

# 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) ID  
DON FORDHAM. HDF.

Vehicle registration (optional) VIN/chassis number  
7 A 9 E 2 5 0 1 8 H 1 0 2 3 6 1 9

Make Component being certified:  Chassis  Load anchorage  
DOMETT  Log bolsters  Towing connection  Brakes  
Model (optional)  SRT  PSV stability  PSV rollover  
S-AXLE FULL.  Swept path  PBS  
Certification category  
HVEK.

Description of work  
TO COMPLY BRAKE SYSTEM.

Code/standard/rule certified to Component load rating(s)  
N.Z.H.V.B. RULE 32015. GVM: 32000kg.

General drawing number(s)  
N/A

Supporting documents  
COMPLIANCE PAPERS.

Special conditions (optional)  
N/A

Certification expiry date (if applicable) or Hubodometer reading (whichever comes first)  
N/A.

**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  


Inspector's name (PRINT IN CAPS) ID number  
DON FORDHAM.

Date Number  
14-06-2017 595058

CoF vehicle inspector ID CoF vehicle inspector signature Date

All fields are mandatory unless otherwise stated.





**Company:** Brakespec Ltd  
**Author:** Don Fordham

**Created:** 14/06/2017  
**Modified:** 14/06/2017

**Document:** 7A9E25018H1023619  
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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 14.0).  
 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:** Dornett

**Vehicle:** 5-Axle Full

**Project:** 7A9E25018H1023619

**Vehicle**

Type	2x3 Drawbar trailer
Calculated effective wheelbase [m]	6.85
Laden (max.) mass [kg]	32000.00
Laden (max.) front axle group load [kg]	14000.00
Laden vertical position of CoG [m]	1.89
Unladen (min.) mass [kg]	5980.00
Unladen (min.) front axle group load [kg]	2800.00
Unladen vertical position of CoG [m]	0.98
Laden/unladen front air spring press.	[bar] 4.50/0.60
Laden/unladen rear air spring press.	[bar] 3.80/0.50

**Axles**

Axle distances [m]	Axle 1		Axle 2		Axle 3		Axle 4		Axle 5	
	Laden	Unladen	Laden	Unladen	Laden	Unladen	Laden	Unladen	Laden	Unladen
Axle loads [kg]	7000	1400	7000	1400	6000	1060	6000	1060	6000	1060
Axle type	MERITOR (ROR)	MERITOR (ROR)	MERITOR (ROR)	MERITOR (ROR)	MERITOR (ROR)	MERITOR (ROR)	MERITOR (ROR)	MERITOR (ROR)	MERITOR (ROR)	MERITOR (ROR)
Tyre size	361-0071-04-FBKV	361-0071-04-FBKV	361-0071-04-FBKV	361-0071-04-FBKV	361-0071-04-FBKV	361-0071-04-FBKV	361-0071-04-FBKV	361-0071-04-FBKV	361-0071-04-FBKV	361-0071-04-FBKV
Dyn. tyre radius [mm]	421	401	421	401	421	401	421	401	421	401
Stat. tyre radius [mm]	401	401	401	401	401	401	401	401	401	401
Brake size or radius [mm] and Brake type	- Disc	- Disc	- Disc	- Disc	- Disc	- Disc	- Disc	- Disc	- Disc	- Disc
Actuator numb./axle & size	Elsa195 LE	Elsa195 LE	Elsa195 LE	Elsa195 LE	Elsa195 LE	Elsa195 LE	Elsa195 LE	Elsa195 LE	Elsa195 LE	Elsa195 LE
Actuator force at 6.5 bar [N]	2 x 16 6590	2 x 16 6590	2 x 16 6260	2 x 16/24 6260	2 x 16/24 6260	2 x 16/24 6260	2 x 16/24 6260	2 x 16/24 6260	2 x 16/24 6260	2 x 16/24 6260
Slack adjuster length [mm]	-	-	-	-	-	-	-	-	-	-
Thresh.mom.[Nm] or force[N]	81.00	81.00	81.00	81.00	81.00	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	22.0	22.0	22.0	22.0	22.0
Dischbrake lever length [mm]	74	74	74	74	74	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	ROR 8616 AF	ROR 8616 AF	ROR 8616 AF	ROR 8616 AF	ROR 8616 AF
Cam shaft length [mm]	-	-	-	-	-	-	-	-	-	-

