

2949

Heavy Vehicle Specialist Inspector and Inspecting Organisation

Heavy Vehicle Specialist Inspector's Name (PRINT IN CAPS) **CHRIS CARKE** ID **CJC**

Vehicle Registration* VIN / Chassis Number **7A8H9000296593205**

Component being certified: Chassis Modification Load Anchorage Log Bolsters
 Towing Connection Brake Code SRT

Certification Category **HUEK**

Description of Work
COMPLIANCE OF TRAILER TO NZHUBR SCHEDULE 5

Code/Standard Certified to **NZHUBR SCHED 5**

Component Load Rating(s)

General Drawing Number(s) **N/A**

N/A

Supporting Documents
Brake Calculation Documentation

*Special Conditions
N/A

Certification Expiry Date **N/A**

OR Hubodometer Reading (whichever comes first)

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 **07-07-2008** Number **296511**

COF Vehicle Inspector ID:

COF Vehicle Inspector Signature:

Date

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



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

Vehicle: 7A8H9000296593205

Project: 4 axle full trailer

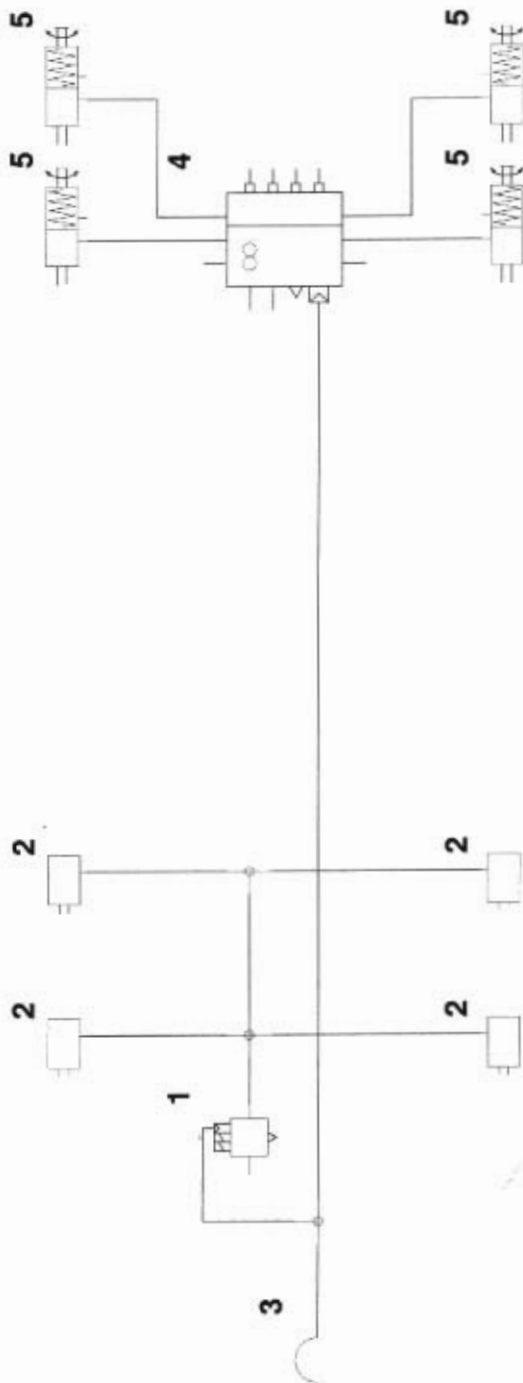
Vehicle

Type	2x2 Drawbar trailer
Calculated effective wheelbase [m]	4.96
Laden (max.) mass [kg]	29000.00
Laden (max.) front axle group load [kg]	14500.00
Laden vertical position of CoG [m]	1.80
Unladen (min.) mass [kg]	6718.00
Unladen (min.) front axle group load [kg]	4048.00
Unladen vertical position of CoG [m]	1.00
Laden/unladen front air spring press. [bar]	-/-
Laden/unladen rear air spring press. [bar]	4.80/0.40

Axles	Axle 1	Axle 2	Axle 3	Axle 4
Type	MERITOR (ROR) 361-0022-02-FBKV	MERITOR (ROR) 361-0022-02-FBKV	MERITOR (ROR) 361-0022-02-FBKV	MERITOR (ROR) 361-0022-02-FBKV
Type size	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 Elsa195 LE	Disc Elsa195 LE	Disc Elsa195 LE	Disc Elsa195 LE
Brake size [mm] or drum/disc radius [mm]	340x200	340x200	340x200	340x200
Actuator size	16	16	16/24	16/24
Actuator force at 6,5 bar [N]	6590	6590	6588	6588
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.



