

Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-PL-18416-01-00 according to DIN EN ISO/IEC 17025:2005

Valid from: 18.09.2019

Date of issue: 18.09.2019

Holder of certificate:

**ACTS-Advanced Car Technology Systems GmbH & Co.KG
Kurfürst-Eppstein-Ring 11, 63877 Sailauf**

Tests in the fields:

Dynamic and static safety testing on automobiles and their components for investigation of the behavior of auto body and the passenger protection, safety of steering systems and interior impact protection, resisting power of safety-belt anchorages and the strength of seats, head restraints and fuel systems caused by collision;

Dynamic testing on automobiles and their components for evaluation of systems for the protection of pedestrians and the impact of rear and front bumper

This document is a translation. The definitive version is the original German annex to the accreditation certificate.

Abbreviations used: see last page

*The certificate together with its annex reflects the status at the time of the date of issue. The current status of the scope of accreditation can be found in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH.
<https://www.dakks.de/en/content/accredited-bodies-dakks>*

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1. Approval of motor vehicles by dynamic crash testing with the focus on restraint systems, structure, safety of steering mechanism, prevention of fire risk and safety of rechargeable electrical energy storage systems in the event of collisions

1.1 Electric/ Electronic		08
1.1.1 Electric vehicles		08-04
UN-R 100 Part II SERIES 02 (EU) 2017/79	Uniform provisions concerning the approval of vehicles with regard to specific requirements for the electric power train Part II: Requirements of a Rechargeable Electrical Energy Storage System (REESS) with regard to its safety, (only chapter 6.4.1 Mechanical Impact - Mechanical Shock / and Annex 8C: REESS-Test Procedures - Mechanical Shock) COMMISSION DELEGATED REGULATION (EU) 2017/79 of 12 September 2016 establishing detailed technical requirements and test procedures for the EC type-approval of motor vehicles with respect to their 112-based eCall in-vehicles systems, of 112-based eCall in-vehicle separate technical units and components and supplementing and amending Regulation (EU) 2015/758 of the European Parliament and of the Council with regard to the exemptions and applicable standards Annex 1 to 3 (only dynamic testing i.e. crash test and sled test)	08-04-23
1.2 Passive Safety		10
1.2.1 Prevention of fire risk		10-01
UN-R 34 Part I SERIES 03	Uniform provision concerning the approval of vehicles with regard to the prevention of fire risks Equivalent Test Procedure:	10-01-11
49CFR571.301 2013-05	Standard No. 301, Fuel system integrity	
TRIAS 15-J017-01 2016-04	Test for Prevention of Fuel Leakage in Collisions (Based on former version TRIAS 33-2005 (UN-R 32))	

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1.2.2 Protection of occupants against frontal collision		10-16
96/79/EC (1999/98/EC)	Directive 96/79/EC of the European Parliament and of the Council of 16 December 1996 on the protection of occupants of motor vehicles in the event of a frontal impact and amending Directive 70/156/EEC	10-16-01
UN-R 94 SERIES 03	Uniform provisions concerning the approval of vehicles with regard to the protection of the occupants in the event of a frontal collision	10-16-22
UN-R 137 SERIES 01	Uniform provisions concerning the approval of passenger cars in the event of a frontal collision with focus on the restraint system	10-16-23
UN-R 33 SERIES 00	Uniform provisions concerning the approval of vehicle with regard to the structure of the impacted vehicle in a head-on collision	10-16-81
FMVSS 208 2013-10	Occupant Crash Protection , incl. Out of Position Testing	

Equivalent Test Procedure:

Frontal Impact

ADR 69/00 2006-04	Full Frontal Impact Occupant Protection
VSTD 44 Rev. 44-1	Steering control system - protection of the driver against the steering mechanism in the event of impact

Offset Frontal Impact

TRIAS 18-R094-02 2016-04	Test for Occupant Protection in Offset Collisions (Agreement Regulation No. 94)
ADR 73/00 2005-11	Offset Frontal Impact Occupant Protection
VSTD 46 Rev. 46-3	Protection of occupants - frontal collision

