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NZ TRANSPORT AGENCY  
WAKA KOTAHI

# Heavy Vehicle Specialist Certificate

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 **7A85N0J0297533155**

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

Certification Category  
**HUEK**

Description of Work  
**CARRY OUT SET UP OF TRAILER EBS SYSTEM IN COMPLIANCE WITH THE NZ HEAVY VEHICLE BRAKE RULE.**

Code/Standard Certified to **HUBNZ 32015 SCHED 5** Component Load Rating(s) **N/A**  
General Drawing Number(s) **N/A**

Supporting Documents  
**KNORR-BREMSE BSD PERFORMANCE CALCULATION**

\*Special Conditions **N/A**

Certification Expiry Date (if applicable) **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 **30.09.2009** Number **322453**

COF Vehicle Inspector ID: COF Vehicle Inspector Signature: Date

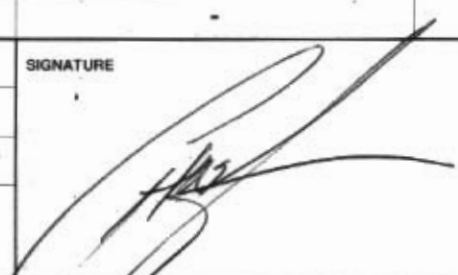
All fields excluding those marked with \* must be completed before this certificate can be accepted.



**KNORR-BREMSE**

ECUtalk V.3.3.1.10

# EOL PROTOCOL REPORT

SYSTEM		Trailer EBS		MATCH CODE		ES 2053							
PRODUCTION DATE		week 51 in 2007		SERIAL NUMBER		247							
PART NUMBER		II 39782		VIN		7A85N0J0297522155							
MANUFACTURER		Nickel Engineering		BRAKE CALCULATION NO.		7A85N0J0297522155							
TYPE		Full trailer		FORMER PIN ACTUAL PIN		30 32 4D 52 30 32 4D 52							
DIFFERENTIAL SLIP [%]	AUX1	OFF	IN A	Disabled		SOFTWARE VERSION	521.17	AXLE	BRAKE CHAMBER SIZE	LEVER LENGTH			
	AUX2	OFF	IN B	Disabled		ISS INVERTED	-	1	15	-			
	AUX3	OFF	IN C	Disabled		RSP	St 2	2	16	-			
	AUX4	ON	IN D	-		ABS CONFIGURATION	4S/3M	3	1624	-			
	AUX5	-	-	POLE WHEEL TEETH SR, SL 90		DYN.TYRE DIAMETER [MM]	840	4	1624	-			
-0.2	-	-	POLE WHEEL TEETH SAR, SAL 90		COMPENSATION AT 1.6 BAR	-	5	-	0.2				
REAR AXLE PRESSURE LIMIT [BAR]		5.0		CONTROLL PRESSURE [BAR]		6.5		CONTROLL PRESSURE [BAR]			0.7	1.6	6.5
AXLE	AXLE LOAD UNLADEN [KG]	SUSP PRESS.UNL. [BAR]	BRAKE PRESS.UNL. [BAR]	AXLE LOAD LADEN [KG]	SUSP PRESS.LADEN [BAR]	BRAKE PRESS.LADEN [BAR]							
1	2024	0	-	7250	0	-	-	-	-	-			
2	2024	0	-	7250	0	-	-	-	-	-			
3	1335	0.4	1.4	7250	4.5	0.56	1.5	5.6	-	-			
4	1335	0.4	1.4	7250	4.5	0.56	1.5	5.6	-	-			
5	-	-	-	-	-	-	-	-	-	-			
KILOMETER COUNTER [KM]	0	NEXT SERVICE [KM]	8000000	ECU SUPPLY VOLTAGE [V]	22.8	VALVE SUPPLY VOLTAGE [V]	23.0						
AIR GAP SPEED SL [KM/H]	4.2	AIR GAP SPEED SR [KM/H]	3.9	AIR GAP SPEED SAL [KM/H]	2.3	AIR GAP SPEED SAR [KM/H]	5.0						
<b>EOL TEST RESULTS</b>													
System pressure test		Succeeded		-		-							
Warning lamp test		Succeeded		-		-							
LSF test		Succeeded		-		-							
SL wheel speed sensor test		Succeeded		-		-							
SR wheel speed sensor test		Succeeded		-		-							
Axle modulator test		Succeeded		-		-							
RSP installation test		Succeeded		-		-							
Active faults in the system		No		-		-							
TESTER NAME	Chris Clarke			SIGNATURE 									
LOCATION	Genese Ltd												
DATE	30/09/2009												
ADDITIONAL INFORMATION	Fonterra Refurb #3278												



