



KNORR-BREMSE
ECUtalk V.3.3.1.10

EOL PROTOCOL REPORT

SYSTEM		Trailer EBS		MATCH CODE		ES 2053					
PRODUCTION DATE		week 50 in 2007		SERIAL NUMBER		545					
PART NUMBER		# 39782		VIN		7A85N0J0297819442					
MANUFACTURER		Nickel Engineering		BRAKE CALCULATION NO.		7A85N0J0297819442					
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	15	-	
	AUX4	ON	IN D	-		ABS CONFIGURATION	4S/3M	3	1524	-	
	AUX5	-	-	POLE WHEEL TEETH SR, SL		DYN.TYRE DIAMETER [MM]	840	4	1524	-	
-0.2	-	-	POLE WHEEL TEETH SAR, SAL		90	5	-	-	-	COMPENSATION AT 1.6 BAR	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]	23.6	VALVE SUPPLY VOLTAGE [V]	23.8				
AIR GAP SPEED SL [KM/H]	4.5	AIR GAP SPEED SR [KM/H]	5.1	AIR GAP SPEED SAL [KM/H]	2.3	AIR GAP SPEED SAR [KM/H]	4.7				
EOL TEST RESULTS											
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	04/08/2009										
ADDITIONAL INFORMATION	Fonterra Hawera Refurb No 3295										



Company: Genese Ltd
 Author: Chris Clarke

Created: 4/08/2009
 Modified: 4/08/2009

Document: 7A85N0J0297819442
 Page: 1 / 7

Database version: 9.0.13

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 Dairys Ltd

Vehicle: 7A85N0J0297819442

Project: 4 axle milk collection full trailer

Vehicle

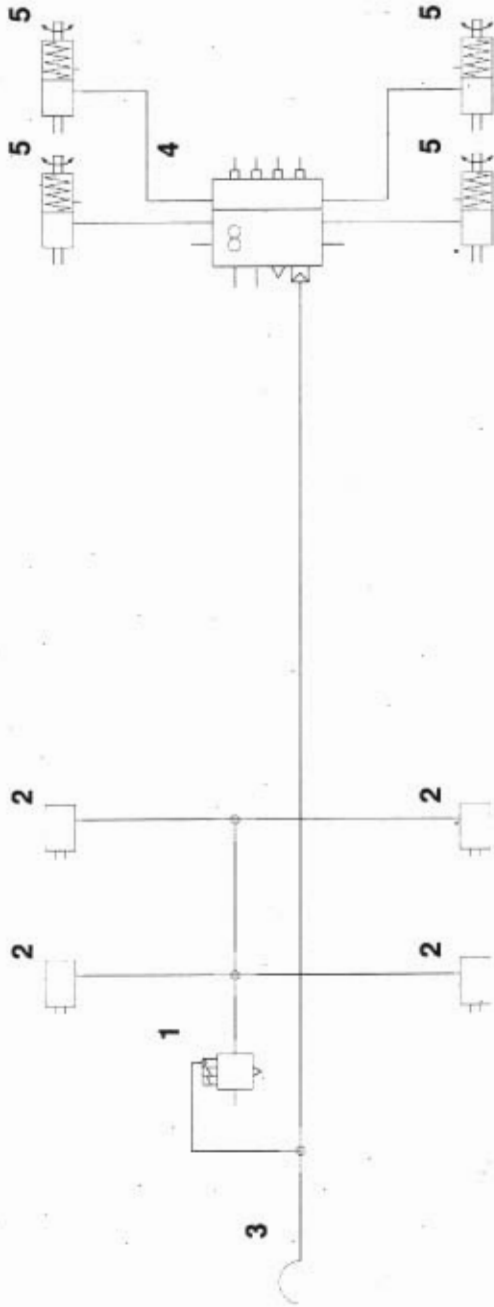
Type	2x2 Drawbar trailer
Calculated effective wheelbase [m]	4.60
Laden (max.) mass [kg]	29000.00
Laden (max.) front axle group load [kg]	14500.00
Laden vertical position of CoG [m]	1.80
Unladen (min.) mass [kg]	6718.00
Unladen (min.) front axle group load [kg]	4048.00
Unladen vertical position of CoG [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

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: 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



Company: Genese Ltd
Author: Chris Clarke

Created: 4/08/2009
Modified: 4/08/2009

Document: 7A85N0J0297819442
Page: 4 / 7

Database version: 9.0.13

Laden vehicle

	Intact system	Front circuit only	Rear circuit only	Calculation press.
Deceleration [m/s ²]	5.93	-	-	5.39
Pressure [bar]	8.50	-	-	6.50

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.



