SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

INDEPENDENT ENGINEERING LABORATORIES, INC.[1]
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MECHANICAL

Valid To: June 30, 2020 Certificate Number: 1492.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory at the location listed above as well as the one satellite laboratory location listed below to perform the following tests (using technologies such as Durability/Performance of Fuel Delivery Modules, Pumps, Regulators, Filters, Rails, Tanks, Injectors, Senders, PPRV Valves, Check Valves, Carbon Canisters, Hoses, "O" Rings, Pressure Transducers, Solenoids, Dampers, Throttle Bodies, and Intake Manifolds) on automotive fuel systems:

Tests:	**Test Methods:**
Fire Resistance/Flammability Testing:	
Associated Test Parameters	DOT/FAA AC 20-135; DOT/FAA Power Plant Engineering Report No. 3A;
Temperature: 200°F to 2000°F	ISO 2685; Rolls-Royce Spec. JES 314-1;
Air Velocity: Up to 500 ft/ min	RTCA/DO-160, Section 26; SAE AIR 1377A;
Flame Intensity: Up to 5,000 BTU/ hr	SAE AS 1055; SAE AS 4273
Vibration with Combined Environment[2]:	
Frequency: (DC to 3000) Hz Combined Temperature: (-40 to 350) °F; (-40 to 1000) °C Humidity: (5 to 95) % RH	
Random: 30,000 lbs force	MIL-STD-810 (F, G) Method 514; PF 9699; RTCA/DO-160D, E, F
Sine: 30,000 lbs force	SAE J2044; ES-4L8E-9F792-AB
Shock: up to 100 Gs, 100 msec	MIL-STD-810 (F, G) Method 516
Sine on Random: 30,000 lbs force	RTCA/DO-160D, E, F

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Tests:	**Test Methods:**
Vibration with Combined Environment Cont'd[2]:	
Sine on Random: 30,000 lbs force	ESDG93-8260-AA, Section 3.15 Pressure, Vibrations, and Temperature (PVT) Durability ESDG93-18B402-AA, Section 3.11 PVT (Pressure, Vibration and Temperature Test) PF.90080, Section 9.3.1 Heavy Duty Test Specification PF.90080, Section 9.3.2 Standard Duty Test Specification PF-11118, Section 7.1.1 Pressure Vibration Thermal Cycling Test TSB5501G, Section 6.2.10 Pressurization Cycle Resistance Test under Vibration GMW 14785, Pressure Vibration Temperature (PVT) Cycle Test GMW14329, Section 4.3 Coolant Circulation Mazda MES PA 15 185, Section 7.2.4 Vibration Resistance Nissan NES D5806 2016-N, Section 6.16 Repeated Pressure Vibration Test Method Daimler Chrysler A 210 006 4099, Section 4 Coolant Hose Durability Test
Permeation:	
LEV Capable /ULEV Capable /Capable to 0 Emissions Hydrocarbon Emissions	GMN-10029SOP; GM CG1752; SAE J2044; Ford CETP 10.00-E-400, 10.00-E-401
Load Testing[2]*:*	
(0 to 5000) lbs Tension or Compression Travel: Pull apart, Assembly Effort, Side Load	SAE J2044
Cyclic Load: Up to 500 Hz, 10,000 lbs	

Tests:	**Test Methods:**
Environmental Simulation:	
High / Low Temperature[2]: (-65 to 650) °F	PF 9699; ES-F8DE-9C968-AA GMW 14329, Section 4.6 Fatigue Test Nissan NES D5806 2016-N, Section 6.20 Sealing Test at Low Temperature Test Method
Relative Humidity[2]: (5 to 95) % RH	ES-4L8E-9F792-AB
Thermal Shock[2]: (-40 to 350) °F Air-to-Air / Liquid-to-Liquid	PF 9699
Burst High Pressure[2]: (0 to 25,000) psi Combined Temperature: (-40 to 350) °F Relative Humidity: (5 to 95) % RH	SAE J2044
Leak Testing[2]: Pressure Decay (-40 to 350) °F	SAE J2044; ES-4L8E-9F792-AB
High Pressure Testing[2]: Nitrogen or Natural Gas, up to 25,000 psi	Eaton 45153
External Chemical and Environmental Resistance ATF, Motor Oil, Brake Fluid, Antifreeze, Diesel, Engine Degreaser, Zinc Chloride	SAE J2044
Fuel Compatibility	SAE J2044
Hydrocarbon Canister Conditioning	PF-90177

[1]This accreditation covers testing performed at the main laboratory listed above, and the satellite laboratory listed below.

INDEPENDENT ENGINEERING LABORATORIES, INC.
145 West Monroe Street
Jackson, MI 49202

Tests:	**Test Methods:**
Fuel Tank Capacity: Filling Performance (Pressure, Temperature, Flow Rate, Weight)	CETP 10.01-L-600; GM 14508 (2008)
Fire Resistance/Flammability Testing Associated Test Parameters Temperature: 200°F to 2000°F Air Velocity: Up to 500 ft/ min Flame Intensity: Up to 5,000 BTU/ hr	DOT/FAA AC 20-135; DOT/FAA Power Plant Engineering Report No. 3A; ISO 2685; Rolls-Royce Spec. JES 314-1; RTCA/DO-160, Section 26; SAE AIR 1377A; SAE AS 1055; SAE AS 4273
Permeation:	
LEV Capable /ULEV Capable /Capable to 0 Emissions Hydrocarbon Emissions	GMN-10029SOP; GM CG1752; SAE J2044; Ford CETP 10.00-E-400, 10.00-E-401
Environmental Simulation:	
Relative Humidity[2]: (5 to 95) % RH	ES-4L8E-9F792-AB
Hydrocarbon Canister Conditioning	PF-90177

Using the following types of specifications and standards: ASTM, Ford, Mazda, Chrysler, Honda, Delphi, GM, SAE, Toyota, Aerospace and directly related to the above tests furnished by the customer on the test methods for the parameters listed above and the equipment capabilities.

[2]Also using customer specified test methods directly related to the tests and parameters listed above.

Accredited Laboratory

A2LA has accredited

INDEPENDENT ENGINEERING LABORATORIES, INC.

Jackson, MI

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 April 2017*).

Presented this 16th day of October 2018.

President and CEO
For the Accreditation Council
Certificate Number 1492.01
Valid to June 30, 2020

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