



# Heavy Vehicle Specialist Certificate

Heavy Vehicle Specialist Inspector and Inspecting Organisation

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

DON FORDHAM.

ID

HDF.

Vehicle Registration\*

VIN / Chassis Number

7A9E38116C1023043

Component being certified:

- Chassis Modification
- Load Anchorage
- Log Bolsters
- Towing Connection
- Brakes
- SRT

Certification Category

HVEK.

Description of Work

TO COMPLY BRAKE SYSTEM. (DOMETI 5-AXLE FULL)

Code/Standard Certified to

N.Z. H.V. B. RULE 32015

General Drawing Number(s)

Component Load Rating(s)

GUM: 35000 Kg.

Supporting Documents

COMPLIANCE PAPERS

\*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

12-12-2012.

Number

418330

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: Brakespec Ltd  
 Author: Don Fordham

Created: 12/12/2012  
 Modified: 12/12/2012

Document: 7A9E38116C1023043  
 Page: 1 / 7

Calculation in accordance with ECE Regulation 13 (11 Series) and EEC Directive 71/320 EEC (2002/78/EC) using Knorr-Bremse Braking System Designer software (version 13.0).  
 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: Domett  
 Vehicle: 5-Axle Full  
 Project: 7A9E38116C1023043

**Vehicle**

Type	2x3 Drawbar trailer
Calculated effective wheelbase [m]	7.35
Laden (max.) mass [kg]	35000.00
Laden (max.) front axle group load [kg]	16000.00
Laden vertical position of CoG [m]	2.00
Unladen (min.) mass [kg]	7000.00
Unladen (min.) front axle group load [kg]	3580.00
Unladen vertical position of CoG [m]	0.91
Laden/unladen front air spring press. [bar]	4.00/0.70
Laden/unladen rear air spring press. [bar]	3.80/0.40

**Axles**

	Axle 1	Axle 2	Axle 3	Axle 4	Axle 5
Axle distances [m]	<----- 1.31 ----->	<----- 5.44 ----->	<----- 1.25 ----->	<----- 1.25 ----->	<----- 1.25 ----->
Axle loads [kg]	8000	8000	6334	6333	6333
	Laden	Laden			
	Unladen	Unladen			
Axle type	MERITOR (ROR)	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
Tyre size	265/70 R 19.5	265/70 R 19.5	355/50 R 22.5	355/50 R 22.5	355/50 R 22.5
Dyn. tyre radius [mm]	421	421	448	448	448
Stat. tyre radius [mm]	401	401	428	428	428
Brake size or radius [mm]	- Disc	- Disc	- Disc	- Disc	- Disc
and Brake type	Elsa195 LE	Elsa195 LE	Elsa195 LE	Elsa195 LE	Elsa195 LE
Actuator numb./axle & size	2 x 16/24	2 x 16/24	2 x 16/24	2 x 16	2 x 16
Actuator force at 6.5 bar [N]	6145	6145	6145	6146	6146
Slack adjuster length [mm]	-	-	-	-	-
Thresh.mom.[Nm] or force[N]	81.00	81.00	81.00	81.00	81.00
Brake Factor by Annex 19	22.0	22.0	22.0	22.0	22.0
Discbrake lever length [mm]	74	74	74	74	74
Int.br.factor (C*) & Mech.eff.(Eta)	-	-	-	-	-
Int.br.factor x Mech.eff.(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	ROR 8616 AF

Calculation pressure [bar]: 6.5  
 Database version: 13.0.32

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	Coupling head	KU1...	
2	Brake Chamber 16" stroke: 67	MASTER	BZ 163.1 20/10/2003
3	Brake Chamber 16" stroke: 67	MASTER	BZ 163.1 20/10/2003
4	Trailer EBS G2	ES206	Sensors on axle 3
5	Brake Chamber 16" stroke: 67	MASTER	BZ 163.1 20/10/2003
6	Brake Chamber 16" stroke: 67	MASTER	BZ 163.1 20/10/2003
7	Electronic Module Premium	ES2071	
8	Spring Brake Actuator 16/24" stroke: 61/61	MASTER	BZ 161.2 / BZ 161.2 11/01/2005
9	Spring Brake Actuator 16/24" stroke: 61/61	MASTER	BZ 161.2 / BZ 161.2 11/01/2005
10	Spring Brake Actuator 16/24" stroke: 61/61	MASTER	BZ 161.2 / BZ 161.2 11/01/2005
11	Spring Brake Actuator 16/24" stroke: 61/61	MASTER	BZ 161.2 / BZ 161.2 11/01/2005
12	Spring Brake Actuator 16/24" stroke: 61/61	MASTER	BZ 161.2 / BZ 161.2 11/01/2005
13	Spring Brake Actuator 16/24" stroke: 61/61	MASTER	BZ 161.2 / BZ 161.2 11/01/2005

