

# Heavy Vehicle Specialist Certificate

Must be presented to a CoF (Heavy) Inspecting Organisation  
Heavy Vehicle Specialist Inspector and Inspecting Organisation

Heavy Vehicle Specialist Inspector's or Manufacturing Inspecting Organisation's Name (PRINT IN CAPS) **DON FORDHAM.** ID **HDF.**

Vehicle Registration\* VIN/Chassis Number  
**7 A 9 E 2 0 0 1 3 F 1 0 2 3 3 4**

Component being certified:

<input checked="" type="checkbox"/> Chassis Modification	<input checked="" type="checkbox"/> Load Anchorage	<input checked="" type="checkbox"/> Log Bolsters
<input checked="" type="checkbox"/> Towing Connection	<input checked="" type="checkbox"/> Brakes	<input checked="" type="checkbox"/> SRT
<input checked="" type="checkbox"/> PSV Stability	<input checked="" type="checkbox"/> PSV Rollover	<input checked="" type="checkbox"/> Swept Path
<input checked="" type="checkbox"/> PBS		

Certification Category  
**HUEK.**

Description of Work  
**TO COMPLY BRAKE SYSTEM. (DOMESTIC 5-AXLE FULL.)**

Code/Standard/Rule Certified to **N.Z.H.V.B. RULE 32015.** Component Load Rating(s) **GUM: 32000 kg.**

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

Supporting Documents  
**COMPLIANCE PAPERS.**

Special Conditions\*  
**N/A ROLL STABILITY (LATERAL ACCIDENT MITIGATOR) FITTED AND ACTIVATED.**

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 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 Appointment. To the best of my knowledge the information contained in the Certificate is true and correct.

Designer's ID (if different from inspector below)

Inspector's Signature **[Signature]**

Inspector's Name (PRINT IN CAPS) ID Number

Date **15-02-2015** Number **497074**

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:** 15/02/2015  
**Modified:** 15/02/2015

**Document:** 7A9E26013F1023334  
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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:** 7A9E26013F1023334

### Vehicle

Type	2x3 Drawbar trailer
Calculated effective wheelbase [m]	7.32
Laden (max.) mass [kg]	32000.00
Laden (max.) front axle group load [kg]	14000.00
Laden vertical position of CoG [m]	1.75
Unladen (min.) mass [kg]	8360.00
Unladen (min.) front axle group load [kg]	3760.00
Unladen vertical position of CoG [m]	0.98
Laden/unladen front air spring press. [bar]	4.30/0.70
Laden/unladen rear air spring press. [bar]	3.70/0.50

### Axles

	Axle 1	Axle 2	Axle 3	Axle 4	Axle 5
Axle distances [m]	-	<----- 1.31 ----->	<----- 5.40 ----->	<----- 1.26 ----->	<----- 1.26 ----->
Axle loads [kg]		Laden 7000 Unladen 1880	Laden 7000 Unladen 1880	Laden 6000 Unladen 1534	Laden 6000 Unladen 1533
Axle type		MERITOR (ROR) 361-0071-04-FBKV 265/70 R 19.5	MERITOR (ROR) 361-0071-04-FBKV 265/70 R 19.5	MERITOR (ROR) 361-0071-04-FBKV 265/70 R 19.5	MERITOR (ROR) 361-0071-04-FBKV 265/70 R 19.5
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 size or radius [mm] and Brake type		- Disc Elsa195 LE 2 x 16	- Disc Elsa195 LE 2 x 16	- Disc Elsa195 LE 2 x 16/24	- Disc Elsa195 LE 2 x 16/24
Actuator numb./axle & size		2 x 16	2 x 16	2 x 16/24	2 x 16/24
Actuator force at 6.5 bar [N]		6260	6260	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		22.0	22.0	22.0	22.0
Discbrake lever length [mm]		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

**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.  
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**System components**