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1.2.3 Protection of occupants against lateral collision		10-17
96/27/EC	Directive 96/27/EC of the European Parliament and of the Council of 20 May 1996 on the protection of occupants of motor vehicles in the event of a side impact and amending Directive 70/156/EEC	10-17-01
UN-R 95 SERIES 03	Uniform provisions concerning the approval of vehicles with regard to the protection of the occupants in the event of a lateral collision	10-17-21
UN-R 135 SERIES 01	Uniform provisions concerning the approval of vehicles with regard to their Pole Side Impact performance (PSI)	10-17-22
FMVSS 214 2012-11	Side Impact Protection	
	Equivalent Test Procedure:	
	Lateral collision with a mobile deformable Barrier	
ADR 72/00 2005-11	Dynamic Side Impact Occupant Protection	
VSTD 45 Rev. 45-2	Protection of occupants - lateral collision	
	Lateral Pole Impact	
ADR 85/00 2015-12	Pole Side Impact Performance	
1.2.4 Protection of the occupants in the event of a rear collision		10-18
UN-R 34 SERIES 03	Uniform provisions concerning the approval of vehicles with regard to the prevention of fire risks (Part II in relation with Part I or Part IV)	10-18-23
UN-R 32 SERIES 00	Uniform provisions concerning the approval of vehicles with regard to the behavior of the structure of the impacted vehicle in a rear-end collision	10-18-81

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2. Approval of motor vehicles by dynamic sled testing with the focus on components of restraint systems, structure and safety of rechargeable electrical energy storage systems in the event of collisions

2.1 Electric/ Electronic		08
2.1.1 Electric vehicle		08-04
UN-R 100 (Part II) SERIES 02	Uniform provisions concerning the approval of vehicles with regard to specific requirements for the electric power train Part II: Requirements of a Rechargeable Electrical Energy Storage System (REESS) with regard to its safety, (only chapter 6.4.1 Mechanical Impact - Mechanical Shock / and Annex 8C: REESS-Test Procedures - Mechanical Shock)	08-04-23
(EU) 2017/79	COMMISSION DELEGATED REGULATION (EU) 2017/79 of 12 September 2016 establishing detailed technical requirements and test procedures for the EC type-approval of motor vehicles with respect to their 112-based eCall in-vehicles systems, of 112-based eCall in-vehicle separate technical units and components and supplementing and amending Regulation (EU) 2015/758 of the European Parliament and of the Council with regard to the exemptions and applicable standards Annex 1 to 3 (only dynamic testing i.e. crash test and sled test)	
2.2 Passive Safety		10
2.2.1 Interior fittings, arrangement of the controls, roof sliding roof, seat-back and rear parts of seats, duplex controls in vehicles for training of applicants for a driving license		10-02
UN-R 21 SERIES 01	Uniform provisions concerning the approval of vehicles with regard to their interior fittings (without Annex VI „Method of measuring projections“)	10-02-11

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2.2.2 Interior fittings, seats and their anchorages, head restraints buses		10-05
UN-R 17 Series 08	Uniform provisions concerning the approval of vehicles with regard to the seats, their anchorages and any head restraints	10-05-11
UN-R 80 Series 03	Uniform provisions concerning the approval of seats of large passenger vehicles and of these vehicles with regard to the strength of the seats and their anchorages	10-05-21
Equivalent Test Procedure:		
ISO 27955 2010	Road vehicles - Securing of cargo in passenger cars, station wagons and multi-purpose vehicles - Requirements and test methods Subpart 5	

3 Approval of vehicles and their components by dynamic testing with impactors with regard to the protection of pedestrians and interior impact protection

3.1 Passive Safety		10
3.1.1 Interior fittings, behavior of the steering mechanism in the event of impact		10-04
UN-R 12 SERIES 04	Uniform provisions concerning the approval of vehicles with regard to the protection of the driver against the steering mechanism in the event of impact	10-04-11
Equivalent Test Procedure:		
VSTD 44 Rev. 44-1	Steering control system - protection of the driver against the steering mechanism in the event of impact	
3.1.2 Interior fittings, seats stability and their anchorages and head restraints		10-05
UN-R 17 SERIES 08	Uniform provisions concerning the approval of vehicles with regard to the seats, their anchorages and any head restraints	10-05-11
UN-R 25 SERIES 04	Uniform provisions concerning the approval of head restraints (headrests), whether or not incorporates in vehicle seats	10-05-12
FMVSS 202a 2013-05	Head Restraints	
FMVSS 207 2009-04	Seating Systems	

Equivalent Test Procedure:

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ISO 27955 Road vehicles - Securing of cargo in passenger cars, station wagons
2010 and multi-purpose vehicles - Requirements and test methods
Subpart 5

3.1.3 Safety-belt anchorages 10-06

UN-R 14 Uniform provisions concerning the approval of vehicles with regard to safety-belt anchorages 10-06-11
SERIES 08