**Axle identifiers**

Axle	Axle identifier	Brake identifier	Axle load identifier	Test report identifier
Axle 1				ID4-361-0022-02-FBKV
Axle 2				ID4-361-0022-02-FBKV
Axle 3				ID4-361-0022-02-FBKV
Axle 4				ID4-361-0022-02-FBKV
Axle 5				ID4-361-0022-02-FBKV

Calculation pressure [bar]: 6.5

Database version: 13.0.32



Company: Brakespec Ltd  
 Author: Don Fordham

Created: 12/12/2012 Document: 7A9E38116C1023043  
 Modified: 12/12/2012 Page: 3 / 7

Service brake Laden vehicle

	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5
Coupling head pres. [bar]	0.00	0.22	0.75	1.27	1.80	2.32	2.85	3.38	3.90	4.43	4.95	5.48	6.01	6.54	7.07
Deceleration [m/s <sup>2</sup> ]	0.00	2.23	7.60	12.96	18.33	23.69	29.05	34.42	39.78	45.14	50.51	55.87	61.23	66.64	72.04
Braking rate [%]	0.2	0.72	1.24	1.77	2.29	2.82	3.34	3.87	4.4	4.92	5.45	5.97	6.5	7.04	7.57
Axle 1 actuator pres. [bar]	0.00	0.74	2.46	4.19	5.91	7.64	9.36	11.09	12.81	14.53	16.26	17.99	19.71	21.46	23.22
Axle 1 braking torque [kNm]	0.00	1.75	5.85	9.95	14.04	18.14	22.23	26.33	30.43	34.52	38.62	42.72	46.81	50.98	55.15
Axle 1 braking force [kN]	0.00	0.02	0.07	0.12	0.16	0.20	0.24	0.28	0.31	0.35	0.38	0.41	0.44	0.47	0.49
Axle 1 adhesion utilised	0.2	0.72	1.24	1.77	2.29	2.82	3.34	3.87	4.4	4.92	5.45	5.97	6.5	7.04	7.57
Axle 2 actuator pres. [bar]	0.00	0.74	2.46	4.19	5.91	7.64	9.36	11.09	12.81	14.53	16.26	17.99	19.71	21.46	23.22
Axle 2 braking torque [kNm]	0.00	1.75	5.85	9.95	14.04	18.14	22.23	26.33	30.43	34.52	38.62	42.72	46.81	50.98	55.15
Axle 2 braking force [kN]	0.00	0.02	0.07	0.12	0.16	0.20	0.24	0.28	0.31	0.35	0.38	0.41	0.44	0.47	0.49
Axle 2 adhesion utilised	0.2	0.68	1.14	1.61	2.08	2.54	3.01	3.47	3.94	4.4	4.87	5.33	5.8	6.27	6.73
Axle 3 actuator pres. [bar]	0.00	0.82	2.15	3.67	5.20	6.73	8.25	9.78	11.31	12.83	14.36	15.89	17.41	18.94	20.47
Axle 3 braking torque [kNm]	0.00	1.39	4.79	8.20	11.61	15.02	18.42	21.83	25.24	28.65	32.05	35.46	38.87	42.28	45.68
Axle 3 braking force [kN]	0.00	0.02	0.08	0.14	0.21	0.27	0.35	0.42	0.51	0.60	0.69	0.79	0.90	1.02	1.15
Axle 3 adhesion utilised	0.2	0.68	1.14	1.61	2.08	2.54	3.01	3.47	3.94	4.4	4.87	5.33	5.8	6.27	6.73
Axle 4 actuator pres. [bar]	0.00	0.62	1.14	1.61	2.08	2.54	3.01	3.47	3.94	4.4	4.87	5.33	5.8	6.27	6.73
Axle 4 braking torque [kNm]	0.00	1.39	4.80	8.21	11.61	15.02	18.43	21.84	25.24	28.65	32.06	35.46	38.87	42.28	45.69
Axle 4 braking force [kN]	0.00	0.02	0.08	0.14	0.21	0.27	0.35	0.42	0.51	0.60	0.69	0.79	0.90	1.02	1.15
Axle 4 adhesion utilised	0.2	0.68	1.14	1.61	2.08	2.54	3.01	3.47	3.94	4.4	4.87	5.33	5.8	6.27	6.73
Axle 5 actuator pres. [bar]	0.00	0.62	2.15	3.68	5.20	6.73	8.26	9.78	11.31	12.83	14.36	15.89	17.41	18.94	20.47
Axle 5 braking torque [kNm]	0.00	0.82	2.15	3.68	5.20	6.73	8.26	9.78	11.31	12.83	14.36	15.89	17.41	18.94	20.47
Axle 5 braking force [kN]	0.00	1.39	4.80	8.21	11.61	15.02	18.43	21.84	25.24	28.65	32.06	35.46	38.87	42.28	45.69
Axle 5 adhesion utilised	0.00	0.02	0.08	0.14	0.21	0.27	0.35	0.42	0.51	0.60	0.69	0.79	0.90	1.02	1.15

