



THE AMERICAN ASSOCIATION FOR
LABORATORY ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

**SOUTHWEST RESEARCH INSTITUTE,
OFFICE OF AUTOMOTIVE ENGINEERING**

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 17025:2005 *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 18 June 2005*).



Presented this 8th day of October 2008.

A handwritten signature in cursive script, appearing to read "Peter Abney".

President

For the Accreditation Council

Certificate Number 0702.01

Valid to May 31, 2010

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

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

SOUTHWEST RESEARCH INSTITUTE
OFFICE OF AUTOMOTIVE ENGINEERING
Fuels and Lubricants Research Division and the
Engine, Emissions and Vehicle Research Division
6220 Culebra Street, P.O. Box 28510
San Antonio, TX 78228-0510
Michael T. Van Hecke Phone: 210 522 5495

MECHANICAL

Valid To: May 31, 2010

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, nonroad 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, 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)

Engine, Emissions and Vehicle Research

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
- Smoke Tests
- California Diesel Fuel Qualification Protocols

For hydrocarbons, carbon monoxide, oxides of nitrogen, carbon dioxide and particulate matter, as applicable, and the following specific analyses on samples taken, as applicable to the procedures above:

Chemical Analyses

- Gas chromatograph analysis of methane, methanol, and ethanol
- Liquid chromatograph analysis of aldehydes and ketones
- Ion chromatograph analysis of sulfate in particulate matter
- Solvent extraction of organics from particulate matter

FUELS AND LUBRICANTS RESEARCH

ASTM Caterpillar: 1M-PC, 1N, 1P, 1K, C13

ASTM Sequence: VIB, IIIF, IIIG, VIII, VG, IVA

Roller Follower Wear Test (RFWT)

Cummins: ISB, ISM

John Deere: JD C00L

Mack: T-8, T-8E, T-10A, T11, T12

Navistar 7.3L HEUI-EOAT

JASO: M336-98, M354-99

ASTM TC Sequences I, II, III

NMMA Recertified TC-W3:

- Mercury 15 hp

- OMC 40 hp

- OMC 70 hp

NMMA FC-W 115 hp

CEC L-53-T-95 M-III Sludge

CEC L-54-T-96 M-III Fuel Economy

CEC L-38-A-94 Peugeot Valve Training Scuffing

CEC L-78-T-97 Volkswagen TDI Ring Sticking

CEC L-88-02 Peugeot TU5 High Temperature

ASTM: D2882, D4998, D5182, D5704, D5579, D6121, D7043, D7038, L-20, L-42

CARB and EPA Procedures:

- PFI, ASTM D 5598

- BMW IVD, ASTM D 5500

Denison: T6H

New Holland: Brake, Jenkins, High Energy Clutch, Driveline Stall

John Deere, JDQ: 84, 94, 95, 96

Massey-Ferguson: Four Square, IPTO, Brake

Eaton: 35VQ25A

U.S. Military: MIL-L-2104, MIL-L-2105/MIL-PRF-2105, MIL-L-21260, MIL-L-46167

SAE J2360

Top Tier Detergent Gasoline Deposit Control Performance Standards:

- Ford 2.3 L IVD, ASTM D 6201

- Intake Valve Sticking (IVS)

- Sequential Central Port Injection (SCPI)

Allison

TES 228 Sect VII Frictional Characteristics with Graphite Composite Clutches

TES 228 Sect IX Frictional Characteristics with Paper Composite Clutches

TES 228 Sect VII Anti-Wear Characteristics

Caterpillar

TO-4 Section 5 Wear Properties, Gears – Pumps

TO-4 Section 6 Friction Properties

General Motors – GM 6417 DEX III, GMN 10055 DEX IIIH, GMN 10060 DEX VI:

Appendix C- Plate Clutch Friction Test

Appendix D- Band Friction

Appendix E- Oxidation Test

Appendix F- Cycling Test

Appendix G- Vehicle Performance Test

Appendix H- ECCC Vehicle Performance Test

Appendix I- Sprag Wear Test

Appendix J- Low Speed Clutch Friction Test

Appendix K- Aeration Test

JASO:

JASO M-348-95 Clutch Friction

JASO T-904-99 Clutch Friction

FORD-MERCON®, MERCON® V, MERCON® SP:

