



Heavy Vehicle Specialist Inspector and Inspecting Organisation

Heavy Vehicle Specialist Inspector's Name (PRINT IN CAPS)

CHRIS CLARKE

ID

CJC

Vehicle Registration\*

VIN / Chassis Number

7A85NOJC297812431

Component being certified:

Chassis Modification

Load Anchorage

Log Bolsters

Towing Connection

Brake Code

SRT

Certification Category

HUEK

Description of Work

CARRY OUT SET UP OF EBS SYSTEM AND COMPLIANCE TO NZ HEAVY VEHICLE BRAKE RULE 32015 SCHEDULES

Code/Standard Certified to

NZHUBR 32015 SCHED 5

Component Load Rating(s)

N/A

General Drawing Number(s)

N/A

Supporting Documents

BRAKE PERFORMANCE CALCULATION

\*Special Conditions

N/A

Certification Expiry Date

N/A

OR

Hubodometer Reading (whichever comes first)

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## Declaration

I the undersigned, declare that I am the Heavy Vehicle Specialist Inspector identified above and I hold a current valid appointment. I certify that the above mentioned vehicle component's design, manufacture and installation, and this certification complies in all respects with the Land Transport Rule Vehicle Standards Compliance 2002 and my Deed of Appointment. To the best of my knowledge the information contained in this Certificate is true and correct.

Designer's ID (if certified by a manufacturer)

Inspector's / Delegate's Signature

\*Delegate's Name (PRINT IN CAPS)

Date

15.08.2008

Number

296531

COF Vehicle Inspector ID:

COF Vehicle Inspector Signature:

Date

All fields excluding those marked with \* must be completed before this certificate can be accepted.



Company: Genese Ltd  
 Author: Chris Clarke

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Calculation in accordance with ECE Regulation 13 (10 Series) and EEC Directive 71/320 EEC (2002/78/EC) using Knorr-Bremse Braking System Designer software (level 9.0).  
 Results based on vehicle data and components as defined by the Braking System Designer program user.  
 No liability assumed by Knorr-Bremse regarding the use of non-Knorr-Bremse product data.

Customer: Fonterra Co-op Ltd  
 Vehicle: 7A85N0J0297812431  
 Project: 4 axle milk collection full trailer

**Vehicle**

Type 2x2 Drawbar trailer  
 Calculated effective wheelbase [m] 4.70  
 Laden (max.) mass [kg] 29000.00  
 Laden (max.) front axle group load [kg] 14500.00  
 Laden vertical position of CoG [m] 1.96  
 Unladen (min.) mass [kg] 6718.00  
 Unladen (min.) front axle group load [kg] 4048.00  
 Unladen vertical position of CoG [m] 1.27  
 Laden/unladen front air spring press. [bar] -/  
 Laden/unladen rear air spring press. [bar] 4.50/0.40

**Axles**

Type	MERITOR (ROR)	MERITOR (ROR)	MERITOR (ROR)	MERITOR (ROR)
361-0022-02-FBKV	361-0022-02-FBKV	361-0022-02-FBKV	361-0022-02-FBKV	361-0022-02-FBKV
265/70 R 19.5	265/70 R 19.5	265/70 R 19.5	265/70 R 19.5	265/70 R 19.5
Dyn. tyre radius [mm]	421	421	421	421
Stat. tyre radius [mm]	401	401	401	401
Brake type	Disc	Disc	Disc	Disc
	Elsa195 LE	Elsa195 LE	Elsa195 LE	Elsa195 LE
Brake size [mm]	340x200	340x200	340x200	340x200
or drum/disc radius [mm]				
Actuator size	16	16	16/24	16/24
Actuator force at 6,5 bar [N]	6590	6590	6260	6260
Slack adjuster length [mm]	-	-	-	-
Thresh.mom.[Nm] or force[N]	81.00	81.00	81.00	81.00
Brake Factor by Annex 19	20.3	20.3	20.3	20.3
Discbrake lever length [mm]	74	74	74	74
Internal brake factor (C*)	-	-	-	-
Mechanical efficiency (Eta)	-	-	-	-
Internal brake factor x	-	-	-	-
Mech. efficiency (C* x Eta)	-	-	-	-
S-Cam radius [mm] or mech.ratio or wedge angle[-]	-	-	-	-