No.	Name	Type	Characteristics
1	Coupling head	KU1...	-
2	Brake Chamber 16" stroke: 76	ROR	BZ 140.0 08/03/2002
3	Brake Chamber 16" stroke: 76	ROR	BZ 140.0 08/03/2002
4	Trailer EBS G2	ES206.	Sensors on axle 3
5	Brake Chamber 16" stroke: 76	ROR	BZ 140.0 08/03/2002
6	Brake Chamber 16" stroke: 76	ROR	BZ 140.0 08/03/2002
7	Electronic Module Premium	ES2071	-
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
12	Spring Brake Actuator 16/24" stroke: 64/64	ROR	BZ 119.6 / 01/02/2001
13	Spring Brake Actuator 16/24" stroke: 64/64	ROR	BZ 119.6 / 01/02/2001

**Axle identifiers**

Axle	Axle identifier	Brake identifier	Axle load identifier	Test report identifier
Axle 1				ID4-361-0071-04-FBKV
Axle 2				ID4-361-0071-04-FBKV
Axle 3				ID4-361-0071-04-FBKV
Axle 4				ID4-361-0071-04-FBKV
Axle 5				ID4-361-0071-04-FBKV



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Laden vehicle

Service	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5
brake	0.00	0.24	0.77	1.29	1.82	2.35	2.88	3.41	3.93	4.46	4.99	5.52	6.05	6.57	7.10
Coupling head pres. [bar]	0.00	2.43	7.81	13.19	18.57	23.96	29.34	34.73	40.11	45.49	50.87	56.25	61.63	67.02	72.40
Braking rate [%]	0.2	0.69	1.17	1.66	2.14	2.62	3.1	3.59	4.07	4.55	5.03	5.52	6	6.48	6.97
Axle 1 actuator pres. [bar]	0.00	0.58	2.20	3.82	5.44	7.06	8.68	10.30	11.92	13.54	15.16	16.78	18.41	20.03	21.65
Axle 1 braking torque [kNm]	0.00	1.37	5.22	9.07	12.92	16.77	20.62	24.47	28.32	32.17	36.02	39.87	43.72	47.57	51.41
Axle 1 braking force [kN]	0.00	0.02	0.07	0.12	0.17	0.22	0.26	0.30	0.34	0.38	0.41	0.44	0.48	0.51	0.54
Axle 1 adhesion utilised	0.2	0.69	1.17	1.66	2.14	2.62	3.1	3.59	4.07	4.55	5.03	5.52	6	6.48	6.97
Axle 2 actuator pres. [bar]	0.00	0.58	2.20	3.82	5.44	7.06	8.68	10.30	11.92	13.54	15.16	16.78	18.41	20.03	21.65
Axle 2 braking torque [kNm]	0.00	1.37	5.22	9.07	12.92	16.77	20.62	24.47	28.32	32.17	36.02	39.87	43.72	47.57	51.41
Axle 2 braking force [kN]	0.00	0.02	0.07	0.12	0.17	0.22	0.26	0.30	0.34	0.38	0.41	0.44	0.48	0.51	0.54
Axle 2 adhesion utilised	0.2	0.62	0.99	1.36	1.73	2.11	2.48	2.85	3.22	3.59	3.96	4.33	4.7	5.07	5.44
Axle 3 actuator pres. [bar]	0.00	0.69	1.98	3.27	4.56	5.85	7.14	8.43	9.72	11.01	12.30	13.59	14.88	16.17	17.46
Axle 3 braking torque [kNm]	0.00	1.63	4.89	7.76	10.82	13.89	16.95	20.03	23.09	26.16	29.22	32.28	35.35	38.41	41.48
Axle 3 braking force [kN]	0.00	0.03	0.08	0.14	0.20	0.26	0.33	0.40	0.47	0.55	0.63	0.72	0.81	0.91	1.02
Axle 3 adhesion utilised	0.2	0.62	0.99	1.36	1.73	2.11	2.48	2.85	3.22	3.59	3.96	4.33	4.7	5.07	5.44
Axle 4 actuator pres. [bar]	0.00	0.69	1.98	3.27	4.56	5.85	7.14	8.43	9.72	11.01	12.30	13.59	14.88	16.17	17.46
Axle 4 braking torque [kNm]	0.00	1.63	4.89	7.76	10.82	13.89	16.95	20.03	23.09	26.16	29.22	32.28	35.35	38.41	41.48
Axle 4 braking force [kN]	0.00	0.03	0.08	0.14	0.20	0.26	0.33	0.40	0.47	0.55	0.63	0.72	0.81	0.91	1.02
Axle 4 adhesion utilised	0.2	0.62	0.99	1.36	1.73	2.11	2.48	2.85	3.22	3.59	3.96	4.33	4.7	5.07	5.44
Axle 5 actuator pres. [bar]	0.00	0.69	1.98	3.27	4.56	5.85	7.14	8.43	9.72	11.01	12.30	13.59	14.88	16.17	17.46
Axle 5 braking torque [kNm]	0.00	1.63	4.89	7.76	10.82	13.89	16.95	20.03	23.09	26.16	29.22	32.28	35.35	38.41	41.48
Axle 5 braking force [kN]	0.00	0.03	0.08	0.14	0.20	0.26	0.33	0.40	0.47	0.55	0.63	0.72	0.81	0.91	1.02
Axle 5 adhesion utilised	0.00	0.03	0.08	0.14	0.20	0.26	0.33	0.40	0.47	0.55	0.63	0.72	0.81	0.91	1.02

