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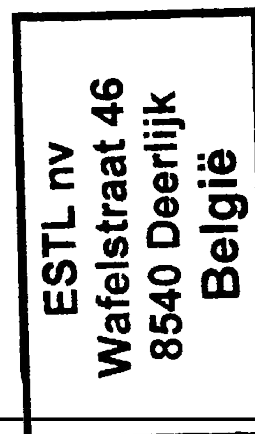
1. Report	No.:	HRUP211103T1	Update:	00
	Ref.:	-	Annexes:	See Part 6.

2. Test Subject	Rear Underrun Protection Devices (RUPDs) - Part I		
According to:	ECE R58-03	Supplement 2	EC 661/2009

3. Information	
Manufacturer:	Almic BV Bosuilstraat 7 3910 Pelt Belgium
Make of the RUPD:	ALMIC
Type of the RUPD:	BR
Variants:	M: Mechanical actuation H: Hydraulic actuation
Version:	450 ; 650; 850; 1050
Commercial description:	/
Category(ies) :	O, N

4. Test		
Place and date:	ESTL, Wafelstraat 46, Deerlijk, Belgium	28/01/2022 & 7/02/2022
Manufacturer's representative:	M. Marc Janssens	
Test Engineer:	Ing. Kristof Baeyens & Ing. Jeroen D'haese	
Technical documentation:	TDHRUP211103T1	
Location of E-mark:	See technical documentation	

5. Conclusions	
The model represented fulfills the hereunder performed tests, as described in Regulation 58-03.	
Performed by:	Revised by:
 Ing. Kristof Baeyens & Ing. Jeroen D'haese Test Engineer	 Ba. Matthias Vindevogel Test Engineer
Date:	3/03/2022



Report type :	Base report / Extension / Revision
Reason for extension / revision :	-
Scope for approval :	Individual / National series / International series
Test subject & scope:	BRM, BRH; 450 ; 650; 850; 1050

Part 1: Information test specimen

Make of the RUPD:	ALMIC
Type of the RUPD:	BR
Commercial description:	/
Category(ies) :	O, N
Possible Variants:	Different lengths and different types of actuations. All combinations are possible.
Sample reception date:	3/11/2021
Worst case evaluation:	The system is tested at : *smallest/largest chassis width. *highest support length. *widest length. *smallest chassis inertia moment *Longest version of 1050mm *The hydraulic and manual mechanical actuation systems are both tested.

Part 2: General specifications

Par.	Subject	Result
5.2	The application for EU type-approval shall be accompanied by an information form, with detailed technical characteristics: *dimensions, and constituent materials *method of installation	Complies

Part 3: Individual specifications

3.0 General specifications

Par.	Subject	Result
7.1	The cross-member shall have a section height of at least 120 mm. The lateral extremities of the cross member shall not bend to the rear or have a sharp outer edge; this condition is fulfilled when the lateral extremities of the cross-member are rounded on the outside and have a radius of curvature of not less than 2.5 mm.	Complies
	RUPD intended to be fitted on vehicles of categories M, N1, N2 with a maximum mass not exceeding 8 t, O1, O2, on vehicles of category G and on vehicles fitted with a platform lift, the cross-member shall have a section height of at least 100 mm.	Not appl.
7.2	The RUPD may be so designed to have several positions at the rear of the vehicle. In this event, there shall be a guaranteed method of securing it in the service position so that any unintentional change of position is precluded. The force applied by the operator to vary the position of the device shall not exceed 40 daN.	Complies

	For RUPD that are designed to have several positions at the rear of the vehicle, a label shall be provided either with (a) symbol(s) or in the language(s) of the country where the device is sold to inform the operator about the standard position of the RUPD to offer effective protection against under-running. Label minimum size: 60x120mm	Complies
7.3	The RUPD shall offer adequate resistance to forces applied parallel to the longitudinal axis of the vehicle. (This shall be demonstrated in accordance with the test procedure and test conditions specified in Annex 5 to this Regulation.) The maximum horizontal deflection of the RUPD observed during and after the application of the test forces specified in Annex 5 shall be recorded on the type approval communication (Annex 1, item 8).	Complies
7.4	For vehicles fitted with a platform lift at the rear, the underrun device may be interrupted for the purposes of the mechanism. In this case, the following special requirements apply:	
7.4.1	The maximum lateral clearance measured between the elements of the underrun device and the elements of the platform lift, which move through the interruption when the lift is operated and which make the interruption necessary, may amount to no more than 2.5 cm.	Not appl.
7.4.2	The individual elements of the underrun protection, including those outboard of the lift mechanism, where provided, must have an effective surface area, in each case, of at least 420 cm ² .	Not appl.
7.4.3	For cross-members with a section height of less than 120 mm, the individual elements of the underrun protection, including those outboard of the lift mechanism, where provided, shall have an effective surface area, in each case, of at least 350 cm ² .	Not appl.
7.4.4	In the case of vehicles having a width of less than 2,000 mm and where it is impossible to achieve the requirements of paragraphs 7.4.2. and 7.4.3., the effective surface may be reduced on the condition that the resistance criteria are met.	Not appl.