**Calculation pressure [bar]:** 6.5  
**Database version:** 14.0.41

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**System components**

No.	Name	Type	Characteristics
1	Coupling head	KU1...	-
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	Trailer EBS G2.x	ES206./9.	Sensors on axle 3
5	Brake Chamber 16" stroke: 64	ROR	BZ 122.1 15/09/2000
6	Brake Chamber 16" stroke: 64	ROR	BZ 122.1 15/09/2000
7	Electronic Module Premium	ES2071	-
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
12	Spring Brake Actuator 16/24" stroke: 76/76	ROR	BZ 141.0 / 08/03/2002
13	Spring Brake Actuator 16/24" stroke: 76/76	ROR	BZ 141.0 / 08/03/2002

**Axle identifiers**

Axle	Axle identifier	Brake identifier	Axle load ident.	Test report identifier	Suffix	Test code
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		

Calculation pressure [bar]: 6.5

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Service	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
brake		0.00	0.19	0.73	1.27	1.81	2.35	2.88	3.42	3.96	4.50	5.04	5.58	6.12	6.66	7.19
	Deceleration [m/s <sup>2</sup> ]	0.00	1.94	7.43	12.92	18.41	23.91	29.40	34.89	40.38	45.88	51.37	56.86	62.36	67.85	73.34
	Braking rate [%]	0.00	0.61	1.15	1.68	2.22	2.75	3.29	3.82	4.36	4.89	5.43	5.96	6.5	7.04	7.57
	Axle 1 actuator pres. [bar]	0.00	0.67	2.53	4.39	6.25	8.12	9.98	11.84	13.70	15.56	17.43	19.29	21.15	23.02	24.88
	Axle 1 braking torque [kNm]	0.00	1.58	6.01	10.43	14.85	19.28	23.70	28.12	32.55	36.97	41.39	45.82	50.25	54.67	59.10
	Axle 1 adhesion utilised	0.00	0.02	0.08	0.14	0.19	0.24	0.29	0.34	0.38	0.42	0.46	0.49	0.53	0.56	0.59
	Axle 2 actuator pres. [bar]	0.00	0.61	1.15	1.68	2.22	2.75	3.29	3.82	4.36	4.89	5.43	5.96	6.5	7.04	7.57
	Axle 2 braking torque [kNm]	0.00	0.67	2.53	4.39	6.25	8.12	9.98	11.84	13.70	15.56	17.43	19.29	21.15	23.02	24.88
	Axle 2 adhesion utilised	0.00	0.02	0.08	0.14	0.19	0.24	0.29	0.34	0.38	0.42	0.46	0.49	0.53	0.56	0.59
	Axle 3 actuator pres. [bar]	0.00	0.64	0.99	1.34	1.69	2.04	2.39	2.75	3.1	3.45	3.8	4.15	4.5	4.85	5.2
	Axle 3 braking torque [kNm]	0.00	0.41	1.59	2.77	3.94	5.12	6.30	7.48	8.65	9.83	11.01	12.19	13.37	14.55	15.72
	Axle 3 adhesion utilised	0.00	0.02	0.07	0.12	0.17	0.23	0.30	0.36	0.44	0.51	0.59	0.68	0.78	0.88	0.99
	Axle 4 actuator pres. [bar]	0.00	0.64	0.99	1.34	1.69	2.04	2.39	2.75	3.1	3.45	3.8	4.15	4.5	4.85	5.2
	Axle 4 braking torque [kNm]	0.00	0.41	1.59	2.77	3.94	5.12	6.30	7.48	8.65	9.83	11.01	12.19	13.37	14.55	15.72
	Axle 4 adhesion utilised	0.00	0.02	0.07	0.12	0.17	0.23	0.30	0.36	0.44	0.51	0.59	0.68	0.78	0.88	0.99
	Axle 5 actuator pres. [bar]	0.00	0.64	0.99	1.34	1.69	2.04	2.39	2.75	3.1	3.45	3.8	4.15	4.5	4.85	5.2
	Axle 5 braking torque [kNm]	0.00	0.41	1.59	2.77	3.94	5.12	6.30	7.48	8.65	9.83	11.01	12.19	13.37	14.55	15.72
	Axle 5 adhesion utilised	0.00	0.02	0.07	0.12	0.17	0.23	0.30	0.36	0.44	0.51	0.59	0.68	0.78	0.88	0.99

