



The American Association for Laboratory Accreditation

World Class Accreditation

Accredited Laboratory

A2LA has accredited

DENTON ATD

Huron, OH

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 8 January 2009*).

Presented this 3rd day of November 2008.





Peter Abney

President & CEO
For the Accreditation Council
Certificate Number 2421.01
Valid to September 30, 2010
Revised November 3, 2009

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

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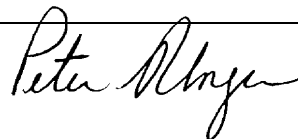
MECHANICAL

Valid To: September 30, 2010

Certificate Number: 2421.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following Crash Test Dummy tests:

Parameter/Equipment	Range	Methods/Standards
Hybrid III 50 th – Eurofoot Lower Foot Heel Impact Test Velocity Acceleration Temperature Humidity	(4.3 to 4.5) m/s (245 to 345) g (19 to 25)°C (10 to 70)%	ECE Addendum 93: Regulation 94
Hybrid III 50 th – Eurofoot Upper Foot Impact Test Velocity Moment Temperature Humidity	(6.6 to 6.8) m/s (95 to 145) Nm (19 to 25)°C (10 to 70)%	ECE Addendum 93: Regulation 94
Hybrid III 50 th – Eurofoot Heel Impact with Shoe Test Velocity Force Temperature Humidity	(6.6 to 6.8) m/s (2.8 to 3.8) kN (19 to 25)°C (10 to 70)%	ECE Addendum 93: Regulation 94
Hybrid III 5 th , 50 th , 95 th Foot Compression Test Force Displacement Temperature Humidity	(0 to 667) N (0 to 8.1) mm (19 to 26)°C (10 to 70)%	SAE – User’s Manual 50 th HIII Test Dummy Engineering Aid (EA-23) SAE – User’s Manual 5 th HIII Test Dummy Engineering Aid (EA-25) SAE – User’s Manual 95 th HIII Test Dummy Engineering Aid (EA-26)



Parameter/Equipment	Range	Methods/Standards
Hybrid III Family Head Drop Test Acceleration Unimodal Oscillation Temperature Humidity	(0 to 300) g 0% to 17% (19 to 26) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart E, N, O, P, R SAE – User’s Manual 95 th HIII Test Dummy Engineering Aid (EA-26) SAE – User’s Manual 10 YO HIII Test Dummy (EA –34)
Hybrid III 5 th , 50 th – Hip Range of Motion, Left & Right Femur Angle Moment Angular Velocity Temperature Humidity	(0 to 50) degrees (0 to 203) Nm (5 to 10) degrees/sec (19 to 26) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart E SAE – User’s Manual 5 th HIII Test Dummy Engineering Aid (EA-25)
Hybrid III Family – Knee Impact Test Velocity Force Temperature Humidity	(2.07 to 2.13) m/s (2.0 to 6.0) kN (19 to 26) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart E, N, O SAE – User’s Manual 95 th HIII Test Dummy Engineering Aid (EA-26) SAE – User’s Manual 10 YO HIII Test Dummy EA-34
Hybrid III 5 th , 50 th , 95 th Knee Slider Test Velocity Force Displacement Temperature Humidity	(2.70 to 2.80) m/s (1.26 to 3.10) kN (10 to 18.3) mm (19 to 26) degrees C (10 to 70)%	SAE – User’s Manual 50 th HIII Test Dummy Engineering Aid (EA-23) SAE – User’s Manual 5 th HIII Test Dummy Engineering Aid (EA-25) SAE – User’s Manual 95 th HIII Test Dummy Engineering Aid (EA-26)



Parameter/Equipment	Range	Methods/Standards
Hybrid III Family – Neck Extension Test Velocity Acceleration Time Angle Moment Temperature Humidity	(0.80 to 6.22) m/s (0.0 to 22.0) g (0 to 174) ms (70.0 to 114.0) degrees (0 to 84) Nm (20.6 to 22.2) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart E, N, O, P, R SAE – User’s Manual 95 th HIII Test Dummy Engineering Aid (EA-26) SAE – User’s Manual 10 YO HIII Test Dummy (EA-34)
Hybrid III Family – Neck Flexion Test Velocity Acceleration Time Angle Moment Temperature Humidity	(1.20 to 7.13) m/s (0.0 to 29.0) g (34 to 128) ms (64 to 92) degrees (0 to 130) Nm (20.6 to 22.2) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart E, N, O, P, R SAE – User’s Manual 95 th HIII Test Dummy Engineering Aid (EA-26) SAE – User’s Manual 10 YO HIII Test Dummy (EA –34)
Hybrid III Family – Thorax Impact Test Velocity Force Displacement Hysteresis Temperature Humidity	(4.90 to 6.83) m/s (680 to 5900) N (12.5 to 76.0) mm (65 to 85)% (20.6 to 22.2) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart E, N, O, P, R SAE – User’s Manual 95 th HIII Test Dummy Engineering Aid (EA-26) SAE – User’s Manual 10 YO HIII Test Dummy (EA-34)
Hybrid III Family – Torso Flexion Test Angular Velocity Force Angle Temperature Humidity	(0.5 to 1.5) degrees/sec (130 to 550) N (0.0 to 45.5) degrees (20.6 to 22.2) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart N, O, P SAE – User’s Manual 95 th HIII Test Dummy Engineering Aid (EA-26) SAE – User’s Manual 10 YO HIII Test Dummy (EA-34)

