

ECU Configuration	4S : 3M Front Remote, Rear Master ECU Left
Vehicle Ident Number	7A9E2501XG1023507
Brake Calculation	023507
Manufacturer	Domett
ECU Serial Number	046105_85
Software	E719
Odometer (km)	0
Date (DD/MM/YY)	06/09/16
Time	09:49

Wheel Scale	Rdyn (mm)	No. Of Teeth
S1A/S1B	421	90
S2A/S2B	421	90

Sensor Tests			Not Applicable
S1A	S1B	S2A	S2B
-	-	-	-

Sensor-Modulator Tests			Passed
S1A	S1B	S2A	S2B
Passed	Passed	Passed	Passed

Push Through Tests		Passed
P21	P22	P23
6.5	6.5	6.6

EBS Pressure Tests					Passed		
	INPUTS		OUTPUTS		Results		
	MASTER	REMOTE	MASTER	REMOTE	P21	P22	P23
Unladen Suspension	0.4	0.6					
Laden Suspension	3.8	4.1					
P0	0.4	0.4					
PD	0.7	0.7	0.4	0.4	0.6	0.4	0.4
PP1 [U]					0.5	0.6	0.4
PP1 [L]	1.5	1.5	0.9	1.2	0.9	0.9	1.3
PP2 [U]					1.5	1.6	1.7
PP2 [L]	4.5	4.5	3.2	4.3	3.3	3.0	4.1
PP3 [U]	6.5	6.5	2.2	2.4	2.3	2.3	2.2
PP3 [L]	6.5	6.5	4.6	6.3	4.6	4.5	6.1
P Limit			8.0	8.0			

Options			
		REV	

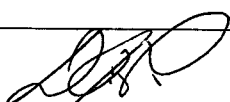
Auxiliary Tests			Passed
Lamp		On / Off	Passed
Aux 1	No Aux		-
Aux 2 Red	No Aux		-
Aux 2 Yel	No Aux		-
Aux 3 Red	No Aux		-
Aux 3 Yel	No Aux		-
Aux 4	No Aux		-
Aux 5	No Aux		-
Lat Acc Internal	Fitted		Passed
24N			-

Leak Test		Not Applicable
Pressure Drop	-	Time Period
		-

EB+ Soft Docking			Not Applicable
Channels	Sensors	Offset (0 ... 60)	
Yellow Channel	-	-	Not Applicable
Green Channel	-	-	Not Applicable
Beeper	Not Applicable	Lights	Not Applicable

Notes

Operator's Name: Brakespec Ltd

Signature:  (HDF) (HUEK)



Company: Don Fordham
Author: Don Fordham

Created: 21/05/2016
Modified: 21/05/2016

Document: 7A9E2501XG1023507
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 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: Domett
Vehicle: 5-Axle Full
Project: 7A9E2501XG1023507

Vehicle

Type	2x3 Drawbar trailer
Calculated effective wheelbase [m]	6.21
Laden (max.) mass [kg]	32000.00
Laden (max.) front axle group load [kg]	14000.00
Laden vertical position of CoG [m]	1.92
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] 4.50/0.50
Laden/unladen rear air spring press.	[bar] 3.80/0.40

Axles

Axle distances [m]	Axle 1		Axle 2		Axle 3		Axle 4		Axle 5	
Axle loads [kg]	Laden	7000	Unladen	1400	7000	1400	6000	1060	6000	1060
Axle type	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	
Dyn. tyre radius [mm]	421		421		421		421		421	
Stat. tyre radius [mm]	401		401		401		401		401	
Brake size or radius [mm] and Brake type	Disc		Disc		Disc		Disc		Disc	
Actuator numbr./axle & size	Elsat195 LE		Elsat195 LE		Elsat195 LE		Elsat195 LE		Elsat195 LE	
Actuator force at 6.5 bar [N]	2 x 16 6590		2 x 16 6590		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	
Brake Factor by Annex 19	22.0		22.0		22.0		22.0		22.0	
Dischbrake 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	
Cam shaft length [mm]	-		-		-		-		-	

Calculation pressure [bar]: 6.5
Database version: 14.0.41

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Company: Don Fordham
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Created: 21/05/2016 Document: 7A9E2501XG1023507
 Modified: 21/05/2016 Page: 2 / 7

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
 Database version: 14.0.41

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Created: 21/05/2016
 Modified: 21/05/2016