UN-R 145 Uniform provisions concerning the approval of vehicles with regard to ISOFIX anchorage systems ISOFIX top tether anchorages and i-Size seating positions 10-06-12
SERIES 00

Equivalent Test Procedure:

FMVSS 210 Seat belt assembly anchorages
2013-12

FMVSS 225 Child Restraint Anchorage Systems
2012-02

TRIAS 18- Test for Head Protection of Pedestrians
J099(1)-01 (Based on former version TRIAS 63-2004)
2016-04

3.1.4 Protection of occupants against frontal collision 10-16

FMVSS 208 Occupant Crash Protection, incl. Out of Position Testing
2013-10

3.1.5 Protection of pedestrians, frontal protection systems 10-20

VO (EG) Regulation (EC) 78/2009 (Annex I clause 2 and 3 including
78/2009 Regulation (EC) 631/2009 Annex clause II chapter II-V) incl.
amendments according to Regulation (EU) 459/2011 10-20-03

VO (EG) Regulation (EC) 78/2009 (Annex I clause 5 including Regulation (EC)
78/2009 631/2009 Annex clause IV chapter II-V) incl. amendments according
to Regulation (EU) 459/2011 10-20-05

VO (EG) Regulation (EC) 78/2009 (Annex I clause 6 including Regulation (EC)
78/2009 631/2009) 10-20-06

UN-R 127 Uniform provisions concerning the approval of motor vehicles with
SERIES 02 regard to their pedestrian safety performance 10-20-11

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4 Anthropomorphe Tests

4.1 Hybrid III Family

49 CFR 572, Anthropomorphic Test Devices
2005-10

4.1.1 HIII Children

49 CFR 572, CRABI 12-Month-Old Infant, Alpha Version
Subpart R 572.152 - head drop test, frontal impact
29.10.2001 572.152 - head drop test, rear impact
572.153 - Neck-headform test procedure (Flexion and Extension)
572.154 - Thorax test procedure

49 CFR 572, 3-Year-old Child Crash Test Dummy, Alpha Version
Subpart P 572.142 - head drop test
14.01.2002 572.143 - Neck-headform test procedure (Flexion and Extension)
572.144 - Thorax test procedure
572.145 - torso flexion test procedure

49 CFR 572, Six-Year-old Child Test Dummy, Beta Version
Subpart N 572.122 - head drop test
07.06.2011 572.123 - Neck-headform test procedure (Flexion and Extension)
572.124 - Thorax test procedure
572.125 - torso flexion test procedure
572.126 - Knee impact test procedure (left/right)

4.1.2 Hybrid III 5th Percentile Female

49 CFR 572, Hybrid III 5th Percentile Female Test Dummy, Alpha Version
Subpart O 572.132 - head drop test
13.09.2002 572.133 - Neck-headform test procedure (Flexion and Extension)
572.134 - Thorax test procedure
572.135 - torso flexion test procedure
572.136 - Knee impact test procedure (left/right)

SAE J2878 Low Speed Thorax Impact Test Procedure for the HIII 5F Dummy
2016-06 (3 m/s Thorax test procedure)

SAE J2862 User's Manual for the Small Adult Female Hybrid III Test Dummy
2015-02 (Knee Slider Test)

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4.1.3 Hybrid III 50th Percentile Male

49 CFR 572, Subpart E 29.11.2011	Hybrid III Test Dummy 572.32 - head drop test procedure 572.33 - Neck-headform test procedure (Flexion and Extension) 572.34 - Thorax Impact test procedure 572.35 - Knee impact test procedure (left/right) 572.35 - HIP Joint test procedure
SAE J2856 2009-09	User Manual for the 50th Percentile Male Hybrid III Dummy
SAE J2876 2015-05	Low Speed Knee Slider Test Procedure for the Hybrid III 50th Male Dummy (Knee Slider Test)
SAE J2779 2015-07	Low Speed Thorax Impact Test Procedure for the HIII 50th Male Dummy (3 m/s Thorax test procedure)
UN-R 94, Annex 10 SERIES 03	Regulation No 94 of the Economic Commission for Europe of the United Nations (UN/ECE) - Uniform provisions concerning the approval of vehicles with regard to the protection of the occupants in the event of a frontal collision, L 130/50 from 2010-05-28 Annex 10 Certification procedure for the dummy lower leg and foot