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Service 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	0.34	1.41	2.47	3.54	4.61	5.68	6.74	7.81	8.88	9.94	11.01	12.08	13.15	14.21
Deceleration [m/s^2]	0.00	3.45	14.35	25.22	36.11	46.98	57.87	68.72	79.61	90.48	101.37	112.24	123.13	134.02	144.90
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	3.22	3.45
Axle 1 actuator pres. [bar]	0.00	0.06	0.81	1.56	2.31	3.06	3.82	4.57	5.32	6.07	6.83	7.58	8.33	9.09	9.84
Axle 1 braking torque [kNm]	0.00	0.13	1.92	3.71	5.50	7.28	9.07	10.85	12.65	14.43	16.22	18.00	19.79	21.58	23.37
Axle 1 braking force [kN]	0.00	0.01	0.10	0.19	0.27	0.35	0.42	0.49	0.55	0.62	0.68	0.73	0.79	0.84	0.89
Axle 1 adhesion utilised	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	3.22	3.45
Axle 2 actuator pres. [bar]	0.00	0.06	0.81	1.56	2.31	3.06	3.82	4.57	5.32	6.07	6.83	7.58	8.33	9.09	9.84
Axle 2 braking torque [kNm]	0.00	0.13	1.92	3.71	5.50	7.28	9.07	10.85	12.65	14.43	16.22	18.00	19.79	21.58	23.37
Axle 2 braking force [kN]	0.00	0.01	0.10	0.19	0.27	0.35	0.42	0.49	0.55	0.62	0.68	0.73	0.79	0.84	0.89
Axle 2 adhesion utilised	0.00	0.01	0.10	0.19	0.27	0.35	0.42	0.49	0.55	0.62	0.68	0.73	0.79	0.84	0.89
Axle 3 actuator pres. [bar]	0.2	0.53	0.74	0.96	1.18	1.39	1.61	1.82	2.04	2.25	2.47	2.68	2.9	3.12	3.33
Axle 3 braking torque [kNm]	0.00	0.36	1.11	1.86	2.61	3.36	4.11	4.86	5.61	6.36	7.11	7.87	8.62	9.37	10.12
Axle 3 braking force [kN]	0.00	0.86	2.64	4.42	6.21	7.99	9.77	11.55	13.33	15.12	16.90	18.68	20.47	22.25	24.03
Axle 3 adhesion utilised	0.00	0.06	0.18	0.31	0.45	0.60	0.76	0.92	1.10	1.29	1.49	1.71	1.94	2.20	2.47
Axle 4 actuator pres. [bar]	0.2	0.53	0.74	0.96	1.18	1.39	1.61	1.82	2.04	2.25	2.47	2.68	2.9	3.12	3.33
Axle 4 braking torque [kNm]	0.00	0.36	1.11	1.86	2.61	3.36	4.11	4.86	5.61	6.36	7.11	7.87	8.62	9.37	10.12
Axle 4 braking force [kN]	0.00	0.86	2.64	4.42	6.21	7.99	9.77	11.55	13.33	15.12	16.90	18.68	20.47	22.25	24.03
Axle 4 adhesion utilised	0.00	0.06	0.18	0.31	0.45	0.60	0.76	0.92	1.10	1.29	1.49	1.71	1.94	2.19	2.47
Axle 5 actuator pres. [bar]	0.2	0.53	0.74	0.96	1.18	1.39	1.61	1.82	2.04	2.25	2.47	2.68	2.9	3.12	3.33
Axle 5 braking torque [kNm]	0.00	0.36	1.11	1.86	2.61	3.36	4.11	4.86	5.61	6.36	7.11	7.87	8.62	9.37	10.12
Axle 5 braking force [kN]	0.00	0.86	2.64	4.42	6.21	7.99	9.77	11.55	13.33	15.12	16.90	18.68	20.47	22.25	24.03
Axle 5 adhesion utilised	0.00	0.06	0.18	0.31	0.45	0.60	0.76	0.92	1.10	1.29	1.49	1.71	1.94	2.20	2.47

