

Lubricants Group Ballot on Accept ILSAC Specification GF-7A and GF-7B into API 1509

LG Ballot to Accept ILSAC Specification GF-7A and GF-7B into API 1509.

The Lubricants Group met on December 11, 2024, to review ILSAC GF-7A and ILSAC GF-7B for inclusion in API 1509. After the review of the ILSAC GF-7 specifications a motion was made to **Ballot Inclusion of ILSAC-GF-7A and ILSAC GF-7B into API 1509.**

The motion detail is given below.

Motion Inclusion of ILSAC GF-7A and GF-7B into API 1509 Annex H.

Motion by: Darryl Purificati/HF Sinclair

Seconded by: Mike Deegan/Ford

The Motion passed on unanimous consent. All supporting documentation including Drafts of API 1509 Table H-8 and Table H-9 are given in the ballot attachments.

Lubricants Group members should Vote on the "**LG Ballot to Accept ILSAC Specification GF-7A and GF-7B into API 1509**" using the online Ballot system at <http://mycommittees.api.org/lubricants/AOAP/default.aspx> .

This Lubricants Ballot will close on January 22, 2025.

- Affirmative Votes do not require any comments
 - a) ; comments are optional.
- Negative Votes must include comments which address:
 - 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.
- Abstentions to the vote should include comments.
 - a) Gives reason for Abstain vote.
 - b) Proposes wording to resolve Abstain vote.

Any questions, please contact API.

Attachment: **12-23-2024=ILSAC GF-7A=GF-7B-in-API-1509-Final**

ILSAC GF-7A AND GF-7B STANDARDS FOR PASSENGER CAR ENGINE OILS (EFFECTIVE MARCH 31, 2024)

The International Lubricants Standardization Advisory Committee (ILSAC), representing Ford Motor Company, General Motors LLC, Stellantis, and Japan Automobile Manufacturers Association, Inc. (JAMA) developed and approved the ILSAC GF-7A and GF-7B minimum performance standards for engine oils for spark-ignited, internal combustion engines.

These standards specify the minimum performance requirements for engine sequence and bench tests and chemical and physical properties for engine oils used in spark-ignited, internal combustion engines. It is expected that many engine manufacturers will recommend ILSAC GF-7A and/or GF-7B oils. However, performance parameters other than those covered by the tests including more stringent limits on those tests included in these standards may be required by individual OEMs.

It is the oil marketer's responsibility to fulfill the requirements of the standards, and comply with all applicable legal and regulatory requirements on substance use restrictions, labeling, and health and safety information when marketing products meeting the ILSAC GF-7A and GF-7B standards. It is also the marketer's responsibility to conduct its business in a manner that represents minimum risk to consumers and the environment.

The ultimate assessment of an engine oil's performance must include a variety of vehicle fleet tests that simulate the full range of customer driving conditions. The engine sequence tests listed in this document have been specified instead of fleet testing to minimize testing time and costs. This simplification of test requirements is only possible because the specified engine sequence tests have been judged to be predictive of a variety of vehicle tests.

The relationships between engine sequence tests and vehicle fleet tests are judged valid based only on the range of base oils and additive technologies investigated — generally those that have proven to have satisfactory performance in service and that are in widespread use at this time. The introduction of base oils or additive technologies that constitute a significant departure from existing practice requires sufficient supporting vehicle fleet testing data to ensure there is no adverse effect to vehicle components or to emission control systems. This vehicle fleet testing should be conducted in addition to the other performance requirements listed in these standards.

It is the responsibility of any individual or organization introducing a new technology to perform this vehicle fleet testing, and the responsibility of the oil marketer to ensure the testing of new technology was satisfactorily completed. No marketer can claim to be acting in a reasonable and prudent manner if they knowingly use a new technology based only on the results of engine sequence testing without verifying the suitability of the new technology in vehicle fleet testing that simulates the full range of customer operation.

The ILSAC GF-7A and GF-7B Minimum Performance Standards include tests for which Viscosity Grade Read Across and Base Oil Interchange Guidelines have been developed by the appropriate groups. It should be pointed out, however, that when oil marketers use the guidelines, they do so based on their own judgment and at their own risk. The use of any guidelines does not absolve the marketer of the responsibility for meeting all specified requirements for any products the marketer sells in the marketplace that are licensed as ILSAC GF-7A or GF-7B with API.

