

## TEST REPORT



Concerning the braking system of certain vehicle categories in accordance with the ECE Regulation R13.11

**Test report number** : RDW-13R-0031174

0.1. **Make** : SCHMITZ CARGOBULL

0.2. **Type** : S.01

0.4. **Category of vehicle** : O4

0.5. **Name and address of the manufacturer** : SAF-HOLLAND GmbH  
Hauptstraße 26  
63856 Bessenbach  
Germany

**General** : The braking system complies with the requirements laid down in:  
- paragraph 5 of above-mentioned Regulation.  
See documentation: calculation WDE 94108S / WDE 94150S  
Test report 361 02 214 / drawing 112470 -W-00

**Tests** : The tests have been conducted according to:  
Annex 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 21 of the  
above mentioned Regulation.

**Conclusion** : The type O test ( laden and unladen ) aswel as the parking brake test are carried  
out.  
The results can be found in this report

**Tests conducted on** : 30 March 2015

**By** : W.Hartman

Lelystad: 30 March 2015  
The test engineer,

  
  
W.R. Hartman

Test department

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*Vehicle Approval and Information*

**List of contents**

- Reason for testing : see below
- General information : page 3
- Environmental information : page 3
- Static Measurements : Page 3
- Test accordance with the Annexes mentioned on page 1 : page 3 to 11
- General requirements : page 12

**List of attached diagrams**

Subject	Diagram number

**Reason for testing**

New vehicle type.

**Used test equipment**

Item	Identification number (make and type)	Calibration papers available
Scale	OPS 08	yes/not checked
Pressure meter	MAN 09/11	yes/not checked
Speed meas equipment	Vijf 79	yes/not checked
Deceleration meter	Vijf 79	yes/not checked
Temperature meter	TEM 36	yes/not checked
Tyre-pressure meter	-	yes/not checked
Force meas equipment	KRA 21	yes/not checked
Reaction-time equipment	-	yes/not checked
Brake test bench	-	yes/not checked
Recorder	-	yes/not checked
Amplifier	-	yes/not checked
Filter	-	yes/not checked
		yes/not checked

**Remarks**

...



Test report number: RDW-13R-0031174

**General information**

Make and type of the vehicle	SCHMITZ CARGOBULL S.01
Vehicle category	O4
Vehicle Identification Number	WSM00000003133433
Test conducted by	W.Hartman
Place	Lelystad
Date	30 March 2015

**Environmental information**

Date	30 March 2015
Road surface	Asphalt
Weather condition	Dry
Temperature	9 °C
Wind direction	WNW
Wind speed	6,2 m/s
Ambient pressure	1013 mbar
Relative humidity	73 %

**Static measurements:**

Maximum allowed weights (mass):					
king pin	15.000	kg			
Axle 1	9.000	kg			
Axle 2	9.000	kg			
Axle 3	9.000	kg			
Total	43.000	kg			
Brake schedule nr.	112470-K-00				
Brake cylinders			Brake levers		
Axle number 1	16	inch	Axle number 1	82	mm
Axle number 2	16/24	inch	Axle number 2	82	mm
Axle number 3	16/24	Inch	Axle number 3	82	mm
Remarks:					



Test report number: RDW-13R-0031174

Tests:											
Type 0 (1.2.4. Annex II)			Type I (1.3.2. Annex II)			Type 0 after I (1.3.3. Annex II)					
Speed		km/h	Speed		km/h	Speed	km/h				
Control force		daN	Control force		dan	Control force	daN				
Control pressure		10 <sup>2</sup> kPa	Control pressure		10 <sup>2</sup> kPa	Control pressure	10 <sup>2</sup> kPa				
Deceleration		m/s <sup>2</sup>	Deceleration		m/s <sup>2</sup>	Deceleration	m/s <sup>2</sup>				
Diagram			Time		s	Diagram					
			Diagram								
Type III (1.6. Annex II)			No	deceleration	control force	No	deceleration	Control force			
Speed		Km/h	1			11					
Control force		daN	2			12					
Control pressure		10 <sup>2</sup> kPa	3			13					
Deceleration		m/s <sup>2</sup>	4			14					
Time		S	5			15					
Diagram			6			16					
Type 0 after III (1.6.3. Annex II)			7			17					
Speed		km/h	8			18					
Control force		daN	9			19					
Control pressure		10 <sup>2</sup> kPa	10			20					
Deceleration		m/s <sup>2</sup>	Remarks:								
Pressure after air supply line fracture (2.2.3.1. Annex II)								≥7,5	10 <sup>2</sup> kPa	Brake performance	pass/fail/N/A
Pressure after air supply line fracture and a deflation speed of at least 1 bar/s (5.2.1.18.4.2)								≥2,0	10 <sup>2</sup> kPa	Brake performance	pass/fail/N/A



