Heavy Vehicle Specialist Certificate

Chris Clarke   CJC

7P9C20036D1023205

✓

HVEK

Carry out compliance to the NZ Heavy Vehicle Brake Rule.

Roll stability function activated

HVBNZ 3205/2 scheds.

                    30000 KG.

N/A.

Brake Design Certificate - CJC 2184.
Prev exemption.

Warning lamp must illuminate when ignition is switched on then extinguish immediately or when vehicle exceed 7 KPH.

                    or

N/A

25·11·2013   454284

WABCO START-UP PROTOCOL

System	Trailer EBS-E	WABCO part number	480 102 080 0
Production date	2013-07-19	Serial number	897001482000G
Serial number (modulator)	000000022679		
Fingerprint Customer EOL / Customer Development / Flash Program	W503643 / 2013-11-25 ; 00000000 / 0000-00-00 ; 00000000 / 0000-00-00		

WABCO TRAILER EBS-E

GGVS/ADR TUEH TB 2007 - 019.00

HERSTELLER MANUFACTURER CONSTRUCTEUR	DOMETT
TYP TYPE TYPE	3AS B FRONT
FAHRZEUG IDEN*NR CHASSIS NUMBER NUMERO DE CHASSIS	7A9C20036D1023205
BREMSBERECHNUNGS-NR BRAKE CALCULATION NO CALCUL DE FREINAGE NO	GenNZ38

POLRADZAHNEZAHL c-d : e-f POLE WHEEL TEETH c-d : e-f DENTS ROUE DENTEE c-d : e-f	90	90	ABS-System ABS-System Systeme ABS	4S/2M

| RSS RSS RSS | Einfachbereifung Single Tyre Monte simple | | Lenkachse Steering axle Essieu v/reut | |
| | Zwillingsbereifung Twin Tyre Monte jumeleu | X | Kippkritisches Fahrzeug Critical Trailer Véhicule critique | |

Subsystems	SB		I/O	24N

GIO	Pin1	Pin3	Pin4
1	---	---	---
2	---	---	---
3	---	---	---
4	---	---	---
5	DIAG	DIAG	DIAG
6	---	---	---
7	---	---	---

	pm (bar)	6.5	pm (bar)	0.7	2.0	---	6.5			(mm)	(mm)	1.0 (bar)	Pz
ACHSE AXLE ESSIEU								pz	TYP TYPE			TR (daN)	
1	1200	0.4	2.1	6600	4.8	0.5	1.8	---	5.9	-	14 / 24	61	80	304	2913
2	1200	0.4	2.1	6600	4.8	0.5	1.8	---	5.9	-	14 / 24	61	80	304	2913
3	1200	0.4	2.1	6600	4.8	0.5	1.8	---	5.9	-	14	62	80	304	2913
4	0	---	---	0	---	---	---	---	---	-	---	---	---	---	---
5	0	---	---	0	---	---	---	---	---	-	---	---	---	---	---

Diagnostic memory	OK	Warning lamp control	OK
Parameter setting	carried out	Stop light power supply	Not tested
EBS pressure test	Not tested	Lifting axle test	Not tested
Redundancy test	OK	ECAS distance sensor calibration	Not tested
ABS sensor assignment	OK	Distance sensor Axle load calibr	Not tested
RTR check	Not tested	Leak test	Not tested
Immobilizer test	Not tested	Signal outputs TEBS	Not tested
Signal inputs	Not tested		

Diagnostic memory ELEX	Not tested	Signal outputs ELEX	Not tested
TailGUARDlight	Not tested	TailGUARD	Not tested