Part list

No.	Name	Type	Characteristics	Qty.
1	ABS Modulator	BR9234	-	1
2	Brake Chamber	ROR	-	4
3	Coupling head - brake	KUJ1400	-	1
4	Trailer EBS ECU	ES20..	-	1
5	Spring Brake Actuator	ROR	-	4

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.



System components

No.	Name	Type	Characteristics
1	ABS Modulator	BR9234	Sensors on axle 2
2	Brake Chamber 16" stroke: 64	ROR	BZ 122.1 15/09/2000
3	Brake Chamber 16" stroke: 64	ROR	BZ 122.1 15/09/2000
4	Brake Chamber 16" stroke: 64	ROR	BZ 122.1 15/09/2000
5	Brake Chamber 16" stroke: 64	ROR	BZ 122.1 15/09/2000
6	Coupling head - brake	KU1400	-
7	Trailer EBS ECU	ES20..	Sensors on axle 4
8	Spring Brake Actuator 16/24" stroke: 64/64	ROR	BZ 119.6 01/02/2001
9	Spring Brake Actuator 16/24" stroke: 64/64	ROR	BZ 119.6 01/02/2001
10	Spring Brake Actuator 16/24" stroke: 64/64	ROR	BZ 119.6 01/02/2001
11	Spring Brake Actuator 16/24" stroke: 64/64	ROR	BZ 119.6 01/02/2001

Calculation pressure [bar]: 6.5

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Service brake Laden vehicle

	0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50
Coupling head pres. [bar]	0.00	0.15	0.50	0.97	1.50	2.06	2.66	3.17	3.65	4.14	4.62	5.10	5.48	5.75	6.02
Deceleration [m/s ²]	0.00	1.50	5.06	9.91	15.31	20.99	27.08	32.30	37.23	42.16	47.10	52.03	55.89	58.63	61.37
Braking rate [%]	0.00	0.59	0.85	1.34	2.59	3.31	3.88	4.39	4.90	5.41	5.92	6.43	6.94	7.45	7.96
Axle 1 actuator pres. [bar]	0.00	0.28	1.11	2.70	4.61	6.70	9.03	10.84	12.48	14.12	15.76	17.39	19.03	20.67	22.31
Axle 1 braking torque [kNm]	0.00	0.68	2.63	6.40	10.95	15.91	21.45	25.75	29.64	33.53	37.43	41.32	45.21	49.10	53.00
Axle 1 adhesion utilised	0.00	0.01	0.04	0.08	0.14	0.19	0.25	0.29	0.33	0.36	0.39	0.42	0.45	0.48	0.52
Axle 2 actuator pres. [bar]	0.00	0.59	0.85	1.34	1.94	2.59	3.31	3.88	4.39	4.90	5.41	5.92	6.43	6.94	7.45
Axle 2 braking torque [kNm]	0.00	0.28	1.11	2.70	4.61	6.70	9.03	10.84	12.48	14.12	15.76	17.39	19.03	20.67	22.31
Axle 2 adhesion utilised	0.00	0.01	0.04	0.08	0.14	0.19	0.25	0.29	0.33	0.36	0.39	0.42	0.45	0.48	0.52
Axle 3 actuator pres. [bar]	0.20	0.70	1.11	1.51	1.92	2.33	2.74	3.15	3.56	3.97	4.38	4.79	5.00	5.00	5.00
Axle 3 braking torque [kNm]	0.00	0.61	1.93	3.24	4.56	5.87	7.19	8.50	9.82	11.13	12.45	13.76	14.44	14.44	14.44
Axle 3 adhesion utilised	0.00	1.45	4.57	7.70	10.83	13.95	17.07	20.20	23.32	26.45	29.57	32.69	34.29	34.29	34.29
Axle 4 actuator pres. [bar]	0.20	0.70	1.11	1.51	1.92	2.33	2.74	3.15	3.56	3.97	4.38	4.79	5.00	5.00	5.00
Axle 4 braking torque [kNm]	0.00	0.61	1.93	3.24	4.56	5.87	7.19	8.50	9.82	11.13	12.45	13.76	14.44	14.44	14.44
Axle 4 adhesion utilised	0.00	1.45	4.57	7.70	10.83	13.95	17.07	20.20	23.32	26.45	29.57	32.69	34.29	34.29	34.29
Axle 4 adhesion utilised	0.00	0.02	0.07	0.12	0.17	0.23	0.30	0.37	0.45	0.54	0.63	0.74	0.81	0.84	0.87

