

Information document: SAF SBS2219K1 disc_brake TDB0892
ECE Regulation 13 Amendment 12 Supplement 1.

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Revision

Request for extension/revision/correction N/A

Reason for extension/revision/correction N/A



THE NETHERLANDS

TEST REPORT

Concerning the braking system of certain categories of trailers corresponding the ECE Regulation number 13.12 Supplement 1.

Test report number : RDW-13R-0130235

0.1. Make : KOEGEL

0.2. Type : Port 20 Tankplex

0.3. Category of vehicle : O3, O4

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

General : The braking system as described in the document below has been inspected in accordance with the requirements laid down in section 5 of the above-mentioned Regulation.
See ID: SAF SBS2219K1 disc_brake TDB0892, dated 12 June 2023

Tests : The tests have been carried out according to Annex ~~4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21 and 22~~ of the above mentioned Regulation. The tested system is representative in terms of the type to be approved.

Conclusion : The type of disc brake fulfill's the above mentioned requirements and the test results can be found further in this document.

Tests conducted on : 5-9 June 2023

By : H. Wagensveld, W. Hartman

Lelystad (NL), 15 June 2023,
The test engineer,



H. Wagensveld

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Reason for testing

New brake type SAF SBS2219K1

Worst case description

Max mass, large Rdyn, short wheelbase

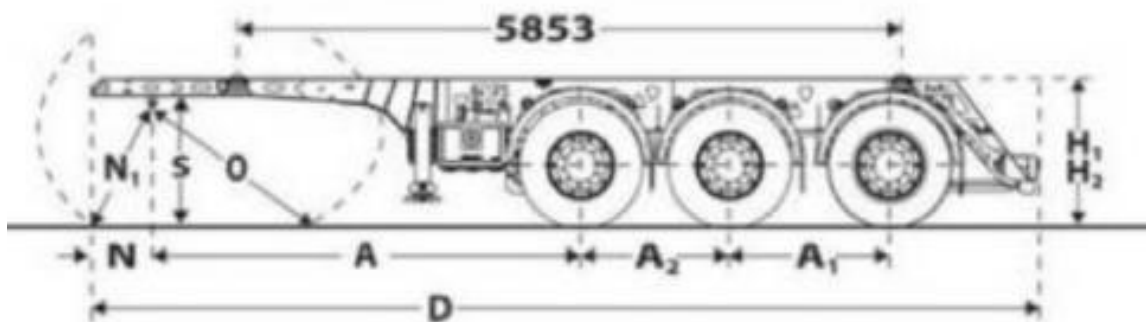
General information of representative test object

Make and type of the vehicle : KOEGEL Port 20 Tankplex
Vehicle category : O3, O4
VIN Nummer : WK0S0002400180428

General test information

Inspected by : H. Wagenveld, W. Hartman
Place : Lelystad (NL)
Date : 5-9 June 2023

Full trailer/Semi trailer ⁽¹⁾	Wheelbase (E _r)	3770-1310-1410	mm
Axes:			
Make and type (ID1)	SAF SBS2243	Code (ID4)	TBD0892
Brakes:			
Make and type (ID2)	SAF SBS2219K1	Lining make and type	SAF 717 / SAF 707
Bogie:			
Make and type	SAF INTRADISC INTEGRAL		
Tyres:			
Tyre size	385/65R22,5		
Tyre pressure	9.0	10 ² kPa	Load Index 160
Suspension:			
Type	Mechanical/pneumatic ⁽¹⁾		
Make	SAF		
Dimensions	Ø 350mm		



(A) Radstand: ca. 3.770 mm

(A1) Achsabstand: ca. 1.410 mm

(A2) Achsabstand: ca. 1.310 mm

Used test equipment

Item	Required accuracy	Identification
Scale	± 10 kg	Ops08
Manometer	± 1 % of 1600 kPa	Man04BID, Man08BID
Pressure sensor	± 2.5 % of 1000 kPa	
Speed measurement equipment	± 1 %	Gps20
Deceleration meter	± 0.3 m/s ²	Vijf77
Pedal-force meter	± 2 daN	
Temperature meter	± 10 °C	Tem65
Tyre-pressure meter	± 20kPa	Bva17
Force measurement equipment	± 3 %	Kra30
Dynamometer		
Time measurement test equipment	± 0.2 %	
Angle meter		
Reaction-time measurement test equipment	± 0.02 sec	
Brake test bench		
Torque measurement test equipment		
Dynamic fatigue test equipment		
Length measurement equipment	Class II	Rbm27BID
Amplifier		
Filter		