Test report number: RDW-13R-0031174

3 axle vehicle

Parking brake (2.2.1. Annex II)					Reaction time (3. Annex III)						
Brake force forward	9.300	daN									
Brake force rearward	9.200	daN	Feed line pressure	6,5					10 <sup>2</sup> kPa		
Control force	-	daN	t <sub>is</sub>						s		
Lever length	82	mm	t <sub>aP</sub> + t <sub>sA</sub> axle 1(Pneumatic)	-					s		
Remarks : test done on 2 axle's!			t <sub>aP</sub> + t <sub>sA</sub> axle 1(CAN)	-					s		
			t <sub>aP</sub> + t <sub>sA</sub> axle 2 (Pneumatic)	-					s		
			t <sub>aP</sub> + t <sub>sA</sub> axle 2(CAN)	-					s		
Mass of the combination	39.840	kg	Capacity of the air reservoirs								
Unladen weight under axles	5.200	kg	Volume air reservoirs	80					dm <sup>3</sup>		
Maximum weight under axles	9.000	kg	Maximum pressure P <sub>0</sub>	8,5					10 <sup>2</sup> kPa		
Rolling resistance combination	0,1	m/s <sup>2</sup>	Rolling resistance trailer	0,1					m/s <sup>2</sup>		
Calculation factor for deceleration (sec. 1.3. Annex IV)											
Laden	1,47		Pressure in reservoir after 1x braking P <sub>1</sub>	-					10 <sup>2</sup> kPa		
Unladen	2,94		Pressure in reservoir after 9x braking P <sub>9</sub>	-					10 <sup>2</sup> kPa		
<b>Additional tests diagram 4A</b>											
Command line pressure (10 <sup>2</sup> kPa)		Brake cylinder pressure (10 <sup>2</sup> kPa)		Deceleration combination (m/s <sup>2</sup> )		Diagram number		Deceleration calculated for trailer (%)		Remarks	
up	down	up	Down	up	down			up	Down	Up	Down
2,0	2,0	1,6	1,6	0,86	0,98	-	-	12,1	13,9	laden	laden
3,0	3,0	2,6	2,6	1,66	1,85	-	-	23,9	26,7	laden	laden
4,0	4,0	3,9	4,0	2,86	2,88	-	-	41,5	41,8	laden	laden
5,0	4,8	4,8	4,8	3,59	3,47	-	-	52,3	50,5	laden	laden
5,5	5,5	5,7	5,7	3,93	3,91	-	-	57,3	57,0	laden	laden
3,9	3,9	1,4	1,4	1,92	1,94	-	-	54,5	55,0	Un.lad	Un.lad
LSD failure (6. Appendix to Annex II)					pass/fail/N/A <sup>(1)</sup>						
<b>Remarks:</b>											
<b>Weights of combination under test conditions</b>											
Un Laden				Laden				Tractor unit solo			
Axle 1	5.745	kg		Axle 1	6.310	kg		Axle 1	-	kg	
Axle 2	4.350	kg		Axle 2	7.700	kg		Axle 2	-	kg	
Axle 3	1.650	kg		Axle 3	8.550	kg					
Axle 4	1.755	kg		Axle 4	8.610	kg					
Axle 5	1.795	kg		Axle 5	8.670	kg					
Total	15.295	kg		Total	39.840	kg		Total	7.900	kg	



