materials Engineering Activity unless specifically instructed by that activity.

The test reports must include results on both the candidate oil and the appropriate reference oils. The standard photographs of the test components are considered an essential part of the required test documentation. The oil sample code used for identification in each test document must be consistent. Any deviation in sample code uniformity must be explained and shown on the cover of each test report.

All tests must be certified by a qualified and authorized representative of the test facility.

The supplier shall identify all the formulation changes and modifications that occurred in the test program that coincide with the tests listed in the ACC and ERC Summaries. Individual formulations should be listed in Supplement A, and for registered tests, identified by the line item number and the formulation code.

3.6.2 Verification

The affected Materials Engineering activity reserves the right to conduct verification testing. If the test results do not support the originally submitted data, the supplier must re-test the product in coordination with the affected Materials Engineering activity. This re-test must be conducted and certified by a facility agreed upon test facility.



3.6.3 Chemical and Physical Properties

Supplier shall furnish appropriate chemical and physical properties as required on Supplement A along with the manufacturing limits that apply to the material upon which approval is requested.

3.6.4 Performance Requirements

Conformance to the engine test requirements listed in Supplement A will be determined by using Multiple Test Acceptance Criteria (MTAC), where applicable. All data and reports from the tests used for MTAC must be provided by the supplier. On Supplement A identify the engine tests that have been used to determine the MTAC results by the corresponding line item number on the ACC Summary. The affected Materials Engineering activity reserves the right to use all tests when averaging in place of MTAC.

3.6.5 Quality Control

Upon engineering approval, supplier and affected Materials Engineering activity shall establish mutually agreed upon quality control limits, to be listed on Supplement B, and will be used for ongoing product verifications at mutually agreed upon frequencies. The infrared absorption spectra of the approved material shall constitute the reference standard and shall be kept on file. All samples shall produce infrared spectra that correspond to the reference standard when tested under the same conditions as those specified on the master spectra.

3.7 FLEET TESTING

Materials which, in the opinion of the affected Materials Engineering activity, constitute a significant departure from conventional formulations, whether in base stocks, refining processes or additive packages, must be fleet tested, in addition to the requirements outlined herein. These tests must include the type(s) of service judged to be affected by the difference in formulation technology. The affected Materials Engineering activity should be consulted prior to testing.



ENGINEERING MATERIAL SPECIFICATION

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(Supplement A Page. 1 of 6)

Oil Company: _____

Date: _____

Product Name: _____

Viscosity Grade: _____

Blend Plant Location (s) _____

Base Stocks

Manufacturing Limits

	Nominal Type	Base Oil Volume %	Viscosity, mm ² /s		Sulfur, %	Cloud Point °C/ Pour Point, °C
			100 °C	40 °C		
A.	_____	_____	_____	_____	_____	_____
B.	_____	_____	_____	_____	_____	_____
C.	_____	_____	_____	_____	_____	_____
D.	_____	_____	_____	_____	_____	_____

	Refinery Name and Location	Process Type	Crude Source
A	_____	_____	_____
B	_____	_____	_____
C	_____	_____	_____
D	_____	_____	_____

Note:

	Viscosity (ASTM D 445) (ASTM D 1552) (ASTM D 2622)	Sulfur (ASTM D 129)	Cloud Point (ASTM D 2500)	Pour Point (ASTM D 97)		
	Additives Type/ Function	Manufacturer Name	Code	Description	Carrier Oil In Additive Volume %	Additive In Finished Oil weight %
E						
F						
G						
H						
I						

Signature _____

Title _____



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ENGINEERING MATERIAL SPECIFICATION

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(Supplement A Page. 2 of 6)

Oil Company: _____

Date: _____

Product Name: _____

Viscosity Grade: _____

Product Code: _____

DV TEST REQUIREMENTS

Dynamometer and vehicle test procedures announced by Ford Otosan Product Development Engineering should be applied during oil validation stage.

Performance Requirements	Test #/Date	Specification	(MTAC) Test Results
Wear			
OM646-LA (CEC L-099-08)			
Cam wear outlet, (avg. max. 8 cams), μm		≤ 155	
OR			
OM602A (CEC-L-51-A-97)			
Average Cam Wear, μm		50 max	
Viscosity Increase at, 40 °C, %		90% max	
Average Bore Polishing, %		7% max	
Average Cylinder Wear, μm		20.0 max	
Oil Consumption, kg/test		10.0 max	
Soot in Oil			
Mack T-8E, 300 hrs (ASTM D 5967)			
Relative viscosity at 4.8% soot			
	1 test	1.8 max	
	2 test avg	1.9 max	
	3 test avg	2.0max	
Soot included Wear			
Cummins ISM			
Rocker pad average weight loss			
At 3.9% soot			
	1 test	7.5max	
	2 test	7.8max	
	3 test avg	7.9max	
Oil filter diff. press @150hr, kPa			
	1 test	55max	
	2 test	67max	
	3 test avg	74max	
Engine sludge, merit			
	1 test	8.1min	
	2 test	8.0min	
	3 test avg	8.0min	
OR			
Cummins M11 High Soot test with EGR			
Crosshead weight loss, mg			
	1 test	20.0 max	
	2 test avg	21.8 max	
	3 test avg	22.6 max	

Signature _____

Title _____



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