Remarks

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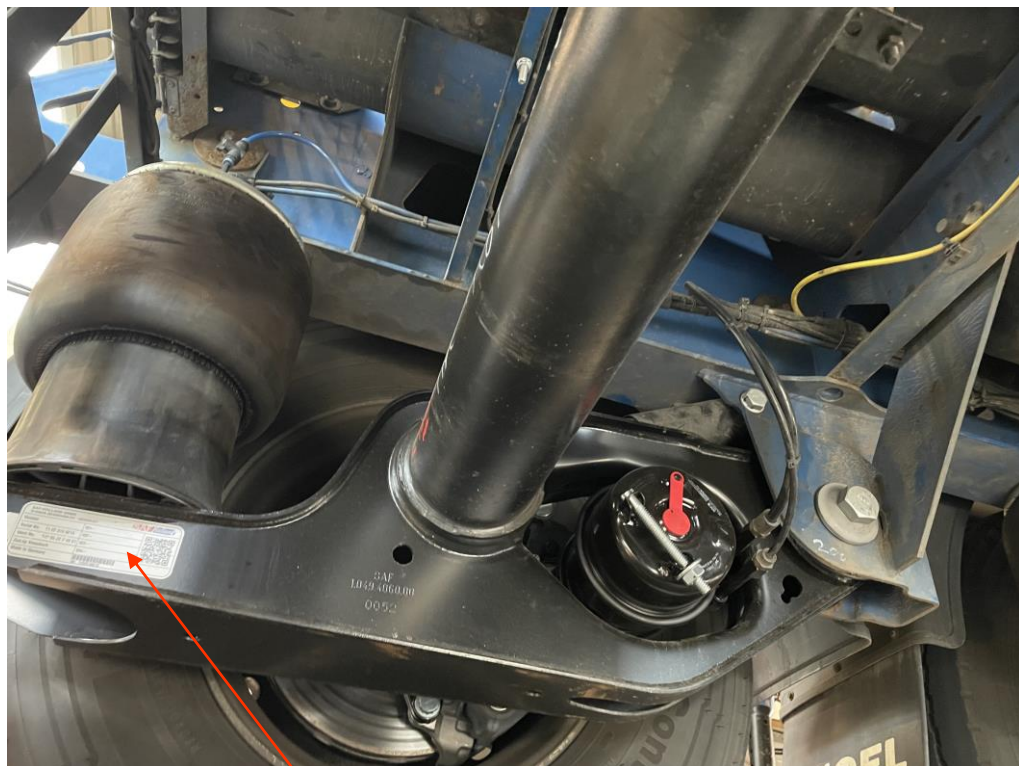


Environmental information

Date	5 June 2023	6 June 2023	7 June 2023
Road surface	Asphalt	Asphalt	Asphalt
Weather condition	Sunny	Sunny	Sunny
Temperature	17,5°C	13°C	16°C
Wind direction	W	N/W	W
Wind speed	1,6 m/s	5 m/s	4,5 m/s
Ambient pressure	1023 hPa	1022 hPa	1019 hPa
Relative humidity	58%	76%	74%

Static measurements:

Maximum allowed weights (mass):					
king pin	15000	kg			
Axle 1	9000	kg			
Axle 2	9000	kg			
Axle 3	9000	kg			
Total	42000	kg			
Brake schedule	N/A				
Brake cylinders			Brake levers		
Axle number 1	16	inch	Axle number 1	74	mm
Axle number 2	16/24	inch	Axle number 2	74	mm
Axle number 3	16/24	inch	Axle number 3	74	mm



SAF-HOLLAND GMBH D-53856 BESENBACH · GERMANY		
Version	B19-22S03	ID1-SBS2243
Serial No.	XX XX XXX XXXX	ID2-SBS2219K1
Ident No.	682 96 12 7 40 20	ID3-10006
Stal. 9000kg Vmax 105km/h		ID4-TDB9892
Made in Germany	E	
 SN XXXXXXXXXXXXX		



5. Specifications

5.2.2.8.2. Checking the wear of the service brake friction components

5.2.2.8.2.1. It shall be possible to easily assess this wear on service brake linings from the outside or underside of the vehicle, without the removal of the wheels, by the provision of appropriate inspection holes or by some other means. This may be achieved by utilizing simple standard workshop tools or common inspection equipment for vehicles.

Alternatively, a trailer mounted display providing information when lining replacement is necessary or a sensing device per wheel (twin wheels are considered as a single wheel), which will warn the driver at his driving position when lining replacement is necessary, is acceptable. In the case of an optical warning, the yellow warning signal specified in paragraph 5.2.1.29.2. above may be used provided that the signal complies with the requirements of paragraph 5.2.1.29.6. above.