Manufacturer	DOMETT	Vehicle ident. no	7A9C20036D1023205
Vehicle type	3AS B FRONT	Odometer reading	0.0 km
next Service	0 km	Trip reading	0.0 km
Tested by	Chris Clarke		
Date	2013-11-25 9:15:26 a.m.	Signature	
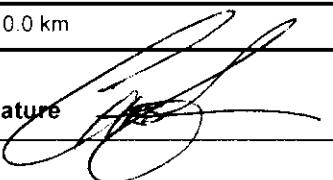
trailer: (full, semi-, centre-axle) with air brake system acc. to UN/ECE R.13.11

distribution: DOMETT
              VA9C20036D1023205
              CJC2134

vehicle manufacturer: DOMETT

trailer model   :   3AS B FRONT

trailer type   :   3-axle-semi-trailer

remarks   :   air / hydraulic / VA suspension
                          kc < 0,95 -> new kc = 0,95
                          WABCO TRAILER - EBS
                          TRISTOP 1+2: 14/24
                          265/70 R 19,5

axle 1 + 2 + 3 : BPW,   TSB 3709, 361-041-08 ECE,

				unladen		laden	
total mass	P in kg		5000	-	6000	39000 - 14000	
king-pin	PS kg		1400		2400	10200 - 14200	
axle 1	P1 in kg				1200	6600	
axle 2	P2 in kg				1200	6600	
axle 3	P3 in kg				1200	6600	
total axle mass	PR in kg				3600	19800	
wheel base	E in mm		6400	-	6400		
centre of gravity height	h in mm				1210	2133	
K factor			Kv min	1.8146		Kc min	0.9500
K-factor			Kv max	1.8153		Kc max	0.9766

	axle 1	axle 2	axle 3
no. of combined axles	1	1	1
no. of brake chambers per axle line KDZ	2	2	2
The power output corresponds to	BC 0056.2	BC 0056.2	BC 0056.2
brake chamber manufacturer	BPW	BPW	BPW
chamber size	14/24	14/24	14.
lever length lBh in mm	80	80	80
brake factor ( )	20.50	20.50	20.50
dyn. rolling radius rdyn min in mm	421	421	421
dyn. rolling radius rdyn max in mm	421	421	421
threshold torque Co Nm	12.0	12.0	12.0

calculation:

	axle 1	axle 2	axle 3
chamber pressure(rdyn min)pH at z=22,5%bar	2.6	2.6	2.6
chamber pressure(rdyn max)pH at z=22,5%bar	2.6	2.6	2.6
chamber press.(servo)pcha at pm6,5bar bar	5.9	5.9	5.9
piston force ThA at pm6,5bar N	4762	4762	4762
brake force(rdyn min)T lad. at pm6,5bar N	36581	36581	36581
brake force(rdyn max)T lad. at pm6,5bar N	36581	36581	36581
brake force within 1 % rolling friction			
proportion %	33.3	33.3	33.3

braking rate z laden	0.565	for rdyn min
z sum (TR)/PRmax	0.565	for rdyn max

Trailer may only be operated in combination with trucks/tractors with
ISO 7638 supply (5 or 7 polar).

brake diagram :

maximum pressure: 8.5 bar

axle 1:
   valve 1: 480 102 ... 0   WABCO
          EBS trailer modulator

   brake cylinder: BPW   05.444.38...

axle 2:
   valve 1: 480 102 ... 0   WABCO
   EBS trailer modulator

   brake cylinder: BPW   05.444.38...

axle 3:
   valve 1: 480 102 ... 0 ()   WABCO   or 480 207 0.. 0 / 2.. 0
   EBS trailer modulator

   brake cylinder: BPW   05.444.38...

test type III (zIII = 0.30)   for rdyn min : axle1 axle2 axle3
at pm 3.7 bar =>   pcha in bar :   3.3   3.3   3.3
test type III (zIII   0.06)   for rdyn min : axle1 axle2 axle3
at pm 1.1 bar =>   pcha in bar :   1.0   1.0   1.0