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/s²] : 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/s²] : -

Braking rate [%] -

Rear axle group

Deceleration [m/s²] : 5.70

Braking rate [%] 58.1

Parking brake Laden vehicle

Max.slope [%]	Up	Down
(must be > 18%)	-40.99	31.23
(max.spring force = 7120 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

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.



Company: Genese Ltd
 Author: Chris Clarke

Created: 4/08/2009
 Modified: 4/08/2009

Document: 7A85N0J0297819442
 Page: 6 / 7

Database version: 9.0.13

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)

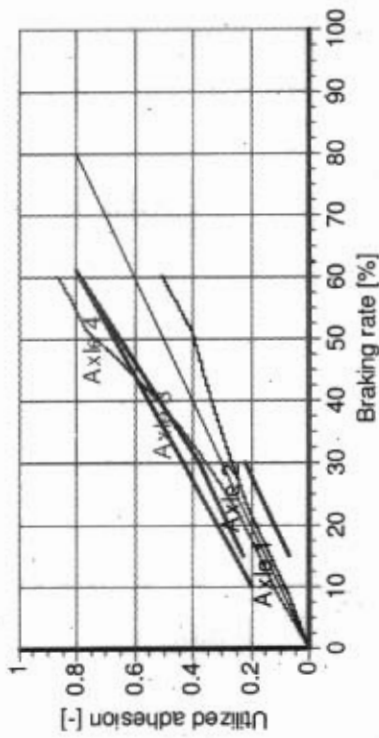
Coupling head pressure [bar]	Brake chamber pressure [bar]	
	Unladen	Laden
0.70	0.56	
1.6	0.74	1.54
6.5	1.40	5.60
Brake pressure compensation at 1.6 bar coupling head pressure [bar]		
Unladen :		0.20
Air spring pressure [bar]		
Unladen :		0.40
Laden :		4.50
Axle boogie load [kg]		
Unladen		Laden
2670		14500

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.

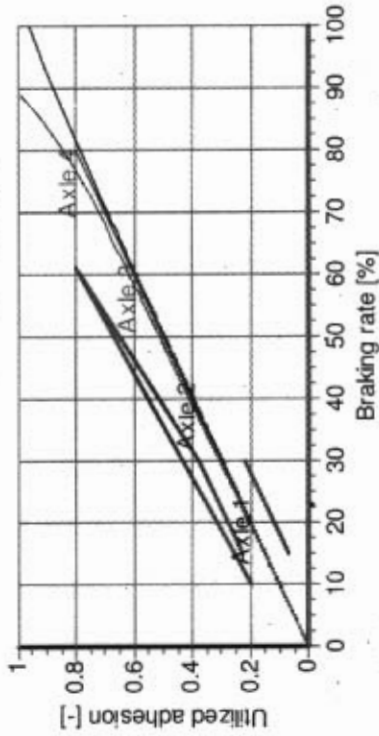


Laden vehicle - adhesion utilisation



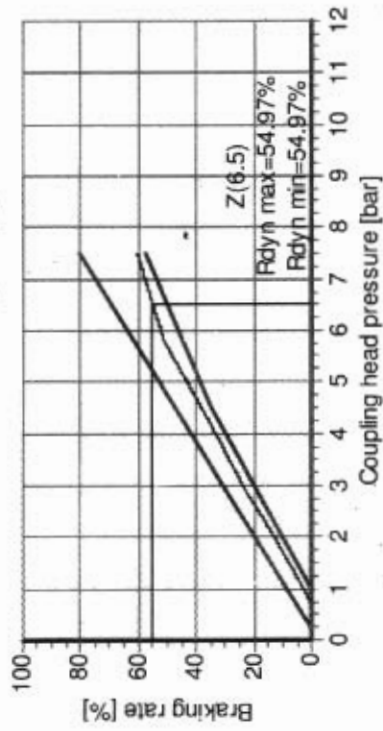
(With anti-lock system the adhesion requirements do not have to be fulfilled.)

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

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.

Unladen vehicle - compatibility

