



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

SOUTHWEST RESEARCH INSTITUTE
Office of Automotive Engineering
Fuels and Lubricants Research Division and the
Powertrain Engineering Division
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MECHANICAL

Valid To: May 31, 2024

Certificate Number: 0702.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform evaluations of automotive fluids, fuels, emissions, automotive components, engine and power train performance and durability using stationary engine dynamometer test stands (light-duty, non-road and heavy-duty) and vehicle dynamometer facilities, and automotive fleets using standards and procedures from the following sources:

ASTM, API, SAE, ACC, CRC, ACEA, CEC, ATIEL, JASO, NMMA, CFR, EPA, CARB, ISO, Passenger Car OEM'S, Heavy-Duty OEM'S, Two-Stroke OEM'S, Lubricant and Fuel Additive Company Proprietary Testing Procedures, and Lubricant and Fuel Marketer Proprietary Testing Procedures.

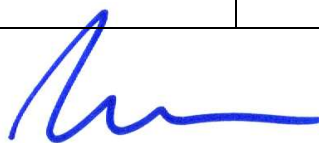
Fuels and Lubricants Research

- Crankcase Lubricant Evaluations (Gasoline, Diesel, and Alternative Fuels)
- Fuels Performance Evaluations (Gasoline, Diesel, and Alternative Fuels)
- Gear Oil Evaluation
- Specialized/Focused Gasoline, Diesel, Alternative Fuels, and Lubricants Evaluations
- Farm Tractor and Industrial Fluid Evaluations
- Automotive Component Evaluations (Engine Dynamometer/Bench Testing)
- Automatic and Powershift Transmission Evaluations
- Power Train (Driveability and Durability)

Powertrain Engineering

- Dynamometer Procedures
- Light-Duty Vehicle Chassis Dynamometer Emissions and Fuel Economy
- Heavy-Duty Engine Dynamometer Emissions and Fuel Consumption
- Non-Road Engine Dynamometer Emissions and Fuel Consumption

<u>FUELS AND LUBRICANTS RESEARCH</u>	
Test(s):	Test Method(s):
Passenger Car Motor Oil (PCMO)	
Method for Dynamometer Evaluation of Unleaded Spark-Ignition Engine Fuel for Intake Valve Deposit Formation	ASTM D6201
IVA Evaluation of Automotive Engine Oils in the Sequence IVA Spark-Ignition Engines	ASTM D6891
Measurement of Effects of Automotive Engine Oils on Fuel Economy of Passenger Cars and Light-Duty Trucks in Sequence VIE Spark Ignition Engine	ASTM D8114
Measurement of Effects of Automotive Engine Oils on Fuel Economy of Passenger Cars and Light-Duty Trucks in Sequence VIF Spark Ignition Engine	ASTM D8226
Evaluation of Automotive Engine Oils in the Sequence VIII Spark-Ignition Engine (CLR Oil Test Engine)	ASTM D6709
Evaluation of Automotive Engine Oils in the Sequence IIIH, Spark-Ignition Engine	ASTM D8111
Evaluation of Rust Preventive Characteristics of Automotive Engine Oils	ASTM D6557
Evaluation of Performance of Automotive Engine Oils in the Mitigation of Low-Speed, Preignition in the Sequence IX Gasoline Turbocharged Direct-Injection, Spark-Ignition Engine	ASTM D8291
Determination of Timing-Chain Wear in a Turbocharged, Direct-Injection, Spark-Ignition, Four-Cylinder Engine	ASTM D8279
Engine Oil Aeration Evaluation for dexos® Oil Qualification (GMAER)	GMW17295
General Motors Oxidation and Deposit (GMOD)	GM17043
Automobile Gasoline Engine Oils – Firing Fuel Economy Procedure	JASO M366
Heavy Duty	
Evaluation of Engine Oils in Diesel Four-Stroke Cycle Supercharged 1M-PC Single Cylinder Oil Test	ASTM D6618
Evaluation of Engine Oils in a High-Speed, Single-Cylinder Diesel Engine – 1K Procedure (0.4 % Fuel Sulfur) and 1N Procedure (0.04 % Fuel Sulfur)	ASTM D6750
Evaluation of Engine Oils in a High Speed, Single-Cylinder Diesel Engine – Caterpillar 1P Test Procedure	ASTM D6681
Evaluation of Heavy-Duty Engine Oils under High Output Conditions – Caterpillar C13 Test Procedure	ASTM D7549
Evaluation of Engine Oils for Roller Follower Wear in Light-Duty Diesel Engine	ASTM D5966
Evaluation of Diesel Engine Oils in T-8 Diesel Engine	ASTM D5967
Evaluation of Diesel Engine Oils in T-8E Diesel Engine	ASTM D5967
Evaluation of Diesel Engine Oils in the T-11 Exhaust Gas Recirculation Diesel Engine	ASTM D7156
Evaluation of Diesel Engine Oils in T-12 Exhaust Gas Recirculation Diesel Engine	ASTM D7422



