RWTÜV

Ein Unternehmen der TÜV Mitte-Gruppe

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Test Report

No. AR 2011 dated 12.03.99

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 1704-7
4	Technically permissible maximum mass per wheel G_{Bo}:	500 kg
5	Maximum braking torque M_{max}:	1350 Nm
5.1	Tested braking torque:	1350 Nm
6	Dynamic tyre rolling radius R_{min}:	0,21 m
	R_{max}:	0,30 m

7 Brief description

Simplex brake: Application with expanding lever and brake cable pull with 90° deflection; 2 equal brake shoes with symmetrical linings, brake lining stuck on: Make FERODO BERAL, type 1517; 1 cylindrical return spring; manual readjustment with adjusting nut on the floating brake shoe support; return system with travel-dependent action.

List of plans and dimensional drawings see appendix 1.

8	Main diagram of the brake:	See drawing no. TE-1823.0
9	Test result	
9.1	Reduction ratio i_g:	$2 \cdot \frac{43 \cdot 119,5}{12,5 \cdot 59} = 13,93$
9.2	Half shoe centre lift s_B:	> 1,6 mm
9.3	Half minimum shoe centre lift s_B*:	1,54 mm
9.4	Withdrawal force P_o:	20 N
9.5	Coefficient ρ:	0,63 m

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Manufacturer : BPW
Type of brake : S 1704-7

9.6 Overload protector according to point 3.6 of Annex VIII: Not provided

9.7 Maximum permissible force P_{max} for M_{max}: 2182 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, 12.03.99

Dipl.-Ing. Kaesler

RWTÜV Laboratorium für Fahrzeugtechnik KBA P-00009-95 0/0011

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: List of plans and dimensional drawings
Appendix 2: Characteristic diagram
Appendix 3: Test of thermal properties
Appendix 4: Braking performance with vehicle reversing
Drawing No. TE-1823.0 dated 11.02.99
Plans and dimensional drawings acc. to list in appendix 1

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Manufacturer	: BPW
Type of brake	: S 1704-7

List of plans and dimensional drawings

Description (Benennung)	**Number** (Nummer)	**Date** (Datum)
Spreizhebelbremse, links, mit Stückliste	C-06 00 229 921	13.10.98
Spreizhebelbremse, rechts, mit Stückliste	C-06 00 229 920	13.10.98
Bremsschildgruppe (links)	D-06 00 229 919	14.10.98
Bremsschildgruppe (rechts)	D-06 00 229 918	14.10.98
Bremsschild, links	C-06 00 229 896	14.10.98
Bremsschild, rechts	C-06 00 229 895	14.10.98
Lager	E-06 00 115 778	03.01.95
Schlauchführung	E-06.338.05.04.0	22.12.94
Stopfen	E-06 00 225 420	28.06.94
Formteil, links	E-06.001.14.81.0	01.10.98
Formteil, rechts	E-06.001.14.80.0	01.10.98
Bolzen	E-06.084.52.39.0	04.11.98
Nachstellmutter	E-06 00 115 782	03.01.95
Schraube	E-06.341.01.12.0	04.11.98
Nachstellbolzen	E-06 00 229 937	01.10.98
Sicherungsscheibe	E-06 00 227 063	27.11.96
Sicherungsklammer	E-06.350.20.12.0	04.11.98
Zugfeder	E-06.397.10.03.0	04.11.98
Bremsbackengruppe	D-06 00 229 927	02.10.98
Bremsbelag	D-06 00 229 931	02.10.98
Bremsbacke	D-06 00 229 928	02.10.98
Backensegment	D-06 00 229 930	02.10.98
Backensteg	D-06 00 229 929	02.10.98
Zugfeder	E-06.397.21.16.0	04.11.98
Druckfeder	E-06 00 229 926	02.10.98
Federbügel	E-06 00 229 938	02.10.98
Spreizschloß	E-06 00 230 658	11.02.99
Spreizhebel	E-06 00 230 655	11.02.99
Bolzen	E-06 00 230 657	11.02.99
Spreizbügelplatte	D-06 00 230 656	11.02.99
Zugbügel	E-06.396.12.02.0	22.12.94
Bremsseilzug	D-06.089.33.73/97.0	22.12.94
Trommelnabe	D-06 00 229 939	30.09.98
Trommelnabe	C-06 00 229 940	30.09.98
Trommelnabe	D-06 00 229 941	01.10.98
Trommelnabe	C-06 00 229 942	30.09.98
Trommelnabe	D-06 00 229 943	01.10.98
Trommelnabe	C-06 00 229 944	30.09.98

