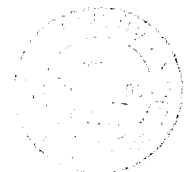


Test Report

No. AR 2008 dated 16.10.2001
 for a mechanical brake according to
 Annex VIII, Appendix 3, Directive 71/320/EEC

- | | | | |
|-----|--|--|-------------|
| 1 | Manufacturer: | BPW Bergische Achsen
Kommanditgesellschaft
D-51674 Wiehl | |
| 2 | Make: | BPW | |
| 3 | Type: | S 2005-7 | |
| 4 | Technically permissible maximum
mass per wheel G_{Bo} : | 750 kg | |
| 5 | Maximum braking torque M_{max} : | 2400 Nm | |
| 5.1 | Tested braking torque: | 2380 Nm | |
| 6 | Dynamic tyre rolling radius R_{min} : | a) 0,26 m | b) 0,215 m |
| | R_{max} : | a) 0,35 m | b) 0,2595 m |
| 7 | Brief description | <p>Simplex brake: Application with expanding lever and brake cable pull with 90° or 115° deflection; 2 equal brake shoes with symmetrical linings, brake lining stuck on: Make Type FERODO BERAL 1517 or FERODO BERAL 1126 or COSID 485; 1 cylindrical return spring; manual readjustment with adjusting nut on the floating brake shoe support; return system with travel-dependent action.</p> <p>List of plans and dimensional drawings see appendix 1.</p> | |
| 8 | Main diagram of the brake: | See drawing no. TE-1823.0 | |
| 9 | Test result | | |
| 9.1 | Reduction ratio i_g : | $2 \cdot \frac{49,7 \cdot 149}{14 \cdot 75} = 14,11$ | |
| 9.2 | Half shoe centre lift s_B : | > 1,6 mm | |
| 9.3 | Half minimum shoe centre lift s_{B^*} : | 1,6 mm | |
| 9.4 | Withdrawal force P_0 : | a) 42 N | b) 9 N |
| 9.5 | Coefficient ρ : | a) 0,86 m | b) 0,74 m |

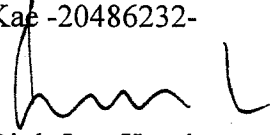


Test Report No. : AR 2008
Date : 16.10.2001
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Manufacturer : BPW
Type of brake : S 2005-7

- 9.6 Overload protector according to point 3.6 of Annex VIII: Not provided
- 9.7 Maximum permissible force P_{max} for M_{max} : 2780 N
- 10 Technical service which carried out the test: RWTÜV Fahrzeug GmbH
Technischer Dienst für Bremsanlagen
D-45307 Essen
- 11 The above brake does conform to the requirements of points 3 and 6 of the testing conditions for vehicles fitted with inertia braking described in Annex VIII.
The brake may be used for an inertia braking system without an overload.

Essen, 16.10.2001
Kae -20486232-


Dipl.-Ing. Kaesler



LABORATORY FOR VEHICLE TECHNOLOGY
Testing Laboratory for Braking Systems
according to Directive 71/320/EEC in the
version of Directive 98/12/EC

- 12 Attached test documents
Appendix 1 dated 16.10.01: List of plans and dimensional drawings
Appendix 2 dated 15.01.01: Characteristic diagram
Appendix 3 dated 15.01.01: Test of thermal properties
Appendix 4 dated 15.01.01: Braking performance with vehicle reversing
Drawing No. TE-1823.0 dated 04.12.96
Plans and dimensional drawings acc. to list in appendix 1
Prüfbericht Nr. KO 185.4
Prüfbericht Nr. KO 185.5
- 13 Remarks on appendices 2, 3 and 4
The test results were determined using a brake pull-cable with 90° deflection (**perpendicular** brake pull-cable connection) and on the basis of a comparative test they are also valid for 115° deflection (**oblique** brake pull-cable connection).