<u>FUELS AND LUBRICANTS RESEARCH</u>	
Test(s):	Test Method(s):
Heavy Duty (cont'd)	
Evaluation of Aeration Resistance of Engine Oils in Direct-Injected Turbocharged Automotive Diesel Engine,	ASTM D6894
Evaluation of Automotive Engine Oils for Valve-Train Wear Performance in Cummins ISB Medium-Duty Diesel Engine	ASTM D7484
Cummins ISM Test	ASTM D7468
Evaluation of Diesel Engine Oils in T-13 Diesel Engine	ASTM D8048
Evaluation of Diesel Engine Oils in DD13 Diesel Engine	ASTM D8074
Evaluation of Engine Oil Aeration Resistance in a Caterpillar C13 Direct-Injected Turbocharged Automotive Diesel Engine	ASTM D8047 (COAT)
Automobile Diesel Engine Oils – Valve Train Wear Test Method	JASO M354
Automobile Diesel Engine Oils – Detergency Test Procedure	JASO M336
Gears / Axles	
FZG Gear Testing	ASTM D4998
Standard Test Method for Evaluating the Scuffing Load Capacity of Oils (FZG Visual Method)	ASTM D5182
FZG Pitting Load Carrying Capacity Test for Gear Oils	CEC L108
FZG “S19-2-Verschleiss” (ZF Standard Wear)	FZG “S19-2-Verschleiss”
Evaluating the Thermal Stability of Manual Transmission Lubricants in a Cyclic Durability Test	ASTM D5579
Load Carrying Capacity Test for Transmission Lubricants	CEC L-07-95
Load Carrying Capacity Test for High EP Oils	CEC L-84-02
Method for Indicating Wear Characteristics of Non-Petroleum and Petroleum Hydraulic Fluids in a Constant Volume Vane Pump	ASTM D7043
Method for Evaluation of Moisture Corrosion Resistance of Automotive Gear Lubricants	ASTM D7038 (L-33)
Method for Indicating Wear Characteristics of Petroleum Hydraulic Fluids in a High Pressure Constant Volume Vane Pump	ASTM D6973; TO-4, Section 5
Evaluation of the Thermal and Oxidative Stability of Lubricating Oils Used for Manual Transmissions and Final Drive Axles	ASTM D5704 (L-60-1)
Evaluation of Load-Carrying Capacity of Lubricants Used in Hypoid Final-Drive Axles Operated under Low-Speed and High-Torque	ASTM D8165 (L-37-1)
Performance of Gear Lubricants in Axles Under High Speed and Shock Loading	ASTM D7452 (L-42)
Transmissions	
Caterpillar Friction Properties	TO-4 Section 6
Automatic Transmission Fluid Testing	
DEXRON®-VI Cycling Test	GMW16444, Appendix F
DEXRON®-VI Aeration Test	GMW16444, Appendix K