Friction material ROR 8616 AF ROR 8616 AF ROR 8616 AF ROR 8616 AF

Calculation pressure [bar]: 6.5

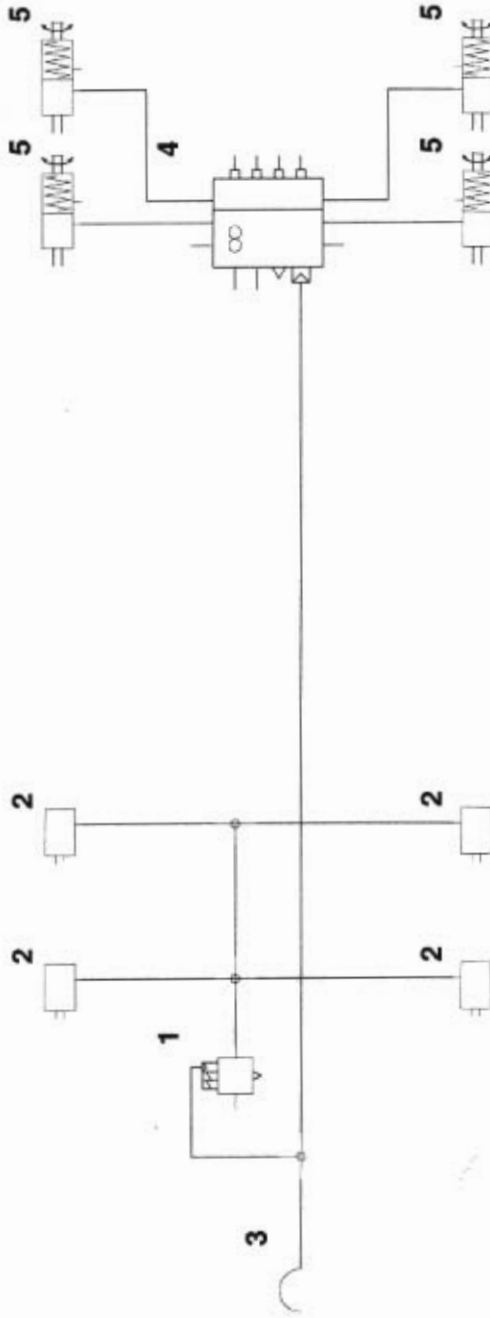
Warning! This brake calculation has been produced using information from a source not controlled by Knorr-Bremse. The results produced by this calculation are therefore dependent upon the accuracy of this information and Knorr-Bremse does not take responsibility for any resulting errors.



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### Part list

No.	Name	Type	Characteristics	Qty.
1	ABS Modulator	BR9234	-	1
2	Brake Chamber	ROR	-	4
3	Coupling head - brake	KU1400	-	1
4	Trailer EBS ECU	ES20..	-	1
5	Spring Brake Actuator	ROR	-	4

Calculation pressure [bar]: 6.5

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### Laden vehicle

	Intact system	Front circuit only	Rear circuit only	Calculation press.
Deceleration [m/s <sup>2</sup> ]	6.08	-	-	5.55
Pressure [bar]	8.50	-	-	6.50

### Unladen vehicle

	Intact system	Front circuit only	Rear circuit only	Calculation press.
Deceleration [m/s <sup>2</sup> ]	14.45	-	-	14.45
Pressure [bar]	8.50	-	-	6.50

Calculation pressure [bar]: 6.5

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Miscellaneous

**Coupling head pressure where z = 22.5% ( laden case )**

Pressure [bar] : 2.90

**Brake chamber pressure [bar] where z = 22.5% ( laden case )**

Axle1 : 2.76 Axle2 : 2.76 Axle3 : 2.58 Axle4 : 2.58

**Automatic braking performance ( at 6.0 [bar], laden case )**

Deceleration [m/s^2] : 3.46

Braking rate [%] 35.2

**Vehicle performance in case of a load sensing device control failure ( at 6.5 [bar], laden case )**

**Front axle group**

Deceleration [m/s^2] : -

Braking rate [%] -

**Rear axle group**

Deceleration [m/s^2] : 5.70

Braking rate [%] 58.1

Parking brake

Max.slope [%] (must be > 18%)	Laden vehicle		Unladen vehicle	
	Up	Down	Up	Down
	-40.99	30.74	-41.84	26.97

(max.spring force = 7120 N at 30 mm strok

Required spring force at 18% slope

Axle 1 [N] -

Axle 2 [N] -

Axle 3 [N] 820

Axle 4 [N] 820

**Calculation pressure [bar]: 6.5**

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Trailer EBS parameters

Number of axles: 4  
 Number of teeth: 90  
 Dynamic tyre radius [cm]: 42.1  
 Inshot pressure [bar]: 0.56  
 Coupling head pressure [bar]: 0.70  
 Pressure compensation (at 1.6 bar) [bar]: 0.20  
 Output pressure (at 6.5 bar) [bar]

Laden: 5.60  
 Unladen: 1.40

Air spring pressure [bar]

Laden : 4.50  
 Unladen : 0.40

Axle boogie load [kg]

Laden: 14500  
 Unladen: 2670

Pressure limitation [bar]

5.30

Slip differential [%]

-0.20

Corresponding sheet on the PC Diagnostic tool (ECU Talk)

Coupling head pressure [bar]	Brake chamber pressure [bar]	
	Unladen	Laden
0.70	0.56	
1.6	0.74	1.54
6.5	1.40	5.60

Brake pressure compensation at 1.6 bar coupling head pressure [bar]
0.20

Air spring pressure [bar]	Unladen :	Laden :
	0.40	4.50

Axle boogie load [kg]	Unladen	Laden
	2670	14500

Calculation pressure [bar]: 6.5

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### Load sensing valve settings at 6.5 bar on rear axle group. Type: ES20..