5.2.2.8.2.2. Assessment of the wear condition of the friction surfaces of brake discs or drums may only be performed by direct measurement of the actual component or examination of any brake disc or drum wear indicators, which may necessitate some level of disassembly. Therefore, at the time of type approval, the vehicle manufacturer shall define the following:

a) The method by which wear of the friction surfaces of drums and discs may be assessed, including the level of disassembly required and tools and process required to achieve this.

b) Information defining the maximum acceptable wear limit at the point at which replacement becomes necessary.

This information shall be made freely available e.g. vehicle handbook or electronic data record.

See Inspection instruction:

<https://safholland.com/de/de>

(Will be made freely available)

5.2.2.14

Where the auxiliary equipment is supplied with energy from the service braking system, the service braking system shall be protected to ensure that the sum of the braking forces exerted at the periphery of the wheels shall be at least 80 per cent of the value prescribed for the relevant trailer as defined in paragraph 3.1.2.1. of Annex 4 to this Regulation.

5.2.2.14.1

This requirement shall be fulfilled under both of the following operating conditions Residual pressure to ensure 80% of the prescribed brake performance:	:	... kPa (park-lose ventiel) ... kPa (modulator)	pass/fail/N/A pass/fail/N/A
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5.2.2.16.1

Additional tests according to R13.11 suppl.18 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 ² kPa
P ₀ (10 ² kPa)	P ₁ (10 ² kPa)	P ₂ (10 ² kPa)	P ₃ (10 ² kPa)	P ₄ (10 ² kPa)	Deceleration ≥ 2,25 m/s ²	Yes/No
-						

5.2.1.18.4.2

Pressure after air supply line fracture and a deflation speed of at least 1 bar/s ≥2,0 10²kPa Brake performance pass/fail/N/A

5.2.2.23 Mandatory provisions for vehicles equipped with a vehicle stability function

The vehicle fulfils the requirements of paragraph 5.2.2.23 of the Regulation.

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

Verification of components and installation

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



ANNEX 4

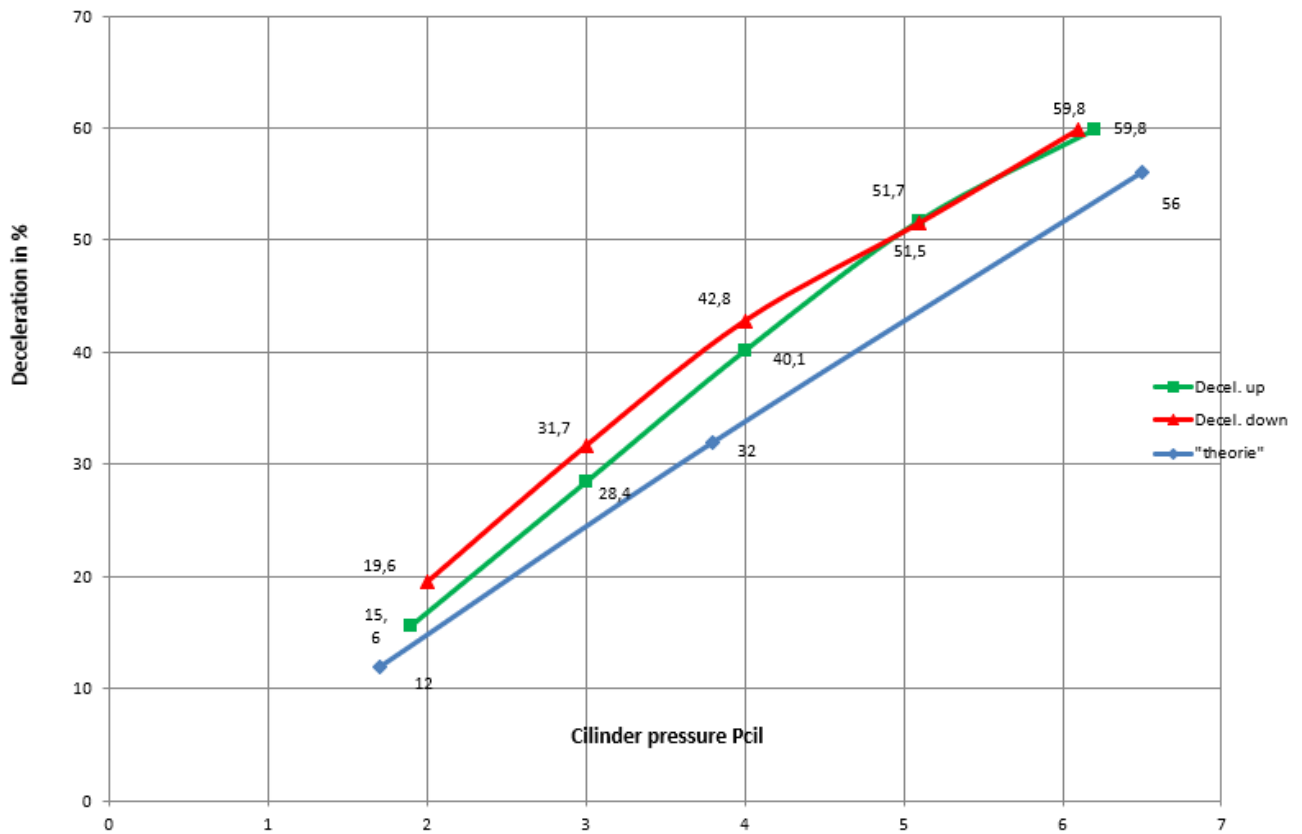
Braking tests and performance of braking systems

