

# Test Report

No. TDB 0264 dated 18.03.2003

for application of Annex 11, ECE Regulation No. 13

RWTÜV Fahrzeug GmbH

A RWTÜV Group Company

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Board:  
Elmar Legge

Management:  
Prof. Dr. Claus Wolff (Vors.)  
Friedo Schäfer

## 1 IDENTIFICATION

### 1.1 Axle

Manufacturer: BPW Bergische Achsen  
Kommanditgesellschaft  
D-51674 Wiehl  
Make: BPW  
Type: SK 68  
Model: -  
Technically permissible axle load  $P_e$ <sup>1)</sup>: 6670,8 daN ( $\hat{=}$  6800 kg)

### 1.2 Brake

Manufacturer: see 1.1  
Make: BPW  
Type: SN 3616  
Model: -  
Technically permissible camshaft  
input torque  $C_{max,e}$ : 2450 Nm  
(for calculation: 2000 Nm at 6,5 bar)

Brake drum - internal diameter: 360 mm  
- mass: 35 kg  
- material: cast iron (grey cast iron)

Brake lining - manufacturer: TMD Friction GmbH  
- make: Textar  
- type: T 090  
- identification: type indication at front  
- width  $b_e$ : 160 mm  
- thickness  $s_e$ : 11...18 mm (crescent-shaped)  
- surface area  $F_e$ : 1070 cm<sup>2</sup>  
- method of attachment: riveted

Brake geometry: see appendix 2 dated 18.03.2003

### 1.3 Wheel (Single)

Rim diameter  $D_e$ : see appendix 1 dated 18.03.2003  
Dimensions: see appendix 1 dated 18.03.2003

### 1.4 Tyres

Dynamic rolling radius  $R_e$   
at reference load  $P_e$ : 508 mm

<sup>1)</sup> See sheet 3/3

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Manufacturer : BPW  
 Type of axle : SK 68

## 1.5 Actuation

Brake actuator -manufacturer: GRAU  
 - type: diaphragm brake actuator  
 - model: 30" (30 LH)

Lever length  $l_e$ : 165 mm

## 1.6 Automatic brake adjustment device:

- manufacturer: see 1.1  
 - make: BPW  
 - type: Eco-Master  
 - version: AGS 2

## 2 RECORD OF TEST RESULTS <sup>2)</sup>

(corrected to take account of rolling resistance  $\hat{=} 0,01 P_e$ )

### 2.1 In the case of vehicles of category O<sub>2</sub> and O<sub>3</sub>:

Test type:		0	I	
Annex 11, Appendix 2, paragraph:		3.5.1.2	3.5.2.2/3	3.5.2.4
Test speed	km/h	40	40	40
Brake actuator pressure $p_e$	bar	3,7	-	3,7
Braking time	min	-	2,55	-
Brake force developed $T_e$	daN	4011	467	3297
Brake efficiency $T_e / P_e$	-	0,60	0,07	0,49
Actuator stroke $s_e$	mm	50	-	65
Camshaft input torque	$C_e$ Nm	1132	-	1132
	$C_{0,e}$ Nm	30	-	30

### 2.2 In the case of vehicles of category O<sub>4</sub>:

Test type:		0	III	
Annex 11, Appendix 2, paragraph :		3.5.1.2	3.5.3.1.2	3.5.3.2
Test speed				
initial	km/h	60	60	60
final	km/h	0	30	0
Brake actuator pressure $p_e$	bar	3,7	-	3,7
Number of brake applications	-	-	20	-
Duration of braking cycle	s	-	60	-
Brake force developed $T_e$	daN	3997	2177	2861
Brake efficiency $T_e / P_e$	-	0,60	0,33	0,43
Actuator stroke $s_e$	mm	50	-	60
Camshaft input torque	$C_e$ Nm	1132	-	1132
	$C_{0,e}$ Nm	30	-	30

<sup>2)</sup> See sheet 3/3



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### 2.3 Performance of the automatic brake adjustment device

2.3.1 Free running according to paragraphs 3.6.1. and 3.6.3. of Annex 11, Appendix 2: yes

## 3 NAME OF TECHNICAL SERVICE CONDUCTING THE TEST

RWTÜV Fahrzeug GmbH  
Technischer Dienst für Bremsanlagen  
D-45307 Essen

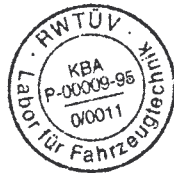
4 DATE OF TEST: 02.07.2002

5 This test has been carried out and the results reported in accordance with ECE Regulation No.13, Supplement 6 to the 09 series of amendments, paragraph 4 and Annex 11, Appendix 2.

6 At the end of test defined in paragraph 3.6 of Annex 11, Appendix 2 the requirements of paragraph 5.2.2.8.1 of ECE Regulation No.13 were deemed to be fulfilled.