<u>FUELS AND LUBRICANTS RESEARCH</u>	
Test(s):	Test Method(s):
Automatic Transmission Fluid Testing (cont'd)	
Axialrillen-Kugellager (ARKL) (DEXRON®)	VW PV1454; GMW16444; GMW16974
Synchronizer Function	CEC L-66-99; GMW16612, Appendix C
Frictional Properties (SAE#2)	
DEXRON®-VI Plate Clutch Friction Test	GMW16444, Appendix C
DEXRON®-VI Low Speed Clutch Friction Test	GMW16444, Appendix J
GM Three (3) Day Wear Test	GMW16974, Appendix G
MERCON® Clutch Friction Durability, Anti Shudder Durability and μ -v Characterization	MERCON®; MERCON®-V; MERCON®-LV; MERCON® ULV
Allison Frictional Properties (Graphite)	TES-439, Appendix C
Allison Frictional Properties (TES-389 Paper)	TES-389, Appendix D
Allison Frictional Properties	TES-295, Appendix D
JASO Friction Characteristic Test Method	JASO M348:2012; JASO T903:2016, Annex A
Oxidation Tests	
DEXRON®-III Oxidation Test (THOT)	GM6417M Appendix E; TO-4, Section 3
Fleet and Fuel	
Top Tier, CARB and EPA Standards, Detergent Gasoline Deposit Control Performance Standards:	
Intake Valve Sticking (IVS)	IVS
CARB and EPA Procedures:	
Method for Evaluating Unleaded Automotive Spark-Ignition Engine Fuel for Electronic Port Fuel Injector (PFI) Fouling	ASTM D5598
Method for Vehicle Evaluation of Unleaded Automotive Spark-Ignition Engine Fuel for Intake Valve Deposit Formation – BMW IVD	ASTM D5500
Marine / Two-Cycle	
NMMA FC-W 115 hp	NMMA FC-W
JASO:	
Clutch Friction	JASO T-903
Lubricity	JASO M-340

<u>FUELS AND LUBRICANTS RESEARCH</u>	
Test(s):	Test Method(s):
Tractor	
Tractor – John Deere	
Water Contamination / Dynamic Corrosion using SAUER-DANFOSS 90 Series Pump	JDQ: 84
Powershift Transmission Procedure	JDQ: 94
Spiral Bevel and Final Drive Gear Wear	JDQ: 95
As Performed with a 1400 Series Axle Brake Torque Variation & Friction Retention	JDQ: 96
John Deere 102A Shear Rig Test Procedure	JDQ: 102A
New Holland: Jenkins, High Energy Clutch, Driveline Stall	
Evaluation of Hydraulic Fluid using the Denison Test Procedure for Hydraulic Fluid Performance Evaluation on Denison Pumps with T6H Hybrid Pump	Denison A-TP-30533
Filter Testing	
Inlet Air Cleaning Equipment for Internal Combustion Engines and Compressors – Performance Testing	ISO 5011
Multi-Pass Method for Evaluating Filtration Performance of a Filter Element	ISO 16889
Full-Flow Lubricating Oil Filters for Internal Combustion Engines – Part 12: Filtration Efficiency using Particle Counting and Contaminant	ISO 4548, Part 12
Filtration Efficiency using Particle Counting and Contaminant Retention Capacity	ISO 19438

<u>POWERTRAIN ENGINEERING</u>	
Test(s):	Test Method(s):
Emission Testing	
Light-Duty Vehicle Fuel Economy Test TIP 07-022	40 CFR Part 600; 40 CFR Part 86, Subpart B
Particle Number Emissions TIP 07-051	Swiss Ordinance on Air Pollution Control (OAPC), Appendix 4, Section 31, 32; Particle Number Measurement in Accordance with European Union Regulation No. 49, 83, & 96
Engine Emissions Testing Procedures TIP 07-049	40 CFR Part 1065
Transmission Spin Loss Test	SwRI TIP 03-2103
Battery Testing	
Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems	UL9540A





Accredited Laboratory

A2LA has accredited

SOUTHWEST RESEARCH INSTITUTE

San Antonio, TX

for technical competence in the field of

Mechanical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 8th day of June 2022.

A blue ink signature of the Vice President of Accreditation Services, written over a horizontal line.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 0702.01
Valid to May 31, 2024

For the tests to which this accreditation applies, please refer to the laboratory's Mechanical Scope of Accreditation.