3 axle Brake lining SAF 717

3.1. Performance of braking systems of vehicles of category O

Command line pressure (10 ² kPa)	Brake cylinder pressure (10 ² kPa)	Deceleration combination (m/s ²)	Diagram number	Deceleration calculated for trailer (%)	Condition vehicle laden/unladen
2.0	1.9	1.02	1	15.6	laden
3.0	3.0	1.83	2	28.4	laden
4.0	4.0	2.57	3	40.1	laden
5.0	5.1	3.30	4	51.7	laden
6.0	6.2	3.81	5	59.8	laden
6.0	6.1	3.81	6	59.8	laden
5.0	5.1	3.29	7	51.5	laden
4.0	4.0	2.74	8	42.8	laden
3.0	3.0	2.04	9	31.7	laden
2.0	2.0	1.27	10	19.6	laden
1,2	1,3	1,56	1c	57,8	unladen
1,2	1,3	1,63	2c	60,5	unladen

Type "O" performance SBS 2219K1 SAF 717 3 Axle's

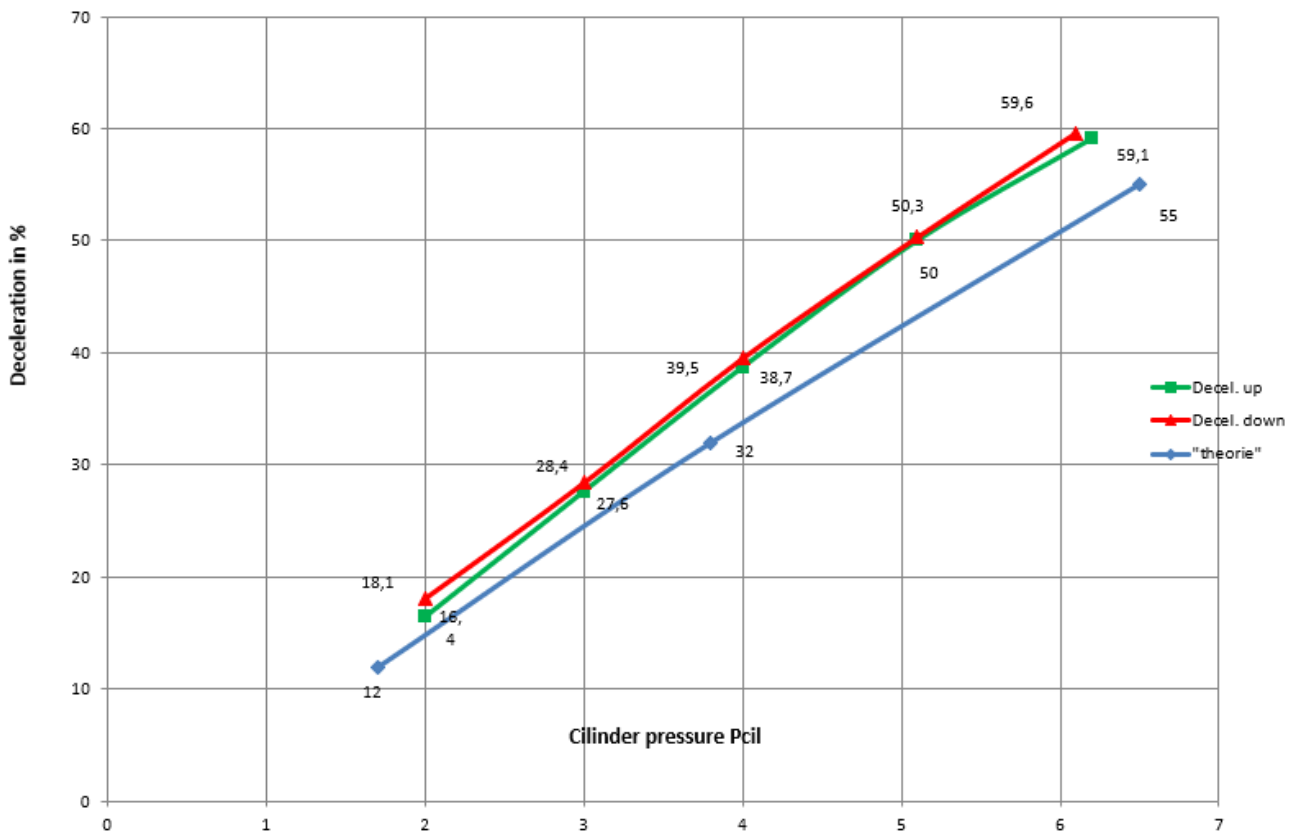


3 axle Brake lining SAF 707

3.1. Performance of braking systems of vehicles of category O

Command line pressure (10 ² kPa)	Brake cylinder pressure (10 ² kPa)	Deceleration combination (m/s ²)	Diagram number	Deceleration calculated for trailer (%)	Condition vehicle laden/unladen
2.0	2.0	1.07	1a	16.4	laden
3.0	3.0	1.78	2a	27.6	laden
4.0	4.0	2.48	3a	38.7	laden