brake chamber pressure laden

pcyl in bar

axle 1
axle 2
axle 3

pm in bar
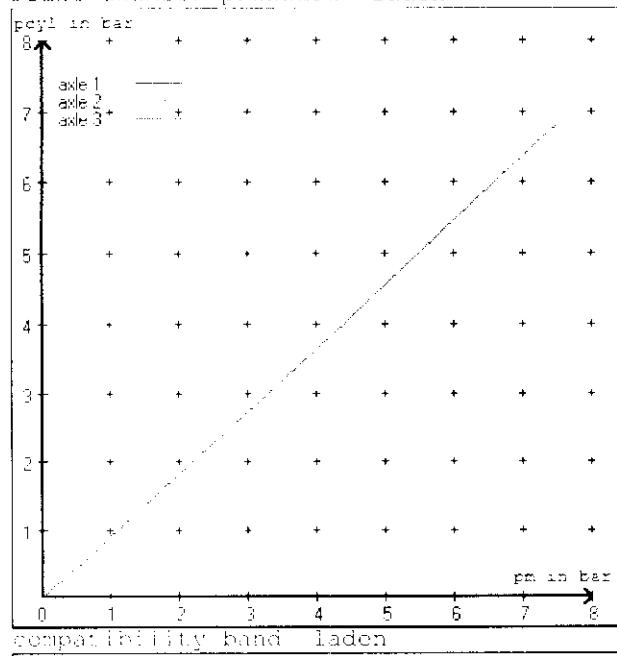
brake chamber pressure unladen

pcyl in bar

axle 1
axle 2
axle 3

pm in bar

compatibility band laden

TR/PR

Kc min 0.9500
Kc max 0.9766

pm =   2   4   6.5 bar
rdyn min :s = 0.14 0.33 0.56
rdyn max :w = 0.14 0.33 0.56

pm in bar

compatibility band unladen

TR/PR

Kv min 1.8146
Kv max 1.8153

in case of guaranteed operation
no prescription

pm =   2   4   6.5 bar
rdyn min :s = 0.21 1.52 1.91
rdyn max :w = 0.21 1.52 1.91
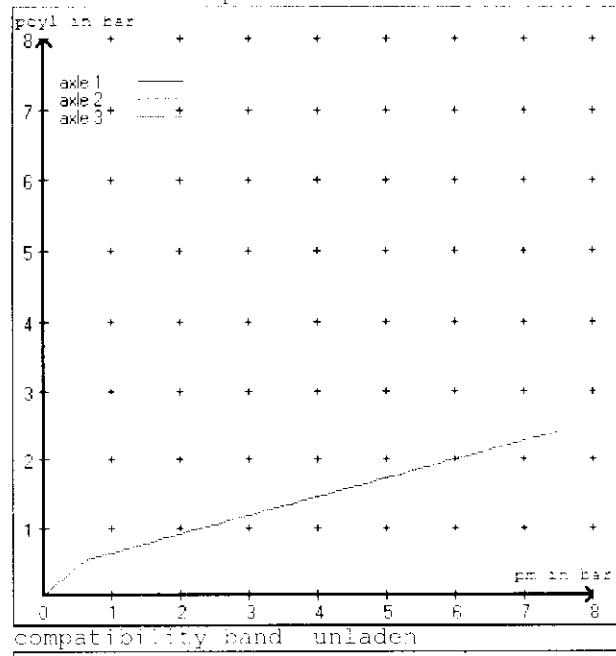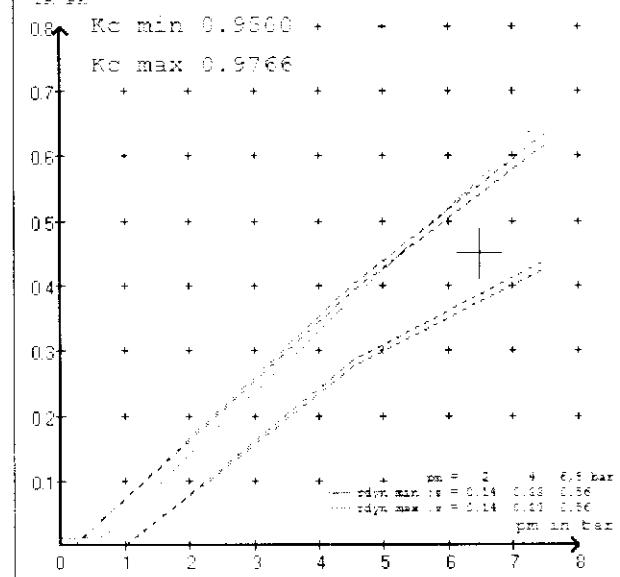
pm in bar

vehicle manufacturer: DOMETT
trailer model   :   3AS B FRONT
trailer type   :   3-axle-semi-trailer

brake chamber and lever length :
axle 1 :   2 x type/diameter   14/24   (BPW)   lever length 80 mm
axle 2 :   2 x type/diameter   14/24   (BPW)   lever length 80 mm
axle 3 :   2 x type/diameter   14.   (BPW)   lever length 80 mm

brake diagram :

valve :
480 102 ... 0   WABCO EBS trailer modulator
480 102 ... 0   WABCO EBS trailer modulator   or 480 207 0.. 0 / 2.. 0