Calculation pressure [bar]: 6.5

Database version: 13.0.32

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: Brakespec Ltd  
 Author: Don Fordham

Created: 12/12/2012 Document: 7A9E38116C1023043  
 Modified: 12/12/2012 Page: 4 / 7

Service brake Unladen vehicle

	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5
Coupling head pres. [bar]	0.00	0.16	1.22	2.29	3.36	4.42	5.49	6.56	7.63	8.69	9.76	10.82	11.89	12.97	14.04
Deceleration [m/s <sup>2</sup> ]	0.00	1.61	12.48	23.37	34.23	45.10	55.98	66.86	77.73	88.61	99.47	110.34	121.23	132.20	143.16
Braking rate [%]	0.2	0.53	0.76	0.98	1.21	1.43	1.66	1.88	2.1	2.33	2.55	2.78	3	3.23	3.46
Axle 1 actuator pres. [bar]	0.00	0.15	0.88	1.62	2.35	3.08	3.82	4.56	5.29	6.03	6.76	7.49	8.23	8.98	9.73
Axle 1 braking torque [kNm]	0.00	0.00	0.35	2.09	3.84	5.58	7.33	9.07	10.82	12.57	14.31	16.06	17.80	19.55	21.33
Axle 1 adhesion utilised	0.00	0.02	0.12	0.21	0.29	0.38	0.45	0.53	0.60	0.67	0.74	0.80	0.86	0.92	0.98
Axle 2 actuator pres. [bar]	0.2	0.53	0.76	0.98	1.21	1.43	1.66	1.88	2.1	2.33	2.55	2.78	3	3.23	3.46
Axle 2 braking torque [kNm]	0.00	0.15	0.88	1.62	2.35	3.08	3.82	4.56	5.29	6.03	6.76	7.49	8.23	8.98	9.73
Axle 2 adhesion utilised	0.00	0.02	0.12	0.21	0.29	0.38	0.45	0.53	0.60	0.67	0.74	0.80	0.86	0.92	0.98
Axle 3 actuator pres. [bar]	0.00	0.02	0.12	0.21	0.29	0.38	0.45	0.53	0.60	0.67	0.74	0.80	0.86	0.92	0.98
Axle 3 braking torque [kNm]	0.00	0.06	0.65	1.25	1.84	2.43	3.03	3.62	4.22	4.81	5.40	6.00	6.59	7.19	7.78
Axle 3 adhesion utilised	0.00	0.01	0.13	0.26	0.40	0.55	0.70	0.87	1.05	1.24	1.44	1.66	1.90	2.16	2.44
Axle 4 actuator pres. [bar]	0.2	0.51	0.69	0.87	1.05	1.23	1.41	1.59	1.78	1.96	2.14	2.32	2.5	2.68	2.86
Axle 4 braking torque [kNm]	0.00	0.06	0.66	1.25	1.84	2.44	3.03	3.62	4.22	4.81	5.40	6.00	6.59	7.19	7.78
Axle 4 adhesion utilised	0.00	0.01	0.14	0.27	0.41	0.54	0.77	0.99	1.24	1.51	1.79	2.06	2.33	2.60	2.87
Axle 5 actuator pres. [bar]	0.00	0.01	0.14	0.27	0.40	0.55	0.71	0.87	1.05	1.24	1.44	1.66	1.90	2.16	2.44
Axle 5 braking torque [kNm]	0.2	0.51	0.69	0.87	1.05	1.23	1.41	1.59	1.78	1.96	2.14	2.32	2.5	2.68	2.86
Axle 5 adhesion utilised	0.00	0.06	0.66	1.25	1.84	2.44	3.03	3.62	4.22	4.81	5.40	6.00	6.59	7.19	7.78
Axle 5 braking force [kN]	0.00	0.14	1.47	2.79	4.11	5.44	6.77	8.09	9.42	10.74	12.06	13.39	14.72	16.04	17.37
Axle 5 adhesion utilised	0.00	0.01	0.14	0.27	0.40	0.55	0.71	0.87	1.05	1.24	1.44	1.66	1.90	2.16	2.44