2 axle vehicle

Parking brake (2.2.2.1. Annex II)				Reaction time (3. Annex III)							
Brake force forward	-	daN									
Brake force rearward	-	daN	Feed line pressure	6,5		10 <sup>2</sup> kPa					
Control force	-	daN	t <sub>SS</sub>			S					
Lever length	-	mm	t <sub>aP</sub> + t <sub>sA</sub> axle 1(Pneumatic)	-		S					
Remarks :			t <sub>aP</sub> + t <sub>sA</sub> axle 1(CAN)	-		S					
			t <sub>aP</sub> + t <sub>sA</sub> axle 2 (Pneumatic)	-		S					
			t <sub>aP</sub> + t <sub>sA</sub> axle 2(CAN)	-		S					
Mass of the combination	39.840	kg	Capacity of the air reservoirs								
Unladen weight under axles	4.890	kg	Volume air reservoirs	80		dm <sup>3</sup>					
Maximum weight under axles	9.000	kg	Maximum pressure P <sub>0</sub>	8,5		10 <sup>2</sup> kPa					
Rolling resistance combination	0,1	m/s <sup>2</sup>	Rolling resistance trailer	0,1		m/s <sup>2</sup>					
Calculation factor for deceleration (sec. 1.3. Annex IV)											
Laden	1,87		Pressure in reservoir after 1x braking P <sub>1</sub>	-		10 <sup>2</sup> kPa					
Unladen	3,13		Pressure in reservoir after 9x braking P <sub>9</sub>	-		10 <sup>2</sup> kPa					
<b>Additional tests diagram 4A</b>											
Command line pressure (10 <sup>2</sup> kPa)		Brake cylinder pressure (10 <sup>2</sup> kPa)		Deceleration combination (m/s <sup>2</sup> )		Diagram number		Deceleration calculated for trailer (%)		Remarks	
up	down	up	Down	up	down			up	Down	Up	Down
2,0	2,0	1,6	1,7	0,97	0,88	-	-	17,26	15,5	laden	laden
4,0	4,0	4,0	4,3	2,39	2,34	-	-	43,8	42,8	laden	laden
5,0	5,0	5,4	5,1	2,94	2,89	-	-	54,1	53,1	laden	laden
4,0	4,0	1,5	1,5	1,69	1,85	-	-	50,7	55,7	Un.lad	Un.lad
LSD failure (6. Appendix to Annex II)				pass/fail/N/A <sup>(1)</sup>							
<b>Remarks:</b>											
<b>Weights of combination under test conditions</b>											
Un Laden				Laden				Tractor unit solo			
Axle 1	5.795	kg		Axle 1	6.565	kg		Axle 1	-	kg	
Axle 2	4.665	kg		Axle 2	9.345	kg		Axle 2	-	kg	
Axle 3	Lifted	kg		Axle 3	Lifted	kg					
Axle 4	2.435	kg		Axle 4	8.900	kg					
Axle 5	2.455	kg		Axle 5	8.925	kg					
Total	15.350	kg		Total	33.735	kg		Total	7.900	kg	



Test report number: RDW-13R-0031174

**Distribution of braking force among the axles of the vehicle and requirements for compatibility between towing vehicles.**

The vehicle fulfils the requirements of paragraph 1.3.2 of Annex 4 in conjunction with Annex 10 pass/fail/N/A

Validation of development of braking force according to Annex 10 paragraph 1.3

	Unladen		Laden	
	Left 10 <sup>3</sup> kPa	Right 10 <sup>3</sup> kPa	Left 10 <sup>3</sup> kPa	Right 10 <sup>3</sup> kPa
Axle nr 1	0,7	0,7	0,7	0,7
Axle nr 2	0,7	0,7	0,7	0,7
Axle nr 3	0,7	0,7	0,7	0,7

**5.1.4. Provisions for the periodic technical inspection of braking systems**

5.1.4.5. Data for braking systems

The data of the compressed-air braking system for the functional and efficiency test must be specified at the vehicle in a visible position in indelible form, or made freely available in another way (e.g. handbook, electronic data recorder) Sticker on the vehicle/Internet/Handbook

5.1.4.6. Reference braking forces

The reference of the brake force will be given on the trailer and/or into the manuel instruction of the trailer or on the internet Sticker on the vehicle/Internet/Handbook

**5.2.2. VEHICLES OF CATEGORY O**

The vehicle fulfils the requirements of paragraph 5.2.2.8.2. of the Regulation. pass/fail/N/A See SAF instructions

Definition of the method by which wear may be assessed and definition of the maximum acceptable wear limit in accordance to 5.2.2.8.2.2. of the Regulation. See Inspection instruction: SAF  
(Will be made freely available)

**Mandatory provisions for vehicles equipped with a vehicle stability function**

The vehicle fulfils the requirements of paragraph 5.2.2.23. of the Regulation. pass/fail/N/A

Does the position of the EBS module comply with the mounting instructions of the manufacturer? pass/fail/N/A

Verification of components and installation pass/fail/N/A

Is the RSS function in the parameter EOL fields switched on? (only for trailers till 3 axles) pass/fail/N/A