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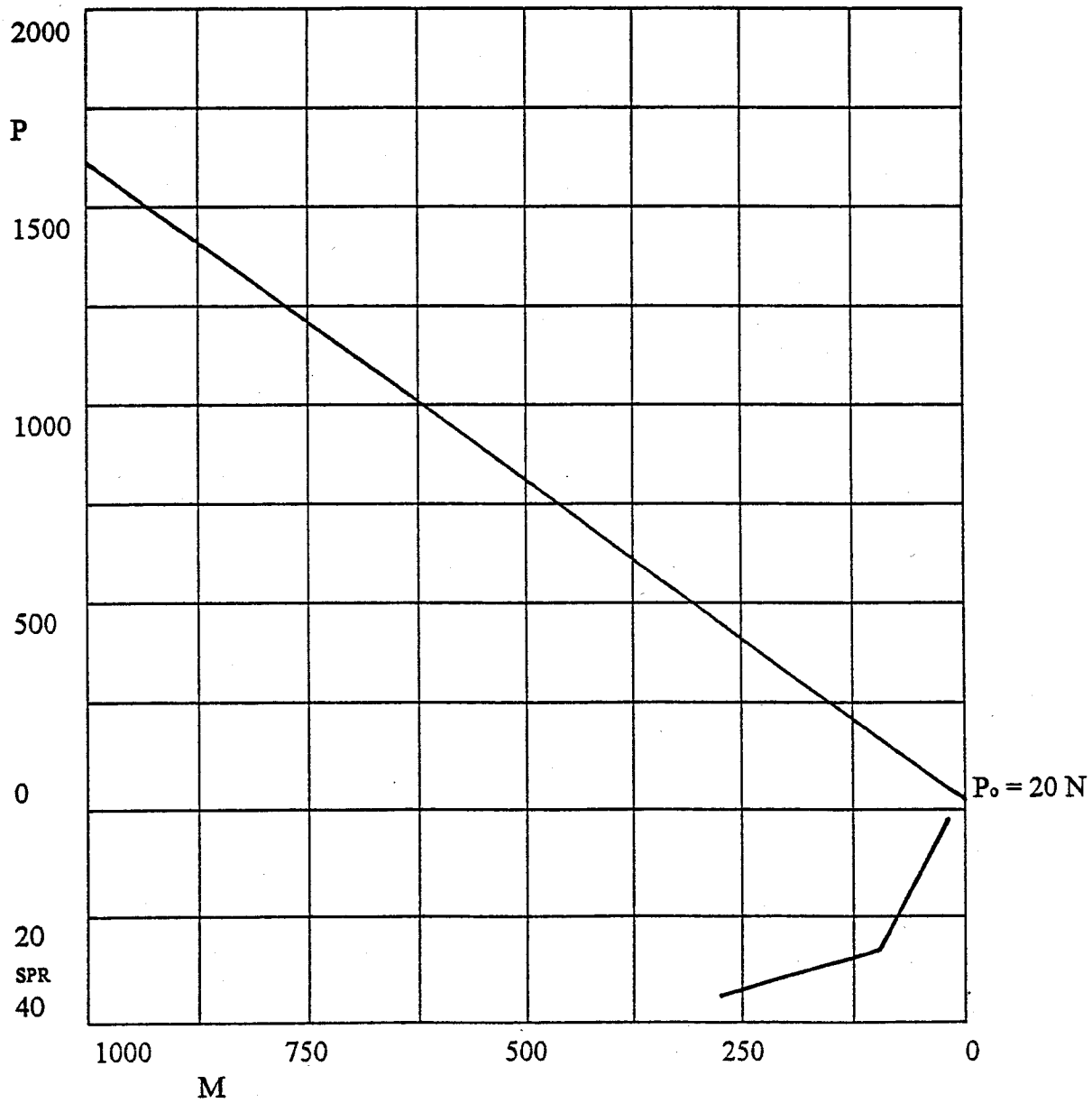
Manufacturer	: BPW
Type of brake	: S 1704-7

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	1000 Nm / (1610N-20N) = 0,63 m



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Manufacturer	: BPW
Type of brake	: S 1704-7

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

Test speed:	40 km/h
Braking ratio:	59 %
Force on brake cable pull:	1400 N

2 Brake test type I

Test speed:	40 km/h
Sustained braking ratio:	7 %
Braking time:	153 s
Hot performance:	62 % (≙ 105 % of brake test type 0)
Force on brake cable pull:	1400 N
Temperature attained at brake drum:	450 °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, 12.03.99

Dipl.-Ing. Kaesler

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Manufacturer	: BPW
Type of brake	: S 1704-7

Braking performance with vehicle reversing

The following applies for the direction of rotation with reverse travel

Reversing braking torque M_R:	100 Nm (incl. rolling resistance $\hat{=}$ 0,01 G_{Bo})
With an application travel s_{PR} at the brake cable pull:	Up to 27 mm
Necessary application travel at brake cable pull for the parking brake:	≥ 36 mm
The travel condition (reversing) for the inertia (overrun) braking system is:	$s'/i_H \leq s_{PR}$