Essen, 18.03.2003  
Wli - 205 10 001-

  
Dipl.-Ing. Walinger



LABORATORY FOR VEHICLE TECHNOLOGY  
Testing Laboratory for Braking Systems  
according to ECE Regulation No. 13

## 7 TEST DOCUMENTS

- / Appendix 1: Dimensions brake drum / wheel / tyre (2 sheet)
- / Appendix 2: Brake geometry (1 sheet)

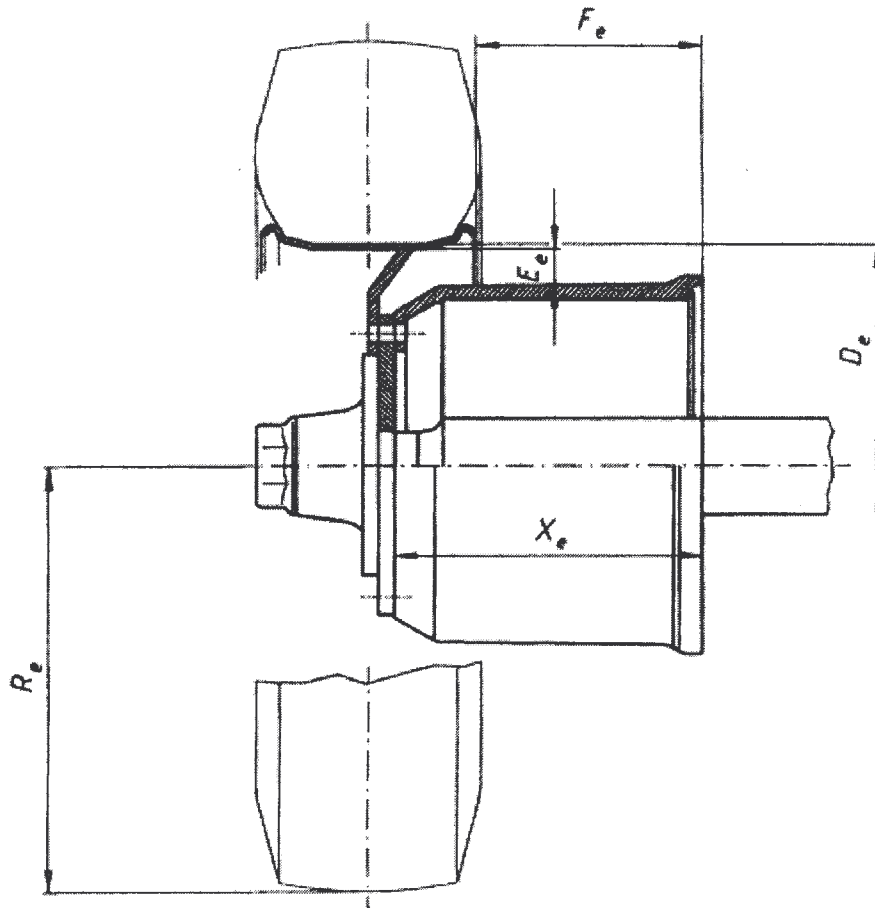
<sup>1)</sup> Calculation with  $g = 9,81 \text{ m/s}^2$

<sup>2)</sup> Inertia dynamometer test, twin,  $R_e = 508 \text{ mm}$

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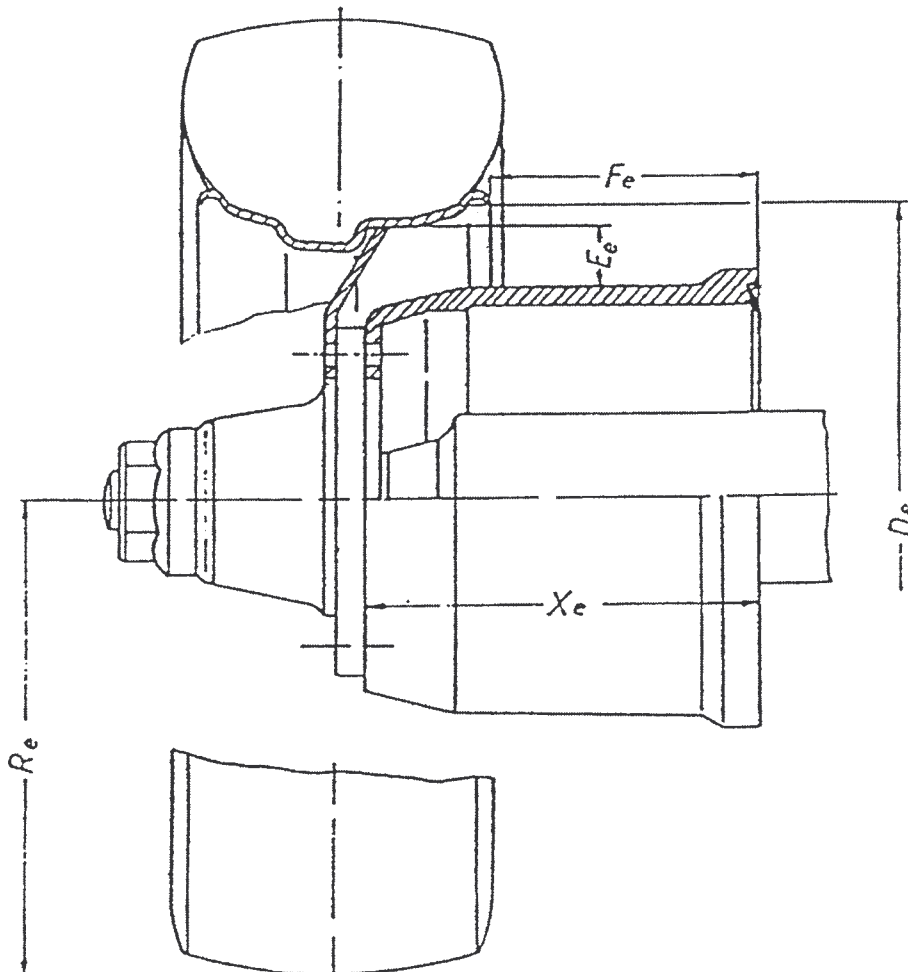
Brake drum-		Axle load $P_e$		Tyre	Rim	$B_e$	$R_e$	$D_e$	$E_e$	$F_e$
width	mass	(daN)	(kg)							
$x_e$ (mm)	(kg)									
$\geq 201$	35	6670,8	6800	10.00 R 20	7,5 - 20	---	508	508	44	102