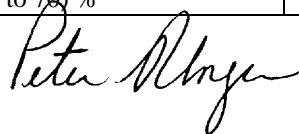


Parameter/Equipment	Range	Methods/Standards
Hybrid II Family – Head Impact Test Velocity Acceleration Unimodal Oscillation Time Temperature Humidity	(2.10 to 2.16) m/s (5.0 to 260.0) g (0 to 10)% (0.9 to 2.0) ms (18.9 to 25.6) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart B, C, I
Hybrid II Family – Neck Flexion Test Velocity Acceleration Time Angle Displacement Temperature Humidity	(4.88 to 7.77) m/s (0.0 to 34.0) g (0.0 to 134.8) ms (30.0 to 92.0) degrees (0.0 to 168.0) mm (18.9 to 25.6) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart B, C, I
Hybrid II Family – Thorax Impact Test Velocity Force Displacement Acceleration Hysteresis Unimodal Time Temperature Humidity	(3.90 to 6.78) m/s (0.0 to 10.01) Kn (0.0 to 43.0) mm (0.0 to 70.0) g (50 to 70)% (0 to 10)% (2.50 to 6.0) ms (18.9 to 25.6) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart B, C, I
Hybrid II Family – Knee Impact Test Velocity Force Time Temperature Humidity	(2.08 to 2.16) m/s (1.0 to 11.12) kN (0.0 to 4.0) ms (18.9 to 25.6) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart B, I
Hybrid II Family – Lumbar, Abdomen Spine and Pelvis Flexion Test Angular Velocity Force Angle Temperature Humidity	(0.5 to 1.5) degrees/s (20.6 to 232.0) N (20.6 to 50.0) degrees (18.9 to 25.6) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart B, C, I

Parameter/Equipment	Range	Methods/Standards
Side Impact Family – Head Drop Test Acceleration Unimodal Oscillation Temperature Humidity	(15 to 150) g (0% to 15%) (20.6 to 22.2) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart M,U,V ECE Addendum 94:Regulation 95 User’s Manual – ES-2 50th Percentile Side Impact Crash Test Dummy SAE User’s Manual – Biosid Side Impact Dummy Engineering Aid (EA-24)
Side Impact Family – Lateral Neck Bending Test Velocity Acceleration Time Angle Moment Temperature Humidity	(1.96 to 7.64) m/s (0.0 to 37.0) g (0 to 70) ms (0.0 to 82.0) degrees (0.0 to 88.0) Nm (20.6 to 22.2) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart M,U,V ECE Addendum 94:Regulation 95 User’s Manual – ES-2 50th Percentile Side Impact Crash Test Dummy SAE User’s Manual – Biosid Side Impact Dummy Engineering Aid (EA-24)
Side Impact Family – Pelvis Impact Test Velocity Acceleration Force Time Unimodal Oscillation Temperature Humidity	(4.20 to 6.84) m/s (15 to 66) g (1.04 to 9.70) kN (3.0 to 15.9) ms (0 to 10)% (20.6 to 22.2) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart F, U ,V ECE Addendum 94;Regulation 95 User’s Manual – ES-2 50th Percentile Side Impact Crash Test Dummy SAE User’s Manual – Biosid Side Impact Dummy Engineering Aid (EA-24)
SID – Damper Impact Test Velocity Force Displacement Temperature Humidity	(3.02 to 6.16) m/s (0.825 to 4.425) kN (30.0 to 39.62) mm (18.9 to 25.6) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart F