Calculation pressure [bar]: 6.5

Database version: 14.0.41

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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	0.30	1.38	2.46	3.54	4.62	5.70	6.79	7.87	8.95	10.03	11.11	12.19	13.27	14.36
Deceleration [m/s <sup>2</sup> ]		0.00	3.04	14.04	25.07	36.10	47.12	58.15	69.18	80.21	91.24	102.26	113.29	124.29	135.32	146.35
Braking rate [%]		0.00	0.17	0.65	0.82	1	1.17	1.35	1.52	1.7	1.87	2.05	2.22	2.4	2.58	2.75
Axle 1 actuator pres. [bar]		0.00	0.47	0.77	1.38	2.00	2.61	3.22	3.83	4.44	5.05	5.66	6.27	6.88	7.49	8.10
Axle 1 braking torque [kNm]		0.00	0.39	1.84	3.29	4.74	6.19	7.64	9.09	10.55	12.00	13.45	14.90	16.34	17.79	19.25
Axle 1 adhesion utilised		0.00	0.03	0.13	0.22	0.31	0.39	0.47	0.55	0.62	0.68	0.75	0.81	0.86	0.92	0.97
Axle 2 actuator pres. [bar]		0.2	0.47	0.65	0.82	1	1.17	1.35	1.52	1.7	1.87	2.05	2.22	2.4	2.58	2.75
Axle 2 braking torque [kNm]		0.00	0.17	0.77	1.38	2.00	2.61	3.22	3.83	4.44	5.05	5.66	6.27	6.88	7.49	8.10
Axle 2 adhesion utilised		0.00	0.39	1.84	3.29	4.74	6.19	7.64	9.09	10.55	12.00	13.45	14.90	16.34	17.79	19.25
Axle 3 actuator pres. [bar]		0.00	0.03	0.13	0.22	0.31	0.39	0.47	0.55	0.62	0.68	0.75	0.81	0.86	0.92	0.97
Axle 3 braking torque [kNm]		0.00	0.56	0.71	0.86	1.01	1.16	1.31	1.45	1.6	1.75	1.9	2.05	2.2	2.35	2.5
Axle 3 adhesion utilised		0.00	0.14	0.64	1.14	1.64	2.14	2.64	3.14	3.64	4.14	4.64	5.14	5.65	6.15	6.65
Axle 4 actuator pres. [bar]		0.00	0.33	1.52	2.71	3.90	5.09	6.28	7.47	8.65	9.84	11.03	12.22	13.41	14.60	15.79
Axle 4 braking torque [kNm]		0.00	0.03	0.15	0.28	0.42	0.56	0.72	0.88	1.06	1.25	1.46	1.69	1.94	2.21	2.51
Axle 4 adhesion utilised		0.2	0.56	0.71	0.86	1.01	1.16	1.31	1.45	1.6	1.75	1.9	2.05	2.2	2.35	2.5
Axle 5 actuator pres. [bar]		0.00	0.14	0.64	1.14	1.64	2.14	2.64	3.14	3.64	4.14	4.64	5.14	5.65	6.15	6.65
Axle 5 braking torque [kNm]		0.00	0.03	0.15	0.28	0.42	0.56	0.72	0.88	1.06	1.25	1.46	1.69	1.94	2.21	2.51
Axle 5 adhesion utilised		0.00	0.33	1.52	2.71	3.90	5.09	6.28	7.47	8.65	9.84	11.03	12.22	13.41	14.60	15.79

Calculation pressure [bar]: 6.5

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Miscellaneous

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

Pressure[bar] 2.87

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

Pressure[bar] Axle1 : 2.65 Axle2 : 2.65 Axle3 : 1.97 Axle4 :

Automatic braking performance ( laden case ) at 6.0 bar

Deceleration [m/s^2] : 5.09

Braking rate [%] 51.9

Vehicle performance in case of a load sensing device  
 control failure ( laden case ) at 6.5 bar

Front axle group

Deceleration [m/s^2] : 6.12

Braking rate [%] 62.4

Rear axle group

Deceleration [m/s^2] : 6.12

Braking rate [%] 62.4

Parking brake Laden vehicle

Max. slope [%]	Up	Down
(must be > 18%)	-59.04	37.68

(max. spring force = 7120 N at 30 mm strok  
 Required spring force at 18% slope

Axle 1 [N]	-
Axle 2 [N]	-
Axle 3 [N]	2242
Axle 4 [N]	2242
Axle 5 [N]	2242

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Trailer EBS parameters

Coupling head pressure [bar]	Brake chamber pressure [bar]	
0.8	Unladen	Laden
1.6	0.74	1.06
6.5	2.2	4.5
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]	3180	18000
voltages [V]	-	-
pressures [bar]	0.5	3.8

defined by vehicle manufacturer

Axle and Tyre information

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

EMP parameters:

Coupling head pressure [bar]	Brake chamber pressure [bar]	
0.8	Unladen	Laden
1.6	0.68	1.26
6.5	2.4	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]	2800	14000
voltages [V]	-	-
pressures [bar]	0.6	4.5