4.1.4 Hybrid III 95th Percentile Male

SAE J2860 2012-09	User's Manual for the Hybrid III Large Male Test Dummy 4.1 - Head drop test procedure 4.2 - Neck-headform test procedure (Flexion and Extension) 4.3 - Thorax Impact test procedure 4.4 - Knee Impact test procedure 4.5 - Knee Slider test procedure
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4.2 THOR Family

<p>THOR Qualification Procedures 2016-08</p>	<p>THOR-M-50th (THOR 50th Percentile Male Qualification Procedures Manual) 4 - Head Qualification Test 5 - Face Qualification Test 6.6 - Neck Torsion Test 6.7 - Neck Frontal Flexion Test 6.8 - Neck Extension Test 6.9 - Neck Lateral Flexion Test (left/right) 7 - Upper Thorax Qualification Test 8 - Lower Thorax Qualification Test 9 - Abdomen Qualification 10 - Knee test procedure (left/right) 11 - Sliding-Knee Test (left/right) 12 - Ankle test procedure left/right 13 - Ball of foot test procedure 14 - Heel test procedure</p>
<p>THOR-50M User Manual Rev. E</p>	<p>THOR-50th Percentile Male Dummy User Manual 472-9900</p>
<p>THOR 5th THOR-5F Users Manual (Rev A) Dummy Certification</p>	<p>THOR 5th Percentile Small Female Dummy Certification Based on THOR-M-50th (THOR 50th Percentile Male Qualification Procedures Manual) 4 - Head Qualification Test 5 - Face Qualification Test 6.6 - Neck Torsion Test 6.7 - Neck Frontal Flexion Test 6.8 - Neck Extension Test 6.9 - Neck Lateral Flexion Test (left/right) 7 - Upper Thorax Qualification Test 8 - Lower Thorax Qualification Test 9 - Abdomen Qualification 10 - Knee test procedure (left/right) 11 - Sliding-Knee Test (left/right) 12 - Ankle test procedure left/right 13 - Ball of foot test procedure 14 - Heel test procedure</p>
<p>EuroNCAP Technical Bulletin Version 0.1 DRAFT 2018-10</p>	<p>THOR Specification and Certification 2.1.1 Head Impact Test 2.1.2 Neck Tests, all 6 six conditions 2.1.3 Upper Thorax Impact at 4.3m/s 2.1.4 Upper Thorax Impact at 2.5m/s 2.1.5 Left and Right Thorax Impact 2.1.6 Abdomen Impact 2.1.7 Left and Right Upper Leg Impact</p>

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4.3 Side Impact Dummy

4.3.1 EuroSID 2

49 CFR 572,
Subpart U
29.11.2011

ES-2re Side Impact Crash Test Dummy, 50th Percentile Adult Male
572.182 - Head drop test
572.183 - Neck-pendulum test procedure
572.184 - Shoulder test procedure
572.185 - Rip test procedure (3 tests)
572.185 - Full body Thorax impact test procedure without arm
572.186 - Abdomen test procedure
572.187 - Lumbar Spine test procedure
572.188 - Pelvis test procedure

UN-R 95, Annex 6
SERIES 03

Uniform provisions concerning the approval of vehicles with regard to the protection of the occupants in the event of a lateral collision
Annex 6 Technical description of the side impact dummy
5.5 - Head drop test
5.6 - Neck-pendulum test procedure
5.7 - Shoulder test procedure
5.9 - Rip test procedure (3 tests)
5.10 - Lumbar Spine test procedure
5.11 - Abdomen test procedure
5.12 - Pelvis test procedure

4.3.2 SID-IIs

49 CFR 572,
Subpart V
23.04.2015

SID-IIsD Side Impact Crash Test Dummy, Small Adult Female (Built Level D)
572.192 - Head drop test
572.193 - Neck-pendulum test procedure
572.194 - Shoulder test procedure
572.195 - Full body Thorax impact test procedure with arm
572.196 - Full body Thorax impact test procedure without arm
572.197 - Abdomen test procedure
572.198 - Pelvis test procedure
572.199 - Iliac test procedure