Table H-8—ILSAC GF-7A Passenger Car Engine Oil Standard

| Requirement | Criterion |
|---|---|
| Viscosity Requirements | |
| SAE J300 | Oils shall meet all requirements of SAE J300. Viscosity grades shall be limited to 0W-20, 5W-20, 0W-30, 5W-30 and 10W-30. New Oil MRV: 40,000 cP max |
| 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. |
| High Temperature/High Shear Viscosity @ 150°C, mPa·s | ASTM D4683, D4741, or D5481 2.6 (min) |
| Engine Test Requirements | |
| Wear and oil thickening | ASTM Sequence IIH (ASTM D8111) |
| Kinematic viscosity increase @ 40°C, % | 100 (max) |
| Average weighted piston deposits, merits | 4.6 (min) |
| Hot stuck rings | None |
| Wear, sludge, and varnish | ASTM Sequence VH (ASTM D8256) |
| Average engine sludge, merits | 7.6 (min) |
| Average rocker cover sludge, merits | 7.7 (min) |
| Average engine varnish, merits | 8.6 (min) |
| Average piston skirt varnish, merits | 7.6 (min) |
| Oil screen sludge, % area | Rate & report |
| Oil screen debris, % area | Rate & report |
| Hot stuck compression rings | None |
| Cold stuck rings | Rate & report |
| Oil ring clogging, % area | Rate & report |
| Valvetrain wear | ASTM Sequence IVB (ASTM D8350) |
| Average intake lifter volume loss (8 position avg), mm ³ | 2.7 (max) |
| End of test iron, ppm | 400 (max) |
| Bearing corrosion | ASTM Sequence VIII (ASTM D6709) |
| Bearing weight loss, mg | 26 (max) |
| Fuel efficiency | ASTM Sequence VIE (ASTM D8114) |
| SAE XW-20 viscosity grade | |
| FEI SUM | 4.3% min |
| FEI 2 | 2.1% min after 125 hours aging |
| SAE XW-30 viscosity grade | |
| FEI SUM | 3.6% min |
| FEI 2 | 1.8% min after 125 hours aging |
| SAE 10W-30 viscosity grade | |
| FEI SUM | 3.0% min |
| FEI 2 | 1.4% min after 125 hours aging |
| Low-speed preignition prevention | ASTM Sequence IX (ASTM D8291) |
| Average number of events for four iterations | 5 (max) |
| Number of events per iteration | 8 (max) |
| Aged oil LSPI prevention | ASTM Sequence IX (ASTM D8291) Appendix X2 |
| Average number of events for four iterations | 5 (max) |
| Number of events per iteration | 8 (max) |

Table H-8—ILSAC GF-7A Passenger Car Engine Oil Standard (continued)

| Requirement | Criterion |
|--|--|
| Engine Test Requirements (continued) | |
| Chain wear Percent increase | ASTM Sequence X (ASTM D8279) 0.080% (max) |
| Bench Test Requirements | |
| Catalyst compatibility Phosphorus content, % (mass) | ASTM D4951 or D5185 0.08% (max) |
| Phosphorus volatility (Sequence IIIHB, phosphorus retention) | ASTM D8111 81% (min) |
| Sulfur content SAE 0W and 5W multigrades, % (mass) SAE 10W-30, % (mass) | ASTM D4951 or D2622 0.5% (max) 0.6% (max) |
| Sulphated Ash Content, % (mass) | ASTM D874 0.90% (max) |
| Wear Phosphorus content,% (mass) | ASTM D4951 or D5185 0.06% (min) |
| Volatility Evaporation loss, % | ASTM D5800 (B&D) 15.0 (max), 1 hour at 250°C |
| High temperature deposits Total deposit weight, mg | TEOST 33C (ASTM D6335) 30 (max) Note: No TEOST 33C limit for SAE 0W-20. |
| Filterability EOWTT, % with 0.6% H ₂ O with 1.0% H ₂ O with 2.0% H ₂ O with 3.0% H ₂ O | ASTM D6794 50 (max) flow reduction 50 (max) flow reduction 50 (max) flow reduction 50 (max) flow reduction |
| EOFT, % | ASTM D6795 50 (max) flow reduction |
| Gelation Test, % flow reduction *if available at time of licensing | WK86363 Rate & Report |
| Fresh oil foaming characteristics Tendency, mL Sequence I Sequence II Sequence III Stability, mL, after 1-minute settling Sequence I Sequence II Sequence III | ASTM D892 (Option A and excluding Section 11 Alternative Procedure) 10 (max) 50 (max) 10 (max) 0 (max) 0 (max) 0 (max) |