EBS input data
----
vehicle manufacturer: DOMETT
trailer model   : 3AS B FRONT
trailer type   : 3-axle semi trailer
brake calculation no.   : GenNZ 3BS

tire circumference main axle   : 2650 for rdyn max
tire circumference auxiliary axle : 2650 for rdyn max

assignment pm / deceleration z: pm 0.6 bar z = 0.010
(laden condition)   2.0 bar z = 0.142
                                   6.5 bar z = 0.565

		control pressure pm	6,5		control pressure pm	0.6	2.0	6.5
axle	axle load unladen	bellow pr. unladen	brake pr. unladen	axle load laden	bellow pr. laden	brake pr. laden		
1	1200	to be	2.1	6600	to be	0.5	1.4	5.9
2	1200	entered by	2.1	6600	entered by	0.5	1.4	5.9
3	1200	the vehicle	2.1	6600	the vehicle	0.5	1.4	5.9
4	0	manufact.	0,0	0	manufact.	0,0	0,0	0,0
5	0		0,0	0		0,0	0,0	0,0

The unladen values indicated in the above table are values for the
basic parameter set. Higher unladen axle loads and liftaxles are
automatically recognized and do not require separate adjustment.
The above unladen axle loads must not be fallen below.
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axle 1   axle 2   axle 3
axle load pcyl   axle load pcyl   axle load pcyl
1200   2.1   1200   2.1   1200   2.1
1700   2.5   1700   2.5   1700   2.5
2200   2.8   2200   2.8   2200   2.8
2700   3.2   2700   3.2   2700   3.2
3200   3.5   3200   3.5   3200   3.5
3700   3.9   3700   3.9   3700   3.9
4200   4.2   4200   4.2   4200   4.2
4700   4.6   4700   4.6   4700   4.6
6600   5.9   6600   5.9   6600   5.9

data sheet to ECE vehicle type-approval certificate concerning braking
equipment: according to ECE R13 annex 11

axle 1 : reference axle: BPW   D 115-2   brake lining: BPW 8101
         test report   :   361 041 08 EC date   : 01.04.2011
axle 2 : reference axle: BPW   D 115 2   brake lining: BPW 8101
         test report   :   361-041 08 EC date   : 01.04.2011
axle 3 : reference axle: BPW   D 115 2   brake lining: BPW 8101
         test report   :   361-041 08 EC date   : 01.04.2011

calc. verif. of residual (hot) braking force type III
(item 4.3.1 of appendix 2 to annex 11)
axle 1   (rdyn 421 mm)   T = 17.2 % Fe
axle 2   (rdyn 421 mm)   T = 17.2 % Fe
axle 3   (rdyn 421 mm)   T = 17.2 % Fe

calculated actuator stroke in mm
(item 4.2.1.1 of appendix 2 to annex 11)
axle 1   (sp = 51 mm)   s = 48 mm
axle 2   (sp = 51 mm)   s = 48 mm
axle 3   (sp = 52 mm)   s = 48 mm

average thrust output in N at pm = 6,5 bar (however max. pcha = 7,0 bar)
axle1   ThA = 4762 N
axle2   ThA = 4762 N
axle3   ThA = 4762 N

calc. residual (hot) braking force in N
(item 4.3.1.4 of appendix 2 to annex 11)
axle 1   (rdyn 421 mm)   T = 33160 N
axle 2   (rdyn 421 mm)   T = 33160 N
axle 3   (rdyn 421 mm)   T = 33160 N

                                     basic test   type III
                                     of subject   (calculated)
                                     trailer (E)   residual
braking rate of the vehicle   (hot)braking
(item 4.3.2 to appendix 2 to annex 11)   0.56   0.51

required braking rate   >= 0,4 and
(items 1.5.3 and 1.7.2 to annex 11)   > 0,6*E (0.34)

axle 1   (rdyn 421 mm)   T = 33160 N
axle 2   (rdyn 421 mm)   T = 33160 N
axle 3   (rdyn 421 mm)   T = 33160 N