Document: 7A9E2501XG1023507
 Page: 3 / 7

Laden vehicle

Service	brake	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	1.29	1.82	2.35	2.89	3.42	3.95	4.49	5.02	5.55	6.09	6.63	7.17
Deceleration [m/s ²]		0.00	2.24	7.68	13.12	18.55	23.99	29.43	34.87	40.31	45.75	51.19	56.63	62.07	67.56	73.04
Braking rate [%]		0.2	0.71	1.21	1.72	2.23	2.74	3.25	3.76	4.27	4.77	5.28	5.79	6.3	6.82	7.34
Axle 1 actuator pres. [bar]		0.00	0.98	2.75	4.52	6.29	8.06	9.83	11.61	13.37	15.15	16.92	18.69	20.46	22.26	24.06
Axle 1 braking torque [kNm]		0.00	2.33	6.54	10.75	14.95	19.15	23.36	27.57	31.77	35.97	40.18	44.39	48.59	52.87	57.15
Axle 1 braking force [kN]		0.00	0.03	0.09	0.14	0.19	0.24	0.28	0.32	0.36	0.40	0.43	0.46	0.49	0.52	0.55
Axle 1 adhesion utilised		0.00	0.03	0.09	0.14	0.19	0.24	0.28	0.32	0.36	0.40	0.43	0.46	0.49	0.52	0.55
Axle 2 actuator pres. [bar]		0.00	0.98	2.75	4.52	6.29	8.06	9.83	11.61	13.37	15.15	16.92	18.69	20.46	22.26	24.06
Axle 2 braking torque [kNm]		0.00	2.33	6.54	10.75	14.95	19.15	23.36	27.57	31.77	35.97	40.18	44.39	48.59	52.87	57.15
Axle 2 braking force [kN]		0.00	0.03	0.09	0.14	0.19	0.24	0.28	0.32	0.36	0.40	0.43	0.46	0.49	0.52	0.55
Axle 2 adhesion utilised		0.00	0.03	0.09	0.14	0.19	0.24	0.28	0.32	0.36	0.40	0.43	0.46	0.49	0.52	0.55
Axle 3 actuator pres. [bar]		0.00	0.62	0.98	1.34	1.7	2.07	2.43	2.79	3.15	3.51	3.88	4.24	4.6	4.96	5.32
Axle 3 braking torque [kNm]		0.00	0.33	1.55	2.76	3.98	5.19	6.41	7.62	8.84	10.06	11.27	12.49	13.71	14.92	16.14
Axle 3 braking force [kN]		0.00	0.01	0.07	0.12	0.18	0.24	0.31	0.38	0.46	0.54	0.63	0.73	0.84	0.96	1.09
Axle 3 adhesion utilised		0.00	0.01	0.07	0.12	0.18	0.24	0.31	0.38	0.46	0.54	0.63	0.73	0.84	0.96	1.09
Axle 4 actuator pres. [bar]		0.00	0.62	0.98	1.34	1.7	2.07	2.43	2.79	3.15	3.51	3.88	4.24	4.6	4.96	5.32
Axle 4 braking torque [kNm]		0.00	0.33	1.55	2.76	3.98	5.19	6.41	7.62	8.84	10.06	11.27	12.49	13.71	14.92	16.14
Axle 4 braking force [kN]		0.00	0.01	0.07	0.12	0.18	0.24	0.31	0.38	0.46	0.54	0.63	0.73	0.84	0.96	1.09
Axle 4 adhesion utilised		0.00	0.01	0.07	0.12	0.18	0.24	0.31	0.38	0.46	0.54	0.63	0.73	0.84	0.96	1.09
Axle 5 actuator pres. [bar]		0.00	0.62	0.98	1.34	1.7	2.07	2.43	2.79	3.15	3.51	3.88	4.24	4.6	4.96	5.32
Axle 5 braking torque [kNm]		0.00	0.33	1.55	2.76	3.98	5.19	6.41	7.62	8.84	10.06	11.27	12.49	13.71	14.92	16.14
Axle 5 braking force [kN]		0.00	0.01	0.07	0.12	0.18	0.24	0.31	0.38	0.46	0.54	0.63	0.73	0.84	0.96	1.09
Axle 5 adhesion utilised		0.00	0.01	0.07	0.12	0.18	0.24	0.31	0.38	0.46	0.54	0.63	0.73	0.84	0.96	1.09