5.0	5.1	3.19	4a	50.0	laden
6.0	6.2	3.77	5a	59.1	laden
6.0	6.1	3.80	6a	59.6	laden
5.0	5.1	3.21	7a	50.3	laden
4.0	4.0	2.53	8a	39.5	laden
3.0	3.0	1.83	9a	28.4	laden
2.0	2.0	1.18	10a	18.1	laden

Type "O" performance SBS 2219K1 SAF 707 3 Axle's



3.1.3.2.	If the trailer is fitted with a compressed air braking system, the pressure in the control line shall not exceed 650 kPa and the pressure in the supply line shall not exceed 700 kPa during the brake test. The test speed is 60 km/h.		
			: pass/fail

1.4.4 Calculation factor for deceleration

Mass of the combination	41935	kg		
Unladen weight under axles	2890	kg	Laden	: 1,55
Maximum weight under axles	27000	kg	Unladen	: 3,81
Rolling resistance value	0,01			

Remarks: N/A

Weights of combination under test conditions

Unladen		Laden			Tractor unit solo			
Axle 1	5185	kg	Axle 1	6160	kg	Axle 1	4940	kg
Axle 2	2535	kg	Axle 2	6425	kg	Axle 2	2030	kg
Axle 3	1000	kg	Axle 3	9705	kg	Total	6970	kg
Axle 4	970	kg	Axle 4	9970	kg			
Axle 5	920	kg	Axle 5	9675	kg			
Total	11010	kg	Total	41935	kg			