Calculation pressure [bar]: 6.5

Database version: 13.0.32

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: Brakespec Ltd  
 Author: Don Fordham

Created: 12/12/2012  
 Modified: 12/12/2012

Document: 7A9E38116C1023043  
 Page: 5 / 7

Miscellaneous

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

Pressure [bar] 2.88

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

Pressure [bar] Axle1 : 2.71 Axle2 : 2.71 Axle3 : 2.45 Axle4 : 2

**Automatic braking performance ( laden case ) at 6.0 bar**

Deceleration [m/s<sup>2</sup>] : 4.72

Braking rate [%] 48.1

**Vehicle performance in case of a load sensing device**

control failure ( laden case ) at 6.5 bar

**Front axle group**

Deceleration [m/s<sup>2</sup>] : 6.01

Braking rate [%] 61.2

**Rear axle group**

Deceleration [m/s<sup>2</sup>] : 6.01

Braking rate [%] 61.2

Parking brake Laden vehicle

Max slope [%]	Up	Down
(must be > 18%)	<b>-45.36</b>	<b>50.26</b>
(max. spring force = 7354 N at 30 mm stroke)		
Required spring force at 18% slope		
Axle 1 [N]	2444	
Axle 2 [N]	2444	
Axle 3 [N]	2603	
Axle 4 [N]	-	
Axle 5 [N]	-	

**Calculation pressure [bar]:** 6.5

**Database version:** 13.0.32



Company: Brakespec Ltd  
 Author: Don Fordham

Created: 12/12/2012  
 Modified: 12/12/2012

Document: 7A9E38116C1023043  
 Page: 6 / 7

Trailer EBS parameters

Coupling head pressure [bar]	0.7	0.4
	Unladen	Laden
1.6	0.73	1.24
6.5	2.5	5.8
Low-range comp. at 1.6 bar	0	0
High-range comp. at 4.5 bar	0	0
Air suspension	Unladen	Laden
Axle boogie load [kg]	3420	19000
voltages [V]	-	-
pressures [bar]	0.4	3.8
Pressure limitation [bar]	-	-

Axle and Tyre information

Number of axles: 5  
 Dynamic tyre radius [cm]: 42.1

EMP parameters:

Coupling head pressure [bar]	0.7	0.4
	Unladen	Laden
1.6	0.8	1.35
6.5	3	6.5
Low-range comp. at 1.6 bar	0	0
High-range comp. at 4.5 bar	0	0
Air suspension	Unladen	Laden
Axle boogie load [kg]	3580	16000
voltages [V]	-	-
pressures [bar]	0.7	4

Pressure limitation [bar] -  
 3rd modulator logic is LS characteristic

Slip differential [%] - from - [bar]

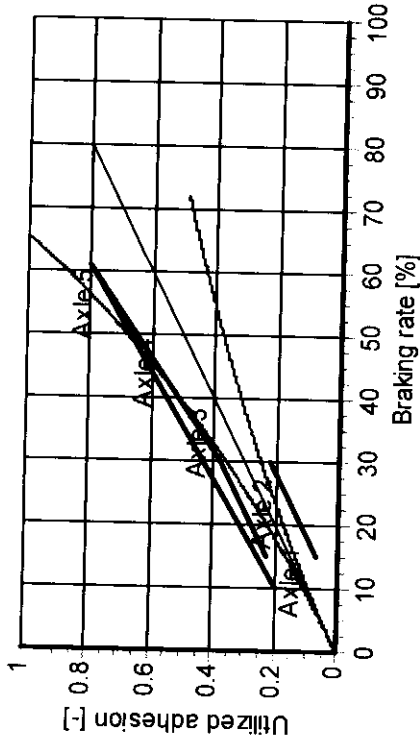
Calculation pressure [bar]: 6.5

Database version: 13.0.32

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.

