



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Link Engineering Company
401 Southfield Road
Dearborn, MI 48120
(and satellite locations as shown on scope)

Fulfills the requirements of

ISO/IEC 17025:2017

In the fields of

TESTING and CALIBRATION

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

A handwritten signature in black ink, appearing to be 'Jason Stine', is positioned above a horizontal line.

Jason Stine, Vice President

Expiry Date: 21 October 2027

Certificate Number: ACT-1997



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
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).



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Link Engineering Company

401 Southfield Road
Dearborn, MI 48120

Daniel Williams
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TESTING AND CALIBRATION

ISO/IEC 17025 Accreditation Granted: **20 October 2025**

Certificate Number: **ACT-1997** Certificate Expiry Date: **21 October 2027**

Mechanical Testing

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Friction Effectiveness/ Performance/Wear	SAE J2522, SAE J2784, SAE J2684, ISO 26867, JASO C406, JASO C407, ATPD-5324-A, ECE R90-02, SAE 2690, ECE R13, ECE R13H, ISO 11157, ECE R139(BAS)	Friction Materials and Components for Hydraulic Brakes	Performance Dynamometer
Noise	SAE J2521, AK Noise, SAE J2636, SAE J294, ATPD-5324-A, USCT, AK Noise	Friction Materials and Components for Hydraulic Brakes	NVH Dynamometer
Wear	JASO C427, SAE J2707, SAE J3006, ATPD-5324-A, USCT	Friction Materials and Components for Hydraulic Brakes	Performance Dynamometer
Structural Performance	JASO C441, JASO C448, SAE J1713, SAE J2928, ECE R90-2, SAE J1404, ATPD-5324-A	Friction Materials and Components for Hydraulic Brakes	Performance Dynamometer

Mechanical Testing

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Friction Effectiveness/ Performance/Wear/ Structural	RP 628, TP-121D, SAE J2115, JASO C407, ISO 26865, ISO 26866, ATPD-5324-A	Friction Materials and Components for Air Brakes	Commercial Vehicle Dynamometer
Performance	JIS D 2603, SAE 1603	Hydraulic Brake Systems	Hydraulic Brake Bench Test
Impact	SAE J175, SAE J2530, SAE J3010, ISO 7141, ABNT NBR 6752	Hub-Bearing Assemblies and Wheels	Drop Tester
Cornering Fatigue	SAE J328, SAE J1095, SAE J2530, ISO 3006, ISO 3894, ABNT NBR 6750, ABNT NBR 6752	Hub-Bearing Assemblies and Wheels	Cornering Fatigue Test
Radial Fatigue	SAE J328, SAE J2530, SAE J3010, ISO3006, ISO 3894, ABNT NBR 6750, ABNT NBR 6752	Hub-Bearing Assemblies and Wheels	Radial Fatigue Test
Biaxial Fatigue	SAE J2562	Hub-Bearing Assemblies and Wheels	Biaxial Test
Performance and Durability	SAE J1153	Master Cylinder Assemblies	Caliper Bench/ Dynamometer
Performance	SAE J101	Hydraulic Wheel Cylinders for Automotive Drum Brakes	Caliper Bench/ Dynamometer
Performance	SAE J2316	Wheel Nut Seat System	Mechanical Test
Friction Coefficient and Wear	SAE J661, VESC-V3, NTC 5388	Friction and Composite Materials	Chase Test System
Compressibility	SAE J2468, ISO 6310, JIS D4413, SAE J3907-2, ABNT NBR 9301, ECE R90-02, GMW 15334, NTC 2406, NTC 5390	Friction and Composite Materials	Compressibility, Oven Test System