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Manufacturer : BPW
Type of brake : S 2005-7

List of plans and dimensional drawings

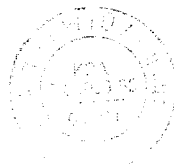
Description (Benennung)	Number (Nummer)	Date (Datum)
Spreizhebelbremse, links	C-06 00 226 218-1	17.09.01
Spreizhebelbremse, links	C-06 00 227 014-1	17.09.01
Spreizhebelbremse (Stückliste), links		
Blatt 1 und 3	C-06 00 226 218-1	22.01.01
Blatt 2	C-06 00 226 218-1	17.09.01
Spreizhebelbremse, rechts	C-06 00 226 217-1	17.09.01
Spreizhebelbremse, rechts	C-06 00 227 012-1	17.09.01
Spreizhebelbremse (Stückliste), rechts		
Blatt 1 und 3	C-06 00 226 217-1	22.01.01
Blatt 2	C-06 00 226 217-1	17.09.01
Bremsschildgruppe, links	D-06 00 226 978	05.02.97
Bremsschildgruppe, rechts	D-06 00 226 983	06.02.97
Bremsschild, links	C-06 00 226 963	04.02.97
Bremsschild, rechts	C-06 00 226 968	04.02.97
Abdeckblech, links	C-06 00 226 973	03.02.97
Abdeckblech, rechts	C-06 00 226 972	03.02.97
Vierkantröhr	E-06 00 226 960	03.02.97
Schlauchführung	E-06.338.05.06.0	18.12.96
Bremsschildgruppe links	D-06 00 226 172	26.02.97
Bremsschildgruppe rechts	D-06 00 226 153	26.02.97
Bremsschild links	C-06 00 226 151	09.01.97
Bremsschild rechts	C-06 00 227 153	09.01.97
Bremsschildgruppe links	D-06 00 226 247	21.02.97
Bremsschildgruppe rechts	D-06 00 226 244	21.02.97
Bremsschild links	C-06 00 226 250	09.01.97
Bremsschild rechts	C-06 00 227 152	09.01.97
Abdeckblech links	C-06 00 226 174	20.02.97
Abdeckblech rechts	C-06 00 226 152	20.02.97
Schlauchführung	E-06.338.05.04.0	22.12.94
Stopfen	E-06 00 225 420	24.08.00
Lager	E-06 00 115 778	03.01.95
Formteil (links)	E-06 00 115 783	03.01.95
Formteil (links)	E-06.001.14.81.0	17.08.00
Formteil (rechts)	E-06 00 115 784	03.01.95
Formteil (rechts)	E-06.001.14.80.0	17.08.00
Bolzen	E-06 00 115 780	03.01.95
Bolzen	E-06.084.52.39.0	04.11.98
Nachstellbolzen	E-06.276.11.04.0	27.11.96
Nachstellbolzen	E-06 00 229 937	17.08.00
Sicherungsscheibe	E-06 00 227 063	27.11.96
Nachstellmutter	E-06 00 115 782	03.01.95
Schraube	E-06 00 225 221	23.08.95
Schraube	E-06.341.01.12.0	04.11.98

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Date : 16.10.2001
Appendix : 1
Sheet : 2 / 2