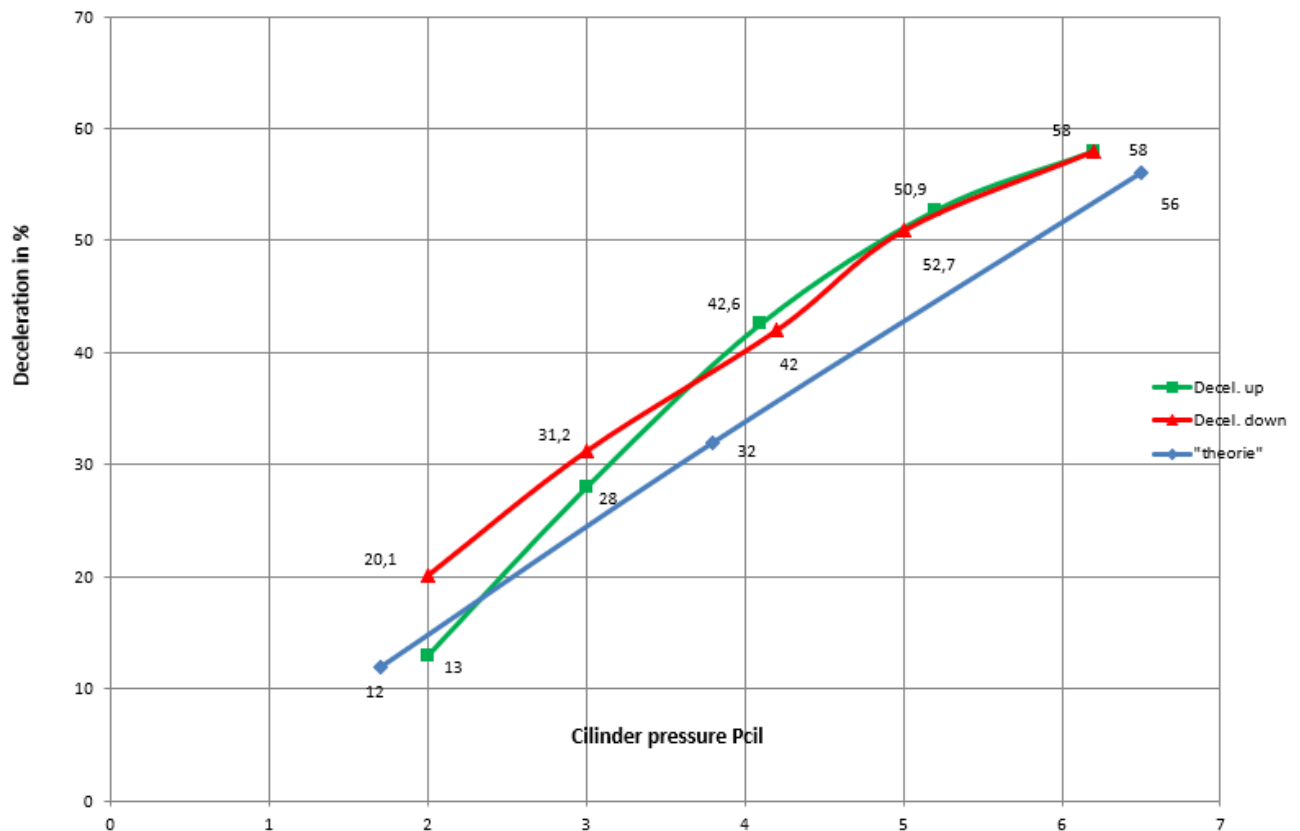


2 axle Brake lining SAF 717

3.1. Performance of braking systems of vehicles of category O

Command line pressure (10 ² kPa)	Brake cylinder pressure (10 ² kPa)	Deceleration combination (m/s ²)	Diagram number	Deceleration calculated for trailer (%)	Condition vehicle laden/unladen
2,0	2,0	0,81	1	13,0	laden
3,0	3,0	1,70	2	28,0	laden
4,0	4,1	2,57	3	42,6	laden
5,0	5,2	3,17	4	52,7	laden
6,0	6,2	3,46	5	57,6	laden
6,0	6,2	3,48	6	58,0	laden
5,0	5,0	3,06	7	50,9	laden
4,0	4,2	2,53	8	42,0	laden
3,0	3,0	1,89	9	31,2	laden
2,0	2,0	1,23	10	20,1	laden
1,7	1,8	1,61	1a	53,9	unladen
1,7	1,7	1,83	4a	61,6	unladen

Type "O" performance SBS 2219K1 SAF 717 2 Axle's



3.1.3.2.	If the trailer is fitted with a compressed air braking system, the pressure in the control line shall not exceed 650 kPa and the pressure in the supply line shall not exceed 700 kPa during the brake test. The test speed is 60 km/h.	: pass/fail
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1.4.4 Calculation factor for deceleration

Mass of the combination	29745	kg		
Unladen weight under axles	3055	kg	Laden	:
Maximum weight under axles	18000	kg	Unladen	: 3,43
Rolling resistance value	0,01			

Remarks: N/A

Weights of combination under test conditions

Unladen		Laden			Tractor unit solo			
Axle 1	5110	kg	Axle 1	5750	kg	Axle 1	4940	kg
Axle 2	2320	kg	Axle 2	4890	kg	Axle 2	2030	kg
Axle 3	1545	kg	Axle 3	9640	kg	Total	6970	kg
Axle 4	1510	kg	Axle 4	9465	kg			
Axle 5	lifted	kg	Axle 5	lifted	kg			
Total	10485	kg	Total	29745	kg			