Pressure limitation [bar] - -

3rd modulator logic is LS characteristic

Slip differential [%] - - from - [bar]

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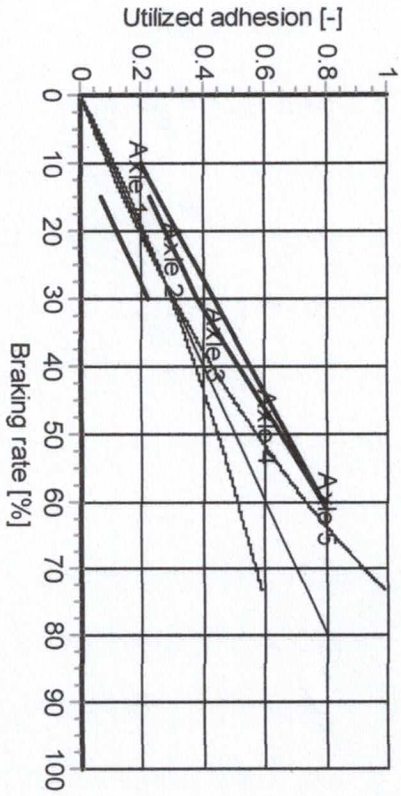


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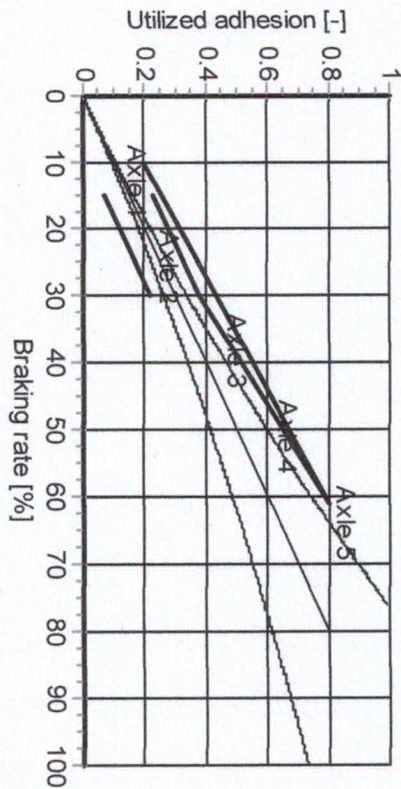
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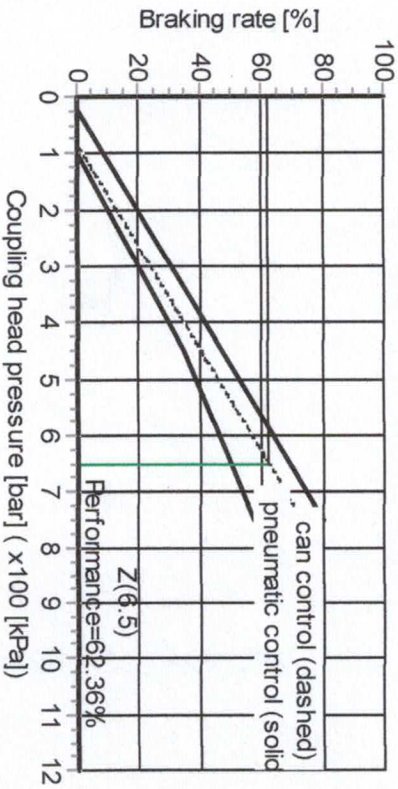
### Laden vehicle - adhesion utilisation



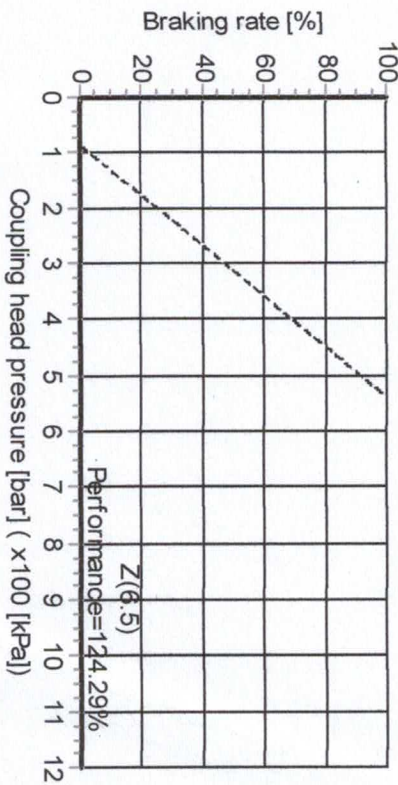
### Unladen vehicle - adhesion utilisation



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



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



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