Mechanical Testing

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Flexural Modulus	ASTM D790	Plastics, Friction and Composite Materials	Tensile Machine
Swell and Growth	SAE J160, ABNT NBR 5505, ISO 6310	Friction and Composite Materials	Compressibility, Oven Test System
Internal Shear, Shear Strength	ISO 6311, ISO 6312, ABNT NBR 5537, NTC 5292, SAE J840, ECE R90-02, NTC 2405	Friction and Composite Materials	Shear Test Stand
Specific Gravity/Density/Porosity	SAE J380, ISO 15484	Friction and Composite Materials	Balance
Hardness	ISO 2039, ASTM E18, ISO 6508-1, SAE J2654	Rockwell Hardness of Metallic, Friction and Composite Materials	Rockwell Tester, Compressibility Stand
Hardness	ASTM E10, ISO 6506-1	Brinell Hardness of Metallic and Composite Materials	Compressibility Stand, Brinell Microscope
Hardness	SAE J379	Gogan Hardness of Friction Materials	Compressibility Stand
Servo-Hydraulic	Customer Specifications	Strength and Durability of End-Products of Non-Standard Size and Shape for Transportation, Automotive, Marine, Military, Medical and Power Sports Products	Linear Hydraulic Actuators (Displacement up to 10 in, Force up to 55,000 lbs), Rotary Hydraulic Actuators (Torque up to 100,000 in-lbs, Angle up to 90°)
Full Brake System	ECE-R13, ECE-R13H, ECE-R78, ECE R90, ECE R139(BAS), FMVSS 105, FMVSS 122, FMVSS 135	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds Field Testing

Mechanical Testing

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Performance	Thermal Capacity, High Speed Fade, AMS Fade Test, Vacuum Boosted, Trailer Tow, Death Valley, Link Brake Balance, New Car Assessment Program, Customer Specified Variations of the Above Listed Tests	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds
Durability	Detroit City Traffic, Phoenix City Traffic, Detroit Suburban Traffic, Phoenix Suburban Traffic, Huron Detroit Metropolitan Traffic, Customer Specification 7.2-L2-495	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Field Testing
Brake Wear	Los Angeles City Traffic, Detroit City Traffic, Phoenix City Traffic, Detroit Suburban Traffic, Phoenix Suburban Traffic, Huron Detroit Metropolitan Traffic, Customer Specification 7.2-L2-495	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Field Testing
Noise	Los Angeles City Traffic, Phoenix City Suburban Traffic, Marquette City Traffic, Customer Specification 7.2-L2-495	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Field Testing
Thermal Failure	Death Valley/Fluid Boil	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System

Mechanical Testing

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Stopping Distance, Brake Line Pressure, Pedal Force, Pedal Travel, Deceleration, Brake Pad Temperature, Rotor Temperature, Customer Specified Variations of the Above Listed Tests	Customer Specification	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System,
Fuel Economy, Coast-down, Fuel Consumption	SAE J1321, SAE J2263	Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds
NVH Vehicle Testing, Interior/Exterior Noise Studies, Pass by Noise	SAE J986	Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds
Thermal HVAC, Cooling Systems, Cold Chamber, Performance, Durability	Customer Specification	Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds
Wheel and Tire, Tire Blow-out, Structural Integrity	FMVSS 110	Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds
Stability Control System	FMVSS 126, ECE R140	Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds

Chemical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Composition	SAE J2975:2011, 2013, SAE J2975:2015, EPA 3051A, 6010C, 3060A, 7196A, EPA/600/R-93/116 ASTM E3061, ASTM D5702	Friction and raw materials, metal alloys, composites materials, paints and coatings	ICP-AES, Microwave, PLM Microscope, UV-Vis Spectrometer, Reference Materials (Cu, Sb, Zn, Cd, Cr, Ni, Pb, Hg, Cr ⁺⁶)
Corrosion	ASTM B117, ISO 9227, MIL-STD-810G Method 509.5, ASTM G85 Annex 1, 2 and 3, ABNT NBR 8094, ASTM D1735 Customer Specifications	Fog (spray) corrosion of metallic and non-metallic materials and composites	Cyclic Corrosion Chamber, Temperature and Humidity Cycling Chambers
Corrosion	GMW14872, SAE J2334, Customer Specifications	Cyclic Corrosion of Metallic and non-metallic materials and composites	Cyclic Corrosion Chamber, Temperature and Humidity Cycling Chambers
Corrosion	ASTM B368, ISO 9227, DIN 50021, Customer Specifications	Accelerated Corrosion: CASS and AASS of Metallic and non-metallic materials and composites	Cyclic Corrosion Chamber, Temperature and Humidity Cycling Chambers
Corrosion	ISO 6314, ASTM D870, ISO 2812-2, Customer Specifications	Resistance to Reagents and Immersion	Visual Inspection with Camera
Corrosion	ISO 2409, ASTM D3359, ABNT NBR 11003, ASTM D610, ASTM D1654	Paint/Coat degree of rusting, migration and adhesion by crosscut, creep-back and tape adhesion	Scribe Tool, Tape