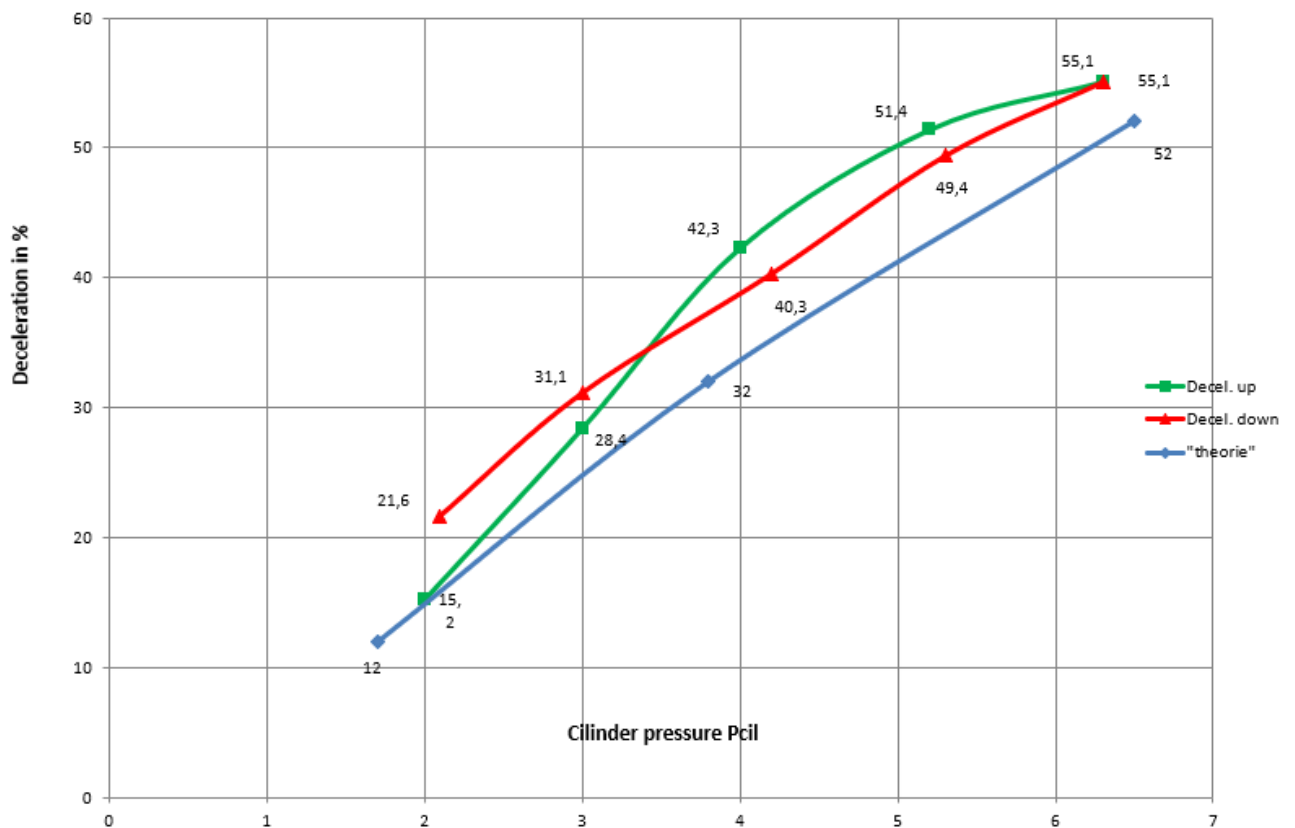


1 axle Brake lining SAF 717

3.1. Performance of braking systems of vehicles of category O

Command line pressure (10 ² kPa)	Brake cylinder pressure (10 ² kPa)	Deceleration combination (m/s ²)	Diagram number	Deceleration calculated for trailer (%)	Condition vehicle laden/unladen
2,0	2,0	0,74	1	15,2	laden
3,0	3,0	1,34	2	28,4	laden
4,0	4,0	1,97	4	42,3	laden
5,0	5,2	2,38	5	51,4	laden
6,0	6,3	2,55	6	55,1	laden
6,0	6,3	2,55	7	55,1	laden
5,0	5,3	2,29	8	49,4	laden
4,0	4,2	1,88	9	40,3	laden
3,0	3,0	1,46	10	31,1	laden
2,1	2,1	1,03	11	21,6	laden
2,2	2,3	1,68	1	48,3	unladen
2,6	2,6	2,13	2	61,8	unladen

Type "O" performance SBS 2219K1 SAF 717 1 Axle's



3.1.3.2.	If the trailer is fitted with a compressed air braking system, the pressure in the control line shall not exceed 650 kPa and the pressure in the supply line shall not exceed 700 kPa during the brake test. The test speed is 60 km/h.	: pass/fail
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1.4.4 Calculation factor for deceleration

Mass of the combination	19.485	kg		
Unladen weight under axles	3390	kg	Laden	: 2,17
Maximum weight under axles	9000	kg	Unladen	: 2,93
Rolling resistance value	0,01			

Remarks: N/A

Weights of combination under test conditions

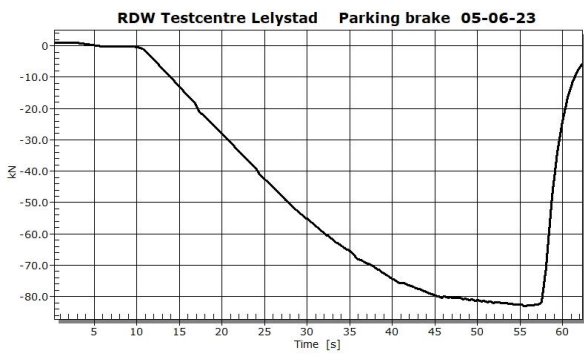
Unladen		Laden			Tractor unit solo			
Axle 1	4865	kg	Axle 1	5590	kg	Axle 1	4940	kg
Axle 2	1690	kg	Axle 2	4220	kg	Axle 2	2030	kg
Axle 3	3390	kg	Axle 3	9675	kg	Total	6970	kg
Axle 4	lifted	kg	Axle 4	lifted	kg			
Axle 5	lifted	kg	Axle 5	lifted	kg			
Total	9945	kg	Total	19485	kg			



