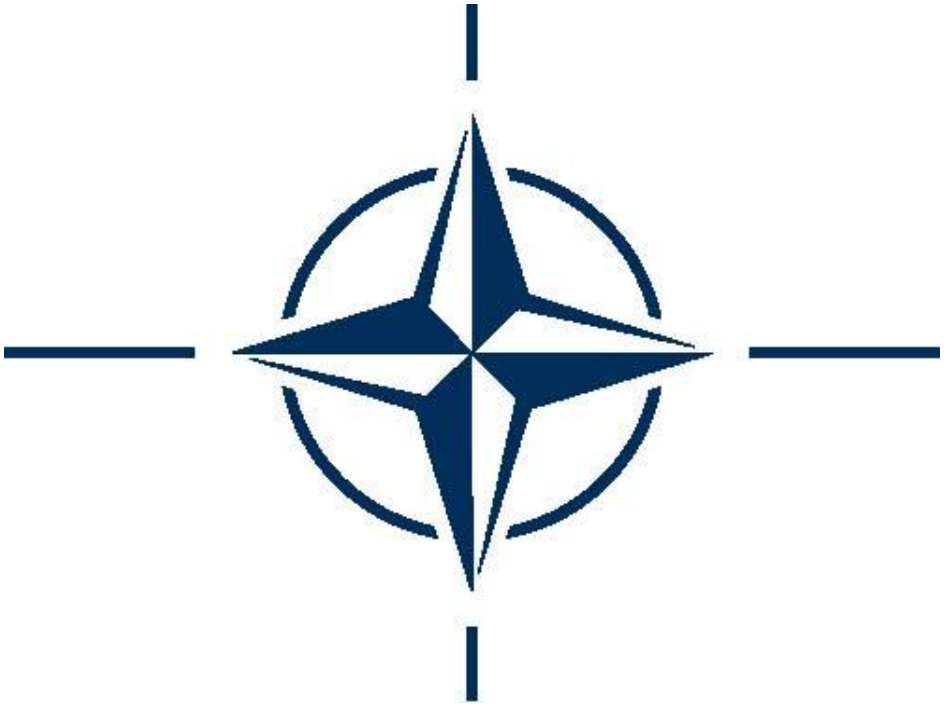
NATO STANDARD

AFLP-7091

GUIDE SPECIFICATION FOR NATO LAND SYSTEM OILS FOR ENGINES AND TRANSMISSIONS

Edition B Version 2
DECEMBER 2019



NORTH ATLANTIC TREATY ORGANIZATION

ALLIED FUELS AND LUBRICANTS PUBLICATION

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NORTH ATLANTIC TREATY ORGANIZATION (NATO)

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NATO LETTER OF PROMULGATION

3 December 2019

1. The enclosed Allied Fuels and Lubricants Publication AFLP-7091, Edition B, Version 2, GUIDE SPECIFICATION FOR NATO LAND SYSTEM OILS FOR ENGINES AND TRANSMISSIONS which has been approved by the nations in the PETROLEUM COMMITTEE, is promulgated herewith. The agreement of nations to use this publication is recorded in STANAG 7091.

2. AFLP-7091 Edition B, Version 2, is effective upon receipt and supersedes AFLP-7091 Edition B, Version 1 which shall be destroyed in accordance with the local procedure for the destruction of documents.

4. This publication shall be handled in accordance with C-M(2002)60.

Zoltán GULYÁS
Brigadier General, HUNAF
Director, NATO Standardization Office

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RECORD OF RESERVATIONS

CHAPTER	RECORD OF RESERVATION BY NATIONS
The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations.	

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RECORD OF SPECIFIC RESERVATIONS

[nation]	[detail of reservation]
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SECTION 1 GENERAL

0101. STANAG 1135, Section 4 - Interchangeability chart of NATO standardized fuels, lubricants and associated products - lists under individual product descriptions of national specifications which have been agreed as interchangeable.

0102. Under previous agreements, a single national specification has been selected for each land systems product to provide the quality standard which other nations' specifications are expected to meet in order to achieve interchangeability. Since product development is constantly in progress and national specifications are frequently revised to take advantage of this, a nation whose specification is used as a guide may find it difficult to make such changes without altering the product quality standard in a manner unacceptable to other nations. Therefore, a nation that has made technical changes to a specification listed in Table-1 (page1-2), is to send it to the AC/112 – Petroleum Committee Staff Officer for distribution to the AC/112 Army Fuels and Lubricants Working Party (Army FLWP) delegates at least one month prior to discussion at the annual ARMY FLWP meeting.

0103. NATO guide specifications have therefore been prepared to define the minimum quality requirements of the most important products. Further specifications may be prepared as considered necessary. The values specified in the sections of this AFLP shall also apply to stored product subject to re-inspection. The requirement, frequency and test parameters are specified in STANAG 4714/AFLP-4714 - Minimum quality surveillance of lubricants and associated products.

NO	NATO CODE	PRODUCT DESCRIPTION (AS LISTED IN STANAG 1135)	GUIDE SPECIFICATION (NOTE 1)
(a)	(b)	(c)	(d)
1	O-185	Lubricating oil, gear extreme pressure, grade 75W, API GL4	see Section 4
2	O-186	Lubricating oil, gear extreme pressure, grade 75W, API GL5	see Section 4
3	O-226	Lubricating oil gear extreme pressure, grade 80W-90	see Section 4
4	O-228	Lubricating oil gear extreme pressure, grade 85W-140	see Section 4
5	O-236	Lubricating oil engine severe duty Diesel & gasoline service 15W-40	see Section 2
6	O-237	Lubricating oil engine severe duty Diesel service, grade 10W	MIL-PRF-2104 M, Grade 10W
7	O-238	Lubricating oil engine severe duty Diesel service, grade 30	MIL-PRF-2104 M Grade 30
8	O-239	Lubricating oil engine severe duty Diesel service, grade 50	NME-2992
9	O-1176	Lubricating oil engine severe duty multigrade 10W-30	D.STAN 91-113 OMD-90
10	O-1177	2 strokes spark lubricating oil biodegradable	DCSEA 242
11	O-1178	Lubricating oil heavy duty engine multigrade 5W-30	see Section 3
12	O-1179	Lubricating oil engine duty multigrade 5W-40	see Section 3
13	O-1180	Lubricating oil engine multigrade 10W-40	see Section 3
14	O-1236	Lubricating oil severe duty Diesel engine 15W-40	MIL-PRF-2104 Grade 15W-40