Electrical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
DC Current-Measure 0.1 mA to 10 A DC Voltage-Measure 1 mV to 100 V DC Resistance-Measure 10 mΩ to 100 MΩ	MIL STD 202, USCAR2, Customer Specifications	Automotive and Non-Automotive Components and Subsystems, EV Components and subsystems	Digital Multimeter, Milliohm Meter
DC Contact Resistance 5 mΩ to 100 Ω	MIL STD 202, USCAR2, Customer Specifications	Automotive and Non-Automotive Components and Subsystems, EV Components and subsystems	Milliohm Meter
DC Insulation Resistance 500 MΩ to 100 GΩ @ 500 V	MIL STD 202, USCAR2, Customer Specifications	Automotive and Non-Automotive Components and Subsystems, EV Components and subsystems	Insulation Tester

CALIBRATION

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
DC Volt Sensors and Transducers ²	(0 to ±10) V (0 to ± 60) V	0.001 V 0.03 V	Comparison to Multimeter with Sources 7.4-L2-1130 DC Voltage Calibration

Electrical – DC/Low Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Electrical Simulation: Temperature Sensor and Transducer Systems ²	(-40 to 2 400) °F	0.7 °F	Millivolt Simulation using Multimeter with Source 7.4-L2-1126 Temperature Hardware Calibration 7.4-L2-1147 Temperature Software Calibration 7.4-L2-1108 Temperature Linearizer Calibration

Mass and Mass Related

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Pressure Sensors	(345 to 27 407) kPa	(0.15 + 0.000 6 <i>P</i>) kPa	Comparison to Pressure Gage 6.4-L2-208 Calibration of Pressure Transducers using Ashcroft Dead Weight Tester
Pressure Sensor and Transducer Systems ²	(0 to -15) psiv (0 to 200) psig (0 to 3 000) psig (0 to 5 000) psig (0 to 7 500) psig	0.03 psiv 0.3 psi 4 psi 8 psi 12 psi	Comparison to Pressure Gage 7.4-L2-1124 Pressure Hardware Calibration 7.4-L2-1145 Pressure Software Calibration
Force Sensors	(89 to 2 224) N	(1.9 + 0.001 3 <i>F</i>) N	Comparison to Force Sensor 6.4-L2-211 Calibration of Pedal Force Transducers Using Squash Rig
Force Sensor and Transducer Systems ²	(0 to 500) lbf (weights) (0 to 500) lbf (0 to 1 000) lbf (0 to 5 000) lbf (0 to 30 000) lbf (0 to 50 000) lbf	0.6 lbf 0.8 lbf 1.6 lbf 5 lbf 60 lbf 84 lbf	Comparison to Force Sensor 7.4-L2-1129 Force Calibration 7.4-L2-1149 Force Software Calibration