Calculation pressure [bar]: 6.5

Database version: 13.0.32

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Miscellaneous

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

Pressure[bar] 2.86

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

Pressure[bar] Axle1 : 2.52 Axle2 : 2.52 Axle3 : 2.03 Axle4 :

Automatic braking performance ( laden case ) at 6.0 bar

Deceleration [m/s<sup>2</sup>] : 5.45

Braking rate [%] 55.5

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>] : 6.05

Braking rate [%] 61.6

Rear axle group

Deceleration [m/s<sup>2</sup>] : 6.05

Braking rate [%] 61.6

Parking brake Laden vehicle

	Up	Down
Max.slope [%] (must be > 18%)	-56.88	38.61
(max.spring force = 7605 N at 30 mm strok Required spring force at 18% slope		
Axle 1 [N]	-	-
Axle 2 [N]	-	-
Axle 3 [N]	2242	2242
Axle 4 [N]	2242	2242
Axle 5 [N]	2242	2242

Calculation pressure [bar]: 6.5

Database version: 13.0.32

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Trailer EBS parameters

Coupling head pressure [bar]	Brake chamber pressure [bar]	
	Unladen	Laden
0.7	0.79	1.07
1.6	0.79	1.07
6.5	2.9	4.7
Low-range comp. at 1.6 bar	0	0
High-range comp. at 4.5 bar	0	0

Axle and Tyre information

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

EMP parameters:

Coupling head pressure [bar]	Brake chamber pressure [bar]	
	Unladen	Laden
0.7	0.8	1.27
1.6	0.8	1.27
6.5	3	6
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]	4600	18000
voltages [V]	-	-
pressures [bar]	0.5	3.7

Air suspension	Unladen	Laden
Axle boogie load [kg]	3760	14000
voltages [V]	-	-
pressures [bar]	0.7	4.3

Pressure limitation [bar] -

3rd modulator logic is LS characteristic

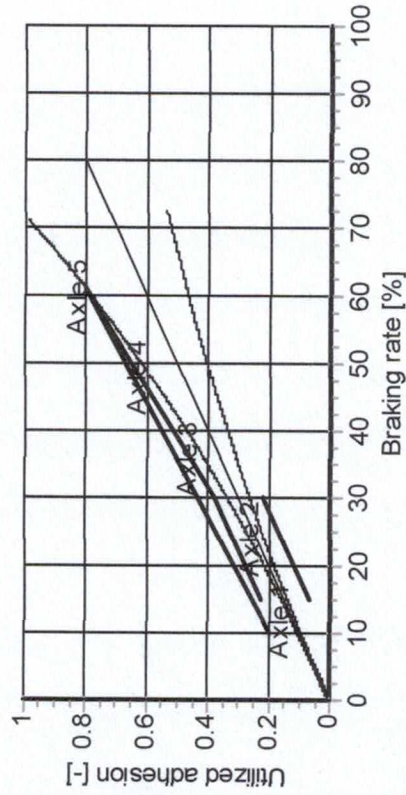
Slip differential [%] - from - [bar]