Service brake Unladen vehicle

	0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50
Coupling head pres. [bar]	0.00	0.00	0.43	0.93	1.45	2.00	2.60	3.24	3.96	4.77	5.75	7.07	9.44	16.84	18.18
Deceleration [m/s ²]	0.00	0.00	4.43	9.47	14.74	20.40	26.48	33.00	40.33	48.65	58.66	72.02	96.25	171.62	185.34
Braking rate [%]	0.00	0.00	0.62	0.75	0.90	1.06	1.24	1.44	1.68	1.96	2.31	2.80	3.77	6.94	7.45
Axle 1 actuator pres. [bar]	0.00	0.00	0.37	0.81	1.28	1.80	2.38	3.02	3.78	4.67	5.79	7.38	10.48	20.67	22.31
Axle 1 braking torque [kNm]	0.00	0.00	0.88	1.92	3.03	4.27	5.65	7.18	8.97	11.08	13.75	17.54	24.89	49.10	53.00
Axle 1 adhesion utilised	0.00	0.00	0.04	0.09	0.15	0.20	0.26	0.33	0.40	0.48	0.58	0.71	0.95	1.57	1.65
Axle 2 actuator pres. [bar]	0.00	0.00	0.62	0.75	0.90	1.06	1.24	1.44	1.68	1.96	2.31	2.80	3.77	6.94	7.45
Axle 2 braking torque [kNm]	0.00	0.00	0.37	0.81	1.28	1.80	2.38	3.02	3.78	4.67	5.79	7.38	10.48	20.67	22.31
Axle 2 adhesion utilised	0.00	0.00	0.04	0.09	0.15	0.20	0.26	0.33	0.40	0.48	0.58	0.71	0.95	1.57	1.65
Axle 3 actuator pres. [bar]	0.00	0.00	0.58	0.66	0.74	0.83	0.91	0.99	1.07	1.15	1.24	1.32	1.40	1.48	1.56
Axle 3 braking torque [kNm]	0.00	0.00	0.24	0.51	0.77	1.03	1.30	1.56	1.82	2.08	2.35	2.61	2.87	3.14	3.40
Axle 3 adhesion utilised	0.00	0.00	0.05	0.10	0.15	0.21	0.27	0.34	0.42	0.50	0.61	0.75	1.02	4.40	10.31
Axle 4 actuator pres. [bar]	0.20	0.50	0.58	0.66	0.74	0.83	0.91	0.99	1.07	1.15	1.24	1.32	1.40	1.48	1.56
Axle 4 braking torque [kNm]	0.00	0.00	0.24	0.51	0.77	1.03	1.30	1.56	1.82	2.08	2.35	2.61	2.87	3.14	3.40
Axle 4 adhesion utilised	0.00	0.00	0.05	0.10	0.15	0.21	0.27	0.34	0.42	0.50	0.61	0.75	1.02	4.40	10.31



Miscellaneous

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

Pressure [bar] : 3.10

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

Axle1 : 2.73 Axle2 : 2.73 Axle3 : 2.42 Axle4 : 2.42

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

Deceleration [m/s²] : 3.70

Braking rate [%] 37.7

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

Front axle group

Deceleration [m/s²] : -

Braking rate [%] -

Rear axle group

Deceleration [m/s²] : 5.59

Braking rate [%] 57.0

Parking brake Laden vehicle

Max.slope [%]	Up	Down
(must be > 18%)	-44.25	31.78

(max.spring force = 7605 N at 30 mm strok

Required spring force at 18% slope

Axle 1 [N] -

Axle 2 [N] -

Axle 3 [N] 3264

Axle 4 [N] 3264

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]: 0.45
 Coupling head pressure [bar]: 0.70
 Pressure compensation (at 1.6 bar) [bar]: 0.00
 Output pressure (at 6.5 bar) [bar]