RWTUV

Manufacturer : BPW
Type of brake : S 2005-7

Description (Benennung)	Number (Nummer)	Date (Datum)
Sicherungsklammer	E-06 00 115 800	07.04.95
Sicherungsklammer	E-06.350.20.12.0	04.11.98
Bolzen	E-06 00 115 797	03.01.95
Zugfeder	E-06 00 115 785	02.01.95
Zugfeder	E-06.397.10.03.0	04.11.98
Bremsbackengruppe	D-06 00 232 135	16.08.00
Bremsbackengruppe	D-06 00 226 181	10.01.96
Bremsbelag	D-06 00 232 136	16.08.00
Bremsbelag	D-06 00 226 182	10.01.96
Bremsbacke	D-06 00 226 180	16.08.00
Backensegment	D-06 00 226 179	16.08.00
Backensteg	D-06 00 226 178	16.08.00
Zugfeder	E-06 00 115 811	29.06.94
Zugfeder	E-06.397.21.16.0	04.11.98
Spannstift	E-06 00 115 857	03.01.95
Spannfeder	E-06 00 115 790	16.08.00
Spreizschloß	E-06.359.01.02.0	13.09.95
Spreizhebel	E-06.358.03.09.0	13.09.95
Bolzen	E-06.084.32.31.0	13.09.95
Spreizbügelplatte	D-06.356.01.03.0	13.09.95
Spreizschloß	E-06 00 226 933	03.02.97
Spreizhebel	E-06 00 226 932	03.02.97
Spreizbügelplatte	D-06 00 115 814	24.08.95
Spreizbügelplatte	D-06 00 115 815	24.08.95
Zugbügel	E-06.396.12.02.0	22.12.94
Trommelnabe	C-06.274.07.26.0	17.08.00
Trommelnabe	C-06.274.17.03.0	24.08.00
Trommelnabe	C-06 00 226 205	29.01.96
Trommelnabe	D-06.274.08.64.0	30.01.96
Trommelnabe	D-06.274.08.65.0	30.01.96
Trommelnabe	C-06.274.08.87.0	06.09.95
Trommelnabe	C-06.274.08.88.0	29.01.96
Bremsseilzug	D-06.089.33.73/97.0	22.12.94