Calculation pressure [bar]: 6.5

Database version: 14.0.41

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Created: 21/05/2016

Modified: 21/05/2016

Document: 7A9E2501XG1023507

Page: 4 / 7

Service	Unladen vehicle														
brake	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	1.22	2.32	3.41	4.51	5.61	6.71	7.81	8.90	10.00	11.10	12.19	13.30	14.41
Deceleration [m/s ²]	0.00	2.26	12.42	23.61	34.81	45.99	57.15	68.38	79.56	90.72	101.95	113.13	124.29	135.56	146.86
Braking rate [%]	0.00	0.5	0.68	0.85	1.02	1.19	1.37	1.54	1.71	1.88	2.06	2.23	2.4	2.58	2.75
Axle 1 actuator pres. [bar]	0.00	0.28	0.88	1.48	2.08	2.68	3.28	3.88	4.48	5.08	5.68	6.28	6.88	7.49	8.10
Axle 1 braking torque [kNm]	0.00	0.66	2.09	3.52	4.94	6.37	7.79	9.22	10.65	12.07	13.49	14.92	16.34	17.79	19.25
Axle 1 adhesion utilised	0.00	0.05	0.15	0.24	0.32	0.40	0.48	0.55	0.61	0.67	0.73	0.79	0.84	0.89	0.94
Axle 2 actuator pres. [bar]	0.00	0.28	0.88	1.48	2.08	2.68	3.28	3.88	4.48	5.08	5.68	6.28	6.88	7.49	8.10
Axle 2 braking torque [kNm]	0.00	0.66	2.09	3.52	4.94	6.37	7.79	9.22	10.65	12.07	13.49	14.92	16.34	17.79	19.25
Axle 2 adhesion utilised	0.00	0.05	0.15	0.24	0.32	0.40	0.48	0.55	0.61	0.67	0.73	0.79	0.84	0.89	0.94
Axle 3 actuator pres. [bar]	0.00	0.49	0.65	0.8	0.96	1.11	1.27	1.42	1.58	1.73	1.89	2.04	2.2	2.36	2.51
Axle 3 braking torque [kNm]	0.00	0.44	0.65	0.8	0.96	1.11	1.27	1.42	1.58	1.73	1.89	2.04	2.2	2.36	2.51
Axle 3 adhesion utilised	0.00	0.00	0.10	0.23	0.38	0.53	0.69	0.87	1.06	1.28	1.51	1.76	2.04	2.35	2.71
Axle 4 actuator pres. [bar]	0.00	0.49	0.65	0.8	0.96	1.11	1.27	1.42	1.58	1.73	1.89	2.04	2.2	2.36	2.51
Axle 4 braking torque [kNm]	0.00	0.44	0.65	0.8	0.96	1.11	1.27	1.42	1.58	1.73	1.89	2.04	2.2	2.36	2.51
Axle 4 adhesion utilised	0.00	0.00	0.10	0.23	0.38	0.53	0.69	0.87	1.06	1.28	1.51	1.76	2.04	2.35	2.71
Axle 5 actuator pres. [bar]	0.00	0.49	0.65	0.8	0.96	1.11	1.27	1.42	1.58	1.73	1.89	2.04	2.2	2.36	2.51
Axle 5 braking torque [kNm]	0.00	0.44	0.65	0.8	0.96	1.11	1.27	1.42	1.58	1.73	1.89	2.04	2.2	2.36	2.51
Axle 5 adhesion utilised	0.00	0.00	0.10	0.23	0.38	0.53	0.69	0.87	1.06	1.28	1.51	1.76	2.04	2.35	2.71

Calculation pressure [bar]: 6.5

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Miscellaneous

Company: Don Fordham
Author:

Created: 21/05/2016
Modified: 21/05/2016

Document: 7A9E2501XG1023507
Page: 5 / 7

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 : 2.64 Axle2 : 2.64 Axle3 : 1.99 Axle4 :

Automatic braking performance (laden case) at 6.0 bar

Deceleration [m/s²] : 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/s²] : 6.09

Braking rate [%] 62.1

Rear axle group

Deceleration [m/s²] : 6.09

Braking rate [%] 62.1

Parking brake Laden vehicle

Max slope [%]	Up	Down
(must be > 18%)	-61.10	36.88

(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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Document: 7A9E2501XG1023507
 Page: 6 / 7

Trailer EBS parameters

Coupling head pressure [bar]	Brake chamber pressure [bar]	
	Unladen	Laden
0.7	0.4	
1.6	0.68	1.05
6.5	2.2	4.6
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	0.4	
1.6	0.71	1.32
6.5	2.4	6.3
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]	0.5	4.5