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4.3.3 WorldSID

<p>W50-9900 User Manual Rev. K 2016</p>	<p>WorldSID 50th (User's Manual for the WorldSID 50th percentile Male Side Impact Dummy) 8.4 - Head drop test 8.5 - Neck-pendulum test procedure 8.7 - Shoulder test procedure 8.8 - Full body Thorax impact test procedure without arm 8.9 - Abdomen test procedure 8.10 - Pelvis test procedure</p>
<p>W5-9900 WorldSID 5th User Manual Rev. E 2015</p>	<p>WorldSID 5th (User's Manual for the WorldSID 5th percentile Small Female Side Impact Dummy) 9.1 - Head drop test 9.2 - Neck-pendulum test procedure 9.3 – Thorax / Shoulder test procedure 9.4 - Thorax with half-arm 9.5 - Full body Thorax impact test procedure without arm 9.6 - Abdomen test procedure 9.7 - Pelvis test procedure</p>
<p>ISO/TS 15830-2 2013-05</p>	<p>Road vehicles - Design and performance specifications for the WorldSID 50th percentile male side-impact dummy Part 2: Mechanical Subsystems</p>
<p>ISO/TS 15830-5 2018-07</p>	<p>Road vehicles - Design and performance specifications for the WorldSID 50th percentile male side-impact dummy Part 5: Dummy design updates</p>

4.4 P-Dummies (Children (P))

<p>UN-R 44, Annex 8 SERIES 04</p>	<p>Uniform provisions concerning the approval of restraining devices for child occupants of power-driven vehicles ("Child Restraint Systems") Annex 8 Description of manikins Appendix 1 Description of the 9 months and 3, 6 and 10-year manikins Appendix 3 Description of the 18 months manikin</p>
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4.5 Q-Dummies(Children (Q))

047-9900 User Manual Q1 Rev. H 2016	Q 1 Year (Advanced 6 week old newborn User Manual) 8.1 - Head drop test 8.2 - Neck-test procedure (Flexion) 8.3 - Lumbar Spine test procedure 8.4 - Abdomen test procedure 8.5 - Thorax test procedure frontal und lateral
048-9900 User Manual Q1.5 Rev. G 2015	Q 1,5 Year (Advanced 1.5 year old child User Manual) 8.1 - Head drop test 8.2 - Neck-test procedure (Flexion) 8.3 - Lumbar Spine test procedure 8.4 - Abdomen test procedure 8.5 - Thorax test procedure frontal und lateral
020-9905 User Manual Q3 Rev. G 2016	Q 3 Year (Advanced 3 year old child User Manual) 8.1 - Head drop test 8.2 - Neck-test procedure (Flexion) 8.3 - Lumbar Spine test procedure 8.4 - Abdomen test procedure 8.5 - Thorax test procedure frontal und lateral
033-9900 User Manual Q6 Rev. M 2016	Q 6 Year (Advanced 6 year old child User Manual) 8.1 - Head drop test 8.2 - Neck-test procedure (Flexion) 8.3 - Lumbar Spine test procedure 8.4 - Abdomen test procedure 8.5 - Thorax test procedure frontal und lateral
010-9900 User Manual Q 10 Rev. G 2016	Q 10 Year (10.5 year old child User Manual) 14.1 to 14.3 - Head drop test 14.4 to 14.7 - Neck- test procedure (Flexion and Extension) 14.8 to 14.10 - Lumbar Spine test procedure 14.11 to 14.13 - Thorax test procedure frontal und lateral 14.14 - Shoulder test procedure frontal 14.15 - Pelvis test procedure 14.16 - Abdomen test procedure 14.17 - Shoulder test procedure lateral

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4.6 Test Impactor Pedestrian Protection (FMH)

49 CFR 572, Subpart L 18.08.1995	Free Motion Headform 572.102 - Head drop test
GTR9 2011-02	Global Technical Regulation No. 9 "PEDESTRIAN SAFETY" 8.3. - Child and adult headform impactors certification
631/2009/EC Annex I 09-2011	Type-approval of motor vehicles with regard to the protection of pedestrians and other vulnerable road users PART V: Test Impactors, Appendix I: Certification of impactors, Chapter 4:Headform impactors (3,5kg/ 4,5kg), upper leg form, lower leg form

4.7 Test Impactor Pedestrian Protection (FlexPli)

133-9900 User Manual FLEX PLI GTR Rev. J/ 2016	Flex PLI GTR User Manual
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Abbreviation used:

ADR	Australian Design Rule
ÄS	Revision number
CFR	Code of Federal Regulations (Office of the Federal Register, U.S. Government)
UN-R	Regulation of the Economic Commission for Europe
EC	European Community
EU	European Union
FMVSS	Federal Motor Vehicle Safety Standards
TRIAS	Standards for the homologation of automobiles to Japan
VSTD	Vehicle Safety Testing Directions (Taiwan)

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