CORRECTED Table H-7: AOAP eBallot - Addition of New Low Viscosity Grades into ILSAC GF-6B

The AOAP Ballot included a draft of Table H-7 - ILSAC GF-6B Passenger Car Engine Oil Standard which contained a transcription error from SAE J300 for the *Shear Stability (Min)*. The draft of Table H-7 has been updated to give the correct Shear Stability (Min) for SAE 0W-8 and SAE 0W-12 viscosity grades.

This is an editorial correction of the AOAP Ballot and does not represent a change in oil viscosity performance. The corrected Table H-7 - ILSAC GF-6B Passenger Car Engine Oil Standard is provided as a reference to how the Low Viscosity Grades, SAE 0W-8 and SAE 0W-12 will be included in ILSAC GF-6B.

The AOAP Ballot is Open for Voting and Comment until March 31, 2023. All AOAP Voting Members can access the ballot to Vote/Comment or Make Changes. The Ballots will not be closed until March 31, 2023.

AOAP members Vote on the ballot using the eBallot at http://mycommittees.api.org/lubricants/AOAP/default.aspx .

AOAP Interest members may comment using the eBallot at http://mycommittees.api.org/lubricants/AOAP/default.aspx

AOAP eBallot - Addition of New Low Viscosity Grades into ILSAC GF-6B

The AOAP met by Teams/Teleconference on January 31, 2023, to review the presentation "Addition of Low Viscosity Grades to GF-6B". The presentation reviewed the addition of the JASO M 366 Fuel Economy Test and adoption of some ILSAC GF-5 performance levels for the SAE 0W-8 and SAE 0W-12 Viscosity Grade Oils. After the review of the presentation a motion was made to ***Ballot Inclusion of Low Viscosity Grades SAE 0W-8 and SAE 0W-12 into Table H-7 - ILSAC GF-6B Passenger Car Engine Oil Standard.***

The motion detail is:

Motion	Ballot* the inclusion of Low Viscosities Grades SAE 0W-8 and SAE 0W-12, as presented, into Table H-7 - ILSAC GF-6B Passenger Car Engine Oil Standard. * Electronic Ballot to be a minimum 30 Day Ballot * Ballot will be declared Passing with an affirmative consensus and review and resolution of negatives and comment.
Motion by:	Bill O'Ryan, API
Seconded by:	Eric Kalberer, Shell

The Montion passed on a Voice Vote of the AOAP with the instruction that the Electronic Ballot was to be a 45 Day Ballot.

AOAP members should Vote on the motion "Ballot* the inclusion of Low Viscosities Grades SAE 0W-8 and SAE 0W-12, as presented, into Table H-7 - ILSAC GF-6B Passenger Car Engine Oil Standard." using the eBallot at http://mycommittees.api.org/lubricants/AOAP/default.aspx .

Ballot supporting documentation, presentation "Addition of Low Viscosity Grades to GF-6B" and Draft Table H-7, are included as Annex 1.

This eBallot will close on Friday March 31, 2023.

All Negative Votes must include comments which:

a) Describes the section to which the negative ballot pertains
b) Gives substantive reason(s) for negative vote.
c) Proposes wording or action to resolve negative vote.

All Abstentions/Waves to the AOAP Vote must include comments which:

a) Gives substantive reason(s) for Abstain vote.
b) Proposes wording or action to resolve Abstain vote.

Any questions, please contact API.

