



# CERTIFICATE OF ACCREDITATION

## ANSI-ASQ National Accreditation Board

500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

This is to certify that

**Link Engineering Company**  
**401 Southfield Road**  
**Dearborn, MI 48120**

has been assessed by ANAB  
and meets the requirements of international standard

## ISO/IEC 17025:2005

while demonstrating technical competence in the fields of

## TESTING & CALIBRATION

Refer to the accompanying Scope of Accreditation for information regarding the types of tests and calibrations to which this accreditation applies.

ACT-1997

Certificate Number

  
ANAB Approval

Certificate Valid: 12/14/2017 - 10/21/2019  
Version No. 006 Issued: 12/14/2017



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. 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 17025:2005

Link Engineering Company

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Dearborn, MI 48120

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Valid to: **October 21, 2019**

Certificate Number: **ACT-1997**

**TESTING**

**Mechanical**

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, 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
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	Hub-Bearing Assemblies and Wheels	Drop Tester



**Mechanical**

<b>Specific Tests and/or Properties Measured</b>	<b>Specification, Standard, Method, or Test Technique</b>	<b>Items, Materials or Product Tested</b>	<b>Key Equipment or Technology</b>
Cornering Fatigue	SAE J328, SAE J1095, SAE J2530, ISO 3006, ISO 3894	Hub-Bearing Assemblies and Wheels	Cornering Fatigue Test
Radial Fatigue	SAE J328, SAE J2530, SAE J3010, ISO3006, ISO 3894	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
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
Specify 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
	ASTM E10, ISO 6506-1	Brinell Hardness of Metallic and Composite Materials	Compressibility Stand, Brinell Microscope
	SAE J379	Gogan Hardness of Friction Materials	Compressibility Stand

**Mechanical**

<b>Specific Tests and/or Properties Measured</b>	<b>Specification, Standard, Method, or Test Technique</b>	<b>Items, Materials or Product Tested</b>	<b>Key Equipment or Technology</b>
Full Brake System	ECE-R13, ECE-R13H, ECE-R78-1, ECE R90-02, FMVSS 105, FMVSS 122, FMVSS 135	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, N.C.A.P., Customer Specification	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds Field Testing
Durability	Detroit City Traffic, Phoenix City Traffic, Detroit Suburban Traffic, Phoenix Suburban Traffic, Huron Detroit Metropolitan Traffic, Customer Specification	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds 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	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds Field Testing
Noise	Los Angeles City Traffic, Marquette City Traffic, Customer Specification	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds Field Testing
Thermal Failure	Fluid Boil, Death Valley	Friction Materials/ Brake Hardware/ Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds Field Testing
Customer Specification	Stopping Distance, Brake Line Pressure, Pedal Force, Pedal Travel, Deceleration, Brake Pad Temperature, Rotor Temperature	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 Field Testing

**Mechanical**

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
NVH Vehicle Testing, Interior/Exterior Noise Studies, Pass by Noise	SAE J986	Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds Field Testing
Thermal HVAC, Cooling Systems, Cold Chamber, Performance, Durability	Customer Specification	Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds Field Testing
Wheel and Tire, Tire Blow-out, Structural Integrity	FMVSS 110	Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds Field Testing
Stability Control System	FMVSS 126	Full Vehicle	Vehicle, In-Vehicle Data Acquisition System, Proving Grounds Field Testing

**Testing - 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, SAE J2975:2013, SAE J2975:2015, EPA 3051A, EPA 6010C, EPA 3060A, EPA 7196A, EPA/600/R-93/116	Friction and Raw Materials	ICP-AES, Microwave, PLM Microscope, UV-Vis Spectrometer
Corrosion	ASTM B117, ISO 9227, MIL-STD-810G - Method 509.5, ASTM G85 Annex 1, 2 and 3, Customer Specifications	Fog (spray) Corrosion of Metallic and non-metallic materials and composites	Cyclic Corrosion Chamber, Temperature Cycling Chamber (Detroit)
	GMW14872, SAE J2334, Customer Specifications	Cyclic Corrosion of Metallic and non-metallic materials and composites	Cyclic Corrosion Chamber, Temperature Cycling Chamber (Detroit)
	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 Cycling Chamber (Detroit)

**Testing - Chemical**

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
	ISO 6314, ASTM D870, ISO 2812-2, Customer Specifications	Resistance to Reagents and Immersion	Solutions: Brake and Motor oil, Saline and water

**CALIBRATION**

**Calibration - Mass**

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Pressure Sensors	(345 to 27 407) kPa	(0.15 + 0.000 6P) kPa	Procedure C-5.5-L3-079 Ashcroft Deadweight Test Bench
Force Sensors	(89 to 2 224) N	(1.93 + 0.001 3N) N	Procedure C-5.5-L3-080 Interface Gold Standard 1610AJH Calibration Load Cell
Decelerometers	(-1 to 1) g	(0.000 8 + 0.003 1A) g	Procedure C-5.5-L3-083 Digital Protractor Angle Gage

**Calibration - Dimensional**

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Non-Contact Displacement Probes	(0.125 to 25.4) mm	0.002 mm	Procedure C-5.5-L3-082 1338 Boeckeler Micrometer
Distance Sensors	(0.254 to 508) mm	(0.06 + 0.003 3L) mm	Procedure C-5.5-L3-006 Mitutoyo Digital Height Gage



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. Parameters identified with an asterisk (\*) are available for on-site testing or calibration.
4. The term P represents Pressure in units appropriate to the uncertainty statement.
5. The term F represents Force in units appropriate to the uncertainty statement.
6. The term L represents Length in units appropriate to the uncertainty statement.
7. The term A represents Acceleration\Deceleration in units appropriate to the uncertainty statement.
8. This scope is part of and must be included with the Certificate of Accreditation No. ACT-1997



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Vice President