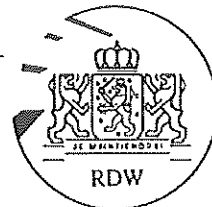
Test report number: RDW-13R-0031174

Full trailer/Semi trailer <sup>(1)</sup>	Wheelbase (E <sub>r</sub> )	7.700	mm
<b>Axles:</b>			
Make and type	SAF B9-22S01	Code	361-022-14
<b>Brakes:</b>			
Make and type	SAF SBS 2243 K0	Lining make and type	Jurid 539
<b>Bogie:</b>			
Make and type	SAF Air	Security cable	Agreed/not agreed/N.A. <sup>(1)</sup>
<b>Tyres:</b>			
Tyre size	385/65 R 22,5		
Tyre pressure	9.50	10 <sup>2</sup> kPa	Load Index 160 J
<b>Suspension:</b>			
Type	Mechanical/pneumatic <sup>(1)</sup>		
Make	Schmitz		
Dimensions	Air		
<b>Parking brake:</b>			
Make	Knorr		
Type	16/24 ( BS 7309)		
On axle number	2+3		
Brake lever length	82		
Support legs	Not used during test		
<b>LSD settings:</b>			
LSD plate	Agreed/not-agreed <sup>(1)</sup>	Test connections	Agreed/not-agreed <sup>(1)</sup>
P <sub>m</sub>	6,5 bar	Suspension travel/suspension pressure	P <sub>out</sub> LSD Mass (kg) LSD lever length
Position	Front	Rear	Front
Unladen	-	0,5	-
Laden	-	5,8	-
<b>Air reservoir capacity test:</b>			
P <sub>9</sub> ≥ 0,5 P <sub>1</sub>	pass/fail/N/A		
P <sub>0</sub> (10 <sup>2</sup> kPa)	P <sub>1</sub> (10 <sup>2</sup> kPa)	P <sub>2</sub> (10 <sup>2</sup> kPa)	P <sub>3</sub> (10 <sup>2</sup> kPa)
-	-	-	-
Additional tests according to R13 11 sup. 5 paragraph 5.2.2.16 and 5.2.2.16.1			
At which pressure does the red and yellow warning light , light up			4,5 10 <sup>2</sup> kPa
P <sub>0</sub> (10 <sup>2</sup> kPa)	P <sub>1</sub> (10 <sup>2</sup> kPa)	P <sub>2</sub> (10 <sup>2</sup> kPa)	P <sub>3</sub> (10 <sup>2</sup> kPa)
-	-	-	-
Deceleration ≥ 2,25 m/s <sup>2</sup>			Yes/No
Annex 8. (§2.4)			
P <sub>start</sub> (10 <sup>2</sup> kPa)	P <sub>0</sub> (10 <sup>2</sup> kPa)	P <sub>1</sub> (10 <sup>2</sup> kPa)	P <sub>2</sub> (10 <sup>2</sup> kPa)
-	-	-	-
Parking brake releases after 3 applications			pass/fail/N/A <sup>(1)</sup>
Parking brake operating pressure			4,5 10 <sup>2</sup> kPa
Annex 8. (§2.5)			
P <sub>start</sub> (10 <sup>2</sup> kPa)	P <sub>0</sub> (10 <sup>2</sup> kPa)	P <sub>1</sub> (10 <sup>2</sup> kPa)	P <sub>2</sub> (10 <sup>2</sup> kPa)
-	-	-	-
Parking brake releases after 3 applications			pass/fail/N/A <sup>(1)</sup>
<b>Remarks:</b>			