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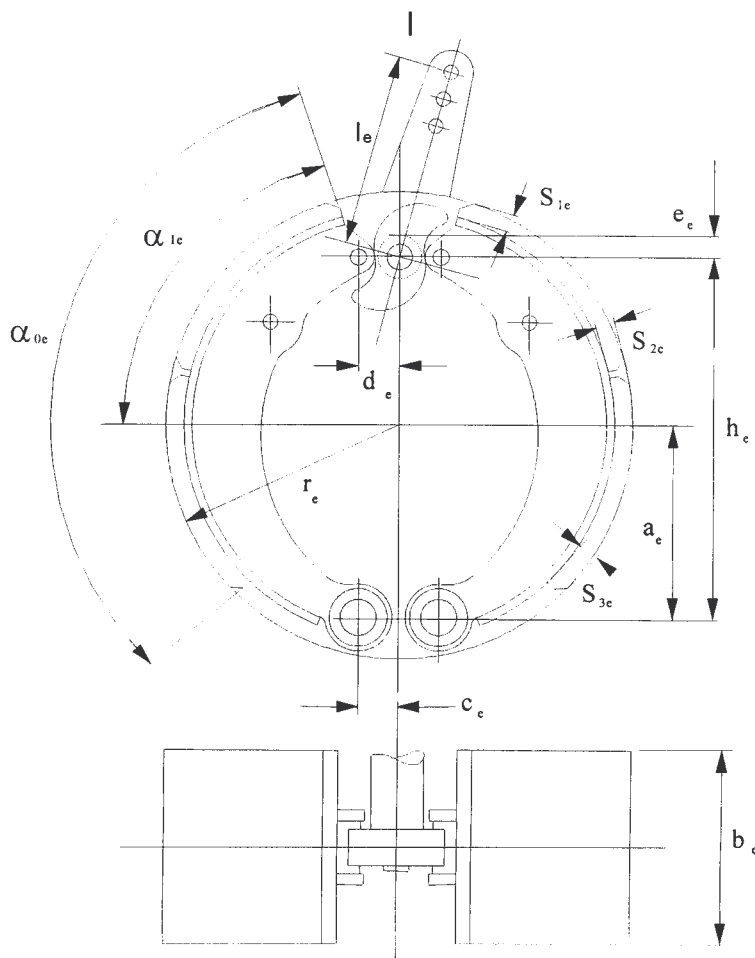
Brake drum- width $x_e$ (mm)	mass (kg)	Axle load $P_e$		Tyre	Rim	$B_e$	$R_e$	$D_e$ (mm)	$E_e$	$F_e$
		(daN)	(kg)							
$\geq 201$	35	6670,8	6800	285/70 R19,5	8,25 x 19,5	---	434	495,3	27	45
$\geq 201$	35	6670,8	6800	285/70 R19,5	8,25 x 19,5	---	434	495,3	27	91
$\geq 201$	35	6670,8	6800	295/70 R22,5	7,50 x 22,5	---	480	571,5	65	100



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- All dimensions - except  $\alpha_{0e}$ ,  $\alpha_{1e}$  et  $F_e$  - in mm
- $b_e$  = brake lining width
- $F_e$  = braking surface per brake in  $\text{cm}^2$
- $l_e$  see test report, no. 1.5

Brake	$a_e$	$h_e$	$c_e$	$d_e$	$e_e$	$\alpha_{0e}$	$\alpha_{1e}$	$b_e$	$r_e$	$F_e$	$S_{1e}$	$S_{2e}$	$S_{3e}$
SN 3616	132	255	33	42	14	115°	69,5°	160	180	1070	13	18	11