Calculation pressure [bar]: 6.5

Database version: 13.0.32

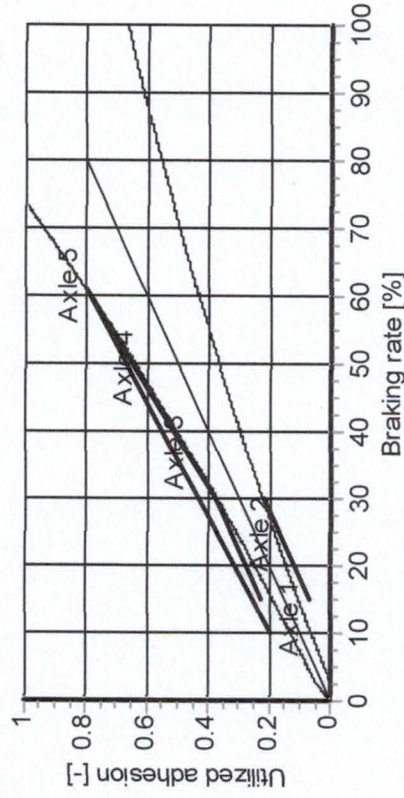


### Laden vehicle - adhesion utilisation



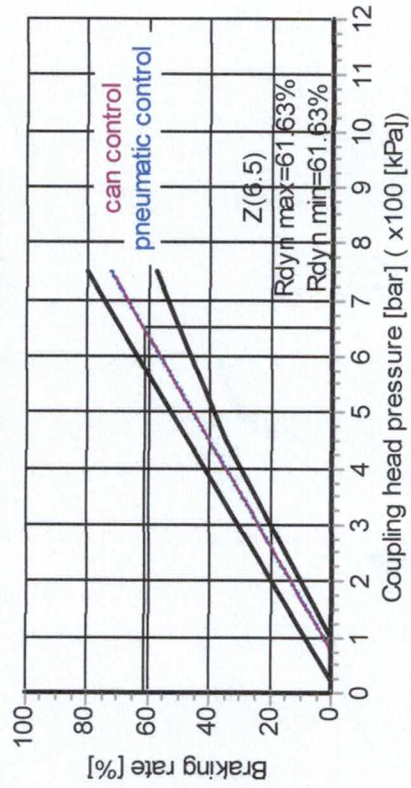
(With anti-lock system the adhesion requirements do not have to be fulfilled.)

### Unladen vehicle - adhesion utilisation



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

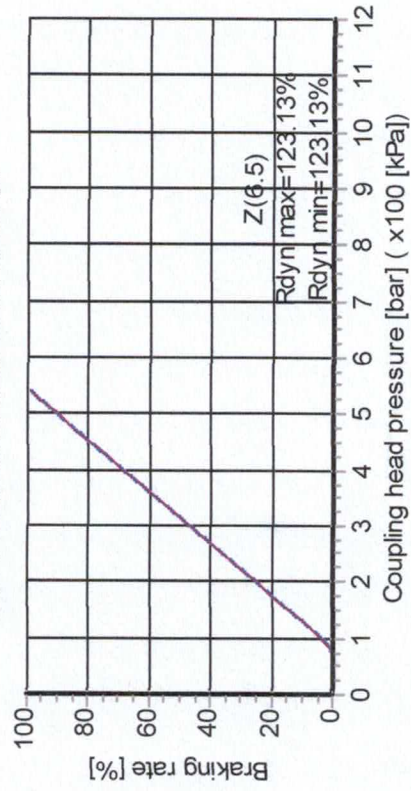
### Laden vehicle - compatibility with Pneumatic and CAN control



Calculation pressure [bar]: 6.5

Database version: 13.0.32

### Unladen vehicle - compatibility with Pneumatic and CAN control



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