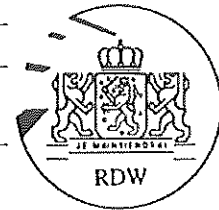
<b>ABS test of full trailer:</b>				
- $V_{initial} = 50 \text{ km/h}$				
- ABS inoperative				
- Condition of the vehicle: unladen				
Annex X section 6.2. (Appendix 2 ad 2.2.)				
<b>Determination of the coefficient of adhesion with the front axle(s) braked (<math>k_f</math>)</b>				
Braking test	$k_H = \pm 0,8$			
	$V_{initial}$ (km/h)	$t_{40-20}$ (sec.)	$P_{cylinder}$ ( $10^2 \text{ kPa}$ )	Diagr. Number
number 1				
number 2				
number 3				
number 4				
$t_{min} =$				
$t_m$ or $t_{min} =^{(1)}$				
$z_{Cmax} = 0,566/t_m$ or $t_{min}^{(2)}$				
$F_{bRmaxi} = z_{Cmaxi} \times (F_M + F_R) - 0,010 \times F_{cnd} - 0,015 \times F_{cd}$				
$F_{idyn} = F_i + \frac{z_{Cmaxi} \times (F_M \times h_D + g \times P \times h_R) - F_{wM} \times h_D}{E}$				
$k_f = \frac{F_{bRmaxi}}{F_{idyn}}$				
<b>Determination of the coefficient of adhesion with the rear axle(s) braked (<math>k_r</math>)</b>				
Braking test	$k_H = \pm 0,8$			
	$V_{initial}$ (km/h)	$t_{40-20}$ (sec.)	$P_{cylinder}$ ( $10^2 \text{ kPa}$ )	Diagr. Number
number 1				
number 2				
number 3				
number 4				
$t_{min} =$				
$t_m$ or $t_{min} =^{(1)}$				
$z_{Cmax} = 0,566/t_m$ or $t_{min}^{(2)}$				
$F_{bRmaxi} = z_{Cmaxi} \times (F_M + F_R) - 0,010 \times F_{cnd} - 0,015 \times F_{cd}$				
$F_{idyn} = F_i + \frac{z_{Cmaxi} \times (F_M \times h_D + g \times P \times h_R) - F_{wM} \times h_D}{E}$				
$k_r = \frac{F_{bRmaxi}}{F_{idyn}}$				



ABS test of semi-trailer or centre-axle trailer:				
- $V_{initial} = 50$ km/h				
- ABS inoperative				
- Condition of the vehicle: unladen				
- Wheels fitted to only one axle, the wheels on the other axle(s) are removed.				
Annex X section 6.2. (Appendix 2 ad 2.3.)				
Determination of the coefficient of adhesion (k)				
Braking test	$k_H = \pm 0,8$			
	$V_{initial}$ (km/h)	$t_{10-20}$ (sec.)	$P_{cylinder}$ ( $10^2$ kPa)	Diagr. Number
number 1				
number 2				
number 3				
number 4				
$t_{min} =$				
$t_m$ or $t_{min} =^{(1)}$				
$z_{Cmax} = 0,566/t_m$ or $t_{min}^{(2)}$				
$F_{bRmax} = z_{Cmax} \times (F_M + F_R) - 0,010 \times F_{end} - 0,015 \times F_{cd}$				
$F_{Rdyn} = F_R - \frac{F_{bRmax} \times h_K + z_C \times g \times P \times (h_R - h_K)}{E_R}$				
$k = \frac{F_{bRmax}}{F_{Rdyn}}$				



ABS test, determination of the maximum braking rate ( $z_{RAL}$ ) and calculation of $k_R$ and $\epsilon$ .								
- $V_{initial} = 50$ km/h								
- ABS in operation								
- Condition of the vehicle: unladen								
- For a semi-trailer all wheels are fitted.								
Annex X section 6.2. (Appendix 2 ad 2.2. and 2.3.)								
Full trailer								
Braking test	$k_L = \leq 0,3^{(1)}$				$k_H = \pm 0,8$			
	$V_{initial}$ (km/h)	$t_{40-20}$ (sec.)	$P_{cylinder}$ ( $10^2$ kPa)	Diagr. number	$V_{initial}$ (km/h)	$t_{40-20}$ (sec.)	$P_{cylinder}$ ( $10^2$ kPa)	Diagr. number
number 1								
number 2								
number 3								
number 4								
$t_{min} =$								
$t_m$ or $t_{min} =^{(2)}$								
$z_{CAL} = 0,566/t_m$ or $t_{min}^{(3)}$								
$k_R = \frac{k_f \times F_{rdyn} + k_r \times F_{rdyn}}{P \times g}$								
$z_{RAL} = \frac{z_{CAL} \times (F_M + F_R) - 0,010 \times F_{cnd} - 0,015 \times F_{cd}}{F_R}$								
$\epsilon = \frac{z_{RAL}}{k_R}$ (rounded to 2 decimals)								
Semi-trailer or centre-axle trailer								
Braking test	$k_L = \leq 0,3^{(1)}$				$k_H = \pm 0,8$			
	$V_{initial}$ (km/h)	$t_{40-20}$ (sec.)	$P_{cylinder}$ ( $10^2$ kPa)	Diagr. number	$V_{initial}$ (km/h)	$t_{40-20}$ (sec.)	$P_{cylinder}$ ( $10^2$ kPa)	Diagr. number
number 1								
number 2								
number 3								
number 4								
$t_{min} =$								
$t_m$ or $t_{min} =^{(2)}$								
$z_{CAL} = 0,566/t_m$ or $t_{min}^{(3)}$								
$F_{bRAL} = z_{CAL} \times (F_M + F_R) - 0,010 \times F_{cnd} - 0,015 \times F_{cd}$								
$F_{Rdyn} = F_R - \frac{F_{bRAL} \times h_K + z_{CAL} \times g \times P \times (h_R - h_K)}{E_R}$								
$z_{RAL} = \frac{F_{bRAL}}{F_{Rdyn}}$								
$\epsilon = \frac{z_{RAL}}{k}$ (rounded to 2 decimals)								