AOAP Ballot Annex 1

Addition of New Low Viscosity Grades into ILSAC GF-6B

Table H-7—ILSAC GF-6B Passenger Car Engine Oil Standard

Requirement	Criterion	
Viscosity Requirements		
SAE J300	Oils shall meet all requirements of SAE J300. Viscosity grades are limited to SAE 0W-8, 0W-12, and 0W-16 oils.[a]	
Gelation Index	ASTM D5133: 12 (max) To be evaluated from -5˚C to temperature at which 40,000 cP is attained or -40˚C, or 2 Celsius degrees below the appropriate MRV TP-1 temperature (defined by SAE J300), whichever occurs first.	
	0W-16	**0W-8, 0W-12**
Engine Test Requirements		
Wear and oil thickening	ASTM Sequence IIIH (ASTM D8111)	
Kinematic viscosity increase @ 40°C, %	100 (max)	150 (max)
Average weighted piston deposits, merits	4.2 (min)	3.7 (min)
Hot stuck rings	None	None
Wear, sludge, and varnish	ASTM Sequence VH (ASTM D8256)	
Average engine sludge, merits	7.6 (min)	7.6 (min)
Average rocker cover sludge, merits	7.7 (min)	7.7 (min)
Average engine varnish, merits	8.6 (min)	8.6 (min)
Average piston skirt varnish, merits	7.6 (min)	7.6 (min)
Oil screen sludge, % area	Rate & report	Rate & report
Oil screen debris, % area	Rate & report	Rate & report
Hot stuck compression rings	None	None
Cold stuck rings	Rate and report	Rate and report
Oil ring clogging, % area	Rate and report	Rate and report
	ASTM Sequence IVB (ASTM D8350)	
Average intake lifter volume loss (8 position avg), mm^3	2.7 (max)	2.7 (max)
End of test iron, ppm	400 (max)	400 (max)
Fuel efficiency	ASTM Sequence VIF (ASTM D8226)	
SAE 0W-16 viscosity grade		
FEI SUM	4.1% min	NR
FEI 2	1.9% min after 125 hours aging	NR
FEI, %	JASO M 366	1.1 min
Low-speed preignition prevention	ASTM Sequence IX (ASTM D8291)	
Average number of events for four iterations	5 (max)	NR
Number of events per iteration	8 (max)	NR

Table H-7—ILSAC GF-6B Passenger Car Engine Oil Standard (cont'd)

Requirement	Criterion	
Bench Test Requirements	**0W-16**	**0W-8, 0W-12**
Catalyst compatibility	ASTM D4951 or D5185	ASTM D4951
Phosphorus content, % (mass)	0.08 (max)	0.08 (max) 0.06 (min)
Phosphorus volatility	ASTM D8111	ASTM D8111
(Sequence IIIHB, phosphorus retention)	81% (min)	81% (min)
Sulfur content	ASTM D4951, D5185, or D2622	ASTM D2622 or D4951
SAE 0W and 5W multigrades, % (mass)	0.5 (max)	0.5 (max)
Wear	ASTM D4951 or D5185	ASTM D4951
Phosphorus content, % (mass)	0.06 (min)	0.06 (min)
Volatility	ASTM D5800 (B&D)	ASTM D5800 (B&D)
Evaporation loss, %	15.0 (max), 1 hour at 250°C	15.0 (max), 1 hour at 250°C
Filterability	ASTM D6794	
EOWTT, %		
with 0.6% H_2O	50 (max) flow reduction	50 (max) flow reduction
with 1.0% H_2O	50 (max) flow reduction	50 (max) flow reduction
with 2.0% H_2O	50 (max) flow reduction	50 (max) flow reduction
with 3.0% H_2O	50 (max) flow reduction	50 (max) flow reduction
	Note: Test formulation with highest additive (DI/VI) concentration. Read across results to all other base oil/viscosity grade formulations using same or lower concentration of identical additive (DI/VI) combination. Each different DI/VI combination must be tested.	
EOFT, %	ASTM D6795	
	50 (max) flow reduction	50 (max) flow reduction
Fresh oil foaming characteristics	ASTM D892 (Option A and excluding Section 11 Alternative Procedure)	
Tendency, mL		
Sequence I	10 (max)	10 (max)
Sequence II	50 (max)	50 (max)
Sequence III	10 (max)	10 (max)
Stability, mL, after 1-minute settling		
Sequence I	0 (max)	0 (max)
Sequence II	0 (max)	0 (max)
Sequence III	0 (max)	0 (max)
Fresh oil high temperature foaming characteristics	ASTM D6082 (Option A)	
Tendency, mL	100 (max)	100 (max)
Stability, mL, after 1-minute settling	0 (max)	0 (max)

Table H-7—ILSAC GF-6B Passenger Car Engine Oil Standard (continued)