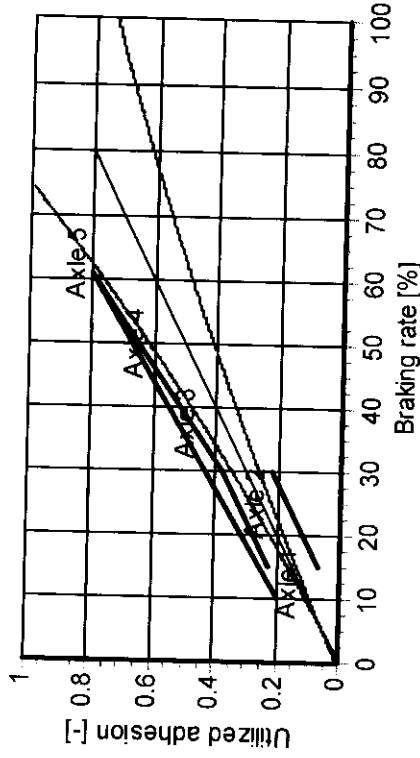


Laden vehicle - adhesion utilisation



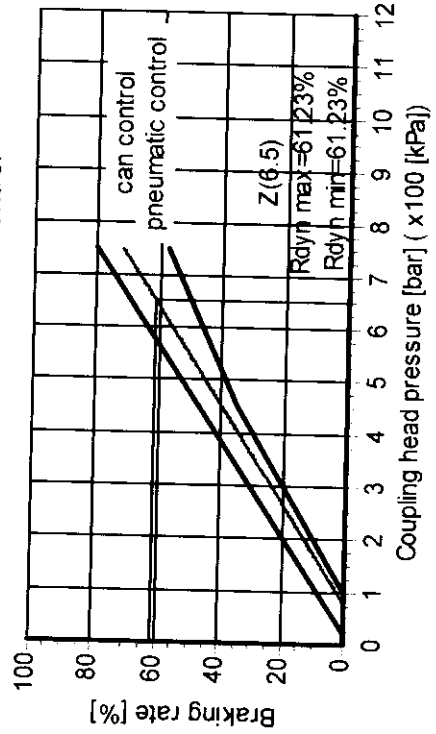
(With anti-lock system the adhesion requirements do not have to be fulfilled.)

Unladen vehicle - adhesion utilisation



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

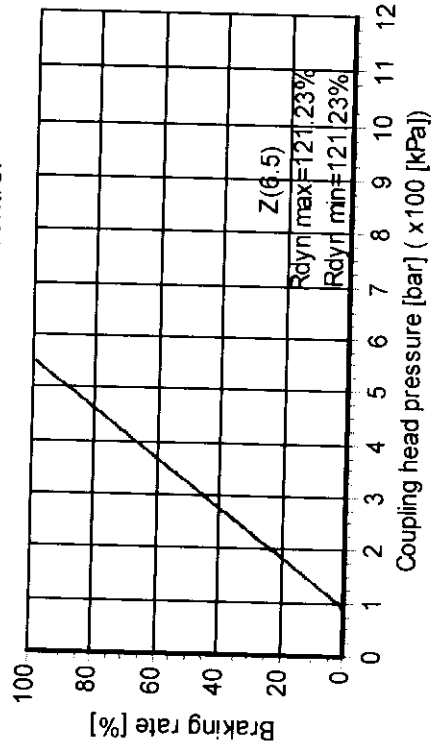
Laden vehicle - compatibility  
 with Pneumatic and CAN control



Calculation pressure [bar]: 6.5

Database version: 13.0.32

Unladen vehicle - compatibility  
 with Pneumatic and CAN control



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.