Table - 1

Note 1 – Consult STANAG 1135 for the applicable version unless otherwise indicated herein

SECTION 2 NATO GUIDE SPECIFICATION FOR LUBRICATING OIL ENGINE, SEVERE DUTY, DIESEL & GASOLINE SERVICE O-236 (GRADE 15W-40)

NO	REQUIREMENTS	UNITS	TEST METHODS	LIMITS	NOTES
(a)	(b)	(c)	(d)	(e)	(f)
1	Flash point	°C	ISO 2592	+195 min.	
2	Total Base Number	mg KOH/g	ISO 3771	12 min.	ASTM D 2896 technical equivalent
3	Sulfated Ash	wt %	ISO 3987	1,5 max.	ASTM D 874 identically, DIN 51575 technical equivalent; NOTE 1
4	Viscosity HTHS	mPa.s	CEC L-036-90	3,5 min.	
5	Evaporation Loss	%	CEC L-040-93	13 max.	
6	Foaming Tendency, Sequence I / II / III	ml	ASTM D 892	10/50/10	
7	Load carrying capability	Load Stage	CEC L-07-95	11 min.	Failure Load stage, FZG
8	Engine Performance			ACEA E3-96 (obsolete)	

NOTE 1: ACEA E 4: 2,0 wt % max. Limitation to 1,5 wt % for use in gasoline and two stroke diesel engines

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SECTION 3 NATO GUIDE SPECIFICATION FOR LUBRICATING OIL, SEVERE DUTY ENGINE MULTIGRADE 5W-30: O-1178; LUBRICATING OIL ENGINE SYNTHETIC GRADE 5W-40: O-1179 AND GRADE 10W-40: O-1180

NO.	REQUIREMENTS	UNITS	TEST METHODS	LIMITS			NOTES
				O-1178	O-1179	O-1180	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1	SAE Viscosity Grade		SAE J 300	5W-30	5W-40	10W-40	
2	Flash point	^{o}C	ISO 2592	200 min.			
3	Total Base Number	mg KOH/g	ISO 3771	9 min.			ASTM D 2896 technical equivalent
4	Sulfated Ash	wt %	ISO 3987	1,65 max.	1,65 max.	1,0 max.	ASTM D 874 identically, DIN 51575 technical equivalent
5	Viscosity HTHS	mPa.s	CEC L-036-90	3,5 min.			
6	Evaporation Loss	%	CEC L-040-93	13 max.			
7	Foaming Tendency Sequence I / II / III	ml	ASTM D 892	10 / 50 / 10			
8	Load carrying capability	Load Stage	CEC L-07-95 CEC L-84-02	10 min.	9 min.	10 min.	Failure Load Stage FZG
9	Engine performance			ACEA E2-96 (obsolete)	ACEA A3 / B4 / E7	ACEA E6 + API CI-4	

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SECTION 4 NATO GUIDE SPECIFICATION FOR LUBRICATING OIL, GEAR: EXTREME PRESSURE O-185 (GRADE 75W) O-186 (GRADE 75W); O-226 (GRADE 80W-90); O-228 (GRADE 85W-140)

NO	REQUIREMENTS	UNITS	TEST METHODS	LIMITS				NOTES
				O-185	O-186	O-226	O-228	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
1	API Classification			API GL-4	API GL-5	API GL-5	API GL-5	
2	SAE Viscosity Grade		SAE J 306	75W	75W	80W-90	85W-140	
3	Channel Point	° C	FED-STD 791-3456	- 45 max.	- 45 max.	- 35 max.	- 20 max.	
4	Flash Point	° C	ISO 2592	+150 min.	+150 min.	+165 min.	+180 min.	
5	Foaming Tendency Seq. I / II / III	ml	ASTM D 892	20 / 50 / 20				
6	Copper Corrosion (+121 °C, 3 h)		ISO 2160	2 a max.				
7	Gear Performance							
7.1	Thermal Oxidation Stability (+100 °C, 50 hrs) - Viscosity Increase - Pentane Insolubles - Toluene Insolubles - Carbon Varnish - Sludge	 % % % rating rating	ASTM D 5704 (L-60-1)	(1)	100 max. 3 max. 2 max. 7,5 min. 9,4 max.			(1) Only additive-packages with enhanced thermal stability, approved in L-60-1 test are permitted

NO	REQUIREMENTS	UNITS	TEST METHODS	LIMITS				NOTES
				O-185	O-186	O-226	O-228	
7.2	High Speed – Low Torque High Torque – Low Speed	rating rating rating rating rating	ASTM D 6121 (L-37)		Ridging: 8 min. Rippling: 8 min. Wear: 5 min. Pitting / Spalling: 9,3 min. Scoring: 10 min.			
7.3	High Speed and Shock Loading Scoring – Pinion and Ring		ASTM D 7452 (L-42)		Equal to or better (lower) than the mean scoring value of the passing reference oil test results used to calibrate the stand.			
7.4	Corrosion Resistance	rating	ASTM D 7038 (L-33)		Final rust: 9,0 min.			

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