Laden: 5.20
 Unladen: 1.40

Air spring pressure [bar]

Laden : 4.80
 Unladen : 0.40

Axle boogie load [kg]

Laden: 14500
 Unladen: 2670

Pressure limitation [bar]

5.00

Slip differential [%]

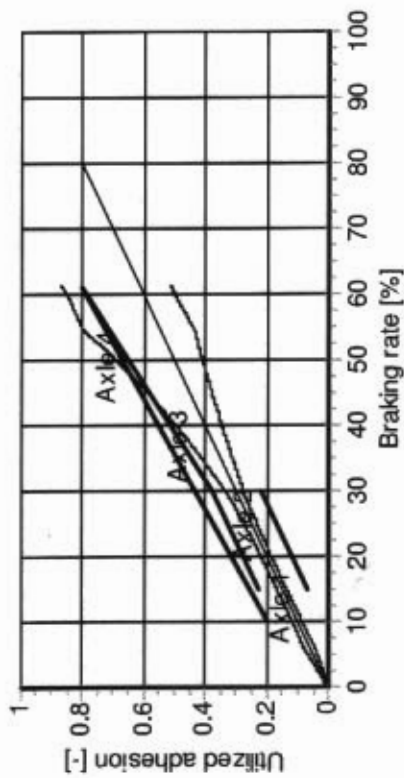
-0.20

Corresponding sheet on the PC Diagnostic tool (ECU Talk)

Coupling head pressure [bar]	Brake chamber pressure [bar]	
	Unladen	Laden
0.70	0.45	
1.6	0.60	1.19
6.5	1.40	5.20
Brake pressure compensation at 1.6 bar coupling head pressure [bar]		
0.00		
Air spring pressure [bar]		
Unladen :		Laden :
0.40		4.80
Axle boogie load [kg]		
Unladen		Laden
2670		14500

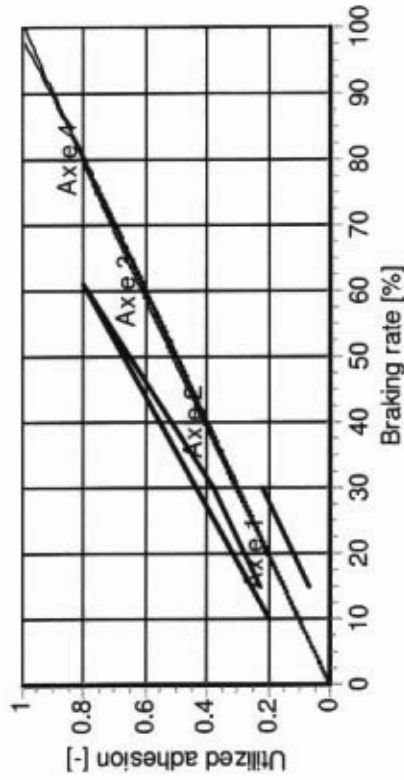


Laden vehicle - adhesion utilisation



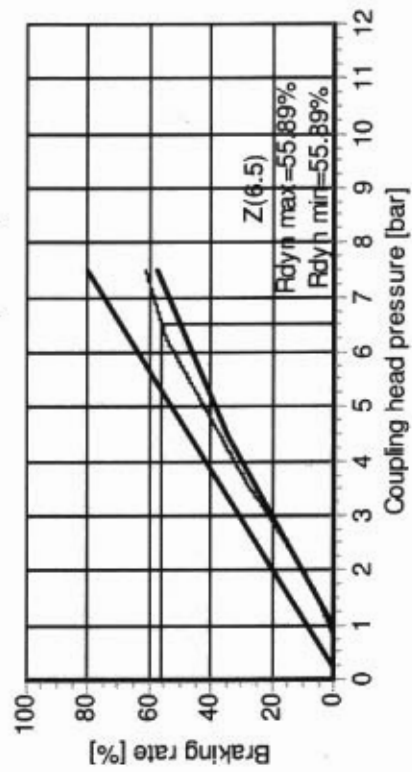
(With anti-lock system the adhesion requirements do not have to be fulfilled.)

