



NZ TRANSPORT AGENCY  
WAKA KOTAHĪ

18018 Domett #8  
Owner say

# 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\* **7AS5NOJO297010629** VIN / Chassis Number

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 AND COMPLIANCE TO THE NZ HEAVY VEHICLE BRAKE RULE 32015 SCHEDULE 5**

Code/Standard Certified to **NZHUBR 32015 SCHED 5** Component Load Rating(s)

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

Supporting Documents  
**BRAKE 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

*Chris Clarke*

\*Delegate's Name (PRINT IN CAPS)

Date **16.10.2008** Number **309211**

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

Created: 16/10/2008 Document: 7A85N0J0297010629  
Modified: 16/10/2008 Page: 1 / 6

Database version: 9.0.13

Calculation in accordance with ECE Regulation 13 (10 Series) and EEC Directive 71/320 EEC (2002/79/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: 7A85N0J0297010629  
Project: 4 axle milk collection full trailer

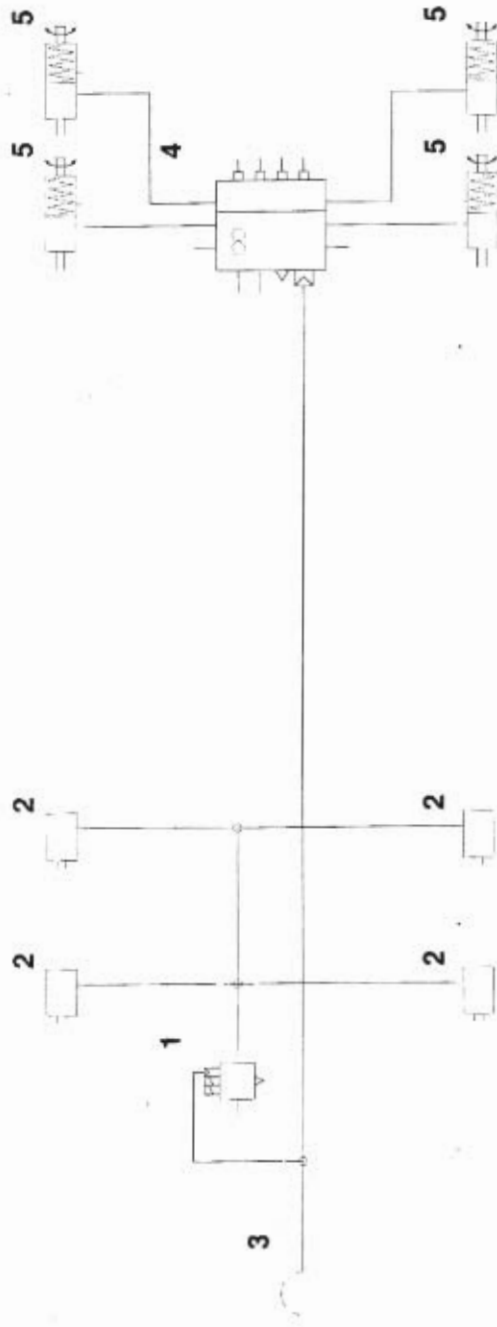
### Vehicle

|   |                     |
|---|---------------------|
| Type  | 2x2 Drawbar trailer |
| Calculated effective wheelbase [m]          | 4.67                |
| 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   | Axle 1                            | Axle 2                            | Axle 3                            | Axle 4                            |
|---|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Type  | MERITOR (ROR)<br>361-0022-02-FBKV | MERITOR (ROR)<br>361-0022-02-FBKV | MERITOR (ROR)<br>361-0022-02-FBKV | MERITOR (ROR)<br>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<br>Elsa195 LE                | Disc<br>Elsa195 LE                | Disc<br>Elsa195 LE                | Disc<br>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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**Document:** 7A85N0J0297010629  
**Page:** 3 / 6

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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               |

**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<sup>2</sup>] : 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<sup>2</sup>] : -

Braking rate [%] -

**Rear axle group**

Deceleration [m/s<sup>2</sup>] : 5.70

Braking rate [%] 58.1

**Parking brake** Laden vehicle

| Max.slope [%]<br>(must be > 18%)  | Up            | Down         |
|---|---------------|--------------|
| (max.spring force = 7120 N at 30 mm strok<br>Required spring force at 18% slope | <b>-40.99</b> | <b>30.69</b> |
| Axle 1 [N]  | -             | -            |
| Axle 2 [N]  | -             | -            |
| Axle 3 [N]  | 3264          | 3264         |
| Axle 4 [N]  | 3264          | 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]: 0.56  
 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  |

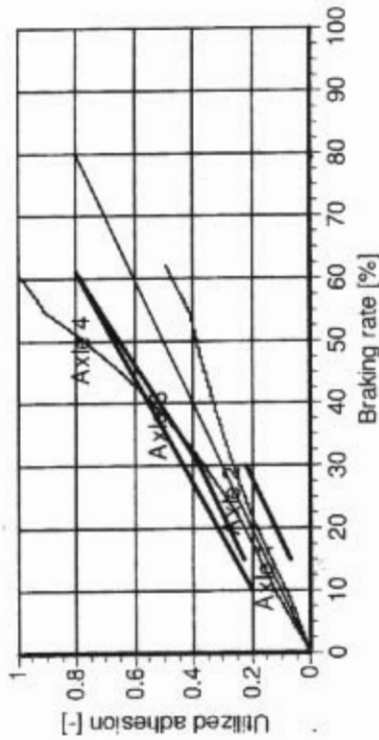
| Air spring pressure [bar] | Unladen : | Laden : |
|---------------------------|-----------|---------|
|                           | 0.40      | 4.50    |

| Axle boogie load [kg] | Unladen | Laden |
|-----------------------|---------|-------|
|                       | 2670    | 14500 |