3.1 Dimensional specifications

Par.	Dimension	Value	
	Wider rear axle width	2550	mm
	Cross-member width	2350	mm
	Transverse distance between brackets: min	760	mm
	Transverse distance between brackets: max	860	mm
	Difference in transverse distance	100	mm
	Width difference on the left side (≤100mm)	100	mm
	Width difference on the right side (≤100mm)	100	mm

Part 4: Physical test

4.0 Test method

A5 1.4	If the cross-member does not have a vertical flat surface of at least 50 % of the minimum section height at the test force height, a device that doesn't modify the dimensional and mechanical characteristics of the RUPD or increase its resistance is used. The device shall neither be rigidly fixed to the RUPD nor to the test equipment.	Complies
A5 1.3	The test procedure may be simulated by calculation. A validation report shall be drafted by the manufacturer or by the technical service and submitted to the Type Approval Authority.	Not appl.

A. Rigid test bench		Complies
A5 1.1.2	RUPD is tested /calculated on a rigid test bench.	Complies
A5 1.2	RUPD is tested on a test bench with a part of chassis of the vehicle type. The parts used to connect the RUPD to the vehicle chassis shall be equivalent to those which are used to secure the RUPD when it is installed on the vehicle. The distance of the foremost fixing point of the RUPD from the rigid test bench shall not be less than 500 mm.	Complies

B. Vehicle test		Not appl.
A5 2.1	The vehicle shall be at rest on a level, flat, rigid and smooth surface.	Not appl.
A5 2.2	The front wheels shall be in the straight-ahead position.	Not appl.
A5 2.3	The tyres shall be inflated to the pressure recommended by the vehicle manufacturer.	Not appl.
A5 2.4	The vehicle may, if necessary to achieve the test forces required in § 3.1. below, be restrained by any method.	Not appl.
A5 2.5	Vehicles equipped with hydropneumatic, hydraulic or pneumatic suspension or a device for automatic levelling according to load shall be tested with the suspension or device in the normal running condition specified by the manufacturer.	Not appl.

4.1 Chassis

Minimal moment of inertia of chassis members (one chassis beam) [mm ⁴]	57080000
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4.2 Height regulation device test

7.2	If the RUPD is designed to have several positions at the rear of the vehicle, there must be a guaranteed method of securing it in the service position so that any unintentional change of position is precluded. Force applied by the operator to change position ≤ 40 daN.	<40	daN
7.2	A label shall be provided either with (a) symbol(s) or in the language(s) of the country where the device is sold to inform the operator about the standard position. Label min. size: 60 x 120 mm	Complies	

4.3 Load test dimensions

Par.	Point	Horizontal transverse position	
A5 3.1.2	P1	975	mm from the middle
A5 3.1.3	P2	350	mm from the middle
A5 3.1.1	P3	0	mm from the middle

Informative

A5 3.2.1	Replacement force if point in interruption area (Platform lift) * P2: replacement point: within 50mm to the intended points * P1: replacement point: max. 325mm from outer edges of the wheels on the rear axle
	Test point height ≤ 600mm above the ground. (If tested on a vehicle)

4.4 Load test forces

Techn. perm. maximum mass vehicle:	Unlimited	kg
If special vehicle: 80% of nominal value [A5 §3,1,3]	100	%

Point (from left to right)	Specified Load A5 §3 [daN]	Max. Applied Load [daN]	Deflection [mm]			
			Horizontal		Vertical	
			During	After	During	After
Hydraulic cylinder						
Point P1 H	10000	10030	107	26	123	38
Point P2 H	18000	18015	56	2	106	13
Point P3 H	10000	10020	17	2	25	0
Point P2 H	18000	18005	59	15	134	37
Point P1 H	10000	18040	93	10	120	24
Manual mechanical system						
Point P1 M	10000	10030	96	11	132	43
Point P2 M	18000	18015	69	14	136	33
Point P3 M	10000	10030	15	1	24	0
Point P2 M	18000	18015	57	12	105	24
Point P1 M	10000	10030	89	10	91	16
Direction of deflection					Downwards	

Remark:	-Tested from left to right -Maximum measured pressure in hydraulic actuation system = 262 Bar
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4.5 Result

		Horizontal		Vertical	
		During	After	During	After
7.3	Max. deflection [mm] A1 Pt. 8	107	26	136	43

Part 5: Conclusions and remarks

-The dimensional requirements are to be evaluated after installation.

Part 6: Annexes

No.	Description	# Pages
-	-	-

Part 7: Used test equipment

Description	Registration number	Calibrated	Applicable
Length meter	T_LMT_5m_05	x	x
Force controller	UTMC_02 MCIL_D60100450_01	x	x
Load cell	LC_99K_01 LC_10T_12	x x	x x
Digital angle meter	T_DHM_08	x	x
Digital protractor	T_DSMM_05	x	x
Radius caliper	CAL_R2,5_01	x	x
Displacement measurement device	T_LTK_1,25m_03&04	x	x
-	-	-	-