Mass and Mass Related

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Decelerometers-Angle Measurement	(-1 to 1) g @ 1 V/g Sensitivity	(0.000 8 + 0.003 1A) g	Comparison to Angle Standards 6.4-L2-226 DTC Calibration of Decelerometers
Torque Sensor and Transducer Systems ²	(0 to 1 000) lbf·in (0 to 5 000) lbf·ft (0 to 25 000) lbf·ft (0 to 75 000) lbf·ft	0.6 lbf·in 8 lbf·ft 30 lbf·ft 180 lbf·ft	Comparison to Torque Sensor 7.4-L2-1123 Torque Hardware Calibration 7.4-L2-1144 Torque Software Calibration 7.4-L2-1151 HBM Torque Calibration - Verification
Liquid Volume ²	(0 to 25) ml	0.1 ml	Comparison to Liquid Volume Sensor 7.4-L2-1127 Volume Calibration
Air Velocity Sensor and Transducer Systems ²	(500 to 3 500) fpm	50 fpm	Comparison to Air Velocity Sensor 7.4-L2-1131 Air Velocity Calibration

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ³	Reference Standard, Method, and/or Equipment
Angle ²	0° to 180° 0° to 7°	0.3° 0.02°	Comparison to Angle Standards 7.4-L2-1143 Angle Calibration
Non-Contact Displacement Probes	(0.125 to 25.4) mm	0.002 mm	Comparison to Displacement Standards 6.4-L2-227 Calibration of Non-Contact Probes
Distance Sensor and Transducer Systems ²	(0 to 1) in (0 to 2) in (0 to 6) in (0 to 24) in	0.000 06 in 0.000 2 in 0.001 in 0.003 in	Comparison to Distance Standards 7.4-L2-1136 Capacitance Measurement System Calibration 7.4-L2-1148 Length Software Calibration 7.4-L2-1128 Length Calibration
Distance Sensors	(0.254 to 508) mm	(0.06 + 0.003 3L) mm	Comparison to Height Standards 6.4-L2-92 Calibration of String Potentiometers

Time and Frequency

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Rotational Speed Sensors and Transducers Systems ²	(0 to 50) rpm (0 to 20 000) rpm	0.1 rpm 3 rpm	Comparison to Rotation Source 7.4-L2-1125 Rotational Speed Calibration and 7.4-L2-1146 Rotational Speed Digital Calibration

Thermodynamic

Parameter / Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method and/or Equipment
Relative Humidity Sensor and Transducer Systems ²	(10 to 95) %RH	5 %RH	Comparison to Humidity Sensor 7.4-L2-1132 Humidity Calibration

- Notes:
1. Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 ($k=2$), corresponding to a confidence level of approximately 95%.
 2. On-site service is available for calibration parameters, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope.
 3. The term *L* represents Length in units appropriate to the uncertainty statement.
 4. The term *A* represents Acceleration\Deceleration in units appropriate to the uncertainty statement.
 5. The term *F* represents Force in units appropriate to the uncertainty statement.
 6. The term *P* represents Pressure in units appropriate to the uncertainty statement.





ANSI National Accreditation Board

Link Engineering Company

Satellite Location

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TESTING

Mechanical Testing

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Friction Effectiveness/ Performance/Wear	SAE J2522; SAE J2784 SAE J2684; ISO 26867 JASO C406; JASO C407 ATPD-5324-A; ECE R90-02 SAE 2690; ECE R13 ECE R13H; ISO 11157	Friction Materials and Components for Hydraulic Brakes	Performance Dynamometer
Noise	SAE J2521 AK Noise; SAE J2636; SAE J294; ATPD- 5324-A; USCT	Friction Materials and Components for Hydraulic Brakes	NVH Dynamometer
Wear	JASO C427; SAE J2707 SAE J3006; ATPD-5324-A; USCT	Friction Materials and Components for Hydraulic Brakes	Performance Dynamometer
Structural Performance	JASO C441; JASO C448 SAE J1713; SAE J2928 ECE R90-2; SAE J1404 ATPD-5324-A	Friction Materials and Components for Hydraulic Brakes	Performance Dynamometer
Friction Effectiveness/ Performance/Wear/ Structural	RP 628, TP-121D; SAE J2115; JASO C407 ISO 26865; ISO 26866 ATPD-5324-A	Friction Materials and Components for Air Brakes	Commercial Vehicle Dynamometer
Vibration ² /Vibration with Environmental Controls ¹	MIL-STD-810H Methods: 514.8, 500.6, 501.7, 502.7, 507.6; IEC 60068-2-6; IEC 60068-2-64, SAE J1455 Section 4.10; Customer Specifications	Automotive and Non- Automotive Components and Subsystems, EV Components and subsystems	Electrodynamic and Servo Hydraulic Vibration Systems with Thermal and Environmental Controls