Requirement	Criterion	
Bench Test Requirements (continued)		
Aged oil low temperature viscosity Measure aged oil low temperature viscosity on final formulation (pursuant to existing read across described in **Error! Reference source not found.**)—this includes base oil and additive combination being licensed—for each viscosity grade by either ROBO or IIIHA Measure CCS viscosity of EOT ROBO or IIIHA sample at CCS temperature corresponding to original viscosity grade	ROBO (ASTM D7528) a) If CCS viscosity measured is less than or equal to the maximum CCS viscosity specified for the original viscosity grade, run ASTM D4684 (MRV TP-1) at the MRV temperature specified in SAE J300 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 D4684 (MRV TP-1) at 5°C higher temperature (i.e., at MRV temperature specified in SAE J300 for the next higher viscosity grade). c) EOT ROBO sample must show no yield stress in the D4684 test and its D4684 viscosity must be below the maximum specified in SAE J300 for the original viscosity grade or the next higher viscosity grade, depending on the CCS viscosity grade, as outlined in a) or b) above. Or	
Aged oil low temperature viscosity Measure aged oil low temperature viscosity on final formulation (pursuant to existing read across described in **Error! Reference source not found.**)—this includes base oil and additive combination being licensed—for each viscosity grade by either ROBO or IIIHA Measure CCS viscosity of EOT ROBO or IIIHA sample at CCS temperature corresponding to original viscosity grade	d) If CCS viscosity measured is less than or equal to the maximum CCS viscosity specified for the original viscosity grade, run ASTM D4684 (MRV TP-1) at the MRV temperature specified in SAE J300 for the original viscosity grade. e) If CCS viscosity measured is higher than the maximum viscosity specified for the original viscosity grade in J300, run ASTM D4684 (MRV TP-1) at 5°C higher temperature (i.e., at MRV temperature specified in SAE J300 for the next higher viscosity grade). f) EOT IIIHA sample must show no yield stress in the D4684 test and its D4684 viscosity must be below the maximum specified in SAE J300 for the original viscosity grade or the next higher viscosity grade, depending on the CCS viscosity grade, as outlined in a) or b) above.	
Shear stability KV @ 100°C after 30 passes, cSt	Diesel Injector (ASTM D6278) 0W-16: 5.8 (min)	0W-8: 4.0 (min) 0W-12: 5.0 (min)
Homogeneity and miscibility	ASTM D6922 Shall remain homogeneous and, when mixed with ASTM Test Monitoring Center (TMC) reference oils, shall remain miscible.	
Engine rusting Average gray value	Ball Rust Test (ASTM D6557) 100 (min)	100 (min)
Emulsion retention 0°C, 24 hours 25°C, 24 hours	ASTM D7563 No water separation No water separation	 No water separation No water separation

Table H-7—ILSAC GF-6B Passenger Car Engine Oil Standard (continued)

Requirement	Criterion
Bench Test Requirements (continued)	
Elastomer compatibility	ASTM D7216 Annex A2 Candidate oil testing for elastomer compatibility shall be performed using the five Standard Reference Elastomers (SREs) referenced herein and defined in SAE J2643. Candidate oil testing shall be performed according to ASTM D7216 Annex A2. The post-candidate-oil-immersion elastomers shall conform to the specification limits detailed below:

Elastomer Material (SAE J2643)	Test Procedure	Material Property	Units	Limits
Polyacrylate Rubber (ACM-1)	ASTM D471	Volume	% Δ	-5, 9
	ASTM D2240	Hardness	pts.	-10, 10
	ASTM D412	Tensile Strength	% Δ	-40, 40
Hydrogenated Nitrile Rubber (HNBR-1)	ASTM D471	Volume	% Δ	-5, 10
	ASTM D2240	Hardness	pts.	-10, 5
	ASTM D412	Tensile Strength	% Δ	-20, 15
Silicone Rubber (VMQ-1)	ASTM D471	Volume	% Δ	-5, 40
	ASTM D2240	Hardness	pts.	-30, 10
	ASTM D412	Tensile Strength	% Δ	-50, 5
Fluorocarbon Rubber (FKM-1)	ASTM D471	Volume	% Δ	-2, 3
	ASTM D2240	Hardness	pts.	-6, 6
	ASTM D412	Tensile Strength	% Δ	-65, 10
Ethylene Acrylic Rubber (AEM-1)	ASTM D471	Volume	% Δ	-5, 30
	ASTM D2240	Hardness	pts.	-20, 10
	ASTM D412	Tensile Strength	% Δ	-30, 30

Applicable Documents:

1. SAE Standard, Engine Oil Viscosity Classification—SAE J300, SAE Handbook.
2. SAE Standard, Standard Reference Elastomers (SRE) for Characterizing the Effects on Vulcanized Rubbers, Proposed Draft 2003-5—SAE J2643, SAE Handbook.
3. ASTM Annual Book of Standards, Volume 5, Petroleum Products and Lubricants, current edition.

4. M. Batko and D. F. Florkowski, “Low Temperature Rheological Properties of Aged Crankcase Oils,” SAE Paper 2000-01-2943.
5. M. Batko and D. F. Florkowski, “Lubricant Requirements of an Advanced Designed High Performance, Fuel Efficient Low Emissions V-6 Engine,” SAE Paper 01FL-265

[a] All oils shall meet the requirements of SAE J300 in force at time of manufacture