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-operative Dairies Ltd

Vehicle: 7A85N0J0297522155

Project: 4 axle full trailer

**Vehicle**

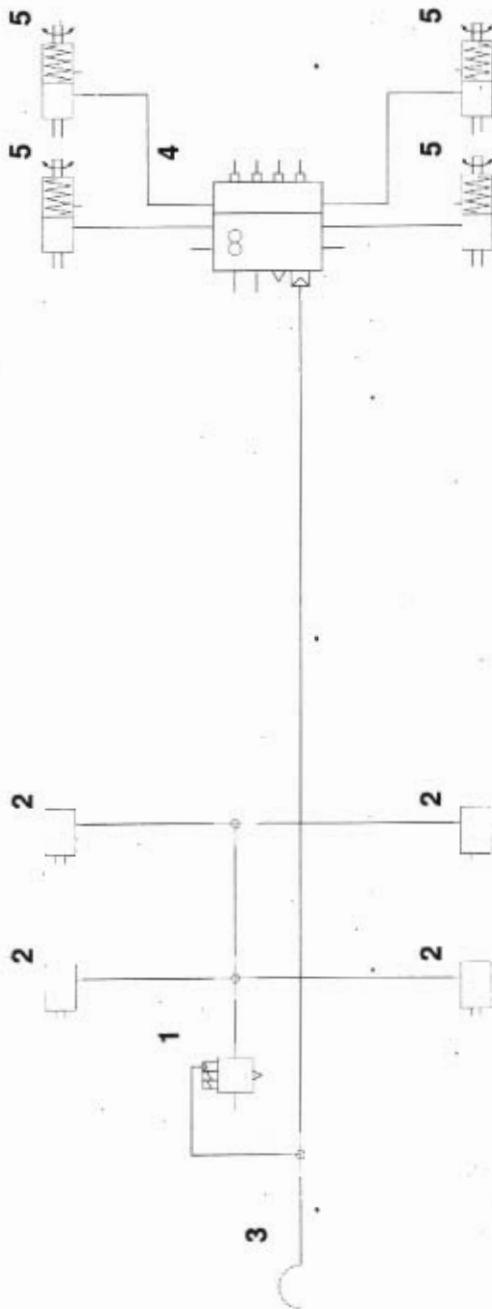
Type	2x2 Drawbar trailer
Calculated effective wheelbase [m]	4.60
Laden (max.) mass [kg]	29000.00
Laden (max.) front axle group load [kg]	14500.00
Laden vertical position of CoG [m]	1.80
Unladen (min.) mass [kg]	6718.00
Unladen (min.) front axle group load [kg]	4048.00
Unladen vertical position of CoG [m]	1.27
Laden/unladen front air spring press. [bar]	-/-
Laden/unladen rear air spring press. [bar]	4.50/0.40

**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
Tyre 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	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.



### 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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Author: Chris Clarke

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### 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: 76/76	ROR	BZ 141.0 08/03/2002
9	Spring Brake Actuator 16/24" stroke: 76/76	ROR	BZ 141.0 08/03/2002
10	Spring Brake Actuator 16/24" stroke: 76/76	ROR	BZ 141.0 08/03/2002
11	Spring Brake Actuator 16/24" stroke: 76/76	ROR	BZ 141.0 08/03/2002

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> ]	5.93			5.39
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 : 2.75 Axle2 : 2.75 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

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**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]**

5.00

**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	0.56	
1.6	0.74	1.54
6.5	1.40	5.60
<b>Brake pressure compensation at 1.6 bar coupling head pressure [bar]</b>		
0.20		
<b>Air spring pressure [bar]</b>		
<b>Unladen :</b>		<b>Laden :</b>
0.40		4.50
<b>Axle boogie load [kg]</b>		
<b>Unladen</b>		<b>Laden</b>
2670		14500