Mechanical Testing

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Mechanical Shock ¹	MIL-STD-810H, Method 516.8; IEC 60068-2-27; SAE J1455 Section 4.11; Customer Specifications	Automotive and Non-Automotive Components and Subsystems, EV Components and subsystems	Electrodynamic and Servo Hydraulic Vibration Systems
Thermal Shock ¹	MIL-STD-810H, Method 503.7; SAE J1455 Section 4.1; IEC 60068-2-14; Customer Specifications	Automotive and Non-Automotive Components and Subsystems, EV Components and subsystems	Thermal Shock Chambers, Temperature/Humidity Chambers, Ovens

Note:

- Also using customer specific test specifications utilizing any combination of test equipment parameters listed above.



Link Engineering Company

Satellite Location

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TESTING AND CALIBRATION

Mechanical Testing

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Full Brake System	ECE-R13, ECE-R13H, ECE-R78, ECE R90, FMVSS 105, FMVSS 122, FMVSS 135, ECE R139 (BAS)	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds Field Testing
Performance	Thermal Capacity, High Speed Fade, AMS Fade Test, Vacuum Boosted, Trailer Tow, Death Valley, Link Brake Balance, New Car Assessment Program, Customer Specified Variations of the Above Listed Tests	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds
Durability	Phoenix City Traffic, Phoenix Suburban Traffic, Customer Specification 7.2-L2-495	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Field Testing
Brake Wear	Los Angeles City Traffic, Phoenix City Traffic, Phoenix Suburban Traffic Customer Specification 7.2-L2-495	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Field Testing
Noise	Los Angeles City Traffic, Phoenix City Traffic, Phoenix City Suburban Traffic Customer Specification 7.2-L2-495	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Field Testing

Mechanical Testing

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Thermal Failure	Death Valley/Fluid Boil, Customer Specification	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds, Field Testing
Stopping Distance, Brake Line Pressure, Pedal Force, Pedal Travel, Deceleration, Brake Pad Temperature, Rotor Temperature, Customer Specified Variations of the Above Listed Tests	Customer Specification	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds, Field Testing
Fuel Economy, Coast-down, Fuel Consumption	SAE J1321, SAE J2263	Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds
NVH Vehicle Testing, Interior/Exterior Noise Studies, Pass by Noise	SAE J986, ECE R51, ECE R28 FMVSS 141, ECE R138	Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds
Wheel and Tire, Tire Blow-out, Structural Integrity	FMVSS 110, ECE R141	Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds
Stability Control System	FMVSS 126, ECE R140	Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds

CALIBRATION

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ^{2, 3, 5, 6}	Reference Standard, Method, and/or Equipment
Pressure Sensors	(0.1 to 206 84.27) kPa @0.0063 mV/kPa	0.021 kPa	6.4-L2-176 Calibration of Pressure Transducers; Comparison to Pressure Transducer

This Scope of Accreditation, version 021, was last updated on: 20 October 2025 and is valid only when accompanied by the Certificate. Page 15 of 19

Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ^{2, 3, 5, 6}	Reference Standard, Method, and/or Equipment
Vacuum Sensors	(0.5 to 711.2) mmHg @0.038 mV/mmHg	0.12 mmHg	6.4-L2-164 Calibration of Vacuum Transducers; Comparison to Vacuum Transducer
Force Sensors	(4.448 to 1 338.92) N (0.99 to 301) lbf @0.08 mV/lbf	0.09 N (0.02 lbf)	6.4-L2-90 Calibration of Pedal Force Transducers; Comparison to Force Transducer
Decelerometers	Up to 1 g _n @1 V/g	0.0038 g	6.4-L2-38 Calibration Procedures for Accelerometers; Comparison to Inclinometer