3 axle Brake lining SAF 717

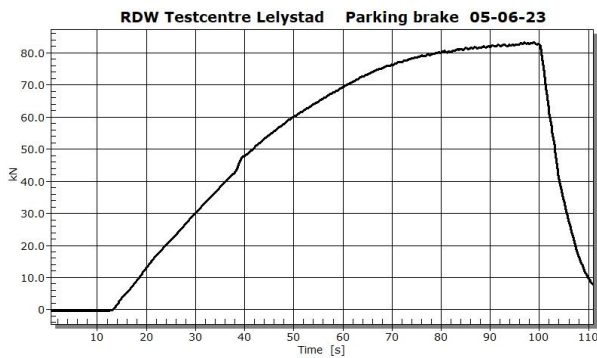
3.2.Parking brake				
Brake force forward	8280	daN	On axle number	: 2+3
Brake force rearward	8300	daN	Support legs used	: yes/no ⁽¹⁾
Control force	-	daN		
Lever length	74	mm		
Brake chamber				
Make	: SAF			
Type	: 16/24			
ID No.	: 04.454.1077			
Remarks: None				

Forward



55,4	-82,8177
55,5	-82,9499
55,6	-82,8912
55,7	-82,7717
55,8	-82,7527
55,9	-82,7799
56	-82,7723
56,1	-82,7762
56,2	-82,7807
56,3	-82,7512

Rearward



98,3	83,04699
98,4	83,07941
98,5	83,03054
98,6	82,99249
98,7	83,02408
98,8	83,12288
98,9	83,22954
99	83,23449
99,1	83,12472
99,2	82,96625

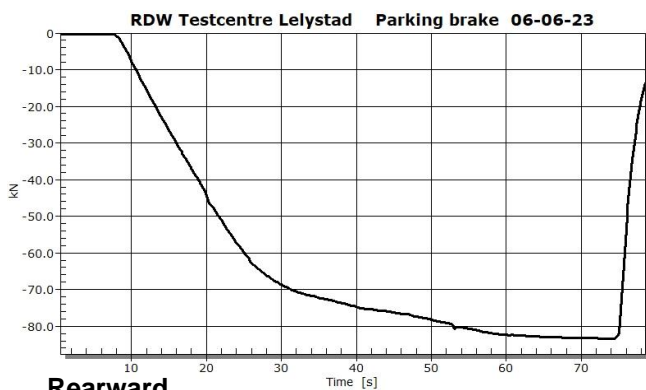


3 axle Brake lining SAF 707

3.2.Parking brake				
Brake force forward	8330	daN	On axle number	: 2+3
Brake force rearward	8310	daN	Support legs used	: yes /no ⁽¹⁾
Control force	-	daN		
Lever length	74	mm		
Brake chamber				
Make	: SAF			
Type	: 16/24			
ID No.	: 04.454.1077			
Remarks: None				

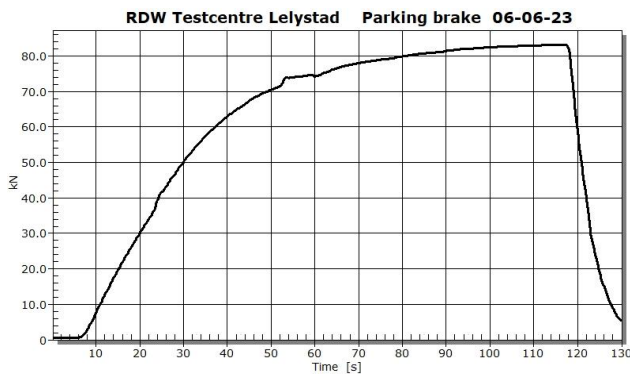
3.3 Automatic brake system			
Speed 40 – 0 km/h		requirement:	result:
Deceleration trailer		> 13,5%	apply/ not apply

Forward



Force	Value
71,6	-83,3033
71,7	-83,3046
71,8	-83,3048
71,9	-83,3063
72	-83,3097
72,1	-83,3157
72,2	-83,325
72,3	-83,3365
72,4	-83,3485
72,5	-83,3589
72,6	-83,3672

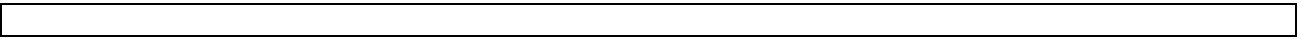
Rearward



Force	Value
114,4	83,11104
114,5	83,11475
114,6	83,11793
114,7	83,12148
114,8	83,1247
114,9	83,12687
115	83,1275
115,1	83,12749
115,2	83,12854
115,3	83,13154



Attachment 1



Parking brake hill 18%
Forward



Rearward