<b>ABS test, energy consumption <math>k &gt; 0,5</math>.</b>									
- V = minimum 30 km/h									
- capacity of reservoirs:   -   dm <sup>3</sup>									
- ABS in operation									
- Condition of the vehicle: unladen with LSD set to the laden position.									
- Initial energy level in the energy storage device shall be 8,0 10 <sup>2</sup> kPa.									
<b>Annex X section 6.1.</b>									
V <sub>max</sub> =     km/h									
- t = 15 seconds									
- Maximum pressure stated by manufacturer   :   10 <sup>2</sup> kPa									
- Pressure of the reservoir before braking   :   10 <sup>2</sup> kPa									
Speed (km/h)			Braking time (s)				Diagram number		
- Pressure in the reservoir after 15 seconds =     10 <sup>2</sup> kPa									
- Pressure in the reservoir after 4 times fully actuating the brakes (at standing position):									
		Front axle (10 <sup>2</sup> kPa)			Rear axle (10 <sup>2</sup> kPa)			Air reservoir (10 <sup>2</sup> kPa)	
number 1									
number 2									
number 3									
number 4									
number 5									
- Pressure necessary for secondary braking:     10 <sup>2</sup> kPa									
<b>Static energy consumption test according to Annex XIV section 6.2</b>									
P <sub>0(10<sup>2</sup> kPa)</sub>	P <sub>1(10<sup>2</sup> kPa)</sub>	P <sub>2(10<sup>2</sup> kPa)</sub>	P <sub>3(10<sup>2</sup> kPa)</sub>	P <sub>4(10<sup>2</sup> kPa)</sub>	P <sub>5(10<sup>2</sup> kPa)</sub>	P <sub>6(10<sup>2</sup> kPa)</sub>	P <sub>7(10<sup>2</sup> kPa)</sub>	P <sub>8(10<sup>2</sup> kPa)</sub>	P <sub>9(10<sup>2</sup> kPa)</sub>
-	-	-	-	-	-	-	-	-	-
P <sub>10(10<sup>2</sup> kPa)</sub>	P <sub>11(10<sup>2</sup> kPa)</sub>	P <sub>12(10<sup>2</sup> kPa)</sub>	P <sub>13(10<sup>2</sup> kPa)</sub>	P <sub>14(10<sup>2</sup> kPa)</sub>	P <sub>15(10<sup>2</sup> kPa)</sub>				
-	-	-	-	-	-				
Remarks :									



<b>ABS test, road behaviour tests (additional checks paragraph 6.3.)</b>		
- Maximum braking		
- ABS in operation		
- Condition of the vehicle: unladen		
Road behaviour on $k_H$ (ad 6.3.1.)		
Speed	Results	Diagram no
40 km/h		
80 km/h		

- V = 50 km/h		
- Maximum braking		
- ABS in operation		
- LSD is set to cycling pressure.		
- Category ABS: A		
Split $\mu$ ( $k_L/k_H$ ) <sup>(2)</sup> (ad 6.3.2. and 6.3.3.)		
Speed km/h	Results Locking behaviour	Diagram no