Electrical-DC and Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ⁴	Reference Standard, Method, and/or Equipment
DC Volt Measurement, Gain LINK VMAX Analog	(0 to ±10) V	0.0004 V	6.4-L2-207 VMAX DAS Calibration Setup
AC Volt Measurement, Gain,	(0 to 10) V _{pp} @ up to 20 kHz	0.005 V	
Electrical Simulation: Temperature Sensor, LINK VMAX Temperature	(-40 to 2400) °F	0.73 °F	7.4-L2-1126 Temperature Hardware Calibration 7.4-L2-1147 Temperature Software Calibration 7.4-L2-1108 Temperature Linearizer Calibration 6.4-L2-207 VMAX DAS Calibration Setup 7.4-L2-2271 VMAX Calibration Using Internal Software; Millivolt Simulation using Function Generator
LINK VMAX Pulse Counter	25 MHz Waveform-Square Wave	0.1 Hz	7.4-L2-2271 VMAX Calibration Using Internal Software; Comparison to Function Generator

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ⁴	Reference Standard, Method, and/or Equipment
Frequency-Measure, LINK VMAX NVH Module	1000 Hz	0.57 Hz	6.4-L2-207 VMAX DAS Calibration Setup
GPS Speed/Distance Transducer	10-174 km/h	(0.117 + 0.0023S) km/h	Link 5 th Wheel Speed Transducer, VMAX Pulse Counter

Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ⁴	Reference Standard, Method, and/or Equipment
Non-Contact Displacement Probes	(0.01 to 25.4) mm	0.002 mm	6.4-L2-227 Calibration of Non-Contact Probes; Comparison to Probe
Distance Sensors	(0.025 to 508) mm	0.005 mm	6.4-L2-92 Calibration of String Potentiometers; Comparison to String Potentiometer

- Notes:
1. Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 ($k=2$), corresponding to a confidence level of approximately 95%.

Link Engineering Company

Satellite Location

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TESTING

Mechanical Testing

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Full Brake System Performance-Stopping Distance	FMVSS 121 FMVSS 105 European Specifications- ECE R13, ECE R139 (BAS) Japanese Specifications- TRIAS 11-1-12, 11-1-13	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System- ABS Functionality, Pneumatic Properties, Line Pressure (Pneumatic and Hydraulic), Temperature, Pedal Force, Stopping Distance Proving Ground Facilities
Full Brake System Performance	Transit Duty Cycle (CV-5.9-L3-706-00) Jennerstown Mountain- Road Course (TOP 2-2-608 Braking, Wheeled Vehicles) Death Valley Descent Tests		
Electronic Stability Control	FMVSS 136	Full Vehicle	Vehicle, In-Vehicle Data Acquisition System- ABS Functionality, Pressure, Speed, J1939 Signals Proving Ground Facilities

Link Engineering Company
Satellite Location

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CALIBRATION

Electrical-DC and Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ⁴	Reference Standard, Method, and/or Equipment
DC Volt Measurement, Gain LINK VMAX Analog	(0 to ±10) V	0.000 4 V	6.4-L2-207 VMAX DAS Calibration Setup
AC Volt Measurement, Gain,	Up to 20 kHz (0 to 10) Vpp	0.005 V	
Thermocouple-Sourcing LINK VMAX Temperature	Types K, J, T (-40 to 2400) °F	0.86 °F	Electrical Simulation using 6.4-L2-207 VMAX DAS Calibration Setup

Time and Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ⁴	Reference Standard, Method, and/or Equipment
Frequency-Measuring, LINK VMAX NVH Module	Up to 20 kHz	0.57 Hz	Direct Measurement using 6.4-L2-207 VMAX DAS Calibration Setup

Notes:

1. Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 (k=2), corresponding to a confidence level of approximately 95%.



Jason Stine, Vice President