Table H-8—ILSAC GF-7A Passenger Car Engine Oil Standard (continued)

| Requirement | Criterion |
|--|---|
| Bench Test Requirements (continued) | |
| Fresh oil high temperature foaming characteristics | ASTM D6082 (Option A) |
| Tendency, mL | 100 (max) |
| Stability, mL, after 1-minute settling | 0 (max) |
| Aged oil low temperature viscosity | Sequence IIIHA (ASTM D8111) or ROBO (ASTM D7528) |
| Measure aged oil low temperature viscosity on final formulation (pursuant to existing read across described in Annex F)—this includes base oil and additive combination being licensed—for each viscosity grade by either IIIHA or ROBO. | 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. |
| Measure CCS viscosity of EOT IIIHA or ROBO sample at CCS temperature corresponding to 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 IIIHA or 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. |
| Shear stability | ASTM Sequence VIII (ASTM D6709) |
| 10-hour stripped KV @ 100°C | |
| XW-20 | Stay in grade |
| XW-30 | Stay in grade |
| Homogeneity and miscibility | ASTM D6922 Shall remain homogeneous and, when mixed with ASTM Test Monitoring Center (TMC) reference oils, shall remain miscible. |
| Engine rusting | Ball Rust Test (ASTM D6557) |
| Average gray value | 100 (min) |
| Emulsion retention | ASTM D7563 |
| 0°C, 24 hours | No water separation |
| 25°C, 24 hours | No water separation |

Table H-8—ILSAC GF-7A 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 |
| Polyacrylate Rubber (ACM-2) | ASTM D471 | Volume | % Δ | Rate & Report |
| | ASTM D2240 | Hardness | pts. | Rate & Report |
| | ASTM D412 | Tensile Strength | % Δ | Rate & Report |
| Ethylene Acrylic Rubber (AEM-2) | ASTM D471 | Volume | % Δ | Rate & Report |
| | ASTM D2240 | Hardness | pts. | Rate & Report |
| | ASTM D412 | Tensile Strength | % Δ | Rate & Report |
| Ethylene Acrylic Rubber (AEM-3) | ASTM D471 | Volume | % Δ | Rate & Report |
| | ASTM D2240 | Hardness | pts. | Rate & Report |
| | ASTM D412 | Tensile Strength | % Δ | Rate & Report |
| Fluorelastomer Rubber (FKM-3) | ASTM D471 | Volume | % Δ | Rate & Report |
| | ASTM D2240 | Hardness | pts. | Rate & Report |
| | ASTM D412 | Tensile Strength | % Δ | Rate & Report |

Table H-9—ILSAC GF-7B Passenger Car Engine Oil Standard

| Requirement | Criterion |
|---|---|
| Viscosity Requirements | |
| SAE J300 | Oils shall meet all requirements of SAE J300. Viscosity grades shall be limited to SAE 0W-16 oils. New Oil MRV: 40,000 cP max |
| 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. |
| Engine Test Requirements | |
| Wear and oil thickening | ASTM Sequence IIH (ASTM D8111) |
| Kinematic viscosity increase @ 40°C, % | 100 (max) |
| Average weighted piston deposits, merits | 4.2 (min) |
| Hot stuck rings | None |
| Wear, sludge, and varnish | ASTM Sequence VH (ASTM D8256) |
| Average engine sludge, merits | 7.6 (min) |
| Average rocker cover sludge, merits | 7.7 (min) |
| Average engine varnish, merits | 8.6 (min) |
| Average piston skirt varnish, merits | 7.6 (min) |
| Oil screen sludge, % area | Rate & report |
| Oil screen debris, % area | Rate & report |
| Hot stuck compression rings | None |
| Cold stuck rings | Rate and report |
| Oil ring clogging, % area | Rate and report |
| Valvetrain wear | ASTM Sequence IVB (ASTM D8350) |
| Average intake lifter volume loss (8 position avg), mm ³ | 2.7 (max) |
| End of test iron, ppm | 400 (max) |
| Fuel efficiency | ASTM Sequence VIF (ASTM D8226) |
| SAE 0W-16 viscosity grade | |
| FEI SUM | 4.3% min |
| FEI 2 | 2.1% min after 125 hours aging |
| Low-speed preignition prevention | ASTM Sequence IX (ASTM D8291) |
| Average number of events for four iterations | 5 (max) |
| Number of events per iteration | 8 (max) |
| Aged oil LSPI prevention | ASTM Sequence IX (ASTM D8291) Appendix X2 |
| Average number of events for four iterations | 5 (max) |
| Number of events per iteration | 8 (max) |
| Chain wear | ASTM Sequence X (ASTM D8279) |
| Percent increase | 0.080 (max) |