                                     basic test   type III
                                     of subject   (calculated)
                                     trailer (E)   residual
braking rate of the vehicle   (hot)braking
(item 4.3.2 to appendix 2 to annex 11)   0.56   0.51

required braking rate   >= 0,4 and
(items 1.5.3 and 1.7.2 to annex 11)   >= 0,6*E (0.34)

data sheet to ECE vehicle type approval certificate concerning braking
equipment: according to ECE R13 annex 11

axle 1 : reference axle: BPW   D 115 2   brake lining: BPW 8200
         test report   :   361-041 08 EC date   : 02.04.2011
axle 2 : reference axle: BPW   D 115-2   brake lining: BPW 8200
         test report   :   361 041-08 EC date   : 02.04.2011
axle 3 : reference axle: BPW   D 115-2   brake lining: BPW 8200
         test report   :   361-041-08 EC date   : 02.04.2011

calc. verif. of residual (hot) braking force type III
(item 4.2.1 of appendix 2 to annex 11)
axle 1   (rdyn 421 mm)   T - 17.2 % Fe
axle 2   (rdyn 421 mm)   T - 17.2 % Fe
axle 3   (rdyn 421 mm)   T = 17.2 % Fe

calculated actuator stroke in mm
(item 4.3.1.1 of appendix 2 to annex 11)
axle 1   (sp - 51 mm)   s = 47 mm
axle 2   (sp - 51 mm)   s - 47 mm
axle 3   (sp - 52 mm)   s - 47 mm

average thrust output in N at pm = 6,5 bar (however max. pcha - 7,0 bar)
axle1   ThA = 4762 N
axle2   ThA - 4762 N
axle3   ThA = 4762 N

calc. residual (hot) braking force in N
(item 4.3.1.4 of appendix 2 to annex 11)
axle 1   (rdyn 421 mm)   T - 34443 N
axle 2   (rdyn 421 mm)   T - 34443 N
axle 3   (rdyn 421 mm)   T - 34443 N

                              basic test   type III
                              of subject   (calculated)
                              trailer (E)   residual
braking rate of the vehicle   (hot)braking
(item 4.3.2 to appendix 2 to annex 11)   0.56   0.53

required braking rate   >- 0,4 and
(items 1.5.3 and 1.7.2 to annex 11)   >= 0,6*E (0.34)

axle 1   (rdyn 421 mm)   T - 34443 N
axle 2   (rdyn 421 mm)   T = 34443 N
axle 3   (rdyn 421 mm)   T - 34443 N

                              basic test   type III
                              of subject   (calculated)
                              trailer (E)   residual
braking rate of the vehicle   (hot)braking
(item 4.3.2 to appendix 2 to annex 11)   0.56   0.53

required braking rate   >- 0,4 and
(items 1.5.3 and 1.7.2 to annex 11)   >= 0,6*E (0.34)

data sheet to ECE vehicle type approval certificate concerning braking
equipment: according to ECE R13 annex 11

```
axle 1 : reference axle: BPW          D 115-2      brake lining: BPW 8302
         test report   :              361-041-08 EC date        : 03.04.2011
axle 2 : reference axle: BPW          D 115-2      brake lining: BPW 8302
         test report   :              361-041-08 EC date        : 03.04.2011
axle 3 : reference axle: BPW          D 115-2      brake lining: BPW 8302
         test report   :              361-041-08 EC date        : 03.04.2011
```

calc. coeff. of residual (hot) braking force type III
(item 4.2.1 of appendix 2 to annex 11)
```
axle 1            (rdyn 421 mm)              T = 17.2 % Fe
axle 2            (rdyn 421 mm)              T = 17.2 % Fe
axle 3            (rdyn 421 mm)              T = 17.2 % Fe
```

calculated actuator stroke in mm
(item 4.3.1.1 of appendix 2 to annex 11)
```
axle 1            (sp - 51 mm)               s = 39 mm
axle 2            (sp - 51 mm)               s = 39 mm
axle 3            (sp - 52 mm)               s = 39 mm
```