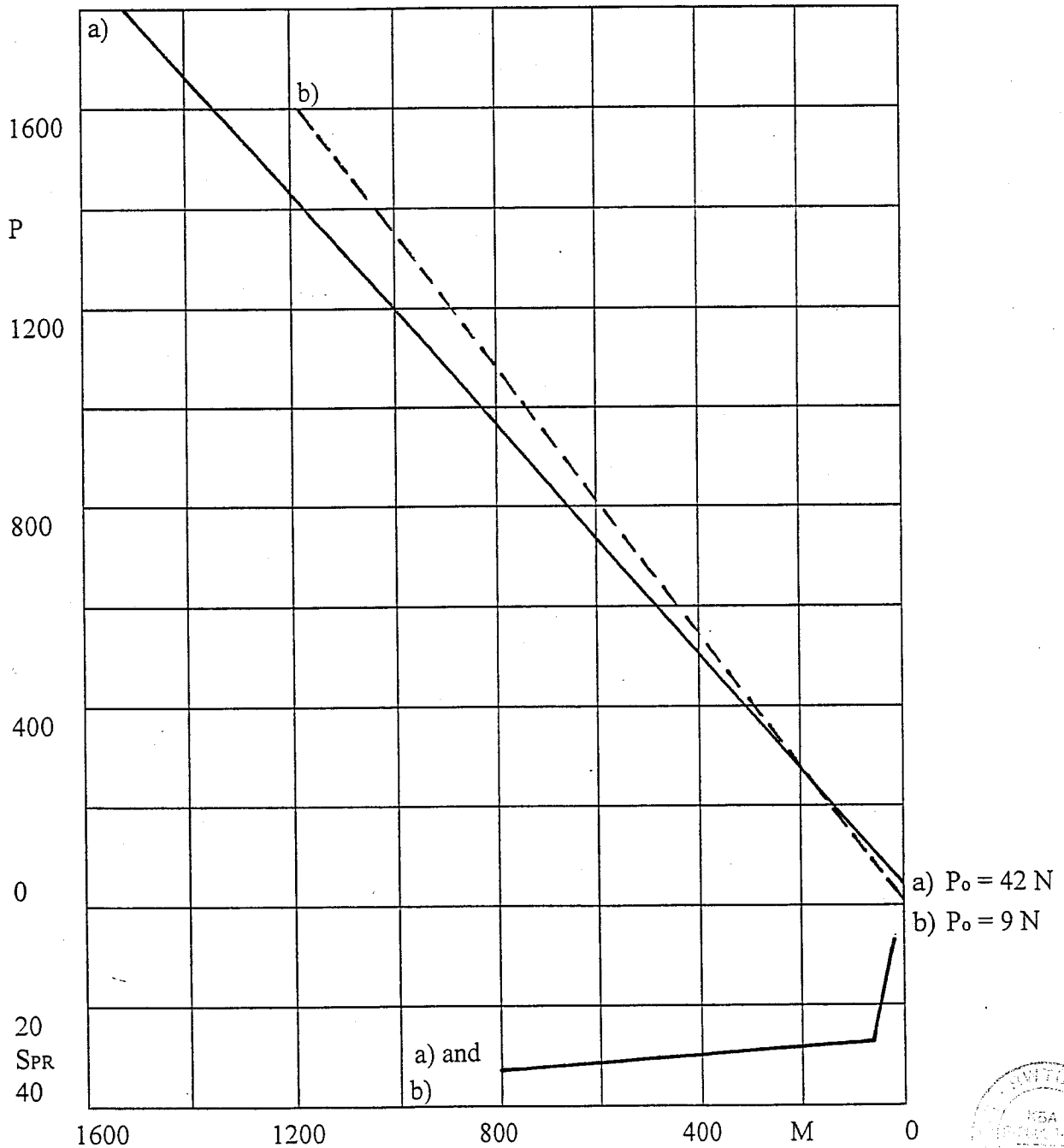


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Manufacturer : BPW
 Type of brake : S 2005-7

Characteristic diagram

- M Braking torque in Nm
- P Force on brake cable pull in N
- SPR Application travel at brake cable pull with vehicle reversing
- ρ a) $1520 \text{ Nm} / (1800\text{N}-42\text{N}) = 0,86 \text{ m}$
 b) $1177 \text{ Nm} / (1600\text{N}-9\text{N}) = 0,74 \text{ m}$



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Manufacturer : BPW
Type of brake : S 2005-7

Test of thermal properties

A specimen of the brakes was examined according to Annex II Directive 71/320/EEC on an inertia dynamometer:


1	Brake test type 0	a)	b)
	Test speed:	40 km/h	40 km/h
	Braking ratio:	60 %	63 %
	Force on brake cable pull:	1800 N	1600 N
2	Brake test type I		
	Test speed:	40 km/h	40 km/h
	Sustained braking ratio:	7 %	7 %
	Braking time:	153 s	153 s
	Hot performance:	42 % ($\hat{=}$ 70 % of brake test type 0)	47 % ($\hat{=}$ 75 % of brake test type 0)
	Force on brake cable pull:	1800 N	1600 N
	Temperature attained at brake drum:	390 °C	370 °C

The rolling resistance of 1 % of the allowable mass per wheel has been taken into account.

Overall result

The brake meets the requirements of Annex II, Appendix 1.3.3, Directive 71/320/EEC in the version of 27.01.98.

Essen, 15.01.01


Dipl.-Ing. Kaesler



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RWTUV

Manufacturer : BPW
Type of brake : S 2005-7

Braking performance with vehicle reversing

The following applies for the direction of rotation with reverse travel

Reversing braking torque M_R : 60 Nm (incl. rolling resistance $\hat{=} 0,01 G_{B0}$)
With an application travel s_{PR}
at brake cable pull: Up to 27 mm
Necessary application travel
at brake cable pull for the
parking brake: ≥ 32 mm

The travel condition (reversing)
for the inertia (overrun) braking
system is:

$$s'/i_H \leq s_{PR}$$

Essen, 15.01.01



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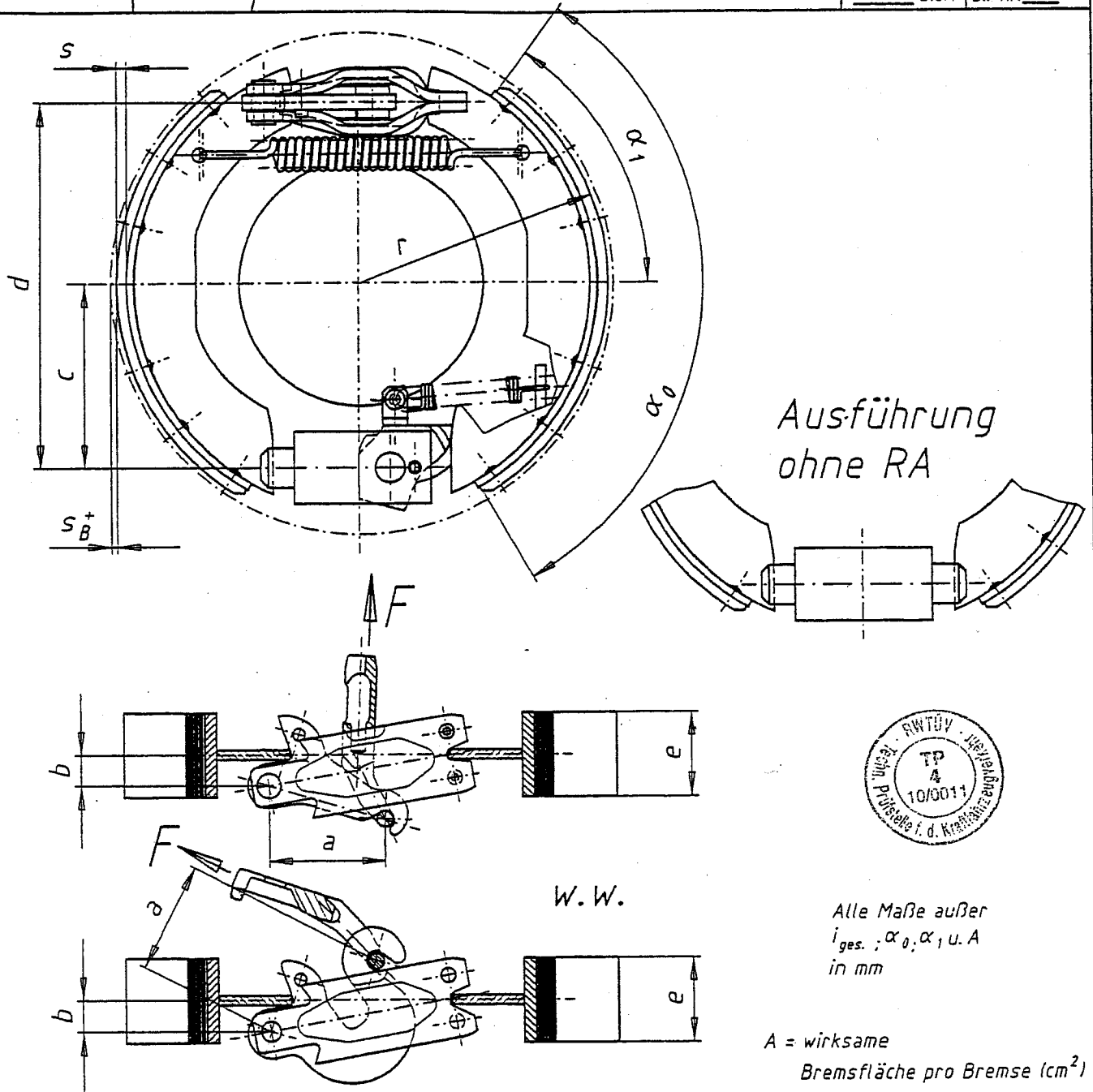


Schemazeichnung Spreizhebelbremse

TE-1823.0

1 Blatt Bl.-Nr. 1

BPW BERGISCHE ACHSEN Kommanditgesellschaft D-51674 WIEHL



Bremsen-Größe	c	d	$i_{ges.}$	s_B^+	a	b	r	e	s	A	α_0	α_1
S 2035-7 RA	75	149	14,1	1,6	49,7	14	100	35	4	136,5	114°	54°30'
S 2035-7												
S 2005-7 RA	75	149	14,1	1,6	49,7	14	100	50	4	195	115°	55°
S 2005-7												
S 2304-7 RA	84	166	14,0	1,66	56,8	16	115	40	4	192	122°	61°
S 2304-7												
S 2504-7 RA	93	186	14,2	1,7	56,8	16	125	40	5	200	117°	58°
S 2504-7												
S 3006-7 RA	112,5	217	13,7	1,8	70	19,6	150	60	5	348	115°	57°
S 3006-7												

3	04.12.96	Datum 30.06.94 Name Bode	Datum 30.06.94 Name Mollerus
Revision	Datum	Erstellt	Genehmigt