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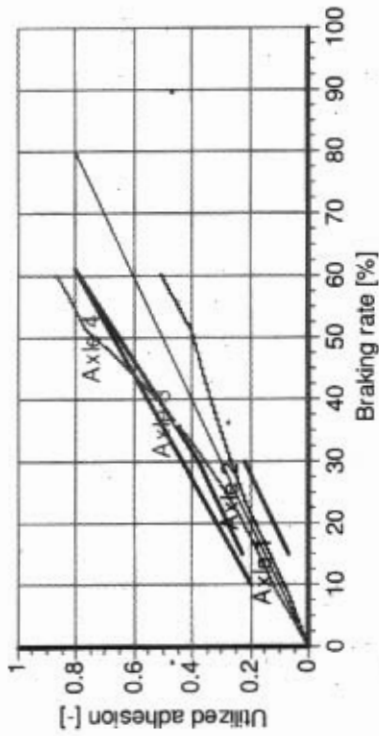
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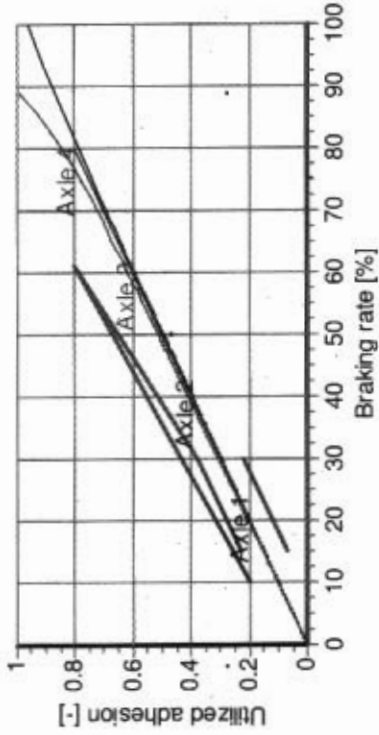
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### Laden vehicle - adhesion utilisation



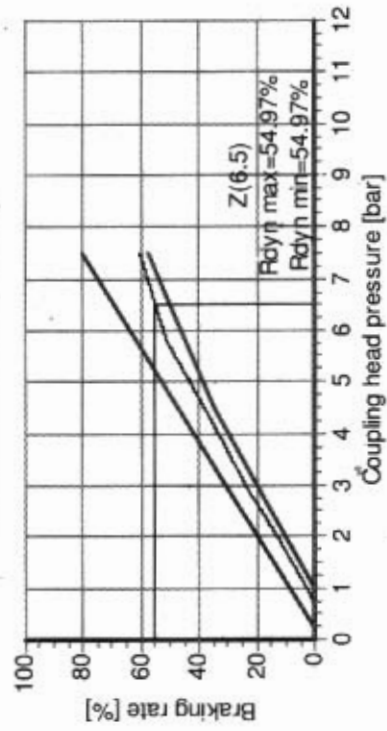
(With anti-lock system the adhesion requirements do not have to be fulfilled.)

### Unladen vehicle - adhesion utilisation

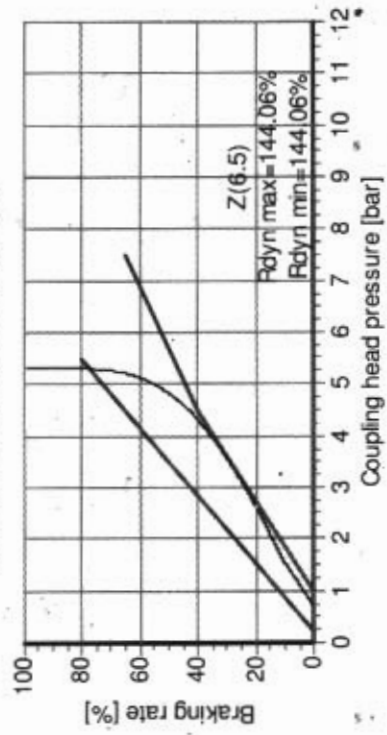


(With anti-lock system the adhesion requirements do not have to be fulfilled.)

### Laden vehicle - compatibility



### Unladen vehicle - compatibility



Calculation pressure [bar]: 6.5

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