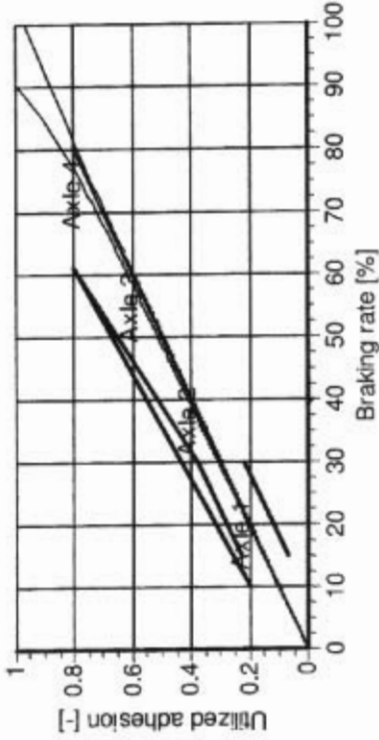


Laden vehicle - adhesion utilisation



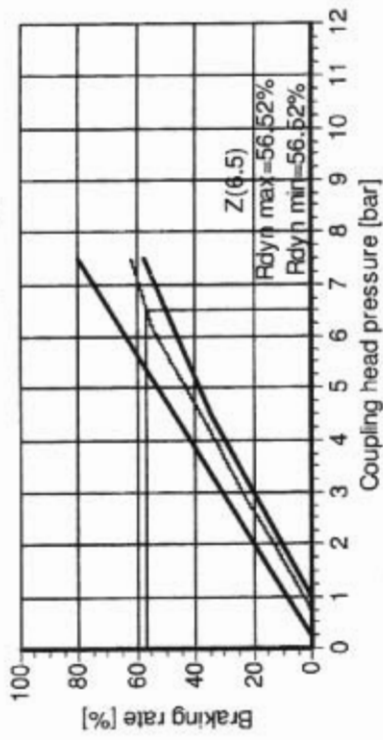
(With anti-lock system the adhesion requirements do not have to be fulfilled.)

Unladen vehicle - adhesion utilisation



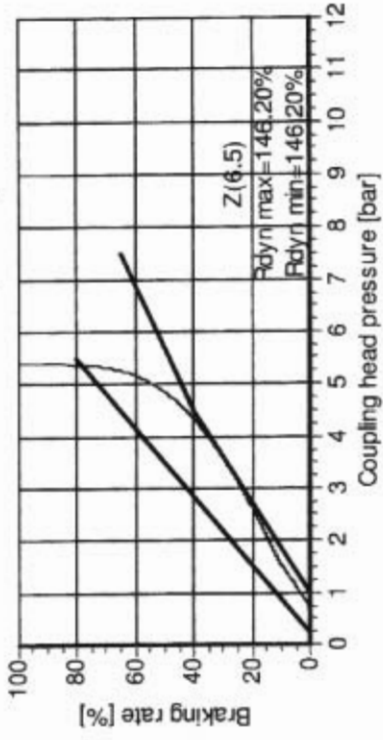
(With anti-lock system the adhesion requirements do not have to be fulfilled.)

Laden vehicle - compatibility



Calculation pressure [bar]: 6.5

Unladen vehicle - compatibility



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**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              |                        | 237                      |        |                         |                    |              |
| PART NUMBER                    |                        | H 39782                 |                        | VIN                        |                        | 7A85N0J0297010629        |        |                         |                    |              |
| MANUFACTURER                   |                        | Nickel Engineering      |                        | BRAKE CALCULATION NO.      |                        | 7A85N0J0297010629        |        |                         |                    |              |
| 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                       | 50                 | -            |
|                                | AUX3                   | OFF                     | IN C                   | Disabled                   |                        | RSP                      | St 2   | 2                       | 90                 | -            |
|                                | AUX4                   | ON                      | IN D                   | -                          |                        | ABS CONFIGURATION        | 4S/3M  | 3                       | 1634               | -            |
|                                | AUX5                   | -                       | -                      | POLE WHEEL TEETH SR, SL 90 |                        | DYN.TYRE DIAMETER (MM)   | 840    | 4                       | 1634               | -            |
| REAR AXLE PRESSURE LIMIT (BAR) |                        | 5.3                     |                        | 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                   | 0.5                     | 1.4                    | 7250                       | 4.5                    | 0.56                     | 1.5    | 5.6                     |                    |              |
| 4                              | 1335                   | 0.5                     | 1.4                    | 7250                       | 4.5                    | 0.56                     | 1.5    | 5.6                     |                    |              |
| 5                              | -                      | -                       | -                      | -                          | -                      | -                        | -      | -                       |                    |              |
| KILOMETER COUNTER (KM)         | 0                      | NEXT SERVICE (KM)       | 800000                 | ECU SUPPLY VOLTAGE (V)     | 23.6                   | VALVE SUPPLY VOLTAGE (V) | 23.9   |                         |                    |              |
| AIR GAP SPEED SL (KM/H)        | 3.9                    | AIR GAP SPEED SR (KM/H) | 3.7                    | AIR GAP SPEED SAL (KM/H)   | 0.7                    | AIR GAP SPEED SAR (KM/H) | 1.3    |                         |                    |              |
| <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<br>              |                        |                          |        |                         |                    |              |
| LOCATION                       | Genese Ltd             |                         |                        |                            |                        |                          |        |                         |                    |              |
| DATE                           | 16/10/2008             |                         |                        |                            |                        |                          |        |                         |                    |              |
| ADDITIONAL INFORMATION         | Fonterra Hawera No.8   |                         |                        |                            |                        |                          |        |                         |                    |              |