Essen, 12.03.99

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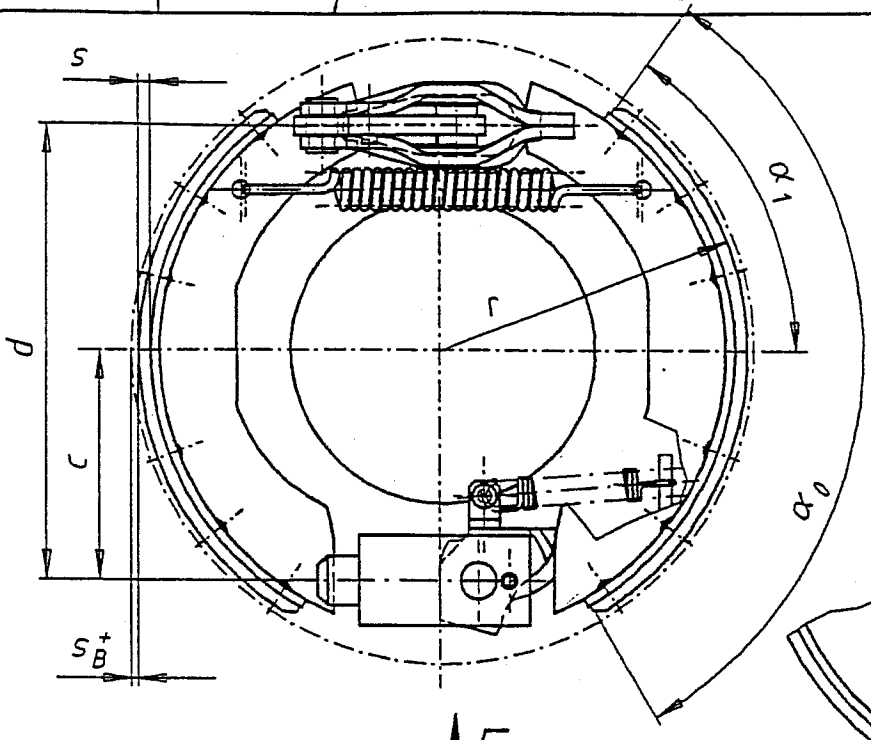
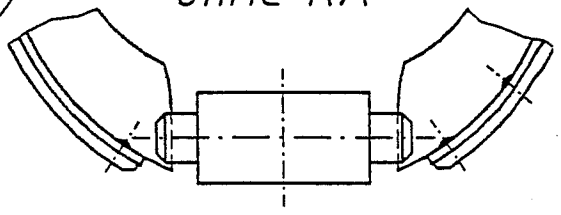
Schemazeichnung
Spreizhebelbremse

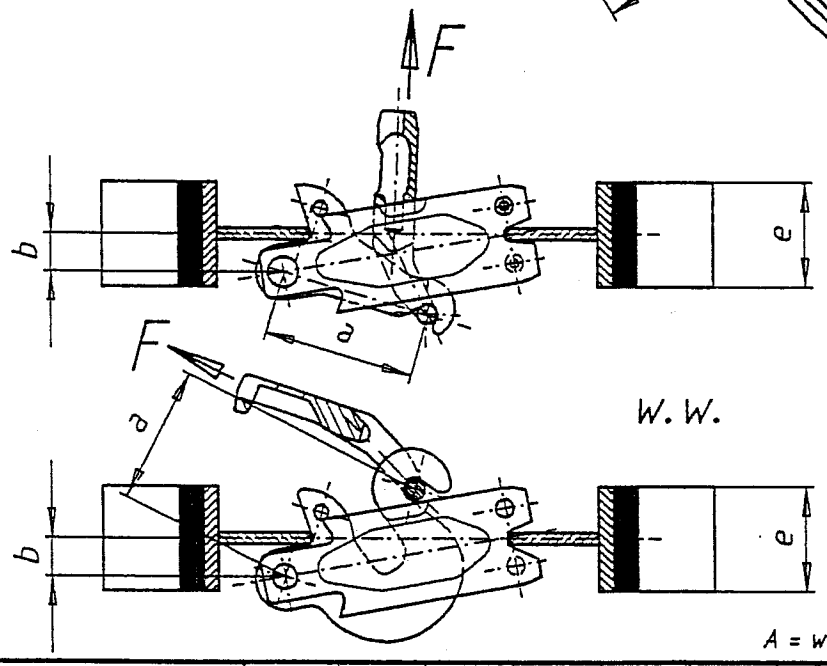
TE-1823.0

1 Blatt | Bl.-Nr. 1



Ausführung ohne RA





Alle Maße außer $i_{ges.}$; α_0; α_1 u. A in mm

A = wirksame Bremsfläche pro Bremse (cm^2)

Bremsen-Größe	c	d	$i_{ges.}$	s_B^+	a	b	r	e	s	A	α_0	α_1
S 1704-7 RA	59	119,5	14,0	1,54	43	12,5	85	40	4	130	110°	58°
S 2035-7 RA	75	149	14,1	1,6	49,7	14	100	35	4	136,5	114°	54°3(
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 SK/ZG	"	"	"	"	"	"	"	"	"	"	"	"
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 SK/ZG	"	"	"	"	"	"	"	"	"	"	"	"
S 3006-7 RASK	112,5	217	13,7	1,8	70	19,6	150	60	5	348	115°	57
S 3006-7 SK/ZG	"	"	"	"	"	"	"	"	"	"	"	"

Revision	Datum	Erstellt	Genehmigt
5	11.02.99	Datum 30.06.94 Name Bode	Datum 30.06.94 Name Mollerus

BPW BERGISCHE ACHSEN Kommanditgesellschaft D-51674 WIEHL