average thrust output in N at pm = 6,5 bar (however max. pcha = 7,0 bar)
```
axle1                             ThA = 4762 N
axle2                             ThA = 4762 N
axle3                             ThA = 4762 N
```

calc. residual (hot) braking force in N
(item 4.3.1.4 of appendix 2 to annex 11)
```
axle 1            (rdyn 421 mm)              T = 35165 N
axle 2            (rdyn 421 mm)              T = 35165 N
axle 3            (rdyn 421 mm)              T = 35165 N
```

```
                                 basic test     type III
                                 of subject     (calculated)
                                 trailer (E)    residual
braking rate of the vehicle                     (hot)braking
(item 4.3.2 to appendix 2 to annex 11)   0.56      0.54

required braking rate                           >= 0,4 and
(items 1.5.3 and 1.7.2 to annex 11)             >= 0,6*E (0.34)
```

```
axle 1            (rdyn 421 mm)              T = 35165 N
axle 2            (rdyn 421 mm)              T = 35165 N
axle 3            (rdyn 421 mm)              T = 35165 N
```

```
                                 basic test     type III
                                 of subject     (calculated)
                                 trailer (E)    residual
braking rate of the vehicle                     (hot)braking
(item 4.3.2 to appendix 2 to annex 11)   0.56      0.54

required braking rate                           >= 0,4 and
(items 1.5.3 and 1.7.2 to annex 11)             >= 0,6*E (0.34)
```

spring parking brake

		axle 1	axle 2
no of TRISTOP actuators per axle line KDZ		2	2
TRISTOP-actuator type		14/24	14/24
lever length	lBh in mm	80	80
stat. tyre radius	rstat max in mm	401	401
at a stroke of	s in mm	30	30
min. force of spring brake	TFZ in N	5809	5809
sp.brake chamber no BPW		05.444.3805.444.38	
release pressure	pLs in bar		
		5.2	5.2

calculation:

		axle 1	axle 2
ratio until road		4.0898	4.0898
$iFb = iBn*Eta*C*rBt/(rBn*rstat)$			
	for rstat in mm	401	401
brake force of spring br. Tf in N		46288	46288
$Tf = (TFZ*KDZ-2*Co/lBh)*iFb$			
braking rate	zf laden	0.288	
$zf = sum (Tf)/F + 0,01$			

Test of the frictional connection required by the parking brake

minimum wheelbase/minimum supporting width min Ef necessary
to fulfil the regulations

$min Ef = E * (1 - PR/P + zferf * h/E) / (1 - zferf / (fzul * nf/ng))$

min Ef = 4628 mm   for E =   6400 mm
----
min Ef = 4678 mm   for E =   6400 mm
=====

min Ef		minimum distance between front axle(s) (trailer) or support (semitrailer) and the rear axle(s) (resultant of the bogie)
E	=	wheel base
fzul	= 0.80	maximum permissible frictional connection required
zferf	= 0.18	maximum required braking ratio of the parking brake
h	= 2.93 mm	height of center of gravity laden
PR	= 19800 kg	maximum bogie mass - laden
P	= 34000 kg	maximum total mass laden
nf	= 2	no. of axle(s) with TRISTOP spring brake actuators
ng	= 2	no. of bogie axle(s)

reference values

reference values for z = 45%   for max rdyn: 421 mm

	pz [bar]	T [N]	T [N]
axle 1	1.0 5.9		3047 29135
axle 2	1.0 5.9		3047 29135
axle 3	1.0 5.9		3047 29135

VIN - no.:

	Axle(s) / Achse(n)				
Brake cylinder type (service / parking) Bremszylinder Typ (Betrieb / Fest)	14/24	14/24	14.7	/	
Maximum stroke smax = ...mm maximaler Hub smax = ...mm	61	61	62		
lever length = ...mm Hebellänge = ...mm	80	60	60		
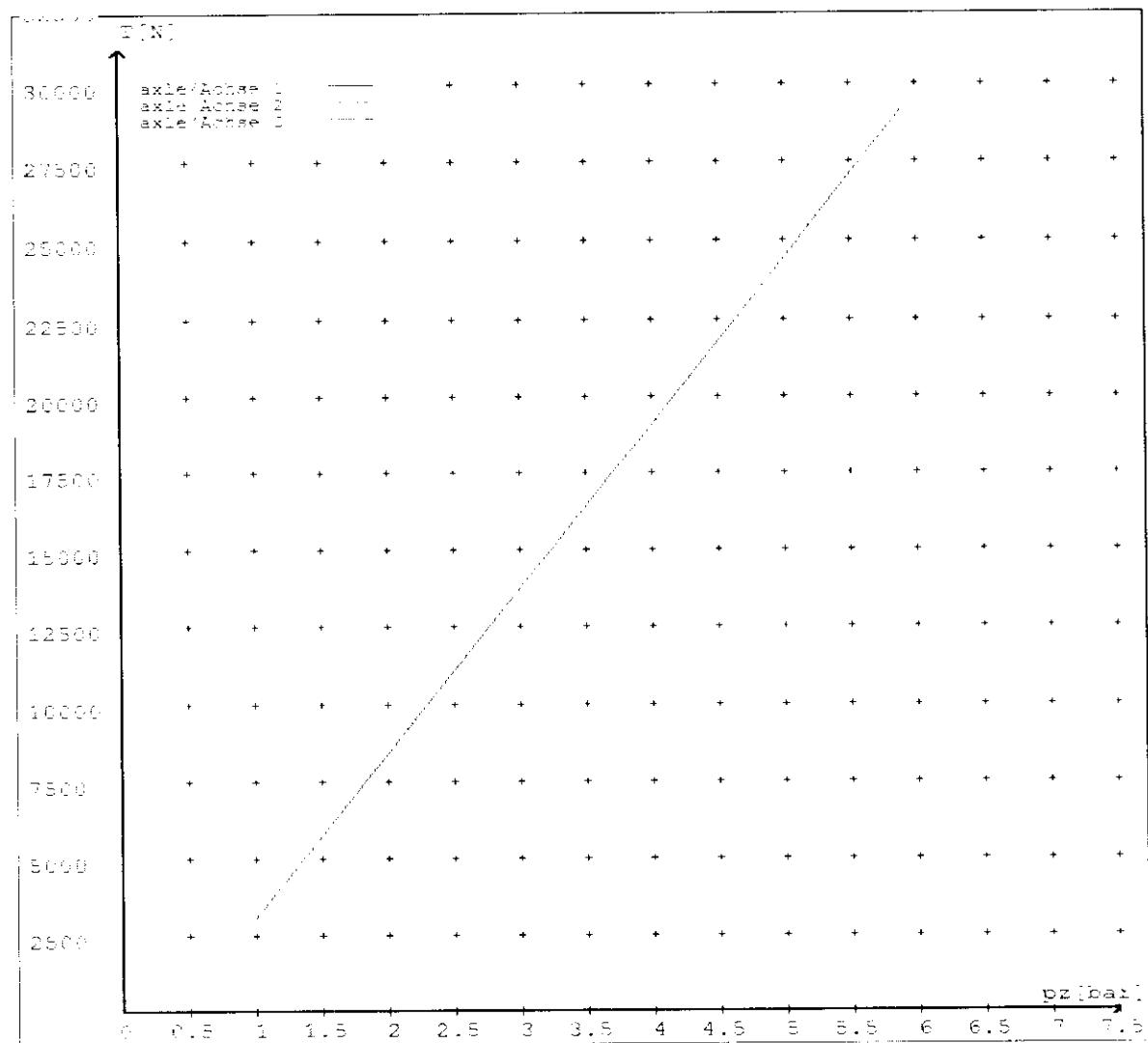
reference values for z = 0.45
Angabe der Referenzwerte für z = 0.45
brake calculation no: GenNZ 38S date 25.11.2013
Bremsberechnung Nr: GenNZ 38S vom 25.11.2013

for max rdyn: 421 mm
für max rdyn: 421 mm

	Axle(s) / Achse(n)				
(parking)	14/24	14/24	14./	/	
	61	61	62		
	80	80	80		