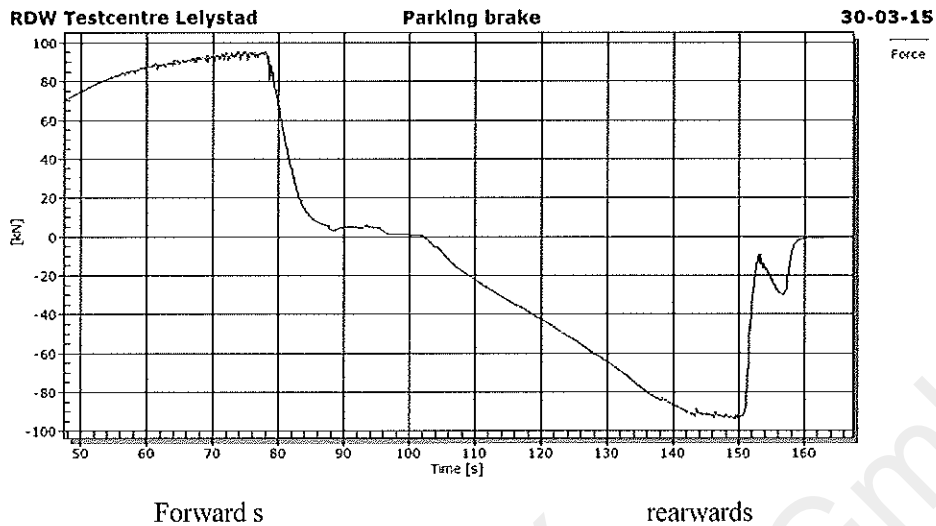
<b>Determination of the braking rate <math>z_{RALS}</math> (additional checks paragraph 6.3.2. and Appendix 3)</b>			
- V = 50 km/h			
- Maximum braking			
- ABS in operation			
- Category ABS: A			
- Condition of the vehicle: unladen			
Braking test split $\mu$	Results		Diagram number
	$V_{initial}$ (km/h)	$t_{40-20}$ (s)	
number 1			
number 2			
number 3			
$z_{RALS} = 0,566/t$			
$\frac{0,75}{\epsilon_H} \times \frac{4 \times z_{RALL} + z_{RALH}}{5}$ (3)			
$z_{RALS} \geq \frac{0,75}{\epsilon_H} \times \frac{4 \times z_{RALL} + z_{RALH}}{5}$ and $z_{RALS} > \frac{z_{RALL}}{\epsilon_H}$			OK/not OK



4. General requirements.

- 4.1. Is any electrical failure (supply, wiring) or sensor anomaly signalled to the driver by a specific optical warning signal? : pass/fail/N/A
- 4.1.1. Does the warning signal light up when the ABS-system is energised? : pass/fail/N/A
- Does the warning signal only extinguish if none of the in 4.1. mentioned defects are present? : pass/fail/N/A
- 4.1.2. Does the static sensor check verify that a sensor was not functioning the last time that the vehicle was at a greater speed than 10 km/h? : pass/fail/N/A  
The warning signal may light up again while the vehicle is stationary, provided that it is extinguished before the vehicle reaches 10 km/h when no defect is present.
- Does the electrically controlled pneumatic modulator cycle at least once during the above mentioned verification phase? : pass/fail/N/A
- 4.4. Does the electrical connection between the trailer and the towing vehicle conform to ISO Standard 7638-1985 or ISO/DIS Standard 7638-1996? (not for vehicles of category O1 and O2) : pass/fail/N/A  
The wiring specification of point 6.2 of ISO 7638-1985 or point 5.4. of ISO/DIS 7638-1996 for the trailer may only be reduced if the trailer is equipped with its own independent fuse. The rating of the fuse shall be such that the current rating of the conductors is not exceeded. With the exception of vehicles of categories N3 and O4, and until a uniform international standard has been agreed, the electrical connection between towing vehicles and trailers equipped with a 12 volt electrical system shall conform with DIN standard 72570, Part 4.
- 4.5. Is the residual braking performance in the event of a defect in the anti-lock braking system (according to point 4.1. of this Annex) at least 80% of the laden prescribed performance for the service braking system? : pass/fail/N/A
- 4.6. The operation of the anti-lock system shall not be adversely affected by magnetic or electrical fields. This shall be demonstrated by compliance with Regulation No. 10, 02 series of amendments. : pass/fail/N/A
- 4.7. Is there no manual device to disconnect the ABS or to change the control mode of the ABS? : pass/fail/N/A  
Only allowed on N2 and N3 OFF-ROAD vehicles under special conditions, see item 4.7.1. - 4.7.5. of Annex X.
- Annex XVIII Is the vehicle complying with the requirements of Annex 18 concerning complex electronics? See report RW TÜV EB 123.10E..... : pass/fail/N/A





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