Air suspension	Unladen	Laden
Axle boogie load [kg]	3180	18000
voltages [V]	-	-
pressures [bar]	0.4	3.8

defined by vehicle manufacturer

Pressure limitation [bar] -

3rd modulator logic is LS characteristic

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

Calculation pressure [bar]: 6.5

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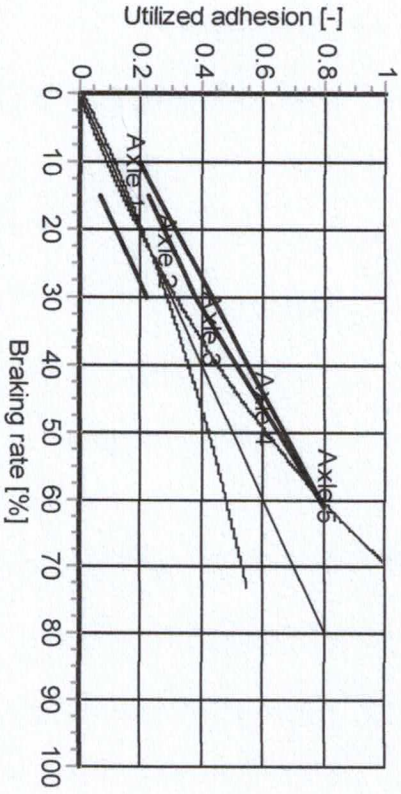


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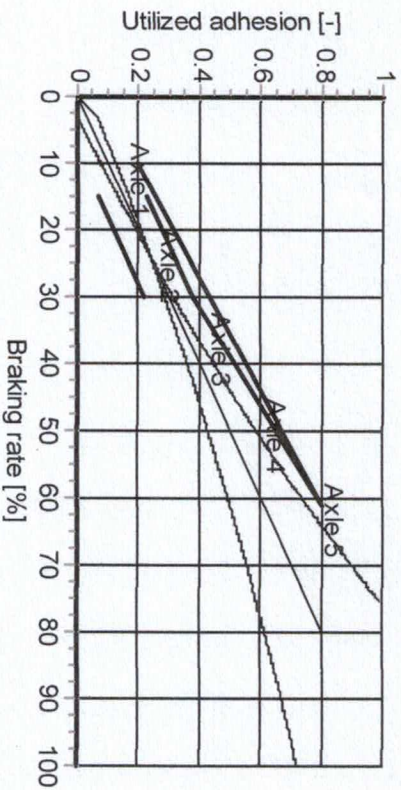
Document: 7A9E2501XG1023507
Page: 7 / 7

Laden vehicle - adhesion utilisation



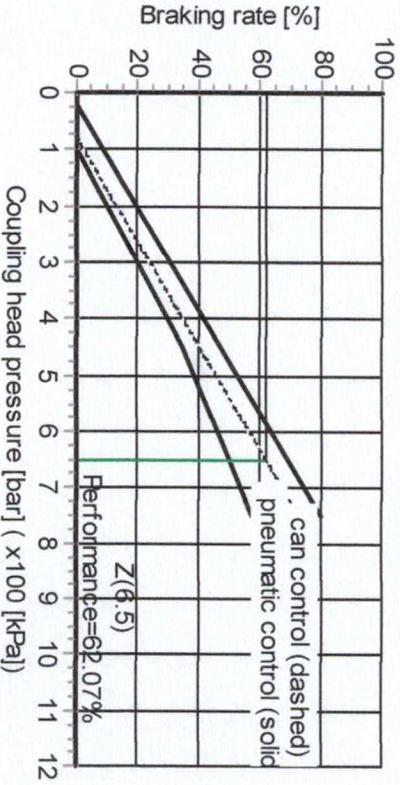
(With anti-lock system the adhesion requirements do not have to be fulfilled.)

Unladen vehicle - adhesion utilisation

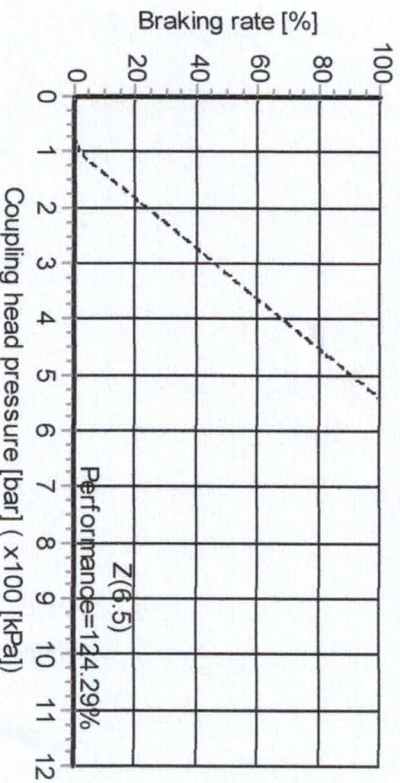


(With anti-lock system the adhesion requirements do not have to be fulfilled.)

Laden vehicle - compatibility with Pneumatic and CAN control



Unladen vehicle - compatibility with Pneumatic and CAN control



Calculation pressure [bar]: 6.5

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