Table H-9—ILSAC GF-7B Passenger Car Engine Oil Standard (cont'd)

| Requirement | Criterion |
|---|---|
| Bench Test Requirements | |
| Catalyst compatibility | ASTM D4951 or D5185 |
| Phosphorus content, % (mass) | 0.08 (max) |
| Phosphorus volatility (Sequence IIIHB, phosphorus retention) | ASTM D8111 81% (min) |
| Sulfur content SAE 0W and 5W multigrades, % (mass) | ASTM D4951, D5185, or D2622 0.5 (max) |
| Sulphated Ash Content, % (mass) | ASTM D874 0.9 (max) |
| Wear Phosphorus content, % (mass) | ASTM D4951 or D5185 0.06 (min) |
| Volatility Evaporation loss, % | ASTM D5800 (B&D) 15.0 (max), 1 hour at 250°C |
| Filterability EOWTT, % | ASTM D6794 |
| with 0.6% H ₂ O | 50 (max) flow reduction |
| with 1.0% H ₂ O | 50 (max) flow reduction |
| with 2.0% H ₂ O | 50 (max) flow reduction |
| with 3.0% H ₂ O | 50 (max) flow reduction |
| EOFT, % | ASTM D6795 50 (max) flow reduction |
| Gelation Test, % flow reduction *if available at time of licensing | WK86363 Rate & report |
| Fresh oil foaming characteristics | ASTM D892 (Option A and excluding Section 11 Alternative Procedure) |
| Tendency, mL | |
| Sequence I | 10 (max) |
| Sequence II | 50 (max) |
| Sequence III | 10 (max) |
| Stability, mL, after 1-minute settling | |
| Sequence I | 0 (max) |
| Sequence II | 0 (max) |
| Sequence III | 0 (max) |
| Fresh oil high temperature foaming characteristics | ASTM D6082 (Option A) |
| Tendency, mL | 100 (max) |
| Stability, mL, after 1-minute settling | 0 (max) |

Table H-9—ILSAC GF-7B Passenger Car Engine Oil Standard (continued)

| Requirement | Criterion |
|---|---|
| Bench Test Requirements (continued) | |
| Aged oil low temperature viscosity | Sequence IIIHA (ASTM D8111) or ROBO (ASTM D7528) |
| Measure aged oil low temperature viscosity on final formulation (pursuant to existing read across described in Annex F)—this includes base oil and additive combination being licensed—for each viscosity grade by either IIIHA or ROBO | 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. |
| Measure CCS viscosity of EOTIIIHA or ROBO sample at CCS temperature corresponding to 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 IIIHA or 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. |
| Shear stability | Diesel Injector (ASTM D6278) or ASTM D7109 (30 cycles) |
| KV @ 100°C after 30 passes, cSt | 5.8 (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 | Ball Rust Test (ASTM D6557) |
| Average gray value | 100 (min) |
| Emulsion retention | ASTM D7563 |
| 0°C, 24 hours | No water separation |
| 25°C, 24 hours | No water separation |

Table H-9—ILSAC GF-7B 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 |
| Polyacrylate Rubber (ACM-2) | ASTM D471 | Volume | % Δ | Rate & Report |
| | ASTM D2240 | Hardness | pts. | Rate & Report |
| | ASTM D412 | Tensile Strength | % Δ | Rate & Report |
| Ethylene Acrylic Rubber (AEM-2) | ASTM D471 | Volume | % Δ | Rate & Report |
| | ASTM D2240 | Hardness | pts. | Rate & Report |
| | ASTM D412 | Tensile Strength | % Δ | Rate & Report |
| Ethylene Acrylic Rubber (AEM-3) | ASTM D471 | Volume | % Δ | Rate & Report |
| | ASTM D2240 | Hardness | pts. | Rate & Report |
| | ASTM D412 | Tensile Strength | % Δ | Rate & Report |
| Fluorelastomer Rubber (FKM-3) | ASTM D471 | Volume | % Δ | Rate & Report |
| | ASTM D2240 | Hardness | pts. | Rate & Report |
| | ASTM D412 | Tensile Strength | % Δ | Rate & Report |

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 2023-5—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