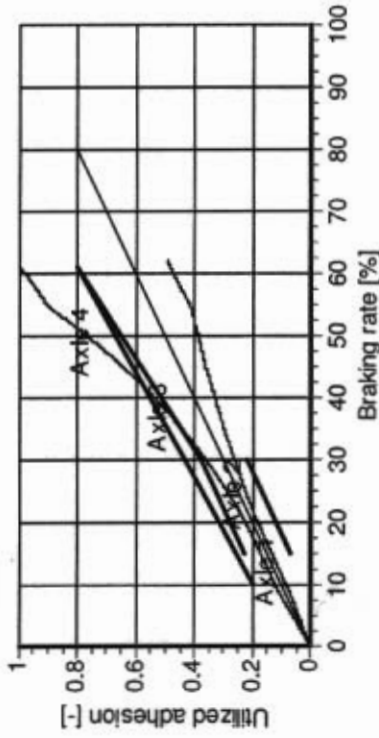
Gross weight [kg]	Axle load [kg]	Air spring pressure [bar]	LSV ratio [-]	LSV Output pressure [bar]	
				input:6,5bar	6.5 bar
29000	7250	4.50	1.23	5.3	5.3
28000	7000	4.33	1.23	5.3	5.3
27000	6750	4.15	1.24	5.2	5.2
26000	6500	3.98	1.28	5.1	5.1
25000	6250	3.81	1.33	4.9	4.9
24000	6000	3.63	1.38	4.7	4.7
23000	5750	3.46	1.43	4.5	4.5
12718	2835	1.44	2.64	2.5	2.5
11718	2585	1.27	2.84	2.3	2.3
10718	2335	1.09	3.08	2.1	2.1
9718	2085	0.92	3.36	1.9	1.9
8718	1835	0.75	3.70	1.8	1.8
7718	1585	0.57	4.12	1.6	1.6
6718	1335	0.40	4.64	1.4	1.4

Calculation pressure [bar]: 6.5

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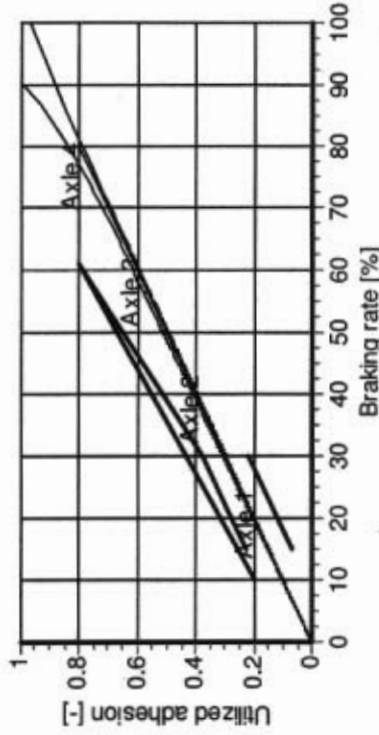


Laden vehicle - adhesion utilisation



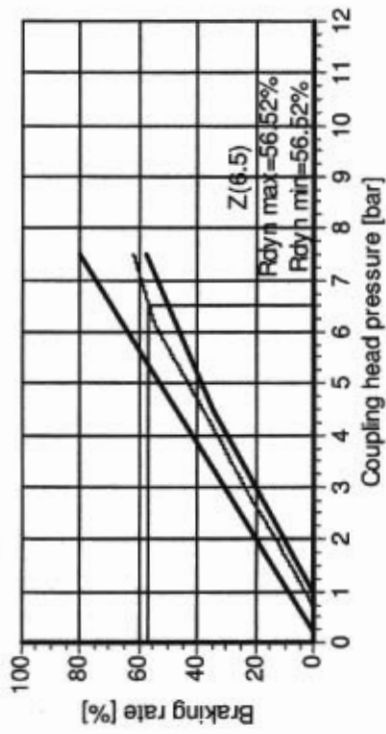
(With anti-lock system the adhesion requirements do not have to be fulfilled.)

Unladen vehicle - adhesion utilisation



(With anti-lock system the adhesion requirements do not have to be fulfilled.)

Laden vehicle - compatibility



Calculation pressure [bar]: 6.5

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Unladen vehicle - compatibility