Parameter/Equipment	Range	Methods/Standards
SID – Thorax Impact Test Velocity Acceleration Temperature Humidity	(4.22 to 4.31) m/s (15.0 to 46.0) g (18.9 to 25.6) degrees C (10 to 70)%	CFR 49 – Part 572 Subpart F, M, U
Side Impact Family Shoulder Impact Test Velocity Acceleration Force Displacement Temperature Humidity	(4.20 to 4.59) m/s (7.5 to 10.50) g (1.60 to 4.50) kN (21.2 to 39.0) mm (20.6 to 22.0) degrees C (10 to 70)%	ECE Addendum 94: Regulation 95 CFR 49 Part 572 Subpart U, V User’s Manual – ES-2 50th Percentile Side Impact Crash Test Dummy SAE User’s Manual – Biosid Side Impact Dummy Engineering Aid (EA-24)
Side Impact Family - Lumbar Spine bending Test Velocity Acceleration Time Angle Temperature Humidity	(5.95 to 6.15) m/s (0.0 to 34.1) g (1.0 to 55.0) ms (27.0 to 55.0) degrees (20.6 to 22.0) degrees C (10 to 70)%	ECE Addendum 94:Regulation 95 User’s Manual – ES-2 50th Percentile Side Impact Crash Test Dummy CFR 49 Part 572 Subpart U
Side Impact Family – Rib/Rib Module/Rib Damper Impact Test Velocity Displacement Temperature Humidity	(1.0 to 10.0) m/s (10.0 to 51.0) mm (18.0 to 22.0) degrees C (10 to 70)%	ECE Addendum 94:Regulation 95 User’s Manual – ES-2 50th Percentile Side Impact Crash Test Dummy CFR Part 572 Subpart U
Side Impact Family Abdomen Impact Test Velocity Acceleration Force Time Displacement Temperature Humidity	(4.41 to 6.40) m/s (5.0 to 212.0) g (1.30 to 11.10) kN (8.50 to 10.4) ms (38.0 to 56.0) mm (20.6 to 22.0) degrees C (10 to 70)%	ECE Addendum 94:Regulation 95 User’s Manual – ES-2 50th Percentile Side Impact Crash Test Dummy SAE User’s Manual – Biosid Side Impact Dummy Engineering Aid (EA-24) CFR Part 572 Subpart U, V

Parameter/Equipment	Range	Methods/Standards
Side Impact Family – Thorax Impact Test (With Arm and Without Arm) Velocity Acceleration Force Time Displacement Temperature Humidity	(4.20 to 6.84) m/s (12.0 to 179.0) g (4.10 to 7.60) kN (8.50 to 10.4) ms (14.0 to 70.0) mm (20.6 to 22.2) degrees C (10 to 70)%	SAE User’s Manual – Biosid Side Impact Dummy Engineering Aid (EA-24) CFR Part 572 Subpart V
Biorid Mini Sled Test Pendulum Velocity Sled Acceleration Pendulum Force Time Temperature Humidity	(4.70 to 4.80) m/s (12.0 to 179.0) m/s ² (4.70 to 5.20) kN (4.0 to 24.0) ms (19.0 to 25.0) degrees C (10 to 70)%	Denton BioRID II User’s Manual
Hybrid III 50 th – Thor LX Hybrid III Retrofit Ball of Foot Velocity Force Moment Angle Temperature Humidity	 (4.90 to 5.10) m/s (2226 to 3738) N (38.4 to 94.20) Nm (32.7 to 42.3) degrees (69.0 to 72.0) degrees F (10 to 70)%	Thor LX / Hybrid III Retrofit Version 3.2 (NHTSA October 2001) Thor LX / Hybrid III Retrofit Version 3.2 (NHTSA June 2004) Thor-FLX/Hybrid III Retrofit Version 1.0
Hybrid III 50 th – Thor LX Hybrid III Retrofit Heel of Foot Velocity Force Temperature Humidity	 (3.90 to 4.10) m/s (1969 to 3673) N (69.0 to 72.0) degrees F (10 to 70)%	Thor LX / Hybrid III Retrofit Version 3.2 (NHTSA October 2001) Thor LX / Hybrid III Retrofit Version 3.2 (NHTSA June 2004) Thor-FLX/Hybrid III Retrofit Version 1.0
Hybrid III 50 th – Thor LX Hybrid III Retrofit Dynamic Inversion / Eversion Velocity Force Moment Angle Temperature Humidity	 (1.90 to 2.10) m/s (305 to 675) N (16.5 to 44.4) Nm (19.6 to 37.0) degrees (69.0 to 72.0) degrees F (10 to 70) %	Thor LX / Hybrid III Retrofit Version 3.2 (NHTSA October 2001) Thor LX / Hybrid III Retrofit Version 3.2 (NHTSA June 2004) Thor-FLX/Hybrid III Retrofit Version 1.0



CALIBRATION SCOPE-POTENTIOMETERS

Parameter/Equipment	Range	CMC ^{1,2,3}	Comments
Rotary Potentiometers	+/- 75 degrees	0.2 % F.S.	WI CL053
Linear Potentiometers	(0 to 72) mm	0.2 % F.S.	WI CL053
Chest Potentiometer Assemblies	(0 to 71) mm	0.8 % F.S.	SAE J2517: 2006

¹ F.S refers to the “Rounded % Full Scale” is chosen to be a conservative number larger than the determined “Calibration and Measurement Capability (CMC)”.

² “Calibration and Measurement Capability (CMC)” is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards or nearly ideal measuring equipment. Calibration and Measurement Capabilities represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of $k = 2$. The actual measurement uncertainty of a specific calibration performed by the laboratory may be greater than the CMC due to the behavior of the customer’s device and to influences from the circumstances of the specific calibration.

³ This laboratory meets the A2LA Calibration Program Requirements for the types of testing listed above. Accredited test reports issued containing appropriate statements of measurement results, CMC, and traceability are considered equivalent to a “calibration” certificate.