- Mercon Appendix 4
 - Friction Durability
 - Over-Running Clutch Wear Test
 - Anti-Shudder Durability Test
 - μ -V Characterization

ENGINE, EMISSIONS AND VEHICLE RESEARCH

Light-Duty Vehicle Federal Test Procedure-75 (Chassis Dynamometer Test)

40 CFR Part 86, Subpart B (Gasoline and Diesel fueled)

Light-Duty Vehicle Fuel Economy Test

40 CFR Part 600, Subpart B (Gasoline and Diesel fueled)

Heavy-Duty Diesel Engine Federal Test Procedure

40 CFR Part 86 Subpart N, (Diesel, Alcohol, and Gaseous-fueled)

Heavy-Duty Otto-Cycle Engine Federal Test Procedure

40 CFR Part 86 Subpart N, (Gasoline, Alcohol, and Gaseous-fueled)

Otto-Cycle and Diesel-Cycle Engines Idle Test Procedure

40 CFR Part 86 Subpart P, (New Methanol, Natural Gas, Liquified Petroleum Gas and Gasoline-fueled)

New Diesel Heavy-Duty Engines; Smoke Exhaust Test Procedure

40 CFR Part 86 Subpart I, (Petroleum and Methanol-fueled) and ISO 8178-9

California Fuel Qualification Test

Title 13, California Code of Regulation, Section 2282

New and In-Use Nonroad Engines; Exhaust Emissions Test Procedures

40 CFR Part 89 and ISO 8178-1

EGR Cooler Thermal Cycle Test
SWRI EGR-TC1

Transmission Spin Loss Test
SWRI TIP 03-2103

Electric Drivetrain Performance, Efficiency and Durability Test
SWRI TIP 03-3001

SAE J726 (Cancelled JUN2002): Air Cleaner Test Code, Recommended Practice

ISO 5011:2000; Inlet Air Cleaning Equipment for Internal Combustion Engines and Compressors –
Performance Testing

MIL-PRF-46736E; Performance Specification, Filter Element, Intake Air Cleaner, Dry Type

MIL-PRF-62048; Air Cleaners, Automotive: Heavy Duty, Dry-Type (for Internal Combustion Engines)

ISO 16889:1999; Multi-Pass Method for Evaluating Filtration Performance of a Filter Element

MIL-F-8815D; Filter and Filter Elements – General Specification

SAE ARP 4205; Hydraulic Filter Elements With Cyclic Flow

SAE J1858; Multipass Method for Evaluating Filtration Performance

FORD; Fuel Pump Contamination KLT

SAE J2554, Engine Intake Air Water Separation Test Procedure, APR2003

Japanese Industrial Standard JIS D 1612, Test Methods of Air Cleaners for Automobiles

Chemistry

Methane Quantitative Analysis
Variation of SAE J1151

Analysis of Aldehydes and Ketones in Exhaust by High Performance Liquid Chromatography
Dinitrophenylhydrazine Derivative with HPLC-UV Analysis

Methanol and Ethanol Analysis by Capillary Column GC
Water Collection with GC-FID Analysis

Analysis of Sulfate in Exhaust by Ion Chromatography
Filter Collection, IPA/Water Extraction with IC Analysis

Organic Solvent Extraction of 47mm Filters
Title 13, California Code of Regulation, Section 1956.8 (b)

Specifications and Qualification Procedures for Aviation Jet Fuel Filter/Separators
API/IP Specification 1581

Specifications and Qualification Procedures for Aviation Fuel Filter Monitors with Absorbent Type Elements
API/IP Specification 1583

Specifications and Qualification Procedures for Aviation Fuel Microfilters
API/IP Specification 1590

Emulsified Water/Fuel Separation Test Method
SAE J1488

Coarse Water/Fuel Separation Test Method
SAE J1839

Particle Counting
ISO 4406; SAE AS 4059, Method A

Water Content by Karl Fischer Titration
ASTM D6304

Interfacial Tension (automated)
ASTM D971

Surface Tension (automated)
ASTM D1331, Method A

Microseparometer
ASTM D3948

Undissolved Water By Aqua-Glo
ASTM D3240