Unladen vehicle - adhesion utilisation



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

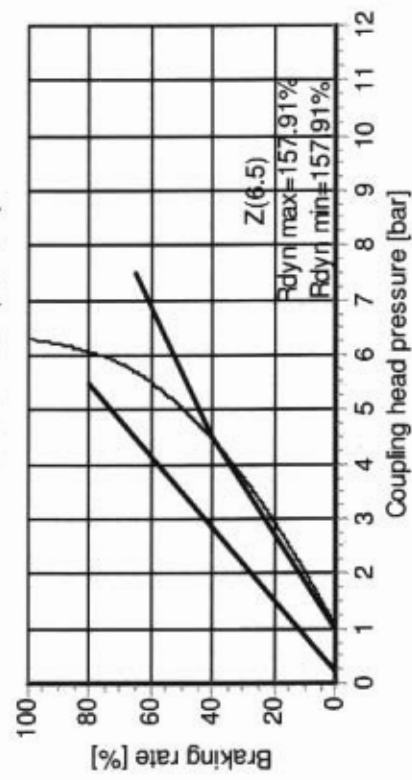
Laden vehicle - compatibility



Calculation pressure [bar]: 6.5

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Unladen vehicle - compatibility

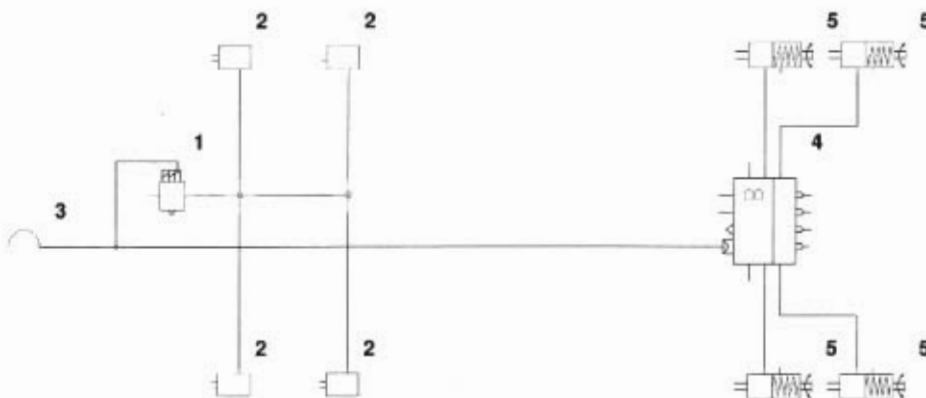




Company: Genese Ltd
Author: Chris Clarke
Document: fonterra26570r19.5

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Page: for Workshops

Complet system diagram



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

Trailer EBS parameters

Coupling head pressure [bar]	Brake chamber pressure [bar]	
	Unladen	Laden
0.70	0.45	
1.6	0.80	1.19
6.5	1.40	5.20
Brake pressure compensation at 1.6 bar coupling head pressure [bar]		0.00
Air spring pressure [bar]	Unladen	Laden
	0.40	4.80
Axle boogie load [kg]	Unladen	Laden
	2670	14500
Pressure limitation [bar]		5.00
Slip differential [%]		-0.20

ABS Modulator Sensors on axle 2
 Brake Chamber 18" stroke: 64 BZ 122.1 15/09/2000
 Brake Chamber 16" stroke: 64 BZ 122.1 15/09/2000
 Brake Chamber 18" stroke: 64 BZ 122.1 15/09/2000
 Brake Chamber 16" stroke: 64 BZ 122.1 15/09/2000
 Coupling head - brake -
 Trailer EBS ECU Sensors on axle 4
 Spring Brake Actuator 16/24" stBZ 119.6 01/02/2001
 Spring Brake Actuator 16/24" stBZ 119.6 01/02/2001
 Spring Brake Actuator 16/24" stBZ 119.6 01/02/2001
 Spring Brake Actuator 16/24" stBZ 119.6 01/02/2001